

## Subject Index, 1973

- (S)-(+)-Abscisic acid**, conversion of blumenol A into: stereochemistry of the blumenols, 566
- Abstraction isotope effect**, variation in, for energetic tritium atoms, 941
- Acetaldehyde**, diazo-, matrix photolysis, 670
- Acetamide**,  $\alpha$ -iodo-,  $\gamma$ -irradiated, the radical  $\dot{C}(I)CONH_2$  in: hyperfine coupling of iodine in  $\alpha$ -iodoalkyl radicals, 717
- Acetoin** derivatives, biacetyl photosensitized decomposition, 824
- Acetone**, hexafluoro-, insertion reactions with tricarbonyl(diene)-iron and  $\pi$ -cyclopentadienyl(diene)rhodium complexes, 114  
photochemical reactions with 2,3-dimethylbut-2-ene, 316
- Acetonide** formation from olean-12-ene-16 $\alpha$ ,28- and -16 $\beta$ ,28-diols, 787
- Acetylene**, mechanism of insertion into the methylgold bond: structure of a reaction intermediate, 373  
phenyl-, hydrogen exchange in, and the hydroxide ion anomaly, 761  
phosphino-, novel cleavage by palladium(II) and platinum(II): Preparation and structure of complexes of 1,3-bis(diphenylphosphino)-2-trifluoromethylpropene derived from 3,3,3-trifluoropropynyl diphenylphosphine, 388
- Acetylenedicarboxylate**, dimethyl, Pd<sup>II</sup>-induced trimerisation: intermediacy of a  $\sigma$ -butadienyl complex and structure of  

$$[Pd\{C_5(CO_2Me)_4CO_2Me\}C(CO_2Me)Cl]\{acac\}$$
, 436
- Acetylenes**, alkoxy-, aryl substituted, photoaddition of phenanthraquinone. Formation of 1,3-dioxoles, 188  
and allenes, vinyl cations in acid-catalysed isomerisations of, 177  
 $\beta$ -alkylation of pyridine and quinoline 1-oxides with: mechanism, 569
- Acetylenes**, new synthesis. Novel rearrangement of  $\alpha\alpha$ -dichlorodibenzyl sulphides, 955  
novel synthesis of heterocyclic compounds from, 280  
one-step conversion of carbonyl compounds into, 151
- Acetylenic** ammonium ylides, apparent [2,3]sigmatropic rearrangements, 657  
cyclisation leading to chloroarylidene tetrahydrofuran-2,4,5-triones, 265
- Achiral** molecules in a cholesteric solvent, optical activity, 712
- Acid halides**, direct cleavage of esters to, 425
- (-)- $\alpha$ -Acorenol** and (+)- $\beta$ -acorenol, stereospecific synthesis, 526
- Acridine** derivatives, 9-alkyl-, synthesis, 794
- Acridone** alkaloids, two novel, from *Atalantia ceylanica* (Rutaceae), 615  
N-methyl-, chemiluminescence induced by potassium superoxide, 200
- Acylation**, electrochemical, of aromatic compounds, 473  
Intramolecular Friedel-Crafts, stereochemistry, 84
- Acyloin** condensation of aldehydes catalysed by *N*-laurylthiazolium bromide, 891
- Adamantane**. Equilibration of biadamantane isomers, 685  
2-oxa-, novel synthesis, 197  
2-iodo-, crystal structure—an axial iodide, 927
- Addition** and substitution reactions, unsymmetrical cyanocuprates as reagents in, 88
- Adenine**, 3,9-dimethyl- and 3-methyl-9-ethyl-, synthesis *via* *N'*-alkoxy-1-alkyl-5-formamidoimidazole-4-carboxamide, 917
- Adenosine**, 3-deaza-, novel synthesis, 64  
deprotonation in aqueous base, unequivocal potentiometric assignment of the site, 485
- Aglaialol**, a (24S)-24,25-epoxytriterpene, configuration, 115
- Alcohols**, complex formation and photochemical oxidation by bipyridylum salts in homogeneous solution and at an air-water interface, 592  
conversion into amides using chlorodiphenylmethylum hexachloroantimonate in nitrile solvents, 331  
hydrogen-exchange with triphenylgermane, 780  
mechanistic controversy in silver oxide-bromine induced cyclizations: dynamic stereochemistry, 451
- Alcohols—continued**  
primary,  $\alpha$ -deuterated, determination of the enantiomeric purity and absolute configuration, 274  
secondary, absolute configurations. Gas chromatographic modification of Horeau's method, 194  
use of pyridinium and flavin derivatives for recycling of catalytic amounts of NAD<sup>+</sup> during preparative-scale horse liver alcohol dehydrogenase-catalysed oxidations of, 205
- Aldehyde** homologation, aryl; a new  $\beta$ -arylethylamine synthesis, 781
- Aldehydes**, acyloin condensation of, catalysed by *N*-laurylthiazolium bromide, 891  
and ketones, amine-catalysed cycloaddition of, in reactions of isoquinolinium ylides, 188  
and ketones, cyanosilylation. Convenient route to cyanohydrin derivatives, 55  
and ketones, reactions with silicon-carbon double-bonded intermediates, 167  
*o*-hydroxy-, and ketones, conversion into *o*-hydroxyanilides by monochloramine, 716
- Aldolases**, Class I and II, and triosephosphate isomerase, an inhibitor of; phosphoglycolhydroxamic acid. A potential antibacterial and antifungal agent, 713
- Aldoximes**, neutral conversions into nitriles at low temperature, 628
- Alginate** system, calcium order-disorder transition: characterization of polysaccharide structure and interactions by circular dichroism, 245
- Aliphatic** compounds, long-chain, deuterium isotope effects on <sup>13</sup>C chemical shifts in, 692
- Alkaloids**, *Adina* alkaloids: the structure of rubenine, 765  
Biogenetically modelled synthesis of a samandarine-type alkaloid, 288  
Biosynthesis of shihunine, an alkaloid of the orchid *Dendrobium pierardii*, 522  
Conversion of becologanin into *Corynanthe*-type alkaloids, 886  
protoberberine-type total synthesis, 137  
Stereochemistry of hydrogen removal  $\beta$  to nitrogen in the biological conversion of *O*-methylnorbelladine into the montanine-type alkaloids, 430  
Stereochemistry of the conversion of tyramine and hordenine into tyrosol by *Willia anomala* Hansen, 862  
Synthetic entry to the hexacyclic *Aspidosperma* alkaloids. Total synthesis of ( $\pm$ )-4-hydroxyaspidofractinine, 301  
Total synthesis of the alkaloids clivonine and clividine, 302  
Total synthesis of the alkaloids ( $\pm$ )-oxocrinine and ( $\pm$ )-oxomaratidine *via* anodic oxidation, 550  
Total synthesis of yohimbine-type alkaloids. Yohimbine skeleton and angustidine, 732  
Two novel acridone alkaloids from *Atalantia ceylanica* (Rutaceae), 615
- Alkanes**. Analysis of the <sup>13</sup>C *T*<sub>1</sub> relaxation times in n-alkanes 757  
azo-, conversion of *NN'*-dialkylsulphamides into. Formation of the thiadiaziridine 1,1-dioxide ring system, 397
- Alkenes**, fluoro-, effect of radical size and structure on the orientation of addition of perfluoroalkyl radicals, 496  
oxidative radical addition: convenient route to  $\gamma\delta$ -unsaturated acids and  $\gamma$ -lactones, 693  
reactions with dialkylplatinum(II) complexes, observations by electron spin resonance spectroscopy of free radicals, 861  
some, exchange with deuterium and isomerization of, catalysed by gallium oxide, 231  
steroidal, unusual mercury(II) acetate oxidations, 56
- trans-Alkenyl** ketones and *trans,trans*-dienes, conjugated, highly stereoselective and general synthesis *via* hydroboration, 606
- Alkyl** bromides, preparation from the corresponding alcohols and Me<sub>2</sub>SBr<sub>2</sub>, 212  
halides, primary; can they hydrolyse by the ion-pair mechanism? 51

- Alkyl**—*continued*  
radicals, perfluoro-, effect of radical size and structure on the orientation of addition to fluoroalkenes, 496
- Alkyldimethylsulphonium** salts, long-chain, base-catalysed reaction with carbonyl compounds in benzene-water; oxiran formation, 527
- 2-Alkylidenecyclobutanols**, ring contraction to cyclopropyl carbonyl compounds, 103
- Alkylmetal** carbonyl compounds, oxidatively induced carbonyl insertion and nucleophilic cleavage reactions, 163
- Alkylnitrenium** ions, unconstrained, semi-empirical molecular orbital calculations, 461
- Alkyne** insertion, and olefin isomerization: activation of platinum complexes by methyl fluorosulphonate, 766
- Alkynes** and dienes, reactions on magnesium and other metal films, 478  
a novel system for highly stereospecific reduction of to *cis*-olefins: "P-2 nickel" catalyst with ethylenediamine, 553
- Alkyltrialkylborate** salts, alkylation and protonation—a new general method for the preparation of ketones, 544
- Allene**, 1,1-dimethyl-, cycloadditions of arylketens and thermal isomerisation of a 2-methylenecyclobutanone adduct to a 2-isopropylidenecyclobutanone, 733  
nickel-catalysed reactions with active hydrogen compounds, 472
- Allenes** and acetylenes, vinyl cations in acid-catalysed isomerisations of, 177  
hindered, reactions with ozone, 340  
Synthesis and some thermal reactions of conjugated *meso*-diallenes, 432
- Allenic** alcohols, synthesis, 709  
and sesquiacetylenic structures of prop-2-ynyl dianions, 576
- Allo-ocimine** and cholestatriene. Triplet lifetime of conjugated trienes, 799
- Allyl** acetates, abnormal ozonolysis: a structural factor, 618  
cation, fluorinated long-lived, 509  
radical, electrocyclic transformation of the cyclopropyl radical to, *ab initio* calculations, 334  
 $\pi$ -Allyl isomerisation, new type: conversion of 1,1- into 1,2-dimethylallyl complexes of cobalt and rhodium, 86
- N-Allylhydrazones**, thermally induced [3,3] sigmatropic rearrangement, 662
- Allylic** anilinium ylides derived from *o*- and *p*-dimethylamino-phenol, rearrangement reactions, 651  
anions, charge control in protonation of, 407
- o*-Allylphenol**, asymmetric induction in the cyclisation of, with chiral mercury(II) carboxylates. The effect of dimethyl sulphoxide, 573
- ( $\pm$ )-**Altenuene**, fungal metabolite, X-ray crystal structure revision, 682
- Alternariol** trimethyl ether, selective chromic acid oxidation; X-ray crystal structure of the major product, 333
- Aluminium** bond configuration in  $\text{AlCl}_3 \cdot \text{NH}_3$ : an electron diffraction study, 750  
Crystal and molecular structure of hepta- $\mu_3$ -methylimido-heptakis(methylaluminium). A new aluminium-nitrogen cage, 934  
Electron-deficient transition metal cluster compounds: preparation and crystal structures of some molybdenum- and tungsten-aluminium compounds, 426  
Structure of aluminotitanium hydride  $[(\text{C}_2\text{H}_5)(\text{C}_2\text{H}_4)\text{Ti}(\text{HAl}(\text{C}_2\text{H}_5)_2)_2]$ , 227  
X-Ray crystal structure of the pentanitratocaluminate anion, 595
- Amide** formation from reactions of isocyanates with  $\beta$ -keto-imine complexes: reactions of co-ordinated ligands, 690
- Amides**, conversion of alcohols into, using chlorodiphenylmethylum hexachloroantimonate in nitrile solvents, 331  
tertiary. Reactive tertiary amide nitrogen in nonrigid systems, 352
- Amine** oxide, chiral, asymmetric induction in allylic rearrangement, 848.
- Amines**, aliphatic, photoreduction of 4-chlorobiphenyl by, 384  
aromatic, and carbon monoxide, new hydrogen selenide-triethylamine catalysed synthesis of formanilides from, 853  
cyclic, rearrangement catalysed by palladium, 307  
phenylalkyl-, *meta*-photocyclisation, 330
- Amino-acids**. Biosynthetic origin of D-isoleucine in the monamycins, 782  
New synthesis of ( $\pm$ )-cucurbitine, 2  
and peptides, crystal structures of seven cadmium(II) complexes: model compounds for metal-protein interaction, 753  
reaction with peroxyacetyl nitrate, 74
- Amino-groups**, slow proton transfer involving, 463
- Amino-protecting** group, alkali-labile substituted benzyloxy-carbonyl, 593
- Ammonia**, amination of phenol: high acidity of silica-titania and its high catalytic activity, 676  
and carboxylic acids, aniline and other aromatic amines from. A metal-catalysed process, 666  
Lone-pair orbital in  $\text{NH}_3$  and the calculation of the HNH angle, 736  
solutions, liquid, of metal salts; Raman spectra, 914  
( $\pm$ )- $\alpha$ -**Amorphene**, stereospecific total synthesis, 598
- Ampicillin**, 6-epi-, intramolecular nucleophilic attack in, 484
- $\beta$ -**Amyrin**, enzyme-catalysed formation from a bicyclic isomer of 2,3-epoxysqualene, 73
- 5 $\alpha$ -Androstan-17 $\alpha$  $\beta$ -yl** tosylate, D-homo-, unexpected inversion of configuration at a quaternary centre during acetolysis, 341
- Angustidine** and the yohimbine skeleton. Total synthesis of yohimbine-type alkaloids, 732
- Anhydrases**. Hyperfine coupling to  $^{13}\text{C}$ -cyanide in electron spin resonance spectra of pentacyanocobaltate(II) and cobalt(II) carbonic anhydrase, 905
- Anhydrides**, photoexcited charge-transfer complexes with electron-rich olefins; oxetan formation, 296
- Anil** formation by oxidative depolymerization, 562
- Anilides**, *o*-hydroxy-, conversion of *o*-hydroxyaldehydes and ketones into, by monochloramine, 716
- Aniline** and other aromatic amines from carboxylic acids and ammonia. A metal-catalysed process, 666
- Anilines**, benzyldene-, ring-substituted, low-temperature mesomorphism, 202  
*N*-2'-chloroallyl-, conversion into 2-methylindoles, 208
- Anilinium ylides**, allylic, derived from *o*- and *p*-dimethylamino-phenol, rearrangement reactions, 651  
2-oxy-, sigmatropic rearrangements, 653  
2-oxy-, CIDNP in rearrangement of. Simultaneous concerted and non-concerted reactions, 654
- Anils**, addition of chlorosulphonylisocyanate: formation of triazinediones, 570
- Anthracene**, *cis-syn-cis*-2,2,6,6-tetramethoxyperhydro-, conformation and ring topomerization, 594
- Anthracenes**, 1,5-disubstituted 9,10-dihydro-9,10-bridged, non-anomalous absolute configuration, 239  
1,5-disubstituted 9,10-dihydro-9,10-etheno-, absolute configuration as revealed by chemical correlation, 22  
(-)-1,5-disubstituted 9,10-dihydro-9,10-etheno- or -ethano-, absolute configuration. Comparison of X-ray and circular dichroism studies, 21
- Anthraquinone** derivatives, simple, photochemical nucleophilic substitution, 111
- Antiaromatic** three-membered rings and their valence tautomers, MINDO/3 and NDDO study, 688
- Antibiotic X-537A**, fluorimetric complexing constants and circular dichroism measurements with univalent and bivalent cations, 431
- Antibiotics**. Biosynthesis of the antibiotic thermozymocidin. Incorporation of [ $^{13}\text{C}$ ]acetate:  $^{13}\text{C}$  nuclear magnetic resonance study, 788  
 $\beta$ -lactam, related dehydropeptides: scheme for biosynthesis of penicillins and cephalosporins, 790  
Molecular weight and structure of the antibiotic vancomycin, 772
- Antimony**. Conversion of alcohols into amides using chlorodiphenylmethylum hexachloroantimonate in nitrile solvents, 331  
Formation of methylketenylacylium ion in  $\text{SbF}_5\text{-FSO}_3\text{H}$ , 5  
pentafluoride, intercalation in the lattice of graphite, 815  
Preparation and characterization of perfluorophosphonium hexadecafluorotriantimonate(V)  $[\text{PF}_4]^+[\text{Sb}_3\text{F}_{16}]^-$ , 559
- Aplysterol**, synthesis of 24,28- and X-ray crystal structure of aplysterol: unusual marine sterols, 825
- Aporphine** synthesis, novel oxidative photochemical. Total synthesis of coronine and nandazurine, 915

- Appearance potentials** and electron impact ionization, determination, 730
- Arene** complexes of mercury(I), preparation and carbon-13 nuclear magnetic resonance spectra, 626
- $\pi$ -**Arene** complex, structural evidence for a new type containing poly(1-pyrazolyl)borate ligands and carbocyclic  $\pi$ -acceptor ligands. X-Ray analysis of [tetrakis(1-pyrazolyl)borato]-(*h*<sup>6</sup>-benzene)ruthenium(II) hexafluorophosphate, 847
- Arenediazonium** and benzoyl cations, molecular complexation by macrocyclic polyethers, 481
- fluoroborates, substitution of 6a-thiathiophthens and related compounds with: rearrangement into novel heterocyclic systems, 92
- ions, pathways for decomposition: question of aryne participation, 545
- salts, substituent effects in reaction with methylamine, 701
- Arenes**, hydroquinone as a reducing agent for conversion of arylidiazonium salts into, 604
- Argon** matrix, photoionisation of  $\pi$ -cyclopentadienyl-nitrosyl-nickel in, 407
- Aromatic** compounds, electrochemical acylation, 473
- molecules, cationic metal-dienyl complexes as electrophilic reagents on, 540
- Aromatic substitution**, concerning the  $\pi$ -complex mechanism for. D Tritiation in trifluoromethanesulphonic acid, 836
- with peroxydicarbonates cerium(IV) ammonium nitrate-promoted, 109
- Aroylchloromaleic** anhydrides from thermal rearrangement of chloroarylidenetetrahydrofuran-2,4,5-triones, 265
- Arsenic**. Arsole metal complexes, 258
- Arsine**. Osmium nitrido-complexes with triphenyl-phosphine, -arsine, and -stibine, with evidence for nitrene-like behaviour of the phosphine complex, 418
- Arsinimines**, formation by reactions of triphenylarsine with compounds generally believed to be nitrene precursors, 586
- Arylazo** and aryl-di-imine derivatives of platinum metals, 176
- Aryldiazonium** salts, hydroquinone as a reducing agent for conversion into arenes, 605
- Arylidenetetrahydrofuran-2,4,5-triones**, chloro-, acetylenic cyclisation leading to, 265
- thermal rearrangement to aroylchloromaleic anhydrides, 265
- Aryne** participation, question of, in pathways for the decomposition of arenediazonium ions, 545
- Aspidofractinine**, ( $\pm$ )-4-hydroxy-, total synthesis. Synthetic entry to the hexacyclic *Aspidosperma* alkaloids, 301
- ent-16S-Atis-13-ene** system, novel, hydride induced conversion of an *ent*-beyer-15-ene 12-*p*-tosylhydrazone into, 552
- Attraction**, nonbonded, in organic molecules and substituent effects on nonbonded attraction, 278
- Avenaciolide**, metabolite, Fourier transform nuclear magnetic resonance spectra: biosynthetic studies with carbon-13, 212
- Azabicycles**, model, thermal chelotropy in; the question of linear *vs.* non-linear extrusion, 840
- Azacyclopropenylidenimine**: a low energy dimer of hydrogen cyanide, 435
- Azaethers**, macrocyclic, multidentate chelating agents, 831
- Azaspiro[2,2]pentane**, 1,2-diphenyl-, synthesis, 33
- 3H-Azepine**, 2-dimethylamino-4,5-dihydro-, photoreaction, 327
- Azepines**. Concerted rotational-inversion process in 5-acyl-10,11-dihydrodibenz[*b,f*]azepines, 282
- Azetidine**, ring puckering: electron diffraction study, 772
- Azetidin-2-ones**, 4-(alk-2-ynylthio), some, hydration of the triple bond, 57
- Aziridine** ring of mitomycin B, incorporation of the amino-group of D-[<sup>15</sup>N]glucosamine into. Mitomycin biosynthesis by *Streptomyces verticillatus*, 88
- Azirines**, aryl-, rationale for the direction of regioselectivity in photocycloaddition of, 342
- Azo**-compound photolysis, *cis*-intermediates, 263
- compounds, use of nuclear magnetic resonance shift reagents with: pyrazoline stereochemistry, 557
- group stereochemistry and a correlation with ultraviolet absorption spectra, 314
- zoalkanes**, conversion of *NN'*-dialkylsulphamides into. Formation of the thiadiaziridine 1,1-dioxide ring system, 397
- Azobenzenes**, *ortho*-metallation: mechanistic results, 558
- Azocine**, 1,2-dihydro-, new synthesis, 665
- Azulene**, ferrocene-sensitized photoalkoxycarbonylation. A transition-metal catalysed photoreaction, 871.
- Azulenes**, hydro-, photochemical approach to, by photolysis of a  $\beta$ -unsaturated ketone: synthetic organic photochemistry, 501
- synthesis based on intramolecular carbene addition, 882
- Barbaralane** system, 9-aza-, (9-azatricyclo[3,3,1,0<sup>3,8</sup>]nona-3,6-diene), 779
- Benzanilides**, photocyclization to phenanthridones with elimination of the *ortho*-methoxy-group, 647
- Benzene** and BF<sub>3</sub>-Et<sub>2</sub>O, reaction of cyclo-octenylidene derivatives with, 890
- and hexafluorobenzene, photoreaction between, 457
- Crystal structure of di- $\mu$ -sulphur dioxide-pentakis(*t*-butyl isocyanide)-triangulo-tripalladium-dibenzene, 445
- 3,5-dinitrocyano-, kinetic and thermodynamic intermediates formed by attack of methoxide ion: high resolution nuclear magnetic resonance study of chemical reactions using flowing liquids, 743
- protiodetritiation in trifluoroacetic acid, 952
- vapour, photoreactions at 2537 Å, 738
- Benzenediazonium** ion, conversion of 1-phenylazo-2-naphthol into: another route to phenyl radicals, 572
- Benzenes**, alkyl-, deuteration. Iridium(III) salts as homogeneous metal catalysts for hydrogen isotope exchange in organic compounds; comparison with heterogeneous iridium, 749
- alkyl-, ring expansion by the zinc-carbenoid reaction with diethylzinc and iodoform, 216
- azo, *ortho*-metallation: mechanistic results, 558
- Benzenoid** compounds, activated, dichotomy in reaction of phthalimidonitrene with, 67
- Benzimidazoles**, *N*-amino-, from acid-catalysed cyclisation of *o*-nitrophenylhydrazines, 41
- Benzimidazolium** salts, 1,3-polymethylene-, and related systems, preparation and properties. *N*-Bridged heterocycles, 427
- Benzimidazolones**, *N*-hydroxy-, synthesis and reactivity, 96
- Benzoate**, methyl, photochemical reactions, 468
- Benzo[c]cinnoline *N*-oxides** as 1,3-dipoles, 837
- 1,2-Benzocyclobutadienequinone**, reaction with zerovalent platinum: preparation and structure of (1,1-bistriphenylphosphine)platinabenzocyclopentenedione, 158
- Benzocyclobutene-1,2-dione**, 4,5-dihydroxy-, (a benzologue of squaric acid), synthesis, and a general synthesis of benzocyclobutene-1,2-diones, 248
- Benzocyclo-octatrienedione** and 2,3-benzohomotropone, formation of two derivatives by dichlorocarbene ring expansion, 363
- Benzocyclopropene**, 7,7-difluoro-2,5-diphenyl-, preparation by halide exchange, 895
- 1H-1,5-Benzodiazepine-3-carbonitrile**, 4-amino-, and related compounds, synthesis, 367
- 3H-1,2-Benzodiazepines**, thermolysis, 85
- 2H-1,4-Benzodiazepin-2-ones**, 1,3-dihydro-, stereochemistry of the enzymic 3-hydroxylation of, 721
- Benzofuran** derivatives, photochemical dimerization, 903
- Benzo[*b*]furanones** and indolones, *cis*-octahydro-, conformational features. 1,2-Cycloaddition of dichloroketen to cycloolefins and the aza-ring expansion of cyclobutanones, 3
- Benzonitriles**, 2,3- and 3,4-dimethyl-, 1,4-dienes from the nitration of, and a 1,3-rearrangement of a nitro-group, 396
- Benzophenone**, anomalous product in photolysis in acidified methanol, 504
- 2-isopropenyl-, photochemistry, 619
- 1,4-Benzoquinone**, 2,6-di-*t*-butyl-, photolysis, a new rearrangement, 844
- 5,6-Benzo-1,2,4-triazine** 1-oxides, reaction with Grignard reagents, 622
- 1-Benzoxepin**, reaction with singlet oxygen: a novel endoperoxide, 344
- Benzoyl** and arenediazonium cations, molecular complexa by macrocyclic polyethers, 481
- peroxide, mechanism of formation of biaryls in thermolysis of, in polyfluorinated aromatic solvents, 286
- Benzylideneacetone**, reaction with (cyclo-octa-1,5-diene)tricar-bonylruthenium, 912

