Subject Index 1996

Corrigenda to previous volumes

Andersen K.E., Begtrup M., Chorghade M.S., Lee E.C., Lau J., Lundt B.F., Petersen H., Sørensen P.O., Thøgersen H.: 50, 8699 (1994): reaction of I to give II is in error, 3375

Doboszewski B., Blaton N., Rozenski J., De Bruyn A., Herdewijn P.: 51, 5381 (1995): correction to value of J_{5'eq,4'} on page 5389, 1479

Ichiba T., Scheuer P.J., Kelly-Borges M.: 51, 12195 (1995): C3 stereochemistry of structures 8-13 and of fig 1 should be reversed, 14079

Moreno-Mañas M., Sebastián R.M., Vallribera A., Molins E.: **51**, 10795 (1995): additional references cited, 2269

Ye M., Logaraj S., Jackman L.M., Hillegass K., Hirsch K.A., Bollinger A.M., Grosz A.L., Mani V.: **50**, 6109 (1994): correction to author name, 6249

Reports

anatoxin-a, synthetic approaches to, 6025 aqueous Barbier-Grignard type reactions, scope, mechanism and synthetic applications, 5643 Baylis-Hillman reaction, 8001

chemistry of C-element-substituted phosphorus ylids, 1855

[4+4]-cycloaddition and its strategic application in natural product synthesis, 6251

enantioselective desymmetrisation of achiral epoxides, 14361

enantioselective synth through enzymatic asymmetrisation, 3769

enediynes, enyne allenes and related compds, 6453

flash photolysis generation and reactivities of carbenium ions and nitrenium ions, 6823

free-radical homolytic substitution, new methods for formation of bonds to heteroatoms, 13265 *trans*-4-hydroxy-L-proline as a chiral starting block, 13803

methods for the synthesis of gem-difluoromethylene compds, 8619

1-\(\beta\)-methyl carbapenem antibiotics, prep of two

pivotal intermediates for synth of, 331 micellar solutions as reaction media, 11113 nucleophilic additions to unsymmetrically substituted trigonal carbons, diastereofacial selection in, 5263

organochlorozirconocene complexes, synthetic applications of, 12853

oxidation of the carbon-silicon bond, 7599 recent developments in kainoid amino acid chemistry, 4149

resorcinarenes, synth and chemistry of, 2663 solid-phase organic reactions; literature review, 4527

stereochemistry of palladium catalysed cyclisation reactions; cascade reactions, 9289

strategies in oligosaccharide synth, 1095

1,2,3,4-tetrahydroquinolines, recent progress in synth of, 15031

transformations of β -dicarbonyl compds by reactions of their transition metal complexes with carbon and oxygen electrophiles, 3377

Symposia-in-print

cascade reactions, 11385

fluoroorganic chemistry: synthetic challenges and biomedicinal rewards, 1

fullerene chemistry, 4925

new synthetic methods - organometallics in organic chemistry, 7201

novel applications of heterocycles in synthesis, 3057

Acetals

alkoxy-1,4-diheteroepanes, reaction with 5-fluorouracil, ring opening to provide 5-fluorouracil derivs, 8907

aromatic aldehyde diethyl acetals, reaction with diethyl phosphoroamidate, synth of *N*-(diethoxyphosphoryl)aldimines, 8789

aryl spiroacetals related to the papulacandin antifungal agents, synth involving addition of ortho-lithiated diethylbenzamides to lactones followed by cyclisation of the resulting ketoalcohols, 9553

1,4-benzoxazinone acetal glucosides GDIBOA and GDIMBOA from *Gramineae* sp., synth by glucosidation of 2,4-dihydroxy-2*H*-1,4-benz-

oxazin-3(4H)-one, 10389

N-butadienyl-N-alkylketene N,O-t-butyldimethylsilyl acetals, synth and cascade Diels-Alder reaction of followed by acylation, synth of bicyclic and tricyclic products, 11643

2,3-butanedione diketal, dialkylation of with 1,8-bis(trimethylsilyl)-2,6-octadiene, synth of 1-acetyl-1-methyl-2,5-divinylcyclopentane which could be converted to 12-oxoestrane derivs, 9093

carbon acetal-tethered trienes, Diels-Alder reactions of, 8937

chiral α -arylsulfinyl acetals, diastereoselective β -elimination of, asymmetric desymmetrisation of *meso*-1,2-diols, 6527

cyclic methyleneketals, synth by methoxymethylation of tartrate, 8517

dilithiated 3-tosylpropanal dimethyl acetal as β , β -acylvinyl dianion or homoenolate dianion equivalent, 4111

dithioacetals from electrophilic substitution of 1-[3-methyl-2-(2-thiolanylthio)-butyl]piperidine, 12745

fused acetals by treatment of β -diketones and β -ketoesters with ceric ammonium nitrate and sodium hydrogen carbonate followed by addition to cyclic enol ethers, 12495

ketalised 3,4-dihydroxybutyllithiums, new intermediates to transfer four-carbon diol functionality to electrophilic reagents, 8333

ketals or enol ethers of 1,5-azido ketones, Schmidt reactions with alkyl azides, 3403

S,N-ketene acetals, Horner-Wittig approach to and acid-catalysed hydrolysis to (S)-thioesters, 11095

O,S-ketene silyl acetals, design and diastereoselective Mukaiyama-Michael reaction of, 9409, 9419

nitroso acetals, synth by tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of nitroalkenes bearing a pendant olefin, 11579

 α -oxoketene dithioacetals, reduction with Zn/ZnCl₂-TMEDA in ethanol, synth of β -methylthiomethylene ketones, β -methylthioketones and α -methylketones, 4679

peroxyacetals and peroxyketals, mechanism of thermolysis of, 8263

pheromones wih spiroketal structure of *Bactrocera nigrotibialis*, *Andrena wilkella* and *Andrena haemorrhoa* F, synth from chiral nitro alcohol, 6139

quinone monoketals, photochemical rearrange-

ment of, 5707

silyl ketene acetals, addition to ferrocenylmethyl ethers, synth of precursors to chiral bridged ferrocenophanes, 1461

N,O-spiroketal formation in synth of (+)-hydantocidin from D-fructose and in one-step synth from D-isoascorbic acid and urea, 1177 trimethylsilylketene acetals, reaction with carbohydrate derived cyclic enolethers, synth of 2,3-unsaturated C-glycosides, 6397

 α,β -unsaturated and α -phenyl acetals, reaction with epoxides promoted by lithium-potassium mixed base LICKOR, synth of homoallyl alcohols, 1433

 γ , δ -unsaturated acetals and aldehydes, synth by ruthenium catalysed coupling of allyl alcohol with alkynes, 5511

uridine 5'-monoselenoacetals, prep by seleno-Pummerer reaction of 5'-deoxy-5'-phenylselenouridines, use as substrates for radicalmediated reactions with allyltributyltin, diastereoselective homolytic C-C bond formation, 9469

see also Thioacetals

Acetogenins

aromin and aromicin, bioactive annonaceous acetogenins with bis-THF ring structure from *Xylopia aromatica*, structures and cytotoxic activity, 4215

epoxyrollin A, annonaceous acetogenin, synth of the epoxy lactone proposed for, 9399

tonkinenin A, polyoxygenated cyclohexane deriv from *Uvaria tonkinensis*, structure, 12373

Acetylenes

see Alkynes

Acylation

acylation procedure of a mixed anhydride for synth of β , γ -unsaturated N-acyl-2-oxazolidinones, 13733

of arylstyrylsilanes, controlling silanucleophile reactivity, 861

diastereoselective α -acylation and subsequent aminolysis of 2-acyl-3-phenyl-l-menthopyrazoles, synth of enolizable β -keto amides, 10335 electroreductive — of 3-aryl substituted α,β -unsaturated esters and nitriles in the presence of aliphatic carboxylic anhydrides, 1943

of a transient Ti(VI)-enolate by acyl halides and anhydrides, synth of α - hydroxy- β -ketoesters, 11037

Adamantanes

3-alkyl-2-oxaadamant-1-yl mesylates, silica

- gel-promoted fragmentation of, synth of 7-alkylbicyclo[3.3.1]non-6-en-3-ones, 5867
- 1,3-dehydroadamantane, 3,6-dehydrohomoadamantane and 1,5-dehydrobicyclo[3.3.1]nonane, mechanisms of addition reactions with HNO₃ and nitronium salts, 5857
- (Z)- and (E)-1,2-di(1-adamantyl)ethene, synth and reactions with dichlorocarbene, 825
- 2,5,7- and 1,3,5-trisubstituted adamantanes, synth by transformation of 2-(4-methylphenyl)-5-(3,4-dimethylphenyl)-2-adamantanol and 2-(1-adamantyl)-2-alkanols, 3983

Addition reactions

- [60] fullerene derivs with octahedral addition patterns, synth using reversible template as well as protecting group tech-niques, 5065
- of allyl and substituted allylic Grignard reagents to (1R)-(+)-camphor and (1R)-(-)-fenchone, synth of homoallylic alcohols with (+)-camphor and (-)-fench-one skeletons, 1699
- aminosilyl anions as hydroxy anion equivalents through addition to vinyloxirane and addition to acetylene, 5765
- of arenesulfonyl iodides with alkynols, synth of cyclic enol ethers, 7779
- competition between nucleophilic addition and electron-transfer in the reaction of 9-diazo-10-anthrone with Grignard reagents, 6795
- conjugate of Me₃Al to 4,4-disubstituted cyclohexa-2,5-dienone catalysed by copper with a (4S)-2-(2',6'-dimethoxyphenyl)-4-isopropyloxazoline ligand, 14177
- conjugate addition of amines to α,β -ethylenic substrates, activation by pressure, lanthanide catalysis and use of water, 13557
- 1,4-conjugate addition of the Reformatsky reagent to α -nitrostyrenes, synth of ethyl 3-aryl-4-nitrobutanoates, 1425
- of cuprates to asymmetric shielded 2-oxocyclopentenecarboxylates, synth of 5-substituted 2-oxo-cyclopentanecarboxylates, 971
- diastereoselective 1,2-addition of carbon nucleophiles to enantiomerically enriched α-sulfenylated aldehydes, synth of vicinal thioether alcohols, 2893
- diastereoselective of cyanide to enantiomerically pure 3-(2-arylethenyl)oxazolines followed by reduction, synth of (R)-4-amino-3-phenylbutyric acid and (R)-baclofen, 15117 diastereoselective – of methyllithium and dimethylcuprateboron trifluoride to imines derived from (S)-1-phenylethyl-mine, synth of

- secondary amines, 12571
- of 2,3-dihydro-5-furanyllithium to diisopropyl squarate as a means for the rapid generation of structurally complex oxygen-containing tetraquinane networks, 3075
- of 2,3-dimethoxybenzaldehyde to lithio(dimethoxybenzene) derivs followed by removal of alcohol function and cleavage of methyl aryl ethers, synth of linear alkyl bridged bis-, trisand tetra(catechol) compds, 2385
- of dimethyl acetylenedicarboxylate to 1-methyl-2-vinyl pyrrole, solvent effects on mechanism of, 10693
- 1,3-dipolar cycloaddition of nitrile oxides to C₆₀, synth of fullerene-fused isoxazoline heterocycles bearing a series of different substituents in the 3-position and reactivity of, 5043
- of 2-(1,3-dithian-2-yl)indole to 3-ethyl-Δ³piperidin-2-ones, synth of 20-epidasycarpidone and 20-epiuleine, 3563
- electrophilic to cyclobutene compds, high selectivities in, 15103
- electrophilic and oxidative addition of NO₂⁺containing reagents to the propellanic C-C
 bond, 5857
- of ester enolate to optically active α, β epoxyaldehydes derived from nerol and geraniol, enhanced diastereoselectivity in, 9047
- Grignard additions to Garner type aldehydes, synth of secondary alcohols which can be readily converted into their respective γ -hydroxy- β -amino alcohols and β -hydroxyamino acids, 11673
- of Grignard reagents to *N,N'*-dibenzylated 2-purinones, 12979
- of hydrogen halides to acetylenic selenides, synth of 1-halo-1-selenoalkenes, 9687
- intramolecular conjugate of N-protected imidazoles to vinyliminophosphoranes promoted by tetrabutylammonium fluoride, synth of the corresponding fused imidazoles, 13671
- of La@ C_{82} with digermirane, chemical derivatisation of the endohedral metallofullerene, 5015
- of lithiated β -hydrazonophosphine oxides to isocyanates and isothiocyanates followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123
- 1,2- of α -lithio- o or m-xylenes onto α -oxoketene dithioacetals followed by cyclodehydration of the resulting carbinols, synth of substituted 1-methyl- and 2-methylnaphthalenes, 14049

- of lithium metal to 1,4-unsymmetrically substituted butatrienes, synth of 3,4-dilithio-1,2-butadienes, 6149
- methoxide ion addition to corands incorporating a thiopyrylium ring, effect of alkali cations, 3509
- of γ-monosubstituted allylchromium(III) reagents to N-protected α-amino aldehydes, synth of a new core for C₂ symmetric HIV-protease inhibitors, 7379
- of nitrenes to C_{60} , synth of [6,5] azaannulenes, 5257
- of nitrogen dioxide radicals to C₆₀, synth of polynitro fullerenes, subsequent hydrolysis gave the corresponding fullerenols, 4963
- nucleophilic additions to α -trifluoromethylated aldehydes, 199
- nucleophilic additions to unsymmetrically substituted trigonal carbons, diastereofacial selection in, 5263
- of organocuprate.BF₃ complexes and organolithium reagents to an α-silyloxyaldimine derived from (S)-ethyl lactate, synth of 1,2-amino alcohols, 13137
- of organometallic reagents to β -hydroxyketones, diastereoselection of, synth of (+)-(2R,4R)-2-phenyl-2,4-pentanediol, 2177
- patterns of addition to buckyballs and buckytubes, 5247
- perfluoro-t-butyl radical addition to terminal olefins, absolute rate constant, 12351
- of piperazine with C_{60} , prep of $C_{60}N_2(C_2H_4)_2$ and six double addition products, consistent geometric distortions of the fullerene core upon adduct formation, 5021
- radical addition of perfluoroalkyl iodide to 1-O-allyl-1,2-diols, synth of 2-perfluoroalkylidenemethyl and 2-perfluoroalkylmethyl-1,4-dioxanes, 6187
- of silyl enol ethers and silyl ketene acetals to ferrocenylmethyl ethers, synth of precursors to chiral bridged ferrocenophanes, 1461
- syn- and anti-electrophilic additions of HOBr to allylically and homoallylically functionalised cyclopentenes, synth of polysubstituted cyclopentanes, 3355
- tetramethylethylene diamine/trimethylsilyl chloride mediated of benzyl copper reagents to α,β -unsaturated esters, 12313
- of titanium and lithium enolates to γ-alkoxy enone, synth of 2,3-anti-3,4-anti and the 2,3-syn-3,4-anti isomers respectively, 3497

trichloromethyl-bromo-addition reactions to p-Y-substituted phenylacetylenes, relative rates, correlation analysis suggests both polar and spin-delocalisation effects, 3017

triethyl phosphite to 3-acetoxy-2-methylenealkanenitriles and -alkanoates, synth of (2E)-2-(diethoxyphosphorylmethyl)alk-2enenitriles and methyl (2Z)-2-(diethoxyphosphorylmethyl)alk-2-enoates, 2261

see also Michael reactions

Aggregation

of synthetic zinc chlorins with several esterified alkyl chains as models of bacteriochlorophyll-c homologues, 12421

Alcohols

- alcohol oxidase from defensive secretion of larvae of leaf beetle *Phaedon armoraciae*, stereochemistry of, 6601
- alcohols, isocyanides, aldehydes and trifunctional α-amino acids, Ugi reactions with, synth of 1,1'-iminodicarboxylic acid derivs, 11657
- alcoholysis of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- 2-(4-alkoxy)-3,3,3-trifluoro-1,2-diphenylpropan-1-ols, acid-catalysed dehydration of, synth of panomifene antitumour compd, effect of trifluoromethyl group, 12821
- α -alkynols, dehydration-hydration over zeolite catalyst, synth of conjugated enynes and α,β -unsaturated ketones, 8287
- alkynols, metal-assisted cyclisation using labile pentacarbonylchromium and pentacarbonylmolybdenum complexes, synth of oxolenes and furans, 1617
- allyl alcohols, Diels-Alder reaction with ethyl (E)-3-(1,3-benzothiazol-2-yl)-3-cyanopropenoate, synth of cis-fused polycyclic systems, 733
- allylic alcohols, benzylic tertiary alcohols and epoxides, methanolysis in the presence of a catalytic amount of ceric ammonium nitrate, mechanism, 4175
- allylic and homoallylic alcohols, epoxidation by sulfonic peracids, 2957
- (2*R*,3*S*)-2-allyloxy-3,4,5,6-tetrahydro-2*H*-pyran-3-ol, prep of both enantiomers by biocatalytic optical resolutions, 8123
- O-aminobenzyl alcohols by hydroalkylation of secondary anilines, subsequent pyrolysis results in O-quinone methide imines which can be converted to quinolines, dihydro- and tetrahydroquinolines, 11705
- bis(aminol) ethers, synth from primary aliphatic

- amines and benzylamine together with formaldehyde and alcohol, conversion to secondary and tertiary amines via iminium salts, 3473
- 2-aziridinemethanols, aza-Paynerearrangementepoxide ring opening reaction of, regio- and stereoselective synth of diastereomerically pure N-protected 1,2-amino alcohols, 11739
- bicyclic octen- and heptenols, *Bacillus stearo*thermophilus alcohol dehydrogenase as catalyst for redox reactions of, 1669
- 1,1'-bi-2-naphthols by oxidative coupling of 2-naphthols suspended in aqueous Fe³⁺ solutions, 1005
- α -(1-bromo-1-chloro-2,2,2-trifluoroethyl)-alcohols and α -(1-chloro-2,2,2-trifluoroethyl)alcohols by reaction of 2-bromo-2-chloro-1,1,1-trifluoroethane with aldehydes in the presence of zinc, 12667
- and carboxylic acids, reaction with ammoniumand phosphoniumperfluoro-cyclobutane ylids, synth of alkyl fluorides or acyl fluorides respectively, 2977
- chiral 4,5-di-O-acetyl-2E,6E-octadiene-1,4,5,8-tetraol, rearrangement generates a 2,7-di-O-acetyl-3E,5E-octadiene-1,2,7,8-tetraol framework, 13909
- chiral carboxylic acids or alcohols, lipasecatalysed resolution using mixed carboxyliccarbonic anhydrides, 4383
- chiral difluorinated gingerol, total synth using (R)- and (S)-(-)-ethyl 2,2-difluoro-3-hydroxy-octanoates as intermediates, 157 cycloalkanols by alkylation-annulation of halo esters with a coupled reagent of samarium(II) diiodide with organometallic reagents, 1953
- cis-3-cyclobutene-1,2-dimethanol, transformation into naturally occurring 1,3,5-alkatrienes and 2,4-decadienoates, 3631
- dehydrative alkylation of with triethyl methanetricarboxylate under Mitsunobu conditions, 13007
- doubly-caged sterically-congested tetraol, synth by Diels-Alder reaction of a cage-annulated cyclohexa-1,3-diene, 6325
- anti- (or erythro-) α,β -epoxy alcohols, synth by reduction of α,β -epoxyketones with diisopropoxytitanium(III) tetrahydroborate, 9137
- [60] fullerenols, synth by addition of nitrogen dioxide radicals to C_{60} via hydrolysis of the resulting polynitro fullerenes, 4963
- 2,5-furandimethanol or furfuryl alcohol, alkylation under microwave in solvent-free

phase transfer catalysis conditions, synth of a new family of furanic ethers, 617

- 1-haloethynyl-2-methylcyclopentanols, ring expansions of which are dependent on the position of the methyl and hydroxyl groups, synth of 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, 10267
- homoallyl alcohols by reaction of α,β -unsaturated and α -phenyl acetals with epoxides promoted by lithium-potassium mixed base LICKOR, 1433
- homoallylic and homopropargylic alcohols by Barbier reaction of carbonyl compds with allylic and propargylic bromides promoted by active zinc and tin powder, 9575
- (2R,2'S)-1-O-(2'-hydroxy-hexadecyl)-glycerol, antitumour compd from shark liver oil, stereoselective synth, 6437
- intramolecular Schmidt reaction of azides with tertiary –, synth of 5-(α -naphthyl)- and 5-(β -naphthyl)indolizidines as potential dopamine analogues and non-opiate antinociceptive agents, 12039
- isovalerenenol, sesquiterpene alcohol isolated from a soft coral, synth using intramolecular aldol and hydrogenation reactions of the corresponding hydrind-enone deriv, 9999
- ketalised 3,4-dihydroxybutyllithiums, new intermediates to transfer four-carbon diol functionality to electrophilic reagents, 8333
- linear alkyl bridged bis-, tris- and tetra-(catechol) compds, synth by addition of 2,3-dimethoxybenzaldehyde to lithio(dimethoxybenzene)derivs, 2385
- lithiation of triflates and triflamides under Barbier-type conditions, indirect transformation of alcohols and amines into organolithium compds, 14341
- p-methoxybenzyl cation, generation of by NIS-mediated activation of p-methoxybenzyl 4-pentenyl ether, 8135
- 2-(4-methylphenyl)-5-(3,4-dimethylphenyl)-2-adamantanol and 2-(1-adamantyl)-2-alkanols, transformation into 2,5,7- and 1,3,5-trisubstituted adamantanes, 3983
- β-nitroalcohols, synth by Amberlyst A-21 catalysed Henry reaction, 1677
- nonracemic homoallylic *exo*-alcohols with (+)-camphor and (-)-fenchone skeleton, synth by addition of allyl and substituted allylic Grignard reagents to (1R)-(+)-camphor and (1R)-(-)-fenchone, 1699

- OH-insertion reactions with rhodium carbenoids, synth of ethers, 5999
- optically active allylic enoate alcohols, diastereoselective dihydroxylation of, synth of polyols, 7861
- phenol and naphthol derivs, reaction with 2-alkoxy-2-fluoroglycosyl fluorides, synth of naphtho- and benzo-dihydrofuran derivs, 7797 polyhydroxylated compds, synth by coupling of chiral aldehydes with 5,6-dihydro-1,4-dithiins, 11857
- primary or secondary polyoxyalkylene alcohol functions, transformation by Williamson reaction, 8245
- propargylic alcohols, titanium-catalysed hydromagnesiation-stannation sequence on, synth of vinyl 1,1-bimetallic compds, 7221
- cis-4-(9*H*-purin-9-yl)-2-cyclohexenylcarbinols, synth from cyclohexadiene and chlorosulfonyl isocyanate, 799
- 2-[5-(9*H*-purin-9-yl)-2-cyclopenten-1-yl)-ethano l analogues, synth, 8407
- reacion with methanesulfonyl- and toluenesulfonyl isothiocyanates, synth of N-sulfonylthioxocarbamates, subsequent radical fission reaction of, synth of O-alkylthioxocarbamates, 2705
- ruthenium catalysed coupling with alkynes, synth of γ, δ -unsaturated acetals and aldehydes, 5511
- secondary alcohols which can be readily converted into their respective γ -hydroxy- β -amino alcohols and β -hydroxyamino acids, synth by Grignard addition to oxazolidine aldehydes, 11673
- silylated epoxy alcohols, nucleophilic ring opening of, synth of stereochemically defined cyclohexanediols, 1231
- substituted allyl alcohols by reduction of functionalised α, β -unsaturated γ, δ -dioxy carboxylates with zinc, 4457
- 4-trimethylsilyl-3-alkyn-1-ols, Wacker-type oxidation of, synth of γ -butyrolactones, 10405 1-ureido-3-propargyl-2,3-dihydropyrrol-2-ols synth by reaction of conjugated azo-alkenes with 3-acetyl-5-hexyn-2-one and with ethyl 2-acetyl-4-pentynoate, 3997
- vicinal thioether alcohols by diastereoselective 1,2-addition of carbon nucleophiles to enantiomerically enriched α-sulfenylated aldehydes, 2893
- vinyl bromo allylic alcohols, conversion into vinylic carbonyl comdps and oxidation of

secondary alcohols to ketones by palladium acetate catalysed Heck reactions, 12291

Aldehydes

- aldehyde addition to t-butyldimethylsilyldihalomethyllithium followed by 1,3- and 1,4rearrangement of silyl group from carbon to oxide, 503
- aldehydes, trifunctional α -amino acids, isocyanides and alcohols, Ugi reactions with, synth of 1,1'-iminodicarboxylic acid derivs, 11657
- aliphatic α-acetoxyaldehydes, synth and properties of, 4347
- (2Z,4E)-alkadienals by ring-opening of 4-alkyl-2-cyclobutene-1-carbaldehydes, 3631
- aminoacid derived aldehydes, reaction with 4-isopropyl-2-oxazolin-5-one anion, synth of α -hydroxy- β -aminoacids, 4719
- (S)-aspartate semi-aldehyde, a key intermediate in the biosynth of lysine, synth by hydrolysis of (S)-2-amino-4-methoxybut-3-enoic acid, 7127
- α, α -azacyclobisalkylation of –, synth of 2-formyl-pyrrolidines by rearrangement of α, δ -dichlorolidimines, 3303
- benzaldehyde, reaction with t-butyldimethylsilyldibromomethane, synth of α -bromo- α -silyl ketones, 14533
- conversion into cyanohydrins by use of the (S)hydroxynitrile lyase from *Hevea brasiliensis*, 7833
- coupling of chiral aldehydes with 5,6-dihydro-1,4-dithiins, synth of polyhydroxylated compds, 11857
- 2,3-dimethoxybenzaldehyde, addition to lithio-(dimethoxybenzene) derivs followed by removal of alcohol function and cleavage of methyl aryl ethers, synth of linear alkyl bridged bis-, tris- and tetra(catechol) compds, 2385
- β -enamidoaldehydes, intramolecular nitrone cycloaddition starting from and subsequent reductive ring-opening of the resulting fused δ -lactam, synth of isomerically functionalised piperidine systems, 14311
- enantiomerically enriched α -sulfenylated aldehydes, diastereoselective 1,2-addition of carbon nucleophiles to, synth of vicinal thioether alcohols, 2893
- α,β-epoxyaldehydes derived from nerol and geraniol, enhanced diastereoselectivity in reaction with lithium t-butylacetate, 9047
- formaldehyde dimethylhydrazone, neutral reagent for nucleophilic hydroformylation and hydrocyanation, 9143

- D-glyceraldehyde analogues, rabbit muscle aldolase catalysed aldolisation of followed by dephosphorylation, synth of D-fructose analogues substituted at C6 position, 1557 D-glyceraldehyde derivs, Strecker reactions of, synth of (2S,3S)- and (2R,3S)-2-amino-3,4-dihydroxybutyric acid, 9563
- β-hydroxy aldehydes, condensation with N-sulfonyl aldimines, synth of 3,6-dihydro-2H-1,3-oxazines and their subsequent use in synth of 1,3-amino alcohol derivs, 3135
- indole-3-carboxaldehyde, Diels-Alder reactions in sulfolane, synth of carbocyclic analogues of canthine and canthin-6-one, 461
- (2R)- and (2S)-2-iodohexadecanal, natural inhibitors of the thyroid gland metabolism, synth from chiral enol ethers, 10473
- L-isoserinal, synth from D-glyceraldehyde acetonide, 7045, corrig. 7807
- isoxazoles as latent α -cyanoaldehydes in construction of the indolo[2,3- α]quinolizine ring system, 987
- mono- or dialdehydes, Tishchenko reactions of using (pentamethylcyclopentadienyl)₂ LnCH(SiMe₃)₂ complexes as catalysts, 4291
- monoactivated dienes and aldehydes, hetero Diels-Alder vs Mukaiyama aldol pathways in reaction of, effect of Lewis acid, 2167
- olefination and hydroxymethylation of using Knochel's (dialkoxyboryl)methylcopper reagents, 915
- oxazolidine aldehydes, Grignard additions to –, synth of secondary alcohols which can be readily converted into their respective γ -hydroxy- β -amino alcohols and β -hydroxy-amino acids, 11673
- oximes of 4-(alk-2-enylamino)-1,6-dimethyl-2-oxo-1,2-dihydropyridine-3-carbaldehydes and 2-(alk-2-enylamino)-4-oxo-4H-pyrido[1,2-a]-pyrimidine-3-carbaldehydes, cycloaddition to fused isoxazolidine derivs, 887 Peterson olefination reaction applied to aldehydes and ketones in conjunction with α -lithiated- α -fluoro- α -trimethylsilylmethylphosphonate, synth of α -fluoro-vinylphosphonates, 14199 phenylhydrazones of 2-(alk-2-enylamino)-4-oxo-4H-pyrido[1,2-a]pyrimidine-3-carbaldehydes and 4-(alk-2-enylamino)-1,6-dimethyl-2-oxo-1,2-dihydropyridine-3-carbaldehydes, cyclo-
- N-protected imidazole-2-carboxaldehydes, reaction with pyrrole in refluxing propionic

addition of, 901

- acid, synth of 5,10,15,20-tetrakis(substituted-imidazol-2-yl)porphyrins, 9877
- reaction with 2-bromo-2-chloro-1,1,1-trifluoroethane in the presence of zinc, synth of α -(1-bromo-1-chloro-2,2,2-trifluoroethyl)alcohols and α -(1-chloro-2,2,2-trifluoroethyl)alcohols, 12667
- reaction with γ-trimethylsilyl N-t-butyl crotonaldimine, subsequent heating and hydrolysis of the resulting δ-silyloxy imines leads to conjugated dienals, 4607
- reaction with nopadiene-derived η^3 -allyltianium complex, synth of (Z)-10-methyl- β -pinene-3-yl carbinols, 4377
- salicylaldehydes, interaction with phosphonoacetates under Knoevenagel reaction conditions, synth of 1,2-benzoxaphosphorines and their dimers, 12597
- tere-, iso- and phthalaldehydes, catalytic enantioselective dialkylation of, synth of chiral diols, 13355
- α-trialkylsilyl-β, γ-unsaturated aldehydes, stereocontrolled synth *via* palladium(0)-catalysed vinyloxirane rearrangement, 7487
- α-trifluoromethylated aldehydes, synth by Pummerer rearrangement or by oxidative cleavage of the corresponding diol, 199
- 2,4,6-trimethoxybenzaldehyde, decarbonylation of catalysed by scandium trifluoromethanesulfonate, synth of 1,3,5-trimethoxybenzene and methyl formate, 11045
- γ,δ-unsaturated aldehydes, synth by ruthenium catalysed coupling of allyl alcohol with alkynes, 5511
- unsaturated dialdehydes, merulidial and isovelleral, reactivity towards triacetic acid lactone, 1473

see also Enals

Aldol reactions

- addition of ester enolate to optically active α,β -epoxyaldehydes derived from nerol and geraniol, enhanced diastereo-selectivity in, 9047
- asymmetric of trifluoromethyl ketones with a chiral Ni(II) complex of glycine, stereocontrolling effect of the tri-fluoromethyl group, 12433
- asymmetric catalysis of with fluoral by chiral binaphthol-derived titanium complex, 85
- boron-mediated aldol/reduction of (R)-1-(benzyloxy)-2-methylpentan-3-one intotal synth of (-)-denticulatins A and B, 1811
- Evans of α,α -difluoro and α,α,α -trifluoro

carbonyl compds, reversal of stereo-selectivity in. 71

gold(I)-catalysed asymmetric – of isocyanoacetic acid derivs with fluoroaryl aldehydes, synth of oxazolines which could be hydrolysed to fluorophenylserines, 245

Mukaiyama aldol vs hetero Diels-Alder pathways in reaction of monoactivated dienes with aldehydes, effect of Lewis acid, 2167

nitroaldol (Henry) reaction catalysed by Amberlyst A-21, synth of β -nitroalcohols, 1677 rabbit muscle aldolase catalysed aldolisation of D-glyceraldehyde analogues followed by dephosphorylation, synth of D-fructose analogues substituted at C6 position, 1557

tin(II) Lewis acid-mediated aldol reactions of (Z)-1-ethylthio-1-trimethylsiloxypropene with aldehydes, synth of 2-methyl-3-hydroxythioesters, 7277

Algar-Flynn-Oyamada reactions

for synth of 2-aryl-3-hydroxy-4*H*-1-benzopyran-4-ones (flavonol) from 6'-substituted 2'-hydroxychalcones, aspects of, 7163

Alkaloids

Amaryllidaceae alkaloids from *Hippeastrum* equestre herb, circular dichroism studies of, 6591

2-(12'-aminotridecyl)-pyrrolidine, defensive alkaloid from the Mexican bean beetle *Epilachna varivestis*, synth and absolute configuration, 6859

anatoxin-a, synthetic approaches to, 6025

(±)-andranginine, indole alkaloid with a perhydroazepine ring fused to a hexahydro-quinoline system from *Craspidosperma* verticillatum, synth of intermediates from methyl N-p-methoxybenzensulfonylindole-2-(2-propenoate), 11291

apogeissoschizine, degradation product of geissospermine, construction of the pentacyclic ring system by addition of the enolate derived from methyl 1-indolepropionate to the γ-position of pyridin-ium salt followed by cyclisation, 8601

E-azaeburnamine skeleton, synth from 2-aryl-4-piperidones via 1-aminoindolo[2,3-a]-quinolizidine, 8581

3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, synth by Fischer indolisation of 6-phenylhydrazono-6,7,8,9-tetrahydro-11*H*-dipyrido[1,2-a;4,3-d]pyrimidine-11-ones, 7789 bicyclic nitrogen heterocycles, construction by

the molybdenum alkylidene-catalysed metathesis of α, ω -dienes, 7251

calystegine B₂, alkaloid with a nortropanic skeleton, synth by intramolecular cyclisation of a polyhydroxylated 4-amino-cyclo-heptanone, 15137

canthines, tetracyclic β -carboline alkaloids, synth of carbocyclic analogues of canthine and canthin-6-one from indole-3-carbox-aldehyde by Diels-Alder reaction, 461

carbazole alkaloids, synth of indolo[3,2-b]-carbazole derivs by acid-catalysed dimerisation of 2-prenylindoles, 9455

carbazomycin B, synth by Diels-Alder reactions of (Z)-ethyl 3-[(1-ethoxycarbonyloxy-2-methoxy)ethenyl]-2-(ethoxycarbonyloxy)indole -1-carboxylate, 3029

ceveratrum alkaloids, compds consisting of C-nor-D-homosteroid based cevanine skeleton isolated from *Veratrum*, synth of DEF ring system of germine by intramolecular nitrile oxide cycloaddition, 4133

chalciporone, 2*H*-azepine alkaloid responsible for the pungent taste of the common mushroom *Chalciporus piperatus*, synth of optically active 2*H*-azepines from α-amino acids, 10883 clathramides A and B, bromopyrrole alkaloids containing the *N*-methylimidazolinium moiety from Caribbean sponge *Agelas clathrodes*, structures and antifungal activity, 13713

(-)-clavizepine, alkaloid with a dibenzopyranazepine skeleton, synth from dibenzoxepinone, 4911

(±)-crinane with basic skeleton of the 5,10bethanophenanthridine class of Amaryllidaceae alkaloids, synth from cyclohexenone, 3107

cyclostellettamine C, a bispyridinium macrocyclic alkaloid with muscarinic acetylcholine receptor antagonistic activity, total synth via 3-(13-hydroxytridecyl)-1-[13-(3-pyridyl)tridecyl]pyridinium trifluoromethane sulfonate, 10849

cis- and trans-deethyleburnamonine, alkaloid for treatment of cerebral disorders, synth from 1-substituted indolo[2,3-a]quinolizidines, 9925

4,5-dioxoaporphine alkaloids, synth from fluorenones, formation of ring C by cyclisation of (biphenyl-2-yl)acetyl morpholines and formation of ring B by photochemistry of chloroacetamides, 11307

epibatidine, amphibian alkaloid from Ecuadorian poison from Epipedobates tricolor, synth by

two routes involving (\pm) -1 α -nitro-2 β -[3-(6-chloropyridyl)]-cyclohexane-4-one, 11053

- 20-epidasycarpidone, *Strychnos* alkaloid, synth by conjugate addition of 2-(1,3-dithian-2-yl)-indole and 3-ethyl- Δ^3 -piperidin-2-ones, 3563 epinardins A-D, pyrroloiminoquinone alkaloids
- of deep-water demosponges from the Indian Ocean, structure and cytotoxic activity, 8899
- 4,5-epoxy-10-normorphinans, synth using the nitrous acid deamination of indolenines as key step, 8209
- (±)-geissoschizine, tetracyclic indole alkaloid, synth from (±)-15-epi-E-geissoschizine, 6803 haliclonacyclamines A and B, cytotoxic alkaloids from tropical marine sponge *Haliclona* sp., structures, 9111
- indole alkaloids such as tetraphylline, 3-epireserpine and reserpine, transformation into the 2,7-dihydro compds followed by further methylation, 9069
- indolocarbazole alkaloid TAN-1030A, Beckmann-type rearrangement to a compd closely related to metabolite K-252a, 1235
- (+)-(9S,13S)-isocyclocelabenzine, spermidine alkaloid, synth using (3S)-3-amino-3-phenyl-propanoic acid as the chiral building block, 14189
- isosaraine-3 and saraine-1-3, macrocyclic diamine alkaloids from Mediterranean sponge *Reniera sarai*, absolute stereo-chemistry of, 14961
- jozimine A and pindikamine A, naphthylisoquinoline alkaloids, synth and antimalarial activity of, 13409, 13419
- (±)-keramaphidin B (pentacyclic alkaloid) and manzamine L (β-carboline alkaloid) from Okinawan sponge *Amphimedon* sp., chiral resolution of (±)-keramaphidin B, configurations, 2319
- linaresine and dihydrolinaresine, alkaloids isolated from *Berberis valdiviana*, structures, 5929
- (±)-α-lycoraneand4,5-dehydroanhydrolycorine, Amaryllidaceae alkaloids, synth from a hydroindolone intermediate derived from [1+4] cycloaddition of 1-isocyanatocyclohexene and cyclohexyl isocyanide, 10569
- magallanesine, alkaloid with an azocine ring from *Berberis darwinii* Hook, synth from isoquinolineacetate by [1,2]-Meisenheimer rearrangement and Heck cyclisation, 14543 manzamine A, oncolytic β-carboline-linked aza-

cycle, synth of a tetracyclic substructure via Diels-Alder reaction of dihydropyridinones, 10597

- N-methylated ageliferins from calcareous sponge Astroscera willeyana, structures and chemotaxonomic relationships, 5381
- micropine and epimicropine, 2,6-disubstituted piperidine alkaloid from leaves of *Microcos philippinensis*, synth through mercuric trifluoroacetate-catalysed intramolecular alkenylamide cyclisation, 13467
- morphinan-6,8-dienes, Diels-Alder reactions with 4-phenyl-4*H*-1,2,4-triazoline-3,5-dione, 2449
- morphine, radical synth of spiro[benzofuran-3(2H),4'-piperidine] and octahydro-1H-benzofuro[3,2-e]isoquinoline fragments, 10935 nazlinin and derivs, *Nitraria* alkaloids, enzyme catalysed oxidative transformation of, characterisation of products, 6725
- peripentadenine and dinorperipentadenine alkaloids, synth via chemoselective transformation of the vinylogous amide (E)-2-benzoylmethylene-1-(2-cyanoethyl)pyrrolidine, 2199
- (±)-physostigmine, indole alkaloid from *Physostigma venenosum* Balf, synth from (Z)-2-hydroxy-5-methoxyindolenine, 5339
- pseudocopsinine, indole alkaloid from *Vinca erecta*, synth of pseudocopsinine skeleton by tandem radical cascade, 647
- pseudodistomin C, a sphingosine-related piperidine alkaloid from Okinawan tunicate *Pseudodistoma kanako*, synth from D-serine, 4573
- ptilomycalin A, cytotoxic, antiviral, antifungal compd from Red Sea sponge *Hemimycale* sp., synth of guanidines as intermediates from pyrrolidin-2-one *via N*-acyliminium ion coupling with silyl enol ethers, 2603, 2629
- ptilomycalin A, guanidine containing biologically active compds, biomimetic model studies towards, 8315
- pyrrolam A, a pyrrolizidine alkaloid from Streptomyces olivaceus, total synth involving intramolecular coupling between a bromoalkyl and ynamide group, 869
- pyrrolizidine alkaloids, pyrrolizidine ring system via N-acyl anion cyclisation as the key step, extension to 2-methyl substituted pyrrolizidines, 3757
- saraines A-C, macrocyclic alkaloids from the Mediterranean sponge *Reniera sarai*, structures, 8341

- sarpagan ring system, attempts to apply the biogenetic-type cyclisation of van Tamelen to prep of the sarpagan ring using indolo[2,3-a]-quinolizidines, 15225
- secofascaplysin and indolopyridocoline, synth involving formation of arylated indole-2-carboxylic acid, 7329
- secoxanthoplanine, dehydroisocorydione, 11,8'-bisisocorydine, (8,8'-R)-and (8,8'-S)-bisisocorydine from leaves of *Dehaasia triandra*, 6561 spirotryprostatins A and B, diketopiper-azine alkaloids produced by *Aspergillus fumigatus*, structures and biological activity, 12651
- storniamides A-D, peptide alkaloids from Patagonian sponge *Cliona celata*, structures, 2727
- synth of 2,5-dihydropyrrole derivs (3-pyrrolines) as intermediates to alkaloids containing five-membered nitrogen rings, 6943
- tacamine-type indole alkaloids of *Tabernaemontana eglandulosa*, synth from pentacyclic intermediates, 11361
- tiliacora alkaloids, synth, 14735
- tricyclic alkaloids from *Myrmicaria opaciventris* ants composed of pyrrolo[2,1,5-cd]indolizines, structures, 13539
- virantmycin, tetrahydroquinoline alkaloid from *Streptomyces nitrosporeus*, synth and stereochemistry of (±)-virantmycin and unnatural (+)-virantmycin, 10609, 10631
- volutamides A-E, halogenated alkaloids with antifeedant properties from Atlantic bryozoan *Amathia convoluta*, structures, 5371

Alkanes

- 3-alkoxy-1,1-dibromo-alkanes diastereoselective bromine/lithium exchange reactions of, 7421 enolates of t-butyl alkanoates and N,N-dialkylalkanamides, reactions with t-butyl p-tolylazo sulfide, synth of α -p-tolylhydrazonylated esters and amides, 5889
- open-chain and cyclic alkanes, photochemical approach to functionalisation of, single electron transfer oxidation and hydrogen abstraction, 5533, 5549
- oxidation of by the reagent O₂-H₂O₂-vanadiumcomplex-pyrazine-2-carboxylicacid, 13051

Alkenes

- N-alkenyl derivs of six-membered and larger 1,2-diaza heterocycles, synth using diazaphosphole derivs generated in situ or the PCl₃/hydrazone combination, 13695
- arylalkenes, photochemical reactivity of aro-

- matic and heteroaromatic nitroderivs in the presence of, synth of nitrones, 14253
- azirene, cyclopropenyl anion, oxirene and thiirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709
- azoalkenes, reaction with thiocarboxylic acids to yield hydrazone 1,4-adducts leading to widely substituted pyrrole and pyrazole rings by internal cyclisation, 1579
- by addition of Knochel's (dialkoxyboryl)methylcopper reagents to aldehydes *via β*-hydroxyalkylboronates, 915
- catalytic epoxidation of unfunctionalised by dinuclear nickel(II) complexes, 3521
- [2+2]-cycloaddition of (S)-4-acyloxymethyl-4-methyl-2(5H)-furanones to as key step in synth of (+)- and (—)-grandisol, the pheromone of cotton boll weevil, 1267, 1279
- (Z)- and (E)-1,2-di(1-adamantyl)ethene, synth and reactions with dichlorocarbene, 825
- dialkyl 3-acetoxy 1-alkenyl phosphonates, synth by palladium catalysed acetoxylation of dialkyl allyl phosphonates, 2087
- α-diazo-β-keto-γ,δ-alkenyl-δ-aryl compds, rhodium(II) acetate catalysed decomposition of, aromatic C-H insertion reaction or Wolff rearrangement-electrocyclisation, 10455
- α,α'-dibromo-o-xylene, redox-mediated cathodic reduction of in the presence of hindered dienophiles, Diels-Alder trapping of the generated o-quinodimethane, 7771
- cis-1,2-difluorotriethylsilylethylene, synth by isomerization of (Z)-HFC = CFSiEt₃ with ultraviolet light and catalytic phenyl disulfide, 37
- electron deficient alkenes, epoxidation with anhydrous t-BuOOH promoted by KF adsorbed on alumina, 3659
- electrophilic bromination of –, evidence for cyclic bromonium ion transfer in, reaction of ω -alkenyl glycosides with aqueous *N*-bromosuccinimide, 7663
- from cross-coupling of heterocyclic allyl sulfides with organomagnesium compds, regio- and enantioselection, 10799
- 4-functionalised1-chloro-2-butenes,DTBB-catalysed lithiation of, synth of 1,2- and 1,4-disubstituted compds, 13243
- 1-halo-1-selenoalkenes, synth by addition of hydrogen halides to acetylenic selenides, 9687 hydrozirconation of, 12853
- p-methoxybenzyl 4-pentenyl ether, NIS-media-

- ted activation of, generation of p-methoxybenzyl cation, 8135
- α -methylstyrene and 1-aryl-1-phenylethylenes, dimerisation of induced by aminium salt, 13971 nitroalkenes, tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of bearing a pendant olefin, synth of nitroso acetals which lead to fused pyrrolidines after hydrogenolysis, 11579
- α-nitrostyrenes, 1,4-conjugate addition of the Reformatsky reagent to –, synth of ethyl 3-aryl-4-nitrobutanoates, 1425
- non-activated alkenes, Heck couplings of cyclohexenyl triflate using a ligand-free palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465
- reaction with α -halo organoindium reagents derived from α,α -dibromo carbonyl compds, synth of cyclopropanes, 2803
- trifluoromethylalkenes in Diels-Alder reactions with Danshefsky's diene and in 1,3-dipolar cycloadditions with nitrones and non-stabilized azomethine ylids, 59
- N,N-bis(trimethylsilyl)-1-alkenesulfenamides, synth by reaction of 1-alkenesulfenate anions with TMSCl and LiHMDS, conversion to 1-alkenesulfenimines, 8387
- 3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, protiodesilylation of, stereochemical study, 3553
- trisubstituted alkenes, diastereoselective synth through lithium amide mediated reaction of ketones and diethyl maleate, Michael initiatedcondensation-elimination sequence, 1389
- two new hydroxystilbenoids named vitisin C and viniferal from *Vitis coignetiae*, structures, 9991 unactivated alkene, cyclisation of α-aminocarbanions onto –, synth of 3-alkylpyrrolidines, 12541
- vinylic substitution of vinyl triflates with β-substituted-α,β-unsaturated carbonyl compds, application to synth of cardenolides, 6983 see also Enamines, Enamides, Enols, Olefins

Alkylation

 α -alkyl- α -aminosilanes, metalation and alkylation between silicon and nitrogen, 5669, 5683 α -alkylation of α -amino esters using a pyridoxal model compd having a Li⁺-ionophore character, synth of α , α -dialkyl- α -amino esters, 12125 aminomethylation of 3-hydroxy-2(1*H*)-pyridinones and 3-hydroxy-4(1*H*)-pyridinones, synth of iso-deferiprone, 1835

- asymmetric of glucose-derived bicyclic oxazinones, synth and evaluation of their use as chiral glycines, 8685
- α,α -azacyclobisalkylation of aldehydes, synth of 2-formylpyrrolidines by rearrangement of α,δ -dichloroaldimines, 3303
- catalytic enantioselective dialkylation of tere-, iso- and phthalaldehydes, synth of chiral diols, 13355
- computational studies of effective asymmetric alkylation utilising a chiral Schiff base derived from 2-hydroxy-3-pinanone, 5961, 5971, corrig. 7807
- de- of arylmethyl ethers in derivs of benzophenones, xanthones, anthraquinones, aryl esters, benzamides and nitroanisoles with BeCl₂, 13623
- dehydrative of alcohols with triethyl methanetricarboxylate under Mitsunobu conditions, 13007
- di— of 2,3-butanedione diketal with 1,8-bis(trimethylsilyl)-2,6-octadiene, synth of 1-acetyl-1methyl-2,5-divinylcyclopentane which could be converted to 12-oxo-estrane derivs, 9093
- diastereoselective methylation of chiral (1S,2R,4R)-10-dicyclohexylsulfamoylisobornyl acetoxycyanoacetate and subsequent nitrile hydrogenation, synth of (2R)- α -methylisoserine, 687
- of 2,5-furandimethanol or furfuryl alcohol under microwave in solvent-free phase transfer catalysis conditions, synth of a new family of furanic ethers, 617
- hydro— of secondary anilines, pyrolysis of the resulting *o*-aminobenzyl alcohols and electrocyclic reaction of the resulting *o*-quinone methide imines, synth of quinolines, dihydroand tetrahydroquinolines, 11705
- hydroxyalkylationof5-alkoxy-(3-hydroxyphenyl)pentanoate, synth of the AB ring system of aklavinone, an 11-deoxyanthracyclinone antibiotic, 13493
- of 5,6-*O*-isopropylidene-L-ascorbic acid in dry acetone and in THF:DMSO, synth of 3-*O*-alkyl and 2,3-di-*O*-alkyl derivs, 1293
- methoxymethylation of tartrate, synth of monoand diMOMtartrates, chiral building blocks, 8517
- of methyl γ -tosylcrotonoate, prep of γ,γ and α,α or α,γ and α,α -dialkylated products, 15243
- mono- of primary and secondary amines by

- reductive decayanation of α -aminonitriles with sodium cyanoborohydride-mercury bis(tri-fluoroacetate), 10835
- monoalkylations, dialkylations and Michael additions of ethyl N-(diphenylmethylene)glycinate to ethylenic and acetylenic acceptors under solid-liquid phase transfer catalysis, 8365
- oflithiated(2S)-2,5-dihydro-3,6-dimethoxy-2-isopropylpyrazine with 2,3-dibromopropene, key step in replacement of disulfide bridge in cystine by two α -alanines, 8807
- reactions of 4-dialkylamino-5-methoxy-1,2-benzoquinones in acidic media, selective *C*-alkylation or *N*-dealkylation, 7841
- reductive N-alkylation of anilines using ketones and α-ketoesters as alkylating agents, synth of aminoacid derivs, 9777
- reductive methylation of 2,7-dihydro derivs of oxygenated indole alkaloids, 9069
- of substituted acetoacetates with geranyl bromide followed by decarboxylation and Wittig condensation, synth of analogues of farnesyl diphosphate bearing substituents at C3, 119
- of substituted benzoic acids with n-octyl bromide under solvent-free phase transfer catalysis and microwave heating, synth of long chain aromatic esters, 6705
- of 5,6,7,8-tetrahydro-5-oxoimidazo[1,5-c]-pyrimidines with alkyl halides, synth of 1-alkyl hystidines and histamines, 5363
- using cyclopentyl β -ketoxime sulfones as nucleophiles, 6903

Alkynes

- acetylenes, Ni(0)-promoted cyclocarbonylation reaction of allyl halides and –, synth of cyclopentenones, 10525
- O-(2,4-alkadienyl) S-(2-alkenyl or alkynyl) dithiocarbonates, [3,3]-sigmatropic rearrangement of prep of S-(1-vinyl-2-alkenyl) S-(2-alkenyl or alkynyl) dithiocarbonates which could be converted to sulfides, 13909
- N-alkenyl-2-alkynamides, cyclisation of, synth of α -chloroalkylidene- γ -butyrolactams and α -chloroalkylidene- δ -valerolactams, structural factors affecting the selectivity of, 10945
- alkyne cycloaddition with 3,4-dihydroisoquinoline N-oxides, synth of 4-substituted Δ^4 -isoxazolines and subsequent rearrangement to isoquinoline-fused pyrroles, 12049
- alkynes or alkynyl- and vinyltrialkyltin derivs, coupling with N-protected 4-haloimidazoles,

13703

- alkynols, addition reactions with arenesulfonyl iodides, synth of cyclic enol ethers, 7779
- α -alkynols, dehydration-hydration over zeolite catalyst, synth of conjugated enynes and α,β -unsaturated ketones, 8287
- alkynols, metal-assisted cyclisation using labile pentacarbonylchromium and pentacarbonylmolybdenum complexes, synth of oxolenes and furans, 1617
- 3-alkynyl- and 3-allenyl-2-(substituted amino)-1imidazolin-4-ones, iodocyclisation of, synth of bicyclic guanidines, imidazo[1,2-a]imidazole and imidazo[1,2-a]pyrimidine, 6581
- benzyne in [4+2]-cycloadditions, an alternative to the use of benzyne based on cycloaddition of 2-chloro-1,4-benzodithiin-*S*,*S*'-tetraoxide, 14247
- 3-butyn-2-one, Lewis acid-induced reaction with sterically unhindered isocyclic allylsilanes, 6685 carbocupration of ethoxyethyne with phenylcopper(I) followed by cross-coupling of the resulting 2-ethoxyvinylcopper(I) complex with iodoarenes, synth of 1,2-diarylethenyl ethyl ethers, 13347
- chiral γ -functionalised (E)-allylic amines, synth from aminoaldehydes derived from natural aminoacids, subsequent stannylcupration affords γ -stannylated (E)-allylamines, 10985
- coupling with allyl alcohol catalysed by ruthenium, synth of γ, δ -unsaturated acetals and aldehydes, 5511
- cyclic carbopalladation of terminated by carbonylative lactamisation using alkenyl or aryl halides containing an ω-carboxamido or ω-sulfonamido group, 11529
- cyclisation-hydride capture processes employing alkynes as relay species and alkynes or allenes as terminating species, 11479
- cyclobutyne, isomerisation to 1,2,3-butatriene and [2+2] cycloaddition to ethylene, 2279
- 3,3-dialkoxy-1-aryl-1-propynes, hydroarylation and hydrovinylation of, synth of 3-aryl- and 3-vinylquinolines, 10225
- 1-diethylamino-1-propyne, reaction with 3-substituted (1*H*)-1-isoindolones, synth of ringexpanded heterocycles, 3339
- ethoxyethyne, carbocupration of with phenylcopper(I) followed by cross-coupling of the resulting 2-ethoxyvinylcopper(I) complex with iodoarenes, synth of 1,2-diarylethenyl ethyl ethers, 13347

ethynyl and allenyl derivs of self condensed cycloalkanones, thermal oxy-Cope rearrangements of, synth of linearly fused tricyclic[5.6.5] and [6.6.6] compds, 7737

1-haloethynyl-2-methylcyclopentanols, ring expansions of which are dependent on the position of the methyl and hydroxyl groups, synth of 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, 10267

hydroalumination and hydrozirconation of—, synth of vinylic organometallics which reacted with benzylic chlorides to yield allylated aromatics, 7265

o-hydroxyphenyl ethynyl ketones, 6-endo- and 5-exo-digonal cyclisation of, 9427

hydrozirconation of, 12853

1-octynyl-C₆₀ carbanion from reaction of 1-octynyl-C₆₀-H with t-BuOK, redox properties and prep of 1,2- or 1,4-disubstituted dihydrofullerenes by reaction with carbon electrophiles, 5077

optically active β,γ -alkynylglycine derivs, synth from naturally occurring L-serine via L-serinal, 11217

pentynoic acids 3- or 5-substituted with an iodoaryl moiety, palladium-catalysed cyclisation of their potassium carboxylates, synth of γ -arylidenebutyrolactones, 11463

2(1*H*)-pyrazinones with a 2-propynylaminomethyl or 3-butynylamino methyl side chain, Diels-Alder reaction of, prep of pyrrolo[3,4-*b*]-and [3,4-*c*]pyridin(on)es and related naphthyridines, 9161

retinyl propynyl ether, Diels-Alder reactions of, synth of a tetrahydroisobenzofuran deriv by addition of the alkyne group at positions 11 and 14 of the retinoid side chain, 405

rod-like conjugated poly-ynes, synth from 4-trimethylsilylethynyl iodobenzene using crosscoupling and desilylation reactions, 5495

α-silylamino-enones and ynones, SET-photosensitised reactions proceeding by 6-endo αamino radical cyclisation pathways, 3195

p-Y-substituted phenylacetylenes, correlation analysis of relative rates of trichloromethylbromo-addition reactions to suggests both polar and spin-delocalisation effects, 3017

symmetrically and unsymmetrically silyl-protected diethynylmethanofullerenes and substituted trimethylsilylethynylfullerenes, synth and characterisation, towards molecular carbon allotropes, 4925 tandem sequence of hydroxylamine-alkyne cyclisation/1,3-dipolar cycloaddition of alkyne-containing *N*-hydroxypyrrolidines, route to piperidines and indolizidines, 11601

4-trimethylsilyl-3-alkyn-1-ols, Wacker-type oxidation of, synth of γ-butyrolactones, 10405 1-ureido-3-propargyl-2,3-dihydropyrrol-2-ols, 1-ureido-3-propargylpyrroles and 1-ureido-3-propargyl-3-phosphono-1*H*-pyrrol-2(3*H*)-ones, synth and transition metal catalysed reactions of, 3997

vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, synth by reaction of allylic diisobutyl-telluronium ylids with alkylidene or arylmethylidene malonic esters, 8747

vinyl radicals generated from bromomethyldimethylsilyl propargyl ethers, radical cascades of, 11405

see also Diynes, Enynes

Allenes

3-alkynyl- and 3-allenyl-2-(substituted amino)-1imidazolin-4-ones, iodocyclisation of, synth of bicyclic guanidines, imidazo[1,2-a]imidazole and imidazo[1,2-a]pyrimidine, 6581

 α -allenic ketone, radical cyclisation of, synth of (\pm) - α -chamigrene sesquiterpene, 13181

 δ - and ω -allenyl aryl halides, hydrostannylation of followed by mono or bis cyclisation, synth of α -vinyl oxygen- and nitrogen heterocycles, 13441

carbopalladation-sulfonylation of –, synth of 2-vinyl or 2-aryl allyl sulfones, 9101

enediynes, enyne allenes and related compds, chemistry of, 6453

hydrozirconation of, 12853

Allylation

diastereoselective – of norephedrine/dihydrocitronellic acid-derived oxazolidinone and intramolecular Diels-Alder reaction of a sulfonyl-substituted dienyne, key steps in synth of CD-ring fragment of vitamin D₃, 4769

palladium(0)-catalysed — of uracils and thiouracils, influence of solvent on the regioselectivity of, 9521

Aluminium and compds

supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853

Amides

acetamide, reaction with phenacyl benzoates in boiling xylene in the presence of BF_3/Et_2O as catalyst, synth of oxazoles, 10131

acrylamides, penultimate group effects in free

radical telomerisations of acrylamides, 4181 N-(2-alken-1-yl)amides, cyclisation of mediated by Mn(III), synth of 1,3,4-trisubstituted pyrrolidin-2-ones, use as route to biologically active amino acids containing a pyrrolidine ring, 1069

- N-alkenyl-2-alkynamides, cyclisation of, synth of α -chloroalkylidene- γ -butyrolactams and α -chloroalkylidene- δ -valerolactams, structural factors affecting the selectivity of, 10945
- (*N*-alkyl)-pipecolic acid anilides, resolution by 2*R*,3*R*-tartaric acid and *O*,*O*'-dibenzoyl-2*R*,3*R*-tartaric acid, formation of diastereoisomers between, 1637
- alkylamides for metalation of 3-chloro-6-methoxypyridazine, improvement of regioselectivity of, 10417
- benzenesulfenamides, LDA-promoted decomposition of, route to aminyl radicals by dioxygen oxidation of lithium amides, 13243
- carboxamides by reaction of amines and sulfenamide with *N*-hydroxypyridine-2(1*H*)-thione derivatives of carboxylic acids, 9347
- ceratinamides A and B, antifouling dibromotyrosine derivs from the marine sponge *Pseudoceratina purpurea*, structures and biological activity of, 8169
- chiral alkyl bicyclic phosphonamides; design, carbanion geometry, reactivity and prep of, conversion to α-substituted α-methyl and α-phenyl phosphonic acids, 13837
- 2-chloroethylnitrososulfamide synth using N-sulfamoyloxazolidinones and -perhydrooxazinones as 2-chloroethylsulfamoyl donors, 14217
- dichloro- and trichloroamides as starting materials in synth of pyroglutamates by radical cyclisation, 6739
- difluoromethyleneketone retroamides, synth as inactivators of aspartyl or seryl proteases, 305 N,N-dimethyl cyanamide, reaction with 1,2-diketones in the presence of titanium(IV) chloride, 3939
- N,N-dimethylacrylamide-triflic anhydride complex as a bifunctional electrophile in reactions with electron-rich aromatics, 12993
- enolizable β-keto amides by diastereoselective α-acylation and subsequent aminolysis of 2-acyl-3-phenyl-l-menthopyrazoles, 10335
- epoxyamides, synth by diastereoselective *syn*epoxidation of 2-alkyl-4-enamides, 3327 fluorine-containing proline amide isostere

- model, synth from N-protected proline ethyl ester, subsequent reaction with CF₃COOH, 225 formanilide, acetanilide and benzanilide, reaction with 4,6-dimethoxyindoles and phosphoryl chloride, synth of 7-indolyl-imines, 4687, 4697
- N-imidazolium-N-methyl amides and bis-amides by reaction of carboxylic acids with 3-methyl-1methylamino-3H-imidazol-1-ium salts, subsequent reaction wih organometallics afforded ketones and diketones, 14297
- lithiation of triflates and triflamides under Barbier-type conditions, indirect transformation of alcohols and amines into organolithium compds, 14341
- 2-[7-(2-methyl-1,2,3,4-tetrahydroisoquinoline)-yl]-*N*-(2-pyridyl)acetamide, a host with two heterocyclic parts separated by a flexible arm, synth from isoquinoline involving acylation and Willgerodt-Kindler reaction, 10441
- L-Ser-\(\beta\)-naphthylamide, enzymatic acylation of by lipoprotein lipase from *Pseudomonas specie*, solvent effect on chemoselectivity, 4867
- phosphonamidic, phosphonamidothioic and phosphonamidodithioic acids, synth and pKa evaluation, 6117
- phosphorylated *o*-aroyl and heteroaroyl benzamides, cyclisation of, synth of 2-alkyl-4-aryl-1(2*H*)-isoquinolones, subsequent reduction gives rise to 4-aryl-1,2,3,4-tetra-hydroisoquinolines, 4433
- salicylamide and bipyridine containing ligands for iron(II) and iron(III) coordination, 12197 secondary amides, ammonolysis of assisted by unsubstituted vicinal amide group, 4141
- substituted α-diazoamides and diazoimides, synth from the corresponding amides or amines, ligand effects in the rhodium(II) catalysed reactions of, 2489
- substituted amido-oximes, intramolecular nitrile oxide cycloaddition of and subsequent reduction, synth of functionalised 3,4-dehydropyrrolidin-2-one and 1,2-dehydropyrrolizidine-3-one, 14323
- 2-tetrahydrofuroamides, conversion into α -hydroxy- δ -valerolactams and general synth of lactams conjugated to 2,4,6-triiodoisophthal-amides, 11177
- α -p-tolylhydrazonylated esters and amides, synth by reactions of the enolates of t-butyl alkanoates and N,N-dialkylalkanamides with t-butyl p-tolylazo sulfide, 5889
- N, N-bis(trimethylsilyl)-1-alkenesulfenamides,

synth by reaction of 1-alkenesulfenate anions with TMSCl and LiHMDS, conversion to 1-alkenesulfenimines, 8387

N-vinylic α-bromo amides, radical cyclisation of, synth of 4-oxo-2-azetidineacetic acids, 13867 see also Enamides, Lactams, Peptides and polypeptides

Amidines

- N'-arylthiocarbamoyl-N,N-dialkylamidines,prep by treatment of 5-(arylimino)-4-(dialkylamino)-5H-1,2,3-dithiazoles with NaOH, 8413
- N-chloro-N'-arylbenzamidines, reaction with 1,1-diaminoethenes, synth of 4-amino-5-chloro-imidazoles and subsequent reduction to 4-amino-unsubstituted imidazoles, 7939
- N-cyanochloroacetamidine, reaction with conjugated thiolato(selenolato)nitriles provides products which can be involved in the Thorpe reaction resulting in diaminopyrimidines via enaminocyanamidines, 1011
- glycoamidines, NMR studies and semiempirical calculations on the structure of, 9263
- 1-substituted vinamidinium salts, reaction of with sarcosine and glycine ethyl esters, synth of 2,3- and 2,5-disubstituted pyrroles, 6879
- N-thioacylacetamidines, conversion to 2-aza-1,3-dienes with electron-releasing substituents at the 1,3-positions through deprotonation of N-ylidene acetamidinium iodides, 10095

Amido-ketones

enolizable β -keto amides by diastereoselective α -acylation and subsequent aminolysis of 2-acyl-3-phenyl-l-menthopyrazoles, 10335

Amination

- electrophilic of 2-azadienes with several nitroso compds, toward the synth of α -amino acid derivs, 7585
- electrophilic of 1,3,2-oxazaphospholanes using (1R),(2S)-1,3-diphenyl-2-(N-isopropylamino)-1-propanol as the chiral auxiliary, 13783
- intramolecular palladium-catalysed aryl amination and aryl amidation, 7525
- of ketimines derived from 2-(trifluoromethyl)anilines and methyl halophenyl ketones by lithium alkylamide reagents, 3273
- reductive of oxoalkylphosphonates, synth of 1-aminoalkylphosphonic acids and 2-aminoalkylphosphonic acids, 10685
- ring-opening aminolysis of santonin sesquiterpene lactone, entry to (+)-β-cyperone and (-)eudesma-3,5-diene, bioactive compds against Locusta migratoria, 10507

substituent effects on the feasibility of azomethine-azomethine isomerisation: synthetic opportunities for biomimetic transamination, 14701

transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, synth of the pyrrolo[2,1-c][1,4]-benzodiazepine ring system of anthramycins, 10751

Amines

- trans 2-(N-acylamino)-1-arylthiocyclohexane, synth by ring opening of symmetrical N-acylaziridines with thiols catalysed by chiral dialkyl tartrate-diethylzinc complexes, 7817
- N-Boc N-alkyl cyclopropyl amines, lithiationsubstitution reactions of, 12333
- α-alkyl-α-aminosilanes, metalation and alkylation between silicon and nitrogen, ²H NMR study of organolithium stabilisation by silicon and by phenyl in solution, 5669, 5683
- amine and aminoalcohol amide and α -ketoamide derivs as inhibitors of serine proteases α -chymotrypsin and subtilisin Carlsberg, 4199
- α -amino ketones, synth by rearrangement of α -hydroxy imines, mechanism and application to the prep of (+)-1-benzyl-1-azaspiro[5.5]undecan-7-one, a precursor to (-)-perhydrohistrionicotoxin, 6647
- 2-amino-1,3-dienes by coupling of α -chloro enamines and alkenyl lithium compds, 2909
- 4-amino-1-azadienes, cyclisation with glyoxylic esters, synth of 2*H*-1,3-oxazines, subsequent reduction to *syn,syn*-1,3-aminoalcohols and further cyclisation to azetidines, 3095
- 4-amino-5-chloroimidazoles and 4-amino-5-unsubstituted imidazoles, synth from *N*-chloro-*N*'-arylbenzamidines and 1,1-diaminoethenes, 7939
- 3-amino-N-(2-hydroxy-1-phenylethyl)-5-methyl-thio-2-piperidones, conformationally restricted analogues of methionine, synth from N-(2-acetoxy-1-phenylethyl)- Δ^5 -piperidin-2-one, 7727
- aminoarenes, deaminative fluorination of using hydrogen fluoride combined with bases, synth of fluoroarenes, 23
- α-aminocarbanions, cyclisation onto unactivated alkene, synth of 3-alkylpyrrolidines, 12541
- aminoheterocycles, reaction with 2-methylthio-4-oxo-3-phenylpyrido [2,1-f][1,2,4] triazinium iodide, synth of conjugated mesomeric betaines, 11349
- 3-aminopyrrolidin-2-ones, synth from *N*-substituted aziridinecarboxamides, 9909

- 4-aminopyrrolidinones by rearrangement of homochiral β-lactams derived from (+)-(1S, 2S)-2-amino-1-phenylpropan-1,3-diol, 8989, 9005
- aminosilyl anions as hydroxy anion equivalents through allylic substitution, addition to vinyloxirane and addition to acetylene followed by oxidative cleavage of the silicon-carbon bonds, 5765
- α-aminosulfonopeptides as functional analogues of penicillin, synth using Curtius rearrangement, 5303
- 3-aminothieno[3,4:3',4']benzo[b]pyranone, 3-aminothieno[3,4-c]quinoline and 5-amino-7-substitutedthieno[3,4-d]pyridazinone, reactivity toward electron-poor olefins and acetylenes, 11915
- 2-(12'-aminotridecyl)-pyrrolidine, defensive alkaloid from the Mexican bean beetle *Epilachna varivestis*, synth and absolute configuration, 6859
- aminoxyls by oxidation of 2,2,4,4-tetrasubstituted 1,3-oxazolidines with *m*-chloroperbenzoic acid, 605
- aniline and *N*-substituted anilines encapsulated in β-cyclodextrin, bromination of, synth of *O*-bromoaniline and *p*-bromo-*N*-methylaniline respectively, 3487
- anilines, reactions with 5-benzoylethyl barbituric acid and 1,3-dimethyl barbituric acid derivs, synth of pyrimidoquinoline derivs and benzazoles respectively, 10147
- anilines, reductive N-alkylation of using ketones and α -ketoesters as alkylating agents, synth of aminoacid derivs, 9777
- aromatic primary amine, reaction with copper(I) cyanide and an alkyl nitrite in DMSO, synth of nitriles, 7137
- 1-arylamino-1-methylthio-2-nitroethene,intriflic acid yields a conjugated dication with aryliminium and hydroxynitrilium sites, 9509
- N-(2-bromo-2-propenyl)-amine, reaction with sodium amide in liquid ammonia, synth of N-triphenylmethyl-2-methyleneaziridine, 7037
- by N-denitration of nitramines by dihydronicotinamides, 9655
- calix[6]arene bridged by an aniline, synth *via* the corresponding nitro compd using iron pentacarbonyl as reducing agent, 10879
- chiral γ -functionalised (E)-allylic amines, synth from aminoaldehydes derived from natural aminoacids, subsequent stannylcupration

- affords γ -stannylated (E)-allylamines, 10985 conjugate addition to α,β -ethylenic substrates, activation by pressure, lanthanide catalysis and use of water, 13557
- N,N-dialkyl-9-triptycylamines, stereodynamics of a series of by NMR, 12409
- (15,25)-3-(3,4-dichlorophenyl)-2-(2-fluoro-4-bi phenylyl)-1-methylpropylamine, synth and use as intermediate to J-104,118 and J-104,123 squalene synthase inhibitors, 13867
- α-(N,N-diethylamino)-alkenylphosphonates, synth by Wittig rearrangement of ammonium salts from quaternisation of diisopropyl (N,N-diethyl)-aminomethylphosphonate, 2075
- 1,3-dihydro-1-isobenzofuranamines which exist in an imine/hemiaminal ring-chain tautomerism, steric and electronic effects, 7679
- N-[2-(dimethylamino)ethyl]-2-(2-fluorophenyl) quinolin-4-amines, synth by cyclisation of ketimines derived from 2-(trifluoromethyl)anilines, 3273
- N,N-dimethylaniline, bromination in aqueous suspensions of different surfactants, nature of head groups of surfactant and length of hydrophobic chain on regioselectivity, 2465
- DTPA (diethylenetriamine pentaacetic acid), synth of C₂-symmetric (S,S)-1,4-dibenzyl-DTPA and 1,4-meso-dibenzyl-DTPA, synth via chiral diamines, 14507
- effect of branching in alkyl groups of tertiary amines on their performance as catalysts in high pressure promoted Baylis-Hillman reaction, 8307
- exo- and endo-N⁶-(5,6-epoxynorborn-2-yl)adenosine, synth via norbornenylamines, potent agonists for the A₁ adenosine receptor, 4735
- N-(fluoro-3-methoxyacryloyl)anilines, synth by condensation between lithium anilides and methyl 2-fluoro-3-methoxyprop-2-enoate, subsequent cyclisation accompanied by elimination of methanol yields 3-fluoro-2-quinolones, 3223
- 2-glycosylaminopyridines, synth through tandem Diels-Alder/retro Diels-Alder reaction starting from 6-glycosylaminopyrimidines with dimethyl acetylenedicarboxylate as dienophile, 5845
- N-methylcyclobutylideneamine N-oxide, synthby reaction of cyclobutanone with methylhydroxylamine, cycloaddition reactions of, 9187
- naloamine, an aminoalkylpyridine, and nalodional, a cytotoxic polypropionate, from Smaragdinella calyculata, structures, 9681 oligonucleotides containing 3'-alkyl amines,

- synth and application of photolabile supports for solid phase synth of, 3827
- primary and secondary amines, alkylation by reductive decayanation of α -aminonitriles with sodium cyanoborohydride-mercury bis(tri-fluoroacetate), 10835
- pyridylmethyl(amino)phosphonates, acidic cleavage of, formation of the corresponding amines, 12483
- reaction with 4-t-trfluorobut-3-en-2-one followed by heating with phosphoryl trichloride, cyclisation and dehydration of the resulting 4-anilino-1,1,1-trifluorobut-3-en-2-ones yields 2-(trifluoromethyl)quinolines, 4637
- secondary amines by diastereoselective addition of methyllithium and dimethylcuprate-boron trifluoride to imines derived from (S)-1-phenylethylamine, 12571
- secondary anilines, hydroalkylation of, pyrolysis of the resulting *o*-aminobenzyl alcohols and electrocyclic reaction of the resulting *o*-quinone methide imines, synth of quinolines, dihydro- and tetrahydroquinolines, 11705
- secondary *E*-allylamines and β-aminophosphorylated compds from β-functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, 9609
- secondary or primary, reaction with *N*-hydroxypyridine-2(1*H*)-thione derivatives of carboxylic acids, synth of carboxamides, 9347
- secondary and tertiary amines from N-alkyl-N-alkoxymethyl-methyleneiminium salts derived from bis(aminol) ethers, 3473
- α -silylamino-enones and ynones, SET-photosensitised reactions proceeding by 6-endo α -amino radical cyclisation pathways, 3195
- spirocyclic amines by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445
- N-sulfonyl-alkylamines, application in [2+4] cycloadditions, 725
- tetramethyl-pyrrolinic,-piperidinic,indolinicand quinolinic aminoxyls, chemical and electrochemical study of their interaction with super-oxide anion, 11257
- thiazolo[2,3-c]-1,2,4-triazolium-3-acylaminides, synth from 4-methallyl substituted 1,2,4-triazoline-3-thiones, 791

Aminium salts

as promoters of the dimerisation of α -methylstyrene and 1-aryl-1-phenylethylenes, solvent effects, 13971

Amino acids and derivs

- N-acylanthranilic acids, cyclisation with Vilsmeier reagents generated from N,N-dimethylformamide and oxalyl chloride, synth of 2-(2'-dimethylamino)ethenyl-4H-3,1-benz-oxazin-4-ones, 753
- porphobilinogen (PBG), synth of (1*S*,2*S*,3*R*,6*S*)-3-chloro-3-methyl-6-isoprenyl-1,2-cyclohexane diol as inhibitor of biosynth of, 4645
- syn and anti-β-hydroxy-γ-amino acids, synth from anti 3-amino-1,2-diols, application to prep of cyclohexylstatine, 7063
- α-alkylated γ,δ-unsaturated amino acids by ester enolate Claisen rearrangement of chelated N-protected amino acid allylic esters, 941
- α-amino acid derivs, synth by cycloaddition of 2-azadienes with several nitroso compds, 7585
- α-amino acid esters, reaction with N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, synth of dipeptides, 9367
- amino acids by reductive N-alkylation of anilines using ketones and α -ketoesters as alkylating agents, 9777
- L- α -amino acids stereospecifically labelled at the β -carbon atom, synth from labelled samples of (2S)-isoserine *via* aziridines, 9891 β -amino derivatives by conjugate addition of amines to α,β -ethylenic substrates, activation by pressure, lanthanide catalysis and use of water, 13557
- (\pm)-(Z)- and (\pm)-(E)-2-amino-2,3-methano-3-(indol-3-yl)-propanoic acids, synth from 3formyl indole and hippuric acid, 9901
- 1-amino-2-phenyl-1-cyclohexanecarboxylicacids as chiral auxiliaries in asymmetric Diels-Alder reactions, 4839
- (2S,3S)- and (2R,3S)-2-amino-3,4-dihydroxybutyric acid, synth by Strecker reaction of D-glyceraldehyde derivs, 9563
- (R)-4-amino-3-phenylbutyric acid and (R)-baclofen, synth by diastereoselective conjugate addition of cyanide to enantiomerically pure 3-(2-arylethenyl)oxazolines followed by reduction, 15117
- (2R,3S)-or(2S,3R)-2-amino-3-trifluoromethyl-3-hydroxyalkanoic acid derivs (threonine analogues), synth from 4,4,4-trifluoro-3-hydroxybutanoic acid, 279
- (-)-3(R)-amino-4(R),5(R)-dihydroxy-1-cyclohex ene-1-carboxylic acid, 3(R)-amino analogue of (-)-shikimic acid, synth from the parent acid, 8565

- α -amino- β , γ -unsaturated acid derivs by photorearrangement of N-alkanoyl β -enaminones, 2405
- 1-aminoalkylphosphonic acids and 2-aminoalkylphosphonic acids, synth by reductive amination of oxoalkylphosphonates, 10685
- (±)-7-aminocephalosporanic acid and (±)-7-epiaminocephalosporanic acid, synth and separation of the four stereoisomers, 7691
- β -aminoesters and β -lactams, synth by Reformatsky-type reaction using (tricarbonyl(η^6)-arene)chromium(0) complexes, 4849
- (S)-aspartate semi-aldehyde, a key intermediate in the biosynth of lysine, synth by hydrolysis of (S)-2-amino-4-methoxybut-3-enoic acid, 7127
- bicyclic oxazinones based on D-glucopyranose as chiral glycines, 8685
- by reaction of iminium ions derived from condensation of glyoxal and N-methyl (R)-phenylglycinol with allylic silanes and enoxysilanes, 9079
- *p*-carboranylalanine (*p*-Car) and 2-methyl-ocarboranylalanine (Me-o-Car) using Oppolzer's sultam method, 9207
- o-carboxyphenylglycine, reconsideration of the double cyclisation of, 12475
- cephalosporanic acid 7β -alkylideneammonio salts, synth by reaction of 7β -aminocephalosporanic acid derivs with ketones under acidic conditions. 11905
- chiral Ni(II) complex of glycine, asymmetric aldol reaction with trifluoromethyl ketones, stereocontrolling effect of the trifluoromethyl group, 12433
- conformationally constrained cyclopropyl amino acids, synth by Wittig olefination of methyl (15,2R)-1-benzamido-2-formylcyclopropane-carboxylate, 5881
- constrained 4-(phosphonomethyl)phenylalanine derivs as hydrolytically stable analogues of *O*-phosphotyrosine, synth, 4411
- cystinyl-cystinyl-cystine [-CSSCCSSC-], synth and conformational study of, 9819
- α,α -dialkyl- α -amino esters, synth by α -alkylation of α -amino esters using a pyridoxal model compd having a Li⁺-ionophore character, 12125
- 2,3-diamino acids, synth from an oxazolidinone alcohol and application to the synth of a β -benzoylamino-phenylalanine, 10279
- (S,S)-α,α-diamino-1,4- and 1,3-benzenediacetic acids and N-Boc- and N-Fmoc-derivs, asym-

metric synth of, 7761

- (R,R)-2,7-diamino-4,5-bis(methylene)octanedioic acid and derivs, synth by stereoselective syntheses as analogues of cystine, 8807
- N-dienyl-L-pyroglutamic esters, Diels-Alder reactions of with acyl nitroso dienophiles, 3283
- 3,4-(difluoro-methano)glutamic acid, synth by reaction of *N*-(4'-bromo-4',4'-difluorocroton-oyl)oxazolidinone with lithium enolate of *N*-diphenylmethylideneglycinate *via gem*-difluorocyclopropane, 271
- 5'-O-(4,4'-dimethoxytrityl)-5-methyl-N'-(1-pyrenylmethyl)cytidine, synth by reaction of 1-pyrenylmethylamine with 4-(1,2,4-triazolyl)-thymidine deriv, insertion into DNA, 15311
- α,α -disubstituted amino acids, synth by regioselective nucleophilic ring opening reactions of 2,2-disubstituted aziridines, 13035
- DTPA (diethylenetriamine pentaacetic acid), synth of C₂-symmetric (*S*, *S*)-1,4-dibenzyl-DTPA and 1,4-meso-dibenzyl-DTPA, synth via chiral diamines, 14507
- ethyl *N*-(diphenylmethylene)glycinate as anionic glycine equivalent, monoalkylation, dialkylation, and Michael additions under solid-liquid phase-transfer catalysis, 8365
- fluorine-containing proline amide isostere model, synth from N-protected proline ethyl ester, subsequent reaction with CF₃COOH, 225 β -fluoroalkyl- β -amino acids, synth by biomimetic base-catalysed [1,3]-proton shift reaction between fluorinated β -keto carboxylic esters and benzylamine, 6943
- N-formyl- $\alpha\beta$ -dehydroamino acid esters, (Z)-selective β -bromination of, synth of α -bromo-imines which are isomerised to (Z)- β -bromo-N-formyl- α , β -dehydroamino acid esters, 5751
- glyoxylic acids by reaction of 3-(4'-chlorophenyl)-4,6-dimethoxyindole with oxalyl chloride *via* 2- and 7-glyoxyloyl chloride derivs, 8925 β-hydroxy aspartates, synth from (+)-(1S,2S)-2-amino-1-phenylpropan-1,3-diol, 8989
- γ-hydroxy-β-amino alcohols and β-hydroxyamino acids, synth by Grignard addition to oxazolidine aldehydes *via* secondary alcohols, 11673
- α-hydroxy-β-aminoacids by reaction of 4-isopropyl-2-oxazolin-5-one anion with aminoacid derived aldehydes, 4719
- trans-4-hydroxy-L-proline as a chiral starting block, report, 13803
- hydroxymethylene phosphonate analogues of

- phosphorylated tyrosine, synth by hydrophosphonylation of 4-formyl-L-phenylalanine, subsequent conversion to monofluoromethylene phosphonate analogues, 11725
- 5-hydroxytryptophan, incorporation into oligopeptides using 5-*O*-benzyl-*N*^α-Fmoc-*N*ⁱⁿ-Boc-5-hydroxytryptophan as reagent, 6965
- indole-3-pyruvic acid oxime ethers and thieno derivs by Heck reaction, 14975
- intramolecular oxime-olefin cycloaddition process starting from homochiral aminoacid precursors, synth of homochiral functionalised pyrrolidinone and pyrrolizidinone systems, 7875
- L-isoserinal, synth from D-glyceraldehyde acetonide, 7045, corrig. 7807
- kainoid amino acid chemistry, recent developments in, 4149
- kainoids, synth of β -benzylglutamic acids and β -methallyl- and β -isobutylglutamic acids, synth and depolarizing activities, 1931
- (2R,3R)-3-mercaptoaspartic acid from L-aspartic acid, synth involving electrophilic sulfenylation using (2,4-dimethoxybenzylthio)-4-methylphenyl sulfonate, 12839
- (2S,3S,6S)-, (2S,3S,6R)- and (2R,3R,6S)-2,3-methano-2,6-diaminopimelic acids, synth, design of enzyme inhibitors, 1149
- methyl (Z)-2-N-acylamidoacrylates, hydrogenation of using carbohydrate derived catalysts, 15079
- N-methylamino acids, coupling of in synth of aureobasidin A by use of bromotris(pyrrolidino)phosphonium hexafluorophosphate as a coupling reagent, 4327
- (2R)-α-methylisoserine by diastereoselective methylation of chiral (1S,2R,4R)-10-dicyclohexylsulfamoylisobornyl acetoxycyanoacetate and subsequent nitrile hydrogenation, 687
- optically active β , γ -alkynylglycine derivs, synth from naturally occurring L-serine *via* L-serinal, 11217
- γ-oxo α-amino acids, synth from hexafluoroacetone protected L-aspartic acid chloride *via* Stille cross coupling reaction, 14757
- (3S)- and (3R)-piperazic acids, constituents of azinothricin family of antitumour antibiotics, synth by hydrazination of chiral N-bromovaleryl carboximide enolates with DBAD, 1047 porphobilinogen, synth in 4 steps from 2-cyano-3,4-substituted pyrroles, 14689
- D,L-Fmoc protected 4-phosphonomethylphenyl-

- alanine derivs, synth and enzymatic resolution, use in solid phase peptide synth, 2021
- N^{α} -(purinyl/pyrimidinyl acetyl)-4-aminoproline diastereomers with potential use in PNA synth, synth from 4R-hydroxy-2S-proline, 15007
- pyroglutamates by treatment of serine-derived N-(α -haloacetamido)dehydroalanine derivs with tributyltin hydride, 6739
- (S)-pyroglutamic acid, reduction with alcohol followed by cyclisation to give bicyclic lactams, conversion to functionalised pyrrolidinones, 3719, corrig. 14079
- pyrrole acids by oxidative degradation of eumelanins, black-to-brown pigments of mammalian skin, hair and eyes, 8775
- (R)- and (S)-3-pyrrolidinacetic acid, synth *via* Mn(III) mediated cyclisation of N-(2-alken-1-vl)amides, 1069
- N-sulfamylaminoacid methylesters, cyclisation of to yield chiral sulfahydantoins, 993
- syn- and anti- β -(polyfluorophenyl)serines, synth by gold(I)-catalysed asymmetric aldol reactions of isocyanoacetic acid derivs with fluoroaryl aldehydes, 245
- thiourea derivs of α-aminoacids, synth and characterisation of, crystal structure of methyl L-valinate and L-leucinate derivs, 6233
- tri-(N-methyl-4-pyridiniumyl)porphyrinsbearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, synth and DNA binding studies, 13569, 13589
- 3,3,3-trifluoroalanine, synth by asymmetric reduction of 2-(*N*-arylimino)-3,3,3-trifluoropropanoic acid esters, 233
- trifunctional α-amino acids, aldehydes, isocyanides and alcohols, Ugi reactions with, synth of 1,1'-iminodicarboxylic acid derivs, 11657
- (2S,4R,5R)-4,5,6-trihydroxynorleucine and 5-hydroxynorvaline, synth from precursors derived from rearrangement of 5,6-dihydro-2-pyrone, 12911
- tyrosine, oxidative cyclisation to methyl 1-benzyloxy-carbonyl-3a-hydroxy-6-oxo-2,3,3a,6, 7,7a-hexahydroindol-2-carboxylate, subsequent conversion to 7-hydroxy-2,3,7,7a-tetrahydroindole ring of gliotoxin, 14403
- use of a C-branched spermine conjugate at the 3'-end or in the middle or at the 5'-end of an oligo DNA for the stabilisation of the duplexes and triplexes, 12275
- valinopine, epileucinopine, isoleucinopine and

phenylalaninopine, opine type amino acids from poisonous mushroom *Clitocybe acromelal-ga*, structures, 877

Amino alcohols

- O-(2-acetamido-2-deoxy-β-D-glucopyranosyl)-(1→4)-2-acetamido-1,2,5-trideoxy-1,5-imino-Dglucitol, potential glycosidase inhibitor, synth from allyl chitobioside, 13315
- amine and aminoalcohol amide and α -ketoamide derivs as inhibitors of serine proteases α -chymotrypsin and subtilisin Carlsberg, 4199 1,2-amino alcohols, synth by addition of organocuprate.BF₃ complexes and organolithium reagents to an α -silyloxyaldimine derived from (S)-ethyl lactate, 13137
- (+)-(1S,2S)-2-amino-1-phenylpropan-1,3-diol, conversion to *cis-β*-lactams and subsequent transformation into carbapenems, 4-cyano-*β*-lactams, *β*-hydroxy aspartates and pyrrolidinones, 8989, 9005
- (9-amino-substituted) 1,2,3,4,4a,9a-hexahydro-9*H*-xanthen-1-ols, synth by cycloaddition of a nitrone derived from 2-(cyclohexen-3-yloxy)-benzaldehyde, 11849
- O-aminobenzyl alcohols by hydroalkylation of secondary anilines, subsequent pyrolysis results in O-quinone methide imines which can be converted to quinolines, dihydro- and tetrahydroquinolines, 11705
- conversion to 2-(2-halophenyl)-oxazoline followed by substitution with phosphorus, sulfur or selenium, 7547
- dichiral β-amino alcohols, electrochemical oxidation of chiral 5-substituted 2-oxazolidinones to provide key building blocks for, 9743 (1R),(2S)-1,3-diphenyl-2-(N-isopropylamino)-1-propanol as chiral auxiliary in electrophilic
- amination of 1,3,2-oxazaphospholanes, 13783 γ -hydroxy- β -amino alcohols and β -hydroxy-amino acids, synth by Grignard addition to oxazolidine aldehydes via secondary alcohols,
- N-protected 1,2-amino alcohols, synth by aza-Payne rearrangement-epoxide ring opening reaction of 2-aziridinemethanols, 11739
- protected 2-aminobut-3-en-1-ols, Heck coupling with cyclohexenyl triflate using a ligand-free palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465
- supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853

synth from 3,6-dihydro-2*H*-1,3-oxazines, 3135 Amino aldehydes

N-protected α-amino aldehydes, addition of γ-monosubstituted allylchromium(III) reagents to, synth of a new core for C₂ symmetric HIV-protease inhibitors, 7379

Amino ketones

N-substituted 7-amino-8-hydroxy-4-methyl-2H-[1]-benzopyran-2-ones, synth by reaction of phosphines with 7-methoxyimino-4-methyl-chromene-2,8-dione, 15007

Amino nitriles

- α-aminonitriles, reductive decyanation of with sodium cyanoborohydride-mercury bis(tri-fluoroacetate), 10835
- lithiated chiral aminonitriles, Michael addition to α,β -unsaturated lactone and alkylation of the resulting compd, synth of unsubstituted and 3-substituted-4-aroyl- δ -lactones, 10083

Amino sugars

3-amino-3-deoxy- and 4-amino-4-deoxyhexoses, synth from 2,3-*O*-isopropylidene-D-glycer-aldehyde using *N*-(t-butoxycarbonyl)-2-(t-butyl-dimethylsiloxy)pyrrole as homologative nucleophile, 4829

Ammonium salts

- ammonium and phosphonium perfluorocyclobutane ylids, synth from perfluorocyclobutene and tertairy amines or phosphines, use as masked fluoride anion source, 9755
- ammonium- and phosphoniumperfluorocyclobutane ylids, reaction with primary or secondary alcohols and carboxylic acids, synth of alkyl fluorides or acyl fluorides respectively, 2977
- cephalosporanic acid 7β -alkylideneammonio salts, synth by reaction of 7β -aminocephalosporanic acid derivs with ketones under acidic conditions, 11905
- cerium(IV) ammonium nitrate (CAN), reaction with 1-(4-methoxyphenyl)-4-(tetrazol-5-yl)-azetidin-2-one and 1-(4-methoxyphenyl)-5-(tetrazol-5-yl-methyl)pyrrolidin-2-one, 10169
- from quaternisation of diisopropyl (N,N-diethyl)-aminomethylphosphonate, Wittig rearrangement of, synth of α -(N,N-diethylamino)-alkenylphosphonates, 2075
- phenylboronic acid deriv with an intramolecular quaternary ammonium ion, use as a glucoside extractant, 12931
- tetraalkylammonium salts in Heck-type reactions, efficiency of, 10113

Analgesics

desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics) interactions with cyclodextrins studied by gas chromatography and NMR, 319

morphine, radical synth of spiro[benzofuran-3(2H),4'-piperidine] and octahydro-1H-benzofuro[3,2-e]isoquinoline fragments, 10935

Annulation

- benzannulation of dienylketenes formed by thermal Wolff rearrangement of α -diazo- β -keto compds, synth of functionalised phenolic derivs, 6665
- 1,3-Michael-Claisen annulation for prep of a Trolox analogue and Precocene II from substituted α-methylene-δ-valerolactone and 1,1-bis-(methylthio)-2-propanone or butanone, 2065
- stereospecific of hydroxy vinyl ethers, synth of 1-hydroxy-2-oxabicyclo[n.4.0]alkane, 2-oxabicyclo[n.4.0]alk-1(6)-eneand2-oxabicyclo[n.4.0]alk-1(6+n)-ene which lead to polyfunctionalised cyclic compds, 7287
- of vinylic cyclopropanes and cyclobutanes by aryl iodides substituted in the *ortho* position catalysed by palladium, 2743

Annulenes

- [6,5] azaannulenes, synth by nitrene addition to C₆₀, 5257
- bridged –, comparison of electronic structure with that of fulleroids, 5207

Anthracenes

- 9-anthrylsubstituted pyridyl enones, study of structure effects on photochemical properties of, 935
- 9-diazo-10-anthrone, reaction with Grignard reagents, competition between nucleophilic addition and electron-transfer process, 6795
- 4,6-diphenylthianthrene and 1-tetrathiafulvalenylnaphthalene, synth and X-ray crystal structures, 4745
- 5-methyl-and6-methyl-1,2,3,4-tetrahydroanthracenes, synth through 1,2-addition of the corresponding α-lithio- o or m-xylenes onto α-oxoketene dithioacetals followed by cyclodehydration of the resulting carbinols, 14049
- 7-oxa(or thia)-3,4,6-triazabenz[d,e]anthracene and 7-oxa-3,4,6,9-tetrazabenz[d,e]anthracene derivs, synth from substituted o-aminonitrile pyridine derivs and phosgeniminium chloride, 10497
- substituted 3,4-dihydro-1(2H)-anthracenone,

synth from naphtho[b]cyclobuten-1(2H)-ols by successive thermal 4π and 6π electrocyclisations, 2235

Anthracyclins/anthracyclinones

- aklavinone, an 11-deoxyanthracyclinone antibiotic with anticancer activity, enantio- and diastereoselective synth of the AB ring system by hydroxyalkylation of 5-alkoxy-(3-hydroxyphenyl)pentanoate, 13493
- anthracyclines of the daunorubicin family fluorinated at position 8 or 10, synth by glycosylation of the corresponding fluorinated aglycones and from daunorubicin respectively, 185
- ditrisarubicin B, member of the anthracycline antitumour antibiotics, ¹H NMR spectrum and solution conformation, 5617
- heteroanthracyclinone analogues, synth of furoisoxazole intermediates by 1,3-cycloaddition of nitrile oxides to 2(5H)-furanones substituted at the 5-position by sulfur bearing groups, 3457

Anthraquinones

aza-anthra-5,10-quinones via metalation of the pyridine nucleus at the C³-carbon atom of the methyl ortho-pyridinecarbonyl benzoates followed by addition of the generated lithiated species to carbomethoxy group, 11025

