

INDEX OF SUBJECTS, 1977

A

- Abilities**, hydrogen-bonding, and polarities of the aromatic derivatives of cyclohex-2-enone, 1983.
and self-association in some potentially bifunctional catalysts. Part 2, mercaptoazole derivatives, 1015.
leaving group, in alkene-forming eliminations activated by sulphonyl groups. Elimination and addition reactions. Part 30, 1898.
- Ability**, bridging, of oxygen and sulphur in vinyl cations, theoretical study of, 542.
- Absolute configuration** and crystal structure of methyl-3,4-di-*O*-acetyl-6-deoxy-6-iodo-2-*O*-*p*-tolylsulphonyl- α -D-mannopyranoside, 1509.
of (+)-(S)-octoclotheptin {2-chloro-10,11-dihydro-11-(4-methylpiperzin-1-yl)dibenzo[*b*,*f*]thiepin}, and the crystal structures of it and of the racemic compound. Conformations of some semi-rigid neuroleptic drugs. Part 2, 186.
- stereochemistry** and structure of (–)-mesembrane and 3'-methoxy-4'-*O*-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus: X-ray analysis of (–)-mesembrane hydrochloride monohydrate. Sceletium alkaloids. Part 7, 1098.
of the peroxy-acid-imine route to optically active oxaziridines, 1339.
- Absorption spectra**, electronic, of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.
electronic, of the dicyanoanilines. Orientation effects in the benzene chromophore bearing one donor and two acceptor groups, 1608.
- Abstraction**, hydrogen atom, from polystyrene by *t*-butoxyl radicals, studied by spin trapping; effect of conformation on reactivity, 1416.
- 5-Acenaphthoic acid**, *cis*-2 α ,5-dihydro-, crystal structure of. Homoaallylic coupling in 1,4-dihydronaphthalenes. Part 2, 1153.
- Acetamidate**, *N*-trimethylammonio-, and substituted *N*-trimethylammonio-benzamidates, the basicities of. The Hammett correlation and the thermodynamics of protonation, 1876.
- Acetamide**, *NN*-dimethyl, and *N*-methyl, –hydrogen chloride systems in deuteriochloroform solution, ¹H, ¹³C, ¹⁴N nuclear magnetic resonance study of, 556.
- Acetanilide** and phenyl acetate radical ions, mechanism of keten elimination from. Electron impact studies. Part 116, 1670.
and some analogues, nitration of: a reconsideration. Electrophilic aromatic substitution. Part 18, 1693.
- Acetic acid**, autoxidation of cholest-5-en-3-one, and its accompanying isomerisation, in, 157.
1,1-bis-(*p*-chlorophenyl)-, (DDA), and 4,4'-dichlorobenzophenone (DBP), crystal structures of. Insecticides. Part 8, 463.
 α -fluorophenyl-, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of. Evidence for a dual mechanism of C–H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- anhydride** and isocyanates, *ortho*-effects in the acylation of substituted phenylureas with, 934.
purified, kinetics of nitration of aromatic hydrocarbons in; identification of the electrophile, 1361.
–nitric acid, nitration of toluene, *t*-butylbenzene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes with. Evidence for a π -inductive effect, 2043.
- Acetone**, *t*-butyl alcohol, acetonitrile, and ethyl acetate, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in. Substitution at saturated carbon. Part 22, 1225.
- Acetonitrile**, *t*-butyl alcohol, acetone, and ethyl acetate, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in. Substitution at saturated carbon. Part 22, 1225.
dimethyl sulphoxide, tetrahydrofuran, and ethyl acetate, reaction of 2,4-dinitrophenyl phenyl ether with morpholine in, and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.
electrochemical oxidation of 1-phenylpyrazolidin-3-one in, 1287.
kinetics of the reactions of *t*-butyl chloride and [²H₆]*t*-butyl chloride with silver salts in, 201.
- oxide**, an octamer of, crystal and molecular structure of, 334.
substitution of *N*-arylbenzimidoyl cyanides by amines in and by alcohols. Nucleophilic attacks on carbon–nitrogen double bonds. Part 4, 659.
- Acetophenone**, 2-diazo-4'-methoxy- and 2-diazo-2-phenyl-, acid-catalysed solvolysis of in aqueous–organic mixtures, 302.
effects of ion-pairing and adsorption on the stereochemistry of the cathodic pinacolisation of, 99.
o-thiocyanato-, condensation of with hydroxylamine. Properties and X-ray crystal structure analysis of (*Z*)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine, 1114.
- Acetyl side-chain** of the 17-hydroxy-isomers in solution, a circular dichroism study of the conformation of, and crystal and molecular structure of 3 α ,17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione. Steroidal analogues of unnatural configuration. Part XI, 402.
- Acetylenic compounds**. Thermodynamic and kinetic acidities in dimethyl sulphoxide. Part 2, 407.
- Acetylation**, Vilsmeier–Haack, kinetics and mechanism of *N*-substitution of indoles and carbazoles in, 1284.
- Acid dissociation**, thermodynamics of, of tertiary aliphatic ammonium ions in 60% w/w methanol–water solution and of the quinuclidinium ion in water, 102.
- Acidic media**, the effect of methyl groups on the kinetics of hydrogen exchange in. Electrophilic substitution on the thiophen ring. Part 5, 1998.

- Acidities** and rates of ionisation of protonated *meso*-tetra-arylporphyrins, substituent effects on, 2076.
thermodynamic and kinetic, in dimethyl sulphoxide. Part 2, acetylenic compounds, 407. Part 3, alcohols and phenols, 570.
- Acidity**, Lewis, quantitative aspects of. Part 17, equilibria between covalent metal halides and thiobenzamide in diethyl ether solution, 592.
functions, a critical analysis of, and the incompatibility amongst proposed empirical correlations. The M_C activity coefficient function for acid-base equilibria. Part 2, 306.
and observed nitration rates, limitations of empirical relationships involving. The M_C activity coefficient function for acid-base equilibria. Part 4, 845.
- Acids**, monobasic, crystal structures of some acid salts of. Part 18, potassium hydrogen bisphenylacetate, determined by neutron diffraction, 979. Part 19, potassium hydrogen dicrotonate, X-ray and neutron diffraction studies, 1740.
 $\beta\gamma$ -unsaturated, effect of β -substituents on the rate of gas-phase decarboxylation of. Studies in decarboxylation. Part 10, 745.
- Acid solution**, reaction with diazonium ions in. Electrophilic substitution in pyrroles. Part 2, 1452.
strengths of various substituted formazans in ethanolic solution, 1683.
- Action** of serine proteases, hydrolyses of *O*-acylglycolamides as models of the deacylation step in the mechanism of: function of the oxyanion pocket, 1221.
- Activating effects** of fluorine in polyfluoropyridines in reactions with ammonia. Mechanisms for reactions of halogenated compounds. Part 1, 585.
- Activation**, effect of substituents on the free energy of: further studies of barriers to rotation in some 3-arylcyclohexenone derivatives. Restricted rotation. Part 2, 356.
- Activity coefficient**, the M_C , function for acid-base equilibria. Part 2, a critical analysis of acidity functions and the incompatibility amongst proposed empirical correlations, 306. Part 3, improvement of the M_C function by mathematical treatment, 309. Part 4, limitations of empirical relationships involving nitration rates and acidity functions, 845.
- Acyclic phosphine oxides**, reaction of with toluene-*p*-sulphonyl isocyanate and related reactions, 1379.
- $\beta\gamma$ -unsaturated ketones**, photochemistry of: the effect of α -methyl substitution, 1357.
- Acyl group** in benzothiazoles, displacement of by nucleophilic alkyl radicals. Homolytic aromatic *ipso*-substitution, 1679.
transfer agents, *N*-hydroxy-compounds as. Part 1, kinetics and mechanism of nucleophilic displacements on 1-hydroxybenzotriazole esters and crystal and molecular structure of 1-benzoyloxybenzotriazole, 224. Part 2, kinetics and mechanism of hydrolysis and aminolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters, 231.
reactions, strain effects in. Part 4, kinetic analysis of the reaction of imidazole buffer solutions with β -propiolactone using a novel graphical method for branched, series reactions, 1492.
- Acyclic and cyclic cyanides**, conformations of: ^{13}C -H couplings, 364.
- Acylation** of *O*-alkylbenzohydroxamic acids: configurational assignment, interconversion, and rearrangement of the *E*- and *Z*-isomers of a new group of *O*-acyl isoamides, 1080.
of substituted phenylureas with isocyanates and acetic anhydride, *ortho*-effects in, 934.
- Acylation**, aromatic, catalysed by metal oxides, 601.
- Acyclic enamines**, carbon-13 nuclear magnetic resonance spectra of. Enamine chemistry. Part 22, 838.
- O*-Acylglycolamides**, hydrolyses of as models of the deacylation step in the mechanism of action of serine proteases: function of the oxyanion pocket, 1221.
- (*E*)-*O*-Acyl isoamides**, isomerisation of to *N*-acyl amides. Mechanism of an intramolecular [1,3] acyl group migration *via* a four-membered transition state, 1085.
- Acyl-oxygen versus aryl-oxygen bond scission** in reactions of benzenethiolate with nitrophenyl esters of carboxylic acids, 966.
- Adamantanes**, substituted, anodic oxidation of, 505.
- Addition and elimination reactions**. Part 30, leaving group abilities in alkene-forming eliminations activated by sulphonyl groups, 1898. Part 31, polar effects on the ionisation of sulphones, nitriles, and ketones, 1909. Part 32, discrimination between concerted and stepwise processes in activated elimination reactions, 1914. Part 33, formation and behaviour of carbanions derived from sulphones and nitriles bearing β -onium substituents, 1920.
of methanol and water to vinyl-substituted quinone methides, products of. The chemistry of reactive lignin intermediates. Part 3, 616.
of thiohypochlorous acid to ethylene, *ab initio* SCF-MO study of the reaction intermediates formed by, 1019.
radical, to alkynes and intramolecular reactions of vinyl radicals, electron spin resonance studies of, 827.
sodium ethoxide, to 2,4-dinitro-6-X-phenetoles in ethanol, equilibrium and kinetic data for. The stabilities of Meisenheimer complexes. Part 14, 1442.
to olefinic substances, kinetics and mechanisms of. Part 13, reactions of 3-substituted cholest-5-enes with sources of electrophilic bromine, 2048. Part 14, reactions of cholest-5-en-3-one with electrophilic brominating agents, 2055. Part 15, chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one: factors affecting the α : β ratio for electrophilic attack and for product formation in cholest-5-enes, 2062.
- Adducts**, free radical, of tri(cyclohexyl)plumbyl radicals with α -dicarbonyl compounds, 1633.
- Adenosine triphosphate**, adenosine diphosphate, and their 1:1 complexes with magnesium(II) at various pH values, hydration and self-association of: infrared investigations, 1824.
- Adsorption and ion-pairing**, effects on the stereochemistry of cathodic pinacolisation of acetophenone, 99.
- Aerosol-OT** and dodecylammonium propionate aggregates in benzene, kinetics of the reaction of *p*-nitrophenyl acetate with amines in the presence of, 1674.
- Aggregation**, molecular in the hydrolysis of *p*-nitrophenyl carboxylates, kinetic consequences of, 1947.
- Alatolide monohydrate**, X-ray crystallographic determination of the molecular conformation of the germacranolide. Sesquiterpenoids. Part XXIII, 255.
- Alcoholic solvents**, kinetics of proton and deuteron transfer from α ,4-dinitrotoluene to 1,8-bis(dimethylamino)naphthalene in, 814.

- Alcohols** and phenols. Thermodynamic and kinetic acidities in dimethyl sulphoxide. Part 3, 570.
 homoallyl, intramolecular O-H... π interaction studies in, 1821.
 some cyclic, gas-phase hydrogen-chloride-catalysed decomposition of, 1425.
 substitution of *N*-arylbenzimidoyl cyanides by alkoxides in and by amines in acetonitrile. Nucleophilic attacks on carbon-nitrogen double bonds. Part 4, 659.
 tertiary, decomposition of carbamates of. Part 3, influence of phenyl and vinyl substituents at the α -carbon atom, 879.
 water, phenols, and carboxylic acids, rates of reactions of quinone methides with. The chemistry of reactive lignin intermediates. Part 5, 1737.
- Aldehyde group**, hydrogen isotope exchange in during the reduction of benzaldehyde by tritiated sodium borohydride (tetrahydridoborate), 1472.
- Aldehydes**, fragmentation reactions and reduction by. Photochemistry of some cyclopropyl conjugated 1,2-diketones, 710.
- Aldohexopyranoses**, a Monte Carlo investigation of the conformational free energies of, 654.
- Aldonolactones**, oxidative decarboxylation of by cerium(IV) sulphate in aqueous sulphuric acid: synthesis of D-arabinose, 685.
- Aliphatic** and aromatic sulphanyl radicals. Electron spin resonance studies. Part 51, 497.
- amines**, *n*, π -homoconjugated, nature of the lone-pair electrons in. Homoallylic interaction between a nitrogen lone pair and a non-adjacent π -bond. Part 6, 1057.
- ammonium ions**, tertiary, in 60% w/w methanol-water solution and the quinuclidinium ion in water, thermodynamics of the acid dissociation of, 102.
- diazo-compounds**, intermediates in the decomposition of. Part 13, mechanistic studies on the reaction of diaryldiazomethanes with singlet molecular oxygen, 327. Part 14, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion, 671.
- Alkaline reaction** of *O*-aroyl-*N*-arylglycolamides, evidence for the 1 \rightarrow 4 migration of an anilino-group in the: alkaline hydrolysis of esters possessing readily ionisable amide groups, 2028.
 solution, intramolecular migration of an amino-group *via* a transannular process during the reaction of *O*-salicyloylglycolamines in: an analogue of the reverse of the Brenner aminoacyl insertion reaction, 1804.
- Alkaloids**, skeleton. Part 7, structure and absolute stereochemistry of (-)-mesembrane and 3'-methoxy-4'-*O*-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus: X-ray analysis of (+)-mesembrane hydrochloride monohydrate, 1098.
 the *Erythrina*, coccoline and coccutrine, X-ray structural and conformational analyses of, 1156.
- Alkanes** and non-conjugated alkenes, molecular mechanics calculations on, 1610.
- Alkenes**, non-conjugated, and alkanes, molecular mechanics calculations on, 1610.
- Alkanethiols**, the pyrolysis of. Part 1, kinetics of the pyrolysis of butane-1-thiol, butane-2-thiol, and 2-methylpropane-2-thiol, 439.
- Alkanoate ions**, long-chain, and alkyl bromides, reactions between, as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions. Intermolecular models for intramolecular reactions. Ring closure reactions. Part 6, 443.
- Alkene-forming eliminations** activated by sulphonyl groups, leaving group abilities in. Elimination and addition reactions. Part 30, 1898.
- Alkenes**, reactions of peracetyl radicals with. Reactions of oxygenated radicals in the gas phase. Part 3, 360.
 the ene reaction of maleic anhydride with, 533.
- Alkoxides** and pyridinium salts in tetrahydrofuran, mechanistic studies of the redox reaction between: pyridinium salts and dihydropyridines, 759.
 methyl- and *n*-butyl-tin, a nuclear magnetic double resonance study of: auto-association in organometallic compounds, 242.
 methylcadmium, a nuclear magnetic resonance study of: auto-association in organometallic compounds, 1187.
 substitution of *N*-arylbenzimidoyl cyanides by in alcohols and by amines in acetonitrile. Nucleophilic attacks on carbon-nitrogen double bonds. Part 4, 659.
- 2-Alkoxy-carbonylphenyl nitroxide** radicals, long-range couplings in, 904.
- Alkoxy** and trimethylsiloxy radicals, an electron spin resonance study of the reactions of with dialkyl sulphoxides, 1708.
- Alkoxy nitroxide radicals** from photolysis of nitropyridines: a kinetic investigation by electron spin resonance spectroscopy, 1132.
- Alkylamines**, some substituted tertiary, electrochemical oxidation of. Amine oxidation. Part 13, 1732.
- Alkyl bromides** and long-chain alkanoate ions, reactions between, as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions. Intermolecular models for intramolecular reactions. Ring closure reactions. Part 6, 443.
- Alkylmercury(II) bromides**, the anion-catalysed substitution of by mercury(II) bromide in ethanol. Calculations of steric effects. Part 3, 221.
- Alkyl radicals**, nucleophilic, displacement of the acyl group in benzothiazoles by. Homolytic aromatic *ipso*-substitution, 1679.
- Alkynes**, radical addition to, and intramolecular reactions of vinyl radicals, electron spin resonance studies of, 827.
- Alkyl systems**, some simple, and 1-aryl-1-methylethyl *p*-nitrobenzoates, phenolyses of: characteristic features of phenol as a solvolytic solvent, 594.
- N*-Allylsulphonamides**, metal carbonyl-catalysed isomerisation of to *N*-prop-2-enyl and *N*-propylidene derivatives. Catalysed prototropic rearrangements. Part 3, 11.
- Alternation**, line-width, and long-range interactions associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from cyclic ethers containing six-membered rings. Investigations of structure and conformation. Part 7, 754.
 and long-range interactions for γ -proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$: temperature-dependent electron spin resonance spectra. Investigations of structure and conformation. Part 6, 116.
- Amidates**, *N*-ammonio-, mono- and di-protonation sites in: a spectroscopic study, 909.
- Amide groups**, readily ionisable, alkaline hydrolysis of esters possessing: evidence for the 1 \rightarrow 4 migration of an anilino-group in the alkaline reaction of *O*-aroyl-*N*-arylglycolamides, 2028.

- Amides**, *N*-acyl, isomerisation of (*E*)-*O*-acyl isoamides to. Mechanism of an intramolecular [1,3] acyl group migration *via* a four-membered transition state, 1085.
- alkylphenylphosphinic, proton magnetic resonance non-equivalence of the enantiomers of, 1882.
- structure and mechanism of formation of intermediates in the reaction between CSCl_2 or PSCl_3 and, or between thioamides and COCl_2 , POCl_3 , or PSCl_3 . Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- Z-Amidoximes**, stereospecific formation of in the reaction of benzonitrile oxides with amines. Reactivity of 1,3-dipoles in aqueous solution. Part 1, 1457.
- Amine oxidation**. Part 13, electrochemical oxidation of some substituted tertiary alkylamines, 1732.
- Amines** and aromatic hydrocarbons, excited complex formation between heterocyclic compounds and, 1280.
- concerning the use of as probes for participation of singlet oxygen in dye-sensitised oxygenation reactions, 178.
- n, π -homoconjugated aliphatic, nature of the lone-pair electrons in. Homoallylic interaction between a nitrogen lone pair and a non-adjacent π -bond. Part 6, 1057.
- kinetics of the reaction of *p*-nitrophenyl acetate with in the presence of dodecylammonium propionate and Aerosol-OT aggregates in benzene, 1674.
- photosensitised oxidation of: mechanism of oxidation of triethylamine, 173.
- primary and secondary, reactivity of with 2-nitrophenazine 10-oxide, 1661.
- stereospecific formation of *Z*-amidoximes in the reaction of benzonitrile oxides with. Reactivity of 1,3-dipoles in aqueous solution. Part 1, 1457.
- substitution of *N*-arylbenzimidoyl cyanides by in acetonitrile and by alkoxides in alcohols. Nucleophilic attacks on carbon-nitrogen double bonds. Part 4, 659.
- tertiary, and styrenes, excited complex formation between, 2002.
- dehydrogenation of by dibenzoyldi-imide, 1977.
- α -Amino-acids**, ^{13}C shielding effects at γ -carbon atoms in the side-chains of, 50.
- 2-Aminobenzothiazole** and dimethyl but-2-ynedioate, synthesis and structure of methyl 2-oxopyrimido[1,2-*b*]benzothiazole-4-carboxylate from condensation of, 1070.
- Amino group**, intramolecular migration of *via* a transannular process during the reaction of *O*-salicyloylglycolamides in alkaline solution: an analogue of the reverse of the Brenner aminoacyl insertion reaction, 1804.
- Aminolysis** and hydrolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters, kinetics and mechanism of. *N*-Hydroxy-compounds as acyl transfer agents. Part 2, 231.
- Ammonia**, activating effects of fluorine in polyfluoropyridines in reactions with. Mechanisms for reactions of halogenated compounds. Part 1, 585.
- Ammonium**, 8-methoxy-*NN*-dimethyl-1-naphthyl-, ion and 8-hydroxy-*NN*-dimethyl-1-naphthylamine, rates of proton transfer, acid dissociation constants, and the strengths of intramolecular hydrogen bonds in, 152.
- ions**, tertiary aliphatic, in 60% w/w methanol-water solution and the quinuclidinium ion in water, thermodynamics of the acid dissociation of, 102.
- salts**, some quaternary, and sulphonium salts in chloroform, conductances of, 952.
- Ammoniumyl radical cation (NH_3^{++})**, generation and reactions of: an electron spin resonance investigation, 987.
- Analgesics** and their interactions, structural studies of. Part 4, crystal structures of phenylbutazone and a 2 : 1 complex between phenylbutazone and piperazine, 693.
- Analogues**, intermolecular, of the lactonisation of ω -bromoalkanoate ions, reactions between long-chain alkanoate ions and alkyl bromides as intermolecular models for intramolecular reactions. Ring closure reactions. Part 6, 443.
- Analysis** of substituent effects for reactions not following the Hammett relation, 2033.
- 5 α -Androstan-17 β -ol**, 2 $\alpha, 3\alpha$ -epithio-, (*R*)-*S*-oxide, crystal structure of, 741.
- Aniline** and azoxybenzene, a mechanistic study of the decomposition of phenylhydroxylamine to, and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediaminetetra-acetic acid, 1868.
- and substituted anilines, kinetic and mechanistic studies of reactions of with chloramine τ , 1275.
- sulphonation of in concentrated aqueous and fuming sulphuric acid. Aromatic sulphonation. Part 59, 1008.
- derivatives** and other nucleophilic species, direct nitrosation of by *N*-nitrosodiphenylamine, 1932.
- Anilines**, *NN*-dimethyl-, di- and tri-substituted, a dipole moment study of the *ortho*-effect in, 559.
- N*-(4-methoxybenzylidene)-, substituent effects and benzene-induced shifts in the proton magnetic resonance spectra of, 715.
- ortho*-substituted; photoisomerisation of substituted 2-methylpyridines to, 1148.
- some substituted, the kinetics of the reactions of picryl chloride with. Part IV, 14.
- substituted, indirect measurement of the rate constants for the diazotisation of by nitrosyl chloride and nitrosyl thiocyanate, 502.
- the dicyano-, electronic absorption spectra of. Orientation effects in the benzene chromophore bearing one donor and two acceptor groups, 1608.
- Aniliniumsulphonic acids**, the rearrangement of phenylsulphamic acid to in concentrated sulphuric acid: evidence for an intermolecular reaction pathway. Aromatic sulphonation. Part 56, 921.
- Anilino-group**, evidence for the 1 \rightarrow 4 migration of in the alkaline reaction of *O*-aroyl-*N*-arylglycolamides: alkaline hydrolysis of esters possessing readily ionisable amide groups, 2028.
- Anils**, *p*-*NN*-dimethylamino-, of some vicinal diketo-compounds, structures and spectral properties of. Positive solvatochromic effect. Conjugated Schiff's bases. Part 8, 1893.
- Anion**, *p*-benzosemiquinone, electron spin resonance studies on the mechanism of the formation of over manganese dioxide, 1421.
- 1,3,5-thiadiazinide, evidence for the existence of a new 8 π -electron system, 939.
- Anisole**, *o*-methylanisole, and *p*-methylanisole in aqueous sulphuric acid, the nitration of. Electrophilic aromatic substitution. Part 16, 248.
- Anisotropies**, magnetic, Kerr constants, and Cotton-Mouton constants of pyridazine, pyrimidine, and pyrazine, 897.
- [10] **Annulene**, 2,7-dinitro-1,6-methano-, an electron-donor-acceptor complex of, steric hindrance to termolecular complex formation in, 994.

- Anodic cleavage** of dibenzyl ether, mechanism of. Electro-organic reactions. Part 10, 803.
- Anthracene**, coronene (dibenzo[*ghi,pqr*]perylene), and triphenylene, protiodetritiation of in anhydrous trifluoroacetic acid. Electrophilic aromatic substitution. Part 18, 353.
- derivatives**. Polar substituents and the luminescence of organic compounds. Part 2, 919.
- Antibiotic A-130A**, a silver salt of, crystal and molecular structure of, 1531.
- Antibiotics**, ionophorous, studies on the. Part 4, crystal and molecular structure of the thallium salt of Ionomycin, 494.
- Anticholinergic agents**, stereochemistry of. Part 10, crystal and molecular structure of the (*R*) enantiomer of *N*-2-(2-cyclohexylmandeloyloxy)ethyl-*N*-methylpiperidinium iodide, 643.
- Apicophilicities**, relative ligand: stereochemical non-rigidity of phosphoranyl radicals, 730.
- Aqueous-organic mixtures**, acid-catalysed solvolysis of 2-diazo-4'-methoxy- and 2-diazo-2-phenyl-acetophenone in, 302.
- solution**, kinetics and mechanism of the oxidation of xanthates with iodine in, 113.
- of the thallium(III) ion promoted decomposition of thiobenzamides in, 1366.
- nuclear magnetic resonance conformational studies of the C α -C β fragments of oxytocin, oxytocinoic acid, and tocinoic acid in, 477.
- study of the conformations of atropine and scopolamine cations in, 2016.
- oxygenated, hydroxyl radical induced oxidation of D-glucose in. Radiation chemistry of carbohydrates in. Part 14, 1958.
- photolysis of dipotassium α -D-glucose 1-phosphate in under argon and oxygen. The photochemistry of phosphorus compounds. Part 11, 132.
- reactions of *N*-methylated 2-aminoindamines in. Benzoquinone imines. Part 13, 1125.
- reactivity of 1,3-dipoles in. Part 1, stereospecific formation of *Z*-amidoximes in the reaction of benzonitrile oxides with amines, 1457.
- Aqueous solutions**, oxygenated and deoxygenated, photo-reactions of fructose 6-phosphate in, 1719.
- D-Arabinose**, synthesis of; oxidative decarboxylation of aldolactones by cerium(IV) sulphate in aqueous sulphuric acid, 685.
- Arenes**, vapour phase chemistry of. Part 6, arylation and transcyanation in the pyrolysis of benzonitrile, 1062.
- Arenesulphonamides**, the acid dissociation of: σ_{Het} -constants for thia- and oxa-substituents in five-membered S-linked heterocycles and effects of substituents in the *N*-linked aromatic ring, 984.
- Argon and oxygen**, photolysis of dipotassium α -D-glucose 1-phosphate in aqueous solution under. The photochemistry of phosphorus compounds. Part 11, 132.
- Aromatic and aliphatic sulphinyl radicals**. Electron spin resonance studies. Part 51, 497.
- polyhalogeno-, compounds, nucleophilic displacement in. Part 3, kinetics of protiodeiodination of iodoarenes, 278.
- acylations** catalysed by metal oxides, 601.
- compounds**, fluorine-19 nuclear magnetic resonance studies of. Part 5, transmission of substituent effects across two aromatic rings connected by C-C and -C- linkages, 1051.
- mono-, di-, and tri-cyanovinyl, structural effects on the electrochemistry and charge distribution of, 1635.
- the S_N mechanism in. Part 41, thermochemical calculations and experimental measurements of methanolysis of 1-fluoro-2,4-dinitrobenzene, picryl chloride, and picryl fluoride, 457.
- derivatives** of cyclohex-2-enone, polarities and hydrogen-bonding abilities of, 1983.
- group** in benzobicyclo[2.2.2]octen-2-one derivatives, effect of the direction of the electric transition dipole moment in. Optical activity in γ -unsaturated ketones. Part 1, 1937.
- halogen substitution**, the kinetics and mechanisms of. Part 34, comments on the physical interpretation of high kinetic orders in bromine, 106.
- homolytic substitution**, structural effects on the reactivity of carbon radicals in. Part 4, the nucleophilicity of bridgehead radicals, 87.
- hydrocarbons** and amines, excited complex formation between heterocyclic compounds and, 1280.
- in purified acetic anhydride, kinetics of nitration of; identification of the electrophile, 1361.
- hydroxylation**. Part 6, oxidation of naphthalene by dioxygen in the presence of iron(II) salts, 1583.
- nucleophilic substitution**, catalysis in. Part 1, reactions of piperidine with 2,4-dinitrophenyl 4-nitrophenyl ether and 2,4-dinitrophenyl phenyl sulphone, 1316.
- reactivities**, electrophilic, *via* pyrolysis of 1-arylethyl esters. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678.
- Part 14, non-additivity of methyl substituent effects: the reactivity selectivity principle, 1537.
- Part 15, non-additivity of chloro-substituent effects: mechanism of the elimination, 1541.
- ring**, fused, effect of on the conformational preferences of perhydropyrido[1,2-*c*][1,3]oxazines and related compounds. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 33, 370.
- the *N*-linked, effects of substituents in and σ_{Het} -constants for thia- and oxa-substituents in five-membered S-linked heterocycles: the acid dissociation of arene-sulphonamides, 984.
- rings**, six-membered, 1,3-dipolar character of. Part 32, derivatives of 1-aryl-3-imidopyridiniums: preparation and X-ray crystal structure, 1304.
- solutes**, other, and benzyl alcohol, a nuclear magnetic resonance investigation of complex formation between imipramine and related psychotropic drugs with, 1964.
- solvent induced shifts** in molecules with and without permanent electric dipole moment, 1656.
- substituents**, effect of on the stereodynamics of hindered hydrazones. Conformational studies by dynamic nuclear magnetic resonance. Part 8, 1666.
- substitution**, electrophilic. Exeter and City Universities: Part 16, the nitration of anisole, *o*-methylanisole and *p*-methylanisole in aqueous sulphuric acid, 248.
- Part 17, products, kinetics and mechanism of nitration in trifluoroacetic acid, 1688.
- Part 18, nitration of acetanilide and some analogues: a reconsideration, 1693.
- University of Sussex: Part 18, protiodetritiation of anthracene, coronene (dibenzo[*ghi,pqr*]perylene), and triphenylene in anhydrous trichloroacetic acid, 353.

Aromatic substitution (*contd.*)

Part 19, protiodetritiation of 1,2-diphenylethane and 9,10-dihydrophenanthrene: effect of strain on aromatic reactivity, 866.

a theoretical investigation of the effect of positively charged substituents on product distribution in; evidence for a dominant field effect of the positive poles, 1066.

nucleophilic, orienting effects of chlorine substituents in. Mechanisms for reactions of halogenated compounds. Part 2, 1774.

substituent effects of phosphorus- and arsenic-containing groups in aromatic substitution. Part 7, comparison of carboxy and phosphonic groups, 1479.

ipso-substitution, homolytic. Displacement of the acyl group in benzothiazoles by nucleophilic alkyl radicals, 1679.

sulphonation. Part 54, sulphonation of polyethylbenzenes. On the Jacobsen rearrangement of the tetraethylbenzenesulphonic acids, 717. Part 55, reaction of polyisopropylbenzenes with concentrated aqueous sulphuric acid, 720. Part 56, the rearrangement of phenylsulphamic acid to aniliniumsulphonic acids in concentrated sulphuric acid: evidence for an intermolecular reaction pathway, 921. Part 57, phenylsulphamic acid in sulphuric acid: solvolysis *versus* sulphonation, 929. Part 58, protonation and sulphonation of methanesulphonanilide in aqueous sulphuric acid, 1003. Part 59, sulphonation of aniline in concentrated aqueous and fuming sulphuric acid, 1008. Part 60, sulphonation in the reactions of aromatic compounds with chlorosulphuric acid in nitromethane and in dichloromethane, 1548. Part 61, sulphonylation in the reaction of aromatic compounds with chlorosulphuric acid in nitromethane and in dichloromethane, 1557. Part 62, sulphonation of biphenyl in concentrated aqueous sulphuric acid, 1560. Part 63, sulphonation of *m*-aminobenzenesulphonic acid in fuming sulphuric acid. Formation of an overcrowded tetrasulphonic acid, 1863.

Arsenic- and phosphorus-containing groups in aromatic substitution, substituent effects of. Part 7, comparison of carboxy and phosphonic groups, 1479.

Arsine, triphenyl-, and its oxide and triphenylphosphine and its oxide, sulphide, and selenide, triphenyl-phosphonium and -arsonium cations and various phosphoranyl and arsoranyl radicals derived from by the action of ionizing radiation. Unstable intermediates. Part 173, 833.

Arsonium, triphenyl-, and triphenyl-phosphonium cations and various phosphoranyl and arsoranyl radicals derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.

Arsoranyl radicals and phosphoranyl radicals, various, and triphenyl-phosphonium and -arsonium cations derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.

Aryl acetates, the effect of leaving group tendency in the chymotrypsin-catalysed hydrolysis of, 351.

Arylation and transcyanation in the pyrolysis of benzo-

nitrile. Vapour phase chemistry of arenes. Part 6, 1062.

N-Arylazetidins-2-ones (*N*-aryl- β -lactams), a study of factors affecting the rates of hydrolysis of some, 765.

Arylazonaphthols exhibiting azo-hydrazone tautomerism, oxidation by singlet oxygen of, 747.

3-Arylcyclohexenone derivatives, further studies of barriers to rotation in some: effect of substituents on the free energy of activation. Restricted rotation. Part 2, 356.

1-Arylethyl esters, pyrolysis of, electrophilic aromatic reactivities *via*. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678. Part 14, non-additivity of methyl substituent effects: the reactivity selectivity principle, 1537. Part 15, non-additivity of chlorosubstituent effects: mechanism of the elimination, 1541.

Arylhydrazines and nitrous acid, kinetics and mechanism of the reaction between, 667.

Arylmethane, di- and tri-, dyes, steric effects in. Part 13, electronic absorption spectra of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion, 450.

1-Aryl-3-methyltriazines and 3-aryl-1-methyltriazines, the effect of electron-withdrawing substituents on the tautomerism between, 17.

Aryl-oxygen *versus* acyl-oxygen bond scission in reactions of benzenethiolate with nitrophenyl esters of carboxylic acids, 966.

Aryloxy radicals by photorearrangement of nitro-compounds, 1240.

Arylphosphorus, hetero-, compounds, the chemistry of. Part 7, heteroaryl, heteroarylmethyl-, and substituted aryl-phosphonate esters. Electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies, 789.

N-Arylsulphamates, protonation equilibria of using ultraviolet and nuclear magnetic resonance methods. Basicity of nitrogen-sulphur(vi) compounds. Part 2, 1180.

Aspects, kinetic and energetic, of the photodimerisation of some systemic pyrimidine fungicides, 216.

quantitative, of Lewis acidity. Part 17, equilibria between covalent metal halides and thiobenzamide in diethyl ether solution, 592.

Assignments, ^{13}C chemical shift, of the carbonyl groups in penicillins and cephalosporins. ^{13}C Nuclear magnetic resonance of *N*-heterocycles. Part 3, 1749.

Asymmetric deformations, methyl and trifluoromethyl; Raman optical activity of simple chiral molecules, 1790.

Atropine and scopolamine cations in aqueous solution, nuclear magnetic resonance study of the conformations of, 2016.

Attack, nucleophilic, and single electron transfer, competition between: reaction of 3-arylimino-2-phenyl-3*H*-indoles with organolithium compounds, 1032.

metal-ion assisted catalysis of. Part 3, co-operation between metal ion and hydroxide, 318.

Attacks, nucleophilic, on carbon-carbon double bonds. Part 24, nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; comments on the work of Le Guillanton and Cariou, 1000.

on carbon-nitrogen double bonds. Part 4, substitution of *N*-arylbenzimidoyl cyanides by amines in acetonitrile and by alkoxides in alcohols, 659.