- Benzylideneanilines**, ring-substituted, low-temperature mesomorphism, 202
- Benzoyloxycarbonyl** amino-protecting group, substituted, alkali-labile, 593
- Benzynes**, Novel 1:1 and 2:1 cycloadducts with, cycloaddition reactions of [2,2](2,5)-furanophane, 930
- Benzynes** and dienolate anions, substituted naphthalenes from, 524
- Betaines**, heteroaromatic, ring expansion of, with cyclopropene derivatives, 833
- ent-Beyer-15-ene** 12-*p*-tosylhydrazone, hydride induced conversion into the novel *ent*-16S-atis-13-ene system, 552
- Biacetyl** photosensitized decomposition of acetoin derivatives, 824
- Biadamantane** isomers, equilibration, 685
- Biaryls**, mechanism of formation in the thermolysis of benzoyl peroxide in polyfluorinated aromatic solvents, 286
- Bicyclo[3,2,0]hepta-1,4-diene**, 3-oxo-, 214
- Bicyclo[3,2,0]hept-2-enes**, 4-methylene-, photoreactions, 458
- Bicyclo[2,2,0]hexanes**, hexamethyl-, inversion and ring opening, 364
- Bicyclo[4,3,0]nona-3,7-dien-2-one**, 7-acetyl-3,5,5,9,9-pentamethyl-1,6-diaza-, end product of photochemical generation of a vinylketen from 5-acetyl-3,3-dimethyl-3*H*-pyrazole; identification by X-ray crystallographic analysis, 247
- Bicyclo[3,3,1]nonanes**, synthesis of *via* Cope reaction of an enol, 549
- Bicyclo[4,2,1]nonanes**, aza-, novel, from anhydrodihydro-nucleosides, 495
- Bicyclo[5,2,0]nona-2,5,8-triene**, 4-aza-, and derivatives, 601
- Bicyclo[2,2,2]octadienedione**, isocyanides from monoimines of, 699
- Bicyclo[2,2,2]oct-1-ene**; formation from 1-ethoxybicyclo[2,2,2]-oct-2-yl-lithium and reaction with *t*-butyl-lithium, 542
- Bicyclo[3,2,1]oct-3-enes**, 3,4-diaryl-2-hydroxy-1,2,5-triaza-, from the peracid oxidation of 3,4-diaryl-6-7-dihydro-1-methyl-1*H*-1,2,5-triazepines, 642
- Bicyclo[9,3,1]pentadec-11-en-15-one**, 1-dimethylaminomethyl-13-methyl-13-aza-, and 13,16-dimethyl-13,16-diazatri-cyclo[9,3,3,1<sup>11,11</sup>]octadecan-18-one: novel products from a Mannich reaction with cyclododecanone, 238
- 2,2'-Bi-1,3-dithiole** and 7,7,8,8-tetracyanoquinodimethane, crystal structure of the radical-cation radical-anion salt from, 471
- 2,2'-Bi-1,3-dithioliylumnickel** bismaleonitriledithiolate, 923
- Biferrocenylene(II,III)** picrate, Mössbauer and magnetic susceptibility studies, 329
- Bile salt** micelles, binding site of naphthalene to, as determined by <sup>1</sup>H nuclear magnetic resonance, 918
- Biphenyl**, 4-chloro-, photoreduction of, by aliphatic amines, 384
- Bis(diphenylmethylene trisulphur)** tetranitride, crystal and molecular structure, 36
- Blumenols**, and theaspirone, stereochemistry, 565  
stereochemistry: conversion of blumenol A into (S)-(+)-abscisic acid, 566
- Bombykol**. Stereoselective synthesis of conjugated *trans*-enynes readily convertible into conjugated *cis*, *trans*-dienes and its application to the synthesis of the pheromone, 874
- Boracyclanes**, light-induced reaction with bromine in the presence of water. Ring contraction of boracyclanes to produce carbocyclic structures, 801
- Boranes**. Crystal and molecular structure of *trans*-dichlorobis-(hexaborane-10)platinum(II), 354  
electron-rich heteroatom-containing, preparation, 914  
Gaseous bivalent borenium cations, 386  
metallo-, electronic considerations, 543  
Preparation and crystallographic characterization of a 2:1 adduct of ethynylidicarbododecaborane(12) and *trans*-IrCl(CO)(PPh<sub>3</sub>)<sub>2</sub>, 465  
Preparation and structure of a singly hydrogen-bridged organoborane anion, 377  
Synthesis and molecular structure of a metalloborane zwitterion Mn(CO)<sub>3</sub>[B<sub>9</sub>H<sub>12</sub>{O(CH<sub>2</sub>)<sub>4</sub>NEt<sub>3</sub>}], 295
- Borate** salts, alkynyltrialkyl-, alkylation and protonation—a new general method for the preparation of ketones, 544
- Borohydride**, potassium tri-isopropoxy-. New mild complex hydride reducing agent with high stereoselectivity for reduction of ketones, 391
- Boron**. Cage compound (BMe)<sub>6</sub>(CH)<sub>4</sub>, 532  
Crystal and molecular structure of [Me<sub>4</sub>N]<sup>+</sup>[PhCHB<sub>10</sub>H<sub>10</sub>-CPH]<sup>-</sup>: relation to the C<sub>2</sub>B<sub>10</sub>H<sub>12</sub><sup>-</sup> ion, 257  
Determination of the molecular structure of C<sub>4</sub>B<sub>2</sub>H<sub>6</sub> by microwave spectroscopy, 928  
Stereochemistry and order of the three alkyl migrations in the cyanoborate process, 186  
Synthesis and molecular structure of a metalloborane zwitterion Mn(CO)<sub>3</sub>[B<sub>9</sub>H<sub>12</sub>{O(CH<sub>2</sub>)<sub>4</sub>NEt<sub>3</sub>}], 295  
Synthesis of cobaltaferracarboranes: two methods, 805  
Thermal isomerizations of steroidal boranes: isomerizations at the junction of the hydrindanic steroidal system, 942  
trifluoride. Reaction of cyclo-octenylidene derivatives with benzene and BF<sub>3</sub>-Et<sub>2</sub>O, 890  
tris(pentafluoro-orthotellurate), B(OTeF<sub>5</sub>)<sub>3</sub>. Preparation and Lewis acidity, 134  
trisulphide and phosphine oxides, optically active phosphine sulphides from, 273
- Botryococcene**—a tetramethylated acyclic triterpenoid of algal origin, 284
- Bridged-ring** system, new heterocyclic, structure and novel reactivity, 597
- Bromine**. CBr<sub>3</sub><sup>-</sup> and related anions, 577  
dioxide, Raman spectrum and structure, 446  
Dynamic stereochemistry: mechanistic controversy in the silver oxide-bromine induced cyclizations of alcohols, 451  
*β*-Bromoethyl radical, CIDNP, 179  
*β*-Bromohydroperoxides, mechanism of dehydrobromination, 343
- Bromonium** ions, four-membered ring, 361
- Brønsted** exponents and energy of reaction, Marcus rate theory and the relationship between, 371  
plots, curved, pyridinolysis of methyl chloroformate and the interpretation of, in nucleophilic reactions, 828
- Butadiene**, acid-promoted amination on nickel(0), 770
- Buta-1,3-diene**, addition of singlet and triplet silylene, 637
- Butadiyne**, diphenyl-, fragmentation of 3,6-diphenyl-4,5-dihydropyridazine to, 819
- Butane**, 1,1,1,4,4,4-hexafluoro-, analysis of multinuclear magnetic resonance spectra, 454
- Butane-2,3-dione** dihydrazone and formaldehyde, metal ion directed syntheses of macrocyclic, tricyclic, and quadricyclic metal complexes from: template condensations, 62
- Butanes** and deuterium, exchange between on alumina, evidence for carbanionic intermediates, 799
- But-2-ene**, 2,3-dimethyl-, photochemical reactions with acetone, 316
- t*-Butoxycarbonyl** radicals, rate of addition to 2-methyl-2-nitrosopropane ('*t*-nitrosobutane'): spin trapping, 173
- t*-Butyl chloride**, effect of hydrogen peroxide on the rate of hydrolysis of, 514  
new information on aqueous hydrolysis of, 663
- But-2-yne**, hexafluoro-, reaction with nickelocene and the crystal structure of [C<sub>6</sub>H<sub>6</sub>NiCF<sub>3</sub>CCCF<sub>3</sub>]<sub>4</sub>, 865
- (CH)<sub>10</sub> series**, unusual anionic rearrangement, 599
- <sup>13</sup>C Nuclear magnetic resonance** study of the structure and dynamical properties of Rh<sub>4</sub>(CO)<sub>12</sub> in solution, 807
- Cadmium**. High resolution <sup>113</sup>Cd nuclear magnetic resonance by pulse Fourier transform, 394  
Model compounds of metal-protein interaction: crystal structures of seven cadmium(II) complexes of amino-acids and peptides, 753
- Caesium** thiocyanate and two isomeric macrocyclic crown polyethers, 6,7,9,10,17,18,20,21-octahydro-7*R*,9*R*,18*S*,20*S*-tetramethyldibenzo[*b,k*][1,4,7,10,13,16]hexaoxacyclo-octadecin (isomer F) and 6,7,9,10,17,18,20,21-octahydro-7*R*,9*R*,18*R*,20*R*-tetramethyldibenzo[*b,k*][1,4,7,10,13,16]hexaoxacyclo-octadecin (isomer G); synthesis and crystal structures of complexes between, 694
- Calcium**. Characterization of polysaccharide structure and interactions by circular dichroism: order-disorder transition in the calcium alginate system, 245
- Calonysterone**, an unusually modified phytoecdysone, 737
- (-)-Campherenone**, (+)-epicampherenone, (-)-*β*-santalene, and (+)-epi-*β*-santalene; synthesis and absolute configuration of the campherenones, 255
- Camphor** derivatives, 8-substituted, synthetic route to, 911

- Carbamate system**, intramolecular nucleophilic attack on, by the ionized carboxy-group, 82
- Carbanions**, structural effects on elimination from, 175
- Carbene addition**, intramolecular, synthesis of azulenes based on, 882
- Carbenes**, imino-, hydrogen transfer in, a new synthesis of isoquinolines, 835
- Carbocyclic structures** produced by ring contraction of boracyclanes. Light-induced reaction of boracyclanes with bromine in the presence of water, 801
- Carbon**. Applicability of the Karplus relation to  $^{31}\text{PCC}^{13}\text{C}$  coupling constants, 287  
 $\text{CBr}_4^-$  and related anions, 577  
 Substituent effects on the  $^{13}\text{C}$  relaxation time along aliphatic chains. Application to a prostaglandin, 951
- Carbon-13** nuclear magnetic resonance signals from quaternary carbon atoms, method for selective enhancement of, 809  
 CIDNP in the reversible addition of pentafluorobenzoyloxy radicals to chlorobenzene, 953
- Carbon-carbon sigma bonds**, cleavage by  $\text{Ru}_3(\text{CO})_{12}$ , 87
- Carbon dioxide**, adducts with copper(II) complexes, 306
- Carbon monoxide** and aromatic amines, new hydrogen selenide-triethylamine catalysed synthesis of formanilides from, 853  
 novel catalysts for low-temperature oxidation:  $\text{SnO}_2\text{-CuO}$  gels, 210  
 reaction with iron porphyrins, 325
- Carbonium ion**, optically active, direct observation of, and measurement of the free-energy barrier to racemisation, 182
- Carbonyl anions**, production by the vacuum ultraviolet photolysis of matrix isolated metal carbonyls, 763  
 compounds,  $\beta$ -alkoxy and  $\beta$ -alkylthio  $\alpha\beta$ -unsaturated, reaction of lithium dialkylcuprates, 907  
 compounds, alkylmetal, oxidatively induced carbonyl insertion and nucleophilic cleavage reactions, 163  
 compounds, base-catalysed reaction with long-chain alkyl-dimethylsulphonium salts: oxiran formation, 527  
 compounds, hydrosilylation, and alcoholysis of diarylsilanes; catalysis by rhodium and ruthenium complexes. Selective catalytic route to bifunctional silanes, 38  
 compounds, one-step conversion into acetylenes, 151  
 infrared band, unusual, in a new mesoionic system, 402  
 olefin metathesis in sequential photochemical and thermal steps: regiospecific thermal cleavage of some oxetan photo-adducts, 374
- Carbonyls**, metal-carbon monoxide bond strength in, and heat of formation of dicobalt octacarbonyl, 317  
 some metal-metal bonded, kinetic and spectroscopic parameters for, 267
- Carborane**, metallo- trimetallic, synthesis by polyhedral expansion, 706
- Carboranes**. Electron diffraction determination of the molecular structure of 1,6-dicarbido-closo-hexaborane(6), 276
- Carboxylic acids** and ammonia, aniline and other aromatic amines from. A metal-catalysed process, 666
- Catalysis**, unusual, with nickel(0) complexes, 157
- Cations**, organic, application of lanthanide induced shift reagents by outer sphere complexation, 630
- Cephalosporins**, C-2-C-3-tricyclic, synthesis, 671  
 from novel conversion of penicillins, 58  
 and penicillins, scheme for biosynthesis: dehydropeptides related to  $\beta$ -lactam antibiotics, 790
- Cerium**. Cerium(IV) ammonium nitrate-promoted aromatic substitution with peroxydicarbonates, 109  
 Formation of  $\beta$ -phase hydrides by palladium-cerium solutions, 102
- Chelating agents**, multidentate: macrocyclic azaethers, 831
- Chemiluminescence** of *N*-methylacridone induced by potassium superoxide, 200
- Chemiluminescent** model compounds: bioluminescence of coelenterates, 467
- Chiral lanthanide nuclear magnetic resonance shift reagents**, 381  
 recognition of a prochiral (*meso*-carbon) centre by  $\Lambda(-)_{436}\text{-}\alpha\text{-}l\text{-}2,9\text{-diazadecanecobaltate}$ , 332
- Chloroformate**, methyl-, pyridinolysis, and the interpretation of curved Brønsted plots in nucleophilic reactions, 828
- Chlorosulphonylisonocyanate** addition to anils: formation of triazinediones, 570
- 5 $\alpha$ -Chol-22-en-3 $\beta$ -ol**, 24,24-dimethyl-, *cis*-isomer of the  $\text{C}_{26}$  marine sterol, 424
- Cholestatriene** and allo-ocimine. Triplet lifetime of conjugated trienes, 799
- Cholest-5-en-19-ol** nitrile, 3 $\beta$ -acetoxy-, photolysis, 752
- Cholesteric solvent**, optical activity of achiral molecules in, 712
- Chroman-4-one**, 3-benzyl-: biosynthesis of eucomin, 438
- Chromenylation**, phenol, regiospecificity, 580
- Chromium**. *cis*-Activation by the nitrate-ligand in ammine-chromium(III) ions, 61  
 Isolation of cyclohexene oxide from the chromyl chloride oxidation of cyclohexene, 195  
 Mechanism of methoxyphenylcarbene insertion into Group IV element-hydrogen bonds *via* a chromium carbene complex, 578  
 Molecular structure of chromyl fluoride,  $\text{CrO}_2\text{F}_2$ : an electron diffraction study, 633  
 Observation of pentacarbonylchromium on flash photolysis of hexacarbonylchromium in cyclohexane solution, 105  
 One-electron reduction of tris(bipyridyl) complexes of cobalt(III) and chromium(III), 640  
 Preparation and magnetic behaviour of complex bromides of chromium(II), 632  
 Slow dissociation of the chromium(II) acetate dimer, 904  
 Synthesis and characterization of tetranitrosylchromium, 40  
 Use of luminescence spectroscopy to determine infrared and Raman inactive fundamentals:  $\tau_{2u}$  vibrational frequencies of the  $\text{Cr}(\text{CN})_6^{3-}$  ion, 489
- CIDNP**, carbon-13 in the reversible addition of pentafluorobenzoyloxy radicals to chlorobenzene, 953
- Cinnamates**, 2-azido-, reductive cyclisation to 2-substituted quinolines, 29
- Cinnamic acids** labelled with deuterium or tritium at the  $\alpha$ -position, 563
- Cinnoline 1- and 2-*N*-oxides**, 4-methyl-, photolysis, 345
- Cinnolines**, 5-amino-, novel formation from 5-oxo-5,6,7,8-tetrahydrocinnolines—abnormal course of Schmidt and Beckmann rearrangements, 926
- Citrylidene**'s cyclisation, stereochemistry and mechanism, 582
- Claisen rearrangement**, association with a novel [1,5] sigmatropic rearrangement, 491
- Clathrate** guest molecule, internal rotation, 621
- Cleistanthane** ring system, conversion of a pimarane diterpene into, 312
- Clivonine** and clividine alkaloids, total synthesis, 302
- Cobalt**. Aquoterpyridine-(1,10-phenanthroline)cobalt(II): a low pH oxygen carrier, 868  
 Chiral recognition of a prochiral (*meso*-carbon) centre by  $\Lambda(-)_{436}\text{-}\alpha\text{-}l\text{-}2,9\text{-diamino-}4,7\text{-diazadecanecobaltate}$ , 332  
 Cobalt to oxygen migration of the trimethylsilyl group in trimethylsilylcobalt tetracarbonyl, 497  
 Crystal and molecular structure of a cationic sodium complex the sodium tetraphenylborate adduct of *NN'*-ethylenebis(salicylideneiminato)cobalt(II). Cobalt(II), nickel(II), and copper(II) complexes of quadridentate Schiff bases as complexing agents for lithium, sodium, and ammonium cations, 384  
 Crystal and molecular structure of di-iodotetrakis(phenylisocyanide)cobalt(II). A strictly linear Co-I-Co bridge, 853  
 Formation of a Co-O<sub>2</sub> complex by the co-ordination of free superoxide ion, 781  
 Heat of formation of dicobalt octacarbonyl and the metal-carbon monoxide bond strength in carbonyls, 317  
 Higher oxidation state iron and cobalt phthalocyanine derivatives. Phthalocyanine radical cation complexes, 483  
 Hyperfine coupling to  $^{13}\text{C}$ -cyanide in electron spin resonance spectra of pentacyanocobaltate(II) and cobalt(II) carbonic anhydrase, 905  
 Intramolecular and intermolecular ligand exchange in five-coordinate cobalt(I) complexes, 221  
 Isolation and characterization of chloro(ethyl)dimethylglyoximateodimethylglyoximecobalt(III) hydrate. Protonated cobaloxime, 415  
 Laser-Raman and infrared spectra of  $\mu$ -superoxidocobalt(III) complexes, 864  
 Ligand field photochemistry of  $\text{Co}(\text{en})_3^{3+}$ ; reaction with  $\text{Fe}(\text{CN})_6^{4-}$  in NaCl solutions, 351