Antibacterials

- activity of wailupemycins A-C and 3-epi-5deoxyenterocin, α-pyrone containing metabolites from *Streptomyces* sp. derived from marine sediment, 8073
- ceratinamides A and B, antifouling dibromotyrosine derivs from the marine sponge *Pseudoceratina purpurea*, antibacterial activity against *Flavobacterium marinotypicum*, 8181
- haliclonacyclamines A and B, cytotoxic alkaloids from tropical marine sponge *Haliclona* sp., structures, 9111
- trichothecane sesquiterpenes with antibacterial activity, general route to A-ring aromatic trichothecane from allyl alcohols, 10363

Antibiotics

- (-)-malyngolide and (+)-epi-malyngolide, antibiotic first isolated from blue-green marine algae Lyngbya majuscula, synth by asymmetric Carroll rearrangement, 5805
- aklavinone, an 11-deoxyanthracyclinone antibiotic with anticancer activity, enantio- and diastereoselective synth of the AB ring system by hydroxyalkylation of 5-alkoxy-(3-hydroxyphenyl)pentanoate, 13493

- anthramycins, DNA-interactive antitumour antibiotics possessing a pyrrolo[2,1-c][1,4]benzodiazepine ring system, synth of the ring system by transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, 10751
- (+)-aphidicolin, cancer growth inhibiting tetracyclic diterpenoid antibiotic from Cephalosporium aphidicola and Nigrospora sphaerica, synth from 4-ethylidene-2-(5-hydroxy-2-pentynyl)cyclohexane ethylene acetal, 10347
- ascomycin, macrolactam antifungal antibiotic, epimerisation and skeletal resection in the ascomycin framework, a study of the biological consequences of lactam rotamer selection, 9643
- aureobasidin A, cyclic depsipeptide antibiotics from *Aureobasidium pullulans* R106, synth using bromotris(pyrrolidino)phosphonium hexafluorophosphate as a coupling reagent, 4327
- azinothricin antitumour antibiotics, synth of (3R)- and (3S)-piperazic acids (components of —) by hydrazination of chiral N-bromovaleryl carboximide enolates with DBAD, 1047
- bicyclomycin, antibiotic with a [4.2.2] bicyclic ring system, ring transformations of 5,5a-dibromobicyclomycin and 5,5a-dibromobicyclomycin-2',3'-acetonide, 833
- C-aryl glycosides related to the chrysomycin antitumour antibiotics, synth using Ramberg-Backlund reaction, 14437
- carbapenem antibiotics PS-5 and thienamycin, synth of intermediates to by 4-exo-trig radical cyclisation of N-[2,2-bis(phenylthio)ethenyl]-α-bromoamides, 489
- carbapenems, synth of 4-acetoxy-β-lactam, starting material in synth of, from (+)-(1S,2S)-2-amino-1-phenylpropan-1,3-diol, 8989, 9005
- cephalosporanic acid 7β -alkylideneammonio salts, synth by reaction of 7β -aminocephalosporanic acid derivs with ketones under acidic conditions, 11905
- chalcomycin, neutral 16-membered macrolide antibiotic, stereochemistry by X-ray crystallography, 3857
- chloramphenicol, synth from 3-bromo-N-t-butyl- N^{α} -phthaloyl-p-nitrophenylalaninamide, neighbouring group effects on substitution reactions over elimination, 7025
- coloradocin, antigonorrheol and antianaerobic antibiotic produced by fermentation of Actino-

- planes coloradoensis sp., biosynthesis of, 10327 defucogilvocarcin V isosteres, aglycone common to some C-aryl glycoside antitumour antibiotics, synth via MAD-mediated conjugate addition of carbanions to naphthoquinone ketals, 3841
- ditrisarubicin B, member of the anthracycline antitumour antibiotics, ¹H NMR spectrum and solution conformation, 5617
- enediynes, enyne allenes and related compds, chemistry of, 6453
- (+)-heptelidic acid, epoxylactone with antibacterial activity from fungal origin, use of 2-oxo-5-isopropyl-cyclohexenecarboxylates as building blocks for EPC synth of (+)-heptelidic acid, 8725
- lasalocide A and other polyether ionophore antibiotics, synth of a fragment of by higher-order vinyl cuprate ring opening of functionalised epoxides derived from tris(hydroxymethyl)methane, 12631
- lysocellin, polyether antibiotic, synth of C1-C9, C16-C23 and C10-C23 subunits followed by total synth, 531, 551
- macbecin I and herbimycin A, ansamycin antibiotics with a wide spectrum of biological activities, asymmetric synth of C3-C15 segment and formal synth of (+)-macbecin I, 3229
- MDL 62,879 (GE 2270A), a peptide produced by *Planobispora rosea* and belonging to the thiazolyl peptide group of antibiotics, chemical modifications of, 8763
- merulidial and isovelleral, fungal antibiotic terpenoids, reactivity of towards triacetic acid lactone, 1473
- 2,3-methano-2,6-diaminopimelic acids, synth as antibiotics by inhibition of L,L-diaminopimelate epimerase. 1149
- 1-B-methyl carbapenem antibiotics, prep of two pivotal intermediates for synth of, 331
- nonactin, macrotetrolide antibiotic, total synth from optically active 2-isoxazolines, 571
- oxamazins, monocyclic β -lactam antibiotics, synth of a protected bicyclic oxamazin through intramolecular Michael addition of an N-hydroxy β -lactam, 4225
- oxetanocin A from *Bacillus megaterium*, synth of DNA dodecamers containing oxetanocin and (2R,3R)-2-C-(adenin-9-yl)-1,4-anhydro-2,3-dideoxy-3-C-hydroxymethyl-D-arabitol, 2863
- papyracillic acid, penicillic acid analogue from the ascomycete *Lachnum papyraceum*, 10249

- polyether antibiotics, synth of tetrahydrofuran units of – by Prins cyclisation with side-chain formation of carbon-carbon bond, remarkable siloxy effect for stereocontrolled cyclisation, 7287
- (±)-semivioxanthin, antifungal antibiotic from *Penicillium citreo veride*, synth of (-)-semivioxanthin methyl ether from orsellinic acid derivs, 7159
- sodium (4*S*,8*S*,9*R*,10*S*,12*R*)-4-fluoro-10-[(*S*)-1-hydroxyethyl]-11-oxo-1-azatricyclo[7.2.0.0^{3,8}]-undec-2-ene-2-carboxylate, a fluoro-tribactam from fluorosulfonimide, 263
- tautomycin, pseudoenantiomeric heteroconjugate addition approach to synth of spiro segment of, 2877
- (+)-tautomycin, specific inhibitor of protein serine/threonine phosphatases and antifungal antibiotic, total synth by formation of C₁-C₁₆ fragment, C₁₇-C₂₆ fragment and various other units, 13363
- tunicamycins, antiviral and antibiotic nucleosides isolated from *Streptomyces lysosuperficus*, prep of 7-deoxy-2-deamino-6-hydroxy tunicamine, 4757
- valinomycin, ionophore antibiotic, synth of cyclodepsipeptides related to valinomycins, 1343, 1361, 1379
- virantmycin, tetrahydroquinoline alkaloid from Streptomyces nitrosporeus, synth and stereochemistry of (±)-virantmycin and unnatural (+)-virantmycin, 10609, 10631
- xanthocidin, cyclopentanone antibiotic from Streptomyces xanthocidicus, synth of (±)-xanthocidin from triethylsilyl enol ether, 14651
- see also Anthracyclins/anthracyclinones, Carbapenems, Penams/penems, Cephams/cephems, Penicillins

Antibodies

2,2':5',2"-terthiophene-5-derivs which can be linked to proteins or other carrier molecules by using different functional groups, synth and conjugation with proteins and antibodies, 11281

Antifeedants

- azadirachtin, *C-seco-*limonoid with antifeedant and growth inhibitory activities, synth of the right hand part from (1*S*,4*S*)-bicyclo[2.2.1]-heptane-2,5-dione, 13933
- 1-(3-furyl)-4,4,7a-trimethyl-2,4,5,6,7,7a-hexahydro-1H-inden-2-one, insect antifeedant related to azadiradione, synth from α -cyclocitral,

4817

- (±)-halipanicine, sesquiterpene isothiocyanates from Okinawan sponge *Halichondria panicea*, synth involving Diels-Alder reaction and Martin's methodology as key steps, 6361
- pseudoguaianolides, sesquiterpenoid tricyclic lactones classified as helenanolides or ambrosanolides, synth from ketal ester intermediates, 6307
- vallartanone B, a γ-pyrone-containing polypropionate from the molluse *Siphonaria maura* which prevents feeding by the *Thallasoma lunare* fish, synth from (S)-3-hydroxy-2-methylpropionate, 13901
- volutamides A-E, halogenated alkaloids with antifeedant properties from Atlantic bryozoan *Amathia convoluta*, structures, 5371

Antifungals

- aryl spiroacetals related to the papulacandin antifungal agents, synth involving addition of ortho-lithiated diethylbenzamides to lactones followed by cyclisation of the resulting ketoalcohols, 9553
- ascomycin, macrolactam antifungal antibiotic, epimerisation and skeletal resection in the ascomycin framework, a study of the biological consequences of lactam rotamer selection, 9643
- aureobasidin A, antifungal cyclic depsipeptide from Aureobasidium pullulans R106, synth using bromotris(pyrrolidino)phosphonium hexafluorophosphate as a coupling reagent, 4327
- brasilinolide A, immunosuppressive and antifungal macrolide from actinomycete *Nocardia* brasiliensis, structure, 9031
- bromotyrosine deriv from Caribbean sponge *Aplysina archeri*, structure and antifungal activity, 9863
- clathramides A and B, bromopyrrole alkaloids from Caribbean sponge *Agelas clathrodes*, antifungal activity, 13713
- diepoxins, spiroketal-linked naphthodiepoxydecalinones from fungus LL-07F275 which grows as a mycelium sterilium, stereochemistry of, 435
- haliclonacyclamines A and B, cytotoxic alkaloids from tropical marine sponge *Haliclona* sp., structures, 9111
- (±)-isoavenaciolide and (±)-ethisolide, antifungal metabolites from Aspergillus avenaceus, synth from (±)-7-oxabicyclo[2.2.1]-

hept-5-en-2-one, 629

macbecin I and herbimycin A, ansamycin antibiotics, asymmetric synth of C3-C15 segment and formal synth of (+)-macbecin I, 3229

monocerin, antifungal metabolite, synth from D-glucose using intramolecular C-glycosidation as the key step, 8535

ptilomycalin A, cytotoxic, antiviral from Red Sea sponge *Hemimycale* sp., synth of guanidines as intermediates from pyrrolidin-2-one via N-acyliminium ion coupling with silyl enol ethers, 2603, 2629

ptilomycalin A, guanidine containing biologically active compds, biomimetic model studies towards, 8315

- (±)-semivioxanthin, antifungal antibiotic from Penicillium citreo veride, synth of (-)-semivioxanthin methyl ether from orsellinic acid derivs, 7159
- (+)-tautomycin, specific inhibitor of protein serine/threonine phosphatases and antifungal antibiotic, total synth by formation of C₁-C₁₆ fragment, C₁₇-C₂₆ fragment and various other units, 13363
- trichothecane sesquiterpenes with antifungal activity, general route to A-ring aromatic trichothecane from allyl alcohols, 10363
- 1,3,5-trideoxy-3-fluoronojirimycin and 1,3,5-trideoxy-3-fluoromannojirimycin, synth from noncarbohydrate precursors as possible antifungals, 131
- virantmycin, tetrahydroquinoline alkaloid from Streptomyces nitrosporeus, synth and stereochemistry of (±)-virantmycin and unnatural (+)-virantmycin, 10609, 10631

Antigens

tetrasaccharide of sialyl Le^x and Le^x antigens, synth from benzyl lactoside, 12775

Antiinflammatory compds

- α -arylpropionic acids, non-steroidal antiinflammatory compds, synth of α -fluoro analogues of, 8257
- (1'E,5'E)-2-(2',6'-dimethylocta-1',5',7'-trienyl)-4-furoic acid, sesquiterpene antiinflammatory metabolite from soft coral *Sinularia* sp., synth involving Claisen rearrangement, 4245
- pseudoguaianolides, sesquiterpenoid tricyclic lactones classified as helenanolides or ambrosanolides, synth from ketal ester intermediates, 6307

Antimalarials

jozimine A and pindikamine A, naphthylisoquinoline alkaloids, synth and antimalarial activity of, 13409, 13419

Antitumour compds

- acyclonucleosides, cytotoxic against HEp human cells, 8907
- aklavinone, an 11-deoxyanthracyclinone antibiotic with anticancer activity, enantio- and diastereoselective synth of the AB ring system by hydroxyalkylation of 5-alkoxy-(3-hydroxyphenyl)pentanoate, 13493, 13493
- anthramycins, DNA-interactive antitumour antibiotics possessing a pyrrolo[2,1-c][1,4]-benzodiazepine ring system, synth of the ring system by transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, 10751
- (+)-aphidicolin, cancer growth inhibiting tetracyclic diterpenoid antibiotic from *Cephalosporium aphidicola* and *Nigrospora sphaerica*, synth from 4-ethylidene-2-(5-hydroxy-2-pentynyl)cyclohexane ethylene acetal, 10347
- C-aryl glycosides related to the chrysomycin antitumour antibiotics, synth using Ramberg-Backlund reaction, 14437
- callipeltins A-C, cytotoxic activity against various human carcinoma cells, 9589
- (±)-camptothecin, first generation synth of (±)-camptothecin by tandem radical reactions of aryl isonitriles with N-propargyl-6-halo-2-pyridones, 11385
- defucogilvocarcin V isosteres, aglycone common to some C-aryl glycoside antitumour antibiotics, synth *via* MAD-mediated conjugate addition of carbanions to naphthoquinone ketals, 3841
- 4,5-dioxoaporphine alkaloids, synth from preformed biaryl bond precursors, cytotoxic activity on several tumour cell lines, 11307 ditrisarubicin B, member of the anthracycline
- antitumour antibiotics, ¹H NMR spectrum and solution conformation, 5617
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges, cytotoxic activity against doxorubicin-resistant L1210/DX tumoural cells, 8899
- etoposide, antineoplastic drug, synth by glycosidation of 4'-demethyl-4'-acetyl-epi-podophyllotoxin with α-1-tributyltin-O-2,3-bis-acetyl-4,6-ethylidene-glucose, 3049
- fredericamycin A, antitumour agent with a

spirodiketone unit, synth of analogues in which ring C is expanded to six atoms, cytotoxic activity, 6085

- (+)-goniodiol from *Goniothalamus*, cytotoxic activity against A-549 human lung carcinoma, synth by Ghosez' methodology, 14877
- (+)-goniofufurone, (+)-goniobutenolide A and (-)-goniobutenolide B, antitumourstryllactones from *Goniothalamus giganteus*, synth, 6547
- hapalosin, a cyclic depsipeptide from blue green alga *Hapalosiphon welwitschii* possessing multidrug resistance reversing activities, activity against human breast cancer cell lines, 14723
- (2*R*,2'*S*)-1-*O*-(2'-hydroxy-hexadecyl)glycerol, antitumour compd from shark liver oil, stereoselective synth, 6437
- labiatin B, diterpenoid from Senegalese gorgonian *Eunicella labiata*, cytotoxic activity against human colon cancer cells, 2735
- macbecin I and herbimycin A, ansamycin antibiotics, asymmetric synth of C3-C15 segment and formal synth of (+)-macbecin I, 3229
- macrolactin A, parent aglycone of the bioactive 24-membered macrolides from marine bacterium with antiviral and cytotoxic properties, synth of the C_7 - C_{20} fragment and the C_1 - C_{14} fragment, 11811, 11821
- neocarzinostatin, kedarcidin, C-1027 and maduropeptin, construction of the bicyclo-[7.3.0]dodecadiyne core structure by aldol reaction, 6283
- 7-oxa(or thia)-3,4,6-triazabenz[d,e]anthracene and 7-oxa-3,4,6,9-tetrazabenz[d,e]anthracene derivs, synth from substituted o-aminonitrile pyridine derivs and phosgeniminium chloride, 10497
- panomifene, follow-up molecule to antiestrogenic drug tamoxifen used to treat mammary tumours, improved synth of from 2-(4-alkoxy)-3,3,3-trifluoro-1,2-diphenylpropan-1-ols, 12821 polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, biological activity against human nonsmall-cell lung carcinoma cells, 10997
- pseudoguaianolides, sesquiterpenoid tricyclic lactones classified as helenanolides or ambrosanolides, synth from ketal ester intermediates, 6307
- ptilomycalin A, guanidine containing biologically active compds, biomimetic model studies towards, 8315
- taxanes: canadensene, baccatin III, paclitaxel

and taxa-4(5),11(12)-diene, NMR and molecular modelling study of, 8957

- taxanes, computerised search of tandem reactions using HOLOWin, application to the taxane framework, 14625
- taxanes, "hydrophobic collapse" conformation of paclitaxel in non-aqueous environment, 2291
- taxanes, intramolecular pyrylium ylid-alkene cyclisations for synth of taxol precursors, synth of the 7-deoxy ABC skeleton and formation of the 8-membered B-ring by pinacol rearrangement, 14081, 14103, 14147, 14081, 14103, 14147 taxanes, left and right-half taxoid building blocks from (S)-(+)-Hajos-Parrish ketone, 12443
- taxanes, synth of *cis*-3-hydroxy-4-phenyl-β-lactams, precursor of the taxol side-chain, from ketenes *via* Staudinger reaction, 5579, 5585
- taxanes, synth of a homochiral taxoid BC-unit by combination of enzymatic hydrolysis and aldol-annelation-fragmentation sequence, 6215
- taxanes, taxuspines K-M, taxane diterpenes from the stems of Japanese yew *Taxus cuspidata* Sieb. et Zucc, structures, 2337
- taxanes, taxuspines N-P, taxoids from Japanese Yew Taxus cuspidata, structures, 5391
- taxanes, taxuspines Q-T, taxoids from Japanese Yew *Taxus cuspidata*, structures, 12159
- taxanes, taxuspines U-W, taxane and related diterpenoids from the Japanese yew *Taxus cuspidata*, structures, 13145, 13145
- thuriferic acid, cyclolignan from *Juniperus* thurifera leaves, prep of epithuriferic acid from isopicropodophyllone, stereochemistry, 4903
- trichothecane sesquiterpenes with tumour inhibitory activity, general route to A-ring aromatic trichothecane from allyl alcohols, 10363

Antivirals

- acyclic analogues of 1,5-anhydrohexitol nucleosides, synth by Mitsunobu reaction, antiviral activity of, 13655
- acyloxymethyl and 4-acyloxybenzyl diester prodrugs of phosphonoformate: hydrolysis and antiviral activity of, 14929
- antiviral activity of pindikamine A, naphthylisoquinoline alkaloid, against HIV-1 and HIV-2, 13419
- 2-glycosylaminopyridines, synth through tandem Diels-Alder/retro Diels-Alder reaction starting from 6-glycosylaminopyrimidines with dimethyl acetylenedicarboxylate as dienophile, 5845

HIV, glycopeptides related to HIV gp120 and mucins, solid-phase synth using piperidine for Fmoc cleavage, 7983

- HIV-1, imidazo[1,5-g][1,4]diazepines, synth and evaluation as anti-HIV agents, 15157
- 2'-isomeric dideoxynucleosides of the D-related class, analogues of anti-HIV active 4'-azido-2'-deoxynucleosides, synth and antiviral studies of, 12643
- macbecin I and herbimycin A, ansamycin antibiotics, asymmetric synth of C3-C15 segment and formal synth of (+)-macbecin I, 3229
- macrolactin A, parent aglycone of the bioactive 24-membered macrolides from marine bacterium with antiviral and cytotoxic properties, synth of the C₇-C₂₀ fragment and the C₁-C₁₄ fragment, 11811, 11821
- ptilomycalin A, cytotoxic, antifungal compd from Red Sea sponge *Hemimycale* sp., synth of guanidines as intermediates from pyrrolidin-2-one *via N*-acyliminium ion coupling with silyl enol ethers, 2603, 2629
- ptilomycalin A, guanidine containing biologically active compds, biomimetic model studies towards, 8315
- 2-[5-(9*H*-purin-9-yl)-2-cyclopenten-1-yl]-ethanol analogues, synth as antiviral agents, 8407
- cis-2-[4-(9H-purin-9-yl)-2-cyclopenten-1-yl]ethanol analogues, synth from racemic 2-cyclopentene-1-acetic acid by palladium-catalysed synth, 2789
- trichothecane sesquiterpenes with antiviral activity, general route to A-ring aromatic trichothecane from allyl alcohols, 10363
- 1,3,5-trideoxy-3-fluoronojirimycin and 1,3,5-trideoxy-3-fluoromannojirimycin, synth from noncarbohydrate precursors as possible antifungals, 131
- tunicamycins, antiviral and antibiotic nucleosides isolated from *Streptomyces lysosuperficus*, prep of 7-deoxy-2-deamino-6-hydroxy tunicamine, 4757
- virantmycin analogues, activity against the influenza virus, 10609, 10631

Arenes

allylated aromatics, synth by Ni-catalysed couplings of benzylic chlorides and vinylic organometallics derived from the hydroalumination and hydrozirconation of alkynes, 7265 arenesulfonyl iodides, addition reaction with alkynols, synth of cyclic enol ethers, 7779 fluoroarenes by deaminative fluorination of

- aminoarenes using hydrogen fluoride combined with bases, 23
- nitroarenes, reaction with carbanions of fivemembered S-heterocycles via the ring-opening vicarious nucleophilic substitution reaction, 3189
- resorcinarenes, synth and chemistry of, 2663 (tricarbonyl(η^6)arene)chromium(0) complexes as chiral auxiliaries in Reformatsky-type reactions, synth of β -aminoesters and β -lactams, 4849

Aromaticity

- analysis of the aromatic character of azaanalogues of benzenoid hydrocarbons, 13795 classical and magnetic criteria of aromaticity, 9945
- of π -electron carbocyclics, separation of the energetic and geometric contributions, 1713 separation of the energetic and geometric contributions to the aromaticity, a general model for the π -electron systems, 10255

Arylation

- palladium catalysed arylation of methyl acrylate, effect of tetraalkylammonium salts on, 10113 palladium catalysed hydro— and hydrovinylation of 3,3-dialkoxy-1-aryl-1-propynes, synth of 3-aryl- and 3-vinylquinolines, 10225
- Ullmann arylation in synth of dibenzo-monoaza-12-crown-3, -15-crown-4, -18-crown-5 and -21crown-6 derivs, 6713

Asymmetric synthesis

- of (1*R*,2*S*,3*R*)-2-acetyl-5-(1,2,3,4-tetrahydroxybutyl)thiazole from 2-acetylthiazole, 14069
- of *syn-* and *anti-*bicyclopropane derivs using reagent controlled asymmetric cyclopropanation reactions, 15325
- of *p*-carboranylalanine (*p*-Car) and 2-methyl-o-carboranylalanine (Me-o-Car) using Oppolzer's sultam method, 9207
- of (S,S)-α,α-diamino-1,4- and 1,3-benzenediacetic acids and N-Boc- and N-Fmoc-derivs, 7761
- of *cis*-2,3-dibenzylbutyrolactone lignan from *meso*-2,3-dibenzylbutanedioic acid anhydride, 12799
- enantioselective synth through enzymatic asymmetrisation, Report, 3769
- of 5-hexadecanolide, pheromone of the Oriental hornet queen *Vespa orientalis*, 4479
- of (2R)- and (2S)-2-iodohexadecanal, natural inhibitors of the thyroid gland metabolism, 10473

of *cis*-2-methylcyclopropanecarboxylic acid, a component of curacin A, by Simmons-Smith cyclopropanation of dienes derived from diethyl L-tartrate, 13327

of α -substituted α -methyl and α -phenyl phosphonic acids from phosphonamides: design, carbanion geometry, reactivity and prep of chiral alkyl bicyclic phosphonamides, 13837

of 3-substituted piperidines from N-(2-hydroxy-1-phenylethyl)piperidine-2-one via a bromo deriv, 7719

see also Enantioselection

Atropisomerism

of cofacial pyridine rings, synth, proton NMR spectra and conformations of 1,8-di(3'-pyridyl)naphthalene, 8703

Aza compds

2-aza-1,3-dienes, [2+4] cycloaddition reaction with *N*-sulfonyl-alkylamines, 725

2-aza-1,3-dienes with electron-releasing substituents at the 1,3-positions, synth from N-thioacylacetamidines through deprotonation of N-ylidene acetamidinium iodides, precursors of pyridine and pyrimidines, 10095

aza-12-crown-4 with a functionalised arm, density functional calculations to analyse Li⁺ selectivity of, 8199

aza-analogues of benzenoid hydrocarbons, analysis of the aromatic character of, 13795

aza-anthra-5,10-quinones via metalation of the pyridine nucleus at the C³-carbon atom of the methyl ortho-pyridinecarbonyl benzoates followed by addition of the generated lithiated species to carbomethoxy group, 11025

[6,5] azaannulenes, synth by nitrene addition to C_{60} , 5257

2-azabicyclo[3.3.0]octanes by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445

azabicyclo[4.2.1]nonane ring system of anatoxina, synth involving anionically induced small ring opening/ring closure/ring opening cascade, 11637

4-azacholest-5-en-3-one, 6-azacholest-4-en-7-one and their N-methyl derivs, reactions with electrophilic reagents such as bromine, acetyl nitrate or CrO₃, 14057

2-azadienes, cycloaddition with several nitroso compds, toward the synth of α -amino acid derivs, 7585

2-azaheptatrienyl lithium compds, 1,7-electrocyclisation of, synth of 1-acyl-2,3-di-

hydroazepines, 14801

3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, synth by Fischer indolisation of 6-phenylhydrazono-6,7,8,9-tetrahydro-11*H*-dipyrido[1,2-a;4,3-d]pyrimidine-11-ones, 7789

27

cyclenphosphine sulfide, synth by reaction of molecular sulfur on cyclenphosphorane, fluxional behaviour and ambident reactivity, 2995

dibenzo-monoaza-12-crown-3, -15-crown-4, -18-crown-5 and -21-crown-6 derivs, synth from 2,2'-dihydroxydiphenylamine or *via* intramolecular Ullmann reaction, 6713

4,6-dichloro-2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones, synth by cycloaddition of 2*H*-1,4-oxazin-2-ones and alkenes, conversion to 1,6-dihydro-6-oxo-2-pyridine-and 6-oxo-2-piperidine-carboxylates, 2591

hydroxyazaisoindolinones, synth and conversion into pyridopyridazinones *via* reaction with hydrazine hydrate, 3261

(functionalised) 2-oxa-5-azabicyclo[2.2.2]-oct-5-en-3-ones, reaction with various nucleophiles, synth of polysubstituted 2-pyridine-ca:boxylic acid derivs, 12529

7-oxa(or thia)-3,4,6-triazabenz[d,e]anthracene and 7-oxa-3,4,6,9-tetrazabenz[d,e]anthracene derivs, synth from substituted o-aminonitrile pyridine derivs and phosgeniminium chloride, 10497

12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthro linophane, synth by cyclisation of 2,9-bis-(bromomethyl)phenanthroline, 4673

Azepines

1-acyl-2,3-dihydroazepines, synth by 1,7-electrocyclisation of 2-azaheptatrienyl lithium compds, 14801

3-aryl-6,7,8,9-tetrahydro-5H-imidazo[1,2-a]azepines, reaction with phenacylbromides and subsequent cyclisation to yield 2a,4a-diazacyclopenta[c,d]azulene, 9835

azepine-ring formation at the periphery of pyridone and pyrido[1,2-a]pyrimidone systems *via* ene reactions, mechanism, 13081, 13097, 13111

(-)-clavizepine, alkaloid with a dibenzopyranazepine skeleton, synth from dibenzoxepinone, 4911

isoxazolinopyrimidoazepine deriv, synth by 1,3dipolar cycloaddition approach, subsequent transformation into pyrimidoazepinone derivs, 5739

optically active 2H-azepines, synth from α -

amino acids and subsequent rearrangement to the corresponding 3H-isomers, 10883

Azepinones

pyrimidoazepinone derivs, intermediates to pyrimidoazepine based folic acid derivs, synth by 1,3-dipolar cycloaddition approach *via* an isoxazolinopyrimidoazepine deriv, 5739

Azetidines

- from 2H-1,3-oxazines via syn,syn-1,3-amino-alcohols, 3095
- highly functionalised 2-oxoazetidine and 2-oxoazetidine-4-sulfenic acid derivs, synth by ozonolysis of Δ^2 -cephem derivs, 10205
- 4-oxo-2-azetidineacetic acids, synth by radical cyclisation of N-vinylic α-bromo amides, 13867
- 4-(2-vinyl-aziridino or azetidino)-5-methoxy-1,2-benzoquinones, mechanism of thermal and acid-catalysed sigmatropic rearrangement of, 13605

Azetidinones

- (3R,4S)-1-acyl-β-lactams, coupling with baccatin III, 10-deacetylbaccatin III and 14β-hydroxy-10-deacetylbaccatin III, synth of fluorine containing analogues of paclitaxel and docetaxel, 209 trans-azetidin-2-ones, synth by ester enolate reaction with chiral N-trimethylsilyl imines, 1685 by [2+2]-cycloaddition of chlorosulfonyl isocyanate to cis and trans 3-O-but-1'-enyl-1,2-O-isopropylidene-α-D-xylofuranose, 6019
- cis- β -lactams by Staudinger reaction of (+)-(15,2S)-2-amino-1-phenylpropan-1,3-diol, subsequent transformation into carbapenems, 4-cyano- β -lactams, β -hydroxy aspartates and pyrrolidinones, 8989, 9005
- D,L-erythrose-, and D,L-1,4-dideoxy-4-aminoerythrose derivs bearing a β-lactam at C-4, synth *via* cycloaddition of azetidinodiazepines with acylnitroso dienophiles, 6201
- *trans*-3-fluoro-3-methyl-2-azetidinone derivs by condensation of 2-fluoropropanethioate lithium enolate with imines, 255
- cis-3-hydroxy-4-phenyl-\(\theta\)-lactams, precursor of the taxol side-chain, synth from ketenes via Staudinger reaction, 5579, 5585
- β -lactams by 4-exo-trig radical cyclisations of N-[2,2-bis(phenylthio)ethenyl]- α -bromo amides, 489
- β-lactams by Lewis acid promoted condensation of silylketene thioacetals and 2-pyridylthioesters with imines, 2573, 2583
- β -lactams, synth by Reformatsky-type reaction using (tricarbonyl(η^6)arene)chromium(0)

complexes, 4849

- cis-β-lactams, synth by Staudinger reaction of homochiral ketenes derived from Oppolzer sultam, 5579, 5585
- β-lactams via ketene-imine cycloaddition using different chiral auxiliaries, steric effects, 3741
- 1-(4-methoxyphenyl)-4-(tetrazol-5-yl)azetidin-2 -one, reaction with cerium(IV) ammonium nitrate, 10169
- 1-(4-methoxyphenyl)azetidin-2-ones, reaction with cerium(IV) ammonium nitrate, structure-reactivity studies, 771
- 1-β-methyl carbapenem antibiotics, prep of two pivotal intermediates for synth of, 331
- oxamazins, monocyclic β -lactam antibiotics, synth of a protected bicyclic oxamazin through intramolecular Michael addition of an N-hydroxy β -lactam, 4225
- sodium (4*S*,8*S*,9*R*,10*S*,12*R*)-4-fluoro-10-[(*S*)-1-hydroxyethyl]-11-oxo-1-azatricyclo[7.2.0.0^{3.8}]-undec-2-ene-2-carboxylate, a fluoro-tribactam from fluorosulfonimide, 263

Azides

- alkyl azides, Schmidt reactions with ketals and enol ethers of 1,5-azidoketones, 3403
- 1-azido-glycopyranosyl cyanides, precursors of anomeric α -amino acids, synth from acetylated 1-halogeno-D-glycopyranosyl cyanides and formamide, reactivity of, 9121
- of α-azidoacetonitriles α-phenyl substituted with triphenylphosphine, synth of phosphazine, an aminophosphonium carbanion salt and a phosphazide, 9629
- 2-azidobenzothiazole, reaction with 1-azido-4-(3',5'-dimethyl-1'-pyrazolyl)tetrafluorobenz ene and C_{60} , synth of imino[60]fullerenes, σ -azaridinefullerene and π -azafullaroid, 6733
- α-azidoesters as divergent intermediates for combinatorial generation of glucofuranose libraries of novel *N*-linked glycopeptides, 10711, 10721
- 3-(2-azidoethyl)-3-[3,4-(methylenedioxy)phenyl]cyclohex-1-ene, relux in toluene to yield 3a-[3,4-methylenedioxy)phenyl]-3,3a,4,5,6,7-hexa hydro-2*H*-indole, key step in synth of (±)-crinane, 3107
- 5-azidomethyl-2,4-tetrahydro-2-hydroxy-3,4-(*O*, *O*)isopropylidene furan, tandem Wittig [2+3] cycloaddition of, synth of nonracemic homo-1-deoxyazasugars with D-talo and L-allo configuration, 14745
- cycloaddition to isothiazole dioxides, synth of

thiadiazabicyclo[3.1.0]hexene derivs, subsequent rearrangement to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183 intramolecular Schmidt reaction with tertiary alcohols, synth of 5-(α -naphthyl)- and 5-(β -naphthyl)indolizidines as potential dopamine analogues and non-opiate antinociceptive agents, 12039

2'-isomeric dideoxynucleosides of the D-related class, analogues of anti-HIV active 4'-azido-2'-deoxynucleosides, synth and antiviral studies of, 12643

protected D-hex-2-ulopyranosyl azides, synth and photolysis of, 9057

sodium azide, reaction with 3(,5)-(di)chloro-2H-1,4-(benz)oxazin-2-ones, synth of substituted 1H-tetrazoles and 1,2,3-triazoles, 8813

variously substituted 2,3-diarylacrylazides, nitration to 3-aryl-4-nitro-isoquinolones followed by reduction, amidification and cyclisation yields dibenzo[c,h]-1,5-naphthyridines, 10427

Azines

azine heterocycles, application of group additivity parameters to the prediction of enthalpies of formation of, 14335

2-methylthio-4-oxo-3-phenylpyrido[2,1-f][1,2,4]-triazinium iodide, reaction with various aminoheterocycles, synth of conjugated mesomeric betaines, 11349

Aziridines

N-alkyl aziridines, stereoselective reaction with di-t-butyl dicarbonate and sodium iodide in acetone, synth of oxazolidin-2-ones, 2097

2-aziridinemethanols, aza-Paynerearrangementepoxide ring opening reaction of, regio- and stereoselective synth of diastereomerically pure N-protected 1,2-amino alcohols, 11739

aziridino ketones, diastereoselective reduction of, synth of alcohols, 12117

aziridinyl-methylenemalonates, Michael-reaction initiated ring closure reactions of, synth of functionalised cyclopropanes, 12253

by rhodium(II)-catalysed aziridination of olefins using (*N*-(*p*-nitrobenzenesulfonyl)imino)phenyliodinane, 1543

2,2-disubstituted aziridines, regioselective nucleophilic ring opening reactions of, synth of α , α -disubstituted amino acids, 13035

N-(R)- and (S)- α -methylbenzylaziridine-2(S)and (R)-carboxaldehyde, reductive ring opening of, synth of both enantiomers of cathinone,

12111

N-substituted aziridine carboxamides, conversion to 4,5-disubstituted-3-amino-γ-lactams, 9909 symmetrical N-acylaziridines, ring opening reaction with thiols catalysed by chiral dialkyl tartrate-diethylzine complexes, synth of trans 2-(N-acylamino)-1-arylthiocyclohexane, 7817 N-triphenylmethyl-2-methyleneaziridine and (S)-N-(1-phenylethyl)-2-methyleneaziridine, synth from N-(2-bromo-2-propenyl)-amine, 7037 4-(2-vinyl-aziridino or azetidino)-5-methoxy-1,2-benzoquinones, mechanism of thermal and acid-catalysed sigmatropic rearrangement of,

13605 Azo compds

α-acetoxy and α-alkoxy azo compds, synth by oxidation of hydrazones by hypervalent organoiodine reagents, 14673

azoalkenes, reaction with thiocarboxylic acids to yield hydrazone 1,4-adducts leading to widely substituted pyrrole and pyrazole rings by internal cyclisation, 1579

diallylbis(arylazo)calix[4]arenes, synth by diazonium coupling between two kinds of p-diallylcalix[4]arenes and p-substituted benzene-diazonium salts, 9805

quadrupolar [1₄]azolophanes built up from heterocyclic betaine subunits, synth, X-ray crystallographic analysis and use as a captodative spacer, 15171, 15189, 15197

substituent effects on the feasibility of azomethine-azomethine isomerisation: synthetic opportunities for biomimetic transamination, 14701

Azocines

N-benzyl derivs of 1,11-(methanoaminomethano)-5H,7H-dibenzo[b,g][1,5]selenazocine, reaction with N-bromosuccinimide, synth of aminoammonio-selenurane, 13951

magallanesine, alkaloid with an azocine ring from *Berberis darwinii* Hook, synth from isoquinolineacetate by [1,2]-Meisenheimer rearrangement and Heck cyclisation, 14543

Azonines

6-oxodibenzo[*b*,*f*]-azonine by Beckmann or Schmidt rearrangements of 2,3,8,9-tetramethoxy-5,6,11,12-tetrahydrodibenzo [*a*,*e*]cycloocten-5-one, 8063

Azulenes

2a,4a-diazacyclopenta[c,d]azulene, synth from 3-aryl-6,7,8,9-tetrahydro-5*H*-imidazo[1,2-a]-azepines by reaction with phenacylbromides

and subsequent cyclisation, 9835

Bacteria

Lyngbya majuscula Caribbean cyanobacterium, synth and biological activity of curacin A, an antimitotic agent from, 14543

Microcystis aeruginosa (NIESS-88) cyanobacterium, structure and absolute stereochemistry of kawaguchipeptin A isolated from, 9025

Microcystis viridis (NIES-102) freshwater cyanobacterium, structures of aeruginosins 102-A and B isolated from, 14501

Oscillatoria agardhii (NIES-204) cyanobacterium, structure and biological activity of agardhipeptins A and B isolated from -, 13129

Oscillatoria agardhii (NIES-204) cyanobacterium, structures of microviridins D-F, serine protease inhibitors from, 8159

phytopathogenic bacteria Erwinia chrysanthemi, synth of methyl esters of 3-deoxy-D-erythro-2-hexulosonic acid analogues as inducers of the expression of pectinase genes in, 4625

Sarcina ventriculi (gram positive bacterium), isolation and structure of a β-1-O-acyl-β-1,2-diglucosyl glycoside from the membranes of, 3873

Baeyer-Villiger reactions

of 2,3,8,9-tetramethoxy-5,6,11,12-tetrahydrodibenzo[*a,e*]cycloocten-5-one, synth of substituted 6-oxodibenzo[*b,f*]oxinin, 8063

Barbier reactions

aqueous Barbier-Grignard type reactions, scope, mechanism and synthetic applications, 5643

of carbonyl compds with α -bromoesters, allylic and propargylic bromides promoted by active zinc and tin powder, synth of β -hydroxyesters, homoallylic and homopropargylic alcohols, 9575

lithiation of carbamoyl and thiocarbamoyl chlorides catalysed by naphthalene, synth of α -hydroxy or α -amino amides respectively, 13739

lithiation of triflates and triflamides under Barbier-type conditions, indirect transformation of alcohols and amines into organolithium compds, 14341

Barium and compds

Ba(II) complex of 18-mercaptomethyl-1,4,7,10,13,16-hexaoxacyclononadecaneascatalyst for methanolysis of *p*-nitrophenyl acetate, 8867

Baylis-Hillman reactions

(2E)-2-butyloct-2-enal, alarm pheromone of

African weaver ant, and (2E)-2-tridecylheptadec-2-enal, metabolite from red alga, synth using Baylis-Hillman adducts, 1253

carbon-carbon bond forming reaction: Report, 8001

effect of branching in alkyl groups of tertiary amines on their performance as catalysts in, 8307

nucleophilic addition of triethyl phosphite to acetates of Baylis-Hillman adducts, synth of (E)- and (Z)-allylphosphonates, 2261

Benzazepines

benzazepine-based nitrones, synth utilising a modified Bischler-Napieralski reaction as the key step, cyclic analogues of the radical trap phenyl t-butyl nitrone, 6519

3*H*-1-benzazepines, synth by dehydrogenation of 2,3- and 2,5-dihydro-1*H*-1-benzazepines by hydride transfer to an iminium ion, 4423

Benzimidazoles

2-benzimidazolylthioacetophenones, synth by reaction of 2-mercaptobenzimidazole with aromatic ketones, subsequent cyclisation gives the thiazolo[3,2-a]benzimidazoles, 10485

Benzodiazepines

pyrrolo[1,2-b][2.4]benzodiazepine, synth by reductive cyclisation of 1-(2-ethoxycarbonyl-benzyl)-2-nitropyrrole, 4485

pyrrolo[1,4]diazepines from the corresponding carbonyl azides and [3,2,2]cyclazines fused to a [1]benzothiophene ring via Diels-Alder reaction of [f]indolizines, 13547

pyrrolo[2,1-c][1,4]benzodiazepine ring system of anthramycins by transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, 10751

spiro(pyrrolidinyl-2,3'-benzodiazepines) related to MK-329, synth by cycloaddition of imines of 1-methyl-3-amino-1,3-dihydro-5-phenyl-(2*H*)-1,4-benzodiazepine-2-one to dipolarophiles, 13455

tilivalline, a pyrrolo[2,1-c][1,4]benzodiazepine isolated from *Klebsiella pneumonia* var. oxytoca, epimerisation of, 13521

Benzodioxins

cyclopenta[b][1,4]benzodioxins, synth by $[4\pi + 2\pi]$ cycloaddition of o-benzoquinones with symmetrical 6,6-pentamethylenefulvene, 4029

Benzofurans

benzo and naphtho-dihydrofuran derivs by reaction of 2-alkoxy-2-fluoro-glycosyl fluorides with phenol and naphthol derivs, 7797

3(2H)-benzofuranone, coupling with disulfur

dichloride, synth of bis-2-spirocoumaranoylidenetetrathiane, 1961

5- or 6-bromobenzofuran-4,7-diones, Diels-Alder reactions with azadienes, synth of furo-[2,3-g] or furo[3,2-g]quinoline-4,9-diones, 9499 dibenzofuran, diphenylether and biphenyl, fluorination with N-F type reagents, regioselectivity of, 11341

didesmethylrocaglamide and aglains A-C from *Aglaia argentea*, structures, 6931

spiro[benzofuran-3(2H),4'-piperidine], tricyclic morphine fragment, synth by intramolecular radical cyclisation of 4-[(2'-bromo-6'-methoxyphenoxy)methyl]-1-methyl-1,2,5,6-tetrahydropyridine, 10935

2-Benzofurans, see Isobenzofurans

Benzonitriles

benzonitrile oxide cycloaddition to pyridazine, pyrimidine and pyrazine, 6421

benzonitrile oxide, cycloadditions with cyanophenols, role of hydrogen bonding in, 7885

Benzopyranones

3-aminothieno[3,4:3',4']benzo[b]pyranone, reactivity toward electron-poor olefins and acetylenes, 11915

N-substituted 7-amino-8-hydroxy-4-methyl-2H-[1]-benzopyran-2-ones, synth by reaction of phosphines with 7-methoxyimino-4-methyl-chromene-2,8-dione, 15007

Benzopyrans

by reaction of 2-substituted 1,3-oxazolidines with mixtures of cyclic and acyclic carbon nucleophiles, 14273

photochromic indolinospirobenzopyrans, synth by Wittig reaction under Phase Transfer Catalysis, 8755

Benzoquinones

o-benzoquinones, $[4\pi + 2\pi]$ -cycloaddition with symmetrical 6,6-dialkyl and cycloalkylfulvenes, formation of bicyclo[2.2.2]octene diones and cyclopenta[b][1,4]benzodioxins, 4029

4-dialkylamino-5-methoxy-1,2-benzoquinones, reactions of in acidic media, selective *C*-alkylation or *N*-dealkylation, 7841

4-(N-methyl-N-allylamino)-5-methoxy-1,2-benzoquinones and 4-(2-vinyl-aziridino or azetidino)-5-methoxy-1,2-benzoquinones,mechanism of thermal and acid-catalysed sigmatropic rearrangement of, 13605

porphyrin/depsipeptide/p-benzoquinone molecule, synth for study of hydrogen bond mediated electron transfer in proteins, 12357

triphenylphosphoranylideneamino-1,4-benzoquinone, aza-Wittig reaction with aryl isocyanates and aroyl chlorides, synth of oxazolo-[5,4-b]phenoxazine and benzoxazole derivs, 6781

Benzothiazepines

3-(dimethylamino)methyl-5*H*,11*H*-pyrrolo-[2,1-*c*][1,4]benzothiazepine derivs with potential central nervous system activity, synth from pyrrolo[2,1-*c*][1,4]benzothiazepines, 7745

Benzothiazines

4-(2*H*-1,2,4-benzothiadiazine-1,1-dioxide-3-yl)-2,6-bis(1,1-dimethylethyl)phenols, synth and free radical scavenging activity of, 12587

Benzothiazoles/benzothiazolones

1,2-benzisothiazole-1,1-dioxidesring-expansions and ring-annulations of resulting in heterocyclic systems, 3339

3-(benzothiazol-2-yl)-3-oxopropanenitrile, synth from ethyl 2-benzothiazolecarboxylate or from 2-bromoacetylbenzothiazole, reactivity with diazonium salts, aromatic amines and hydrazines, 7893

ethyl (*E*)-3-(1,3-benzothiazol-2-yl)-3-cyanopropenoate, use in interand intramolecular Diels-Alder reactions, 733

 α -ketosulfides of benzothiazoles, reaction with allylic carbonates affords α - and α , α -diallylated ketosulfides, intermediates for stereoselective synth of allyl ketones, allyl thiiranes and dienes, 2155

Benzothiophenes

benzo[1,2-b:4,5-b']dithiophene derivs, synth by oxidative dimerisation of diethyl 3-thienyl-malonate by high valent metal salts, 13227

4,6-dimethyldibenzothiophene, synth involving coupling of two aromatic rings by nucleophilic substitution followed by Pschorr-type reaction, synth from 2-bromo-3-nitrotoluene and o-thiocresol, 3953

4-methyl- and 4,6-dimethyldibenzothiophenes, synth from dibenzothiophene, 9087

pyrrolo[1,4]diazepines from the corresponding carbonyl azides and [3,2,2]cyclazines fused to a [1]benzothiophene ring via Diels-Alder reaction of [f]indolizines, 13547

Benzotriazoles

2H-benzotriazole derivs, chemistry and nonlinear optical properties of, 14607

Benzoxazines

1,4-benzoxazinone acetal glucosides GDIBOA and GDIMBOA from *Gramineae* sp., synth by

- glucosidation of 2,4-dihydroxy-2*H*-1,4-benz-oxazin-3(4*H*)-one, 10389
- 3(,5)-(di)chloro-2*H*-1,4-(benz)oxazin-2-ones, reaction with sodium azide or diazocompds, synth of substituted 1*H*-tetrazoles and 1,2,3-triazoles, 8813
- 2-(2'-dimethylamino)ethenyl-4H-3,1-benzoxazin-4-ones, synth by cyclisation of N-anthranilic acids with Vilsmeier reagents, 753
- 5H-pyrrolo[1,2-a][3,1]benzoxazin-5-ones, X-ray structure and reverse Diels-Alder reaction of, 12475

Benzoxepins

forbaglins A-B from Aglaia forbesii, structures, 6931

Bergman reactions

see Diynes

Betaines

- 2-alkyl(aryl)-4-hydroxy(mercapto)-6-oxo-1,6-di hydropyrimidin-5-yl-triphenylphosphonium chloride suitable for prep of phosphonium ylid-betaines, synth by reaction of Ph₃P⁺C HCN with acylisocyanates and thio analogues, 8835
- conjugated mesomeric betaines, synth from reaction of various aminoheterocycles with 2-methylthio-4-oxo-3-phenylpyrido[2,1-f][1,2,4]-triazinium iodide, 11349
- quadrupolar [1₄]azolophanes built up from heterocyclic betaine subunits, synth, X-ray crystallographic analysis and use as a captodative spacer, 15171, 15189, 15197

Biaryls

- bis-cyclic crown ethers derived from biphenyl, influence of conformation in complexation of mercury dithiocyanate, 669
- symmetrically substituted hexamethoxybiphenyls, electrooxidation of, synth of either cation radical salt or spiro(fluorene-9,1'cyclohexadienones), 4449

Bicyclic compds

- 7-alkylbicyclo[3.3.1]non-6-en-3-ones, synth by silica gel-promoted fragmentation of 3-alkyl-2-oxaadamant-1-yl mesylates, 5867
- angularly disubstituted *cis*-decalins, synth by radical ring expansion and cyclisation process of α -iodomethylcyclopentanones, 13339
- 2-azabicyclo[3.3.0] octanes by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445
- azabicyclo[4.2.1]nonane ring system of anatoxina, synth involving anionically induced small

- ring opening/ring closure/ring opening cascade, 11637
- 1,2-benzoxaphosphorine-3-carboxylates and coumarin-3-phosphonates by interaction of salicylaldehydes with phosphonoacetates under Knoevenagel reaction conditions, 12597
- bicyclic carbohydrate-based compds by intramolecular metathesis reaction of di- and trisubstituted ω-unsaturated glucose and glucosamine derivs, 10903
- bicyclic furans, conversion to benzisoindoles using furan-pyrrole ring exchange as key step, 8169
- bicyclic guanidines by iodocyclisation of 3-alkynyl- and 3-allenyl-2-(substituted amino)-1-imidazolin-4-ones, 6581
- bicyclic guanidines as intermediates to ptilomycalin A alkaloid, synth from pyrrolidin-2-one via N-acyliminium ion coupling with silyl enol ethers, 2603, 2629
- bicyclic nitrogen heterocycles, construction by the molybdenum alkylidene-catalysed metathesis of α , ω -dienes, 7251
- bicyclic octen- and hepten-ols and -ones, Bacillus stearothermophilus alcohol dehydrogenase as catalyst for redox reactions of, 1669
- bicyclic orthoesters having a six or a sevenmembered orthoester ring, hydrolysis of, experimental observations and theoretical rationalisation, 14841
- bicyclo[2.2.2]octene diones and cyclopenta[b] [1,4]benzodioxins, synth by $[4\pi + 2\pi]$ cycloaddition of o-benzoquinones with symmetrical 6,6-dialkyl and cycloalkylfulvenes, 4029
- bicyclo[4.1.0]hept-2-enes by oligocyclisation of 2-bromododeca-1,11-diene-6-ynes followed by Diels-Alder reactions, 11545
- bicyclo[4.1.0]ketones, electron transfer mediated cascade ring-opening reactions of, 11421
- bicyclo[4.3.0]nonene and bicyclo[4.4.0]decene derivs, synth from 2-bromo-1,6- and 2-bromo-1,7-dienes by Heck reaction *via* vicinal exodimethylenecycloalkanes, 11503
- bicyclo [5.4.0^{3,8}] undecenones containing the structural elements of the B/C rings of taxane, synth by intramolecular pyrylium ylid-alkene cyclisations and conversion to B/C rings of taxanes, 14081, 14103, 14147
- bicyclomycin, antibiotic with a [4.2.2] bicyclic ring system, ring transformations of 5,5a-dibromobicyclomycin and 5,5a-dibromobicyclomycin-2',3'-acetonide, 833

- syn- and anti-bicyclopropane derivs, asymmetric synth using reagent controlled asymmetric cyclopropanation reactions, 15325
- bicyclopropylidene derivs with furan moieties attached on tethers of various length, rates of Diels-Alder reactions of, 12185
- endo-3-bromo-4-methylcamphor, unexpected multiple rearrangement of in bromination, endo-3,9-dibromo-4-(bromomethyl)camphor: intermediates for triterpenoid synth, 14661
- 1-bromo-5-bromomethyl-6,6-dichlorobicyclo-[3.1.0]hexane, 1,n-elimination reactions of, strained 1,3-bridged cyclopropene and a vinylcarbene as reactive intermediates, 14641
- by oxidative free-radical cyclisation of unsaturated 2-cyclohexenones with Mn(OAc)₃ via unsaturated α'-keto radicals, 6073
- caryophyllene, cleavage of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- 2,6-diaryl-3,7-dioxabicyclo[3.3.0]octaneskeleton of gmelinol, rearrangement and subsequent reduction gives an triol epimeric with di-Omethyl cycloolivil, 14349
- 1,8-diazabicyclo[5.4.0]undec-7-ene and 1,5-diazabicyclo[4.3.0]non-5-ene, reaction with methyl pheophorbide a. promoted by trialkylsilyl triflates, synth of substituted chlorin amides, 849
- 4,6-dichloro-2-oxa-5-aza-bicyclo[2.2.2]oct-5-en-3-ones, reaction with nucleophiles, synth of substituted 6-chloro-2-pyridinecarboxylic acid derivs, 6997
- 4,6-dichloro-2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones, synth by cycloaddition of 2*H*-1,4-oxazin-2-ones and alkenes, conversion to 1,6-dihydro-6-oxo-2-pyridine-and 6-oxo-2-piperidine-carboxylates, 2591
- 3,3-dimethyl-2-oxo- and 2,2-dimethyl-3-oxo-1-norbornyl triflates, participation of σ , π and n orbitals in the solvolysis of, 14041
- 2,4-disubstituted-8-oxabicyclo[3.2.1]oct-6-en-3-ones and 8-oxabicyclo[3.2.1]octan-3-one, starting materials for synth of polysubstituted cycloheptenones, 11297
- 2-exo-functionalised bicyclo[3.2.1]oct-3-en-8-ones by iron-mediated carbonylation of bicyclo-[4.1.0]hept-2-enes, 5449
- homobenzonorbornadiene, bromination of at different temperatures, 14005
- (+)-hydantocidin, stepwise synth from D-fructose and one-step synth from D-isoascorbic acid and urea, study of *N,O*-spiroketal formation, 1177

- (±)-isoavenaciolide and (±)-ethisolide, antifungal metabolites from Aspergillus avenaceus, synth from (±)-7-oxabicyclo[2.2.1]hept-5-en-2one, 629
- lithium and chlorotitanocene enolates derived from camphor, diastereoselectivity of oxidation of, 5487
- 6-endo-methyl substituted bicyclo[2.2.1]heptane derivs, synth by Michael addition reactions of vinyl sulfones derived from allyl sulfones and cyclopentenones, 8795
- 6-methyl-4-(2',5'-dioxohexyl)-bicyclo[4.3.0]-non-3-en-2-one by self-condensation of 1-acetyl-2-methylcyclopentene and subsequent autoxidation, 9785
- (functionalised) 2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones, reaction with various nucleophiles, synth of polysubstituted 2-pyridinecarboxylic acid derivs, 12529
- oxamazins, monocyclic β -lactam antibiotics, synth of a protected bicyclic oxamazin through intramolecular Michael addition of an N-hydroxy β -lactam, 4225
- thiadiazabicyclo[3.1.0]hexene derivs, synth by cycloaddition of azides to isothiazole dioxides, subsequent rearrangement to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183
- bis[(2,4,6-trimethylphenyl)methanoyl]bicyclo-[2.2.1]hept-5-enes, rearrangement to 2-oxabicyclo[3.3.0]octa-3,7-dienes, 5699
- 3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, protiodesilylation of, stereochemical study, 3553

Biologically active compds

- A90720A, cyclic depsipeptide serine protease inhibitor from the terrestrial blue-green alga *Microchaete loktakensis*, isolation and structure, 395
- (1R,2S,3R)-2-acetyl-5-(1,2,3,4-tetrahydroxybutyl)thiazole, asymmetric synthesis from 2acetylthiazole, 14069
- acyloxymethyl and 4-acyloxybenzyl diester prodrugs of phosphonoformate: hydrolysis and antiviral activity of, 14929
- aeruginosins 102-A and B, thrombin inhibitors from the freshwater cyanobacterium *Microcystis viridis* (NIES-102), structures, 14501
- agardhipeptins A and B, inhibition of plasmin, 13129
- 3-amino-*N*-(2-hydroxy-1-phenylethyl)-5-methylthio-2-piperidones, conformationally restricted analogues of methionine, synth from *N*-(2-

acetoxy-1-phenylethyl)- Δ^5 -piperidin-2-one, 7727 anatoxin-a, freshwater algae from Anabaena flos aqua, synth of the azabicyclo[4.2.1]nonane ring system of anatoxin-a involving anionically induced small ring opening/ring closure/ring opening cascade, 11637

- Aniracetam, cognition activating agent, direct access to by oxidation of *N*-(4-methoxybenzyl)-2-pyrrolidinones to *N*-(4-methoxybenzoyl)-2-pyrrolidinones, 12521
- 4-aryl-1,4-dihydropyridine calcium channel antagonists, conformational dynamics of by NMR and saturation transfer, 9665
- 11β-arylandrost-4-en-3-one and the corresponding 9β,19-cyclo deriv, synth, role of the 11β-region in steroid progesterone receptor interaction, 1529
- 3-(1-benzyl-1,2,3,6-tetrahydropyridin-4-yl)-1*H*-indoles, synth by reaction of substituted indoles with *N*-benzyl-4-piperidinone, 10185
- biomedicinal rewards in fluoroorganic chemistry, 1
- C-branched spermine tethered oligo DNA for the stabilisation of the duplexes and triplexes, 12275
- D-ribo- C_{18} -phytosphingosine ((2S,3S,4R)-2-amino-octadecane-1,3,4-triol), synth from divinylcarbinol *via* Sharpless asymmetric epoxidation and dihydroxylation, 2187
- callipeltins A-C, cytotoxic activity against various human carcinoma cells, 9589
- cathinone, active compd with biological activity analogous to amphetamines and dopamine, from leaves of *Catha edulis* synth of both enantiomers by ring-opening of substituted aziridines, 12111
- curacin A, antimitotic agent from Caribbean cyanobacterium *Lyngbya majuscula*, synth and biological activity, 14543
- curacin A, antimitotic agent from cyanobacterium *Lyngbya majuscula*, synth of *cis*-2-methylcyclopropanecarboxylic acid, a component of, by Simmons-Smith cyclopropanation of dienes, 13327
- cyclohexenyl nucleosides, synth and biological activity of *trans*-3-(pyrin-9-yl)-4-cyclohexenyl-carbinols, 8969
- cyclophosphazenes containing acetyl salicylic substituents, synth from hexachlorocyclophosphazene, 9535
- cyclostellettamine C, macrocyclic alkaloid with muscarinic acetylcholine receptor antagonistic

- activity, total synth via 3-(13-hydroxytridecyl)-1-[13-(3-pyridyl)tridecyl]pyridinium trifluoromethane sulfonate, 10849
- (+)-β-cyperone and (-)-eudesma-3,5-diene, bioactive compds against *Locusta migratoria*, synth from santonin, 10507
- 2-dehydro-3-deoxy-20-hydroxyecdysone, 3-deoxy-20-hydroxyecdysone and 2-epi-3-deoxy-5α-20-hydroxyecdysone, synth from 20-hydroxyecdysone, moulting hormone activity of, 10673
- (-)-denticulatins A and B, polypropionate metabolites from the pulmonates of genus Siphonaria denticulata, total synth from (R)-1-(benzyloxy)-2-methylpentan-3-one, 1811
- dichotomins A-E, cyclic penta or hexapeptides with cell growth inhibitory activities against p-388 lymphocytic leukemia cells from roots of *Stellaria dichotoma*, structures, 1165
- 7,7-difluoro-7,8-dihydropterins and pterins with fluoroalkyl substituents at the 6 or 7 positions, synth from fluorine-containing aliphatic precursors and substituted pyrimidines, 13017
- 3-(dimethylamino)methyl-5*H*,11*H*-pyrrolo[2,1*c*][1,4]benzothiazepine derivs with potential central nervous system activity, synth from pyrrolo[2,1-*c*][1,4]benzothiazepines, 7745
- DNA binding studies of tri-(N-methyl-4-pyridiniumyl)porphyrins bearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, 13569, 13589
- elongated analogues of perhydroretinol, synth from 3-bromo-2-methyl-1-propanol enantiomers, neurotrophic activity on neuronal cells derived from fetal rat cerebral hemispheres, 14891
- exo- and endo- N^6 -(5,6-epoxynorborn-2-yl)-adenosine, potent agonists for the A_1 adenosine receptor, synth, 4735
- hapalosin, a cyclic depsipeptide from blue green alga *Hapalosiphon welwitschii* possessing multidrug resistance reversing activities, synth from the corresponding hydroxy- and γ -amino acids, 14723
- hexasaccharide corresponding to a porcine zona pellucida fragment that inhibits porcine spermoocyte interaction *in vivo*, synth, 5945
- 2-hydroxy-6-[[(16R)-β-D-mannopyranosyloxy]-heptadecyl]benzoic acid, fungal metabolite with GABA_A ion channel receptor inhibiting properties, synth, 15071
- (2S,5S)- and (2R,5S)-5-hydroxyhomopipecolic acid, synth from S-glutamic acid, 6409

hydroxylamine analogues of polyamines, synth by enzymatic decarboxylation of ornithine and S-adenosylmethionine, 13751

- **4-**, **5-**, **and 6-substituted** imidazo[4,5-*c*]pyrazoles, synth from imidazo[4,5-*c*]pyrazole-5-thiones, 7179
- (2R)- and (2S)-2-iodohexadecanal, natural inhibitors of the thyroid gland metabolism, asymmetric syntthesis from chiral enol ethers via iodocyclisation with ICl, 10473
- (±)-isoavenaciolide and (±)-ethisolide, antifungal metabolites from Aspergillus avenaceus, synth from (±)-7-oxabicyclo[2.2.1]hept-5-en-2one. 629
- isoquinolines, synth from 2-phenylethylamines, amides, nitriles and carboxylic acids in polyphosphoric acid, 12299
- kainoids, synth of β -benzylglutamic acids and β -methallyl- and β -isobutylglutamic acids, synth and depolarizing activities, 1931
- L-755,807, non-peptide bradykinin binding inhibitor from an endophytic *Microsphaeropsis* sp., isolation and structure, 1481
- lactone substituted derivs of digitoxigenin, synth and inhibitory activity of the cardiac Na⁺ pump and the iontropic effect, 12723
- linearly fused cis:anti:cis tricyclopentanoids and protoilludane framework having fused four, six and five membered rings, synth, 7087
- MDL 62,879 (GE 2270A), a peptide produced by *Planobispora rosea* and belonging to the thiazolyl peptide group of antibiotics, chemical modifications of, 8763
- melanin formation from dopamine, DOPA, DHI or DHICA, analysis by MALDI-TOF mass spectrometry, 3947
- merulidial and isovelleral, fungal antibiotic terpenoids, reactivity of towards triacetic acid lactone, structure-activity relationship, 1473
- 2,3-methano-2,6-diaminopimelic acids, synth as study directed toward design of inhibitors of L,L-diaminopimelate epimerase, 1149
- 6'-α-methyl and 6'-α-hydroxymethyl carbocyclic thymidines and 5-methyl 2'-deoxycytidines, synth and incorporation into oligodeoxyribonucleotides, effect on DNA/RNA duplex stability, 12699
- monofluorinated analogues of (±)-ibuprofen, (±)-flurbiprofen and (±)-naproxen, synth by oxidation of the corresponding primary alcohols, 12761
- 5-(α -naphthyl)- and 5-(β -naphthyl)indolizidines,

potential dopamine analogues and non-opiate antinociceptive agents, synth by intramolecular Schmidt reaction of azides with tertiary alcohols, 12039

- panomifene, follow-up molecule to antiestrogenic drug tamoxifen used to treat mammary tumours, improved synth of from 2-(4-alkoxy)-3,3,3-trifluoro-1,2-diphenylpropan-1-ols, 12821
- (±)-β-pinguisene and (±)-pinguisenol, sesquiterpenes from *Porella* liverworts, synth *via* hydroazulene involving Amberlyst 15-catalysed cyclisations of allyl- and propargylsilanes, 7475
- plakortones A-D, activators of cardiac SR-Ca²⁺ pumping ATPase, from *Plakortis halichondrioides* sponge, 377
- podophyllotoxin, aryltetralin lignan from *Podophyllum peltatum* and *P. emodi*, synth of an Aring pyridazine analogue from (–)-podophyllotoxin using the Stille reaction, 14235
- porphobilinogen, synth in 4 steps from 2-cyano-3,4-substituted pyrroles, 14689
- pyridopyridazinones, biologically active compds, synth by reaction of hydroxyazaisoindolinones with hydrazine hydrate, 3261
- pyrrolo[1,4]diazepines from the corresponding carbonyl azides and [3,2,2]cyclazines fused to a [1]benzothiophene ring *via* Diels-Alder reaction of [flindolizines, 13547
- solandelactones A-I, cyclopropyl and lactone containing novel docosanoids from the hydroid *Solanderia secunda*, structures and bioactivity, 10583
- spirotryprostatins A and B, mammalian cell cycle inhibitors produced by *Aspergillus fumigatus*, structures and biological activity, 12651
- substituted pterocarpans and pterocarpenes, synth involving Lewis acid Ti(IV) promoted [3+2] cycloaddition of 2-alkoxy-1,4-benzo-quinones with substituted 2*H*-chromenes, 2217
- 2,2':5',2"-terthiophene-5-derivs which can be linked to proteins or other carrier molecules by using different functional groups, synth and conjugation with proteins and antibodies, 11281
- [1,2,4]triazolo[3,4-a]isoquinolines and pyrrolo-[2,1-a]isoquinolines, cardiovascular, antiinflammatory and antidepressant compds, synth, 3451 U-68,215, a γ-arylidenebutyrolactone with antiulcer activity, synth from pentynoic acids 3- or 5-substituted with an iodo-aryl moiety, 11463 see also Chemotherapy, Drugs, Hormones, Insecticides, Pheromones, Phytoalexins, Toxins,

Vaccines

Biomimetic reactions

biogenetic-type cyclisation of van Tamelen, application to prep of the sarpagan ring using indolo[2,3-a]quinolizidines, 15225

biomimetic base-catalysed [1,3]-proton shift reaction between fluorinated β -keto carboxylic esters and benzylamine, synth of β -fluoroalkyl- β -amino acids 6943

biomimetic model studies towards the guanidine containing natural product ptilomycalin A, 8315

biomimetic transamination, substituent effects on the feasibility of azomethine-azomethine isomerisation, 14701

of 7,7'-dimethoxy-4,4'-dimethyl-3,3'-, 7,7'-dimethoxy-4,4'-dimethyl-3,6'-, 7,7',8,8'-tetramethoxy-4,4'-dimethyl-3,3'- and 7,7',8,8'-tetramethoxy-4,4'-dimethyl-3,5'- -bicoumarins, 3991

Biosynthesis

of the algal pheromone hormosirene by the freshwater diatom *Gomphonema parvulum* (Bacillariophyceae), 10073

5-amino-4-sulfonamidoimidazole nucleosides, synth as potential inhibitors of purine nucleotide biosynthesis, 9219

of coloradocin, antigonorrheol and antianaerobic antibiotic produced by fermentation of *Actinoplanes coloradoensis* sp., 10327

of melanin, analysis of melanin formation from dopamine, DOPA, DHI or DHICA by MALDI -TOF mass spectrometry, 3947

of natural glucosides and fluorogenic substrates for β-glucosidases followed by *in vivo* ¹³C NMR with high density plant cell cultures, 925 of penicillin, synth of tripeptide probes in order to investigate the insertion-homolysis mechanism leading to carbon-sulfur bond formation in biosynth, 2515, 2537

of terpenoic acid glycerides from dorid nudibranchs Archidoris odhneri and A. montereyensis, stable isotope incorporation evidence for the de novo biosynth of, 6869

Bischler-Napieralski reactions

modified – as the key step in synth of benzazepine-based nitrones, cyclic analogues of the radical trap phenyl t-butyl nitrone, 6519

for synth of substituted 1,2,3,4-tetrahydroisoquinolin-1-one derivs, fragment of (+)-isocyclocelabenzine, 14189

Boron and compds

combination of sodium cyanoborohydride and boron trifluoride etherate for reduction of quinolines to 1,2,3,4-tetrahydro derivs, 1631

cyanine dye bearing two boronic acids as probe for fluorescence and CD spectroscopic sugar sensing, design and synth, 1195

diethyl(2-pyridyl)boranes, rigid cyclic dimers via intermolecular boron-nitrogen coordination bonds, 13933

dimesitylboron stabilised carbanions, condensation with aromatic aldehydes followed by oxidation, synth of *erythro*-1,2-diols, 1085

dimethylcuprate-boron trifluoride and methyllithium, addition to imines derived from (S)-1phenylethylamine, synth of secondary amines, 12571

Knochel's (dialkoxyboryl)methylcopper reagents, addition to aldehydes, olefination and hydroxymethylation of aldehydes *via* β-hydroxyalkylboronates, 915

lithiated phosphine-borane or a phosphinite borane, reaction with C₆₀, synth of phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent after removal of BH₃ group, 5091

phenylboronic acid deriv with an intramolecular quaternary ammonium ion, use as a glucoside extractant. 12931

see also Carboranes

Bridgehead chemistry

3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, synth by Fischer indolisation of 6-phenylhydrazono-6,7,8,9-tetrahydro-11*H*-dipyrido[1,2-a;4,3-*d*]pyrimidine-11-ones, 7789

4a,9a-dihydro-9*H*-carbazoles, bridgehead-dihydro benzo-annulated heteroaromatic ring system, synth *via* iron-mediated cyclisations, 7345

Bryostatins

bryostatin 10, marine antinoplastic compd from *Bugula neritina*, conformational analysis, 2369

Cage compds

cage-annulated cyclohexa-1,3-diene, Diels-Alder reactions of, synth of a doubly-caged sterically-congested tetraol, 6325

Calixarenes

calix[4]arene ethers fixed in the cone conformation and substituted at the upper rim by various urea residues, synth by reaction of amino calix[4]arenes with isocyanates, 8489

- calix[4]arenes having electron donating groups at the upper rim as molecular platforms and host molecules, synth, 6011
- calix[6]arene bridged by an aniline, synth *via* the corresponding nitro compd using iron pentacarbonyl as reducing agent, 10879
- calixarene based macrocycles consisting of three to eight calix[4]arene subunits, synth from 5,11,17,23-tetra-t-butyl-25,27-dihydroxy-26,28-dipropoxycalix[4]arene, 12399
- diallylbis(arylazo)calix[4]arenes, synth by diazonium coupling between two kinds of p-diallylcalix[4]arenes and p-substituted benzene-diazonium salts, 9805
- 5-(1-pyridinio)-11,17,23-tri-t-butyl-28-hydroxy-25,26,27-trialkoxycalix[4]arene and 5,17-bis(1-pyridinio)-11,23-di-t-butyl-26,28-dihydroxy-25, 27-di(ethoxycarbonyl)methoxycalix[4]arene perchlorates, synth, 639
- resorcinarenes, synth and chemistry of, 2663 p-triallylcalix[4]arene, synth by Claisen rearrangement of calix[4]arene triallyl ether,
- trimethyl ethers of monodeoxycalix[4]arenes, conformational isomers of by X-ray crystallography, 2301

Carbamates

- (4*R*,5*R*)-4,5-bis(alkylcarbamoyl)-1,3-dioxolanes analysis of the conformational preferences of, 8275
- *O*-alkylthioxocarbamates, synth by radical fission reaction of *N*-sulfonylthioxocarbamates, 2705
- N'-arylthiocarbamoyl-N,N-dialkylamidines,prep by treatment of 5-(arylimino)-4-(dialkylamino)-5H-1,2,3-dithiazoles with NaOH, 8413
- t-butyl carbamate derivs of aminomethyltrialkylsilanes, ability to undergo metalation between nitrogen and silicon, 5669, 5683
- carbamoyl and thiocarbamoyl chlorides, lithiation under Barbier-type reaction conditions catalysed by naphthalene, synth of α -hydroxy or α -amino amides respectively, 13739

Carbanions

- carbanions of five-membered S-heterocycles, reaction with nitroarenes through the ringopening vicarious nucleophilic substitution reaction, 3189
- dimesitylboron stabilised carbanions, condensation with aromatic aldehydes followed by oxidation, synth of *erythro*-1,2-diols, 1085
- 1-octynyl-C₆₀ carbanion from reaction of 1-oct-

ynyl- C_{60} -H with t-BuOK, redox properties and prep of 1,2- or 1,4-disubstituted dihydro-fullerenes by reaction with carbon electrophiles, 5077

Carbapenems

- 4-acetoxy-β-lactam, starting material in synth of carbapenem antibiotics, synth from (+)-(1S, 2S)-2-amino-1-phenylpropan-1,3-diol, 8989, 9005
- carbapenem antibiotics PS-5 and thienamycin, synth of intermediates to by 4-exo-trig radical cyclisation of N-[2,2-bis(phenylthio)ethenyl]- α -bromoamides, 489
- 1-β-methyl carbapenem antibiotics, prep of two pivotal intermediates for synth of, 331

Carbenes and carbenoids

- dichlorocarbene reaction with (*Z*)- and (*E*)-1,2-di(1-adamantyl)ethene, 825
- Fischer carbene complex of ethyl (2E)-3-diethylamino-3-phenylprop-2-enoate, studies on chemoselectivity of dimethyldioxirane promoted decomplexation, 3973
- α-halo carbanions from aryl α-haloalkyl sulfoxides by ligand exchange reaction with alkylmetals, 2349
- rhodium carbenoid attached to a polystyrene resin, generation by treatment of a resin-bound diazoacetamide with rhodium(II) acetate, 5999
- α,β-unsaturated alkoxychromiumcarbene complexes, reaction with sulfur ylids, synth of vinylenol ethers, cyclopropanes and vinylcyclopropanes, 13215
- vinylcarbene as intermediate in 1-n-elimination reactions of 1-bromo-5-bromomethyl-6,6-dichlorobicyclo[3.1.0]hexane, 14641

Carbenium ions

flash photolysis generation and reactivities of carbenium ions and nitrenium ions, 6823

Carbohydrates

- O-(2-acetamido-2-deoxy-β-D-glucopyranosyl)-(1→4)-2-acetamido-1,2,5-trideoxy-1,5-imino-Dglucitol, potential glycosidase inhibitor, synth from allyl chitobioside, 13315
- (2R,3R)-2-C-(adenin-9-yl)-1,4-anhydro-2,3-dideoxy-3-C-hydroxymethyl-D-arabitol, incorporation into DNA dodecamers, 2863
- aldonolactones, chain extension by samarium iodide mediated Dreiding-Schmidt reactions and samarium assisted Imamoto reactions, 9759
- 2-alkoxy-2-fluoro-glycosyl fluorides as 1,2-dielectrophilic synthons for the synth of naphtho-

- and benzo-dihydrofuran derivs, 7797
- 3-amino-3-deoxy sugars, route to by isoxazolidin-5-one-isoxazolidine rearrangement, 1411
- 3-amino-3-deoxy- and 4-amino-4-deoxyhexoses, synth from 2,3-O-isopropylidene-D-glycer-aldehyde using N-(t-butoxycarbonyl)-2-(t-butyldimethylsiloxy)pyrrole as homologative nucleophile, 4829
- aryl telluride carbohydrates, experiments with, synth of carbocycles using intramolecular radical cyclisation, 8233
- 1-arylthio and 1-arylselenoglycosides, treatment with 4-methyl(difluoroiodo)benzene, synth of 1-fluoroglycosides, 149
- 1-azido-glycopyranosyl cyanides, precursors of anomeric α-amino acids, synth from acetylated 1-halogeno-D-glycopyranosyl cyanides and formamide, reactivity of, 9121
- 1,4-benzoxazinone acetal glucosides GDIBOA and GDIMBOA from *Gramineae* sp., synth by glucosidation of 2,4-dihydroxy-2*H*-1,4-benzoxazin-3(4*H*)-one, 10389
- 4,6-O-benzylidene protected 2,3-bis (O-diphenylphosphino)-D-glycopyranoside rhodium(I) chelate catalysts for hydrogenation of methyl (Z)-2-N-acylamidoacrylates, 15079
- bicyclic oxazinones based on D-glucopyranose, synth and asymmetric alkylation of, evaluation of their use as chiral glycines, 8685
- cis and trans 3-O-but-1'-enyl-1,2-O-isopropylidene-α-D-xylofuranose, [2+2]-cycloaddition of chlorosulfonyl isocyanate to, synth of azetidinones, 6019
- β-cyclodextrin encapsulated aniline and N-substituted anilines, bromination of, synth of O-bromoaniline and p-bromo-N-methylaniline respectively, 3487
- 3-deoxy-3-substituted or 4-deoxy-4-substituted glycosides, synth by ring opening of benzyl 3,4-anhydro-β-D-ribopyranoside, 1747
- 3-deoxy- α -hydrazono-octulosonates, synth by application of the Barton ester based radical reaction with ethyl α -trifluoroacetoxy acrylate followed by treatment with phenylhydrazine, 2717
- 2-deoxy-D-ribose, epoxidation-ring closure of, route to homo-*N*-desoxynucleosides, 5563
- di-and tri-substituted ω-unsaturated glucose and glucosamine derivs, tungsten aryloxo-complex catalysed intramolecular metathesis reaction of, synth of bicyclic carbohydrate-based compds, 10903

- 1-[3- and 1-[2-(diethoxyphosphinyl)-5-O-tritylβ-D-xylo and -arabinofuranosyl]uracil, reaction with triflyl chloride and 4-pyrrolidinopyridine, synth of nucleoside epoxyphosphonates, 11695 erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge Erylus cf. lendenfeldi, structures, 7921
- D,L-erythrose-, and D,L-1,4-dideoxy-4-aminoerythrose derivs bearing a β -lactam at C-4, synth *via* cycloaddition of azetidinodiazepines with acylnitroso dienophiles, 6201
- fatty acylamino-trisaccharides, synth and stereochemical properties, 10771
- fluorescence and CD spectroscopic sugar sensing by a cyanine dye bearing two boronic acids, 1195
- D-fructose analogues substituted at position C6, synth by rabbit muscle aldolase catalysed aldolisation of D-glyceraldehyde analogues followed by dephosphorylation, 1557
- galactopyranosyl substituted porphyrins, synth from porphyrin carboxylic esters, 5441
- D-galactose, starting material for synth of both enantiomers of the BC-ring part of ciguatoxin, 12091
- glucofuranose libraries of novel N-linked glycopeptides, synth from azidoesters via glucoheptonolactone intermediates, 10711, 10721
- D-glucose, conversion to monocerin antifungal metabolite by intramolecular C-glycosidation, 8535
- glucose-6-phosphate and 3,4-dihydroxyphenylalanine, selective binding with boronic-acidappended metalloporphyrin, 2817
- glucoside extraction using a phenylboronic acid deriv with an intramolecular quaternary ammonium ion, 12931
- glucosyl radicals from the photoreaction of α -bromo-2,3,4,6-tetra-O-acetylglucose with hexabutylditin, reaction with phenols, synth of α -O-glucosides, 10241
- D-glyceraldehyde derivs, Strecker reactions of, synth of (2S,3S)- and (2R,3S)-2-amino-3,4-dihydroxybutyric acid, 9563
- glycoamidines, NMR studies and semiempirical calculations on the structure of, 9263
- 2-glycosylaminopyridines, synth through tandem Diels-Alder/retro Diels-Alder reaction starting from 6-glycosylaminopyrimidines with dimethyl acetylenedicarboxylate as dienophile, 5845
- hexasaccharide corresponding to a porcine zona pellucida fragment that inhibits porcine sperm-

- oocyte interaction in vivo, synth, 5945
- 2-hydroxy-6-[[(16R)-\(\beta\)-D-mannopyranosyloxy]heptadecyl]benzoic acid, fungal metabolite with GABA_A ion channel receptor inhibiting properties, synth, 15071
- intramolecular 1,3-dipolar cycloaddition of Dglucose in synth of isoxazolidinecarboxylic derivs, 11265
- 5,6-O-isopropylidene-L-ascorbic acid, alkylation in dry acetone and in THF:DMSO, synth of 3-O-alkyl and 2,3-di-O-alkyl derivs, 1293
- α -linked ketodisaccharides by glycosidation of 1-C-(2-thiazolyl)- α -D-galactopyranosyl acetate and 1-C-(2-thiazolyl)- α -D-mannofuranosyl acetate, 3057
- methyl 5-deoxy-5-diazo-2, 3-O-isopropylidene-β-D-ribofuranoside, condensation with 1,2: 3,4-di-O-isopropylidene-D-galactohexono-1,5-pyranoside, prep of ketone disaccharide, 4757 methyl esters of 3-deoxy-D-erythro-2-hexulosonic acid analogues, inducers of the expression of pectinase genes in the phytopathogenic bacteria Erwinia chrysanthemi, synth, 4625
- natural glucosides and fluorogenic substrates for β -glucosidases, preparative biosynthesis followed by *in vivo* ¹³C NMR with high density plant cell cultures, 925
- natural-labelled 6-deoxy-L-sorbose, precursor of furaneol, an important food flavour, biological route to based on production of natural hydroxypyruvate and 4-deoxy-L-threose, 8223
- nonracemic homo-1-deoxyazasugars with D-talo and L-allo configuration, synth by Wittig [2+3] cycloaddition of 5-azidomethyl-2,4-tetrahydro-2-hydroxy-3,4-(O,O)-isopropylidene furan, 14745
- nucleotide (deoxy) sugars, combined enzymatic synth from sucrose and nucleoside monophosphates, 2395
- partially O-methylated α -D-mannopyranosides, synth using bis-t-butyldiphenylsilyl ethers as intermediates, 10785
- phenolic glycolipids of *Mycobacterium kansasii* serovars I, II and IV, synth of tetrameric fragments corresponding to, 3575, 3593
- protected D-hex-2-ulopyranosyl azides, synth and photolysis of, 9057
- pyruvated tetrasaccharide 5-aminopentyl glycoside, the repeating unit of the immunodominant capsular polysaccharide of *Streptomyces pneumoniae* type 27, synth, 2925
- strategies in oligosaccharide synth, 1095

- 3-substituted-3-deoxyxylose derivs, synth by ring opening reactions of benzyl 2,3-anhydro- α -D-ribopyranoside with nucleophiles, 5607
- tetrasaccharide of sialyl Le^x and Le^x antigens, synth from benzyl lactoside, 12775
- α-1-tributyltin-O-2,3-bisacetyl-4,6-ethylideneglucose as a glycosidation reagent, synth of etoposide antineoplastic drug from 4'-demethyl-4'-acetyl-epipodophyllotoxin, 3049
- 2-C-trifluoromethylsubstituted3-deoxypentoses, synth from trifluoropyruvates for use in prep of nucleoside antibiotics, 143
- see also Amino sugars, Cyclodextrins, Glycals, Glycolipids, Glycosides

Carbonyl compds

- *o*-alkyltellurophenyl carbonyl compds, synth using 3H(3R)-benzo-2,1-oxatelluroles as intermediates, 3365
- 1,3-dicarbonyl compds, hydroxylation by dimethyldioxirane, 5799
- 1,3-dicarbonyl compds, mechanism of fluorination of, 1
- α,α -difluoro and α,α,α -trifluoro carbonyl compds, reversal of stereoselectivity in Evans aldol reaction of, 71
- α -fluorocarbonyl compds by isomerisation of α -fluorooxiranes derived from oxidation of fluoroalkenes, 2429
- α -halo organoindium reagents derived from α, α -dibromo carbonyl compds, reaction with aldehydes and alkenes gives oxiranes and cyclopropanes, 2803
- labile pentacarbonylchromium and pentacarbonylmolybdenum complexes for metalassisted cyclisation of alkynols, synth of oxolenes and furans, 1617
- methyl *ortho*-pyridinecarbonyl benzoates, metalation of the pyridine nucleus at the C³-carbon atom of followed by addition of the generated lithiated species to carbomethoxy group, synth of aza-anthra-5,10-quinones, 11025
- microbial reduction of using Yarrowia lipolytica, 3547
- reaction with N-vinylic phosphazenes, reactivity of the vinyl side-chain versus aza-Wittig reaction, 4857
- β-substituted-α,β-unsaturated carbonyl compds, vinylic substitution of vinyl triflates with, application to synth of cardenolides, 6983
- transformations of β -dicarbonyl compds by reactions of their transition metal complexes

with carbon and oxygen electrophiles, 3377 tricarbonyl(η^6 -cyclobutabenzene)chromium complexes, diastereoselective synth and use in asymmetric cycloaddition reactions, 7363

(tricarbonyl(η^6)arene)chromium(0) complexes as chiral auxiliaries in Reformatsky-type reactions, synth of β -aminoesters and β -lactams, 4849

vinylic carbonyl comdps from vinyl bromo allylic alcohols by palladium acetate catalysed Heck reactions, 12291

see also Aldehydes, Ketones, and other relevant compound classes. For metal carbonyls see Chromium, Iron, Manganese, Tungsten, and compds

Carbonylation

iron-mediated – of bicyclo[4.1.0]hept-2-enes, synth of 2-exo-functionalised bicyclo[3.2.1]-oct-3-en-8-ones, 5449

Ni(0)-promoted cyclo- reaction of allyl halides and acetylenes, synth of cyclopentenones, 10525

Carboranes

p-carboranylalanine (p-Car) and 2-methyl-o-carboranylalanine (Me-o-Car) using Oppolzer's sultam method, 9207

Carboxylic acids and derivs

- 1,6-dihydro-6-oxo-2-pyridine- and 6-oxo-2-piperidinecarboxylates, synth from 4,6-dichloro-2oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones by cleavage with alcohols, 2591
- substituted 6-chloro-2-pyridinecarboxylic acid derivs from the reaction of 4,6-dichloro-2-oxa-5-aza-bicyclo[2.2.2]oct-5-en-3-oneswith nucleophiles, 6997
- abscisic acid, plant hormone inducing physiological responses to environmental stresses, ring conformational requirement for biological activity, 8081
- acetoxy- and phenethylbenzoates, enzymatic hydrolyses by *Candida cylindracea* lipase, 9869 3-F-alkyl 2,3-epoxypropanoates, nucleophilic ring-opening, regioselective access to α , β -difunctional β -F-alkylpropanoates, 14631
- alkylidene or arylmethylidene malonic esters, reaction with allylic diisobutyltelluronium ylids, synth of vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, 8747
- allylic acetates, palladium catalysed regio- and stereo-specific 5-, 6- and 7-exo-dig mono-, bis- and tris-cyclisation processes of, 11479
- 1-amino-2-phenyl-1-cyclohexanecarboxylicacids as chiral auxiliaries in asymmetric Diels-Alder

reactions, 4839

- (-)-3(R)-amino-4(R),5(R)-dihydroxy-1-cyclohex ene-1-carboxylic acid, 3(R)-amino analogue of (-)-shikimic acid, synth from the parent acid, 8565
- 2-aryl-2-fluoropropionic acids by treatment of either ethyl α -hydroxy carboxylates or cyanohydrin O-silyl ethers with diethylaminosulfur trifluoride and subsequent hydrolysis, 8257
- arylated indole-2-carboxylic acid, formation as key step in synth of alkaloids secofascaplysin and indolopyridocoline, 7329
- 2-(N-arylimino)-3,3,3-trifluoropropanoic acid esters, asymmetric reduction of, synth of enantiomerically enriched 3,3,3-trifluoroalanine, 233
- asymmetric protected 2-oxo-5-isopropyl-cyclohexenecarboxylates, synth from 3-methylbutanal as building blocks for an EPC synth of (+)heptelidic acid, 1221
- aziridinyl-methylenemalonates, Michael-reaction initiated ring closure reactions of, synth of functionalised cyclopropanes, 12253
- chiral carboxylic acids or alcohols, lipase-catalysed resolution using mixed carboxylic-carbonic anhydrides, 4383
- chiral carboxylic acids, determination of the absolute configuration of by ¹H NMR spectroscopy, 9841
- cinnamic esters, ceric ammonium nitrate mediated oxidative [3+2] cycloaddition of 1,3-diketones to, regio- and stereoselective synth of dihydrofurans, 2193
- ¹³CO₂H-labelled adipic, succinic and malonic acids, synth and acidity constants of, 5319
- connection and disconnection of hydrogen bonds, a case study with dimeric and highly associated monocarboxylic acids with simple receptors, 12223
- conversion to dialkyl diselenides by Barton PTOC ester based radical chemistry using *O*-cholestan-3β-yl-2,2,2-trichloroselenoacetate and *O-neo*-pentyl selenobenzoate as radical traps, 11163
- 2-cyclopenten-1-ylacetic acid, conversion into strigol seco-analogues, 14827
- 3-deoxy-D-manno-2-octulosonic acid, synth of derivs of by Barton ester based radical reactions, 2717
- meso-2,3-dibenzylbutanedioic acid anhydride, synth and reaction with (+)-α-methylbenzylamine to give a butanedioic acid monoamide

which is converted to cis-2,3-dibenzylbutyrolactone lignan, 12799

- dicarboxylic acid derivs, complexation with 2-amino-4*H*-pyrimidones in supramolecular synth, 3153
- dicarboxylic acids by oxidative cleavage of cycloalkanones using sodium hypochlorite under phase transfer catalysis conditions, extension of the haloform reaction to non-methyl ketones, 13641
- diethyl 3-thienylmalonate, oxidative dimerisation by high valent metal salts, synth of benzo-[1,2-b:4,5-b']dithiophene derivs, 13227
- diethyl maleate, reaction with ketones by Michael initiated-condensation-elimination sequence, synth of trisubstituted alkenes, 1389 5,6-dihydroxyindole-2-carboxylic acid, oxidative polymerisation to melanin, 7913
- dimethyl 2-(tosylmethyl)fumarate, synth and use as electrophilic reagent for the synth of itaconate ester derivs, 1035
- dimethyl acetylenedicarboxylate addition to 1methyl-2-vinyl pyrrole, solvent effects on mechanism of, 10693
- (S)-2-ethyl-2-methylpentanoic acid, synth from the formate ester of (S) ethyl 2-formyl-3hydroxy-2-methylpropionate via C-2 and C-1 chain elongations, 14281
- five orsellinic acid derivs, isolation from liverwort *Blasia pusilla* L., 14487
- fluorinated β -keto carboxylic esters, biomimetic base-catalysed [1,3]-proton shift reaction with benzylamine, synth of β -fluoroalkyl- β -amino acids 6943
- from dehydrative alkylation of alcohols with triethyl methanetricarboxylate under Mitsunobu conditions, 13007
- (+)-heptelidic acid, epoxylactone of fungal origin, use of 2-oxo-5-isopropyl-cyclohexene-carboxylates as building blocks for EPC synth of (+)-heptelidic acid, 8725
- (5S)-HETE (hydroxy eicosatetraenoic acid), synth by coupling of dienyne and chiral iodo vinyl alcohol, 6635
- 4-hydroxy-2-butenoicacid moiety, deoxygenation of mediated by zinc, prep of multifunctional chiral building blocks from carbohydrates and tartaric acid, 4457
- 2-hydroxy-6-[[(16R)-β-D-mannopyranosyloxy]-heptadecyl]benzoic acid, fungal metabolite with GABA_A ion channel receptor inhibiting properties, synth, 15071

- α-hydroxy-β-aminoacids by reaction of 4-isopropyl-2-oxazolin-5-one anion with aminoacid derived aldehydes, 4719
- (2S,5S)- and (2R,5S)-5-hydroxyhomopipecolic acid, synth from S-glutamic acid, 6409
- N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, reactions with amine, sulfenamide and α-amino acid esters, synth of carboxamides and simple dipeptides, 9347, 9367
- 1,1'-iminodicarboxylic acid derivs, synth by Ugi reactions with trifunctional α-amino acids, aldehydes, isocyanides and alcohols, 11657
- 5,6-O-isopropylidene-L-ascorbic acid, alkylation in dry acetone and in THF:DMSO, synth of 3-O-alkyl and 2,3-di-O-alkyl derivs, 1293
- isoxazolidinecarboxylic derivs, precursors for bioactive chiral nucleosides and for glycosidase inhibitors, synth from D-glucose through intramolecular 1,3-dipolar cycloaddition, 11265
- kainoids, synth of β -benzylglutamic acids and β -methallyl- and β -isobutylglutamic acids, synth and depolarizing activities, 1931
- malonic acid receptors with decarboxylative activity, geometry and electronic properties, 12323
- methoxymethylation of tartrate, synth of monoand diMOMtartrates, chiral building blocks, 8517
- methyl (15,2R)-1-benzamido-2-formylcyclopropane-carboxylate, Wittig olefination of, synth of conformationally constrained cyclopropyl amino acids, 5881
- methyl cis-(Z)-dehydrojasmonate, principal note for the scent of Cymbidium goeringhii, synth of both enantiomers of, 1487
- methyl ester of 2-fluoro-3-methoxyacrylic acid and corresponding acyl chloride as building blocks for synth of fluorine bearing pyrazolones, pyrimidines, coumarins and benzothiopyranones, 4403
- methyl esters of 3-deoxy-D-erythro-2-hexulosonic acid analogues, inducers of the expression of pectinase genes in the phytopathogenic bacteria Erwinia chrysanthemi, synth, 4625
- methyl γ-tosylcrotonoate, reactivity as ambident reagent in organic synth, 15243
- methyl 1,1,2-tribromocyclopropanecarboxylate, synth by dibromocyclopropanation of methyl α -bromoacrylate, use as intermediate for four carbon cyclopropane and cyclopropene synthons, 3409

- cis-2-methylcyclopropanecarboxylic acid, a component of curacin A, asymmetric synth by Simmons-Smith cyclopropanation of dienes derived from diethyl L-tartrate, 13327
- monoesters of dicarboxylic acid chlorides, cross-coupling reactions with organocopper reagents derived from Grignard reagents, cuprous bromide and lithium bromide, synth of α, ω -ketoesters, 13513
- monofluorinated analogues of (±)-ibuprofen, (±)-flurbiprofen and (±)-naproxen, synth by oxidation of the corresponding primary alcohols, 12761
- O₂-H₂O₂-vanadium complex-pyrazine-2-carboxylic acid as reagent for oxidation of alkanes, 13051
- 4-oxo-2-azetidineacetic acids, synth by radical cyclisation of *N*-vinylic α-bromo amides, 13867 2-oxo-5-isopropyl-cyclohexenecarboxylates as building blocks for EPC synth of (+)-heptelidic acid, 8725
- pentynoic acids 3- or 5-substituted with an iodo-aryl moiety, palladium-catalysed cyclisation of their potassium carboxylates, synth of γ-arylidenebutyrolactones, 11463
- polysubstituted 2-pyridinecarboxylic acid derivs by reaction of (functionalised) 2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones with various nucleophiles, 12529
- reactions with 2-phenylethylamines, amides, nitriles in polyphosphoric acid, synth of iso-quinolines, 12299
- salicylaldehydes, interaction with phosphonoacetates under Knoevenagel reaction conditions, synth of 1,2-benzoxaphosphorines and their dimers, 12597
- (-)-3-epi-shikimic acid and halogenated derivs using (-)-shikimic acid as starting material, 10547
- sodium 1,3-cyclohexadiene-1,4-diethanoate, synth as a new colourless and water-soluble trap of singlet oxygen, 2031
- solvated lithium dienediolates of methyl substituted 2-butenoic acids, structures by PM3 semiempirical calculations, 11105
- 5-substituted 2-oxo-cyclopentanecarboxylates, synth by mixed cuprate addition to asymmetric shielded 2-oxo-cyclopentenecarboxylates, 971
- 3-substituted alkyl (E)-2,3-dibromopropenoates, cross-coupling with arylzinc or aryltin derivs, synth of 3,3-disubstituted alkyl 2-bromopropenoates, 4095
- substituted benzoic acids, alkylation of with