- Auto-association** in organometallic compounds: a nuclear magnetic double resonance study of methyl- and n-butyl-tin alkoxides, 242.
- in organometallic compounds: a nuclear magnetic resonance study of methylcadmium alkoxides, 1187.
- Autoxidation** by spin trapping, study of. Spin trapping of peroxy radicals by phenyl *N*-*t*-butyl nitron, 1770.
- liquid-phase, of cumene with lead dioxide, electron spin resonance and kinetic studies on, 784.
- of cholest-5-en-3-one, and its accompanying isomerisation, in acetic acid, 157.
- Auto-oxidation-reduction** of substituted nitrobenzenes in cyclohexane, kinetics, 1989.
- Azavinyl systems**, stereochemistry of bimolecular displacement in; crystal and molecular structure of *N*-(2,4-dinitrophenyl)-*N*-methylpivalohydrazonyl bromide, 1136.
- Azetidin-2-one**, 1-(2-bromophenyl)-, and 1-(2-bromophenyl)-pyrrolidin-2-one, conformation of, 547.
- Azetidin-2-ones**, *N*-aryl, (*N*-aryl- β -lactams), a study of factors affecting the rates of hydrolysis of some, 765.
- Azines**, tautomeric. Part 6, phthalazin-1(2*H*)-one, 1184.
- Azoalkanes**, thermolysis of in a stirred-flow system, 1887.
- [¹⁵N]Azoles, proton, carbon-13, and nitrogen-15 nuclear magnetic resonance studies of: 1-phenylpyrazole and the tautomerically mobile 3-methyl-1-phenylpyrazolin-5-one, 1024.
- Azomethines**, molecular conformation and electronic structure of. Part 5, determination of the conformation of some *N*-methylimine derivatives of aldehydes and ketones from dipole moment data, 2038.
- Azoxybenzene** and aniline, a mechanistic study of the decomposition of phenylhydroxylamine to, and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediaminetetra-acetic acid, 1868.
- Azoxy groupings**, comparison with three-co-ordinate nitrogen in, and extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover two-co-ordinate nitrogen in the other groupings with oxygen and carbon. Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.

B

- Baker-Nathan effect**, carbon-carbon hyperconjugation and the origin of. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl esters. Part 13, 678.
- Band systems**, near ultraviolet, of disubstituted benzene derivatives, polarisation directions of, 1262.
- Barbituric acids**, 5-alkyl-5-(3-hydroxy-1-methylbutyl)-, circular dichroism of, 983.
- Barrier** to ring inversion in *cis*-1,2-, *trans*-1,3-, and *cis*-1,4-dimethylcyclohexane, application of the Forsen-Hoffman spin-saturation method and ¹³C nuclear magnetic resonance spectroscopy to the determination of, 84.
- Barriers**, rotational, in 1-dimethylamino-3-dimethylimino-2-(*para*-substituted phenyl)propene perchlorates, 1388.
- to nitrogen inversion in six-membered rings. Ring and nitrogen inversion in some methylene bridged bisheterocycles, 588.
- to rotation in some 3-arylcyclohexenone derivatives, further studies of: effect of substituents on the free energy of activation. Restricted rotation. Part 2, 356.
- Base catalysed** ring opening of 3-unsubstituted isoxazoles. Derivatives of 4- and 5-phenylisoxazole, 1121.
- Bases**, *N*-heteroaromatic, reactions of with nitrous acid. Part 4, kinetics of the diazotisation of 2- and 4-aminopyridine 1-oxide, 1830. Part 5, kinetics of the diazotisation of substituted 2-aminopyridine and 2-aminopyridine 1-oxide, 1835.
- two minor, from *S. namaquense* L. Bolus, (–)-mesembrane and 3'-methoxy-4'-*O*-methyljoubertiamine, structure and absolute stereochemistry of: X-ray analysis of (–)-mesembrane hydrochloride monohydrate. Scelerium alkaloids. Part 7, 1098.
- weak, eliminations promoted by. Part 7, E2C and E2H reactions of cyclohexyl toluene-*p*-sulphonate with triphenylphosphine and other neutral bases, 293. Part 8, kinetics and mechanisms of reactions of cyclohexyl toluene-*p*-sulphonate with thiourea in various solvents, 298.
- Basicities** of *N*-trimethylammonioacetamidate and of substituted *N*-trimethylammonioacetamidates. The Hammett correlation and the thermodynamics of protonation, 1876.
- Basicity** of nitrogen-sulphur(vi) compounds. Part 2, protonation equilibria of *N*-arylsulphamates using ultraviolet and nuclear magnetic resonance methods, 1180.
- constants**, correlation between, corrected for steric effects, and Taft σ^* values for some ketones and nitriles. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- Basic solutions**, reactions of carbonyl compounds in. Part 8, mechanism of alkaline hydrolysis of methyl pseudo-8-(3- or 4-substituted benzoyl)-1-naphthoate and pseudo-2-(3- or 4-substituted benzoyl)-benzoates, 526.
- Behaviour** and formation of carbanions derived from sulphones and nitriles bearing β -onium substituents. Elimination and addition reactions. Part 33, 1920.
- Benzaldehyde**, hydrogen isotope exchange in the aldehyde group during the reduction of by tritiated sodium borohydride (tetrahydridoborate), 1472.
- Benzamidates**, substituted *N*-trimethylammonio-, and *N*-trimethylammonio-acetamidate, the basicities of. The Hammett correlation and the thermodynamics of protonation, 1876.
- Benzamide**, *o*-mercapto-*NN*-dimethyl-, intramolecular hydrogen bonding in, 166.
- Benzamidine-catalysed mutarotation** of 2,3,4,6-tetra-*O*-methyl-D-glucose, 1047.
- Benzene**, *t*-butyl-, toluene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes, nitration of with nitric acid-acetic anhydride. Evidence for a π -inductive effect, 2043.
- 1-chloro-2,4-dinitro-, reaction of with morpholine in ethyl acetate and of 2,4-dinitrophenyl phenyl ether with morpholine in dimethyl sulphoxide, acetonitrile, tetrahydrofuran, and ethyl acetate, 597.
- [di(benzoyloxy)iodo]-, mechanism of the thermal decomposition of in bromobenzene, 860.
- 1-fluoro-2,4-dinitro-, picryl chloride, and picryl fluoride, thermochemical calculations and experimental measurements of methanolysis of. The S_N mechanism in aromatic compounds. Part 41, 457.
- kinetics of ester imidazolysis in, 1176.
- of the reaction of *p*-nitrophenyl acetate with amines in the presence of dodecylammonium propionate and Aerosol-OT aggregates in, 1674.

Benzene (*contd.*)

- chromophore** bearing one donor and two acceptor groups, orientation effects in. Electronic absorption spectra of the dicyanoanilines, 1608.
- derivatives**, disubstituted, polarisation directions of the near ultraviolet band systems of, 1262.
on the interpretation of linear correlations between nuclear magnetic resonance substituent chemical shifts and substituent reactivity parameters in, 769.
- nitromethane**, mercury (II) cyanide promoted reactions of 2-*O*-acetyl-3,4,6-tri-*O*-methyl- α -D-glucopyranosyl bromide with cyclohexanol in, mechanistic study of. Koenigs-Knorr reactions. Part 3, 795.
- Benzenes**, *ortho*-disubstituted, a nuclear magnetic resonance study of the conformations of. Conformational analysis, 693.
iodo-, photoelectron spectra of, 962.
methyl-, anodic oxidation of at potentials in the first voltammetric wave, 1952.
polyethyl-, sulphonation of. On the Jacobsen rearrangement of the tetraethylbenzenesulphonic acids. Aromatic sulphonation. Part 54, 717.
polyisopropyl, reaction of with concentrated aqueous sulphuric acid. Aromatic sulphonation. Part 55, 720.
some chloro- and nitro-, Cotton-Mouton and Kerr effects of, 901.
substituted nitroso-, in cyclohexane, kinetics of auto-oxidation-reduction of, 1989.
- Benzenesulphonic acid**, *m*-amino-, sulphonation of in fuming sulphuric acid. Formation of an overcrowded tetrasulphonic acid. Aromatic sulphonation. Part 63, 1863.
- Benzenesulphonic acids**, tetraethyl-, on the Jacobsen rearrangement of. Sulphonation of polyethylbenzenes. Aromatic sulphonation. Part 54, 717.
- Benzenesulphonates**, phenyl, photochemical rearrangement of, 1629.
- Benzenethiolate**, reactions of with nitrophenyl esters of carboxylic acids, acyl-oxygen *versus* aryl-oxygen bond scission in, 966.
- Benzenethiols**, *para*-substituted, thermodynamic functions of proton ionisation of, 149.
- Benzil**, 4,4'-dimethylbenzil, and 4,4'-dimethoxybenzil, reaction with. Mechanistic studies in the chemistry of urea. Part 2, 1972.
- Benzoates**, pseudo-2-(3- or 4-substituted benzoyl)-, and methyl pseudo-8-(3- or 4-substituted benzoyl)-1-naphthoates, mechanism of alkaline hydrolysis of. Reactions of carbonyl compounds in basic solutions. Part 8, 526.
2-(3- or 4-substituted benzoyl)- and methyl 8-(3- or 4-substituted benzoyl)-1-naphthoates, base- and acid-catalysed rearrangements of pseudo to normal. Ring-chain tautomerism. Part 6, 1927.
- Benzo-furan**, furan, benzothiophen, and thiophen, 1,3-cycloadditions of 3,5-dichloro-2,4,6-trimethylbenzonitrile oxide to, 706.
- Benzohydroxamic acids**, *O*-alkyl, acylation of; configurational assignment, interconversion, and rearrangement of the *E*- and *Z*-isomers of a new group of *O*-acyl isoamides, 1080.
- Benzoic acids** and phenols, substituted, in dioxan-water mixtures, study of the Hammett equation for the ionisation of, 1513.
- Benzonitrile**, arylation and transcyanation in the pyrolysis of. Vapour phase chemistry of arenes. Part 6, 1062.
oxide, 3,5-dichloro-2,4,6-trimethyl-, 1,3-cycloadditions of to furan, benzofuran, thiophen, and benzothiophen, 706.
oxides, stereospecific formation of *Z*-amidoximes in the reaction of with amines. Reactivity of 1,3-dipoles in aqueous solution. Part 1, 1457.
- Benzophenone**, 4,4'-dichloro-, (DBP) and 1,1-bis-(*p*-chlorophenyl)acetic acid (DDA), crystal structures of. Insecticides. Part 8, 463.
derivatives, formation of inclusion complexes of; β -cyclodextrin studied by induced circular dichroism, 1419.
- Benzo[*a*]pyrene**, a fluorimetric and electron spin resonance study of the oxygenation of; an interpretation of the enzymic oxidation, 1172.
- Benzoquinone imines**. Part 13, reactions of *N*-methylated 2-aminoindamines in aqueous solution, 1125.
- p*-Benzosemiquinone anion**, electron spin resonance studies of the formation of over manganese dioxide, 1421.
- 2*H*-1,3-Benzothiazine**, (*Z*)-2-hydroxyimino-4-methyl-, properties and *X*-ray crystal structure analysis of. Condensation of *o*-thiocyanatoacetophenone with hydroxylamine, 1114.
- Benzotriazole**, 1-hydroxy-, esters, kinetics and mechanism of nucleophilic displacements on and crystal and molecular structure of 1-benzoyloxybenzotriazole. *N*-Hydroxy-compounds as acyl transfer agents. Part 1, 224.
- Benzothiazoles**, displacement of the acyl group in by nucleophilic alkyl radicals. Homolytic aromatic *ipso*-substitution, 1679.
- [2,1-*b*]Benzothiazole-4-carboxylate, methyl 2-oxypyrimido-, from condensation of 2-aminobenzothiazole and dimethylbut-2-ynedioate, synthesis and *X*-ray structure of, 1070.
- Benzothiophen**, thiophen, benzofuran, and furan, 1,3-cycloadditions of 3,5-dichloro-2,4,6-trimethylbenzonitrile oxide to, 706.
- [1,2-*c*][1,3]Benzoxazines, 8,9,10,11,11a,11b,12,13-octahydro-7a*H*-quino-, and 7a, 8, 9, 10, 10a, 10b, 11,12-octahydro-cyclopent[5,6][1,3]oxazino[3,4-*a*]quinolines, stereochemistry of. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 34, 1592.
- Benzoylglycolic acid**, intramolecular general base catalysis in the hydrolysis of the ester group of, 1563.
- 1,3-Benzoyl migration** of 2-benzoyl-2-phenylazindane-1,3-dione. Molecular conformations and crystal structures of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazine) and indene-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazine), 847.
- Benzyl alcohol** and other aromatic solutes, a nuclear magnetic resonance investigation of complex formation between imiprimine and related psychotropic drugs with, 1964.
- Benzylamine**, piperidine, *n*-butylamine, and morpholine, kinetics of the reactions of with 2,4-dinitrophenyl phenyl ether, 1580.
- Benzyl insertion** of diphenylmethane into diastereoisomeric esters of α -fluorophenylacetic acid, chemically induced dynamic nuclear polarisation during. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- Biacetyl mono-oxime ethyl ether**, photoisomerisation of. Photochemistry of α -oxo-oximes. Part 1, 1351.
- Biacridan**, 10,10'-dimethyl-, reversible photochemistry of: internal and external heavy atom effects, and the structure of photoisomer F, 550.

- 10H,10'H-Bianthridene**, reversible photochemistry and photocyclisation of, 564.
- Bicyclo[2.2.1]heptadiene**, cyclo-octa-1,5-diene, and cyclohexa-1,3-diene, rearrangements accompanying oxidative photoaddition of nitroamines to, 93.
- Bicyclo[2.2.1]heptane-2,6-carbolactones**, all six 3-bromo-5-hydroxy- and -5-oxo-, preparation and oxidation with chromic acid of, 430.
- Bicyclo[3.1.0]hexane**, a conformational study of. Crystal and molecular structure of *N'*-isopropylidenebicyclo[3.1.0]hexane-6-*exo*-carbohydrazide, 1577.
- Bicyclo[2.2.2]octanes**, 4-substituted 1-phenyl-, toluene, and *t*-butylbenzene, nitration of with nitric acid-acetic anhydride. Evidence for a π -inductive effect, 2043.
- Bicyclo[2.2.2]octen-2-one**, benzo-, derivatives, effect of the direction of the electric transition dipole moment in the aromatic group in. Optical activity in $\beta\gamma$ -unsaturated ketones. Part 1, 1937.
- syn-2,2'-Bifenchylidene E**, crystal structure of at -120°C , 1435.
- Bifunctional catalysts**, some potentially, hydrogen bonding abilities and self-association of. Part 2, mercaptoazole derivatives, 1015.
- Binding affinities** of inorganic ions to carrageenans and carboxymethylcellulose. Polyanions and their complexes, 1229.
- sites of lanthanoid shift reagents, evidence for two at the carbonyl groups of camphor and canthaxathin, 1390.
- Biphenyl** and fluorene systems, the transmission of substituent effects across. Stability of carbonium ions. Part 3, 426.
- sulphonation of in concentrated aqueous sulphuric acid. Aromatic sulphonation. Part 62, 1560.
- series, substituent effects in. Part IV, the kinetics of piperidinobromination of 4'-substituted 3-bromo-4-nitrobiphenyls, 137.
- 2,2'-Biphenyl**, theoretical investigation of, nuclear magnetic resonance and: conformational studies of molecules partially oriented in nematic phase, 314.
- Biphenyls**, *o,o'*-bis-(2-arylvinyl), intramolecular photocyclisations of, 268.
- Bipyridyl radical cations**, study of. Part 4, reaction of diquat radical cation with oxygen and copper(II), 445. Part 5, effect of structure on the dimerisation equilibrium, 1787.
- Bisheterocycles**, some methylene bridged, ring and nitrogen inversion in some. Barriers to nitrogen inversion in six-membered rings, 588.
- Bond**, the S=O, chemistry of. Part 6, infrared and Raman spectra of some methyl-substituted trimethylene sulphites, 612.
- angles, dihedral, in the *gauche* O-CH₂-CH₂-O moiety of cyclic 7,8-dihydrodibenzo[*f,h*][1,4]dioxecin, ¹H nuclear magnetic resonance and X-ray study of, 1942.
- scission, acyl-oxygen *versus* aryl-oxygen, in reactions of benzenethiolate with nitrophenyl esters of carboxylic acids, 966.
- π -Bond, a non-adjacent, homoallylic interaction between a nitrogen lone pair and. Part 6, nature of the lone-pair electrons, in *n,\pi*-homoconjugated aliphatic amines, 1057.
- Bonds**, carbon-carbon double, nucleophilic attacks on. Part 24, nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; comments on the work of Le Guillanton and Cariou, 1000.
- double, carbon-nitrogen, nucleophilic attacks on. Part 4, substitution of *N*-arylbenzimidoyl cyanides by amines in acetonitrile and by alkoxides in alcohols, 659.
- Brenner aminoacyl insertion reaction**, an analogue of the reverse of: intramolecular migration of an amino-group via a transannular process during the reaction of *O*-sali-cyloylglycolamides in alkaline solution, 1804.
- Bridgehead nitrogen**, proton magnetic resonance studies of compounds with. Part 33, effect of a fused aromatic ring on the conformational preferences of perhydro-pyrido[1,3-*c*][1,3]oxazines and related compounds, 370. Part 34, stereochemistry of 8,9,10,11,11a,11b,12,13-octahydro-7a*H*-quino[1,2-*c*][1,3]benzoxazines and 7a-, 8,9,10,10a,10b,11,12-octahydrocyclopent[5,6][1,3]oxa-zino-[3,4-*a*]quinolines, 1592.
- radicals, the nucleophilicity of. Structural effects on the reactivity of carbon radicals in homolytic aromatic substitution. Part 4, 87.
- Bridging ability** of oxygen and sulphur in vinyl cations, theoretical study on, 542.
- Bromides**, alkyl, and long-chain alkanoate ions, reactions between as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions. Intermolecular models for intramolecular reactions. Ring closure reactions. Part 6, 443.
- Brominating agents**, electrophilic, reactions of cholest-5-en-3-one with. The kinetics and mechanisms of addition to olefinic substances. Part 14, 2055.
- Bromine**, comments on the physical interpretation of high kinetic orders in. The kinetics and mechanisms of aromatic halogen substitution. Part 34, 106.
- electrophilic, reactions of 3-substituted cholest-5-enes with sources of. The kinetics and mechanisms of addition of olefinic substances. Part 13, 2048.
- Butane-1-thiol**, butane-2-thiol, and 2-methylpropane-2-thiol, kinetics of the pyrolysis of. The pyrolysis of alkanethiols. Part 1, 439.
- Butazone**, phenyl-, and a 2:1 complex between phenyl-butazone and piperazine, crystal structures of. Structural studies of analgesics and their interactions. Part 4, 693.
- t*-Butoxyl radicals**, hydrogen atom abstraction from polystyrene by, studies by spin trapping; effect of conformation on reactivity, 1416.
- t*-Butyl alcohol**, acetonitrile, acetone, and ethyl acetate, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in. Substitution at saturated carbon. Part 22, 1225.
- kinetic study of elimination from 3 α -chloro-3 β -methyl- and 3 β -chloro-3 α -methyl-5 α -cholestane promoted by potassium *t*-butoxide in, 436.
- n*-Butylamine**, piperidine, morpholine, and benzylamine, kinetics of the reactions of with 2,4-dinitrophenyl phenyl ether, 1580.
- t*-Butyl chloride** and [²H]₃*t*-butyl chloride, kinetics of the reactions of with silver salts in acetonitrile, 201.
- solvolytic transition state and the tetraethyltin-mercury(II) chloride transition state, effect of alcoholic solvents on the enthalpy and entropy of; comparison with 1:1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
- t*-Butyl hydroperoxide**, molybdenum catalysed oxidation of organosulphur compounds by. Metal catalysis in oxidation by peroxides. Part 2, 576.
- N-t*-Butyl nitrone**, phenyl, spin trapping of peroxy radicals by. Study of autoxidation by spin trapping, 1770.

- t-Butyl radicals** in solution, electron spin resonance measurements of the termination rate constants for, 1504.
- But-2-yne dioate, dimethyl**, and 2-aminobenzothiazole, synthesis and X-ray structure of methyl 2-oxypyrimido[2,1-*b*]benzothiazole-4-carboxylate from condensation of, 1070.
- Butyramide methiodide**, 4-diisopropylamino-2,2-diphenyl-, (isopropamide iodide), crystal and molecular structure, 781.

C

- Cadmium**, methyl-, alkoxides, a nuclear magnetic resonance study of: auto-association in organometallic compounds, 1187.
- Calculations**, INDO, on several geometrical conformations: diphenylcarbene, 634.
- model, of heavy atom isotope effects for *E2* and *E1cB* dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1847.
- of the hydrogen-deuterium isotope effects for *E2* and *E1cB* dehydrochlorinations of 1,1-diaryl-2,2-dichloroethanes, 1763.
- molecular mechanics, on alkanes and non-conjugated alkenes, 1610.
- of steric effects. Part 3, the anion-catalysed substitution of alkylmercury(II) bromides by mercury(II) bromide in ethanol, 221.
- published *ab initio* molecular orbital, comparison of various isodesmic and homodesmotic reaction heats with values derived from, 1036.
- thermochemical, and experimental measurements of methanolysis of 1-fluoro-2,4-dinitrobenzene, picryl chloride, and picryl fluoride. The S_N mechanism in aromatic compounds. Part 41, 457.
- Camphenilones**, 1-substituted, and some derived *N*-nitroimines, substituent effects on carbon-13 chemical shifts in, 125.
- Camphor** and canthaxanthin, evidence for two binding sites of lanthanoid shift reagents at the carbonyl groups of, 1390.
- and related molecules, Raman optical activity of, 1074.
- Canthaxanthin** and camphor, evidence for two binding sites of lanthanoid shift reagents at the carbonyl groups of, 1390.
- Carbaldehydes**, furan-, pyrrole-, and pyridine-, conformations of: an *ab initio* molecular orbital study, 1601.
- Carbamates** of tertiary alcohols, decomposition of. Part 3, influence of phenyl and vinyl substituents at the α -carbon atom, 879.
- Carbanion mechanism** of olefin-forming elimination. Part 9, proton tunnelling and isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1753. Part 10, isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1758.
- Carbanions** derived from sulphones and nitriles bearing β -onium substituents, formation and behaviour of. Elimination and addition reactions. Part 33, 1920.
- Carbazoles** and indoles, *N*-substitution of in Vilsmeier-Haack acetylation, kinetics and mechanisms of, 1284.
- Carbene**, diphenyl-; INDO calculations on several geometrical conformations, 634.
- addition to 3-substituted propenes, polar selectivity of, 1094.
- Carbohydrates**, model, solvent and temperature effects on the optical rotation and conformation of. Polysaccharide conformation. Part 10, 191.
- radiation chemistry of. Part 14, hydroxyl radical induced oxidation of D-glucose in oxygenated aqueous solution, 1958.
- Carbon** and oxygen, extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover two-co-ordinate nitrogen in the other groupings with, and comparison with three-co-ordinate nitrogen in planar groupings (azoxy *etc.*). Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- carbon double bonds, nucleophilic attacks on. Part 24, nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; comments on the work of Le Guillanton and Cariou, 1000.
- radicals** in homolytic aromatic substitution, structural effects on the reactivity of. Part 4, the nucleophilicity of bridgehead radicals, 87.
- saturated, substitution at. Part 21, effect of alcoholic solvents on the enthalpy and entropy of the tetraethyltin-mercury(II) chloride transition state and of the 5-butyl chloride solvolysis transition state; comparison with 1:1 electrolytes, 1028. Part 22, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in *t*-butyl alcohol, acetonitrile, acetone, and ethyl acetate, 1225.
- α -Carbon atom, influence of phenyl and vinyl substituents at the. Decomposition of carbamates of tertiary alcohols. Part 3, 879.
- γ -Carbon atoms in the side chains of α -amino-acids, ^{13}C shielding effects at, 50.
- Carbonium ions**, stability of. Part 3, the transmission of substituent effects across the fluorene and biphenyl systems, 426.
- Carbonyl compounds** in basic solutions, reactions of. Part 8, mechanism of alkaline hydrolysis of methyl pseudo-8-(3- or 4-substituted benzoyl)-1-naphthoates and pseudo-2-(3- or 4-substituted benzoyl)benzoates, 526.
- reduction of by sodium borohydride (tetrahydridoborate) in water, dimethyl sulphoxide, and their mixtures as solvents: products and kinetics, 1466.
- Carbonyl group** and a sulphur atom, interaction between. Part 8, correlation between the basicity constants, corrected for steric effects, and Taft σ^* values for some ketones and nitriles, 2025.
- Carbonyl groups** in penicillins and cephalosporins, ^{13}C chemical shift assignments of. ^{13}C Nuclear magnetic resonance in *N*-heterocycles. Part 3, 1749.
- of camphor and canthaxanthin, evidence for two binding sites of lanthanoid shift reagents at, 1390.
- Carboxy groups** and phosphonic groups, comparison of. Substituent effects of phosphorus- and arsenic-containing groups in aromatic substitution. Part 7, 1479.
- Carboxylates**, *p*-nitrophenyl, concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in deacylation of. Macrocyclic enzyme model systems, 24.
- kinetic consequences of molecular aggregation in the hydrolysis of, 1947.
- Carboxylic acid-fluoride systems**: *ab initio* studies of the strongest type of hydrogen bond, 2079.
- Carboxylic acids**, nitrophenyl esters of, reactions of with benzenethiolate, acyl-oxygen *versus* aryl-oxygen bond scission in, 966.

Carboxylic acids, (contd.)

water, alcohols, and phenols, rates of reactions of with quinone methides. The chemistry of reactive lignin intermediates. Part 5, 1737.

Carrageenans and carboxymethylcellulose, binding affinities of inorganic ions to. Polyanions and their complexes, 1229.

Catalysis by *E.coli*(*lacZ*)- β -galactosidase, role of the substituent at C-5 of the pyranose ring in, 1198.

concurrent nucleophilic-electrostatic bifunctional, by [20]paracyclophanes in deacylation of *p*-nitrophenyl carboxylates. Macrocyclic enzyme model systems, 24.

electrophilic, by transition metal ions and the irrelevance of intramolecular participation by the pyridyl group: hydrolysis of 2-pyridylphosphonic acid mono- and di-esters, 418.

functional micellar. Part 2, ester hydrolysis promoted by micelles containing the imidazole ring and the hydroxy-group, 821.

in aromatic nucleophilic substitution. Part 1, reactions of piperidine with 2,4-dinitrophenyl 4-nitrophenyl ether and 2,4-dinitrophenyl phenyl sulphone, 1316.

intramolecular. Part 2, mechanism of hydrolysis of 8-hydroxy-1-naphthoates, 1799.

general base, in the hydrolysis of the ester group of benzoylglycolic acid, 1563.

nucleophilic, in the hydrolysis of 4-nitrophenyl quinolin-8-yl phosphate, 64.

metal, in oxidation by peroxides. Part 2, molybdenum catalysed oxidation of organosulphur compounds by *t*-butyl hydroperoxide, 576.

metal-ion assisted, of nucleophilic attack. Part 3, cooperation between metal ion and hydroxide, 318.

of the decomposition of phenylhydroxylamine to azoxybenzene and aniline by iron(II) and iron(III) ions stabilised by ethylenediaminetetra-acetic acid, a mechanistic study of, 1868.

Catalytic action of dibromobis(triphenylphosphine)nickel, X-ray structure of a novel product formed from 2,5-dimethylhex-3-yne-2,5-diol by, 1011.

power of *E.coli*(*lacZ*)- β -galactosidase, quantification of the main source of, and S_N1 hydrolyses of glycosyl pyridinium salts, 1191.

Catalysts, some potentially bifunctional, hydrogen bonding abilities and self-association of. Part 2, mercaptoazole derivatives, 1015.

Cation, neutral, and nitroxide radicals of phenothiazine, substituent effects on the distribution of spin density in. Heterocyclic free radicals. Part 7, 517.

exchange, intramolecular, in metal ketyl ion pairs. Electron spin resonance studies on the interactions between radical ion pairs and macrocyclic polyethers. Part 2, 1327.

radical, transannular, formation, anodic oxidation of [2,2]metacyclophanes and. Electron-organic chemistry, 384.

Cations, atropine and scopolamine, in aqueous solution, nuclear magnetic resonance study of the conformations of, 2016.

bipyridyl radical, study of. Part 4, reaction of diquat radical cation with oxygen and copper(II), 445. Part 5, effect of structure on the dimerisation equilibrium, 1787.

1-*p*-tolylethyl- and di-*p*-tolylmethyl-tricarbonylchrom-

ium, carbon-13 nuclear magnetic resonance spectra of, 483.

triphenyl-phosphonium and -arsonium, and various phosphoranyl and arsoranyl radicals derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.

vinyl. Part 13, secondary kinetic deuterium isotope effects in the solvolysis of ring-substituted β -styryl trifluoromethanesulphonates, 1486.

theoretical study of the bridging ability of oxygen and sulphur in, 542.

Cellulose, carboxymethyl-, and carrageenans, binding affinities of inorganic ions to. Polyanions and their complexes, 1229.

Cephalosporins and penicillins, ^{13}C chemical shift assignments of the carbonyl groups in. ^{13}C Nuclear magnetic resonance of *N*-heterocycles. Part 3, 1749.

Cerium(IV) sulphate in aqueous sulphuric acid, oxidative decarboxylation of aldono-lactones by; synthesis of D-arabinose, 685.

Chain-ring tautomerism. Part 6, base- and acid-catalysed rearrangement of pseudo to normal methyl 8-(3- or 4-substituted benzoyl)-1-naphthoates and 2-(3- or 4-substituted benzoyl)benzoates, 1927.

Charge distribution and the electrochemistry of mono-, di-, and tri-cyanovinyl aromatic compounds, structural effects on, 1635.

Chemical equilibration and ^1H nuclear magnetic resonance conformational study of 4,5-dimethyl-, 2,4,5-trimethyl-, and 2,2,4,5- and 2,4,4,5-tetramethyl-1,3-oxathiolans. Properties and reactions of 1,3-oxathiolans. Part 6, 343.

shift, ^{13}C , assignments of the carbonyl groups in penicillins and cephalosporins. ^{13}C Nuclear magnetic resonance of *N*-heterocycles. Part 3, 1749.

measurements, proton and carbon-13 on 4-substituted styrenes, substituent effects of the groups $\text{CH}_2\text{M}(\text{CH}_3)_3$ ($\text{M} = \text{C to Pb}$) and $\text{M}(\text{CH}_3)_3$ ($\text{M} = \text{Si to Pb}$) from, 971.

Chemical shifts, carbon-13, in 1-substituted camphenilones and some derived *N*-nitroimines, substituent effects on, 125.

nuclear magnetic resonance substituent, and substituent reactivity parameters in benzene derivatives, on the interpretation of linear correlations between, 769.

Chiral molecules, simple, Raman optical activity of; methyl and trifluoromethyl asymmetric deformations, 1790.

thiirans, optical activity of the 260 nm transition of, 1105.

Chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one; factors affecting the $\alpha : \beta$ ratio for electrophilic attack and for product formation, in cholest-5-enes. The kinetics and mechanisms of additions to olefinic substances. Part 15, 2062.

Chloroform, conductances of some quaternary ammonium and sulphonium salts in, 952.

kinetics and mechanism of decomposition of benzyldimethylsulphonium salts in, 958.

5 α -Cholestane, 3 α -chloro-3 β -methyl- and 3 β -chloro-3 α -methyl-, kinetic study of elimination from promoted by potassium *t*-butoxide in *t*-butyl alcohol, 436.

Cholest-5-enes, 3-substituted, reactions of with sources of electrophilic bromine. The kinetics and mechanisms of addition to olefinic substances. Part 13, 2048.

- Cholest-5-en-3-one**, autoxidation of, and its accompanying isomerisation, in acetic acid, 157.
chlorination of cholest-5-ene and its 3-substituted derivatives, including; factors affecting the $\alpha:\beta$ ratio for electrophilic attack, and for product formation, in cholest-5-enes. The kinetics and mechanisms of additions to olefinic substances. Part 15, 2062.
reactions of with electrophilic brominating agents. The kinetics and mechanism of additions to olefinic substances. Part 14, 2055.
stereochemistry of epoxidation of and of the base-catalysed rearrangement of the derived epoxides, 975.
- Chloramine T**, kinetic and mechanistic studies of reactions of aniline and substituted anilines with, 1275.
- Chlorine substituents** in nucleophilic aromatic substitution, orienting effects of. Mechanisms for reactions of halogenated compounds. Part 2, 1774.
- Chloro-substituent effects**, non-additivity of: mechanism of the elimination. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 15, 1541.
- Chlorosulphuric acid** in nitromethane and in dichloromethane, sulphonation in the reactions of aromatic compounds with. Aromatic sulphonation. Part 60, 1548.
and in dichloromethane, sulphonylation in the reaction of aromatic compounds with. Aromatic sulphonation. Part 61, 1557.
- Chromic acid**, oxidation with, and preparation of all six 3-bromo-5-hydroxy- and -5-oxo-bicyclo[2.2.1]heptane-2,6-carbolactones, 430.
- Chromium**, 1-*p*-tolylethyl- and di-*p*-tolylmethyl-tricarbonyl-, cations, carbon-13, nuclear magnetic resonance spectra of, 483.
- Chromophore**, the benzene, bearing one donor and two acceptor groups, orientation effects in. Electronic absorption spectra of the dicyanoanilines, 1608.
- Clathrate**, the methylcyclohexane, use of quartets in the crystal structure determination of; synthesis and properties of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenylazolin-4(3*H*)-one, 1427.
- Cleavage**, anodic, of dibenzyl ether, mechanism of. Electro-organic reactions. Part 10, 803.
- Cobalt(III)**, manganese(III), and lead(IV) trifluoroacetates, mechanism of oxidation of saturated hydrocarbons by, 511.
- Cocculine and coccutrine**, the *Erythrina* alkaloids, *X*-ray structural and conformational analyses of, 1156.
- Comparison** of various isodesmic and homodesmotic reaction heats with values derived from published *ab initio* molecular orbital calculations, 1036.
- Competition** between single electron transfer and nucleophilic attack: reaction of 3-arylimino-2-phenyl-3*H*-indoles with organolithium compounds, 1032.
- Comments** on the work of Le Guillanton and Cariou; nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles. Nucleophilic attacks on carbon-carbon double bonds. Part 24, 1000.
- Complex**, a 2 : 1, between phenylbutazone and piperazine, and phenylbutazone, crystal structures of. Structural studies of analgesics and their interactions. Part 4, 693.
an electron-donor-acceptor, of 2,7-dinitro-1,6-methano-[10]annulene, steric hindrance to termolecular complex formation in, 994.
- Complexes**, inclusion, of benzophenone derivatives, formation of; β -cyclodextrin studied by induced circular dichroism, 1419.
Meisenheimer, the stabilities of. Part 14, equilibrium and kinetic data for sodium ethoxide addition to 2,4-dinitro-6-*X*-phenetoles in ethanol, 1442.
1 : 1, of adenosine triphosphate and adenosine diphosphate with magnesium(II) at various pH values, hydration and self-association of: infrared investigations, 1824.
- Complex formation** between imipramine and related psychotropic drugs with benzyl alcohol and other aromatic solutes, a nuclear magnetic resonance investigation of, 1964.
excited, between heterocyclic compounds and aromatic hydrocarbons and amines, 1280.
between styrenes and tertiary amines, 2002.
- Compounds**, halogenated, mechanism for reactions of. Part 1, activating effects of fluorine in polyfluoropyridines in reactions with ammonia, 585. Part 2, orienting effects of chlorine substituents in nucleophilic aromatic substitution, 1774.
unsaturated, mechanism of the permanganate oxidation of. Part 7, kinetics of the oxidation of propiolic and phenylpropionic acids, 630. Part 8, kinetics of the oxidation of halogenomaleic acids, 1794.
- Condensation** of 2-aminobenzothiazole and dimethyl but-2-ynedioate, synthesis and *X*-ray structure of methyl 2-oxopyrimido[2,1-*b*]benzothiazole-4-carboxylate from, 1070.
of *o*-thiocyanatoacetophenone with hydroxylamine. Properties and *X*-ray crystal structure analysis of (*Z*)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine, 1114.
- Conductances** of some quaternary ammonium and sulphonium salts in chloroform, 952.
- Conductimetric methods**, ^{13}C and ^1H nuclear magnetic resonance spectroscopic, and potentiometric methods, studies of the protonation equilibria of sulphamates using, 580.
- Configuration**, absolute, and crystal structure of methyl 3,4-di-*O*-acetyl-6-deoxy-6-iodo-2-*O*-*p*-tolylsulphonyl- α -*D*-mannopyranoside, 1509.
unnatural, steroidal analogues of. Part XI, crystal and molecular structure of 3 α ,17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione and a circular dichroism study of the conformation of the acetyl side-chain of the 17-hydroxy-isomers in solution, 402.
- Configurational assignment**, interconversion, and rearrangement of the *E*- and *Z*-isomers of a new group of *O*-acyl isoamides; acylation of *O*-alkylbenzohydroxamic acids, 1080.
- Conformation** and dipole moments of some 1-(α -aroyloxy-arylideneamino)-4,5-dimethyl-1,2,3-triazoles, 1779.
and structure, investigations of. Part 6, long-range interactions and line-width alternation for γ -proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$: temperature-dependent electron spin resonance spectra, 116. Part 7, long-range interactions and line-width alternation associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from cyclic ethers containing six-membered rings, 754. Part 8, e.s.r. studies of conformational preferences, radical-centre inversion, and restricted rotation about $\cdot\text{C}-\text{CH}_3$ in some 1,3-dioxolan-2-yl radicals, 1161.