**Cobalt**—*continued*

- Ligand field photochemistry of  $d^8$  complexes. High yield photoaquation mode in  $\text{Co}(\text{NH}_3)_5\text{N}_3^{2+}$ , 674  
 mechanism of aquation of (dimethyl sulphoxide)penta-ammine-cobalt(III) perchlorate, 822  
 Metal complexes of novel sulphur- and phosphorus-containing heterocycles. Preparation and structure of tricarbonyl  $\eta^4$ -(1-pentafluorophenyl-2,3,4,5-tetrakis(trifluoromethylthiophen)manganese and  $\pi$ -cyclopentadienyl-(1-hydroxy-2,3,4,5-tetrakis(trifluoromethyl)phosphole 1-oxide)cobalt, 583  
 New organometallic reagent,  $\text{KCo}[\text{P}(\text{OR})_3]_4$ , 683  
 New type of  $\pi$ -allyl isomerisation: conversion of 1,1- into 1,2-dimethylallyl complexes of cobalt and rhodium, 86  
 One-electron reduction of tris(bipyridyl) complexes of cobalt(III) and chromium(III), 640  
 oxide, reduced, nitrogen chemisorption on, with  $\text{K}_2\text{O}$  as promoter, 270  
 Oxygen adduct of cobaltocene, 230  
 Oxygen carrier and redox properties of some cobalt chelates, including vitamin  $\text{B}_{12}$ , 810  
 Preparation, crystal structure, and magnetic properties of a binuclear cobalt(II) carboxylate, 52  
 Preparation of 1-methyl-2,2-diphenylcyclopropylcobaloxime and theoretical considerations for its mode of formation, 153  
 Radical anions and other reduced species of the  $\text{Co}_3\text{C}$  cluster, 894  
 Some tetranuclear nickel(II), cobalt(II), and mixed cobalt(II)/cobalt(III) complexes of a binucleating ligand, 392  
 Transition metal cryptates: crystal and molecular structure of a cobalt(II) cryptate,  $[\text{Co}(\text{C}_{16}\text{H}_{32}\text{N}_2\text{O}_5)][\text{Co}(\text{SCN})_4]$ , 816  
 18-Tungstotetracobalto(II)diphosphate and related anions: a novel structural class of heteropolyanions, 139
- Cobaltferracarboranes**, two methods of synthesis, 805  
**Cochlioquinones**, biosynthesis, 213  
**Coelenterates**, bioluminescence: chemiluminescent model compounds, 467  
**Colubrinol** acetate and colubrinol, antileukaemic ansa macrolides from *Colubrina texensis*: plant antitumour agents, 390  
**Concinndiol**, a bromo-diterpene alcohol from the red alga, *Laurencia concinna*. Marine natural products, 470  
**Configuration** assignment from proton spin-lattice relaxation time measurements, 459  
**Conformational** analysis of some *trans*-2-decalones, 949  
**Conformational free energy** ( $\Delta G$  value) of the amino-group in cyclohexylamine from low temperature carbon-13 nuclear magnetic resonance spectroscopy, 945  
**Convallamarogenin**, the steroidal sapogenin, origin of the 27-methylene group, 184  
**Co-ordination compounds**, solvent cages, glasses, crystals, and related systems cation vibrations in, 161  
**Copper**. Adducts of copper(II) complexes with carbon dioxide, 306  
 Aromatic complexes of copper(I) trifluoromethanesulphonate, 12  
 Chloro-bridged triplet ground-state copper(II) dimer, 133  
 complexes of biologically active molecules: preparation and structure of chlorobis-(2-thiouracil)copper(I) dimethylformamide solvate, 869  
 Copper(I) ketenide, 921  
 Criticism of the use of the Ising model to describe linear chains of antiferromagnetically coupled copper(II) ions, 178  
 Crystal structure of a binuclear five-co-ordinate copper(II) complex with tetra-amine macrocyclic ligands and single chloride bridge, 289  
 Crystal structure of the copper nitrate-dinitrogen tetroxide adduct  $\text{Cu}(\text{NO}_3)_2 \cdot \text{N}_2\text{O}_4$ , 644  
 Crystal structure (at  $-40^\circ$ ) of tetrakis[trimethylsilylmethylcopper(I)], an alkyl bridged, square planar, tetranuclear copper(I) cluster, 475  
 Dimeric copper(II) carboxylate complexes with unusually low magnetic moments, 702  
 Molecular structure of the ground state triplet  $\text{Cu}_6\text{Cl}_6^{2-}$  dimer in  $(\text{Ph}_4\text{As})\text{CuCl}_3$ , 607  
 Molecular structures of an aliphatic disulphide and of its cyclic dimeric copper(I) complex, 876  
 Preparation and structures of the  $\text{Me}_4\text{N}\{\text{M}^1\{\text{M}^2(\text{CO})_3(\pi\text{-C}_5\text{H}_5)\}_2\}$  salts ( $\text{M}^1 = \text{Cu}^I$  or  $\text{Ag}^I$ ;  $\text{M}^2 = \text{Mo}$  or  $\text{W}$ ), 71  
 X-Ray crystal structure of copper(I) acetate, 124

**Copper**—*continued*

- X-Ray crystal structure of the thiamine hydrochloride-copper(II) complex, 900  
 Reaction of lithium dialkylcuprates with  $\beta$ -alkoxy and  $\beta$ -alkylthio  $\alpha\beta$ -unsaturated carbonyl compounds, 907  
 Reduction of a ketone by lithium di-*n*-butylcuprate, 320  
 Six-membered  $\text{Cu}_3\text{S}_3$  ring in decakis(thiourea)tetracopper(I) hexafluorosilicate monohydrate: X-ray crystallographic structure determination, 256  
 $\text{SnO}_2$ -CuO gels: novel catalysts for the low-temperature oxidation of carbon monoxide, 210  
 Trimethylsilylmethylcopper, a stable copper(I) alkyl, 24  
 Unsymmetrical cyano-cuprates as reagents in substitution and addition reactions, 88
- Coproporphyrin-III** and protoporphyrin-IX, biosynthetic intermediates between, 183  
**Coproporphyrins**,  $^{13}\text{C}$  nuclear magnetic resonance spectra, 401  
**Cordycepin**, 4'-thio-, synthesis, 686  
**Cornforth** rearrangement, nature of intermediate, 925  
**Corunne** and nandazurine, total synthesis. Novel oxidative photochemical aporphine synthesis, 915  
**Costunolide** and dihydrocostunolide in solution, conformations. Simultaneous application of the nuclear Overhauser effect and an n.m.r. shift reagent, 620  
**Cryptates**: control over bivalent/monovalent cation selectivity, 15  
 transition metal: crystal and molecular structure of a cobalt(II) cryptate,  $[\text{Co}(\text{C}_{16}\text{H}_{32}\text{N}_2\text{O}_5)][\text{Co}(\text{SCN})_4]$ , 816  
 with macrotricyclic ligands: crystal and molecular structure of the silver 3-cryptates,  $\text{C}_{24}\text{H}_{48}\text{N}_4\text{O}_6 \cdot 3\text{AgNO}_3$ , 678  
 (–)-**Cryptomerion**, synthesis, absolute configuration, and photocyclisation of the sesquiterpene, 236  
**Crystals**, solvent cages, co-ordination compounds, glasses, and related systems, cationic vibrations in, 161  
 (±)-**Cucurbitine**, new synthesis of the amino-acid, 2  
**Cyanate**, oxygen-bonded; X-ray crystal structure and variable temperature magnetic susceptibility of di- $\mu$ -cyanatobis-[2,2',2''-triaminotriethylamine]dinickel(II) tetraphenylborate, 411  
**Cyanide**, hydrogen. Azacycloprenylideneimine: a low energy dimer, 435  
 nitrosyl, microwave spectrum and structure, 241  
**Cyanoborate** process, stereochemistry and order of the three alkyl migrations in, 186  
**Cyanogen** isocyanate, microwave spectrum and structure, 47  
**Cyanohydrin**, convenient route to derivatives. Cyanosilylation of aldehydes and ketones, 55  
**p-Cyanophenyl** azide, effect of wavelength on photolysis in dimethylamine, 360  
**Cycloaddition**, polar, stereoselectivity due to electrostatic repulsion, 156  
 reactions of [2,2](2,5)-furanophane. Novel 1:1 and 2:1 cycloadducts with benzyne, 930  
**Cycloalkanones**,  $\alpha$ -cyano-, photochemical ring enlargement, 640  
**Cyclobutadiene**, an aza-: 2-phenylbenzazete, 19  
**Cyclobutane**, methylene rocking and minimum bond tortuosity in, 786  
 monoterpenoid, first vegetable monocyclic: "junione" [1-(2,2-dimethylcyclobutyl)but-1-en-3-one], 746  
**Cyclobutane-1,2-dicarboxylates**, dimethyl, substituent effects on the competing thermal cracking and isomerization of, 375  
**Cyclobutane-1,2-dione**, microwave spectrum, planarity, and dipole moment, 612  
**Cyclobutanols**, 2-alkylidene-, ring contraction to cyclopropyl carbonyl compounds, 103  
**Cyclobutanone**, adduct, 2-methylene-, thermal isomerisation to a 2-isopropylidene-cyclobutanone: cycloadditions of arylketens to 1,1-dimethylallene, 733  
**Cyclobutanones**. Aza-ring expansion; 1,2-cycloaddition of dichloroketen to cyclo-olefins. Conformational features of *cis*-octahydrobenzo[*b*]furanones and *cis*-octahydroindolones, 3  
**1H-Cyclobut[b]indoles**, tetrahydro-, synthesis: photoaddition of olefins to indoles, 311  
**Cyclododecanone**, novel products from a Mannich reaction: 13,16-dimethyl-13,16-diazatricyclo[9,3,3,1<sup>1</sup>,1<sup>1</sup>]octadecan-18-one and 1-dimethylaminomethyl-13-methyl-13-azabicyclo[9,3,1]pentadec-11-en-15-one, 238

- Cycloheptatriene**, reaction with ruthenium carbonyl: X-ray crystallographic determination of the molecular structure of  $\text{Ru}_3(\text{CO})_6(\text{C}_7\text{H}_7)(\text{C}_7\text{H}_9)$ , 726  
 tricarbonyliron deactivation towards electrophilic attack, 482
- Cycloheptatrienethione**, cycloaddition with dienophiles, 196
- Cycloheptatrienyl** complexes, bridging: X-ray crystal structure of  $[\text{Ru}_2(\text{CO})_5(\text{SiMe}_3)(\text{C}_7\text{H}_6\text{SiMe}_3)]$ , 727
- Cyclohexa-1,3-diene**, symmetry-forbidden pyrolysis of, and unimolecular isomerisation of hexa-1, *trans*-3,5-triene, 14
- Cyclohexa-2,5-dien-1-one**, 3,4-dimethyl-4-nitro-, adduct intermediate in formation, 300
- Cyclohexadienones**, 6/5-fused cross-conjugated, photochemical rearrangements in protic solvents, 469
- Cyclohexanediones**, polychlorinated, new route to, 83
- Cyclohexene** oxide, isolation from the chromyl chloride oxidation of cyclohexene, 195
- Cyclohex-2-enones**, 3-(but-3-enyl)oxy- and 3-(pent-4-enyl)oxy-, intramolecular photocycloaddition: stereospecific formation of 2-oxabicyclo-[3,2,0]heptane and -[4,2,0]octane systems, 101
- Cyclohexyl**, 2-(but-3-enyl)-, and deca-5,9-dienyl radicals, cyclization, 280
- Cyclohexylamine**, conformational free energy ( $\Delta G$  value) of the amino-group in; from low temperature carbon-13 nuclear magnetic resonance spectroscopy, 945
- Cyclo-octatrienedione**, benzo-, and 2,3-benzohomotropone, formation of two derivatives by dichlorocarbene ring expansion, 363
- Cyclo-octenyldiene** derivatives, reactions with benzene and  $\text{BF}_3\text{-Et}_2\text{O}$ , 890
- Cyclopentadiene**, reactions with carbonyl-ruthenium and -osmium complexes: formation of carbonyl-metal hydrides, 326
- Cyclopentadienyl** group as a two-centre three-electron ligand: crystal and molecular structure of triscyclopentadienyltitanium, 97
- Cyclopentadienyldes**, sulphonium, formation. Photolysis of diazocyclopentadiene in alkyl sulphides, 365
- $\pi$ -Cyclopentadienylnitrosylnickel**, photoionisation in an argon matrix, 407
- Cyclopentasarcosyl**, crystal and solution conformation, 646
- Cyclopent-2-enones**, 4-hydroxy-2-(prop-2-enyl)-, isomerisation to 2-n-propylcyclopent-2-ene-1,4-diones, 875
- Cyclophanes**, synthesis by photochemical extrusion of sulphur, 406
- Cyclopropane**, *cis*-divinyl-, isolation and characterisation, 319  
 systems, vinyl-, alternative modes of addition of dienophiles, 859
- Cyclopropanecarbaldehydes**, ring-fused, novel epimerizations catalysed by iodide salts, 403
- Cyclopropanethiol** (homothioenol) formation by  $\beta$ -hydrogen abstraction: thione photochemistry, 130
- Cyclopropene** derivatives. Ring expansion of heteroaromatic betaines with, 833
- Cyclopropenone**, diphenyl-, rearrangements in reactions with isoxazoles, 349
- Cyclopropyl** azides, thermolysis: stereochemistry of the olefin forming process, 739  
 carbonyl compounds from ring contraction of 2-alkylidene-cyclobutanols, 103  
 groups, influence of in hydrolysis of alkylphenylphosphinamides in acidic solution, 774  
 radical, electrocyclic transformation to the allyl radical, *ab initio* calculations, 334
- Cyclopropylethylenes**, selective hydrogenation of a double bond of, by di-imine, 525
- Cyclopropylmethyl** systems, base-catalysed ring expansions in, 394
- 1-Cyclopropylvinyl** cations, effect of 2-substitution on rearrangement, 589
- Cytochalasins E and F**, revised structures, 551
- $\beta$ -Damasconone** and related compounds, simple synthesis, 161
- $\alpha$ -Damasconone**, alternative synthesis; Lewis acid catalysed Diels-Alder reaction with inverse electron demand, 742
- Deca-5,9-dienyl** and 2-(but-3-enyl)cyclohexyl radicals, cyclization, 280
- cis*-Decahydroquinoline**, effect of *N*-alkylation on the position of conformational equilibrium, 666
- trans*-2-Decalones**, conformational analysis, 949
- Dendrobine**, aspects of biosynthesis of the terpenoid, 729
- 5'-Deoxyadenosylcobalamin**, mechanism of reactions catalysed by. Facilitation of intramolecular 1,2-shifts in radicals by protonation, 939
- Deuterium**. Evidence for carbanionic intermediates during exchange between butanes and deuterium on alumina, 799  
 resonance, proton-noise-decoupled, at natural abundance, by Fourier transform, 70
- meso-Diallenes**, conjugated, synthesis and some thermal reactions, 432
- Diamantane**, splitting effect of added diamantan-4-ol on the first pre-melting transition, 7
- Diazepines**. Synthesis of 4-amino-1*H*-1,5-benzodiazepine-3-carbonitrile and related compounds, 367
- Diazepyl-2-ones**, 1,3-dihydro-2*H*-1,4-benzo-, stereochemistry of the enzymic 3-hydroxylation, 721
- Diazoacetaldehyde**, matrix photolysis, 670
- 5*H*-Dibenz[*b,f*]azepine** derivatives, photochemical cyclodimerisation, 244
- Dibenz[*b,f*]azepines**, 5-acyl-10,11-dihydro-, concerted rotational-inversion process, 282
- 2,3,4,5-Dibenzoxepin**, synthesis. Photorearrangement of 9,10-epoxy-9,10-dihydrophenanthrene, 37
- Dibenzyl** ( $^{12}\text{CH}_2$ ,  $^{13}\text{CH}_2$ ) sulphoxide—an example of optical activity due to isotopic dissymmetry of carbon, 645
- 1,6-Dicarba-closo-hexaborane(6)**, electron diffraction determination of the molecular structure, 276
- Di-*o*-carvocrotide** and di-*o*-thymotide, conformational behaviour, 571
- Dichlorocarbene** ring expansion, formation of two benzocyclo-octatrienedione and 2,3-benzohomotropone derivatives, 363
- Dichloroketen**, 1,2-cycloaddition to cyclo-olefins, and the azaring expansion of cyclobutanones. Conformational features of *cis*-octahydrobenzo[*b*]furanones and *cis*-octahydroindolones, 3
- Dictyopteris**, dihydrotropone from, 937
- 1,1-Dideuterio-2-phenyl-2-*o*-tolylethylene**, photoinduced intramolecular hydrogen abstraction, 529
- Diels-Alder** additions with *exo*-selectivity, 421  
 reactions of non-conjugated olefins, *endo*-selectivity in, 420
- Dienes** and alkynes, reactions on magnesium and other metal films, 478  
*trans,trans*-, and *trans*-alkenyl ketones, conjugated, highly stereoselective and general synthesis *via* hydroboration, 606
- 1,4-Dienes** from the nitration of 2,3- and 3,4-dimethylbenzonitriles and a 1,3-rearrangement of a nitro-group, 396
- 5,6-Dienol**, synthesis, 444
- Dienolate** anions and benzynes, substituted naphthalenes from, 524
- Dienophiles**, alternative modes of addition to vinylcyclopropane systems, 859  
 cycloaddition of cycloheptatrienethione with, 196
- 2,2-Di-(*p*-ethoxyphenyl)-3,3-dimethylloxetan**, a new insecticide, X-ray determination of structure, 34
- Dihydrotropone** from *Dictyopteris*, 937
- Di-imine**, selective hydrogenation of a double bond of cyclopropylethylenes by, 525
- trans*-Di-isopropylethylene**, detection of unstable intermediates during liquid-phase ozonolysis, 575
- Dimethylbromosulphonium** bromide. Preparation of alkyl bromides from the corresponding alcohols and  $\text{Me}_2\text{SBr}_2$ , 212
- 1,1-Dimethyl-1-phenacylhydrazinium** bromide, rearrangement, 53
- Dinitrogen tetroxide**-copper nitrate adduct,  $\text{Cu}(\text{NO}_3)_2\cdot\text{N}_2\text{O}_4$ , crystal structure, 644
- Diosquinone**, a naphthoquinonylnaphthoquinone epoxide, 463
- 1,3,2-Dioxaphospholans** from hexafluoroacetone and phosphetans, X-ray analysis. Square pyramidal phosphorus, 856
- 1,3,2-Dioxaphosphorinan-2-ones**, 2-substituted, chemical studies of their stereochemistry, 310
- 1,4,2-Dioxazines**, 2,3,3-trimethyl- and 2-methyl-tetrahydro-, preparation and conformational analysis, 908
- 1,3-Dioxoles**, formation. Photoaddition of phenanthraquinone to alkyl-substituted alkoxyacetylenes, 188
- Diphenylcyclopropenone**, rearrangements in reactions with isoxazoles, 349
- Diphenylmethane** derivatives, new synthesis, 488