- n-octyl bromide under solvent-free phase transfer catalysis and microwave heating, synth of long chain aromatic esters, 6705
- 2R,3R-tartaric acid and O,O'-dibenzoyl-2R,3R-tartaric acid, study of the diastereoisomers formed with (N-alkyl)pipecolic acid-anilides during resolution, 1637
- 2- and 3-thienylmethylbenzoates, flash vacuum pyrolysis of, mechanism involving 2-, 3-thienyl methyl and phenyl radicals, 13615
- thiocarboxylic acids, reaction with azoalkenes, synth of hydrazone 1,4-adducts leading to widely substituted pyrrole and pyrazole rings by internal cyclisation, 1579
- trifluoropyruvates, conversion to 2-C-trifluoromethyl substituted 3-deoxypentoses for use in prep of nucleoside antibiotics, 143
- vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, synth by reaction of allylic diisobutyltelluronium ylids with alkylidene or arylmethylidene malonic esters, 8747
- see also Amides, Esters, and other relevant compound classes

Cascade reactions

- based on squarate esters, 1,3-dioxolane as a chaperone functional group for lithium ions, 11625
- of N-butadienyl-N-alkylketene N,O-t-butyldimethylsilyl acetals followed by acylation, synth of bicyclic and tricyclic products, 11643
- cascade radical cyclisations of imines, 11445 cyclic carbopalladation of alkynes terminated by carbonylative lactamisation using alkenyl or aryl halides containing an ω-carboxamido or ω-sulfonamido group, 11529
- domino Heck-Diels-Alder reactions of 2-bromo-1,6- and 2-bromo-1,7-dienes, synth of bicyclo-[4.3.0]nonene and bicyclo[4.4.0]decene derivs via vicinal exodimethylenecycloalkanes, 11503 electron transfer mediated cascade ring-opening reactions of bicyclo[4.1.0]ketones, 11421
- palladium catalysed tandem cyclisation-anion capture processes. Cyclisation onto alkynes or allenes with hydride capture, 11479
- palladium-catalysed oligocyclisations of 2bromododeca-1,11-diene-6-ynes, 11545
- radical cascades of vinyl radicals generated from bromomethyldimethylsilyl propargyl ethers, 11405
- route to γ-arylidenebutyrolactones via a tandem carbopalladation-heterocyclisation sequence, synth of U-68,215, 11445

synth of the azabicyclo[4.2.1]nonane ring system of anatoxin-a involving anionically induced small ring opening/ring closure/ring opening cascade, 11637

tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of nitroalkenes bearing a pendant olefin, synth of nitroso acetals which lead to fused pyrrolidines after hydrogenolysis, 11579

tandem radical reactions of isonitriles with 2pyridonyl and other radicals, synth of (±)camptothecin, 11385

tandem sequence of hydroxylamine-alkyne cyclisation/1,3-dipolar cycloaddition of alkyne-containing *N*-hydroxypyrrolidines, route to piperidines and indolizidines, 11601

Ugi reactions with trifunctional α-amino acids, aldehydes, isocyanides and alcohols, synth of 1,1'-iminodicarboxylic acid derivs, 11657

Catalysis

alkylation of 2,5-furandimethanol or furfuryl alcohol under microwave in solvent-free phase transfer catalysis conditions, synth of a new family of furanic ethers, 617

asymmetric catalysis of carbonyl-ene and aldol reactions with fluoral by chiral binaphtholderived titanium complex, 85

n-butyl-oxazaborolidine catalysis for reduction of ketophosphonates, synth of diisopropyl α -, β - and γ -hydroxyphosphonates, 589

catalytic epoxidation of unfunctionalised alkenes by dinuclear nickel(II) complexes, 3521

design and synth of a bifunctional label for selection of β -lactamase displayed on filamentous bacteriophage by catalytic activity, 5591

Heck coupling of protected 2-aminobut-3-en-1ols with cyclohexenyl triflate using a ligandfree palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465

lanthanide catalysis to activate the conjugate addition of amines to α,β -ethylenic substrates, 13557

ligand effects in the rhodium(II) catalysed reactions of substituted α -diazoamides and diazoimides, 2489

palladium catalysed arylation of methyl acrylate, effect of tetraalkylammonium salts on, 10113 phase transfer catalysis in the presence of bis-(dibenzylideneacetone)palladium(0), prep of diynes, 1337

ruthenium-catalysed epoxidation of unfunctionalised aromatic and aliphatic olefins using t-butyl hydroperoxide as the oxidant, 12971

Catalysts

Amberlyst A-21 as heterogeneous basic catalyst for nitroaldol (Henry) reaction, synth of β -nitroalcohols, 1677

Bacillus stearothermophilus alcohol dehydrogenase as catalyst for redox reactions of bicyclic octen- and hepten-ols and -ones, 1669

Ba(II) complex of 18-mercaptomethyl-1,4,7,10, 13,16-hexaoxacyclononadecane as – for methanolysis of *p*-nitrophenyl acetate, 8867

chiral(salen) manganese(III) complex bearing a sesquiterpene salicylaldehyde and (R,R)-1,2-cyclohexanediamine moieties as a catalyst for epoxidation of unfunctionalised olefins, 12031 copper catalyst bearing a bipyrindine ligand for ring expansion reaction of oxetane, synth of trans-whisky lactone, 3905

copper with a (4*S*)-2-(2',6'-dimethoxyphenyl)-4-isopropoxazoline ligand as – for addition of Me₃Al to 4,4-disubstituted cyclohexa-2,5-dienone, 14177

dinuclear nickel(II) complexes, synth and use in epoxidation of unfunctionalised alkenes, 3521 Heck coupling of protected 2-aminobut-3-en-1-ols with cyclohexenyl triflate using a ligand-free palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465

magnesium perchlorate catalysts, effect on chemo- and enantioselectivity of intramolecular ene reactions and intramolecular hetero Diels-Alder reactions, 12009, 12019

Mn(III)-salen complex as catalyst for asymmetric oxidation of sulfides, 13895

Mn(III)-tetraarylporphyrins bearing perfluoroalkylamido tails as catalysts for epoxidation of alkenes employing aqueous NaOCl as oxygen donor, 11879

(pentamethylcyclopentadienyl)₂LnCH(SiMe₃)₂ complexes as catalysts for the Tishchenko reaction of mono- or dialdehydes, 4291

polystyrene-supported n^5 -cyclopentadienyl rhodium catalyst for synth of cyclopentanone derivs by hydrocarbonylative cyclisation or Claisen rearrangement, 5461

RhCl₃- and PtCl₄-aliquat 336[®] ion pair catalysts for transformation of phenylated diynes to polycyclic compds, 8349

rhodium(II) catalysed reactions of substituted α -diazoamides and diazoimides, ligand effects, 2489

scandium trifluoromethanesulfonate as a catalyst in the decarbonylation of aromatic aldehydes, 11045

silica-alumina gel catalysts prepared by the sol-gel method, use for cleavage of ethers, 9387

supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853

tertiary amines as catalysts in high pressure promoted Baylis-Hillman reaction, effect on performance of branching in alkyl groups of tertiary amines, 8307

[WZnMn(II)₂(ZnW₉O₃₄)₂]¹² polyoxometalate as catalyst for oxidations with hydrogen peroxide, 8781

see also Enzymes and enzyme reactions

Catenanes

dicopper(I) [3]-catenate by cyclisation of a system consisting of two lipophilic 4,7-di-(n-hexyl)-2,9-diphenyl-1,10-phenanthroline moieties linked by a diacetylenic bridge and ended by two alkyne groups, 10921

"Möbius strip approach" to catenanes in olefin metathesis, mechanistic misconception, 2565

Cephalosporins

- (±)-7-aminocephalosporanic acid and (±)-7epi-aminocephalosporanic acid, synth and separation of the four stereoisomers, 7691
- cephalosporanic acid 7β -alkylideneammonio salts, synth by reaction of 7β -aminocephalosporanic acid derivs with ketones under acidic conditions, 11905
- Δ²-cephem derivs, ozonolysis of, synth of highly functionalised 2-oxoazetidine and 2-oxoazetidine-4-sulfenic acid derivs, 10205
- N-nitrosochloroethyl-cephalosporin carbamate, prodrug for antibody-directed enzyme prodrug therapy (ADEPT), synth via acylation and selective nitrosation of a cephalothin deriv, 5983
- penicillin and cephalosporin derivs, aerobic oxidation in the presence of cobalt(III) acetylacetonate and an aldehyde, synth of the corresponding sulfoxides, 2343

Cephams/cephems

 Δ^2 -cephem derivs, ozonolysis of, synth of highly functionalised 2-oxoazetidine and 2-oxoazetidine-4-sulfenic acid derivs, 10205

N-nitrosochloroethyl-cephalosporin carbamate, prodrug for antibody-directed enzyme prodrug therapy (ADEPT), synth via acylation and selective nitrosation of a cephalothin deriv, 5983

Cerium and compds

cerium(IV) ammonium nitrate (CAN), reaction

withl-(4-methoxyphenyl)-4-(tetrazol-5-yl)azetidin-2-one and 1-(4-methoxyphenyl)-5-(tetrazol-5-yl-methyl)pyrrolidin-2-one, 10169

cerium(IV) ammonium nitrate, reaction with 1-(4-methoxyphenyl)azetidin-2-ones, structurereactivity studies, 771

Chemotherapy

anthracyclines of the daunorubicin family fluorinated at position 8 or 10, anticancer chemotherapeutic agents, synth by glycosylation of the corresponding fluorinated aglycones and from daunorubicin respectively, 185

azinothricin antitumour antibiotics, synth of (3S)- and (3R)-piperazic acids (components of —) by hydrazination of chiral N-bromovaleryl carboximide enolates with DBAD, 1047

bryostatin 10, marine antinoplastic compd from *Bugula neritina*, conformational analysis, 2369 dichotomins A-E, cyclic penta or hexapeptides with cell growth inhibitory activities against p-388 lymphocytic leukemia cells from roots of *Stellaria dichotoma*, structures, 1165

etoposide, antineoplastic drug, synth by glycosidation of 4'-demethyl-4'-acetyl-epipodophyllotoxin with α-1-tributyltin-*O*-2,3-bisacetyl-4,6-ethylidene-glucose, 3049

labiatin B, diterpenoid from Senegalese gorgonian *Eunicella labiata*, cytotoxic activity against human colon cancer cells, 2735

taxanes, fluorine-containing analogues of paclitaxel and docetaxel, synth by coupling of (3R,4S)-1-acyl- β -lactams with baccatin III, 10-deacetylbaccatin III and 14β -hydroxy-10-deacetylbaccatin III, 209

taxanes, "hydrophobic collapse" conformation of paclitaxel in non-aqueous environment, 2291 taxanes, taxuspines K-M, taxane diterpenes from the stems of Japanese yew *Taxus cuspidata* Sieb. et Zucc, structures, 2337

see also Antitumour compds

Chlorins and derivs

methyl pheophorbide a., reaction with 1,8-diazabicyclo[5.4.0]undec-7-ene and 1,5diazabicyclo-[4.3.0]non-5-ene promoted by trialkylsilyl triflates, synth of substituted chlorin amides, 849 covalently linked pyropheophorbide dimers, models of the special pair in the photosynthetic reaction center, synth by condensation of 3-devinyl-3-carboxylpyropheophorbide-a, 4311 (22R)-30a,30b-dihomohopan-30b-yl and tetrahymanyl esters of pyrophaeophorbide a, triterpenoid chlorin esters, water column trans-

formation products of chlorophyll a resulting from zooplankton herbivory, 13427

synthetic zinc chlorins, aggregation of with several esterified alkyl chains as models of bacteriochlorophyll-c homologues, 12421

Chlorophyll

bacteriochlorophyll-c homologues, aggregation of synthetic zinc chlorins with several esterified alkyl chains as models of, 12421

(22R)-30a,30b-dihomohopan-30b-yl and tetrahymanyl esters of pyrophaeophorbide a, triterpenoid chlorin esters, water column transformation products of chlorophyll a resulting from zooplankton herbivory, 13427

methyl pheophorbide a., reaction with 1,8-diazabicyclo[5.4.0]undec-7-ene and 1,5-diazabicyclo[4.3.0]non-5-ene promoted by trialkylsilyl triflates, synth of substituted chlorin amides, 849

Chromans

3,4-dihydro-2-ethoxycarbonyl-6-methoxy-7-hydroxy-benzopyran (Trolox analogue) and Precocene II, synth from substituted α-methylene-δ-valerolactone and 1,1-bis-(methylthio)-2-propanone or butanone, 2065

Chromatography

capillary gas chromatography to study interactions of cyclodextrins with desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics), 319

gas, oxidation of alkanes by the reagent O₂-H₂O₂-vanadium complex-pyrazine-2-carboxylic acid, 13051

gas, tricyclic alkaloids from *Myrmicaria opaci*ventris ants composed of pyrrolo[2,1,5-cd]indolizines, 13539

HPLC, aeruginosins 102-A and B, thrombin inhibitors from the freshwater cyanobacterium *Microcystis viridis* (NIES-102), 14501

HPLC, CE analysis of capsaicinoids, 8439

HPLC, 1,1-dianisyl-2,2,2-trichloroethyl group as a 2'-hydroxyl protecting group of ribonucleotides, 1493

HPLC, (Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)methyl]-4-pyridinyl]methylene]-2-th ioxo-4-thiazolidinone, 14787

HPLC, keramaphidin B, 2319

HPLC, MALDI-TOF, SVPD and alkaline phosphatase digets of PO oligonucleotide 5'd[GGT-GGT-GGT-GGT], 14419

HPLC, O⁶-modified deoxyguanosine-containing oligodeoxyribonucleotides for triple-helix

formation, 2047

HPLC, oligodeoxynucleotides containing 6-methylthiopurine residues, 10737

HPLC, oligodeoxyribonucleotides bearing a 5'phosphate group, 3933

HPLC, products from oxidative polymerisation of 5,6-dihydroxyindole-2-carboxylic acid to melanin, 7913

Chromenes

3,4-dihydro-2-ethoxycarbonyl-6-methoxy-7-hydr oxy-benzopyran (Trolox analogue) and Precocene II, synth from substituted α -methylene- δ -valerolactone and 1,1-bis-(methylthio)-2-propanone or butanone, 2065

7-methoxyimino-4-methylchromene-2,8-dione, reaction with phosphines, prep of *N*-substituted 7-amino-8-hydroxy-4-methyl-2*H*-[1]-benzo-pyran-2-ones, 15007

Chromium and compds

labile pentacarbonylchromium and pentacarbonylmolybdenum complexes for metalassisted cyclisation of alkynols, synth of oxolenes and furans, 1617

 γ -monosubstituted allylchromium(III) reagents, addition to N-protected α -amino aldehydes, synth of a new core for C_2 symmetric HIV-protease inhibitors, 7379

tricarbonyl(η^6 -cyclobutabenzene)chromium complexes, diastereoselective synth and use in asymmetric cycloaddition reactions, 7363

(tricarbonyl(η^6)arene)chromium(0) complexes as chiral auxiliaries in Reformatsky-type reactions, synth of β -aminoesters and β -lactams, 4849

α,β-unsaturated alkoxychromiumcarbene complexes, reaction with sulfur ylids, synth of vinylenol ethers, cyclopropanes and vinylcyclopropanes, 13215

Chromones

chromones by photolysis of 3-methoxychromones through extrusion of the methoxy function, 7855, corrig. 10265

3-formyl chromones by Vilsmeier-Haack reaction with O-hydroxy acetophenones, 3669

Circular dichroism

of acyclic 1,2-/1,3-mixed pentols, application to determination of absolute configuration of bacteriohopanepentols from *Nostoc* PCC 6720, 2759, 2777

Amaryllidaceae alkaloids from *Hippeastrum* equestre herb, circular dichroism studies of, 6591

- CD and fluorescence spectroscopic sugar sensing by a cyanine dye bearing two boronic acids, 1195
- CD spectrum of 4-dimethylaminobenzoate, 10631
- spectra of bridged dithia[n]paracyclophanes, 10043
- spectra of chiral non-racemic C₆₀ derivs, proposed sector rule for fullerene absolute configuration, 5131
- spectra of covalently linked pyropheophorbide dimers, 4311
- spectra of 2-deoxy-3,24-diepibrassinolide and 2-deoxy-24-epibrassinolide, 1997
- spectra of indolocarbazole alkaloids TAN-1030A, K-252a and ring contracted product of TAN-1030A, 1235
- spectra of mesobilirubin-XIIIα with quinine in CHCl₃, 447
- spectrum of synthetic zinc chlorins, 12421
- spectrum of vallartanone B, a γ-pyrone-containing polypropionate from the molluse *Siphonaria maura*, 13901
- tri-(N-methyl-4-pyridiniumyl)porphyrinsbearing an amino acid or peptide side-chain on the fourth meso aromatic substituent in the presence of DNA, 13569, 13589

Clays and earths see also Zeolites

Cleavage reactions

- acidic cleavage of pyridylmethyl(amino)phosphonates, formation of the corresponding amines, 12483
- C-S cleavage mediated by chloride ion oxidation in rearrangement of β -hydroxy sulfides in dichloromethane, 4303
- of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- cleavage of MEM ethers by tetrahalozincate reagents, 15257
- of 1,4-dithiafulvene-substituted 1,2,3-thiadiazoles with base and dimerisation of the resulting alkyne-1-thiolate yields tetrathiafulvalene-type vinylogue extended π -donors, 3171
- of ethers using silica-alumina gel catalysts prepared by the sol-gel method, 9387
- oxidative of cycloalkanones to dicarboxylic acid using sodium hypochlorite under phase transfer catalysis conditions, extension of the haloform reaction to non-methyl ketones, 13641
- of the troponoid rings of mesylate and tosylate of tropone oxime by nucleophiles, 8439

Cobalt and compds

see also Pauson-Khand reactions

Colloids

see Micelles

Combinatorial chemistry

- glucofuranose libraries of novel *N*-linked glycopeptides, synth from azidoesters *via* glucoheptonolactone intermediates, 10711, 10721
- oligonucleotide synth using combinatorial protecting group strategy, 6913
- solid-phase organic reactions; literature review (Report 394), 4527
- synth of 1,2,3-triazoles on a solid support involving condensation of a resin bound 3-oxobutyramide with aliphatic amines, 10823

Complexation

- of bis-cyclic crown ethers derived from biphenyl with mercury dithiocyanate, influence of conformation, 669
- calcichrome (calcion) complexes with α -, β and γ -cyclodextrins in water, 10979
- of β -dicarbonyl compds with transition metals, reactions with carbon and oxygen electrophiles, 3377
- of dinucleating ligands derived from 2,6-diformylphenols, 5913
- of macrolactones and crown ethers with alkali cations and Hg(SCN)₂, electronic and steric effects, 3683
- of 5-(1-pyridinio)-11,17,23-tri-t-butyl-28-hydroxy-25,26,27-trialkoxycalix[4]arene and 5,17-bis-(1-pyridinio)-11,23-di-t-butyl-26,28-dihydroxy-25,27-di(ethoxycarbonyl)methoxycalix[4]arene perchlorates with metals, 639
- properties of resorcinarenes, 2663
- selective binding of glucose-6-phosphate and 3,4-dihydroxyphenylalanine with boronic-acid-appended metalloporphyrin, 2817
- supramolecular synth by complexation of 2amino-4*H*-pyrimidones with dicarboxylic acid guests, 3153
- of tetra[benzo(18-crown-6)]-crowned cleft and two bis[benzo(15-crown-5)]-crowned clefts with metal ions, 8979
- of *meso*-tetrakis-(1-benzylpyrazol-4-yl)-porphyrin with Zn(II) and Co(III), 10811
- and transport studies using a bis-cyclic crown ether derived from biphenyl, allosteric behaviour of, 12499

Computer-assisted synthesis

molecular modelling of electrophilic additions

to di- and trisubstituted cyclopentenes, synth of polysubstituted cyclopentanes, 3355

Condensation

- of *N*-tosyl-2- and -3-acetylpyrroles or *N*-tosyl-2-pyrrolidone with cyano compds and of 2,4-bis(methylsulfonyl)pyrimidineswith nucleophiles, synth of heterocyclic substituted and 2,4-difunctionalised pyrimidines, 7973
- of α -acetoxynitro compds with isocyanoacetonitrile using DBU in THF, synth of 2-cyano-3,4-substituted pyrroles and subsequent 4 step conversion to porphobilinogen, 14689
- between lithium anilides and methyl 2-fluoro-3-methoxyprop-2-enoate, synth of N-(fluoro-3-methoxyacryloyl)anilines, subsequent cyclisation accompanied by elimination of methanol yields 3-fluoro-2-quinolones, 3223
- of chiral N-trimethylsilyl imines with ester enolates, synth of trans-azetidin-2-ones, 1685
- of 3-devinyl-3-carboxylpyropheophorbide-a, synth of covalently linked pyropheophorbide dimers, 4311
- of dimesitylboron stabilised carbanions with aromatic aldehydes followed by oxidation, synth of *erythro*-1,2-diols, 1085
- of 2-fluoropropanethioate lithium enolate with imines, synth of *trans*-3-fluoro-3-methyl-2-azetidinone derivs, 255
- of glyoxal and N-methyl (R)-phenylglycinol, synth of iminium ions and subsequent reaction with allylic silanes and enoxysilanes, synth of α -amino acid derivs, 9079
- of β-hydroxy aldehydes with N-sulfonyl aldimines, synth of 3,6-dihydro-2H-1,3-oxazines and their subsequent use in synth of 1,3-amino alcohol derivs, 3135
- Lewis acid promoted of silylketene thioacetals and 2-pyridylthioesters with imines, synth of β -lactams, 2573, 2583
- of methyl 5-deoxy-5-diazo-2,3-*O*-isopropylideneβ-D-ribofuranoside with 1,2:3,4-di-*O*-isopropylidene-D-galactohexono-1,5-pyranoside, synth of ketone disaccharide which could be reduced to tunicamine derivs, 4757
- of pyridoxal 5'-phosphate with rhodanine, synth of (Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonoxy)methyl]-4-pyridinyl]methylene]-2-thioxo-4-thiazolidinone, 14787
- Reformatsky-type reaction for synth of β -aminoesters and β -lactams using (tricarbonyl(η^6)-arene)chromium(0) complexes as chiral auxiliaries, 4849

- Schiff base condensation of 2,6-diformylphenols with primary amines, synth of unsymmetrical dinucleating ligands bearing nitrogen and oxygen donor atoms, 5913
- self— of 1-acetyl-2-methylcyclopentene and subsequent autoxidation, synth of indenone, 9785
- of substituted indoles with *N*-benzyl-4-piperidinone, synth of 3-(1-benzyl-1,2,3,6-tetrahydropyridin-4-yl)-1*H*-indoles, 10185
- of trifluoroacetylacetone and its methyl enacetal with cyanothioacetamide, key step in synth of 4- and 6-trifluoromethyl-3-cyano-2(1H)-pyridinethiones, 10841

Configuration

- absolute of chiral carboxylic acids by ¹H NMR spectroscopy, 9841
- absolute of methyl cis-(Z)-dehydrojasmonate, principal note for the scent of Cymbidium goeringhii, 1487
- configurational and conformational analyses of lyciumin A, a cyclic octapeptide from *Lycium chinese*, 2795
- proposed sector rule for fullerene absolute configuration, chiral non-racemic C_{60} derivs, 5131
- reasons for opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025

Conformation

- analysis of conformational preferences of (4R, 5R)-4,5-bis(alkylcarbamoyl)-1,3-dioxolanes, 8275
- analysis of 1,1,10,10-tetramethyl[3.3]metacyclophane-2,11-dione, 2847
- conformational analysis of bryostatin 10, marine antinoplastic compd from *Bugula neritina*, 2369 conformational analysis of stereoselective epoxidations in flexible systems, 6699
- conformational behaviour of purine and pyrimidine β -D-threo-hex-3'-enopyranosyl nucleosides, 9249
- conformational change of cyclic chalcogenides, formation of hypervalent dichalcogenoselenuranes, 10375
- conformational changes of the steroid ring system of 11β -arylandrost-4-en-3-one by steric interaction between C19 and the aryl residue, 1529
- conformational and configurational analyses of lyciumin A, a cyclic octapeptide from *Lycium chinese*, 2795

- conformational dynamics of 4-aryl-1,4-dihydropyridine calcium channel antagonists by NMR and saturation transfer, 9665
- conformational energetics of sugar thioureas, synth of glycosyl thioureido sugars, 12947
- conformational isomers of trimethyl ethers of monodeoxycalix[4]arenes by X-ray crystallography, 2301
- conformational study of acid cyclisation of 5-ketogermacren-6,12-olides, 11827
- conformational study of β -hydroxy sulfones, bioisosteres of oxisuran metabolites, 11239
- conformational study of ethyl *N*-[2'-[1'-(2-nitropyrrolyl)]phenyl]-*N*-toluene-4-sulfonamide glycinate, 4485
- conformational study of polypyrazolylpyridines, 11075
- conformers of the 1,2,3-propanetriol triacetate in gas phase and in aqueous solution, 677 of extinul-custing LCSSCCSSC-1
- of cystinyl-cystine [-CSSCCSSCC], 9819
- of 3'-deoxy-3'-C-hydroxymethyl-α-L-lyxopyranosyl thymine and 3'-deoxy-3'-C-hydroxymethyl-α-L-threofuranosyl thymine, 1651
- enantiotopomerisation and conformational analysis of hindered aryl alkyl ketones investigated by dynamic and solid state NMR, 2471
- 5-fluorouracil derivs, 8907
- "hydrophobic collapse" conformation of paclitaxel in non-aqueous environment, crystal structure of 10-deacetyl-7-epitaxol, 2291
- inflence on complexation of bis-cyclic crown ethers derived from biphenyl with mercury dithiocyanate, 669
- of bis-(pyrimidiniumolates), 5475
- ring conformational requirement for biological activity of abscisic acid, the plant hormone inducing physiological responses to environmental stresses, 8081
- solution conformation of ditrisarubicin B, member of the anthracycline antitumour antibiotics, 5617
- solution conformations and complete 2D ¹H and ¹³C chemical shift assignments of vitamin D metabolites and analogues, 1239
- stereochemical properties of fatty acylaminotrisaccharides, 10771
- structure-activity relationships of lactone substituted derivs of digitoxigenin in terms of the Höltje-Anzali model, 12723
- of 12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthrolinophane, 4673

of meso-tetrakis[1-[2-(trimethylsilyl)ethoxymethy]pyrazol-5-yl]-porphyrin by X-ray analysis, 10811

Copper and compds

- copper with a (4S)-2-(2',6'-dimethoxyphenyl)-4-isopropyloxazoline ligand as catalyst for addition of Me₃Al to 4,4-disubstituted cyclohexa-2,5-dienone, 14177
- dicopper(I) [3]-catenate by cyclisation of a system consisting of two lipophilic 4,7-di-(n-hexyl)-2,9-diphenyl-1,10-phenanthroline moieties linked by a diacetylenic bridge and ended by two alkyne groups, 10921
- benzyl copper reagents, tetramethylethylene diamine/trimethylsilyl chloride mediated addition to α,β -unsaturated esters, 12313
- carbocupration of ethoxyethyne with phenylcopper(I) followed by cross-coupling of the resulting 2-ethoxyvinylcopper(I) complex with iodoarenes, synth of 1,2-diarylethenyl ethyl ethers, 13347
- copper(I) cyanide, aprotic diazotization in the presence of, 7137
- cuprate rearrangements and stannylcupration, application to the stereo- and enantiospecific synth of a stannyldiene C₁₀-C₁₅ fragment of des-epoxy-rosaramycin, 6613
- dimethylcuprate-boron trifluoride and methyllithium, addition to imines derived from (S)-1phenylethylamine, synth of secondary amines, 12571
- Knochel's (dialkoxyboryl)methylcopper reagents, addition to aldehydes, olefination and hydroxymethylation of aldehydes *via* β-hydroxyalkylboronates, 915
- mixed cuprate addition to asymmetric shielded 2-oxo-cyclopentenecarboxylates, synth of 5-substituted 2-oxo-cyclopentanecarboxylates, 971
- organocuprate.BF₃ complexes and organolithium reagents, addition to an α -silyloxyaldimine derived from (S)-ethyl lactate, synth of 1.2-amino alcohols, 13137

Coronands

corands incorporating a thiopyrylium ring, effect of alkali cations on the methoxide ion addition to, 3509

Coumarins

- coumarin analogue of retinal, synth by Wittig condensation, 9581
- 7,7'-dimethoxy-4,4'-dimethyl-3,3'-, 7,7'-dimethoxy-4,4'-dimethyl-3,6'-, 7,7',8,8'-tetramethoxy-4,4'-dimethyl-3,3'- and 7,7',8,8'-tetramethoxy-4,4'-dimethyl-3,5'- -bicoumarins,

biomimetic synth, 3991

fluorine bearing coumarins, synth using methyl ester of 2-fluoro-3-methoxyacrylic acid as building block, 4403

fused coumarins, quinolines, and quinolones, synth from dihydrothiophenes *via O*-quinodimethane intermediates, 3107

bis-2-spirocoumaranoylidenetetrathiane, synth by coupling of 3(2H)-benzofuranone with disulfur dichloride, 1961

Coupling reactions

- N-acyliminium ion coupling reactions of β -ketoester derived silyl enol ethers with lactams, synthetic studies towards ptilomycalin A, 2603
- of (3R,4S)-1-acyl-β-lactams with baccatin III, 10-deacetylbaccatin III and 14β-hydroxy-10-deacetylbaccatin III, synth of fluorine containing analogues of paclitaxel and docetaxel, 209
- of 3(2H)-benzofuranone with disulfur dichloride, synth of bis-2-spirocoumaranoylidenetetrathiane, 1961
- C-C of 1,5-dibromo-2,6-dihydroxynaphthalene with alkali 2-naphthoxide, synth of *cis* and *trans*-1,1':5',1"-ternaphthyls, effects of counterion coordination and hydrogen bonding on stereoselectivity, 11013
- of α-chloro enamines and alkenyl lithium compds, synth of 2-amino-1,3-dienes, 2909
- cross— involving 3-substituted alkyl (E)-2,3-dibromopropenoates and arylzinc or aryltin derivs, synth of 3,3-disubstituted alkyl 2-bromopropenoates, 4095
- cross-coupling of the 2-ethoxyvinylcopper(I) complex, formed in carbocupration of ethoxyethene with phenylcopper(I), with iodoarenes, synth of 1,2-diarylethenyl ethyl ethers, 13347
- cross-coupling of heterocyclic allyl sulfides with organomagnesium compds, synth of optically active alkenes, regio- and enantioselection, 10799
- cross-coupling reactions of aryl and alkenyl iodides, synth of polyfunctional biphenyls and 1,3-dienes, 7201
- cross-coupling reactions of monoesters of dicarboxylic acid chlorides with organocopper reagents derived from Grignard reagents, cuprous bromide and lithium bromide, synth of α,ω-ketoesters, 13513
- cross-coupling reactions of selenium-containing zirconium(IV) complexes with alkenyl halides, synth of (*E,E*)-1-arylselenobutadienes, 9819 diazonium coupling between two kinds of *p*-di-

allylcalix[4]arenes and p-substituted benzenediazonium salts, synth of diallylbis(arylazo)calix[4]arenes, 9805

- of 1,8-dibromonaphthalene and diethyl(3-pyridyl)borane, synth of 1,8-di(3'-pyridyl)naphthalene, atropisomerism of, 8703
- of dienyne and chiral iodo vinyl alcohol, synth of (5S)-HETE (hydroxy eicosatetraenoic acid), 6635
- of 5,6-dihydro-1,4-dithiins with chiral aldehydes, synth of polyhydroxylated compds, 11857
- Heck coupling of protected 2-aminobut-3-en-1ols with cyclohexenyl triflate using a ligandfree palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465
- of N-protected 4-haloimidazoles with alkynes or alkynyl- and vinyltrialkyltin derivs or of 4-trimethylstannylimidazole with aryl and vinyliodides, synth of 4-substituted imidazoles, 13703
- Ni-catalysed of benzylic chlorides and vinylic organometallics derived from the hydroalumination and hydrozirconation of alkynes, synth of allylated aromatics, 7265
- oxidative of 2-naphthols suspended in aqueous Fe³⁺ solutions, synth of 1,1'-bi-2-naphthols, 1005
- palladium-catalysed cross-coupling of arylmetal compds with β -iodoenones and a cyclohexyl triflate, synth of α -arylcyclohexenones, 9485
- pentafluorophenylester coupling in synth of cyclodepsipeptides related to valinomycins, 1343
- ruthenium catalysed coupling of allyl alcohol with alkynes, synth of γ, δ -unsaturated acetals and aldehydes, 5511
- samarium diiodide-mediated pinacolisation of diketones, synth of fused mono-, bi- and tricyclic cyclobutane-1,2-diols and a cyclopentane-1,2-diol, 11783, 11799
- Stille coupling of 2,6-dihalopurines, regiochemistry of, 5625
- Stille Pd(0) coupling of (E)-1,2-bis(tributyl-stannyl)ethylene and vinyliodide, application to synth of stannylidene C₁₀-C₁₅ fragment of desepoxy-rosaramycin, 6613
- Stille reaction of hexafluoroacetone protected L-aspartic acid chloride followed by Michael addition, synth of γ-oxo α-amino acids, 14757
- of (2-(2',3',4',6'-tetra-O-benzyl-β-D-hexopyranosyloxy)-3-methoxypyridine and 2-(2',3', 4',6'-tetra-O-benzyl-β-D-hexopyranosyl)-thio pyridylcarbonate with pyrimidine bases, synth

of 1,2-nucleosides, 10827

Crown ethers

aza-12-crown-4 with a functionalised arm, density functional calculations to analyse Li⁺ selectivity of, 8199

Ba(II) complex of 18-mercaptomethyl-1,4,7,10, 13,16-hexaoxacyclononadecane as — for methanolysis of p-nitrophenyl acetate, 8867

bis-cyclic crown ethers derived from biphenyl, influence of conformation in complexation of mercury dithiocyanate, 669

crown ethers and macrolactones, electronic effects and steric hindrance on complexation with alkali cations and Hg(SCN)₂, 3683

bis-cyclic crown ether derived from biphenyl, complexation and transport studies of, allosteric behaviour of, 12499

dibenzo-monoaza-12-crown-3, -15-crown-4, -18-crown-5 and -21-crown-6 derivs, synth from 2,2'-dihydroxydiphenylamine or *via* intramolecular Ullmann reaction, 6713

tetra[benzo(18-crown-6)]-crowned cleft and two bis[benzo(15-crown-5)]-crowned clefts, synth and study of their selectivities in metal ion complexation, 8979

Cumulenes

heterocumulene-substituted indoles, intramolecular ring-closure of, prep of γ-carbolines and pyrimido[3,4-a]indole derivs, 5833

Cyano compds

1-azido-glycopyranosyl cyanides, precursors of anomeric α-amino acids, synth from acetylated 1-halogeno-D-glycopyranosyl cyanides and formamide, reactivity of, 9121

2-cyano-3,4-substituted pyrroles by condensation of α-acetoxynitro compds with isocyanoacetonitrile using DBU in THF, subsequent 4 step conversion to porphobilingen, 14689

N-cyanochloroacetamidine, reaction with conjugated thiolato(selenolato)nitriles provides products which can be involved in the Thorpe reaction resulting in diaminopyrimidines via enaminocyanamidines, 1011

cyanophenols, role of hydrogen bonding in cycloadditions of benzonitrile oxide with, 7885 N,N-dimethyl cyanamide, reaction with 1,2-diketones in the presence of titanium(IV) chloride, 3939

hydrocyanation using formaldehyde dimethylhydrazone as a neutral reagent, 9143

sodium cyanoborohydride-mercury bis (trifluoro-acetate) for the reductive decyanation of α -

aminonitriles, 10835

1,2,3-triazolo[1,5-a]pyridinium N-2-dicyanomethylides, prep, structure and reactivity with acetylenic dipolarophiles, 10519

4-and6-trifluoromethyl-3-cyano-2(1H)-pyridinethiones, regioselective synth based on condensation reactions of trifluoroacetylacetone and its methyl enacetal with cyanothioacetamide, 10841

10,15,20-tritolylporphyrins linked to high acceptor strength cyano quinones as models for the photosynthetic reactions centre, 8497 see also Cyanohydrins, Nitriles

Cyanohydrins

from aldehydes by use of the (S)-hydroxynitrile lyase from *Hevea brasiliensis*, 7833

protected – by asymmetric [2,3]-sigmatropic Wittig rearrangement of chiral α-allyloxy-hydrazones, synth of the corresponding α-hydroxyhydrazones, 1503

Cyclic ketones

N-alkanoyl β -enaminones, photorearrangement of, synth of α -amino- β , γ -unsaturated acid derivs, 2405

(αR,3RS,5S)-3-amino-N-(2-hydroxy-1-phenylethyl)-5-methylthio-2-piperidones, synth from enamide by free radical addition of methanothiol at 5-position and amination at 3-position, 7727

4-arylmethylene pyrazol-5-ones or isoxazol-5-ones, reduction of with 2-arylbenzimidazoline, synth of C,C- and C,N-linked dimers and 4-arylmethyl derivs, 1443

2-benzhydrylidene-4,4-diphenyl[1,3]oxathiolan-5-one, synth by reaction between electrogenerated diphenylketene, 2-bromo-2,2-diphenylacetyl bromide and sulfide ion, 1259

3(2H)-benzofuranone, coupling with disulfur dichloride, synth of bis-2-spirocoumaranoylidenetetrathiane, 1961

bicyclic octen- and hepten-ones, *Bacillus* stearothermophilus alcohol dehydrogenase as catalyst for redox reactions of, 1669

bicyclo[4.1.0]ketones, samarium(II) iodide and other electron transfer agent mediated cascade ring-opening reactions of bicyclo[4.1.0]ketones, 11421

bicyclo[5.4.0^{3.8}]undecenones containing the structural elements of the B/C rings of taxane, synth by intramolecular pyrylium ylid-alkene cyclisations and conversion to B/C rings of taxanes, 14081, 14103, 14147

- endo-3-bromo-4-methylcamphor, unexpected multiple rearrangement of in bromination, endo-3,9-dibromo-4-(bromomethyl)camphor: intermediates for triterpenoid synth, 14661
- (1R)-(+)-camphor and (1R)-(-)-fenchone, addition of allyl and susbtituted allylic Grignard reagents to, synth of homoallylic alcohols with (+)-camphor and (-)-fenchone, 1699
- cycloalkanones, oxidative cleavage to dicarboxylic acid using sodium hypochlorite under phase transfer catalysis conditions, extension of the haloform reaction to non-methyl ketones, 13641
- cyclobutanone, reaction with methylhydroxylamine, synth of *N*-methylcyclobutylideneamine *N*-oxide, cycloaddition reactions of, 9187
- cyclohexanone and cyclododecanone, ring-enlargement of, synth of muscolide, (R)-(-)-phoracantholide I and (9R)-(-)-9-tetradecanolide, 4581
- cyclohexanone, reaction with t-butyldimethylsilyldibromomethane, synth of α -bromoacylsilanes, 14533
- cyclopentanones, Horner-Wadsworth-Emmons reaction of, synth of (-)-mitsugashiwalactone, (+)-iridomyrmecin, (-)-isoiridomyrmecin and (+)-teucriumlactone, iridoid cyclopentapyranones, 3435
- cyclopentenones, asymmetric synth by means of Ni(CO)₄-promoted alkyne-allyl halide cyclisation-carbonylation, 10525
- 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, synth by ring expansion of 1-haloethynyl-2-methylcyclopentanols, 10267
- 3-fluoro-2-quinolones, synth from N-(fluoro-3-methoxyacryloyl)anilines by cyclisation accompanied by elimination of methanol, 3223 fredericamycin A, antitumour agent with a spirodiketone unit, synth of analogues in which ring C is expanded to six atoms, examination of the diastereoselectivity of radical spirocyclisation, 6085
- functionalised 3,4-dehydropyrrolidin-2-one and 1,2-dehydropyrrolizidine-3-one, synth by intramolecular nitrile oxide cycloaddition of substituted amido-oximes followed by reduction, 14323
- furonaphthyridinones by selective β -scission of cyclobutanoxyl radicals generated from [2+2] photoadducts of 4-hydroxy-1-phenyl[1,8]naphthyridin-2(1H)-one with alkenes, 6125
- 3-hydroxy-2(1H)-pyridinones and 3-hydroxy-

- 4(1*H*)-pyridinones, directed aminomethylation of, synth of iso-deferiprone, 1835
- 2-hydroxy-3-pinanone, computational studies of effective asymmetric alkylation utilising a chiral Schiff base derived from -, 5961, 5971, corrig. 7807
- indolin-2-ones, reaction with indoles and phosphoryl chloride or trifluoromethane sulfonic anhydride, synth of 2,2'-, 2,3'- and 2,7'-bi-indolyls, 4697
- α-iodomethylcyclopentanones, radical ring expansion and cyclisation process of, synth of angularly disubstituted *cis*-decalins, 13339
- 5-ketogermacren-6,12-olides, acid cyclisation of three related—, reactivity and conformational study, 11827
- 6-methyl-4-(2',5'-dioxohexyl)-bicyclo[4.3.0]non-3-en-2-one by self-condensation of 1acetyl-2-methylcyclopentene and subsequent autoxidation, 9785
- (functionalised) 2-oxa-5-azabicyclo[2.2.2]-oct-5-en-3-ones, reaction with various nucleophiles, synth of polysubstituted 2-pyridinecarboxylic acid derivs, 12529
- 2-substituted 1,3-oxazin-6-ones, synth by pyrolysis of acylaminomethylene Meldrum's acid derivs under FVP conditions, 3163
- substituted 3,4-dihydro-1(2*H*)-naphthalenones and substituted 3,4-dihydro-1(2*H*)-anthracenone, synth by electrocyclisations of alkenylbenzocyclobutenols and naphthocyclobutenols respectively, 2235
- 2,3,6,7-substituted cyclohept-4-enones, 2,5,6,7-substituted cyclohept-3-enones, and 6,7-disubstituted cyclohept-2-enones, synth from bicyclic compds, 11297

Cyclisation

- acid of three related 5-ketogermacren-6,12olides, reactivity and conformational study, 11827
- N-acyl anion cyclisation as the key step in synth of pyrrolizidine ring system, extension to 2-methyl substituted pyrrolizidines, 3757
- of N-acylanthranilic acids with Vilsmeier reagents generated from N,N-dimethylformamide and oxalyl chloride, synth of 2-(2'-dimethylamino)ethenyl-4H-3,1-benzoxazin-4-ones, 753
- of N-(2-alken-1-yl)amides mediated by Mn(III), synth of 1,3,4-trisubstituted pyrrolidin-2-ones, use as route to biologically active amino acids containing a pyrrolidine ring, 1069
- Amberlyst 15-catalysed of allyl- and pro-

pargylsilanes, synth of hydroazulene intermediate to (\pm) - β -pinguisene and (\pm) -pinguisenol, 7475

- of 4-amino-1-azadienes with glyoxylic esters, synth of 2H-1,3-oxazines, subsequent reduction to syn,syn-1,3-aminoalcohols and further cyclisation to azetidines, 3095
- of α -aminocarbanions onto unactivated alkene, synth of 3-alkylpyrrolidines, 12541
- of (-)-δ-araneosene diterpene to dolasta-1(15),8-diene, 1549
- of aryl bromoamines, bromoamides and bromosulfonamides, 7525
- of 2-benzimidazolylthioacetophenones, synth of thiazolo[3,2-a]benzimidazoles, 10485
- biogenetic-type cyclisation of van Tamelen, application to prep of the sarpagan ring using indolo[2,3-a]quinolizidines, 15225
- of (biphenyl-2-yl)acetyl morpholines, formation of the C ring of 4,5-dioxoaporphine alkaloids, 11307
- of 4-[(2'-bromo-6'-methoxyphenoxy)methyl]-1-methyl-1,2,5,6-tetrahydropyridine and 9-methoxy-3-methyl-2,3,4,4aα,5,6,7,7aα-octahydro-1*H* -benzofuro[3,2-*e*]isoquinoline, synth of oxide fragments of morphine, 10935
- of 2,9-bis(bromomethyl)phenanthroline, synth of 12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthrolinophane, 4673
- of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- cascade radical of imines as a new protocol for the synth of a range of nitrogen heterocycles, 11445
- 1,7-electro— of 2-azaheptatrienyl lithium compds, synth of 1-acyl-2,3-dihydroazepines, 14801
- 6-endo α -amino radical cyclisation pathways for SET-photosensitised reactions of α -silylamino-enones and ynones, 3195
- 6-endo- and 5-exo-digonal of o-hydroxyphenyl ethynyl ketones, formation of benzopyranones, 9427
- exo cyclisation of 5-hexenyl or 6-heptenyl radicals, prep of cyclohexanoids and cyclopentanoids, 8233
- hydrazination-nucleophilic cyclisation in synth of (3R)- and (S)-piperazic acids, comparative unimportance of DMPU mediated retro-hydrazination, 1047
- hydrocarbonylative of 1,4-dienes, synth of cyclopentanones, 5461

- hydrostannylation and bis-cyclisation of δ and ω -allenyl aryl halides, synth of α -vinyl oxygenand nitrogen heterocycles, 13441
- of iminium salts, allenes and cyclooctanes, routes to anatoxin-a, 6025
- intramolecular pyrylium ylid-alkene cyclisations for synth of taxane precursors, 14081, 14103, 14147
- iodo— of 3-alkynyl- and 3-allenyl-2-(substituted amino)-1-imidazolin-4-ones, synth of bicyclic guanidines, imidazo[1,2-a]imidazole and imidazo[1,2-a]pyrimidine, 6581
- iodocyclisation of 3-(alk-2-enyl)-2-(substituted amino)-1-imidazolin-4-ones, synth of imidazo-[1,2-a]pyrimidine and imidazo[1,2-a]imidazole, 2827
- iron-mediated cyclisations for synth of 4a,9a-dihydro-9*H*-carbazoles, 7345
- of ketimines derived from 2-(trifluoromethyl)-anilines and methyl halophenyl ketones, synth of N-[2-(dimethylamino)ethyl]-2-(2-fluorophenyl)quinolin-4-amines, 3273
- [1,2]-Meisenheimer rearrangement and Heck-, key steps in synth of magallanesine alkaloid from isoquinolineacetate, 14543
- metal-assisted of alkynols using labile pentacarbonylchromium and pentacarbonylmolybdenum complexes, synth of oxolenes and furans, 1617
- Ni(0)-promoted cyclocarbonylation reaction of allyl halides and acetylenes, synth of cyclopentenones, 10525
- oligo— of 2-bromododeca-1,11-diene-6-ynes followed by rearrangement or Diels-Alder reaction, synth of [1,2:3,4]bisannelated cyclohexadiene derivs and bicyclic alkenes respectively, 11545
- organoselenium-induced of *N*-allyl acethydrazides to 1,3,4-oxadiazines or *N*-acetyl pyrazolidines, 11841
- oxidative of o-phenolic oxime-acid derivs using phenyliodonium diacetate, synth of spiro-isoxazoline derivs, 14713
- oxidative of tyrosine to methyl 1-benzyloxy-carbonyl-3a-hydroxy-6-oxo-2,3,3a,6,7,7a-hexa-hydroindol-2-carboxylate, subsequent conversion to 7-hydroxy-2,3,7,7a-tetrahydroindole ring of gliotoxin, 14403
- oxidative free-radical of unsaturated 2-cyclohexenones with Mn(OAc), 6073
- palladium catalysed regio- and stereo-specific 5-, 6- and 7-exo-dig mono-, bis- and tris-

- processes of aryl and vinyl halides and allylic acetates, 11479
- palladium-catalysed carbocyclisation in the 1,4-oxidation of conjugated dienes, 7511
- palladium(II) catalysed of N-alkenyl-2-alkynamides, synth of α -chloroalkylidene- γ -butyrolactams and α -chloroalkylidene- δ -valerolactams, structural factors affecting the selectivity of, 10945
- Pauson-Khand intramolecular of 1-(3-alkoxy-2-propynyloxy)methylcyclopentenes and 1-(5-alkoxy-4-pentynyl)cyclopentenes, synth of tricyclic enones, 14021
- of phosphorylated o-aroyl and heteroaroyl benzamides, synth of 2-alkyl-4-aryl-1(2H)-iso-quinolones, subsequent reduction gives rise to 4-aryl-1,2,3,4-tetra-hydroisoquinolines, 4433
- Prins to tetrahydrofuran units of polyether antibiotics, remarkable siloxy effect for stereocontrolled cyclisation, 7287
- 4-exo-trig radical of N-[2,2-bis(phenylthio)-ethenyl]- α -bromo amides, synth of intermediates for carbapenem antibiotics PS-5 and thienamycin, 489
- radical of N-vinylic α-bromo amides, synth of 4-oxo-2-azetidineacetic acids, 13867
- radical cyclisation of α -allenic ketone, synth of (\pm) - α -chamigrene sesquiterpene, 13181
- radical cyclisation approach to pyroglutamates using dichloro- and trichloroamides as starting materials, 6739
- radical ring expansion and cyclisation process of α -iodomethylcyclopentanones, synth of angularly disubstituted *cis*-decalins, 13339
- of several heterocyclic radicals by addition to α,β -unsaturated esters, 9713
- stereochemistry of palladium catalysed cyclisation reactions; cascade reactions, 9289
- of a system consisting of two lipophilic 4,7-di-(n-hexyl)-2,9-diphenyl-1,10-phenanthroline moieties linked by a diacetylenic bridge and ended by two alkyne groups, synth of dicopper-(I) [3]-catenate, 10921
- tandem sequence of hydroxylamine-alkyne cyclisation/1,3-dipolar cycloaddition of alkyne-containing *N*-hydroxypyrrolidines, route to piperidines and indolizidines, 11601

Cycloaddition

- [4+2] of acenaphth[1,2-a]acenaphthylene with various dienes, 14777
- [2+2] of (S)-4-acyloxymethyl-4-methyl-2(5H)furanones with ethylene as key step in synth of

- (+)- and (-)-grandisol, the pheromone of cotton boll weevil, 1267, 1279
- of 2-azadienes with several nitroso compds, toward the synth of α-amino acid derivs, 7585 of azides to isothiazole dioxides, synth of thiadiazabicyclo[3.1.0]hexene derivs, subsequent rearrangement to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183 of benzonitrile oxide with cyanophenols, role of hydrogen bonding in, 7885
- of benzonitrile oxide to pyridazine, pyrimidine and pyrazine, 6421
- $[4\pi + 2\pi]$ of o-benzoquinones with symmetrical 6,6-dialkyl and cycloalkylfulvenes, formation of bicyclo[2.2.2]octene diones and cyclopenta[b]-[1,4]benzodioxins, 4029
- [4+2]- of benzyne, alternative to the use of benzyne based on cycloaddition of 2-chloro-1,4-benzodithiin-S,S'-tetraoxide, 14247
- [3+2]- between α -silyl- α -diazoketones and phosphaalkenes, synth of 5-alkylidene-4,5-dihydro-3H1,2,4(λ ³)-diazaphospholes, 10053
- [3+2] and [4+2] of C_{60} , exohedral functionalisation of, 5407, 5421
- ceric ammonium nitrate mediated oxidative [3+2] of 1,3-diketones to cinnamic esters, regio- and stereoselective synth of dihydrofurans, 2193
- [2+2]- of chlorosulfonyl isocyanate to *cis* and *trans* 3-O-but-1'-enyl-1,2-O-isopropylidene-α-D-xylofuranose, synth of azetidinones, 6019
- [4+4]-cycloaddition and its strategic application in natural product synthesis, Report, 6251
- 3+2-cycloadditions of 3-(4-halogenophenyl)pyridazinium ylids to acrylate and propiolate of ether, synth of pyrrolopyridazine heterocycles, 8853
- [2+4] cycloadditions of N-sulfonyl-alkylamines, 725
- of cyclobutyne to ethylene, theoretical methods, 2279
- Diels-Alder reaction of vinylpyrazoles, synergy between microwave irradiationand solvent-free conditions, 9237
- of 3,4-dihydroisoquinoline N-oxides with alkynes, synth of 4-substituted Δ^4 -isoxazolines and subsequent rearrangement to isoquinoline-fused pyrroles, 12049
- of (diisopropoxyphosphoryl)nitrile oxide with functionalised cyclopropenes, 8877
- [2+2] of 1,2-diketones to N,N-dimethyl cyanamide in the presence of titanium(IV) chlor-

- ide, subsequent ring opening to 1,3-butadienes, 3939
- 1,3-dipolar of 2-phenylthio-3,3,3-trifluoropropene, its sulfoxide and sulfone, 4383
- 1,3-dipolar of diazomethane to $\alpha\beta$ -unsaturated esters and lactones, synth of conjugated Δ^2 -pyrazolines, 4515
- 1,3-dipolar of homochiral cyclic nitrones derived from 1-deoxynojirimycin with phenyl isocyanate and trichloroacetonitrile as dipolarophiles, 4467
- 1,3-dipolar of nitrile oxides to C_{60} , synth of fullerene-fused isoxazoline heterocycles bearing a series of different substituents in the 3-position and reactivity of, 5043
- 1,3-dipolar of polycyclic aromatic hydrocarbons with 3,5-dichloro-2,4,6-trimethyland 2,4,6-trimethylbenzonitrile oxide, 13027
- 1,3-dipolar of trifluoromethylalkenes with nitrones and non-stabilized azomethine ylids, 59
- 1,3-dipolar cycloaddition of 3-carboxyalkyl- or acylnitrones to vinyl acetate followed by condensation with silylated thymine or 5-fluorouracil, synth of dideoxynucleosides, 8889
- 1,3-dipolar cycloaddition approach to isoxazolinopyrimidoazepine deriv, subsequent transformation into pyrimidoazepinone derivs, 5739 intramolecular 1,3-dipolar cycloaddition of D-
- intramolecular 1,3-dipolar cycloaddition of Dglucose in synth of isoxazolidinecarboxylic derivs, 11265
- intramolecular of isomünchnones derived from N-alkenyl substituted diazoimides, 3247 intramolecular of a nitrone derived from 2-(cyclohexen-3-yloxy)benzaldehyde using (R)-α-phenylethylamine as a chiral auxiliary, synth of (9-amino-substituted) 1,2,3,4,4a,9a-hexahydro-9H-xanthen-1-ols, 11849
- intramolecular nitrone and nitrile oxide cycloaddition, synth of piperidine and pyrroliddine systems respectively, 14311, 14323
- intramolecular oxime-olefin cycloaddition process starting from homochiral aminoacid precursors, synth of homochiral functionalised pyrrolidinone and pyrrolizidinone systems, 7875
- 1,4- of 1-isocyanatocyclohexene and cyclohexyl isocyanide, synth of 3-(cyclohexylamino)-1,4,5,6-tetrahydro-2H-indol-2-onejntermediate to (\pm) - α -lycorane and 4,5-dehydroanhydrolycorine alkaloids, 10569
- Lewis acid Ti(IV) promoted [3+2] of 2-alkoxy-1,4-benzoquinones with substituted 2H-

- chromenes, key step in synth of pterocarpans and pterocarpenes, 2217
- of N-methylcyclobutylideneamine N-oxide, 9187 [3+2]—of methylenecyclopropanes, stereochemical aspects of, 4883
- 3a-[3,4-(methylenedioxy)phenyl]-3,3a,4,5,6,7-hexahydro-2*H*-indole by reaction of 3-(2-azidoethyl)-3-[3,4-(methylenedioxy)phenyl]cyclohex -1-ene in toluene, key step in synth of (±)-crinane, 3107
- of nitrile oxides to 2(5H)-furanones substituted at the 5-position by sulfur bearing groups, synth of furoisoxazole which are synthons for heteroanthracyclinone analogues, 3457
- of nitrones, route to anatoxin-a, 6025
- of imines of 1-methyl-3-amino-1,3-dihydro-5-phenyl-(2H)-1,4-benzodiazepine-2-one to dipolarophiles, synth of spiro(pyrrolidinyl-2,3'-benzodiazepines) related to MK-329, 13455
- of 2*H*-1,4-oxazin-2-ones and alkenes, synth of 4,6-dichloro-2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones, 2591
- oxime-nitrone isomerisation and hydrazone-azomethine imine isomerisation at the periphery of pyridine and pyrido[1,2-a]pyrimidine systems, 887, 901
- Staudinger reaction, synth of β -lactams via ketene-imine cycloaddition using different chiral auxiliaries, steric effects, 3741
- of substituted 2-nitro-1,3-dienes, 9275
- tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of nitroalkenes bearing a pendant olefin, synth of nitroso acetals which lead to fused pyrrolidines after hydrogenolysis, 11579
- tandem sequence of hydroxylamine-alkyne cyclisation/1,3-dipolar cycloaddition of alkyne-containing N-hydroxypyrrolidines, route to piperidines and indolizidines, 11601
- tandem Wittig [2+3] cycloaddition of 5-azidomethyl-2,4-tetrahydro-2-hydroxy-3,4-(O,O)-iso propylidene furan, synth of nonracemic homo-1-deoxyazasugars with D-talo and L-allo configuration, 14745
- transannular nitrone 1,3-dipolar cycloaddition of (Z)- and (E)-19-nor-5,10-secosteroidal ketone with methylhydroxylamine hydrochloride, synth of isoxazolidines, 11995
- use of tricarbonyl(η^6 -cyclobutabenzene)-chromium complexes in asymmetric cycloaddition reactions, 7363

Cycloalkanes

vicinal exodimethylenecycloalkanes, synth by Heck reaction of 2-bromo-1,6- and 2-bromo-1,7-dienes, 11503

Cycloalkanones

ethynyl and allenyl derivs of self condensed cycloalkanones, thermal oxy-Cope rearrangements of, synth of linearly fused tricyclic[5.6.5] and [6.6.6] compds, 7737

Cyclobutanes

- ammonium and phosphonium perfluorocyclobutane ylids, synth from perfluorocyclobutene and tertairy amines or phosphines, use as masked fluoride anion source, 9755
- ammonium- and phosphoniumperfluorocyclobutane ylids, reaction with primary or secondary alcohols and carboxylic acids, synth of alkyl fluorides or acyl fluorides respectively, 2977
- trans-1,2-diaminocyclobutane, synth by boraneinduced reductive ring-expansion reaction of 1-(diphenylmethylene)amino-1-cyclopropanecarbonitrile, 2421
- fused mono-, bi- and tricyclic cyclobutane-1,2-diols, synth by samarium diiodide-mediated pinacolisation of diketones, 11783, 11799
- vinylic cyclobutanes, palladium catalysed annulation by reaction with aryl iodides substituted in the *ortho* position, 2743

Cyclobutanones

reaction with methylhydroxylamine, synth of *N*-methylcyclobutylideneamine *N*-oxide, cycloaddition reactions of, 9187

Cyclobutenes

cis-3-cyclobutene-1,2-dimethanol, synth and transformation into naturally occurring 1,3,5-alkatrienes and 2,4-decadienoates, 3631 electrophilic addition to cyclobutene compds, high selectivities in, 15103

Cyclodextrins

- β-cyclodextrin encapsulated aniline and N-substituted anilines, bromination of, synth of O-bromoaniline and p-bromo-N-methylaniline respectively, 3487
- α -, β and γ -cyclodextrins as guests to calcichrome (calcion) in water, 10979
- interactions with desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics) studied by gas chromatography and NMR, 319

Cycloheptenones

2,3,6,7-substituted cyclohept-4-enones, 2,5,6,7-substituted cyclohept-3-enones, and 6,7-disub-

stituted cyclohept-2-enones, synth from bicyclic compds, 11297

Cyclohexanes

- 1-amino-2-phenyl-1-cyclohexanecarboxylicacids as chiral auxiliaries in asymmetric Diels-Alder reactions, 4839
- (15,25,3R,6S)-3-chloro-3-methyl-6-isoprenyl-1,2 -cyclohexanediol, synth by Prins reaction as inhibitor of biosynth of porphobilinogen, 4645 cyclohexanoids and cyclopentanoids by *exo* cyclisation of 5-hexenyl or 6-heptenyl radicals, 8233
- stereochemically defined cyclohexanediols, synth by regioselective ring-opening of silylated epoxy alcohols, 1231
- symmetrical *N*-acylaziridines, ring opening reaction with thiols catalysed by chiral dialkyl tartrate-diethylzinc complexes, synth of *trans* 2-(*N*-acylamino)-1-arylthiocyclohexane, 7817 tonkinenin A, polyoxygenated cyclohexane deriv from *Uvaria tonkinensis*, structure, 12373

Cyclohexanones

- and cyclododecanone, ring-enlargement of, synth of muscolide, (R)-(-)-phoracantholide I and (9R)-(-)-9-tetradecanolide, 4581
- 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, synth by ring expansion of 1-haloethynyl-2-methylcyclopentanols, 10267

Cyclohexenes

- asymmetric protected 2-oxo-5-isopropyl-cyclohexenecarboxylates, synth from 3-methylbutanal as building blocks for an EPC synth of (+)-heptelidic acid, 1221
- 3-(2-azidoethyl)-3-[3,4-(methylenedioxy)phenyl | cyclohex-1-ene, relux in toluene to yield 3a-[3,4-(methylenedioxy)phenyl]-3,3a,4,5,6,7-hexa hydro-2*H*-indole, key step in synth of (±)-crinane, 3107
- cyclohexene-fused C₆₀ derivs having ethoxycarbonyl, acetyl, cyano, phenylsulfonyl and nitro groups, synth by Diels-Alder reactions using 1,3-butadienes substituted with electronwithdrawing and electron-donating groups, 4983
- cyclohexenyl nucleosides, synth and biological activity of *trans*-3-(pyrin-9-yl)-4-cyclohexenyl-carbinols, 8969
- 1-isocyanatocyclohexene, 1,4-cycloaddition with cyclohexyl isocyanide, synth of 3-(cyclohexylamino)-1,4,5,6-tetrahydro-2H-indol-2-one, intermediate to (±)-α-lycorane and 4,5-dehydroanhydrolycorine alkaloids, 10569

Cyclohexenones

 α -arylcyclohexenones, synth by palladium catalysed cross-coupling of arylmetal compds with β -iodoenones and a cyclohexyl triflate, 9485 unsaturated 2-cyclohexenones, oxidative free-radical cyclisation with Mn(OAc)₃, synth of unsaturated α '-keto radicals which cyclise to bicyclic products, 6073

Cyclooctenones

2,3,8,9-tetramethoxy-5,6,11,12-tetrahydrodibenzo [a,e]cycloocten-5-one,Baeyer-Villigeroxidation to substituted 6-oxodibenzo[b,f]oxinin and Beckmann and Schmidt rearrangements, 8063

Cyclopentanes

- cyclohexanoids and cyclopentanoids by *exo* cyclisation of 5-hexenyl or 6-heptenyl radicals, 8233 cyclopentane-1,2-diol, synth by samarium diodide-mediated pinacolisation of diketones, 11783, 11799
- 1,2-dialkyl-1-phenyl cyclopentanes, synth by intramolecular carbolithiation of α -thioalkenes or by intramolecular carbolithiation of olefins, 7435, 7465
- 1-haloethynyl-2-methylcyclopentanols, ring expansions of which are dependent on the position of the methyl and hydroxyl groups, synth of 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, 10267
- linearly fused *cis:anti:cis* tricyclopentanoids and protoilludane framework having fused four, six and five membered rings, synth, 7087
- cis:syn:cis tricyclopentanoids, synth from 1-hydroxy[5.3.1.0^{2.6}]undecadienones, 3693

Cyclopentanones

- α-iodomethylcyclopentanones, radical ring expansion and cyclisation process of, synth of angularly disubstituted *cis*-decalins, 13339
- substituted by hydrocarbonylative cyclisation starting from 1,4-dienes or from allyl vinyl ethers by tandem Claisen rearrangement and hydroacylation catalysed by polystyrene-supported η^5 -cyclopentadienyl rhodium compds, 5461
- xanthocidin, cyclopentanone antibiotic from Streptomyces xanthocidicus, synth of (±)-xanthocidin from triethylsilyl enol ether, 14651

Cyclopentenes

- 1-acetyl-2-methylcyclopentene, self-condensation of and subsequent autoxidation, synth of indenone, 9785
- 1-(3-alkoxy-2-propynyloxy)methylcyclopentenes and 1-(5-alkoxy-4-pentynyl)cyclopentenes,

- Pauson-Khand intramolecular cyclisation of, synth of tricyclic enones, 14021
- asymmetric shielded 2-oxo-cyclopentenecarboxylates, synth and addition of cuprates to, synth of 5-substituted 2-oxo-cyclopentanecarboxylates, 971
- di- and trisubstituted cyclopentenes, electrophilic additions of HOBr to, synth of polysubstituted cyclopentenes, 3355
- 2-[5-(9*H*-purin-9-yl)-2-cyclopenten-1-yl]-ethan-ol analogues, synth, 8407

Cyclopentenones

- asymmetric synth by means of Ni(CO)₄-promoted alkyne-allyl halide cyclisation-carbonylation, 10525
- 1,3-dithiolane and 1,3-dithiane derivs of 3-substituted 2-cyclopentenones, reaction with dienophiles, synth of 2-norbornanone dithioacetals, 9979

Cyclophanes

- bridged dithia[n]paracyclophanes, synth by cesium-assisted high-dilution cyclisation, crystal structures and chiroptical properties, 10043
- quadrupolar [1₄]azolophanes built up from heterocyclic betaine subunits, synth, X-ray crystallographic analysis and use as a captodative spacer, 15171, 15189, 15197
- 12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthro linophane, synth by cyclisation of 2,9-bis-(bromomethyl)phenanthroline, 4673
- 1,1,10,10-tetramethyl[3.3]metacyclophane-2,11dione, conformational analysis, shielding effect of the carbonyl group, 2847

Cyclopropanation

- reagent controlled asymmetric cyclopropanation reactions for asymmetric synth of syn- and anti-bicyclopropane derivs, 15325
- Simmons-Smith of dienes derived from diethyl L-tartrate, synth of *cis-2*-methylcyclopropanecarboxylic acid, a component of curacin A, 13327

Cyclopropanes

- \bar{N} -Boc \bar{N} -alkyl cyclopropyl amines, lithiationsubstitution reactions of, 12333
- syn- and anti-bicyclopropane derivs, asymmetric synth using reagent controlled asymmetric cyclopropanation reactions, 15325
- cyclopropane analogues of the pheromones of Musca domestica L., Plutella xylostella L. and Ephestia elutella Hbn., 12509
- cyclopropanes, vinylcyclopropanes and vinylenol ethers, synth by reaction of α,β -unsaturated

- alkoxychromiumcarbene complexes with sulfur ylids, 13215
- cyclopropanoid nucleoside analogues, synth by a chemoenzymatic approach from racemic dialkyl 1,2-cyclopropane dicarboxylates, 6383
- 1,1-diphenoxy-2-(phenylsulfonyl)cyclopropane, reactions of the lithio deriv of with acyl chlorides and acyl imidazoles, synth of dihydrofurans which could be transformed into the corresponding furans, 7149
- trans-disubstituted gem-difluorocyclopropane by reaction of N-(4'-bromo-4',4'-difluorocroton-oyl)oxazolidinone with lithium enolate of N-diphenylmethylideneglycinate, conversion to glutamic acid, 271
- functionalised cyclopropanes by Michaelreaction initiated ring closure reactions of aziridinyl-methylenemalonates, 12253
- methyl (15,2R)-1-benzamido-2-formylcyclopropanecarboxylate, Wittig olefination of, synth of conformationally constrained cyclopropyl amino acids, 5881
- methyl 1,1,2-tribromocyclopropanecarboxylate, synth by dibromocyclopropanation of methyl α-bromoacrylate, use as intermediate for four carbon cyclopropane and cyclopropene synthons, 3409
- cis-2-methylcyclopropanecarboxylic acid, a component of curacin A, asymmetric synth by Simmons-Smith cyclopropanation of dienes derived from diethyl L-tartrate, 13327
- methylenecyclopropanes, stereochemical aspects of intramolecular palladium-catalysed [3+2] cycloadditions of, 4883
- vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, synth by reaction of allylic diisobutyl-telluronium ylids with alkylidene or arylmethylidene malonic esters, 8747
- 2-vinyl-1,1,2-trihalocyclopropanes, synth of five carbon cyclopropane and cyclopropene intermediates, 10955
- vinylic cyclopropanes and cyclobutanes, palladium catalysed annulation by reaction with aryl iodides substituted in the *ortho* position, 2743

Cyclopropenes

- cyclopropenyl anion, azirene, oxirene and thiirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709
- functionalised cyclopropenes, dipolar cycloadditions of (diisopropoxyphosphoryl)nitrile oxide to, 8877

- 1-halo-2-vinylcyclopropenes, synth by dehalogenation of dichloro- and dibromocarbene adducts of chloroprene and 2,3-dichlorobutadiene, 10955
- strained 1,3-bridged cyclopropene as intermediate in 1-n-elimination reactions of 1-bromo-5-bromomethyl-6,6-dichlorobicyclo[3.1.0]hexane, 14641

Cytotoxins

- acyclonucleosides, cytotoxic against HEp human cells, 8907
- aromin and aromicin, bioactive annonaceous acetogenins with bis-THF ring structure from *Xylopia aromatica*, structures and cytotoxic activity, 4215
- callipeltins B and C, cytotoxic peptides from the New Calidonian sponge *Callipelta* sp., structures, 9589
- ceratinamides A and B, antifouling dibromotyrosine derivs from the marine sponge Pseudoceratina purpurea, cytotoxic activity against P388 murine leukemia cells, 8181
- dichotomins A-E, cyclic penta or hexapeptides with cell growth inhibitory activities against p-388 lymphocytic leukemia cells from roots of *Stellaria dichotoma*, structures, 1165
- 4,5-dioxoaporphine alkaloids, synth from preformed biaryl bond precursors, cytotoxic activity on several tumour cell lines, 11307
- dorisenones, cytotoxic spongian diterpenoids from nudibranch *Chromodoris obsoleta*, activity against L1210 and KB cells, 8187
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges, cytotoxic activity against doxorubicin-resistant L1210/DX tumoural cells, 8899
- erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge Erylus cf. lendenfeldi, structures, 7921
- (+)-goniodiol from *Goniothalamus*, cytotoxic activity against A-549 human lung carcinoma, synth by Ghosez' methodology, 14877
- haliclonacyclamines A and B, cytotoxic alkaloids from tropical marine sponge *Haliclona* sp., structures, 9111
- jaspiferals A-G, cytotoxic isomalabaricane-type nortriterpenoids from Okinawan marine sponge *Jaspis stellifera*, structures, 5745
- labiatin B, diterpenoid from Senegalese gorgonian Eunicella labiata, cytotoxic activity, 2735 macrolactin A, parent aglycone of the bioactive 24-membered macrolides from marine bacter-

ium with antiviral and cytotoxic properties, synth of the C_7C_{20} fragment and the C_1 - C_{14} fragment, 11811, 11821

microcolins B, lipopeptide with cytotoxic and immunosuppressive properties from blue-green alga *Lyngbya majuscula*, synth, 425, corrig. 3767

nalodional, a cytotoxic polypropionate from Smaragdinella calyculata, structure, 9681

polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, biological activities against human nonsmall-cell lung carcinoma cells, 10997

ptilomycalin A, antiviral, antifungal compd from Red Sea sponge *Hemimycale* sp., synth of guanidines as intermediates from pyrrolidin-2one via N-acyliminium ion coupling with silyl enol ethers, 2603, 2629

ptilomycalin A, guanidine containing biologically active compds, biomimetic model studies towards, 8315

Dealkoxylation

chloro- and bromo-demethoxylation of methoxy substituted polynitrophenyl and -biphenyl systems, 5639

Decarbonylation

photolytic double — of a cyclohexane solution of 4,7-ethanoindene-8,9-dione deriv, synth of a mixture of dihydroindene and benzofulvene, 2481

of 2,4,6-trimethoxybenzaldehyde catalysed by scandium trifluoromethanesulfonate, synth of 1,3,5-trimethoxybenzene and methyl formate, 11045

Decarboxylation

malonic acid receptors with decarboxylative activity, geometry and electronic properties, 12323

Degradation

oxidative — of eumelanins, black-to-brown pigments of mammalian skin, hair and eyes, generation of pyrrole acids, 8775

Dehydrogenation

of 2,3- and 2,5-dihydro-1*H*-1-benzazepines by hydride transfer to an iminium ion, synth of 3*H*-benzazepines, 4423

Dendrimers

polyether dendritic sectors, prep by a convergent approach from 4-t-butylphenol, phloro-glucinol and 1,3-dibromopropane, useful building blocks for functional dendrimers, 4277

Deoxygenation

of 4-hydroxy-2-butenoic acid moiety mediated by zinc, prep of multifunctional chiral building blocks from carbohydrates and tartaric acid, 4457

Deprotonation

of bis(phenylthio)methane and [1,3]-dithiane by NaNH₂/Et(OCH₂CH₂)₂-ONa, mechanisms, 15147

Depsipeptides

A90720A, cyclic depsipeptide from the terrestrial blue-green alga *Microchaete loktakensis*, isolation and structure, 395

agardhipeptins A and B, cyclic hepta- and octapeptides from the cyanobacterium *Oscillatoria* agardhii (NIES-204), structure and biological activity, 13129

aureobasidin A, antifungal cyclic depsipeptide from Aureobasidium pullulans R106, synth using bromotris(pyrrolidino)phosphonium hexafluorophosphate as a coupling reagent, 4327

cyclodepsipeptides related to valinomycins, synth, 1343, 1361, 1379

destruxin analogues, depsi peptidic bond replacement by amide bond, 6173

hapalosin, a cyclic depsipeptide from blue green alga *Hapalosiphon welwitschii* possessing multidrug resistance reversing activities, synth from the corresponding hydroxy- and γ-amino acids, 14723

porphyrin/depsipeptide/p-benzoquinone molecule, synth for study of hydrogen bond mediated electron transfer in proteins, 12357

Diamides

dimethylmalonyl bisdiamides of a 1,2-disubstituted chiral aminoethanol, starting material for stereodivergent synth of 4,5-disubstituted bis-(oxazolines), 13649

18-membered diamide-diester macrocycles possessing pyridine/thioether/ether as ligating units, synth by dehydrochlorination of diacid dichlorides and diols, effect of ligating units on Ag⁺ selectivity, 13483

Diamines

2,3-diaminobutanes, synth from 1,4-bis(diethylamino)-2,3-dinitro-1,3-butadiene *via* dinitro-butadienes, 3313

trans-1,2-diaminocyclobutane, synth by boraneinduced reductive ring-expansion reaction of 1-(diphenylmethylene)amino-1-cyclopropanecarbonitrile, 2421

(R,R)-N,N-bis(3-diphenylphosphino-2-hydroxybenzylidene)-1,2-diphenylethane-1,2-diamine (salenophos), synth of a titanium(IV) -palladium(II) complex based on, 14599

fused diaminopyrimidinones, synth using N-cyanochloroacetamidine as a building block, 1011

isosaraine-3 and saraine-1-3, macrocyclic diamine alkaloids from Mediterranean sponge *Reniera sarai*, absolute stereochemistry of, 14961

Diastereoselection

- design and diastereoselective Mukaiyama-Michael reaction of O,S-ketene silyl acetals, 9409, 9419
- diastereofacial selection in nucleophilic additions to unsymmetrically substituted trigonal carbons, 5263
- diastereoselective bromine/lithium exchange reactions of 3-alkoxy-1,1-dibromo-alkanes, 7421 diastereoselective *syn*-epoxidation of 2-alkyl-4-enamides, synth of epoxyamides, 3327
- diastereoselectivity of oxidation of lithium and chlorotitanocene enolates derived from camphor, 5487
- enhanced diastereoselectivity in reaction of α, β epoxyaldehydes derived from nerol and geraniol with lithium t-butylacetate, 9047
- opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025
- reversal of the facial diastereoselectivity in Paternò-Büchi reactions of silyl enol ethers carrying a chiral substituent in α -position, 10861

see also Stereoselection

Diaza compds

- N-alkenyl derivs of six-membered and larger 1,2-diaza heterocycles, synth using diazaphosphole derivs generated in situ or the PCl₃/hydrazone combination, 13695
- 5-alkylidene-4,5-dihydro-3H-1,2,4(λ ³)-diaza-phospholes, synth from α -silyl- α -diazoketones and phosphaalkenes, 10053
- 1,8-diazabicyclo[5.4.0]undec-7-ene and 1,5-diazabicyclo[4.3.0]non-5-ene, reaction with methyl pheophorbide *a.* promoted by trialkylsilyl triflates, synth of substituted chlorin amides, 849 1,6-diazacyclodeca-3,8-diynes, palladium-catalysed rearrangement to *N,N**-diisopropyl-3,3'-bispyrrole, 10383
- 2a,4a-diazacyclopenta[c,d]azulene, synth from 3-

aryl-6,7,8,9-tetrahydro-5*H*-imidazo[1,2-*a*]azepines by reaction with phenacylbromides and subsequent cyclisation, 9835

macrocyclic diazatetralactams and derivs, synth involving dissymetrisation of the reactivity of a diacid via its cyclic anhydride and the activation-cyclisation of the intermediate diamide diacid, 9793

thiadiazabicyclo[3.1.0]hexene derivs, synth by cycloaddition of azides to isothiazole dioxides, subsequent rearrangement to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183

Diazepines

imidazo[1,5-g][1,4]diazepines, analogues of TIBO lacking the aromatic ring, synth by condensation of β -aminoalcohols with 4-chloroethylimidazole deriv, evaluation as anti-HIV agents, 15157

tricyclic pyrrolo[1,2-a][1]benzothieno[2,3-e]-[1,4]diazepines from the corresponding carbonyl azides by thermolysis, 13547

Diazo compds

- 9-diazo-10-anthrone, reaction with Grignard reagents, competition between nucleophilic addition and electron-transfer process, 6795
- α-diazo-β-keto compds, Wolff rearrangement of, synth of dienylketenes, subsequent benzannulation formed functionalised phenolic derivs, 6665
- α-diazo-β-keto-γ,δ-alkenyl-δ-aryl compds, rhodium(II) acetate catalysed decomposition of, aromatic C-H insertion reaction or Wolff rearrangement-electrocyclisation, 10455
- diazomethane, 1,3-dipolar cycloaddition to α,β -unsaturated esters and lactones, synth of conjugated Δ^2 -pyrazolines, 4515
- isomünchnones derived from N-alkenyl substituted diazoimides, intramolecular cycloadditions of, 3247
- reaction with 3(,5)-(di)chloro-2*H*-1,4-(benz)-oxazin-2-ones, synth of substituted 1*H*-tetrazoles and 1,2,3-triazoles, 8813
- substituted α-diazoamides and diazoimides, synth from the corresponding amides or amines, ligand effects in the rhodium(II) catalysed reactions of, 2489

Diels-Alder reactions

- of 2,4-alkadienyl 2'-(alkenyl or alkynyl) sulfides, synth of hydrobenzo[c]thiophene derivs, 13909
- of *N*-arylimines, investigation of mechanism of, synth of [3,4-b]quinolines, 955

- asymmetric employing modified camphorderived oxazolidin-2-one chiral auxiliaries, 4079
- asymmetric using 1-amino-2-phenyl-1-cyclohexanecarboxylic acids as chiral auxiliaries, 4839
- asymmetric hetero Diels-Alder and ene reactions of alkyl glyoxylates with dienes in nitro-alkane solvents, solvent effects, 7287
- of azetidinodiazepines with acylnitroso dienophiles, key reaction in synth of D,L-erythroseand D,L-1,4-dideoxy-4-aminoerythrose derivs bearing a β -lactam at C-4, 6201
- between an acylnitroso compd and a cyclohepta-1,3-diene, synth of 4-amino-cycloheptanone which can be cyclised to calystegine alkaloid, 15137
- of 5- or 6-bromobenzofuran-4,7-diones with azadienes, synth of furo[2,3-g] or furo[3,2-g]quinoline-4,9-diones, 9499
- of C₆₀ with electron-rich 2,3-dioxy-substituted-1,3-butadienes, 5421
- of C₆₀, functionalising a carbon sphere with flexibly and rigidly bound addends, 5033
- of C₆₀ using 1,3-butadienes substituted with electron-withdrawing and electron-donating (silyloxy) groups, functionalisation of [60]-fullerene, 4983
- of a cage-annulated cyclohexa-1,3-diene, synth of a doubly-caged sterically-congested tetraol, 6325
- of carbon acetal-tethered trienes, 8937
- cascade of N-butadienyl-N-alkylketene N,O-t-butyldimethylsilyl acetals followed by acylation, synth of bicyclic and tricyclic products, 11643 catalysed by supported chiral amino alcohols and diols functionalised with aluminium and titanium, 9853
- Diels-Alder trapping of o-quinodimethane generated by redox-mediated cathodic reduction of α , α '-dibromo-o-xylene in the presence of hindered dienophiles, 7771
- of N-dienyl-L-pyroglutamic esters with acyl nitroso dienophiles, 3283
- of dihydropyridinones, synth of the tetracyclic substructure of manzamine A alkaloid, 10597 of 5,6-dimethylenepyrimidin-4-ones and pyrimidine *o*-quinodimethanes, 1723, 1735
- of (Z)-ethyl 3-[(1-ethoxycarbonyloxy-2-methoxy)-ethenyl]-2-(ethoxycarbonyloxy)indole-1-carboxylate, synth of carbazole alkaloid carbazomycin B, 3029

of ethyl (E)-3-(1,3-benzothiazol-2-yl)-3-cyanopropenoate as 1-aza-1,3-butadiene, 733

- Heck-Diels-Alder reactions of 2-bromo-1,6- and 2-bromo-1,7-dienes, synth of bicyclo[4.3.0]-nonene and bicyclo[4.4.0]decene derivs *via* vicinal exodimethylenecycloalkanes, 11503
- hetero of quinolinetriones, 5933
- hetero Diels-Alder vs Mukaiyama aldol pathways in reaction of monoactivated dienes with aldehydes, effect of Lewis acid, 2167
- of indole-3-carboxaldehyde in sulfolane, synth of carbocyclic analogues of canthine and canthin-6-one, 461
- of indoles, ketones and maleic anhydride to give tetrahydrocarbazoles and carbazoles, 4555
- intramolecular of bicyclopropylidene derivs with furan moieties attached on tethers of various length, reaction rates, 12185
- intramolecular of a series of ether-tethered trienes, effect of nature of dienophile-activating group and substituents in linking chain on the selectivity, 695
- intramolecular of a sulfonyl-substituted dienyne, key step in synth of CD-ring fragment of vitamin D₃, 4769
- intramolecular hetero Diels-Alder reactions versus intramolecular ene reaction, effect of magnesium perchlorate catalysts on chemoand enantioselectivity, 12009, 12019
- of methyl *N-p*-methoxybenzensulfonylindole-2-(2-propenoate), synth of advanced intermediates for the synth of (±)-andranginine alkaloid, 11291
- mono- and bicyclic olefin Diels-Alder adducts, kinetic resolution of *via* Sharpless asymmetric dihydroxylation, 7901
- of morphinan-6,8-dienes with 4-phenyl-4*H*-1,2,4-triazoline-3,5-dione, 2449
- of 1,4-oxathiin-S-oxides, synth of α -oxosulfines, subsequent Diels-Alder reactions yields thio-quinone-S-oxides, 12233, 12247
- of (E)-1-phenylsulfonyl-3-alken-2-oneswithvinyl ethers, synth of 2,4-cis-3,4-dihydro-2H-pyrans, 1205
- of 2(1*H*)-pyrazinones with a 2-propynylaminomethyl or 3-butynylamino methyl side chain, synth of pyrrolo[3,4-*b*]- and [3,4-*c*]pyridin(on)es and related 1,7-naphthyridinones and 2,7-naphthyridines, 9161
- of pyridine o-quinodimethane analogues generated from functionalised o-bis(chloromethyl)-pyridines, 11889

of retinyl propynyl ether, synth of a tetrahydroisobenzofuran deriv by addition of the alkyne group at positions 11 and 14 of the retinoid side chain, 405

role of heavy atom effects in -, 14459

route to bicyclo[4.1.0]hept-2-enes by oligocyclisation of 2-bromododeca-1,11-diene-6-ynes followed by Diels-Alder reactions, 11545

tandem Diels-Alder retro Diels-Alder reaction of 6-amino-3-methylpyrimidin-4(3H)-ones with DMAD, 13721

tandem Diels-Alder/retro Diels-Alder reaction of 6-glycosylaminopyrimidines with dimethyl acetylenedicarboxylate as dienophile, synth of 2-glycosylaminopyridines, 5845

tandem Wittig-Horner/intramolecular Michael reaction followed by retro Diels-Alder cleavage, key reactions in synth of 3-pyrrolines, 6943 of trifluoromethylalkenes with Danshefsky's diene, 59

of vinylpyrazoles, synergy between microwave irradiation and solvent-free conditions, 9237

Dienals

conjugated dienals by heating and hydrolysis of δ-silyloxy imines derived from reaction of γ-trimethylsilyl N-t-butyl crotonaldimine with aldehydes, 4607

Dienediynes

see Diynes

Dienes

2-amino-1,3-dienes by coupling of α-chloro enamines and alkenyl lithium compds, 2909

(*E,E*)-1-arylselenobutadienes by cross-coupling reactions of selenium-containing zirconium(IV) complexes with alkenyl halides, 9819

2-aza-1,3-dienes with electron-releasing substituents at the 1,3-positions, synth from *N*-thio-acylacetamidines through deprotonation of *N*-ylidene acetamidinium iodides, precursors of pyridine and pyrimidines, 10095

2-azadienes, cycloaddition with several nitroso compds, toward the synth of α -amino acid derivs. 7585

2-bromo-1,6- and 2-bromo-1,7-dienes, Heck-Diels-Alder reactions of, synth of bicyclo-[4.3.0]nonene and bicyclo[4.4.0]decene derivs via vicinal exodimethylenecycloalkanes, 11503

cage-annulated cyclohexa-1,3-diene, Diels-Alder reactions of, synth of a doubly-caged sterically-congested tetraol, 6325

chiral 4,5-di-O-acetyl-2E,6E-octadiene-1,4,5,8-tetraol, rearrangement generates a 2,7-di-O-

acetyl-3*E*,5*E*-octadiene-1,2,7,8-tetraol framework, 13909

conjugated dienes, palladium-catalysed carbocyclisation in the 1,4-oxidation of-, 7511

(*E,E*)-cyclodeca-1,6-dienols, biotransformation of using a root suspension of fresh chicory (*Cichorium intybus*), 11273

cyclodimerisation of 1,3-cyclohexadiene, determination of photosensitising ability of triphenylpyrylium and dibenzotropylium cations within zeolite media, 7755

1,4-dienes, auxiliary-directed peroxidation of -, 12381

α,ω-dienes, molybdenum alkylidene-catalysed metathesis of –, synth of bicyclic nitrogen heterocycles, 7251

(Z,E)-dienes and trienes by ring-opening of 4-alkyl-2-cyclobutene-1-carbaldehydes via (2Z,4E)-alka-2,4-dienals, 3631

1,4-bis(diethylamino)-2,3-dinitro-1,3-butadiene, synth by ring opening of 3,4-dinitrothiophene, subsequent Grignard reactions give 2,3-diaminobutanes *via* dinitrobutadienes, 3313

3,4-dilithio-1,2-butadienes by addition of lithium metal to 1,4-unsymmetrically substituted butatrienes, 6149

4-*N*,*N*-dimethylcarbamoyl-2,3-disubstituted-1-oxa-4-aza-1,3-butadienes and 1,4-di-(*N*,*N*-dimethylcarbamoyl)-2,3-disubstituted-1,4-diaza-1,3-butadienes, synth from 1,2-diketones, 3939 from α-ketosulfides of benzothiazoles *via* allyl episulfides, 2155

hexacyclo[11.2.1.0^{2.12}.0^{5,10}.0^{5,15}.0^{10,14}]hexadeca-6,8-diene-4,11-dione, synth and acid and base promoted rearrangements of, mechanism and X-ray structures of products, 13531

homobenzonorbornadiene, bromination of at different temperatures, 14005

monoactivated dienes and aldehydes, hetero Diels-Alder vs Mukaiyama aldol pathways in reaction of, effect of Lewis acid, 2167

morphinan-6,8-dienes, Diels-Alder reactions with 4-phenyl-4*H*-1,2,4-triazoline-3,5-dione, 2449

2-oxabicyclo[3.3.0]octa-3,7-dienes, synth by rearrangement of bis[(2,4,6-trimethylphenyl)-methanoyl]bicyclo[2.2.1]hept-5-enes, 5699

polyfunctional biphenyls and 1,3-dienes by cross-coupling of aryl and alkenyl iodides, 7201 stannylidene C₁₀-C₁₅ fragment of des-epoxyrosaramycin, synth involving cuprate rearrangement and stannylcupration, 6613

substituted 2-nitro-1,3-dienes, generation and cycloaddition reactions of, 9275

see also Allenes

Dienones

- 4,4-disubstituted cyclohexa-2,5-dienone, coppercatalysed addition of Me₃Al to—using a (4S)-2-(2',6'-dimethoxyphenyl)-4-isopropyloxazoline ligand, 14177
- 1-hydroxy[5.3.1.0^{2,6}]undecadienones by carbocationic rearrangement of annulated bicyclo-[2.2.2]octenones, subsequent conversion to *cis:syn:cis* tricyclopentanoids, 3693
- 17β-hydroxy-17α-methyl-androsta-1,4-dien-3one and androsta-1,4-diene-3,17-dione, bioconversion in cultures of green alga T76 Scenedesmus quadricauda, 13981
- spirodienones by hypervalent iodine oxidation of phenolic dibenzylbutyrolactones, intermediates in the biosynth of tetrahydrodibenzocyclooctene, 1303
- spiro(fluorene-9,1'-cyclohexadienones) from electrooxidation of 3,3',4,4',5,5'-hexamethoxybiphenyl and 2,2',3,3',4,4'-hexamethoxybiphenyl, 4449

Dienynes

- 2-bromododeca-1,11-diene-6-ynes, pligocyclisations of followed by rearrangement or Diels-Alder reaction, synth of [1,2:3,4]bisannelated cyclohexadiene derivs and bicyclic alkenes respectively, 11545
- cyclononadienyne, synth by trapping of 1-lithio-2-(1-chlorovinyl)cyclopropene with methyl chloroformate, 10955

Dihydroxylation

see Hydroxylation

Dimerisation

- acid-catalysed of 2-prenylindoles, 9455
- cyclodimerisation of 1,3-cyclohexadiene, determination of photosensitising ability of triphenylpyrylium and dibenzotropylium cations within zeolite media, 7755
- of α-methylstyrene and 1-aryl-1-phenylethylenes induced by aminium salt, solvent effects, 13971 oxidative of diethyl 3-thienylmalonate by high valent metal salts, synth of benzo[1,2-b:4,5-b']-dithiophene derivs, 13227

Dimers

covalently linked pyropheophorbide dimers, models of the special pair in the photosynthetic reaction center, synth by condensation of 3-devinyl-3-carboxylpyropheophorbide-a, 4311 diethyl(2-pyridyl)boranes, rigid cyclic dimers via

intermolecular boron-nitrogen coordination bonds, 13933

hydrogen bonded homo- and heterodimers of tetra urea derivs of calix[4]arenes, synth, 8489 *C,C*- and *C,N*-linked dimers and 4-arylmethyl derivs by of reduction of 4-arylmethylene pyrazol-5-ones or isoxazol-5-ones with 2-arylbenzimidazoline, 1443

triterpene dimers from *Maytenus scutioides* (Celastraceae), structures and absolute configuration, 9597

Diols

- 1,2-alkanediols, synth by addition of Knochel's (dialkoxyboryl)methylcopper reagents to aldehydes *via* β-hydroxyalkylboronates, 915
- 1-O-allyl-1,2-diols, radical addition of perfluoroalkyl iodide to, synth of 2-perfluoroalkylidenemethyl and 2-perfluoroalkylmethyl-1,4-dioxanes, 6187
- anti 3-amino-1,2-diols, synth by catalytic asymmetric epoxidation of an allylic alcohol and titanium-promoted oxirane opening, subsequent conversion to syn and anti-β-hydroxy-γ-amino acids, 7063
- (+)-(1S,2S)-2-amino-1-phenylpropan-1,3-diol, conversion to $cis-\beta$ -lactams by Staudinger reaction, subsequent transformation into carbapenems, 4-cyano- β -lactams, β -hydroxy aspartates and pyrrolidinones, 8989, 9005
- by aldehyde addition to t-butyldimethylsilyldihalomethyllithium followed by 1,3- and 1,4-rearrangement of silyl group from carbon to oxide, 503
- D-ribo-C₁₈-phytosphingosine, synth from divinylcarbinol via Sharpless asymmetric epoxidation and dihydroxylation, 2187
- chiral diols by catalytic enantioselective dialkylation of tere-, iso- and phthalaldehydes and by a catalytic enantioselective autoinductive reaction, 13355
- (15,25,3R,6S)-3-chloro-3-methyl-6-isoprenyl-1,2 -cyclohexanediol, synth by Prins reaction as inhibitor of biosynth of porphobilinogen, 4645 meso-1,2-diols, asymmetric desymmetrisation of via diastereoselective β -elimination of chiral α -arylsulfinyl acetals, 6527
- erythro-1,2-diols by condensation of dimesitylboron stabilised carbanions with aromatic aldehydes followed by oxidation, 1085
- sec,sec-1,2-diols, regioselective oxidation by dimethyldioxirane, fine regioselective tuning of, 10969

- enantiopure epoxides and vicinal diols by biohydrolyses of various substituted styrene oxide derivs, 4593
- fluorine-containing monosilylated diols, 1,2- and 1,3-O,O-silyl migration reactions of, synth of alkoxides stabilised by strongly electron withdrawing fluorine-containing methyl groups, 11753
- fused mono-, bi- and tricyclic cyclobutane-1,2diols and a cyclopentane-1,2-diol, synth by samarium diiodide-mediated pinacolisation of diketones, 11783, 11799
- (+)-goniodiol from Goniothalamus, cytotoxic activity against A-549 human lung carcinoma, synth by Ghosez' methodology, 14877
- optically active diols with C_2 -symmetry and (R)-4-pentanolide, synth by Pichia farinosa IAM 4682 mediated reduction, 8113
- oxidative cleavage of for synth of α -trifluoro-methylated aldehydes, 199
- (+)-(2R,4R)-2-phenyl-2,4-pentanediol, synth by organometallic reagent addition to β -hydroxy-ketones, 2177
- relative affinities of various diols and other O-containing compds for Na⁺ determined from the intensities of the [M+Na]⁺ ions relative to 1,2-hexadecanediol, 9017
- stereochemically defined cyclohexanediols, synth by regioselective ring-opening of silylated epoxy alcohols, 1231
- supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853
- synth by Barbier-type DTBB-catalysed lithiation using polychlorinated materials as a source of polyanionic synthons, 1797