Conformation (*contd.*)

- of 4-nitrophenyl acetate from proton nuclear magnetic resonance of nematic solutions, 1383.
- of β -thiodan in the solid state and in solution. Application of the infrared-*X*-ray method, 144.
- effect of on reactivity; hydrogen atom abstraction from polystyrene by *t*-butoxyl radicals, studied by spin trapping, 1416.
- molecular, and electronic structure of azomethines. Part 5, determination of the conformation of some *N*-methylimine derivatives of aldehydes and ketones from dipole moment data, 2038.
- of the germacranolide alatolide monohydrate, *X*-ray crystallographic determination of. Sesquiterpenoids. Part XXIII, 255.
- of 1-(2-bromophenyl)azetidid-2-one and 1-(2-bromophenyl)pyrrolidin-2-one, 547.
- of the acetyl side-chain of the 17-hydroxy-isomers in solution, a circular dichroism study of, and crystal and molecular structure of 3 α ,17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione. Steroidal analogues of unnatural configuration. Part XI, 402.
- polysaccharide. Part 10, solvent and temperature effects on the optical rotation and conformation of model carbohydrates, 191.
- of triphenyl-*s*-triazine, 1818.
- of various tetracycline species determined with the aid of a nuclear magnetic resonance relaxation probe, 1319.
- studies** by nuclear magnetic resonance spectroscopy in nematic phases: 3-phenyl-1,2,5-oxa-, -thia-, and -seleno-diazole, 561.
- the solution, of retinals, determination of by using lanthanoid shift reagents, 1400.
- Conformations**, INDO calculations on several geometrical: diphenylcarbene, 634.
- molecular, and crystal structures of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone). 1,3-Benzoyl migration of 2-benzoyl-*N*-phenylhydrazone). 1,3-Benzoyl migration of 2-benzoyl-2-phenylazoindane-1,3-dione, 847.
- non-chair, evidence for in tropane derivatives: carbon-13 magnetic resonance, 1202.
- of atropine and scopolamine cations in aqueous solution, nuclear magnetic resonance study of, 2016.
- of conjugated hydrocarbons. Part 2, a spectroscopic and thermodynamic study of *cis*- and *trans*-penta-1,3-diene, 1311.
- of cyclic and acyclic cyanides: ^{13}C -H couplings, 364.
- of furan-, pyrrole-, and pyridine-carbaldehydes: an *ab initio* molecular orbital study, 1601.
- of peptides in solution by nuclear magnetic resonance spectroscopy. Part 5, homoallylic proton spin coupling in linear peptides, 1294.
- of some semi-rigid neuroleptic drugs. Part 2, crystal structures of racemic and of (+)-(*S*)-octoclothepein {2-chloro-10,11-dihydro-11-(4-methylpiperazin-1-yl)di-benzo[*b,f*]thiepin} and the absolute configuration of the latter, 186.
- Conformational analysis** and *X*-ray structural analysis of the *Erythrina* alkaloids cocculine and coccutrine, 1156.
- A nuclear magnetic resonance study of the conformations of *ortho*-disubstituted benzenes, 699.
- of cyclohexa-1,4-dienes by nuclear magnetic resonance, 842.
- of cyclohexene and a heterocyclic analogue by ^{13}C nuclear magnetic resonance spectroscopy. 1,2-Oxazine chemistry. Part 6, 619.
- of 3,4-dimethyltetrahydro-1,3,4-oxadiazine, 1816.
- of saturated heterocycles. Part 78, passing pyramidal nitrogen inversions in some perhydro-1,3-oxazines and -1,3-diazines, 818.
- preference** of ring A in 3-oxo- $\Delta^5,^{10}$ -steroids: *X*-ray crystal structure analysis of 17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one (norethynodrel), 379.
- preferences** of perhydropyrido[1,2-*c*][1,3]oxazines and related compounds, effect of a fused aromatic ring on. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 33, 370.
- of 4-(*para*-substituted phenyl)-2-isopropoxy-2,3-dihydropyran[2,3-*c*]pyrazoles: an example of dipole-dipole interaction, 1725.
- studies** by dynamic nuclear magnetic resonance. Part 8, effect of aromatic substituents on the stereodynamics of hindered hydrazones, 1666.
- nuclear magnetic resonance, of the C_α - C_β fragments of oxytocin, oxytocinoic acid, and tocinoic acid in aqueous solution, 477.
- of molecules partially oriented in nematic phase: nuclear magnetic resonance and theoretical investigation of 2,2'-biphenyl, 314.
- study** by dipole moments, spectroscopy, and nucleophilic reactivity: 2-chloromethylenecycloheptan- and -octanones, 1301.
- ^1H nuclear magnetic resonance, and chemical equilibration of 4,5-dimethyl-, 2,4,5-trimethyl-, and 2,2,4,5- and 2,4,4,5-tetramethyl-1,3-thiolans. Properties and reactions of 1,3-thiolans. Part 6, 343.
- of bicyclo[3.1.0]hexane. Crystal and molecular structure of *N'*-isopropylidenebicyclo[3.1.0]hexane-6-*exo*-carbohydrazide, 1577.
- Conformers**, a mixture of, values for the gas-phase thermodynamic functions of conjugated compounds existing as, 1307.
- Conjugated compounds** existing as a mixture of conformers, values for the gas-phase thermodynamic functions of, 1307.
- Schiff's bases**. Part 8, structure and spectral properties of *p*-*NN*-dimethylaminoanils of some vicinal diketone compounds. Positive solvatochromic effect, 1893.
- Consequences**, kinetic, of molecular aggregation in the hydrolysis of *p*-nitrophenyl carboxylates, 1947.
- σ_{Her} -**Constants** for thia- and oxa-substituents in five-membered *S*-linked heterocycles and effects of substituents in the *N*-linked aromatic ring: the acid dissociation of arenesulphonamides, 984.
- Contact shifts**, ^{13}C , of α -bonded molecules, electronic and structural effects on, 809.
- Copper(II)** and oxygen, reaction of diquat radical cation with. Study of bipyridyl radical cations. Part 4, 445.
- Cornforth rearrangement**, MINDO/3 study of. Ground states of molecules. Part 35, 724.
- Coronene** (dibenzo[*ghi,pqr*]perylene), anthracene, and triphenylene, protidetritiation of in anhydrous trifluoroacetic acid. Electrophilic aromatic substitution. Part 18, 353.
- Correlation** between the basicity constants, corrected for steric effects, and Taft σ^* values for some ketones and

Correlation (*contd.*)

- nitriles. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- the Hammett, and the thermodynamics of protonation. The basicities of *N*-trimethylammonioacetamide and of substituted *N*-trimethylammoniobenzamides, 1876.
- the nuclear magnetic resonance-ultraviolet, extension of in nitroso-compounds to cover two-co-ordinate nitrogen in the other groupings with oxygen and carbon, and comparison with three-co-ordinate nitrogen in planar groupings (azoxy etc.). Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- Correlations**, linear, between nuclear magnetic resonance substituent chemical shifts and substituent reactivity parameters in benzene derivatives, on the interpretation of, 769.
- proposed empirical, a critical analysis of acidity functions and the incompatibility amongst. The M_G activity coefficient function for acid-base equilibria. Part 2, 306.
- Cotton-Mouton constants**, Kerr constants, and magnetic anisotropies of pyridazine, pyrimidine, and pyrazine, 897.
- Mouton effect** and Kerr effect of some chloro- and nitrobenzenes, 901.
- Coumarins**, some 7-hydroxy- and related compounds, concerning the fluorescence of, 262.
- Coupling**, homoallylic, in 1,4-dihydronaphthalenes. Part 2, crystal structure of *cis*-2a,5-dihydro-5-acenaphthoic acid, 1153.
- proton spin, in linear peptides. Conformations of peptides in solution by nuclear magnetic resonance spectroscopy. Part 5, 1294.
- constants**, ^{13}C - ^1H one-bond, the usefulness of as selectivity parameters in the synthesis of organolithium compounds. Reactivity parameters. Part 2, 473.
- Couplings**, ^{13}C - ^1H : conformations of cyclic and acyclic cyanides, 364.
- long-range, in 2-alkoxycarbonylphenyl nitroxide radicals, 904.
- Criticism** of a paper by Rappaport and Topol; stereochemistry of nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles, 997.
- Crown ethers**, chemistry of: the mass spectra of macrocyclic polyethers, 206.
- Crystal and molecular structure** of a new cyclopropane triterpene: passifloric acid methyl ester [methyl(22*R*,24*S*)-22,31-epoxy-1 α ,3 β ,24,31-tetrahydroxy-24-methyl-9,19-cyclo-9 β -lanostan-28-oate], 605.
- of an octamer of acetonitrile oxide, 334.
- of a silver salt of antibiotic A-130A, 1531.
- of 1-benzoyloxybenzotriazole and kinetics and mechanism of nucleophilic displacements on 1-hydroxybenzotriazole esters. *N*-Hydroxy-compounds as acyl transfer agents. Part 1, 224.
- of 3-chloro-5-cyclohexylamino-1-di-isopropylamino-1*H*-1,2,4,6-thia(*iv*)triazine, 1322.
- of 3 α ,17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione and a circular dichroism study of the conformation of the acetyl side-chain of the 17 α -hydroxy-isomers in solution. Steroidal analogues of unnatural configuration. Part XI, 402.
- of *N*-(2,4-dinitrophenyl)-*N*-methylpivalohydrazonyl bromide; stereochemistry of bimolecular displacement in azavinyl systems, 1136.
- of di(pyridine)magnesium(II) octaethylporphyrinate, 2072.
- of 3-hydroxy-5-(methylsulphonyl)-4-phenylisothiazole, 1332.
- of isopropamide iodide (4-di-isopropylamino-2,2-diphenylbutylamide methiodide), 781.
- of *N'*-isopropylidenebicyclo[3.1.0]hexane-6-*exo*-carbohydrazide. A conformational study of bicyclo[3.1.0]hexane, 1577.
- of 2a,3,4,5,6,7,8,8b-octafluoro-2-methyl-2-(2-methylprop-1-enyl)-1,2,2a,8b-tetrahydrocyclobuta[*a*]naphthalene, 1985.
- of *cis*-5,6,6a,7,8,9,10,10a-octahydro-5-methyl-10a-*p*-tolylsulphonylamino-6-*p*-tolylsulphonyliminophenanthridine, 1335.
- of 2-(tetracyclo[5.5.1.0^{2,6}.0^{8,12}]tridec-9-en-4-yl)propionic acid. Nickel-catalysed stereospecific cyclocarbonylation of cyclooctadiene dimer, 389.
- of the (*R*)-enantiomer of *N*-[2-(2-cyclohexylmandeloyloxy)ethyl]-*N*-methylpiperidinium iodide. Stereochemistry of anticholinergic agents. Part 10, 643.
- of the germacrane furanosesquiterpenoid linderalactone, 646.
- of the histamine H_2 -receptor antagonists, *N*-methyl-*N'*-{2-[(5-methylimidazol-4-yl)methylthio]ethyl}thiourea (metamide) and *N*-{2-[(imidazol-4-yl)methylthio]ethyl}-*N'*-methylthiourea (thiaburimamide), 68.
- of the thallium salt of lomomycin. Studies on the ionophorous antibiotics. Part 4, 494.
- of 4-(thio-*p*-toluoyl)-5-*p*-tolyl-1,2-dithiole-3-thione, 1854.
- Crystal structure** and absolute configuration of methyl 3,4-di-*O*-acetyl-6-deoxy-6-iodo-2-*O*-*p*-tolylsulphonyl- α -D-mannopyranoside, 1509.
- and molecular conformation of 2',3'-*O*-methoxymethyleneneuridine: *X*-ray and nuclear magnetic resonance investigations, 487.
- and valence tautomerism of 5-dimethyliminio-4,4-dimethyl- Δ^2 -thiazoline-2-thiolate. Cycloaddition reactions of heterocumulenes. Part 8, 466.
- determination of the methylcyclohexane clathrate, use of quartets in; synthesis and properties of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)-phenylquinazolin-4(3*H*)-one, 1427.
- of 2-benzyl-1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl-1-phenylisoquinolinium iodide. Stereochemical studies. Part 29, 1141.
- of *syn*-2,2'-bifenchylidene E at -120°C , 1435.
- of *cis*-2a,5-dihydro-5-acenaphthoic acid. Homoallylic coupling in 1,4-dihydronaphthalenes. Part 2, 1153.
- of dithizone, redetermination and refinement of, 1248.
- of 2 α ,3 α -epithio-5 α -androstan-17 β -ol (*R*)-*S*-oxide, 741.
- of 25-hydroxy-vitamin D₃ monohydrate: a stereochemical analysis of vitamin D molecules, 393.
- X*-ray, and preparation: derivatives of 1-aryl-3-imidopyridiniums. 1,3-Dipolar character of six-membered aromatic rings. Part 32, 1304.
- Crystal structures** and molecular conformations of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone). 1,3-Benzoyl migration of 2-benzoyl-2-phenylazoindane-1,3-dione, 847.
- of 1,1-bis-(*p*-chlorophenyl)acetic acid (DDA) and 4,4'-dichlorobenzophenone (DBP). Insecticides. Part 8, 463.
- of 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)-ethylene (DDE)

Crystal structures (*contd.*)

and 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)-ethane (DDD). Insecticides. Part 7, 460.

of phenylbutazone and a 2 : 1 complex between phenylbutazone and piperazine. Structure studies of analgesics and their interactions. Part 4, 693.

of racemic and of (+)-(S)-octoclothepein {2-chloro-10,11-dihydro-11-(4-methylpiperazin-1-yl)dibenzo[*b,f*]thiopin} and the absolute configuration of the latter. Conformations of some semi-rigid neuroleptic drugs. Part 2, 186.

of some acid salts of monobasic acids. Part 18, potassium hydrogen bisphenylacetate, redetermined by neutron diffraction, 979. Part 19, potassium hydrogen dicrotonate, X-ray and neutron diffraction studies, 1740.

Crystal structure analysis, X-ray, and properties of (Z)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine. Condensation of *o*-thiocyanatoacetophenone with hydroxylamine, 1114.

of 17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one (norethynodrel): conformational preference of ring A in 3-oxo- $\Delta^{5,10}$ -steroids, 379.

Crystal Violet, Malachite Green, and Michler's Hydrol Blue, electronic absorption spectra of derivatives of exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.

Cumene, the liquid-phase autoxidation of with lead dioxide, electron spin resonance and kinetic studies on, 784.

hydroperoxide, decay kinetics of cumylperoxyl radical produced by the decomposition of, 622.

electron spin resonance and kinetic studies on the liquid-phase decomposition of by lead dioxide, 625.

Cumulenes, hetero, cycloaddition reactions of. Part 8, crystal structure and valence tautomerism of 5-dimethylimino-4,4-dimethyl- Δ^2 -thiazoline-2-thiolate, 466.

Cumylperoxyl radical produced by the decomposition of cumene hydroperoxide, decay kinetics of, 622.

Cyanides, *N*-arylbenzimidoyl, substitution of by amines in acetonitrile and by alkoxides in alcohols. Nucleophilic attacks on carbon-nitrogen double bonds. Part 4, 659. cyclic and acyclic, conformations of: ^{13}C -H couplings, 364.

Cyclic and acyclic cyanides, conformations of: ^{13}C -H couplings, 364.

ethers containing six-membered rings, long-range interactions and line-width alternation associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from. Investigations of structure and conformation. Part 7, 754.

Cycloaddition reactions of heterocumulenes. Part 8, crystal structure and valence tautomerism of 5-dimethylimino-4,4-dimethyl- Δ^2 -thiazoline-2-thiolate, 466.

1,3-Cycloadditions of 3,5-dichloro-2,4,6-trimethylbenzotrile oxide to furan, benzofuran, thiophen, and benzothiophen, 706.

Cycloalkanes, stanna-, the homolytic reactivity of. Homolytic organometallic reactions. Part 13, 1499.

Cycloalkenes, direct photolysis of, 1635.

trans-Cycloalkenes. Part 7, variable temperature ^{13}C nuclear magnetic resonance studies on *cis,trans*-cyclo-octa-1,5-diene and related compounds, 1371.

Cycloalkanespirodiazirines, thermal and photochemical decomposition of, 1214.

Cyclobutadieneiron, tricarbonyl-, system, substituent effects in, 907.

Cyclobuta[*a*]naphthalene, 2a,3,4,5,6,7,8,8b-octafluoro-2-methyl-2-(2-methylprop-1-enyl)-1,2,2a,8b-tetrahydro-, crystal and molecular structure, 1985.

Cyclobutanone, 3,3-dimethyl-, thermal decomposition of, 752.

3-vinyl-, thermal decomposition of, 2082.

Cyclocarbonylation, nickel-catalysed stereospecific, of cyclopentadiene dimer. Crystal and molecular structure of 2-(tetracyclo[5.5.1.0 2,6 .0 8,12]tridec-9-en-4-yl)propionic acid, 389.

Cyclodehydrofluorination of 1,5-bis-(2-fluorophenyl)-3-mercaptopformazan, kinetics and mechanism of. Studies on dithione analogues. Part 3, 1118.

Cyclodextrin-polyelectrolyte systems, esterolysis in, 432.

β -Cyclodextrin studied by induced circular dichroism; formation of inclusion complexes of benzophenone derivatives, 1419.

Cycloheptan, 2-chloromethylene-, and -octanones: a conformational study by dipole moments, spectroscopy, and nucleophilic reactivity, 1301.

Cyclohexa-1,3-diene, bicyclo[2.2.1]heptadiene, and cyclo-octa-1,5-diene, rearrangements accompanying oxidative photoaddition of nitrosamines to, 93.

Cyclohexa-1,4-dienes, conformational analysis of by nuclear magnetic resonance, 842.

Cyclohexane, *cis*-1,2-, *trans*-1,3-, and *cis*-1,4-dimethyl, application of the Forsén-Hoffman spin-saturation method and ^{13}C nuclear magnetic resonance spectroscopy to the determination of the barrier to ring inversion in, 84.

and tetrahydrofuran, effect of dichloromethane on insertion into. Stabilisation of singlet ethoxycarbonylnitrene, 80.

kinetics of the auto-oxidation-reduction of substituted nitrosobenzenes in, 1989.

methyl, clathrate, use of quartets in the crystal structure determination of; synthesis and properties of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenylquinazolin-4(3*H*)-one, 1427.

Cyclohexene and a heterocyclic analogue, conformational analysis of by ^{13}C nuclear magnetic resonance spectroscopy. 1,2-Oxazine chemistry. Part 6, 619.

Cyclohexenone, 3-aryl-, derivatives, further studies of barriers to rotation in some: effect of substituents on the free energy of activation. Restricted rotation. Part 2, 356.

Cyclohex-2-enone, polarities and hydrogen-bonding abilities of aromatic derivatives of, 1983.

Cyclohexanol, mercury(II) cyanide promoted reactions of 2-*O*-acetyl-3,4,6-tri-*O*-methyl- α -D-glucopyranosyl bromide with in benzene-nitromethane, mechanistic study of. Koenigs-Knorr reactions. Part 3, 795.

Cyclohexyl toluene-*p*-sulphonate, *E*2C and *E*2H reactions of with triphenylphosphine and other neutral bases. Eliminations promoted by weak bases. Part 7, 293.

kinetics and mechanisms of reactions of with thiourea in various solvents. Eliminations promoted by weak bases. Part 8, 298.

9,19-Cyclo-9 β -lanostan-28-oate, methyl(22*R*,24*S*)-22,31-epoxy-1 α ,3 β ,24,31-tetrahydroxy-24-methyl-, (passifloric acid methyl ester): crystal and molecular structure of a new cyclopropane triterpene, 605.

***cis,trans*-Cyclo-octa-1,5-diene** and related compounds, variable temperature ^{13}C nuclear magnetic resonance studies on. *trans*-Cycloalkenes. Part 7, 1371.

- Cyclo-octa-1,5-diene**, cyclohexa-1,3-diene, and bicyclo[2.2.1]-heptadiene, rearrangements accompanying oxidative photoaddition of nitrosamines to, 93.
- Cyclo-octanones**, 2-chloromethylene-, and -octanones: a conformational study by dipole moments, spectroscopy, and nucleophilic reactivity, 1301.
- Cyclopentadiene dimer**, nickel-catalysed stereospecific cyclo-carbonylation of. Crystal and molecular structure of 2-(tetracyclo[5.5.1.0^{2,6}.0^{8,12}]tridec-9-en-4-yl)propionic acid, 389.
- Cyclopentane-1,3-dicarboxylate** diesters, relative stabilities of. Steric effects in five-membered rings. Part 7, 75.
- Cyclophane**, [20]para-, oximes provided by hydrophobic effects, unusual nucleophilic reactivity of un-ionised. Macrocyclic enzyme model systems, 32.
- Cyclophanes**, [2,2]meta-, anodic oxidation of and trans-annular cation radical formation. Electron-organic chemistry, 384.
- [20]para-, concurrent nucleophilic-electrostatic bifunctional catalysis by in deacylation of *p*-nitrophenyl carboxylates. Macrocyclic enzyme model systems, 24.
- Cyclopropane** triterpene, a new, crystal and molecular structure of passifloric acid methyl ester [methyl(2*R*, -2*S*)-22,31-epoxy-1 α ,3 β ,24,31-tetrahydroxy-24-methyl-9, -19-cyclo-9 β -lanostan-28-oate], 605.
- Cyclopropyl** conjugated 1,2-diketones, photochemistry of some. Part 2, fragmentation reactions and reduction by aldehydes, 710.
- Cytosines**, methyl-, kinetics and mechanism of reaction of hydroxylamine with, 609.
- D**
- DBP and DDA**, [4,4'-dichlorobenzophenone and 1,1-bis-(*p*-chlorophenyl)acetic acid], crystal structures of. Insecticides. Part 8, 463.
- DDD and DDE**, [1,1-dichloro-2,2-bis-(*p*-chlorophenyl)-ethane and -ethylene], crystal structures of. Insecticides. Part 7, 460.
- Deacylation** of *p*-nitrophenyl carboxylates, concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in. Macrocyclic enzyme model systems, 24.
- step** in the mechanism of action of serine proteases, hydrolyses of *O*-acylglycolamides as models of: function of the oxyanion pocket, 1221.
- Debromination**, piperidino-, of 4'-substituted 3-bromo-4-nitrobiphenyls, the kinetics of. Substituent effects in the biphenyl series. Part IV, 137.
- Decarboxylation**, acid catalysed, of indole-3-carboxylic acids. Heteroaromatic hydrogen exchange reactions. Part 9, 281.
- alkaline, of trichloroacetate ion in water-methanol solutions, kinetics of. Solvolysis rates in aqueous-organic mixed solutions. Part 4, 1237.
- of 5-amino-1,3,4-oxadiazole-2-carboxylic acid to 2-amino-1,3,4-oxadiazole in water, kinetic study of as a function of proton activity, 639.
- oxidative, of aldonolactones by cerium(IV) sulphate in aqueous sulphuric acid: synthesis of D-arabinose, 685.
- Decay kinetics** of cumylperoxyl radical produced by the decomposition of cumene hydroperoxide, 622.
- Decomposition**, gas-phase hydrogen-chloride catalysed, of some cyclic alcohols, 1425.
- Decarboxylation**, studies in. Part 10, effect of β -substituents on the rate of gas-phase decarboxylation of $\beta\gamma$ -unsaturated acids, 745.
- Decomposition** of aliphatic diazo-compounds, intermediates in. Part 13, mechanistic studies on the reaction of diaryldiazomethanes with singlet molecular oxygen, 327. Part 14, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion, 671.
- of benzyldimethylsulphonium salts in chloroform, kinetics and mechanism of, 958.
- of carbamates of tertiary alcohols. Part 3, influence of phenyl and vinyl substituents at the α -carbon atom, 879.
- of cumene hydroperoxide, decay kinetics of cumylperoxyl radical produced by, 622.
- of norbornan-2-one and norborn-5-en-2-one tosylhydrazones sodium salts, kinetic studies of, 1490.
- of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediaminetetra-acetic acid, a mechanistic study of, 1868.
- oxidative induced, of ($\alpha\alpha'$ -diphenyl)azoethane, inhibition of by transition metal ions. Interactions of metal ions with α -phenylethylperoxyl radical, 59.
- the liquid-phase, of cumene hydroperoxide by lead dioxide, electron spin resonance and kinetic studies of, 625.
- thermal, of 3-vinylcyclobutanone, 2082.
- unimolecular, of 2-ethoxy-3,4-dihydro-2*H*-pyran, 870.
- and photochemical, of cycloalkanespirodiazirines, 1214.
- of 3,3-dimethylcyclobutanone, 752.
- the thallium(III) ion promoted, of thiobenzamides in aqueous solution, kinetics and mechanism of, 1366.
- the thermal, of [di(benzoyloxy)iodo]-benzene in bromobenzene, mechanism of, 860.
- Deformations**, methyl and trifluoromethyl asymmetric; Raman optical activity of simple chiral molecules, 1790.
- Dehalogenation reactions** of vicinal dihalides. Part V, kinetic study of the reactions of 1,2-dihalogeno-1,2-diphenylethanes with triphenylphosphine, 140.
- Dehydration** of *N*-(α -cyanobenzyl)-*N*-phenylhydroxylamines, kinetics of, 1437.
- Dehydrochlorination**, *E2* and *E1cB*, of 1,1-diaryl-2,2-dichloroethanes, model calculations of heavy atom isotope effects for, 1847.
- of 1,1-diaryl-2,2-dichloroethanes, isotope effects in. The carbanion mechanism of olefin-forming elimination. Part 10, 1758.
- proton tunnelling and isotope effects in. The carbanion mechanism of olefin-forming elimination. Part 9, 1753.
- Dehydrochlorinations**, *E2* and *E1cB*, of 1,1-diaryl-2,2-dichloroethanes, model calculations of hydrogen-deuterium isotope effects for, 1763.
- Dehydrogenation** of tertiary amines with dibenzoyldiimide, 1977.
- Denitrosation** and the Fischer-Hepp rearrangement, kinetics and mechanism of. Part 9, ring-methyl substituent effects, 44.
- Derivatives**, 2-substituted, of furan, thiophen, selenophen, and tellurophen, a comparative study of electric dipole moments of, 775.

- Determination**, X-ray crystallographic, of the molecular conformation of the germacranolide alatolide monohydrate. Sesquiterpenoids. Part XXIII, 255.
- Deuteriochloroform solution**, ^1H , ^{13}C , and ^{14}N nuclear magnetic resonance study of the hydrogen chloride-*NN*-dimethylacetamide and hydrogen chloride-*N*-methylacetamide systems in, 556.
- Deuterium labelling**, selective distribution of. Photolysis of methyl [6- ^2H]-pyridylacetate, 1980.
- Deuteron transfer and proton transfer** from α ,4-dinitrotoluene to 1,8-bis(dimethylamino)naphthalene, kinetics of in alcoholic solvents, 814.
- Dialkyl sulphoxides**, an electron spin resonance study of the reactions of alkoxy and trimethylsiloxy radicals with, 1708.
- 1*H*-1,3-Diazepines**, 1,2-diaryl-4,5,6,7-tetrahydro-, and 1,2-diaryl-1,4,5,6,7,8-hexahydro-1,3-diazocines, synthesis and properties of. Comparison with the five- and six-membered homologues, 2068.
- 1,3-Diazines**, perhydro- and perhydro-1,3-oxazines, passing pyrimidal nitrogen inversions in some. Conformational analysis of saturated heterocycles. Part 78, 818.
- 1,3-Diazocines**, 1,2-diaryl-1,4,5,6,7,8-hexahydro-, and 1,2-diaryl-4,5,6,7-tetrahydro-1*H*-1,3-diazepines, synthesis and properties of. Comparison with the five- and six-membered homologues, 2068.
- Diazo-compounds**, aliphatic, intermediates in the decomposition of. Part 13, mechanistic studies on the reaction of diaryldiazomethanes with singlet molecular oxygen, 327. Part 14, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion, 671.
- Diazole**, 3-phenyl-1,2,5-oxa-, -thia-, and -seleno-: conformational studies by nuclear magnetic resonance spectroscopy in nematic phases, 561.
- Diazonium ions** in acid solution, reaction with. Electrophilic substitution in pyrroles. Part 2, 1452.
- Diazotisation** of 2- and 4-aminopyridine 1-oxide, kinetics of. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 4, 1830.
- of substituted 2-aminopyridine and 2-aminopyridine 1-oxide, kinetics of. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 5, 1835.
- of substituted anilines by nitrosyl chloride and nitrosyl thiocyanate, indirect measurement of the rate constants for, 502.
- Dibenzoyldi-imide**, dehydrogenation of tertiary amines by, 1977.
- Dibenzyl ether**, mechanism of anodic cleavage of. Electroorganic reactions. Part 10, 803.
- α -Dicarbonyl compounds**, free radical adducts of tri(cyclohexyl)plumbyl radicals with, 1633.
- Dichloromethane**, chlorosulphuric acid in, and in nitromethane, sulphonation in the reactions of aromatic compounds with. Aromatic sulphonation. Part 60, 1548.
- chlorosulphuric acid in, and in nitromethane, sulphonylation in the reaction of aromatic compounds with. Aromatic sulphonation. Part 61, 1557.
- Dichroism**, circular, of 5-alkyl-5-(3-hydroxy-1-methylbutyl)-barbituric acids, 983.
- circular, study of the configuration of the acetyl side-chain of the 17-hydroxy-isomers in solution and crystal and molecular structure of 3 α ,17 α -dihydroxy-4,4,14 α -tri-methyl-19-nor-10 α -pregn-5-ene-11,20-dione. Steroidal analogues of unnatural configuration. Part XI, 402.
- induced circular, β -cyclodextrin studied by; formation of inclusion complexes of benzophenone derivatives, 1419.
- linear, of organic molecules in electrically oriented liquid crystal matrices, 1208.
- magnetic circular, studies. Part 45, a comparison between the magnetic circular dichroism and Shpol'skii spectra of palladium, zinc, and magnesium porphyrin, 337.
- Diesters**, cyclopentane-1,3-dicarboxylate, relative stabilities of. Steric effects in five-membered rings. Part 7, 75.
- Diethyl ether solution**, equilibria between covalent metal halides and thiobenzamide in. Quantitative aspects of Lewis acidity. Part 17, 592.
- peroxide**, kinetics and mechanism of the reaction of Δ^3 -phospholens with, 882.
- Dihalides**, vicinal, dehalogenation reactions of. Part V, kinetic study of the reactions of 1,2-dihalogeno-1,2-diphenyl ethanes with triphenylphosphine, 140.
- Diketo-compounds**, some vicinal, structures and spectral properties of *p*-*NN*-dimethylaminoanils of. Positive solvatochromic effect. Conjugated Schiff's bases. Part 8, 1893.
- 1,3-Diketones**, some, and trifluoronitrosomethane, free radical formation in the reactions between. Nitroxide chemistry. Part XII, 7.
- 1,2-Diketones**, some cyclopropyl conjugated, photochemistry of. Part 2, fragmentation reactions and reduction by aldehydes, 710.
- Dimerisation equilibrium**, effect of structure on. Study of bipyridyl radical cations. Part 5, 1787.
- Dimethylamine**, *N*-nitroso, effect of ionising radiation on: an electron spin resonance study. Unstable intermediates. Part 175, 1449.
- Dimethyl but-2-ynedioate** and 2-aminobenzothiazole, synthesis and X-ray structure of methyl 2-oxopyrimido[2,1-*b*]-benzothiazole-4-carboxylate from condensation of, 1070.
- Dimethylformamide** and dimethyl sulphoxide, base-catalysed mutarotation of glucose in, 2021.
- Dimethyl sulphoxide**, acetonitrile, tetrahydrofuran, and ethyl acetate, reaction of 2,4-dinitrophenyl phenyl ether with morpholine in, and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.
- and dimethylformamide, base-catalysed mutarotation of glucose in, 2021.
- thermodynamic and kinetic acidities in. Part 2, acetylenic compounds, 407. Part 3, alcohols and phenols, 570.
- water, and their mixtures as solvents, reduction of carbonyl compounds by sodium borohydride (tetrahydridoborate) in: products and kinetics, 1446.
- 20% and 30% (v/v), rates of proton transfer from protonated 1,8-bis(dimethylamino)- and 1,8-bis(diethylamino)-naphthalene to hydroxide ion in, 1589.
- kinetic and equilibrium studies of the protonation of *meso*-tetraphenylporphyrin in, 1610.
- 2,4-Dinitrophenyl 4-nitrophenyl ether** and 2,4-dinitrophenyl phenyl sulphone, reactions of with piperidine. Catalysis in aromatic nucleophilic substitution. Part 1, 1316.
- phenyl ether**, kinetics of the reactions of piperidine, *n*-butylamine, morpholine, and benzylamine with, 1580.

2,4-Dinitrophenyl 4-nitrophenyl ether (*contd.*)

reaction of with morpholine in dimethyl sulphoxide, acetonitrile, tetrahydrofuran, and ethyl acetate and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.

Dioxan-water mixtures, study of the Hammett equation for the ionisation of substituted benzoic acids and phenols in, 1513.

[f,h]-[1,4]**Dioxecin**, cyclic 7,8-dihydrodibenzo-, ^1H nuclear magnetic resonance and *X*-ray study of dihedral bond angles in the *gauche* $\text{O}\cdot\text{CH}_2\cdot\text{CH}_2\cdot$ moiety of, 1942.

1,3-Dioxolan-2-yl radicals, e.s.r. studies of configurational preferences, radical-centre inversion, and restricted rotation about $\cdot\text{C}\text{--}\text{CH}_3$ in some. Investigations of structure and conformation. Part 8, 1161.

Dioxygen, oxidation of naphthalene by in the presence of iron(II) salts. Aromatic hydroxylation. Part 6, 1583.

Diphenylamine, *N*-nitroso-, direct nitrosation of aniline derivatives and other nucleophilic species by, 1932.

Diphenylmethyl derivatives, effect of solvent ionising power on the selectivity of. Reactivity selectivity relationships. Part 5, 1860.

1,3-Dipolar character of six-membered aromatic rings. Part 32, derivatives of 1-aryl-3-imidopyridiniums: preparation and *X*-ray crystal structure, 1304.

Dipole-dipole interaction, an example of: conformational preferences of 4-(*para*-substituted) 2-isopropoxy-2,3-dihydropyran [2,3-*c*] pyrazoles, 1725.

1,3-Dipoles, reactivity of in aqueous solution. Part 1, stereospecific formation of *Z*-amidoximes in the reaction of benzonitriles oxides with amines, 1457.

Dipole moment, a permanent electric, aromatic solvent induced shifts in molecules with and without, 1656.

electric transition, in the aromatic group in benzobicyclo[2.2.2]octen-2-one derivatives, effect of the direction of. Optical activity in $\beta\gamma$ -unsaturated ketones. Part 1, 1937.

study of the *ortho*-effect in di- and tri-substituted *NN*-dimethylanilines, 559.

Dipole moments and conformation of some 1-(α -aryloxy-arylideneamino)-4,5-dimethyl-1,2,3-triazoles, 1779.

electric, of 2-substituted derivatives of furan, thiophen, selenophen, and tellurophen, a comparative study of, 775.

spectroscopy, and nucleophilic reactivity, a conformational study by: 2-chloromethylenecycloheptan and -octanones, 1301.

Diquat radical cation, reaction of with oxygen and copper(II). Study of bipyridyl radical cations. Part 4, 445.

Discrimination between concerted and stepwise processes in activated elimination reactions. Elimination and addition reactions. Part 32, 1914.

Displacement, bimolecular, stereochemistry of in azavinyl systems; crystal and molecular structure of *N*-(2,4-dinitrophenyl)-*N*-methylpivalohydrazonyl bromide, 1136.

nucleophilic, in polyhalogenoaromatic compounds. Part 3, kinetics of protodeiodination of iodoarenes, 278.

of the acyl group in benzothiazoles by nucleophilic alkyl radicals. Homolytic aromatic *ipso*-substitution, 1679.