- 1,3-Dipoles**, benzo[*c*]cinnoline *N*-oxides as, 837
- Disulphide**, aliphatic, molecular structures of, and of its cyclic dimeric copper(I) complex, 876
- Diterpenoids**. Convenient synthesis of the tricyclo[3,2,1,0<sup>2,7</sup>]octane system: simplified synthesis of the diterpenoid trachylobane, 689  
Microbiological transformations of 17-norkauran-16-one and 16-norphylloladan-16-one by *Aspergillus niger*, 143
- 1,2-Dithiin** 1,1-dioxides, and 5,6-dihydro-, substituted: addition of sulphenes to thioamide vinyllogues, 672
- $\alpha$ -(1,2-Dithiol-3-ylidene) ketones**, photochemically-induced *cis-trans*-isomerisation, 123
- Di-*o*-thymotide** and di-*o*-carvocrotide, conformational behaviour, 571
- Divinyloxiran-dihydro-oxepin** rearrangement, biological, stereochemistry: X-ray studies of the sesquiterpenoids miscandenin and dihydromikanolide, 428
- Donor ligand** complexation *vs.* *ortho*-metallation, 724
- Dopastin**, a dopamine  $\beta$ -hydroxylase inhibitor of microbial origin, synthesis, 147
- E2 Transition states** with non-linear proton abstraction, isotope effects, 850
- Ecdysone** biosynthesis in the blowfly *Calliphora stygia*, 203
- Electrode** surfaces, Raman spectra, 80
- Electron** impact ionization and appearance potentials, determination, 730  
polarization, chemically induced, and exciplex formation, 121
- Enamine** anions, stabilized, 636
- Enmein** and oridonin, diterpenes, biosynthesis from *ent*-16-kaurene, 434
- trans-Enynes**, conjugated, stereoselective synthesis of those readily convertible into conjugated *cis,trans*-dienes and its application to the synthesis of the pheromone bombykol, 874
- Enzyme** model system, new, showing marked substrate specificity, 898
- Epoxides**, chiral, configurational correlations for by nuclear magnetic resonance spectroscopy in optically active solvents, 25  
neighbouring hydroxy-group participation in the opening of, by nucleophiles, 839  
new method for converting into olefins: use of triphenylphosphine selenide and trifluoroacetic acid, 253
- Epoxydon**, biosynthesis with [<sup>13</sup>C]acetate, 814
- $\beta\gamma$ -Epoxy-ketones** of macrolides from their photolysis: synthetic organic photochemistry, 223
- Erbium**. Differences in Er<sup>III</sup> complexation with chloride and nitrate ions determined by the ultrasonic relaxation technique, 354
- Ergosterol** '5 $\beta$ ,8 $\beta$ -peroxide', identity, 530
- Eriolanganin** and eriolanin, novel antileukaemic *seco*-eudesmanolides from *Eriophyllum lanatum*, 842
- Eriolanin**, and eriolanganin, novel antileukaemic *seco*-eudesmanolides from *Eriophyllum lanatum*, 842
- Esters**, direct cleavage to acid halides, 425
- Etamycin**, peptide antibiotic, biosynthesis. Origin of the 3-hydroxypicolinyl and amino-acid fractions, 185
- Ethane**, excited, isotope effect on lifetime, 146
- Ethyl** acetate, 2-chloro-1-(chloromethyl)-, thermal rearrangement, 269  
radical,  $\beta$ -bromo-, CIDNP studies, 179
- Ethylamine**,  $\beta$ -aryl-, new synthesis by aryl aldehyde homologation, 781
- C-Ethylation**, biological, simulation using sulphoxide anions as intermediates, 145
- Ethylene**, chlorotrifluoro-, addition of bistrifluoromethyl trioxide. Direct synthesis of fluorocarbon peroxide, 386  
1,1-dideuterio-2-phenyl-2-*o*-tolyl, photoinduced intramolecular hydrogen abstraction in, 529  
*trans*-di-isopropyl-, detection of unstable intermediates during liquid-phase ozonolysis, 575  
Laser-Raman spectrum of polyethylene under high pressure, 16  
oligomerisation with zirconium arylalkyls and alkenyls, 132  
polymerization, electrochemical formation of initiators, 138  
Preparation of five-co-ordinate platinum- $\pi$ -ethylene complex: (diacetyl-bismethylphenylhydrazone)dichloro- $\pi$ -ethylene-platinum(II), 369  
tetrayano-, termolecular complexes with weak electron donors, 609
- Ethylene**—*continued*  
vinylidene complex derived from: H<sub>2</sub>O<sub>3</sub>(CCH<sub>2</sub>)(CO)<sub>3</sub>, hydrogenation and fluxional behaviour, 277
- Ethylenes**, cyclopropyl-, selective hydrogenation of a double bond of, by di-imine, 525  
1,1-diphenyl, reactions with. Fluorination with xenon fluoride, 845
- Ethylidene**, 1,1,1-trifluoro-, a formal insertion reaction of tricarbonyl- $\pi$ -tetramethylcyclobutadieneiron with, ring-expansion reactions of  $\pi$ -cyclobutenyliron complexes, 112
- Eucomin**, a 3-benzylchroman-4-one, biosynthesis, 438
- seco-Eudesmanolides**, eriolanganin and eriolanin, novel antileukaemic, from *Eriophyllum lanatum*, 842
- Europium**; the barrier to rotation about the Eu-N bond in the 3-picoline diadduct of tris-(2,2,6,6-tetramethylheptane-3,5-dionato)europium(III), Eu(dpm)<sub>3</sub>(3-pic)<sub>2</sub>, 936  
Eu(fod)<sub>3</sub> induced <sup>3</sup>J<sub>HP</sub> variation and conformational changes in seven-membered ring phosphates, 494  
Mass spectrometric observation of gaseous EuCN and the determination of its atomization energy, 561  
Three-co-ordinate scandium(III) and europium(III); crystal and molecular structures of their tris-hexamethylsilylamides, 669
- Everninomicin B**, hydrolysis products, 531
- Exciplex** formation and chemically induced electron polarization, 121
- Exciplexes**, formation between aromatic hydrocarbons and halogenated anions, 262
- Extrusion**, thermal cheletropy in model azabicycles; the question of linear *vs.* non-linear, 840
- 2-cis-Farnesol**, biosynthesis, 465
- Farnesols**, 2-*trans*-, 6-*trans*- and 2-*cis*-, 6-*trans*-, biosynthesis by soluble enzymes from tissue cultures of *Andrographis paniculata*, 378
- Fatty acids**, dehydrogenation to the corresponding  $\alpha\beta$ -unsaturated derivatives, 94
- Ferrocene**, 1,1'-bis-( $\alpha$ -hydroxyisopropyl)-, intramolecular cyclization reaction, 199  
sensitized photoalkoxycarbonylation of azulene. A transition-metal catalysed photoreaction, 871
- Ferrocenes**. Mössbauer and magnetic susceptibility studies of biferrrocenylene(II,III) picrate, 329
- Flavin** and pyridinium derivatives for recycling of catalytic amounts of NAD<sup>+</sup> during preparative-scale horse liver alcohol dehydrogenase-catalysed oxidations of alcohols, 205  
a new compound, roseoflavin, X-ray crystallographic determination, 703
- Flavone**, 3,4'-dihydroxy-, base-catalysed autoxidation, 9
- Flavonoid** and terphenyl metabolites, biosynthesis by the fungus *Aspergillus candidus*, 555
- Fluorene-9-methanol**, used as a phosphate protecting group in the synthesis of deoxyribo-oligonucleotides, 803
- Fluorescence**, aromatic hydrocarbon, quenching by alkylpyridinium halides, 728
- Fluorine**. Direct observation of an isolated state in the ion C<sub>2</sub>F<sub>6</sub><sup>+</sup>: a violation of the quasi-equilibrium theory of mass spectra, 832  
Gas-phase nucleophilicities of the anions: H<sup>-</sup>, F<sup>-</sup>, OH<sup>-</sup>, and NH<sub>2</sub><sup>-</sup>, 35  
non-equivalence of the apical fluorine atoms on pentacoordinate phosphorus studies by <sup>19</sup>F nuclear magnetic resonance spectroscopy, 745
- Formanilides**, new hydrogen selenide-triethylamine catalysed synthesis from aromatic amines and carbon monoxide, 853
- Free-radical ligand**, stable, spin density delocalization from, onto diamagnetic metal ions, 748
- Free radicals** as intermediates in the oxidative addition of alkyl halides to platinum(0), 948
- Friedel-Crafts** acylation, intramolecular, stereochemistry, 84
- Fulvalene**, octachloro-, Diels-Alder reactions, 910
- Furan** compounds, template effect in synthesis, 534  
mechanistic aspects of electrophilic attack on. Molecular electrostatic potentials, 617
- Furanoid** norditerpene, novel, from *Teucrium viscidum var. Miquelianum*: tuecvin, 793
- 9-Furoic acid**, 5-nitro-, and 5-nitrouacil, oxidative denitration by hydroxy-radicals, 309

- [2,2](2,5)-Furophane, cycloaddition reactions of. Novel 1:1 and 2:1 cycloadducts with benzene, 930
- $\beta$ -D-Galactopyranosylpyridinium cation,  $\beta$ -galactosidase-catalysed hydrolysis, 535
- Gallium.** X-Ray structural characterization of the pyrazolyl dideuteriogallane dimer, 189  
Synthesis and structure of a five-co-ordinate gallium complex: chlorobis-(8-hydroxy-2-methylquinolino)gallium(III), 884
- Gentamine C<sub>1</sub>**, 3-amino-2,3-dideoxy- $\alpha$ -D-arabino-hexopyranosyl, synthesis, 675
- Germacranolide**, novel cytotoxic, from *Elephantopus mollis*: molephantin. X-Ray crystal structure, 476  
sesquiterpene dilactone, new, carbon-13 and proton magnetic resonance study of the structure and conformation, 614
- Germane**, triphenyl-, hydrogen-exchange with alcohols, 780
- Germanium.** Novel formation of polygermanes, 127  
silicon, and tin pentafluoro-orthotellurates, 600
- $\Delta^{10}(11)$ -Gibbanes** and related compounds, stereochemistry of catalytic reduction: intramolecular keto-carbenoid addition to double bonds, 548
- Gibberellin** biosynthesis in the mutant BI-41a of *Gibberella fujikuroi*, 777
- Glasses**, solvent cages, co-ordination compounds, crystals, and related systems, cation vibrations in, 161
- D-Gluconate**, 2,5-diketo-: new intermediate for the synthesis of N-methyl- and -aryl-5-oxidopyridinium derivatives, 796
- D-[<sup>15</sup>N]Glucosamine**, incorporation of the amino-group of into the aziridine ring of mitomycin B. Mitomycin biosynthesis by *Streptomyces verticillatus*, 88
- D-Glucose**, 2,4-diacetamido-2,4,6-trideoxy-, synthesis and identification with the diacetamido-sugar of *Bacillus licheniformis*, 668  
6-phosphates, deoxyfluoro-, disodium, high resolution field desorption mass spectrometry, 416
- Glyceraldehyde**: an X-ray study of DL-glyceraldehyde dimer, 880
- Glycerol** derivatives, nucleophilic substitution in. Reactions of acylglycerols with triphenylphosphine and carbon tetrachloride, 110
- 6-Glycosylpyrazolo[3,4-d]pyrimidines**, 4-amino-, synthesis, 680
- Gold.** Antisymbiosis and the *trans*-effect in gold(I) thiocyanate complexes, 613  
Crystal structure of  $[\text{Xe}_2\text{F}_{11}]^+[\text{AuF}_6]^-$ , 131  
Hydrogenation over supported gold catalysts, 444  
Mechanism of insertion of an acetylene into the methylgold bond: structure of a reaction intermediate, 373  
New route to aryl-gold  $\sigma$ -bonded complexes, 851  
New type of organogold compound. Molecular structure of  $[(\pi\text{-C}_6\text{H}_5)_2\text{Fe}(\pi\text{-C}_5\text{H}_4)\text{Au}_2(\text{PPh}_3)_2]^+[\text{BF}_4]^-$ , 338  
Spontaneous isomerization of t-butylgold(III), 423
- Graphite**, intercalation of antimony pentafluoride in the lattice of, 815
- Grignard reagents**, homogeneous catalytic activation by nickel complexes. New stereospecific method for reduction of alkoxy-, chloro-, and fluoro-silanes, 164  
reaction with 5,6-benzo-1,2,4-triazine 1-oxides, 622
- Group VIII Metals**, reductive nitrosylation, 64
- Guanosine**, 7-methyl-, demethylation with lithium 2-methylpropane-2-thiolate, 387
- Hallactones A and B**, insect toxins from *Podocarpus hallii*, structures, 166
- Halogen** anions and aromatic hydrocarbons, formation of exciplexes between, 262
- Hepta-5,6-dienyl** toluene-*p*-sulphonate, cationic cyclization involving a remote allene function in trifluoroethanolysis of, 679
- Heptaketide** naphthalic anhydride from *Verticillium lamellicola*—lamellicolic anhydride, 108
- [3,2,0]Heptane and [4,2,0]octane, 2-oxabicyclo-, stereospecific formation: intramolecular photocycloaddition of 3-(but-3-enyl)oxy- and 3-(pent-4-enyl)oxy-cyclohex-2-enones, 101
- Heterocycles**, N-bridged. Preparation and properties of 1,3-polymethylenebenzimidazolium salts and related systems, 427
- Heterocyclic** bridged-ring system, new, structure and novel reactivity, 597  
compounds, nitrogen, quaternised, simple method for demethylation, 32  
compounds, novel synthesis from acetylenes, 280  
systems, novel, from substitution of 6a-thiathiophthens and related compounds with arenediazonium fluoroborates with accompanying rearrangement, 92
- Heteropolyanions**, novel structural class: 18-tungstotetra-cobalt(II)diphosphate and related anions, 139
- Hexamethyldisilane**, kinetically determined bond dissociation energies, 323
- Hexane**, 1-acetoxy-4,5-epoxy-, and *trans*- and *cis*-1-acetoxy-3,4-epoxy-pentane, acid-catalysed rearrangements, 261
- Hexa-1,trans-3,5-triene**, unimolecular isomerisation and symmetry-forbidden pyrolysis of cyclohexa-1,3-diene, 14
- $\alpha$ -D-ribo-Hexopyranoside**, 2,6-diacetamido-2,3,6-trideoxy-, ethyl, a derivative of the diamino-sugar component of the antibiotic nebramycin factor 6, synthesis, 710
- D-Homo-5 $\alpha$ -androstan-17 $\alpha$  $\beta$ -yl** tosylate, unexpected inversion of configuration of a quaternary centre during acetolysis, 341
- "Homo-Favorskii" reaction**, evidence against a keten intermediate in, 771  
intermediacy of a keten, 165
- Homotropone**, 2,3-benzo-, and benzocyclo-octatrienedione, formation of two derivatives by dichlorocarbene ring expansion, 363
- Hordenine** and tyramine, stereochemistry of conversion into tyrosol by *Willia anomala* Hansen, 862
- Horeau's** method, gas chromatographic modification. Absolute configurations of secondary alcohols, 194
- Hydrazine**-producing intermediate in the nitrogen fixing system  $\text{cp}_2\text{TiCl}_2 + \text{Pr}^1\text{MgCl} + \text{N}_2$ , 169
- Hydrazines**, reactions with platinum-nitrile complexes; X-ray structural characterization and electrochemistry of *trans*-bis-1-acetyl-3-t-butyl-1,2,4-triazabutadieneplatinum, 297
- Hydrazonates**, aliphatic, 932
- Hydrides**,  $\beta$ -phase, formation by palladium-cerium solid solutions, 102
- Hydrocarbon** fluorescence, aromatic, quenching by alkylpyridinium halides, 728  
molecules, strained, theoretical study of proton approach towards, 747
- Hydrocarbons**, aliphatic open-chain, proton chemical shift and localization, 536  
aromatic, and halogen anions, formation of exciplexes between, 262  
aromatic, disproportionation of toluene over electron donor-acceptor complexes with sodium, 498  
[CH]<sub>12</sub>. Directed synthesis of pentacyclo [6,4,0<sup>8,11</sup>,0<sup>7,9</sup>,0<sup>10,12</sup>]-dodeca-2,4-diene, 409  
studies of hot hydrogen reactions with; effect of helium moderator, 107  
Unusual anionic rearrangement in the [CH]<sub>10</sub> series, 599
- Hydrogen** atoms adsorbed on clusters of nickel atoms, CNDO MO calculations, 625  
compounds, active, nickel-catalysed reactions with allene, 472  
exchange, aromatic, steric hindrance in, 936  
Gas-phase nucleophilicities of the anions: H<sup>-</sup>, F<sup>-</sup>, OH<sup>-</sup>, and NH<sub>2</sub><sup>-</sup>, 35  
hot, reactions with hydrocarbons, effect of helium moderator in studies, 107  
Reappraisal of an inconsistency in recoil tritium chemistry, 225
- Hydrogenation** over supported gold catalysts, 444
- Hydrogen cyanide**, a low energy dimer: azacycloprop-enylideneimine, 435
- Hydrogen peroxide**, effect on the rate of hydrolysis of t-butyl chloride, 514
- Hydroquinone** as a reducing agent for conversion of aryldiazonium salts into arenes, 605
- Hydroxamic** acids, oxidative cleavage, nitrosocarbonyl compounds as intermediates, 704
- Illudin M**, sesquiterpenoid, incorporation of [<sup>2-3</sup>H<sub>2</sub>]- and [4(R)-4-<sup>3</sup>H]-mevalonoid hydrogen atoms, 171

- Imidazole-4-carboxamidine**, *N'*-alkoxy-1-alkyl-5-formamido-, synthesis of 3,9-dimethyl- and 3-methyl-9-ethyl-adenine *via*, 917
- Imines**, bicyclic, alkylation with the Stork-Dowd reagent system, 299
- Imino-group**, novel method for conversion into the carbonyl group *via* nitrosoimines: preparation of *S*-alkyl thiocarbamates from *S*-alkylisothiouras, 13
- 4-Iminoacetidin-2-one** derivatives, formation. Cycloaddition of isocyanates to ketenimines, 271
- Indene** radical cation, photochemical and ferric ion-induced formation and reactions of: radical cations, 677
- Indolequinones**, synthesis. New synthetic route to the pyrrolo[1,2-*a*]indole ring systems, 358
- Indoles**, 2-methyl-, conversion of *N*-2'-chloroallylanilines into, 208  
photoaddition of ketones: synthesis of oxeto[2,3-*b*]indoles, 13  
Photoaddition of olefins to indoles: synthesis of tetrahydro-1*H*-cyclobut[*b*]indoles, 311
- Indolones** and benzo[*b*]furanones, *cis*-octahydro-, conformational features. 1,2-Cycloaddition of dichloroketen to cyclo-olefins and the aza-ring expansion of cyclobutanones, 3
- INDOR** nuclear magnetic resonance spectra, pseudo, using double resonance difference spectroscopy and the Fourier transform technique, 611
- Intramolecular 1,2-shifts**, facilitation of in radicals by protonation. The mechanism of reactions catalysed by 5'-deoxyadenosylcobalamin, 939
- Iodine** atoms, excited, chemical reactions, 683  
Hyperfine coupling of iodine in  $\alpha$ -iodoalkyl radicals: the radical HC(I)CONH<sub>2</sub> in  $\gamma$ -irradiated  $\alpha$ -iodoacetamide, 717  
kinetics of the gas-phase reaction with trimethylsilane and the bond dissociation energy  $D(\text{Me}_3\text{Si}-\text{H})$ , 513
- $\alpha$ -Iodocarboxylates**, new class of reagents for their formation: thallium(i) carboxylates, 359
- Iodoform** and diethylzinc, ring-expansion of alkylbenzenes by the zinc-carbenoid reaction with, 216
- Iodomethyl** sulphoxides, synthesis, 319
- Ions**, metastable and normal, appearance potentials and the kinetic shift, 510
- Iridium**. Iridium(III) salts as homogeneous metal catalysts for hydrogen isotope exchange in organic compounds: comparison with heterogeneous iridium for the deuteration of alkylbenzenes, 749  
Large ring compounds involving *trans*-bonding bidentate ligands, 947  
New hydrido-iridium(III) isomer of Ir(PPh<sub>3</sub>)<sub>2</sub>(CO)Cl, 857  
Preparation and crystallographic characterization of a 2:1 adduct of ethynyl-dicarbonyldecaborane(12) and *trans*-IrCl(CO)(PPh<sub>3</sub>)<sub>2</sub>, 465  
Preparation and *X*-ray crystal and molecular structure of di- $\mu$ -diphenylphosphido-bis(triphenylphosphinecarbonyl-iridium), 946  
Preparation and *X*-ray crystal structure of tetranitrosylbis(triphenylphosphine)di-iridium, 789
- Iron**. Chiral tricarbonylcyclobutadieneiron complexes, 76  
Electrophilic substitution of tricarbonyl(norbornadiene)iron, 271  
Formal insertion reaction of tricarbonyl- $\pi$ -tetramethylcyclobutadieneiron with 1,1,1-trifluoroethylidene; ring-expansion reactions of  $\pi$ -cyclobutenyliron complexes, 112  
Higher oxidation state iron and cobalt phthalocyanine derivatives. Phthalocyanine radical cation complexes, 483  
Insertion reactions of hexafluoroacetone with tricarbonyl-(diene)iron and  $\pi$ -cyclopentadienyl(diene)rhodium complexes, 114  
Intramolecular cyclization reaction of 1,1'-bis-( $\alpha$ -hydroxyisopropyl)ferrocene, 199  
Ligand field photochemistry of Co(en)<sub>3</sub><sup>3+</sup>; reaction with Fe(CN)<sub>6</sub><sup>4-</sup> in NaCl solutions, 351  
Magnetic and Mössbauer investigations of *NN*-disubstituted dithiocarbamate-iron(II) complexes, 902  
Monocarbon monoxide complexes of iron(II): synthesis and *X*-ray structural characterisation, 337  
Mössbauer and magnetic susceptibility studies of biferrocenylene(II,III) picrate, 329  
New method for determining signs of Mössbauer quadrupole splittings: relative signs of <sup>119</sup>Sn and <sup>57</sup>Fe quadrupole splittings in {Fe(SnCl<sub>3</sub>)[P(OMe)<sub>3</sub>]<sub>3</sub>}<sup>+</sup> BPh<sub>4</sub><sup>-</sup>, 503
- Iron**—*continued*  
Nitric oxide complexes of iron(II) and iron(III) porphyrins, 897  
N<sub>4</sub>O<sub>6</sub><sup>3+</sup> group: *X*-ray crystal structure of Fe(NO<sub>3</sub>)<sub>3</sub>·1.5 N<sub>2</sub>O<sub>4</sub>, 347  
Oxidations of a quadridentate iron(II) Schiff base complex by organic molecules, 17  
Paramagnetic hydrido- and chloro-complexes of iron(I), 233  
porphyrins and carbon monoxide, reaction between, 325  
Primary photochemistry of matrix isolated tricarbonylcyclobutadieneiron, 681  
Synthesis of cobaltaferracarboranes: two methods, 805  
*meso*-Tetraphenylmethoxyisoporphyriniron(III) chloride, 715  
Tricarbonyliron deactivation of a cycloheptatriene towards electrophilic attack, 482  
(±)-**4-Isoavenaciolide**, a metabolite of *Aspergillus avenaceus*, total synthesis, 499
- Isocyanates**, amide formation from reactions with  $\beta$ -ketoimine complexes: reactions of co-ordinated ligands, 690  
cycloaddition to ketenimines. Formation of 4-iminoacetidin-2-one derivatives, 271
- D-Isoleucine**, biosynthetic origin in the monamycins, 782
- Isoquinoline**. *cis-trans* Isomerisation and ligand exchange reactions of an isoquinoline-platinum(II) complex, 486
- Isoquinolines**. Hydrogen transfer in imminocarbenes; a new synthesis of, 835
- Isoquinolinium** ylides, reactions: amine-catalysed cycloaddition of aldehydes and ketones, 188
- Isothiazolo[2,3- $\alpha$ ]pyridinium** salts, synthesis, 150
- Isoxazoles**, rearrangements in reactions with diphenylcyclopropenone, 349
- 5-Isoxazolylalkyl** carbanions, acylation: synthesis of bis- and tris-isoxazole compounds, 233
- "Junione"** [1-(2,2-dimethylcyclobutyl)but-1-en-3-one], the first vegetable monocyclic cyclobutane monoterpene, 746
- Karplus** relation, applicability to <sup>31</sup>PCC<sup>13</sup>C coupling constants, 287
- ent-16-Kaurene**, biosynthesis of the diterpenes enmein and oridonin from, 434
- Keten**, intermediacy in the "Homo-Favorskii" reaction, 165  
intermediate in the "Homo-Favorskii" reaction, evidence against, 771
- Ketenimines** from cycloaddition of isocyanates. Formation of 4-iminoacetidin-2-one derivatives, 271
- Keto-carbenoid** addition to double bonds, intramolecular, stereochemistry of the catalytic reduction of  $\Delta^9(11)$ -gibbenes and related compounds, 548
- $\beta$ -Ketoimine** complexes, amide formation from reactions with isocyanates: reactions of co-ordinated ligands, 690
- Ketone**, reduction by lithium di-*n*-butylcuprate, 320  
 $\beta\gamma$ -unsaturated, photochemical approach to hydroazulenes by photolysis of: synthetic organic photochemistry, 501
- Ketones**, alicyclic, direct deoxygenation of, a new olefin synthesis, 935  
and aldehydes, amine-catalysed cycloaddition of, in reactions of isoquinolinium ylides, 188  
and aldehydes, cyanosilylation. Convenient route to cyanohydrin derivatives, 55  
and aldehydes, reactions with silicon-carbon double-bonded intermediates, 167  
and *o*-hydroxyaldehydes, conversion into *o*-hydroxyanilides by monochloramine, 716  
aromatic  $\alpha$ -halogeno-, zinc-induced free-radical reactions with terminal olefins, 858  
dehydrogenation, new method: fragmentation of selenoxides, 695  
 $\beta\gamma$ -epoxy-, macrolides from their photolysis: synthetic organic photochemistry, 223  
 $\beta\gamma$ -epoxy, photochemistry: photoisomerization of 2,2,4,4-tetramethyl-7-oxabicyclo[4,1,0]heptan-3-one, 881  
new general method for their preparation—alkylation and protonation of alkynyltrialkylborate salts, 544  
new mild complex hydride reducing agent with high stereoselectivity for their reduction. Potassium tri-isopropoxyborohydride,  
photoaddition to indoles: synthesis of oxeto[2,3-*b*]indoles, 13
- Kinetic shift** and appearance potentials of metastable and normal ions, 510
- Koibe reaction**, stereoselectivity and adsorption in, 305