Diones

- 2-allyl-2-(O-nitrophenyl)-1,3-cyclohexanedione, synth from 1,3-cyclohexanedione by O-nitro-arylation followed by O-allylation and subsequent Claisen rearrangement, 4013
- bicyclo[2.2.2]octene diones and cyclopenta[b]-[1,4]benzodioxins, synth by $[4\pi + 2\pi]$ cycloaddition of o-benzoquinones with symmetrical 6,6-dialkyl and cycloalkylfulvenes, 4029
- 1,1'-bicyclohexylidene-4,4'-dione dioxime, formation of a non-covalent polymer by hydrogen bonding between the oxime functionalities, 1773
- 5- or 6-bromobenzofuran-4,7-diones, Diels-Alder reactions with azadienes, synth of furo[2,3-g] or furo[3,2-g]quinoline-4,9-diones,

9499

- cyclohexane solution of 4,7-ethanoindene-8,9dione deriv, photolytic double decarbonylation of, synth of a mixture of dihydroindene and benzofulvene, 2481
- heterocyclic 2,3-diones, reaction with Lawesson's reagent, synth of isoindigoide dyes, 5427
- hexacyclo[11.2.1.0^{2.12}.0^{5,10}.0^{5,15}.0^{10,14}]hexadeca-6,8-diene-4,11-dione, synth and acid and base promoted rearrangements of, mechanism and X-ray structures of products, 13531
- Meldrum's acid, synth of acylaminomethylene Meldrum's acid derivs, pyrolysis of provides 2-substituted 1,3-oxazin-6-ones, 3163
- 7-methoxyimino-4-methylchromene-2,8-dione, reaction with phosphines, prep of *N*-substituted 7-amino-8-hydroxy-4-methyl-2*H*-[1]-benzopyran-2-ones, 15007
- 1,1,10,10-tetramethyl[3.3]metacyclophane-2,11dione, conformational analysis, shielding effect of the carbonyl group, 2847
- thaxtomines, phytotoxins from Streptomyces, synth by cross-coupling reactions of lithiated 2,5-piperazinedione anions with gramine methosulfate, 8525

Dioxanes

- dispiro-1,3-dioxanes with axial and helical chirality, synth and stereochemistry of, 12783 Meldrum's acid, synth of acylaminomethylene Meldrum's acid derivs, pyrolysis of provides 2-substituted 1,3-oxazin-6-ones, 3163
- 2-perfluoroalkylidenemethyl and 2-perfluoroalkylmethyl-1,4-dioxanes, synth from 1-Oallyl-1,2-diols by radical addition of perfluoroalkyl iodide, 6187

Dioxetanes

1,2-dioxetanone as luminescence intermediate in low-temperature photooxygenation of coelenterate luciferin analogue, 12061

Dioxiranes

- dimethyl dioxirane for oxidation of nor quinone methide triterpenes (pristimerin and tingenone) possessing one enol double bond, 10667 dimethyldioxirane for hydroxylation of 1,3-dicarbonyl compds, 5799
- dimethyldioxirane promoted oxidative decomplexation of Fischer carbene complex of ethyl (2E)-3-diethylamino-3-phenylprop-2enoate, studies on chemoselectivity, 3973
- dimethyldioxirane for regioselective oxidation of sec, sec-1,2-diols, fine regioselective tuning,

10969

methyl(trifluoromethyl)dioxirane as oxidising agent for oxidation of 1,2,4,5-tetrazines to 3-aryl-1,2,4,5-tetrazine N-oxides, 2377

methyl(trifluoromethyl)dioxirane for oxyfunctionalisation of brassinosteroids, synth of 25-hydroxy-brassinolide and 25-hydroxy-24-epibrassinolide, 10653

Dioxolanes

- (4R,5R)-4,5-bis(alkylcarbamoyl)-1,3-dioxolanes analysis of the conformational preferences of, 8275
- 1,3-dioxolane as a chaperone functional group for lithium ions, reaction cascades based on squarate esters, 11625
- 4-(p-isopropylphenyl)-2-nonyl-1,3-dioxolane, photodeacetalisation of using 2,4,6-triphenyl-pyrylium tetrafluoroborate as sensitiser, effect of limiting the amounts of water, oxygen and sensitiser, 4911

Dithianes

- 1,3-dithiane and 1,3-dithiolane derivs of 3-substituted 2-cyclopentenones, reaction with dienophiles, synth of 2-norbornanone dithioacetals, 9979
- 2-lithio-2-vinyl-1,3-dithiane, reaction with an aryl halide to form ketenedithioacetal, subsequent transmetalation generates an alkyl halide and a 2-indanyl-2-lithio-1,3-dithiane, 14951
- bis(phenylthio)methane and [1,3]-dithiane, deprotonation of by NaNH₂/Et(OCH₂CH₂)₂-ONa, mechanisms, 15147
- 2-substituted-1,3-dithiane 1-oxides, synth using modified Sharpless sulfoxidation of 2-substituted-1,3-dithianes followed by deacylation, 2125

Dithiazoles

5-(arylimino)-4-(dialkylamino)-5*H*-1,2,3-dithiazles, treatment with NaOH, synth of *N*arylthiocarbamoyl-*N*,*N*-dialkylamidines, 8413

Dithiols

1,3-dithiolane and 1,3-dithiane derivs of 3-substituted 2-cyclopentenones, reaction with dienophiles, synth of 2-norbornanone dithioacetals, 9979

Diynes

- butadiynes as starting materials for synth of non-anellated 1,2-dithiines via(Z,Z)-butadiene-1,4-dithiols, 12677
- by phase transfer catalysis in the presence of a Pd(0) catalyst such as bis(dibenzylidene-acetone)palladium(0), 1337

- 1,6-diazacyclodeca-3,8-diynes, palladium-catalysed rearrangement to *N,N**-diisopropyl-3,3*-bispyrrole, 10383
- (diisopropoxyphosphoryl)nitrile oxide, dipolar cycloadditions with functionalised cyclopropenes, 8877
- enediynes, enyne allenes and related compds, chemistry of, 6453
- neocarzinostatin, kedarcidin, C-1027 and maduropeptin, construction of the bicyclo-[7.3.0]dodecadiyne core structure by aldol reaction, 6283
- phenylated diynes, transformations to polycyclic compds by RhCl₃- and PtCl₄-aliquat 336° ion pair catalysts, 8349

Dreiding-Schmidt reactions

of aldonolactones mediated by samarium iodide, chain extension of, 9759

Drugs

- cis- and trans-deethyleburnamonine, alkaloid for treatment of cerebral disorders, synth from 1-substituted indolo[2,3-a]quinolizidines, 9925
- deferiprone, synth of iso-deferiprone by aminomethylation of 3-hydroxy-2(1H)-pyridinones and 3-hydroxy-4(1H)-pyridinones, 1835
- etoposide, antineoplastic drug, synth by glycosidation of 4'-demethyl-4'-acetyl-epi-podophyllotoxin with α-1-tributyltin-O-2,3-bis-acetyl-4,6-ethylidene-glucose, 3049
- (±)-ibuprofen, (±)-flurbiprofen and (±)-naproxen, synth of monofluorinated analogues of by oxidation of the corresponding primary alcohols, 12761
- panomifene, follow-up molecule to antiestrogenic drug tamoxifen used to treat mammary tumours, improved synth of from 2-(4-alkoxy)-3,3,3-trifluoro-1,2-diphenylpropan-1-ols, 12821 profens, α-arylpropionic acids, non-steroidal antiinflammatory compds, synth of α-fluoro analogues of, 8257
- see also Alkaloids, Biologically active compds
- cyanine dye bearing two boronic acids as probe for fluorescence and CD spectroscopic sugar sensing, design and synth, 1195
- FD&C yellow Nº 6, NMR examinations of azohydrazone for, 5691
- isoindigoide dyes by reaction of heterocyclic 2,3-diones with Lawesson's reagent, synth and rearrangement, 5427

Eicosanoids

- 3-ethyl-2,7,9-trimethyl-(10*H*)-dipyrrin-1-one, conversion to a lipid analogue of bilirubin with eicosanoic acid side chains, synth and properties of, 447
- (5S)-HETE (hydroxy eicosatetraenoic acid), synth by coupling of dienyne and chiral iodo vinyl alcohol, 6635

Electrochemical reactions

- anodic oxidation of benzene and substituted benzenes, synth of the corresponding phenol derivs, 3889
- electrochemical behaviour of tetramethyl-pyrrolinic, -piperidinic, indolinic and quinolinic aminoxyls and of oxygen, electron transfer process between aminoxyls and superoxide anion, 11257
- electrooxidation of 1-methylindole, 2-methylindole and 3-methylindole, mechanisms and structures of products, 7947
- electrooxidation of symmetrically substituted hexamethoxybiphenyls, synth of either cation radical salt or spiro(fluorene-9,1'-cyclohexadienones), 4449
- electrooxidative pinacol-type rearrangement of β -hydroxy sulfides, generation of 2-phenyl substituted ketones as ring expanded products, 4303
- electroreductive acylation of 3-aryl substituted α,β -unsaturated esters and nitriles in the presence of aliphatic carboxylic anhydrides, 1943 oxidation of chiral 5-substituted 2-oxazolidinones, synth of the corresponding methoxy substituted oxazolidinones which are precursors of dichiral β -amino alcohols, 9743
- reaction between electrogenerated diphenylketene, 2-bromo-2,2-diphenylacetyl bromide and sulfide ion, synth of 2-benzhydrylidene-4,4-diphenyl[1,3]oxathiolan-5-one, 1259
- redox-mediated cathodic reduction of α,α' -dibromo-o-xylene in the presence of hindered dienophiles, Diels-Alder trapping of the generated o-quinodimethane, 7771
- theoretical and electrochemical studies to investigate the electronic structure and redox property of two silylmethylated C_{60} compds, 5053
- thermal 4π and 6π electrocyclisations of 1-alkenylbenzocyclobutenols, synth of substituted 3,4-dihydro-1(2H)-naphthalenones, 2235

Electrochemistry

anodic oxidation of the N-cyanomethyloxazolidine system in acetonitrile at a platinum

- electrode, generation of a radical cation, mechanism, 15127
- cyclic voltammogram of 2,2'-bi[3,6-dimethyl-selenolo[3,2-b]selenophene], 471
- electrochemical properties of fullerenolanthanides, 4973
- electrochemical properties of substituted fulleropyrrolidines, 5221
- redox properties of 1-octynyl-C₆₀ anion, 5077 redox properties of phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent, 5091

Electrocyclic reactions

see also Cyclization, Photochemistry

Electron spin resonance

- adduct from digermirane addition with La@ C_{82} , 5015
- (2,6-dichlorophenyl)bis(2,4,6-trichlorophenyl) methyl radical, 7013
- EPR and ENDOR spectroscopy of photochemically generated radicals in reversed micelles, 8497
- free radical scavenging activity of 4-(2*H*-1,2,4-benzothiadiazine-1,1-dioxide-3-yl)-2,6-bis(1,1-dimethylethyl)phenols, 12587
- intramolecular spin-interactions between nitronyl nitroxide or imino nitroxide radical units linked to thieno[2,3-b]thiophene and thieno-[2,3-b]thieno[3',2'-d]thiophene chromophores, 6893
- photoreaction of α -bromo-2,3,4,6-tetra-O-acetylglucose with hexabutylditin, generation of glucosyl radicals which react with phenols to produce α -O-glucosides, 10241

Electron transfer

- competition between nucleophilic addition and electron-transfer in the reaction of 9-diazo-10anthrone with Grignard reagents, 6795
- deacetalisation by photoinduced electron transfer with a pyrylium salt, effect of limiting the amount of water, oxygen and sensitiser, 4911
- electron transfer mediated cascade ring-opening reactions of bicyclo[4.1.0]ketones, 11421
- hydrogen bond mediated electron transfer in proteins, study of using a porphyrin/depsipeptide/p-benzoquinone molecule, 12357
- photochemical approach to functionalisation of open-chain and cyclic alkanes, single electron transfer oxidation, 5533, 5549
- SET oxidative processes of commonly used solvents as revealed through the photochemical reaction of 1,2,4,5-benzenetetracarbonitrile,

1785

Electronic effects

electron withdrawing-substituted methanofullerenes, effect of cyano substitution in the 61 position of methanofullerenes, 5149

electronic properties of malonic acid receptors with decarboxylative activity, 12323

and steric effects of the CF₃ group in cycloadditions using trifluoromethylalkenes, 59

steric and electronic effects in imine-hemiaminal ring-chain tautomerism, 7679

and steric hindrance in complexation of macrolactones and crown ethers with alkali cations and Hg(SCN)₂, 3683

Electronic spectra

absorption, covalently linked pyropheophorbide dimers, 4311

absorption, photochemical approach to functionalisation of open-chain and cyclic alkanes, single electron transfer oxidation and hydrogen abstraction, 5533, 5549

photoelectron spectra and spectroelectrograms of dihydropyrazoleselone, dihydropyrazolethione S-oxide and dihydropyrazolone hydrazone, 1965

UV, 4-dimethylaminobenzoate, 10631

UV, 3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, 7789

UV, exciton coupling in various substituted arylphthalimide bichromophoric systems, 13201

UV, 1-methyl-7,7-dimethyl-2,4-diaza-bicyclo-[4.2.0]-octa-1,5-diene-3-one, 10159

UV, oligodeoxynucleotides containing 6-methylthiopurine residues, 10737

UV,2,4,6-trimethoxybenzaldehyde-scandiumtriflate, 11045

UV-vis, C_{60} and dihydrofullerene, 5179

UV-vis, 3,6-dimethylthieno[3,2-b]thiophene and 3,6-dimethylselenolo[3,2-b]selenophene, 471

UV-vis, 1-(hydroxyalkyl)-4-methyl-8, 11, 15, 18, 22, 25-hexaoctylphthalocyanines, 809

UV-vis, methanofullerenes with cyano, nitro and carboxyethyl substituents on C_{61} , 5149

UV-Vis, study of hydrogen bond mediated electron transfer in proteins using a porphyrin/depsipeptide/p-benzoquinone molecule, 12357 UV-vis, synthetic zinc chlorins, 12421

UV-vis,tri-(N-methyl-4-pyridiniumyl)porphyrins bearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, 13569, 13589

UV-vis, 1,2,3-tri-t-butyl-6,13- and 8,9,10-tri-t-butyl-5,14-pentacenequinones, 4269

UV-vis, 4- and 6-trifluoromethyl-3-cyano-2(1*H*)-pyridinethiones, 10841

Elimination reactions

diastereoselective β -elimination of chiral α -arylsulfinyl acetals, asymmetric desymmetrisation of *meso*-1,2-diols, 6527

1,4-elimination of benzenesulfinic acid from β -keto phenylsulfone tosylhydrazone *via* α,β -unsaturated ketone tosylhydrazones, 10705

1,n-elimination reactions of 1-bromo-5-bromomethyl-6,6-dichlorobicyclo[3.1.0]hexane,strained 1,3-bridged cyclopropene and a vinylcarbene as reactive intermediates, 14641

1,1-, 1,2- and 1,4-eliminations from the corresponding dihalogenated compds using Bu₃SnSiMe₃-F^{*}, 8143

neighbouring group effects on promotion of substitution reactions over elimination, route to chloramphenicol from 3-bromo-N-t-butyl- N^{α} -phthaloyl-p-nitrophenylalaninamide, 7025

Emmons-Horner-Wadsworth reactions

on enolisable cyclopentanones, synth of (-)-mitsugashiwalactone, (+)-iridomyrmecin, (-)-isoiridomyrmecin and (+)-teucriumlactone, iridoid cyclopentapyranones, 3435

Enals

(alkoxyallyl)sulfones as enal β -anion equivalents, synth of 5-substituted 2(5*H*)-furanones and mono-, di- and trisubstituted furans by reaction with aldehydes, 15267, 15289

(2E)-2-butyloct-2-enal, alarm pheromone of African weaver ant, and (2E)-2-tridecylhepta-dec-2-enal, metabolite from red alga, synth using Baylis-Hillman adducts, 1253

Enamides

2-alkyl-4-enamides, diastereoselectivesyn-epoxidation to epoxyamides, 3327

β-enamidoaldehydes, intramolecular nitrone cycloaddition starting from – and subsequent reductive ring-opening of the resulting fused δ-lactam, synth of isomerically functionalised piperidine systems, 14311

Enamines

N-alkanoyl β -enaminones, photorearrangement of, synth of α -amino- β , γ -unsaturated acid derivs, 2405

α-chloro enamines, coupling reactions with alkenyl lithium compds, synth of 2-amino-1,3-dienes, 2909

enaminonucleosides, synth from reaction of the ribonucleoside with secondary amines *via* 1,2-hydride shift, 4877

 β -functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, conversion to secondary *E*-allylamines and β -aminophosphorylated compds, 9609

macrocyclic enaminolactams by ring expansion of 2-oxocyclododecane-1-carbonitrile with diarylcarbodiimides, 4363

trialkylsilylenaminones and α' -silylated β -diketones, synth by reaction of β -(monoalkylamino) α,β -unsaturated ketones with trialkylchlorosilanes and subsequent hydrolysis, 9179

Enantiomeric purity

chemical differentiation of enantiopure groups; diastereoselective opening of a prochiral dilactone, 14577

enantiomerically and diastereomerically pure (+)-7-aminocephalosporanic acid, 7691

Enantioselection

4,6-*O*-benzylidene protected 2,3-bis(*O*-diphenylphosphino)-D-glycopyranoside rhodium(I) chelate catalysts for hydrogenation of methyl (*Z*)-2-*N*-acylamidoacrylates, 15079

chemical differentiation of enantiopure groups; diastereoselective opening of a prochiral dilactone, 14577

enantioselectivity of intramolecular ene reactions and intramolecular hetero Diels-Alder reactions, effect of magnesium perchlorate catalysts on, 12009, 12019

enantioselectivity of lipase-catalysed hydrolysis, factors influencing, 5397

Ene reactions

of allylbenzene and 3-phenylbut-1-ene with oxomalonic esters, mechanism, 8827

asymmetric catalysis of – with fluoral by chiral binaphthol-derived titanium complex, 85

asymmetric hetero Diels-Alder and ene reactions of alkyl glyoxylates with dienes in nitro-alkane solvents, solvent effects, 7287

intramolecular ene reaction versus intramolecular hetero Diels-Alder reactions, effect of magnesium perchlorate catalysts on chemoand enantioselectivity, 12009, 12019

intramolecular imine and carbonyl ene reactions for azepine-ring formation at the periphery of heterocyclic systems, mechanism, 13081, 13097, 13111

Enediynes

see Diynes

Enol ethers

enol ethers of 1,5-azido ketones, Schmidt reactions with alkyl azides, 3403

silyl enol ethers, addition to ferrocenylmethyl ethers, synth of precursors to chiral bridged ferrocenophanes, 1461

silyl enol ethers carrying a chiral substituent in α -position, reversal of the facial diastereoselectivity in the Paternò-Büchi reaction of, 10861

vinylenol ethers, cyclopropanes and vinylcyclopropanes, synth by reaction of α,β -unsaturated alkoxychromium carbene complexes with sulfur ylids, 13215

Enolates

enolates of t-butyl alkanoates and N,N-dialkylalkanamides, reactions with t-butyl p-tolylazo sulfide, synth of α -p-tolylhydrazonylated esters and amides, 5889

ester enolate Claisen rearrangement of chelated N-protected amino acid allylic esters, synth of α -alkylated γ , δ -unsaturated amino acids, 941 ester enolate reaction with chiral N-trimethylsily limines, synth of *trans*-azetidin-2-ones, 1685 lithium and chlorotitanocene enolates derived from camphor, diastereoselectivity of oxidation of, 5487

samarium(III) enolates from ring-opening reactions of cyclopropyl ketones with samarium(II) iodide, 11421

titanium and lithium enolates, stereoselective conjugate addition to γ-alkoxy enone, synth of 2,3-anti-3,4-anti and the 2,3-syn-3,4-anti isomers respectively, 3497

Ti(VI)-enolate formed from methyl phenylgly-oxylate, acylation of by acyl halides and anhydrides, synth of α -hydroxy- β -ketoesters, 11037

Enols

cyclic enol ethers *via* arenesulfonyl iodide additions to alkynols, 7779

see also Enolates

Enones

γ-alkoxy enone, addition of titanium and lithium enolates to, synth of 2,3-anti-3,4-anti and the 2,3-syn-3,4-anti isomers respectively, 3497

7-alkylbicyclo[3.3.1]non-6-en-3-ones, synth by silica gel-promoted fragmentation of 3-alkyl-2-oxaadamant-1-yl mesylates, 5867

9-anthrylsubstituted pyridyl enones, study of structure effects on photochemical properties of, 935

(+)-(1S,2R,4R,7S,11R)-7-t-butyldimethylsiloxy methyl-3,3,11-trimethyltricyclo[6.3.0.0^{2.4}]undec -8-en-10-one, starting material for synth of

- aromadendrenes, 4257
- 4,6-dichloro-2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones, synth by cycloaddition of 2*H*-1,4-oxa-zin-2-ones and alkenes, subsequent conversion to 1,6-dihydro-6-oxo-2-pyridine- and 6-oxo-2-piperidinecarboxylates, 2591
- 2-exo-functionalised bicyclo[3.2.1]oct-3-en-8-ones by iron-mediated carbonylation of bicyclo-[4.1.0]hept-2-enes, 5449
- β -iodoenones, palladium-catalysed cross-coupling of arylmetal compds with and a cyclohexyl triflate, synth of α -arylcyclohexenones, 9485
- 6-methyl-4-(2',5'-dioxohexyl)-bicyclo[4.3.0]non-3-en-2-one by self-condensation of 1acetyl-2-methylcyclopentene and subsequent autoxidation, 9785
- α -silylamino-enones and ynones, SET-photosensitised reactions proceeding by 6-endo α -amino radical cyclisation pathways, 3195
- 2,3,6,7-substituted cyclohept-4-enones, 2,5,6,7-substituted cyclohept-3-enones, and 6,7-disubstituted cyclohept-2-enones, synth from bicyclic compds, 11297
- 4-t-trĪluorobut-3-en-2-one, reaction with anilines followed by heating with phosphoryl trichloride, cyclisation and dehydration of the resulting 4-anilino-1,1,1-trifluorobut-3-en-2-ones yields 2-(trifluoromethyl)quinolines, 4637
- tricyclic enones by Pauson-Khand intramolecular cyclisation of 1-(3-alkoxy-2-propynyloxy)-methylcyclopentenes and 1-(5-alkoxy-4-pentynyl)cyclopentenes, 14021

see also Cycloalkenones

Enynes

- conjugated enynes and α,β -unsaturated ketones by dehydration-hydration of α -alkynols over a zeolite catalyst, 8287
- dienyne, coupling with chiral iodo vinyl alcohol, synth of (5S)-HETE (hydroxy eicosatetraenoic acid), 6635
- enediynes, enyne allenes and related compds, chemistry of, 6453

Enzyme and enzyme reactions

- lipase of *Pseudomonas fluorescens* for desymmetrisationof*cis*-3-cyclobutene-1,2-dimethanol to give both enantiomers of 3-oxabicyclo[3.2.0]-hept-6-en-2-one, 3631
- alcohol oxidase from defensive secretion of larvae of leaf beetle *Phaedon armoraciae*, stereochemistry of, 6601
- Bacillus stearothermophilus alcohol dehydrogen-

- ase as catalyst for redox reactions of bicyclic octen- and hepten-ols and -ones, 1669
- baker's yeast mediated reduction of 4-(4-hydroxyphenyl)-but-3-en-2-one, synth of 4-(4-hydroxyphenyl)-2-butanone (Raspberry ketone), 4041
- Candida cylindracea lipase for hydrolyses of acetoxy- and phenethylbenzoates, 9869 catalase enzyme, intermediates in an Fe^{III}

catalase model in pyridine, 10313

- design and synth of a bifunctional label for selection of β -lactamase displayed on filamentous bacteriophage by catalytic activity, 5591 enzymatic asymmetrisation for enantioselective synth, Report, 3769
- glycerol-3-phosphate dehydrogenase, synth of monofluoro-and difluoro-methylenephosphonate analogues of *sn*-glycerol-3-phosphate as substrates for, 165
- (S)-hydroxynitrile lyase from *Hevea brasiliensis* for conversion of aldehydes to cyanohydrins, 7833
- isopenicillin N synthase, enzyme resonsible for ring closure of an acyclic tripeptide into isopenicillin N, mechanism, 2515, 2537
- lipase catalysed resolution of chiral carboxylic acids or alcohols using mixed carboxylic-carbonic anhydrides, 4383
- lipoprotein lipase from *Pseudomonas specie* for enzymatic acylation of L-Ser-\(\beta\)-naphthylamide, solvent effect on chemoselectivity, 4867
- natural glucosides and fluorogenic substrates for β-glucosidases, preparative biosynthesis followed by *in vivo* ¹³C NMR with high density plant cell cultures, 925
- N-nitrosochloroethyl-cephalosporin carbamate, prodrug for antibody-directed enzyme prodrug therapy (ADEPT), synth via acylation and selective nitrosation of a cephalothin deriv, 5983
- olipase/4S (*Rhizopus japonicus*) for resolution of ethyl 2,2-difluoro-3-hydroxyoctanoates, subsequent use of enatiomers in total synth of difluorinated [6]-gingerol, 157
- pH-sensitivespin-labelled carbodiimide N-cyclohexyl-N'-(1-oxyl-2,2,3,5,5-pentamethylimidaz olidine-4-yl)-methylcarbodiimide, synth for probing protonation reactions in proton-pumping enzymes, 5783
- Pichia farinosa IAM 4682, mediator of reduction of diketones and ketoacids, 8113 pig liver esterase as catalyst for hydrolysis of
- trans-2,5-bis(acetoxymethyl)pyrrolidine, 565

- pig liver esterase for chemoenzymatic approach to cyclopropanoid nucleoside analogues from racemic dialkyl 1,2-cyclopropane dicarboxylates, 6383
- porcine kidney diamine oxidase a catalyst for oxidative transformation of *Nitraria* alkaloids, 6725
- Pseudomonas cepacia for biocatalytic optical resolution of (2R,3S)-2-allyloxy-3,4,5,6-tetrahydro-2H-pyran-3-ol, 8123
- rabbit muscle aldolase as catalyst for aldolisation of D-glyceraldehyde analogues followed by dephosphorylation, synth of D-fructose analogues substituted at C6 position, 1557
- subtilisin Carlsberg esterase for resolution of D,L-Fmocprotected4-phosphonomethylphenylalanine derivs, 2021
- sucrose synthase, nucleoside monophosphate kinase or myokinase, use for combined enzymatic synth of nucleotide (deoxy) sugars from sucrose and nucleoside monophosphates, 2395
- two peptide -oligonucleotide conjugates containing as their peptide moiety the active site mimic of ribonuclease A and the Cu(II) complexing metallopeptide, synth, 3005
- Yarrowia lipolytica strains for microbial reduction of prochiral carbonyl compds, 3547

Enzyme inhibitors

- A90720A, cyclic depsipeptide serine protease inhibitor from the terrestrial blue-green alga *Microchaete loktakensis*, isolation and structure, 395
- O-(2-acetamido-2-deoxy-β-D-glucopyranosyl)-(1→4)-2-acetamido-1,2,5-trideoxy-1,5-imino-Dglucitol, potential glycosidase inhibitor, synth from allyl chitobioside, 13315
- aeruginosins 102-A and B, thrombin inhibitors from the freshwater cyanobacterium *Microcystis viridis* (NIES-102), 14501
- arcyriaflavins B-D, inhibitors of protein kinase C or topoisomerases, synth of the indolo[2,3-a]pyrrolo[3,4-c]carbazole ring system, 8099, corrig. 14079
- aspartyl protease inhibitors, synth of cyclohexylstatine, a key component of, 7063
- calyculin A, protein phosphatase inhibitor from marine sponge *Discodermia calyx*, synth of C₂₀-C₂₅ building blocks from L-malic acid using Grignard reaction of Weinreb amides, 8297
- calystegine B₂, alkaloid with a nortropanic skeleton possessing inhibitory activity against β-glycosidases, synth by intramolecular cyclis-

- ation of a polyhydroxylated 4-amino-cycloheptanone, 15137
- (1S,2S,3R,6S)-3-chloro-3-methyl-6-isoprenyl-1,2 -cyclohexanediol, synth by Prins reaction as inhibitor of porphobilinogen synthase, 4645
- 1-deoxynojirimycin, inhibitor of α -glucosidase, 1,3-dipolar cycloaddition of homochiral cyclic nitrones derived from 1-deoxynojirimycin with phenyl isocyanate and trichloroacetonitrile as dipolarophiles, 4467
- 1,1-difluoro-1-[2-(4-hydroxynaphthalenyl)]meth yl]phosphonic acid, an inhibitor of proteintyrosine phosphatase, design and synth, 9963
- difluoromethyleneketone retroamides as inactivators of aspartyl or seryl proteases, 305
- dipeptidyl peptidase IV(CD26), study of inhibition of using fluoroolefin containing dipeptide isosteres, synth, 291
- inhibition of protein kinase C by a compd closely related to K-252a alkaloid, synth by Beckmann-type rearrangement of TAN-1030A, 1235 inhibition of purine nucleoside phosphorylase by phosphonate derivs of N^9 -benzylguanine, synth, 177
- inhibition of subtilisin Carlsberg and α -chymotrypsin, serine proteases, by chiral amine- and aminoalcohol derivs, 4199
- inhibitors of L,L-diaminopimelate epimerase, studies in design of by synth of 2,3-methano-2,6-diaminopimelic acids, 1149
- isoxazolidinecarboxylic derivs, precursors for glycosidase inhibitors, synth from D-glucose through intramolecular 1,3-dipolar cycloaddition, 11265
- J-104,118 and J-104,123 potent inhibitors of squalene synthase, synth *via* (15,25)-3-(3,4-di-chlorophenyl)-2-(2-fluoro-4-biphenylyl)-1-methylpropylamine, 13867
- lyciumin A, a cyclic octapeptide from *Lycium* chinese, inhibitor of angiotensin-converting enzyme, configurational and conformational analyses, 2795
- microviridins D-F, serine protease inhibitors from the cyanobacterium *Oscillatoria agardhii* (NIES-204), structures, 8159
- MK-639 (indinavir sulfate), inhibitor of HIV-1 protease, synth of intermediate to by syn epoxidation of 2-alkyl-4-enamides, 3327
- N1-C2 bridged tricyclic DNA gyrase inhibitors from pyrazolo[1,5-a]quinolines, 8471
- optically active β, γ -alkynylglycine derivs, synth as possible inhibitors of L-alanine racemase,

11215

pusilatins B and C from liverwort Blasia pusilla L. with DNA polymerase β inhibitory activity, 14487

 C_2 symmetric HIV-protease inhibitors, synth of a new core by addition of γ -monosubstituted allylchromium(III) reagents to N-protected α -amino aldehydes, 7379

tautomycin, inhibitor of protein phosphatase, pseudoenantiomeric heteroconjugate addition approach to synth of spiro segment of, 2877

- (+)-tautomycin, specific inhibitor of protein serine/threonine phosphatases, total synth by formation of C₁-C₁₆ fragment, C₁₇-C₂₆ fragment and various other units, 13363
- 1,3,5-trideoxy-3-fluoronojirimycin and 1,3,5-trideoxy-3-fluoromannojirimycin, synth from noncarbohydrate precursors as possible inhibitors of glucosidases and mannosidases, 131
- 4,4-bis(trifluoromethyl)imidazoline analogues, synth as cholesterol acyltransferase inhibitors, 11153

Epimerisation

- and skeletal resection in the ascomycin framework, a study of the biological consequences of lactam rotamer selection, 9643
- of 1-substituted indolo[2,3-a]quinolizidines, route to *cis* and *trans*-deethyleburnamonine, 9925
- of tilivalline, a pyrrolo[2,1-c][1,4]benzodiazepine, 13521

Epoxidation

- aerobic catalytic of unfunctionalised olefins using a chiral(salen) manganese(III) complex bearing a sesquiterpene salicylaldehyde and (*R*,*R*)-1,2-cyclohexanediamine moieties, 12031
- of alkenes employing aqueous NaOCl as oxygen donor catalysed by Mn(III)-tetraarylporphyrins bearing perfluoroalkylamido tails, 11879
- of cyclobutene compds by electrophilic addition, high selectivities in, 15103
- diastereoselective and bishydroxylation of cyclic t-butyl allyl peroxides, 13151
- diastereoselective syn-epoxidation of 2-alkyl-4enamides to epoxyamides, synth of epoxide intermediate of HIV-1 protease inhibitor MK-639, 3327
- diastereoslective of olefins by organo sulfonic peracids, 2957
- of electron deficient alkenes with anhydrous t-BuOOH promoted by KF adsorbed on alumina, 3659

epoxidation-ring closure route to homo-N-desoxynucleosides from 2-deoxy-D-ribose, 5563

Mn-salen catalysed asymmetric – of olefins, mechanism of oxygen atom transfer from oxo (salen)manganese(V) complex to olefins, 515 ruthenium-catalysed – of unfunctionalised

ruthenium-catalysed — of unfunctionalised aromatic and aliphatic olefins using t-butyl hydroperoxide as the oxidant, 12971

Sharpless asymmetric epoxidation and dihydroxylation for synth of D-ribo-C₁₈-phytosphingosine from divinylcarbinol, 2187

stereoselective -- in flexible systems, conformational analysis of, 6699

of unfunctionalised alkenes by dinuclear nickel-(II) complexes, 3521

Epoxides

- achiral epoxides, enantioselective desymmetrisation of, 14361
- 3-F-alkyl 2,3-epoxypropanoates, nucleophilic ring-opening, regioselective access to α,β -difunctional β -F-alkylpropanoates, 14631
- aza-Payne rearrangement-epoxide ring opening reaction of 2-aziridinemethanols, regio- and stereoselective synth of diastereomerically pure *N*-protected 1,2-amino alcohols, 11739
- benzyl 3,4-anhydro-β-D-ribopyranoside, ring opening reactions with nucleophiles, synth of 3-deoxy-3-substituted or 4-deoxy-4-substituted glycosides, 1747
- diepoxins, spiroketal-linked naphthodiepoxydecalinones from fungus LL-07F275 which grows as a mycelium sterilium, stereochemistry of, 435
- enantiopure epoxides and vicinal diols by biohydrolyses of various substituted styrene oxide derivs, 4593
- epoxide-functionalised polycarbocyclic systems and epoxy-derivatives of tetrahydro- and hexahydromethanonaphthalenes, crystal density modelling, 9703
- anti- (or erythro-) α,β -epoxy alcohols, synth by reduction of α,β -epoxyketones with diisopropoxytitanium(III) tetrahydroborate, 9137
- 2,3-epoxy sulfides, rearrangement to 3-trimethylsilyloxy-1,2-thiiranium ions which react with silylated nitrogen heterocycles and amides to form 1-substituted-3-hydroxy-2-thioethers, 3609
- 4,5-epoxy-10-normorphinans, synth using the nitrous acid deamination of indolenines as key step, 8209
- α,β -epoxyaldehydes derived from nerol and geraniol, enhanced diastereoselectivity in

reaction with lithium t-butylacetate, 9047

exo- and endo-N⁶-(5,6-epoxynorborn-2-yl)adenosine, synth via norbornenylamines, potent agonists for the A₁ adenosine receptor, 4735 epoxyrollin A, annonaceous acetogenin, synth of the epoxy lactone proposed for, 9399

exo- and endo-7,8- and 6,7-epoxyhomotropanes, synth and approach to synth of scopine and pseudoscopine, 11947, 11963, 11977

functionalised epoxides derived from asymmetrisedtris(hydroxymethyl)methane, exploitation in the synth of a fragment of lasalocide A and other polyether ionophore antibiotics, 12631

(+)-heptelidic acid, epoxylactone with antibacterial activity from fungal origin, use of 2-oxo-5-isopropyl-cyclohexenecarboxylatesasbuilding blocks for EPC synth of (+)-heptelidic acid, 8725

as intermediates in synth of 2-aryl-3-hydroxy-4H-1-benzopyran-4-ones (flavonol) by Algar-Flynn-Oyamada reaction of 6'-substituted 2'-hydroxychalcones, 7163

nucleoside epoxyphosphonates, synth by reaction of 1-[3- and 1-[2-(diethoxyphosphinyl)-5-O-trityl- β -D-xylo and -arabinofuranosyl]uracilwith triflyl chloride and 4-pyrrolidinopyridine, 11695 reaction with α,β -unsaturated and α -phenyl acetals promoted by lithium-potassium mixed base LICKOR, synth of homoallyl alcohols, 1433 silylated epoxy alcohols, nucleophilic ring open-

ing of, synth of stereochemically defined cyclohexanediols, 1231

see also Oxiranes

Esters

3-F-alkyl 2,3-epoxypropanoates, nucleophilic ring-opening, regioselective access to α,β -difunctional β -F-alkylpropanoates, 14631

3-aryl substituted α,β -unsaturated esters and nitriles, electroreductive acylation in the presence of aliphatic carboxylic anhydrides, 1943

α-azidoesters as divergent intermediates for combinatorial generation of glucofuranose libraries of novel *N*-linked glycopeptides, 10711, 10721

bicyclic orthoesters having a six or a sevenmembered orthoester ring, hydrolysis of, experimental observations and theoretical rationalisation, 14841

of 2,3-dichloro-5,6-dicyanohydroquinone diesters of 2-substituted cinnamic acids using Zn-AcOH

system, synth of saturated acids and hydrocarbons which oxidise to the corresponding tropones, 1707

ethyl 3-aryl-4-nitrobutanoates by 1,4-conjugate addition of the Reformatsky reagent to α -nitrostyrenes, 1425

formate ester of (S) ethyl 2-formyl-3-hydroxy-2-methylpropionate, conversion to (S)-2-ethyl-2-methylpentanoic acid via C-2 and C-1 chain elongations, 14281

from mono- or di-aldehydes by (pentamethyl-cyclopentadienyl)₂LnCH(SiMe₃)₂ catalysed Tishchenko reaction, 4291

halo esters, alkylation-annulation with a coupled reagent of samarium(II) diiodide with organometallic reagents, synth of cycloalkanols, 1953 itaconate ester derivs by reaction of dimethyl 2-(tosylmethyl)fumarate with carbonucleophiles or sodium methoxide, 1035

long chain aromatic esters by alkylation of substituted benzoic acids with n-octyl bromide under solvent-free phase transfer catalysis and microwave heating, 6705

squarate esters, reaction cascades based on—, 1,3-dioxolane as a chaperone functional group for lithium ions, 11625

 α -p-tolylhydrazonylated esters and amides, synth by reactions of the enolates of t-butyl alkanoates and N,N-dialkylalkanamides with t-butyl p-tolylazo sulfide, 5889

 α,β -unsaturated esters, tetramethylethylene diamine/trimethylsilyl chloride mediated addition of benzyl copper reagents to α,β -unsaturated esters, 12313

Ethers

arylmethyl ethers in derivs of benzophenones, xanthones, anthraquinones, aryl esters, benzamides and nitroanisoles, selective removal of methyl group with BeCl₂, 13623

cyclic enol ethers *via* arenesulfonyl iodide additions to alkynols, 7779

1,2-diarylethenyl ethyl ethers by a sequence of carbocupration of ethoxyethyne with phenyl-copper(I) followed by cross-coupling of the resulting 2-ethoxyvinylcopper(I) complex with iodoarenes, 13347

diphenylether, dibenzofuran and biphenyl, fluorination with N-F type reagents, regioselectivity of, 11341

lithiomethyl ethyl ether from chloromethyl ethyl ether by DTBB-catalysed lithiation followed by hydrolysis, 1643

MEM ethers, cleavage of by tetrahalozincate reagents, 15257

p-methoxybenzyl 4-pentenyl ether, NIS-mediated activation of, generation of p-methoxybenzyl cation, 8135

tetrahydropyranyl, methoxymethyl, 1-ethoxyethyl, 1-methyl-1-methoxyethyl and trimethylsilyl ethers, cleavage using silica-alumina gel catalysts prepared by the sol-gel method, 9387 see also Oxygen heterocycles

Exchange reactions

diastereoselective bromine/lithium exchange reactions of 3-alkoxy-1,1-dibromo-alkanes, 7421

Expansion reactions

radical ring expansion and cyclisation process of α -iodomethylcyclopentanones, synthof angularly disubstituted *cis*-decalins, 13339

Fenestranes

naphtho-anellated [5.6.5]- and [6.5.5.5]fenestranes, synth using cyclodehydration route *via* 1,3-indandiols, 13167

Ferrocenes

chiral bridged ferrocenophanes, synth of precursors to by addition of silyl enol ethers and silyl ketene acetals to ferrocenylmethyl ethers, 1461

Films

fullerene based films, thermally evaporated and solution cast films, polymeric films, Langmuir-Blodgett films and self-assembled films, 5113

Flavanoids and isoflavanoids

profisetinidin triflavanoid related phlobatannins, synth by biomimetic reaction *via* the repetitive formation of the interflavanyl bond and pyran ring rearrangement of the chain extender, 6003

Flavonoids

2-aryl-3-hydroxy-4*H*-1-benzopyran-4-one(flavonol) by Algar-Flynn-Oyamada reaction of 6'substituted 2'-hydroxychalcones, 7163

Flavours and fragrances

capsaicin, pungent principle of hot pepper fruit, synth of 15 analogues from (E)-alkenoates derived from Claisen rearrangement of allylic alcohols, 8439

chalciporone, 2H-azepine alkaloid responsible for the pungent taste of the common mushroom *Chalciporus piperatus*, synth of optically active 2H-azepines from α -amino acids, 10883

(R)-(+)- γ -decalactone used in fruit and dairy flavours, synth based on castor oil ozonolysis via (R)-(-)-1,3-nonandiol, 11321

3,10-disubstituted β -pinene derivs, flavour and

aroma constituents, synth by reaction of α -pinene-derived η^3 -allyltitanium complex with electrophiles, 4377

furaneol, synth of natural-labelled 6-deoxy-Lsorbose as a precursor of furaneol flavouring, biological route to based on production of natural hydroxypyruvate and 4-deoxy-L-threose, 8223

4-(4-hydroxyphenyl)-2-butanone (Raspberry ketone), synth by baker's yeast mediated reduction of 4-(4-hydroxyphenyl)-but-3-en-2-one, stereochemistry of reaction, 4041

4-(4-hydroxyphenyl)butan-2-one, principal flavour substance of raspberries, comparison of sensorially active compds with fluorine and methyl substituted analogues, 99

methyl cis-(Z)-dehydrojasmonate, principal note for the scent of Cymbidium goeringhii, synth of both enantiomers of, 1487

3-monothiosubstituted furans, odour and flavour chemicals, synth by regiospecific mono-ipso-substitution and *ortho*-metalation from 3,4-dibromofuran, 4065

muscolide, (R)-(-)-phoracantholide I and (9R)-(-)-9-tetradecanolide, synth by ring-enlargement of cyclohexanone and cyclododecanone, 4581

trans-whisky lactone, synth by ring expansion reaction of oxetane using a copper catalyst bearing a bipyrindane or biquinoline ligand, 3905

Fluorenes/fluorenones

echinotinctone (2,6-dihydroxy-1,8-dimethyl-3*H*-xanthen-3-one), fluorone orange pigment from the wood-rotting polypores *Echinodontium tinctorium* and *Pyrofomes albomarginatus*, 5783 spiro(fluorene-9,1'-cyclohexadienones) from electrooxidation of 3,3',4,4',5,5'-hexamethoxybiphenyl and 2,2',3,3',4,4'-hexamethoxybiphenyl, 4449

Fluorescence

bischalcone isomers from photoisomerisation of 9-anthrylsubstituted pyridyl enones, 935

4,9-dihydro-4,6-dimethyl-9-oxo-3-(β-D-ribofura nosyl)imidazo[1,2-a]purine (Wyosine), fluorescent Y-nucleoside, assessment of structure and reactivity by chemistry, spectroscopy and calculations, 1597

fluorescence and CD spectroscopic sugar sensing by a cyanine dye bearing two boronic acids, 1195

(Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)

- methyl]-4-pyridinyl]methylene]-2-thioxo-4-thia zolidinone, 14787
- spectra of covalently linked pyropheophorbide dimers, 4311
- study of hydrogen bond mediated electron transfer in proteins using a porphyrin/depsipeptide/p-benzoquinone molecule, 12357

Fluorine and compds

- benzyl 4-methyl-3-(2,2,2-trifluoro-1-methoxyethyl)-2-pyrrolecarboxylate and benzyl 5-acetoxymethyl-3-methyl-4-(2,2,2-trifluoro-1-methoxyethyl)-2-pyrrolecarboxylate, synth and conversion to a hematoporphyrin, 13961
- cyclohexylammonium salts of (1RS,3S)-3,4-dihydroxy-1-fluorobutylphosphonic acid and (S)difluoro-3,4-dihydroxybutylphosphonic acid, substrates for glycerol-3-phosphate dehydrogenase, 165
- fluorine-containing analogues of paclitaxel and docetaxel, synth by coupling of (3R,4S)-1-acyl- β -lactams with baccatin III, 10-deacetylbaccatin III and 14β -hydroxy-10-deacetylbaccatin III, 209
- sodium (4*S*,8*S*,9*R*,10*S*,12*R*)-4-fluoro-10-[(*S*)-1-hydroxyethyl]-11-oxo-1-azatricyclo[7.2.0.0^{3,8}]-undec-2-ene-2-carboxylate, a fluoro-tribactam from fluorosulfonimide, 263
- 2-(4-alkoxy)-3,3,3-trifluoro-1,2-diphenylpropan-1-ols, acid-catalysed dehydration of, synth of panomifene antitumour compd, effect of trifluoromethyl group, 12821
- alkyl fluorides or acyl fluorides, synth from reaction of ammonium- and phosphonium perfluorocyclobutane ylids with primary or secondary alcohols and carboxylic acids, 2977
- (2*R*,3*S*)-or(2*S*,3*R*)-2-amino-3-trifluoromethyl-3-hydroxyalkanoic acid derivs (threonine analogues), synth from 4,4,4-trifluoro-3-hydroxy-butanoic acid, 279
- ammonium and phosphonium perfluorocyclobutane ylids, synth from perfluorocyclobutene and tertairy amines or phosphines, use as masked fluoride anion source, 9755
- anthracyclines of the daunorubicin family fluorinated at position 8 or 10, synth by glycosylation of the corresponding fluorinated aglycones and from daunorubicin respectively, 185
- α -(1-bromo-1-chloro-2,2,2-trifluoroethyl)alcohols and α -(1-chloro-2,2,2-trifluoroethyl)alcohols by reaction of 2-bromo-2-chloro-1,1,1-trifluoroethane with aldehydes in the presence of

- zinc, 12667
- chiral difluorinated gingerol using (R)- and (S)-(-)-ethyl 2,2-difluoro-3-hydroxyoctanoates as intermediates, 157
- comparison of sensorially active compds with fluorine and methyl substituted analogues of 4-(4-hydroxyphenyl)butan-2-one, 99
- desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics) interactions with cyclodextrins studied by gas chromatography and NMR, 319
- α,α -difluoro and α,α,α -trifluoro carbonyl compds, reversal of stereoselectivity in Evans aldol reaction of, 71
- 1,1-difluoro-1-[2-(4-hydroxynaphthalenyl)]meth yl]phosphonic acid, an inhibitor of protein-tyrosine phosphatase, design and synth, 9963
- 7,7-difluoro-7,8-dihydropterins and pterins with fluoroalkyl substituents at the 6 or 7 positions, synth from fluorine-containing aliphatic precursors and substituted pyrimidines, 13017
- 3,4-(difluoro-methano)glutamic acid, synth by reaction of *N*-(4'-bromo-4',4'-difluorocrotonoyl)oxazolidinone with lithium enolate of *N*-diphenylmethylideneglycinate *via gem*-difluorocyclopropane, 271
- difluoromethyleneketone retroamides, synth as inactivators of aspartyl or seryl proteases, 305
- 2'- and 3'-difluoromethyleneuridine, prep of 3'- and 2'-phosphoramidites of, 7929
- cis-1,2-difluorotriethylsilylethylene, synth by isomerization of (Z)-HFC=CFSiEt₃ with ultraviolet light and catalytic phenyl disulfide, 37
- N,N-dimethylacrylamide-triflic anhydride complex as a bifunctional electrophile in reactions with electron-rich aromatics, 12993
- fluorinated β -keto carboxylic esters, biomimetic base-catalysed [1,3]-proton shift reaction with benzylamine, synth of β -fluoroalkyl- β -amino acids 6943
- fluorinated phenylrhodopsin analogues, binding selectivity, restricted rotation and ¹⁹F-NMR studies, 109
- fluorination of 1,3-dicarbonyl compds, 1 fluorine as a hydrogen bond acceptor, 12613 fluorine-containing monosilylated diols, 1,2- and
- 1,3-O,O-silyl migration reactions of, synth of alkoxides stabilised by strongly electronwith-drawing fluorine-containing methyl groups, 11753
- fluorine-containing proline amide isostere model, synth from N-protected proline ethyl

ester, subsequent reaction with CF₃COOH, 225 3-fluoro-2-quinolones, synth from N-(fluoro-3-methoxyacryloyl)anilines by cyclisation accompanied by elimination of methanol, 3223

- trans-3-fluoro-3-methyl-2-azetidinone derivs by condensation of 2-fluoropropanethioate lithium enolate with imines, 255
- 3-fluoro-4-chloronitrobenzene and 3,5-difluoro-4-chloronirobenzene, S_NAr reactions of with hard and soft nucleophiles, effect of activating nitro group, 2557
- (ω-1)-fluoroalkan-ω-olides, synth by bromofluorination of alk-ω-enoic acids, 5469
- fluoroarenes by deaminative fluorination of aminoarenes using hydrogen fluoride combined with bases, 23
- α-fluorocarbonyl compds by isomerisation of αfluorooxiranes derived from oxidation of fluoroalkenes, 2429
- 1-fluoroglycosides, prep from 1-arylthio and 1-arylselenoglycosides using 4-methyl(difluoroiodo)benzene, 149
- fluoroolefin containing dipeptide isosteres, synth as inhibitors of dipeptidyl peptidase IV(CD26), 291
- 1-fluoroolefins by treatment of (E)- and (Z)-fluorovinyl sulfones with tributyltin hydride and catalytic AIBN via (fluorovinyl)stannanes, 45 fluoroorganic chemistry: synthetic challenges and biomedicinal rewards, 1
- 5-fluorouracil derivs by tin(IV) chloride mediated ring opening of alkoxy-1,4-dihetero-epanes, 8907
- α-fluorovinylphosphonates, synth by Peterson olefination reaction applied to aldehydes and ketones in conjunction with α-lithiated-α-fluoro-α-trimethylsilylmethylphosphonate, 14199
- KF adsorbed on alumina as promoter of the epoxidation of electron deficient alkenes with anhydrous t-BuOOH, 3659
- methyl ester of 2-fluoro-3-methoxyacrylic acid and corresponding acyl chloride as building blocks for synth of fluorine bearing pyrazolones, pyrimidines, coumarins and benzothiopyranones, 4403
- Mn(III)-tetraarylporphyrins bearing perfluoroalkylamido tails as catalysts for epoxidation of alkenes employing aqueous NaOCl as oxygen donor, 11879
- mono-, di- and tifluoromethyl analogues of farnesyl diphosphate, synth by alkylation of appropriately substituted acetoacetates with

geranyl bromide followed by decarboxylation and Wittig condensation, 119

- mono-fluorides and gem-difluorides by desulfurative fluorination of phenylsulfides and dithiolane derivs using nitrosonium tetrafluoroborate and pyridinium poly(hydrogen fluoride), 9
- mono/difluoroketones and fluoromethylpyridines fluorination of imines and methyl-substituted pyridines respectively with N-fluoro-bis-[(trifluoromethyl)sulfonyl]imide, 15
- monofluorinated analogues of (±)-ibuprofen, (±)-flurbiprofen and (±)-naproxen, synth by oxidation of the corresponding primary alcohols, 12761
- monofluoromethylene phosphonate analogues of phosphorylated tyrosine, synth from 4formyl-L-phenylalanine, 11725
- perfluoro-t-butyl radical addition to terminal olefins, absolute rate constant, 12351
- 2-perfluoroalkylidenemethyl and 2-perfluoroalkylmethyl-1,4-dioxanes, synth from 1-O-allyl-1,2-diols by radical addition of perfluoroalkyl iodide, 6187
- syn- and anti-β-(polyfluorophenyl)serines, synth by gold(I)-catalysed asymmetric aldol reactions of isocyanoacetic acid derivs with fluoroaryl aldehydes, 245
- 1,3,5-trideoxy-3-fluoronojirimycin and 1,3,5-trideoxy-3-fluoromannojirimycin, synth from non-carbohydrate precursors as possible inhibitors of glucosidases and mannosidases, 131
- 3,3,3-trifluoroalanine, synth by asymmetric reduction of 2-(*N*-arylimino)-3,3,3-trifluoro-propanoic acid esters, 233
- trifluoromethyl ketones, asymmetric aldol reaction with a chiral Ni(II) complex of glycine, stereocontrolling effect of the trifluoromethyl group, 12433
- 2-C-trifluoromethylsubstituted3-deoxypentoses, synth from trifluoropyruvates for use in prep of nucleoside antibiotics, 143
- trifluoromethylalkenes in Diels-Alder reactions with Danshefsky's diene and in 1,3-dipolar cycloadditions with nitrones and non-stabilized azomethine ylids, 59
- α-trifluoromethylated aldehydes, synth by Pummerer rearrangement or by oxidative cleavage of the corresponding diol, 199
- 4,4-bis(trifluoromethyl)imidazoline analogues, synth by oxidation of α,α-bis(trifluoromethyl) 4,5-bis(4-fluorophenyl)-1*H*-pyrrole-2-methanamine, 11153
- 2-(trifluoromethyl)quinolines, synth by reaction

of anilines with 4-t-trfluorobut-3-en-2-one followed by cyclisation and dehydration, 4637 3,3,3-trifluoropropene, α-sulfide, sulfoxide, sulfone and bromide derivs of, synth and reactivity in 1,3-dipolar cycloadditions, 4383 see also Halogens and derivs

Formylation

using formaldehyde dimethylhydrazone as a neutral reagent, 9143

Fragmentation reactions

silica gel-promoted fragmentation of 3-alkyl-2-oxaadamant-1-yl mesylates, synth of 7-alkylbi-cyclo[3.3.1]non-6-en-3-ones, 5867

Frogs

Epipedobates tricolor (Ecuadorian poison frog), synth of epibatidine by two routes involving $(\pm)-1\alpha$ -nitro- 2β -[3-(6-chloropyridyl)]-cyclohexane-4-one, 11053

Fullerenes

[60]fullerene derivs with octahedral addition patterns, synth using reversible template as well as protecting group techniques, 5065 buckyballs and buckytubes, patterns of addition to, 5247

by pyrolysis of hydrocarbons, cyclopentadienide metal complexes and mellitic acid anhydride, synth of crowned methanofullerenes, 4949

 C_{60}^{+} , C_{60}^{2+} and C_{60}^{3+} , reactions with C_2H_4 and C_2H_4 in gas phase, polymerisation initiated by C_{60}^{-3+} , 5191

C₆₀, nitrene addition to, synth of [6,5] azaannulenes, 5257

C₆₀reactionwith5-imino-1,2,4-thiadiazolidine-3-ones, synth of 1,2-(3-aryl-2-arylimino-tetra-hydrothiazolo)-[60]fullerenes, 8733

 C_{60} reaction with piperazine, prep of $C_{60}N_2$ (C_2H_4)₂ and six double addition products, consistent geometric distortions of the fullerene core upon adduct formation, 5021

 C_{60} , reaction with 2-azidobenzothiazole and 1-azido-4-(3',5'-dimethyl-1'-pyrazolyl)tetraflu orobenzene, synth of imino[60]fullerenes, σ -azaridinefullerene and π -azafullaroid, 6733

C₆₀-linked deoxyoligonucleotide, synth from bromoacetate, sequence-specific modification of guanosine in DNA by-, 5179

C₆₀(TEMPO)_n (TEMPO=2,2,6,6-tetramethylpiperidin-1-oxyl TEMPON=4-oxo-TEMPO), synth by pyrolysis of the sodium salt of TEMPON tosylhydrazone in the presence of C₆₀, characterisation of, 5103

chiral non-racemic C₆₀ derivs, proposed sector rule for fullerene absolute configuration, 5131

cyclohexene-fused C₆₀ derivs having ethoxycarbonyl, acetyl, cyano, phenylsulfonyl and nitro groups, synth by Diels-Alder reactions using 1,3-butadienes substituted with electron-withdrawing and electron-donating groups, 4983

1,3-dipolar cycloaddition of nitrile oxides to -, synth of fullerene-fused isoxazoline heterocycles bearing a series of different substituents in the 3-position and reactivity of, 5043

exohedral functionalisation of C_{60} by [3+2] and [4+2] cycloadditions, 5407, 5421

fullerene formation in flames, thermodynamic driving forces, 5161

fullerene molecules containing noble gas atoms in their interior, rates and amounts of noble gas release on heating, 5143

fullerene-based thin film materials, literature review, 5113

fullerenolanthanides, electrochemical properties of, 4973

[60] fullerenols, synth by addition of nitrogen dioxide radicals to C_{60} via hydrolysis of the resulting polynitro fullerenes, 4963

fulleroids, electronic structure of with the π -orbital axis vector (POAV) analysis and 3D-HMO theory, comparison with bridged annulenes, 5207

functionalisation of by Diels-Alder reactions, functionalising a carbon sphere with flexibly and rigidly bound addends, 5033

functionalisation of C₆₀ by photochemical reaction with cyclosilanes and cyclogermane, 4995 La@C₈₂, endohedral metallofullerene, addition reactions with digermirane, chemical derivatisation of, 5015

main-chain polymers with incorporated [60]fullerene units, synth by reaction of buckminsterfullerene with functionalised bis-O-quinodimethanes, 5007

methanofullerenes with cyano, nitro and carboxyethyl substituents on C₆₁, synth and characterisation, linear free energy relations of, 5149 1-octynyl-C₆₀ carbanion from reaction of 1-octynyl-C₆₀-H with t-BuOK, redox properties and prep of 1,2- or 1,4-disubstituted dihydrofullerenes by reaction with carbon electrophiles, 5077

phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent, synth by reaction of a lithiated phosphine-borane or a phosphinite borane with C₆₀ followed by removal of the BH₃ group, 5091

silylmethylated C60 compds, theoretical and

electrochemical studies to investigate the electronic structure and redox property of, 5053 substituted fulleropyrrolidines, synth and

electrochemical properties of, 5221

symmetrically and unsymmetrically silyl-protected diethynylmethanofullerenes and substituted trimethylsilylethynylfullerenes, synth and characterisation, towards molecular carbon allotropes, 4925

symposia-in-print, 4925

yellow $C_{70}Ph_{10}$ and orange-red $C_{70}Ph_{8}$ luminescent compds, synth by electrophilic substitution of benzene by $C_{70}Cl_{10}$, synth and characterisation, 5235

Fulvenes and fulvalenes

symmetrical 6,6-dialkyl and cycloalkylfulvenes, $[4\pi + 2\pi]$ -cycloaddition of o-benzoquinones with, formation of bicyclo[2.2.2]octene diones and cyclopenta[b][1,4]benzodioxins, 4029

benzofulvene and dihydroindene by photolytic double decarbonylation of a cyclohexane solution of 4,7-ethanoindene-8,9-dione deriv, 2481 functionalised ethylenediselenotetrathiafulvalenes synth and characterisation comparative

enes, synth and characterisation, comparative study with their all-sulfur analogues, 11063

tetrathiafulvalene-type vinylogue extended π -donors by cleavage of 1,4-dithiafulvene-substituted 1,2,3-thiadiazoles and dimerisation of the resulting alkyne-1-thiolate, 3171

Fungi

Aspergillus niger and Beauveria sulfurescens for biohydrolyses of various substituted styrene oxide derivs, prep of enantiomerically enriched epoxides and diols via enantioselective and regioselective hydration, 4593

Cladosporium, cotylenol, a diterpenoid glycoside originally isolated from, synth from condensation of two iridoid synthons, 3921

Clitocybe acromelalga poisonous mushroom, structures of valinopine, epileucinopine, isoleucinopine and phenylalaninopine, opine type amino acids isolated from, 877

Cunninghamella echinulata, deacetylation and hydroxylation of $2\alpha,5\alpha,10\beta,14\beta$ -tetra-acetoxy-4(20),11-taxadiene by the fungus, 8739

Echinodontium tinctorium and Pyrofomes albomarginatus, wood-rotting polypores, isolation of orange pigment echinotinctone from—, 5783

Gibberella fujikuroi, use in microbiological reduction of α, β -unsaturated carbonyl ent-kaurenes, 13767

Lachnum papyraceum ascomycete, isolation of

papyracillic acid, a penicillic acid analogue from, 10249

LL-07F275 which grows as a mycelium sterilium, isolation of diepoxins, spiroketal-linked naphthodiepoxydecalinones from, 435

Nocardia brasiliensis IFM 0406, structure of brasilinolide A, isolated from, 9031

Rhynchosporium orthosporum, synth of (+)orthosporin, phytotoxic metabolite from culture filtrate of, 7159

Streptomyces nitrosporeus, synth and stereochemistry of (±)-virantmycin, originally isolated from, 10609, 10631

Streptomyces olivaceus strain Tü 3082, total synth of pyrrolam A, a pyrrolizidine alkaloid originally isolated from, 869

Furanones

(S)-4-acyloxymethyl-4-methyl-2(5H)-furanones, cycloadditions with ethylene as key step in synth of (+)- and (-)-grandisol, the pheromone of cotton boll weevil, 1267, 1279

2(5H)-furanones substituted at the 5-position by sulfur bearing groups, cycloaddition of nitrile oxides to, synth of furoisoxazole which are synthons for heteroanthracyclinone analogues, 3457

isoindigoide dyes by reaction of heterocyclic 2,3-diones with Lawesson's reagent, synth and rearrangement, 5427

5-substituted 2(5H)-furanones, synth from (alkoxyallyl)sulfone, 15267, 15289

Furans

5-azidomethyl-2,4-tetrahydro-2-hydroxy-3,4-(*O*, *O*)-isopropylidene furan, tandem Wittig [2+3] cycloaddition of, synth of nonracemic homo-1-deoxyazasugars with D-talo and L-allo configuration, 14745

2,5-diaryl-2,5-diphenyltetrahydrofuran derivs from aminium salt induced dimerisation of 1-aryl-1-phenylethylenes, 13971

1,3-dihydro-1-isobenzofuranamines which exist in an imine/hemiaminal ring-chain tautomerism, steric and electronic effects, 7679

2,3-dihydro-5-furanyllithium addition to disopropyl squarate as a means for the rapid generation of structurally complex oxygen-containing tetraquinane networks, 3075

dihydrofurans, regio- and stereoselective synth by ceric ammonium nitrate mediated oxidative [3+2] cycloaddition of 1,3-diketones to cinnamic esters, 2193

dihydrofurans which could be transformed into

- the corresponding furans, synth by reaction of the lithio deriv of 1,1-diphenoxy-2-(phenylsulfonyl)cyclopropane with acyl chlorides and acyl imidazoles, 7149
- 2,5-furandimethanol or furfuryl alcohol, alkylation under microwave in solvent-free phase transfer catalysis conditions, synth of a new family of furanic ethers, 617
- 5,6-O-isopropylidene-L-ascorbic acid, alkylation in dry acetone and in THF:DMSO, synth of 3-O-alkyl and 2,3-di-O-alkyl derivs, 1293
- mono-, di- and trisubstituted furans, synth from (alkoxyallyl)sulfone, 15267, 15289
- nonclassical furoxans, ab initio and density functional theoretical studies, 743
- oxolenes and furans by metal-assisted cyclisation of alkynols using labile pentacarbonylchromium and pentacarbonylmolybdenum complexes, 1617
- pantofuranoids A-F, tetrahydrofuran monoterpenes from Antarctic *Pantoneura plocamioides*, structures and stereochemistry, 5899
- polysubstituted 3-thiofurans, synth by regiospecific mono-*ipso*-substitution and *ortho*metalation from 3,4-dibromofuran, 4065
- substituted pterocarpans and pterocarpenes, synth involving Lewis acid Ti(IV) promoted [3+2] cycloaddition of 2-alkoxy-1,4-benzo-quinones with substituted 2*H*-chromenes, 2217 tetrahydrofuran units of polyether antibiotics, synth by Prins cyclisation with side-chain formation of carbon-carbon bond, remarkable siloxy effect for stereocontrolled cyclisation, 7287

Gabriel reactions

Gabriel synth of 3-arylmethylenephthalide from phenylthio- and 2-(3-)thienyl- acetic acids under microwave irradiation, 14995

Germanium and compds

- cyclogermane, photochemical reaction with C_{60} , functionalisation of C_{60} , 4995
- digermirane, addition reaction with La@C₈₂, chemical derivatisation of the endohedral metallofullerene, 5015

Gibberellins

α,β-unsaturated carbonyl ent-kaurenes, microbiological reduction by the fungus Gibberella fujikuroi, 13767

Glycals

carbohydrate derived cyclic enolethers, reaction with trimethylsilylketene acetals, synth of 2,3-unsaturated C-glycosides, 6397

Glycerol

(2R,2'S)-1-O-(2'-hydroxy-hexadecyl)glycerol, antitumour compd from shark liver oil, stereoselective synth, 6437

monofluoro- and difluoro- methylenephosphonate analogues of *sn*-glycerol-3-phosphate, substrates for glycerol-3-phosphate dehydrogenase, X-ray structure, 165

Glycolipids

- erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge *Erylus* cf. lendenfeldi, structures, 7921
- fatty acylamino-trisaccharides, synth and stereochemical properties, 10771
- glycosphingolipid composition of the marine sponge *Agelas dispar*, isolation of immunomodulating glycosyl ceramides from, structures, 1573
- phenolic glycolipids of *Mycobacterium kansasii* serovars I, II and IV, synth of tetrameric fragments corresponding to, 3575, 3593

Glycopeptides/glycoproteins

- glucofuranose libraries of novel *N*-linked glycopeptides, synth from azidoesters *via* glucoheptonolactone intermediates, 10711, 10721
- glycopeptides related to HIV gp120 and mucins, solid-phase synth using piperidine for Fmoc cleavage, 7983
- hexasaccharide corresponding to a porcine zona pellucida fragment that inhibits porcine spermocyte interaction *in vivo*, synth, 5945

Glycosidation

- of 4'-demethyl-4'-acetyl-epipodophyllotoxin with α-1-tributyltin-O-2,3-bisacetyl-4,6-ethylidene-glucose, synth of etoposide antineoplastic drug, 3049
- promotion by combinations of iodosobenzene and various acids using thioglycosides as glycosyl donors, 3897
- synth of monocerin, antifungal metabolite, from D-glucose, 8535
- of 1-C-(2-thiazolyl)- α -D-galactopyranosyl acetate and 1-C-(2-thiazolyl)- α -D-mannofuranosyl acetate, synth of α -linked ketodisaccharides, 3057

Glycosides

- β-1-O-acyl-β-1,2-diglucosyl glycoside from the membranes of a gram positive bacterium Sarcina ventriculi, isolation and structure, 3873
- ω-alkenyl glycosides, reaction with aqueous Nbromosuccinimide, evidence for cyclic bromonium ion transfer in, 7663
- apigenin 7-O-β-D-glucoside, isolation from

liverwort Blasia pusilla L., 14487

1,4-benzoxazinone acetal glucosides GDIBOA and GDIMBOA from *Gramineae* sp., synth by glucosidation of 2,4-dihydroxy-2*H*-1,4 -benzoxazin-3(4*H*)-one, 10389

benzyl 2,3-anhydro-α-D-ribopyranoside, ring opening reactions of with nucleophiles, 5607

benzyl 3,4-anhydro-β-D-ribopyranoside, ring opening reactions with nucleophiles, synth of 3-deoxy-3-substituted or 4-deoxy-4-substituted glycosides, 1747

C-aryl glycosides related to the chrysomycin antitumour antibiotics, synth using Ramberg-Backlund reaction, 14437

cotylenol, fusicoccane diterpenoid glycoside having leaf growth activity, synth from condensation of two iridoid synthons, 3921

1-fluoroglycosides, prep from 1-arylthio and 1-arylselenoglycosides using 4-methyl(difluoroiodo)benzene, 149

partially O-methylated α-D-mannopyranosides, synth using bis-t-butyldiphenylsilyl ethers as intermediates, 10785

polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, structures and biological activities, 10997

pyruvated tetrasaccharide 5-aminopentyl glycoside, the repeating unit of the immunodominant capsular polysaccharide of *Streptomyces pneumoniae* type 27, synth, 2925

terpenoic acid glycerides from dorid nudibranchs Archidoris odhneri and A. montereyensis, stable isotope incorporation evidence for the de novo biosynth of, 6869

tetrasaccharide of sialyl Le^x and Le^x antigens, synth from benzyl lactoside, 12775

thioglycosides as glycosyl donors in glycosidation promoted by combinations of iodosobenzene and various acids, 3897

tricolorins A-E, oligosaccharide phytogrowth inhibitors from the resins of *Ipomoea tricolor* (Convolvulaceae), mass spectrometry and NMR study, 13065

2,3-unsaturated C-glycosides from the trimethylsilyltriflate catalysed reaction between carbohydrate derived cyclic enolethers and trimethylsilylketene acetals, 6397

Glycosylation

of chiral sulfahydantoins, synth of pseudonucleosides, 993 glycosylation strategies, report, 1095 of phenol and naphthol derivs by reaction with 2-alkoxy-2-fluoro-glycosyl fluorides, synth of naphtho- and benzo-dihydrofuran derivs, 7797

Grignard reactions/reagents

allyl and substituted allylic Grignard reagents, addition to (1R)-(+)-camphor and (1R)-(-)-fenchone, synth of homoallylic alcohols with (+)-camphor and (-)-fenchone skeletons, 1699 aqueous Barbier-Grignard type reactions, scope, mechanism and synthetic applications, 5643

of 1,4-bis(diethylamino)-2,3-dinitro-1,3-butadiene, prep of 1,4-dialkyl- and 1,4-diaryl-2,3dinitro-1,3-butadienes and 1-alkyl-4-diethylamino- and 1-aryl-4-diethyl-amino-2,3-dinitro-1,3-butadienes, 3313

Grignard additions to Garner type aldehydes, synth of secondary alcohols which can be readily converted into their respective γ -hydroxy- β -amino alcohols and β -hydroxyamino acids, 11673

Grignard reagent addition to N, N'-dibenzylated 2-purinones, 12979

organomagnesium compds, cross-coupling of heterocyclic allyl sulfides with –, synth of optically active alkenes, regio- and enantioselection, 10799

organometallic reagent addition to β -hydroxy-ketones, diastereoselection of, synth of (+)-(2R,4R)-2-phenyl-2,4-pentanediol, 2177

reagent reaction with 9-diazo-10-anthrone, competition between nucleophilic addition and electron-transfer process, 6795

Guanidines

bicyclic guanidines by iodocyclisation of 3alkynyl- and 3-allenyl-2-(substituted amino)-1-imidazolin-4-ones, 6581

bicyclic guanidines (imidazo[1,2-a]-imidazole and imidazo[1,2-a]pyrimidine) by iodocyclisation of 3-(alk-2-enyl)-2-(substituted amino)-1-imidazolin-4-ones, 2827

bicyclic guanidines as intermediates to ptilomycalin A alkaloid, synth from pyrrolidin-2-one via N-acyliminium ion coupling with silyl enol ethers, 2603, 2629

guanidine containing marine natural product ptilomycalin A, 8315

Halogenation

at C-3 of the shikimate nucleus, synth of 3α and 3β -fluoro and 3β -chloro acids, 10547
bromination of aniline and N-substituted anilines encapsulated in β -cyclodextrin, synth of

- O-bromoaniline and p-bromo-N-methylaniline respectively, 3487
- bromination of endo-3-bromo-4-methylcamphor, unexpected multiple rearrangement to endo-3,9-dibromo-4-(bromomethyl) camphor: intermediates for triterpenoid synth, 14661
- bromination of homobenzonorbornadiene at different temperatures, 14005
- bromination of *N*,*N*-dimethylaniline in aqueous suspensions of different surfactants, nature of head groups of surfactant and length of hydrophobic chain on regioselectivity, 2465
- bromination, (Z)-selective β -bromination of N-formyl- $\alpha\beta$ -dehydroamino acid esters, synth of α -bromoimines which are isomerised to (Z)- β -bromo-N-formyl- $\alpha\beta$ -dehydroamino acid esters, 5751
- chlorination of aromatic compds with tin(IV) chloride and lead tetraacetate, 8863
- chlorination of δ -chloroaldimines with N-chlorosuccinimide, synth of α, δ -dichloroaldimines, subsequent rearrangement gives 2-formylpyrrolidinones, 3303
- desulfurative fluorination of phenylsulfides and dithiolane derivs using nitrosonium tetrafluoroborate and pyridinium poly(hydrogen fluoride), q
- electrophilic bromination of alkenes, evidence for cyclic bromonium ion transfer in, reaction of ω -alkenyl glycosides with aqueous *N*-bromosuccinimide, 7663
- fluorination of 1,3-dicarbonyl compds, mechanisms, 1
- fluorination, ammonium- and phosphoniumperfluorocyclobutane ylids as fluorination reagents, 2977
- fluorination, deaminative fluorination of aminoarenes using hydrogen fluoride combined with bases, 23
- fluorination of imines and 2- and 4-methyl-substituted pyridines using *N*-fluoro-bis[(tri-fluoromethyl)sulfonyl]imide, synth of mono and/or difluoroketones and fluoromethyl-pyridines respectively, 15
- fluorination, regioselectivity in the fluorination of dibenzofuran, diphenylether and biphenyl with N-F type reagents, 11341
- halo-de-hydroxylation and dihalo-de-oxo-bisubstitution reactions of benzylic alcohols, benzaldehydes, acyloins and epoxides using tungsten hexachloride, 14929
- of organozirconocenes, 12853

- photohydrodehalogenation of 3,4-dibromobiphenyl, formation of 4-bromobiphenyl and 3-bromobiphenyl, 8397
- synth of *gem*-difluoromethylene compds, Tetrahedron report, 8619

Halogens and compds

- α-keto hydrazonoyl halides, reaction with 3,4-dihydro-6,7-dimethoxyisoquinoline, synth of [1,2,4]triazolo[3,4-a]isoquinolines and pyrrolo-[2,1-a]isoquinolines, 3451
- 3-alkoxy-1,1-dibromo-alkanesdiastereoselective bromine/lithium exchange reactions of, 7421
- 2-alkoxy-2-fluoro-glycosyl fluorides as 1,2-dielectrophilic synthons for the synth of naphthoand benzo-dihydrofuran derivs, 7797
- arenesulfonyl iodides, addition reaction with alkynols, synth of cyclic enol ethers, 7779
- aryl bromoamines, bromoamides and bromosulfonamides, cyclisation of, 7525
- aryl and vinyl halides, palladium catalysed regio- and stereo-specific 5-, 6- and 7-exo-dig mono-, bis- and tris-cyclisation processes of, 11479
- 2-aryl-2-fluoropropionic acids by treatment of either ethyl α-hydroxy carboxylates or cyanohydrin O-silyl ethers with diethylaminosulfur trifluoride and subsequent hydrolysis, 8257
- α -(1-bromo-1-chloro-2,2,2-trifluoroethyl)alcohols and α -(1-chloro-2,2,2-trifluoroethyl)alcohols by reaction of 2-bromo-2-chloro-1,1,1-trifluoroethane with aldehydes in the presence of zinc, 12667
- chloro- and bromo-demethoxylation of methoxy substituted polynitrophenyl and -biphenyl systems, 5639
- gem-difluoromethylene compds, report on methods for the synth of, 8619
- 1,2- and 1,4-eliminations from dihalogenated compds using Bu₃SnSiMe₃-F-, synth of alkylidene carbene, benzyne and *o*-quinodimethane, 8143
- 3α and 3β -fluoro and 3β -chloro acids, synth from (-)-shikimic acid, 10547
- α -halo carbanions from aryl α -haloalkyl sulfoxides by ligand exchange reaction with alkylmetals, 2349
- halo esters, alkylation-annulation with a coupled reagent of samarium(II) diiodide with organometallic reagents, synth of cycloalkanols, 1953 α-halo organoindium reagents, prep from reaction of gem-dihalo compds with indium metal,

reactions with carbonyl compds and electron-

deficient alkenes, 2803

1-halo-2-vinylcyclopropenes, synth by dehalogenation of dichloro- and dibromocarbene adducts of chloroprene and 2,3-dichlorobutadiene, 10955

hydrazonyl halides by treatment of hydrazones with N-halosuccinimide-dimethyl sulfide complex, 661

hydrogen halides, addition to acetylenic selenides, synth of 1-halo-1-selenoalkenes, 9687

hypervalent organoiodine reagents for oxidation of hydrazones, regeneration of the carbonyl group and facile synth of α -acetoxy and α -alkoxy azo compds, 14673

 β -iodoenones, palladium-catalysed cross-coupling of arylmetal compds with — and a cyclohexyl triflate, synth of α -arylcyclohexenones, 9485

iodosobenzene and various acids as promoters of glycosidation using thioglycosides as glycosyl donors, 3897

ketimines derived from 2-(trifluoromethyl)anilines and methyl halophenyl ketones, amination and cyclisation of by lithium alkylamide reagents, 3273

(N-(p-nitrobenzenesulfonyl)imino)phenyliodinane, rhodium(II)-catalysed decomposition of in the presence of olefins, 1543

polychlorinated materials as a source of polyanionic synthons in Barbier-type DTBB-catalysed lithiation, 1797

polyfunctional aryl and alkenyl zinc halides, synth from functionalised unsaturated organolithiums and their reactivity in cross-coupling and conjugated addition reactions, 7201

sodium hypochlorite for oxidative cleavage of cycloalkanones to dicarboxylic acid under phase transfer catalysis conditions, extension of the haloform reaction to non-methyl ketones, 13641

see also Fluorine and compds, Perfluoroalkyl compds

Heck reactions

Heck coupling of protected 2-aminobut-3-en-1ols with cyclohexenyl triflate using a ligandfree palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465

Heck-Diels-Alder reactions of 2-bromo-1,6- and 2-bromo-1,7-dienes, synth of bicyclo[4.3.0]nonene and bicyclo[4.4.0]decene derivs *via* vicinal exodimethylenecycloalkanes, 11503

Heck-type reactions facilitated by tetraalkylammonium salts, 10113 palladium acetate catalysed Heck reactions for conversion of vinyl bromo allylic alcohols into vinylic carbonyl comdps and oxidation of secondary alcohols to ketones, 12291

for synth of indole-3-pyruvic acid oxime ethers and thieno derivs, application to synth of thiatryptophans, 14975

three-step solid phase synth involving a Heck reaction, monitoring of using magic angle spinning NMR spectroscopy, 12209

Henry reactions

catalysed by Amberlyst A-21, synth of β -nitroalcohols, 1677

Herbicides

hydantocidin, nono-toxic herbicide, synth of glucofuranose analogues of, 10711, 10721

(+)-hydantocidin, stepwise synth from D-fructose and one-step synth from D-isoascorbic acid and urea, study of *N,O*-spiroketal formation, 1177

macbecin I and herbimycin A, ansamycin antibiotics, asymmetric synth of C3-C15 segment and formal synth of (+)-macbecin I, 3229

Hormones

abscisic acid, plant hormone inducing physiological responses to environmental stresses, ring conformational requirement for biological activity, 8081

brassinosteroid analogues with a 2 β ,3 β -diol and a A/B *cis* and *trans* ring junction, synth and plant growth promoter activity, 2435

25-hydroxy-brassinolide and 25-hydroxy-24-epibrassinolide, steroidal phytohormones, synth by oxyfunctionalisation of brassinosteroids by methyl(trifluoromethyl)dioxirane, 10653

moulting hormone activity of 2-deoxy-20-hydroxyecdysone and derivs, 12623

synth and moulting hormone activity of 2-dehydro-3-deoxy-20-hydroxyecdysone3-deoxy-20-hydroxyecdysone and 2-epi-3-deoxy-5α-20-hydroxyecdysone, 10673

Horner-Wadsworth-Emmons reactions

see Emmons-Horner-Wadsworth reactions

Horner-Wittig reactions

Horner-Wittig approach to S,N-ketene acetals and acid-catalysed hydrolysis to (S)-thioesters, 11095

tandem Wittig-Horner/intramolecular Michael reaction followed by retro Diels-Alder cleavage, key reactions in synth of 3-pyrrolines, 6943

Host compds

2-amino-4H-pyrimidones as hosts for dicarboxyl-

- ic acid guests, 3153
- calcichrome (calcion) as host to α -, β and γ cyclodextrins in water, 10979
- calix[4]arenes having electron donating groups at the upper rim as molecular platforms and host molecules, synth, 6011
- corands incorporating a thiopyrylium ring, effect of alkali cations on the methoxide ion addition to, 3509
- 2-[7-(2-methyl-1,2,3,4-tetrahydroisoquinoline)-y l]-N-(2-pyridyl)acetamide, a host with two heterocyclic parts separated by a flexible arm, synth from isoquinoline involving acylation and Willgerodt-Kindler reaction, 10441
- resorcinarenes, synth and properties of, 2663 tetra[benzo(18-crown-6)]-crowned cleft and two bis[benzo(15-crown-5)]-crowned clefts, synth and study of their selectivities in metal ion complexation, 8979

Hydantoins

see Imidazolidines, imidazolidinones

Hydrazides

N-allyl acethydrazides, organoselenium-induced cyclisation to 1,3,4-oxadiazines or N-acetyl pyrazolidines, 11841

Hydrazines

- 1-acyl-2-arylhydrazines, reagents for reduction of Ag(I), mechanism of photographic infectious development, 3961
- hydrazine hydrate, reaction with hydroxyazaisoindolinones, synth of pyridopyridazinones, 3261 hydrazine, *N*-aminomorpholine and t-butoxycarbonylhydrazine, reactions with 1,4-dinitroimidazole: synth of 1,2,4-triazine, 1-(*N*-morpholino)-4-nitroimidazole and glyoxal dihydrazone derivs respectively, 14905
- (3S)- and (3R)-piperazic acids, constituents of azinothricin family of antitumour antibiotics, synth by hydrazination of chiral N-bromovaleryl carboximide enolates with DBAD, 1047

Hydrazones

- azo-hydrazone, NMR investigations of, acidbase equilibria of FD&C yellow N° 6, 5691 by reaction of 3-(benzothiazol-2-yl)-3-oxopropanenitrile with heterocyclic diazonium salts and with diazotized aromatic amines, 7893
- chiral α -allyloxy-hydrazones, asymmetric [2,3]-sigmatropic Wittig rearrangement of, synth of the corresponding α -hydroxyhydrazones, 1503
- 3-deoxy- α -hydrazono-octulosonates, synth by application of the Barton ester based radical reaction with ethyl α -trifluoroacetoxy acrylate

- followed by treatment with phenylhydrazine, 2717
- formaldehyde dimethylhydrazone, neutral reagent for nucleophilic hydroformylation and hydrocyanation, 9143
- from reaction of thiocarboxylic acids with azoalkenes, subsequent conversion to widely substituted pyrrole and pyrazole rings by internal cyclisation, 1579
- glyoxal dihydrazone derivs by reaction of 1,4dinitroimidazoles with t-butoxycarbonylhydrazine, 14905
- glyoxal monohydrazones, stereoselective ring closure of with β -ketoesters in a solvent-free reaction, 5819
- hydrazonyl halides by treatment of hydrazones with N-halosuccinimide-dimethyl sulfide complex, 661
- α-keto hydrazonoyl halides, reaction with 3,4-dihydro-6,7-dimethoxyisoquinoline, synth of [1,2,4]triazolo[3,4-a]isoquinolines and pyrrolo[2,1-a]isoquinolines, 3451
- β -keto phenylsulfone tosylhydrazone, reaction with DBU to afford α,β -unsaturated ketone tosylhydrazones *via* 1,4-elimination of benzene sulfinic acid, 10705
- lithiated β -hydrazonophosphine oxides, addition to isocyanates and isothiocyanates followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123
- oxidation of by hypervalent organoiodine reagents, regeneration of the carbonyl group and facile synth of α -acetoxy and α -alkoxy azo compds, 14673
- phenylhydrazones of 2-(alk-2-enylamino)-4-oxo-4*H*-pyrido[1,2-*a*]pyrimidine-3-carbaldehydes and 4-(alk-2-enylamino)-1,6-dimethyl-2-oxo-1,2-dihydropyridine-3-carbaldehydes, cyclo-addition of, 901
- 6-phenylhydrazono-6,7,8,9-tetrahydro-11H-dipy rido[1,2-a;4,3-d]pyrimidine-11-ones, Fischer indolisation of, synth of 3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, 7789 sodium salt of TEMPON tosylhydrazone, pyrolysis in the presence of C_{60} , synth of C_{60} (TEMPO)_n (TEMPO=2,2,6,6-tetramethylpiperidin-1-oxyl), 5103
- α-sulfenylated aldehyde-SAMP-hydrazones, asymmetric alkylation and oxidation to yield aldehydes, subsequent 1,2-addition of carbon nucleophiles to, synth of vicinal thioether

alcohols, 2893

α-p-tolylhydrazonylated esters and amides, synth by reactions of the enolates of t-butyl alkanoates and N,N-dialkylalkanamides with t-butyl p-tolylazo sulfide, 5889

Hydrocarbons

aza-analogues of benzenoid hydrocarbons, analysis of the aromatic character of, 13795

1,6,17,21-octahydrobotryococcene and sacredicene, triterpenoid hydrocarbons from sediments of Sacred Lake, Mount Kenya, structures, 6973

pyrolysis of –, synth of fullerenes, 4949 saturated hydrocarbons, functionalization of, 10287, 10301, 10313

Hydrogen bonding

of 1,1'-bicyclohexylidene-4,4'-dione dioxime, formation of a non-covalent polymer, 1773

connection and disconnection of hydrogen bonds, a case study with dimeric and highly associated monocarboxylic acids with simple receptors, 12223

in cycloadditions of benzonitrile oxide with cyanophenols, 7885

effects of counterion coordination and hydrogen bonding on stereoselectivity in C-C coupling of 1,5-dibromo-2,6-dihydroxynaphthalene with alkali 2-naphthoxide, synth of *cis*- and *trans*-1,1':5',1"-ternaphthyls, 11013

fluorine as a hydrogen bond acceptor, 12613 hydrogen bond mediated electron transfer in proteins, study of using a porphyrin/depsipeptide/p-benzoquinone molecule, 12357

hydrogen bonded homo- and heterodimers of tetra urea derivs of calix[4]arenes, synth, 8489 intramolecular – between eicosanoic acid and dipyrrinone groups, 447

intramolecular C-H...N and to water C-H...O hydrogen bonding in quadrupolar [14](meta-ortho), azolophanes, 15171, 15189, 15197

MM2 force field parameterisation, modelling and structure prediction of salen-type monomeric and hydrogen-bonded dimeric manganese complexes, 10193

Hydrogenation

4,6-O-benzylidene protected 2,3-bis (O-diphenyl-phosphino)-D-glycopyranosiderhodium(I)chelate catalysts for — of methyl (Z)-2-N-acyl-amidoacrylates, 15079

of 17-substituted 13β-ethyl-11β-hydroxy-gona-4,9-dien-3-ones, prep of the corresponding 11β-hydroxy-gon-4-en-3-ones, NMR study, 4495

Hydrolysis

of acetoxy- and phenethylbenzoates by *Candida* cylindracea lipase, 9869

acid-catalysed – of S,N-ketene acetals, synth of (S)-thioesters, 11095

of (S)-2-amino-4-methoxybut-3-enoic acid, synth of (S)-aspartate semi-aldehyde, a key intermediate in the biosynth of lysine, 7127

of bicyclic orthoesters having a six or a sevenmembered orthoester ring, experimental observations and theoretical rationalisation, 14841

bio— of various substituted styrene oxide derivs using fungi Aspergillus niger and Beauveria sulfurescens prep of enantiomerically enriched epoxides and diols via enantioselective and regioselective hydration, 4593

lipase-catalysed -, factors influencing the enantioselectivity of, 5397

of 2-(2-nitrophenoxy)quinoxaline in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, 11665

Hydroxamic acids and derivs

(Z)-(S)Ala- ψ [CF=C]-(RS)-Pro containing N,O-diacylhydroxamic acid type protease inhibitors, synth and study of geometry on inhibition, 291

Hydroxy-acids/-esters

syn and anti-β-hydroxy-γ-amino acids, synth from anti 3-amino-1,2-diols, application to prep of cyclohexylstatine, 7063

 α,β -difunctional β -F-alkylpropanoates, synth by ring-opening of 3-F-alkyl 2,3-epoxypropanoates, 14631

(5S)-HETE (hydroxy eicosatetraenoic acid), synth by coupling of dienyne and chiral iodo vinyl alcohol, 6635

4-hydroxy-2-butenoicacid moiety, deoxygenation of mediated by zinc, prep of multifunctional chiral building blocks from carbohydrates and tartaric acid, 4457

9-hydroxy-10-oxo-decanoic acid, 9-acetoxy-10-oxo-decanoic acid, synth and properties of, 4347

 γ -hydroxy- β -amino alcohols and β -hydroxy-amino acids, synth by Grignard addition to oxazolidine aldehydes via secondary alcohols, 11673

 α -hydroxy- β -aminoacids by reaction of 4-iso-propyl-2-oxazolin-5-one anion with aminoacid derived aldehydes, 4719

α-hydroxy-β-ketoesters, synth by acylation of a transient Ti(VI)-enolate by acyl halides and anhydrides, 11037

- trans-4-hydroxy-L-proline as a chiral starting block, report, 13803
- β -hydroxyesters by Barbier reaction of carbonyl compds with α -bromoesters promoted by active zinc and tin powder, 9575
- 2-methyl-3-hydroxythioesters, prep of both enantiomers of by tin(II) Lewis acid-mediated aldol reactions of (Z)-1-ethylthio-1-trimethyl-siloxypropene with aldehydes, 7277
- ω-thiohydroxyesters, Michael-type addition to butenolides or α,β-unsaturated lactams, cyclisation to S-heterocycles and perhydrogenated thieno[2,3-c]furan, 9035
- (2S,4R,5R)-4,5,6-trihydroxynorleucine and 5-hydroxynorvaline, synth from precursors derived from rearrangement of 5,6-dihydro-2-pyrone, 12911

Hydroxy-ethers

hydroxy vinyl ethers, stereospecific annulation of, synthof 1-hydroxy-2-oxabicyclo[n.4.0]alkane, 2-oxabicyclo[n.4.0]alk-1(6)-ene and 2-oxabicyclo[n.4.0]alk-1(6+n)-ene which lead to polyfunctionalised cyclic compds, 7287

Hydroxylamines

- hydroxylamine analogues of polyamines, synth by enzymatic decarboxylation of ornithine and *S*-adenosylmethionine, 13751
- methyl—, reaction with cyclobutanone, synth of N-methylcyclobutylideneamine N-oxide, cycloaddition reactions of, 9187
- tandem sequence of hydroxylamine-alkyne cyclisation/1,3-dipolar cycloaddition of alkyne-containing *N*-hydroxypyrrolidines, route to piperidines and indolizidines, 11601
- unsymmetrical *N,N*-disubstituted hydroxylamines, regioselective mercury(II) oxide oxidation of, synth of aldonitrones, 14917

see also Hydroxamic acids

Hydroxylation

- bishydroxylation and diastereoselective epoxidation of cyclic t-butyl allyl peroxides, 13151
- deacetylation and hydroxylation of $2\alpha, 5\alpha, 10\beta$, 14β -tetra-acetoxy-4(20),11-taxadiene by the fungus *Cunninghamella echinulata*, 8739
- di- of optically active allylic enoate alcohols, synth of polyols, 7861
- of 1,3-dicarbonyl compds by dimethyldioxirane, 5799
- halo-de-hydroxylation and dihalo-de-oxo-bisubstitution reactions of benzylic alcohols, benzaldehydes, acyloins and epoxides using tungsten hexachloride, 14929

- monohydroxylation of benzene and substituted benzenes by anodic oxidation, synth of the corresponding phenol derivs, 3889
- Sharpless asymmetric di- of mono- and bicyclic olefins readily available by Diels-Alder methodology, kinetic resolution of, 7901
- Sharpless asymmetric epoxidation and dihydroxylation for synth of D-ribo-C₁₈-phytosphingosine from divinylcarbinol, 2187
- Sharpless dihydroxylation and Mitsunobu alkylation of protected hexenetriol, key steps in synth of acyclic analogues of 1,5-anhydrohexitol nucleosides, 13655

Imidates

see Imidic acids and derivs

Imidazoles/imidazolines

- 3-alkynyl- and 3-allenyl-2-(substituted amino)-1-imidazolin-4-ones, iodocyclisation of, synth of bicyclic guanidines, imidazo[1,2-a]imidazole and imidazo[1,2-a]pyrimidine, 6581
- 5-amino-4-sulfonamidoimidazole nucleosides and an imidazothiadiazine dioxide analogue of adenosine, synth, 9219
- 4-amino-5-chloroimidazoles and 4-amino-5-unsubstituted imidazoles, synth from *N*-chloro-*N*'-arylbenzamidines and 1,1-diaminoethenes, 7939
- 1-butyl-4-[imidazol-4(5)-ylhydroxymethyl]pyridi nium salts, chemical stability to oxidation, 15197
- N,N'-carbonyldiimidazole, reaction with O,O-dialkyl α -hydroxybenzylphosphonates, synth of O,O-dialkyl α -halobenzylphosphonates, 10215
- clathramides A and B, bromopyrrole alkaloids containing the *N*-methylimidazolinium moiety from Caribbean sponge *Agelas clathrodes*, structures and antifungal activity, 13713
- 1,4-dinitroimidazole, reactions with hydrazine, *N*-aminomorpholine and t-butoxycarbonylhydrazine: synth of 1,2,4-triazine, 1-(*N*-morpholino)-4-nitroimidazole and glyoxal dihydrazone derivs respectively, 14905
- 1-ethoxycarbonyl-3-methylbenzimidazolium salts, reaction with superoxide to yield ring-opened products and 1-methylbenzimidazoles, 6569
- imidazo[1,2-a]-imidazole and imidazo[1,2-a]-pyrimidine by iodocyclisation of 3-(alk-2-enyl)-2-(substituted amino)-1-imidazolin-4-ones, 2827 imidazo[1,5-g][1,4]diazepines, analogues of TIBO lacking the aromatic ring, synth by