Displacements, nucleophilic, on 1-hydroxybenzotriazole esters, kinetics and mechanism of and crystal and molecular structure of 1-benzoyloxybenzotriazole. *N*-Hydroxy-compounds as acyl transfer agents. Part 1, 224.

Dissociation, the acid, of arenosulphonamides: σ_{Het} constants for thia- and oxa-substituents in five-membered *S*-linked heterocycles and the effects of substituents in the *N*-linked aromatic ring, 984.

constants, acid, rates of proton transfer and the strengths of intramolecular hydrogen bonds in 8-methoxy-*NN*-dimethyl-1-naphthyl ammonium ion and 8-hydroxy-*NN*-dimethyl-1-naphthylamine, 152.

equilibria, ion-pair, for trityl hexafluoro-arsenate and -antimoniate in polar solvents, 1729.

Distribution, selective, of deuterium labelling. Photolysis of methyl [6- ^2H]-pyridylacetate, 1980.

1,2-Dithiole-3-thione, 4-(thio-*p*-toluoyl)-5-*p*-tolyl-, crystal and molecular structure of, 1854.

Dithizone: redetermination and refinement of its crystal structure, 1248.

analogues, studies on. Part 3, kinetics and mechanism of cyclodehydrofluorination of 1,5-bis-(2-fluorophenyl)-3-mercaptopformazan, 1118.

Dodecylammonium propionate and Aerosol-OT aggregates in benzene, kinetics of the reaction of *p*-nitrophenyl acetate with amines in the presence of, 1674.

Dopa-melanin, the electron transfer and free radical properties of. Studies related to the chemistry of melanins. Part 15, 1346.

Drugs, conformations of some semi-rigid neuroleptic. Part 2, crystal structures of the racemic and of (+)-(*S*)-octoclothepein{2-chloro-10,11-dihydro-11-(4-methylpiperazin-1-yl)dibenzo[*b,f*]thiepin} and the absolute configuration of the latter, 186.

Dye binding to chemically different sites, mechanism of. Poly-anions and their complexes. Part 10, 38.

Dyes, di- and tri-arylmethane, steric effects in. Part 13, electronic absorption spectra of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion, 450.

E

***ortho*-Effect** in di- and tri-substituted *NN*-dimethylanilines, a dipole moment study of, 559.

Effects, activating, of fluorine in polyfluoropyridines in reactions with ammonia. Mechanisms for reactions of halogenated compounds. Part 1, 585.

calculations of steric. Part 3, the anion-catalysed substitution of alkylmercury(II) bromides by mercury(II) bromide in ethanol, 221.

hydrophobic, unusual nucleophilic reactivity of un-ionised [20]paracyclophane oximes provided by. Macrocyclic enzyme model systems, 32.

internal and external heavy atom, and the structure of photoisomer F: reversible photochemistry of 10,10'-dimethylbiacridan, 550.

^{13}C shielding, at γ -carbon atoms in side-chains of α -aminoacids, 50.

***ortho*-Effects** in the acylation of substituted phenylureas with isocyanates and acetic anhydride, 934.

Electric transition dipole moment in the aromatic group in benzobicyclo[2.2.2]octen-2-one derivatives, effect of the direction of. Optical activity in $\beta\gamma$ -unsaturated ketones. Part 1, 1937.

Electrochemical oxidation of some substituted tertiary alkylamines. Amine oxidation. Part 13, 1732.

- Electrochemistry** and charge distribution of mono-, di-, and tri-cyanovinyl aromatic compounds, structural effects on, 1643.
- 1 : 1 Electrolytes**, comparison with; effect of alcoholic solvents on the enthalpy and entropy of the tetraethyltin-mercury(II) chloride transition state and of the *t*-butyl chloride solvolysis transition state. Substitution at saturated carbon. Part 21, 1028.
- Electron capture** processes in organic phosphates: an electron spin resonance study. Unstable intermediates. Part 170, 286.
- impact studies**. Part 116, mechanisms of keten elimination from acetanilide and phenyl acetate radical ions, 1670.
- Electronic absorption spectra** of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.
- of the dicyanoanilines. Orientation effects in the benzene chromophore bearing one donor and two acceptor groups, 1608.
- Electronic effects** and structural effects on the ^{13}C contact shifts of α -bonded molecules, 809.
- of substituents at phosphorus on the rates of alkaline hydrolysis, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies. Heteroaryl-, heteroarylmethyl-, and substituted aryl-phosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
- structure** and geometry of intimate and solvent-separated ion pairs of fluoromethane in water, 162.
- and molecular conformation of azomethines. Part 5, determination of the conformation of some *N*-methylimine derivatives of aldehydes and ketones from dipole moment data, 2038.
- Electron-organic chemistry**. Anodic oxidation of [2,2]-metacyclophanes and transannular cation radical formation, 384.
- Electrons**, lone-pair, nature of in n , π -homoconjugated aliphatic amines. Homoallylic interaction between a nitrogen lone pair and a non-adjacent π -bond. Part 6, 1057.
- Electron spin resonance** and fluorimetric study of the oxygenation of benzo[*a*]pyrene; an interpretation of the enzymic oxygenation, 1172.
- and kinetic studies on the liquid-phase autoxidation of cumene with lead dioxide, 784.
- and kinetic studies on the liquid-phase decomposition of cumene hydroperoxide by lead dioxide, 625.
- investigation: generation and reactions of the ammonium-yl radical cation (NH_3^+), 987.
- measurements of the termination rate constants for *t*-butyl radicals in solution, 1504.
- reinvestigation of dihydropyridyl radicals, 943.
- spectra and electronic structure of nitrophenoxatellurine anion-radicals, 529.
- of radicals from cyclic ethers containing six-membered rings, long-range interactions, and line-width alternation associated with β - and γ -proton splittings in. Investigations of structure and conformation. Part 7, 754.
- temperature-dependent: long-range interactions and line-width alternation for γ -proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$. Investigations of structure and conformation. Part 6, 116.
- spectroscopy, a kinetic investigation by: alkoxy nitroxide radicals from photolysis of nitropyridines, 1132.
- studies. Part 51, aliphatic and aromatic sulphinyl radicals, 497.
- of conformational preferences, radical-centre inversion, and restricted rotation about $\cdot\text{C}-\text{CH}_3$ in some 1,3-dioxolan-2-yl radicals. Investigations of structure and conformation. Part 8, 1161.
- of radical addition to alkynes and intramolecular reactions of vinyl radicals, 827.
- of the mechanism of the formation of *p*-benzosemiquinone anion over manganese dioxide, 1421.
- on the interactions between radical ion pairs and macrocyclic polyethers. Part 2, intramolecular cation exchange in metal ketyl ion pairs, 1327.
- study: effect of ionising radiation on *N*-nitrosodimethylamine. Unstable intermediates. Part 175, 1449.
- electron-transfer process with pyridinium, quinolinium, and pyrazinium salts, 948.
- electron capture processes in organic phosphates. Unstable intermediates. Part 170, 286.
- of a stable benzo[*b*]furan radical, 1545.
- of fluoroalkoxy- and fluoroalkylphosphoranyl radicals, 889.
- of hydrogen adduct radicals generated from indole and its derivatives in γ -irradiated methanolic glasses at 77 K, 347.
- of the reactions of alkoxy and trimethylsilyl radicals with dialkyl sulphoxides, 1708.
- 8 π -Electron system**, evidence for the existence of a new, 1,3,5-thiadiazinide anion, 939.
- Electron transfer** and free radical properties of dopa-melanin. Studies related to the chemistry of melanins. Part 15, 1346.
- from excited carboxyalkylferrocenes to nitrous oxide, 1353.
- single, and nucleophilic attack, competition between: reaction of 3-arylimino-2-phenyl-3*H*-indoles with organolithium compounds, 1032.
- Electron-withdrawing substituents**, the effect of on the tautomerism between 1-aryl-3-methyltriazines and 3-aryl-1-methyltriazines, 17.
- Electro-organic reactions**. Part 10, mechanism of anodic cleavage of dibenzyl ether, 803.
- Electrophile**, identification of; kinetics of nitration of aromatic hydrocarbons in purified acetic anhydride, 1361.
- Electrophilic aromatic reactivities** *via* pyrolysis of 1-aryl-ethyl esters. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678.
- Part 14, non-additivity of methyl substituent effects: the reactivity selectivity principle, 1537. Part 15, non-additivity of chloro-substituent effects: mechanism of the elimination, 1541.
- aromatic substitution**. Exeter and City Universities: Part 16, the nitration of anisole, *o*-methylanisole and *p*-methylanisole in aqueous sulphuric acid, 248.
- Part 17, products, kinetics and mechanism of nitration in trifluoroacetic acid, 1688. Part 18, nitration of acetanilide and some analogues: a reconsideration, 1693.
- University of Sussex: Part 18, protiodetritiation of anthracene, coronene (dibenzo[*ghi,pqr*]perylene), and

Electrophilic aromatic reactivities (*contd.*)

triphenylene in anhydrous trichloroacetic acid, 353. Part 19, protiodetritiation of 1,2-diphenylethane and 9,10-dihydrophenanthrene: effect of strain on aromatic reactivity, 866.

a theoretical investigation of the effect of positively charged substituents on product distribution in; evidence for a dominant field effect of the positive state, 1066.

attack, the $\alpha : \beta$ ratio for, and for product formation, in cholest-5-enes, factors affecting; chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one. The kinetics and mechanisms of additions to olefinic substances. Part 15, 2062.

substitution in pyrroles. Part 2, reaction with diazonium ions in acid solution, 1452.

on the thiophen ring. Part 5, the effect of methyl groups on the kinetics of hydrogen exchange in acidic media, 1998.

Elimination and addition reactions. Part 30, leaving group abilities in alkene-forming eliminations activated by sulphonyl groups, 1898. Part 31, polar effects on the ionisation of sulphones, nitriles, and ketones, 1909. Part 32, discrimination between concerted and stepwise processes in activated elimination reactions, 1914. Part 33, formation and behaviour of carbanions derived from sulphones and nitriles bearing β -onium substituents, 1920.

from 3 α -chloro-3 β -methyl- and 3 β -chloro-3 α -methyl-5 α -cholestane promoted by potassium *t*-butoxide in *t*-butyl alcohol, kinetic study of, 436.

mechanism of: non-additivity of chloro-substituent effects. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 15, 1541.

olefin-forming, the carbanion mechanism of. Part 9, proton tunnelling and isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1753.

Part 10, isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1758.

reactions, base-promoted, and base-catalysed 1,3-proton transfer reactions, extreme deuterium isotope effects as evidence of ion-pair intermediates in, 1569.

Eliminations promoted by weak bases. Part 7, *E*2C and *E*2H reactions of cyclohexyl toluene-*p*-sulphonate with triphenylphosphine and other neutral bases, 293. Part 8, kinetics and mechanisms of reactions of cyclohexyl toluene-*p*-sulphonate with thourea in various solvents, 298.

Enamine chemistry. Part 22, carbon-13 nuclear magnetic resonance spectra of acyclic enamines, 838.

(R)-Enantiomer of *N*-[2-(2-cyclohexylmandeloyloxy)ethyl]-*N*-methylpiperidinium iodide, crystal and molecular structure of. Stereochemistry of anticholinergic agents. Part 10, 643.

Enantiomers of alkylphenylphosphinic amides, proton magnetic resonance non-equivalence of, 1882.

Ene reaction of maleic anhydride with alkenes, 533.

Energies, the conformational free, of the aldohexopyranoses, a Monte Carlo investigation of, 654.

Enthalpy and entropy of the tetraethyltin-mercury(II) chloride transition state and of the *t*-butyl chloride solvolysis transition state, effect of alcoholic solvents on; comparison with 1:1 electrolytes. Substitution at saturated carbon. Part 21, 1028.

Enzyme model systems, macrocyclic. Concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in deacylation of *p*-nitrophenyl carboxylates, 24.

Unusual nucleophilic reactivity of un-ionised [20]paracyclophane oximes provided by hydrophobic effects, 32.

-**thiamine** model interactions, solvent effects of. 2,3,4-Trimethylthiazolium iodide, a model for interaction with negative charges, 1484.

Enzymic oxygenation, an interpretation of; a fluorimetric and electron spin resonance study of the oxygenation of benzo[*a*]pyrene, 1172.

Epoxidation of cholest-5-en-3-one, stereochemistry of, and of the base-catalysed rearrangement of the derived epoxides, 975.

Epoxide ring, neighbouring-group participation by phenolate in the opening of, 917.

Equilibria, acid-base, the M_C activity coefficient function for. Part 2, a critical analysis of acidity functions and the incompatibility amongst proposed empirical correlations, 306. Part 3, improvement of the M_C function by mathematical treatment, 309. Part 4, limitations of empirical relationships involving observed nitration rates and acidity functions, 845.

between covalent metal halides and thiobenzamide in diethyl ether solution. Quantitative aspects of Lewis acidity. Part 17, 592.

ion-pair dissociation, for trityl hexafluoro-arsenate and -antimonate in polar solvents, 1729.

potentiometric, of sulphamates, studies of using ^{13}C and ^1H nuclear magnetic resonance spectroscopic, potentiometric, and conductimetric methods, 580.

protonation, of *N*-arylsulphamates using ultraviolet and nuclear magnetic resonance methods. Basicity of nitrogen-sulphur(vi) compounds. Part 2, 1180.

Equilibration, chemical, and ^1H nuclear magnetic resonance conformational study of 4,5-dimethyl-, 2,4,5-trimethyl-, and 2,2,4,5- and 2,4,4,5-tetramethyl-1,3-oxathiolans. Properties and reactions of 1,3-oxathiolans. Part 6, 343.

Equilibrium, the dimerisation, effect of structure on. Study of bipyridyl radical cations. Part 5, 1787.

data and kinetic data for sodium ethoxide addition to 2,4-dinitro-6-*X*-phenetoles in ethanol. The stabilities of Meisenheimer complexes. Part 14, 1442.

studies and kinetic studies on the protonation of *meso*-tetraphenylporphyrin in dimethyl sulphoxide-water, 1624.

Ester group of benzoylglycolic acid, intramolecular general base catalysis in the hydrolysis of, 1563.

hydrolysis promoted by micelles containing the imidazole ring and the hydroxy-group. Functional micellar catalysis. Part 2, 821.

imidazolysis in benzene, kinetics of, 1176.

Esterolysis in cyclodextrin-polyelectrolyte systems, 432.

Esters, 1-arylethyl, pyrolysis of, electrophilic aromatic reactivities *via*. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678.

diastereoisomeric, of α -fluorophenylacetic acid, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.

heteroaryl, heteroarylmethyl-, and substituted aryl-

Esters, (contd.)

phosphonate. Electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies. The chemistry of heteroarylphosphorus compounds. Part 7, 789.

nitrophenyl, of carboxylic acids, reactions of with benzethiolate-, acyl-oxygen *versus* aryl-oxygen bond scission in, 966.

organophosphorus, magnetic non-equivalence in, 1232.

possessing readily ionisable amide groups, alkaline hydrolysis of: evidence for the 1 \rightarrow 4 migration of anilic group in the alkaline reaction of *O*-aroyl-*N*-arylglycolamides, 2028.

Estr-5(10)-en-3-one, 17 α -ethynyl-17 β -hydroxy-, (norethynodrel), *X*-ray crystal structure analysis of: conformational preference of ring A in 3-oxo- $\Delta^5, 10$ -steroids, 379.

Ethane, 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)- (DDD), and 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)-ethylene (DDE), crystal structures of. Insecticides. Part 7, 460.

($\alpha\alpha'$ -diphenyl)azo-, inhibition of oxidative induced decomposition of by transition metal ions. Interactions of metal ions with α -phenylethylperoxyl radical, 59.

1,3-diphenyl-, and 9,10-dihydrophenanthrene, protiodetritiation of: effect of strain on aromatic reactivity. Electrophilic aromatic substitution. Part 19, 866.

Ethanes, 1,1-diaryl-2,2-dichloro-, isotope effects in the dehydrochlorination of. The carbanion mechanism of olefin-forming elimination. Part 10, 1758.

model calculations of heavy atom isotope effects for *E2* and *E1cB* dehydrochlorination of, 1847.

model calculations of hydrogen-deuterium isotope effects for *E2* and *E1cB* dehydrochlorinations of, 1763.

proton tunnelling and isotope effects in the dehydrochlorination of. The carbanion mechanism of olefin-forming elimination. Part 9, 1753.

1,2-dihalogeno-1,2-diphenyl-, kinetic studies of the reactions of with triphenylphosphine. Dehalogenation reactions of vicinal dihalides. Part V, 140.

Ethanol, equilibrium and kinetic data for sodium ethoxide addition to 2,4-dinitro-6-*X*-phenetoles in. The stabilities of Meisenheimer complexes. Part 14, 1442.

the anion-catalysed substitution of alkylmercury(II) bromide by mercury(II) bromide in. Calculations of steric effects. Part 3, 221.

Ethanolic solution, acid strengths of various substituted formazans in, 1683.

Ether, see *Diethyl ether*.

Ethers, crown, chemistry of: the mass spectra of macrocyclic polyethers, 206.

cyclic, containing six-membered rings, long-range interactions and line-width alternation associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from. Investigations of structure and conformation. Part 7, 754.

Ethyl acetate, *t*-butyl alcohol, acetonitrile, and acetone, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in. Substitution at saturated carbon. Part 22, 1225.

dimethyl sulphoxide, acetonitrile, and tetrahydrofuran, reaction of 2,4-dinitrophenyl phenyl ether with morpholine in, and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.

Ethylene, 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)- (DDE), and 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)-ethane (DDD), crystal structures of. Insecticides. Part 7, 460.

ab initio SCF-MO study of the reaction intermediates formed by addition of thiohypochlorous acid to, 1019.

Ethyl ether, biacetyl mono-oxime, photoisomerisation of. Photochemistry of α -oxo-oximes. Part 1, 1351.

Exchange, halogen, between methylene halides and ionic halides in water-methylene halide two-phase systems, 1462.

hydrogen isotope, in the aldehyde group during the reduction of benzaldehyde by tritiated sodium borohydride (tetrahydridoborate), 1472.

Experimental studies and theoretical studies on protonation of thioketones, 1516.

F

Ferrocenes, carboxyalkyl-, excited, electron-transfer from to nitrous oxide, 1353.

Field effect, a dominant, of the positive poles, evidence for; a theoretical investigation of the effect of positively charged substituents on product distribution in electrophilic aromatic substitution, 1066.

Fischer-Hepp rearrangement and denitrosation, kinetics and mechanism of. Part 9, ring-methyl substituent effects, 44.

Fluorescence of some 7-hydroxycoumarins and related compounds, 262.

Fluoride-carboxylic acid systems: *ab initio* studies of the strongest type of hydrogen bond, 2079.

Fluorimetric study and electron spin resonance study of the oxygenation of benzo[*a*]pyrene; an interpretation of the enzymic oxygenation, 1172.

Fluorine, activating effects of in polyfluoropyridines in reactions with ammonia. Mechanisms for reactions of halogenated compounds. Part 1, 585.

and biphenyl systems, the transmission of substituent effects across. Stability of carbonium ions. Part 3, 426.

Fluoromethane, geometry and electronic structure of intimate and solvent-separated ion pairs of in water, 162.

Formation and behaviour of carbanions derived from sulphones and nitriles bearing β' -onium substituents. Elimination and addition reactions. Part 33, 1920.

mechanism of, and structure of the intermediates in the reactions between amides and CSCl_2 or PSCl_3 or between thioamides and COCl_2 , POCl_3 , or PSCl_3 . Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.

of an overcrowded tetrasulphonic acid. Sulphonation of *m*-aminobenzenesulphonic acid in fuming sulphuric acid. Aromatic sulphonation. Part 63, 1863.

of *p*-benzosemiquinone anion over manganese dioxide, electron spin resonance studies of the mechanism of, 1421.

of dialkylhydroxylamines and nitroxides: rearrangements involving a *C*-nitroso group, 1255.

of inclusion complexes of benzophenone derivatives; β -cyclodextrin studies by induced circular dichroism, 1419.

stereospecific, of *Z*-amidoximes in the reaction of benzonitrile oxides with amines. Reactivity of 1,3-dipoles in aqueous solution. Part 1, 1457.

- Formazan**, 1,5-bis-(2-fluorophenyl)-3-mercapto-, kinetics and mechanism of the cyclodehydrofluorination of. Studies on dithizone analogues. Part 3, 1118.
- Formazans**, various substituted, in ethanolic solution, acid strengths of, 1683.
- Formyl** and hydroxymethyl groups, a re-evaluation of the Hammett σ_p values for, 993.
- Forsén-Hoffman spin-saturation method**, and ^{13}C nuclear magnetic resonance spectroscopy, application of to the determination of the barrier to ring inversion in *cis*-1,2-, *trans*-1,3-, and *cis*-1,4-dimethylcyclohexane, 84.
- Fourier transform** nuclear magnetic resonance investigations of organotin compounds. Part 6, Tin-119 and carbon-13 nuclear magnetic resonance spectra of hexaorganoditins and octaorganotritins, 1842.
- Fragmentation**, mass spectral, and the synthesis of some 1,2-disubstituted tricarbonyl- η -cyclopentadienylmanganese derivatives: 2-lithiation of tricarbonyl(η -*NN*-dimethylsulphamoylcyclopentadienyl)manganese, 703.
- reactions** and reduction by aldehydes. Photochemistry of some cyclopropyl conjugated 1,2-diketones. Part 2, 710.
- Fragments**, the C_α - C_β , of oxytocin, oxytocinoic acid, and tocinoic acid in aqueous solution, nuclear magnetic resonance conformational studies of, 477.
- Free energies**, conformational, of the aldohexopyranoses, a Monte Carlo investigation of, 654.
- energy** of activation, effect of substituents on: further studies of barriers to rotation in some 3-arylcyclohexenone derivatives. Restricted rotation. Part 2, 356.
- radical** and electron transfer properties of dopa-melanin. Studies related to the chemistry of melanins. Part 15, 1346.
- adducts** of tri(cyclohexyl)plumblyl radicals with α -dicarbonyl compounds, 1633.
- formation** in the reactions between trifluoronitrosomethane and some 1,3-diketones. Nitroxide chemistry. Part XII, 7.
- radicals**, heterocyclic. Part 7, substituent effects on the distribution of spin density in the cation, neutral, and nitroxide radicals of phenanthroline, 517.
- Fructose 6-phosphate**, photoreactions of in oxygenated and deoxygenated aqueous solutions, 1719.
- Fulgide**, di-*p*-cumenyl-, (bis-*p*-cumenylmethylenesuccinic anhydride) the photochemistry of, 1.
- Function**, the M_C activity coefficient, for acid-base equilibria. Part 2, a critical analysis of acidity functions and the incompatibility amongst proposed empirical correlations, 306. Part 3, improvement of the M_C function by mathematical treatment, 309. Part 4, limitations of empirical relationships involving observed nitration rates and acidity functions, 845.
- Functional groups**, neighbouring, reactions of *m*-chloroperbenzoic acid with olefins which have, 914.
- Functions**, thermodynamic, of proton ionisation of *para*-substituted benzenethiols, 149.
- Fungicides**, some systemic pyrimidine, kinetic and energetic aspects of the photodimerisation of, 216.
- Furan**, benzofuran, thiophen, and benzothiophen, 1,3-cycloadditions of 3,5-dichloro-trimethylbenzoxonitrile oxide to, 706.
- pyrrole, and pyridine-carbaldehydes, conformations of: an *ab initio* molecular orbital study, 1601.
- tetrahydro-, and cyclohexane, effect of dichloromethane on insertion into. Stabilisation of singlet ethoxy-carbonylnitrene, 80.
- mechanistic studies of the redox reaction between pyridinium salts and alkoxydes in: pyridinium salts and dihydropyridines, 759.
- thiophen, selenophen, and tellurophen, a comparative study of electric dipole moments of 2-substituted derivatives of, 775.
- Furans**, substituted dibenzo-, steric hindrance in, 54.
- Furanosquiterpenoid**, the germacrane, linderalactone, crystal and molecular structure of, 646.
- Furanyl**, benzo[*b*], radical, a stable, electron spin resonance study of, 1545.

G

- E. coli*(lacZ)- β -Galactosidase**, quantification of the main source of catalytic power of, and $\text{S}_{\text{N}}1$ hydrolyses of glycosyl pyridinium salts, 1191.
- E. coli*(lacZ)- β -Galactosidase**, role of the substituent at C-5 of the pyranose ring in catalysis by, 1198.
- Gas phase** hydrogen chloride-catalysed decomposition of some cyclic alcohols, 1425.
- reactions** of oxygenated radicals in. Part 3, reactions of peracetyl radicals with alkenes, 360.
- thermodynamic functions** of conjugated compounds existing as a mixture of conformers, values for, 1307.
- Generation** and reactions of the ammoniumyl radical cation (NH_3^+): an electron spin resonance investigation, 987.
- Geometry** and electronic structure of intimate and solvent-separated ion pairs of fluoromethane in water, 162.
- Germacranolide**, the, alatolide monohydrate, X-ray crystallographic determination of the molecular conformation of. Sesquiterpenoids. Part XXIII, 255.
- Germin**, 10,10-dimethylphenoxathia-, -silin, and -stannin derivatives and 9,9-dimethylthioxanthen, oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of. Group IVB heterocyclic compounds, 689.
- α -D-Glucopyranosyl bromide**, 2-*O*-acetyl-3,4,6-tri-*O*-methyl-, mercury(II) cyanide promoted reactions of with cyclohexanol in benzene-nitromethane, mechanistic study of. Koenigs-Knorr reactions. Part 3, 795.
- Glucose**, base-catalysed mutarotation of in dimethylformamide and dimethyl sulphoxide, 2021.
- D-Glucose**, hydroxyl radical induced oxidation of in oxygenated aqueous solution. Radiation chemistry of carbohydrates. Part 14, 1958.
- 2,3,4,6-tetra-*O*-methyl-, benzamidinium-catalysed mutarotation of, 1047.
- α -D-Glucose 1-phosphate**, dipotassium, in aqueous solution under oxygen and argon, the photolysis of. The photochemistry of phosphorus compounds. Part 11, 132.
- Glycolamides**, *O*-acyl-, hydrolyses of as models of the deacylation step in the mechanism of action of serine proteases: function of the oxyanion pocket, 1221.
- O*-aroyl-*N*-aryl-, evidence for the 1 \rightarrow 4 migration of an anilo-group in the alkaline reaction of: alkaline hydrolysis of esters possessing readily ionisable amide groups, 2028.
- O*-salicyloyl-, in alkaline solution, intramolecular migration of an amino-group *via* a transannular process during the reaction of: an analogue of the reverse of the Brenner aminoacyl insertion reaction, 1804.

Glucoside, a pseudoguaianolide, paucin monohydrate, X-ray crystallographic analysis of. Sesquiterpenoids. Part XXIV, 259.

Glycosyl pyridinium salts, S_N1 hydrolyses of, and quantification of the main source of catalytic power of *E. coli*(*lacZ*)- β -galactosidase, 1191.

Graphical method, a novel, for branched, series reactions, kinetic analysis of the reaction of imidazole buffer solutions with β -propiolactone using. Strain effects in acyl transfer reactions. Part 4, 1492.

Ground states of molecules. Part 35, MINDO/3 study of the Cornforth rearrangement, 724.

Group IVB heterocyclic compounds. Oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of 10,10-dimethylphenothia-silin, -germin, and -stannin derivatives and of 9,9-dimethylthioxanthen, 689.

Groups $CH_2M(CH_3)_3$ ($M = C$ to Pb) and $M(CH_3)_3$ ($M = Si$ to Pb), substituent effects of from proton and carbon-13 chemical shift measurements on 4-substituted styrenes, 971.

one donor and two acceptor, orientation effects in the benzene chromophore bearing. Electronic absorption spectra of the dicyanoanilines, 1608.

the hydroxymethyl and formyl, a re-evaluation of the Hammett σ_p values for, 993.

neighbouring functional, reactions of *m*-chloroperbenzoic acid with olefins which have, 914.

H

Halides, 4-nitrophenyl(phenyl)methyl, and 4-nitrobenzyl, reaction of with potassium *t*-butoxide, 1856.

Halogenated compounds, mechanisms for reactions of. Part 1, activating effects of fluorine in polyfluoropyridines in reactions with ammonia, 585. Part 2, orienting effects of chlorine substituents in nucleophilic aromatic substitution, 1774.

Halogen exchange between methylene halides and ionic halides in water-methylene halide two-phase systems, 1462.

substitution, aromatic, the kinetics and mechanisms of. Part 34, comments on the physical interpretation of high kinetic orders in bromine, 106.

Hammett correlation and the thermodynamics of protonation. The basicities of *N*-trimethylammonioacetamide and of substituted *N*-trimethylammonio benzamides, 1876.

equation for the ionisation of substituted benzoic acids and phenols in dioxan-water mixtures, study of, 1513.

relation, the analysis of substituent effects for reactions not following, 2033.

σ_p values for the hydroxymethyl and formal groups, a re-evaluation of, 993.

Heavy atom effects, internal and external, and the structure of photoisomer F: reversible photochemistry of 10,10'-dimethylbiacridan, 550.

Heteroaromatic hydrogen exchange reactions. Part 9, acid catalysed decarboxylation of indole-3-carboxylic acids, 281.

N-Heteroaromatic bases, reactions of with nitrous acid. Part 4, kinetics of the diazotisation of 2- and 4-aminopyridine 1-oxide, 1830. Part 5, kinetics of the diazotisation of substituted 2-aminopyridine and 2-aminopyridine 1-oxide, 1835.

Heteroarylphosphorus compounds, the chemistry of. Part

7, heteroaryl-, heteroarylmethyl-, and substituted arylphosphonate esters. Electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies, 789. Part 10, synthesis and kinetics of alkaline hydrolysis of heteroarylphosphinate esters and hydrolysis of heteroarylphosphine oxides, 1705.

Heterocycles, derived, heavily substituted with phenyl groups and 2,4,5-triphenyl-3*H*-pyrrol-3-one 1-oxide, mass spectra of, 412.

five-membered *S*-linked, σ_{Het} constants for thia- and oxasubstituents in, and effects of substituents in the *N*-linked aromatic ring: the acid dissociation of arenesulphonamides, 984.

saturated, conformational analysis of. Part 78, passing pyrimidal nitrogen inversions in some perhydro-1,3-oxazines and -1,3-diazenes, 818.

N-Heterocycles, ^{13}C nuclear magnetic resonance of. Part 2, natural abundance carbon-13 and nitrogen-15 nuclear magnetic resonance studies of Δ^3 - and Δ^4 -pyrrolin-2-ones and model compounds, 1746. Part 3, ^{13}C chemical shift assignments of the carbonyl groups in penicillins and cephalosporins, 1749.

Heterocyclic analogue of cyclohexene, conformational analysis of by ^{13}C nuclear magnetic resonance spectroscopy. 1,2-Oxazine chemistry. Part 6, 619. **compounds** and aromatic hydrocarbons and amines, excited complex formation between, 1280.

Group IVB. Oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of 10,10-dimethylphenothia-silin, -germin, and -stannin derivatives and of 9,9-dimethylthioxanthen, 689.

ring opening and closing in. Kinetic studies on solvent effects in the reaction between 6-nitrobenzothiazole and methoxide ion at 25 °C, 20.

stereochemical investigations of. Part 4, crystal and molecular structure of 3-chloro-5-cyclohexylamino-1-diisopropylamino-1*H*-1,2,4,6-thia(IV)triazine, 1322.

free radicals. Part 7, substituent effects on the distribution of spin density in the cation, neutral, and nitroxide radicals of phenothiazine, 516.

Hexaorganoditins and octaorganotritins, tin-119 and carbon-13 nuclear magnetic resonance spectra of. Fourier transform nuclear magnetic resonance investigations of organotin compounds. Part 6, 1842.

Hex-3-yne-2,5-diol, 2,5-dimethyl-, a novel product formed from by catalytic action of dibromobis(triphenylphosphine)nickel, X-ray structure of, 1011.

Histamine H_2 receptor antagonists, crystal and molecular structure of *N*-methyl-*N'*-{2-[(5-methylimidazol-4-yl)methylthio]ethyl}thiourea (metiamide) and *N*-{2-[(imidazol-4-yl)methylthio]ethyl}-*N'*-methylthiourea (thiaburimamide), 68.

Homoallyl alcohols, intramolecular O-H... π interaction studies in, 1821

Homoallylic coupling in 1,4-dihydronaphthalenes. Part 2, crystal structure of *cis*-2a,5-dihydro-5-acenaphthoic acid, 1153.

proton spin coupling in linear peptides. Conformations of peptides in solution by nuclear magnetic resonance spectroscopy. Part 5, 1294.

Homodesmotic and isodesmic reaction heats, comparison of various with values derived from published *ab initio* molecular orbital calculations, 1036.

- Homologues**, five- and six-membered, comparison with. Synthesis and properties of 1,2-diaryl-4,5,6,7-tetrahydro-1*H*-1,3-diazepines and 1,2-diaryl-1,4,5,6,7,8-hexahydro-1,3-diazocines, 2068.
- Homolytic aromatic substitution**, structural effects on the reactivity of carbon radicals in. Part 4, the nucleophilicity of bridgehead radicals, 87.
- ipso*-substitution**, aromatic. Displacement of the acyl group in benzothiazoles by nucleophilic alkyl radicals, 1679.
- organometallic reactions**. Part 13, the homolytic reactivity of stannacycloalkanes, 1499.
- Hydration** and self-association of adenosine triphosphate, adenosine diphosphate, and their 1:1 complexes with magnesium(II) at various pH values: infrared investigations, 1824.
- Hydrazine**, methyl-, and *NN*-dimethylhydrazine, kinetics and mechanism of the nitrosation of, 274.
- Hydrazones**, hindered, effect of aromatic substituents on the stereodynamics of. Conformational studies by dynamic nuclear magnetic resonance. Part 8, 1666.
- Hydrocarbons**, aromatic, and amines, excited complex formation between heterocyclic compounds and, 1280.
- aromatic, in purified acetic anhydride, kinetics of nitration of; identification of the electrophile, 1361.
- conjugated, conformations of. Part 2, a spectroscopic and thermodynamic study of *cis*- and *trans*-penta-1,3-diene, 1311.
- saturated, mechanism of oxidation of by cobalt(III), manganese(III), and lead(IV) trifluoroacetates, 511.
- Hydrogen adduct** radicals generated from indole and its derivatives in γ -irradiated methanolic glasses at 77 K, electron spin resonance study of, 347.
- atom abstraction** from polystyrene by *t*-butoxyl radicals, studied by spin trapping; effect of conformation on reactivity, 1416.
- bond**, *ab initio* studies of the strongest type of: carboxylic acid-fluoride system, 2079.
- bonds**, intramolecular, the strengths of, rates of proton transfer, and acid dissociation constants in 8-hydroxy-*NN*-dimethyl-1-naphthylammonium ion and 8-hydroxy-*NN*-dimethyl-1-naphthylamine, 152.
- bonding**, intramolecular, in *o*-mercapto-*NN*-dimethylbenzamide, 166.
- bonding abilities** and polarities of the aromatic derivatives of cyclohex-2-enone, 1983.
- and self-association of some potentially bifunctional catalysts. Part 2, mercaptoazole derivatives, 1015.
- chloride-*NN*-dimethylacetamide** and hydrogen chloride-*N*-methylacetamide systems in deuteriochloroform solution, ¹H, ¹³C, and ¹⁴N nuclear magnetic resonance study of, 556.
- exchange** in acidic media, the effect of methyl groups on the kinetics of. Electrophilic substitution on the thiophen ring. Part 5, 1998.
- in thioamides, rates of, 1385.
- reactions**, heteroaromatic. Part 9, acid catalysed decarboxylation of indole-3-carboxylic acids, 281.
- isotope exchange** in the aldehyde group during the reduction of benzaldehyde by tritiated sodium borohydride (tetrahydridoborate), 1472.
- Hydrol Blue**, Michler's, Crystal Violet, and Malachite Green, electronic absorption spectra of derivatives of exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.
- Hydrolyses** of *O*-acylglycolamides as models of the deacylation step in the mechanism of action of serine proteases: function of the oxyanion pocket, 1221.
- S_N1**, of glycosyl pyridinium salts, and quantification of the main source of catalytic power of *E. coli*(*lacZ*)- β -galactosidase, 1191.
- Hydrolysis**, alkaline, electronic effects of substituents at phosphorus on the rates of, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies. Heteroaryl-, heteroarylmethyl-, and substituted aryl-phosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
- kinetics of, and synthesis of heteroarylphosphinate esters and hydrolysis of heteroarylphosphine oxides. The chemistry of heteroarylphosphorus compounds. Part 10, 1705.
- of esters possessing readily ionisable amide groups: evidence for the 1 \rightarrow 4 migration of an anilo-group in the alkaline reaction of *O*-aroyl-*N*-arylglycolamides, 2028.
- of methyl pseudo-8-(3- or 4-substituted benzoyl)-1-naphthoates and pseudo-2-(3- or 4-substituted benzoyl)-benzoates, mechanism of. Reactions of carbonyl compounds in basic solutions. Part 8, 526.
- and aminolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters, kinetics and mechanism of. *N*-Hydroxy-compounds as acyl transfer agents. Part 2, 231.
- chymotrypsin-catalysed, of aryl acetates, the effect of leaving group tendency in, 351.
- of *O*-aryl *N*-phenylthiocarbamates, kinetics and mechanism of, 650.
- of 8-hydroxy-1-naphthoates, mechanism of. Intramolecular catalysis. Part 2, 1799.
- of methyl halides and methyl perchlorate, comments on the putative ion pair mechanism for, 873.
- of *p*-nitrophenyl carboxylates, kinetic consequences of molecular aggregation in, 1947.
- of 4-nitrophenyl quinoline-8-yl phosphate, intramolecular nucleophilic catalysis in, 64.
- of 2-pyridylphosphonic acid mono- and di-esters: electrophilic catalysis by transition metal ions and the irrelevance of intramolecular participation by the pyridyl group, 418.
- of some *N*-arylazetid-2-ones (*N*-aryl- β -lactams), a study of factors affecting the rates of, 765.
- of the ester group in benzoylglycolic acid, intramolecular general base catalysis in, 1563.
- Hydrophobic effects**, unusual nucleophilic reactivity of unionised [20]paracyclophane oximes provided by. Macrocyclic enzyme model systems, 32.
- Hydroxide** and metal ion, co-operation between. Metal-ion assisted catalysis of nucleophilic attack. Part 3, 318.
- ion** in 20% and 30% (v/v) dimethyl sulphoxide-water, rates of proton transfer from protonated 1,8-bis(diethylamino)- and 1,8-(diethylamino)-naphthalene to, 1589.
- N*-Hydroxy-compounds** as acyl transfer agents. Part 1, kinetics and mechanism of nucleophilic displacements on 1-hydroxybenzotriazole esters and crystal and molecular structure of 1-benzoyloxybenzotriazole, 224. Part 2, kinetics and mechanism of hydrolysis and aminolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters, 231.