- Krypton.** Cations  $\text{KrF}^+$ ,  $\text{XeOF}_3^+$ , and  $\text{XeOF}_5^+$  and oxidizing properties of  $\text{KrF}^+$ , 26  
difluoride adducts, new, 370
- $\alpha$ -Lactams**, thermal decomposition: new ring expansion of an  $\alpha$ -lactam to a  $\beta$ -lactam system, 48
- $\beta$ -Lactams**, synthesis by photolytic Wolff rearrangement, 328
- Lactone**,  $\text{C}_{16}$ -terpenoid, a plant growth regulator, biosynthesis, 802
- Lactones**, method for alkylating, 711  
 $\alpha$ -methylene, general route to:  $\alpha$ -carboxylation of lactones, 501
- $\gamma$ -Lactones** and  **$\gamma\delta$ -unsaturated acids**, convenient route to: oxidative radical addition to alkenes, 693
- Lamellicolic anhydride**—a heptaketide naphthalic anhydride from *Verticillium lamellicola*, 108
- Lanthanide** induced shift reagents, application to organic cations by outer sphere complexation, 630  
nuclear magnetic resonance shift reagents, chiral, 381  
nuclear magnetic resonance shift reagents, nature of the species present in solutions of, 113  
and related metals, cleavage of metal-metal and metal-halogen bonds by, 775  
shift reagent systems, solvation numbers for, 339
- Lead.** Stabilisation of metals in a low co-ordinative environment using the bis(trimethylsilyl)methyl ligand: coloured  $\text{Sn}^{\text{II}}$  and  $\text{Pb}^{\text{II}}$  alkyls,  $\text{M}[\text{CH}(\text{SiMe}_3)_2]_2$ , 317
- Ligands**, heterocyclic, equilibria in complexes of, 585  
*trans*-bonding bidentate, large ring compounds involving, 947
- Linear dichroism**, use of for the establishment of rotameric conformations of acetyl substituted steroids, 943
- Liquid crystalline esters**, unsymmetrical, 396
- Lithium**, *t*-butyl-, reaction with 1-ethoxybicyclo[2,2,2]oct-2-yl-lithium; formation of bicyclo[2,2,2]oct-1-ene, 542  
dialkylcuprates, reaction with  $\beta$ -alkoxy- and  $\beta$ -alkylthio- $\alpha\beta$ -unsaturated carbonyl compounds, 907  
*di-n*-butylcuprate, reduction of a ketone by, 320  
Electron-deficient transition-metal compounds: a lithiobis- $\pi$ -cyclopentadienylmolybdenum tetramer: crystal structure and properties, 759  
2-methylpropane-2-thiolate, demethylation of 7-methylguanine with, 387  
Synthesis and crystal structure of bicyclo[1,1,0]butan-1-yl-lithium-tetramethylethylenediamine, 44
- Long-chain** aliphatic compounds, deuterium isotope effects on  $^{13}\text{C}$  chemical shifts in long-chain aliphatic compounds, 692
- Luciferin**, *Renilla* (sea pansy), and its analogues, chemiluminescence, 492
- Macrocyclic** systems, novel multi-bridged, 366
- Magnesium.** Hydrazine-producing intermediate in the nitrogen fixing system:  $\text{cp}_2\text{TiCl}_2 + \text{Pr}^{\text{I}}\text{MgCl} + \text{N}_2$ , 169  
iodide reaction with tosylates, 821  
Reactions of alkynes and dienes on magnesium and other metal films, 478  
reactivity, effect of added metal salts. Activated metals, 879
- Malonate** anion, fluxional isomerism—an instance of intramolecular homoconjugate addition, 81
- Manganese**, and rhenium carbonyl difluorosulphoximides, 823  
Crystal structure of di- $\mu$ -hydroxo-bis-[ $\text{N}^{\text{N}}$ -trimethylenebis(salicylaldiminato)manganese(III)]-tetrapyrroline, a supposed oxygen carrier, 760  
Dicarbonyl(methylcyclopentadienyl)(benzonorbornadienone)-manganese, 795  
Group VI transition metal carbonyl derivatives, 405  
Metal complexes of novel sulphur- and phosphorus-containing heterocycles. Preparation and structure of tricarbonyl- $\eta^4$ -(1-pentafluorophenyl)-2,3,4,5-tetrakis(trifluoromethylthiophen)-manganese and  $\pi$ -cyclopentadienyl-(1-hydroxy-2,3,4,5-tetrakis(trifluoromethyl)phosphole 1-oxide)cobalt, 583  
Preparation and molecular structure of (3-acetyl-4,5-dihydrofuran-2-yl)tetracarbonylmanganese(I), 243  
Synthesis and molecular structure of a metalloborane zwitterion  $\text{Mn}(\text{CO})_5[\text{B}_3\text{H}_{12}\{\text{O}(\text{CH}_2)_4\text{NEt}_3\}]$ , 295  
Three- and five-co-ordinate manganese(II) in zeolite A, 382
- Marcus rate theory** and the relationship between Brønsted exponents and energy of reaction, 371
- Maslinic acid** and 3-epimaslinic acid, biosynthesis of the terpenes, in tissue cultures of *Isodon japonicus* Hara, 707
- Mass spectra**, Direct observation of an isolated state in the ion  $\text{C}_6\text{F}_6^+$ : a violation of the quasi-equilibrium theory of, 832
- Mass spectrometry.** Fragmentation occurring in proton-transfer chemical-ionization mass spectrometry, 872
- Meisenheimer** complexes, thio-analogues, 229
- Mephenesin** isomers: absolute configuration of 3-aryloxypropane-1,2-diols and derivatives, 896
- Mercury.** Asymmetric induction in the cyclisation of *o*-allylphenol with chiral mercury(II) carboxylates. Effect of dimethyl sulphoxide, 573  
Binding of methylmercury by amino-acids: X-ray structure of DL-penicillaminatomethylmercury(II), 741  
Novel mercury(II) porphyrins: identification of porphyrin primary 'type-isomers', 515  
Preparation and carbon-13 nuclear magnetic resonance spectra of arene complexes of mercury(I), 626  
Preparation and crystal structure of the  $\text{Hg}_2^{2+}$  ion, 723
- Mesoionic system**, new, unusual carbonyl infrared band, 402
- [2,2]Metacyclophanes**, unsymmetrically-substituted, *via* a free-radical substitution reaction, 220
- Metal**, alkyl-, carbonyl compounds; oxidatively induced carbonyl insertion and nucleophilic cleavage reactions, 163  
arsole complexes, 258  
bis-phosphine derivatives, deceptive  $^{13}\text{C}$  nuclear magnetic resonance spectra, 455  
carbonyls, production of carbonyl anions by vacuum ultraviolet photolysis of, 763  
chelates, bridging intermediates in a redistribution reaction of some, 50  
complexes, macrocyclic, tricyclic, and quadricyclic. Metal ion directed syntheses from butane-2,3-dione dihydrazone and formaldehyde: template condensations, 62  
dienyl complexes, cationic, as electrophilic reagents on aromatic molecules, 540  
hydrides, carbonyl-, formation: reactions of cyclopentadiene with carbonyl-ruthenium and -osmium complexes, 326  
ions, diamagnetic, spin density delocalization from a stable free-radical ligand onto, 748  
-metal and metal-halogen bond cleavage by lanthanide and related metals, 775  
-metal bonded carbonyls, kinetic and spectroscopic parameters for, 267  
salts, Raman spectra of liquid ammonia solutions of, 914
- Metallation** of 2-vinylpyridine by rhodium(III), 838  
internal, of *N*- or *P*-donor bidentate ligands to give multi-dentate organometallic compounds, 516
- ortho-Metallation** *vs.* donor ligand complexation, 724
- Metallocarborane**, mixed-metal bimetallic monocarbon, synthesis by polyhedral expansion, 560  
trimetallic, synthesis by polyhedral expansion, 706
- Metals**, Group VIII B, reductive nitrosylation, 64
- Methane** derivatives, diphenyl-, new synthesis, 488  
Electron diffraction study of gaseous  $\text{CH}(\text{NO}_2)_3$  and  $\text{CCl}(\text{NO}_2)_3$ , 709  
Linnett planar, 163
- Methionine**, stereospecific oxidation to methionine sulphoxide by tetrachloroauric(III) acid, 878
- Methoxide**, sodium, adduct with 2-methoxytropone: a flattened, conjugated seven-membered ring with tetrahedral carbon, 523
- Methoxyphenylcarbene** insertion into Group IV element-hydrogen bonds *via* a chromium carbene complex, mechanism, 578
- Methyl** groups, vinylic, conformation, 754  
halides, triaryl-, one-electron transfer in reactions with the perfluoro-*t*-butyl anion, 458  
isonitrile, insertion into niobium- and tantalum-chlorine bonds, 127  
nitrite rotamers, vibrational assignments, 450
- Methylamine**, reaction with arenediazonium salts: substituent effects, 701
- N-Methylaminosulphonates**, aryl, evidence consistent with an elimination mechanism in their hydrolysis, 356
- Methylene** group, unusual photochemical loss of, 502
- $\alpha$ -Methylene** lactones, general route to:  $\alpha$ -carboxylation of lactones, 500
- Methylodine(III)** difluoride, 739
- Methylketenylacylium** ion, formation in  $\text{SbF}_5\text{-FSO}_3\text{H}$ , 5
- Methylthiomethyl** esters, formation and hydrolysis, 224

- [2-3H<sub>2</sub>]- and [4(R)-4-3H]-Mevalonoid hydrogen atoms, incorporation into the sesquiterpenoid illudin M, 171
- Micellar** solutions, counter-ion nuclear magnetic resonance chemical shifts in, 93
- Microwave** spectroscopy, determination of the molecular structure of C<sub>4</sub>B<sub>2</sub>H<sub>6</sub>, 928
- Mikanolide**, dihydro-, and miscandenin, X-ray studies of the sesquiterpenoids: stereochemistry of the biological divinylloxiran-dihydro-oxepin rearrangement, 428
- Miscandenin** and dihydromikanolide, sesquiterpenoids, X-ray studies: stereochemistry of the biological divinylloxiran-dihydro-oxepin rearrangement, 428
- Mitomycin** biosynthesis by *Streptomyces verticillatus*. Incorporation of the amino-group of D-[<sup>15</sup>N]glucosamine into the aziridine ring of mitomycin B, 88
- Molephantin**, a novel cytotoxic germacranolide from *Elephantopus mollis*. X-Ray crystal structure, 476
- Mollisin**, Fourier transform <sup>13</sup>C nuclear magnetic resonance spectrum; utilization of <sup>13</sup>C—<sup>13</sup>C coupling in structural and biosynthetic studies, 867
- Molybdenum** and tungsten hexafluorides, oxidising behaviour, 667
- Electron-deficient transition metal cluster compounds: Preparation and crystal structures of some molybdenum- and tungsten-aluminium compounds, 426
- Electron-deficient transition-metal compounds: a lithiobis- $\pi$ -cyclopentadienylmolybdenum tetramer: crystal structure and properties, 759
- Heptakis(alkyl isocyanide)molybdenum(II) complexes, 202
- Novel free-radical-containing molybdenum(V) complex, 120
- Observation of a  $\pi$ - to  $\sigma$ -rearrangement upon proton addition to bicyclo[6,1,0]nonatrienetricarbonylmolybdenum, 187
- Preparation and structures of the Me<sub>4</sub>N[M<sup>1</sup>{M<sup>2</sup>(CO)<sub>5</sub>( $\pi$ -C<sub>5</sub>H<sub>5</sub>)<sub>2</sub>}<sub>2</sub>] salts (M<sup>1</sup> = Cu<sup>I</sup> or Ag<sup>I</sup>; M<sup>2</sup> = Mo or W), 71
- Preparation, spectrum, and substitution properties of Mo-(H<sub>2</sub>O)<sub>6</sub><sup>3+</sup>, 767
- X-Ray structural and Raman data, including remarkable resonance Raman effects, for quadruple molybdenum-to-molybdenum bonds, 399
- Separation and unusual stability of the sulphur bridged ion Mo<sub>2</sub>S<sub>2</sub>O<sub>4</sub><sup>2+</sup>, 909
- Synthesis of bis- $\pi$ -benzene-titanium and -molybdenum using metal vapours, 866
- Montanine**-type alkaloids, biological conversion of *O*-methyl-norbelladine into, stereochemistry of hydrogen removal  $\beta$  to nitrogen, 430
- Monoterpenes**, Raman circular intensity differential observations on some, 152
- Monaterpenoid**, first vegetable monocyclic cyclobutane, "junione" [1-(2,2-dimethylcyclobutyl)but-1-en-3-one], 746
- Muscalure**, (Z)-tricos-9-ene, one-step synthesis of the housefly sex attractant, 735
- Mycelianamide**, biosynthetic incorporation of stereoselectively labelled [ $\beta$ -<sup>3</sup>H]tyrosine into, 322
- Mycophenolic acid**, halogenated analogues, 222
- Nandazurine**, and corunnine, total synthesis. Novel oxidative photochemical porphine synthesis, 915
- Naphthalene**, binding site of, to bile salt micelles as determined by <sup>1</sup>H nuclear magnetic resonance, 918
- derivatives, 1-aryltetrahydro-, molecular crowding and remote substituent effects, 487
- [<sup>2</sup>H<sub>8</sub>]Naphthalene, infrared spectroscopy in its lowest triplet state, 528
- [2,2](2,7)Naphthalenophane-1,11-diene, synthesis, 806
- Naphthalenes**, substituted, from benzynes and dienolate anions, 524
- Naphthalic anhydride**, heptaketide, from *Verticillium lamellicola*—lamellicolic anhydride, 108
- 2-Naphthol**, 1-phenylazo-, conversion into the benzenediazonium ion: another route to phenyl radicals, 572
- 2-Naphthonitrile** and vinyl ethers, photoreaction: a novel photorearrangement of the primary cycloadduct, 219
- 1,4-Naphthoquinone**, 2-benzimidoyl-3-hydroxy-, and its analogues, photochemical synthesis. A new type of plant growth regulator, 218
- Naphthoquinonylnaphthoquinone** epoxide: diosquinone, 463
- Naphthyl ketones**,  $\alpha$   $\rightarrow$   $\beta$  rearrangements under Friedel-Crafts acylation conditions, 362
- 1,8-Naphthyridine**, 1,5,7-trisubstituted 4-oxo-1,4,5,8-tetrahydro-, spontaneous hydroxylation, 579
- Nebramycin** factor 6, antibiotic, synthesis of a derivative of the diamino-sugar component: ethyl-2,6-diacetamido-2,3,6-trideoxy- $\alpha$ -D-ribo-hexopyranoside, 710
- Neighbouring hydroxy-group participation** in the opening of epoxides by nucleophiles, 839
- Neopentane** molecule recently labelled by recoil tritium, evidence for the non-equilibration of vibrational excitation energy, 474
- Nephelauxetic** effect and Pauling electronegativity, 635
- Nickel**, 2,2'-Bi-1,3-dithiolyliumnickel bismaleonitridedithiolate, 923
- CNDO MO Calculations for hydrogen atoms absorbed on clusters of nickel atoms, 625
- Conversion of distorted tetrahedral bis(benzylidiphenylphosphine)dibromonickel(II) into a pure planar complex by high pressure, 266
- Crystal and molecular structure of tetrafluoroethylene-1,1,1-tris(diphenylphosphinomethyl)ethanenickel, 198
- Evidence for a dissociative mechanism in the reaction of a five-co-ordinate nickel(II) complex, 556
- Mass spectroscopic detection of Ni(CS)<sub>4</sub>, 705
- Photoelectron spectrum of bis( $\pi$ -allyl)nickel, 250
- Photoionisation of  $\pi$ -cyclopentadienylnitrosylnickel in an argon matrix, 407
- "P-2 nickel" catalyst with ethylenediamine, a novel system for highly stereospecific reduction of alkynes to *cis*-olefins, 553
- Pressure induced irreversible conversion of distorted tetrahedral dichloro-*trans*-2-(2'-quinolyl)methylene-3-quinclidinenickel(II), [Ni(qnqn)Cl<sub>2</sub>], into binuclear square pyramidal [Ni(qnqn)Cl<sub>2</sub>]<sub>2</sub>, 719
- X-Ray crystal structure and variable-temperature magnetic susceptibility of di- $\mu$ -cyanato-bis-[2,2',2''-triaminotriethylamine]dinickel(II) tetraphenylborate; an oxygen-bonded cyanate, 411
- Reaction of hexafluorobut-2-yne with nickelocene and the crystal structure of [C<sub>8</sub>H<sub>8</sub>NiCF<sub>3</sub>CCCCF<sub>3</sub>]<sub>4</sub>, 865
- Solvatochromic dithiolenes- $\alpha$ -di-imine nickel complexes, 433
- Some tetranuclear nickel(II), cobalt(II), and mixed cobalt(II)/cobalt(III) complexes of a binucleating ligand, 392
- Synthesis and crystal structure of bis(triethylphosphine)-[hexakis(trifluoromethyl)benzene]platinum, and of a nickela-cycloheptatriene complex, 31
- Trigonal pyramidal five-co-ordinated Ni(0) complex, 886
- Unusual catalysis with nickel(0) complexes, 157
- Nicotinamide** mononucleotide, solution conformation: a nuclear Overhauser effect investigation, 42
- Nigrifactin**, biosynthesis, 75
- Niobium**. Eight-co-ordinated metal chelate with a D<sub>4</sub> square antiprismatic configuration: tetrakis(dipivaloylmethanato)niobium(IV), 242
- Insertion of methyl isonitrile into niobium- and tantalum-chlorine bonds, 127
- The octacyanonioate(IV) ion, 816
- Nitrates**. N<sub>4</sub>O<sub>8</sub><sup>2+</sup> group: X-ray crystal structure of Fe(NO<sub>3</sub>)<sub>3</sub>·1.5N<sub>2</sub>O<sub>4</sub>, 347
- Nitric oxide** complexes of iron(II) and iron(III) porphyrins, 897
- Nitrile**, methyl, vibrational assignments for rotamers, 450
- sulphides, 524
- Nitriles**, neutral conversion into, at low temperature, 628
- Nitro-group**, 1,3-rearrangement of, and 1,4-dienes from the nitration of 2,3- and 3,4-dimethylbenzotrioles, 396
- ortho-Nitrobenzyl** resin, removal of protected peptides from, by photolysis, 610
- Nitrogen** chemisorption on reduced cobalt oxide with K<sub>2</sub>O as promoter, 270
- heterocyclic compounds, quaternised, simple method for demethylation, 32
- Nitrogen-15 nuclear magnetic resonance spectroscopy. Spin-coupling between directly bonded <sup>15</sup>N-nuclei, 602
- Nitronylnitroxide**, free-radical, and diamagnetic succinimide, X-ray structures, 888
- Nitrosamine** photoaddition to norbornene and the mechanism of nitroalkane cleavage, 827
- N-Nitrosobis(2,4,6-trimethylbenzyl)amine**, abnormal reduction with lithium aluminium hydride, 98
- Nitrosocarbonyl** compounds as intermediates in the oxidative cleavage of hydroxamic acids, 704