- condensation of β -aminoalcohols with 4-chloroethylimidazole deriv, evaluation as anti-HIV agents, 15157
- imidazo[2,1-c]-1,2,4-triazoline-3-thiones, synth from 4-methallyl substituted 1,2,4-triazoline-3-thiones, 791
- 4-, 5-, and 6-substituted imidazo[4,5-c]pyrazoles, synth from imidazo[4,5-c]pyrazole-5-thiones, 7179
- imidazole-1-sulfonate, synth and nucleophilic displacement reactions of, 10557
- N-imidazolium-N-methyl amides and bis-amides by reaction of carboxylic acids with 3-methyl-1methylamino-3H-imidazol-1-ium salts, subsequent reaction wih organometallics afforded ketones and diketones, 14297
- 4-nitroimidazoles, reduction by sodium borohydride or sodium borodeuteride, synth of oximes of 4-imidazolidinones, 9541
- N-protected imidazoles, intramolecular conjugate addition to vinyliminophosphoranes promoted by tetrabutylammonium fluoride, synth of the corresponding fused imidazoles, 13671
- 4-substituted imidazoles, synth by coupling of N-protected 4-haloimidazoles with alkynes or alkynyl- and vinyltrialkyltin derivs or of 4-trimethylstannylimidazole with aryl and vinyliodides, 13703
- 5,6,7,8-tetrahydro-5-oxoimidazo[1,5-c]pyrimidi nes, alkylation with alkyl halides, synth of 1-alkyl hystidines and histamines, 5363
- 5,10,15,20-tetrakis(substituted-imidazol-2-yl)-porphyrins, synth from *N*-protected imidazole-2-carboxaldehydes and pyrrole, 9877
- 4,4-bis(trifluoromethyl)imidazoline analogues, synth by oxidation of α , α -bis(trifluoromethyl)-4,5-bis(4-fluorophenyl)-1*H*-pyrrole-2-methanamine, 11153

Imidazolidines/imidazolidinones

- chiral sulfahydantoins, synth by cyclisation starting from N-sulfamylaminoacid methylesters, regioselective glycosylation of these sulfahydantoins provides pseudonucleosides, 993
- pH-sensitive spin-labelled carbodiimide N-cyclohexyl-N'-(1-oxyl-2,2,3,5,5-pentamethylim idazolidine-4-yl)-methylcarbodiimide, synth for probing protonation reactions in proton-pumping enzymes, 5783

Imides

N-bromosuccinimide, reaction with N-benzyl derivs of 1,11-(methanoaminomethano)-5H,7H-

- dibenzo[b,g][1,5]selenazocine, synth of amino-ammonio-selenurane, 13951
- diarylcarbodiimides, reaction with 2-oxocyclododecane-1-carbonitrile, synth of macrocyclic enaminolactams by ring expansion, 4363
- N-fluoro-bis[(trifluoromethyl)sulfonyl]imide for fluorination of imines and 2- and 4-methyl-substituted pyridines, synth of mono and/or difluoroketones and fluoromethylpyridines respectively, 15
- N-halosuccinimide-dimethyl sulfide complex, reaction with hydrazones leads to hydrazonyl halides, 661
- isomünchnones derived from N-alkenyl substituted diazoimides, intramolecular cycloadditions of, 3247
- pH-sensitive spin-labelled carbodiimide *N*-cyclohexyl-*N*'-(1-oxyl-2,2,3,5,5-pentamethylimidazolidine-4-yl)-methylcarbodiimide, synth for probing protonation reactions in proton-pumping enzymes, 5783
- substituted aryl-phthalimide bichromophoric systems, exciton coupling in, 13201

Imidic acids and derivs

imidates from photolysis of protected D-hex-2ulopyranosyl azides, 9057

Imines

- 1,2-(3-aryl-2-arylimino-tetrahydrothiazolo)-[60] fullerenes, synth by reaction of 5-imino-1,2,4-thiadiazolidine-3-ones with [60]fullerene, 8733 N-arylimines, investigation of mechanism of Diels-Alder reactions of, synth of [3,4-b]-quinolines, 955
- 5-(arylimino)-4-(dialkylamino)-5*H*-1,2,3-dithiaz oles, treatment with NaOH, synth of *N*-arylthiocarbamoyl-*N*,*N*-dialkylamidines, 8413
- 2-(N-arylimino)-3,3,3-trifluoropropanoic acid esters, asymmetric reduction of, synth of enantiomerically enriched 3,3,3-trifluoroalanine, 233
- α -bromoimines, synth by (Z)-selective β -bromination of N-formyl- $\alpha\beta$ -dehydroamino acid esters, subsequent isomerisation yields (Z)- β -bromo-N-formyl- $\alpha\beta$ -dehydroamino acid esters, 5751
- cascade radical cyclisation of as a new protocol for the synth of a range of nitrogen heterocycles, 11445
- chiral N-trimethylsilyl imines, reaction with ester enolates, synth of trans-azetidin-2-ones, 1685
- diastereoselective addition of methyllithium and

dimethylcuprate-boron trifluoride to – derived from (S)-1-phenylethylamine, synth of secondary amines, 12571

- α , δ -dichloroaldimines, rearrangement to 2-formylpyrrolidines, overall α , α -azacyclobisalkylation of aldehydes, 3303
- N-(diethoxyphosphoryl)aldimines, prep by reaction of diethyl phosphoroamidate with aromatic aldehyde diethyl acetals, 8789
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges, cytotoxic activity against doxorubicin-resistant L1210/DX tumoural cells, 8899
- fluorination of with N-fluoro-bis[(trifluoro-methyl)sulfonyl]imide, synth of mono and/or difluoroketones, 15
- α -hydroxy imines, rearrangement to α -amino ketones, mechanism and application to the prep of (+)-1-benzyl-1-azaspiro[5.5]undecan-7-one, a precursor to (-)-perhydrohistrionicotoxin, 6647
- imines of 1-methyl-3-amino-1,3-dihydro-5-phenyl-(2H)-1,4-benzodiazepine-2-one, cycloaddition to dipolarophiles, synth of spiro-(pyrrolidinyl-2,3'-benzodiazepines) related to MK-329, 13455
- imino[60]fullerenes, σ -azaridinefullerene and π -azafullaroid from reaction of 2-azidobenzothiazole with 1-azido-4-(3',5'-dimethyl-1'-pyrazolyl)tetrafluorobenzene and C_{60} , 6733
- 1,1'-iminodicarboxylic acid derivs, synth by Ugi reactions with trifunctional α-amino acids, aldehydes, isocyanides and alcohols, 11657
- 7-indolyl-imines by reaction of 4,6-dimethoxy-indoles with secondary amides and phosphoryl chloride, 4687
- ketimines derived from 2-(trifluoromethyl)anilines and methyl halophenyl ketones, amination and cyclisation of by lithium alkylamide reagents, 3273
- 7-methoxyimino-4-methylchromene-2,8-dione, reaction with phosphines, prep of *N*-substituted 7-amino-8-hydroxy-4-methyl-2*H*-[1]-benzopyran-2-ones, 15007
- O-quinone methide imines which can be converted to quinolines, dihydro- and tetrahydro-quinolines, synth by pyrolysis of O-aminobenzyl alcohols derived from secondary anilines, 11705
- reaction with 2-fluoropropanethioate lithium enolate, synth of *trans*-3-fluoro-3-methyl-2-azetidinone derivs, 255

- reaction with silylketene thioacetals and 2-pyridylthioesters promoted by Lewis acids, synth of β -lactams, 2573, 2583
- Schiff bases, synth by reaction of aliphatic α -hydroxyaldehydes with amines, 4347
- δ -silyloxy imines by reaction of γ -trimethylsilyl N-t-butyl crotonaldimine with aldehydes, subsequent heating and hydrolysis leads to conjugated dienals, 4607
- α-silyloxyaldimine derived from (S)-ethyl lactate, addition of organocuprate.BF₃ complexes and organolithium reagents to—, synth of 1,2-amino alcohols, 13137
- substituted α-diazoamides and diazoimides, synth from the corresponding amides or amines, ligand effects in the rhodium(II) catalysed reactions of, 2489
- *N*-sulfonyl aldimines for condensation of β -hydroxy aldehydes, synth of 3,6-dihydro-2*H*-1,3-oxazines and their subsequent use in synth of 1,3-amino alcohol derivs, 3135

Iminium salts

- N-acyliminium ion coupling reactions of β-ketoester derived silyl enol ethers with lactams, synthetic studies towards ptilomycalin A, 2603 N-alkyl-N-alkoxymethyl-methyleneiminiumsalts by reaction of bis(aminol) ethers with electrophiles, subsequent reactions with electron rich compds produced secondary and tertiary amines, 3473
- by ring closure of alkenyl nitrones induced by phenylselenenyl bromide, 6811
- iminium ions derived from condensation of glyoxal and N-methyl (R)-phenylglycinol, reaction with allylic silanes and enoxysilanes, synth of α -amino acid derivs, 9079
- 1-substituted vinamidinium salts, reaction of with sarcosine and glycine ethyl esters, synth of 2,3- and 2,5-disubstituted pyrroles, 6879

Imino ethers

see Imidic acids and derivs

Immunosuppressive compds

- brasilinolide A, immunosuppressive and antifungal macrolide from actinomycete *Nocardia* brasiliensis, structure, 9031
- gliotoxin, synth of the 7-hydroxy-2,3,7,7a-tetrahydroindole ring of gliotoxin from tyrosine *via* methyl 1-benzyloxy-carbonyl-3a-hydroxy-6-oxo-2,3,3a,6,7,7a-hexahydroindol-2-carboxylate, 14403
- glycosphingolipid composition of the marine sponge Agelas dispar, isolation of immuno-

modulating glycosyl ceramides from, structures, 1573

β-hydroxy sulfones, bioisosteres of oxisuran metabolites, synth from 2-ethoxy-carbonylpyrazine, conformational study, 11239 microcolins B, lipopeptide with cytotoxic and immunosuppressive properties from blue-green alga Lyngbya majuscula, synth, 425, corrig. 3767

rapamycin, synth of two rapamycin-peptide hybrid molecules RAP-P containing the rapamycin-FK 506-ascomycin binding domain and different peptide tethers, 4053

Indanes/hydrindanes

highly substituted indanes, synth involving a triple umpolung sequence in which a 2-lithio-2-vinyl-1,3-dithiane is united with an aryl halide to form ketenedithioacetal, 14951

indan-1-ones from reaction of N,N-dimethylacrylamide-triflic anhydride complex with alkoxybenzenes followed by hydrolysis, 12993 1,3,3-trimethyl-1-phenylindane from aminium salt induced dimerisation of α -methylstyrene, 13971

Indenes

dihydroindene and benzofulvene by photolytic double decarbonylation of a cyclohexane solution of 4,7-ethanoindene-8,9-dione deriv, 2481 1-(3-furyl)-4,4,7a-trimethyl-2,4,5,6,7,7a-hexahyd ro-1*H*-inden-2-one, insect antifeedant related to azadiradione, synth from α-cyclocitral, 4817

Indium and compds

α-halo organoindium reagents, prep from reaction of gem-dihalo compds with indium metal, reactions with carbonyl compds and electron-deficient alkenes, 2803

Indoles

apogeissoschizine, degradation product of geissospermine, prep of the pentacyclic ring system by addition of the enolate derived from methyl 1-indolepropionate to the γ-position of pyridinium salt followed by cyclisation, 8601

arylated indole-2-carboxylic acid, formation as key step in synth of alkaloids secofascaplysin and indolopyridocoline, 7329

3-(1-benzyl-1,2,3,6-tetrahydropyridin-4-yl)-1*H*-indoles, synth by reaction of substituted indoles with *N*-benzyl-4-piperidinone, 10185

biindolyls by reaction of indoles with indolin-2ones and phosphoryl chloride or trifluoromethanesulfonic anhydride, 4687, 4697

3-(4'-chlorophenyl)-4,6-dimethoxyindole, react-

ion with oxalyl chloride, synth of 2- and 7-glyoxyloyl chloride derivs which could be converted to glyoxylic acids, 8925

3-(cyclohexylamino)-1,4,5,6-tetrahydro-2H-indol-2-one, synth as intermediate to (\pm) - α -lycorane and 4,5-dehydroanhydrolycorine alkaloids. 10569

Diels-Alder reaction of –, ketones and maleic anhydride to give tetrahydrocarbazoles and carbazoles, 4555

5,6-dihydroxyindole-2-carboxylic acid, oxidative polymerisation to melanin, 7913

4,6-dimethoxy-2,3-diphenylindole, Vilsmeier reaction with 3-substituted indolin-2-ones and either phosphoryl chloride or triflic anhydride, synth of 2,7'-biindolyl, 7,7';2,7'-terindolyls and 7,7'-biindolyl, 7003

2-(1,3-dithian-2-yl)indole, addition to 3-ethyl-Δ³-piperidin-2-ones, synth of 20-epidasycarpidone and 20-epiuleine, 3563

(Z)-ethyl 3-[(1-ethoxycarbonyloxy-2-methoxy)-ethenyl]-2-(ethoxycarbonyloxy)indole-1-carbox ylate, Diels-Alder reaction of, synth of carbazole alkaloid carbazomycin B, 3029

Fischer indolisation and nitrous acid deamination of indolenines as strategy for construction of tetracyclic hexahydrobenzofuranes, 8209

(±)-geissoschizine, tetracyclic indole alkaloid, synth from (±)-15-epi-*E*-geissoschizine, 6803

heterocumulene-substituted indoles, intramolecular ring-closure of, prep of γ-carbolines and pyrimido[3,4-a]indole derivs, 5833

2-hydroxy-1,2-dihydro-3*H*-indol-3-ones, synth by oxidation of 1,2-dihydro-3*H*-indol-3-ones, 2983

7-hydroxy-2,3,7,7a-tetrahydroindole ring of gliotoxin, synth from tyrosine *via* methyl 1-benzyloxy-carbonyl-3a-hydroxy-6-oxo-2,3,3a,6,7,7a-hexahydroindol-2-carboxylate, 14403

indole alkaloids such as tetraphylline, 3-epireserpine and reserpine, transformation into the 2,7-dihydro compds followed by further methylation, 9069

indole-3-carboxaldehyde, Diels-Alder reactions in sulfolane, synth of carbocyclic analogues of canthine and canthin-6-one, 461

indole-3-pyruvic acid oxime ethers and thieno derivs by Heck reaction, 14975

indoles, indolines, quinolines and tetrahydroquinolines, synth from N-(cyclohexylidene)amines, 3705

indolo[2,3-a]pyrrolo[3,4-c]carbazoleringsystem, synth involving coupling between indole and

- methylmaleimide portions and cyclisation of bisindolylmaleimide, synth of arcyriaflavin B-D, 8099, corrig. 14079
- indolo[2,3-a]quinolizine ring system, synth using the thermal decarboxylative ring-opening of 3-carboxyl isoxazoles into α-cyano aldehydes, 987
- 7-indolyl-imines by reaction of 4,6-dimethoxyindoles with secondary amides and phosphoryl chloride, 4687, 4697
- methyl N-p-methoxybenzensulfonylindole-2-(2-propenoate), Diels-Alder reaction of, synth of advanced intermediates for the synth of (±)-andranginine alkaloid, 11291
- 1-methylindole, 2-methylindole and 3-methylindole, mechanisms of electrooxidation of, structures of products, 7947
- 3a-(O-nitrophenyl)octahydroindol-4-ones, synth by ozonolysis and reductive amination of 2-allyl-2-(O-nitrophenyl)-1,3-cyclohexanedione, 4013
- (±)-physostigmine, indole alkaloid from *Physostigma venenosum* Balf, synth from (Z)-2-hydroxy-5-methoxyindolenine, 5339
- 2-prenylindoles, acid-catalysed dimerisation of, 9455
- pseudocopsinine, indole alkaloid from *Vinca erecta*, synth of pseudocopsinine skeleton by tandem radical cascade, 647
- tacamine-type indole alkaloids of *Tabernae-montana eglandulosa*, synth from pentacyclic intermediates, 11361

Indolines

- indolines, indoles, quinolines and tetrahydroquinolines, synth from N-(cyclohexylidene)amines, 3705
- perhydroindolines by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445
- spiroindolinopyranswithunsaturated side-chains in benzopyran site, synth by Wittig reaction under Phase Transfer Catalysis, 8755
- 3-substituted indolin-2-ones, Vilsmeier reaction with 4,6-dimethoxy-2,3-diphenylindole and either phosphoryl chloride or triflic anhydride, synth of 2,7'-biindolyl, 7,7';2,7'-terindolyls and 7,7'-biindolyl, 7003
- tetramethyl-indolinic aminoxyls, chemical and electrochemical study of their interaction with superoxide anion, 11257

Indolisation

Fischer - of 6-phenylhydrazono-6,7,8,9-tetra-

- hydro-11*H*-dipyrido[1,2-*a*;4,3-*d*]pyrimidine-11-ones, synth of 3-azarutecarpine (1-azanaucle-fine) and its 7-methyl deriv, 7789
- Fischer indolisation and nitrous acid deamination of indolenines as strategy for construction of tetracyclic hexahydrobenzofuranes, 8209

Indolizines/indolizidines

- [1]benzothieno[2,3(3,2)-f]indolizines, synth from 2(3)-(2-formylpyrrol-1-ylmethyl)-[1]benzothio phene, subsequent reaction with DEAD leads to [3,2,2]cyclazines fused to a [1]benzothiophene ring, 13547
- 5-(α-naphthyl)- and 5-(β-naphthyl)indolizidines, potential dopamine analogues and non-opiate antinociceptive agents, synth by intramolecular Schmidt reaction of azides with tertiary alcohols, 12039
- pyrrolo[2,1,5-cd]indolizines, structures of tricyclic alkaloids composed of from *Myrmicaria opaciventris* ants, 13539
- trisubstituted indolizines by reaction of 1,2,3-triazolo[1,5-a]pyridiniumV2-dicyanomethylides with methyl propiolate, 10519

Inert gases

noble gas atoms contained within fullerene molecules, rates and amounts of noble gas release on heating, 5143

Infrared spectra

- 3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, 7789
- 3,4-dilithio-1,2-butadienes, 6149
- FT-IR, study of hydrogen bond mediated electron transfer in proteins using a porphyrin/depsipeptide/p-benzoquinone molecule, 12357 polynitro fullerenes and fullerenols, 4963
- probing solid-phase reactions by monitoring the IR bands on a single "flattened" resin bead, 843

Insecticides

- (+)-β-cyperone and (-)-eudesma-3,5-diene, bioactive compds against *Locusta migratoria*, synth from santonin, 10507
- effect of depside group on activity, replacement of depsi peptidic bond of destruxin analogues by amide bond, 6173
- Precocene II (2,2-dimethyl-6,7-dimethoxychromene), synth from substituted α-methylene-δ-valerolactone and 1,1-bis-(methylthio)-2-propanone or butanone, 2065
- trichothecane sesquiterpenes with insecticidal activity, general route to A-ring aromatic trichothecane from allyl alcohols, 10363

Insects

Anthonomous grandis (cotton boll weevil), synth of (+)- and (-)-grandisol (pheromone of) using [2+2] cycloaddition of (S)-4-acyloxymethyl-4-methyl-2(5H)-furanones with ethylene as key step, 1267, 1279

Anthonomus grandis (cotton boll-weevil), synth of (+)-grandisol (the major pheromone of) from (+)-citronellol using an intramolecular carbenoid cyclisation, 3879

Epilachna varivestis (Mexican bean beetle), synth and absolute configuration of 2-(12'-aminotridecyl)-pyrrolidine, the defensive alkaloid of, 6859

insect moulting hormone activity of 2-deoxy-20hydroxyecdysone and derivs, 12623

Locusta migratoria, synth of (+)-β-cyperone and (-)-eudesma-3,5-diene, bioactive compds against Locusta migratoria, 10507

Macrocentrus grandii (larval parasitoid), synth of (3S,5R,6S)-3,5-dimethyl-6-isopropyl-3,4,5,6-tet rahydropyran-2-one, sex pheromone of, 5907

Manica mutica, Manica bradleyi and Manica rubida (ants), synth of (S)-(+)-manicone, their alarm pheromone from 2-chloro-3-pentanone, 12815

Musca domestica L., Plutella xylostella L. and Ephestia elutella Hbn., synth of cyclopropane analogues of the pheromones of, 12509

Myrmicaria opaciventris African ants, isolation of tricyclic alkaloids composed of pyrrolo[2,1,5-cd]indolizines from, structures, 13539

Oecophylla longinoda African weaver ant, synth of alarm pheromone (2E)-2-butyloct-2-enal using Baylis-Hillman adducts, 1253

Phaedon armoraciae leaf beetle, stereochemistry of an alcohol oxidase from defensive secretion of, 6601

Solenopsis invicta, synth of (-)-invictolide, component of the queen recognition pheromone of - from (-)-carvone, 12177

Vespa orientalis (Oriental hornet), asymmetric synth of 5-hexadecanolide, pheromone of the queen hornet, 4479

Insertion reactions

of α-diazo-β-keto-γ,δ-alkenyl-δ-aryl compds versus Wolff rearrangement-electrocyclisation, 10455

OH-insertion reactions of rhodium carbenoids with alcohols, synth of ethers, 5999

Ionophores

lasalocide A and other polyether ionophore

antibiotics, synth of a fragment of by higherorder vinyl cuprate ring opening of functionalised epoxides derived from tris(hydroxymethyl)methane, 12631

18-membered diamide-diester macrocycles possessing pyridine/thioether/ether as ligating units, synth by dehydrochlorination of diacid dichlorides and diols, effect of ligating units on Ag⁺ selectivity, 13483

pyridinium derivs of calix[4]arenes as chromoionophores exhibiting optical responses in organic solvents upon complexation of lithium, sodium and potassium salts, 639

valinomycin, ionophore antibiotic, synth of cyclodepsipeptides related to valinomycins, 1343, 1361, 1379

Iridoids

(-)-mitsugashiwalactone, (+)-iridomyrmecin, (-)-isoiridomyrmecinand(+)-teucriumlactone, iridoid cyclopentapyranones, synth by Horner-Wadsworth-Emmons reaction on enolisable cyclopentanones, 3435

Iron and compds

 (η^5-C_{5H5}) Fe(CO)(PPh₃)(COCH₂Ph), elaboration of the acyl ligand in, 12553

reactions in the Fe^{II}-Fe^{IV} manifold, mechanism of Tempo trapping in Gif-type systems and a study of the intermediates in an Fe^{III} catalase model in pyridine, 10287, 10301, 10313

synth of salicylamide and bipyridine containing ligands for iron(II) and iron(III) coordination, 12197

tripodal iron chelating agents based on 8-hydroxyquinoline linked by tris(2-aminoethylamine), synth and NMR study, 4659

Isobenzofurans

tetrahydroisobenzofuran deriv by Diels-Alder reactions of retinyl propynyl ether involving addition of the alkyne group at positions 11 and 14 of the retinoid side chain, 405

Isocyanates

chlorosulfonylisocyanate,[2+2]-cycloadditionto cis and trans 3-O-but-1'-enyl-1,2-O-isopropylidene-α-D-xylofuranose, 6019

isocyanates and isothiocyanates, addition of lithiated β -hydrazonophosphine oxides to – followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123

1-isocyanatocyclohexene, 1,4-cycloaddition with cyclohexyl isocyanide, synth of 3-(cyclohexylamino)-1,4,5,6-tetrahydro-2H-indol-2-one, intermediate to (±)-α-lycorane and 4,5-dehydroanhydrolycorine alkaloids, 10569

isocyanoacetic acid derivs, gold(I)-catalysed asymmetric aldol reactions of with fluoroaryl aldehydes, synth of oxazolines which could be hydrolysed to fluoro-phenylserines, 245

2,6-xylyl isoselenocyanate, reaction with organolithium compds, synth of carbophilic and/or selenophilic products, 12165

Isocyanides

antifouling sesquiterpene isocyanides from nudibranchs of the *Phyllidiidae* family, structures and activity, 9447

isocyanides, aldehydes, trifunctional α-amino acids and alcohols, Ugi reactions with, synth of 1,1'-iminodicarboxylic acid derivs, 11657

Isoindoles

benzoisoindoles, synth from bicyclic furans using furan-pyrrole ring exchange as key step, 8169 hydroxyazaisoindolinones, synth and conversion into pyridopyridazinones *via* reaction with hydrazine hydrate, 3261

3-substituted (1H)-1-isoindolones, reaction with 1-diethylamino-1-propyne, synth of ring-expanded heterocycles, 3339

Isomerisation

of cyclobutyne to 1,2,3-butatriene, 2279

of α -fluorooxiranes derived from oxidation of fluoroalkenes, synth of α -fluorocarbonyl compds, 2429

of (Z)-HFC=CFSiEt₃ with ultraviolet light and catalytic phenyl disulfide, synth of *cis*-1,2-difluorotriethylsilylethylene, 37

oxime-nitrone – and hydrazone-azomethine imine – at the periphery of pyridine and pyrido[1,2-a]pyrimidine systems, 887, 901

photo— of 9-anthrylsubstituted pyridyl enones, study of structure effects on photochemical properties, 935

substituent effects on the feasibility of azomethine-azomethine isomerisation: synthetic opportunities for biomimetic transamination, 14701

Isomers

classification scheme of isomers of organic molecules, 12941

Isonitriles

aryl isonitriles, tandem radical reactions with N-propargyl-6-halo-2-pyridones, synth of tetraand penta-cyclic products, first generation synth of (±)-camptothecin, 11385

Isoprenoids

analogues of farnesyl diphosphate bearing substituents at C3, synth by alkylation of appro-

priately substituted acetoacetates with geranyl bromide followed by decarboxylation and Wittig condensation, 119

(15,25,3R,6S)-3-chloro-3-methyl-6-isoprenyl-1,2 -cyclohexanediol, synth by Prins reaction as inhibitor of biosynth of porphobilinogen, 4645 1,6,17,21-octahydrobotryococcene and sacredicene, isoprenoidal hydrocarbons from sediments of Sacred Lake, Mount Kenya, structures, 6973

Isoquinolines

2-alkyl-4-aryl-1(2*H*)-isoquinolones, synth from phosphorylated *o*-aroyl and heteroaroyl benzamides, subsequent reduction gives rise to 4-aryl-1,2,3,4-tetra-hydroisoquinolines, 4433

3,4-dihydroisoquinoline N-oxides, cycloaddition with alkynes, synth of 4-substituted Δ^4 -isoxazolines and subsequent rearrangement to isoquinoline-fused pyrroles, 12049

3,4-dihydroisoquinolines, 2-alkyl(acyl)-1(2*H*)-3,4-dihydroisoquinolinones, 2-alkyl-1(2*H*)-isoquinolinones and 1-alkyl-2(2*H*)-quinolinones by oxidation with potassium permanganate, 1451

jozimine A and pindikamine A, naphthylisoquinoline alkaloids, synth and antimalarial activity of, 13409, 13419

linaresine and dihydrolinaresine, benzoyl isoquinoline alkaloids isolated from *Berberis* valdiviana, structures, 5929

2-[7-(2-methyl-1,2,3,4-tetrahydroisoquinoline)-yl]-N-(2-pyridyl)acetamide, a host with two heterocyclic parts separated by a flexible arm, synth from isoquinoline involving acylation and Willgerodt-Kindler reaction, 10441

N-phenyl and methyl tetrahydroisoquinoline, reductive opening of, synth of functionalised organolithium compds, 8545

synth from 2-phenylethylamines, amides, nitriles and carboxylic acids in polyphosphoric acid, 12299

[1,2,4]triazolo[3,4-a]isoquinolines and pyrrolo-[2,1-a]isoquinolines, synth by reaction of α -keto hydrazonoyl halides with 3,4-dihydro-6,7-dimethoxyisoquinoline, 3451

Isosteres

defucogilvocarcin V isosteres, aglycone common to some C-aryl glycoside antitumour antibiotics, synth *via* MAD-mediated conjugate addition of carbanions to naphthoquinone ketals, 3841

fluorine-containing proline amide isostere model, synth from N-protected proline ethyl ester, subsequent reaction with CF₃COOH, 225

fluoroolefin containing dipeptide isosteres, synth as inhibitors of dipeptidyl peptidase IV(CD26), 291

β-hydroxy sulfones, bioisosteres of oxisuran metabolites, synth from 2-ethoxycarbonyl-pyrazine, conformational study, 11239

Isothiazoles

isothiazol-3(2*H*)-one 1,1-dioxides, synth by oxidation of isothiazolium salts, 783

isothiazolo[5,4-b]pyridin-3(2H)-one derivs, molecular modelling of, 8947

Isothiocyanates

(±)-halipanicine, sesquiterpene isothiocyanates from Okinawan sponge *Halichondria panicea*, synth involving Diels-Alder reaction and Martin's methodology as key steps, 6361

methanesulfonyl- and toluenesulfonyl isothiocyanates, reaction with alcohols to give N-sulfonylthioxocarbamates, subsequent radical fission reaction of, synth of O-alkylthioxocarbamates, 2705

Isotope substitution

see Labelling

Isoxazoles

3-carboxyl isoxazoles, thermal decarboxylative ring-opening of into α -cyano aldehydes which could be converted in four steps to the indolo-[2,3-a]quinolizine ring system, 987

furoisoxazoles, synthons for heteroanthracyclinone analogues, synth by 1,3-cycloaddition of nitrile oxides to 2(5H)-furanones substituted at the 5-position by sulfur bearing groups, 3457

Isoxazolidines

2'-N-alkyl-3'-hydroxyalkyl-1',2'-isoxazolidin-yl thymidine and 5-fluorouridine derivs, synth by 1,3-dipolar cycloaddition of 3-carboxyalkyl- or acylnitrones to vinyl acetate followed by condensation, 8889

by transannular nitrone 1,3-dipolar cycloaddition of (Z)- and (E)-19-nor-5,10-secosteroidal ketone with methylhydroxylamine hydrochloride, 11995

isoxazolidinecarboxylic derivs, precursors for bioactive chiral nucleosides and for glycosidase inhibitors, synth from D-glucose through intramolecular 1,3-dipolar cycloaddition, 11265

3-substituted isoxazolidin-5-ones, synth by addition-rearrangement of N-benzylhydroxylamine to α,β -unsaturated lactones, entry to 3-amino-3-deoxy sugars, 1411

Isoxazolines

4-arylmethylene pyrazol-5-ones or isoxazol-5-

ones, reduction of with 2-arylbenzimidazoline, synth of C,C- and C,N-linked dimers and 4-arylmethyl derivs, 1443

fullerene-fused isoxazoline heterocycles bearing a series of different substituents in the 3position, synth by 1,3-dipolar cycloaddition of nitrile oxides to C₆₀, 5043

4-substituted Δ^4 -isoxazolines by cycloaddition of 3,4-dihydroisoquinoline N-oxides with alkynes, subsequent rearrangement to isoquinoline-fused pyrroles, 12049

Ketals

see Acetals

Ketenes

N-butadienyl-N-alkylketene N,O-t-butyldimethylsilyl acetals, synth and cascade Diels-Alder reaction of followed by acylation, synth of bicyclic and tricyclic products, 11643

dienylketenes formed by thermal Wolff rearrangement of α -diazo- β -keto compds, benzannulation of, synth of functionalised phenolic derivs. 6665

homochiral ketenes derived from Oppolzer sultam, use in ketene-imine cycloaddition reaction (Staudinger reaction), synth of cis-\(\theta\)-lactams, 5579, 5585

S,N-ketene acetals, Horner-Wittig approach to and acid-catalysed hydrolysis to (S)-thioesters, 11095

ketene selenothioacetals by trapping of lithium eneselenoates with alkyl halides, 2839

O,S-ketene silyl acetals, design and diastereoselective Mukaiyama-Michael reaction of, 9409, 9419

ketenedithioacetal by reaction of 2-lithio-2vinyl-1,3-dithiane with an aryl halide, subsequent transmetalation generates an alkyl halide and a 2-indanyl-2-lithio-1,3-dithiane, 14951

 α -oxoketene dithioacetals, 1,2-addition of α -lithio-xylenes onto – followed by cyclodehydration of the resulting carbinols, synth of substituted 1-methyl- and 2-methylnaphthalenes, 14049

 α -oxoketene dithioacetals, reduction with Zn/ZnCl₂-TMEDA in ethanol, synth of β -methylthiomethylene ketones, β -methylthioketones and α -methylketones, 4679

silyl ketene acetals, addition to ferrocenylmethyl ethers, synth of precursors to chiral bridged ferrocenophanes, 1461

trimethylsilylketene acetals, reaction with carbo-

hydrate derived cyclic enolethers, synth of 2,3-unsaturated C-glycosides, 6397

Keto-acids/-esters

- β -diketones and β -ketoesters, treatment with ceric ammonium nitrate and sodium hydrogen carbonate followed by addition to cyclic enol ethers, synth of fused acetals, 12495
- α-hydroxy-β-ketoesters, synth by acylation of a transient Ti(VI)-enolate by acyl halides and anhydrides, 11037
- α,ω-ketoesters by cross-coupling reactions of monoesters of dicarboxylic acid chlorides with organocopper reagents derived from Grignard reagents, cuprous bromide and lithium bromide, 13513
- 1,3-ketoesters, mechanism of fluorination of, 1 β -ketoesters for ring closure of glyoxal monohydrazones, 5819

Ketones

- N-acetoacetyl derivs of oxazolidinones, Schmidt reaction of in dimethoxyethane, synth of homochiral N-(5-oxazolyl)oxazolidinones, 1609
- aliphatic ketones, prediction of tautomeric equilibrium constants for a series of in aqueous solution using the quantum chemical self-consistent reaction field approach, 11325
- α -allenic ketone, radical cyclisation of, synth of (\pm) - α -chamigrene sesquiterpene, 13181
- allyl ketones, synth from α -ketosulfides of benzothiazoles by reaction with allylic carbonates via α and α , α -diallylated ketosulfides, 2155
- α -amino ketones, synth by rearrangement of α -hydroxy imines, mechanism and application to the prep of (+)-1-benzyl-1-azaspiro[5.5]-undecan-7-one, a precursor to (-)-perhydrohistrionicotoxin, 6647
- aziridino ketones, diastereoselective reduction of, synth of alcohols, 12117
- 5'-O-benzoyl-2'-keto-3'-deoxy-α-uridine, characterisation and use to establish anomerisation of 2'-ketouridines under basic conditions, 1767
- α-bromo-α-silyl ketones and α-bromoacylsilanes from t-butyldimethylsilyldibromomethane and carbonyl compds, 14533
- 3-butyn-2-one, Lewis acid-induced reaction with sterically unhindered isocyclic allylsilanes, 6685 cycloalkanones, oxidative cleavage to dicarboxylic acid using sodium hypochlorite under phase transfer catalysis conditions, extension of the haloform reaction to non-methyl ketones, 13641
- difluoromethyleneketone retroamides, synth as

- inactivators of aspartyl or seryl proteases, 305 1,2-diketones, [2+2]-cycloaddition to N,N-dimethyl cyanamide in the presence of titanium-(IV) chloride, subsequent ring opening to 1,3-butadienes, 3939
- β -diketones and β -ketoesters, treatment with ceric ammonium nitrate and sodium hydrogen carbonate followed by addition to cyclic enol ethers, synth of fused acetals, 12495
- and diketones by reaction of *N*-imidazolium-*N*-methyl amides and bis-amides with organometallics, 14297
- 1,3-diketones, ceric ammonium nitrate mediated oxidative [3+2] cycloaddition of to cinnamic esters, regio- and stereoselective synth of dihydrofurans, 2193
- diketones, samarium diiodide-mediated pinacolisation of –, synth of fused mono-, bi- and tricyclic cyclobutane-1,2-diols and a cyclopentane-1,2-diol, 11783, 11799
- 1,2-dioxetanone as luminescence intermediate in low-temperature photooxygenation of coelenterate luciferin analogue, 12061
- enolizable β -keto amides by diastereoselective α -acylation and subsequent aminolysis of 2-acyl-3-phenyl-*l*-menthopyrazoles, 10335
- α,β -epoxyketones, reduction with diisopropoxytitanium(III) tetrahydroborate, synth of anti- (or erythro-) α,β -epoxy alcohols, 9137
- from oxidation of secondary alcohols by palladium acetate catalysed Heck reactions, 12291 (S)-(+)-Hajos-Parrish ketone, synth of left and right-half taxoid building blocks from -, 12443 ω-haloacylsilanes, transformation *via* thioacylsilanes into Z-silyl-enethiols or into 2-silyl-thiacycloalk-2-enes, 4803
- hindered aryl alkyl ketones, enantiotopomerisation and conformational analysis of investigated by dynamic and solid state NMR, 2471
- O-hydroxy acetophenones, Vilsmeier-Haack reaction of, synth of 3-formyl chromones, 3669 β -hydroxyketones, diastereoselective addition reaction with organometallic reagents, synth of (+)-(2R,4R)-2-phenyl-2,4-pentanediol, 2177
- o-hydroxyphenyl ethynyl ketones, 6-endo- and 5-exo-digonal cyclisation of, 9427
- 4-(4-hydroxyphenyl)-2-butanone (Raspberry ketone), synth by baker's yeast mediated reduction of 4-(4-hydroxyphenyl)-but-3-en-2-one, stereochemistry of reaction, 4041
- (S)-(+)-manicone ((4E,6S)-(+)-4,6-dimethyl-4-octen-3-one), alarm pheromone of *Manica*

ants, synth from 2-chloro-3-pentanone, 12815 β -methylthiomethylene ketones, β -methylthioketones and α-methylketones, synth by reduction of α -oxoketene dithioacetals Zn/ZnCl₂-TMEDA in ethanol, 4679

Peterson olefination reaction applied to ketones and aldehydes in conjunction with α -lithiated- α -fluoro- α -trimethylsilylmethylphosphonate, synth of α -fluorovinylphosphonates, 14199

(E)-1-phenylsulfonyl-3-alken-2-ones, Diels-Alder reactions with vinyl ethers, synth of 2,4-cis-3,4-dihydro-2*H*-pyrans, 1205

reaction with diethyl maleate by Michael initiated-condensation-elimination sequence, synth of trisubstituted alkenes, 1389

(Z)- and (E)-19-nor-5,10-secosteroidal ketone, transannular nitrone 1,3-dipolar cycloaddition with methylhydroxylamine hydrochloride, synth of isoxazolidines, 11995

α-silyl-α-diazoketones, cycloaddition with phosphaalkenes, synth of 5-alkylidene-4,5-dihydro- $3H1,2,4(\lambda^3)$ -diazaphospholes, 10053

trialkylsilylenaminones and α' -silylated β -diketones, synth by reaction of β -(monoalkylamino) α,β -unsaturated ketones with trialkylchlorosilanes and subsequent hydrolysis, 9179 trifluoromethyl ketones, asymmetric aldol reaction with a chiral Ni(II) complex of glycine, stereocontrolling effect of the trifluoromethyl group, 12433

 α,β -unsaturated ketones and conjugated enymes by dehydration-hydration of α -alkynols over a zeolite catalyst, 8287

 α,β -unsaturated ketones, epoxidation of by sulfonic peracids, 2957

 β, γ -unsaturated N-acyl-2-oxazolidinones, synth by imide formation method, 13525

1-ureido-3-propargyl-3-phosphono-1*H*-pyrrol-2 (3H)-ones, synth by cyclisation reaction between cojugated azoalkene and ethyl 2acetyl-4-pentynoate, 3997

see also Cyclic ketones, Dienones, Diones, Enones

Kinetics

absolute rate constants for addition of n-alkyl radicals to styrenes, 12351

ammonolysis of secondary amides assisted by unsubstituted vicinal amide group, 4141

basic hydrolysis of 2-(2-nitrophenoxy)quinoxaline in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, relation between rate and surfactant concentration, 11665

conformationof12,13,25,26-tetraaza-2,15-dithia-[3.3] phenanthrolinophane, 4673

correlation analysis of relative rates of trichloromethyl-bromo-addition reactions to p-Y-substituted phenylacetylenes suggests both polar and spin-delocalisation effects, 3017

factors influencing enantioselectivity of lipasecatalysed hydrolysis, 5397

free-radical homolytic substitution, new methods for formation of bonds to heteroatoms, report, 13265

kinetic mechanism for formation of fullerenes C_{60} and C_{70} in flames, 5161

kinetic resolution of mono- and bicyclic olefin Diels-Alder adducts via Sharpless asymmetric dihydroxylation, 7901

localised enhancements of reaction rate using microwave heating, non-isothermal and heterogeneous kinetics, 5505

and mechanism of Vilsmeier-Haack reaction with O-hydroxy acetophenones, synth of 3formyl chromones, 3669

mercury(II) oxide oxidation of unsymmetrical N,N-disubstituted hydroxylamines, synth of aldonitrones, 14917

meta substitution with respect to the activating nitro group in 3,4-dihalogenonitrobenzenes, 2557

methanolysis of p-nitrophenyl acetate using Ba(II) complex of 18-mercaptomethyl-1,4,7,10, 13,16-hexaoxacyclononadecane as catalyst, 8867 of oxidation of alkanes by the reagent O₂-H₂O₂vanadium complex-pyrazine-2-carboxylic acid,

rate of cheletropic reaction of 3,4-dimethyl-2,5dihydrothiophen-1,1-dioxide, solvent effects, 6241

rate constants and half lifes for rearrangement of (S)-7-butyl-2-methyl-2H-azepine, 10883 rate constants for the interactions of aminoxyls with superoxide anion, 11257

rate studies for reaction of ω-alkenyl glycosides with aqueous N-bromosuccinimide, evidence for cyclic bromonium ion transfer in, 7663

rates and amounts of noble gas release from the

interior of fullerenes on heating, 5143 reactions of C_{60}^{+} , C_{60}^{2+} and C_{60}^{-3+} with C_2H_4 and C_2H_4 in gas phase, polymerisation initiated by $C_{60}^{2.3+}$, 5191

of SeO₂ promoted oxidative rearrangement of 2-substituted oxazolines to dihydrooxazinones,

14475

sodium 1,3-cyclohexadiene-1,4-diethanoate as a new colourless and water-soluble trap for the measurement of photogenerated singlet oxygen, 2031

Knoevenagel reactions

of salicylaldehydes with phosphonoacetates, synth of 1,2-benzoxaphosphorines and their dimers, 12597

of 2-substituted 1,3-oxazinanes and 1,3-oxazolidines with acyclic nucleophiles, synth of α -tetralones, 14273

Labelling

L- α -amino acids stereospecifically labelled at the β -carbon atom, synth from labelled samples of (2S)-isoserine via aziridines, 9891 labelled water for the hydrolysis of bicyclic orthoesters having a six or a seven-membered

orthoesters having a six or a seven-membered orthoester ring, experimental observations and theoretical rationalisation, 14841

natural-labelled 6-deoxy-L-sorbose, precursor of furaneol, an important food flavour, biological route to based on production of natural hydroxypyruvate and 4-deoxy-L-threose, 8223

stable isotope incorporation evidence for the *de novo* biosynth of terpenoic acid glycerides from dorid nudibranchs *Archidoris odhneri* and *A. montereyensis*, 6869

for study of the biosynthesis of coloradocin, antigonorrheol and antianaerobic antibiotic produced by fermentation of *Actinoplanes coloradoensis* sp., 10327

Lactamisation

carbonylative lactamisation, to terminate cyclic carbopalladation of alkynes, using alkenyl or aryl halides containing an ω-carboxamido or ω-sulfonamido group, 11529

Lactams

ascomycin, macrolactam antifungal antibiotic, epimerisation and skeletal resection in the ascomycin framework, a study of the biological consequences of lactam rotamer selection, 9643

by anthraquinone photosensitised reactions of N-allylamines with α,β -unsaturated esters via rearrangement of the α -aminoallyl radical, 3425

α-chloroalkylidene-γ-butyrolactams and α-chloroalkylidene-δ-valerolactams, synth by cyclisation of N-alkenyl-2-alkynamides, 10945 N-(2-hydroxy-1-phenylethyl)piperidine-2-one,

conversion to 3-substituted piperidines via a bromo deriv, 7719

α-hydroxy-δ-valerolactams, synth from 2-tetrahydrofuroamides and general synth of lactams conjugated to 2,4,6-triiodoisophthalamides, 11177

cis-β-lactams, synth by Staudinger reaction of homochiral ketenes, 5579, 5585

macrocyclic dioxa-, dithia-, diazatetralactams and derivs, synth involving dissymetrisation of the reactivity of a diacid via its cyclic anhydride and the activation-cyclisation of the intermediate diamide diacid, 9793

macrocyclic enaminolactams by ring expansion of 2-oxocyclododecane-1-carbonitrile with diarylcarbodiimides, 4363

for β -lactams see Azetidinones

Lactones

aldonolactones, chain extension by samarium iodide mediated Dreiding-Schmidt reactions and samarium assisted Imamoto reactions, 9759

γ-arylidenebutyrolactones, synth from pentynoic acids 3- or 5-substituted with an iodo-aryl moiety by palladium-catalysed cyclisation of their potassium carboxylates, 11463

γ-butyrolactones, synth by Wacker-type oxidation reaction of 4-trimethylsilyl-3-alkyn-1-ols, mechanism, 10405

(+)-β-cyperone and (-)-eudesma-3,5-diene, bioactive compds against *Locusta migratoria*, synth from santonin, 10507

(R)-(+)- γ -decalactone used in fruit and dairy flavours, synth based on castor oil ozonolysis via (R)-(-)-1,3-nonandiol, 11321

8-deoxy-pseudo-Ascidiatrienolide C, synth of 9-substituted Δ⁵-octenolides by Mukaiyama cyclisation, 2113

cis-2,3-dibenzylbutyrolactone lignan, synth from meso-2,3-dibenzylbutanedioic acid anhydride, 12799

epoxyrollin A, annonaceous acetogenin, synth of the epoxy lactone proposed for, 9399

(ω-1)-fluoroalkan-ω-olides, synth by bromofluorination of alk-ω-enoic acids, 5469

ginkgolides, highly oxidised diterpene trilactones from the leaves and bark of *Ginkgo biloba* (maidenhair tree), NMR study of C-1 stereochemistry of, 4505

(+)-goniofufurone, (+)-goniobutenolide A and (-)-goniobutenolide B, antitumourstryllactones from *Goniothalamus giganteus*, synth, 6547

- (+)-heptelidic acid, sesquiterpene lactone, use of asymmetric protected 2-oxo-5-isopropyl-cyclohexenecarboxylates as building blocks for an EPC synth of, 1221
- (-)-invictolide, component of the queen recognition pheromone of *Solenopsis invicta*, synth from (-)-carvone, 12177
- lactone substituted derivs of digitoxigenin, synth and inhibitory activity of the cardiac Na⁺ pump and the iontropic effect, 12723
- macrolactones and crown ethers, electronic effects and steric hindrance on complexation with alkali cations and Hg(SCN)₂, 3683
- phenolic dibenzylbutyrolactones, hypervalent iodine oxidation of, synth of spirodienones which are intermediates in the biosynth of tetrahydrodibenzocyclooctene, 1303
- plakortones A-D, activators of cardiac SR-Ca²⁺ pumping ATPase, from *Plakortis halichondrioides* sponge, 377
- prochiral dilactone, diastereoselective opening of, prep of 3-ketoglutaric mono acid products, 14577
- solandelactones A-I, cyclopropyl and lactone containing novel docosanoids from the hydroid *Solanderia secunda*, structures, 10583
- unsubstituted and 3-substituted-4-aroyl- δ -lactones, synth by Michael addition of lithiated chiral aminonitriles to α, β -unsaturated lactone and alkylation of the resulting compd, 10083
- trans-whisky lactone, synth by ring expansion reaction of oxetane using a copper catalyst bearing a bipyrindane or biquinoline ligand, 3905

see also Furanones, Macrolides

Lanthanides

- fullerenolanthanides, electrochemical properties of, 4973
- La@C₈₂, endohedral metallofullerene, addition reactions with digermirane, chemical derivatisation of, 5015
- lanthanide catalysis to activate the conjugate addition of amines to α,β -ethylenic substrates,
- (pentamethylcyclopentadienyl)₂LnCH(SiMe₃)₂ complexes as catalysts for the Tishchenko reaction of mono- or dialdehydes, 4291

see also Cerium, Samarium, and compds

Lead and compds

lead tetraacetate and tin(IV) chloride for chlorination of aromatic compds, 8863

Lignans

- cis-2,3-dibenzylbutyrolactone lignan, synth from meso-2,3-dibenzylbutanedioic acid anhydride via reaction with (+)- α -methylbenzylamine, 12799
- gmelinol, rearrangement of the 2,6-diaryl-3,7-dioxabicyclo[3.3.0] octane skeleton by reaction with BF₃-etherate and *N,N*-dimethylaniline, subsequent reduction produced a triol epimeric with di-O-methyl cycloolivil, 14349
- podophyllotoxin, aryltetralin lignan from *Podophyllum peltatum* and *P. emodi*, synth of an A-ring pyridazine analogue from (-)-podophyllotoxin using the Stille reaction, 14235
- tetrahydrodibenzocyclooctene lignans and spirodienones, synth by hypervalent iodine oxidation of phenolic dibenzylbutyrolactones, 1303
- thuriferic acid, cyclolignan from *Juniperus thuri*fera leaves, prep of epithuriferic acid from isopicropodophyllone, stereochemistry, 4903

Limonoids

- azadirachtin, *C-seco-*limonoid with antifeedant and growth inhibitory activities, synth of the right hand part from (1*S*,4*S*)-bicyclo[2.2.1]heptane-2,5-dione, 13933
- 1-(3-furyl)-4,4,7a-trimethyl-2,4,5,6,7,7a-hexahydro-1H-inden-2-one, insect antifeedant related to azadiradione, synth from α -cyclocitral, 4817

Linear free energy relations

- of methanofullerenes with cyano, nitro and carboxyethyl substituents on C_{61} , synth and characterisation, 5149
- strigol seco-analogues, synth from 2-cyclopenten-1-ylacetic acid, 14827
- structure-activity relationships of lactone substituted derivs of digitoxigenin in terms of the Höltje-Anzali model, 12723

Lipids

see also Glycolipids, Phospholipids

Liquid crystals

1-(hydroxyalkyl)-4-methyl-8,11,15,18,22,25-hexaoctylphthalocyanines, synth and use as precursors to more complex derivs, 809

Lithiation

- of *N*-alkoxycarbonyl-2-(2'-bromoethyl)oxazolidines derived from norephedrines, subsequent cyclisation and aldol reaction, synth of enantiopure 3-substituted pyrrolidines, 10761
- Barbier-type DTBB-catalysed lithiation using polychlorinated materials as a source of polyanionic synthons, 1797

- of carbamoyl and thiocarbamoyl chlorides under Barbier-type reaction conditions catalysed by naphthalene, synth of α -hydroxy or α -amino amides respectively, 13739
- carbo— of N-methyl-3-phenyl-prop-2-enylamine with t-butyllithium, synth of monomeric benzyllithium compd, reason for opposite diastereoselectivities, 10025
- of dibenzothiophene, first step in prep of 4methyl- and 4,6-dimethyldibenzothiophenes, 9087
- DTBB-catalysed of 4-functionalised 1-chloro-2-butenes, synth of 1,2- and 1,4-disubstituted compds, 13243
- DTBB-catalysed lithiation of chloromethyl ethyl ether followed by hydrolysis, synth of lithiomethyl ethyl ether, 1643
- inter-ring directed *ortho* lithiation by the 2pyridyl group in bipyridines, 14469
- intramolecular carbolithiation of α -thioalkenes or olefins, synth of 1,2-dialkyl-1-phenyl cyclopentanes, 7435, 7465
- lithiation-substitution reactions of N-Boc N-alkyl cyclopropyl amines, 12333
- of the pyridine nucleus at the C³-carbon atom of the methyl *ortho*-pyridinecarbonyl benzoates followed by addition of the generated lithiated species to carbomethoxy group, synth of aza-anthra-5,10-quinones, 11025
- of triflates and triflamides under Barbier-type conditions, indirect transformation of alcohols and amines into organolithium compds, 14341

Lithium and compds

- ab initio investigation on the reactivity of mixed LiMe/KOMe complexes as bases, model for Schlosser LICKOR superbase, 7053
- alkenyl lithium compds, coupling reactions with α -chloro enamines, synth of 2-amino-1,3-dienes, 2909
- 2-azaheptatrienyl lithium compds, 1,7-electrocyclisation of, synth of 1-acyl-2,3-dihydroazepines, 14801
- t-butyldimethylsilyldihalomethyllithium as a dihalomethylene dianion synthon, 1,3- and 1,4-rearrangement of silyl group from carbon to oxide, 503
- diastereoselective bromine/lithium exchange reactions of 3-alkoxy-1,1-dibromo-alkanes, 7421
- 2,3-dihydro-5-furanyllithium addition to disopropyl squarate as a means for the rapid generation of structurally complex oxygen-containing tetraquinane networks, 3075
- dilithiated 3-tosylpropanal dimethyl acetal as

- β,β -acylvinyl dianion or homoenolate dianion equivalent, 4111
- 3,4-dilithio-1,2-butadienes by addition of lithium metal to 1,4-unsymmetrically substituted butatrienes, 6149
- 1,3-dioxolane as a chaperone functional group for lithium ions, reaction cascades based on squarate esters, 11625
- ketalised 3,4-dihydroxybutyllithiums, new intermediates to transfer four-carbon diol functionality to electrophilic reagents, 8333
- lithiated \(\theta\)-hydrazonophosphine oxides, addition to isocyanates and isothiocyanates followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123
- lithiomethyl ethyl ether from chloromethyl ethyl ether by DTBB-catalysed lithiation followed by hydrolysis, 1643
- lithium eneselenoates from reaction of lithium alkyneselenolates with thiols, trapping by alkyl halides or allylic bromides leads to ketene selenothioacetals and γ,δ-unsaturated selenothioesters respectively, 2839
- methyllithium and dimethylcuprate-boron trifluoride, addition to imines derived from (S)-1phenylethylamine, synth of secondary amines, 12571
- nitrogen-containing remote functionalised organolithium compds by reductive opening of fiveand six-membered heterocycles, 8545
- opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025
- organolithium compds, reaction with 2,6-xylyl isoselenocyanate, synth of carbophilic and/or selenophilic products, 12165
- organolithium reagents and organocuprate.BF₃ complexes, addition to an α -silyloxyaldimine derived from (S)-ethyl lactate, synth of 1,2-amino alcohols, 13137

Luminescence

- 1,2-dioxetanone as luminescence intermediate in low-temperature photooxygenation of coelenterate luciferin analogue, 12061
- yellow $C_{70}Ph_{10}$ and orange-red $C_{70}Ph_{8}$ luminescent compds, synth by electrophilic substitution of benzene by $C_{70}Cl_{10}$, synth and characterisation, 5235
- see also Fluorescence

Macrocycles

calixarene based macrocycles consisting of three to eight calix[4]arene subunits, synth from

5,11,17,23-tetra-t-butyl-25,27-dihydroxy-26,28-dipropoxycalix[4]arene, 12399

corands incorporating a thiopyrylium ring, effect of alkali cations on the methoxide ion addition to, 3509

crown ethers and macrolactones, electronic effects and steric hindrance on complexation with alkali cations and Hg(SCN)₂, 3683

dicopper(I) [3]-catenate, synth by cyclisation of a system consisting of two lipophilic 4,7-di-(n-hexyl)-2,9-diphenyl-1,10-phenanthroline moieties linked by a diacetylenic bridge and ended by two alkynes, 10921

macrocyclic dioxa-, dithia-, diazatetralactams and derivs, synth involving dissymetrisation of the reactivity of a diacid via its cyclic anhydride and the activation-cyclisation of the intermediate diamide diacid, 9793

macrocyclic enaminolactams by ring expansion of 2-oxocyclododecane-1-carbonitrile with diarylcarbodiimides, 4363

MDL 62,879 (GE 2270A), a peptide produced by *Planobispora rosea* and belonging to the thiazolyl peptide group of antibiotics, chemical modifications of, 8763

18-membered diamide-diester macrocycles possessing pyridine/thioether/ether as ligating units, synth by dehydrochlorination of diacid dichlorides and diols, effect of ligating units on Ag⁺ selectivity, 13483

muscolide, (R)-(-)-phoracantholide I and (9R)-(-)-9-tetradecanolide, synth by ring-enlargement of cyclohexanone and cyclododecanone, 4581

nonactin, macrotetrolide antibiotic, total synth from optically active 2-isoxazolines, 571

quadrupolar [1₄]azolophanes built up from heterocyclic betaine subunits, synth, X-ray crystallographic analysis and use as a captodative spacer, 15171, 15189, 15197

resorcinarenes, synth and properties of, 2663 saraines A-C, macrocyclic alkaloids from the Mediterranean sponge *Reniera sarai*, structures, 8341

see also Cembranoids, Macrolides

Macrolides

brasilinolide A, immunosuppressive and antifungal macrolide from actinomycete *Nocardia* brasiliensis, structure, 9031

chalcomycin, neutral 16-membered macrolide antibiotic, stereochemistry by X-ray crystallography and correlation with other polyoxo macrolide antibiotics, 3857

Magnesium and compds

magnesium perchlorate catalysts, effect on chemo- and enantioselectivity of intramolecular ene reactions and intramolecular hetero Diels-Alder reactions, 12009, 12019

organomagnesium compds, cross-coupling of heterocyclic allyl sulfides with –, synth of optically active alkenes, regio- and enantioselection, 10799

see also Grignard reactions/reagents

Manganese and compds

chiral(salen) manganese(III) complex bearing a sesquiterpene salicylaldehyde and (R,R)-1,2-cyclohexanediamine moieties as a catalyst for epoxidation of unfunctionalised olefins, 12031

MM2 force field parameterisation, modelling and structure prediction of salen-type monomeric and hydrogen-bonded dimeric manganese complexes, 10193

Mn-salen catalysed asymmetric epoxidation of —, mechanism of oxygen atom transfer from oxo (salen)manganese(V) complex to olefins, 515

Mn(III)-salen complex as catalyst for asymmetric oxidation of sulfides, 13895

Mn(III)-tetraarylporphyrins bearing perfluoroalkylamido tails, synth and use as catalysts for epoxidation of alkenes employing aqueous NaOCl as oxygen donor, 11879

[WZnMn(II)₂(ZnW₉O₃₄)₂]¹²- polyoxometalate as catalyst for oxidations with hydrogen peroxide, 8781

Marine metabolites

(-)-malyngolide and (+)-epi-malyngolide, antibiotic first isolated from blue-green marine algae Lyngbya majuscula, synth by asymmetric Carroll rearrangement, 5805

antifouling sesquiterpene isocyanides from nudibranchs of the *Phyllidiidae* family, structures and activity, 9447

briareolate esters and briareolides, diterpenes from the Caribbean gorgonian octocoral *Briareum asbestinum*, structures, 9953

bromotyrosine deriv from Caribbean sponge *Aplysina archeri*, structure and antifungal activity, 9863

bryostatin 10, marine antinoplastic compd from *Bugula neritina*, conformational analysis, 2369 callipeltins B and C, bioactive peptides from the New Calidonian sponge *Callipelta* sp., structures, 9589

- calyculin A, protein phosphatase inhibitor from marine sponge *Discodermia calyx*, synth of C₂₀-C₂₅ building blocks from L-malic acid using Grignard reaction of Weinreb amides, 8297
- ceratinamides A and B, antifouling dibromotyrosine derivs from the marine sponge *Pseudoceratina purpurea*, structures and biological activity of, 8169
- ciguatoxin from the moray eel *Gymnothorax javanicus*, synth of both enantiomers of the BC-ring part of ciguatoxin from D-galactose, 12091
- clathramides A and B, bromopyrrole alkaloids containing the *N*-methylimidazolinium moiety from Caribbean sponge *Agelas clathrodes*, structures and antifungal activity, 13713
- coelenterate luciferin analogue, low-temperature photooxygenation of, synth and proof of 1,2-dioxetanone as luminescence intermediate, 12061
- cyclostellettamine C, macrocyclic alkaloid with muscarinic acetylcholine receptor antagonistic activity, total synth via 3-(13-hydroxytridecyl)-1-[13-(3-pyridyl)tridecyl]pyridinium trifluoromethane sulfonate, 10849
- (-)-denticulatins A and B, polypropionate metabolites from the pulmonates of genus *Siphonaria denticulata*, total synth from (*R*)-1-(benzyloxy)-2-methylpentan-3-one, 1811
- 8-deoxy-pseudo-Ascidiatrienolide C, synth of 9substituted Δ^5 -octenolides by Mukaiyama cyclisation, 2113
- (1'E,5'E)-2-(2',6'-dimethylocta-1',5',7'-trie nyl)-4-furoic acid, sesquiterpene anti-inflammatory metabolite from soft coral *Sinularia* sp., synth involving Claisen rearrangement, 4245
- dolabriferol, polypropionate from the skin of anaspidean mollusc *Dolabrifera dolabrifera*, structure, 12831
- dorisenones, cytotoxic spongian diterpenoids from nudibranch *Chromodoris obsoleta*, structures, 8187
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges from the Indian Ocean, structure and cytotoxic activity, 8899
- erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge *Erylus cf. lendenfeldi*, structures, 7921
- fourteen terpenoids from marine sponge Acanthella cavernosa with antifouling activity against barnacle Balanus amphitrite, structures, 2359 glycosphingolipid composition of the marine

- sponge Agelas dispar, isolation of immunomodulating glycosyl ceramides from, structures, 1573
- haliclonacyclamines A and B, cytotoxic alkaloids from tropical marine sponge *Haliclona* sp., structures, 9111
- hymenamide F, cyclic heptapeptide from marine sponge *Hymeniacidon* sp., structure elucidation, 6355
- isosaraine-3 and saraine-1-3, macrocyclic diamine alkaloids from Mediterranean sponge *Reniera sarai*, absolute stereochemistry of, 14961
- isovalerenenol, sesquiterpene alcohol isolated from a soft coral, synth using intramolecular aldol and hydrogenation reactions of the corresponding hydrindenone deriv, 9999
- jaspiferals A-G, cytotoxic isomalabaricane-type nortriterpenoids from Okinawan marine sponge *Jaspis stellifera*, structures, 5745
- (±)-keramaphidin B (pentacyclic alkaloid) and manzamine L (β-carboline alkaloid) from Okinawan sponge *Amphimedon* sp., chiral resolution of (±)-keramaphidin B, configurations, 2319
- labiatamides A-B and labiatins A-C, diterpenoids from Senegalese gorgonian *Eunicella labiata*, structures and cytotoxic activity, 2735
- macrolactin A, parent aglycone of the bioactive 24-membered macrolides from marine bacterium, synth of the C_7 - C_{20} fragment and the C_1 - C_{14} fragment, 11811, 11821
- manzamine A, oncolytic β-carboline-linked azacycle, synth of a tetracyclic substructure via Diels-Alder reaction of dihydropyridinones, 10597
- N-methylated ageliferins from calcareous sponge Astroscera willeyana, structures and chemotaxonomic relationships, 5381
- microcolins B, lipopeptide from blue-green alga *Lyngbya majuscula*, synth, 425, corrig. 3767
- naloamine and nalodional from Smaragdinella calyculata, structures, 9681
- pantofuranoids A-F, tetrahydrofuran monoterpenes from Antarctic *Pantoneura plocamioides*, structures and stereochemistry, 5899
- plakortones A-D, activators of cardiac SR-Ca²⁺ pumping ATPase, from *Plakortis halichondrioides* sponge, 377
- polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, structures and biological activities,

10997

pseudodistomin C, a sphingosine-related piperidine alkaloid from Okinawan tunicate *Pseudo*distoma kanako, synth from D-serine, 4573

ptilomycalin A, cytotoxic, antiviral and fungal from Red Sea sponge *Hemimycale* sp., synth of guanidines as intermediates from pyrrolidin-2one via N-acyliminium ion coupling with silyl enol ethers, 2603, 2629

saraines A-C, macrocyclic alkaloids from the Mediterranean sponge *Reniera sarai*, structures, 8341

storniamides A-D, peptide alkaloids from Patagonian sponge *Cliona celata*, structures, 2727 (2E)-2-tridecylheptadec-2-enal, metabolite from red alga *Laurencia* sp., synth using Baylis-Hillman adducts, 1253

vallartanone B, a γ -pyrone-containing polypropionate from the mollusc *Siphonaria maura*, synth from (S)-3-hydroxy-2-methylpropionate, 13901

volutamides A-E, halogenated alkaloids with antifeedant properties from Atlantic bryozoan *Amathia convoluta*, structures, 5371

wailupemycins A-C and 3-epi-5-deoxyenterocin, α-pyrone containing metabolites from *Strepto-myces* sp. derived from marine sediment, structures and antimicrobial activity, 8073

xenia diterpenoids containing a cyclononane skeleton from soft coral *Xenia* sp., structures, 13121

zooecdysteroid gerardiasterone from Mediterranean zoanthid *Gerardia savaglia*, synth employing asymmetric dihydroxylation of an *E*-olefin, 14515

Mass spectra

 β -1-O-acyl- β -1,2-diglucosyl glycoside, 3873

CI, GC, HR, tricyclic alkaloids from *Myrmicaria* opaciventris ants composed of pyrrolo[2,1,5-cd]-indolizines, 13539

2-deoxy-3,24-diepibrassinolide and 2-deoxy-24-epibrassinolide, 1997

EI, C₇₀Ph₁₀ and C₇₀Ph₈, 5235

ESI MS/MS, macrocyclic enaminolactams, 4363 FAB, adduct from digermirane addition with La@C₈₂, 5015

FAB, callipeltins B and C, cytotoxic peptides from the New Calidonian sponge *Callipelta* sp., 9589

FAB, coordination of alkali metal cation to oxygen functions to form adduct ion in fast atom bombardment mass spectrometry, 9017

FAB, cystinyl-cystine [-CSSCCSSCC SSC-], 9819

FAB, (*Z*)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)methyl]-4-pyridinyl]methylene]-2-thioxo-4 -thiazolidinone, 14787

FAB, imino[60]fullerenes, σ -azaridinefullerene and π -azafullaroid, 6733

FAB mass spectrometry and high resolution NMR investigation of tricolorins A-E, oligosaccharides from the resins of *Ipomoea tricolor* (Convolvulaceae), 13065

GC-MS, 1,6,17,21-octahydrobotryococcene and sacredicene, isoprenoidal hydrocarbons from sediments of Sacred Lake, Mount Kenya, 6973

LC-MS, bicyclic carbohydrate-based compds from metathesis reaction of di- and tri-substituted ω-unsaturated glucose and glucosamine derivs, 10903

MALDI-TOF, analysis of melanin formation from dopamine, DOPA, DHI or DHICA, 3947 MALDI-TOF, fullerene formation by pyrolysis of hydrocarbons, cyclopentadienide metal complexes and mellitic acid anhydride, 4949

MALDI-TOF, main-chain polymers with incorporated [60] fullerene units, 5007

methyl 9-oxo-nona-5Z,7E-dienoate, 10073 polynitro fullerenes and fullerenols, 4963

to measure noble gas release from the interior of fullerenes on heating, 5143

Mechanisms

acid-promoted ring opening of a pentacyclo-[5.4.0.0^{2.6}.0^{3.10}.0^{5.9}]undecane-spiroannulated oxetane, stereoselective intramolecular 1,5hydride transfer, 6063

of anodic oxidation of the N-cyanomethyloxazolidine system in acetonitrile at a platinum electrode, generation of a radical cation, 15127 anthraquinone photosensitised reactions of Nallylamines with α,β -unsaturated esters, synth of lactams via rearrangement of the α -aminoallyl radical, 3425

azepine-ring formation at the periphery of pyridone and pyrido[1,2-a]pyrimidone systems *via* ene reactions, mechanism, 13081, 13097, 13111

Baylis-Hillman reaction, Tetrahedron Report, 8001

cleavage of the troponoid rings of mesylate and tosylate of tropone oxime by nucleophiles, 8439

computational studies of effective asymmetric alkylation utilising a chiral Schiff base derived

- from 2-hydroxy-3-pinanone, 5961, 5971, corrig. 7807
- deprotonation of bis(phenylthio)methane and [1,3]-dithiane by NaNH₂/Et(OCH₂CH₂)₂-ONa, mechanisms, 15147
- Diels-Alder reactions of *N*-arylimines, synth of [3,4-*b*]quinolines, 955
- of dimethyl acetylenedicarboxylate addition to 1-methyl-2-vinyl pyrrole, solvent effects, 10693 disproportionation of diphenyl H-phosphonate under anhydrous basic conditions, 9931
- electrooxidation of 1-methylindole, 2-methylindole and 3-methylindole, 7947
- of electrophilic and oxidative addition of NO₂⁺-containing reagents to the propellanic C-C bond, 5857
- ene reaction of allylbenzene and 3-phenylbut-1ene with oxomalonic esters, 8827
- fluorination of 1,3-dicarbonyl compds, 1
- formation of catenanes in olefin metathesis, formed by a statistical threading process and not Möbius strip approach, 2565
- fullerene synth by pyrolysis of hydrocarbons, cyclopentadienide metal complexes and mellitic acid anhydride, 4949
- in situ reduction of oximes obtained from 1,5 dihydro-2H-pyrrol-2-ones with Raney nickel and W7 Raney nickel, prep of pyrrolo[3,2-b]-pyrrolone derivs and amines respectively, 12919
- investigation of the insertion-homolysis mechanism leading to carbon-sulfur bond formation in biosynth of penicillin using tripeptide probes containing a deuterated cyclopropane ring, 2515, 2537
- and kinetics of Vilsmeier-Haack reaction with *O*-hydroxy acetophenones, synth of 3-formyl chromones, 3669
- of methanolysis of allylic alcohols, benzylic tertiary alcohols and epoxides in the presence of a catalytic amount of ceric ammonium nitrate, 4175
- of rearrangements of hexacyclo[11.2.1.0^{2,12}.0^{5,10}. 0^{5,15}.0^{10,14}]hexadeca-6,8-diene-4,11-dione,13531 of thermal and acid-catalysed sigmatropic rearrangement of 4-(*N*-methyl-*N*-allylamino)-5-methoxy-1,2-benzoquinones and 4-(2-vinyl-aziridino or azetidino)-5-methoxy-1,2-benzoquinones, 13605
- oxime-nitrone isomerisation and hydrazone-azomethine imine isomerisation at the periphery of pyridine and pyrido[1,2-a]pyrimidine

systems, 887, 901

- of oxygen atom transfer from oxo (salen)manganese(V) complex to olefins in Mn-salen catalysed asymmetric epoxidation of olefins, 515 palladium(II)-promoted hetero-Claisen rearrangement of chiral 4,5-di-O-acetyl-2E,6E-octadiene-1,4,5,8-tetraol, generation of a 2,7-di-O-acetyl-3E,5E-octadiene-1,2,7,8-tetraol framework, 13909
- photolytic demethoxylation of 3-methoxychromones, 7855, corrig. 10265
- reaction of angularly and linearly fused 1,2- and 1,3-disubtituted [1,2,4]triazolium salts with nucleophiles, 1399
- reduction of Ag(I) by 1-acyl-2-arylhydrazines, photographic infectious development, 3961
- ring expansion of 2-oxocyclododecane-1-carbonitrile with diarylcarbodiimides, synth of macrocyclic enaminolactams, 4363
- role of heavy atom effects in Diels-Alder reactions, 14459
- route to oxazoles by reaction of acetamide (instead of ammonium acetate) with phenacyl benzoates in boiling xylene in the presence of BF₃/Et₂O as catalyst, 10131
- ruthenium-catalysed epoxidation of unfunctionalised aromatic and aliphatic olefins using t-butyl hydroperoxide as the oxidant, 12971
- SeO₂ promoted oxidative rearrangement of 2substituted oxazolines to dihydrooxazinones, 14475
- of Tempo trapping in Gif-type systems, oxidation of Tempo by Fe^V to give an oxoammonium salt and a Fe^{IV} species, 10301
- thermolysis of peroxyacetals and peroxyketals, 8263

Medium-ring carbocycles

- (+)-aromadendrene and (-)-alloaromadendrene, total synth *via* (+)-(1*S*,2*R*,4*R*,7*S*,11*R*)-7-t-butyldimethylsiloxymethyl-3,3,11-trimethyltricyclo[6.3.0.0^{2,4}]undec-8-en-10-one, 4257
- calystegine B_2 , alkaloid with a nortropanic skeleton possessing inhibitory activity against β -glycosidases, synth by intramolecular cyclisation of a polyhydroxylated 4-amino-cycloheptanone, 15137

Medium-ring heterocycles

- from ring-expansions and ring-annulations of 1,2-benzisothiazole-1,1-dioxides, 3339
- (+)-heptelidic acid, epoxylactone with antibacterial activity from fungal origin, use of 2oxo-5-isopropyl-cyclohexenecarboxylates as building blocks for EPC synth of (+)-heptel-

idic acid, 8725

Metabolites

2-hydroxy-6-[[(16R)-β-D-mannopyranosyloxy]-heptadecyl]benzoic acid, fungal metabolite with GABA_A ion channel receptor inhibiting properties, synth, 15071

L-755,807, non-peptide bradykinin binding inhibitor from an endophytic *Microsphaeropsis* sp., isolation and structure, 1481

monocerin, antifungal metabolite, synth from D-glucose using intramolecular C-glycosidation as the key step, 8535

Metalation

allylzincation and propargylzincation of various y-heterosubstituted vinyl metals, 7235

between nitrogen and silicon with t-butyl carbamate derivs of aminomethyltrialkylsilanes, 5669, 5683

of 3-chloro-6-methoxypyridazine using hindered bases as metalating agents, improvement of regioselectivity of, 10417

hydroalumination and hydrozirconation of alkynes, synth of vinylic organometallics which reacted with benzylic chlorides to yield allylated aromatics, 7265

of the pyridine nucleus at the C³-carbon atom of the methyl *ortho*-pyridinecarbonyl benzoates followed by addition of the generated lithiated species to carbomethoxy group, synth of aza-anthra-5,10-quinones, 11025

of the 2-pyridyl group of 2,2'-bipyridine or 2,4'-bipyridine in the presence of lithium 2,2,6,6-(tetramethyl)piperidine resulting in *ortho*-lithiation, 14469

trans— of ketenedithioacetal with an alkyllithium reagent, synth of an alkyl halide and a 2-indanyl-2-lithio-1,3-dithiane, 14951

transmetalation of organozirconocenes, 12853
Micelles

hydrolysis of 2-(2-nitrophenoxy)quinoxaline in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, 11665

Michael reactions

addition of lithiated chiral aminonitriles to α,β -unsaturated lactone and alkylation of the resulting compd, synth of unsubstituted and 3-substituted-4-aroyl- δ -lactones, 10083

addition of benzylphenylsulfide to protected (4S)- and (4R)-4-amino-2-penten-5-olide and to protected (2S)- and (2R)-3-dehydro-2-hydroxymethyl-5-pyrrolidone, synth of kainoids, 1931 addition reactions of vinyl sulfones derived from

allyl sulfones and cyclopentenones, synth of 6endo-methyl substituted bicyclo[2.2.1]heptane derivs, 8795

addition of ω -thiohydroxyesters to butenolides or α,β -unsaturated lactams, cyclisation to S-heterocycles and perhydrogenated thieno-[2,3-c]furan, 9035

1,4-conjugate addition-Michael [3+2] annulation process involving reaction of *N*-methylaminoquinolones with acrylate derivs, synth of pyrazolo[1,5-a]quinolines, 8471

of 5,6-dimethylenepyrimidin-4-ones with thiol nucleophiles to give thioethers, 1723

inter- and intramolecular – addition for synth of pyrrolidino[3,4-c]carbazoles, 6373

Michael additions of ethyl N-(diphenylmethylene)glycinate to ethylenic and acetylenic acceptors under solid-liquid phase transfer catalysis, 8365

1,3-Michael-Claisen annulation for prep of a Trolox analogue and Precocene II from substituted α-methylene-δ-valerolactone and 1,1-bis-(methylthio)-2-propanone or butanone, 2065

Michael-reaction initiated ring closure reactions of aziridinyl-methylenemalonates, synth of functionalised cyclopropanes, 12253

Mukaiyama-Michael reactions of ketene silyl acetals, 9409, 9419

Stille reaction of hexafluoroacetone protected L-aspartic acid chloride followed by Michael addition, synth of γ -oxo α -amino acids, 14757 tandem Wittig-Horner/intramolecular Michael reaction followed by retro Diels-Alder cleavage, key reactions in synth of 3-pyrrolines, 6943

Microwave heating

alkylation of 2,5-furandimethanol or furfuryl alcohol under microwave in solvent-free phase transfer catalysis conditions, synth of a new family of furanic ethers, 617

of alkylation of substituted benzoic acids with n-octyl bromide under solvent-free phase transfer catalysis, synth of long chain aromatic esters, 6705

for conversion of pyrrolidines fused with dihydrofuran to pyridazinones, 5819

as a method to induce localised enhancements of reaction rate, non-isothermal and heterogeneous kinetics, 5505

microwave assisted Gabriel synth of phthalides, 14995

microwave irradiation and solvent-free conditions for Diels-Alder cycloaddition of vinyl-

pyrazoles, 9237

Migration

1,2- and 1,3-O,O-silyl migration reactions of fluorine-containing monosilylated diols, synth of alkoxides stabilised by strongly electronwith-drawing fluorine-containing methyl groups, 11753 Mitsunobu reactions

dehydrative alkylation of alcohols with triethyl methanetricarboxylate under Mitsunobu conditions, 13007

Sharpless dihydroxylation and Mitsunobu alkylation of protected hexenetriol, key steps in synth of acyclic analogues of 1,5-anhydrohexitol nucleosides. 13655

Models

ab initio investigation on the reactivity of mixed LiMe/KOMe complexes as bases, model for Schlosser LICKOR superbase, 7053 intermediates in an Fe^{III} catalase model in

intermediates in an Fe^{III} catalase model in pyridine, 10313

Molecular modelling/mechanics

absolute configuration of hymenamide F, cyclic heptapeptide from marine sponge *Hymeniacidon* sp., 6355

AM1 semi-empirical, epimerisation of tilivalline, a pyrrolo[2,1-c][1,4]benzodiazepine, 13521

amine and aminoalcohol amide and α -ketoamide derivs as inhibitors of serine proteases α -chymotrypsin and subtilisin Carlsberg, 4199 conformational analysis of 1,1,10,10-tetramethyl-[3.3]metacyclophane-2,11-dione, 2847

conformational study of acid cyclisation of 5-ketogermacren-6,12-olides, 11827

conformations of 1,3,4-trisubstituted pyrrolidin-2-ones, 1069

design, carbanion geometry, reactivity and prep of chiral alkyl bicyclic phosphonamides, conversion to α -substituted α -methyl and α -phenyl phosphonic acids, 13837

effect of alkali cations on the methoxide ion addition to corands incorporating a thiopyrylium ring, 3509

electronic effects and steric hindrance in complexation of macrolactones and crown ethers with alkali cations and Hg(SCN)₂, 3683 enantiotopomerisation and conformational analysis of hindered aryl alkyl ketones investigated by dynamic and solid state NMR, 2471

MM2 force field parameterisation, modelling and structure prediction of salen-type monomeric and hydrogen-bonded dimeric manganese complexes, 10193

MMX and Altona relationship for conformatio-

nal study of β -hydroxy sulfones, bioisosteres of oxisuran metabolites, 11239

modelling (MNDO, AM1, PM3, SAM1 and ab initio) of isothiazolo[5,4-b]pyridin-3(2H)-one derivs, 8947

modelling and NMR study of canadensene, baccatin III, paclitaxel and taxa-4(5),11(12)-diene, 8957

modelling studies on cystinyl-cystinyl-cystine [-CSSCCSSCC], 9819

molecular modelling of electrophilic additions to di- and trisubstituted cyclopentenes, synth of polysubstituted cyclopentanes, 3355

Monte Carlo and restrained molecular dynamics calculations using AMBER force field, conformational and configurational analyses of lyciumin A, 2795

QSAR correlation for brassinosteroid analogues with a 2β , 3β -diol and a A/B cis and trans ring junction, 2435

quantum mechanical calculations AM1 for [28]-tetraoxaporphyrinogen(6.0.6.0), 11763

see also Theoretical calculations

Molecular recognition

interactions of desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics) with cyclodextrins studied by gas chromatography and NMR, 319

see also Receptors

Molybdenum and compds

labile pentacarbonylchromium and pentacarbonylmolybdenum complexes for metal-assisted cyclisation of alkynols, synth of oxolenes and furans, 1617

Mukaiyama reactions

Mukaiyama aldol vs hetero Diels-Alder pathways in reaction of monoactivated dienes with aldehydes, effect of Lewis acid, 2167

Mukaiyama cyclisation for construction of 9substituted Δ^5 -octenolides, synth of 8-deoxypseudo-Ascidiatrienolide C, 2113

Mukaiyama-Michael reactions of ketene silyl acetals, 9409, 9419

Naphthalenes

acenaphth[1,2-a]acenaphthylene, [4+2]cycloaddition reactions with various dienes, 14777 benzo and naphtho-dihydrofuran derivs by reaction of 2-alkoxy-2-fluoro-glycosyl fluorides with phenol and naphthol derivs, 7797

1,1'-bi-2-naphthols by oxidative coupling of 2-naphthols suspended in aqueous Fe³⁺ solu-

- tions, 1005
- chiral binaphthol-derived titanium complex as catalyst for carbonyl-ene and aldol reactions with fluoral, 85
- 1,8-di(3'-pyridyl)naphthalene, synth by coupling of 1,8-dibromonaphthalene and diethyl(3-pyridyl)borane, atropisomerism of, 8703
- dibenzo[c,h]-1,5-naphthyridines (11-aza-benzo-[c]phenanthridines), synth by nitration, reduction, amidification and subsequent cyclisation of substituted 2,3-diarylacrylazides, 10427
- 1,5-dibromo-2,6-dihydroxynaphthalene.coupling with alkali 2-naphthoxide, synth of *cis* and *trans*-1,1':5',1"-ternaphthyls, effects of counterion coordination and hydrogen bonding on stereoselectivity, 11013
- diepoxins, spiroketal-linked naphthodiepoxydecalinones from fungus LL-07F275 which grows as a mycelium sterilium, stereochemistry of, 435
- [1,1-difluoro-1-[2-(4-hydroxynaphthalenyl)]met hyl]phosphonic acid, an inhibitor of proteintyrosine phosphatase, design and synth, 9963
- epoxy-derivatives of tetrahydro- and hexahydromethanonaphthalenes, crystal density modelling, 9703
- furonaphthyridinones by selective β -scission of cyclobutanoxyl radicals generated from [2+2] photoadducts of 4-hydroxy-1-phenyl[1,8]-naphthyridin-2(1H)-one with alkenes, 6125
- hydroxynaphthalenephosphonates by rhodium-(II) acetate catalysed decomposition of α -diazo- β -keto- γ , δ -alkenyl- δ -aryl compds, 10455 jozimine A and pindikamine A, naphthyliso-quinoline alkaloids, synth and antimalarial activity of, 13409, 13419
- naphtho-anellated [5.6.5]- and [6.5.5.5]fenestranes, synth using cyclodehydration route *via* 1,3-indandiols, 13167
- 5-(α-naphthyl)- and 5-(β-naphthyl)indolizidines, potential dopamine analogues and non-opiate antinociceptive agents, synth by intramolecular Schmidt reaction of azides with tertiary alcohols, 12039
- L-Ser-\(\beta\)-naphthylamide, enzymatic acylation of by lipoprotein lipase from *Pseudomonas specie*, solvent effect on chemoselectivity, 4867
- pyrrolo[3,4-b]- and [3,4-c]pyridin(on)es and related 1,7-naphthyridinones and 2,7-naphthyridines, synth by Diels-Alder reaction of 2(H)-pyrazinones, 9161
- reaction with N,N-dimethylacrylamide-triflic

- anhydride followed by hydrolysis, synth of dihydrophenalen-1-ones, 12993
- substituted 1-methyl- and 2-methylnaphthalenes, synth through 1,2-addition of the corresponding α -lithio- o or m-xylenes onto α -oxoketene dithioacetals followed by cyclodehydration of the resulting carbinols, 14049
- substituted 3,4-dihydro-1(2H)-naphthalenones, synth from 1-alkenylbenzocyclobutenols by successive thermal 4π and 6π electrocyclisations, 2235
- 1-tetrathiafulvalenylnaphthalene, synth and X-ray crystal structure, 4745

Natural products

- (+)-aromadendrene and (-)-alloaromadendrene, total synth *via* (+)-(1*S*,2*R*,4*R*,7*S*,11*R*)-7-t-butyldimethylsiloxymethyl-3,3,11-trimethyltricyclo[6.3.0.0^{2,4}]undec-8-en-10-one, 4257
- caryophyllene, cleavage of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- exo- and endo-7,8- and 6,7-epoxyhomotropanes, synth and approach to synth of scopine and pseudoscopine, 11977
- [6]-gingerol derived from natural ginger, total synth of chiral difluorinated gingerol using (*R*)-and (*S*)-(-)-ethyl 2,2-difluoro-3-hydroxyoctanoates as intermediates, 157
- see also Alkaloids, Antibiotics, Marine metabolites, Steroids and sterols, Terpenes and terpenoids, and other classes

Nickel and compds

- Raney nickel and W7 Raney nickel for *in situ* reduction of oximes obtained from 1,5 dihydro-2*H*-pyrrol-2-ones, prep of pyrrolo[3,2-*b*]-pyrrolone derivs and amines respectively, mechanisms, 12919
- chiral Ni(II) complex of glycine, asymmetric aldol reaction with trifluoromethyl ketones, stereocontrolling effect of the trifluoromethyl group, 12433
- dinuclear nickel(II) complexes, synth and use in epoxidation of unfunctionalised alkenes, 3521 nickel(II) catalysed hydroxylation of 1,3-dicarbonyl compds by dimethyldioxirane, 5799

Nitration

- of 1-aryl(or 1-benzyl)pyrroles, synth of 1-aryl-(or 1-benzyl)- 2-nitropyrroles, 4485
- N-de- of nitramines by dihydronicotinamides, synth of free amines, 9655
- of variously substituted 2,3-diarylacrylazides to 3-aryl-4-nitro-isoquinolones, subsequent reduction, amidification and cyclisation yields di-

benzo[c,h]-1,5-naphthyridines, 10427

Nitrenes

nitrene addition to C_{60} , synth of [6,5] aza-annulenes, 5257

Nitrenium ions

flash photolysis generation and reactivities of carbenium ions and nitrenium ions, 6823

Nitrile oxides

- benzonitrile oxide cycloaddition to pyridazine, pyrimidine and pyrazine, 6421
- 1,3-cycloaddition to 2(5H)-furanones substituted at the 5-position by sulfur bearing groups, synth of furoisoxazole which are synthons for heteroanthracyclinone analogues, 3457
- 3,5-dichloro-2,4,6-trimethyl- and 2,4,6-trimethylbenzonitrile oxide, 1,3-dipolar cycloaddition of polycyclic aromatic hydrocarbons with, 13027
- (diisopropoxyphosphoryl)nitrile oxide, dipolar cycloadditions with functionalised cyclopropenes, 8877
- 1,3-dipolar cycloaddition to C_{60} , synth of fullerene-fused isoxazoline heterocycles bearing a series of different substituents in the 3-position, 5043
- intramolecular nitrile oxide cycloaddition of substituted amido-oximes and subsequent reduction, synth of functionalised 3,4-dehydropyrrolidin-2-one and 1,2-dehydropyrrolizidine-3-one, 14323

Nitriles

- 3-acetoxy-2-methylenealkanenitriles, triethyl phosphite addition to, synth of (2E)-2-(diethoxyphosphorylmethyl)alk-2-enenitriles, 2261
- 3-aryl substituted α, β -unsaturated esters and nitriles, electroreductive acylation in the presence of aliphatic carboxylic anhydrides, 1943
- of α-azidoacetonitriles α-phenyl substituted with triphenylphosphine, synth of phosphazine, an aminophosphonium carbanion salt and a phosphazide, 9629
- 3-(benzothiazol-2-yl)-3-oxopropanenitrile, synth from ethyl 2-benzothiazolecarboxylate or from 2-bromoacetylbenzothiazole, reactivity with diazonium salts, aromatic amines and hydrazines, 7893
- by reaction of an aromatic primary amine, copper(I) cyanide and an alkyl nitrite in DMSO, 7137
- conjugated thiolato(selenolato)nitriles, reaction with N-cyanochloroacetamidine provides products which can be involved in the Thorpe reac-

- tion resulting in diaminopyrimidines via enaminocyanamidines, 1011
- 1-(diphenylmethylene)amino-1-cyclopropanecarbonitrile, borane-induced reductive ringexpansion reaction of, synth of *trans*-1,2diaminocyclobutane, 2421
- (S)-hydroxynitrile lyase from *Hevea brasiliensis* for conversion of aldehydes to cyanohydrins, 7833
- 2-oxocyclododecane-1-carbonitrile, ring expansion reaction with diarylcarbodiimides, synth of macrocyclic enaminolactams, 4363
- photo-excited 1,2,4,5-benzenetetra carbonitrile as oxidant to determine chemical reactivity upon single electron transfer of some common solvents, 1785
- saturated nitriles by reduction of α,β -unsaturated nitriles and α -halonitriles with sodium hydrogen telluride, 8611
- as solvents for prep and reactions of samarium diiodide, 14225
- substituted o-aminonitrile pyridine derivs, reaction with phosgeniminium chloride, synth of 7-oxa(or thia)-3,4,6-triazabenz[d,e]anthracene and 7-oxa-3,4,6,9-tetraazabenz[d,e]anthracenes, 10497

see also Cyano compds, Cyanohydrins

Nitrilium ions

hydroxynitrilium ions from 1-arylamino-1-methylthio-2-nitroethene in triflic acid, 9509

Nitro compds

- α-acetoxynitro compds, condensation with isocyanoacetonitrile using DBU in THF, synth of 2-cyano-3,4-substituted pyrroles and subsequent 4 step conversion to porphobilinogen, 14689
- 1-aryl-2-nitropyrroles, synth and reactions of, conformation of ethyl *N*-[2'-[1'-(2-nitropyrrolyl)]phenyl]-*N*-toluene-4-sulfonamide glycinate, 4485
- 3-aryl-4-nitro-isoquinolones by nitration of 2,3-diarylacrylazides, subsequent reduction, amidification and cyclisation yields dibenzo-[c,h]-1,5-naphthyridines, 10427
- 1-arylamino-1-methylthio-2-nitroethene,intriflic acid yields a conjugated dication with aryliminium and hydroxynitrilium sites, 9509
- 3,4-dinitrothiophene, ring opening with diethylamine to 1,4-bis(diethylamino)-2,3-dinitro-1,3-butadiene, subsequent Grignard reactions give 2,3-diaminobutanes via dinitrobutadienes, 3313
- 3-fluoro-4-chloronitrobenzene and 3,5-difluoro-4-chloronirobenzene, S_NAr reactions of with

hard and soft nucleophiles, effect of activating nitro group, 2557

- methoxy substituted polynitrophenyl and -biphenyl systems, chloro- and bromo-demethoxylation of, 5639
- nitramines, N-denitration of by dihydronicotinamides, synth of free amines, 9655
- 1-nitro-2-propanol as starting material for pheromones wih spiroketal structure of *Bactro*cera nigrotibialis, Andrena wilkella and Andrena haemorrhoa F, 6139
- β -nitroalcohols, synth by Amberlyst A-21 catalysed Henry reaction, 1677
- nitroalkane solvents, effect on asymmetric hetero Diels-Alder and ene reactions of alkyl glyoxylates with dienes, 7287
- nitroalkenes, tandem intermolecular [4+2]/ intramolecular [3+2] cycloaddition of – bearing a pendant olefin, synth of nitroso acetals which lead to fused pyrrolidines after hydrogenolysis, 11579
- nitroarenes, photochemical reactions in the presence of arylalkenes, synth of nitrones, 14253
- nitroarenes, reaction with carbanions of fivemembered S-heterocycles via the ring-opening vicarious nucleophilic substitution reaction, 3189
- (N-(p-nitrobenzenesulfonyl)imino)phenyliodin ane, rhodium(II)-catalysed decomposition of in the presence of olefins, 1543
- 4-nitroimidazoles, 4-nitropyrazoles and 3-nitropyridines, reduction by sodium borohydride or sodium borodeuteride, synth of oximes of 4imidazolidinones and azoxy compds, 9541
- 2-(2-nitrophenoxy)quinoxaline, synth from 2chloroquinoxaline, investigation of the basic hydrolysis in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, 11665
- 3a-(O-nitrophenyl)octahydroindol-4-ones, synth by ozonolysis and reductive amination of 2-allyl-2-(O-nitrophenyl)-1,3-cyclohexanedione, 4013
- α-nitrostyrenes, 1,4-conjugate addition of the Reformatsky reagent to –, synth of ethyl 3-aryl-4-nitrobutanoates, 1425
- polynitro fullerenes by nitrogen dioxide radical addition to C₆₀, subsequent hydrolysis gave the corresponding fullerenols, 4963
- substituted 2-nitro-1,3-dienes, generation and cycloaddition reactions of, 9275

Nitrogen heterocycles

- azepine-ring formation at the periphery of pyridone and pyrido[1,2-a]pyrimidone systems *via* ene reactions, mechanism, 13081, 13097, 13111
- azirene, cyclopropenyl anion, oxirene and thiirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709
- bicyclic nitrogen heterocycles, construction by the molybdenum alkylidene-catalysed metathesis of α, ω -dienes, 7251
- by cascade radical cyclisation of imines, 11445 by intramolecular palladium-catalysed aryl amination and aryl amidation, 7525
- 2a,4a-diazacyclopenta[c,d]azulene, synth from 3-aryl-6,7,8,9-tetrahydro-5H-imidazo[1,2-a]aze pines by reaction with phenacylbromides and subsequent cyclisation, 9835
- five- and six-membered heterocycles, reductive opening of, synth of nitrogen-containing remote functionalised organolithium compds, 8545
- S-heterocycles by addition of ω -thiohydroxyesters to butenolides or α,β -unsaturated lactams, 9035
- mono- and dialkylsubstituted 1,10-phenanthrolines, synth from *o*-anisidine derived 8-amino-quinolines, 2937
- pyrrolopyridazine heterocycles, synth by 3+2cycloadditions of 3-(4-halogenophenyl)pyridazinium ylids to acrylate and propiolate of ether. 8853
- see also Lactams, and the individual ring systems

Nitrones

- aldonitrones by mercury(II) oxide oxidation of unsymmetrical N,N-disubstituted hydroxylamines, 14917
- alkenyl nitrones, reaction with phenylselenenyl bromide to yield ring closure products, synth of 1,2-oxazines and N-unsubstituted-1,2-oxazines via iminium salts, 6811
- benzazepine-based nitrones, synth utilising a modified Bischler-Napieralski reaction as the key step, cyclic analogues of the radical trap phenyl t-butyl nitrone, 6519
- homochiral cyclic nitrones derived from 1deoxynojirimycin, 1,3-dipolar cycloaddition with phenyl isocyanate and trichloroacetonitrile as dipolarophiles, 4467
- intramolecular nitrone cycloaddition starting

from β -enamidoaldehydes and subsequent reductive ring-opening of the resulting fused δ -lactam, synth of isomerically functionalised piperidine systems, 14311

nitrone derived from 2-(cyclohexen-3-yloxy)-benzaldehyde, cycloaddition of using (R)-α-phenylethylamine as a chiral auxiliary, synth of (9-amino-substituted) 1,2,3,4,4a,9a-hexahydro-9H-xanthen-1-ols, 11849

synth by photochemical reaction of aromatic and heteroaromatic nitroderivs in the presence of arylalkenes, 14253