- Hydroxy-group** and the imidazole ring, ester hydrolysis promoted by micelles containing. Functional micellar catalysis. Part 2, 821.
- Hydroxylamine**, condensation of *o*-thiocyanatoacetophenone with. Properties and *X*-ray crystal structure analysis of (*Z*)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine, 1114.
kinetics and mechanism of reaction of with methylcytosines, 609.
phenyl-, a mechanistic study of the decomposition of to azoxybenzene and aniline and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediaminetetraacetic acid, 1868.
- Hydroxylamines**, *N*-(α -cyanobenzyl)-*N*-phenyl-, kinetics of the dehydration of, 1437.
dialkyl, and nitroxides, formation of: rearrangements involving a *C*-nitroso group, 1255.
- Hydroxylation**, aromatic. Part 6, oxidation of naphthalene by dioxygen in the presence of iron(II) salts, 1583.
- Hydroxyl radical** induced oxidation of D-glucose in oxygenated aqueous solution. Radiation chemistry of carbohydrates. Part 14, 1958.
- Hyperconjugation**, carbon-carbon, and the origin of the Baker-Nathan effect. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl esters. Part 13, 678.

I

- Imidazole**, 1-hydroxy-, and 1-hydroxypyrazole esters, kinetics and mechanism of hydrolysis and aminolysis of. *N*-Hydroxy-compounds as acyl transfer agents. Part 2, 231.
buffer solutions, kinetic analysis of the reaction of with β -propiolactone using a novel graphical method for branched, series reactions. Strain effects in acyl transfer reactions. Part 4, 1492.
ring and the hydroxy-group, ester hydrolysis promoted by micelles containing. Functional micellar catalysis. Part 2, 821.
- Imidazolidine-2-thione** and -2-selone, infrared spectroscopic study on, 1529.
- Imidazolysis**, ester, in benzene, kinetics of, 1176.
- Imines**, benzoquinone. Part 13, reactions of *N*-methylated 2-amino-indamines in aqueous solution, 1125.
some derived *N*-nitro, and 1-substituted camphenilones, substituent effects on carbon-13 chemical shifts in, 125.
- Iminium ion** intermediates, nuclear magnetic resonance investigation of. Part 6, a hydrogen-1 and carbon-13 structural and dynamic study of various substituted iminium salts, 536. Part 7, structure and mechanism of formation of the intermediates in the reactions between amides and CSCl_2 or PSCl_3 or between thioamides and COCl_2 , POCl_3 , or PSCl_3 , 1243.
- Imipramine** and related psychotropic drugs, a nuclear magnetic resonance investigation of complex formation with benzyl alcohol and other aromatic solutes, 1964.
- Inclusion complexes** of benzophenone derivatives, formation of; β -cyclodextrin studied by induced circular dichroism, 1419.
compound, 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)-phenylquinazolin-4-(3*H*)-one, synthesis and properties of; use of quartets in the crystal structure determination of the methylcyclohexane clathrate, 1427.
- Indamines**, *N*-methylated 2-amino-, in aqueous solution, reactions of. Benzoquinone imines. Part 13, 1125.
- Indane-1,3-dione**, 2-benzoyl-2-phenylazo-, 1,3-benzoyl migration of. Molecular conformations and crystal structures of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone), 847.
- INDO calculations** on several geometrical conformations: diphenylcarbene, 634.
- Indole** and its derivatives in γ -irradiated methanolic glasses at 77 K, electron spin resonance study of hydrogen adduct radicals generated from, 347.
- Indoles** and carbazoles, *N*-substitution of in Vilsmeier-Haack acetylation, kinetics and mechanism of, 1284.
- Indole-3-carboxylic acids**, acid catalysed decarboxylation of. Heteroaromatic hydrogen exchange reactions. Part 9, 281.
- 3*H*-Indoles**, 3-arylimino-2-phenyl-, reaction of with organolithium compounds: competition between single electron transfer and nucleophilic attack, 1032.
- π -**Inductive effect**, evidence for. Nitration of toluene, *t*-butylbenzene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes with nitric acid-acetic anhydride, 2043.
- Infrared investigations**: hydration and self-association of adenosine triphosphate, adenosine diphosphate, and their 1 : 1 complexes with magnesium(II) at various pH values, 1824.
spectra and Raman spectra of some methyl-substituted trimethylene sulphites. Chemistry of the S=O bond. Part 6, 612.
stretching frequencies, phosphoryl, and phosphorus-31 nuclear magnetic resonance studies, and electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis. Heteroaryl-, heteroarylmethyl-, and substituted aryl-phosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
spectroscopic study on imidazolidine-2-thione and -2-selone, 1529.
- Infrared study** of 1,3-thiazolidin(e)-2-one, -2-thione, and -2-selone and their 1-oxa-analogues, 324.
- Inhibition** by oxidative induced decomposition of ($\alpha\alpha'$ -diphenyl)azoethane by transition metal ions. Interactions of metal ions with α -phenylethylperoxyl radical, 59.
- Inorganic ions**, binding affinities of to carrageenans and carboxymethylcellulose. Polyanions and their complexes, 1229.
- Insecticides**. Part 7, crystal structures of 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)ethylene (DDE), and 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethane (DDD), 460. Part 8, crystal structures of 1,1-bis-(*o*-chlorophenyl)-acetic acid (DDA) and 4,4'-dichlorobenzophenone (DBP), 463.
- Insertion** into tetrahydrofuran and cyclohexane, effect of dichloromethane on. Stabilisation of singlet ethoxy-carbonylnitrene, 80.
reaction, the Brenner aminoacyl, an analogue of the reverse of: intramolecular migration of an amino-group *via* a transannular process during the reaction of *O*-salicyloylglycolamides in alkaline solution, 1804.
- Interaction** between the carbonyl group and a sulphur atom. Part 8, correlation between the basicity constants corrected for steric effects, and Taft σ^* values for some ketones and nitriles, 2025.
studies, intramolecular O-H $\cdots \pi$, in homoallyl alcohols, 1821.

- Interactions** between radical ion pairs and macrocyclic polyethers, electron spin resonance studies on. Part 2, intramolecular cation exchange in metal ketyl ion pairs, 1327.
- long-range, and line-width alternation for γ -proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$: temperature-dependent electron spin resonance spectra. Investigations of structure and conformation. Part 6, 116.
- of metal ions with α -phenylethylperoxyl radical. Inhibition of oxidative induced decomposition of ($\alpha\alpha'$ -diphenyl)azoethane by transition metal ions, 59.
- thiamine-enzyme model, solvent effects on. 2,3,4-Trimethylthiazolium iodide, a model for interaction with negative charges, 1484.
- Intermediates**, iminium ions, nuclear magnetic resonance investigation of. Part 6, a hydrogen-1 and carbon-13 structural and dynamic study of various substituted iminium salts, 536. Part 7, structure and mechanism of formation of the intermediates in the reactions between amides and CSCl_2 or PSCl_3 or between thioamides and COCl_2 , POCl_3 , or PSCl_3 , 1243.
- unstable. Part 175, effect of ionising radiation on *N*-nitrosodimethylamine: an electron spin resonance study, 1449. Part 178, the structure of intermediates formed in the radiolysis of thiols, 2005.
- Inversion**, pyrimidal, thermal racemisation of *N*-unsubstituted and various *N*-substituted *S*-*o*-methoxyphenyl *S*-phenyl sulphimides by, 1783.
- radical-centre, conformational preferences, and restricted rotation about $\cdot\text{C}-\text{CH}_3$ in some 1,3-dioxolan-2-yl radicals, e.s.r. studies of. Investigations of structure and conformation. Part 8, 1161.
- Investigation**, theoretical, of 2,2'-biphenyl, nuclear magnetic resonance and: conformational studies of molecules partially oriented in nematic phase, 314.
- Iodine**, kinetics and mechanism of the oxidation of xanthates with in aqueous solution, 113.
- Iodoarenes**, kinetics of protodeiodination of. Nucleophilic displacement in polyhalogenoaromatic compounds. Part 3, 278.
- Ion**, trichloroacetate, in water-methanol solvents, kinetics of the alkaline decarboxylation of. Solvolysis rates in aqueous-mixed solutions. Part 4, 1237.
- Ions**, diazonium, in acid solution, reaction with. Electrophilic substitution in pyrroles. Part 2, 1452.
- inorganic, bonding affinities of to carrageenans and carboxymethylcellulose. Polyanions and their complexes, 1229.
- iron(II) and iron(III), stabilised by ethylenediaminetetraacetic acid, a mechanistic study of the decomposition of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by, 1868.
- Ionic halides** and methylene halides in water-methylene halide two-phase systems, halogen exchange between, 1462.
- Ionisation** of substituted benzoic acids and phenols in dioxan-water mixtures, study of the Hammett equation for, 1513.
- of sulphones, nitriles, and ketones, polar effects on. Elimination and addition reactions. Part 31, 1909.
- proton, of *para*-substituted benzenethiols, thermodynamic functions of, 149.
- rates of, and the acidities of protonated *meso*-tetra-arylporphyrins, substituent effects on, 2076.
- Ionising power**, solvent, effect of on the selectivity of diphenylmethyl derivatives. Reactivity selectivity relationships. Part 5, 1860.
- radiation**, effect of on *N*-nitrosodimethylamine: an electron spin resonance study. Unstable intermediates. Part 175, 1449.
- Ion-pairing** and adsorption, effects on the stereochemistry of cathodic pinacolisation of acetophenone, 99.
- Ion pairs**, intimate and solvent-separated, of fluoromethane in water, geometry and electronic structure of, 162.
- radical, and macrocyclic polyethers, electron spin resonance studies on the interactions between. Part 2, intramolecular cation exchange in metal ketyl ion pairs, 1327.
- dissociation equilibria** for trityl hexafluoro-arsenate and antimonate in polar solvents, 1729.
- intermediates** in base-promoted elimination reactions and base-catalysed 1,3-proton transfer reactions, extreme deuterium isotope effects as evidence of, 1569.
- mechanism**, the putative, for hydrolysis of methyl halides and methyl perchlorate, comments on, 873.
- Insertion**, benzylic, of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid, chemically induced dynamic nuclear polarisation during. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- Interaction**, homoallylic, between a nitrogen lone pair and a non-adjacent π -bond. Part 6, nature of the lone-pair electrons in n,π -homoconjugated aliphatic amines, 1057.
- Interactions**, long-range, and line-width alternation associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from cyclic ethers containing six-membered rings. Investigations of structure and conformation. Part 7, 754.
- Interconversion**, configurational assignment, and rearrangement of the *E*- and *Z*-isomers of a new group of *O*-acyl isoamides. Acylation of *O*-alkylbenzohydroxamic acids, 1080.
- Intermediates** in the decomposition of aliphatic diazo-compounds. Part 13, mechanistic studies on the reaction of diaryldiazomethanes with singlet molecular oxygen, 327. Part 14, chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion, 671.
- ion-pair, in base-promoted elimination reactions and base-catalysed 1,3-proton transfer reactions, extreme deuterium isotope effects as evidence of, 1569.
- reaction, formed by addition of thiohypochlorous acid to ethylene, *ab initio* SCR-MO study of, 1019.
- unstable. Part 170, electron capture processes in organic phosphates: an electron spin resonance study, 286.
- Part 173, triphenyl-phosphonium and -arsonium cations and various phosphoranyl and arsoranyl radicals derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation, 833.
- Interpretation** of linear correlations between nuclear magnetic resonance substituent chemical shifts and substituent reactivity parameters in benzene derivatives, 769.
- Investigation**, a Monte Carlo, of the conformational free energies of the aldohexopyranoses, 654.

Investigation, (contd.)

- a theoretical, of the effect of positively charged substituents on product distribution in electrophilic aromatic substitution; evidence for a dominant field effect of the positive poles, 1066.
- Iron**, tricarbonylcyclobutadiene-, system, substituent effects in, 907.
- Iron(II) salts**, oxidation of naphthalene by dioxygen in the presence of. Aromatic hydroxylation. Part 6, 1583.
- and iron(III) ions** stabilised by ethylenediaminetetraacetic acid, a mechanistic study of the decomposition of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by, 1868.
- Isoamides**, *O*-acyl, configurational assignment, interconversion, and rearrangement of the *E*- and *Z*-isomers of a new group of; acylation of *O*-alkylbenzohydroxamic acids, 1080.
- (*E*)-*O*-acyl, isomerisation of to *N*-acyl amides. Mechanism of an intramolecular [1,3] acyl group migration *via* a four-membered transition state, 1085.
- Isocyanates** and acetic anhydride, *ortho*-effects in the acylation of substituted phenylureas with, 934.
- Isocyanates**, sulphonyl, reaction of phosphetan oxides with, and related reactions, 1373.
- Isodesmic** and homodesmotic reaction heats, comparison of various with values derived from published *ab initio* molecular orbital calculations, 1036.
- Isomers**, the 17-hydroxy-, in solution, a circular dichroism study of the conformation of the acetyl side-chain of, and crystal and molecular structure of 3 α ,17 α -dihydroxy-4,4,-14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione. Steroidal analogues of unnatural configuration. Part XI, 402.
- Isomerisation** accompanying autoxidation of cholest-5-en-3-one in acetic acid, 157.
- metal carbonyl-catalysed, of *N*-allylsulphonamides to *N*-prop-2-enyl and *N*-propylidene derivatives. Catalysed prototropic rearrangements. Part 3, 11.
- of (*E*)-*O*-acyl isoamides to *N*-acyl amides. Mechanism of an intramolecular [1,3] acyl group migration *via* a four-membered transition state, 1085.
- E*- and *Z*-Isomers** of a new group of *O*-acyl isoamides, configurational assignment, interconversion, and rearrangement of; acylation of *O*-alkylbenzohydroxamic acids, 1080.
- Isopropamide iodide** (4-di-isopropylamino-2,2-diphenylbutyramide methiodide), crystal and molecular structure, 781.
- Isoquinolinium iodide**, 2-benzyl-1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl-1-phenyl-, crystal structure of. Stereochemical studies. Part 29, 1141.
- Isothiazole**, 3-hydroxy-5-(methylsulphonyl)-4-phenyl-, crystal and molecular structure of, 1332.
- Isotope effects** and proton tunnelling in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes. The carbanion mechanism of olefin-forming elimination. Part 9, 1753.
- deuterium kinetic, and rates. Solvolysis of *endo*- and *exo*-bicyclo[3.2.1]octan-3-yl toluene-*p*-sulphonates. Part 2, 1991.
- extreme deuterium, as evidence of ion-pair intermediates in base-promoted elimination reactions and base-catalysed 1,3-proton transfer reactions, 1569.
- heavy atom, for *E2* and *E1cB* dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, model calculations of, 1847.
- hydrogen-deuterium, for *E2* and *E1cB* dehydrochlorinations of 1,1-diaryl-2,2-dichloroethanes, model calculations of, 1763.
- in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes. The carbanion mechanism of olefin-forming elimination. Part 10, 1758.
- kinetic hydrogen, for simple proton transfer, solvent dependence of, 1812.
- secondary kinetic deuterium, in the solvolysis of ring-substituted-styryl trifluoromethanesulphonates. Vinyl cations. Part 13, 1486.
- Isoxazole**, 3-methyl-1,2-benz-, kinetics and mechanism of nitration of, 47.
- Isoxazoles**, 3-unsubstituted, on the base catalysed ring opening of. Derivatives of 4- and 5-phenylisoxazole, 1121.

J

- Jacobsen rearrangement** of the tetraethylbenzenesulphonic acids. Sulphonation of polyethylbenzenes. Aromatic sulphonation. Part 54, 717.
- Joubertiamine**, 3'-methoxy-4'-*O*-methyl-, and (–)-mesembrane, two minor bases from *S. namaquense* L. Bolus, structure and absolute stereochemistry of: X-ray analysis of (–)-mesembrane hydrochloride monohydrate. Sceletium alkaloids. Part 7, 1098.

K

- Keonigs-Knorr reactions**. Part 3, mechanistic study of mercury(II) cyanide promoted reactions of 2-*O*-acetyl-3,4,6-tri-*O*-methyl- α -D-glucopyranosyl bromide with cyclohexanol in benzene-nitromethane, 795.
- Kerr constants**, Cotton-Mouton constants, and magnetic anisotropies of pyridazine, pyrimidine, and pyrazine, 897.
- effect** and Cotton-Mouton effect of some chloro- and nitrobenzenes, 901.
- Keten elimination** from acetanilide and phenyl acetate radicals ions, mechanism of. Electron impact studies. Part 116, 1670.
- Ketones**, acyclic $\beta\gamma$ -unsaturated, photochemistry of: the effect of α -methyl substitution, 1357.
- and nitriles, Taft σ^* values for, and correlation between the basicity constants, corrected for steric effects. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- mechanism of the reaction of with dihalogeno-oxirans catalysed by some Lewis acids, 1526.
- sulphones, and nitriles, polar effects on the ionisation of. Elimination and addition reactions. Part 31, 1909.
- $\beta\gamma$ -unsaturated, optical activity in. Part 1, effect of the direction of the electric transition dipole moment in the aromatic group in benzobicyclo[2.2.2]octen-2-one derivatives, 1937.
- Ketyl metal ion pairs**, intramolecular cation exchange in. Electron spin resonance studies on the interactions between radical ion pairs and macrocyclic polyethers. Part 2, 1327.
- Kinetic** and electron spin resonance studies on the liquid-phase autoxidation of cumene with lead dioxide, 784.
- and energetic aspects of the photodimerisation of some systemic pyrimidine fungicides, 216.

Kinetic (*contd.*)

- and thermodynamic acidities in dimethyl sulphoxide. Part 2, acetylenic compounds, 407. Part 3, alcohols and phenols, 570.
- analysis** of the reaction of imidazole buffer solutions with β -propiolactone using a novel graphical method for branched, series reactions. Strain effects on acyl transfer reactions. Part 4, 1492.
- consequences** of molecular aggregation in the hydrolysis of *p*-nitrophenyl carboxylates, 1947.
- data** and equilibrium data for sodium ethoxide addition to 2,4-dinitro-6-X-phenetoles in ethanol. The stabilities of Meisenheimer complexes. Part 14, 1442.
- effects**, hydrogen isotope, for simple proton transfer, solvent dependence of, 1812.
- investigation** by electron spin resonance spectroscopy: alkoxy nitroxide radicals from pyrolysis of nitropyridines, 1132.
- isotope effects**, deuterium, and rates. Solvolysis of *endo*- and *exo*-bicyclo[3.2.1]octan-3-yl toluene-*p*-sulphonates. Part 2, 1991.
- secondary deuterium, in the solvolysis of ring-substituted β -styryl trifluoromethanesulphonates. Vinyl cations. Part 13, 1486.
- orders**, high, in bromine, comments on the physical interpretation of. The kinetics and mechanisms of aromatic halogen substitution. Part 34, 106.
- studies** and electron spin resonance studies on the liquid-phase decomposition of cumene hydroperoxide by lead dioxide, 625.
- and equilibrium studies on the protonation of *meso*-tetraphenylporphyrin in dimethyl sulphoxide-water, 1624.
- and mechanistic studies of the reactions of aniline and substituted anilines with chloramine T, 1275.
- of the decomposition of norbornan-2-one and norborn-5-en-2-one tosylhydrazone sodium salts, 1490.
- of the reactions of 1,2-dihalogeno-1,2-diphenylethanes with triphenylphosphine. Dehalogenation reactions of vicinal dihalides. Part V, 140.
- on solvent effects in the reaction between 6-nitrobenzothiazole and methoxide ion at 25 °C. Ring opening and closing in heterocyclic compounds, 20.
- study** of elimination from 3 α -chloro-3 β -methyl- and 3 β -chloro-3 α -methyl-5 α -cholestane promoted by potassium *t*-butoxide in *t*-butyl alcohol, 436.
- study** of the decarboxylation of 5-amino-1,3,4-oxadiazole-2-carboxylic acid to 2-amino-1,3,4-oxadiazole in water as a function of proton activity, 639.
- Kinetics** and products: reduction of carbonyl compounds by sodium borohydride (tetrahydridoborate) in water, dimethyl sulphoxide, and their mixtures as solvents, 1466.
- decay, of cumylperoxy radical produced by the decomposition of cumene hydroperoxide, 622.
- of alkaline hydrolysis of and synthesis of heteroarylphosphinate esters and hydrolysis of heteroarylphosphine oxides. The chemistry of heteroarylphosphorus compounds. Part 10, 1705.
- of auto-oxidation-reduction of substituted nitrosobenzenes in cyclohexane, 1989.
- of ester imidazolysis in benzene, 1176.
- of hydrogen exchange in acidic media, the effect of methyl groups on. Electrophilic substitution on the thiophen ring. Part 5, 1998.
- of nitration of aromatic hydrocarbons in purified acetic anhydride; identification of the electrophile, 1361.
- of piperidinobromination of 4'-substituted 3-bromo-4-nitrobiphenyls. Substituent effects in the biphenyl series. Part IV, 137.
- of protodeiodination of iodoarenes. Nucleophilic displacement in polyhalogenoaromatic compounds. Part 3, 278.
- of proton and deuterium transfer from α ,4-dinitrotoluene to 1,8-bis(dimethylamino)naphthalene in alcoholic solvents, 814.
- of the alkaline decarboxylation of trichloroacetate ion in water-methanol solutions. Solvolysis rates in aqueous-organic mixed solvents. Part 4, 1237.
- of the dehydration of *N*(α -cyanobenzyl)-*N*-phenylhydroxylamines, 1437.
- of the diazotisation of 2- and 4-aminopyridine 1-oxide. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 4, 1830.
- of the diazotisation of substituted 2-aminopyridine and 2-aminopyridine 1-oxide. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 5, 1835.
- of the oxidation of halogenomaleic acids. Mechanism of the permanganate oxidation of unsaturated compounds. Part 8, 1794.
- of propiolic and phenylpropiolic acids. Mechanism of the permanganate oxidation of unsaturated compounds. Part 7, 630.
- of the pyrolysis of butane-1-thiol, butane-2-thiol, and 2-methylpropane-2-thiol. The pyrolysis of alkane-thiols. Part 1, 439.
- of the reaction of *p*-nitrophenylacetate with amines in the presence of dodecylammonium propionate and Aerosol-OT aggregates in benzene, 1674.
- of the reactions of *t*-butyl chloride and [²H₆]*t*-butyl chloride with silver salts in acetonitrile, 201.
- of picryl chloride with some substituted anilines. Part IV, 14.
- of piperidine, *n*-butylamine, morpholine, and benzylamine with 2,4-dinitrophenyl phenyl ester, 1580.
- products, and mechanism of nitration in trifluoroacetic acid. Electrophilic aromatic substitution. Part 17, 1688.
- Kinetics and mechanism** of addition to olefinic substances. Part 13, reactions of 3-substituted cholest-5-enes with sources of electrophilic bromine, 2048. Part 14, reactions of cholest-5-en-3-one with electrophilic brominating agents, 2055. Part 15, chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one; factors affecting the α : β ratio for electrophilic attack and for product formation in cholest-5-enes, 2062.
- of aromatic halogen substitution. Part 34, comments on the physical interpretation of high kinetic orders in bromine, 106.
- of cyclodehydrofluorination of 1,5-bis-(2-fluorophenyl)-3-mercaptoformazan. Studies on dithizone analogues. Part 3, 1118.
- of decomposition of benzyldimethylsulphonium salts in chloroform, 958.
- of hydrolysis and aminolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters. *N*-Hydroxy-compounds as acyl transfer agents. Part 2, 231.
- of nitration of 3-methyl-1,2-benzisoxazole, 47.

Kinetics and mechanism (*contd.*)

- of nucleophilic displacements on 1-hydroxybenzotriazole esters and crystal and molecular structure of 1-benzoyloxybenzotriazole. *N*-Hydroxy-compounds as acyl transfer agents. Part 1, 224.
- of reaction of hydroxylamine with methylcytosines, 609.
- of reactions of cyclohexyl toluene-*p*-sulphonate with thiourea in various solvents. Eliminations promoted by weak bases. Part 8, 298.
- of *N*-substitution of indoles and carbazoles in Vilsmeier-Haack acetylation, 1284.
- of the Fischer-Hepp rearrangement and denitrosation. Part 9, ring-methyl substituent effects, 44.
- of the hydrolysis of *O*-aryl *N*-phenylthiocarbamates, 650.
- of the nitrosation of methylhydrazine and *NN*-dimethylhydrazine, 274.
- of the oxidation of xanthates with iodine in aqueous solution, 113.
- of the reaction between nitrous acid and arylhydrazines, 667.
- of Δ^3 -phospholens with diethyl peroxide, 882.
- of the thallium(III) ion promoted decomposition of thio-benzamides in aqueous solution, 1366.

L

- β -Lactams, *N*-aryl-, (*N*-arylazetid-2-ones), a study of factors affecting the rates of hydrolysis of some, 765.
- Lactonisation of ω -bromoalkanoate ions, reactions between long-chain alkanoate ions and alkyl bromides as intermolecular analogues of. Intermolecular models for intramolecular reactions. Ring closure reactions. Part 6, 443.
- Lanthanoid shift reagents, determination of the solution conformation of retinals by using, 1400.
- evidence for two binding sites of at the carbonyl groups of camphor and canthaxanthin, 1390.
- Lead(IV), cobalt(III), and manganese(III) trifluoroacetates, mechanism of oxidation of saturated hydrocarbons by, 511.
- dioxide, electron spin resonance and kinetic studies on the liquid-phase autoxidation of cumene with, 784.
- electron spin resonance and kinetic studies on the liquid-phase decomposition of cumene hydroperoxide by, 625.
- Leaving group abilities in alkene-forming eliminations activated by sulphonyl groups. Elimination and addition reactions. Part 30, 1898.
- tendency in the chymotrypsin-catalysed hydrolysis of aryl acetates, the effect of, 351.
- Le Guillanton and Cariou, comments on the work of; nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles. Nucleophilic attacks on carbon-carbon double bonds. Part 24, 1000.
- Lewis acidity, quantitative aspects of. Part 17, equilibria between covalent metal halides and thiobenzamide in diethyl ether solution, 588.
- Lewis acids, some, mechanism of the reaction of dihalogeno-oxirans with ketones catalysed by, 1526.
- Ligand apicophilicities, relative: stereochemical non-rigidity of phosphoranyl radicals, 730.
- Lignin, the chemistry of reactive intermediates. Part 3, products of addition of methanol and water to vinyl-substituted quinone methides, 616. Part 5, rates of

- reactions of quinone methides with water, alcohols, phenols, and carboxylic acids, 1737.
- Linderallactone, the germacrane furanosesquiterpenoid, crystal and molecular structure of, 646.
- Linkages, C-C and -C-, transmission of substituent effects across two aromatic rings connected by. Fluorine-19 nuclear magnetic resonance studies of aromatic compounds. Part 5, 1051.
- Liquid crystal matrices, electrically oriented, linear dichroism of organic molecules in, 1208.
- 2-Lithiation of tricarbonyl(η -*NN*-dimethylsulphamoylcyclopentadienyl)manganese: the synthesis and mass spectral fragmentation of some 1,2-disubstituted tricarbonyl- η -cyclopentadienylmanganese derivatives, 703.
- Lone pair, a nitrogen, and a non-adjacent π -bond, homoallylic interaction between. Part 6, nature of the lone-pair electrons in n,π -homoconjugated aliphatic amines, 1057.
- Lonomyacin, the thallium salt of, crystal and molecular structure of. Studies on the ionophorous antibiotics. Part 4, 494.
- Luminescence of organic compounds, polar substituents and. Part 2, anthracene derivatives, 919.
- characteristics of morphine derivatives, 121.

M

- Macrocyclic model systems, enzyme. Concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in deacylation of *p*-nitrophenyl carboxylates, 24.
- Unusual nucleophilic reactivity of un-ionised [20]paracyclophane oximes provided by hydrophobic effects, 32.
- polyethers and radical ion pairs, electron spin resonance studies on the interactions between. Part 2, intramolecular cation exchange in metal ketyl ion pairs, 1327.
- Magnesium, palladium, and zinc porphin, a comparison between the magnetic circular dichroism and Shpol'skii spectra of. Magnetic circular dichroism studies. Part 45, 337.
- Magnesium(II), adenosine triphosphate, adenosine diphosphate, and their 1 : 1 complexes with at various pH values, hydration and self-association of: infrared investigations, 1824.
- di(pyridine)-, octaethylporphyrinate, crystal and molecular structure, 2072.
- Magnetic anisotropies, Kerr constants, and Cotton-Mouton constants of pyridazine, pyrimidine, and pyrazine, 897.
- resonance, carbon-13: evidence for non-chair conformations in tropene derivatives, 1202.
- Malachite Green, Crystal Violet, and Michler's Hydrol Blue, electronic absorption spectra of derivatives of exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.
- Maleic acids, halogeno-, kinetics of the oxidation of. Mechanism of the permanganate oxidation of unsaturated compounds. Part 8, 1799.
- anhydride, the ene reaction of with alkenes, 533.
- Manganese, tricarbonyl- η -cyclopentadienyl-, some 1,2-disubstituted derivatives: 2-lithiation of tricarbonyl(η -*NN*-dimethylsulphamoylcyclopentadienyl)manganese, 703.

Manganese, (*contd.*)

- dioxide**, electron spin resonance studies on the mechanism of the formation of *p*-benzosemiquinone anion over, 1421.
- Manganese(III)**, lead (IV), and cobalt(III) trifluoroacetates, mechanism of oxidation of saturated hydrocarbons by, 511.
- α -D-Mannopyranoside**, methyl 3,4-di-*O*-acetyl-6-deoxy-6-iodo-2-*O*-*p*-tolylsulphonyl-, crystal structure and absolute configuration of, 1509.
- Mass spectra** of macrocyclic polyethers: chemistry of crown ethers, 206.
- of 2,4,5-triphenyl-3*H*-pyrrol-3-one 1-oxide and derived heterocycles heavily substituted with phenyl groups, 412.
- Mathematical treatment**, improvement of the M_C function by. The M_C activity coefficient function for acid-base equilibria. Part 3, 309.
- Measurement**, indirect, of the rate constants for the diazotisation of substituted anilines by nitrosyl chloride and nitrosyl thiocyanate, 502.
- Measurement** of solvent polarity, a model process for, 1111.
- Measurements**, experimental, and thermochemical calculations of methanolysis of 1-fluoro-2,4-dinitrobenzene, picryl chloride, and picryl fluoride. The S_N mechanism in aromatic compounds. Part 41, 457.
- proton and carbon-13 chemical shift, on 4-substituted styrenes, substituent effects of the groups $CH_2M(CH_3)_3$ ($M = C$ to Pb) and $M(CH_3)_3$ ($M = Si$ to Pb) from, 971.
- Mechanism**, dual, of C-H insertion, evidence for. Chemically induced dynamic nuclear polarisation during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- of action of serine proteases, hydrolyses of *O*-acylglycolamides as models of the deacylation step in; function of the oxyanion pocket, 1221.
- of alkaline hydrolysis of methyl pseudo-8-(3- or 4-substituted benzoyl)-1-naphthoate and pseudo-2-(3- or 4-substituted benzoyl)-benzoates. Reactions of carbonyl compounds in basic solutions. Part 8, 526.
- of an intramolecular [1,3]acyl group migration *via* a four-membered transition state. Isomerisation of (*E*)-*O*-acyl isoamides to *N*-acyl amides, 1085.
- of anodic cleavage of dibenzyl ether. Electro-organic reactions. Part 10, 803.
- of dye binding to chemically different sites. Polyanions and their complexes. Part 10, 38.
- of formation and structure of the intermediates in the reactions between amides and $CSCl_2$ or $PSCl_3$ or between thioamides and $COCl_2$, $POCl_3$, or $PSCl_3$. Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- of hydrolysis of 8-hydroxy-1-naphthoates. Intramolecular catalysis. Part 2, 1799.
- of keten elimination from acetanilide and phenyl acetate radical ions. Electron impact studies. Part 116, 1670.
- of oxidation of saturated hydrocarbons by cobalt(III), manganese(III), and lead(IV) trifluoroacetates, 511.
- of triethylamine: photosensitised oxidation of amines, 173.
- of the elimination: non-additivity of chloro-substituent effects. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 15, 1541.
- of the formation of *p*-benzosemiquinone anion over manganese dioxide, electron spin resonance studies on, 1421.
- of the permanganate oxidation of unsaturated compounds. Part 7, kinetics of the oxidation of propiolic and phenylpropionic acids, 630. Part 8, kinetics of the oxidation of halogenomaleic acids, 1794.
- of the reaction of dihalogeno-oxirans with ketones catalysed by some Lewis acids, 1526.
- of the thermal decomposition of [di(benzoyloxy)iodo]-benzene in bromobenzene, 860.
- products, and kinetics of nitration in trifluoroacetic acid. Electrophilic aromatic substitution. Part 17, 1688.
- the carbanion, of olefin-forming elimination. Part 9, proton tunnelling and isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1753. Part 10, isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes, 1758.
- Mechanism**, the putative ion pair, for hydrolysis of methyl halides and methyl perchlorate, comments on, 873.
- Mechanism**, the S_N , in aromatic compounds. Part 41, thermochemical calculations and experimental measurements of methanolysis of 1-fluoro-2,4-dinitrobenzene, picryl chloride, and picryl fluoride, 457.
- Mechanisms** for reactions of halogenated compounds. Part 1, activating effects of fluorine in polyfluoropyridines in reactions with ammonia, 585. Part 2, orienting effects of chlorine substituents in nucleophilic aromatic substitution, 1774.
- Mechanistic studies** and kinetic studies of reactions of aniline and substituted anilines with chloramine T, 1275. in the chemistry of urea. Part 2, reaction with benzil, 4,4'-dimethylbenzil, and 4,4'-dimethoxybenzil, 1972.
- of the redox reaction between pyridinium salts and alkoxides in tetrahydrofuran: pyridinium salts and dihydropyridines, 759.
- on the reaction of diaryldiazomethanes with singlet molecular oxygen. Intermediates in the decomposition of aliphatic diazo-compounds. Part 13, 327.
- Mechanistic study** of mercury(II) cyanide promoted reactions of 2-*O*-acetyl-3,4,6-tri-*O*-methyl- α -D-glucopyranosyl bromide with cyclohexanol in benzene-nitromethane. Keonigs-Knorr reactions. Part 3, 795.
- of the decomposition of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediaminetetra-acetic acid, 1868.
- Media**, acidic, the effect of methyl groups on the kinetics of hydrogen exchange in. Electrophilic substitution on the thiophen ring. Part 5, 1998.
- Meisenheimer complexes**, the stabilities of. Part 14, equilibrium and kinetic data for sodium ethoxide addition to 2,4-dinitro-6-X-phenetoles in ethanol, 1442.
- Melanins**, studies related to the chemistry of. Part 15, the electron transfer and free radical properties of dopa-melanin, 1346.
- Mercaptoazole derivatives**. Hydrogen bonding abilities and self-association of some potentially bifunctional catalysts. Part 2, 1015.
- Mercury(II) bromide** in ethanol, the anion-catalysed substitution of alkylmercury(II) bromides by. Calculations of steric effects. Part 3, 221.