- Nitrosoimines**, conversion of the imino-group into the carbonyl group *via*, novel method; preparation of *S*-alkyl thiocarbamates from *S*-alkylisothioureas, 13
- Nitrosyl cation**, co-ordinated, electrophilic behaviour, 919  
cyanide, microwave spectrum and structure, 241  
ligand as an oxidant, 650
- Nitrosylation**, reductive, of Group VIIIb metals, 64
- Nitroxides**, acyl, stable, synthesis, 883
- Nonbonded attraction** in organic molecules and substituent effects on nonbonded attraction, 278
- Norbelladine**, *O*-methyl-, stereochemistry of hydrogen removal  $\beta$  to nitrogen in biological conversion into the montanine-type alkaloids, 430
- Norbornadiene**, co-ordinated, *endo*-attack on: crystal structure of di- $\mu$ -chloro-bis(*endo*-3-phenylnorbornen-2-yl-*endo*-palladium), 698
- Norbornene**, nitrosamine photoaddition to, and the mechanism of nitrosalkane cleavage, 827
- Norborn-2-ene**, 5-methylene-, photoelectron spectrum and through-space interactions (homobutadiene conjugation), 627
- Norbornen-7-ylum** dication, 7-triphenylphosphonio- formation: a non-classical dication, 574
- 17-Norkauran-16-one** and 16-norphyllodan-16-one, microbiological transformations by *Aspergillus niger*, 143
- Norlignan**, novel dihydronaphthalene; sequirin-D (*sequoia sempervirens*). Constitution, 649
- Nuclear magnetic resonance**,  $^{13}\text{C}$  spectra of bis-phosphonates, 933  
high resolution  $^{113}\text{Cd}$ , by pulse Fourier transform, 394  
shift reagents, chiral lanthanide, 381  
shift reagents, lanthanide, nature of the species present in solutions of, 113  
slow rotation of a methyl group, 830  
spectra, carbon-13, deuterium isotope effects, 408  
spectra, pseudo INDOOR, using double resonance difference spectroscopy and the Fourier transform technique, 611  
spectral assignments, carbon-13, in large molecules with the aid of spin-lattice relaxation data, 379  
spectroscopy, nitrogen-15. Spin-coupling between directly bonded  $^{15}\text{N}$ -nuclei, 602  
use of differential solvent shifts, 744
- Nucleic acid** constituents, aza analogues: crystal structures of 6-azauracil and 6-azathymine, 439
- Nucleosides** and nucleotides, water-soluble alkylating agent for: 1-oxidopyridin-2-yl diazomethane, 673  
anhydrodihydro-, novel azabicyclo[4,2,1]nonanes from, 495  
Synthesis of 4'-thiocordycepin, 686
- Nucleotides**. Combined use of  $^1\text{H}$  and  $^{31}\text{P}$  fast Fourier transform nuclear magnetic resonance spectroscopy and line shape computer simulations to determine the torsional diastereomers constrained to the C(5')-O(5') bonds of pyridine dinucleotides, 140  
Oligonucleotide synthesis on polar polymer supports. Use of a polypeptide support, 193  
Solution conformation of nicotinamide mononucleotide: a nuclear Overhauser effect investigation, 42
- Obtusifoliol**, inversion of the  $4\beta$ -hydrogen during conversion of the sterol into periferasterol by *Ochromonas malhamensis*, 149
- Olean-12-ene-16 $\alpha$ ,28-** and **-16 $\beta$ ,28-diols**, acetonide formation from, 787
- Olefin** complexes of palladium(II) and platinum(II), role of electronic effects in determining their thermodynamic stabilities, 591  
forming process, stereochemistry: thermolysis of cyclopropyl azides, 739  
isomerization and alkyne insertion: activation of platinum complexes by methyl fluorosulphonate, 766  
Metathesis, new catalyst, 174  
new synthesis, direct deoxygenation of alicyclic ketones, 935  
Rydberg transition, optical activity, 253
- Olefinic** double-bond, solvent participation in catalytic *trans*-hydrogenation, 234
- Olefins**, electron-rich,  $\text{Cr}^0$ ,  $\text{Fe}^0$ ,  $\text{Ir}^I$ ,  $\text{Ni}^{II}$ ,  $\text{Pd}^{II}$ ,  $\text{Pt}^{II}$ , and  $\text{Au}^I$  mono-, and oligo-carbene species from electron-rich olefins, 206  
electron-rich, oxetan formation from photoexcited charge-transfer complexes of anhydrides with, 296
- Olefins** *continued*  
new method for converting epoxides into: use of triphenylphosphine selenide and trifluoroacetic acid, 253  
non-conjugated, *endo*-selectivity in Diels-Alder reactions, 420  
*cis*-, novel system for highly stereospecific reduction to alkynes: "P-2 nickel" catalyst with ethylenediamine, 553  
Novel through-space hydrogen-fluorine spin-spin coupling in some five-co-ordinate platinum(II) fluoro-olefin complexes stabilized by the hydrotris-(1-pyrazolyl)borate ligand, 870  
photoaddition to indoles: synthesis of tetrahydro-1*H*-cyclobut[b]indoles, 311  
Regiospecific thermal cleavage of some oxetan photoadducts: carbonyl-olefin metathesis in sequential photochemical and thermal steps, 374  
stereospecific reaction of, with sulphur trioxide-dioxan, 841  
synthesis by desulphuration of  $\alpha\beta$ -unsaturated phenyl sulphones, 351  
terminal, zinc-induced free-radical reactions with aromatic  $\alpha$ -halogenoketones, 858
- Oligonucleotide** synthesis on polar polymer supports. Use of a polypeptide support, 193
- Oligonucleotides**, deoxyribo-, use of fluorene-9-methanol as a phosphate protecting group in the synthesis of, 803
- Organic** molecules, nonbonded attraction in, and substituent effects on nonbonded attraction, 278
- Organometallic** compounds, multidentate, given by internal metallation of *N*- and *P*-donor bidentate ligands, 516
- Oridonin** and enmein, diterpenes, biosynthesis from *ent*-16-kaurane, 434
- Oroidin**, a bromopyrrole derivative from marine sponge; reinvestigation into structure, 78
- Osmium**. Anomalous  $^1\text{H}$  nuclear magnetic resonance spectra of new osmium complexes, 77  
Hydrogenation and fluxional behaviour of  $\text{H}_2\text{Os}_3(\text{CCH}_2)(\text{CO})_9$ , a vinylidene complex derived from ethylene, 277  
nitrido-complexes with triphenyl-phosphine, -arsine, and -stibine, with evidence for nitrene-like behaviour of the phosphine complex, 418  
Reactions of cyclopentadiene with carbonyl-ruthenium and -osmium complexes: formation of carbonyl-metal hydrides, 326
- 3-Oxabicyclo[3,2,0]hepta-1,4-diene**, 214
- 2-Oxabicyclo[4,2,0]octane** and 2-oxabicyclo [3,2,0]heptane, stereospecific formation: intramolecular photoaddition of 3-(but-3-enyl)oxy- and 3-(pent-4-enyl)oxy-cyclohex-2-enones, 101
- Oxa-penam**, synthesis and some properties, 293
- Oxazole**, 2-phenyl-, photo-rearrangement, 539
- Oxazolo[4,3-c][1,4]thiazinium** chloride, 3,8-dihydro-3,3,8,8-tetramethyl-6-phenoxyacetamido-1-oxo-, *X*-ray crystal structure: novel ring expansion product of penicillin V  $\beta$ -sulphoxide, 226
- Oxapin**, 2,3:4,5-dibenzo-, synthesis. Photorearrangement of 9,10-epoxy-9,10-dihydrophenanthrene, 37
- Oxetan**, 2,2-di-( $\beta$ -ethoxyphenyl)-3,3-dimethyl-, a new insecticide; *X*-ray determination of structure, 34  
formation from photoexcited charge-transfer complexes of anhydrides with electron-rich olefins, 296  
photoadducts, regiospecific thermal cleavage of some: carbonyl-olefin metathesis in sequential photochemical and thermal steps, 374
- Oxeto[2,3-*b*]indoles**, synthesis: photoaddition of ketones to indoles, 13
- Oxidant**, nitrosyl ligand as, 650
- Oximes**, phenolic, intramolecular cyclisation with manganese(III) tris(acetylacetonate), 604
- Oxiran** formation in the base-catalysed reaction of long-chain alkyl dimethylsulphonium salts and carbonyl compounds in benzene-water, 527
- ( $\pm$ )-**Oxocrinine** and ( $\pm$ )-oxomaritidine, total synthesis of the alkaloids *via* anodic oxidation, 550
- Oxophlorin**, octaethyl-, stable radical, 1
- Oxygen** carrier and redox properties of some cobalt chelates, including vitamin  $\text{B}_{12r}$ , 810  
carrier, low pH; aquoterpyridine-(1,10-phenanthroline)-cobalt (II), 868  
effect on the photochemistry of 4-methyl-1-phenylpentan-1-one, 207

**Oxygen**—*continued*

- Formation of a Co-O<sub>2</sub> complex by the co-ordination of free superoxide ion, 781  
 Reactivity of O<sub>2</sub><sup>-</sup> on ZnO, 877  
 removal from samples used in nuclear magnetic resonance studies of spin-lattice relaxation times, 893  
 Surface oxygen species on isotopically labelled surfaces, 955  
**Ozone**, reactions with hindered allenes, 340

**Palladium**. *endo*-Attack on co-ordinated norbornadiene; crystal structure of di- $\mu$ -chloro-bis(*endo*-3-phenylnorbornen-2-yl-*endo*-palladium), 698

- Crystal structure of di- $\mu$ -sulphur dioxide-pentakis(*t*-butyl isocyanide)-*triangulo*-tripalladium-dibenzene, 445  
 Dichloro-1,2-bis(isopropylseleno)ethanepalladium(II): a conformational study by nuclear magnetic resonance, 797  
 Formation of  $\beta$ -phase hydrides by palladium-cerium solid solutions, 102  
 Novel cleavage of a phosphinoacetylene by palladium(II) and platinum(II): preparation and structure of complexes of 1,3-bis(diphenylphosphino)-2-trifluoromethylpropene derived from 3,3,3-trifluoropropynyldiphenylphosphine, 388  
 Palladium(0), tertiary phosphine complexes, 938  
 X-Ray crystallographic determination of the molecular structure of bis-( $\mu$ -*N,N*-dimethylthiocarbonyl)-bis[chloro(trimethyl phosphite)palladium(II)], 493  
 X-Ray crystallographic determination of the structure of  $\mu$ -diphenylacetylenebis-( $\pi$ -pentaphenylcyclopentadienyl)dipalladium(I), 368  
 X-Ray molecular structure of bis-(*L*-ornithinato)palladium(II). Conformation of the seven-membered chelate ring, 170  
 rearrangement of cyclic amines catalysed by, 307  
 Role of electronic effects in determining the thermodynamic stabilities of olefin complexes of palladium(II) and platinum(II), 591  
 Structure and bonding in tris(dibenzylideneacetone)dipalladium(0), 207

Structure of  $[\text{Pd}\{\text{C}_5(\text{CO}_2\text{Me})_4(\text{CO}_2\text{Me})\text{C}(\text{CO}_2\text{Me})\text{Cl}\}\{\text{acac}\}]$  and the intermediacy of a  $\sigma$ -butadienyl complex in the Pd<sup>II</sup>-induced trimerisation of dimethyl acetylenedicarboxylate, 436

**[2,*n*]Paracyclophan-(*n* + 7)-enes**, syntheses and reactions, 520**Pauling** electronegativity and nephelauxetic effect, 635**DL-Penicillaminomethylmercury(II)**, X-ray structure: binding of methylmercury by amino-acids, 741**Penicillin** sulphoxides, multiple rearrangements, 259

V,  $\beta$ -sulphoxide, novel ring expansion product: X-ray crystal structure of 3,8-dihydro-3,3,8,8-tetramethyl-6-phenoxy-acetamido-1-oxo-oxazolo[4,3-*c*][1,4]thiazinium chloride, 226

**Penicillins** and cephalosporins, scheme for biosynthesis: dehydropeptides related to  $\beta$ -lactam antibiotics, 790  
 new degradation, 477

vinyl sulphoxides from, 303

**Pentacyclo[6,4,0<sup>6</sup>,11,0<sup>7</sup>,9,0<sup>10</sup>,12]dodeca-2,4-diene**, directed synthesis.  $[\text{CH}]_{12}$  hydrocarbons, 409**Penta-2,3-dienes**, excited singlet, non-radiative lifetime of, from the absolute rate of a 5-3 hydrogen shift in the vapour phase, 818**Pentalene**, transition-metal carbonyl complex, 587**Pentane**, *trans*- and *cis*-1-acetoxy-3,4-epoxy-, and 1-acetoxy-4,5-epoxy-hexane, acid-catalysed rearrangements, 261**Pentan-1-one**, 2-methyl-1-phenyl-, effect of oxygen on photochemistry, 207**Peptide** antibiotic elamycin, biosynthesis. Origin of the 3-hydroxypicolinyl and amino-acid fractions, 185  
 sequencing, method, 392**Peptides**, and amino-acids, crystal structures of seven cadmium(II) complexes: model compounds for metal-protein interaction, 753

Crystal and solution conformation of cyclopentasarcoyl, 646

Dehydropeptides related to  $\beta$ -lactam antibiotics: scheme for the biosynthesis of penicillins and cephalosporins, 790

Oligonucleotide synthesis on polar polymer supports. Use of a polypeptide support, 193

protected, removal from an *ortho*-nitrobenzyl resin by photolysis, 610

Unique conformation of the cyclic octapeptide of sarcosine and a related depsiptide, 346

**Periodic reaction**, homogeneous, inhibition by radical scavengers, 30**Peroxides**, fluorocarbon, direct synthesis. Addition of bistrifluoromethyl trioxide to chlorotrifluoroethylene, 386

Reaction of 1-benzoxepin with singlet oxygen: a novel *endo*-peroxide, 344

**Peroxyacetyl** nitrate, reaction with amines, 74**Peroxydicarbonates**, cerium(IV) ammonium nitrate-promoted aromatic substitution with, 109**Phenanthraquinone**, photoaddition to alkyl-substituted alkoxyacetylenes. Formation of 1,3-dioxoles, 188**Phenanthrene**, 9,10-epoxy-9,10-dihydro-, photorearrangement. Synthesis of 2,3:4,5-dibenzoxepin, 37**Phenanthridones**, from photocyclization of benzanilides with elimination of the *ortho*-methoxy-group, 647**Phenol**, amination with ammonia; high acidity of silica-titania and its high catalytic activity, 676

chromenylation, regioselectivity, 580

*o*- and *p*-dimethylamino-, rearrangement reactions of allylic anilinium ylides derived from, 651

**Phenolic oximes**, intramolecular cyclisation with manganese(III) tris(acetylacetonate), 604**Phenyl azide**, *p*-cyano-, effect of wavelength on photolysis in dimethylamine, 360

-carbon bonds, electronic and steric effects on hindered rotation about, 95

chlorosulphate, reaction with anions. A possible displacement at chlorine, 210

radicals, another route to: conversion of 1-phenylazo-2-naphthol into the benzenediazonium ion, 572

radicals, desulphurization of episulphides by, 901

**Phenylacetylene**, hydrogen exchange and the hydroxide ion anomaly, 761**Phenylalkylamines**, *meta*-photocyclisation, 330**2-Phenylbenzazete**, an azacyclobutadiene, 19***p*-Phenylenediamine** radical cation, resonance Raman spectrum, 192**Phenylhydrazines**, *o*-nitro-, acid-catalysed cyclisation to *N*-aminobenzimidazoles, 41**Phenylnitromethane**, 4-nitro-, proton-transfer reactions with bases, kinetic isotope effects in various solvents, 854**Pheromones**. Stereoselective synthesis of conjugated *trans*-enynes readily convertible into conjugated *cis,trans*-dienes and its application to the synthesis of the pheromone bombykol, 874**Phosphate** protecting group, use of fluorene-9-methanol as, in the synthesis of deoxyribo-oligonucleotides, 803**Phosphates**. High resolution field mass spectrometry of disodium deoxyfluoro-D-glucose 6-phosphates, 416  
 seven-membered-ring, Eu(fod)<sub>3</sub> induced <sup>3</sup>J<sub>HF</sub> variation and conformational changes in, 494**Phosphetans** and hexafluoroacetone, X-ray analysis of 1,3,2-dioxaphospholans from. Square pyramidal phosphorus, 856**Phosphetidines**. Nuclear magnetic resonance studies of pseudo-rotation in some unsymmetrical diazadiphosphetidines, 23**Phosphinanilides**, alkylphenyl-, hydrolysis in acidic solution: influence of cyclopropyl groups, 774**Phosphine** complexes, tertiary, of platinum(II), hydrogen-deuterium exchange at a saturated carbon atom, 191

Deceptive <sup>13</sup>C nuclear magnetic resonance spectra in bisphosphine metal derivatives, 455

oxide. Applicability of the Karplus relation to <sup>31</sup>PCC<sup>13</sup>C coupling constants, 287

-platinum cluster compounds, 650

sulphides, optically active, from phosphine oxides and boron trisulphide, 273

tertiary, palladium(0) complexes, 938

triphenyl-, and carbon tetrachloride, reaction of acylglycerols with. Nucleophilic substitution in glycerol derivatives, 110

**Phosphines**. Crystal and molecular structure of tetraphenylcyclohexaphosphine monosulphide, 623

osmium nitrido-complexes with triphenyl-phosphine, -arsine, and -stibine, with evidence for nitrene-like behaviour of the phosphine complex, 418

X-Ray crystal structure and interconversions of three isomeric platinum complexes containing metallated *t*-butyldi-*o*-tolylphosphine ligands, 128

- Phosphinoacetylene**, novel cleavage by palladium(II) and platinum(II): Preparation and structure of complexes of 1,3-bis(diphenylphosphino)-2-trifluoromethylpropene derived from 3,3,3-trifluoropropynylidiphenylphosphine, 388
- Phosphoglycolhydroxamic acid**: inhibitor of Class I and II aldolases and triosephosphate isomerases. Potential antibacterial and antifungal agent, 713
- Phospholes**, 1,3,2-benzodithia-, preparation, and X-ray crystal structure of 2-methyl-2,2'-spirobi-(1,3,2-benzodithiaphosphole), 144
- Phosphoniumbornen-7-ylum** dication, 7-triphenyl-: a non-classical dication, 574
- Phosphonitric chloride** trimer, bonding in: electron spin resonance evidence for the radical anion, 313
- Phosphonium** bromide, triphenyl(prop-2-ynyl)-, preparation of 1,3,5-trisubstituted pyrazoles, methyltriphenyl-5-phenylpyridazin-3-ylphosphonium bromide, and 4-substituted 2-methylquinolines from, 7  
hexadecafluorotriantimonate(V), perfluoro-,  $[\text{PF}_4]^+[\text{Sb}_3\text{F}_{16}]^-$ , preparation and characterization, 559
- Phosphorane**, benzochloromethylene(triphenyl)-, photolysis, 567
- Phosphoranylpyrrole**, 2-methyl-5-tetrafluoro-, preparation and structure, 190
- Phosphorus**. Applicability of the Karplus relation to  $^{31}\text{PCC}^{13}\text{C}$  coupling constants, 287  
 $^{13}\text{C}$  Nuclear magnetic resonance spectra of bis-phosphonates, 933  
Internal metallation of N- or P-donor bidentate ligands to give multidentate organometallic compounds, 516  
Non-equivalence of the apical fluorine atoms on pentacoordinate phosphorus studied by  $^{19}\text{F}$  nuclear magnetic resonance spectroscopy, 745  
pentavalent, insensitivity to steric hindrance of a nucleophilic neighbouring-group substitution at, 238  
Preparation and nuclear magnetic resonance parameters for perfluoroalkyl-substituted phosphorus(V) hydrides, 813  
Preparation and X-ray crystal and molecular structure of di- $\mu$ -diphenylphosphido-bis(triphenylphosphinecarbonyliridium), 946  
square pyramidal, X-Ray analysis of the 1,3,2-dioxaphospholans from hexafluoroacetone and phosphetans, 856  
and sulphur-containing heterocycles, novel, metal complexes. Preparation and structure of tricarbonyl- $\eta^4$ -(1-pentafluorophenyl-2,3,4,5-tetrakis(trifluoromethylthiophen)manganese and  $\pi$ -cyclopentadienyl-(1-hydroxy-2,3,4,5-tetrakis(trifluoromethylphosphole 1-oxide)cobalt, 583
- Photolysis** of 2,6-di-*t*-butyl-1,4-benzoquinone: a new rearrangement, 844  
of  $\text{R}_3\text{Sn}$ . Tris[bis(trimethylsilyl)methyl]tin(III),  $\text{R}_3\text{Sn}^+$ , an unusually stable stannyl radical, 829
- Phthalimidonitrene**, dichotomy in reaction with activated benzenoid compounds, 67
- Phthalocyanine** radical cation complexes. Higher oxidation state iron and cobalt phthalocyanine derivatives, 482
- Phytoecdysone**, unusually modified: calonysterone, structure, 737
- Picolinyl**, 3-hydroxy-, and amino-acid fractions, origin of in the biosynthesis of the peptide antibiotic etamycin, 185
- Pictet-Gams reaction**, observations of mechanism, 889
- Pimarane** diterpene, conversion into the cleistanthane ring system, 312
- Platinum**. Bromination of 2-(alkenyl)pyridine complexes of platinum(II), 817  
Carbon-13 nuclear magnetic resonance study of the styrene-platinum(II) bond, 449  
complexes, activation by methyl fluorosulphonate: olefin isomerization and alkyne insertion, 766  
Crystal and molecular structure of *trans*-dichlorobis(hexaborane-10)platinum(II), 354  
Free radicals as intermediates in the oxidative addition of alkyl halides to platinum(0), 948  
Halogen exchange in platinum(IV) complexes, 931  
Hydrogen-deuterium exchange at a saturated carbon atom in tertiary phosphine complexes of platinum(II), 191  
*cis-trans* Isomerisation and ligand exchange reactions of an isoquinoline-platinum(II) complex, 486  
Large ring compounds involving *trans*-bonding bidentate ligands, 947  
Mechanisms of substitution reactions of platinum(0) complexes, 631
- Platinum**—*continued*  
metals, arylazo and aryl-di-imine derivatives, 176  
Novel through-space hydrogen-fluorine spin-spin coupling in some five-coordinate platinum(II) fluoro-olefin complexes stabilized by the hydrotris-(1-pyrazolyl)borate ligand, 870  
Observation by electron spin resonance spectroscopy of free radicals in reactions of dialkylplatinum(II) complexes with alkenes, 861  
Origin of line broadening in the hydridic nuclear magnetic resonance of isothiocyanato-platinum(II) complexes, 249  
-phosphine cluster compounds, 650  
Preparation of a five-coordinate platinum- $\pi$ -ethylene complex: (biacetyl bismethylphenylhydrazone)dichloro- $\pi$ -ethyleneplatinum(II), 368  
X-Ray crystal structure and interconversions of three isomeric platinum complexes containing metallated *t*-butyldi-*o*-tolylphosphine ligands, 128  
Reaction of 1,2-benzocyclobutadienequinone with zerovalent platinum: preparation and structure of (1,1-bistriphenylphosphine)platinabenzocyclopentenedione, 158  
Reactions of hydrazines with platinum-nitrile complexes; X-ray structural characterization and electrochemistry of *trans*-bis-1-acetyl-3-*t*-butyl-1,2,4-triazabutadieneplatinum, 297  
Role of electronic effects in determining the thermodynamic stabilities of olefin complexes of palladium(II) and platinum(II), 591  
Synthesis and crystal structure of bis(triethylphosphine)-[hexakis(trifluoromethyl)benzene]platinum, and of a nickelacycloheptatriene complex, 31
- Polar bonds**, vicinal, their conformational and chemical consequences, 90
- Pollinastanol** acetate, a 9,19-cyclopropane steroid, X-ray crystal and molecular structure, 929
- Polyethers**, macrocyclic crown, two isomeric: 6,7,9,10,17,18,20,21-octahydro-7*R*,9*R*,18*S*,20*S*-tetramethyldibenzo[*b,h*][1,4,7,10,13,16]hexaoxacyclo-octadecan (isomer F) and 6,7,9,10,17,18,20,21-octahydro-7*R*,9*R*,18*R*,20*R*-tetramethyldibenzo-[*b,h*][1,4,7,10,13,16]hexaoxacyclo-octadecan (isomer G); synthesis and crystal structures of complexes with caesium thiocyanate, 694  
macrocyclic, molecular complexation of arenediazonium and benzoyl cations by, 481
- Polyethylene**, laser-Raman spectrum under high pressure, 16
- 1,3-Polyethylenebenzimidazolium** salts and related systems, preparation and properties. N-Bridged heterocycles, 427
- Polysaccharide** structure and interactions, characterization by circular dichroism: order-disorder transition in the calcium alginate system, 245.
- Poriferasterol**, inversion of the 4 $\beta$ -hydrogen during the conversion of the sterol obtusifoliiol by *Ochromonas malhamensis* into, 149
- Porphobilinogen** synthesis, 43
- Porphyrin** biosynthesis, intermediates: studies with  $^{14}\text{C}$ - and  $^{13}\text{C}$ -labelled pyrromethanes, 768  
primary 'type-isomers', identification: novel mercury(II) porphyrins, 515  
zinc octaethyl, magnetic circular emission spectrum, 546
- Porphyrins**. Assignment of  $^{13}\text{C}$ -signals from *meso*-carbons by syntheses of  $^{13}\text{C}$ -protoporphyrin-IX dimethyl esters, 441  
Biosynthetic intermediates between coproporphyrinogen-III and protoporphyrin-IX, 183  
iron, reaction with carbon monoxide, 325  
iron(II) and iron(III), nitric oxide complexes, 897  
2- and 4-Monoformyldeuteroporphyrin-IX, 453  
 $^{13}\text{C}$  nuclear magnetic resonance spectra of coproporphyrins, 401  
*meso*-Tetraphenylmethoxyisoporphyriniron(III) chloride, 715  
Type-III biosynthesis: nature of the rearrangement process, 442
- Potassium**. Nitrogen chemisorption on reduced cobalt oxide with  $\text{K}_2\text{O}$  as promoter, 270
- Proanthocyanidin-A2**, dimeric, and its derivatives, structure, 518
- Prochiral** (*meso*-carbon) centres, chiral recognition of, by  $\Delta(-)_{495}\text{-}\alpha\text{-l,l-2,9-diamino-4,7-diazadecanecobaltate}$ , 332
- Propane**, 2-methyl-2-nitroso-, ('*t*-nitrosobutane'), rate of addition of *t*-butoxycarbonyl radicals: spin trapping, 173
- Propane-1,2-diols**, 3-aryloxy-, and derivatives, absolute configuration: mephensin isomers, 896