Nitroso compds

acyl nitroso dienophiles, Diels-Alder reactions with N-dienyl-L-pyroglutamic esters, 3283

for cycloaddition of 2-azadienes, toward the synth of α -amino acid derivs, 7585

nitroso acetals, synth by tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of nitroalkenes bearing a pendant olefin, 11579

N-nitrosochloroethyl-cephalosporin carbamate, prodrug for antibody-directed enzyme prodrug therapy (ADEPT), synth via acylation and selective nitrosation of a cephalothin deriv, 5983 see also Nitrosamines

Nitroxides

nitronyl nitroxide or imino nitroxide radical units linked to thieno[2,3-b]thiophene and thieno[2,3-b]thieno[3',2'-d]thiophene chromophores, intramolecular spin-interactions between, 6893

NMR

carbon, nOe, proton, secoxanthoplanine, dehydroisocorydione, 11,8'-bisisocorydine, (8,8'-R)- and (8,8'-S)-bisocorydine from leaves of *Dehaasia triandra*, 6561

carbon, antifouling sesquiterpene isocyanides, 9447

carbon, 1,2-(3-aryl-2-arylimino-tetrahydro-thiazolo)-[60]fullerenes, 8733

carbon, asymmetric protected 2-oxo-5-isopropylcyclohexenecarboxylates, 1221

carbon, COLOC, COSY, HETCOR, proton, 118-hydroxy-gon-4-en-3-ones, 4495

carbon, COLOC, COSY, HETCOR, storniamides A-D, peptide alkaloids from sponge *Cliona celata*, 2727

carbon, COLOC, COSY, proton, products from cleavage of the troponoid rings of mesylate and tosylate of tropone oxime by nucleophiles, 8439

carbon, COLOC, HMBC, HMQC, proton,

adducts from addition of Grignard reagents to N,N'-dibenzylated 2-purinones, 12979

carbon, COSY, DEPT, HETCOR, HMBC, proton, dolabriferol, polypropionate from anaspidean mollusc *Dolabrifera dolabrifera*, 12831

carbon, COSY, DEPT, HETCOR, nOe, proton, doubly-caged sterically-congested tetraol, 6325 carbon, COSY, DEPT, HMBC, HMQC, NOESY, proton, L-755,807, non-peptide brady-kinin binding inhibitor from an endophytic *Microsphaeropsis* sp., 1481

carbon, COSY, DEPT, HMBC, HSQC, NOESY, proton, dorisenones, cytotoxic spongian diterpenoids from nudibranch *Chromodoris obsoleta*, 8187

carbon, COSY, DEPT, HMQC, nOe, proton, solution conformations of vitamin D metabolites and analogues, 1239

carbon, COSY, DEPT, HOHAHA, NOEDF, NOESY, proton, 1,6,17,21-octahydrobotryococcene and sacredicene, isoprenoidal hydrocarbons from sediments of Sacred Lake, Mount Kenya, 6973

carbon, COSY, DEPT, NOESY, proton, 4-oxa- 5α - and 4-oxa- 5β -androstan-17-ones, study of shielding effect of ether C-O bond obtained from proton chemical shifts, 2325

carbon, COSY, HETCOR, NOESY, proton, protected bicyclic oxamazin, 4225

carbon, COSY, HETCOR, proton, investigation of azo-hydrazone for FD&C yellow N° 6, 5691 carbon, COSY, HETCOR, proton, TOCSY, reptansterone, 28-epi-sengosterone, 5,29-dihydroxycapitasterone, 2- and 3-dehydroajugalactone, 10137

carbon, COSY, HMBC, HMQC, briareolate esters and briareolides from *Briareum* asbestinum, 9953

carbon, COSY, HMBC, HMQC, HOHAHA, NOESY, proton, microviridins D-F, 8159

carbon, COSY, HMBC, HMQC, nOe, NOESY, proton, ROESY, dichotomins A-E, cyclic peptides from roots of *Stellaria dichotoma*, 1165

carbon, COSY, HMBC, HMQC, nOe, proton, plakortones A-D from *Plakortis hali-chondrioides* sponge, 377

carbon, COSY, HMBC, HMQC, nOe, proton, spirotryprostatins A and B from Aspergillus fumigatus, 12651

carbon, COSY, HMBC, HMQC, NOESY, proton, kawaguchipeptin A from cyanobac-

- terium Microcystis aeruginosa, 9025
- carbon, COSY, HMBC, HMQC, NOESY, proton, taxuspines K-M from the stems of Japanese yew *Taxus cuspidata* Sieb. et Zucc, 2337
- carbon, COSY, HMBC, HMQC, proton, echinotinctone (2,6-dihydroxy-1,8-dimethyl-3*H*-xanthen-3-one), 5783
- carbon, COSY, HMBC, HMQC, proton, TOCSY, tricolorins A-E, oligosaccharide phytogrowth inhibitors from the resins of *Ipomoea tricolor* (Convolvulaceae), 13065
- carbon, COSY, HMBC, HMQC-HOHAHA, proton, brasilinolide A, 9031
- carbon, COSY, HMBC, HSQC, proton, hymenamide F, cyclic heptapeptide from marine sponge *Hymeniacidon* sp., 6355
- carbon, COSY, HMBC, INEPT, nOe, proton, tonkinenin A, polyoxygenated cyclohexane deriv from *Uvaria tonkinensis*, 12373
- carbon, COSY, HMBC, nOe, proton, africanane, seco- and nor-seco-africanane, guaiane and germacrane type sesquiterpenoids from the liverwort *Porella swartziana*, 6339
- carbon, COSY, HMBC, nOe, proton, wailupemycins A-C and 3-epi-5-deoxyenterocin, α-pyrone containing metabolites from Streptomyces sp., 8073
- carbon, COSY, HMBC, NOESY, proton, aeruginosin 102-A, 14501
- carbon, COSY, HMBC, NOESY, proton, taxuspines Q-T, 12159
- carbon, COSY, HMBC, NOESY, proton, taxuspines U-W from the Japanese yew *Taxus cuspidata*, 13145
- carbon, COSY, HMBC, NOESY, proton, tricyclic alkaloids from *Myrmicaria opaciventris* ants composed of pyrrolo[2,1,5-cd]indolizines, 13539
- carbon, COSY, HMBC, proton, clathramides A and B, alkaloids from *Agelas clathrodes*, 13713 carbon, COSY, HMBC, proton, erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge *Erylus cf. lendenfeldi*, 7921
- carbon, COSY, HMBC, proton, naloamine and nalodional from *Smaragdinella calyculata*, 9681 carbon, COSY, HMQC, HOHAHA, proton, ROESY, glycosphingolipid composition of the marine sponge *Agelas dispar*, 1573
- carbon, COSY, HMQC, NOESY, proton, solandelactones A-I from Solanderia secunda, 10583

- carbon, COSY, HOHAHA, proton, polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, 10997
- carbon, COSY, nOe, proton, $C_{70}Ph_{10}$ and $C_{70}Ph_{8}$, 5235
- carbon, COSY, nOe, proton, ROESY, A90720A, cyclic depsipeptide from the terrestrial blue-green alga *Microchaete loktakensis*, 395
- carbon, COSY, nOe, proton, xenia diterpenoids from soft coral *Xenia* sp., 13121
- carbon, COSY, NOESY, proton, determination of charge distribution and reactivity of benzanthrenyl and 1-hydroperyllenyl anions, 2647
- carbon, COSY, NOESY, proton, jaspiferals A-G, cytotoxic compds from *Jaspis stellifera*, 5745
- carbon, COSY, NOESY, proton, metabolites with C₁₃ skeletons from *Baeckea frutescens*, 9735
- carbon, COSY, proton, glycopeptides related to HIV gp120 and mucins, 7983
- carbon, COSY, proton, volutamides A-E, halogenated alkaloids from Atlantic bryozoan Amathia convoluta, 5371
- carbon, DEPT, 6-deoxy-6-iodo- α,β -D-fructose, 1549
- carbon, determination of acidity constants of ¹³CO₂H-labelled adipic, succinic and malonic acids, 5319
- carbon, DQFCOSY, HMBC, HMQC-HOHAHA, proton, haliclonacyclamines A and B *Haliclona* sp., 9111
- carbon, DQFCOSY, HMQC, NOESY, proton, TOCSY, canadensene, baccatin III, paclitaxel and taxa-4(5),11(12)-diene, 8957
- carbon, *erythro* and *threo*-1-aryl-1,2-diols, 1085 carbon, (±)-geissoschizine, 6803
- carbon, HETCOR, nOe, proton, chlorin e_6 amide, 849
- carbon, HETCOR, NOESY, proton, benzo and naphtho-dihydrofuran derivs, 7797
- carbon, HETCOR, proton, benzylidene-2-thiophthalide, 11867
- carbon, HMBC, HMQC, nOe, proton, ROESY, triterpene dimers from *Maytenus scutioides* (Celastraceae), 9597
- carbon, HMBC, HMQC, NOESY, proton, quadrupolar [1₄]azolophanes built up from heterocyclic betaine subunits, 15171, 15189, 15197

- carbon, HMBC, HMQC, NOESY, proton, taxuspines N-P, taxoids from Japanese Yew *Taxus cuspidata*, 5391
- carbon, HMBC, nOe, NOESY, proton, ROESY, pusilatins A-D, apigenin 7-O-β-D-glucoside, shikimic acid and five orsellinic acid derivs from liverwort Blasia pusilla L., 14487
- carbon, HMBC, NOESY, proton, agardhipeptins A and B, 13129
- carbon, HMBC, NOESY, proton, didesmethylrocaglamide, aglains A-C, aglaforbesins A-B, ethylrocaglaol and forbaglins A-B from *Aglaia* argentea and *Aglaia forbesii*, 6931
- carbon, HMBC, NOESY, proton, papyracillic acid, 10249
- carbon, HMBC, proton, 6-endo- and 5-exodigonal cyclisation of o-hydroxyphenyl ethynyl ketones, 9427
- carbon, HMBC, proton, products from photochemical reaction of cyclosilanes and cyclogermane with C_{60} , 4995
- carbon, 25-hydroxy-brassinolide and 25-hydroxy-24-epibrassinolide, 10653
- carbon, keramaphidin B (pentacyclic alkaloid) and manzamine L (β-carboline alkaloid), 2319
- carbon, labelling studies on the biosynthesis of coloradocin, antigonorrheol and antianaerobic antibiotic produced by fermentation of *Actinoplanes coloradoensis* sp., 10327
- carbon, low-temperature photooxygenation of coelenterate luciferin analogue, 12061
- carbon, macrocyclic dioxa-, dithia-, diazatetralactams and derivs, 9793
- carbon, of natural glucosides and fluorogenic substrates for β -glucosidases with high density plant cell cultures, 925
- carbon, 3a-(O-nitrophenyl)octahydroindol-4-ones, 4013
- carbon, nOe, proton, glycoamidines, 9263
- carbon, nOe, proton, labiatamides A-B and labiatins A-C, diterpenoids from Senegalese gorgonian *Eunicella labiata*, 2735
- carbon, nOe, proton, N-methylated ageliferins from calcareous sponge Astroscera willeyana, 5381
- carbon, nOe, proton, pantofuranoids A-F, 5899 carbon, nOe, proton, products from alcoholysis of caryophyllene oxide catalysed by tetracyanoethylene, 7961
- carbon, nOe, proton, spirodienones from oxidation of phenolic dibenzylbutyrolactones, 1303 carbon, nOe, proton, thuriferic and epithuriferic

acid, 4903

- carbon, nOe, proton, tripodal iron chelating agents based on 8-hydroxyquinoline linked by tris(2-aminoethylamine), 4659
- carbon, NOESY, proton, callipeltins B and C, cytotoxic peptides from the New Calidonian sponge *Callipelta* sp., 9589
- carbon, NOESY, proton, fourteen terpenoids from marine sponge *Acanthella cavernosa*, 2359 carbon, 1-(1-octynyl-1,9-dihydrofullerene-60 and (1-octynyl)fulleride ion, 5077
- carbon, phosphorus, fluxional behaviour of cyclenphosphine sulfide, 2995
- carbon, polynitro fullerenes and fullerenols, 4963
- carbon, proton, 7-alkylbicyclo[3.3.1]-non-6-en-3-ones, 5867
- carbon, proton, (4*R*,5*R*)-4,5-bis(alkylcarbamoyl)-1,3-dioxolanes, 8275
- carbon, proton, aromin, aromicin and aromin-15,20 diacetate, 4215
- carbon, proton, 3-azarutecarpine (1-azanaucle-fine) and its 7-methyl deriv, 7789
- carbon, proton, trans-azetidin-2-ones, 1685
- carbon, proton, [[(benzo[15]crown-5)-4-yl]methano][60]fullerene, 4949
- carbon, proton, bromotyrosine deriv from Caribbean sponge Aplysina archeri, 9863
- carbon, proton, conjugated dication with aryliminium and hydroxynitrilium sites from 1-arylamino-1-methylthio-2-nitroethene, 9509
- carbon, proton, dihydroxy-3-friedelanone triterpenes from the Cameroonian medicinal plant *Lepidobotrys staudtii*, 14989
- carbon, proton, 2,7-dimethyl-2*H*-azepine and 2,7-dimethyl-3*H*-azepine, 10883
- carbon, proton, (Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)methyl]-4-pyridinyl]methylene]-2-thioxo-4-thiazolidinone, 14787
- carbon, proton, hydroxynaphthalenephosphonates from rhodium(II) acetate catalysed decomposition of α -diazo- β -keto- γ , δ -alkenyl- δ -aryl compds, 10455
- carbon, proton, indolocarbazole alkaloids K-252a and ring contracted product of TAN-1030A, 1235
- carbon, proton, methyl and allyl α-D-mannopyranoside derivs, 10785
- carbon, proton, 1-methyl-7,7-dimethyl-2,4-diaza-bicyclo[4.2.0]-octa-1,5-diene-3-one,10159 carbon, proton, mono- and dialkylsubstituted 1,10-phenanthrolines, 2937

carbon, proton, (3R)-piperazic acid trifluoro-acetic acid salt, 1047

- carbon, proton, polyether dendritic sectors, prep by a convergent approach from 4-t-butylphenol, phloroglucinol and 1,3-dibromopropane, 4277
- carbon, proton, porphyrins with four azole substituents and complexation studies of *meso*tetrakis-(1-benzylpyrazol-4-yl)-porphyrin with Zn(II) and Co(III), 10811
- carbon, proton, products from deacetylation and hydroxylation of $2\alpha,5\alpha,10\beta,14\beta$ -tetra-acetoxy-4(20),11-taxadiene by the fungus *Cunninghamella echinulata*, 8739
- carbon, proton, ROESY, stereochemistry of C-1 in ginkgolide B and C, 4505
- carbon, proton, saraines A-C, macrocyclic alkaloids from the Mediterranean sponge *Reniera* sarai, 8341
- carbon, proton, stereodynamics of a series of *N,N*-dialkyl-9-triptycylamines, 12409
- carbon, proton, (2S,4R,5R)-4,5,6-trihydroxynorleucine and 5-hydroxynorvaline, 12911
- carbon, proton, two new hydroxystilbenoids named vitisin C and viniferal from *Vitis* coignetiae, 9979
- carbon, proton, 1-ureido-3-propargyl-2,3-dihydropyrrol-2-ols, 1-ureido-3-propargyl-pyrroles and 1-ureido-3-propargyl-3-phosphono-1*H*-pyrrol-2(3*H*)-ones, 3997
- carbon, pyrrolylpyridines, alternating pyrrole:pyridine oligomers and polymers and related systems, 8707
- carbon, stable isotope incorporation evidence for the *de novo* biosynth of terpenoic acid glycerides from dorid nudibranchs *Archidoris* odhneri and *A. montereyensis*, 6869
- carbon, 5-substituted 2-oxo-cyclopentanecarboxylates, 971
- carbon, tetracyclic and pentacyclic apogeissoschizine-type compds, 8601
- carbon, $(2\alpha,3\alpha,22S)$ -trihydroxy- 5α -cholestan-6-one and $(2\alpha,3\alpha,22R)$ -trihydroxy- 5α -cholestan-6-one, 5525
- COSY, NOESY, 4-oxo-L-pipecolic acid derivs, 14757
- COSY, proton, oligodeoxynucleotide pentadecamers containing two octylphosphonate linkages with stereoregular or stereorandom chirality, 10011
- COSY, cis-2-[4-(9H-purin-9-yl)-2-cyclopenten-1-yl]ethanol analogues, 2789

deuterium, 4-(4-hydroxyphenyl)-2-butanone (Raspberry ketone), 4041

- deuterium, study of organolithium stabilisation by silicon and by phenyl in solution, 5683
- dynamic and solid state NMR for the investigation of enantiotopomerisation and conformational analysis of hindered aryl alkyl ketones, 2471
- fluorine, nOe, proton, tin, 1-fluoroolefins from (E)- and (Z)-fluorovinyl sulfones, 45
- fluorine, proton, fluorinated phenylrhodopsin analogues, binding selectivity and restricted rotation, 109
- fluorine, proton, study of interactions of cyclodextrins with desflurane, isoflurane, enflurane and analogues (fluoroether anesthetics), 319
- fluorine, proton, 4- and 6-trifluoromethyl-3cyano-2(1H)-pyridinethiones, 10841
- fluorine, to follow fluorination of 1,3-dicarbonyl compds, 1
- lithium, proton, opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025
- magic angle spinning, monitoring of a three-step solid phase synth involving a Heck reaction, 12209
- nOe, products from asymmetric alkylation of bicyclic oxazinones based on D-glucopyranose, 8685
- nOe, proton, 4-aryl-1,4-dihydropyridine calcium channel antagonists, 9665
- nOe, proton, dolasta-1(15),8-diene and derivs, 1549
- nOe, proton, pyrrolo[3,2b]pyrrolone derivs, 12919
- nOe, proton, 1,3,4-trisubstituted pyrrolidin-2-ones, 1069
- NOESY, 1,3,2-oxazaphospholanes, 13783
- NOESY, proton, 2,3- and 2,5-disubstituted pyrroles from reaction of 1-substituted vinamidinium salts with sarcosine and glycine ethyl esters repectively, 6879
- phosphorus, mechanism of disproportionation of diphenyl H-phosphonate under anhydrous basic conditions, 9931
- phosphorus, proton, pyridylaminophosphonates and quinolyl phosphonate, 12483
- proton, *trans* 2-(*N*-acylamino)-1-arylthio-cyclohexane, 7817
- proton, 2-(12'-aminotridecyl)-pyrrolidine, defensive alkaloid from the Mexican bean

- beetle Epilachna varivestis, 6859
- proton, calcichrome (calcion) complexes with α -, β and γ -cyclodextrins in water, 10979
- proton, calix[6]arene bridged by an aniline, 10879
- proton, calixarene based macrocycles consisting of three to eight calix[4]arene subunits, 12399 proton, carbon, COSY, HMQC, proton, β -1-O-acyl- β -1,2-diglucosyl glycoside, 3873
- proton, conformational analysis of bryostatin 10, marine antinoplastic compd from *Bugula neritina*, 2369
- proton, conformational study of β -hydroxy sulfones, bioisosteres of oxisuran metabolites, 11239
- proton, cystinyl-cystine [-CSSCCSS CCSSC-], 9819
- proton, 2-dehydro-3-deoxy-20-hydroxyecdysone, 3-deoxy-20-hydroxyecdysone and 2-*epi*-3-deoxy-5α-20-hydroxyecdysone, 10673
- proton, 2-deoxy-20-hydroxyecdysone and derivs, 12623
- proton, determination of the absolute configuration of chiral carboxylic acids, 9841
- proton, p-diallylcalix[4]arenes and diallylbis(arylazo)calix[4]arenes, 9805
- proton, (2,6-dichlorophenyl)bis(2,4,6-trichlorophenyl)methyl radical, 7013
- proton, (22R)-30a,30b-dihomohopan-30b-yl and tetrahymanyl esters of pyrophaeophorbide a, 13427
- proton, 3,4-dihydroisoquinolines, 2-alkyl(acyl)-1(2H)-3,4-dihydroisoquinolinones, 2-alkyl-1(2H)-isoquinolinones and 1-alkyl-2(2H)-quinolinones, 1451
- proton, 7,7'-dimethoxy-4,4'-dimethyl-3,3'-, 7,7'-dimethoxy-4,4'-dimethyl-3,6'-, 7,7',8,8'-tetramethoxy-4,4'-dimethyl-3,3'- and 7,7',8, 8'-tetramethoxy-4,4'-dimethyl-3,5'- -bicoumarins, 3991
- proton, 1,2[2',3'-dipropyl-2'-butene-1',4'-diyl]-1,2-dihydro-[60]fullerene, 5033
- proton, ditrisarubicin B, member of the anthracycline antitumour antibiotics, 5617
- proton, hydrogen bonded homo- and heterodimers of tetra urea derivs of calix[4]arenes, 8489
- proton, 1-(hydroxyalkyl)-4-methyl-8,11,15,18,22, 25-hexaoctylphthalocyanines, 809
- proton, R-nopadiene-C₆₀ adduct, 5131
- proton, planar-chiral 9,12-dimethyl-2,6-dithia-[7]paracyclophane and metacyclophane, 10043

- proton, rod-like conjugated poly-ynes, 5495 proton, ROE, lyciumin A, a cyclic octapeptide from Lycium chinese, 2795
- proton, six new isomers of 3-dehydroretinal, 7809
- proton, solvent effect on enzyme chemoselectivity in enzymatic acylation of L-Ser-β-naphthylamide, 4867
- proton, stereoisomerism of dispiro-1,3-dioxanes with axial and helical chirality, 12783
- proton, structure effects on photochemical properties of 9-anthrylsubstituted pyridyl enones, 935
- proton, 1,1,10,10-tetramethyl[3.3]metacyclophane-2,11-dione, 2847
- proton, tetraoxa[24]porphyrinogen(4.0.4.0)/ tetraoxa[22]porphyrin(4.0.4.0) dication, 1981 proton, tri-(N-methyl-4-pyridiniumyl)porphyrins bearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, 13569, 13589
- proton, p-triallylcalix[4]arene, 13189
- proton, 26,27,28-trimethoxy-5,17-dimethylcalix-[4]arene and 17-t-butyl-26,27,28-trimethoxy-5,11-23-trimethylcalix[4]arene, 2301
- selenium, aminoammonio-selenurane, 13951

Nucleic acids

- DNA, artificial peptide designed to combine the DNA-recognition portion of the bZIP motif from the yeast transcription factor GCN4 with an intercalating portion, 9-aminoacridine, synth, 2229
- insertion of 5'-O-(4,4'-dimethoxytrityl)-5-methyl-N⁴-(1- reylmethyl)cytidine into DNA, duplex, three- way junction and triplex stabilities, 15311
- O⁶-modified deoxyguanosine-containing oligodeoxyribonucleotides for triple-helix formation, 2047
- PNA synth, prep of N^{α} -(purinyl/pyrimidinyl acetyl)-4-aminoproline diastereomers with potential use in PNA synth, synth from 4R-hydroxy-2S-proline, 15007

Nucleosides

- acyclic analogues of 1,5-anhydrohexitol nucleosides, synth by Mitsunobu reaction, antiviral activity of, 13655
- acyclonucleosides , 5-fluorouracil derivs by tin(IV) chloride mediated ring opening of alkoxy-1,4-diheteroepanes, 8907
- (2R,3R)-2-C-(adenin-9-yl)-1,4-anhydro-2,3-dide oxy-3-C-hydroxymethyl-D-arabitol, incorpor-

110

- ation into DNA dodecamers, 2863
- 2'-N-alkyl-3'-hydroxyalkyl-1',2'-isoxazolidiny l thymidine and 5-fluorouridine derivs, synth by 1,3-dipolar cycloaddition of 3-carboxyalkyl- or acylnitrones to vinyl acetate followed by condensation, 8889
- 5-amino-4-sulfonamidoimidazole nucleosides and an imidazothiadiazine dioxide analogue of adenosine, synth, 9219
- 5'-O-benzoyl-2'-keto-3'-deoxy-α-uridine, characterisation and use to establish anomerisation of 2'-ketouridines under basic conditions, 1767 by radical-mediated reactions of uridine 5'-monoselenoacetals with allyltributyltin, 9469 cyclohexenyl nucleosides, synth and biological activity of *trans*-3-(pyrin-9-yl)-4-cyclohexenyl-carbinols, 8969
- cyclopropanoid nucleoside analogues, synth by a chemoenzymatic approach from racemic dialkyl 1,2-cyclopropane dicarboxylates, 6383
- 2'-deoxy-2'-alkoxylaminouridines, synth by ring-opening of 2,2'-*O*-anhydrouridines, 14385 3'-deoxy-3'-*C*-hydroxymethyl-α-L-lyxopyranos yl thymine and 3'-deoxy-3'-*C*-hydroxymethyl-α-L-threofuranosyl thymine, synth from tetra-*O*-acetyl-3-deoxy-3-*C*-hydroxymethyl-L-lyxo-(1, 6)-furanose, 1651
- 2'- and 3'-difluoromethyleneuridine, prep of 3'- and 2'-phosphoramidites of, 7929
- 4,9-dihydro-4,6-dimethyl-9-oxo-3-(β-D-ribofura nosyl)imidazo[1,2-a]purine (Wyosine), fluorescent Y-nucleoside, assessment of structure and reactivity by chemistry, spectroscopy and calculations, 1597
- homo-*N*-desoxynucleosides, synth from 2-deoxy-D-ribose using epoxidation-ring closure, 5563
- 2'-isomeric dideoxynucleosides of the D-related class, analogues of anti-HIV active 4'-azido-2'-deoxynucleosides, synth and antiviral studies of, 12643
- isoxazolidinecarboxylic derivs, precursors for bioactive chiral nucleosides, synth from Dglucose through intramolecular 1,3-dipolar cycloaddition, 11265
- 6'-α-methyl and 6'-α-hydroxymethyl carbocyclic thymidines and 5-methyl 2'-deoxycytidines, synth and incorporation into oligodeoxyribonucleotides, effect on DNA/RNA duplex stability, 12699
- nucleoside epoxyphosphonates, synth by reaction of 1-[3- and 1-[2- -(diethoxyphosphinyl)-5-O-trityl-β-D-xylo and -arabino- -furanosyl]-

- uracil with triflyl chloride and 4-pyrrolidinopyridine, 11695
- S-nucleosidyl S-aryl disulfides, synth from the corresponding thioesters and their reaction with phosphites, 1027
- pseudonucleosides containing chiral sulfahydantoins by glycosylation, 993
- cis-4-(9*H*-purin-9-yl)-2-cyclohexenylcarbinols, synth from cyclohexadiene and chlorosulfonyl isocyanate, 799
- cis-2-[4-(9H-purin-9-yl)-2-cyclopenten-1-yl]etha nol analogues, synth from racemic 2-cyclopentene-1-acetic acid by palladium-catalysed synth, 2789
- purine nucleoside phosphorylase, inhibition of by phosphonate derivs of N^9 -benzylguanine, synth, 177
- purine and pyrimidine β-D-threo-hex-3'-enopyranosyl nucleosides, Synth from 1,5-anhydro-4,6-O-benzylidene-2-O-p-toluoyl-D-glucitol, conformational behaviour, 9249
- pyrimidine and purine nucleosides by oxidation of thiopyrimidine and thiopurine nucleosides with dimethyldioxirane, 6759
- 1,2-trans hexopyranosyl nucleosides, synth via anomeric activation, 10827
- 5'-O-trityl-3'-O-mesyluridine deriv, reaction with secondary amines produces the enaminonucleosides *via* 1, 2-hydride shift, 4877
- tunicamycins, antiviral and antibiotic nucleosides isolated from *Streptomyces lysosuperficus*, prep of 7-deoxy-2-deamino-6-hydroxy tunicamine, 4757

Nucleotides

- C₆₀-linked deoxyoligonucleotide, synth from bromoacetate, sequence-specific modification of guanosine in DNA by-, 5179
- 5'-O-(4,4'-dimethoxytrityl)-5-methyl-N⁴-(1-pyr enylmethyl)cytidine, synth by reaction of 1-pyrenylmethylamine with 4-(1,2,4-triazolyl)-thymidine deriv, insertion into DNA, 15311
- DNA dodecamers containing oxetanocin and (2R,3R)-2-C-(adenin-9-yl)-1,4-anhydro-2,3-dideoxy-3-C-hydroxymethyl-D-arabitol, 2863
- 6'-α-methyl and 6'-α-hydroxymethyl carbocyclic thymidines and 5-methyl 2'-deoxycytidines, synth and incorporation into oligodeoxyribonucleotides, effect on DNA/RNA duplex stability, 12699
- mixed-backbone-oligonucleotides with phosphoric diester or phosphorothioate backbones with segments of internucleotidic O-methyl-

- phosphate or *O*-methylphosphorothioate linkages, synth using *N*-pent-4-enoyl nucleosides, 14419
- modified deoxyguanosine derivs linked through their C-6 position to a psoralen and an acridine derivs, synth and incorporation into oligonucleotide chains, 2047
- nucleotide (deoxy) sugars, combined enzymatic synth from sucrose and nucleoside monophosphates, 2395
- oligodeoxynucleotide pentadecamers containing two octylphosphonate linkages with stereoregular or stereorandom chirality, synth and duplex stability of, 10011
- oligodeoxynucleotides containing 6-methylthiopurine residues, synth via the phosphoramidite or by prep of oligomers containing 6-thiopurine residues and subsequent methylation, 10737
- oligodeoxyribonucleotides bearing a 5'-phosphate group, synth using 2-n-decylthioethyl as protecting group of the 5'-terminal phosphate function, 3933
- oligonucleotide synth using combinatorial protecting group strategy, 6913
- oligonucleotides containing 3'-alkyl amines, synth and application of photolabile supports for solid phase synth of, 3827
- 3'-S-phosphorothiolate-containing nucleotides, synth by Michaelis-Arbusov reactions of S-nucleosidyl S-aryl disulfides with phosphites, 1027
- ribonucleotides, 1,1-dianisyl-2,2,2-trichloroethyl group as a 2'-hydroxyl protecting group of ribonucleotides, 1493
- two peptide -oligonucleotide conjugates containing as their peptide moiety the active site mimic of ribonuclease A and the Cu(II) complexing metallopeptide, synth, 3005
- use of a C-branched spermine conjugate at the 3'-end or in the middle or at the 5'-end of an oligo DNA for the stabilisation of the duplexes and triplexes, 12275

Olefination

- of aldehydes by Knochel's (dialkoxyboryl)methylcopper reagents *via* β-hydroxyalkylboronates, 915
- Peterson reaction applied to aldehydes and ketones in conjunction with α -lithiated- α -fluoro- α -trimethylsilylmethylphosphonate, synth of α -fluorovinylphosphonates, 14199

Wittig – of methyl (1S,2R)-1-benzamido-2-formylcyclopropancarboxylate, synth of conformationally constrained cyclopropyl amino acids, 5881

Wittig olefination of indolinospirobenzopyrans catalysed by 18-crown-6, 8755

Olefins

- diastereoslective epoxidation of by organo sulfonic peracids, 2957
- flexible cyclic olefins, conformational analysis of stereoselective epoxidations of, 6699
- 1-fluoroolefins by treatment of (E)- and (Z)-fluorovinyl sulfones with tributyltin hydride and catalytic AIBN via (fluorovinyl)stannanes, 45 intramolecular carbolithiation of, synth of 1,2-dialkyl-1-phenyl cyclopentanes, 7435, 7465
- intramolecular oxime-olefin cycloaddition process starting from homochiral aminoacid precursors, synth of homochiral functionalised pyrrolidinone and pyrrolizidinone systems, 7875
- Mn-salen catalysed asymmetric epoxidation of —, mechanism of oxygen atom transfer from oxo (salen)manganese(V) complex to olefins, 515
- mono- and bicyclic olefin Diels-Alder adducts, kinetic resolution of *via* Sharpless asymmetric dihydroxylation, 7901
- prep of catenanes in olefin metathesis, formed by a statistical threading process and not Möbius strip approach, 2565
- rhodium(II)-catalysed aziridination of using (N-(p-nitrobenzenesulfonyl)imino)phenyliodinane, 1543
- unfunctionalised aromatic and aliphatic olefins, ruthenium-catalysed epoxidation of using t-butyl hydroperoxide as the oxidant, 12971
- unfunctionalised olefins, aerobic catalytic epoxidation of using a chiral(salen) manganese(III) complex bearing a sesquiterpene salicylaldehyde and (*R*,*R*)-1,2-cyclohexanediamine moieties, 12031

see also Alkenes, Cycloalkenes

Oligomers

pyrrolylpyridines, alternating pyrrole:pyridine oligomers and polymers and related systems, synth by Stetter procedure and characterisation of, 8707

Organoleptics

see Flavours and fragrances, Pheromones Osmium and compds

see Hydroxylation

Oxadiazines

1,3,4-oxadiazines or *N*-acetyl pyrazolidines, synth by organoselenium-induced cyclisation of *N*-allyl acethydrazides, 11841

Oxazines

- bicyclic oxazinones based on D-glucopyranose, synth and asymmetric alkylation of, evaluation of their use as chiral glycines, 8685
- 3(,5)-(di)chloro-2*H*-1,4-(benz)oxazin-2-ones, reaction with sodium azide or diazocompds, synth of substituted 1*H*-tetrazoles and 1,2,3-triazoles, 8813
- 3,6-dihydro-2H-1,3-oxazines by condensation of β -hydroxy aldehydes with N-sulfonyl aldimines, subsequent use in synth of 1,3-amino alcohol derivs, 3135
- dihydrooxazinones by SeO₂ promoted oxidative rearrangement of 2-substituted oxazolines, kinetic studies and mechanism, 14475
- 2H-1,4-oxazin-2-ones, cycloadditions with alkenes, synth of 4,6-dichloro-2-oxa-5-aza-bicyclo[2.2.2]oct-5-en-3-ones, 2591
- 1,2-oxazines and *N*-unsubstituted-1,2-oxazines from ring closure reaction of alkenyl nitrones with phenylselenenyl bromide *via* iminium salts, 6811
- 2H-1,3-oxazines, synth by cyclisation of 4amino-1-azadienes with glyoxylic esters, subsequent reduction to syn,syn-1,3-aminoalcohols and further cyclisation to azetidines, 3095
- 2-substituted 1,3-oxazin-6-ones, synth by pyrolysis of acylaminomethylene Meldrum's acid derivs under FVP conditions, 3163
- 2-substituted 1,3-oxazinanes and 1,3-oxazolidines, condensations and Knoevenagel reactions of, synth of xanthenes and α -tetralones, 14273
- N-sulfamoylperhydrooxazinones, synth and use as 2-chloroethylsulfamoyl donors in 2-chloroethylnitrososulfamide synth, 14217

Oxaziridines

by oxidation of 2,2,4,4-tetrasubstituted 1,3-oxazolidines with *m*-chloroperbenzoic acid, 605

Oxazoles

- homochiral N-(5-oxazolyl)oxazolidinones, synth by Schmidt reaction of N-acetoacetyl derivs of oxazolidinones, 1609
- isomünchnones derived from N-alkenyl substituted diazoimides, intramolecular cycloadditions of, 3247
- oxazolo[5,4-b]phenoxazine and benzoxazole derivs, synth from aza-Wittig reaction of tri-

- phenylphosphoranylideneamino-1,4-benzoquinone with aryl isocyanates and benzoxazole derivs, 6781
- synth by reaction of acetamide (instead of ammonium acetate) with phenacyl benzoates in boiling xylene in the presence of BF₃/Et₂O as catalyst, 10131

1,2-Oxazoles

see Isoxazoles

Oxazolidines/oxazolidinones

- N-acetoacetyl derivs of oxazolidinones, Schmidt reaction of in dimethoxyethane, synth of homochiral N-(5-oxazolyl)oxazolidinones, 1609
- N-alkoxycarbonyl-2-(2'-bromoethyl)oxazolidines derived from norephedrines, transformation into lithium derivs and subsequent cyclisation and aldol reaction, synth of enantiopure 3-substituted pyrrolidines, 10761
- N-(4'-bromo-4',4'-difluorocrotonoyl)oxazolidinone, reaction with lithium enolate of N-diphenylmethylideneglycinate, synth of 3,4-(difluoro-methano)glutamic acid, 271
- camphor-derived oxazolidin-2-one, Diels-Alder reactions employing –, 4079
- chiral 5-substituted 2-oxazolidinones, electrochemical oxidation of, synth of the corresponding methoxy substituted oxazolidinones which are precursors of dichiral β-amino alcohols, 9743
- (4S)-2-(2',6'-dimethoxyphenyl)-4-isopropyloxa zoline as ligand for copper catalysed addition of Me₃Al to 4,4-disubstituted cyclohexa-2,5-dienone, 14177
- oxazolidin-2-ones, synth by reaction of *N*-alkyl aziridines with di-t-butyl dicarbonate, 2097
- oxazolidine aldehydes, Grignard additions to \neg , synth of secondary alcohols which can be readily converted into their respective γ -hydroxy- β -amino alcohols and β -hydroxyamino acids, 11673
- oxazolidinone alcohol, starting material for synth of 2,3-diamino acids, application to the synth of a β -benzoylamino-phenylalanine, 10279
- 2-substituted 1,3-oxazolidines, condensations, Knoevenagel reactions, and reactions with mixtures of cyclic and acyclic carbon nucleophiles, synth of xanthenes, α-tetralones and benzopyrans, 14273
- N-sulfamoyloxazolidinones and -perhydrooxazinones, synth and use as 2-chloroethylsulfamoyl donors in 2-chloroethylnitrososulfamide synth,

14217

2,2,4,4-tetrasubstituted 1,3-oxazolidines, oxidation with *m*-chloroperbenzoic acid, synth of aminoxyls or oxaziridines, 605

 β , γ -unsaturated *N*-acyl-2-oxazolidinones, synth by acylation procedure of a mixed anhydride, 13733

 β , γ -unsaturated *N*-acyl-2-oxazolidinones, synth by imide formation method, 13525

Oxazolines/oxazolinones

- 4,5-disubstitutedbis(oxazolines),stereodivergent synth from dimethylmalonyl bisdiamides of a suitable 1,2-disubstituted chiral aminoethanol, 13649
- enantiomerically pure 3-(2-arylethenyl)oxazolines, addition of cyanide to followed by reduction, synth of (R)-4-amino-3-phenylbutyric acid and (R)-baclofen, 15117
- 4-isopropyl-2-oxazolin-5-one anion as masked umpoled synthon for both formyl and hydroxycarbonyl anions, application to synth of sugars and non-protenogenic aminoacid derivs, 4719
- oxazolines from gold(I)-catalysed asymmetric aldol reactions of isocyanoacetic acid derivs with fluoroaryl aldehydes, subsequent hydrolysis to fluoro-phenylserines, 245
- phosphorus, sulfur and selenium containing 2aryloxazolines, synth from amino alcohols, 7547
- spiroisoxazoline derivs, synth by oxidative cyclisation of o-phenolic oxime-acid derivs using phenyliodonium diacetate, 14713
- 2-substituted oxazolines, SeO₂ promoted oxidative rearrangement to dihydrooxazinones, kinetic studies and mechanism, 14475

Oxetanes/oxetanones

pentacyclo[5.4.0.0^{2.6}.0^{3.10}.0^{5.9}]undecane-spiroannulated oxetane, mechanism of acid-promoted ring opening of, stereoselective intramolecular 1,5-hydride transfer, 6063

Oxidation

- of [28]tetraoxaporphyrinogen(6.0.6.0), synth of diatropic [26]tetraoxaporphyrin(6.0.6.0)dications, 11763
- aerobic of penicillin and cephalosporin derivs in the presence of cobalt(III) acetylacetonate and an aldehyde, synth of the corresponding sulfoxides, 2343
- of alkanes by the reagent O_2 - H_2O_2 -vanadium complex-pyrazine-2-carboxylic acid, 13051
- anodic of the N-cyanomethyloxazolidine system in acetonitrile at a platinum electrode,

- generation of a radical cation, mechanism, 15127
- anodic oxidation of benzene and substituted benzenes, synth of the corresponding phenol derivs, 3889
- auxiliary-directed peroxidation of 1,4-dienes, 12381
- of 4-azacholest-5-en-3-one, 6-azacholest-4-en-7-one and their N-methyl derivs, synth of cholestanoic acids, 14057
- Baeyer-Villiger oxidation of 2,3,8,9-tetramethoxy-5,6,11,12-tetrahydrodibenzo [a,e]cycloocten-5-one, synth of substituted 6-oxodibenzo[b,f]oxinin, 8063
- of bicyclic octen- and hepten-ols and -ones catalysed by *Bacillus stearothermophilus* alcohol dehydrogenase, 1669
- of 1-butyl-3-[1,2,4-triazol-5(3)-ylmethyl]pyridinium and 1-butyl-4-[imidazol-4(5)-ylhydroxymethyl]pyridinium salts, chemical stability of, 15197
- of the carbon-silicon bond, Tetrahedron report, 7599
- catalytic asymmetric oxidation of sulfides using Mn(III)-salen complex as catalyst, 13895
- of chiral 5-substituted 2-oxazolidinones, synth of the corresponding methoxy substituted oxazolidinones which are precursors of dichiral β -amino alcohols, 9743
- of 2,3- and 2,5-dihydro-1*H*-1-benzazepines by hydride transfer to an iminium ion, synth of 3*H*-1-benzazepines, 4423
- dimethyldioxirane promoted oxidative decomplexation of Fischer carbene complex of ethyl (2E)-3-diethylamino-3-phenylprop-2-enoate, studies on chemoselectivity, 3973
- dioxygen oxidation of lithium amides, route to aminyl radicals, 13255
- electro— of 1-methylindole, 2-methylindole and 3-methylindole, mechanisms and structures of products, 7947
- electro— of symmetrically substituted hexamethoxybiphenyls, synth of either cation radical salt or spiro(fluorene-9,1'-cyclohexadienones), 4449
- enzyme catalysed oxidative transformation of *Nitraria* alkaloids, characterisation of products, 6725
- heteroatom oxidation and chemoselectivity with *p*-toluenesulfonic peracid, 5773
- of hydrazones by hypervalent organoiodine reagents, regeneration of the carbonyl group and

facile synth of α -acetoxy and α -alkoxy azo compds, 14673

- with hydrogen peroxide catalysed by [WZnMn-(II)₂(ZnW₉O₃₄)₂]¹² polyoxometalate, 8781
- hypervalent iodine of phenolic dibenzylbutyrolactones, synth of spirodienones which are intermediates in the biosynth of tetrahydrodibenzocyclooctene, 1303
- of indoles and 1,2-dihydro-3*H*-indol-3-ones, synthof2-hydroxy-1,2-dihydro-3*H*-indol-3-ones, 2983
- of lithium and chlorotitanocene enolates derived from camphor, diastereoselectivity of, 5487
- mercury(II) oxide of unsymmetrical N,N-disubstituted hydroxylamines, synth of aldonitrones, 14917
- of 7-methoxy-4-methyl-coumarin and 7,8-dimethoxy-4-methylcoumarin with Mn(OAc)₃/ HClO₄, synth of bicoumarins, 3991
- of N-(4-methoxybenzyl)-2-pyrrolidinones to N-(4-methoxybenzoyl)-2-pyrrolidinones, direct access to 5-alkyl analogues of the cognition activating agent Aniracetam, 12521
- oxidative cyclisation of *o*-phenolic oxime-acid derivs using phenyliodonium diacetate, synth of spiroisoxazoline derivs, 14713
- oxidative polymerisation of 5,6-dihydroxy-indole-2-carboxylic acid to melanin, 7913
- palladium catalysed acetoxylation of dialkyl allyl phosphonates with Pd(OAc)₂/benzoquinone/MnO₂/HOAc system, synth of dialkyl 3-acetoxy 1-alkenyl phosphonates, 2087
- palladium-catalysed carbocyclisation in the 1,4-oxidation of conjugated dienes, 7511
- potassium permanganate oxidation in synth of 3,4-dihydroisoquinolines, 2-alkyl(acyl)-1(2*H*)-3,4-dihydroisoquinolinones, 2-alkyl-1(2*H*)-isoquinolinones and 1-alkyl-2(2*H*)-quinolinones, 1451
- of nor quinone methide triterpenes (pristimerin and tingenone) possessing one enol double bond with dimethyl dioxirane, 10667
- regioselective of sec, sec-1,2-diols by dimethyldioxirane, fine regioselective tuning, 10969
- of secondary alcohols to ketones by palladium acetate catalysed Heck reactions, 12291
- SeO₂ promoted oxidative rearrangement of 2substituted oxazolines to dihydrooxazinones, kinetic studies and mechanism, 14475
- SET oxidative processes of commonly used solvents as revealed through the photochemical

- reaction of 1,2,4,5-benzenetetracarbonitrile, 1785
- Sharpless sulfoxidation of 2-substituted-1,3-dithianes, subsequent deacylation allows prep of 2-alkyl-1,3-dithiane 1-oxides, 2125
- sulfides to sulfoxides by Fe^{III} catalase in pyridine, 10313
- of sulfides to sulfoxides using salts of selenoxides with sulfonic acids, 1841
- Swern of secondary alcohols, synth of aziridino ketones, 12117
- of 2,2,4,4-tetrasubstituted 1,3-oxazolidines with *m*-chloroperbenzoic acid, synth of aminoxyls or oxaziridines, 605
- of 1,2,4,5-tetrazines with methyl(trifluoromethyl)dioxirane, synth of 3-aryl-1,2,4,5-tetrazine *N*-oxides, 2377
- of thiopyrimidine and thiopurine nucleosides with dimethyldioxirane, synth of pyrimidine and purine nucleosides, 6759
- of α,α -bis(trifluoromethyl)-4,5-bis(4-fluorophenyl)-1*H*-pyrrole-2-methanamine, synth of 4,4-bis(trifluoromethyl)imidazoline analogues, 11153
- Wacker-type oxidation reaction of 4-trimethylsilyl-3-alkyn-1-ols, synth of γ-butyrolactones, 10405

N-Oxides

- 3-aryl-1,2,4,5-tetrazine *N*-1-oxides, synth by oxidation with methyl(trifluoromethyl)dioxirane, 2377
- 3,4-dihydroisoquinoline N-oxides, cycloaddition with alkynes, synth of 4-substituted Δ^4 -isoxazolines and subsequent rearrangement to isoquinoline-fused pyrroles, 12049
- N-methylcyclobutylideneamineN-oxide, synthby reaction of cyclobutanone with methylhydroxylamine, cycloaddition reactions of, 9187
- pyridine N-oxide and pyridinium ion synthons for prep of isomeric quaterpyridines, 4239 see also Nitrile Oxides, Nitrones

(Super)oxides

reaction of — with 1-ethoxycarbonyl-3-methylbenzimidazolium salts, formation of ringopened products and 1-methylbenzimidazoles, 6569

Oximes

of 4-(alk-2-enylamino)-1,6-dimethyl-2-oxo-1,2-dihydropyridine-3-carbaldehydes and 2-(alk-2-enylamino)-4-oxo-4*H*-pyrido[1,2-*a*]pyrimidine-3-carbaldehydes, cycloaddition to fused isox-azolidine derivs, 887

- 1,1'-bicyclohexylidene-4,4'-dione dioxime, formation of a non-covalent polymer by hydrogen bonding between the oxime functionalities, 1773
- cyclopentane β -ketoxime sulfones, synth and selected transformations of, 6903
- in situ reduction of obtained from 1,5 dihydro-2H-pyrrol-2-ones with Raney nickel and W7 Raney nickel, prep of pyrrolo[3,2-b]pyrrolone derivs and amines respectively, mechanisms, 12919
- indole-3-pyruvic acid oxime ethers and thieno derivs by N-allylation of N-Boc substituted o-iodo anilines and thienoamines with methyl or benzyl oxime ethers of ethyl (E)-2-oxo-5-bromo-3-pentenoate and Heck reaction, 14975 intramolecular oxime-olefin cycloaddition process starting from homochiral aminoacid precursors, synth of homochiral functionalised pyrrolidinone and pyrrolizidinone systems, 7875
- mesylate and tosylate of tropone oxime, cleavage of the troponoid rings by nucleophiles, 8439
- oximes of 4-imidazolidinones, synth by reduction of 4-nitroimidazoles by sodium borohydride or sodium borodeuteride, 9541
- o-phenolic oxime-acid derivs, oxidative cyclisation of using phenyliodonium diacetate, synth of spiroisoxazoline derivs, 14713
- substituted amido-oximes, intramolecular nitrile oxide cycloaddition of and subsequent reduction, synth of functionalised 3,4-dehydropyrrolidin-2-one and 1,2-dehydropyrrolizidine-3-one, 14323

Oxiranes

- by decomposition of methacrylic-type peroxidic compds, stereoselectivity of, 14855
- by reaction of aldehydes with α -halo organoindium reagents derived from α,α -dibromo carbonyl compds, 2803
- epoxide-functionalised polycarbocyclic systems and epoxy-derivatives of tetrahydro- and hexahydromethanonaphthalenes, crystal density modelling, 9703
- α-fluorooxiranes derived from oxidation of fluoroalkenes, isomerisation of, synth of α-fluorocarbonyl compds, 2429
- palladium(0)-catalysed vinyloxirane rearrangement, synth of α -trialkylsilyl- β , γ -unsaturated aldehydes, 7487

see also Epoxides

Oxocarbon acids and derivs

- diisopropyl squarate, addition of 2,3-dihydro-5furanyllithium as a means for the rapid generation of structurally complex oxygen-containing tetraquinane networks, 3075
- oxirene, cyclopropenyl anion, azirene and thiirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709

Oxygen heterocycles

- crown ethers and macrolactones, electronic effects and steric hindrance on complexation with alkali cations and Hg(SCN)₂, 3683
- exo- and endo-7,8- and 6,7-epoxyhomotropanes, synth of scopine, pseudoscopine, 11947, 11963, 11077
- S-heterocycles by addition of ω -thiohydroxyesters to butenolides or α,β -unsaturated lactams, 9035
- oxirene, cyclopropenyl anion, azirene and thiirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709
- oxolenes and furans by metal-assisted cyclisation of alkynols using labile pentacarbonylchromium and pentacarbonylmolybdenum complexes, 1617
- see also Lactones, and the individual ring systems

Oxygen, singlet

measurement of photogenerated singlet oxygen by sodium 1,3-cyclohexadiene-1,4-diethanoate trap, 2031

Oxygenation

low-temperature photo— of coelenterate luciferin analogue, synth and proof of 1,2-dioxetanone as luminescence intermediate, 12061

Ozonolysis

- of Δ^2 -cephem derivs, synth of highly functionalised 2-oxoazetidine and 2-oxoazetidine-4-sulfenic acid derivs, 10205
- of (R,Z)-(+)-12-hydroxy-9-octadecenoic acid (castor oil), synth of (R)-(-)-1,3-nonandiol, an intermediate to (R)-(+)- γ -decalactone, 11321
- of (+)-limonene, (-)- β -pinene, (+)-sabinene, (+)-aromadendrene and camphene, 14813
- and reductive amination of 2-allyl-2-(*O*-nitrophenyl)-1,3-cyclohexanedione, synth of 3a-(*O*-nitrophenyl)octahydroindol-4-ones, 4013

Palladium and compds

carbopalladation-sulfonylation of allenes, synth

- of 2-vinyl or 2-aryl allyl sulfones, 9101
- cyclic carbopalladation of alkynes terminated by carbonylative lactamisation using alkenyl or aryl halides containing an ω-carboxamido or ω-sulfonamido group, 11529
- bis(dibenzylideneacetone)palladium(0) as catalyst for prep of diynes, 1337
- Heck coupling of protected 2-aminobut-3-en-1ols with cyclohexenyl triflate using a ligandfree palladium catalyst, potassium carbonate and tetrabutylammonium triflate, 12465
- titanium(IV)-palladium(II) complex based on (R,R)-N,N-bis(3-diphenylphosphino-2-hydroxy benzylidene)-1,2-diphenylethane-1,2-diamine (salenophos), 14599
- see also Catalysis, Catalysts

Paternò-Büchi reactions

of silyl enol ethers carrying a chiral substituent in α -position, reversal of the facial diastereoselectivity in, 10861

Pauson-Khand reactions

- intramolecular cyclisation of 1-(3-alkoxy-2-propynyloxy)methylcyclopentenes and 1-(5-alkoxy-4-pentynyl)cyclopentenes, synth of tricyclic enones, 14021
- modified with ethylene, use as key transformation in total synth of sesquiterpene (+)-taylorione from (+)-2-carene, 7391

Penicillins

- α-aminosulfonopeptides as functional analogues of penicillin, synth using Curtius rearrangement, 5303
- biosynthesis of, synth of tripeptide probes in order to investigate the insertion-homolysis mechanism leading to carbon-sulfur bond formation in biosynth, 2515, 2537
- papyracillic acid, penicillic acid analogue from the ascomycete *Lachnum papyraceum*, 10249 penicillin and cephalosporin derivs, aerobic oxidation in the presence of cobalt(III) acetylacetonate and an aldehyde, synth of the corresponding sulfoxides, 2343

Peptides and polypeptides

- aeruginosins 102-A and B, thrombin inhibitors from the freshwater cyanobacterium *Microcystis viridis* (NIES-102), structures, 14501
- agardhipeptins A and B, cyclic hepta- and octapeptides from the cyanobacterium *Oscillatoria* agardhii (NIES-204), structure and biological activity, 13129
- alkylphosphonylated peptides, solid phase assembly using p-methoxybenzyl N,N-diiso-

- propylaminomethylphosphonamidite phosphonylating reagents, 2103
- α-aminosulfonopeptides as functional analogues of penicillin, synth using Curtius rearrangement, 5303
- artificial peptide designed to combine the DNA-recognition portion of the bZIP motif from the yeast transcription factor GCN4 with an intercalating portion, 9-aminoacridine, synth, 2229
- callipeltins B and C, cytotoxic peptides from the New Calidonian sponge *Callipelta* sp., structures, 9589
- dichotomins A-E, cyclic penta or hexapeptides from roots of *Stellaria dichotoma*, structures, 1165
- dipeptides by reaction of α -amino acid esters with N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, 9367
- fluoroolefin containing dipeptide isosteres, synth as inhibitors of dipeptidyl peptidase IV(CD26), 291
- hymenamide F, cyclic heptapeptide from marine sponge *Hymeniacidon* sp., structure elucidation, 6355
- kawaguchipeptin A, cyclic undecapeptide from cyanobacterium *Microcystis aeruginosa* (NIESS-88), structure and absolute stereochemistry, 9025
- lyciumin A, a cyclic octapeptide from *Lycium* chinese, configurational and conformational analyses, 2795
- MDL 62,879 (GE 2270A), a peptide produced by *Planobispora rosea* and belonging to the thiazolyl peptide group of antibiotics, chemical modifications of, 8763
- microcolins B, lipopeptide from blue-green alga Lyngbya majuscula, synth, 425, corrig. 3767
- microviridins D-F, serine protease inhibitors from the cyanobacterium *Oscillatoria agardhii* (NIES-204), structures, 8159
- oligopeptides incorporating 5-hydroxytryptophan, synthusing 5-*O*-benzyl-*N*^α-Fmoc-*N*ⁱⁿ-Boc-5-hydroxytryptophan as reagent, 6965
- 6-oxoperhydropyrrolo[1,2-a]pyrazines as spacer templates for peptidomimetics, synth from the corresponding 3,6-dioxo analogues, 13991
- D,L-Fmoc protected 4-phosphonomethylphenylalanine derivs for solid phase peptide synth, 2021
- rapamycin-peptide hybrid molecules RAP-P containing the rapamycin-FK 506-ascomycin

- binding domain and different peptide tethers, synth, 4053
- storniamides A-D, peptide alkaloids from Patagonian sponge *Cliona celata*, structures, 2727 tri-(*N*-methyl-4-pyridiniumyl)porphyrinsbearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, synth and DNA binding studies, 13569, 13589
- tripeptide probes containing a deuterated cyclopropane ring, synth in order to investigate the insertion-homolysis mechanism leading to carbon-sulfur bond formation in biosynth of penicillin, 2515, 2537
- two peptide -oligonucleotide conjugates containing as their peptide moiety the active site mimic of ribonuclease A and the Cu(II) complexing metallopeptide, synth, 3005

see also Glycopeptides, glycoproteins

Perfumes

see Flavours and fragrances

Peroxides

- t-butyl hydroperoxide as the oxidant in ruthenium-catalysed epoxidation of unfunctionalised aromatic and aliphatic olefins, 12971
- cyclic t-butyl allyl peroxides, diastereoselective epoxidation and bishydroxylation of, 13151
- endoperoxide with a C₁₃ skeleton from the aerial parts of *Baeckea frutescens*, structure, 9735
- 3-hydroperoxy sultams and corresponding isothiazol-3(2H)-one 1,1-dioxides, synth by oxidation of isothiazolium salts. 783
- methacrylic-type peroxidic compds, stereoselectivity of the intramolecular decomposition of, 14855
- peroxyacetals and peroxyketals, mechanism of thermolysis of, 8263

Petrochemistry

see Geochemistry

Pharmacologically active compds

see Antitumour compds, Biologically active compds, Drugs

Phenols

- 4-(2*H*-1,2,4-benzothiadiazine-1,1-dioxide-3-yl)-2,6-bis(1,1-dimethylethyl)phenols by cyclisation of 3,5-bis(1,1-dimethylethyl)-4-hydroxy-*N*-2-(sulfamoylphenyl)benzamides, free radical scavenging activity of, 12587
- by direct monohydroxylation of benzene and substituted benzenes by anodic oxidation, 3889 cyanophenols, role of hydrogen bonding in cycloadditions of benzonitrile oxide with, 7885 dinucleating ligands derived from 2,6-diformyl-

phenols, synth, 5913

- functionalised phenolic derivs *via* the benzannulation of dienylketenes formed by thermal Wolff rearrangement of α-diazo-β-keto compds, 6665
- phenol and naphthol derivs, reaction with 2-alkoxy-2-fluoro-glycosyl fluorides, synth of naphtho- and benzo-dihydrofuran derivs, 7797
- phenolic dibenzylbutyrolactones, hypervalent iodine oxidation of, synth of spirodienones which are intermediates in the biosynth of tetrahydrodibenzocyclooctene, 1303
- phenolic glycolipids of *Mycobacterium kansasii* serovars I, II and IV, synth of tetrameric fragments corresponding to, 3575, 3593
- o-phenolic oxime-acid derivs, oxidative cyclisation of using phenyliodonium diacetate, synth of spiroisoxazoline derivs, 14713
- reaction with glucosyl radicals to produce α -O-glucosides, 10241

Pheromones

- algal pheromone hormosirene and dictyopterene A, biosynthesis of by the freshwater diatom *Gomphonema parvulum* (Bacillariophyceae), 10073
- 2-(12'-aminotridecyl)-pyrrolidine, defensive alkaloid from the Mexican bean beetle *Epila-china varivestis*, synth and absolute configuration, 6859
- (2E)-2-butyloct-2-enal, alarm pheromone of African weaver ant *Oecophylla longinoda*, synth using Baylis-Hillman adducts, 1253
- defensive secretion of larvae of the leaf beetle *Phaedon armoraciae*, stereochemistry of an alcohol oxidase from, 6601
- (3S,5R,6S)-3,5-dimethyl-6-isopropyl-3,4,5,6-tetrahydropyran-2-one, sex pheromone of the larval parasitoid *Macrocentrus grandii*, synth, 5907
- (+)-grandisol, major pheromone of the cotton boll-weevil *Anthonomus grandis*, synth from (+)-citronellol using an intramolecular carbenoid cyclisation, 3879
- (+)- and (-)-grandisol, male-produced of cotton boll weevil *Anthonomous grandis*, synth using [2+2] cycloaddition of (S)-4-acyloxymethyl-4-methyl-2(5H)-furanoneswithethylene as key step, 1267, 1279
- 5-hexadecanolide, pheromone of the Oriental hornet queen *Vespa orientalis*, asymmetric synth from a chiral epoxide, 4479
- (-)-invictolide, component of the queen recog-

nition pheromone of Solenopsis invicta, synth from (-)-carvone, 12177

(S)-(+)-manicone, alarm pheromone of *Manica* ants, synth from 2-chloro-3-pentanone, 12815 of *Musca domestica* L., *Plutella xylostella* L. and *Ephestia elutella* Hbn., synth of cyclopropane analogues of, 12509

wih spiroketal structure of Bactrocera nigrotibialis, Andrena wilkella and Andrena haemorrhoa F, synth from chiral nitro alcohol, 6139

Phosphaalkenes

cycloaddition with α -silyl- α -diazaketones, synth of 5-alkylidene-4,5-dihydro-3H1,2,4(λ ³)-diazaphospholes, 10053

Phosphazenes

cyclophosphazenes containing acetyl salicylic substituents, synth from hexachlorocyclophosphazene, 9535

N-vinylic phosphazenes, synth and reaction with carbonyl compds, reactivity of the vinyl side-chain versus aza-Wittig reaction, 4857

Phosphine oxides

(diisopropoxyphosphoryl)nitrile oxide, dipolar cycloadditions with functionalised cyclopropenes, 8877

 β -functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, conversion to secondary *E*-allylamines and β -aminophosphorylated compds, 9609

lithiated β-hydrazonophosphine oxides, addition to isocyanates and isothiocyanates followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123

Phosphine ylids

see Phosphoranes

Phosphines

of α -azidoacetonitriles α -phenyl substituted with triphenylphosphine, synth of phosphazine, an aminophosphonium carbanion salt and a phosphazide, 9629

4,6-O-benzylidene protected 2,3-bis (O-diphenyl-phosphino)-D-glycopyranosiderhodium (I) chelate catalysts for hydrogenation of methyl (Z)-2-N-acylamidoacrylates, 15079

 $(\eta^5-C_5H_5)$ Fe(CO)(PPh₃)(COCH₂Ph), elaboration of the acyl ligand in, 12553

cyclenphosphine sulfide, synth by reaction of molecular sulfur on cyclenphosphorane, fluxional behaviour and ambident reactivity, 2995 (*R,R*)-*N,N*-bis(3-diphenylphosphino-2-hydroxybenzylidene)-1,2-diphenylethane-1,2-diamine

(salenophos), synth of a titanium(IV)-palladium(II) complex based on, 14599

phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent, synth by reaction of a lithiated phosphine-borane or a phosphinite borane with C₆₀ followed by removal of the BH₃ group, 5091

phosphorus containing 2-aryloxazolines, synth from amino alcohols, 7547

reaction with 7-methoxyimino-4-methylchromene-2,8-dione, prep of N-substituted 7-amino-8hydroxy-4-methyl-2H-[1]-benzopyran-2-ones, 15007

Staudinger reaction with conjugated azides, synth of N-vinylic phosphazenes, subsequent reaction with carbonyl compds, reactivity of the vinyl side-chain versus aza-Wittig reaction, 4857

Phosphinic acids and derivs

phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent, synth by reaction of a lithiated phosphine-borane or a phosphinite borane with C₆₀ followed by removal of the BH₃ group, 5091

Phospholanes

1,3,2-oxazaphospholanes, electrophilic amination of using (1*R*),(2*S*)-1,3-diphenyl-2-(*N*-isopropylamino)-1-propanol as the chiral auxiliary, 13783

Phospholes

5-alkylidne-4,5-dihydro-3H-1,2,4(λ^3)-diazaphos pholes, synth from α -silyl- α -diazoketones and phosphaalkenes, 10053

diazaphosphole derivs generated *in situ* or the PCl₃/hydrazone combination for synth of *N*-alkenyl derivs of six-membered and larger 1,2-diaza heterocycles, 13695

Phospholipids

phosphoramide analogues of sphinganine-1phosphate, synth by alkylation of N-methoxy-Nmethylcarboxyamide of diaminopropanoic acid and subsequent reduction followed by deprotection and phosphorylation, 2945

Phosphonamidates

nucleoside octylphosphonamidite monomers containing octylphosphonate linkages, synth and application to solid phase synth of oligonucleotides containing stereorandom or stereochemically pure octylphosphonate links, 10011

Phosphonamides

design, carbanion geometry, reactivity and prep of chiral alkyl bicyclic phosphonamides, con-

version to α -substituted α -methyl and α -phenyl phosphonic acids, 13837

phosphonamidic, phosphonamidothioic and phosphonamidodithioic acids, synth and pKa evaluation, 6117

Phosphonamidites

p-methoxybenzyl N,N-diisopropylaminomethylphosphonamidite phosphonylating reagents for solid phase assembly of alkylphosphonylated peptides, 2103

Phosphonic acids and derivs

- cyclohexylammonium salts of (1RS,3S)-3,4-dihydroxy-1-fluorobutylphosphonic acid and (S)difluoro-3,4-dihydroxybutylphosphonic acid, substrates for glycerol-3-phosphate dehydrogenase, 165
- nucleoside epoxyphosphonates, synth by reaction of 1-[3- and 1-[2-(diethoxyphosphinyl)-5-O-trityl-β-D-xylo and -arabinofuranosyl]uracil with triflyl chloride and 4-pyrrolidinopyridine, 11695
- acyloxymethyl and 4-acyloxybenzyl diester prodrugs of phosphonoformate: hydrolysis and antiviral activity of, 14929
- alkylphosphonylated peptides, solid phase assembly using *p*-methoxybenzyl *N*,*N*-diisopropylaminomethylphosphonamidite phosphonylating reagents, 2103
- (E)- and (Z)-allylphosphonates by nucleophilic addition of triethyl phosphite to acetates of Baylis-Hillman adducts, 2261
- 1-aminoalkylphosphonic acids and 2-aminoalkylphosphonic acids, synth by reductive amination of oxoalkylphosphonates, 10685
- α-aminophosphonic acids by electrophilic amination of 1,3,2-oxazaphospholanes using (1R), (2S)-1,3-diphenyl-2-(N-isopropylamino)-1-propanol as the chiral auxiliary, 13783
- constrained 4-(phosphonomethyl)phenylalanine derivs as hydrolytically stable analogues of *O*-phosphotyrosine, synth, 4411
- O,O-dialkyl α -halobenzylphosphonates, synth from O,O-dialkyl α -hydroxybenzylphosphonates by reaction with N,N'-carbonyldiimidazole, 10215
- dialkyl allyl phosphonates, palladium catalysed acetoxylation of with Pd(OAc)₂/benzoquinone/MnO₂/HOAc system, synth of dialkyl 3-acetoxy 1-alkenyl phosphonates, 2087
- α-(N,N-diethylamino)-alkenylphosphonates, synth by Wittig rearrangement of ammonium salts from quaternisation of diisopropyl

- (N,N-diethyl)-aminomethylphosphonate, 2075 [1,1-difluoro-1-[2-(4-hydroxynaphthalenyl)]met hyl]phosphonic acid, an inhibitor of proteintyrosine phosphatase, design and synth, 9963 diisopropyl α -, β and γ -hydroxyphosphonates by reduction of ketophosphonates, effect of the phosphonyl group, 589
- diphenyl H-phosphonate, disproportionation of under anhydrous basic conditions, mechanistic investigations, 9931
- α-fluorovinylphosphonates, synth by Peterson olefination reaction applied to aldehydes and ketones in conjunction with α-lithiated-α-fluoro-α-trimethylsilylmethylphosphonate, 14199
- β -functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, conversion to secondary *E*-allylamines and β -aminophosphorylated compds, 9609
- hydroxymethylene phosphonate analogues of phosphorylated tyrosine, synth by hydrophosphonylation of 4-formyl-L-phenylalanine, subsequent conversion to monofluoromethylene phosphonate analogues, 11725
- hydroxynaphthalenephosphonates by rhodium-(II) acetate catalysed decomposition of α -diazo- β -keto- γ , δ -alkenyl- δ -aryl compds, 10455 oligodeoxynucleotide pentadecamers containing two octylphosphonate linkages with stereoregular or stereorandom chirality, synth and duplex stability of, 10011
- phosphines, phosphinites and phosphonic acid esters bearing a fullerene substituent, synth by reaction of a lithiated phosphine-borane or a phosphinite borane with C₆₀ followed by removal of the BH₃ group, 5091
- phosphonamidic, phosphonamidothioic and phosphonamidodithioic acids, synth and pKa evaluation, 6117
- phosphonate derivs of N^9 -benzylguanine, prep as purine nucleoside phosphorylase inhibitors, 177
- phosphonoacetates, interaction with salicylaldehydes under Knoevenagel reaction conditions, synth of 1,2-benzoxaphosphorines and their dimers, 12597
- 2- and 3-phosphonyl radicals derived from the corresponding 2- and 3-halo substituted phosphonates, reaction with alkenes provides functionalised phosphonates, 13681
- pyridylmethyl(amino)phosphonates, acidic cleavage of, formation of the corresponding amines,

12483

 α -substituted α -methyl and α -phenyl phosphonic acids, asymmetric synth from phosphonamides: design, carbanion geometry, reactivity and prep of chiral alkyl bicyclic phosphonamides, 13837

Phosphonium salts

- 2-alkyl(aryl)-4-hydroxy(mercapto)-6-oxo-1,6-di hydropyrimidin-5-yl-triphenylphosphonium chloride, synth by reaction of Ph₃P⁺C⁻HCN with acylisocyanates and thio analogues, 8835 ammonium and phosphonium perfluorocyclobutane ylids, synth from perfluorocyclobutene and tertairy amines or phosphines, use as masked fluoride anion source, 9755
- ammonium- and phosphoniumperfluorocyclobutane ylids, reaction with primary or secondary alcohols and carboxylic acids, synth of alkyl fluorides or acyl fluorides respectively, 2977
- β -functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, conversion to secondary E-allylamines and β -aminophosphorylated compds, 9609
- substituted and unsubstituted diphenylphosphonium diylides, reactivity towards carbonic anhydride derivs such as phenylisocyanate and dicyclohexylcarbodiimide, 2005

Phosphonylation

- hydrophosphonylation of 4-formyl-L-phenylalanine, synth of hydroxymethylene phosphonate analogues of phosphorylated tyrosine, subsequent conversion to monofluoromethylene phosphonate analogues, 11725
- p-methoxybenzyl N,N-diisopropylaminomethylphosphonamidite phosphonylating reagents for solid phase assembly of alkylphosphonylated peptides, 2103

Phosphoramidates

- diethyl phosphoroamidate, reaction with aromatic aldehyde diethyl acetals, synth of N-(diethoxyphosphoryl)aldimines, 8789
- phosphoramide analogues of sphinganine-1phosphate, synth by alkylation of *N*-methoxy-*N*-methylcarboxyamide of diaminopropanoic acid and subsequent reduction followed by deprotection and phosphorylation, 2945

Phosphoramidites

*O-β-*cyanoethyl-*O-*[*S-n*-decyl-2-mercapto-1-eth yl]-*N*,*N*-diisopropyl phosphoramidite, synth for use in prep of oligonucleotide 5'-phosphates, 3933

- 6-methylthiopurine phosphoramidite, prep and incorporation into oligomers, 10737
- 3'- and 2'-phosphoramidites of 2'- and 3'-difluoromethyleneuridine, prep, 7929

Phosphoranes

- cyclenphosphorane, synth by transamination of hexamethylphosphorus triamide with 1,4,7,10tetraazacyclododecane, subsequent reaction with molecular sulfur provides cyclenphosphine sulfide, 2995
- N-(diethoxyphosphoryl)aldimines, prep by reaction of diethyl phosphoroamidate with aromatic aldehyde diethyl acetals, 8789
- triphenylphosphoranylideneamino-1,4-benzoquinone, aza-Wittig reaction with aryl isocyanates and aroyl chlorides, synth of oxazolo-[5,4-b]phenoxazine and benzoxazole derivs, 6781
- vinyliminophosphoranes, conjugate addition of *N*-protected imidazoles to promoted by tetrabutylammonium fluoride, synth of the corresponding fused imidazoles, 13671
- for Imino-- see Phosphinimines

Phosphoric acid and derivs

- pyridoxal 5'-phosphate, condensation with rhodanine, synth of (*Z*)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)methyl]-4-pyridinyl] methylene]-2-thioxo-4-thiazolidinone, 14787
- analogues of farnesyl diphosphate bearing substituents at C3, synth by alkylation of appropriately substituted acetoacetates with geranyl bromide followed by decarboxylation and Wittig condensation, 119
- 1,2-benzoxaphosphorines and their dimers, synth by interaction of salicylaldehydes with phosphonoacetates under Knoevenagel reaction conditions, 12597
- glucose-6-phosphate and 3,4-dihydroxyphenylalanine, selective binding with boronic-acidappended metalloporphyrin, 2817
- nucleoside monophosphates, combined enzymatic synth of nucleotide (deoxy) sugars from sucrose and nucleoside monophosphates, 2395
- oligodeoxyribonucleotides bearing a 5'-phosphate group, synth using 2-n-decylthioethyl as protecting group of the 5'-terminal phosphate function, 3933
- see also Inositols, Nucleic acids, Nucleosides, Phospholipids

Phosphorothioic acids

mixed-backbone-oligonucleotides with phosphorothioate backbones with segments of inter-

nucleotidic O-methylphosphorothioate linkages, synth using N-pent-4-enoyl nucleoside phosphoroamidite synthons, 14419

Phosphorous acid and derivs

phosphite reaction with S-nucleosidyl S-aryl disulfides, synth of 3'-S-phosphorothiol-ate-containing nucleotides, 1027

triethyl phosphite addition to acetates of Baylis-Hillman adducts, synth of (E)- and (Z)-allylphosphonates, 2261

Phosphorus compds

C-element-substituted phosphorus ylids, chemistry of, 1855

Phosphorus heterocycles

1,2-benzoxaphosphorine-3-carboxylates by interaction of salicylaldehydes with phosphonoacetates under Knoevenagel reaction conditions, 12597

Phosphorylation

addition of lithiated β-hydrazonophosphine oxides to isocyanates and isothiocyanates followed by cyclisation, synth of 4-phosphorylated pyrazoles, 4123

secondary E-allylamines and β -aminophosphorylated compds from β -functionalised enamines derived from phosphonium salts, phosphine oxides and phosphonates, 9609

Photochemistry

anthraquinone photosensitised reactions of N-allylamines with α,β -unsaturated esters, synth of lactams via rearrangement of the α -aminoallyl radical, 3425

benzophenone phororeduction during laser-jet photolysis to generate a hydroxydiphenylmethyl radical, effect of alcohol solvent on crosscoupling *versus* hydrogen abstraction, 10399

covalently linked pyropheophorbide dimers, models of the special pair in the photosynthetic reaction center, synth by condensation of 3-devinyl-3-carboxylpyropheophorbide-a, 4311

cyclobutanoxyl radicals generated from [2+2] photoadducts of 4-hydroxy-1-phenyl[1,8]naphthyridin-2(1H)-one with alkenes, β -scission of, synth of furonaphthyridinones, 6125

flash photolysis generation and reactivities of carbenium ions and nitrenium ions, 6823

low-temperature photooxygenation of coelenterate luciferin analogue, synth and proof of 1,2dioxetanone as luminescence intermediate, 12061

photochemical approach to functionalisation of open-chain and cyclic alkanes, single electron

transfer oxidation and hydrogen abstraction, 5533, 5549

photochemical reaction of 1,2,4,5-benzenetetracarbonitrile, SET oxidative processes of commonly used solvents revealed by, 1785

photochemical reaction of cyclosilanes and cyclogermane with C_{60} , functionalisation of C_{60} , 4995

photochemical reactivity of aromatic and heteroaromatic nitroderivs in the presence of arylalkenes, 14253

photochemical rearrangements of quinone monoketals, 5707

photochromic behaviour of 1,2,3-tri-t-butyl-6,13and 8,9,10-tri-t-butyl-5,14-pentacenequinones, 4269

photodeacetalisation of 4-(p-isopropylphenyl)-2nonyl-1,3-dioxolane using 2,4,6-triphenylpyrylium tetrafluoroborate as sensitiser, effect of limiting the amounts of water, oxygen and sensitiser, 4911

photohydrodehalogenation of 3,4-dibromobiphenyl, formation of 4-bromobiphenyl and 3bromobiphenyl, 8397

photoirradiation of 5-t-butyl-1-methyluracil, synth, structure and properties of 1,2-dihydro-pyrimidin-2-one, 10159

photoisomerisation of 9-anthrylsubstituted pyridyl enones, study of structure effects on photochemical properties, 935

photoisomerisation of *S-trans-(2E)-14-oxo-1*phenyl-2-(phenylamino)-1-azacyclotetradec-2ene-3-carbonitrile, 4363

photolysis of 3-methoxychromones in methanol, synth of chromones through extrusion of the methoxy function, 7855, corrig. 10265

photolysis of protected D-hex-2-ulopyranosyl azides, prep of imidates, 9057

photoreaction of α -bromo-2,3,4,6-tetra-O-acetylglucose with hexabutylditin, generation of glucosyl radicals which react with phenols to produce α -O-glucosides, 10241

photorearrangement of N-alkanoyl β -enaminones, synth of α -amino- β , γ -unsaturated acid derivs, 2405

photosynthetic reactions, 10,15,20-tritolylporphyrins linked to high acceptor strength cyano quinones as models for the photosynthetic reactions centre, 8497

SET-photosensitised reactions of α-silylaminoenones and ynones proceeding by 6-endo αamino radical cyclisation pathways, 3195

sigmatropic 1,2- and 1,3-acyl shifts, synth of linearly fused cis:anti:cis tricyclopentanoids and protoilludane framework having fused four, six and five membered rings, 7087

sodium 1,3-cyclohexadiene-1,4-diethanoate as a new colourless and water-soluble trap for the measurement of photogenerated singlet oxygen, 2031

triplet sensitised photoreaction of appropriately appended tricyclo[5.2.2.0^{2,6}]undecane systems followed by aldol condensation, synth of angularly and linearly fused tetraquinanes, 14287

zeolite-based heterogeneous photosensitisers containing triphenylpyrylium and dibenzotropylium cations, modifications of product selectivity in cyclodimerisation of 1,3-cyclohexadiene, 7755

Photodynamic therapy

galactopyranosyl substituted porphyrins, synth from porphyrin carboxylic esters, 5441

hexafluorohematoporphyrin deriv, synth for use in PDT, 13961

photodynamic efficacy of methyl esters and aspartyl amides of benzoporphyrin derivs from rhodoporphyrin XV dimethyl ester and 3-vinylphylloerythrin methyl ester, 5349

Photoelectron spectra

see Electronic spectra

Phthalides

3-arylmethylenephthalide, Gabriel synth from phenylthio- and 2-(3-)thienyl- acetic acids under microwave irradiation, 14995

Phthalocyanines

1-(hydroxyalkyl)-4-methyl-8,11,15,18,22,25-hexaoctylphthalocyanines, synth and use as precursors to more complex derivs, 809

Phytoalexins

substituted pterocarpans and pterocarpenes, synth involving Lewis acid Ti(IV) promoted [3+2] cycloaddition of 2-alkoxy-1,4-benzoquinones with substituted 2H-chromenes, 2217

Pigments

bacteriochlorophyll-c homologues, aggregation of synthetic zinc chlorins with several esterified alkyl chains as models of, 12421

covalently linked pyropheophorbide dimers, models of the special pair in the photosynthetic reaction center, synth by condensation of 3-devinyl-3-carboxylpyropheophorbide-a, 4311 echinotinctone (2,6-dihydroxy-1,8-dimethyl-3*H*-xanthen-3-one), fluorone orange pigment from

the wood-rotting polypores Echinodontium tinctorium and Pyrofomes albomarginatus, 5783

3-ethyl-2,7,9-trimethyl-(10*H*)-dipyrrin-1-one, conversion to a lipid analogue of bilirubin with eicosanoic acid side chains, synth and properties of, 447

eumelanins, black-to-brown pigments of mammalian skin, hair and eyes, oxidative degradation of natural and synthetic eumelanins with H₂O₂ provided pyrrole acids, 8775

fluorinated phenylrhodopsin analogues, binding selectivity, restricted rotation and ¹⁹F-NMR studies, 109

melanin formation from dopamine, DOPA, DHI or DHICA, analysis by MALDI-TOF mass spectrometry, 3947

melanin, oxidative polymerisation of 5,6-dihydroxyindole-2-carboxylic acid to –, 7913 mesobiliverdin-XIIIα and mesobilirubin-XIIIα, synth of carbon labelled compds and determination of acidity constants, 5319

porphobilinogen, synth in 4 steps from 2-cyano-3,4-substituted pyrroles, 14689

sulfhemes-A and -C, synth of metal-free oxygen analogues of from protoporphyrin-IX dimethyl ester, 1123

Pinacols and pinacol reactions

see Diols

Piperazines

see Pyrazines

Piperazinones

racemic *thaxtomines*, phytotoxins from *Streptomyces*, synth by cross-coupling reactions of lithiated 2,5-piperazinedione anions with gramine methosulfate, 8525

Piperidines

($\alpha R, 3RS, 5S$)-3-amino-N-(2-hydroxy-1-phenylethyl)-5-methylthio-2-piperidones, synth from enamide by free radical addition of methanothiol at 5-position and amination at 3-position, 7727

2-aryl-4-piperidones, synthetic applications of, synth of *E*-azaeburnamine skeleton, 8581

(2RS,5S)-5-(t-butyldimethylsilyloxy)-2-(2'-propenyl)-piperidine carboxylate, starting material for diastereoselective synth of homopipecolic acids, 6409

 $C_{60}(TEMPO)_n(TEMPO=2,2,6,6-tetramethylpi$ peridin-1-oxyl TEMPON=4-oxo-TEMPO),synth by pyrolysis of the sodium salt ofTEMPON tosylhydrazone in the presence of $<math>C_{60}$, characterisation of, 5103

- 1,6-dihydro-6-oxo-2-pyridine- and 6-oxo-2-piperidinecarboxylates, synth from 4,6-dichloro-2oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones by cleavage with alcohols, 2591
- isomerically functionalised piperidine systems by intramolecular nitrone cycloaddition starting from β -enamidoaldehydes and subsequent reductive ring-opening of the resulting fused δ -lactam, 14311
- 1-[3-methyl-2-(2-thiolanylthio)-butyl]piperidine, synth from L-valine, electrophilic substitution of, dethioacetalisation of semicyclic dithioacetals, 12745
- micropine and epimicropine, 2,6-disubstituted piperidine alkaloid from leaves of *Microcos philippinensis*, synth through mercuric trifluoroacetate-catalysed intramolecular alkenylamide cyclisation, 13467
- piperidine versus morpholine for Fmoc cleavage in solid phase glycopeptide synth, synth of glycopeptides related to HIV gp120 and mucins, 7983
- pseudodistomin C, a sphingosine-related piperidine alkaloid from Okinawan tunicate *Pseudo*distoma kanako, synth from D-serine, 4573
- spiro[benzofuran-3(2H),4'-piperidine], tricyclic morphine fragment, synth by intramolecular radical cyclisation of 4-[(2'-bromo-6'-methoxyphenoxy)methyl]-1-methyl-1,2,5,6-tetrahyd ropyridine, 10935
- tetramethyl-piperidinic aminoxyls, chemical and electrochemical study of their interaction with superoxide anion, 11257
- 1,3,5-trideoxy-3-fluoronojirimycin and 1,3,5-trideoxy-3-fluoromannojirimycin, synth from fluorohydroxysulfinylhexene and benzyloxy-fluorosulfinylhexene respectively, 131

Piperidinones

3-substituted piperidines, synth from *N*-(2-hydroxy-1-phenylethyl)piperidine-2-one *via* a bromo deriv, 7719

Plants

- abscisic acid, plant hormone inducing physiological responses to environmental stresses, ring conformational requirement for biological activity, 8081
- Aglaia argentea and Aglaia forbesii, isolation of didesmethylrocaglamide, aglains A-C, aglaforbesins A-B, ethylrocaglaol and forbaglins A-B, structures, 6931
- Ajuga reptans, isolation of reptansterone, 28-episengosterone, 5,29-dihydroxycapitasterone, 2-

- and 3-dehydroajugalactone (phytoecdysteroids) from roots of, 10137
- Baeckea frutescens, isolation of metabolites with C_{13} skeletons, 9735
- biosynthesis of natural glucosides and fluorogenic substrates for β-glucosidases followed by in vivo ¹³C NMR with high density plant cell cultures, 925
- Blasia pusilla L. liverwort; isolation of pusilatins A-D, apigenin 7-O-β-D-glucoside, shikimic acid and five orsellinic acid derivs from, structure elucidation, 14487
- capsaicin, pungent principle of hot pepper fruit (Capsicum), synth of 15 analogues from (E)-alkenoates derived from Claisen rearrangement of allylic alcohols, 8439
- Catha edulis, synth of both enantiomers of cathinone, originally isolated from –, synth by regioselective reductive ring opening of substituted aziridines, 12111
- Cichorium intybus chicory, source of guaiane sesquiterpene lactones, use for biotransformation of (E,E)-cyclodeca-1,6-dienols, 11273
- cotylenol, fusicoccane diterpenoid having leaf growth activity, synth from condensation of two iridoid synthons, 3921
- Craspidospermaverticillatum Apocynaceae plant, synth of intermediates to (±)-andranginine, an alkaloid isolated from—, 11291
- Cymbidium goeringhii (Asian orchid), synth of both enantiomers of methyl cis-(Z)-dehydro-jasmonate, the principal note for the scent of, 1487
- Dehaasia triandra, isolation of five new alkaloids, secoxanthoplanine, dehydroisocorydione, 11,8'-bisisocorydine, (8,8'-R)- and (8,8'-S)-bisocorydine from leaves of, 6561
- 24-epiteasterone, 24-epityphasterol, 2-deoxy-3,24-diepibrassinolide and 2-deoxy-24-epibrassinolide, steroidal phytohormones, synth from ergosterol, 1997
- Ginkgo biloba (maidenhair tree), NMR study of C-1 stereochemistry of ginkgolides isolated from, 4505
- Goniothalamus, cytotoxic activity of (+)goniodiol against A-549 human lung carcinoma, synth by Ghosez' methodology, 14877
- Goniothalamus giganteus, synth of (+)-goniofufurone, (+)-goniobutenolide A and (-)-goniobutenolide B, antitumour stryllactones from, 6547
- Juniperus thurifera, synth and stereochemistry of

epithuriferic acid, a deriv of thuriferic acid isolated from leaves of, 4903

Lepidobotrys staudtii Cameroonian medicinal plant, structures of dihydroxy-3-friedelanone triterpenes from the leaves and the stem bark of, 14989

Maytenus scutioides (Celastraceae), structures and absolute configuration of triterpene dimers from, 9597

Microcos philippinensis, synth of micropine and epimiropine originally isolated from, 13467

Mylia taylorii (liverwort), synth of (+)-taylorione sesquiterpene originally isolated from -, 7391

Peripentadenia mearsii (elaeocarpaceous tree), synth of peripentadenine and dinorperipentadenine alkaloids originally isolated from, 2199 plant growth promoter activity of brassinosteroid analogues with a 2β , 3β -diol and a A/B cis and trans ring junction, 2435

Porella (liverwort), synth of (\pm) - β -pinguisene and (\pm) -pinguisenol originally isolated from, 7475

Porella swartziana (liverwort), structures of africanane, seco- and nor-seco-africanane, guaiane and germacrane type sesquiterpenoids isolated from, 6339

Salvia apiana Jeps, isolation of 13,14-dioxo-11-hydroxy-7-methoxy-hassane-8,11,15-trien-(22,6)-olide, a C₂₃ terpenoid from –, structure and biosynthetic origin, 12309

shikimate pathway, synth of (-)-3(R)-amino-4(R),5(R)-dihydroxy-1-cyclohexene-1-carboxylic acid, the 3(R)-amino analogue of (-)-shikimic acid, 8565

Stellaria dichotoma L. var.lanceolata Bge., structures of dichotomins A-E isolated from roots of, 1165

Striga, Alectra and Orobanche, synth of strigol seco-analogues from 2-cyclopenten-1-ylacetic acid, 14827

Tabernaemontana eglandulosa, synth of tacamine-type alkaloids orginally isolated from, 11361

Taxus cuspidata (Japanese Yew), structures of taxuspines N-P isolated from, 5391

Taxus cuspidata (Japanese Yew), structures of taxuspines Q-T, taxoids from -, 12159

Taxus cuspidata (Japanese yew), structures of taxuspines U-W isolated from, 13145

tricolorins A-E, oligosaccharide phytogrowth inhibitors from the resins of *Ipomoea tricolor* (Convolvulaceae), mass spectrometry and

NMR study, 13065

Vitis coignetiae Kyohou, isolation of two new hydroxystilbenoids named vitisin C and viniferal from, structures, 9991

Xylopia aromatica (Annonaceae), structures and cytotoxic activity of aromin and aromicin, acetogenins isolated from bark of, 4215

Platinum and compds

RhCl₃- and PtCl₄-aliquat 336° ion pair catalysts for transformation of phenylated diynes to polycyclic compds, 8349

Podands

see also Complexation, Host molecules

Polonovski-Potier reactions

epimerisation of 20-epitacamonine in synth of apotacamine alkaloid, 11361

Polyamines

spermine and spermidine, synth of hydroxylamine analogues of polyamines by enzymatic decarboxylation of ornithine and S-adenosylmethionine, 13751

Polycyclic aliphatic compds

linearly fused tricyclic[5.6.5] and [6.6.6] compds, synth by thermal oxy-Cope rearrangement of ethynyl and allenyl derivs of self condensed cycloalkanones, 7737

see also Adamantanes, Cage molecules, Cubanes, Quinanes

Polycyclic aromatic compds

acenaphth[1,2-a]acenaphthylene, [4+2]cyclo-addition reactions with various dienes, 14777

cis-1α-acetoxy-7-methoxy-1,2,3,4,4a,10a-hexahy dro-9(10H)-phenanthrenone, synth from 6-methoxy-1-tetralone, 15209

benzanthrenyl and 1-hydroperyllenyl anions, spectrometry and reactivity, 2647

by transformation of phenylated diynes using RhCl₃- and PtCl₄-aliquat 336° ion pair catalysts, 8349

4a,9a-dihydro-9*H*-carbazoles, bridgehead-dihydro benzo-annulated heteroaromatic ring system, synth *via* iron-mediated cyclisations, 7345

1,3-dipolar cycloadditions of — with 3,5-dichloro-2,4,6-trimethyl- and 2,4,6-trimethylbenzonitrile oxide, 13027

doubly-caged sterically-congested tetraol, synth by Diels-Alder reaction of a cage-annulated cyclohexa-1,3-diene, 6325

linearly fused tricyclic[5.6.5] and [6.6.6] compds, synth by thermal oxy-Cope rearrangement of ethynyl and allenyl derivs of self condensed

cycloalkanones, 7737

naphtho-anellated [5.6.5]- and [6.5.5.5]fenestranes, synth using cyclodehydration route *via* 1,3-indandiols, 13167

polycyclic frameworks containing a cyclobutane-1,2-diol and a cyclopentane-1,2-diol, synth by samarium diiodide-mediated pinacolisation of diketones, 11799

see also Calixarenes, Fullerenes, and the individual ring systems

Polycyclic heterocyclic compds

angularly and linearly fused 1,2- and 1,3-disubtituted [1,2,4]triazolium salts, synth and reaction with nucleophiles, 1399

γ-carbolines and pyrimido[3,4-a]indole derivs by intramolecular ring-closure of heterocumulene-substituted indoles, 5833

dibenzo[*c*,*h*]-1,5-naphthyridines (11-aza-benzo-[*c*]phenanthridines), synth by nitration, reduction, amidification and subsequent cyclisation of substituted 2,3-diarylacrylazides, 10427

3-(dimethylamino)methyl-5*H*,11*H*-pyrrolo[2,1-*c*][1,4]benzothiazepine derivs with potential central nervous system activity, synth from pyrrolo[2,1-*c*][1,4]benzothiazepines, 7745

4,6-diphenylthianthrene, synth and X-ray crystal structure, 4745

exo- and endo-7,8- and 6,7-epoxyhomotropanes, synth of scopine, pseudoscopine, 11947, 11963, 11977

indolo[2,3-a]pyrrolo[3,4-c]carbazole ringsystem, synth involving coupling between indole and methylmaleimide portions and cyclisation of bisindolylmaleimide, synth of arcyriaflavins, 8099, corrig. 14079

mono- and dialkylsubstituted 1,10-phenanthrolines, synth from o-anisidine derived 8-amino-quinolines, 2937

pyrrolidino[3,4-c]carbazoles, synth from *N*-benzyl-2-formyl-5- and 7-methoxyindole, 6373 system consisting of two lipophilic 4,7-di-(n-hexyl)-2,9-diphenyl-1,10-phenanthrolinemoieties linked by a diacetylenic bridge and ended by two alkynes, cyclisation of, synth of dicopper(I) [3]-catenate, 10921

12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthro linophane, synth by cyclisation of 2,9-bis-(bromomethyl)phenanthroline, 4673

tetrahydrocarbazoles and carbazoles from Diels-Alder reactions of indoles, ketones and maleic anhydride, 4555

Polyethers

lasalocide A and other polyether ionophore antibiotics, synth of a fragment of by higherorder vinyl cuprate ring opening of functionalised epoxides derived from tris(hydroxymethyl)methane, 12631

lysocellin, polyether antibiotic, synth of C1-C9, C16-C23 and C10-C23 subunits followed by total synth, 531, 551

polyether dendritic sectors, prep by a convergent approach from 4-t-butylphenol, phloro-glucinol and 1,3-dibromopropane, useful building blocks for functional dendrimers, 4277

Polyketides

assembly of a polyketide chain in biosynthesis of coloradocin, antigonorrheol and antianaerobic antibiotic produced by fermentation of *Actinoplanes coloradoensis* sp., 10327

plakortones A-D, activators of cardiac SR-Ca²⁺ pumping ATPase, from *Plakortis halichondrioides* sponge, 377

Polymer support

photolabile supports for solid phase synth of oligonucleotides containing 3'-alkyl amines, 3827

polystyrene-supported η^5 -cyclopentadienyl rhodium catalyst for synth of cyclopentanone derivs by hydrocarbonylative cyclisation or Claisen rearrangement, 5461

rhodium carbenoid attached to a polystyrene resin, generation by treatment of a resin-bound diazoacetamide with rhodium(II) acetate, 5999

Polymerisation

oxidative – of 5,6-dihydroxyindole-2-carboxylic acid to melanin, 7913

reactions of C_{60}^{-+} , C_{60}^{2+} and C_{60}^{-3+} with C_2H_4 and C_2H_4 in gas phase, polymerisation initiated by C_{60}^{-3+} , 5191