Mercury(II) bromide (*contd.*)

- carboxylates**, rate constants for the substitution of tetraethyltin by *t*-butyl alcohol, acetonitrile, acetone, and ethyl acetate. Substitution at saturated carbon. Part 22, 1225.
- chloride-tetraethyltin transition state** and the *t*-butyl chloride solvolysis transition state, effect of alcoholic solvents on the enthalpy and entropy of; comparison with 1:1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
- (-)-Mesembrane** and 3'-methoxy-4'-*O*-methyljoubertamine, two minor bases from *S. namaquense* L. Bolus, structure and absolute stereochemistry of: X-ray analysis of (-)-mesembrane hydrochloride monohydrate. Sceletium alkaloids. Part 7, 1098.
- Metal carbonyl-catalysed isomerisation** of *N*-allylsulphonamides to *N*-prop-2-enyl and *N*-propylidene derivatives. Catalysed prototropic rearrangements. Part 3, 11.
- catalysis** in oxidation by peroxides. Part 2, molybdenum catalysed oxidation of organosulphur compounds by *t*-butyl hydroperoxide, 576.
- halides**, covalent, and thiobenzamides, equilibria between in diethyl ether solution. Quantitative aspects of Lewis acidity. Part 17, 592.
- ketyl ion pairs**, intramolecular cation exchange in. Electron spin resonance studies on the interactions between radical ion pairs and macrocyclic polyethers. Part 2, 1327.
- oxides**, aromatic acylations catalysed by, 601.
- Metal-ion** assisted catalysis of nucleophilic attack. Part 3, co-operation between metal ion and hydroxide, 318.
- Metal ions**, interactions of with α -phenylethylperoxy radical. Inhibition of oxidative induced decomposition of ($\alpha\alpha'$ -diphenyl)-azoethane by transition metal ions, 59.
- Methane**, di- and tri-aryl, dyes, steric effects in. Part 13, electronic absorption spectra of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion, 450.
- dichloro-, effect of on insertion into tetrahydrofuran and cyclohexane. Stabilisation of singlet ethoxycarbonylnitrene, 80.
- dimethoxy, radical from, long-range interactions and line-width alternation for γ -proton splittings in: temperature-dependent electron spin resonance spectra. Investigations of structure and conformation. Part 6, 116.
- fluoro-, geometry and electronic structure of intimate and solvent-separated ion pairs of in water, 162.
- Methane**, trifluoronitroso-, and some 1,3-diketones, free radical formation in the reactions between. Nitroxide chemistry. Part XII, 7.
- Methanes**, diaryldiazo-, mechanistic studies on the reaction of with singlet molecular oxygen. Intermediates in the decomposition of aliphatic diazo-compounds. Part 13, 327.
- Methanesulphonanilide**, protonation and sulphonation of in aqueous sulphuric acid. Aromatic sulphonation. Part 58, 1003.
- Methanol** and water, products of addition of to vinyl-substituted quinone methides. The chemistry of reactive lignin intermediates. Part 3, 616.
- water solution**, 60% w/w, tertiary aliphatic ammonium ions in and the quinuclidinium ion in water, thermodynamics of the acid dissociation of, 102.
- water solutions**, kinetics of the alkaline decarboxylation of trichloroacetate ion in. Solvolysis rates in aqueous-mixed solvents. Part 4, 1237.
- Methanolic glasses** at 77 K, γ -irradiated, electron spin resonance study of hydrogen adduct radicals generated from indole and its derivatives in, 347.
- Methanolysis** of 1-fluoro-2,4-dinitrobenzene, picryl chloride, and picryl fluoride, thermochemical calculations and experimental measurements of. The S_N mechanism in aromatic compounds. Part 41, 457.
- Methides**, 2-pyridylacetate, and their pyrimidine analogues, the photochemistry of, 1410.
- vinyl-substituted quinone, products of addition of methanol and water to. The chemistry of reactive lignin intermediates. Part 3, 616.
- Method**, infrared-X-ray, application of. Structure and conformation of β -thiodan in the solid state and in solution, 144.
- Methoxide ion** at 25 °C and 6-nitrobenzothiazole, kinetic studies on solvent effects in the reaction between. Ring opening and closing in heterocyclic compounds, 20.
- Metiamide**, (*N*-methyl-*N'*-{2-[(5-methylimidazol-4-yl)methylthio]ethyl}thiourea) and thiaburimamide (*N*-{2-[(imidazol-4-yl)methylthio]ethyl}-*N'*-methylthiourea), crystal and molecular structure of the histamine H_2 -receptor antagonists, 68.
- Methyl**, hydroxy-, and formyl groups, a re-evaluation of the Hammett σ_p values for, 993.
- N*-Methylated** 2-amino-indamines in aqueous solution, reactions of. Benzoquinone imines. Part 13, 1125.
- Methylene**, diphenyl-, benzylic insertion of into diastereoisomeric esters of α -fluorophenylacetic acid, chemically induced dynamic nuclear polarisation during. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- halide** and ionic halides in water-methylene halide two-phase systems, halogen exchange between, 1462.
- Methyl group**, the effect of on the kinetics of hydrogen exchange in acidic media. Electrophilic substitution on the thiophen ring. Part 5, 1998.
- halides** and methyl perchlorate, comments on the putative ion pair mechanism for hydrolysis of, 873.
- substituent effects**, non-additivity of: the reactivity selectivity principle. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 14, 1537.
- α -Methyl substitution**, the effect of: photochemistry of acyclic $\beta\gamma$ -unsaturated ketones, 1357.
- Micelles** containing the imidazole ring and the hydroxy-group, ester hydrolysis promoted by. Functional micellar catalysis. Part 2, 821.
- Michler's Hydrol Blue**, Crystal Violet, and Malachite Green, electronic absorption spectra of derivatives of exhibiting simultaneous central and terminal steric distortion. Steric effects in di- and tri-arylmethane dyes. Part 13, 450.
- Migration**, an intramolecular [1,3] acyl group, *via* a four-membered transition state, mechanism of. Isomerisation of (*E*)-*O*-acyl isoamides to *N*-acyl amides, 1085.
- 1,3-benzoyl, of 2-benzoyl-2-phenylindane-1,3-dione. Molecular conformations and crystal structures of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone), 847.
- intramolecular, of an amino-group *via* a transannular pro-

Migration, (contd.)

- cess during the reaction of *O*-salicyloylglycolamides in alkaline solution: an analogue of the reverse of the Brenner aminoacyl insertion reaction, 1804.
- 1** → **4 Migration** of an anilo-group in the alkaline reaction of *O*-aroyl-*N*-arylglycolamides, evidence for: alkaline hydrolysis of esters possessing readily ionisable amide groups, 2028.
- Model interactions**, thiamine-enzyme, solvent effects on. 2,3,4-Trimethylthiazolium iodide, a model for interaction with negative charges, 1484.
- systems**, macrocyclic enzyme. Concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in deacylation of *p*-nitrophenyl carboxylates, 24.
- Models**, intermolecular, for intramolecular reactions. Reactions between long-chain alkanolate ions and alkyl bromides as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions. Ring closure reactions. Part 6, 443.
- of fixed structure and hydroxy- and mercapto-pyridines, photoelectron spectra of, 1652.
- of the deacylation step in the mechanism of action of serine proteases, hydrolyses of *O*-acylglycolamides as: function of the oxyanion pocket, 1221.
- Moiety**, the *gauche* $O\cdot CH_2\cdot CH_2\cdot O$, of cyclic 7,8-dihydrodibenzo[*f,h*]-[1,4]-dioxecin, 1H nuclear magnetic resonance and *X*-ray study of dihedral bond angles in, 1942.
- Molecular aggregation** in the hydrolysis of *p*-nitrophenyl carboxylates, kinetic consequences of, 1947.
- conformation** and crystal structure of 2',3'-*O*-methoxymethyleneneuridine: *X*-ray and nuclear magnetic resonance investigation, 487.
- and electronic structure of azomethines. Part 5, determination of the conformation of some *N*-methylimine derivatives of aldehydes and ketones from dipole moment data, 2038.
- of the germacranolide alatoide monohydrate, *X*-ray crystallographic determination of. Sesquiterpenoids. Part XXIII, 255
- conformations** and crystal structures of the rearrangement products, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone). 1,3-Benzoyl migration of 2-benzoyl-2-phenylazoindane-1,3-dione, 847.
- mechanics calculations** of alkanes and non-conjugated alkenes, 1610.
- orbital calculations**, published *ab initio*, comparison of various isodesmic and homodesmotic reaction heats with values derived from, 1036.
- oxygen**, singlet, mechanistic studies on the reaction of diaryldiazomethanes with. Intermediates in the decomposition of aliphatic diazo-compounds. Part 13, 327.
- ab initio Molecular orbital study**: conformations of furan-, pyrrole-, and pyridine-carbaldehydes, 1601.
- Molecules**, α -bonded, electronic and structural effects on the ^{13}C contact shifts of, 809
- ground states of. Part 35, MINDO/3 study of the Cornforth rearrangement, 724.
- partially oriented in nematic phase, conformational studies of: nuclear magnetic resonance and theoretical investigation of 2,2'-biphenyl, 314.
- Molecules** with and without a permanent electric dipole moment, aromatic solvent induced shifts in, 1656.
- Molybdenum** catalysed oxidation of organosulphur compounds by *t*-butyl hydroperoxide. Metal catalysis in oxidation by peroxides. Part 2, 576.
- Monte Carlo investigation** of the conformational free energies of the aldohexopyranoses, 654.
- Morphine derivatives**, luminescence characteristics of, 121.
- Morpholine**, piperidine, *n*-butylamine, and benzylamine, kinetics of the reactions of with 2,4-dinitrophenyl ether, 1580.
- reaction of with 2,4-dinitrophenyl phenyl ether in dimethyl sulphoxide, acetonitrile, tetrahydrofuran, and ethyl acetate and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.
- Mutarotation**, base-catalysed, of glucose in dimethylformamide and dimethyl sulphoxide, 2021.
- benzamidine-catalysed, of 2,3,4,6-tetra-*O*-methyl-D-glucose, 1047.

N

- Naphthalene**, 1,8-bis-(dimethylamino)-, kinetics of proton and deuteron transfer from α ,4-dinitrotoluene to in alcoholic solvents, 814.
- oxidation of by dioxygen in the presence of iron(II) salts. Aromatic hydroxylation. Part 6, 1583.
- protonated 1,8-bis(dimethylamino)- and 1,8-bis(diethylamino)-. Rates of proton transfer from to hydroxide ion in 20% and 30% (v/v) dimethyl sulphoxide-water, 1589.
- Naphthalenes**, 1,4-dihydro-, homoallylic coupling in. Part 2, crystal structure of *cis*-2a,5-dihydro-5-acenaphthoic acid, 1153.
- 1-Naphthoates**, 8-hydroxy-, mechanism of hydrolysis of. Intramolecular catalysis. Part 2, 1799.
- methyl 8-(3- or 4-substituted benzoyl)- and 2-(3- or 4-substituted benzoyl)-benzoates, base- and acid-catalysed rearrangements of pseudo to normal. Ring-chain tautomerism. Part 6, 1927.
- methyl pseudo-8-(3- or 4-substituted benzoyl)-, and pseudo-2-(3, or 4-substituted benzoyl)-benzoates, mechanism of alkaline hydrolysis of. Reactions of carbonyl compounds in basic solutions. Part 8, 526.
- Naphthols**, arylazo-, exhibiting azo-hydrazone tautomerism, oxidation by singlet oxygen of, 747.
- 1-Naphthylamine**, 8-hydroxy-*NN*-dimethyl-, and 8-methoxy-*NN*-dimethyl-1-naphthylammonium ion, rates of proton transfer, acid dissociation constants, and the strengths of intramolecular hydrogen bonds in, 152.
- Negative charges**, 2,3,4-trimethylthiazolium iodide a model for interaction with. Solvent effects on thiamine-enzyme model interactions, 1484.
- Neighbouring functional groups**, reactions of *m*-chloroperbenzoic acid with olefins which have, 914.
- Neighbouring-group participation** by phenolate in the opening of an epoxide ring, 917.
- Nematic phase**, conformational studies of molecules partially oriented in: nuclear magnetic resonance and theoretical investigation of 2,2'-biphenyl, 314.
- phases**, conformation studies by nuclear magnetic resonance spectroscopy in: 3-phenyl-1,2,5-oxa-, -thia-, and -seleno-diazole, 561.
- solutions**, structure and conformation of 4-nitrophenyl acetate from proton nuclear magnetic resonance of, 1383.

- Neuridine**, 2',3'-*O*-methoxymethylene-, crystal structure and molecular conformation of: *X*-ray and nuclear magnetic resonance investigation, 487.
- Neuroleptic drugs**, conformations of some semi-rigid. Part 2, crystal structures of racemic and of (+)-(*S*)-octoclothe-pin {2-chloro-10,11-dihydro-11-(4-methylpiperazin-1-yl)-dibenzo[*b,f*]thiepin} and the absolute configuration of the latter, 186.
- Neutral**, cation, and nitroxide radicals of phenothiazine, substituent effects on the distribution of spin density in. Heterocyclic free radicals. Part 7, 517.
- Neutron diffraction and X-ray studies**, potassium hydrogen dicrotonate. Crystal structures of some acid salts of monobasic acids. Part 19, 1740.
crystal structure of potassium hydrogen bisphenylacetate redetermined by. Crystal structures of some acid salts of monobasic acids. Part 18, 979.
- Nickel**, dibromobis(triphenylphosphine)-, *X*-ray structure of a novel product formed from 2,5-dimethylhex-3-yne-diol by catalytic action of, 1011.
- Nickel-catalysed stereospecific cyclocarbonylation** of cyclopentadiene dimer. Crystal and molecular structure of 2-(tetracyclo[5.5.1.0^{2,6}.0^{8,12}]tridec-9-en-4yl)propionic acid, 389.
- Nitration** in trifluoroacetic acid, products, kinetics, and mechanism of. Electrophilic aromatic substitution. Part 17, 1688.
of acetanilide and some analogues: a reconsideration. Electrophilic substitution. Part 18, 1693.
of anisole, *o*-methylanisole, and *p*-methylanisole in aqueous sulphuric acid. Electrophilic aromatic substitution. Part 16, 248.
of aromatic hydrocarbons in purified acetic anhydride, kinetics of; identification of the electrophile, 1361.
of 3-methyl-1,2-benzisoxazole, kinetics and mechanism of, 47.
of toluene, *t*-butylbenzene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes with nitric acid-acetic anhydride. Evidence for a π -inductive effect, 2042.
rates observed and acidity functions, limitations of empirical relationships involving. The M_C activity coefficient function for acid-base equilibria. Part 4, 845.
- Nitrene**, singlet ethoxycarbonyl-, stabilisation of. Effect of dichloromethane on insertion into tetrahydrofuran and cyclohexane, 80.
- Nitric acid-acetic anhydride**, nitration of toluene, *t*-butylbenzene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes with. Evidence for a π -inductive effect, 2043.
- Nitriles** and ketones, Taft σ^* values for some, and correlation between the basicity constants, corrected for steric effects. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
and sulphones bearing β -onium substituents, formation and behaviour of carbanions derived from. Elimination and addition reactions. Part 33, 1920.
sulphones, and ketones, polar effects on the ionisation of. Elimination and addition reactions. Part 31, 1909.
- Nitrobenzenes**, alkylthio-, alkylsulphinyl-, and alkylsulphonyl-, radical anions and nitroxides from, 1252.
- p*-Nitrobenzoates**, 1-aryl-1-methylethyl, and some simple alkyl systems, phenolyses of: characteristic features of phenol as a solvolytic solvent, 594.
- 4-Nitrobenzyl** and 4-nitrophenyl(phenyl)methyl halides, reactions of with potassium *t*-butoxide, 1856.
- 4-Nitrobiphenyls**, 4'-substituted 3-bromo-, the kinetics of piperidinodebromination of. Substituent effects in the biphenyl series. Part IV, 137.
- Nitro-compounds**, aryloxy radicals by photorearrangement of, 1240.
- Nitrogen**, bridgehead, proton magnetic resonance studies of compounds with. Part 33, effect of a fused aromatic ring on the conformational preferences of perhydropyrido[1,2-*c*][1,3]oxazines and related compounds, 370. Part 34, stereochemistry of 8,9,10,11,11a,11b,12,13-octahydro-7a*H*-quino-[1,2*c*][1,3]-benzoxazines and 7a, 8,9,10,10a,10b,11,12-octahydrocyclopent[5,6]oxazino-[3,4-*a*]quinolines, 1592.
two-co-ordinate, in the other groupings with oxygen and carbon, extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover, and comparison with three co-ordinate nitrogen in planar groupings (azoxy *etc.*). Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- inversion** in six-membered rings, barriers to. Ring and nitrogen inversion in some methylene bridged bisheterocycles, 588.
- inversions**, passing pyramidal, in some perhydro-1,3-oxazines and -1,3-diazines. Conformational analysis of saturated heterocycles. Part 78, 818.
- lone pair** and a non-adjacent π -bond, homoallylic interaction between. Part 6, nature of the lone-pair electrons in n,π -homoconjugated aliphatic amines, 1057.
- Nitrogen-sulphur(vi) compounds**, basicity of. Part 2, protonation equilibria of *N*-arylsulphamates using ultraviolet and nuclear magnetic resonance methods, 1180.
- Nitromethane**, chlorosulphuric acid in, and in dichloromethane, sulphonation in the reactions of aromatic compounds with. Aromatic sulphonation. Part 60, 1548.
chlorosulphuric acid in, and in dichloromethane, sulphonylation in the reaction of aromatic compounds with. Aromatic sulphonation. Part 61, 1557.
- Nitrophenyl esters** of carboxylic acids, reactions of with benzenethiolate, acyl-oxygen *versus* aryl-oxygen bond scission in, 966.
- p*-Nitrophenyl acetate**, kinetics of the reaction of with amines in the presence of dodecylammonium propionate and Aerosol-OT aggregates in benzene, 1674.
- carboxylates**, concurrent nucleophilic-electrostatic bifunctional catalysis by [20]paracyclophanes in deacylation of. Macrocyclic enzyme systems, 24.
- 4-Nitrophenyl acetate**, structure and conformation of from proton nuclear magnetic resonance of nematic solutions, 1383.
- Nitropyridines**, alkoxy nitroxide radicals from photolysis of: a kinetic investigation by electron spin resonance spectroscopy, 1132.
- Nitrosamines**, rearrangements accompanying oxidative photoaddition of to bicyclo[2.2.1]heptadiene, cycloocta-1,5-diene, and cyclohexa-1,3-diene, 93.
- Nitrosation**, direct, of aniline derivatives and other nucleophilic species by *N*-nitrosodiphenylamine, 1932.
of methylhydrazine and *NN*-dimethylhydrazine, kinetics and mechanism of, 274.
- S*-Nitrosation** of thiourea and thiocyanate ion. Nitrosyl thiocyanate and the *S*-nitroso adduct of thiourea and nitrosating agents, 128.
- Nitroso-compounds**, extension of the nuclear magnetic resonance-ultraviolet correlation in to cover two-co-ordinate nitrogen in the other groupings with oxygen

Nitroso-compounds, (contd.)

- and carbon, and comparison with three-co-ordinate nitrogen in planar groupings (azoxy *etc.*). Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- C-Nitroso group**, rearrangements involving: formation of dialkylhydroxylamines and nitroxides, 1255.
- Nitrosyl chloride** and nitrosyl thiocyanate, indirect measurement of the rate constants for the diazotisation of substituted anilines by, 502.
- thiocyanate** and the *S*-nitroso-adduct of thiourea as nitrosating agents. *S*-nitrosation of thiourea and thiocyanate ion, 128.
- Nitrous acid** and arylhydrazines, kinetics and mechanism of the reaction between, 667.
- reactions of *N*-heteroaromatic bases with. Part 4, kinetics of the diazotisation of 2- and 4-aminopyridine 1-oxide, 1830. Part 5, kinetics of the diazotisation of substituted 2-aminopyridine and 2-aminopyridine 1-oxide, 1835.
- oxide**, electron-transfer from excited carboxyalkylferrocenes to, 1353.
- Nitroxide**, 2-alkoxycarbonylphenyl, radicals, long-range couplings in, 904.
- cation, and neutral radicals of phenothiazine, substituent effects on the distribution of spin density in. Heterocyclic free radicals. Part 7, 517.
- chemistry**. Part XII, free radical formation in the reactions between trifluoronitrosomethane and some 1,3-diketones, 7.
- radicals**, alkoxy, from photolysis of nitropyridines: a kinetic investigation by electron spin resonance spectroscopy, 1132.
- Nitroxides** and dialkylhydroxylamines, formation of: rearrangements involving a *C*-nitroso group, 1255. and radical anions from alkylthio-, alkylsulphinyl-, and alkylsulphonyl-nitrobenzenes, 1252.
- Non-additivity** of chloro-substituent effects: mechanism of the elimination. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 15, 1541.
- of methyl substituent effects: the reactivity selectivity principle. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 14, 1537.
- Non-equivalence**, magnetic, in organophosphorus esters, 1232.
- proton magnetic resonance, of the enantiomers of alkylphenylphosphinic amides, 1882.
- Non-rigidity**, stereochemical, of phosphoranyl radicals: relative ligand apicophilicities, 730.
- Norbornan-2-one** and norborn-5-en-2-one tosylhydrazone sodium salts, kinetic studies of the decomposition of, 1490.
- Norethynodrel** (17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one), *X*-ray crystal structure analysis of: conformational preference of ring A in 3-oxo- $\Delta^5,10$ -steroids, 379.
- Nuclear magnetic resonance** and *X*-ray investigation: crystal and molecular conformation of 2',3'-*O*-methoxymethyleneneuridine, 487.
- ¹H, and *X*-ray study of dihedral bond angles in the *gauche* O·CH₂·CH₂·O moiety of cyclic 7,8-dihydrodibenzo[*f,h*][1,4]dioxecin, 1942.
- and theoretical investigation of 2,2'-biphenyl: conformational studies of molecules partially oriented in nematic phase, 314.
- and ultraviolet methods, protonation equilibria of *N*-arylsulphamates using. Basicity of nitrogen-sulphur(vi) compounds. Part 2, 1180.
- carbon-13: evidence for non-chair conformations in tropane derivatives, 1202.
- oxidation rates, and photoelectron spectra of 10,10-dimethylphenothia-silin, -germin, and -stannin derivatives and of 9,9-dimethylthioxanthen. Group IVB heterocyclic compounds, 689.
- spectra of acyclic enamines. Enamine chemistry. Part 22, 838.
- conformational analysis of cyclohexa-1,3-dienes by, 842.
- studies of the C $_{\alpha}$ -C $_{\beta}$ fragments of oxytocin, oxytocinoic acid, and tocinoic acid in aqueous solution, 477.
- ¹H, conformational study and chemical equilibration of 4,5-dimethyl, 2,4,5-trimethyl, and 2,2,4,5- and 2,4,4,5-tetramethyl-1,3-oxathiolans. Properties and reactions of 1,3-thiolans. Part 6, 343.
- double, study of methyl- and *n*-butyl-tin alkoxides: auto-association in organometallic compounds, 242.
- dynamic, conformational studies by. Part 8, effect of aromatic substituents on the stereodynamics of hindered hydrazones, 1666.
- investigation of complex formation between imipramine and related psychotropic drugs with benzyl alcohol and other aromatic solutes, 1964.
- investigation of iminium ion intermediates. Part 6, a hydrogen-1 and carbon-13 structure and dynamic study of various substituted iminium salts, 536. Part 7, structure and mechanism of formation of the intermediates in the reaction between amides and CSeCl₂ or PSeCl₃ or between thioamides and COCl₂, POCl₃, or PSeCl₃, 1243.
- investigations, Fourier transform, of organotin compounds. Part 6, tin-119 and carbon-13 nuclear magnetic resonance spectra of hexaorganoditins and octaorganotritins, 1842.
- Nuclear magnetic resonance**, ¹³C, of *N*-heterocycles. Part 2, natural abundance carbon-13 and nitrogen-15 nuclear magnetic resonance studies of Δ^3 - and Δ^4 -pyrrolin-2-ones and model compounds, 1746. Part 3, ¹³C chemical shift assignments of the carbonyl group in penicillins and cephalosporins, 1749.
- phosphorus-31, and phosphoryl infrared stretching frequency studies, and electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis. Heteroaryl-, heteroarylmethyl-, and substituted arylphosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
- proton, carbon-13, and nitrogen-15, studies of [¹⁵N]azoles: 1-phenylpyrazole and the tautomerically mobile 3-methyl-1-phenylpyrazolin-5-one, 1024.
- of nematic solutions, structure and conformation of 4-nitrophenyl acetate from, 1383.
- relaxation probe, conformation of various tetracycline species determined with the aid of, 1319.
- spectra, carbon-13, of 1-*p*-tolylethyl, and di-*p*-tolylmethyltricarboxylchromium cations, 483.
- ¹³C and ¹H, spectroscopic, potentiometric, and conductimetric methods, studies of the protonation equilibria of sulphamates using, 580.
- spectroscopy, ¹³C, and the Forsén-Hoffman spin-saturation method, application of the determination of the barrier to ring inversion in *cis*-1,2-, *trans*-1,3-, and *cis*-dimethylcyclohexane, 84.
- ¹³C, spectroscopy, conformational analysis of cyclohexene and a heterocyclic analogue by. 1,2-Oxazine chemistry. Part 6, 619.

Nuclear magnetic resonance, (contd.)

- spectroscopy**, conformations of peptides in solution by. Part 5, homoallylic proton spin coupling in linear peptides, 1294.
- conformation studies by in nematic phases: 3-phenyl-1,2,5-oxa-, -thia-, and -seleno-diazole, 561.
- spectroscopy**, natural abundance nitrogen-15. The pyrimidine and purine nucleosides, 1268.
- nitrogen. Part 7, extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover two-co-ordinate nitrogen in the other groupings with oxygen and carbon, and comparison with three-co-ordinate nitrogen in planar groupings (azoxy *etc.*), 469.
- Nuclear magnetic resonance study**, ^1H , ^{13}C , and ^{14}N , of the hydrogen chloride-*NN*-dimethylacetamide and hydrogen chloride-*N*-methylacetamide systems in deuteriochloroform solution, 556.
- of methylcadmium alkoxides: auto-association in organometallic compounds, 1187.
- of the conformations of atropine and scopolamine cations in aqueous solution, 2016.
- of the conformations of *ortho*-disubstituted benzenes. Conformational analysis, 693.
- studies, fluorine-19, of aromatic compounds. Part 5, transmission of substituent effects across two aromatic rings connected by C-C and -C- linkages, 1051.
- substituent chemical shifts and substituent reactivity parameters in benzene derivatives, on the interpretation of linear correlations between, 769.
- variable temperature ^{13}C , studies on *cis,trans*-cyclo-octa-1,5-diene and related compounds. *trans*-Cycloalkenes. Part 7, 1371.
- Nuclear polarisation**, chemically induced dynamic, during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
- Nucleophilic aromatic substitution**, orienting effects of chlorine substituents in. Mechanisms for reactions of halogenated compounds. Part 3, 1774.
- attack** and single electron transfer, competition between: reaction of 3-arylimino-2-phenyl-3*H*-indoles with organolithium compounds, 1032.
- attacks** on carbon-carbon double bonds. Part 24, nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; comments on the work of Le Guillanton and Cariou, 1000.
- on carbon-nitrogen double bonds. Part 4, substitution of *N*-arylbenzimidoyl cyanides by amines in acetonitrile and by alkoxides in alcohols, 659.
- displacement** in polyhalogenoaromatic compounds. Part 3, kinetics of protonodeiodination of iodoarenes, 278.
- reactions** of thioketones, angular *versus* linear transition state in, 1169.
- reactivity**, dipole moments, and spectroscopy, a conformational study by: 2-chloromethylenecycloheptan- and -octan-ones, 1301.
- unusual, of un-ionised [20]paracyclophane oximes provided by hydrophobic effects. Macrocyclic enzyme model systems, 32.
- species**, other, and aniline derivatives, direct nitrosation of by *N*-nitrosodiphenylamine, 1932.
- Nucleophilic substitution** of (*E*)- and (*Z*)-3-chloro-2-

- phenylpropenenitriles, stereochemistry of; criticism of a paper by Rapport and Topol, 997.
- aromatic, catalysis in. Part 1, reactions of piperidine with 2,4-dinitrophenyl 4-nitrophenyl ether and 2,4-dinitrophenyl phenyl sulphone, 1316.
- Nucleophilicity** of bridgehead radicals. Structural effects on the reactivity of carbon radicals in homolytic aromatic substitution. Part 4, 87.
- Nucleosides**, the pyrimidine and purine. Natural abundance nitrogen-15 nuclear magnetic resonance spectroscopy, 1268.

O

- Octamer** of acetonitrile oxide, crystal and molecular structure of, 334.
- Octaorganotritins** and hexaorganoditins, tin-119 and carbon-13 nuclear magnetic resonance investigations of organotin compounds. Part 6, 1840.
- Octoclotheptin** {2-chloro-10,11-dihydro-11-(4-methylpiperazin-1-yl)dibenzo[*b,f*]thiepin}, crystal structures of racemic and of (+)-(*S*)-, and the absolute configuration of the latter. Conformations of some semi-rigid neuroleptic drugs. Part 2, 186.
- Olefinic substances**, kinetics and mechanism of addition to. Part 13, reactions of 3-substituted cholest-5-enes with sources of electrophilic bromine, 2048. Part 14, reactions of cholest-5-en-3-one with electrophilic brominating agents, 2055. Part 15, chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one; factors affecting the α : β ratio for electrophilic attack and for product formation in cholest-5-enes, 2062.
- Olefins** which have neighbouring functional groups, reactions of *m*-chloroperbenzoic acid with, 914.
- β -Onium substituents**, formation and behaviour of carbanions derived from sulphones and nitriles bearing. Elimination and addition reactions. Part 33, 1920.
- Opening** of an epoxide ring, neighbouring-group participation by phenolate in the, 917.
- Optical activity** in $\beta\gamma$ -unsaturated ketones. Part 1, effect of the direction of the electric transition dipole moment in the aromatic group in benzobicyclo[2.2.2]octen-2-one derivatives, 1937.
- of the 260 nm transition of chiral thirans, 1105.
- Raman, of camphor and related molecules, 1074.
- of simple chiral molecules; methyl and trifluoromethyl asymmetric deformations, 1790.
- rotation** and conformation of model carbohydrates, solvent and temperature effects on. Polysaccharide conformation. Part 10, 191.
- Orders**, high kinetic, in bromine, comments on the physical interpretation of. The kinetics and mechanisms of aromatic halogen substitution. Part 34, 106.
- Organic compounds**, polar substituents and the luminescence of. Part 2, anthracene derivatives, 919.
- molecules** in electrically oriented liquid crystal matrices, linear dichroism of, 1208.
- Organolithium compounds**, reaction of with 3-arylimino-2-phenyl-3*H*-indoles: competition between single electron transfer and nucleophilic attack, 1032.
- the usefulness of ^{13}C - ^1H one-bond coupling constants as selectivity parameters in the synthesis of. Reactivity parameters. Part 2, 473.

- Organometallic compounds**, auto-association in: a nuclear magnetic double resonance study of methyl- and n-butyl-tin alkoxides, 242.
- auto-association in: a nuclear magnetic resonance study of methylcadmium alkoxides, 1187.
- reactions**, homolytic. Part 13, the homolytic reactivity of stannacycloalkanes, 1499.
- Organophosphorus esters**, magnetic non-equivalence in, 1232.
- Organosulphur compounds**, molybdenum catalysed oxidation of by t-butyl hydroperoxide. Metal catalysis in oxidation by peroxides. Part 2, 576.
- Organotin compounds**, Fourier transform nuclear magnetic resonance investigations of. Part 6, tin-119 and carbon-13 nuclear magnetic resonance spectra of hexaorganoditins and octaorganotritins, 1842.
- Orientation effects** in the benzene chromophore bearing one donor and two acceptor groups. Electronic absorption spectra of the dicyanoanilines, 1608.
- Orienting effects** of chlorine substituents in nucleophilic aromatic substitution. Mechanisms for reactions of halogenated compounds. Part 2, 1774.
- 1-Oxa-analogues** of 1,3-thiazolidin(e)-2-one, -2-thione, and -2-selone, infrared study of, 324.
- 1,3,4-Oxadiazine**, 3,4-dimethyltetrahydro-, conformational analysis of, 1816.
- 1,3,4-Oxadiazole-2-carboxylic acid**, 5-amino-, kinetic study of the decarboxylation of to 2-amino-1,3,4-oxadiazole in water as a function of proton activity, 639.
- 1,3-Oxathiolans**, properties and reactions of. Part 6, chemical equilibration and ^1H nuclear magnetic resonance conformational study of 4,5-dimethyl-, 2,4,5-trimethyl-, and 2,2,4,5- and 2,4,4,5-tetramethyl-1,3-oxathiolans, 343.
- 1,2-Oxazine** chemistry. Part 6, conformational analysis of cyclohexene and a heterocyclic analogue by ^{13}C nuclear magnetic resonance spectroscopy, 619.
- 1,3-Oxazines**, perhydro- and perhydro-1,3-diazines, passing pyramidal nitrogen inversions in some. Conformational analysis of saturated heterocycles. Part 78, 818.
- [1,3]Oxazines**, perhydroprido[1,2-c]-, and related compounds, effect of a fused aromatic ring on the conformational preferences of. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 33, 370.
- Oxaziridines**, optically active, absolute stereochemistry of the peroxy-acid-imine route to, 1339.
- Oxidation**, amine. Part 13, electrochemical oxidation of some substituted tertiary alkylamines, 1732.
- Oxidation**, anodic, of [2,2]metacyclophanes and transannular cation radical formation. Electron-organic chemistry, 384.
- of methylbenzenes at potentials in the first voltammetric wave, 1952.
- of substituted adamantanes, 505.
- by peroxides, metal catalysis in. Part 2, molybdenum catalysed oxidation of organosulphur compounds by t-butyl hydroperoxide, 576.
- by singlet oxygen of arylazonaphthols exhibiting azo-hydrazone tautomerism, 747.
- electrochemical, of 1-phenylpyrazolidin-3-one in acetonitrile, 1287.
- hydroxyl radical induced, of D-glucose in oxygenated aqueous solution. Radiation chemistry of carbohydrates. Part 14, 1958.
- of naphthalene by dioxygen in the presence of iron(II) salts. Aromatic hydroxylation. Part 6, 1583.
- of saturated hydrocarbons by cobalt(III), manganese(III), and lead (IV) trifluoroacetates, mechanisms of, 511.
- of xanthates with iodine in aqueous solution, kinetics and mechanism of, 113.
- permanganate, of unsaturated compounds, mechanism of. Part 7, kinetics of the oxidation of propiolic and phenylpropiolic acids, 630. Part 8, kinetics of the oxidation of halogenomaleic acids, 1794.
- photosensitised, of amines: mechanism of oxidation of triethylamine, 173.
- with chromic acid and preparation of all six 3-bromo-5-hydroxy- and -5-oxo-bicyclo[2.2.1]heptane-2,6-carbolactones, 430.
- rates**, carbon-13 nuclear magnetic resonance, and photoelectron spectra of 10,10-dimethylphenothia-silin-, -germin, and -stannin derivatives and of 9,9-dimethylthioxanthen. Group IVB heterocyclic compounds, 689.
- Oxidative decarboxylation** of aldolactones by cerium(IV) sulphate in aqueous sulphuric acid: synthesis of D-arabinose, 685.
- decomposition**, induced, of ($\alpha\alpha'$ -diphenyl)azoethane, inhibition of by transition metal ions. Interactions of metal ions with α -phenylethylperoxyl radical, 59.
- Oximes**, [20]paracyclophane, provided by hydrophobic effects, unusual nucleophilic reactivity of un-ionised. Macrocyclic enzyme model systems, 32.
- Oxirans**, dihalogeno-, mechanism of the reaction of with ketones catalysed by some Lewis acids, 1526.
- α -Oxo-oximes**, photochemistry of. Part 1, photoisomerisation of biacetyl mono-oxime ethyl ether, 1351.
- Oxanyan pocket**, function of: hydrolyses of O-acylglycolamides as models of the deacylation step in the mechanism of action of serine proteases, 1221.
- Oxygen** and argon, photolysis of dipotassium α -D-glucose 1-phosphate in aqueous solution under. The photochemistry of phosphorus compounds. Part 11, 132.
- and carbon, extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover two-co-ordinate nitrogen in the other groupings with, and comparison with three-co-ordinate nitrogen in planar groupings (azoxy *etc.*). Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- and copper(II), reaction of diquat radical cation with. Study of bipyridyl radical cation. Part 4, 445.
- and sulphur, theoretical study on the bridging ability of in vinyl cations, 542.
- Oxygen**, singlet molecular, mechanistic studies on the reaction of diaryldiazomethanes with. Intermediates in the decomposition of aliphatic diazo-compounds. Part 13, 327.
- oxidation by of arylazonaphthols exhibiting azo-hydrazone tautomerism, 747.
- participation of in dye-sensitised oxygenation reactions, concerning the use of amines as probes for 178.
- Oxygenation** of benzo[a]pyrene, a fluorimetric and electron spin resonance study of; an interpretation of the enzymic oxidation, 1172.
- Oxygen-sulphur bond**, chemistry of. Part 6, infrared and Raman spectra of some methyl-substituted trimethylene sulphites, 612.