- [2,2,2]Propellane**, theoretical approach to synthesis, 291
- Prop-2-ynyl dianions**, sesquiacetylenic and allenic structures, 576  
substituted nitroxide radical, decomposition: X-ray crystal structure of the product, 751
- Prostaglandin**, E<sub>1</sub>, stereoselective total synthesis, 180  
E<sub>2</sub>, preparation from *Plexaura homomalla*, 254  
series, regioselective intramolecular photocyclisation in, 480  
Substituent effects on the <sup>13</sup>C relaxation time along aliphatic chains. Application to a prostaglandin, 951
- Prostaglandins**, 11-deoxy-10 $\alpha$ -hydroxy-, synthesis, 119
- Protein-metal interaction**, model compounds for: crystal structures of seven cadmium(II) complexes of amino-acids and peptides, 753
- Protiodetrinitiation** of benzene in trifluoroacetic acid, 952
- Protoberberine-type alkaloids**, novel total synthesis, 137
- Protoporphyrin-IX** and coproporphyrinogen-III, biosynthetic intermediates between, 183  
<sup>13</sup>C-, dimethyl esters, assignment of <sup>13</sup>C-signals from the *meso*-carbons by syntheses of, 441
- Pyranoses**, 1,4-anhydro-, formation from 1-*O*-acetyl-6-deoxy-2,3-*O*-isopropylidene-4-*O*-methylsulphonyl- $\alpha$ -L-manno- and -talo-pyranose, 142
- Pyrazine**, 1,4-dibenzyl-1,4-dihydro-2,6-diphenyl-, suprafacial [1,3] sigmatropic benzyl shift in, 511
- Pyrazole**, 5-acetyl-3,3-dimethyl-3*H*-, photochemical generation of a vinylketen from, and identification of the end product as 7-acetyl-3,5,5,9,9-pentamethyl-1,6-diazabicyclo[4,3,0]-nona-3,7-dien-2-one by X-ray crystallographic analysis, 247
- Pyrazoles**, 1,3,5-trisubstituted, methyltriphenyl-5-phenylpyridazin-3-ylphosphonium bromide, and 4-substituted 2-methylquinolines; formation from triphenyl(prop-2-ynyl)phosphonium bromide, 7
- Pyrazoline stereochemistry**. Use of nuclear magnetic resonance shift reagents with azo-compounds, 557
- Pyrazolo[3,4-*d*]pyrimidines**, 4-amino-6-glycosyl-, synthesis, 680
- Pyridazine**, 3,6-diphenyl-4,5-dehydro-, fragmentation to diphenylbutadiene, 819  
dicyanomethylides, photolysis, 521
- Pyridazinium derivatives**, *N*-methyl- and -aryl-5-oxido-, new intermediate for synthesis: 2,5-diketo-D-gluconate, 796
- Pyridine** and quinoline 1-oxides,  $\beta$ -alkylation with acetylenes: studies of the mechanism, 569  
Crystal structure of di- $\mu$ -hydroxo-bis-[*NN'*-trimethylenebis-(salicylaldiminato)manganese(III)]-tetrapyridine, a supposed oxygen carrier, 760  
dinucleotides, determination of torsional diastereomers constrained to the C(5')-O(5') bonds: combined use of <sup>1</sup>H and <sup>31</sup>P fast Fourier transform nuclear magnetic resonance spectroscopy and line shape computer simulations, 140  
2-vinyl, metallation of, by rhodium(III), 838
- Pyridinium cation**,  $\beta$ -D-galactopyranosyl- $\beta$ -galactosidase-catalysed hydrolysis, 535  
1-(2,4-dinitrophenyl)-3-oxido-; rearrangement and dipolar additions, 292  
and flavin derivatives for recycling of catalytic amounts of NAD<sup>+</sup> during preparative-scale horse liver alcohol dehydrogenase-catalysed oxidations of alcohols, 205  
halides, alkyl-, quenching of aromatic hydrocarbon fluorescence by, 728  
iodide solutions, *N*-methyl-, ultrasonic relaxation evidence for two types of ion pairs, 696
- Pyridinolysis** of methyl chloroformate and the interpretation of curved Brønsted plots in nucleophilic reactions, 828
- Pyridin-2-yl diazomethane**, 1-oxido-; a water-soluble alkylating agent for nucleosides and nucleotides, 673
- 2-Pyrones**, alkylated 4-hydroxy-, convenient syntheses, 568
- Pyrophosphoramides**, diastereoisomeric, effect of chiral solvents on <sup>31</sup>P nuclear magnetic resonance spectra, 18
- Pyrrole**, 2-methyl-5-tetrafluorophosphoranyl-, preparation and structure, 190
- Pyrroles**. Reinvestigation into the structure of oroidin, a bromopyrrole derivative from marine sponge, 78
- Pyrrolo[1,2-*a*]indole** ring systems, new synthetic route to. Synthesis of indolequinones, 358
- Pyrrolo[1,2-*d*]-as-triazine**. A new heteroaromatic system, 35
- Pyrrmethanes**, <sup>14</sup>C- and <sup>13</sup>C-labelled, studies with: intermediates in porphyrin biosynthesis, 768
- Pyrylium perchlorate**, 4-ethyl-2,6-dimethyl-, light-induced 1,2-transposition and 2,6-bonding in, 410
- Quinodimethane**, 7,7,8,8-tetracyano-, and 2,2'-bi-1,3-dithiole, crystal structure of the radical-cation radical-anion salt from, 471  
7,7,8,8-tetracyano-, 1,6-photoaddition of toluene, 9
- Quinoline** and pyridine 1-oxides,  $\beta$ -alkylation with acetylenes: studies of the mechanism, 569
- Quinolines**, 1,2-dihydro-, photochemical reactions, 922  
2-substituted, from reductive cyclisation of 2-azidocinnamates, 29.  
4-substituted 2-methyl-, trisubstituted pyrazoles, and methyltriphenyl-5-phenylpyridazin-3-ylphosphonium bromide; preparation from triphenyl(prop-2-ynyl)phosphonium bromide, 7
- $\alpha$ -**Quinolylimine** as the long-lived photocoloured form, 684
- o-Quinones**. Reaction of 1,2-benzocyclobutadienequinone with zerovalent platinum: preparation and structure of (1,1-bis-triphenylphosphine)platinabenzocyclopentenedione, 158
- Quinones**. Total synthesis of ( $\pm$ )-scabequinone, 718
- Radical cations**: photochemical and ferric ion-induced formation and reactions of indene radical cation, 677
- E2 Reactions**, attractive interactions in: the origin of the *syn-anti* duality and the divergent stereoselectivity of the two competing pathways, 168
- Reaction**, energy of, and Brønsted exponents; Marcus rate theory and relationship between, 371
- Reagent**, organometallic, new: KCo[P(OR)<sub>3</sub>]<sub>4</sub>, 683
- Reformatsky-Claisen reaction**, a new synthetically useful sigmatropic process, 117
- Rhenium** and manganese carbonyl difluorosulphoximides, 823  
A  $\mu$ -dinitrogen complex with a long N-N bond. X-Ray crystal structure of [(PMe<sub>2</sub>Ph)<sub>4</sub>ClReN<sub>2</sub>MoCo<sub>4</sub>(OMe)], 808  
new compounds: preparation and crystal structures of Re(CO)<sub>5</sub>F·ReF<sub>5</sub> and [Re(CO)<sub>6</sub>]<sup>+</sup>[Re<sub>2</sub>F<sub>11</sub>]<sup>-</sup>, 321
- Rhodium**. Crystal structure of  $\mu$ -octaethylporphinato-bis[dicarbonylrhodium(t)], 792  
Hydrogenation of tris(triphenylphosphine)chlororhodium(t), 629  
Insertion reactions of hexafluoroacetone with tricarbonyl-(diene)iron and  $\pi$ -cyclopentadienyl(diene)rhodium complexes, 114  
Metallation of 2-vinylpyridine by rhodium(III), 838  
New type of  $\pi$ -allyl isomerisation: conversion of 1,1- and 1,2-dimethylallyl complexes of cobalt and rhodium, 86  
Structure and dynamical properties of Rh<sub>4</sub>(CO)<sub>12</sub> in solution: <sup>13</sup>C nuclear magnetic resonance study, 807  
Variable temperature <sup>13</sup>C nuclear magnetic resonance of dicyclopentadienyltricarbonyldirrhodium, 79
- Rheoadanes**, convenient route, 740
- Ring 'flipping'** in bis(cyclo-octatetraene)titanium(II); an organometallic intramolecular redox reaction which involves only the geometrical deformation of organic ligands, 172
- Roseoflavin**, a new flavin compound, X-ray crystallographic determination of a derivative, 703
- Rotameric conformations** of acetyl substituted steroids, use of linear dichroism for the establishment of, 943
- Rotation**, slow, of a methyl group. Nuclear magnetic resonance, 830
- Rotational isomers**, enantiomeric, direct observation using <sup>1</sup>H nuclear magnetic resonance spectroscopy, 537
- Rubinine**, structure: *Adina* alkaloids, 765
- Rubidium**. Cleavage of carbon-carbon sigma bonds by Ru<sub>3</sub>(CO)<sub>12</sub>, 87
- Ruthenium**. Bridging cycloheptatrienyl complexes: X-ray crystal structure of [Ru<sub>2</sub>(CO)<sub>6</sub>(SiMe<sub>3</sub>)(C<sub>7</sub>H<sub>6</sub>SiMe<sub>3</sub>)], 727  
Isomeric conformations in a pentaco-ordinated ruthenium compound; crystal and molecular structures of the orange and violet isomers of (Ph<sub>3</sub>P)<sub>2</sub>[(CF<sub>3</sub>)<sub>2</sub>C<sub>2</sub>S<sub>2</sub>]Ru(CO), 39  
Reaction of benzylideneacetone with (cyclo-octa-1,5-diene)tricarbonylruthenium, 912  
Reaction of cycloheptatriene with ruthenium carbonyl: X-ray crystallographic determination of the molecular structure of Ru<sub>3</sub>(CO)<sub>6</sub>(C<sub>7</sub>H<sub>7</sub>)(C<sub>7</sub>H<sub>9</sub>), 726  
Reactions of cyclopentadiene with carbonyl-ruthenium and -osmium complexes: formation of carbonyl-metal hydrides, 326

**Ruthenium**—*continued*

Structural evidence for a new type  $\pi$ -arene complex containing poly(1-pyrazolyl)borate ligands and carbocyclic  $\pi$ -acceptor ligands. X-Ray analysis of [tetrakis(1-pyrazolyl)borato](*h*<sup>6</sup>-benzene)ruthenium(II) hexafluorophosphate, 847.

**Saccharides**, mono-, and their derivatives, five- and six-membered rings in: rules for conformation nomenclature, 505

**Salicylides**. Conformational behaviour of di-*o*-thymotide and di-*o*-carvocrotide, 571

**Samandarine**-type alkaloid, biogenetically modelled synthesis, 288

(-)- $\beta$ -Santalene, (-)-campherenone, (+)-epicampherenone, and (+)-epi- $\beta$ -santalene; synthesis and absolute configuration of the terpenes, 235

**Sapogenins**. Origin of the 27-methylene group of the steroidal sapogenin convallamarogenin, 184

**Sarcosine**, unique conformation of the cyclic octapeptide of, and a related depsipeptide, 346

( $\pm$ )-Scabequinone, total synthesis, 718

**Scandium**. Stable silylmethyl and neopentyl complexes of scandium(III) and yttrium(III), 126

Three-co-ordinate scandium(III) and europium(III): crystal and molecular structures of their tris-hexamethyl-disilylamides, 669

**Secalonic acid**, new, isolation, 464

**Secologanin**, conversion into *Corymanthé*-type alkaloids, 886

**Selenium**. Dichloro-1,2-bis(isopropylseleno)ethanepalladium(II): a conformational study by nuclear magnetic resonance, 797  
Signs of nuclear spin-spin coupling constants involving selenium: effect of electron lone pairs, 10

**Selenophen**. Reversal in the sequence of two highest occupied molecular orbitals in the series thiophen, selenophen, and tellurophen, 541

**Selenoxides**, fragmentation: new method for dehydrogenation of ketones, 695

**Semibullvalene** and related substances, carbon-13 nuclear magnetic resonance spectral analysis, 135  
stereoselective 1,4-bromination, and tri-*n*-butyl-in hydride reduction of the dibromide, 129

**Sequirin-D** (*Sequoia sempervirens*), a novel dihydronaphthalene norlignan, constitution, 649

**Sesquiterpenes**. Carbon-13 and proton magnetic resonance study of the structure and conformation of a new germacranolide sesquiterpene dilactone, 614

Synthesis, absolute configuration, and photocyclisation of the sesquiterpene (-)-cryptomerion, 236

zizaene-related, rearrangement, 447

**Sesquiterpenoids**. Aspects of the biosynthesis of the terpenoid dendrobine, 729

Incorporation of [<sup>2-3</sup>H<sub>2</sub>]- and [4(*R*)-4-<sup>3</sup>H]-mevalonoid hydrogen atoms into the sesquiterpenoid illudin M, 171

Miscandenin and dihydromikanolide, X-ray studies: stereochemistry of the biological divinylloxiran-dihydro-oxepin rearrangement, 428

**Shift reagent** systems, lanthanide, solvation numbers for, 339

**Shift reagents**, lanthanide induced, application to organic cations by outer sphere complexation, 630  
nuclear magnetic resonance, chiral lanthanide, 381

**Shihunine**, an alkaloid of the orchid *Dendrobium pierardii*, biosynthesis, 522

[1,5] **Sigmatropic rearrangement**, novel, association of the Claisen rearrangement, 491

**Sigmatropic rearrangements**, [4,5] anionic, 658

[2,3] anionic, concertedness in, 656

apparent [2,3], of acetylenic ammonium ylides, 657

more [4,5], 661

**Silacyclobutane**, 1,1-diphenyl-, photochemical generation of an intermediate containing a silicon-carbon double bond or its equivalent from, 54

**Silane**, dimethylindenyl-, reductive solvolysis: evidence for a two-step mechanism, 533

trimethyl-, and iodine, kinetics of the gas-phase reaction between and the bond dissociation energy  $D(\text{Me}_3\text{Si-H})$ , 513

**Silanes**, alkoxy-, chloro-, and fluoro-, new stereospecific method for reduction. Homogeneous catalytic activation of Grignard reagents by nickel complexes, 164

bifunctional, selective catalytic route to. Catalysis by rhodium and ruthenium complexes of the alcoholysis of diarylsilanes and the hydrosilylation of carbonyl compounds, 38

**Silanes**—*continued*

Kinetically determined bond dissociation energies in hexamethyldisilane, 323

phenyl-, <sup>29</sup>Si-<sup>1</sup>H nuclear Overhauser effects, 255

**Silicates**. Crystal structure of the  $\beta$ -12-tungstosilicate anion, 648

**Silicon**, germanium, and tin pentafluoro-orthotellurates, 600

High acidity of silica-titania and its high catalytic activity for amination of phenol with ammonia, 676

mechanism of nucleophilic substitution at: kinetic evidence on the slow formation of a five-co-ordinate silicon intermediate, 116

Reactions of silicon-carbon double-bonded intermediates with aldehydes and ketones, 167

**Silver**. Cryptates with macrotricyclic ligands: crystal and molecular structure of the silver [3]-cryptates, C<sub>24</sub>H<sub>48</sub>N<sub>4</sub>O<sub>6</sub>·3AgNO<sub>3</sub>, 678

Dynamic stereochemistry: mechanistic controversy in the silver oxide-bromine induced cyclizations of alcohols, 451

New type of  $\sigma$ -bonded organosilver compound: [Ag-C(OR)=N-Ar]<sub>3</sub>, 260

Preparation and structures of the Me<sub>4</sub>N[M<sup>1</sup>{M<sup>2</sup>(CO)<sub>3</sub>( $\pi$ -C<sub>5</sub>H<sub>5</sub>)<sub>2</sub>]<sub>2</sub> salts (M<sup>1</sup> = Cu<sup>I</sup> or Ag<sup>I</sup>; M<sup>2</sup> = Mo or W), 71

X-Ray crystal structure of ethylenebis(biguanide)silver(III) perchlorate, 46

**Silyl**, trimethyl-, cobalt to oxygen migration of the group in trimethylsilylcobalt tetracarbonyl, 496

**Silylene**, singlet and triplet, addition to buta-1,3-diene, 637

**Silylmethyl** and neopentyl complexes of scandium(III) and yttrium(III), stable, 126

**Sodium**. Crystal and molecular structure of a cationic sodium complex: the sodium tetraphenylborate adduct of NN'-ethylenebis(salicylideneiminato)cobalt(II). Cobalt(II), nickel(II), and copper(II) complexes of quadridentate Schiff bases as complexing agents for lithium, sodium, and ammonium cations, 384

Disproportionation of toluene over electron donor-acceptor complexes of aromatic hydrocarbons with sodium, 498

**Solvent cages**, co-ordination compounds, glasses, crystals, and related systems, cation vibrations in, 161

**Spin-lattice** relaxation times, removal of oxygen from samples used in nuclear magnetic resonance studies of, 893

**Spin trapping**: rate of addition of t-butoxycarbonyl radicals to 2-methyl-2-nitrosopropane ('t-nitrosobutane'), 173

**Spiro[2,3]hexan-4-ones**, flash thermolysis. Case of vinylketen generation, 795

**Spiro[2,2]pentane**, 1,2-diphenylaza-, synthesis, 33

**Sporidesmin G**, X-ray crystallographic determination of the stereochemistry of the tetrathio-bridge in, 554

**Squalene**, 2,3-epoxy-, enzyme-catalysed formation of  $\beta$ -amyrin from a bicyclic isomer of, 73

**Squaric acid**, synthesis of a benzologue of, (4,5-dihydroxybenzocyclobutene-1,2-dione), and general synthesis of benzocyclobutene-1,2-diones, 248

**Stemonamine**, a new alkaloid from *Stemona japonica* Miq., X-ray crystallographic determination of structure: isolation of isostemonamine, 125

**Steric hindrance** in aromatic hydrogen exchange, 936

**Steroidal alkenes**, unusual mercury(II) acetate oxidation, 56

**Steroids**, acetyl substituted, use of linear dichroism for the establishment of rotameric conformations of, 943

Efficient synthesis and mechanisms of formation of 4-azido-,

4-thiocyanato-, and 4-isothiocyanato-3-oxo- $\Delta^4,6$ -steroids, 72

Generation and reaction of 2,4-dienolate ions from  $\Delta^4$ -3-keto-

steroids with lithium hexamethyldisilazane, 564

Hyperacidic media. Novel route to 13 $\alpha$ -steroids, 785

Light-induced formation of seco-steroids, 480

Origin of the 27-methylene group of the steroidal sapogenin convallamarogenin, 184

X-Ray analysis of Nic-11 from *Nicandra physaloides*; a 17-spirobicyclomethylsteroid, 821

X-Ray crystal and molecular structure of pollinastanol acetate, a 9,19-cyclopropane steroid, 929

Thermal isomerizations of steroidal boranes: isomerizations at the junction of the hydrindanic steroidal system, 942

**Sterols**. Identity of ergosterol '5 $\beta$ ,8 $\beta$ -peroxide', 530

*cis*-Isomer of the C<sub>26</sub> marine sterol 24,24-dimethyl-5 $\alpha$ -chol-22-en-3 $\beta$ -ol, 424