Polymers

formation of a non-covalent polymer by hydrogen bonding between the oxime functionalities of 1,1'-bicyclohexylidene-4,4'-dione dioxime, 1773

fullerene-based thin polymeric film, literature review, 5113

main-chain polymers with incorporated [60]fullerene units, synth by reaction of buckminsterfullerene with functionalised bis-O-quinodimethanes, 5007

pyrrolylpyridines, alternating pyrrole:pyridine oligomers and polymers and related systems, synth by Stetter procedure and characterisation of, 8707

rod-like conjugated poly-ynes, synth from 4trimethylsilylethynyl iodobenzene using crosscoupling and desilylation reactions, 5495

Polyols

acyclic 1,2-/1,3-mixed pentols, synth and general trends in bichromophoric exciton coupled CD spectra, application to determination of absolute configuration of bacteriohopanepentols from *Nostoc* PCC 6720, 2759, 2777

derived from the diastereoselective dihydroxylation of optically active allylic enoate alcohols, manipulation of, 7861

see also Carbohydrates, Inositols

Porphyrins and analogues

[28]tetraoxaporphyrinogen(6.0.6.0), synth and oxidation to diatropic [26]tetraoxaporphyrin-(6.0.6.0)dications, 11763

boronic-acid-appended metalloporphyrin, selective binding of glucose-6-phosphate and 3,4-dihydroxyphenylalanine, 2817

galactopyranosyl substituted porphyrins, synth from porphyrin carboxylic esters, 5441

hexafluorohematoporphyrin deriv, synth starting from benzyl 3,5-dimethyl-2-pyrrolecarboxylate, 13961

methyl esters and aspartyl amides of benzoporphyrin derivs from rhodoporphyrin XV dimethyl ester and 3-vinylphylloerythrin methyl ester, synth and photodynamic efficacy of, 5349 Mn(III)-tetraarylporphyrins bearing perfluoroalkylamido tails, synth and use as catalysts for epoxidation of alkenes employing aqueous NaOCl as oxygen donor, 11879

porphyrin/depsipeptide/p-benzoquinone molecule, synth for study of hydrogen bond mediated electron transfer in proteins, 12357

sulfhemes-A and -C, synth of metal-free oxygen analogues of from protoporphyrin-IX dimethyl ester, 1123

5,10,15,20-tetrakis(substituted-imidazol-2-yl)-porphyrins, synth from *N*-protected imidazole-2-carboxaldehydes and pyrrole, 9877

tetraoxa[24]porphyrinogen(4.0.4.0)/tetraoxa-[22]porphyrin(4.0.4.0) dication, synth, 1981

tri-(N-methyl-4-pyridiniumyl)porphyrinsbearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, synth and DNA binding studies, 13569, 13589

10,15,20-tritolylporphyrins linked to high acceptor strength cyano quinones as models for the photosynthetic reactions centre, 8497

meso-tetrakis[1-benzyloxy-3-methylpyrazol-5-yl

]-porphyrin, synth from 1-benzyloxy-5-formyl-pyrazole, complexation of *meso*-tetrakis-(1-benzylpyrazol-4-yl)-porphyrin with Zn(II) and Co(III), 10811

see also Chlorins and derivs

Pressure, reactions under

activation of the conjugate addition of amines to α,β -ethylenic substrates by pressure, lanthanide catalysis and use of water, 13557

Prins reactions

induced by zinc and trimethylsilyl chloride for synth of (1*S*,2*S*,3*R*,6*S*)-3-chloro-3-methyl-6-iso-prenyl-1,2-cyclohexanediol, 4645

Propellanes

aromatic propellanes, synth, X-ray structures and conformational study of polypyrazolylpyridines, 11075

[4.3.3]-propellanes by Diels-Alder reactions of acenaphth[1,2-a]acenaphthylene, 14777

reaction with HNO₃ and nitronium salts, mechanisms, 5857

Protecting groups

arylmethyl ethers in derivs of benzophenones, xanthones, anthraquinones, aryl esters, benzamides and nitroanisoles, selective removal of methyl group with BeCl₂, 13623

combinatorial protecting group strategy for synth of oligonucleotides, 6913

2-n-decylthioethyl as protecting group of the 5'-terminal phosphate function in synth of oligodeoxyribonucleotides bearing a 5'-phosphate group, 3933

1,1-dianisyl-2,2,2-trichloroethyl group as a 2'-hydroxyl protecting group of ribonucleotides, 1493

Fmoc cleavage by piperidine in solid phase glycopeptide synth, 7983

MEM ethers, cleavage of by tetrahalozincate reagents, 15257

tetrahydropyranyl, methoxymethyl, 1-ethoxyethyl, 1-methyl-1-methoxyethyl and trimethylsilyl ethers, cleavage using silica-alumina gel catalysts prepared by the sol-gel method, 9387

Proteins

bacteriorhodopsin, retinylidne protein, synth of a coumarin analogue of retinal for study of the bacteriorhodopsin chromophore binding site, 9581

cystinyl-cystinyl-cystine [-CSSCCSSCCSSC-], synth and conformational study of, 9819

hydrogen bond mediated electron transfer in proteins, study of using a porphyrin/depsi-

peptide/p-benzoquinone molecule, 12357 sulfhemes-A and -C, synth of metal-free oxygen analogues of from protoporphyrin-IX dimethyl ester. 1123

2,2':5',2"-terthiophene-5-derivs which can be linked to proteins or other carrier molecules by using different functional groups, synth and conjugation with proteins and antibodies, 11281

Pschorr reactions

of substituted diphenyl sulfide, synth of 4,6-dimethyldibenzothiophene, 3953

Pterins

7,7-difluoro-7,8-dihydropterins and pterins with fluoroalkyl substituents at the 6 or 7 positions, synth from fluorine-containing aliphatic precursors and substituted pyrimidines, 13017

Pummerer reactions

see Rearrangements

Purines

- 5-amino-4-sulfonamidoimidazole nucleosides, synth as potential inhibitors of purine nucleotide biosynthesis, 9219
- N,N'-dibenzylated 2-purinones, regiochemistry in addition of Grignard reagents to, 12979
- 2,6-dihalopurines, regiochemistry of Stille coupling of, 5625
- exo- and endo-N⁶-(5,6-epoxynorborn-2-yl)adenosine, synth via norbornenylamines, potent agonists for the A₁ adenosine receptor, 4735
- oligodeoxynucleosides containing 6-methylthiopurine residues, synth *via* the phosphoramidite or by prep of oligomers containing 6-thiopurine residues and subsequent methylation, 10737
- phosphonate derivs of N^9 -benzylguanine, prep as purine nucleoside phosphorylase inhibitors, 177
- cis-4-(9H-purin-9-yl)-2-cyclohexenylcarbinols, synth from cyclohexadiene and chlorosulfonyl isocyanate, 799
- 2-[5-(9*H*-purin-9-yl)-2-cyclopenten-1-yl]-ethan-ol analogues, synth, 8407
- cis-2-[4-(9H-purin-9-yl)-2-cyclopenten-1-yl]etha nol analogues, synth from racemic 2-cyclopentene-1-acetic acid by palladium-catalysed synth, 2789
- purine and pyrimidine β-D-threo-hex-3'-enopyranosyl nucleosides, Synth from 1,5-anhydro-4,6-O-benzylidene-2-O-p-toluoyl-D-glucitol, conformational behaviour, 9249
- N^{α} -(purinyl/pyrimidinyl acetyl)-4-aminoproline

diastereomers with potential use in PNA synth, synth from 4R-hydroxy-2S-proline, 15007

pyrimidine and purine nucleosides by oxidation of thiopyrimidine and thiopurine nucleosides with dimethyldioxirane, 6759

ST 689, a deriv of allopurinol and an immunostimulatory drug, synth, 2271

see also Nucleosides, Nucleotides

Pyranones

see Pyrones

Pyrans

benzyl 2,3-anhydro- α -D-ribopyranoside, ring opening reactions of with nucleophiles, 5607 2,4-cis-3,4-dihydro-2H-pyrans, synth by Diels-Alder reactions of (E)-1-phenylsulfonyl-3-alken-2-ones, 1205

(3S,5R,6S)-3,5-dimethyl-6-isopropyl-3,4,5,6-tetrahydropyran-2-one, sex pheromone of the larval parasitoid *Macrocentrus grandii*, synth, 5907

fused pyran derivs, synth by carbon transfer reactions of 1,3-oxazinanes and oxazolidines with carbon nucleophiles, 14273

protected D-hex-2-ulopyranosyl azides, synth and photolysis of, 9057

spiroindolinopyranswithunsaturatedside-chains in benzopyran site, synth by Wittig reaction under Phase Transfer Catalysis, 8755

Pyrazines

benzonitrile oxide cycloaddition to, 6421

O₂-H₂O₂-vanadium complex-pyrazine-2-carboxylic acid as reagent for oxidation of alkanes, 13051

6-oxoperhydropyrrolo[1,2-a]pyrazines, synth as spacer templates for peptidomimetics from the corresponding 3,6-dioxo analogues, 13991

piperazine reaction with C_{60} , prep of $C_{60}N_2$ (C_2H_4)₂ and six double addition products, consistent geometric distortions of the fullerene core upon adduct formation, 5021

2(1H)-pyrazinones with a 2-propynylaminomethyl or 3-butynylamino methyl side chain, Diels-Alder reaction of, prep of pyrrolo[3,4-b]and [3,4-c]pyridin(on)es and related naphthyridines, 9161

spirotryprostatins A and B, diketopiperazine alkaloids produced by Aspergillus fumigatus, structures and biological activity, 12651

Pyrazoles

2-acyl-3-phenyl-l-menthopyrazoles, diastereoselective α -acylation and subsequent aminolysis of, synth of enolizable β -keto amides, 10335

- fluorine bearing pyrazolones, synth using methyl ester of 2-fluoro-3-methoxyacrylic acid as building block, 4403
- functionalised pyrazolium salts, reduction of, synth of functionalised pyrazolidines, 9193
- 4-, 5-, and 6-substituted imidazo[4,5-c]pyrazoles, synth from imidazo[4,5-c]pyrazole-5-thiones, 7179
- 4-nitropyrazoles, reduction by sodium borohydride or sodium borodeuteride, synth of azoxy compds, 9541
- 4-phosphorylated pyrazoles, synth by addition of lithiated β -hydrazonophosphine oxides to isocyanates and isothiocyanates followed by cyclisation, 4123
- polypyrazolylpyridines, synth, X-ray structures and conformational study of, 11075
- pyrazoles, thiazete dioxides and 1,2,6-thiadiazine dioxides by rearrangement of thiadiazabicyclo[3.1.0]hexene derivs, 7183
- pyrazolo[1,5-a]quinolines, synth by reaction of N-methylaminoquinoloneswithvarious acrylate derivs in the presence of NaH, 8471
- pyrazolo[5,1-c]pyrimido[4,5-e][1,2,4]triazines, synth by reaction of *N,N*-dimethyldichloromethyleniminium chloride with ethyl 4-amino-3-cyanopyrazolo[5,1-c][1,2,4]triazine-8-carboxy late, 3037
- pyrrole and pyrazole rings *via* reaction of thiocarboxylic acids with azoalkenes and subsequent internal cyclisation of the resulting hydrazone 1,4-adducts, 1579
- 4-substituted 1-(hydroxyalkyl)-1*H*-pyrazolo[3,4-*d*]pyrimidines, synth from 4-chloro-1*H*-pyrazolo [3,4-*d*]-pyrimidine, 2271
- 4-substituted 3,3,5,5-tetramethyl-3,5-dihydro-4*H*-pyrazoles, electronic structure by photo-electron spectroscopy and gas-phase thermolysis of, cyclisation to an alkylideneselenirane, 1965
- meso-tetrakis[1-[2-(trimethylsilyl)ethoxymethyl] pyrazol-5-yl]-porphyrin, crystal and molecular structure by X-ray analysis, 10811
- vinylpyrazoles, Diels-Alder reactions of, synergy between microwave irradiationand solvent-free conditions, 9237

Pyrazolidines/pyrazolidinones

- N-acetyl pyrazolidines or 1,3,4-oxadiazines, synth by organoselenium-induced cyclisation of N-allyl acethydrazides, 11841
- functionalised pyrazolidines by reduction of functionalised pyrazolium salts, 9193

Pyrazolines/pyrazolinones

- 4-arylmethylene pyrazol-5-ones or isoxazol-5-ones, reduction of with 2-arylbenzimidazoline, synth of C,C- and C,N-linked dimers and 4-arylmethyl derivs, 1443
- conjugated Δ^2 -pyrazolines by 1,3-dipolar cycloaddition of diazomethane to $\alpha\beta$ -unsaturated esters and lactones, 4515

Pyridazines

- A-ring pyridazine analogue of (-)-podophyllotoxin, synth using the Stille reaction, 14235
- 5-amino-7-substitutedhieno[3,4-d]pyridazinone, reactivity toward electron-poor olefins and acetylenes, 11915
- benzonitrile oxide cycloaddition to, 6421
- 3-chloro-6-methoxypyridazine, metalation of using hindered bases as metalating agents, improvement of regioselectivity of, 10417
- 3-(4-halogenophenyl)pyridazinium ylids, 3+2 dipolar cycloadditions to acrylate and propiolate of ether, synth of pyrrolopyridazine heterocycles, 8853
- pyridopyridazinones, biologically active compds, synth by reaction of hydroxyazaisoindolinones with hydrazine hydrate, 3261

Pyridines

- 4-aryl-1,4-dihydropyridine calcium channel antagonists, conformational dynamics of by NMR and saturation transfer, 9665
- azepine-ring formation at the periphery of pyridone and pyrido[1,2-a]pyrimidone systems *via* ene reactions, mechanism, 13081, 13097, 13111
- 3-(1-benzyl-1,2,3,6-tetrahydropyridin-4-yl)-1*H*-indoles, synth by reaction of substituted indoles with *N*-benzyl-4-piperidinone, 10185
- bipyridine containing ligands for iron(II) and iron(III) coordination, 12197
- 2,3- and 3,4-o-bis(chloromethyl)pyridines, synth *via* cycloaddition of oxazinones with propargyl chloride and 1,4-dichloro-2-butyne, use as precursors to pyridine o-quinodimethane analogues, 11889
- 1,8-di(3'-pyridyl)naphthalene, synth by coupling of 1,8-dibromonaphthalene and diethyl(3-pyridyl)borane, atropisomerism of, 8703
- diethyl(2-pyridyl)boranes, rigid cyclic dimers via intermolecular boron-nitrogen coordination bonds, 13933
- 1,6-dihydro-6-oxo-2-pyridine- and 6-oxo-2-piperidinecarboxylates, synth from 4,6-dichloro-2oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones by cleav-

- age with alcohols, 2591
- dihydropyridinones, Diels-Alder reactions of, synth of the tetracyclic substructure of manzamine A alkaloid, 10597
- 2-glycosylaminopyridines, synth through tandem Diels-Alder/retro Diels-Alder reaction starting from 6-glycosylaminopyrimidines with dimethyl acetylenedicarboxylate as dienophile, 5845
- 3-hydroxy-2(1*H*)-pyridinones and 3-hydroxy-4(1*H*)-pyridinones, directed aminomethylation of, synth of iso-deferiprone, 1835
- N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, reactions with amine, sulfenamide and α-amino acid esters, synth of carboxamides and simple dipeptides, 9347, 9367 isomeric quaterpyridines with 2,2'-bipyridine
- isomeric quaterpyridines with 2,2'-bipyridine units, synth using pyridine N-oxide and pyridinium ion synthons, 4239
- isothiazolo[5,4-b]pyridin-3(2H)-one derivs, molecular modelling of, 8947
- naloamine, an aminoalkylpyridine, and nalodional, a cytotoxic polypropionate, from *Smaragdinella calyculata*, structures, 9681
- 3-nitropyridines, reduction by sodium borohydride or sodium borodeuteride, synth of azoxy compds, 9541
- 6-phenylhydrazono-6,7,8,9-tetrahydro-11*H*-dipy rido[1,2-*a*;4,3-*d*]pyrimidine-11-ones, Fischer indolisation of, synth of 3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, 7789
- polypyrazolylpyridines, synth, X-ray structures and conformational study of, 11075
- polysubstituted 2-pyridinecarboxylic acid derivs by reaction of (functionalised) 2-oxa-5-azabicyclo[2.2.2]oct-5-en-3-ones with various nucleophiles, 12529
- pyridine derivs, construction from 2-aza-1,3dienes with electron-releasing substituents at the 1,3-positions, 10095
- pyridine and pyrido[1,2-a]pyrimidine systems, oxime-nitrone isomerisation and hydrazone-azomethine imine isomerisation at the periphery of, 887, 901
- 5-(1-pyridinio)-11,17,23-tri-t-butyl-28-hydroxy-2 5,26,27-trialkoxycalix[4]arene and 5,17-bis(1-pyridinio)-11,23-di-t-butyl-26,28-dihydroxy-25, 27-di(ethoxycarbonyl)methoxycalix[4]arene perchlorates, synth, 639
- pyridopyridazinones, biologically active compds, synth by reaction of hydroxyazaisoindolinones with hydrazine hydrate, 3261
- 2-pyridyl group of 2,2'-bipyridine or 2,4'-bi-

- pyridine, metalation of in the presence of lithium2,2,6,6-(tetramethyl)piperidineresulting in *ortho*-lithiation, 14469
- pyridylmethyl(amino)phosphonates, acidic cleavage of, formation of the corresponding amines, 12483
- pyrrolo[3,4-b]- and [3,4-c]pyridin(on)es and related 1,7-naphthyridinones and 2,7-naphthyridines, synth by Diels-Alder reaction of 2(H)-pyrazinones, 9161
- pyrrolylpyridines, alternating pyrrole:pyridine oligomers and polymers and related systems, synth by Stetter procedure and characterisation of, 8707
- substituted 6-chloro-2-pyridinecarboxylic acid derivs from the reaction of 4,6-dichloro-2-oxa-5-aza-bicyclo[2.2.2]oct-5-en-3-ones with nucleophiles, 6997
- substituted o-aminonitrile pyridine derivs, reaction with phosgeniminium chloride, synth of 7-oxa(or thia)-3,4,6-triazabenz[d,e]anthracene and 7-oxa-3,4,6,9-tetraazabenz-[d,e]anthracenes, 10497
- 4-and6-trifluoromethyl-3-cyano-2(1H)-pyridinethiones, regioselective synth based on condensation reactions of trifluoroacetylacetone and its methyl enacetal with cyanothioacetamide, 10841

Pyridinium salts

- 1-butyl-3-[1,2,4-triazol-5(3)-ylmethyl]pyridinium and 1-butyl-4-[imidazol-4(5)-ylhydroxymethyl]pyridinium salts, chemical stability to oxidation, 15197
- tri-(*N*-methyl-4-pyridiniumyl)porphyrinsbearing an amino acid or peptide side-chain on the fourth meso aromatic substituent, synth and DNA binding studies, 13569, 13589
- 1,2,3-triazolo[1,5-a]pyridinium N2-dicyanomethylides, prep, structure and reactivity with acetylenic dipolarophiles, 10519

Pyridones

N-propargyl-6-halo-2-pyridones, tandem radical reactions with aryl isonitriles, synth of tetraand penta-cyclic products, first generation synth of (±)-camptothecin, 11385

Pyrimidines

see also Nucleosides, Nucleotides, Uracils

Pyrimidines/pyrimidinones

2-alkyl(aryl)-4-hydroxy(mercapto)-6-oxo-1,6-di hydropyrimidin-5-yl-triphenylphosphonium chloride, synth by reaction of Ph₃P+CHCN with acylisocyanates and thio analogues, 8835

6-amino-3-methylpyrimidin-4(3H)-ones, theoretical investigation of their reactivity towards DMAD, tandem Diels-Alder retro Diels-Alder reaction, 13721

benzonitrile oxide cycloaddition to, 6421

5-benzoylethyl barbituric acid and 1,3-dimethyl barbituric acid derivs, synth and reactions with anilines, synth of pyrimidoquinoline derivs and benzazoles respectively, 10147

1,2-dihydropyrimidin-2-one, synth by photoirradiation of 5-t-butyl-1-methyluracil, synth, structure and properties, 10159

fluorine bearing pyrimidines, synth using methyl ester of 2-fluoro-3-methoxyacrylic acid as building block, 4403

fused diaminopyrimidinones, synth using N-cyanochloroacetamidine as a building block, 1011

6-glycosylaminopyrimidines, tandem Diels-Alder/retro Diels-Alder of – using dimethyl acetylenedicarboxylate as dienophile, synth of 2-glycosylaminopyridines, 5845

heterocyclic substituted and 2,4-difunctionalised pyrimidines, synth from *N*-tosyl-2- and -3-acetylpyrroles or *N*-tosyl-2-pyrrolidone or from 2,4-bis(methylsulfonyl)pyrimidines, 7973

imidazo[1,2-a]pyrimidine by iodocyclisation of 3-(alk-2-enyl)-2-(substituted amino)-1-imidazolin-4-one, 2827

imidazo[1,2-a]pyrimidine by iodocyclisation of 3-alkynyl- and 3-allenyl-2-(substituted amino)-1-imidazolin-4-ones, 6581

6-phenylhydrazono-6,7,8,9-tetrahydro-11*H*-dipy rido[1,2-a;4,3-d]pyrimidine-11-ones, Fischer indolisation of, synth of 3-azarutecarpine (1-azanauclefine) and its 7-methyl deriv, 7789

purine and pyrimidine β-D-threo-hex-3'-enopyranosyl nucleosides, Synth from 1,5-anhydro-4,6-O-benzylidene-2-O-p-toluoyl-D-glucitol, conformational behaviour, 9249

 N^{α} -(purinyl/pyrimidinyl acetyl)-4-aminoproline diastereomers with potential use in PNA synth, synth from 4*R*-hydroxy-2*S*-proline, 15007

pyridine and pyrido[1,2-a]pyrimidine systems, oxime-nitrone isomerisation and hydrazone-azomethine imine isomerisation at the periphery of, 887, 901

pyrimidine derivs, construction from 2-aza-1,3dienes with electron-releasing substituents at the 1,3-positions, 10095

pyrimidine and purine nucleosides by oxidation of thiopyrimidine and thiopurine nucleosides

with dimethyldioxirane, 6759

pyrimidine sulfones, synth and heating to give pyrimidine O-quinodimethanes, subsequent Diels-Alder reactions yielded tetrahydro-quinazolines, 1735

bis-(pyrimidiniumolates), synth and conformation, 5475

pyrimido[3,4-a]indole derivs by intramolecular ring-closure of heterocumulene-substituted indoles, 5833

pyrimidoazepinone derivs, intermediates to pyrimidoazepine based folic acid derivs, synth by 1,3-dipolar cycloaddition approach *via* an isoxazolinopyrimidoazepine deriv, 5739

pyrimidoquinoline derivs by reaction of anilines with 5-benzoylethyl barbituric acid, 10147

4-substituted 1-(hydroxyalkyl)-1*H*-pyrazolo[3,4-*d*]pyrimidines, synth from 4-chloro-1*H*-pyrazolo[3,4-*d*]-pyrimidine, 2271

5,6,7,8-tetrahydro-5-oxoimidazo[1,5-c]pyrimidi nes, alkylation with alkyl halides, synth of 1-alkyl hystidines and histamines, 5363

Pyrimidones

2-amino-4*H*-pyrimidones as hosts for dicarboxylic acid guests, 3153

pyrimidone sulfones, synth and heating to give 5,6-dimethylenepyrimidin-4-ones, subsequent Diels-Alder reactions of, 1723

Pyrindanes

chiral bipyrindine and biquinoline ligands, synth using Mn-salen catalysed asymmetric epoxidation as a key step, application to synth of *trans*-whisky lactone, 3905

Pyrolysis

of acylaminomethylene Meldrum's acid derivs under FVP conditions, synth of 2-substituted 1,3-oxazin-6-ones, 3163

flash vacuum pyrolysis of 2- and 3-thienylmethylbenzoates, mechanism involving 2-, 3thienyl methyl and phenyl radicals, 13615

of hydrocarbons, cyclopentadienide metal complexes and mellitic acid anhydride, synth of fullerenes, 4949

Pyrones 4 8 1

5,6-dihydro-2-pyrone, rearrangement of, synth of precursors to (2*S*,4*R*,5*R*)-4,5,6-trihydroxynor-leucine and 5-hydroxynorvaline, 12911

(-)-mitsugashiwalactone, (+)-iridomyrmecin, (-)-isoiridomyrmecinand(+)-teucriumlactone, iridoid cyclopentapyranones, synth by Horner-Wadsworth-Emmons reaction on enolisable cyclopentanones, 3435

vallartanone B, a γ-pyrone-containing polypropionate from the mollusc *Siphonaria maura*, synth from (S)-3-hydroxy-2-methylpropionate, 13901

Pyrroles

- 1-aryl-2-nitropyrroles, synth and reactions of, conformation of ethyl *N*-[2'-[1'-(2-nitropyrrolyl)]phenyl]-*N*-toluene-4-sulfonamide glycinate, 4485
- benzyl 4-methyl-3-(2,2,2-trifluoro-1-methoxyethyl)-2-pyrrolecarboxylate and benzyl 5-acetoxymethyl-3-methyl-4-(2,2,2-trifluoro-1-metho xyethyl)-2-pyrrolecarboxylate, synth and conversion to a hematoporphyrin, 13961
- N-(t-butoxycarbonyl)-2-(t-butyldimethylsiloxy)pyrrole as homologative nucleophile for synth of 3-amino-3-deoxy- and 4-amino-4-deoxyhexoses from 2,3-O-isopropylidene-D-glyceraldehyde, 4829
- 2-cyano-3,4-substituted pyrroles by condensation of α -acetoxynitro compds with isocyanoacetonitrile using DBU in THF, subsequent 4 step conversion to porphobilinogen, 14689
- 1,2-(3,4-dihydro-2H-pyrrolo)- C_{60} , synth by [3+2] cycloaddition of C_{60} , 5407
- 2,5-dihydropyrrole derivs, intermediates to alkaloids, synth from hydroxy amides or carbamates involving tandem Wittig-Horner/intramolecular Michael reaction followed by retro Diels-Alder cleavage, 6943
- *N,N*'-diisopropyl-3,3'-bispyrrole by palladium-catalysed rearrangement of 1,6-diazacyclodeca-3,8-diynes, 10383
- 3-(dimethylamino)methyl-5*H*,11*H*-pyrrolo[2,1-c][1,4]benzothiazepine derivs with potential central nervous system activity, synth from pyrrolo[2,1-c][1,4]benzothiazepines, 7745
- 2,3- and 2,5-disubstituted pyrroles by reaction of 1-substituted vinamidinium salts with sarcosine and glycine ethyl esters repectively, 6879
- 2,4-disubstituted pyrrolo[2,1-f][1,2,4]triazines by reaction of *N*,*N*-dimethyldichloromethyleniminium chloride with 1-aminopyrrole-2-carbonitrile, 3037
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges, cytotoxic activity against doxorubicin-resistant L1210/DX tumoural cells, 8899
- 3-ethyl-2,7,9-trimethyl-(10*H*)-dipyrrin-1-one, conversion to a lipid analogue of bilirubin with eicosanoic acid side chains, synth and properties of, 447

- indolo[2,3-a]pyrrolo[3,4-c]carbazole ring system, synth involving coupling between indole and methylmaleimide portions and cyclisation of bisindolylmaleimide, synth of arcyriaflavin B-D, 8099, corrig. 14079
- isoquinoline-fused pyrroles by rearrangement of 4-substituted Δ^4 -isoxazolines, 12049
- L-755,807, non-peptide bradykinin binding inhibitor from an endophytic *Microsphaeropsis* sp., isolation and structure, 1481
- 1-methyl-2-vinyl pyrrole, dimethyl acetylenedicarboxylate addition to, solvent effects on mechanism of, 10693
- 6-oxoperhydropyrrolo[1,2-a]pyrazines, synth as spacer templates for peptidomimetics from the corresponding 3,6-dioxo analogues, 13991
- porphobilinogen (PBG), synth of (1*S*,2*S*,3*R*,6*S*)-3-chloro-3-methyl-6-isoprenyl-1,2-cyclohexane diol as inhibitor of biosynth of, 4645
- pyrrole acids by oxidative degradation of eumelanins, black-to-brown pigments of mammalian skin, hair and eyes, 8775
- pyrrole and pyrazole rings *via* reaction of thiocarboxylic acids with azoalkenes and subsequent internal cyclisation of the resulting hydrazone 1,4-adducts, 1579
- 5*H*-pyrrolo[1,2-*a*][3,1]benzoxazin-5-ones, X-ray structure and reverse Diels-Alder reaction of, 12475
- pyrrolo[2,1-a]isoquinolines, synth by reaction of α -keto hydrazonoyl halides with 3,4-dihydro-6,7-dimethoxyisoquinoline, 3451
- pyrrolo[2,1-c][1,4]benzodiazepine ring system of anthramycins by transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, 10751
- pyrrolo[3,2b]pyrrolone derivs from in situ reduction of oximes derived from 1,5-dihydro-2H-pyrrol-2-ones with Raney nickel, 12919
- pyrrolo[3,4-b]- and [3,4-c]pyridin(on)es and related 1,7-naphthyridinones and 2,7-naphthyridines, synth by Diels-Alder reaction of 2(H)-pyrazinones, 9161
- pyrrolo[2,1,5-cd]indolizines, structures of tricyclic alkaloids composed of from *Myrmicaria opaciventris* ants, 13539
- pyrrolylpyridines, alternating pyrrole:pyridine oligomers and polymers and related systems, synth by Stetter procedure and characterisation of, 8707
- tetramethyl-pyrrolinic aminoxyls, chemical and electrochemical study of their interaction with superoxide anion, 11257

tilivalline, a pyrrolo[2,1-c][1,4]benzodiazepine isolated from *Klebsiella pneumonia* var. oxytoca, epimerisation of, 13521

- α,α-bis(trifluoromethyl)-4,5-bis(4-fluorophenyl)
 -1H-pyrrole-2-methanamine, singlet oxygen oxidation of, synth of 4,4-bis(trifluoromethyl)imidazoline analogues, 11153
- 1-ureido-3-propargyl-2,3-dihydropyrrol-2-ols, 1-ureido-3-propargylpyrroles and 1-ureido-3propargyl-3-phosphono-1*H*-pyrrol-2(3*H*)-ones, synth and transition metal catalysed reactions of, 3997

Pyrrolidines/pyrrolidinones

- 3-alkylpyrrolidines, synth by cyclisation of α -aminocarbanions onto unactivated alkene, 12541
- alkyne-containing N-hydroxypyrrolidines, cascade cyclisation of, 11601
- 3-aminopyrrolidin-2-ones, synth from *N*-substituted aziridinecarboxamides, 9909
- 4-aminopyrrolidinones by rearrangement of homochiral β-lactams derived from (+)-(1S, 2S)-2-amino-1-phenylpropan-1,3-diol, 8989, 9005
- 2-(12'-aminotridecyl)-pyrrolidine, defensive alkaloid from the Mexican bean beetle *Epilachna varivestis*, synth and absolute configuration, 6859
- by ring closure of glyoxal monohydrazones with β -ketoesters in a solvent-free reaction, subsequent conversion to pyridazinones, 5819
- N-cycloalkylpyrrolidines by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445
- disubstituted 3-trifluoromethyl-pyrrolidines, synth by 1,3-dipolar cycloaddition of N-benzyl-azomethine ylid with trifluoropropene derivs, 4383
- enantiopure 3-substituted pyrrolidines, synth from N-alkoxycarbonyl-2-(2'-bromoethyl)oxazolidines derived from norephedrines by transformation into lithium derivs and subsequent cyclisation and aldol reaction, 10761
- 2-formylpyrrolidines, synth by rearrangement of α, δ -dichloroaldimines, overall α, α -azacyclobisalkylation of aldehydes, 3303
- functionalised 3,4-dehydropyrrolidin-2-one and 1,2-dehydropyrrolizidine-3-one, synth by intramolecular nitrile oxide cycloaddition of substituted amido-oximes followed by reduction, 14323
- functionalised hydroxymethylpyrrolidinones,

- synth from (S)-pyroglutamic acid derived lactam enolates by hemiaminal ether cleavage, 3719, corrig. 14079
- fused pyrrolidines, synth by tandem intermolecular [4+2]/intramolecular [3+2] cycloaddition of nitroalkenes bearing a pendant olefin via hydrogenolysis of nitroso acetals, 11579
- homochiral functionalised pyrrolidinone and pyrrolizidinone systems by intramolecular oxime-olefin cycloaddition, 7875
- N-isopropyl-2-phenylpyrrolidine, N-phenyl-3pyrroline, N-phenyl and methyl tetrahydroisoquinoline, reductive opening of, synth of functionalised organolithium compds, 8545
- N-(4-methoxybenzyl)-2-pyrrolidinonesoxidation to N-(4-methoxybenzoyl)-2-pyrrolidinones, direct access to 5-alkyl analogues of the cognition activating agent Aniracetam, 12521
- 1-(4-methoxyphenyl)-5-(tetrazol-5-yl-methyl)py rrolidin-2-one, reaction with cerium(IV) ammonium nitrate, 10169
- peripentadenine and dinorperipentadenine alkaloids, synth *via* chemoselective transformation of the vinylogous amide (*E*)-2-benzoylmethylene-1-(2-cyanoethyl)pyrrolidine, 2199
- pyrrolidin-2-one, starting materials for synth of bicyclic guanidines *via* an *N*-acyliminium ion coupling reaction with silyl enol ethers and direct guanylation, 2629
- pyrrolidino[3,4-c]carbazoles, synth from *N*-benzyl-2-formyl-5- and 7-methoxyindole, 6373 spiro(pyrrolidinyl-2,3'-benzodiazepines) related to MK-329, synth by cycloaddition of imines of 1-methyl-3-amino-1,3-dihydro-5-phenyl-(2*H*)-1,4-benzodiazepine-2-one to dipolarophiles, 13455
- substituted fulleropyrrolidines, synth and electrochemical properties of, 5221
- C₂-symmetric(-)-(2S,5S)-N-benzyl-trans-2,5-bis-(acetoxymethyl)pyrrolidine by lipase catalysed hydrolysis of racemic diacetate, 565
- 1,3,4-trisubstituted pyrrolidin-2-ones by intramolecular cyclisation of N-(2-alken-1-yl)amides mediated by Mn(III), use as route to biologically active amino acids containing a pyrrolidine ring, 1069

Pyrrolines/pyrrolinones

2,5-dihydropyrrole derivs (3-pyrrolines), intermediates to alkaloids, synth from hydroxy amides or carbamates involving tandem Wittig-Horner/intramolecular Michael reaction follo-

wed by retro Diels-Alder cleavage, 6943 7-indolyl-pyrrolines and tetrahydropyridines from 4,6-dimethoxyindoles, 4687

N-phenyl-3-pyrroline, N-isopropyl-2-phenyl-pyrrolidine, N-phenyl and methyl tetrahydro-isoquinoline, reductive opening of, synth of functionalised organolithium compds, 8545

pyrrolo[3,2b]pyrrolone derivs from *in situ* reduction of oximes derived from 1,5 dihydro-2*H*-pyrrol-2-ones with Raney nickel, 12919

Pyrrolizines/pyrrolizidines

functionalised 1,2-dehydropyrrolizidine-3-one systems, synth by intramolecular nitrile oxide cycloaddition of substituted amido-oximes followed by reduction, 14323

homochiral functionalised pyrrolidinone and pyrrolizidinone systems by intramolecular oxime-olefin cycloaddition, 7875

pyrrolam A, a pyrrolizidine alkaloid from *Streptomyces olivaceus*, total synth involving intramolecular coupling between a bromoalkyl and ynamide group, 869

pyrrolizidine ring system *via N*-acyl anion cyclisation as the key step, extension to 2-methyl substituted pyrrolizidines, 3757

Pyrylium ions

corands incorporating a thiopyrylium ring, effect of alkali cations on the methoxide ion addition to, 3509

deacetalisation of photoinduced electron transfer with a pyrylium salt, effect of limiting the amounts of water, oxygen and sensitiser, 4911 intramolecular pyrylium ylid-alkene cyclisations for synth of taxane precursors, 14081, 14103, 14147

Quinanes

angular triquinanes by Pauson-Khand intramolecular cyclisation of 1-(3-alkoxy-2-propynyloxy)methylcyclopentenes and 1-(5-alkoxy-4-pentynyl)cyclopentenes, 14021

angularly and linearly fused tetraquinanes via triplet sensitised photoreaction of appropriately appended tricyclo[5.2.2.0².6]undecane systems followed by aldol condensation, 14287 structurally complex oxygen-containing tetraquinane networks, rapid generation by addition of 2,3-dihydro-5-furanyllithium to diisopropyl squarate, 3075

Quinolines

8-aminoquinolines, synth from o-anisidine, condensation of, synth of mono- and dialkylsubstituted 1,10-phenanthrolines, 2937

3-aminothieno[3,4-c]quinoline, reactivity toward electron-poor olefins and acetylenes, 11915

3-aryl- and 3-vinylquinolines, synth by palladium catalysed hydroarylation and hydrovinylation of 3,3-dialkoxy-1-aryl-1-propynes, 10225

chiral bipyrindine and biquinoline ligands, synth using Mn-salen catalysed asymmetric epoxidation as a key step, application to synth of *trans*-whisky lactone, 3905

3,4-dihydroisoquinolines, 2-alkyl(acyl)-1(2*H*)-3,4-dihydroisoquinolinones, 2-alkyl-1(2*H*)-isoquinolinones and 1-alkyl-2(2*H*)-quinolinones by oxidation with potassium permanganate, 1451 3-fluoro-2-quinolones, synth from *N*-fluoro-3-

3-fluoro-2-quinolones, synth from *N*-(fluoro-3-methoxyacryloyl)anilines by cyclisation accompanied by elimination of methanol, 3223

furo[2,3-g] or furo[3,2-g]quinoline-4,9-diones by Diels-Alder reactions of 5- or 6-bromobenzo-furan-4,7-diones with azadienes, 9499

fused quinolines, quinolones and coumarins, synth from dihydrothiophenes *via O*-quinodimethane intermediates, 3107

polycationic species derived from 9-hydroxy and 9-aminothiazolo[5,4-*b*]quinolines, protonation constants, 11929

pyrazolo[1,5-a]quinolines, synth by reaction of N-methylaminoquinoloneswithvarious acrylate derivs in the presence of NaH, 8471

pyrimidoquinoline derivs by reaction of anilines with 5-benzoylethyl barbituric acid, 10147

quinolines, indoles, indolines and tetrahydroquinolines, synth from N-(cyclohexylidene)amines, 3705

quinolinetriones, hetero Diels-Alder reactions of, synth of antitumour triones related to the antibiotic diazaquinomycin A, 5933

reduction to 1,2,3,4-tetrahydro derivs using a combination of sodium cyanoborohydride and boron trifluoride etherate, 1631

1,2,3,4-tetrahydroquinolines, recent progress in synth of, 15031

tetramethyl-quinolinic aminoxyls, chemical and electrochemical study of their interaction with superoxide anion, 11257

2-(trifluoromethyl)quinolines, synth by reaction of anilines with 4-t-trfluorobut-3-en-2-one followed by cyclisation and dehydration, 4637 tripodal iron chelating agents based on 8-hydroxyquinoline linked by tris(2-aminoethyl-amine), synth and NMR study, 4659

virantmycin, tetrahydroquinoline alkaloid from

Streptomyces nitrosporeus, synth and stereochemistry of (±)-virantmycin and unnatural (+)-virantmycin, 10609, 10631

quinolines, dihydro- and tetrahydroquinolines, synth by hydroalkylation of secondary anilines, pyrolysis of the resulting o-aminobenzyl alcohols and electrocyclic reaction of the resulting o-quinone methide imines, 11705

Quinolizines/quinolizidines

- 1-aminoindolo[2,3-a]quinolizidine, synth by cyclisation of 3-amino-2-(2-indolyl)piperidin-4-one, subsequent closure of ring E provides a 17-azaeburnamine compd, 8581
- apogeissoschizine, degradation product of geissospermine, prep of pentacyclic ring system by addition of enolate derived from methyl 1-indolepropionate to γ-position of pyridinium salt followed by cyclisation, 8601
- biogenetic-type cyclisation of van Tamelen in prep of the sarpagan ring using indolo[2,3-a]-quinolizidines, 15225
- indolo[2,3-a]quinolizine ring system, synth using the thermal decarboxylative ring-opening of 3-carboxyl isoxazoles into α-cyano aldehydes, 987 isosaraine-3 and saraine-1-3, macrocyclic diamine alkaloids from Mediterranean sponge *Reniera sarai*, absolute stereochemistry of, 14961
- quinolizine by reaction of 1,2,3-triazolo[1,5-a]-pyridinium N2-dicyanomethylides with dimethyl acetylenedicarboxylate, 10519
- 1-substituted indolo[2,3-a]quinolizidines, epimerisation of, route to *cis* and *trans*-deethyleburnamonine, 9925

Ouinones

- 4-dialkylamino-5-methoxy-1,2-benzoquinones, reactions of in acidic media, selective *C*-alkylation or *N*-dealkylation, 7841
- 2,3-dichloro-5,6-dicyanohydroquinone diesters of 2-substituted cinnamic acids, reduction using Zn-AcOH system, synth of saturated acids and hydrocarbons which oxidise to the corresponding tropones, 1707
- epinardins A-D, pyrroloiminoquinone alkaloids of deep-water demosponges, cytotoxic activity against doxorubicin-resistant L1210/DX tumoural cells, 8899
- O-quinone methide imines which can be converted to quinolines, dihydro- and tetrahydro-quinolines, synth by pyrolysis of O-aminobenzyl alcohols derived from secondary anilines, 11705

- nor quinone methide triterpenes (pristimerin and tingenone) possessing one enol double bond, oxidation with dimethyl dioxirane, 10667 quinone monoketals, photochemical rearrangement of, 5707
- thioquinone-S-oxides, synth by retro-Diels-Alder reaction of benzo-oxathiin-S-oxides, 12233, 12247
- 1,2,3-tri-t-butyl-6,13- and 8,9,10-tri-t-butyl-5,14-pentacenequinones, synth from 2,3,4-tri-t-butyl-cyclopenta-2,4-dien-1-one, photochromic behaviour, 4269
- 10,15,20-tritolylporphyrins linked to high acceptor strength cyano quinones as models for the photosynthetic reactions centre, 8497 see also Anthraquinones

Quinonoid compds

- functionalised bis-O-quinodimethanes, reaction with C₆₀, synth of main-chain polymers with incorporated [60]fullerene units, 5007
- pyridine o-quinodimethane analogues generated from functionalised o-bis(chloromethyl)-pyridines, Diels-Alder reactions of, 11889
- pyrimidine *O*-quinodimethanes by heating of pyrimidine sulfones in trichlorobenzene, subsequent Diels-Alder reactions yielded tetrahydroquinazolines, 1735
- o-quinodimethane generated by redox-mediated cathodic reduction of α , α '-dibromo-o-xylene in the presence of hindered dienophiles, trapping of, 7771
- O-quinodimethane intermediates in synth of fused quinolines, quinolones and coumarins from dihydrothiophenes, 3107
- (ortho-quinodimethane)Cr(CO)₃intermolecular Diels-Alder reaction of, synth of nonracemic tetralins, 7363
- thieno-o-quinodimethanes, synth *via* electrophilic substitution reactions of thieno-3sulfolene, 12459

Quinoxalines

- 2-(2-nitrophenoxy)quinoxaline, synth from 2chloroquinoxaline, investigation of the basic hydrolysis in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, 11665
- pyrrolo[1,2-a]quinoxaline via transamination of 1-(2-aminophenyl)-2-iminomethylpyrroles, 10751

Radicals and radical reactions

- cyclobutanoxyl radicals generated from [2+2] photoadducts of 4-hydroxy-1-phenyl[1,8]naphthyridin-2(1H)-one with alkenes, β -scission of, synth of furonaphthyridinones, 6125
- heterocyclic radicals by hydrogen abstraction from 1,3-dithiane, 1,3-dithiolane and 1,3-oxathiane rings, subsequent addition of the radicals to α,β -unsaturated esters yields the cyclised products, 9713
- nitronyl nitroxide or imino nitroxide radical units linked to thieno[2,3-b]thiophene and thieno[2,3-b]thieno[3',2'-d]thiophene chromophores, intramolecular spin-interactions between, 6893
- aminyl radicals by dioxygen oxidation of lithium amides, 13255
- Barton ester based radical reaction with ethyl α-trifluoroacetoxy acrylate followed by treatment with phenylhydrazine, synth of 3-deoxy-α-hydrazono-octulosonates, 2717
- benzazepine-based nitrones, cyclic analogues of the radical trap phenyl t-butyl nitrone, synth utilising a modified Bischler-Napieralski reaction as the key step, 6519
- cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, new protocol for the synth of a range of nitrogen heterocycles, 11445
- cascade reactions, symposia-in-print, 11385
- conversion to dialkyl diselenides by Barton PTOC ester based radical chemistry using *O*-cholestan-3β-yl-2,2,2-trichloroselenoacetate and *O-neo*-pentyl selenobenzoate as radical traps, 11163
- (2,6-dichlorophenyl)bis(2,4,6-trichlorophenyl) methyl radical, synth, magnetic behaviour and crystal structure, 7013
- flash vacuum pyrolysis of 2- and 3-thienyl-methylbenzoates, mechanism involving 2-, 3-thienyl methyl and phenyl radicals, 13615
- free radical scavenging activity of 4-(2*H*-1,2,4-benzothiadiazine-1,1-dioxide-3-yl)-2,6-bis(1,1-dimethylethyl)phenols, 12587
- free radical telomerisations of acrylamides, penultimate group effects, 4181
- free-radical homolytic substitution, new methods for formation of bonds to heteroatoms, report, 13265
- generation of a radical cation by anodic oxidation of the *N*-cyanomethyloxazolidine system in acetonitrile at a platinum electrode, 15127

- glucosyl radicals from the photoreaction of α -bromo-2,3,4,6-tetra-O-acetylglucose with hexa-butylditin, reaction with phenols, synth of α -O-glucosides, 10241
- 5-hexenyl or 6-heptenyl radicals, *exo* cyclisation of, prep of cyclohexanoids and cyclopentanoids, 8233
- hydroxydiphenylmethyl radical generated during photoreduction of triplet benzophenone, effect of alcohol solvent on cross-coupling versus hydrogen abstraction, 10399
- nitrogen dioxide radical addition to C₆₀, synth of polynitro fullerenes, subsequent hydrolysis gave the corresponding fullerenols, 4963
- oxidative free-radical cyclisation of unsaturated 2-cyclohexenones with Mn(OAc)₃, synth of unsaturated α'-keto radicals which cyclise to bicyclic products, 6073
- palladium catalysed regio- and stereo-specific 5-, 6- and 7-exo-dig mono-, bis- and triscyclisation processes of aryl and vinyl halides and allylic acetates, 11479
- pentadienyl radicals, addition of triplet oxygen to the proximal position of, synth of conjugated diene hydroperoxides, 12381
- perfluoro-t-butyl radical addition to terminal olefins, absolute rate constant, 12351
- 2- and 3-phosphonyl radicals derived from the corresponding 2- and 3-halo substituted phosphonates, reaction with alkenes provides functionalised phosphonates, 13681
- photochemical approach to functionalisation of open-chain and cyclic alkanes, single electron transfer oxidation and hydrogen abstraction, 5533, 5549
- radical addition of perfluoroalkyl iodide to 1-O-allyl-1,2-diols, synth of 2-perfluoroalkylidenemethyl and 2-perfluoroalkylmethyl-1,4-dioxanes, 6187
- radical cyclisation of α -allenic ketone, synth of (\pm) - α -chamigrene sesquiterpene, 13181
- radical cyclisation approach to pyroglutamates using dichloro- and trichloroamides as starting materials, 6739
- radical cyclisation of N-vinylic α-bromo amides, synth of 4-oxo-2-azetidineacetic acids, 13867 radical cyclisation in synth of spiro[benzofuran-
- 3(2*H*),4'-piperidine] and octahydro-1*H*-benzo-furo[3,2-*e*]isoquinoline fragments, 10935
- 4-exo-trig radical cyclisations of N-[2,2-bis-(phenylthio)ethenyl]- α -bromo amides, synth of intermediates to carbapenem antibiotics, 489

- radical fission reaction of N-sulfonylthioxocarbamates to give the corresponding O-alkylthioxocarbamates, 2705
- radical ring expansion and cyclisation process of α-iodomethylcyclopentanones, synth of angularly disubstituted cis-decalins, 13339
- radical substitution reaction of aromatic sulfones, new approach to organostannanes, 11329
- radical-mediated reactions of uridine 5'-monoselenoacetals with allyltributyltin, diastereoselective homolytic C-C bond formation, 9469 rearrangement of α-aminoallyl radical in anthraquinone photosensitised reactions of N-allylamines with α,β-unsaturated esters, 3425 reduction of Ag(1) by 1-acyl-2-arylhydrazines, photographic infectious development, 3961 role of heavy atom effects in Diels-Alder reac-
- role of heavy atom effects in Diels-Alder reactions, 14459
- SET oxidative processes of commonly used solvents as revealed through the photochemical reaction of 1,2,4,5-benzenetetracarbonitrile, 1785
- SET-photosensitised reactions of α-silylaminoenones and ynones proceeding by 6-endo αamino radical cyclisation pathways, 3195
- stable cation radical salt from electrooxidation of 2,2',4,4',5,5'-hexamethoxybiphenyl, 4449
- tandem radical cascade strategy for one-step construction of the five fused rings of pseudocopsinine, 647
- Tempo trapping in Gif-type systems, mechanism of oxidation of Tempo by Fe^V to give an oxoammonium salt and a Fe^{IV} species, 10301
- trichloromethyl-bromo-addition reactions to p-Y-substituted phenylacetylenes, relative rates, correlation analysis suggests both polar and spin-delocalisation effects, 3017
- vinyl radicals generated from bromomethyldimethylsilyl propargyl ethers, radical cascades of, 11405

Rearrangements

- acid-promoted ring opening of a pentacyclo-[5.4.0.0^{2.6}.0^{3.10}.0^{5.9}]undecane-spiroannulated oxetane, stereoselective intramolecular 1,5hydride transfer, 6063
- of *O*-(2,4-alkadienyl) *S*-(2-alkenyl or alkynyl) dithiocarbonates, synth of *S*-(1-vinyl-2-alkenyl) *S*-(2-alkenyl or alkynyl) dithiocarbonates which could be converted to sulfides, 13909
- asymmetric [2,3]-sigmatropic Wittig of chiral α -allyloxy-hydrazones, synth of the corres-

- ponding α-hydroxyhydrazones, 1503
- aza-Payne epoxide ring opening reaction of 2aziridinemethanols, regio- and stereoselective synth of diastereomerically pure *N*-protected 1,2-amino alcohols, 11739
- Beckmann or Schmidt rearrangements of 2,3,8, 9-tetramethoxy-5,6,11,12-tetrahydrodibenzo [a,e]cycloocten-5-one, synth of 6-oxodibenzo-[b,f]-azonine, 8063
- Beckmann-type of indolocarbazole alkaloid TAN-1030A, ring contraction to a compd closely related to metabolite K-252a, 1235
- carbocationic of annulated bicyclo[2.2.2]-octenones, synth of 1-hydroxy[5.3.1.0^{2.6}]undecadienones and subsequent conversion to *cis:syn: cis* tricyclopentanoids, 3693
- Claisen of calix[4]arene triallyl ether, synth of *p*-triallylcalix[4]arene, 13189
- Claisen and intramolecular hydroacylation of 4-pentenals, synth of cyclopentanones, 5461
- Claisen of methyl alcohols, synth of ethylmethyl alkenoates, key step in synth of capsaicin analogues, 8439
- Claisen, for synth of (1'E,5'E)-2-(2',6'-dimethylocta-1',5',7'-trienyl)-4-furoic acid, sesquiterpene anti-inflammatory metabolite from soft coral *Sinularia* sp., 4245
- cuprate rearrangements and stannylcupration, application to the stereo- and enantiospecific synth of a stannyldiene C₁₀-C₁₅ fragment of des-epoxy-rosaramycin, 6613
- of4-dialkylamino-5-methoxy-1,2-benzoquinones to 3-alkylated-1,2-benzoquinones, 7841
- of the 2,6-diaryl-3,7-dioxabicyclo[3.3.0] octane skeleton of gmelinol by reaction with BF₃-etherate and *N*,*N*-dimethylaniline, subsequent reduction produced a triol epimeric with di-*O*-methyl cycloolivil, 14349
- of 1,6-diazacyclodeca-3,8-diynes to *N,N'*-diisopropyl-3,3'-bispyrrole, 10383
- of α , δ -dichloroaldimines to 2-formylpyrrolidines, α , α -azacyclobisalkylation of aldehydes, 3303
- of 5,6-dihydro-2-pyrone, synth of precursors to (2S,4R,5R)-4,5,6-trihydroxynorleucine and 5-hydroxynorvaline, 12911
- electrooxidative pinacol-type of β -hydroxy sulfides, generation of 2-phenyl substituted ketones as ring expanded products, 4303
- epoxide-arene reaction involving 1,2-alkyl shift rearrangement in synth of *cis*-1β-acetoxy-5-methoxy-1,2,3,4,4a,10a-hexahydro-9(10*H*)-phe nathrenone, 15209

- of 2,3-epoxy sulfides to 3-trimethylsilyloxy-1,2-thiiranium ions which react with silylated nitrogen heterocycles and amides to form 1-substituted-3-hydroxy-2-thioethers, 3609
- ester enolate Claisen of chelated N-protected amino acid allylic esters, synth of α -alkylated γ , δ -unsaturated amino acids, 941
- of homochiral β-lactams derived from (+)-(1S, 2S)-2-amino-1-phenylpropan-1,3-diol, synth of 4-aminopyrrolidinones, 8989, 9005
- 1,2-hydride shift rearrangement in conversion of ribonucleoside to enaminonucleoside by reaction with secondary amines, 4877
- of α -hydroxy imines to α -amino ketones, mechanism and application to the prep of (+)-1-benzyl-1-azaspiro[5.5]undecan-7-one, a precursor to (-)-perhydrohistrionicotoxin, 6647
- isoxazolidin-5-one-isoxazolidine rearrangement, route to 3-amino-3-deoxy sugars, 1411
- [1,2]-Meisenheimer rearrangement and Heck cyclisation, key steps in synth of magallanesine alkaloid from isoquinolineacetate, 14543
- of 2-(4-methylphenyl)-5-(3,4-dimethylphenyl)-2-adamantanoland2-(1-adamantyl)-2-alkanols, transformation into 2,5,7- and 1,3,5-trisubstituted adamantanes, 3983
- multiple in bromination of *endo-3*-bromo-4-methylcamphor, prep of *endo-3*,9-dibromo-4-(bromomethyl)camphor: intermediates for triterpenoid synth, 14661
- of hexacyclo[11.2.1.0^{2,12}.0^{5,10}.0^{5,15}.0^{10,14}]hexadeca-6,8-diene-4,11-dione, mechanism and X-ray structures of products, 13531
- of optically active 2*H*-azepines to the corresponding 3*H*-isomers, 10883
- palladium(0)-catalysed vinyloxirane rearrangement, synth of α -trialkylsilyl- β , γ -unsaturated aldehydes, 7487
- palladium(II)-promoted hetero-Claisen of chiral 4,5-di-O-acetyl-2E,6E-octadiene-1,4,5,8-tetraol, generation of a 2,7-di-O-acetyl-3E,5E-octadiene-1,2,7,8-tetraol framework, 13909
- photo— of N-alkanoyl β-enaminones, synth of α-amino- β , γ-unsaturated acid derivs, 2405
- photochemical rearrangements of quinone monoketals, 5707
- Pummerer followed by hydrolysis for synth of α-trifluoromethylated aldehydes, 199
- 1,3- and 1,4-rearrangement of silyl group from carbon to oxide in t-butyldimethylsilyldihalomethyllithium, 503
- route to [1,2:3,4] bisannelated cyclohexadiene by

- oligocyclisation of 2-bromododeca-1,11-diene-6-ynes followed by rearrangement, 11545
- semi-pinacol rearrangement of neopentyl triflates, contsruction of the eight-membered Bring of the taxanes, 14147
- SeO₂ promoted oxidative rearrangement of 2-substituted oxazolines to dihydrooxazinones, kinetic studies and mechanism, 14475
- sigmatropic [2,3]-Wittig of ammonium salts resulting from quaternisation of diisopropyl (N,N-diethyl)-aminomethyphosphonate, synth of α -(N,N-diethylamino)-alkenylphosphonates, 2075
- of 4-substituted Δ^4 -isoxazolines to isoquinolinefused pyrroles, 12049
- thermal and acid-catalysed sigmatropic of 4-(*N*-methyl-*N*-allylamino)-5-methoxy-1,2-ben zoquinones and 4-(2-vinyl-aziridino or azetidino)-5-methoxy-1,2-benzoquinones, mechanisms, 13605
- thermal oxy-Cope of ethynyl and allenyl derivs of self condensed cycloalkanones, synth of linearly fused tricyclic[5.6.5] and [6.6.6] compds, 7737
- of thiadiazabicyclo[3.1.0]hexene derivs to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183
- of bis[(2,4,6-trimethylphenyl)methanoyl]bicyclo[2,2,1]hept-5-enes to 2-oxabicyclo[3,3,0]-octa-3,7-dienes, 5699
- unexpected —in the synth of benzylidenedithiophthalide and pentylidenedithiophthalides from thiophthalic anhydride and 2-thiophthalide, 11867
- Wolff of α -diazo- β -keto compds, synth of dienylketenes, subsequent benzannulation formed functionalised phenolic derivs, 6665
- Wolff— of α-diazo-β-keto-γ,δ-alkenyl-δ-aryl compds *versus* aromatic C-H insertion reaction, 10455

Receptors

- corands incorporating a thiopyrylium ring, effect of alkali cations on the methoxide ion addition to 3509
- malonic acid receptors with decarboxylative activity, geometry and electronic properties, 12323 see also Molecular recognition

Recognition

2-[7-(2-methyl-1,2,3,4-tetrahydroisoquinoline)-yl]-N-(2-pyridyl)acetamide, a host with two heterocyclic parts separated by a flexible arm, synth from isoquinoline involving acylation and

Willgerodt-Kindler reaction, 10441

molecular recognition, connection and disconnection of hydrogen bonds, a case study with dimeric and highly associated monocarboxylic acids with simple receptors, 12223

selective binding of glucose-6-phosphate and 3,4-dihydroxyphenylalanine with boronic -acid-appended metalloporphyrin, 2817

Reduction

- of Ag(I) by 1-acyl-2-arylhydrazines, mechanism of photographic infectious development, 3961 of 2-alkyl-4-aryl-1(2H)-isoquinolones, synth of 4-aryl-1,2,3,4-tetra-hydroisoquinolines, 4433
- of 3-aryl-4-nitro-isoquinolones to 4-amino-3-aryl-isoquinolones, amidification and subsequent cyclisation yields dibenzo[c,h]-1,5-naphthyridines, 10427
- of 4-arylmethylene pyrazol-5-ones or isoxazol-5-ones with 2-arylbenzimidazoline, synth of *C*, *C*-and *C*, *N*-linked dimers and 4-arylmethyl derivs, 1443
- asymmetric of 2-(*N*-arylimino)-3,3,3-trifluoropropanoic acid esters, synth of enantiomerically enriched 3,3,3-trifluoroalanine, 233
- baker's yeast mediated of 4-(4-hydroxy-phenyl)-but-3-en-2-one, synth of 4-(4-hydroxyphenyl)-2-butanone (Raspberry ketone), 4041
- benzophenone phororeduction during laser-jet photolysis to generate a hydroxydiphenylmethyl radical, effect of alcohol solvent on cross-coupling *versus* hydrogen abstraction, 10399
- of bicyclic octen- and hepten-ols and -ones catalysed by *Bacillus stearothermophilus* alcohol dehydrogenase, 1669
- of (1S,4S)-bicyclo[2.2.1]heptane-2,5-dione with baker's yeast, kinetic resolution to give (1S,4S, 5S)-5-hydroxybicyclo[2.2.1]heptan-2-one,13933 borane-induced reductive ring-expansion reaction of 1-(diphenylmethylene)amino-1-cyclopro-
- ion of 1-(diphenylmethylene)amino-1-cyclopropanecarbonitrile, synth of *trans*-1,2-diaminocyclobutane, 2421
- diastereoselective reduction of aziridino ketones, synth of alcohols, 12117
- of 2,3-dichloro-5,6-dicyanohydroquinone diesters of 2-substituted cinnamic acids using Zn-AcOH system, synth of saturated acids and hydrocarbons which oxidise to the corresponding tropones, 1707
- of diketones and ketoacids mediated by *Pichia farinosa* IAM 4682, synth of optically active diols and (*R*)-4-pentanolide, 8113

- electroreductive acylation of 3-aryl substituted α,β -unsaturated esters and nitriles in the presence of aliphatic carboxylic anhydrides, 1943 of α,β -epoxyketones with disopropoxytitanium-(III) tetrahydroborate, synth of *anti* (or *erythro*-) α,β -epoxy alcohols, 9137
- of functionalised α,β-unsaturated γ,δ-dioxy carboxylates with zinc, synth of substituted allyl alcohols, 4457
- of functionalised pyrazolium salts, synth of functionalised pyrazolidines, 9193
- in situ of oximes obtained from 1,5-dihydro-2H-pyrrol-2-ones with Raney nickel and W7 Raney nickel, prep of pyrrolo[3,2b]pyrrolone derivs and amines respectively, mechanisms, 12919
- of ketophosphonates, synth of diisopropyl α -, β and γ -hydroxyphosphonates, effect of the phosphonyl group, 589
- of 7-methoxy-1,2,3,4,9,10-hexahydro-1-oxophenanthrene, acetylation and oxidation yielded *cis*-1α-acetoxy-7-methoxy-1,2,3,4,4a,10a-hexahydro-9(10*H*)-phenanthrenone, 15209
- microbial reduction of prochiral carbonyl compds using *Yarrowia lipolytica* strains, 3547 microbiological of α,β -unsaturated carbonyl *ent*-kaurenes by the fungus *Gibberella fujikuroi*, 13767
- of 4-nitroimidazoles, 4-nitropyrazoles and 3nitropyridines by sodium borohydride or sodium borodeuteride, synth of oximes of 4imidazolidinones and azoxy compds, 9541
- of α -oxoketene dithioacetals with Zn/ZnCl₂-TMEDA in ethanol, synth of β -methylthiomethylene ketones, β -methylthioketones and α -methylketones, 4679
- of quinolines to 1,2,3,4-tetrahydro derivs using a combination of sodium cyanoborohydride and boron trifluoride etherate, 1631
- redox-mediated cathodic of α,α' -dibromo-o-xylene in the presence of hindered dienophiles, Diels-Alder trapping of the generated o-quino-dimethane, 7771
- reductive N-alkylation of anilines using ketones and α -ketoesters as alkylating agents, synth of aminoacid derivs, 9777
- reductive alkylation of oxoalkylphosphonates, synth of 1-aminoalkylphosphonic acids and 2-aminoalkylphosphonic acids, 10685
- reductive methylation of 2,7-dihydro derivs of oxygenated indole alkaloids, 9069
- reductive ring-opening of N-(R)- and (S)- α -

- methylbenzylaziridine-2(S)- and (R)-carboxaldehyde, synth of both enantiomers of cathinone, 12111
- of α,β -unsaturated nitriles and α -halonitriles with sodium hydrogen telluride, synth of the corresponding saturated nitriles, 8611

see also Deoxygenation, Hydrogenation

Reformatsky reactions

- 1,4-conjugate addition of the Reformatsky reagent to α -nitrostyrenes, synth of ethyl 3-aryl-4-nitrobutanoates, 1425
- for synth of β -aminoesters and β -lactams using (tricarbonyl(η^6)arene)chromium(0) complexes as chiral auxiliaries, 4849

Regiochemistry

of addition of Grignard reagents to N,N'-dibenzylated 2-purinones, 12979

Regioselection

- fine regioselective tuning in the oxidation of sec,sec 1,2-diols by dimethyldioxirane, 10969 improvement of by use of hindered bases for metalation of 3-chloro-6-methoxypyridazine, 10417
- regioselective bromination of aniline and Nsubstituted anilines encapsulated in β -cyclodextrin, synth of O-bromoaniline and p-bromo-N-methylaniline respectively, 3487
- regioselectivity in the fluorination of dibenzofuran, diphenylether and biphenyl with N-F type reagents, 11341

Regiospecificity

regiochemistry in Stille couplings of 2,6-dihalopurines, 5625

Resins

- rhodium carbenoid attached to a polystyrene resin, generation by treatment of a resin-bound diazoacetamide with rhodium(II) acetate, 5999
- Rink AM, Rink Amide and Wang "flattened" resin beads for monitoring the IR bands of compds, probing solid-phase reactions, 843
- solid-phase organic reactions; literature review (Tetrahedron Report 394), 4527
- tricolorins A-E, oligosaccharide phytogrowth inhibitors from the resins of *Ipomoea tricolor* (Convolvulaceae), mass spectrometry and NMR study, 13065

Resolution

- of (N-alkyl)-pipecolic acid anilides by 2R,3R-tartaric acid and O,O'-dibenzoyl-2R,3R-tartaric acid, formation of diastereoisomers between, 1637
- of (1S,4S)-bicyclo[2,2,1]heptane-2,5-dione by

- reduction with baker's yeast to give (1S,4S,5S)-5-hydroxybicyclo[2.2.1]heptan-2-one, 13933 biocatalytic optical resolution of (2R,3S)-2-allyloxy-3,4,5,6-tetrahydro-2H-pyran-3-ol, 8123
- kinetic resolution of mono- and bicyclic olefin Diels-Alder adducts *via* Sharpless asymmetric dihydroxylation, 7901
- lipase catalysed of chiral carboxylic acids or alcohols using mixed carboxylic-carbonic anhydrides, 4383
- of D,L-Fmoc protected 4-phosphonomethylphenylalanine derivs using subtilisin Carlsberg esterase, 2021
- of racemic ethyl 2,2-difluoro-3-hydroxyoctanoates using olipase/4S (*Rhizopus japonicus*), subsequent use of enatiomers in total synth of difluorinated [6]-gingerol, 157
- C₂-symmetric(-)-(2S,5S)-N-benzyl-trans-2,5-bis-(acetoxymethyl)pyrrolidine by lipase catalysed hydrolysis of racemic diacetate, 565
- of (±)-keramaphidin B, a pentacyclic alkaloid from Okinawan sponge *Amphimedon* sp., 2319

Retinoids

- coumarin analogue of retinal, synth by Wittig condensation, 9581
- 3-dehydroretinal, prep and spectroscopic properties of six new isomers of, 7809
- elongated analogues of perhydroretinol, synth from 3-bromo-2-methyl-1-propanol enantiomers, neurotrophic activity on neuronal cells derived from fetal rat cerebral hemispheres, 14891
- fluorinated phenylrhodopsin analogues, binding selectivity, restricted rotation and ¹⁹F-NMR studies, 109
- retinyl propynyl ether, Diels-Alder reactions of, synth of a tetrahydroisobenzofuran deriv by addition of the alkyne group at positions 11 and 14 of the retinoid side chain, 405

Rhodium and compds

- 4,6-O-benzylidene protected 2,3-bis (O-diphenyl-phosphino)-D-glycopyranosiderhodium (I)chelate catalysts for hydrogenation of methyl (Z)-2-N-acylamidoacrylates, 15079
- polystyrene-supported η^{5} -cyclopentadienyl rhodium catalyst for synth of cyclopentanone derivs by hydrocarbonylative cyclisation or Claisen rearrangement, 5461
- RhCl₃- and PtCl₄-aliquat 336[®] ion pair catalysts for transformation of phenylated diynes to polycyclic compds, 8349
- rhodium carbenoid attached to a polystyrene

resin, generation by treatment of a resin-bound diazoacetamide with rhodium(II) acetate, 5999 rhodium(II) catalysed reactions of substituted α-diazoamides and diazoimides, ligand effects, 2489

Ring expansions

- of β -hydroxy sulfides by electrooxidative pinacol-type rearrangement, 4303
- followed by the reduction of the cyclobutane to allyl alcohol, 10363
- of 1-haloethynyl-2-methylcyclopentanols which are dependent on the position of the methyl and hydroxyl groups, synth of 2-(dihalomethylidene)-3- and 6-methylcyclohexanones, 10267
- of 2-oxocyclododecane-1-carbonitrile with diarylcarbodiimides, synth of macrocyclic enaminolactams, 4363
- ring expansion reaction of oxetane using a copper catalyst bearing a bipyrindane or biquinoline ligand, synth of *trans*-whisky lactone, 3905
- and ring-annulations of 1,2-benzisothiazole-1,1-dioxides. 3339
- ring-enlargement of cyclohexanone and cyclododecanone, synth of muscolide, (R)-(-)-phoracantholide I and (9R)-(-)-9-tetradecanolide, 4581
- of tropnaes, route to anatoxin-a, 6025

Rotation

see Atropisomerism

Sakurai-Hosomi reactions

supression of by use of sterically unhindered isocyclic allylsilanes, 6685

Samarium and compds

- samarium diiodide, preparation from samarium metal in various nitriles, reactions of, 14225
- samarium(II) diiodide coupled with organometallic reagents, reagent for alkylationannulation of halo esters, synth of cycloalkanols, 1953
- samarium(II) iodide mediated cascade ringopening reactions of bicyclo[4.1.0]ketones, 11421
- SmI₂-mediated intramolecular coupling between a bromoalkyl and ynamide group in total synth of pyrrolam A, 869

Scandium and compds

scandium trifluoromethanesulfonate as a catalyst in the decarbonylation of aromatic aldehydes, 11045

Schiff bases

see Imines

Schmidt reactions

- of *N*-acetoacetyl derivs of oxazolidinones in dimethoxyethane, synth of homochiral *N*-(5-oxazolyl)oxazolidinones, 1609
- of alkyl azides with ketals and enol ethers of 1,5-azidoketones, 3403
- intramolecular of azides with tertiary alcohols, synth of 5-(α -naphthyl)- and 5-(β -naphthyl)indolizidines as potential dopamine analogues and non-opiate antinociceptive agents, 12039

Selenium and compds

- uridine 5'-monoselenoacetals, prep by seleno-Pummerer reaction of 5'-deoxy-5'-phenylselenouridines, use as substrates for radical-mediated reactions with allyltributyltin, diastereoselective homolytic C-C bond formation, 9469
- alkyl phenyl selenide or alkyl phenyl sulfide from hydrocarbons by utilisation of the Fe^{II} - H_2O_2 system in the presence of diphenyl diselenide, phenylselenol, diphenyl disulfide and thiophenol, 10287
- alkylideneselenirane, by elimination of nitrogen and cyclisation of tetramethyldihydropyrazoles, 1965
- aminoammonio-selenurane, synth by reaction of *N*-benzyl derivs of 1,11-(methanoaminomethano)-5*H*,7*H*-dibenzo[*b*,*g*][1,5]selenazocine with *N*-bromosuccinimide, 13951
- (E,E)-1-arylselenobutadienes by cross-coupling reactions of selenium-containing zirconium(IV) complexes with alkenyl halides, 9819
- 1-arylselenoglycosides, treatment with 4-methyl-(difluoroiodo)benzene, synth of 1-fluoroglycosides, 149
- dialkyl diselenides, synth from carboxylic acids by Barton PTOC ester based radical chemistry using *O*-cholestan-3β-yl-2,2,2-trichloroselenoacetate and *O-neo*pentyl selenobenzoate as radical traps, 11163
- 3,6-dimethylselenolo[3,2-b]selenophene, synth and characterisation of dimers, trimers and tetramers of, 471
- functionalised ethylenediselenotetrathiafulvalenes, synth and characterisation, comparative study with their all-sulfur analogues, 11063 1-halo-1-selenoalkenes, synth by addition of hydrogen halides to acetylenic selenides, 9687 hypervalent dichalcogenoselenuranes, formation

- by conformational change of cyclic chalcogenides, 10375
- lithium eneselenoates, trapping by alkyl halides or allylic bromides leads to ketene selenothioacetals and γ,δ-unsaturated selenothioesters respectively, 2839
- phenylselenenyl bromide, reaction with alkenyl nitrones to yield ring closure products, synth of 1,2-oxazines and N-unsubstituted-1,2-oxazines via iminium salts, 6811
- salts of selenoxides with sulfonic acids, synth by addition of sulfonic acid to a solution of selenoxide and removal of the solvent, use as oxidising agents for sulfides to sulfoxides, 1841
- selenium containing 2-aryloxazolines, synth from amino alcohols, 7547
- 2,6-xylyl isoselenocyanate, reaction with organolithium compds, synth of carbophilic and/or selenophilic products, 12165

Selones

see Selenoaldehydes

Sharpless reactions

Sharpless sulfoxidation of 2-substituted-1,3-dithianes, subsequent deacylation allows prep of 2-alkyl-1,3-dithiane 1-oxides, 2125

Shikimic acid and derivs

- (-)-3(R)-amino-4(R),5(R)-dihydroxy-1-cyclohex ene-1-carboxylic acid, 3(R)-amino analogue of (-)-shikimic acid, synth from the parent acid, 8565
- (-)-3-epi-shikimic acid and halogenated derivs using (-)-shikimic acid as starting material, 10547
- shikimic acid, isolation from liverwort *Blasia* pusilla L., 14487

Siderophores

salicylamide and bipyridine containing ligands for iron(II) and iron(III) coordination, 12197 tripodal iron chelating agents based on 8-hydroxyquinoline linked by tris(2-aminoethylamine), synth and NMR study, 4659

Silicon and compds

- α-alkyl-α-aminosilanes, metalation and alkylation between silicon and nitrogen, ²H NMR study of organolithium stabilisation by silicon and by phenyl in solution, 5669, 5683
- allylic silanes and enoxysilanes, reaction with iminium ions derived from condensation of gly-oxal and N-methyl (R)-phenylglycinol, synth of α -amino acid derivs, 9079
- aminosilyl anions as hydroxy anion equivalents through allylic substitution, addition to vinyl-

- oxirane and addition to acetylene followed by oxidative cleavage of the silicon-carbon bonds, 5765
- arylstyrylsilanes, controlling silanucleophile reactivity in acylation, 861
- α-bromo-α-silyl ketones and α-bromoacylsilanes from t-butyldimethylsilyldibromomethane and carbonyl compds, 14533
- t-butyldimethylsilyldihalomethyllithium as a dihalomethylene dianion synthon, 1,3- and 1,4-rearrangement of silyl group from carbon to oxide, 503
- bis-t-butyldiphenylsilyl ethers as intermediates for synth of partially O-methylated α -D-mannopyranosides, 10785
- cyclosilanes, photochemical reaction with C_{60} , functionalisation of C_{60} , 4995
- ω-haloacylsilanes, transformation *via* thioacylsilanes into Z-silyl-enethiols or into 2-silyl-thiacycloalk-2-enes, 4803
- O,S-ketene silyl acetals, design and diastereoselective Mukaiyama-Michael reaction of, 9409, 9419
- oxidation of the carbon-silicon bond, Tetrahedron report, 7599
- silica-alumina gel catalysts prepared by the sol-gel method, use for cleavage of ethers, 9387
- silyl enol ethers and silyl ketene acetals, addition to ferrocenylmethyl ethers, synth of precursors to chiral bridged ferrocenophanes, 1461
- 1,2- and 1,3-*O*,*O*-silyl migration reactions of fluorine-containing monosilylated diols, synth of alkoxides stabilised by strongly electronwith-drawing fluorine-containing methyl groups, 11753
- α -silylamino-enones and ynones, SET-photosensitised reactions proceeding by 6-endo α -amino radical cyclisation pathways, 3195
- sterically unhindered isocyclic allylsilanes, Lewis acid-induced reaction with 3-butyn-2-one, 6685 α -trialkylsilyl- β , γ -unsaturated aldehydes, stereocontrolled synth *via* palladium(0)-catalysed vinyloxirane rearrangement, 7487
- trialkylsilylenaminones and α' -silylated β -diketones, synth by reaction of β -(monoalkylamino) α,β -unsaturated ketones with trialkylchlorosilanes and subsequent hydrolysis, 9179 3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, protiodesilylation of, stereochemical study, 3553

unsubstituted and substituted allyl 1,1-heteroand homobimetallic compds where M=Sn or Si, synth by palladium-catalysed reduction using ammonium formate, 7221

vinyl radicals generated from bromomethyldimethylsilyl propargyl ethers, radical cascades of, 11405

Silver and compds

Ag(I), reduction of by 1-acyl-2-arylhydrazines, mechanism of photographic infectious development, 3961

Solid-supported reactions

- monitoring of a three-step solid phase synth involving a Heck reaction using magic angle spinning NMR spectroscopy, 12209
- resin bound 3-oxobutyramide, condensation with aliphatic amines, synth of 3-amino-2-butenoic acid amides, key step in solid-supported synth of 1,2,3-triazoles, 10823
- solid-phase organic reactions; literature review (Tetrahedron Report 394), 4527
- synth of 1,2,3-triazoles on a solid support involving condensation of a resin bound 3-oxobutyramide with aliphatic amines, 10823

Solvents and solvent effects

- in asymmetric hetero Diels-Alder and ene reactions of alkyl glyoxylates with dienes in nitroalkane solvents, 7287
- on cheletropic reaction of 3,4-dimethyl-2,5-dihydrothiophen-1,1-dioxide, 6241
- conformers of the 1,2,3-propanetriol triacetate in gas phase and in aqueous solution, 677
- on cross-coupling *versus* hydrogen abstraction of the excited hydroxydiphenylmethyl radical generated during photoreduction of benzophenone, 10399
- on Diels-Alder reaction of vinylpyrazoles, synergy between microwave irradiation and solvent-free conditions, 9237
- on dimerisation of α-methylstyrene and 1-aryl-1phenylethylenes induced by aminium salt, 13971
- dimethoxyethane as an alternative solvent for Schmidt reactions of ketones and β -ketoesters with sodium azide and methanesulfonic acid, 1609
- effect on enzyme chemoselectivity in enzymatic acylation of L-Ser-β-naphthylamide, 4867
- effect of traces of trapped solvent on the thermal decomposition of fullerenes, 5143
- on enantioselectivity of lipase-catalysed hydrolysis, 5397
- influence of solvent on the regioselectivity of

- palladium(0)-catalysed allylation of uracils and thiouracils, 9521
- on the mechanism of addition of dimethyl acetylenedicarboxylate to 1-methyl-2-vinyl pyrrole, 10693
- micellar solutions as reaction media, report, 11113
- pH, solvent and concentration dependence of fluorescence and CD spectroscopic sugar sensing by a cyanine dye bearing two boronic acids, 1195
- on pig liver esterase catalysed hydrolysis of trans-2,5-bis(acetoxymethyl)pyrrolidine, 589
- SET oxidative processes of commonly used solvents as revealed through the photochemical reaction of 1,2,4,5-benzenetetracarbonitrile, 1785
- solid-liquid phase synth of 1,1'-bi-2-naphthols by oxidative coupling of 2-naphthols suspended in aqueous Fe³⁺ solutions, 1005
- variuos nitriles as solvents for prep and reactions of samarium diiodide, 14225
- on Vilsmeier-Haack reaction with *O*-hydroxy acetophenones, synth of 3-formyl chromones, 3669
- water to activate the conjugate addition of amines to α,β -ethylenic substrates, 13557 see also Water, reactions in

Solvolysis

of 2- and 3-oxo-1-norbornyl triflates, participation of σ , π and n orbitals, 14041

Spiro compds

- aryl spiroacetals related to the papulacandin antifungal agents, synth involving addition of *ortho*-lithiated diethylbenzamides to lactones followed by cyclisation of the resulting keto-alcohols, 9553
- (+)-1-benzyl-1-azaspiro[5.5]undecan-7-one,precursor to (-)-perhydrohistrionicotoxin, synth involving rearrangement of α-hydroxy imines to α-amino ketones, 6647
- diepoxins, spiroketal-linked naphthodiepoxydecalinones from fungus LL-07F275 which grows as a mycelium sterilium, stereochemistry of, 435
- dioxaspiro compds which constitute structural units of prehispanolone and 14,15-dihydroprehispanolone diterpenes, synth employing intramolecular Michael addition, 12137
- dispiro-1,3-dioxanes with axial and helical chirality, synth and stereochemistry of, 12783 fredericamycin A, antitumour agent with a spirodiketone unit, synth of analogues in which

ring C is expanded to six atoms, examination of the diastereoselectivity of radical spirocyclisation, 6085

- pentacyclo[5.4.0.0^{2,6}.0^{3,10}.0^{5,9}]undecane-spiroann ulated oxetane, mechanism of acid-promoted ring opening of, stereoselective intramolecular 1,5-hydride transfer, 6063
- pheromones wih spiroketal structure of *Bactrocera nigrotibialis*, *Andrena wilkella* and *Andrena haemorrhoa* F, synth from chiral nitro alcohol, 6139
- spiro[benzofuran-3(2H),4'-piperidine], tricyclic morphine fragment, synth by intramolecular radical cyclisation of 4-[(2'-bromo-6'-methoxyphenoxy)methyl]-1-methyl-1,2,5,6-tetrahyd ropyridine, 10935
- bis-2-spirocoumaranoylidenetetrathiane, synth by coupling of 3(2H)-benzofuranone with disulfur dichloride, 1961
- spirocyclic amines by cascade cyclisation of sp³ carbon-centred radicals onto the C-atom of imines, 11445
- spirodienones by hypervalent iodine oxidation of phenolic dibenzylbutyrolactones, intermediates in the biosynth of tetrahydrodibenzocyclooctene, 1303
- spiro(fluorene-9,1'-cyclohexadienones) from electrooxidation of 3,3',4,4',5,5'-hexamethoxybiphenyl and 2,2',3,3',4,4'-hexamethoxybiphenyl, 4449
- spiroindolinopyrans with unsaturated side-chains in benzopyran site, synth by Wittig reaction under Phase Transfer Catalysis, 8755
- spiroisoxazoline derivs, synth by oxidative cyclisation of o-phenolic oxime-acid derivs using phenyliodonium diacetate, 14713
- N,O-spiroketal formation in synth of (+)-hydantocidin from D-fructose and in one-step synth from D-isoascorbic acid and urea, 1177
- spiro(pyrrolidinyl-2,3'-benzodiazepines) related to MK-329, synth by cycloaddition of imines of 1-methyl-3-amino-1,3-dihydro-5-phenyl-(2*H*)-1,4-benzodiazepine-2-one to dipolarophiles, 13455
- spirotryprostatins A and B, diketopiperazine alkaloids produced by *Aspergillus fumigatus*, structures and biological activity, 12651
- tautomycin, pseudoenantiomeric heteroconjugate addition approach to synth of spiro segment of, 2877
- α -vinyl oxygen- and nitrogen heterocycles from hydrostannylation of δ and ω -allenyl aryl hal-

ides followed by mono or bis cyclisation, 13441 Staudinger reactions

- of α-azidoacetonitriles α-phenyl substituted with triphenylphosphine, synth of phosphazine, an aminophosphonium carbanion salt and a phosphazide, 9629
- of homochiral ketenes, synth of *cis-β*-lactams, 5579, 5585
- β-lactams via ketene-imine cycloaddition using different chiral auxiliaries, steric effects, 3741 reaction of phosphines with conjugated azides, synth of N-vinylic phosphazenes, subsequent reaction with carbonyl compds, reactivity of the vinyl side-chain versus aza-Wittig reaction, 4857

Stereochemistry

- absolute of saraine-1 and -2, macrocyclic diamine alkaloids from Mediterranean sponge *Reniera sarai*, 14961
- of alcohol oxidase from defensive secretion of larvae of leaf beetle *Phaedon armoraciae*, 6601 of C-1 in ginkgolide B and C by ROESY NMR, 4505
- of chalcomycin, neutral 16-membered macrolide antibiotic, by X-ray crystallography and correlation with other polyoxo macrolide antibiotics, 3857
- of diepoxins, spiroketal-linked naphthodiepoxydecalinones from fungus LL-07F275 which grows as a mycelium sterilium, 435
- exciton coupling in various substituted arylphthalimide bichromophoric systems, 13201
- of intramolecular Diels-Alder reactions of a series of ether-tethered trienes, effect of nature of dienophile-activating group and substituents in linking chain on, 695
- of the intramolecular pyrylium ylid-alkene cyclisation for synth of taxane precursors, 14081
- pseudoenantiomeric heteroconjugate addition approach to synth of spiro segment of tautomycin, 2877
- stereochemical aspects of intramolecular palladium-catalysed [3+2] cycloadditions of methylenecyclopropanes, 4883
- stereochemical study of the protiodesilylation of 3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, 3553
- of thuriferic and epithuriferic acid, 4903

Stereocontrol

stereocontrolling effect of the trifluoromethyl group in asymmetric aldol reactions of trifluoromethyl ketones with a chiral Ni(II) complex of glycine, 12433

Stereoisomerism

- classification scheme of isomers of organic molecules, 12941
- of dispiro-1,3-dioxanes with axial and helical chirality, 12783

Stereoselection

- effects of counterion coordination and hydrogen bonding on— in C-C coupling of 1,5-dibromo-2,6-dihydroxynaphthalene with alkali 2-naphthoxide, synth of *cis*- and *trans*-1,1':5',1"ternaphthyls, 11013
- penultimate group effects in free radical telomerisations of acrylamides, 4181
- reversal of stereoselectivity in Evans aldol reaction of α,α -difluoro and α,α,α -trifluoro carbonyl compds, 71
- endo-selective Diels-Alder reactions of (E)-1-phenylsulfonyl-3-alken-2-ones with vinyl ethers, synth of 2,4-cis-3,4-dihydro-2H-pyrans, 1205
- selectivities in electrophilic addition to cyclobutene compds, 15103
- stereoselective epoxidations in flexible systems, conformational analysis of, 6699
- see also Diastereoselection

Steric and strain effects

- electronic effects and steric hindrance in complexation of macrolactones and crown ethers with alkali cations and Hg(SCN)₂, 3683 electronic structure of fulleroids, comparison with bridged annulenes, 5207
- in Staudinger reaction using different chiral auxiliaries, 3741
- steric effects on the acidity of bimacrocyclic and acyclic *m*-terphenylsulfinic acids, 599
- steric and electronic effects of the CF₃ group in cycloadditions using trifluoromethylalkenes, 59 steric and electronic effects in imine-hemiaminal ring-chain tautomerism, 7679

Steroids and sterols

- 12-oxo-estrane derivs, synth involving dialkylation of 2,3-butanedione diketal with 1,8-bis-(trimethylsilyl)-2,6-octadiene *via* 1-acetyl-1-methyl-2,5-divinylcyclopentane, 9093
- 2-dehydro-3-deoxy-20-hydroxyecdysone, 3-deoxy-20-hydroxyecdysone and 2-epi-3-deoxy-5α-20-hydroxyecdysone, synth from 20-hydroxyecdysone, moulting hormone activity of, 10673
- 17β-hydroxy-17α-methyl-androsta-1,4-dien-3-0 ne and androsta-1,4-diene-3,17-dione, bioconversion in cultures of green alga T76 Scene-desmus quadricauda, 13981
- 11β-arylandrost-4-en-3-one and the correspond-

- ing 9β ,19-cyclo deriv, synth, role of the 11β -region in steroid progesterone receptor interaction, 1529
- 4-azacholest-5-en-3-one, 6-azacholest-4-en-7-one and their N-methyl derivs, reactions with electrophilic reagents such as bromine, acetyl nitrate or CrO₃, 14057
- brassinosteroid analogues with a 2β , 3β -diol and a A/B cis and trans ring junction, synth and structure/activity relationship, 2435
- ceveratrum alkaloids, compds consisting of Cnor-D-homosteroid based cevanine skeleton isolated from Veratrum, synth of DEF ring system of germine by intramolecular nitrile oxide cycloaddition, 4133
- 2-deoxy-20-hydroxyecdysone and derivs, synth from 20-hydroxyecdysone, moulting hormone activity of, 12623
- 24-epiteasterone, 24-epityphasterol, 2-deoxy-3, 24-diepibrassinolide and 2-deoxy-24-epi-brassinolide, synth from ergosterol, 1997
- erylusamine TA, erylusine and erylusidine, cytotoxic glycolipids from Red Sea sponge Erylus cf. lendenfeldi, structures, 7921
- (20*R*,22*R*,23*S*)-2*β*,3*β*,14α,20,22,23,25-heptahydr oxy-5*β*-cholest-7-en-6-one, zooecdysteroid gerardiasterone, synth employing asymmetric dihydroxylation of an *E*-olefin, 14515
- 25-hydroxy-brassinolide and 25-hydroxy-24-epibrassinolide, synth by oxyfunctionalisation of brassinosteroids by methyl(trifluoromethyl)dioxirane, 10653
- 19-methyl and 19-nor-5,10-secosteroids, structure-reactivity relationship in, intramolecular nitrone 1,3-dipolar cycloadditions, 11995
- 4-oxa-5α-and 4-oxa-5β-androstan-17-ones, synth and study of shielding effect of ether C-O bond obtained from proton chemical shifts of, 2325
- polyhydroxysteroids and steroidal oligoglycosides from Antarctic starfish of *Echinasteridae* family, structures and biological activities, 10997
- reptansterone, 28-epi-sengosterone, 5,29-dihydroxycapitasterone, 2- and 3-dehydroajugalactone, phytoecdysteroids from *Ajuga reptans*, structures, 10137
- 17-substituted 13β-ethyl-11β-hydroxy-gona-4,9-dien-3-ones, hydrogenation of, prep of the corresponding 11β-hydroxy-gon-4-en-3-ones, NMR study, 4495
- 4,4-bis(trifluoromethyl)imidazoline analogues as

cholesterol acyltransferase and cholesterol biosynthesis inhibitors, 11153

 $(2\alpha,3\alpha,22S)$ -trihydroxy- 5α -cholestan-6-one and $(2\alpha,3\alpha,22R)$ -trihydroxy- 5α -cholestan-6-one, synth involving the coupling of aldehyde with arsenic ylids, 5525

vitamin D₃ CD-ring fragment, synth involving diastereoselective allylation of norephedrine/ dihydrocitronellic acid-derived oxazolidinone, and intramolecular Diels-Alder reaction of a sulfonyl-substituted dienyne, 4769

Strain effects

see Steric and strain effects

Strecker reactions

of D-glyceraldehyde derivs, synth of (2S,3S)- and (2R,3S)-2-amino-3,4-dihydroxybutyric acid, 9563

Structure activity

see Linear free energy relations

Substituent effects

ammonolysis of secondary amides assisted by unsubstituted vicinal amide group, 4141

comparison of sensorially active compds with fluorine and methyl substituted analogues of 4-(4-hydroxyphenyl)butan-2-one, 99

in diastereoselective β -elimination of chiral α-arylsulfinyl acetals, asymmetric desymmetrisation of meso-1,2-diols, 6527

effect of nature of dienophile-activating group and substituents in linking chain on the selectivity in Diels-Alder reactions of ether-tethered trienes, 695

effect of ortho-hydroxy substituent in cycloadditions of benzonitrile oxide with cyanophenols,

effect of substitution pattern on site of attack in reaction of angularly and linearly fused 1,2and 1,3-disubtituted [1,2,4]triazolium salts with nucleophiles, 1399

effect of tetra-ortho-substitution on the acidity of bimacrocyclic and acyclic m-terphenylsulfinic acids, 599

electron withdrawing-substituted methanofullerenes, effect of cyano substitution in the 61 position of methanofullerenes, 5149

on the feasibility of azomethine-azomethine isomerisation: synthetic opportunities for biomimetic transamination, 14701

in 11β-hydroxy-gon-4-en-3-ones, 4495

neighbouring group effects on promotion of substitution reactions over elimination, route to chloramphenicol from 3-bromo-N-t-butyl-

 N^{α} -phthaloyl-p-nitrophenylalaninamide, 7025 shielding effect of ether C-O bond obtained from proton chemical shifts of 4-oxa-5 α - and 4-oxa- 5β -androstan-17-ones, 2325

on the solvolysis rates of 2- and 3-oxo-1-norbornyl triflates, 14041

on thermolysis of peroxyacetals and peroxyketals, 8263

Substitution

aminosilyl anions as hydroxy anion equivalents through allylic substitution, 5765

dihalo-de-oxo-bisubstitution and halo-de-hydroxylation reactions of benzylic alcohols, benzaldehydes, acyloins and epoxides using tungsten hexachloride, 14929

electrophilic-of1-[3-methyl-2-(2-thiolanylthio)butyllpiperidine, prep of semicyclic dithioacetals which readily undergo dethioacetalisation, 12745

electrophilic – of thieno-3-sulfolene, synth of thieno-o-quinodimethanes after thermolysis of the resulting substituted 3-sulfolenes, 12459

electrophilic substitution of benzene by C₇₀Cl₁₀, synth of $C_{70}Ph_{10}$ and $C_{70}Ph_{8}$, 5235

electrophilic substitution between acyl cations and arylstyrylsilanes, 861

free-radical homolytic substitution, new methods for formation of bonds to heteroatoms, report, 13265

intramolecular homolytic - in the decomposition of methacrylic-type peroxidic compds, stereoselectivity of, 14855

intramolecular palladium-catalysed aryl amination and aryl amidation, 7525

lithiation-substitution reactions of N-Boc Nalkyl cyclopropyl amines, 12333

mono-S-ipso-substitution of 3,4-dibromofuran, prep of 3,4-disubstituted furans, 4065

neighbouring group effects on promotion of substitution reactions over elimination, route to chloramphenicol from 3-bromo-N-t-butyl- N^{α} -phthaloyl-p-nitrophenylalaninamide, 7025 nucleophilic — between 2-bromo-3-nitrotoluene and o-thiocresol, synth of substituted diphenyl sulfide which undergoes Pschorr-type reaction to yield 4,6-dimethyldibenzothiophene, 3953 radical substitution reaction of aromatic sulfones, new approach to organostannanes,

11329 reactions of 4-amino-5-chloroimidazoles, 7939

S_N2' reaction of dimethyl 2-(tosylmethyl)fumarate with carbonucleophiles or sodium meth-

- oxide, synth of itaconate ester derivs, 1035
- S_N2 substitution reactions at sterically crowded centres using imidazole-1-sulfonates as leaving groups, 10557
- S_N2-like mechanism for annulation of hydroxy vinyl ethers, synth of 1-hydroxy-2-oxabicyclo-[n.4.0]alkane, 2-oxabicyclo[n.4.0]alk-1(6)-ene and 2-oxabicyclo[n.4.0]alk-1(6+n)-ene which lead to polyfunctionalised cyclic compds, 7287
- S_NAr reactions of 3-fluoro-4-chloronitrobenzene and 3,5-difluoro-4-chloronirobenzene with hard and soft nucleophiles, effect of activating nitro group, 2557
- synth of (ω -1)-fluoroalkan- ω -olides from alk- ω -enoic acids *via* an S_N2-reaction, 5469
- vicarious nucleophilic substitution of hydrogen proceeding via heterocyclic ring opening, 3189 vinylic of vinyl triflates with β -substituted- α , β -

unsaturated carbonyl compds, application to synth of cardenolides, 6983

Sulfamic acids and derivs

N-sulfamoyloxazolidinones and -perhydrooxazinones, synth and use as 2-chloroethylsulfamoyl donors in 2-chloroethylnitrososulfamide synth, 14217