- Oxyhalides**, structure and mechanism of formation of the intermediates in the reactions between thioamides and, or between amides and CSCl_2 or PSCl_3 . Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- Oxytocin**, oxitocinoic acid, and tocinoic acid in aqueous solution, nuclear magnetic resonance conformational studies of the $\text{C}_\alpha\text{-C}_\beta$ fragments of, 477.
- P**
- Palladium**, zinc, and magnesium porphin, a comparison of the magnetic circular dichroism and Shpol'skii spectra of. Magnetic circular dichroism studies. Part 45, 1337.
- Paper** by Rappoport and Topol, criticism of; stereochemistry of nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles, 997.
- Parameters**, reactivity. Part 2, the usefulness of ^{13}C - ^1H one-bond coupling constants as selectivity parameters in the synthesis of organolithium compounds, 473. substituent reactivity, and nuclear magnetic resonance substituent chemical shifts in benzene derivatives, on the interpretation of linear correlations between, 769.
- Participation**, intramolecular, by the pyridyl group, the irrelevance of, and electrophilic catalysis by transition metal ions: hydrolysis of 2-pyridylphosphonic acid mono- and di-esters, 418. neighbouring-group, by phenolate in the opening of an epoxide ring, 917. of singlet oxygen in dye-sensitised oxygenation reactions, concerning the use of amines as probes for, 178.
- Passifloric acid methyl ester** [methyl(22*R*,24*S*)-22,31-epoxy-1 α ,3 β ,24,31-tetrahydroxy-24-methyl-9,19-cyclo-9 β -lanostan-28-oate]: crystal and molecular structure of a new cyclopropane triterpene, 605.
- Paucin monohydrate**, a pseudoguaianolide glucoside, X-ray crystallographic analysis of. Sesquiterpenoids. Part XXIV, 259.
- Penicillins** and cephalosporins, ^{13}C chemical shift assignments of the carbonyl groups in. ^{13}C Nuclear magnetic resonance in *N*-heterocycles. Part 3, 1749.
- cis- and trans-Penta-1,3-diene**, a spectroscopic and thermodynamic study of. Conformations of conjugated hydrocarbons, 1311.
- Peptides**, conformations of in solution by nuclear magnetic resonance spectroscopy. Part 2, homoallylic proton spin coupling in linear peptides, 1294.
- Peracetyl radicals**, reactions of with alkenes. Reactions of oxygenated radicals in the gas phase. Part 3, 360.
- Perbenzoic acid**, *m*-chloro-, reactions of with olefins which have neighbouring functional groups, 914.
- Permanganate oxidation** of unsaturated compounds, mechanism of. Part 7, kinetics of the oxidation of propiolic and phenylpropiolic acids, 630. Part 8, kinetics of the oxidation of halogenomaleic acids, 1794.
- Peroxides**, metal catalysis in oxidation by. Part 2, molybdenum catalysed oxidations of organosulphur compounds by *t*-butyl hydroperoxide, 576.
- Peroxy-acid-imine** route to optically active oxaziridines, absolute stereochemistry of, 1339.
- Peroxy**, α -phenylethyl-, radical, interactions of metal ions with. Inhibition of oxidative induced decomposition of ($\alpha\alpha'$ -diphenyl)azoethane by transition metal ions, 59. radicals, spin trapping of by phenyl *N*-*t*-butyl nitron. Study of autoxidation by spin trapping, 1770.
- Perylene**, dibenzo[*ghi,pqr*], (coronene), anthracene, and triphenylene, protidetritiation of in anhydrous trifluoroacetic acid. Electrophilic aromatic substitution. Part 18, 353.
- Phenanthrene**, 9,10-dihydro-, and 1,2-diphenylethane, protidetritiation of: effect of strain on aromatic reactivity. Electrophilic aromatic substitution. Part 19, 866.
- Phenanthridine**, *cis*-5,6,6a,7,8,9,10,10a-octahydro-5-methyl-10a-*p*-tolylsulphonylamino-6-*p*-tolylsulphonylimino-, crystal and molecular structure, 1335.
- Phenazine-10-oxide**, 2-nitro-, reactivity of primary and secondary amines with, 1661.
- N*-oxides**, the effect of substituents on the photochemistry of, 238.
- 6-X-Phenetoles**, 2,4-dinitro-, in ethanol, equilibrium and kinetic data for sodium ethoxide addition to. The stabilities of Meisenheimer complexes. Part 14, 1442.
- Phenol** as a solvolytic solvent, characteristic features of: Phenolyses of 1-aryl-1-methylethyl *p*-nitrobenzoates and some simple alkyl systems, 594.
- Phenols** and alcohols. Thermodynamic and kinetic acidities in dimethyl sulphoxide. Part 3, 570.
- Phenols** and benzoic acids, substituted, study of the Hammett equation for the ionisation of in dioxan-water mixtures, 1513. water, alcohols, and carboxylic acids, rates of reactions of quinone methides with. The chemistry of reactive lignin intermediates. Part 5, 1737.
- Phenolate**, neighbouring-group participation by in the opening of an epoxide ring, 917.
- Phenolyses** of 1-aryl-1-methylethyl *p*-nitrobenzoates and some simple alkyl systems: characteristic features of phenol as a solvolytic solvent, 594.
- Phenothiazine**, substituent effects on the distribution of spin density in the cation, neutral, and nitroxide radicals of. Heterocyclic free radicals. Part 7, 517.
- Phenyl acetate** and acetanilide radical ions, mechanism of keten elimination from. Electron impact studies. Part 116, 1670.
- N*-*t*-butyl nitron**, spin trapping of peroxy radicals by. Study of autoxidation by spin trapping, 1770.
- groups**, derived heterocycles heavily substituted with, and 2,4,5-triphenyl-3*H*-pyrrol-3-one, mass spectra of, 412.
- substituents** and vinyl substituents at the α -carbon atom, influence of. Decomposition of carbamates of tertiary alcohols. Part 3, 879.
- Phenylsulphamic acid** in sulphuric acid: solvolysis *versus* sulphonation. Aromatic sulphonation. Part 57, 929. the rearrangement of to aniliniumsulphonic acids in concentrated sulphuric acid: evidence for an intermolecular reaction pathway. Aromatic sulphonation. Part 56, 921.
- S-Phenyl sulphimides**, *S*-*o*-methoxyphenyl, *N*-unsubstituted and various *N*-substituted, thermal racemisation of by pyramidal inversion, 1783.
- Phenyl sulphone**, 2,4-dinitrophenyl, and 2,4-dinitrophenyl 4-nitrophenyl ether, reactions of piperidine with. Catalysis in aromatic nucleophilic substitution. Part 1, 1316.
- Phenylureas**, substituted, *ortho*-effects in the acylation of with isocyanates and acetic anhydride, 934.
- Phosphates**, organic, electron capture processes in: an electron spin resonance study. Unstable intermediates. Part 170, 286.

- Phosphetan oxides**, reaction of with sulphonyl isocyanates and related reactions, 1373.
- Phosphinate esters**, heteroaryl, synthesis and kinetics of alkaline hydrolysis of and hydrolysis of heteroarylphosphine oxide. The chemistry of heteroarylphosphorus compounds. Part 10, 1705.
- Phosphine**, triphenyl-, and its oxide, sulphide, and selenide and triphenylarsine and its oxide, triphenyl-phosphonium and -arsonium cations and various phosphoranyl and arsoranyl radicals derived from by the action of ionizing radiation. Unstable intermediates. Part 173, 833.
- triphenyl-, kinetic study of the reactions of 1,2-dihalogeno-1,2-diphenylethanes with. Dehalogenation reactions of vicinal dihalides. Part V, 140.
- oxides**, acyclic, reaction of with toluene-*p*-sulphonyl isocyanate and related reactions, 1379.
- heteroaryl-, hydrolysis of, and synthesis and kinetics of alkaline hydrolysis of heteroarylphosphinate esters. The chemistry of heteroarylphosphorus compounds. Part 10, 1705.
- Δ^3 -Phospholens**, kinetics and mechanism of the reaction of with diethyl peroxide, 882.
- Phosphonic acid**, 2-pyridyl-, mono- and di-esters, hydrolysis of: electrophilic catalysis by transition metal ions and the irrelevance of intramolecular participation by the pyridyl group, 418.
- groups** and carboxy groups, comparison of. Substituent effects of phosphorus- and arsenic-containing groups in aromatic substitution. Part 7, 1479.
- Phosphonium**, triphenyl-, and triphenylarsonium cations and various phosphoranyl and arsoranyl radicals derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.
- Phosphoranyl radicals** and arsoranyl radicals, various, and triphenyl-phosphonium and -arsonium cations derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.
- fluoroalkoxy- and fluoroalkyl-, an electron spin resonance study of, 889.
- stereochemical non-rigidity of: relative ligand apico-philicities, 730.
- Phosphorus** and arsenic-containing groups in aromatic substitution, substituent effects of. Part 7, comparison of carboxy and phosphonic groups, 1479.
- heteroaryl-, compounds, the chemistry of. Part 7, heteroaryl-, heteroarylmethyl-, and substituted aryl-phosphonate esters. Electronic effects of substituents at phosphorus on the rates of alkaline hydrolysis, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies, 789.
- compounds**, heteroaryl-, the chemistry of. Part 10, synthesis and kinetics of alkaline hydrolysis of heteroarylphosphinate esters and hydrolysis of heteroarylphosphine oxides, 1705.
- the photochemistry of. Part 11, photolysis of dipotassium α -D-glucose 1-phosphate in aqueous solution under argon and oxygen, 132.
- Photaddition**, oxidative, of nitrosamines to bicyclo[2.2.1]-heptadiene, cyclo-octa-1,5-diene, and cyclohexa-1,3-diene, rearrangements accompanying, 93.
- Photochemical rearrangement** of phenyl benzenesulphonates, 1629.
- Photochemistry** and photocyclisation, reversible, of 10*H*,10'*H*-bianthrylidene, 564.
- of acyclic $\beta\gamma$ -unsaturated ketones: the effect of α -methyl substitution, 1357.
- of di-*p*-cumenylfulgide (bis-*p*-cumenylmethylenesuccinic anhydride), 1.
- of 2,3-epoxy-3-phenylpropiophenones, 1522.
- of α -oxo-oximes. Part 1, photoisomerisation of biacetyl mono-oxime ethyl ether, 1351.
- of phenazine *N*-oxides, the effect of substituents on, 238.
- of phosphorus compounds. Part 11, photolysis of dipotassium α -D-glucose 1-phosphate in aqueous solution under argon and oxygen, 132.
- of 2-pyridylacetate methides and their pyrimidine analogues, 1410.
- of some cyclopropyl conjugated 1,2-diketones. Part 2, fragmentation reactions and reduction by aldehydes, 710.
- reversible, of 10,10'-dimethylbiacridan: internal and external heavy atom effects, and the structure of photoisomer F, 550.
- Photocyclisation** and photochemistry, reversible, of 10*H*,10'*H*-bianthrylidene, 564.
- Photocyclisations**, intramolecular, of *o,o'*-bis-(2-arylvinyll)-biphenyls, 268.
- Photodimerisation** of some systemic pyrimidine fungicides, kinetic and energetic aspects of, 216.
- Photoelectron spectra** of bromo- and iodo-thiophenes, 1413.
- of hydroxy- and mercapto-pyridines and models of fixed structure, 1652.
- of iodobenzenes, 962.
- oxidation rates, and carbon-13 nuclear magnetic resonance of 10,10-dimethylphenothia-silin, -germin, and -stannin derivatives and of 9,9-dimethylthioxanthen. Group IVb heterocyclic compounds, 689.
- Photoisomer F**, the structure of, and internal and external heavy atom effects: reversible photochemistry of 10,10'-dimethylbiacridan, 550.
- Photoisomerisation** of biacetyl mono-oxime ethyl ether. Photochemistry of α -oxo-oximes. Part 1, 1351.
- of substituted 2-methylpyridines to *ortho*-substituted anilines, 1148.
- Photolysis**, direct, of cycloalkenes, 1635.
- of dipotassium α -D-glucose 1-phosphate in aqueous solution under argon and oxygen. The photochemistry of phosphorus compounds. Part 11, 132.
- of methyl[6-²H]pyridylacetate. Selective distribution of deuterium labelling, 1980.
- Photo-oxidation reactions**, dye-sensitised, factors affecting, 169.
- Photoreactions** of fructose 6-phosphate in oxygenated and deoxygenated aqueous solutions, 1719.
- Photorearrangement** of nitro-compounds, aryloxy radicals by, 1240.
- Phthalazin-1(2*H*)-one**. Tautomeric azines. Part 6, 1184.
- Picryl chloride**, the kinetics of the reactions of with some substituted anilines. Part IV, 14.
- and fluoride**, and 1-fluoro-2,4-dinitrobenzene, thermochemical calculations and experimental measurements of methanolysis of. The S_N mechanism in aromatic compounds. Part 41, 457.
- Pinacolisation**, cathodic, of acetophenone, effects of ion-pairing and adsorption on the stereochemistry of, 99.

- Piperazine**, a 2:1 complex of with phenylbutazone, and phenylbutazone, crystal structures of. Structural studies of analgesics and their interactions. Part 4, 693.
- Piperidine**, π -butylamine, morpholine, and benzylamine, kinetics of the reaction of with 2,4-dinitrophenyl phenyl ether, 1580.
reactions of with 2,4-dinitrophenyl 4-nitrophenyl ether and 2,4-dinitrophenyl phenyl sulphone. Catalysis in aromatic nucleophilic substitution. Part 1, 1316.
- Piperidinium**, *N*-[2-(2-cyclohexylmandeloyloxy)ethyl]-*N*-methyl-, iodide, crystal and molecular structure of the (*R*)-enantiomer of. Stereochemistry of anticholinergic agents, 643.
- Piperidinodebromination** of 4'-substituted 3-bromo-4-nitrobiphenyls, the kinetics of. Substituent effects in the biphenyl series. Part IV, 137.
- Pivalohydrazonyl bromide**, *N*-(dimethylphenyl)-*N*-methyl-, crystal and molecular structure of; stereochemistry of bimolecular displacement in azavinyl systems, 1136.
- Planar groupings** (azoxy *etc.*), comparison with three-coordinate nitrogen in, and extension of the nuclear magnetic resonance-ultraviolet correlation in nitroso-compounds to cover two-coordinate nitrogen in the other groupings with oxygen and carbon. Nitrogen nuclear magnetic resonance spectroscopy. Part 7, 469.
- Plumbyl radicals**, tri(cyclohexyl)-, free radical adducts of with α -dicarbonyl compounds, 1633.
- Polar effects** on the ionisation of sulphones, nitriles, and ketones. Elimination and addition reactions. Part 31, 1909.
- Polarisation**, chemically induced dynamic nuclear, during benzylic insertion of diphenylmethylene into diastereoisomeric esters of α -fluorophenylacetic acid. Evidence for a dual mechanism of C-H insertion. Intermediates in the decomposition of aliphatic diazo-compounds. Part 14, 671.
directions of the near ultraviolet band systems of disubstituted benzene derivatives, 1262.
- Polarities** and hydrogen-bonding abilities of the aromatic derivatives of cyclohex-2-enone, 1983.
- Polarographic behaviour** of pyridoxyl 5'-phosphate, 1715.
- Polar selectivity** of carbene addition to 3-substituted propenes, 1094.
solvents, ion-pair dissociation equilibria for trityl hexafluoro-arsenate and -antimonate in, 1729.
substituents and the luminescence of organic compounds. Part 2, anthracene derivatives, 919.
- Polyanions** and their complexes. Binding affinities of inorganic ions to carrageenans and carboxymethyl-cellulose, 1229.
and their complexes. Part 10, mechanism of dye binding to chemically different sites, 38.
- Polyelectrolyte-cyclodextrin** systems, esterolysis in, 432.
- Polyethers**, macrocyclic, and radical ion pairs, electron spin resonance studies on the interactions between. Part 2, intramolecular cation exchange in metal ketyl ion pairs, 1327.
the mass spectra of: chemistry of crown ethers, 206.
- Polyhalogenoaromatic compounds**, nucleophilic displacement in. Part 3, kinetics of protiodeiodination of iodoarenes, 278.
- Polysaccharide conformation**. Part 10, solvent and temperature effects on the optical rotation and conformation of model carbohydrates, 191.
- Polystyrene**, hydrogen atom abstraction from by *t*-butoxyl radicals, studies by spin trapping; effect of conformation on reactivity, 1416.
- Porphin**, palladium, zinc, and magnesium, a comparison between the magnetic circular dichroism and Shpol'skii spectra of. Magnetic circular dichroism studies. Part 45, 337.
- Porphyrin**, *meso*-tetraphenyl-, in dimethyl sulphoxide-water, kinetic and equilibrium studies on the protonation of, 1610.
- Porphyryns**, protonated *meso*-tetra-aryl-, substituent effects on the acidities and rates of ionisation of, 2076.
- Porphyrylate**, octaethyl-, di(pyridine)magnesium(II), crystal and molecular structure, 2072.
- Positive poles**, evidence for a dominant field effect of; a theoretical investigation of the effect of positively charged substituents on product distribution in electrophilic aromatic substitution, 1066.
- Potassium *t*-butoxide** in *t*-butyl alcohol, kinetic study of elimination from 3 α -chloro-3 β -methyl- and 3 β -chloro-3 α -methyl-5 α -cholestane promoted by, 436.
reaction of 4-nitrobenzyl and 4-nitrophenyl(phenyl)-methyl halides with, 1856.
- Potassium hydrogen bisphenylacetate**, crystal structure redetermined by neutron diffraction. Crystal structures of some acid salts of monobasic acids. Part 18, 979.
dicrotonate, *X*-ray and neutron diffraction studies. Crystal structures of some acid salts of monobasic acids. Part 19, 1740.
- Potentials** in the first voltammetric wave, anodic oxidation of methylbenzenes at, 1952.
- Potentiometric methods**, ^{13}C and ^1H nuclear magnetic resonance spectroscopic, and conductimetric methods, studies of the protonation equilibria using, 580.
- Preferences**, conformational, of 4-(*para*-substituted) 2-isopropoxy-2,3-dihydropyran[2,3-*c*]pyrazoles: an example of dipole-dipole interaction, 1725.
conformational, radical-centre inversion, and restricted rotation about $\cdot\text{C}-\text{CH}_3$ in some 1,3-dioxolan radicals, e.s.r. studies of. Investigations of structure and conformation. Part 8, 1161.
- 10 α -Pregn-5-ene-11,20-dione**, 3 α ,17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-, and a circular dichroism study of the conformation of the acetyl side-chain of the 17-hydroxy-isomers in solution. Steroidal analogues of unnatural configuration. Part XI, 402.
- Preparation** and oxidation with chromic acid of all six 3-bromo-5-hydroxy- and 5-oxo-bicyclo[2.2.1]heptane-2,6-carbolactones, 430.
and *X*-ray crystal structure: derivatives of 1-aryl-3-imidopyridiniums. 1,3-dipolar character of six-membered aromatic rings. Part 32, 1304.
- Principle**, the reactivity selectivity: non-additivity of methyl substituent effects. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates, 1537.
- Probes** for participation of singlet oxygen in dye-sensitised oxygenation reactions, concerning the use of amines as, 178.
- Process**, a model, for measurement of solvent polarity, 1111.
a transannular, intramolecular migration of an amino group *via* during the reaction of *O*-salicyloylglycol-amides in alkaline solution: an analogue of the reverse of the Brenner aminoacyl insertion reaction, 1804.
electron-transfer, with pyridinium, quinolinium, and pyrazinium salts; an electron spin resonance study, 948.

- Processes**, concerted and stepwise, in activated elimination reactions, discrimination between. Elimination and addition reactions. Part 32, 1914.
- electron capture, in organic phosphates: an electron spin resonance study. Unstable intermediates. Part 170, 286.
- Product**, a novel, formed from 2,5-dimethylhex-3-yne-2,5-diol by catalytic action of dibromobis(triphenylphosphine)nickel, X-ray structure of, 1011.
- distribution** in electrophilic aromatic substitution, a theoretical investigation of the effect of positively charged substituents on; evidence for a dominant field effect of the positive poles, 1066.
- formation**, the α : β ratio for, and for electrophilic attack, in cholest-5-enes, factors affecting; chlorination of cholest-5-ene and its 3-substituted derivatives, including cholest-5-en-3-one. The kinetics and mechanisms of additions to olefinic substances. Part 15, 2062.
- Products** and kinetics: reduction of carbonyl compounds by sodium borohydride (tetrahydridoborate) in water, dimethyl sulphoxide, and their mixtures as solvents, 1466. kinetics, and mechanism of nitration in trifluoroacetic acid. Electrophilic aromatic substitution. Part 17, 1688.
- Propane-2-thiol**, 2-methyl-, butane-1-thiol, and butane-2-thiol, kinetics of the pyrolysis of. The pyrolysis of alkane-thiols. Part 1, 439.
- Propene**, 1-dimethylamino-3-dimethylamino-2-(*para*-substituted phenyl)-, perchlorates, rotational barriers in, 1388.
- Propenes**, 3-substituted, polar selectivity of carbene addition to, 1094.
- Propenenitriles**, (*E*)- and (*Z*)-3-chloro-2-phenyl-, nucleophilic substitution of; comments on the work of Le Guillanton and Cariou. Nucleophilic attacks on carbon-carbon double bonds. Part 24, 1000.
- (*E*)- and (*Z*)-3-chloro-2-phenyl-, stereochemistry of nucleophilic substitution of; criticism of a paper by Rappoport and Topol, 997.
- N*-Prop-2-enyl** and *N*-propylidene derivatives, metal-carbonyl-catalysed isomerisation of *N*-allylsulphonamides to. Catalysed prototropic rearrangements. Part 3, 11.
- Properties** and X-ray crystal structure analysis of (*Z*)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine. Condensation of *o*-thiocyanatoacetophenone with hydroxylamine, 1114.
- and synthesis of 1,2-diaryl-4,5,6,7-tetrahydro-1*H*-1,3-diazepines and 1,2-diaryl-1,4,5,6,7,8-hexahydro-1,3-diazocines. Comparison with the five- and six-membered homologues, 2068.
- and synthesis of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenylquinazolin-4(3*H*)-one; use of quartets in the crystal structure determination of the methylcyclohexane clathrate, 1427.
- β -Propiolactone**, kinetic analysis of the reaction of imidazole buffer solutions with using a novel graphical method for branched, series reactions. Strain effects in acyl transfer reactions. Part 4, 1492.
- Propiolic** and phenylpropiolic acids, kinetics of the oxidation of. Mechanism of the permanganate oxidation of unsaturated compounds. Part 7, 630.
- Propionic acid**, 2-(tetracyclo[5.5.1.0^{2,6}.0^{8,12}]tridec-9-en-4-yl)-, crystal and molecular structure of. Nickel-catalysed stereospecific cyclocarbonylation of cyclopentadiene dimer, 389.
- Propiophenones**, 2,3-epoxy-3-phenyl-, photochemistry of, 1522.
- N*-Propylidene** and *N*-prop-2-enyl derivatives, metal-carbonyl-catalysed isomerisation of *N*-allylsulphonamides to. Catalysed prototropic rearrangements. Part 3, 11.
- Proteases**, serine, hydrolyses of *O*-acylglycolamides as models of the deacylation step in the mechanism of action of: function of the oxyanion pocket, 1221.
- Protiodiodination** of iodoarenes, kinetics of. Nucleophilic displacement in polyhalogenoaromatic compounds. Part 3, 278.
- Protiodetritiation** of anthracene, coronene (dibenzo[*ghi*,*pqr*]-perylene), and triphenylene in anhydrous trifluoroacetic acid. Electrophilic aromatic substitution. Part 18, 353.
- of 1,2-diphenylethane and 9,10-dihydrophenanthrene: effect of strain on aromatic reactivity. Electrophilic aromatic substitution. Part 19, 806.
- Protonation** and sulphonation of methanesulphonanilide in aqueous sulphuric acid. Aromatic sulphonation. Part 58, 1003.
- of *meso*-tetraphenylporphyrin in dimethyl sulphoxide-water, kinetic and equilibrium studies on, 1610.
- of thioketones, experimental and theoretical studies on, 1516.
- the Hammett correlation and the thermodynamics of. The basicities of *N*-trimethylammonioacetamides and of substituted *N*-trimethylammonio benzamides, 1876.
- equilibria** of *N*-arylsulphamates using ultraviolet and nuclear magnetic resonance methods. Basicity of nitrogen-sulphur(vi) compounds. Part 2, 1180.
- of sulphamates, studies of using ¹³C and ¹H nuclear magnetic resonance spectroscopic, potentiometric, and conductimetric methods, 580.
- sites**, mono- and di-, in *N*-ammonio-amidates: a spectroscopic study, 909.
- Proton activity**, kinetic study of the decarboxylation of 5-amino-1,3,4-oxadiazole-2-carboxylic acid to 2-amino-1,3,4-oxadiazole in water as a function of, 639.
- ionisation** of *para*-substituted benzenethiols, thermodynamic functions of, 149.
- magnetic resonance** non-equivalence of the enantiomers of alkylphenylphosphonic amides, 1882.
- spectra of *N*-(4-methoxybenzylidene)anilines, substituent effects and benzene-induced shifts in, 715.
- studies of compounds with bridgehead nitrogen. Part 33, effect of a fused aromatic ring on the conformational preferences of perhydropyrido[1,3-*c*][1,3]-oxazines and related compounds, 370. Part 34, stereochemistry of 8,9,10,11,11a,11b,12,13-octahydro-7*aH*-quino[1,2-*c*][1,3]benzoxazines and 7*a*,8,9,10,10*a*,10*b*,11,12-octahydrocyclopent[5,6][1,3]oxazino[3,4-*a*]quinolines, 1592.
- spin coupling**, homoallylic, of linear peptides. Conformations of peptides in solution by nuclear magnetic resonance spectroscopy. Part 5, 1294.
- splittings**, β - and γ -, in the e.s.r. spectra of radicals from cyclic ethers containing six-membered rings, long-range interactions and line-width alternation associated with. Investigations of structure and conformation. Part 7, 754.
- transfer** and deuteron transfer from α ,4-dinitrotoluene to 1,8-bis(dimethylamino)naphthalene kinetics of in alcoholic solvents, 814.
- transfer**, rates of, acid dissociation constants and the

Proton activity, transfer, (contd.)

- strengths of intramolecular hydrogen bonds in 8-methoxy-*NN*-dimethyl-1-naphthylammonium ion and 8-hydroxy-*NN*-dimethyl-1-naphthylamine, 152.
- simple, solvent dependence of kinetic hydrogen isotope effects for, 1812.
- tunnelling and isotope effects in the dehydrochlorination of 1,1-diaryl-2,2-dichloroethanes. The carbanion mechanism of olefin-forming elimination. Part 9, 1753.
- γ -Proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$, long-range interactions and line-width alternation for: temperature-dependent electron spin resonance spectra. Investigations of structure and conformation. Part 6, 116.
- Prototropic rearrangements**, catalysed. Part 3, metal carbonyl-catalysed isomerisation of *N*-allylsulphonamides to *N*-prop-2-enyl and *N*-propylidene derivatives, 11.
- Psychotropic drugs**, imiprimine and related, a nuclear magnetic resonance investigation of complex formation with benzyl alcohol and other aqueous solutes, 1964.
- Purine and pyrimidine nucleosides**. Natural abundance nitrogen-15 nuclear magnetic resonance spectroscopy, 1268.
- Pyramidal inversion**, thermal racemisation of *N*-unsubstituted and various *N*-substituted *S*-*o*-methoxyphenyl *S*-phenyl sulphimides by, 1783.
- 2H-Pyran**, 2-ethoxy-3,4-dihydro-, thermal unimolecular decomposition of, 870.
- Pyranose ring**, role of the substituent at C-5 of in catalysis by *E. coli*(*lacZ*)- β -galactosidase, 1198.
- Pyranoses**, aldohexo-, a Monte Carlo investigation of the conformational free energies of, 654.
- Pyrazine**, pyrimidine, and pyridazine, Kerr constants, Cotton-Mouton constants, and magnetic anisotropies of, 897.
- Pyrazinium**, quinolinium, and pyridinium salts, electron transfer process with; an electron spin resonance study, 948.
- Pyrazole**, 1-hydroxy, and 1-hydroxyimidazole esters, kinetics and mechanism of hydrolysis and aminolysis of. *N*-Hydroxy-compounds as acyl transfer agents. Part 2, 231.
- 1-phenyl, and the tautomericly mobile 3-methyl-1-phenylpyrazolin-5-one: proton, carbon-13, and nitrogen-15 nuclear magnetic resonance studies of [^{15}N]-azoles, 1024.
- [2,3-*c*]Pyrazoles, 4-(*para*-substituted) 2-isopropoxy-2,3-dihydropyran-, conformational preferences of: an example of dipole-dipole interaction, 1725.
- Pyrazolidin-3-one**, 1-phenyl-, in acetonitrile, electrochemical oxidation of, 1287.
- Pyridazine**, pyrimidine, and pyrazine, Kerr constants, Cotton-Mouton constants, and magnetic anisotropies of, 897.
- Pyridine-**, furan-, and pyrrole-carbaldehydes, conformations of: an *ab initio* molecular orbital study, 1601.
- 1-oxide, 2-amino, and 2-aminopyridine, substituted, kinetics of the diazotisation of. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 5, 1835.
- 2- and 4-amino-, kinetics of the diazotisation of. Reactions of *N*-heteroaromatic bases with nitrous acid. Part 4, 1830.
- Pyridines**, dihydro-, and pyridinium salts: mechanistic studies of the redox reaction between pyridinium salts and alkoxides in tetrahydrofuran, 759.
- hydroxy- and mercapto-, and models of fixed structure, photoelectron spectra of, 1652.
- polyfluoro-, activating effects of fluorine in, in reactions with ammonia. Mechanisms for reactions of halogenated compounds. Part 1, 585.
- substituted 2-methyl-, photoisomerisation of to *ortho*-substituted anilines, 1148.
- Pyridinium**, quinolinium, and pyrazinium salts, electron-transfer process with; an electron spin resonance study, 948.
- salts and dihydropyridines**: mechanistic studies of the redox reaction between pyridinium salts and alkoxides in tetrahydrofuran, 759.
- glycosyl, $\text{S}_{\text{N}}1$ hydrolyses of, and quantification of the main source of catalytic power of *E. coli*(*lacZ*)- β -galactosidase, 1191.
- Pyridinums**, 1-aryl-3-imido-, derivatives of: preparation and X-ray crystal structure. 1,3-Dipolar character of six-membered aromatic rings. Part 32, 1304.
- Pyridoxyl 5'-phosphate**, polarographic behaviour of, 1715.
- [6- ^3H]Pyridylacetate, methyl, photolysis of. Selective distribution of deuterium labelling, 1980.
- Pyridyl group**, the irrelevance of intramolecular participation by, and electrophilic catalysis by transition metal ions: hydrolysis of 2-pyridylphosphonic acid mono- and di-esters, 418.
- radicals**, dihydro-, an electron spin resonance reinvestigation of, 943.
- Pyrimidine fungicides**, systemic, kinetic and energetic aspects of the photodimerisation of some, 216.
- pyridazine, and pyrazine, Kerr constants, Cotton-Mouton constants, and magnetic anisotropies of, 897.
- analogues of 2-pyridylacetate methides**, the photochemistry of, 1410.
- Pyrimidines and purine nucleosides**. Natural abundance nitrogen-15 nuclear magnetic resonance spectroscopy, 1268.
- Pyrolysis of alkanethiols**. Part 1, kinetics of the pyrolysis of butane-1-thiol, butane-2-thiol, and 2-methylpropane-2-thiol, 439.
- of 1-arylethyl esters, electrophilic aromatic reactivities *via*. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678. Part 14, non-additivity of methyl substituent effects: the reactivity selectivity principle, 1537. Part 15, non-additivity of chloro-substituent effects: mechanism of the elimination, 1541.
- of benzonitrile, arylation and transcyanation in. Vapour phase chemistry of arenes. Part 6, 1062.
- of nitropyridines, alkoxy nitroxide radicals from: a kinetic investigation by electron spin resonance spectroscopy, 1132.
- Pyrrole-**, furan-, and pyridine-carbaldehydes, conformations of: an *ab initio* molecular orbital study, 1601.
- Pyrroles**, electrophilic substitution in. Part 2, reaction with diazonium ions in acid solution, 1452.
- Pyrrolidin-2-one**, 1-(2-bromophenyl), and 1-(2-bromophenyl)azetid-2-one, conformation of, 547.
- Δ^3 - and Δ^4 -Pyrrolin-2-ones and model compounds, natural abundance carbon-13 and nitrogen-15 nuclear magnetic resonance studies of. ^{13}C Nuclear magnetic resonance of *N*-heterocycles. Part 2, 1746.
- 3H-Pyrrol-3-one**, 2,4,5-triphenyl-, 1-oxide and derived heterocycles heavily substituted with phenyl groups, 412.

Q

Quantification of the main source of catalytic power of *E. coli*(*lacZ*)- β -galactosidase, and S_N1 hydrolyses of glycosyl pyridinium salts, 1191.

Quartets, use of in the crystal structure determination of the methylcyclohexane clathrate; synthesis and properties of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenylquinazolin-4(3*H*)-one, 1427.

Quinazolin-4(3*H*)-one, 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenyl-, the inclusion compound, synthesis and properties of; use of quartets in the crystal structure determination of the methylcyclohexane clathrate, 1427.

[3,4-**a**]Quinolines, 7a, 8, 9, 10, 10a, 10b, 11, 12-octahydrocyclopent[5,6][1,3]oxazino, and 8, 9, 10, 11, 11a, 11b, 12, 13-octahydro-7a*H*-quino[1,2-*c*][1,3]benzoxazines, stereochemistry of. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 34, 1592.

Quinolinium, pyridinium, and pyrazinium salts, electron-transfer process with; an electron spin resonance study, 948.

Quinolin-8-yl phosphate, 4-nitrophenyl-, intramolecular nucleophilic catalysis in the hydrolysis of, 64.

Quinone methides, rates of reactions of with water, alcohols, phenols, and carboxylic acids. The chemistry of reactive lignin intermediates. Part 5, 1737.

vinyl-substituted, products of addition of methanol and water to. The chemistry of reactive lignin intermediates. Part 3, 616.

Quinuclidinium ion in water and tertiary aliphatic ammonium ions in 60% w/w methanol-water solution, thermodynamics of the acid dissociation of, 102.

R

Racemisation, thermal, of *N*-unsubstituted and various *N*-substituted *S*-*o*-methoxyphenyl *S*-phenyl sulphimides by pyramidal inversion, 1783.