Photolysis of 3 $\beta$ -acetoxycholest-5-en-19-ol nitrite, 752

**Sterols**—*continued*

- unusual marine, synthesis of 24,28-didehydroaplysterol and X-ray crystal structure of aplysterol, 825
- Steviol** and its derivatives, metabolism of, by *Gibberella fujikuroi*, mutant B1-41a, 778
- Stibine**. Osmium nitrido-complexes with triphenyl-phosphine, -arsine, and -stibine, with evidence for nitrene-like behaviour of the phosphine complex, 418
- (-)-**Stilbenediamine**, absolute configuration, 422
- Stipitalide**, a new tropolone from *Penicillium stipitatum* Thom.; determination of structure, 65
- Strychnine**, biosynthesis, 217
- Styrene**. Carbon-13 nuclear magnetic resonance study of the styrene-platinum(II) bond, 449  
and derivatives, low temperature stopped flow studies of the stage I polymerisation by HClO<sub>4</sub> and CH<sub>2</sub>Cl<sub>2</sub>, 419
- Substitution** and addition reactions, unsymmetrical cyanocuprates as reagents in, 88
- Succinimide**, diamagnetic, and a free radical nitronynitroxide, X-ray structures, 888
- Succinimides**, *N*-halogeno-, carbon-sulphur bond cleavage in the reaction of benzyl and *t*-butyl sulphoxides with, 4
- Sugars**. Synthesis of 2,4-diacetamido-2,4,6-trideoxy-D-glucose and its identification with the diacetamido-sugar of *Bacillus licheniformis*, 668
- Sulphamides**, *NN'*-dialkyl-, conversion into azoalkanes. Formation of the thiadiaziridine 1,1-dioxide ring system, 397
- Sulphenes**, addition to thioamide vinylogues: substituted 5,6-dihydro-1,2-dithiin 1,1-dioxides and 1,2-dithiin 1,1-dioxides, 672
- Sulphides**. Desulphurization of episulphides by phenyl radicals, 901  
 $\alpha$ -dichlorodibenzyl, novel rearrangement. New synthesis of acetylenes, 955  
 $\alpha$ -halogeno-, oxidative chlorination of as a synthetic route to  $\alpha$ -halogeno-sulphoxides, sulphinyl chlorides, and sulphonyl chlorides, 50  
nitrile, 524  
 $\alpha$ -Sulphinyl carbanion derived from methyl 1-phenylethyl sulphoxide, nature of, 398
- Sulphonamide** cleavage, convenient method, 664
- Sulphonates**, aryl *N*-methylamino-, evidence consistent with an elimination mechanism in their hydrolysis, 356
- Sulphone** di-imines, *N*-toluene-*p*-sulphonyl-, synthesis, 590
- Sulphones**,  $\alpha\beta$ -unsaturated phenyl, synthesis of olefins by desulphuration of, 351
- Sulphonic acid**, trifluoromethane-. Concerning the  $\pi$ -complex mechanism for aromatic substitution. Detritiation in, 836
- Sulphonium** cations, cyclic five-membered, stereochemistry of the hydrogen-deuterium base-catalysed exchange and conformation, 156  
cyclopentadienylides, formation. Photolysis of diazocyclopentadiene in alkyl sulphides, 365  
salts, long-chain alkyl dimethyl-, base-catalysed reaction with carbonyl compounds in benzene-water: oxiran formation, 527
- Sulphoxide** anions as intermediates in simulation of biological C-ethylation, 145  
dimethyl, effect on asymmetric induction in the cyclisation of *o*-allylphenol with chiral mercury(II) carboxylates, 573  
methyl 1-phenylethyl, nature of the  $\alpha$ -sulphinyl carbanion derived from, 398
- Sulphoxides**, benzyl and *t*-butyl, carbon-sulphur bond cleavage in reaction with *N*-halogenosuccinimides, 4  
iodomethyl, synthesis, 319  
site of protonation: carbon-13 nuclear magnetic resonance evidence, 251  
vinylic, from penicillins, 303
- Sulphoximides**, some cyclic, synthesis, 776
- Sulphur**-bridged ion Mo<sub>2</sub>S<sub>2</sub>O<sup>2+</sup>, separation and unusual stability, 909  
Crystal and molecular structure of bis(diphenylmethylene)-trisulphur tetranitride, 36  
deposited from a thiocyanate melt onto a platinum electrode, photoelectric effect, 154  
NS<sub>4</sub><sup>-</sup> anion; the blue species formed by heptasulphur imide in basic media, 734

**Sulphur**—*continued*

- and phosphorus-containing heterocycles, novel, metal complexes. Preparation and structure of tricarbonyl- $\eta^4$ -(1-pentafluorophenyl)-2,3,4,5-tetrakis(trifluoromethylthio)phenyl-manganese and  $\pi$ -cyclopentadienyl (1-hydroxy-2,3,4,5-tetrakis(trifluoromethylphosphole-1-oxide)cobalt, 583  
Synthesis of cyclophanes by photochemical extrusion of sulphur, 406
- Sulphur trioxide**-dioxan. Stereospecific reaction of olefins with, 841
- Tantalum**. Insertion of methyl isonitrile into niobium- and tantalum-chlorine bonds, 127
- Tellurium**. Bistetraethylammonium chlorobis-(1,2-dicyanoethylene-1,2-dithiolato)tellurium(III): a paramagnetic tellurium complex, 624  
Boron tris(pentafluoro-orthotellurate) B(OTeF<sub>5</sub>)<sub>3</sub>. Preparation and Lewis acidity, 134  
Pentafluoro-orthotellurates of silicon, germanium, and tin, 600
- Tellurophen**. Reversal in the sequence of two highest occupied molecular orbitals in the series thiophen, selenophen, and tellurophen, 541
- Tellurophens**, 2-substituted, electric dipole moments, 342
- Terpenes**. Acetonide formation from olean-12-ene-16 $\alpha$ ,28- and -16 $\beta$ ,28-diols, 787  
Biosynthesis of the diterpenes enmein and oridonin from *ent*-16-kaurene, 434  
Biosynthesis of the terpenes maslinic acid and 3-epimaslinic acid in tissue cultures of *Isodon japonicus* Hara, 707  
Carbon-13 and proton magnetic resonance study of the structure and conformation of a new germacranolide sesquiterpene dilactone, 614  
Configuration of aglaiol, a (24S)-24,25-epoxytriterpene, 116  
Conversion of a pimarane diterpene into the claianthane ring system, 312  
Marine natural products. Concinnadiol, a bromo-diterpene alcohol from the red alga, *Lawrenzia concinna*, 470  
Metabolism of steviol and its derivatives by *Gibberella fujikuroi* mutant B1-41a, 778  
Raman circular intensity differential observations of some monoterpenes, 152  
Rearrangement of zizaene-related sesquiterpenes, 447  
Stereospecific total synthesis of ( $\pm$ )- $\alpha$ -amorphene, 598  
Synthesis and absolute configuration of the terpenes (-)-campherone, (+)-epicampherone, (-)- $\beta$ -santalene, and (+)-*epi*- $\beta$ -santalene, 235  
Teucvin a novel furanoid norditerpene from *Teucrium viscidum* var. *Miquelianum*, 793
- Terpenoids**. Biosynthesis of a C<sub>16</sub>-terpenoid lactone, a plant growth regulator, 802
- Terphenyl** and flavonoid metabolites, biosynthesis by the fungus *Aspergillus candidus*, 555
- Tetracyanoethylene**, termolecular complexes with weak electron donors, 609
- Tetrahydrofuran-2,4,5-triones**, chloroarylidene-, acetylenic cyclisation leading to, 265  
chloroarylidene-, thermal rearrangement to aroylchloromaleic anhydrides, 265
- NNN'-Tetramethylmethanediimine**, 783
- Tetramic acid**,  $\alpha$ -acetyl- $\gamma$ -( $\beta$ -indolyl)methyl-. A biosynthetic intermediate of cyclopiazonic acid and of bis-secodehydrocyclopiazonic acid, 812
- Tetraphenylcyclotetraphosphine** monosulphide, crystal and molecular structure, 623
- Teucvin**, novel furanoid norditerpene from *Teucrium viscidum* var. *Miquelianum*, 793
- Thallium**. Thallium(I) carboxylates: a new class of reagents for the formation of  $\alpha$ -iodocarboxylates, 359
- Theaspirone** and the blumenols, stereochemistry, 565
- Thermal cheletropy** in model azabicycles; the question of linear vs. non-linear extrusion, 840
- Thermozymocidin**, biosynthesis of the antibiotic. Incorporation of [1-<sup>13</sup>C]acetate: <sup>13</sup>C nuclear magnetic resonance study, 788
- Thiadiaziridine** 1,1-dioxide ring system, formation. Conversion of *NN'*-dialkylsulphamides into azoalkanes, 397
- Thiamine** hydrochloride-copper(II) complex, X-ray crystal structure, 900

- 6a-Thiathiophthens**, and related compounds, substitution with arenediazonium fluoroborates: rearrangement into novel heterocyclic systems, 92
- 1,4-Thiazine oxides**, thermal racemisation: evidence for a sigmatropic pathway, 285
- Thietan** 1,1-dioxides,  $\alpha$ -bromination, 861  
*cis*- and *trans*-3-ethyl-2-propyl-, photolysis; evidence for the formation of unscavengable diradical intermediates, 106.  
1-oxides, 3-*t*-butyl-, isomeric, heats of oxidation, 121
- Thiocarbamates**, *S*-alkyl, preparation from *S*-alkylisothio-ureas; novel method for the conversion of the imino-group into the carbonyl group *via* nitrosoimines, 13
- Thiocarboxylates**, *S*-alkyl, photodecomposition modes, 294
- Thiols**. Crystal structure of the radical-cation radical-anion salt from 2,2'-bi-1,3-dithiole and 7,7,8,8-tetracyanoquinodimethane, 471
- Thiomethyl** esters, methyl-, formation and hydrolysis, 224
- Thione** photochemistry: cyclopropanethiol (homothioenol) formation by  $\beta$ -hydrogen abstraction, 130
- Thiophen**, selenophen, and tellurophen, reversal in the sequence of two highest occupied molecular orbitals in the series, 541
- Thorium**. Structure of the dimer in ammonium tri- $\mu$ -fluorobis-(hexafluorothorate) hydrate, 69
- Three-membered** rings, antiaromatic, and their valence tautomers, a MINDO/3 and NDDO study, 688
- Thymine**, ultrasonic degradation, 414  
6-aza-, and 6-azauracil, crystal structures: aza analogues of nucleic acid constituents, 439
- Tin**. New method for determining signs of Mössbauer quadrupole splittings: relative signs of  $^{119}\text{Sn}$  and  $^{67}\text{Fe}$  quadrupole splittings in  $\{\text{Fe}(\text{SnCl}_3)[\text{P}(\text{OMe})_3]_3\}^+\text{BPh}_4^-$ , 503  
 $^{51}\text{Sn}$  Nuclear quadrupole resonance study of the *cis-trans* isomerism of tin tetrachloride complexes, 429  
Preparation and X-ray crystal structure of  $\text{Sn}_3\text{F}_8$ , 944  
Resonance Raman spectrum of tin tetraiodide, 762  
silicon, and germanium pentafluoro-orthotellurates, 600  
 $\text{SnO}_2$ -CuO gels: novel catalysts for the low-temperature oxidation of carbon monoxide, 210  
Stabilisation of metals in a low co-ordinative environment using the bis(trimethylsilyl)methyl ligand: coloured  $\text{Sn}^{\text{II}}$  and  $\text{Pb}^{\text{II}}$  alkyls,  $\text{M}[\text{CH}(\text{SiMe}_3)_2]_2$ , 317  
Synthesis of tetrakis(trifluoromethyl)tin, 104  
 $\text{Tris}[\text{bis}(\text{trimethylsilyl})\text{methyl}]\text{tin}(\text{III})$ ,  $\text{R}_3\text{Sn}^+$ , an unusually stable stannyl radical, from photolysis of  $\text{R}_3\text{Sn}$ , 829
- Titanium**. Crystal and molecular structure of triscyclopentadienyltitanium: the cyclopentadienyl group as a two-centre three-electron ligand, 97  
High acidity of silica-titania and its high catalytic activity for amination of phenol with ammonia, 676  
Hydrazine-producing intermediate in the nitrogen fixing system:  $\text{cp}_2\text{TiCl}_2 + \text{Pr}^{\text{I}}\text{MgCl} + \text{N}_2$ , 169  
Ring 'flipping' in bis(cyclo-octatetraene)titanium(II); an organometallic intramolecular redox reaction which involves only the geometrical deformation of organic ligands, 172  
Structure of aluminotitanium hydride  $[(\text{C}_5\text{H}_5)_2(\text{C}_5\text{H}_4)\text{Ti}(\text{H})(\text{C}_2\text{H}_5)_2]_2$ , 227  
Synthesis of bis- $\pi$ -benzene-titanium and -molybdenum using metal vapours, 866
- Toluene**, disproportionation over electron donor-acceptor complexes of aromatic hydrocarbons with sodium, 498  
1,6-photoaddition to 7,7,8,8-tetracyanoquinodimethane, 9
- N*-Toluene-*p*-sulphonylsulphone** di-imines, synthesis, 590
- Toluenes**, tetrafluoro- and pentafluoro-, dipole moment evidence for hyperconjugation, 723
- Tosylates**, 3-oxo-, solvolysis; 1,4-carbonyl participation, 756  
reaction of magnesium iodide with, 821
- Trachylobane**, diterpenoid, simplified synthesis: convenient synthesis of the tricyclo[3,2,1,0<sup>2,7</sup>]octane system, 689
- Transition metal** carbene complexes, general synthesis:  $\text{Cr}^0$ ,  $\text{Fe}^0$ ,  $\text{Ir}^{\text{I}}$ ,  $\text{Ni}^{\text{II}}$ ,  $\text{Pd}^{\text{II}}$ ,  $\text{Pt}^{\text{II}}$ , and  $\text{Au}^{\text{I}}$  mono- and oligo-carbene species from electron-rich olefins, 206  
carbonyl complex of pentalene, 587  
carbonyl derivatives of manganese, Group VI, 405  
centre, free-radical displacement reactions at: bimolecular homolytic substitution ( $\text{S}_{\text{H}}2$ ) at square-planar  $\text{Pt}^{\text{II}}$ , 350  
cluster compounds, electron deficient: preparation and crystal structures of some molybdenum- and tungsten-aluminium compounds, 426  
complex, evidence for a two-stage process in electron-transfer to, 917
- 1,2,5-Triazepines**, 3,4-diaryl-6,7-dihydro-1-methyl-1*H*, 3,4-diaryl-2-hydroxy-1,2,5-triazabicyclo[3,2,1]oct-3-enes from peracid oxidation of, 642
- 1,2,4-Triazine** 1-oxides, 5,6-benzo-, reaction with Grignard reagents, 622
- Triazinediones**, formation: chlorosulphonylisocyanate addition to anils, 570
- Tribenzo[ $\alpha,\epsilon,\zeta$ ]cyclododecane**, 5,6,11,12,17,18-hexahydro-, and its derivatives, conformational behaviour, 638
- (*Z*)-Tricos-9-ene** (Muscalure), one-step synthesis of the house-fly sex attractant, 735
- Tricyclo[3,3,1,0<sup>2,8</sup>]nona-3,6-diene**, 9-aza-, the 9-azabarbaralane system, 779
- Tricyclo[9,3,3,1<sup>1,11</sup>]octadecan-18-one**, 13,16-dimethyl-13,16-diaza-, and 1-dimethylaminomethyl-13-methyl-13-azabicyclo[9,3,1]pentadec-11-en-15-one: novel products from a Mannich reaction with cyclododecanone, 238
- Tricyclo[3,2,1,0<sup>2,7</sup>]octane** system: convenient synthesis: simplified synthesis of the diterpenoid trachylobane, 689
- Tricyclo[2,1,0,0<sup>2,5</sup>]pentan-3-one** derivatives, transition metal-catalysed reactions. Decarbonylation, 45
- Tridecaborane(19)**, crystal structure, 308
- Trienes**, conjugated, triplet lifetime. Allo-ocimine and cholestatriene, 799
- Trimethylenemethane** dianion; metallation reactions, 275
- 1,3,5-Trinitrobenzene**.  $^1\text{H}$  nuclear magnetic resonance evidence for *cis-trans*-isomerism in the  $\text{C}_6\text{H}_3(\text{NO}_2)_3 \cdot (\text{SO}_3^{2-})_2$  adduct, 215
- Triosephosphate** isomerase and class I and II aldolases, an inhibitor of: phosphoglycolohydroxamic acid. A potential antibacterial and antifungal agent, 713
- Triplet**-singlet energy transfer in solution, 634
- Triptycenes**, 1,6-bis-(1-cyano-1-methylethyl)-, stable isomers, 232
- Triterpenoid** oxide from *Rhododendron macrophyllum*, structure, 357
- Triterpenoids**. Botryococcene—a tetramethylated acyclic triterpenoid of algal origin, 284  
from *Guarea glabra* (Meliaceae): a new skeletal class identified by chemical, spectroscopic, and X-ray evidence, 159
- 1,3,5-Trithian**, pathway of its oxidative chlorination, 49
- Tritium** atoms, energetic, variation in the abstraction isotope effect for, 941  
reappraisal of an inconsistency in recoil chemistry, 225
- Tropine**, pseudo-, synthesis, 720
- Tropolone** acetate, temperature-dependent carbon-13 nuclear magnetic resonance spectra, 283
- Tropolones**. Determination of the structure of stipitalide, a new tropolone from *Penicillium stipitatum* Thom., 65
- Tropone**, crystal structure at  $-60^\circ\text{C}$ , 66  
2-methoxy-, adduct with sodium methoxide: a flattened, conjugated seven-membered ring with tetrahedral carbon, 523
- Tungsten**. Crystal structure of the  $\beta$ -12-tungstosilicate anion, 648  
Electron-deficient transition metal cluster compounds: preparation and crystal structures of some molybdenum- and tungsten-aluminium compounds, 426  
and molybdenum hexafluorides, oxidising behaviour, 667  
Preparation and structures of the  $\text{Me}_3\text{N}[\text{M}^1\{\text{M}^2(\text{CO})_3(\pi\text{-C}_5\text{H}_5)\}_2]_2$  salts ( $\text{M}^1 = \text{Cu}^{\text{I}}$  or  $\text{Ag}^{\text{I}}$ ;  $\text{M}^2 = \text{Mo}$  or  $\text{W}$ ), 71  
Sign of  $^1J(^{31}\text{P}-^{183}\text{W})$  in octahedral complexes of tungsten(0), 336  
Synthesis and X-ray crystallographic characterization of  $[\text{Et}_4\text{N}]_2[\text{W}_2(\text{CO})_2\text{H}_2]$  including the direct location and the refinement of the two bridging hydride ligands, 691  
Synthesis and structure of  $\text{HW}_6(\text{CO})_6(\text{NO})$ , 181  
18-Tungstotetracobalto(II)diphosphate and related anions: a novel structural class of heteropolyanions, 139
- Tungsten-fluorine** system, transport reactions, 846
- Tyramine** and hordenine, stereochemistry of conversion into tyrosol by *Willia anomala* Hansen, 862  
[ $\beta$ - $^3\text{H}$ ]Tyrosine, stereoselectively labelled, biosynthetic incorporation into mycelianamide, 322
- $\gamma\delta$ -Unsaturated acids and  $\gamma$ -lactones, convenient route: oxidative radical addition to alkenes, 693
- Uracil**, 6-aza-, and 6-azathymine, crystal structures: aza analogues of nucleic acid constituents, 439

- Uracil**—*continued*  
5-nitro-, and 5-nitro-9-furoic acid, oxidative denitration by hydroxy-radicals, 309
- Uracils.** Copper complexes of biologically active molecules: preparation and structure of chlorobis-(2-thiouracil)copper(II) dimethylformamide solvate, 869
- Uranium.** Absorption spectrum and reaction kinetics of the photoreactive state of the uranyl ion, 59  
(C<sub>6</sub>H<sub>5</sub>)<sub>4</sub>P[UOCl<sub>5</sub>]: a new type of uranium(VI) oxochloro-complex, 820  
Dichloro-derivatives of *NN'*-ethylenebis(salicylideneiminato)-uranium(IV) and a redistribution reaction for a uranium(IV) chelate, 784  
pentafluoro, one electron reduction synthesis, 920  
*X*-Ray crystallographic characterization of the uranium-carbon  $\sigma$ -bond in tricyclopentadienylphenylethynyluranium(IV), 452
- Uridines**, deoxyhalogeno-, preparation, 201
- Vancomycin**, molecular weight and structure of the antibiotic, 772
- Vinyl** cations in acid-catalysed isomerisations of acetylenes and allenes, 177  
cations, 1-cyclopropyl-, effect of 2-substitution on rearrangement, 589  
ethers and 2-naphthonitrile, photoreaction; a novel photo-rearrangement of the primary cycloadduct, 219
- Vinylcyclopropane** systems, alternative modes of addition of dienophiles, 859
- Vinylic** methyl groups, conformation, 754  
sulphoxides from penicillins, 303
- Vinylidene** complex derived from ethylene: hydrogenation and fluxional behaviour of H<sub>2</sub>O<sub>8</sub>(CCH<sub>2</sub>)(CO)<sub>8</sub>, 277
- Vinylketen** generation, case of. Flash thermolysis of spiro-[2,3]hexan-4-ones, 795  
photochemical generation from 5-acetyl-3,3-dimethyl-3*H*-pyrazole and identification of the end product as 7-acetyl-3,5,5,9,9-pentamethyl-1,6-diazabicyclo[4,3,0]nona-3,7-dien-2-one by *X*-ray crystallographic analysis, 247
- Vinylogues**, thioamide, addition of sulphenes: substituted 5,6-dihydro-1,2-dithiin 1,1-dioxides and 1,2-dithiin 1,1-dioxides, 672
- Vitamin B<sub>12</sub>**, biosynthesis: the macrocycle and studies on the geminal methyl groups of ring c, 404  
model compound, evidence for intermediates in substitution reactions, 413
- Vitamin B<sub>12</sub>er**, oxygen carrier and redox properties of some cobalt chelates, 810
- Xenon.** Cations KrF<sup>+</sup>, XeOF<sub>3</sub><sup>+</sup>, XeF<sub>3</sub><sup>+</sup>, and XeOF<sub>5</sub><sup>+</sup> and oxidizing properties of KrF<sup>+</sup>, 26  
Crystal structure of [Xe<sub>2</sub>F<sub>11</sub>]<sup>+</sup>[AuF<sub>2</sub>]<sup>-</sup>, 131  
difluoride, fluorination with. Reactions with 1,1-di-phenylethylenes, 845
- Yohimbine** skeleton and angustidine. Total synthesis of yohimbine-type alkaloids, 732
- Yttrium.** Stable silylmethyl and neopentyl complexes of scandium(III) and yttrium(III), 126
- Zeolite A**, three- and five-co-ordinate manganese(II) in, 382
- Zinc**, highly reactive, preparation. Activated metals, 269  
octaethylporphyrin, magnetic circular emission spectrum, 546  
Reactivity of O<sub>2</sub><sup>-</sup> on ZnO, 877  
Ring-expansion of alkylbenzenes by the zinc-carbenoid reaction with diethylzinc and iodoform, 216
- Zirconium.** Ethylene oligomerisation with zirconium aryl-alkyls and alkenyls, 132
- Zizaene**-related sesquiterpenes, rearrangement, 447
- Zoanthoxanthin**, a heteroaromatic base from *Parazoanthus* *cf.* *axinellae* (Zoantharia): structure confirmation by *X*-ray crystallography, 99
- Zwitterionic ligands**, crystal structures of complexes with, 68