Sulfenamides

reaction with N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, synth of carboxamides. 9347

Sulfenic acids and derivs

- benzenesulfenamides, LDA-promoted decomposition of, route to aminyl radicals by dioxygen oxidation of lithium amides, 13243
- enantiomerically enriched α -sulfenylated aldehydes, diastereoselective 1,2-addition of carbon nucleophiles to, synth of vicinal thioether alcohols, 2893
- 2-oxoazetidine-4-sulfenic acid derivs, synth by ozonolysis of Δ^2 -cephem derivs, 10205
- N,N-bis(trimethylsilyl)-1-alkenesulfenamides, synth by reaction of 1-alkenesulfenate anions with TMSCl and LiHMDS, conversion to 1-alkenesulfenimines, 8387

Sulfides

- 2,4-alkadienyl 2'-(alkenyl or alkynyl) sulfides, synth by heating of S-(1-vinyl-2-alkenyl) S-(2-alkenyl or alkynyl) dithiocarbonates, subsequent Diels-Alder reactions gave hydrobenzo-[c]thiophene, 13909
- alkyl phenyl selenide or alkyl phenyl sulfide from hydrocarbons by utilisation of the Fe^{II}-H₂O₂ system in the presence of diphenyl di-

- selenide, phenylselenol, diphenyl disulfide and thiophenol, 10287
- catalytic asymmetric oxidation of using Mn(III)-salen complex as catalyst, 13895
- cyclenphosphine sulfide, synth by reaction of molecular sulfur on cyclenphosphorane, fluxional behaviour and ambident reactivity, 2995
- cyclic sulfonium salts by Me₃SiI-promoted intramolecular displacement of hydroxide or methoxide by sulfide, ring contraction thiepane to thiolane, 5989
- 2,3-epoxy sulfides, rearrangement to 3-trimethylsilyloxy-1,2-thiiranium ions which react with silylated nitrogen heterocycles and amides to form 1-substituted-3-hydroxy-2-thioethers, 3609 heterocyclic allyl sulfides, cross-coupling of with organomagnesium compds, synth of optically active alkenes, regio- and enantioselection, 10799
- β-hydroxy sulfides, electrooxidative pinacol-type rearrangement of, generation of 2-phenyl substituted ketones as ring expanded products, 4303
- α -ketosulfides of benzothiazoles, reaction with allylic carbonates affords α and α , α -diallylated ketosulfides, intermediates for stereoselective synth of allyl ketones, allyl thiiranes and dienes, 2155
- S-nucleosidyl S-aryl disulfides, synth from the corresponding thioesters and their reaction with phosphites, 1027
- phenylsulfides and dithiolane derivs, desulfurative fluorination using nitrosonium tetrafluoroborate and pyridinium poly(hydrogen fluoride),
- α-sulfide deriv of 3,3,3-trifluoropropene, synth and reactivity in 1,3-dipolar cycloadditions, 4383

see also Thioethers, Thiols

Sulfines

see Thiocarbonyl oxides

Sulfinic acids and derivs

- benzenesulfinic acid, 1,4-elimination of from β -keto phenylsulfone tosylhydrazone via α,β -unsaturated ketone tosylhydrazones, 10705
- bimacrocyclic and acyclic m-terphenylsulfinic acids, synth and steric effects on acidity of, 599 chiral α -arylsulfinyl acetals, diastereoselective β -elimination of, asymmetric desymmetrisation of meso-1,2-diols, 6527
- sulfinamoyl-esters, -sulfonamides and -sulfones, aminolysis of, thiooxamate and thiourea forma-

tion via a sulfine intermediate, 14865

Sulfonamides

5-amino-4-sulfonamidoimidazole nucleosides and an imidazothiadiazine dioxide analogue of adenosine, synth, 9219

sulfinamoyl-esters, -sulfonamides and -sulfones, aminolysis of, thiooxamate and thiourea formation *via* a sulfine intermediate, 14865

Sulfones

(alkoxyallyl)sulfones as enal β-anion equivalents, synth of 5-substituted 2(5H)-furanones and mono-, di- and trisubstituted furans by reaction with aldehydes, 15267, 15289

aromatic sulfones, radical substitution reaction of –, new approach to organostannanes, 11329 cyclopentane β -ketoxime sulfones, synth and selected transformations of, 6903

dilithiated 3-tosylpropanal dimethyl acetal as β , β -acylvinyl dianion or homoenolate dianion equivalent, 4111

dimethyl 2-(tosylmethyl)fumarate, synth and use as electrophilic reagent for the synth of itaconate ester derivs, 1035

(E)- and (Z)-fluorovinyl sulfones, treatment with tributyltin hydride and catalytic AIBN, synth of (fluorovinyl)stannanes which can be converted to 1-fluoro olefins, 45

β-hydroxy sulfones, bioisosteres of oxisuran metabolites, synth from 2-ethoxycarbonyl-pyrazine, conformational study, 11239

pyrimidone and pyrimidine sulfones, synth and heating to give 5,6-dimethylenepyrimidin-4-ones and pyrimidine *o*-quinodimethanes respectively, subsequent Diels-Alder reactions of, 1723, 1735

sulfinamoyl-esters, -sulfonamides and -sulfones, aminolysis of, thiooxamate and thiourea formation *via* a sulfine intermediate, 14865

sulfone deriv of 3,3,3-trifluoropropene, synth and reactivity in 1,3-dipolar cycloadditions, 4383

2-vinyl or 2-aryl allyl sulfones by carbopalladation-sulfonylation of allenes, 9101

vinyl sulfones derived from allyl sulfones and cyclopentenones, Michael addition reactions of, synth of 6-endo-methyl substituted bicyclo-[2.2.1]heptane derivs, 8795

Sulfonic acids and derivs

α-aminosulfonopeptides as functional analogues of penicillin, synth using Curtius rearrangement, 5303

(2,4-dimethoxybenzylthio)-4-methylphenyl sulf-

onate, use as a sulfenylating agent in prep of (2R,3R)-3-mercaptoaspartic acid from L-aspartic acid, 12839

N,N-dimethylacrylamide-triflic anhydride complex as a bifunctional electrophile in reactions with electron-rich aromatics, 12993

1,1-diphenoxy-2-(phenylsulfonyl)cyclopropane, reactions of the lithio deriv of — with acyl chlorides and acyl imidazoles, synth of dihydrofurans which could be transformed into the corresponding furans, 7149

imidazole-1-sulfonate, synth and nucleophilic displacement reactions of, 10557

salts of selenoxides with sulfonic acids, synth by addition of sulfonic acid to a solution of selenoxide and removal of the solvent, use as oxidising agents for sulfides to sulfoxides, 1841

scandium trifluoromethanesulfonate as a catalyst in the decarbonylation of aromatic aldehydes, 11045

sulfonic peracids, behaviour towards olefins, allylic and homoallylic alcohols and α,β -unsaturated ketones, 2957

p-toluenesulfonic peracid generated *in situ* by oxidation of compds containing nitrogen/or sulfur, heteroatom oxidation and chemoselectivity, 5773

Sulfonimides

N-fluorobenzenesulfonimide, conversion to α -fluoro ketone, a key intermediate for synth of a fluorinated tribactam, 263

Sulfonium salts

cyclic sulfonium salts by Me₃SiI-promoted intramolecular displacement of hydroxide or methoxide by sulfide, ring contraction thiepane to thiolane, 5989

Sulfonyl compds

arenesulfonyl iodides, addition reaction with alkynols, synth of cyclic enol ethers, 7779

methanesulfonyl- and toluenesulfonyl isothiocyanates, reaction with alcohols to give N-sulfonylthioxocarbamates, subsequent radical fission reaction of, synth of O-alkylthioxocarbamates, 2705

methyl *N-p*-methoxybenzensulfonylindole-2-(2-propenoate), Diels-Alder reaction of, synth of advanced intermediates for the synth of (±)-andranginine alkaloid, 11291

(E)-1-phenylsulfonyl-3-alken-2-ones, Diels-Alder reactions with vinyl ethers, synth of 2,4-cis-3,4-dihydro-2*H*-pyrans, 1205

N-sulfonyl-alkylamines, application in [2+4]

cycloadditions, 725

Sulfoxides

aryl α -haloalkyl sulfoxides, ligand exchange reaction with alkylmetals, synth of α -halo carbanions, 2349

by aerobic oxidation of penicillin and cephalosporin derivs in the presence of cobalt(III) acetylacetonate and an aldehyde, 2343

by oxidation of sulfides using salts of selenoxides with sulfonic acids, 1841

sulfoxide deriv of 3,3,3-trifluoropropene, synth and reactivity in 1,3-dipolar cycloadditions, 4383

sulfoxides of 2-substituted-1,3-dithianes, synth by Sharpless sulfoxidation, subsequent deacylation allows prep of 2-alkyl-1,3-dithiane 1-oxides, 2125

Sulfur and compds

1-arylamino-1-methylthio-2-nitroethene,intriflic acid yields a conjugated dication with aryliminium and hydroxynitrilium sites, 9509

sulfur containing 2-aryloxazolines, synth from amino alcohols, 7547

Sulfur heterocycles

N'-arylthiocarbamoyl-N,N-dialkylamidines,prep by treatment of 5-(arylimino)-4-(dialkylamino)-5H-1,2,3-dithiazoles with NaOH, 8413

benzylidenedithiophthalide and pentylidenedithiophthalides, unexpected rearrangement in their synth from thiophthalic anhydride and 2-thiophthalide, 11867

diethyl 3-thienylmalonate, oxidative dimerisation by high valent metal salts, synth of benzo[1,2-b:4,5-b']dithiophene derivs, 13227

4,6-diphenylthianthrene and 1-tetrathiafulvalenylnaphthalene, synth and X-ray crystal structures, 4745

functionalised ethylenediselenotetrathiafulvalenes, synth and characterisation, comparative study with their all-sulfur analogues, 11063 macrocyclic dithiatetralactams and derivs, synth involving dissymetrisation of the reactivity of a diacid via its cyclic anhydride and the activation-cyclisation of the intermediate diamide diacid, 9793

monocyclic 1,2-dithiines, synth *via* (*Z*,*Z*)-1,4-difunctionalised butadienes, structure and reactivity of, 12677

2-silylthiacycloalk-2-enes, synthfrom ω-haloacylsilanes *via* thioacylsilanes, 4803

bis-2-spirocoumaranoylidenetetrathiane, synth by coupling of 3(2H)-benzofuranone with disulfur dichloride, 1961

12,13,25,26-tetraaza-2,15-dithia[3.3]phenanthro linophane, synth by cyclisation of 2,9-bis-(bromomethyl)phenanthroline, 4673

thieno-3-sulfolene, electrophilic substitution of, synth of thieno-o-quinodimethanes, 12459

2- and 3-thienylmethylbenzoates, mechanism of flash vacuum pyrolysis of involving 2-, 3-thienyl methyl and phenyl radicals, 13615

3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, protiodesilylation of, stereochemical study, 3553

see also the individual ring systems

Sultams

3-hydroperoxy sultams and corresponding isothiazol-3(2*H*)-one 1,1-dioxides, synth by oxidation of isothiazolium salts, 783

Oppolzer sultam, homochiral ketenes derived from, use in ketene-imine cycloaddition reaction (Staudinger reaction), synth of *cis-β*-lactams, 5579

Supported reagents

KF adsorbed on alumina as promoter of the epoxidation of electron deficient alkenes with anhydrous t-BuOOH, 3659

photolabile supports for solid phase synth of oligonucleotides containing 3'-alkyl amines, 3827

probing solid-phase reactions by monitoring the IR bands on a single "flattened" resin bead, 843

rhodium carbenoid attached to a polystyrene resin, generation by treatment of a resin-bound diazoacetamide with rhodium(II) acetate, 5999 silica-alumina gel catalysts prepared by the sol-gel method, use for cleavage of ethers, 9387

supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853

Supported reagents/reactions

see also Polymer supported synthesis

Surfactants

nature of head groups of surfactant and length of hydrophobic chain on regioselectivity of bromination of *N*,*N*-dimethylaniline, 2465

Tandem reactions

computerised search using HOLOWin, application to the taxane framework, 14625

tandem Diels-Alder retro Diels-Alder reaction of 6-amino-3-methylpyrimidin-4(3H)-ones with

DMAD, 13721

Tannins

profisetinidin triflavanoid related phlobatannins, synth by biomimetic reaction *via* the repetitive formation of the interflavanyl bond and pyran ring rearrangement of the chain extender, 6003

Tautomerism

- keto-enol tautomerism in aqueous solution, theoretical study, 11325
- steric and electronic effects in imine-hemiaminal ring-chain tautomerism, 7679

Tellurium and compds

- allylic diisobutyltelluronium ylids, reaction with alkylidene or arylmethylidene malonic esters, synth of vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, 8747
- 3*H*(3*R*)-benzo-2,1-oxatelluroles as synthons in synth of *o*-alkyltellurophenyl carbonyl compds, 3365

Terpenes and terpenoids

- (+)-aphidicolin, tumour inhibiting tetracyclic diterpenoid antibiotic from *Cephalosporium aphidicola* and *Nigrospora sphaerica*, synth from 4-ethylidene-2-(5-hydroxy-2-pentynyl)cyclohex ane ethylene acetal, 10347
- taxanes, fluorine-containing analogues of paclitaxel and docetaxel, synth by coupling of (3*R*, 4*S*)-1-acyl-β-lactams with baccatin III, 10-dea c e t y l b a c c a t i n I I I a n d 14β-hydroxy-10-deacetylbaccatin III, 209
- africanane, seco- and nor-seco-africanane, guaiane and germacrane type sesquiterpenoids from the liverwort *Porella swartziana*, structures, 6339
- antifouling sesquiterpene isocyanides from nudibranchs of the *Phyllidiidae* family, structures and activity, 9447
- bacteriohopanepentols with acyclic pentol sidechains from *Nostoc* PCC 6720, structures by circular dichroism, 2759, 2777
- briareolate esters and briareolides, diterpenes from the Caribbean gorgonian octocoral *Briar*eum asbestinum, structures, 9953
- (\pm)- α -chamigrene, spirocyclic sesquiterpene containing a spiro[5.5]undecane skeleton, synth by radical cyclisation of α -allenic ketone, 13181 chicory (*Cichorium intybus*), source of guaiane sesquiterpene lactones, use for biotransformation of (*E,E*)-cyclodeca-1,6-dienols, 11273
- chiral(salen) manganese(III) complex bearing a sesquiterpene salicylaldehyde and (R,R)-1,2cyclohexanediamine moieties as a catalyst for

- epoxidation of unfunctionalised olefins, 12031 cotylenol, fusicoccane diterpenoid having 5-8-5-membered tricyclic framework possessing leaf growth activity, synth from condensation of two iridoid synthons, 3921
- (+)-β-cyperone and (-)-eudesma-3,5-diene, bioactive compds against *Locusta migratoria*, synth from santonin, 10507
- (±)-demethyl salvicanol, a rearranged 9(10→20)abeo-8,11,13-triene diterpene, synth involving zinc-promoted coupling of benzyl bromide with ketone and alkylation of ketone with iodide, 10659
- endo-3,9-dibromo-4-(bromomethyl)camphor, intermediate for triterpenoid synth: synth by unexpected rearrangement of endo-3-bromo-4-methylcamphor, 14661
- (22R)-30a,30b-dihomohopan-30b-yl and tetrahymanyl esters of pyrophaeophorbide a, triterpenoid chlorin esters, water column transformation products of chlorophyll a resulting from zooplankton herbivory, 13427
- dihydroxy-3-friedelanone triterpenes from the leaves and the stem bark of the Cameroonian medicinal plant *Lepidobotrys staudtii*, structures, 14989
- (1'E,5'E)-2-(2',6'-dimethylocta-1',5',7'-trienyl)-4-furoic acid, sesquiterpene anti-inflammatory metabolite from soft coral *Sinularia* sp., synth involving Claisen rearrangement, 4245 13,14-dioxo-11-hydroxy-7-methoxy-hassane-8, 11,15-trien-(22,6)-olide, a C₂₃ terpenoid from *Salvia apiana* Jeps, structure and biosynthetic origin, 12309
- dolasta-1(15),8-diene and derivs by in vitro cyclisation of dolabellatriene diterpenes, 1549 dorisenones, cytotoxic spongian diterpenoids from nudibranch Chromodoris obsoleta, structures, 8187
- forskolin, synth of (3aS,6aR,9aS,9bS,9cS)-1,1, 6,8,8,9c-hexamethyl-2,3,3a,5,6a,9a,9b,9c-octa-hydro-1*H*-4,7,9-trioxa-cyclopenta[*c*]acenaphth alen-5-one as intermediate to, 7703
- fourteen terpenoids from marine sponge Acanthella cavernosa with antifouling activity against barnacle Balanus amphitrite, structures, 2359
- ginkgolides, highly oxidised diterpene trilactones from the leaves and bark of *Ginkgo biloba* (maidenhair tree), NMR study of C-1 stereochemistry of, 4505
- (±)-halipanicine, sesquiterpene from Okinawan sponge Halichondria panicea, synth involving

Diels-Alder reaction and Martin's methodology as key steps, 6361

- (+)-heptelidic acid, sesquiterpene lactone, use of asymmetric protected 2-oxo-5-isopropyl-cyclohexenecarboxylates as building blocks for an EPC synth of, 1221
- (+)-cis-2-isopropenyl-1-methylcyclobutaneetha nol ((+)-grandisol), pheromone of cotton boll-weevil, synth from (+)-citronellol by intramolecular carbenoid cyclisation, 3879
- isovalerenenol, sesquiterpene alcohol isolated from a soft coral, synth using intramolecular aldol and hydrogenation reactions of the corresponding hydrindenone deriv, 9999
- jaspiferals A-G, cytotoxic isomalabaricane-type nortriterpenoids from Okinawan marine sponge *Jaspis stellifera*, structures, 5745
- 5-ketogermacren-6,12-olides, acid cyclisation of three related—, reactivity and conformational study, 11827
- labiatamides A-B and labiatins A-C, diterpenoids from Senegalese gorgonian *Eunicella labiata*, structures and cytotoxic activity, 2735
- (+)-limonene, (-)-β-pinene, (+)-sabinene, (+)-aromadendrene and camphene, ozonolysis of, 14813
- linearly fused *cis:anti:cis* tricyclopentanoids and protoilludane framework having fused four, six and five membered rings, synth, 7087
- merulidial and isovelleral, fungal antibiotic terpenoids, reactivity of towards triacetic acid lactone, 1473
- (-)-mitsugashiwalactone, (+)-iridomyrmecin, (-)-isoiridomyrmecinand(+)-teucriumlactone, iridoid cyclopentapyranones, synth by Horner-Wadsworth-Emmons reaction on enolisable cyclopentanones, 3435
- 1,6,17,21-octahydrobotryococcene and sacredicene, triterpenoid hydrocarbons from sediments of Sacred Lake, Mount Kenya, structures, 6973 pantofuranoids A-F, tetrahydrofuran monoterpenes from Antarctic *Pantoneura plocamioides*, structures and stereochemistry, 5899
- (±)-β-pinguisene and (±)-pinguisenol, sesquiterpenes from *Porella* liverworts, synth *via* hydroazulene involving Amberlyst 15-catalysed cyclisations of allyl- and propargylsilanes, 7475 prehispanolone and 14,15-dihydroprehispanolone, labdane diterpenes from *Leonurus heterophyllus*, synth of dioxaspiro compds which constitute structural units of –, 12137
- pseudoguaianolides, sesquiterpenoid tricyclic

lactones classified as helenanolides or ambrosanolides, synth from ketal ester intermediates, 6307

- nor quinone methide triterpenes (pristimerin and tingenone) possessing one enol double bond, oxidation with dimethyl dioxirane, 10667 taxanes: canadensene, baccatin III, paclitaxel and taxa-4(5),11(12)-diene, NMR and molecular modelling study of, 8957
- taxanes, computerised search of tandem reactions using HOLOWin, application to the taxane framework, 14625
- taxanes, "hydrophobic collapse" conformation of paclitaxel in non-aqueous environment, crystal structure of 10-deacetyl-7-epitaxol, 2291
- taxanes, intramolecular pyrylium ylid-alkene cyclisations for synth of taxol precursors, synth of the 7-deoxy ABC skeleton and formation of the 8-membered B-ring by pinacol rearrangement, 14081, 14103, 14147
- taxanes, left and right-half taxoid building blocks from (S)-(+)-Hajos-Parrish ketone, 12443
- taxanes, synth of β -benzoylamino-phenylalanine, an analogue of the taxol side chain, 10279
- taxanes, synth of *cis*-3-hydroxy-4-phenyl- β -lactams, precursor of the taxol side-chain, from ketenes *via* Staudinger reaction, 5579, 5585
- taxanes, synth of a homochiral taxoid BC-unit by combination of enzymatic hydrolysis and aldol-annelation-fragmentationsequence, 6215 taxanes, taxuspines K-M, taxane diterpenes from the stems of Japanese yew *Taxus cuspidata* Sieb. et Zucc, structures, 2337
- taxanes, taxuspines N-P, taxoids from Japanese Yew Taxus cuspidata, structures, 5391
- taxanes, taxuspines Q-T, taxoids from Japanese Yew Taxus cuspidata, structures, 12159
- taxanes, taxuspines U-W, taxane and related diterpenoids from the Japanese yew *Taxus* cuspidata, structures, 13145
- taxanes, $2\alpha,5\alpha,10\beta,14\beta$ -tetra-acetoxy-4(20),11-taxadiene, selective deacetylation and hydroxylation of by the fungus *Cunninghamella* echinulata, 8739
- (+)-taylorione, sesquiterpene from liverwort *Mylia taylorii*, synth from (+)-2-carene by modified Pauson-Khand reaction, 7391
- terpenoic acid glycerides from dorid nudibranchs Archidoris odhneri and A. montereyensis, stable isotope incorporation evidence for the de novo biosynth of, 6869

- trichothecane sesquiterpenes with antifungal, antibacterial, antiviral, tumour inhibition and insecticidal activities, general route to A-ring aromatic trichothecane from allyl alcohols, 10363
- triterpene dimers from *Maytenus scutioides* (Celastraceae), structures and absolute configuration, 9597
- xenia diterpenoids containing a cyclononane skeleton from soft coral *Xenia* sp., structures, 13121
- see also Gibberellins, Iridoids, Limonoids, Retinoids, Steroids and sterols, Vitamins A and D

Tetramic acids

see Pyrrolidinones

Tetrazines

3-aryl-1,2,4,5-tetrazine *N*-1-oxides, synth by oxidation with methyl(trifluoromethyl)dioxirane. 2377

Tetrazoles

- 1-(4-methoxyphenyl)-4-(tetrazol-5-yl)azetidin-2 -one and 1-(4-methoxyphenyl)-5-(tetrazol-5-ylmethyl)pyrrolidin-2-one, reaction with cerium-(IV) ammonium nitrate, 10169
- substituted 1*H*-tetrazoles and 1,2,3-triazoles, synth *via* reactions of 3(,5)-(di)chloro-2*H*-1,4-(benz)oxazin-2-ones with sodium azide or diazocompds, 8813

Tetronic acids

see Furans

Theoretical calculations

- ab initio calculations for assessment of structure and reactivity of 4,9-dihydro-4,6-dimethyl-9-oxo-3-(β-D-ribofuranosyl)imidazo[1,2-a]purine (Wyosine), 1597
- ab initio and density functional theoretical studies on nonclassical furoxans, 743
- ab initio investigation on the reactivity of mixed LiMe/KOMe complexes as bases, model for Schlosser LICKOR superbase, 7053
- ab initio studies on 6-endo- and 5-exo-digonal cyclisation of o-hydroxyphenyl ethynyl ketones, 9427
- AM1 methodology to compute reaction pathways, isomerisation of cyclobutyne and [2+2] cycloaddition to ethylene, 2279
- AM1 and PM3 calculations for 1,8-di(3'-pyrid-yl)naphthalene, 8703
- analysis of the aromatic character of azaanalogues of benzenoid hydrocarbons, 13795 analysis of the electrophilic amination of

- 1,3,2-oxazaphospholanes using (1R),(2S)-1,3-diphenyl-2-(N-isopropylamino)-1-propanol as the chiral auxiliary, 13783
- application of group additivity parameters to the prediction of the enthalpies of formation of heteroaromatic compds, 14335
- cleavage of the troponoid rings of mesylate and tosylate of tropone oxime by nucleophiles, 8439
- computational studies of effective asymmetric alkylation utilising a chiral Schiff base derived from 2-hydroxy-3-pinanone, 5961, 5971, corrig. 7807
- density functional calculations to analyse Li⁺ selectivity of aza-12-crown-4 with a functionalised arm, 8199
- determination of pK_a values for polycationic species derived from 9-hydroxy and 9-aminothiazolo[5,4-b]quinolines, 11929
- electronic structure of fulleroids with the π orbital axis vector (POAV) analysis and 3DHMO theory, comparison with bridged annulenes, 5207
- fluorine as a hydrogen bond acceptor, 12613 HOLOWin; computerised searching system for tandem reactions, application to the taxane framework, 14625
- imbalanced Kekule structure contributions in the ring in 1,3,5-trisubstituted benzene derivs, X-ray study on 1,3,5-trimethoxybenzene and ab initio study on 1,3,5-triformylo-benzene and trimethoxy-benzene, 11379
- meta substitution with respect to the activating nitro group in 3,4-dihalogenonitrobenzenes, 2557
- patterns of addition to buckyballs and buckytubes, 5247
- PM3 semiempirical, reactivity of 6-amino-3-methylpyrimidin-4(3H)-ones towards DMAD, tandem Diels-Alder retro Diels-Alder reaction, 13721
- prediction of tautomeric equilibrium constants for a series of aliphatic ketones in aqueous solution using the quantum chemical self-consistent reaction field approach, 11325
- reasons for opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025
- relationship of classical and magnetic criteria of aromaticity, 9945
- semi-empirical and ab initio 3-21G level calculations, hydrolysis of bicyclic orthoesters having

- a six or a seven-membered orthoester ring, 14841
- semiempirical calculations to determine charge distribution and reactivity of benzanthrenyl and 1-hydroperyllenyl anions, 2647
- separation of the energetic and geometric contributions of π -electron carbocyclics, 1713
- separation of the energetic and geometric contributions to the aromaticity, a general model for the π -electron systems, 10255
- Strecker reaction of D-glyceraldehyde derivs, synth of (2S,3S)- and (2R,3S)-2-amino-3,4-dihydroxybutyric acid, 9563
- study of conformers of the 1,2,3-propanetriol triacetate in gas phase and in aqueous solution, 677
- theoretical and electrochemical studies to investigate the electronic structure and redox property of two silylmethylated C₆₀ compds, 5053
- theoretical model of solvated lithium dienediolates of methyl substituted 2-butenoic acids, 11105
- theoretical study of the solvent effects on the mechanism of addition of dimethyl acetylene-dicarboxylate to 1-methyl-2-vinyl pyrrole, 10693 see also Molecular modelling/mechanics

Thermochemistry

- ab initio calculations for assessment of structure and reactivity of 4,9-dihydro-4,6-dimethyl-9-oxo-3-(β-D-ribofuranosyl)imidazo[1,2-a]purine (Wyosine), 1597
- ab initio calculations on hydrogenated C_{60} , patterns of addition to, 5247
- ab initio and density functional theoretical studies on nonclassical furoxans, 743
- ab initio investigation on the reactivity of mixed LiMe/KOMe complexes as bases, model for Schlosser LICKOR superbase, 7053
- ab initio and PM3 transition states for reactions of 4- or 5-substituted-2,4-pentadienyl allyl sulfides, 13909
- *ab initio* studies on 6-endo- and 5-exo-digonal cyclisation of o-hydroxyphenyl ethynyl ketones, 9427
- AM1 calculations, photohydrodehalogenation of 3,4-dibromobiphenyl, formation of 4-bromobiphenyl and 3-bromobiphenyl, 8397
- application of group additivity parameters to the prediction of the enthalpies of formation of heteroaromatic compds, 14335
- basic hydrolysis of 2-(2-nitrophenoxy)quinoxal-

- ine in aqueous solutions of non-reactive counter-ion surfactants with bulky head groups, relation between rate and surfactant concentration, 11665
- conformational analysis of stereoselective epoxidations in flexible systems, 6699
- conformational dynamics of 4-aryl-1,4-dihydropyridine calcium channel antagonists by NMR and saturation transfer, 9665
- conformational energetics of sugar thioureas, synth of glycosyl thioureido sugars, 12947
- density functional calculations to analyse Li⁺ selectivity of aza-12-crown-4, 8199
- determination of pK_a values for polycationic species derived from 9-hydroxy and 9-aminothiazolo[5,4-b]quinolines, 11929
- enantiotopomerisation and conformational analysis of hindered aryl alkyl ketones investigated by dynamic and solid state NMR, 2471
- FMO analysis of 1,3-dipolar cycloadditions of polycyclic aromatic hydrocarbons with 3,5-dichloro-2,4,6-trimethyland 2,4,6-trimethylbenzonitrile oxide, 13027
- heats of formation and steric energy of epithuriferic acid, 4903
- HOMO and LUMO energy for photochemical reactions between nitroarenes and arylalkenes, 14253
- imbalanced Kekule structure contributions in the ring in 1,3,5-trisubstituted benzene derivs, X-ray study on 1,3,5-trimethoxybenzene and *ab initio* study on 1,3,5-triformylo-benzene and trimethoxy-benzene, 11379
- intramolecular spin-interactions between nitronyl nitroxide or imino nitroxide radical units linked to thieno[2,3-b]thiophene and thieno-[2,3-b]thieno[3',2'-d]thiophene chromophores, 6893
- Marcus approach to study competition between nucleophilic addition and electron-transfer in the reaction of 9-diazo-10-anthrone with Grignard reagents, 6795
- photochemical approach to functionalisation of open-chain and cyclic alkanes, single electron transfer oxidation and hydrogen abstraction, 5533, 5549
- "physiological size" of fluorine substituents on 4-(4-hydroxyphenyl)butan-2-one, principal flavour substance of raspberries, comparison with methyl substituted analogues, 99
- pK_as of ¹³CO₂H-labelled adipic, succinic and malonic acids, 5319

- PM3 calculations for functionalisation of [60]-fullerene by Diels-Alder reactions, 4983
- PM3 MO calculations on cyclisation of 3alkynyl- and 3-allenyl-2-(substituted amino)-1imidazolin-4-ones, 6581
- PM3 semiempirical approach to structures of solvated lithium dienediolates of methyl substituted 2-butenoic acids, 11105
- PM3 semiempirical investigation of the reactivity of 6-amino-3-methylpyrimidin-4(3*H*)-ones towards DMAD, tandem Diels-Alder retro Diels-Alder reaction, 13721
- prediction of tautomeric equilibrium constants for a series of aliphatic ketones in aqueous solution using the quantum chemical self-consistent reaction field approach, 11325
- rate constants and half lifes for rearrangement of (S)-7-butyl-2-methyl-2H-azepine, 10883
- reasons for opposite diastereoselectivities of benzyllithium compds containing lithium amide and lithium alkoxide functionalities, 10025
- relationship of classical and magnetic criteria of aromaticity, 9945
- resonance energies, pHa, electron affinities and ionisation potentials of pyridine and diazines, cycloaddition of benzonitrile oxide to, 6421
- semi-empirical MO calculations using PM3 method for the ene reaction of *N*-methyl imine, 13097, 13111
- semi-empirical molecular orbital (MO) calculations to investigate the electronic structure and redox property of two silylmethylated C_{60} compds, 5053
- semiempirical calculations on glycoamidines, 9263
- semiempirical quantum chemical calculations and *ab initio* treatment of bis-(pyrimidinium-olates), 5475
- separation of the energetic and geometric contributions of π -electron carbocyclics, 1713
- SINDO1 investigations on the low-lying states of cyclopropenyl anion, azirene, oxirene and thiirene, three membered antiaromatic systems, 4709
- stereodynamics of a series of N,N-dialkyl-9-triptycylamines, 12409
- study of conformers of the 1,2,3-propanetriol triacetate in gas phase and in aqueous solution, 677
- thermodynamic driving forces for fullerene formation in flames, 5161

Thiadiazoles

1,4-dithiafulvene-substituted 1,2,3-thiadiazoles,

cleavage with base and dimerisation of the resulting alkyne-1-thiolate yields tetrathiafulvalene-type vinylogue extended π -donors, 3171

Thiadiazolines

5-imino-1,2,4-thiadiazolidine-3-ones, reaction with [60]fullerene, synth of 1,2-(3-aryl-2-aryl-imino-tetrahydrothiazolo)-[60]fullerenes, 8733

Thiafulvalenes

functionalised ethylenediselenotetrathiafulvalenes, synth and characterisation, comparative study with their all-sulfur analogues, 11063 1-tetrathiafulvalenylnaphthalene, synth and X-ray crystal structure, 4745

Thiazetes

thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles by rearrangement of thiadiazabi-cyclo[3.1.0]hexene derivs, 7183

Thiazines

2-methylthio-4-oxo-3-phenylpyrido[2,1-f][1,2,4]-triazinium iodide, reaction with various aminoheterocycles, synth of conjugated mesomeric betaines, 11349

Thiazoles

- (1*R*,2*S*,3*R*)-2-acetyl-5-(1,2,3,4-tetrahydroxybut-yl)thiazole, asymmetric synthesis from 2-acetyl-thiazole, 14069
- 1,2-(3-aryl-2-arylimino-tetrahydrothiazolo)-[60] fullerenes, synth by reaction of 5-imino-1,2,4-thiadiazolidine-3-ones with [60]fullerene, 8733
- 2-azidobenzothiazole, reaction with 1-azido-4-(3',5'-dimethyl-1'-pyrazolyl)tetrafluorobenz ene and C_{60} , synth of imino[60]fullerenes, σ azaridinefullerene and π -azafullaroid, 6733
- isothiazole dioxides, cycloaddition of azides to —, synth of thiadiazabicyclo[3.1.0]hexene derivs, subsequent rearrangement to thiazete dioxides, 1,2,6-thiadiazine dioxides and pyrazoles, 7183 isothiazolo[5,4-b]pyridin-3(2H)-one derivs, molecular modelling of, 8947
- MDL 62,879 (GE 2270A), a peptide produced by *Planobispora rosea* and belonging to the thiazolyl peptide group of antibiotics, chemical modifications of, 8763
- polycationic species derived from 9-hydroxy and 9-aminothiazolo[5,4-b]quinolines, protonation constants, 11929
- thiazolo[3,2-a]benzimidazoles, synth by cyclisation of 2-benzimidazolylthioacetophenones, 10485
- 1-C-(2-thiazolyl)- α -D-galactopyranosyl acetate and 1-C-(2-thiazolyl)- α -D-mannofuranosyl acetate, glycosidation of, synth of α -linked

ketodisaccharides, 3057

Thiazolidines

(Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)-methyl]-4-pyridinyl]methylene]-2-thioxo-4-thiazolidinone, synth by condensation of pyridoxal 5'-phosphate with rhodanine, 14787

Thiazolines

curacin A, antimitotic agent from Caribbean cyanobacterium *Lyngbya majuscula*, synth and biological activity, 14543

Thienes

- thieno-o-quinodimethanes, synth via electrophilic substitution reactions of thieno-3sulfolene, 12459
- 2- and 3-thienylmethylbenzoates, mechanism of flash vacuum pyrolysis of involving 2-, 3-thienyl methyl and phenyl radicals, 13615

Thiiranes/thiirenes

- allyl thiiranes, synth from α -ketosulfides of benzothiazoles by reaction with allylic carbonates via α and α , α -diallylated ketosulfides, 2155
- thiirene, cyclopropenyl anion, azirene and oxirene, three membered antiaromatic systems, SINDO1 investigations on the low-lying states of, 4709
- 3-trimethylsilyloxy-1,2-thiiranium ions from rearrangement of 2,3-epoxy sulfides, reaction with silylated nitrogen heterocycles and amides forms 1-substituted-3-hydroxy-2-thioethers, 3609

Thioacetals

- ketene selenothioacetals by trapping of lithium eneselenoates with alkyl halides, 2839
- ketenedithioacetal by reaction of 2-lithio-2vinyl-1,3-dithiane with an aryl halide, subsequent transmetalation generates an alkyl halide and a 2-indanyl-2-lithio-1,3-dithiane, 14951
- 2-norbornanone dithioacetals, synth by reaction of 1,3-dithiane and 1,3-dithiolane derivs of 3-substituted 2-cyclopentenones with dienophiles, 9979
- α -oxoketene dithioacetals, 1,2-addition of α -lithio-xylenes onto followed by cyclode-hydration of the resulting carbinols, synth of substituted 1-methyl- and 2-methylnaphthalenes, 14049
- α -oxoketene dithioacetals, reduction with Zn/ZnCl₂-TMEDA in ethanol, synth of β -methylthiomethylene ketones, β -methylthioketones and α -methylketones, 4679
- bis(phenylthio)methane and [1,3]-dithiane, deprotonation of by NaNH₂/Et(OCH₂CH₂)₂-

ONa, mechanisms, 15147

silylketene thioacetals, Lewis acid promoted condensation with imines, synth of β -lactams, 2573, 2583

Thioacids

thiocarboxylic acids, reaction with azoalkenes, synth of hydrazone 1,4-adducts leading to widely substituted pyrrole and pyrazole rings by internal cyclisation, 1579

Thioalkenes

- (Z)-1-ethylthio-1-trimethylsiloxypropene, tin(II) Lewis acid-mediated aldol reactions of with aldehydes, synth of 2-methyl-3-hydroxythioesters, 7277
- α-thioalkenes, intramolecular carbolithiation of, synth of 1,2-dialkyl-1-phenyl cyclopentanes, 7435, 7465

Thiocarbonyl compds

- 6-amino-5-thioformyluracils, synth from 6-amino-1,3-disubstituted uracils, stability of, 9971
- 3-amino-N-(2-hydroxy-1-phenylethyl)-5-methylthio-2-piperidones, conformationally restricted analogues of methionine, synth from N-(2acetoxy-1-phenylethyl)- Δ^5 -piperidin-2-one, 7727
- 2-benzimidazolylthioacetophenones, synth by reaction of 2-mercaptobenzimidazole with aromatic ketones, subsequent cyclisation gives the thiazolo[3,2-a]benzimidazoles, 10485
- 4-methallylsubstituted1,2,4-triazoline-3-thiones, conversion to thiazolo[2,3-c]-1,2,4-triazolium-3-acylaminides and imidazo[2,1-c]-1,2,4-triazoline-3-thiones, 791
- β -methylthiomethylene ketones, β -methylthioketones and α -methylketones, synth by reduction of α -oxoketene dithioacetals with Zn/ZnCl₂-TMEDA in ethanol, 4679
- thioacylsilanes as intermediates in synth of Z-silyl-enethiols and 2-silylthiacycloalk-2-enes from ω -haloacylsilanes, 4803
- thioquinone-S-oxides, synth by retro-Diels-Alder reaction of benzo-oxathiin-S-oxides, 12233, 12247
- 4-and6-trifluoromethyl-3-cyano-2(1H)-pyridinethiones, regioselective synth based on condensation reactions of trifluoroacetylacetone and its methyl enacetal with cyanothioacetamide, 10841
- 3-trimethylsilyl-2-thiabicyclo[2.2.1]hept-5-enes and derivs, protiodesilylation of, stereochemical study, 3553
- see also other specific thiono-compds, Xanthates

Thiocarbonyl oxides

α-oxosulfines by RDA reactions of 1,4-oxathiin-S-oxides, subsequent Diels-Alder reactions yields thioquinone-S-oxides, 12233, 12247

Thioesters

- 2-fluoropropanethioate lithium enolate, condensation with imines, synth of *trans*-3-fluoro-3-methyl-2-azetidinone derivs, 255
- 2-methyl-3-hydroxythioesters, prep of both enantiomers of by tin(II) Lewis acid-mediated aldol reactions of (Z)-1-ethylthio-1-trimethyl-siloxypropene with aldehydes, 7277
- 2-pyridylthioesters, Lewis acid promoted condensation with imines, synth of β -lactams, 2573, 2583
- (S)-thioesters by acid-catalysed hydrolysis of S,N-ketene acetals, 11095
- ω-thiohydroxyesters, Michael-type addition to butenolides or α,β-unsaturated lactams, cyclisation to S-heterocycles and perhydrogenated thieno[2,3-c]furan, 9035
- thiooxamate and thiourea formation from aminolysis of sulfinamoyl-esters, -sulfonamides and -sulfones via a sulfine intermediate, 14865
- γ,δ-unsaturated selenothioesters by trapping of lithium eneselenoates with allylic bromides, 2839

Thioethers

- 1-substituted-3-hydroxy-2-thioethers by reaction of 3-trimethylsilyloxy-1,2-thiiranium ions with silylated nitrogen heterocycles and amides, 3609
- vicinal thioether alcohols by diastereoselective 1,2-addition of carbon nucleophiles to enantiomerically enriched α-sulfenylated aldehydes, 2893

see also Sulfides

Thiofurans

polysubstituted 3-thiofurans, synth by regiospecific mono-ipso-substitution and ortho-metalation from 3,4-dibromofuran, 4065

Thioglycosides

- 1-arylthio and 1-arylselenoglycosides, treatment with 4-methyl(difluoroiodo)benzene, synth of 1-fluoroglycosides, 149
- as glycosyl donors in glycosidation promoted by combinations of iodosobenzene and various acids, 3897

Thiolanes/thiolenes

2-benzhydrylidene-4,4-diphenyl[1,3]oxathiolan-5-one, synth by reaction between electrogenerated diphenylketene, 2-bromo-2,2-diphenylacetyl bromide and sulfide ion, 1259

dithiolane derivs, desulfurative fluorination using nitrosonium tetrafluoroborate and pyridinium poly(hydrogen fluoride), 9

1-[3-methyl-2-(2-thiolanylthio)-butyl]piperidine synth from L-valine, electrophilic substitution of, dethioacetalisation of semicyclic dithioacetals, 12745

thiolanes by ring contraction of thiepane, 5989 Thiols

trans 2-(N-acylamino)-1-arylthiocyclohexane, synth by ring opening of symmetrical N-acylaziridines with thiols catalysed by chiral dialkyl tartrate-diethylzinc complexes, 7817

conjugated thiolato(selenolato)nitriles, reaction with N-cyanochloroacetamidine provides products which can be involved in the Thorpe reaction resulting in diaminopyrimidines via enaminocyanamidines, 1011

phosphonamidic, phosphonamidothioic and phosphonamidodithioic acids, synth and pKa evaluation, 6117

Z-silyl-enethiols, synth from ω -haloacylsilanes via thioacylsilanes, 4803

Thiones

benzylidenedithiophthalide and pentylidenedithiophthalides, unexpected rearrangement in their synth from thiophthalic anhydride and 2-thiophthalide, 11867

N-hydroxypyridine-2(1H)-thione derivatives of carboxylic acids, reactions with amine, sulfenamide and α-amino acid esters, synth of carboxamides and simple dipeptides, 9347, 9367 see Thiocarbonyl compds

Thiophenes

- 3-aminothieno[3,4:3',4']benzo[b]pyranone, 3-aminothieno[3,4-c]quinoline and 5-amino-7-substitutedthieno[3,4-d]pyridazinone,reactivity toward electron-poor olefins and acetylenes, 11915
- benzo[1,2-b:4,5-b']dithiophene derivs, synth by oxidative dimerisation of diethyl 3-thienyl-malonate by high valent metal salts, 13227
- dihydrothiophenes, precursors to fused quinolines, quinolones and coumarins via O-quinodimethane intermediates, 3107
- 3,4-dimethyl-2,5-dihydrothiophen-1,1-dioxide, solvent effects on rate of, 6241
- 4,6-dimethyldibenzothiophene, synth involving coupling of two aromatic rings by nucleophilic substitution followed by Pschorr-type reaction, synth from 2-bromo-3-nitrotoluene and o-thio-

cresol, 3953

3,6-dimethylthieno[3,2-b]thiophene and 3,6-dimethylselenolo[3,2-b]selenophene, synth and characterisation of dimers, trimers and tetramers of, 471

3,4-dinitrothiophene, ring opening with diethylamine to 1,4-bis(diethylamino)-2,3-dinitro-1,3-butadiene, subsequent Grignard reactions give 2,3-diaminobutanes via dinitrobutadienes, 3313

hydrobenzo[c]thiophene derivs by Diels-Alder reactions of 2,4-alkadienyl 2'-(alkenyl or alkynyl) sulfides, 13909

nitronyl nitroxide or imino nitroxide radical units linked to thieno[2,3-b]thiophene and thieno[2,3-b]thieno[3',2'-d]thiophene chromophores, intramolecular spin-interactions between, 6893

2,2':5',2"-terthiophene-5-derivs which can be linked to proteins or other carrier molecules by using different functional groups, synth and conjugation with proteins and antibodies, 11281

Thiopyrans

- 2-chloro-1,4-benzodithiin-*S*,*S*'-tetraoxide, cycloaddition of in alternative to benzyne cycloaddition, 14247
- 5,6-dihydro-1,4-dithiins, coupling with chiral aldehydes, synth of polyhydroxylated compds, 11857
- fluorine bearing benzothiopyranones, synth using methyl ester of 2-fluoro-3-methoxyacrylic acid as building block, 4403
- monocyclic 1,2-dithiines, synth *via* (*Z*,*Z*)-1,4-difunctionalised butadienes, structure and reactivity of, 12677
- 1,4-oxathiin-S-oxides, Diels-Alder reaction of, synth of α -oxosulfines, subsequent Diels-Alder reactions yields thioquinone-S-oxides, 12233, 12247

Thiouracils

palladium(0)-catalysed allylation of, influence of solvent on the regioselectivity of, 9521

Thioureas

glycosyl thioureido sugars, synth, conformational energetics of sugar thioureas, 12947

thiooxamate and thiourea formation from aminolysis of sulfinamoyl-esters, -sulfonamides and -sulfones *via* a sulfine intermediate, 14865

thiourea derivs of α-aminoacids, synth and characterisation of, crystal structure of methyl L-valinate and L-leucinate derivs, 6233

Thorpe reactions

as route to fused diaminopyrimidinones using N-cyanochloroacetamidine as a building block, 1011

Tin and compds

active zinc and tin powder, synth in liquid ammonia and use as promoters in synth of β -hydroxyesters, homoallylic and homopropargylic alcohols, 9575

alkynes or alkynyl- and vinyltrialkyltin derivs, coupling with *N*-protected 4-haloimidazoles, and coupling of 4-trimethylstannylimidazole with aryl and vinyliodides, synth of 4-substituted imidazoles, 13703

aryltributylstannane, cross-coupling reactions with 3-alkyl, 3-aryl and 3-alkoxycarbonyl substituted (*E*)-2,3-dibromopropenoates, 4095

Bu₃SnSiMe₃·F⁻ for 1,1-, 1,2- and 1,4-eliminations from dihalogenated compds, synth of alkylidene carbene, benzyne and *o*-quinodimethane, 8143

hydrostannylation of δ - and ω -allenyl arylhalides followed by mono or bis cyclisation, synth of α -vinyl oxygen- and nitrogen heterocycles, 13441

organostannanes by intermolecular radical substitution reactions of aromatic sulfones, 11329 γ -stannylated (E)-allylamines, synth by stannyl-cupration of γ -functionalised (E)-allylic amines, 10985

stannylcupration and cuprate rearrangements, application to the stereo- and enantiospecific synth of a stannyldiene C₁₀-C₁₅ fragment of des-epoxy-rosaramycin, 6613

tin(IV) chloride and lead tetraacetate for chlorination of aromatic compds, 8863

tributyltin hydride, treatment of (E)- and (Z)-fluoroolefins with tributyltin hydride and catalytic AIBN, synth of 1-fluoroolefins via (fluorovinyl)stannanes, 45

unsubstituted and substituted allyl 1,1-heteroand homobimetallic compds where M=Sn or Si, synth by palladium-catalysed reduction using ammonium formate, 7221

Tishchenko reactions

of mono- or dialdehydes using (pentamethyl-cyclopentadienyl)₂LnCH(SiMe₃)₂ complexes as catalysts, 4291

Titanium and compds

chiral binaphthol-derived titanium complex as catalyst for carbonyl-ene and aldol reactions with fluoral, 85

- diisopropoxytitanium(III) tetrahydroborate as reducing reagent for α,β -epoxyketones, synth of anti- (or erythro-) α,β -epoxy alcohols, 9137
- lithium and chlorotitanocene enolates derived from camphor, diastereoselectivity of oxidation of, 5487
- α -pinene-derived η^3 -allyltitanium complex, reaction with electrophiles, synth of 3,10-disubstituted β -pinene derivs, 4377
- supported chiral amino alcohols and diols functionalised with aluminium and titanium as catalysts for Diels-Alder reactions, 9853
- titanium(IV)-palladium(II) complex based on (*R*,*R*)-*N*,*N*-bis(3-diphenylphosphino-2-hydroxy benzylidene)-1,2-diphenylethane-1,2-diamine (salenophos), 14599
- Ti(VI)-enolate formed from methyl phenylglyoxylate, acylation of by acyl halides and anhydrides, synth of α-hydroxy-β-ketoesters, 11037

Toxins

- anatoxin-a, freshwater blue-green algae from *Anabaena flos aqua*, synth of the azabicyclo-[4.2.1]nonane ring system of anatoxin-a involving anionically induced small ring opening/ring closure/ring opening cascade, 11637 anatoxin-a, synthetic approaches to, 6025
- ciguatoxin, principal toxin causing ciguatera from the moray eel Gymnothorax javanicus, synth of both enantiomers of the BC-ring part of ciguatoxin from D-galactose, 12091
- gliotoxin, synth of the 7-hydroxy-2,3,7,7a-tetrahydroindole ring of gliotoxin from tyrosine *via* methyl1-benzyloxy-carbonyl-3a-hydroxy-6-oxo-2,3,3a,6,7,7a-hexahydroindol-2-carboxylate, 14403
- kawaguchipeptin A, cyclic undecapeptide from cyanobacterium *Microcystis aeruginosa* (NIESS-88), structure and absolute stereochemistry, 9025
- lactone substituted derivs of digitoxigenin, synth and inhibitory activity of the cardiac Na⁺ pump and the iontropic effect, 12723
- (+)-orthosporin, phytotoxic metabolite from culture filtrate of *Rhynchosporium orthosporum*, synth from (S)-ethyl 3-hydroxybutyrate, 7159
- (-)-perhydrohistrionicotoxin, synth of (+)-1-benzyl-1-azaspiro[5.5]undecan-7-one as a precursor to-, 6647
- podophyllotoxin, aryltetralin lignan from *Podophyllum peltatum* and *P. emodi*, synth of an A-ring pyridazine analogue from (–)-podo-

- phyllotoxin using the Stille reaction, 14235
- thaxtomines, phytotoxins from Streptomyces, synth by cross-coupling reactions of lithiated 2,5-piperazinedione anions with gramine methosulfate, 8525
- valinopine, epileucinopine, isoleucinopine and phenylalaninopine, opine type amino acids from poisonous mushroom *Clitocybe acromelalga*, structures, 877

Transition metals

complexes with β -dicarbonyl compds, reactions with carbon and oxygen electrophiles, 3377

Trapping reactions

- Diels-Alder trapping of o-quinodimethane generated by redox-mediated cathodic reduction of α , α' -dibromo-o-xylene in the presence of hindered dienophiles, 7771
- of lithium eneselenoates by alkyl halides or allylic bromides leads to ketene selenothio-acetals and γ,δ-unsaturated selenothioesters respectively, 2839
- trapping of samarium(III) enolates from ringopening reactions of cyclopropyl ketones with samarium(II) iodide, 11421

Triazines

- 2,4-disubstituted pyrrolo[2,1-f][1,2,4]triazines and pyrazolo[5,1-c]pyrimido[4,5-e][1,2,4]triazines, synth, 3037
- 1,2,4-triazine, synth by reaction of 2-methyl-1,4-dinitroimidazole with hydrazine, 14905

Triazoles

- angularly and linearly fused 1,2- and 1,3-disubstituted [1,2,4]triazolium salts, synth and reaction with nucleophiles, 1399
- 2H-benzotriazoles derivs, chemistry and nonlinear optical properties of, 14607
- 1-butyl-3-[1,2,4-triazol-5(3)-ylmethyl]pyridinium salts, chemical stability to oxidation, 15197 pyrazolo[5,1-c]-1,2,4-triazine, 1,2,4-triazolo-[5,1-c]-1,2,4-triazine and 1,2,4-triazolo[4,3-a]-benzimidazole derivs, synth from 3-(benzothiazolo-2-yl)-3-oxopropanenitrile via hydrazones, 7893
- substituted 1*H*-tetrazoles and 1,2,3-triazoles, synth *via* reactions of 3(,5)-(di)chloro-2*H*-1,4-(benz)oxazin-2-ones with sodium azide or diazocompds, 8813
- 1,2,3-triazoles, synth on a solid support involving condensation of a resin bound 3-oxobutyramide with aliphatic amines, 10823
- 1,2,3-triazolo[1,5-a]pyridinium N2-dicyanomethylides, prep, structure and reactivity with

acetylenic dipolarophiles, 10519

[1,2,4]triazolo[3,4-a]isoquinolines and pyrrolo-[2,1-a]isoquinolines, synth by reaction of α -keto hydrazonoyl halides with 3,4-dihydro-6,7-dimethoxyisoquinoline, 3451

Triazolines

- 4-methallylsubstituted1,2,4-triazoline-3-thiones, conversion to thiazolo[2,3-c]-1,2,4-triazolium-3-acylaminides and imidazo[2,1-c]-1,2,4-triazoline-3-thiones, 791
- 4-phenyl-4*H*-1,2,4-triazoline-3,5-dione, Diels-Alder reactions of morphinan-6,8-dienes with, 2449
- triazolino- C_{60} and 1,2-(3,4-dihydro-2*H*-pyrrolo)- C_{60} , synth by [3+2] cycloaddition of C_{60} , 5407

Trienes

- 2-azaheptatrienyl lithium compds, 1,7-electrocyclisation of, synth of 1-acyl-2,3-dihydroazepines, 14801
- carbon acetal-tethered trienes, Diels-Alder reactions of, 8937
- (±)-demethyl salvicanol, a rearranged 9(10→20)abeo-8,11,13-triene diterpene, synth involving zinc-promoted coupling of benzyl bromide with ketone and alkylation of ketone with iodide, 10659
- (*Z*,*E*)-dienes and trienes by ring-opening of 4-alkyl-2-cyclobutene-1-carbaldehydes *via* (2*Z*,4*E*)-alka-2,4-dienals, 3631
- ether-tethered trienes, effect of nature of dienophile-activating group and substituents in linking chain on the selectivity in Diels-Alder reactions of, 695
- (Z,Z,Z)-trienes by reaction of the mesylate of tropone oxime by nucleophiles, 8439
- 1,4-unsymmetrically substituted butatrienes, addition of lithium metal to, synth of 3,4-dilithio-1,2-butadienes, 6149

Triols

- D-ribo- C_{18} -phytosphingosine ((2S,3S,4R)-2-amino-octadecane-1,3,4-triol), synth from divinylcarbinol *via* Sharpless asymmetric epoxidation and dihydroxylation, 2187
- 1,2,3-propanetriol triacetate, conformation of in gas phase and in aqueous solution, 677

Triones

- 5-benzoylethyl barbituric acid and 1,3-dimethyl barbituric acid derivs, synth and reactions with anilines, synth of pyrimidoquinoline derivs and benzazoles respectively, 10147
- quinolinetriones, hetero Diels-Alder reactions of, synth of antitumour triones related to the

antibiotic diazaquinomycin A, 5933

Troponoids

- by oxidation of the hydrocarbons resulting from reduction of 2,3-dichloro-5,6-dicyanohydroquinone diesters of 2-substituted cinnamic acids using Zn-AcOH system, 1707
- exo- and endo-7,8- and 6,7-epoxyhomotropanes, synth and approach to synth of scopine and pseudoscopine, 11947, 11963, 11977
- mesylate and tosylate of tropone oxime, cleavage of the troponoid rings by nucleophiles, 8439

Tungsten and compds

- tungsten hexachloride for halo-de-hydroxylation and dihalo-de-oxo-bisubstitution reactions of benzylic alcohols, benzaldehydes, acyloins and epoxides, 14929
- [WZnMn(II)₂(ZnW₉O₃₄)₂]¹² polyoxometalate as catalyst for oxidations with hydrogen peroxide, 8781

Ugi reactions

with trifunctional α-amino acids, aldehydes, isocyanides and alcohols, synth of 1,1'-iminodicarboxylic acid derivs, 11657

Ultrasound effects

see Sonochemistry

Ultraviolet spectra

see Electronic spectra

Hracil

- 6-amino-5-thioformyluracils, synth from 6amino-1,3-disubstituted uracils, stability of, 9971
- 5-t-butyl-1-methyluracil, photoirradiation of, synth, structure and properties of 1,2-dihydropyrimidin-2-one, 10159
- 5-fluorouracil derivs by tin(IV) chloride mediated ring opening of alkoxy-1,4-dihetero-epanes, 8907
- palladium(0)-catalysed allylation of, influence of solvent on the regioselectivity of, 9521

Hread

calix[4]arene ethers fixed in the cone conformation and substituted at the upper rim by various urea residues, synth by reaction of amino calix[4]arenes with isocyanates, 8489

Uridines

5'-O-benzoyl-2'-keto-3'-deoxy-α-uridine, characterisation and use to establish anomerisation of 2'-ketouridines under basic conditions, 1767 2'-deoxy-2'-alkoxylaminouridines, synth by ring-opening of 2,2'-O-anhydrouridines, 14385 2'- and 3'-difluoromethyleneuridine, prep of

3'- and 2'-phosphoramidites of, 7929

5'-O-trityl-3'-O-mesyluridine deriv, reaction with secondary amines produces the enaminonucleosides *via* 1, 2-hydride shift, 4877

uridine 5'-monoselenoacetals, prep by seleno-Pummerer reaction of 5'-deoxy-5'-phenylselenouridines, use as substrates for radicalmediated reactions with allyltributyltin, diastereoselective homolytic C-C bond formation, 9469

Vaccines

pyruvated tetrasaccharide 5-aminopentyl glycoside, the repeating unit of the immunodominant capsular polysaccharide of *Streptomyces pneumoniae* type 27, synth, 2925

synth of fatty acylamino-trisaccharides, 10771 tetrameric fragments corresponding to phenolic glycolipids of *Mycobacterium kansasii* serovars I, II and IV, 3575, 3593

Vanadium and compds

O₂-H₂O₂-vanadium complex-pyrazine-2-carboxylic acid as reagent for oxidation of alkanes, 13051

Vilsmeier reactions

of 4,6-dimethoxy-2,3-diphenylindole with 3-substituted indolin-2-ones and either phosphoryl chloride or triflic anhydride, synth of 2,7'-biindolyl, 7,7';2,7'-terindolyls and 7,7'-bi-indolyl, 7003

Vilsmeier reagents generated from *N*,*N*-dimethylformamide and oxalyl chloride for cyclisation of *N*-acylanthranilic acid, synth of 2-(2'-dimethylamino)ethenyl-4*H*-3,1-benzoxazin-4-ones, 753

Vilsmeier-Haack reactions

with O-hydroxy acetophenones, synth of 3formyl chromones, investigation of different solvent systems, 3669

Vinylation

palladium catalysed hydroarylation and hydroof 3,3-dialkoxy-1-aryl-1-propynes, synth of 3aryl- and 3-vinylquinolines, 10225

Vitamins

A, 3-dehydroretinal, prep and spectroscopic properties of six new isomers of, 7809

B, (Z)-5-[[3-hydroxy-2-methyl-5-[(phosphonooxy)methyl]-4-pyridinyl]methylene]-2-thioxo-4 -thiazolidinone, vitamin B₆ coenzyme, synth by condensation of pyridoxal 5'-phosphate with rhodanine, 14787

D, vitamin D₃ CD-ring fragment, synth involving

diastereoselective allylation of norephedrine/ dihydrocitronellic acid-derived oxazolidinone, and intramolecular Diels-Alder reaction of a sulfonyl-substituted dienyne, 4769

D, vitamin D metabolites and analogues, 2D NMR study of solution conformations and complete ¹H and ¹³C chemical shift assignments, 1239

Wacker reactions

Wacker-type oxidation reaction of 4-trimethylsilyl-3-alkyn-1-ols, synth of γ-butyro-lactones, 10405

Water, reactions in

see Solvents and solvent effects

Williamson reactions

in biphasic solid/liquid, slightly hydrated medium, allows transformation of primary or secondary polyoxyalkylene alcohol functions, 8245

Wittig reactions

aza-Wittig — of triphenylphosphoranylideneamino-1,4-benzoquinone with aryl isocyanates and aroyl chlorides, synth of oxazolo[5,4-b]phenoxazine and benzoxazole derivs, 6781

aza-Wittig of phosphazenes derived from diphenylmethylphosphine, formation of substituted 2-azadiene, 4857

of substituted and unsubstituted diphenylphosphonium diylides, reactivity, 2005

tandem Wittig [2+3] cycloaddition of 5-azidomethyl-2,4-tetrahydro-2-hydroxy-3,4-(*O,O*)-isopropylidene furan, synth of nonracemic homol-deoxyazasugars with D-talo and L-allo configuration, 14745

Wittig olefination of indolinospirobenzopyrans catalysed by 18-crown-6, 8755

Wittig olefination of methyl (15,2R)-1-benzamido-2-formylcyclopropancarboxylate, synth of conformationally constrained cyclopropyl amino acids, 5881

Wittig rearrangements

see Rearrangements

Wittig-Horner reactions

see Horner-Wittig reactions

X-ray crystal structures

2-amino-4*H*-pyrimidones with various dicarboxylic acid guests, 3153

3,6-dimethyl-6-(dimethylamino)-2-(methylthio) -3,4,5,6-tetrahydropyridine-5-carbonitrile, 10095 N-acetyl 1α ,5-epoxyimino-19-nor- 5α -androstane-

- 3β , 17β -diyl diacetate, 11995
- (9S)-(S)-O-acetyllactyl ester, cis-syn-cis-tricyclic enone and a homochiral taxoid BC-unit, 6215 active zinc and tin powder, 9575
- adducts from C_{60} reaction with piperazine, 5021 5-alkylidene-4,5-dihydro-3H-1,2,4-diazaphosphole and 4,5-dihydro-1H-1,2,4-diazaphosphole, 10053
- 6-amino-3-methyl-1-phenyl-5-thioformyluracil, 9971
- N,N"-bis-Boc-2-[1-(amino-imino-methyl)-pyrr olidin-2-yl]-3-hydroxybutyric acid methyl ester and2-[1-(amino-imino-methyl)-pyrrolidin-2-yl]-3,3-dimethoxybutyric acid methyl ester, 2629 aminoammonioselenurane bromide, 13951
- 1-aminocarbonyl-3-methyl-4-benzoylthio-1*H*-py razol-5(2*H*)-one, 1-phenylaminocrbonyl-3-methyl-4-benzoylthio-1*H*-pyrazol-5(2*H*)-one, 1579
- (2*R*,3*S*,6*R*,3'*R*,4'*S*)-*N*-[1'-(*p*-anisylazetidin-2'-one-3'-yl]-2,10-camphorsultam, 5579
- 2-(benzimidazole-2-ylidenamino)-4-oxo-3-phen ylpyrido[2,1-f][1,2,4]triazinium salts, 11349
- 5'-O-benzoyl-2'-keto-3'-deoxy-α-uridine, 1767
- 4-benzoyl-3-(4-benzoyl-5-phenyl-2(3*H*)-furanon -3-ylidene)-5-phenyl-2(3*H*)-furanone and 4-benzoyl-5-phenyl-1-triphenylphosphoranylidene-4-cyclopentene-2,3-dione, 5427
- benzyl 2-(N-camphorsulfonylamino)-3,3,3-trifluoropropanoate, 233
- benzyl (3S,6S)-6c-[(5'S)-5'-(t-butyloxycarbonyl)-2'-oxo-pyrrolidin-"-yl]-3r-methyl-3,6-dihydro-2*H*-1,2-oxazine-2-carboxylate, 3283
- 2-(2'-benzyl-3'-phenyl-3'-oxo)propanoyl-3-phenyl-*l*-menthopyrazole, 10335
- (4*R*,*S*,5*RS*)-1-benzyl-5-(t-butylamino)-4-methyl-4,5-dihydropyrido[1',2':1,2]pyrimido[4,5-*b*]-azepin-6(1*H*)-one, 13081
- (2*R*,5,4*RS*,10*RS*)-1-benzyl-6,7-dimethyl-10-phe nyl-1,4-dihydro-2,4-ethano-2*H*-pyrido[4,3-*d*] [1,3]oxazin-5(6*H*)-one, 13081
- (1*R*,2*S*)-1-benzylamino-1-phenyl-2-propanol, 13137
- (-)-(1'S,2'S,3'R,4R)-4-(2'-benzyloxy-3'-t-but yldimethylsilyloxy-1'-hydroxy-3'-phenylprop-yl)-2-buten-4-olide, 6547
- \tilde{N} -(benzyloxycarbonyl)-3 α ,4 α -epoxy-6-aza-7-oxabicyclo[3.2.2]non-8-ene, 11977
- 2,2'-bi[3,6-dimethylselenolo[3,2-b]seleno-phene], 471
- 1,1'-bicyclohexyliden-4-one oxime, 1,1'-bicyclohexylidene-4,4'-dione and its dioxime, 1773

briareolate ester D, 9953

- bridged dithia[n]paracyclophanes, 10043
- (3*S*,4*S*,5*S*)-3-(3-bromobutoxy-3-ene)-4-hydroxy-5-hydroxymethyl-5-methyl-3-oxamido-γ-lactone, 833
- chalcomycin, a neutral 16-membered macrolide antibiotic, 3857
- (1S,2S,3R,6S)- and (1R,2S,3R,6R)-3-chloro-3-methyl-6-isoprenyl-1,2-cyclohexanediol, 4645
- 2-chloro-6,7,9,10,12,13-hexahydro-19*H*-dibenzo [*b,n*][1,4,7,10,13]-monoaza-tetraoxacyclopenta decin, 6713
- N-chloromethylated analogue of 7,7-diphenyl-indolizino-[3,4-b]quinoline, 955
- 2-chloro-6,7,9,10,12,13,15,16-octahydro-22*H*-di benzo[*b*,*q*][1,4,7,10,13,16]-monoaza-pentaoxa cyclododecin, 6713
- ($\alpha R,3S$)-3-(2-chloropyridin-5-yl-methyl)-N-(2-hydroxy-1-phenylethyl)piperidin-2-one, 7719 2-chloro-6,7,9,10-tetrahydro-16H-dibenzo[b,k]
- [1,4,7,10]-monoaza-trioxacyclododecin, 6713 2,3-cis-3,4-trans \gamma-lactone, 3497
- complex of (-)-(S)-3,4,4,5-tetramethylcyclohexa-2-enone and (-)-trans-α,α'-(2,2-dimethyl-1,3-dioxolane-4,5-diyl)bis(diphenylmethanol), 14177
- complex of bis-cyclic crown ethers derived from biphenyl with mercury dithiocyanate, 669
- crystal density modelling of epoxide-functionalised polycarbocyclic systems and epoxy-derivatives of tetrahydro- and hexahydromethanonaphthalenes, 9703
- 2-cyano-2-(3-cyano-1-methyl-2-oxo-2,3-dihydro-1*H*-indol-3-yl)-*N*-methyl-*N*-phenylacetamide, 2480
- (3S,4R)-4-[cyano(N-(2,2-dimethyl-4-(S)-phenyl-1,2-dioxan-5-(S)-yl)-N-methylamino)(4-methoxyphenyl)methyl]-3-[(trimethylsilylmethyl)-allyl]tetrahydropyran-2-one, 10083
- cyclohexyl selenoxide/p-bromo benzene sulfonic acid salt, 1841
- (3a-cis-)-2-(1-cyclopenten-1-yl)-5,7-bis(1,1-dim ethylethyl)-3a,9a-dihydro-1*H*-cyclopenta[b] [1,4]benzodioxin, 4029
- 10-deacetyl-7-epitaxol, 2291
- 3'-deoxy-3'-S-(2-nitrophenyldisulfanyl)thymidine, 1027
- 9-N-[(2'-deoxy- β -D-ribo-pentofuranosyl)methyl]adenine, 1-N-[(2'-deoxy- β -ribo-pentofuranosyl)methyl]cytosine and 1-N-[(2'-deoxy- β -D-ribo-pentofuranosyl)methyl]thymine, 5563
- (E)-1,2-di[3-(di-chloromethyl)-1-adamantyl]eth

- ene, 825
- 1,4-di-(*N*,*N*-dimethylcarbamoyl)-2,3-diphenyl-1,4-diaza-1,3-butadiene, 3939
- μ-diacetato-μ-[2,6-bis(2-pyridin-2-yl-ethylimino -methyl)phenolato]bisnickel(II).perchlorate. methanol, 3521
- (1'*R*,2*R*,3*R*,4*R*,5*R*)-6,8-diaza-3,4-dihydroxy-2-(1',2'-dihydroxyethyl)-1-oxa-8-*N*-phenyl-spiro [4.4]nonane-7,9-dione, 10721
- bis-diazocarbonyl compd, N-benzyl-2-diazo-N-(3-methoxyphenyl)malonamic acid ethyl ester, and decomposition compds of diazoamides and diazoimides, 2489
- (2,6-dichlorophenyl)bis(2,4,6-trichlorophenyl) methyl radical, 7013
- dichotomin A, cyclic peptide from roots of Stellaria dichotoma, 1165
- diethyl[2-(5-methylpyridyl)]borane, 13933
- diethyl 13-methoxy-9-methoxycarbonyltetracyclo-[7.4.0.0^{1,10}.0^{2,6}]tridec-2(6)-ene-4,4-dicarboxylate, 11545
- diethyl 6a,6b,12a,12b-tetrahydro-exo,endo-6,12-diethoxy-endo,exo-6,12-dioxo-6H,12H-cyclo-buta[1,2-c:3,4-c']bis[1,2]benzoxaphosphorine-trans-6a,12a-dicarboxylate, 12597
- diethyl 6a,6b,12a,12b-tetrahydro-exo,exo-6,12-diethoxy-endo,endo-6,12-dioxo-6H,12H-cyclo-buta[1,2-c:3,4-c']bis[1,2]benzoxaphosphorine-trans-6a,12a-dicarboxylate, 12597
- 2,6-diethyl-3,6-dihydro-5-methyl-3-phenylsulfon yl-2*H*-1,3-oxazineand2,6-diethyl-4,5-dihydroxy-5-methyl-3-tosyl-tetrahydro-1,3-oxazine, 3135
- 2[[3,3-diethylthioureido)phenylmethyl]amino]--3-methylbutyric acid methyl ester and -4methylpentanoic acid methyl ester, 6233
- 17β H-digitoxigenin and 3β , 14-dihydroxy-21-((R)-hydroxybenzyl)- 5β , 14β , 21(R)-card-20(22)-enol ide, 12723
- 1,4-dihydro-2,6-dimethyl-4-(2'-chloro-6'-meth ylphenyl)-3,5-pyridine-dicarboxylic acid dimethyl ester, 9665
- 13,18-dihydro-6b,12b[9',10']-anthracenoacenaphth[1,2-a]acenaphthylene and a methanobridged [4.3.3]propellane, 14777
- 9,10-dihydro-9-(1,3-diphenyl-2-propynyliden)-anthracene, 8349
- 8c,14-dihydro-13b-phenylbenzo[4,5]pentaleno [10,9-l]phenanthren-9-one, 8349
- 1,4-bis[1,2-dihydro-61-[(triisopropylsilyl)ethynyl]-1,2-methanofullerene[60]-61-yl]buta-1,3-diyne, 4925
- (S)-diisopropyl 1-hydroxy-(1-naphthyl)chloro-

phosphonate, 589

- dimethyl 3,6-dimethyl-6-(dimethylamino)-2-(methylthio)-3,4,5,6-tetrahydropyridine-4,5-dicarboxylate, 10095
- dimethyb-(dimethylamino)-6-methyl-2-(methyl-thio)-3,4,5,6-tetrahydropyridine-4,5-dicarboxyl ate, 10095
- (3aR,4'R,5S,6S,6aR)-5-(2,2'-dimethyl-1',3'-di oxolane-4'-yl)-6-hydroxy-3a-N-phenylcarbox-amidotetrahydrofuro[2.3-d]-1,2-oxazolidine-2-one, 10721
- (5*S*,8*R*,10*S*)-8,10-dimethyl-1,6-dioxaspiro[4,5]d ecanylidene-2-(pentacarbonylchromium), 1617 (1*S*,2*R*,3*S*,5*R*)-2,5-dimethyl-1-(phenylsulfonyl)bicyclo[3.2.0]heptan-2,3-diol, 3879
- 1,2-dimethyl-4-methythio-6-oxo-1,6-dihydro-pyrimidin-5-yl-triphenylphosphoniumperchlorate, 8835
- 5,5-dimethyl-6-endo-methyl(4-methylphenyl)-sulfonylbicyclo[2.2.1]heptan-2-one, 8795
- syn-3,6-dimethyl-6-methoxy-2-oxa-1-adamantan ol, 5867
- (1*R*,3*R*,5*S*,6*S*,10*R*)-3,5-dimethyl-10-hydroxy-2-oxabicyclo[4.4.0]decane, 7287
- 2-(2'-dimethylamino-1'-phenyl)ethenyl-4*H*-3,1 -benzoxazin-4-ones, 753
- 11β-[4-(dimethylamino)phenyl]-17β-hydroxy-9, 19-cyclo-9β-androst-4-en-3-one and 17βhydroxy-11β-(4-methoxyphenyl)androst-4-en-3 -one, 1529
- 4,6-dimethyldibenzothiophene, synth involving coupling of two aromatic rings by nucleophilic substitution followed by Pschorr-type reaction, synth from 2-bromo-3-nitrotoluene and o-thiocresol, 3953
- 3,6-di(morpholinomethyl)-1,2-dithiine and 3,6-di(4-cyclohexylphenyl)-1,2-dithiine, 12677
- threo-1-(3',5'-dinitrobenzoyloxy)-2-acetoxy-1,2 -di(1-adamantyl)ethane, 825
- [1,1-dioxo-4-(4-methoxyphenyl)-4-(4-methoxyand nitro- phenyliminomethyl)-1,4-dihydro-[1,2]-thiazet-3-yl]-diethylamine, 7183
- 4,5-diphenylbenzo[a]cyclopenta[l,m]pyrene, 8349 4,6-diphenylthianthrene and 1-tetrathiafulvalenylnaphthalene, 4745
- dolabriferol, polypropionate from anaspidean mollusc *Dolabrifera dolabrifera*, 12831
- doubly-caged sterically-congested tetraol, 6325 20-epidasycarpidone, 3563
- (2aS,3R,4R,5R,5aR,6S,8aS,8bS)-4,6-epoxy-3,5-dihydroxy-3,5a,6,8b-tetramethyl-decahydronaphtho[1,8-bc]furane-2-one, 7703

- trans,trans-3-ethoxycarbonyl-2-ethyl-5-methyl-4-nitro-1-phenylpyrazolidine, 9193
- 5-ethoxycarbonyl-5-(triphenylphosphoranylidene-amino)-5,6-dihydroimidazo[2,1-a]isoquin oline, 13671
- (3aS,5S,12S)-12-ethoxycarbonyl-7,9-dimethyl-4-[(R)-(+)-1-(1-naphthyl)ethyl]-1,2,3,3a,4,5-hexa hydro-3a,5-ethanopyrrolo[b]pyrimido[4,5-d-]pyrimidine-6,8(5H,7H,9H)-dione, 13111
- ethyl 1-(4-methoxybenzyl)-2-triisopropylsiloxyindole-3-carboxylate, ethyl 2-benzyl-3-oxo-1,2, 3,3a-tetrahydrocyclohepta[c]pyrrole-3a-carboxylate, 2489
- ethyll-hydroxy-4-phenyl-2-naphthalenecarboxylate, 10455
- ethyl 2-hydroxy-6,7-dimethoxy-3-oxo-1,2,3,4,5, 10,11,12,13,13a-decahydro-3a-aza-benzo[d]-phenanthrene-2-carboxylate, 2489
- ethyl *N*-[2'-[1'-(2-nitropyrrolyl)]phenyl]-*N*-toluene-4-sulfonyl glycinate, 4485
- ethyl 7,8,9-trifluoro-1-methyl-5-oxo-1,5-dihydro-pyrazolo[1,5-a]quinoline-4-carboxylate, 8471
- (3RS,3aRS,4SSR)-ethyl 7,8,9-trifluoro-3-methoxycarbonyl-4-(2-methoxycarbonyl)ethyl-1-methyl-5-oxo-'1,2,3,3a,4,5-hexahydropyrazolo [1,5-a]quinoline-4-carboxylate, 8471
- (2*R*,3*S*)-3-ferrocenyl-2-methylbutyrophenone, 1461
- 2-fluoro-2-(6-methoxynaphth-2-yl)propanoic acid, 12761
- fluoromethylenephosphonate moiety of cyclohexylammonium salts of (1RS,3S)-3,4-dihydroxy-1-fluorobutylphosphonic acid and (S)-difluoro-3,4-dihydroxybutylphosphonic acid, 165
- N-[2-(4-fluorophenyl)-4,5-dihydro-1-methyl-5,5-bis(trifluoromethyl)-1H-imidazol-5-yl]-N-methylacetamide, 11153
- forbaglin A from Aglaia forbesii, 6931
- 1-formyl-2-phenyl-3-tolyl-2,3-dihydroazepine, 14801
- fused oxazolidine-4,5-dione, 753
- haliclonacyclamines A, 9111
- hexacyclo[11.2.1.0^{2,12}.0^{5,10}.0^{5,15}.0^{10,14}]hexadeca-6,8-diene-4,11-dione and its rearrangement products, 13531
- [2S- $(2\beta,3a\beta,6\alpha,7\alpha,7a\beta)$]-2,3,3a,6,7,7a-hexahydro-6-acetyloxy-3a-benzoyloxy-7-(t-butyl-dimethylsilyloxy)-1*H*-indole-2-carboxylic acid methyl ester, 14403
- Hg(SCN)₂ complex with a bis-cyclic crown ether derived from biphenyl, 12499
- μ -hydroxo- μ -[2,6-bis[N-((S)-1-benzyl-2-yl-pyrro

- lidine)-formimidoyl]phenolato]bisnickel(II) bisperchlorate, 3521
- 5-hydroxy-3,4-dimethoxycarbonyl-2,5-dimethyl-6-phenylamino-3a,4,5,6a-tetrahydrofuro[2,3-b]-pyrrole and 5-hydroxy-2,4-dimethoxycarbonyl-3-(dimethylhydrazonomethyl)-5-ethyl-6-methyl-cyclohexan-1-one, 5819
- (3RS,4SR)-4-hydroxy-3-(1-chloro-isopropenyl)-tetrahydropyrane, 4645
- 1,1'-bis(α-hydroxybenzyl)ferrocenes and 1,1'-bis(3-[3-phenylpropanoic acid])ferrocene, 1461
- (2R,5S)-5-hydroxyhomopipecolic acid and methyl (2'R,5'S,2R)-2-amino-5'-hydroxy-1'-methoxycarbonyl-2'-piperidinyl acetate hydrochloride, 6409
- $(6aR, 9aS\alpha R)$ -7-(1-hydroxymethyl-propyl)-6a-methylpyrrolo[3,2-b]-1,4-benzothiazinone, 9035 7α -hydroxyspongian-16-one, 8187
- imbalanced Kekule structure contributions in the ring in 1,3,5-trisubstituted benzene derivs, X-ray study on 1,3,5-trimethoxybenzene and ab initio study on 1,3,5-triformylo-benzene and trimethoxy-benzene, 11379
- (+)-(9S,13S)- and (+)-(9S,13R)-isocyclocelabenzine, 14189
- cis,cis,bis-β-lactam derived from (+)-(15,2S)-2-amino-1-phenylpropan-1,3-diol, 9005
- (4aβ,10aβ)-5-methoxy-10a-hydroxy-3,4,4a,9,10-hexahydro-1(2H)-phenanthrenone, 15209
- (2S,3S)-3-(2-methoxyethyl)-3-methyl-2-(phenyl-sulfonyl)cyclopentanone, 3879
- 4α-methoxy-1,3,5-trioxo-2,3,3aβ,4,5,10bβ-hexahydro-1*H*-pyrrolo[[3,4-*a*]-carbazole-10-carboxylic acid ethyl ester, 3029
- methyl[(1*S*,4*R*)- and (1*S*,4*S*)- 4-benzenesulfonyl-4-[(*S*)-1-hydroxy-2-methyl-propyl]-2-cyclopent en-1-yl]acetate, 14827
- methyl 2-amino-2-deoxy-3,4-di-*O*-t-butyldimethylsilyl-6,7-*O*-isopropylidene-β-D-gluco-2heptulofuranosonate, 10711
- methyl 2-oxo-7-phenyl-8-oxa-3-azatricyclo-[4.2.1.0^{3,7}]nonane-1-carboxylate, 3247
- methyl 4(S)-benzoyloxy-3(S)-bromo-5(R)-methoxy-1-cyclohexene-1-carboxylate, 8565
- methyl 6,8-di-*O*-acetyl-3,7-anhydro-2,4,5-tri-deoxy-2,2-dimethyl-β-D-erythro-oct-4-enoate, 6397
- (1*R*,2*S*,3*R*)-2-(2-methyl-1,3-dioxolanyl-5-[3,4-*O*-(2'-propylidene)-3,4-dihydroxybutyl]thiazole, 14069
- 2-(2-methyl-1,3-dioxolanyl)-5-(hydroxymethyl)-thiazole, 14069

- (2R,3S,8S)-3-methyl-3-(1-cyano-2-methoxy-2-oxoethyl)-2,3-dihydro-2-hydroxy-1*H*-indole-1-carboxylate, 5339
- (3R,5R)-4-methyl-3-(2-methyl-allyl)-5-phenyl-morpholine-2-one, 9079
- 2-methyl-4,6-dioxo-5-triphenylphosphoranylidene-1,4,5,6-tetrahydropyrimidine, 8835
- 2-methyl-4-oxo-6-thioxo-5-triphenylphosphoran ylidene-1,4,5,6-tetrahydropyrimidine, 8835
- [1*R*,5*S*,6*S*,9*R*]-1-methyl-5-(phenylsulfonyl)-9-(prop-2-yl)bicyclo[4.3.0]nonane, 4769
- 2-methyl-6-methythio-4-oxo-5-triphenylphosphoranylidene-4,5-dihydropyrimidine, 8835
- 1-methyl-7,7-dimethyl-2,4-diaza-bicyclo[4.2.0]-octa-1,5-diene-3-one, 10159
- (+)-[1R,2'R,5R,6R,9R]-1-methyl-9-(6-methyl-hept-2-yl)-5-(phenylsulfonyl)-bicyclo[4.3.0]non ane. 4769
- 17-methyl-9-oxo-10-nor-4,5-epoxymorphinan, 8209
- cis-8-methyl-bicyclo[4.2.0]octane-cis-1,8-diol, 11783
- (3aS/R,6R/S,6aS/R)-6-methyl-hexahydro-thieno[2,3-c]furan-3,4-dione, 9035
- (1S,2R,6S,7R, exo)-N-((3'R,4'S,5'S,6'R)-5'-methylbicyclo[2.2.1]heptene-4'-carbonyl)-3-oxa-5-aza-7,10,10-trimethyltricyclo[5.2.1.0^{2.6}]-decan-4-one, 4079
- (2R)- α -methylisoserine, 687
- 2-methylisothiazolo[5,4-*b*]pyridin-3(2*H*)-onethe 1-oxide and 1,1-dioxide derivs and isothiazolo-[5,4-*b*]pyridin-3(2*H*)-one 1,1-dioxide, 8947
- MM2 force field parameterisation, modelling and structure prediction of salen-type monomeric and hydrogen-bonded dimeric manganese complexes, 10193
- (+)- $(\alpha R, 2aS, 5aR, 10bS(and10bR)10cR)$ -1,2a,3,4, 5,5a,10b,10c-octahydro-1- $(\alpha$ -phenylethyl)xanth eno[9,1-cd]isoxazole, 11849
- (3aR,6aS,6bR,9S,10bR)-5,6,6a,6b,7,8,9,10b-octa hydro-9,10b-dihydroxy-1,2-diisopropoxydicyclo pent[a,b]inden-3(4H)-one, 11625
- orthobenzoate, 14841
- 12-oxa-2-oxo-11-phenyl-3,4,5,6-tetrahydro-2*H*-1,5-methanobenzo[*b*]azocine-3-carboxylic acid t-butyl ester, 3247
- S-trans-(2E)-14-oxo-1-phenyl-2-(phenylamino)-1-azacyclotetradec-2-ene-3-carbonitrile and its S-cis-(2Z)-dimer, 4363
- 4-oxo-3-phenylpyrido[2,1-f][1,2,4]triazinium-2-azolates, 11349
- 2-oxo-5-isopropyl-cyclohexenecarboxylates, 8725

- $(1'S,2'R,3R,\alpha S)-N-(2'-phenyl-2'-hydroxy-1'-methylethyl)-3-(\alpha-hydroxyethyl)-pyrrolidine, 10761$
- 2-phenyl-3-[(1'R,2'R)-1'-(2',3'-O-isopropyli dene-1',2',3'-trihydroxypropyl)]-5,6-dihydro-1,4-dithiin, 11857
- 2-phenyl-3-[(1'*R*,2'*S*)-1'-(2'-*N*,3'-*O*-isopropylidene-2'-*N*-Boc-amino-1',3'-dihydroxypropyl]-5,6-dihydro-1,4-dithiin, 11857
- 3-phenyl-4-[10-(phenylethynyl)phenanthren-9-yl]-2-(5H)furanone, 8349
- 5-phenyl-10*H*-dibenz[3,4:6,7]cyclohepta-[1,2-*b*]-naphthalene, 8349
- (Z)-2-(9-phenylbenzo[4,5]pentaleno[9,10-I]phe nanthren-9-yl)-2-butenedioic acid dimethyl ester. 8349
- 1,2-bis(phenylethynyl)acenaphthylene, 8349
- [2-(phenylethynyl)phenanthren-1-yl]-2-phenyl-3,4,5,6-benzenetetracarboxylic acid tetramethyl ester, 8349
- polypyrazolylpyridines, 11075
- product from acid-catalysed dimerisation of 2-prenylindoles, 9455
- pusilatin A hexa-acetate, 14487
- 5*H*-pyrrolo[1,2-*a*][3,1]benzoxazin-5-ones, X-ray structure and reverse Diels-Alder reaction of, 12475
- quadrupolar [1₄](meta-ortho)₂azolophanes, 15189
- a right half taxoid building unit from Hajos-Parrish ketone, 12443
- spiro[[1,2,3,6,7,8-hexamethoxyfluorene-9,1',[2',3'-dimethoxy-6'-(3'',4'',5''-trimethoxy-phenyl)]cyclohexa-2',5'-dien-4'-one]], 4449
- structurally complex oxygen-containing tetraquinane networks generated by addition of 2,3dihydro-5-furanyllithium to diisopropyl squarate, 3075
- swartzianin C and D, germacraswartzianin and norsecoswartzianin, 6339
- meso-tetrakis[1-[2-(trimethylsilyl)ethoxymethyl] pyrazol-5-yl]-porphyrin, 10811
- 1,1,10,10-tetramethyl[3.3]metacyclophane-2,11-dione, 2847
- Z-1,2,4,5-tetrathiane-3,6-bis-spiro-2',2"-bis-3 (2H)-benzofuranone, 1961
- titanium(IV)-palladium(II) complex based on (R,R)-N,N-bis(3-diphenylphosphino-2-hydroxy benzylidene)-1,2-diphenylethane-1,2-diamine (salenophos), 14599
- trans-3-(toluene-4-sulfonyl)amino-4-hexyl-5,5-di(ethoxycarbonyl)pyrrolidin-2-one, 9909

- trans ethyl 1-(3-methoxyphenyl)-2-oxo-4-phenyl-3-carboxylate, ethyl-6-methoxy-3-oxo-2-phenyl-1,2,3,3a-tetrahydrocyclohepta[c]pyrrole-3a-carboxylate, 2489
- tricarbonyl[$(1-4-\eta)$ -4a,9a-dihydro-6-methoxy-7, 8,9-trimethyl-9H-carbazole]iron, 7345
- (+)-tricarbonyl[N-(4-methoxyphenyl)-3,3-dimethyl-4(2-methylphenyl)azetidin-2-one]chro mium, 4849
- 2-[4,4-bis(trifluoromethyl)-2-(4-fluorophenyl)-4,5-dihydro-1*H*-imidazol-5-ylidine]-1-(4-fluorophenyl)-1-ethanone, 11153
- 26,27,28-trimethoxy-5,17-dimethylcalix[4]arene and 17-t-butyl-26,27,28-trimethoxy-5,11-23-trimethylcalix[4]arene, 2301
- 2,3,5-trimethyl-3*H*-1-benzazepine, 4423
- 1,5,11-trioxo-2,4;8,10;14,16-tribenzo-6,12,18-tri oxacyclooctadecane, 4291
- N-(triphenylmethyl)-2-methyleneaziridine,7037 triphenylphosphinazine derived from α-diazophenylacetonitrile and an aminotriphenylphosphonium salt derived from phenylmalononitrile, 9629
- volutamide D, 5371

X-ray crystallography

α-hydroxy-δ-valerolactams and lactams conjugated to 2,4,6-triiodoisophthalamides, X-ray contrast agents, synth from 2-tetrahydrofuro-amides, 11177

Xanthates

O-(2,4-alkadienyl) S-(2-alkenyl or alkynyl) dithiocarbonates, [3,3]-sigmatropic rearrangement of prep of S-(1-vinyl-2-alkenyl) S-(2-alkenyl or alkynyl) dithiocarbonates which could be converted to sulfides, 13909

Xanthenes

- (9-amino-substituted) 1,2,3,4,4a,9a-hexahydro-9*H*-xanthen-1-ols, synth by cycloaddition of a nitrone derived from 2-(cyclohexen-3-yloxy)-benzaldehyde, 11849
- echinotinctone (2,6-dihydroxy-1,8-dimethyl-3*H*-xanthen-3-one), fluorone orange pigment from the wood-rotting polypores *Echinodontium tinctorium* and *Pyrofomes albomarginatus*, 5783
- xanthene derivs by acid catalysed condensations of 2-substitute 1,3-oxazinanes and 1,3-oxazolidines with cyclic carbon nucleophiles, 14273

Ylids

2-alkyl(aryl)-4-hydroxy(mercapto)-6-oxo-1,6-di hydropyrimidin-5-yl-triphenylphosphonium chloride suitable for prep of phosphonium

- ylid-betaines, synth by reaction of Ph₃P⁺C HCN with acylisocyanates and thio analogues, 8835
- allylic diisobutyltelluronium ylids, reaction with alkylidene or arylmethylidene malonic esters, synth of vinyl and ethynylcyclopropane 1,1-dicarboxylic esters, 8747
- ammonium and phosphonium perfluorocyclobutane ylids, synth from perfluorocyclobutene and tertairy amines or phosphines, use as masked fluoride anion source, 9755
- ammonium- and phosphoniumperfluorocyclobutane ylids, reaction with primary or secondary alcohols and carboxylic acids, synth of alkyl fluorides or acyl fluorides respectively, 2977
- arsenic ylids, use in synth of $(2\alpha,3\alpha,22S)$ -trihydroxy- 5α -cholestan-6-one and $(2\alpha,3\alpha,22R)$ -trihydroxy- 5α -cholestan-6-one, 5525
- N-benzyl-azomethine ylid, 1,3-dipolar cycloaddition with trifluoropropene derivs, synth of disubstituted 3-trifluoromethyl-pyrrolidines, 4383
- C-element-substituted phosphorus ylids, chemistry of, 1855
- 3-(4-halogenophenyl)pyridazinium ylids, 3+2 dipolar cycloadditions to acrylate and propiolate of ether, synth of pyrrolopyridazine heterocycles, 8853
- intramolecular pyrylium ylid-alkene cyclisations for synth of taxane precursors, 14081, 14103, 14147
- substituted and unsubstituted diphenylphosphonium diylides, reactivity towards carbonic anhydride derivs such as phenylisocyanate and dicyclohexylcarbodiimide, 2005
- sulfur ylids, reaction with α,β-unsaturated alkoxychromium carbene complexes, synth of vinylenol ethers, cyclopropanes and vinyleyclopropanes, 13215
- 1,2,3-triazolo[1,5-a]pyridinium N2-dicyanomethylides, prep, structure and reactivity with acetylenic dipolarophiles, 10519

Zeolites

- acid zeolites, treatment of α -alkynols with, synth of conjugated enynes and α,β -unsaturated ketones, 8287
- zeolite-based heterogeneous photosensitisers containing triphenylpyrylium and dibenzotropylium cations, modifications of product selectivity in cyclodimerisation of 1,3-cyclohexadiene, 7755

see also Clays and earths, Supported reagents/reactions

Zinc and compds

active zinc and tin powder, synth in liquid ammonia and use as promoters in synth of β -hydroxyesters, homoallylic and homopropargylic alcohols, 9575

allylzincation and propargylzincation of various γ-heterosubstituted vinyl metals, 7235

aryl or 1-alkynylzinc chlorides, cross-coupling reactions with 3-alkyl, 3-aryl and 3-alkoxycarbonyl substituted (*E*)-2,3-dibromopropenoates, 4095

chiral dialkyl tartrate-diethylzinc complexes as catalysts for ring opening of symmetrical *N*-acylaziridines with thiols, 7817

dialkyl zinc for catalytic enantioselective dialkylation of tere-, iso- and phthalaldehydes, synth of chiral diols, 13355

Knochel's (dialkoxyboryl)methylcopper reagents, addition to aldehydes, olefination and hydroxymethylation of aldehydes *via* β-hydroxyalkylboronates, 915

polyfunctional aryl and alkenyl zinc halides, synth from functionalised unsaturated organolithiums and their reactivity in cross-coupling and conjugated addition reactions, 7201

reaction of 2-bromo-2-chloro-1,1,1-trifluoroethane with aldehydes in the presence of –, synth of α -(1-bromo-1-chloro-2,2,2-trifluoroethyl)alcohols and α -(1-chloro-2,2,2-trifluoroethyl)alcohols, 12667

synthetic zinc chlorins, aggregation of with several esterified alkyl chains as models of bacteriochlorophyll-c homologues, 12421

tetrahalozincate reagents for cleavage of MEM ethers, 15257

[WZnMn(II)₂(ZnW₉O₃₄)₂]¹²-polyoxometalate as catalyst for oxidations with hydrogen peroxide, 8781

see also Reformatsky reactions

Zirconium and compds

organochlorozirconocene complexes, synthetic applications of, 12853

Zwitterions

see also Betaines, Ylids