Radiation, ionizing, triphenyl-phosphonium and -arsonium cations and various phosphoranyl and arsoranyl radicals derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of. Unstable intermediates. Part 173, 833.

chemistry of carbohydrates. Part 14, hydroxyl radical induced oxidation of D-glucose in oxygenated aqueous solution, 1958.

Radical, a stable benzo[*b*]furanyl, electron spin resonance study of, 1545.

cumylperoxyl, produced by the decomposition of cumene hydroperoxide, decay kinetics of, 622.

hydroxyl, induced oxidation of D-glucose in oxygenated aqueous solution. Radiation chemistry of carbohydrates. Part 14, 1958.

α -phenylethylperoxyl, interactions of metal ions with. Inhibition of oxidative induced decomposition of ($\alpha\alpha'$ -diphenyl)azoethane by transition metal ions, 59.

addition to alkynes and intramolecular reactions of vinyl radicals, electron spin resonance studies of, 827.

anions and nitroxides from alkylthio-, alkylsulphinyl-, and alkylsulphonyl-nitrobenzenes, 1252.

cation, the ammoniumyl (NH_3^{+}), generation and re-

actions of: an electron spin resonance investigation, 987.

cations, bipyridyl, study of. Part 4, reaction of diquat radical cation with oxygen and copper(II), 445. Part 5, effect of structure on the dimerisation equilibrium, 1787.

ions, acetanilide and phenyl acetate, mechanism of keten elimination from. Electron impact studies. Part 116, 1670.

Radicals, aliphatic and aromatic sulphinyl. Electron spin resonance studies. Part 51, 497.

alkoxyl and trimethylsiloxy, an electron spin resonance study of the reactions of with dialkyl sulphoxides, 1708.

alkoxy nitroxide, from photolysis of nitropyridines: a kinetic investigation by electron spin resonance spectroscopy, 1132.

2-alkoxycarbonylphenyl nitroxide, long-range couplings in, 904.

anion-, nitrophenoxatellurin, electron spin resonance spectra and electronic structure of, 529.

aryloxy, by photo-rearrangement of nitro-compounds, 1240.

bridgehead, the nucleophilicity of. Structural effects on the reactivity of carbon radicals in homolytic aromatic substitution. Part 4, 87.

t-butoxyl, hydrogen atom abstraction from polystyrene by, studied by spin trapping; effect of conformation on reactivity, 1416.

t-butyl, in solution, electron spin resonance measurements of the termination rate constants for, 1504.

dihydropyridyl, an electron spin resonance reinvestigation of, 943.

fluoroalkoxy- and fluoroalkyl-phosphoranyl, an electron spin resonance study of, 889.

from cyclic ethers containing six-membered rings, long-range interactions and line-width alternations associated with β - and γ -proton splittings in the e.s.r. spectra of. Investigations of structure and conformation. Part 7, 754.

hydrogen adduct, generated from indole and its derivatives in γ -irradiated methanolic glasses at 77 K, electron spin resonance study of, 347.

nucleophilic alkyl, displacement of the acyl group in benzothiazoles by. Homolytic aromatic *ipso*-substitution, 1679.

oxygenated, reactions of in the gas phase. Part 3, reactions of peracetyl radicals with alkenes, 360.

peroxyl, spin trapping of by phenyl *N*-*t*-butyl nitrene. Study of autoxidation by spin trapping, 1770.

phosphoranyl, stereochemical non-rigidity of: relative ligand apicophilicities, 730.

some 1,3-dioxolan-2-yl, e.s.r. studies of conformational preferences, radical-centre inversion, and restricted rotation about $\cdot\text{C}-\text{CH}_2$ in. Investigations of structure and conformation. Part 8, 1161.

tri(cyclohexyl)plumblyl, free radical adducts of with α -dicarbonyl compounds, 1633.

various phosphoranyl and arsoranyl, and triphenyl-phosphonium and -arsonium cations derived from triphenylphosphine and its oxide, sulphide, and selenide and triphenylarsine and its oxide by the action of ionizing radiation. Unstable intermediates. Part 173, 833.

Radiolysis of thiols, the structure of intermediates formed in. Unstable intermediates. Part 178, 2005.

- Raman optical activity** of camphor and related molecules, 1074.
of simple chiral molecules; methyl and trifluoromethyl asymmetric deformations, 1790.
- spectra** and infrared spectra of some methyl-substituted trimethyl sulphites. Chemistry of the S=O bond. Part 6, 612.
- Rappoport and Topol**, criticism of a paper by; stereochemistry of nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles, 997.
- Rate** of gas-phase decarboxylation of β -unsaturated acids, effect of $\beta\gamma$ -substituents on. Studies in decarboxylation. Part 10, 745.
- constants** for the diazotisation of substituted anilines by nitrosyl chloride and nitrosyl thiocyanate, indirect measurement of, 502.
for the substitution of tetraethyltin by mercury(II) carboxylates in *t*-butyl alcohol, acetonitrile, acetone, and ethyl acetate. Substitution at saturated carbon. Part 22, 1225.
termination, for *t*-butyl radicals in solution, electron spin resonance measurements for, 1504.
- Rates** and deuterium kinetic isotope effects. Solvolysis of *endo*- and *exo*-bicyclo[3.2.1]octan-3-yl toluene-*p*-sulphonates. Part 2, 1991.
of alkaline hydrolysis, electronic effects of substituents at phosphorus on, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies. Heteroaryl-, heteroarylmethyl- and substituted aryl-phosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
of hydrogen exchange in thioamides, 1385.
of hydrolysis of some *N*-arylazetid-2-ones (*N*-aryl- β -lactams), a study of factors affecting, 765.
of ionisation and the acidities of protonated *meso*-tetraarylporphyrins, substituent effects on, 2076.
of proton transfer, acid dissociation constants and the strengths of intramolecular hydrogen bonds in 8-methoxy-*NN*-dimethyl-1-naphthylammonium ion and 8-hydroxy-*NN*-dimethyl-1-naphthylamine, 152.
from protonated 1,8-bis(dimethylamino)- and 1,8-bis(diethylamino)-naphthalene to hydroxide ion in 20% and 30% (v/v) dimethyl sulphoxide-water, 1589.
of reactions of quinone methides with water, alcohols, phenols, and carboxylic acids. The chemistry of reactive lignin intermediates. Part 5, 1737.
- α : β Ratio** for electrophilic attack, and for product formation, in cholest-5-enes, factors affecting; chlorination of cholest-5-ene and its 3-substituted derivatives including cholest-5-en-3-one. The kinetics and mechanisms of addition to olefinic substances. Part 15, 2062.
- X-Ray** and neutron diffraction studies, potassium hydrogen dicarbonate. Crystal structures of some acid salts of monobasic acids. Part 19, 1740.
and nuclear magnetic resonance investigation: crystal structure and molecular conformation of 2',3'-O-methoxymethyleneneuridine, 487.
and ^1H nuclear magnetic resonance study of dihedral bond angles in the *gauche* O-CH₂-CH₂-O moiety of cyclic 7,8-dihydrodibenzo[*f,h*][1,4]dioxecin, 1942.
- analysis** of (–)-mesembrane hydrochloride monohydrate: structure and absolute stereochemistry of (–)-mesembrane and 3'-methoxy-4'-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus. Sceletium alkaloids. Part 7, 1098.
- crystallographic analysis** of paucin monohydrate, a pseudoguaianolide glucoside. Sesquiterpenoids. Part XXIV, 259.
determination of the molecular conformation of the germacranolide alatolide monohydrate. Sesquiterpenoids. Part XXIII, 255.
- crystal structure analysis** and properties of (*Z*)-2-hydroxyimino-4-methyl-2*H*-1,3-benzo[*e*]thiazine. Condensation of *o*-thiocyanatoacetophenone with hydroxylamine, 1114.
of 17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one (nor-ethynodrel): conformational preferences of ring A in 3-oxo- $\Delta^{5,10}$ -steroids, 379.
- crystal structure** and preparation: derivatives of 1-aryl-3-imidopyridiniums. 1,3-Dipolar character of six-membered aromatic rings. Part 32, 1304.
- structural analysis** and conformational analysis of the *Erythrina* alkaloids cocculine and coccutrine, 1156.
and synthesis of 4-*p*-hydroxyphenyl-2,2,4,7-tetramethylthiochroman, 1145.
- structure** and synthesis of methyl 2-oxopyrimido[2,1-*b*]-benzothiazole-4-carboxylate from condensation of 2-aminobenzothiazole and dimethyl but-2-ynedioate, 1070.
of a novel product formed from 2,5-dimethylhex-3-yne-2,5-diol by catalytic action by dibromobis(triphenylphosphine)nickel, 1011.
- Reaction**, redox, between pyridinium salts and alkoxides in tetrahydrofuran, mechanistic studies of: pyridinium salts and dihydropyridines, 759.
the ene, of maleic anhydride with alkenes, 533.
- heats**, isodesmic and homodesmotic, various, comparison of with values derived from published *ab initio* molecular orbital calculations, 1036.
- intermediates** formed by addition of thiohypochlorous acid to ethylene, *ab initio* SCF-MO study of, 1019.
- pathway**, an intermolecular, evidence for: the rearrangement of phenylsulphamic acid to aniliniumsulphonic acids in concentrated sulphuric acid. Aromatic sulphonation. Part 56, 921.
- E2C* and *E2H*, of cyclohexyl toluene-*p*-sulphonate with triphenylphosphine and other neutral bases. Eliminations promoted by weak bases. Part 7, 293.
- base-promoted elimination and base-catalysed 1,3-proton transfer, extreme deuterium isotope effects as evidence of ion-pair intermediates in, 1569.
- dehalogenation, of vicinal dihalides. Part V, kinetic studies of the reactions of 1,2-dihalogeno-1,2-diphenylethanes with triphenylphosphine, 140.
- dye-sensitised oxygenation, concerning the use of amines as probes for participation of singlet oxygen in, 178.
- photo-oxidation, factors affecting, 169.
- electro-organic. Part 10, mechanism of anodic cleavage of dibenzyl ether, 803.
- heteroaromatic hydrogen exchange. Part 9, acid catalysed decarboxylation of indole-3-carboxylic acids, 281.
- intramolecular, of vinyl radicals and radical addition to alkynes, electron spin resonance studies of, 827.
- mercury(II) cyanide promoted, of 2-*O*-acetyl-3,4,6-tri-*O*-methyl- α -D-glucopyranosyl bromide with cyclohexanol in benzene-nitromethane, mechanistic study of. Koenigs-Knorr reactions. Part 3, 795.
- not following the Hammett relation, the analysis of substituent effects for, 2033.

Reaction, pathway, (contd.)

- nucleophilic, of thioketones, angular *versus* linear transition state in, 1169.
- ring closure. Part 6, intermolecular models for intramolecular reactions. Reactions between long-chain alkanolate ions and alkyl bromides as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions, 443.
- Reactivities**, electrophilic aromatic, *via* pyrolysis of 1-aryl-ethyl esters. Part 13, carbon-carbon hyperconjugation and the origin of the Baker-Nathan effect, 678. Part 14, non-additivity of methyl substituent effects: the reactivity selectivity principle, 1537. Part 15, non-additivity of chloro-substituent effects: mechanism of the elimination, 1541.
- Reactivity**, aromatic, effect of strain on: protiodetritiation of 1,2-diphenylethane and 9,10-dihydrophenanthrene. Electrophilic aromatic substitution. Part 19, 866.
- effect of conformation on; hydrogen atom abstraction from polystyrene by *t*-butoxyl radicals, studied by spin trapping, 1416.
- of carbon radicals in homolytic aromatic substitution, structural effects on. Part 4, the nucleophilicity of bridgehead radicals, 87.
- of 1,3-dipoles in aqueous solution. Part 1, stereospecific formation of *Z*-amidoximes in the reaction of benzonitrile oxides with amines, 1457.
- of primary and secondary amines with 2-nitrophenazine 10-oxide, 1661.
- the homolytic, of stannacycloalkanes. Homolytic organometallic reactions. Part 13, 1499.
- unusual nucleophilic, of un-ionised [20]paracyclophane oximes provided by hydrophobic effects. Macrocyclic enzyme model systems, 32.
- parameters**, substituent, and nuclear magnetic resonance substituent chemical shifts in benzene derivatives, on the interpretation of linear correlations between, 769. Part 2, the usefulness of ^{13}C - ^1H one-bond coupling constants as selectivity parameters in the synthesis of organolithium compounds, 473.
- selectivity relationships**. Part 5, effect of solvent ionising power on the selectivity of diphenylmethyl derivatives, 1860.
- Rearrangement**, base- and acid-catalysed, of pseudo to normal methyl 8-(3- or 4-substituted benzoyl)-1-naphthoates and 2-(3- or 4-substituted benzoyl)benzoates. Ring-chain tautomerism. Part 6, 1927.
- configurational assignment, and interconversion of the *E*- and *Z*-isomers of a new group of *O*-acyl isoamides; acylation of *O*-alkylbenzohydroxamic acids, 1080.
- of phenylsulphamic acid to aniliniumsulphonic acids in concentrated sulphuric acid: evidence for an intermolecular reaction pathway. Aromatic sulphonation. Part 56, 921.
- photochemical, of phenyl benzenesulphonates, 1629.
- the base-catalysed, of epoxides derived from the epoxidation of cholest-5-en-3-one, stereochemistry of, 975.
- the Cornforth, MINDO/3 study of. Ground states of molecules. Part 35, 724.
- the Fischer-Hepp, and denitrosation, kinetics and mechanism of. Part 9, ring-methyl substituent effects, 44.
- the Jacobsen, of the tetraethylbenzenesulphonic acids. Sulphonation of polyethylbenzenes. Aromatic sulphonation. Part 54, 724.
- products**, indane-1,2,3-trione 2-(*N*-benzoyl-*N*-phenylhydrazone) and indane-1,2,3-trione 2-(*N*-bromobenzoyl-*N*-phenylhydrazone), molecular conformations and crystal structures of. 1,3-Benzoyl migration of 2-benzoyl-2-phenylazoindane-1,3-dione, 847.
- Rearrangements** accompanying oxidative photoaddition of nitrosoamines to bicyclo[2.2.1]heptadiene, cyclo-octa-1,5-diene, and cyclohexa-1,3-diene, 93.
- catalysed prototropic. Part 3, metal carbonyl-catalysed isomerisation of *N*-allylsulphonamides to *N*-prop-2-enyl and *N*-propylidene derivatives, 11.
- involving a *C*-nitroso-group: formation of dihydroxylamines and nitroxides, 1255.
- Receptor antagonists**, histamine H_2 -, crystal and molecular structure of, *N*-methyl-*N'*-(2-[(5-methylimidazol-4-yl)methylthio]ethyl)thiourea (metamide) and *N*-{2-[(imidazol-4-yl)methylthio]ethyl}-*N'*-methylthiourea (thiaburimamide), 68.
- Redetermination** and refinement of the crystal structure of dithizone, 1248.
- by neutron diffraction of the crystal structure of potassium hydrogen bisphenylacetate. Crystal structures of some acid salts of monobasic acids. Part 18, 979.
- Redox reaction** between pyridinium salts and alkoxides in tetrahydrofuran, mechanistic studies of: pyridinium salts and dihydropyridines, 759.
- Reduction** and fragmentation reactions by aldehydes. Photochemistry of some cyclopropyl conjugated 1,2-diketones. Part 2, 710.
- of benzaldehyde by tritiated sodium borohydride (tetrahydridoborate), hydrogen isotope exchange in the aldehyde group during, 1472.
- of carbonyl compounds by sodium borohydride (tetrahydridoborate) in water, dimethyl sulphoxide, and their mixtures as solvents: products and kinetics, 1466.
- auto-oxidation** of substituted nitrosobenzenes in cyclohexane, kinetics of, 1989.
- Re-evaluation** of the Hammett σ_p values for the hydroxymethyl and formyl groups, 993.
- Refinement** and redetermination of the crystal structure of dithizone, 1248.
- Reinvestigation**, an electron spin resonance, of dihydropyridyl radicals, 943.
- Relationships**, empirical, limitations of involving observed nitration rates and acidity functions. The M_C activity coefficient function for acid-base equilibria. Part 4, 845.
- reactivity selectivity. Part 5, effect of solvent ionising power on the selectivity of diphenylmethyl derivatives, 1860.
- Relaxation probe**, nuclear magnetic resonance, conformations of various tetracycline species determined with the aid of, 1319.
- Retinals**, determination of the solution conformation of by using lanthanoid shift reagents, 1400.
- Ring**, fused aromatic, effect of on the conformational preferences of perhydropyrido[1,2-*c*][1,3]oxazines and related compounds. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 33, 370.
- A in 3-oxo- $\Delta^{5,10}$ -steroids, conformational preference of: X-ray crystal structure analysis of 17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one (norethynodrel), 379.
- chain tautomerism**. Part 6, base- and acid-catalysed rearrangement of pseudo to normal methyl 8-(3- or

Ring-chain tautomerism (*cont'd.*)

4-substituted benzoyl)-1-naphthoates and 2-(3- or 4-substituted benzoyl)benzoates, 1927.

closure reactions. Part 6, intermolecular models for intramolecular reactions. Reactions between long-chain alkanoate ions and alkyl bromides as intermolecular analogues of the lactonisation of ω -bromoalkanoate ions, 443.

inversion in *cis*-1,2-, *trans*-1,3-, and *cis*-1,4-dimethylcyclohexane, application of the Forsén-Hoffman spin-saturation method and ^{13}C nuclear magnetic resonance spectroscopy to the determination of the barrier to, 84.

opening and closing in heterocyclic compounds. Kinetic studies on solvent effects in the reaction between 6-nitrobenzothiazole and methoxide ion at 25 °C, 20.

base catalysed, of 3-unsubstituted isoxazoles. Derivatives of 4- and 5-phenylisoxazole, 1121.

Ring-methyl substituent effects. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part 9, 44.

Rings, aromatic six-membered, 1,3-dipole character of. Part 32, derivatives of 1-aryl-3-imidopyridiniums: preparation and X-ray crystal structure, 1304.

five-membered, steric effects in. Part 7, relative stabilities of cyclopentane-1,3-dicarboxylate diesters, 75.

six-membered, barriers to nitrogen inversion in. Ring and nitrogen inversion in some methylene bridged bisheterocycles, 588.

long-range interactions and line-width alternation associated with β - and γ -proton splittings in the e.s.r. spectra of radicals from cyclic ethers containing. Investigations of structure and conformation. Part 7, 754.

two aromatic connected by C-C and -C- linkages, transmission of substituent effects across. Fluorine-19 nuclear magnetic resonance studies of aromatic compounds. Part 5, 1051.

Rotation, restricted, about C-CH₃, conformational preferences, and radical-centre inversion in some 1,3-dioxolan-2-yl radicals, e.s.r. studies of. Investigations of structure and conformation. Part 8, 1161. Part 2, further studies of barriers to rotation in some 3-aryl-cyclohexenone derivatives: effect of substituents on the free energy of activation, 356.

Rotational barriers in 1-dimethylamino-3-dimethylimino-2-(*para*-substituted phenyl)propene perchlorates, 1388.

Route, the peroxy-acid-imine, to optically active oxaziridines, absolute stereochemistry of, 1339.

S

Salts, some acid, of monobasic acids, crystal structures of. Part 18, potassium hydrogen bisphenylacetate, redetermined by neutron diffraction, 979. Part 19, potassium hydrogen dicrotonate, X-ray and neutron diffraction studies, 1740.

Sceletium alkaloids. Part 7, structure and absolute stereochemistry of (-)-mesembrane and 3'-methoxy-4'-O-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus: X-ray analysis of (-)-mesembrane hydrochloride monohydrate, 1098.

Schiff's bases, conjugated. Part 8, structure and spectral

properties of *p*-*NN*-dimethylaminoanils of some vicinal diketone-compounds. Positive solvatochromic effect, 1893.

Scopolamine and atropine cations in aqueous solution, nuclear magnetic resonance study of the conformations of, 2016.

Selectivity of diphenylmethyl derivatives, effect of solvent ionising power on. Reactivity selectivity relationships. Part 5, 1860.

parameters, the usefulness of ^{13}C - ^1H one-bond coupling constants as in the synthesis of organolithium compounds. Reactivity parameters. Part 2, 473.

Selenophen, furan, thiophen, and tellurophen, a comparative study of electric dipole moments of 2-substituted derivatives of, 769.

Self-association and hydration of adenosine triphosphate, adenosine diphosphate, and their 1 : 1 complexes with magnesium(II) at various pH values: infrared investigations, 1824.

and hydrogen bonding abilities of some potentially bifunctional catalysts. Part 2, mercaptoazole derivatives, 1015.

Series reactions, branched, kinetic analysis of the reaction of imidazole buffer solutions with β -propiolactone using a novel graphical method for. Strain effects in acyl transfer reactions. Part 4, 1492.

Serine proteases, hydrolyses of *O*-acylglycolamides as models of the deacylation step in the mechanism of action of: function of the oxyanion pocket, 1221.

Sesquiterpenoids. Part XXIII, X-ray crystallographic determination of the molecular conformation of the germanolide alatolide monohydrate, 255. Part XXIV, X-ray crystallographic analysis of paucin monohydrate, a pseudoguaianolide glucoside, 259.

Shielding effects, ^{13}C , at γ -carbon atoms in the side-chains of α -amino-acids, 50.

Shift measurements, proton and carbon-13 chemical, on 4-substituted styrenes, substituent effect of the groups CH₂M(CH₃)₃ (M = C to Pb) and M(CH₃)₃ (M = Si to Pb) from, 971.

Shifts, aromatic solvent induced, in molecules with and without a permanent electric dipole moment, 1656.

benzene-induced, and substituent effects in the proton magnetic resonance spectra of *N*-(4-methoxybenzylidene)anilines, 715.

carbon-13 chemical, in 1-substituted camphenilones and some derived *N*-nitro-imines, substituent effects on, 125.

^{13}C contact, of α -bonded molecules, electronic and structural effects on, 809.

nuclear magnetic resonance substituent chemical, and substituent reactivity parameters in benzene derivatives, on the interpretation of linear correlations between, 769.

Shpol'skii spectra and the magnetic circular dichroism of palladium, zinc, and magnesium porphyrin, a comparison between. Magnetic circular dichroism studies. Part 45, 337.

Side-chains of α -amino-acids, ^{13}C shielding effects at γ -carbon atoms in, 50.

Silin, 10,10-dimethylphenoxathia-, -germin, and -stannin derivatives and 9,9-dimethylthioxanthen, oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of. Group IVB heterocyclic compounds, 689.

Siloxyl, trimethyl-, and alkoxy radicals, an electron spin resonance study of the reactions of with dialkyl sulphoxides, 1708.

- Silver salt** of antibiotic A-130A, crystal and molecular structure of, 1531.
- Silver salts** in acetonitrile, kinetics of the reactions of *t*-butyl chloride and $[^2\text{H}_9]\text{t}$ -butyl chloride with, 201.
- Sites**, chemically different, mechanism of dye binding to. Polyanions and their complexes. Part 10, 38.
- Sodium borohydride** (tetrahydridoborate) in water, dimethyl sulphoxide, and their mixtures as solvents, reduction of carbonyl compounds by; products and kinetics, 1466.
- tritiated, (tetrahydridoborate), hydrogen isotope exchange in the aldehyde group during the reduction of benzaldehyde by, 1472.
- ethoxide** addition to 2,4-dinitro-6-X-phenetoles in ethanol, equilibrium and kinetic data for. The stabilities of Meisenheimer complexes. Part 14, 1442.
- Solutes**, other aromatic, and benzyl alcohol, a nuclear magnetic resonance investigation of complex formation between imipramine and related psychotropic drugs with, 1964.
- Solution conformation** of retinals, determination of by using lanthanoid shift reagents, 1400.
- Solvatochromic effect**, positive. Structures and spectral properties of *p*-*NN*-dimethylaminoanils of some vicinal diketo-compounds. Conjugated Schiff's bases. Part 8, 1893.
- Solvent**, solvolytic, characteristic features of phenol as a: phenolyses of 1-aryl-1-methylethyl *p*-nitrobenzoates and some simple alkyl systems, 594.
- dependence** of kinetic hydrogen isotope effects for simple proton transfer, 1812.
- effects** and temperature effects on the optical rotation and conformation of model carbohydrates. Polysaccharide conformation. Part 10, 191.
- in the reaction between 6-nitrobenzothiazole and methoxide ion at 25 °C, kinetic studies of. Ring opening and closing in heterocyclic compounds, 20.
- on thiamine-enzyme model interactions. 2,3,4-Trimethylthiazolium iodide, a model for interaction with negative charges, 1484.
- ionising power**, effect of on the selectivity of diphenylmethyl derivatives. Reactivity selectivity relationships. Part 5, 1860.
- polarity**, a model process for measurement of, 1111.
- Solvents**, alcoholic, effect of on the enthalpy and entropy of the tetraethyltin-mercury(II) chloride transition state and of the *t*-butyl chloride solvolysis transition state; comparison with 1 : 1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
- aqueous-organic mixed, solvolysis rates in. Part 4, kinetics of the alkaline decarboxylation of trichloroacetate ion in water-methanol solutions, 1237.
- Solvolysis**, acid-catalysed, of 2-diazo-4'-methoxy- and 2-diazo-2-phenyl-acetophenone in aqueous-organic mixtures, 302.
- of *endo*- and *exo*-bicyclo[3.2.1]octan-3-yl toluene-*p*-sulphonates. Part 2, rates and deuterium kinetic isotope effects, 1991.
- of ring-substituted β -styryl trifluoromethanesulphonates, secondary kinetic deuterium isotope effects in. Vinyl cations. Part 13, 1486.
- versus* sulphonation. Phenylsulphamic acid in sulphuric acid. Aromatic sulphonation. Part 57, 929.
- the *t*-butyl, transition state and the tetraethyltin-mercury(II) chloride transition state, effect of alcoholic solvents on the enthalpy and entropy of; comparison with 1 : 1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
- rates** in aqueous-organic mixed solvents. Part 4, kinetics of the alkaline decarboxylation of trichloroacetate ion in water-methanol solutions, 1327.
- Spectral properties** and structures of *p*-*NN*-dimethylaminoanils of some vicinal diketo-compounds. Positive solvatochromic effect. Conjugated Schiff's bases. Part 8, 1893.
- Spectroscopic study** and thermodynamic study of *cis*- and *trans*-penta-1,3-diene. Conformations of conjugated hydrocarbons, 1311.
- of mono- and di-protonation sites in *N*-ammonio-amidates, 909.
- Spectroscopy**, dipole moments, and nucleophilic reactivity, a conformational study by: 2-chloromethylenecycloheptanones and -octanones, 1301.
- Spin density** in the cation, neutral, and nitroxide radicals of phenothiazine, substituent effects on the distribution in. Heterocyclic free radicals. Part 7, 517.
- trapping**, hydrogen atom abstraction from polystyrene by *t*-butoxyl radicals, studied by; effect of conformation on reactivity, 1416.
- study of autoxidation by. Spin trapping of peroxy radicals by phenyl *N*-*t*-butyl nitron, 1770.
- Spin-saturation** method, the Forsén-Hoffman, and ^{13}C nuclear magnetic resonance spectroscopy, application of to the determination of the barrier to ring inversion in *cis*-1,2-, *trans*-1,3-, and *cis*-1,4-dimethylcyclohexane, 84.
- Stabilisation** of singlet ethoxycarbonylnitrene. Effect of dichloromethane on insertion into tetrahydrofuran and cyclohexane, 80.
- Stabilities** of Meisenheimer complexes. Part 14, equilibrium and kinetic data for sodium addition to 2,4-dinitro-6-X-phenetoles in ethanol, 1442.
- relative, of cyclopentane-1,3-dicarboxylate diesters. Steric effects in five-membered rings. Part 7, 75.
- Stability** of carbonium ions. Part 3, the transmission of substituent effects across the fluorene and biphenyl systems, 426.
- Stannacycloalkanes**, the homolytic reactivity of. Homolytic organometallic reactions. Part 13, 1499.
- Stannin**, 10,10-dimethylphenoxa-, -silin, and -germin derivatives and 9,9-dimethylthioxanthen, oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of. Group IVB heterocyclic compounds, 689.
- Stereochemical analysis** of vitamin D molecules. Crystal structure of 25-hydroxy-vitamin D₃ monohydrate, 393.
- investigations** of heterocyclic compounds. Part 4, crystal and molecular structure of 3-chloro-5-cyclohexylamino-1-di-isopropylamino-1*H*-1,2,4,6-thia(IV)-triazine, 1322.
- non-rigidity** of phosphoranyl radicals: relative ligand apicophilicities, 730.
- studies**. Part 29, crystal structure of 2-benzyl-1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl-1-phenylisoquinolinium iodide, 1141.
- Stereochemistry**, absolute, and structure of (–)-mesembrane and 3'-methyl-4'-*O*-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus: X-ray analysis of (–)-mesembrane hydrochloride monohydrate. Sceletium alkaloids. Part 7, 1098.
- of the peroxy-acid-imine route to optically active oxaziridines, 1339.

Stereochemistry (*contd.*)

- of anticholinergic agents. Part 10, crystal and molecular structure of the (*R*)-enantiomer of *N*-[2-(2-cyclohexylmandeloyloxy)ethyl]-*N*-methylpiperidinium iodide, 643.
- of bimolecular displacement in azavinyl systems; crystal and molecular structure of *N*-(2,4-dinitrophenyl)-*N*-methylpivalohydrazonyl bromide, 1136.
- of cathodic pinacolisation of acetophenone, effects of ion-pairing and adsorption on, 99.
- of epoxidation of cholest-5-en-3-one and of the base-catalysed rearrangement of the derived epoxides, 975.
- of nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; criticism of a paper by Rappoport and Topol, 997.
- of 8,9,10,11a,11b,12,13-octahydro-7a*H*-quino[1,2-*c*][1,3]-benzoxazines and 7a,8,9,10,10a,10b,11,12-octahydrocyclopent[5,6][1,3]oxazino[3,4-*a*]quinolines. Proton magnetic resonance studies of compounds with bridgehead nitrogen. Part 34, 1592.
- Stereodynamics** of hindered hydrazones, effect of aromatic substituents on. Conformational studies by dynamic magnetic resonance. Part 8, 1666.
- Stereospecific formation** of *Z*-amidoximes in the reaction of benzonitrile oxides with amines. Reactivity of 1,3-dipoles in aqueous solution. Part 1, 1457.
- Steric effects**, calculations of. Part 3, the anion-catalysed substitution of alkylmercury(II) bromides by mercury(II) bromide in ethanol, 221.
- correlation between the basicity constants, corrected for, and Taft σ^* values for some ketones and nitriles. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- in di- and tri-arylmethane dyes. Part 13, electronic absorption spectra of derivatives of Crystal Violet, Malachite Green, and Michler's Hydrol Blue exhibiting simultaneous central and terminal steric distortion, 450.
- in five-membered rings. Part 7, relative stabilities of cyclopentane-1,3-dicarboxylate diesters, 75.
- hindrance** in substituted dibenzofurans, 54.
- to termolecular complex formation in an electron-donor-acceptor complex of 2,7-dinitro-1,6-methano[10]-annulene, 994.
- Steroid analogues** of unnatural configuration. Part XI, crystal and molecular structure of 3 α -17 α -dihydroxy-4,4,14 α -trimethyl-19-nor-10 α -pregn-5-ene-11,20-dione and a circular dichroism study of the conformation of the acetyl side-chain of the 17-hydroxy-isomers in solution, 402.
- Steroids**, 3-oxo- $\Delta^5,10$ -, conformational preference of ring A in: *X*-ray crystal structure analysis of 17 α -ethynyl-17 β -hydroxyestr-5(10)-en-3-one (norethynodrel), 379.
- Strain**, effect of on aromatic reactivity: protiodetritiation of 1,2-diphenylethane and 9,10-dihydrophenanthrene. Electrophilic aromatic substitution. Part 19, 866.
- effects** in acyl transfer reactions. Part 4, kinetic analysis of the reaction of imidazole buffer solution with β -propiolactone using a novel graphical method for branched, series reactions, 1492.
- Structural analysis**, *X*-ray, and conformational analysis of the *Erythrina* alkaloids cocculine and coccutrine, 1156.
- X*-ray, and synthesis of 4-*p*-hydroxyphenyl-2,2,4,7-tetramethylthiochroman, 1145.

- effects** and electronic effects on the ^{13}C contact shifts of α -bonded molecules, 809.
- on the electrochemistry and charge distribution of mono-, di-, and tri-cyanovinyl aromatic compounds, 1643.
- on the reactivity of carbon radicals in homolytic aromatic substitution. Part 4, the nucleophilicity of bridgehead radicals, 87.
- studies** of analgesics and their interactions. Part 4, crystal structures of phenylbutazone and a 2:1 complex between phenylbutazone and piperazine, 693.
- Structure** and absolute stereochemistry of (–)-mesembrane and 3'-methoxy-4'-*O*-methyljoubertiamine, two minor bases from *S. namaquense* L. Bolus: *X*-ray analysis of (–)-mesembrane hydrochloride monohydrate. Sceletium alkaloids. Part 7, 1098.
- and conformation, investigations of. Part 6, long-range interactions and line-width alternation for γ -proton splittings in $\cdot\text{CH}_2\text{OCH}_2\text{OCH}_3$: temperature-dependent electron spin resonance spectra, 116. Part 7, long-range interactions and line-width alternation associated with β - and γ -proton splittings on the e.s.r. spectra of radicals from cyclic ethers containing six-membered rings, 754. Part 8, e.s.r. studies of conformational preferences, radical-centre inversion, and restricted rotation about $\cdot\text{C}-\text{CH}_3$ in some 1,3-dioxolan-2-yl-radicals, 1161.
- and conformation of 4-nitrophenyl acetate from proton nuclear magnetic resonance of nematic solutions, 1383.
- and conformation of β -thiodan in the solid state and in solution. Application of the infrared-*X*-ray method, 144.
- and mechanism of formation of the intermediates in the reactions between amides and CSCl_2 or PSCl_3 , or between thioamides and COCl_2 , POCl_3 , or PSCl_3 . Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- effect of on the dimerisation equilibrium. Study of bipyridyl radical cations. Part 5, 1787.
- electronic, and electron spin resonance spectra of nitrophenoxatellurin anion-radicals, 529.
- and molecular conformation of azomethines. Part 5, determination of the conformation of some *N*-methylimine derivatives of aldehydes and ketones from dipole moment data, 2038.
- fixed, models of, and hydroxy- and mercapto-pyridines, photoelectron spectra of, 1652.
- of intermediates formed in the radiolysis of thiols. Unstable intermediates. Part 178, 2005.
- of photoisomer F, and internal and external heavy atom effects: reversible photochemistry of 10,10'-dimethylbiacridan, 550.
- X*-ray, and synthesis of methyl 2-oxopyrimido[2,1-*b*]-benzothiazole-4-carboxylate from condensation of 2-aminobenzothiazole and dimethyl but-2-ynedioate, 1070.
- X*-ray, of a novel product formed from 2,5-dimethylhex-3-yne-2,5-diol by catalytic action of dibromobis-(triphenylphosphine)nickel, 1011.
- Structures** and spectral properties of *p*-*NN*-dimethylaminoanils of some vicinal diketo-compounds. Positive solvatochromic effect. Conjugated Schiff's bases. Part 8, 1893.

- Studies**, conformational, by dynamic nuclear magnetic resonance. Part 8, effect of aromatic substituents on the stereodynamics of hindered hydrazones, 1666.
- electron impact. Part 116, mechanism of keten elimination from acetanilide and phenyl acetate radical ions, 1670.
- intramolecular O-H... π interaction, in homoallyl alcohols, 1821.
- mechanistic, in the chemistry of urea. Part 2, reaction with benzil, 4,4'-dimethylbenzil, and 4,4'-dimethoxybenzil, 1972.
- ab initio*, of the strongest type of hydrogen bond: carboxylic acid-fluoride systems, 2079.
- X-ray and neutron diffraction, of potassium hydrogen dicrotonate. Crystal structures of some acid salts of monobasic acids. Part 19, 1740.
- Study**, a conformational, of bicyclo[3.1.0]hexene. Crystal and molecular structure of *N'*-isopropylidenebicyclo[3.1.0]hexane-6-*exo*-carbohydrazide, 1577.
- a fluorimetric and electron spin resonance, of the oxygenation of benzo[*a*]pyrene; an interpretation of the oxidation, 1172.
- a hydrogen-1 and carbon-13 structural and dynamic, of various substituted iminium salts. Nuclear magnetic resonance investigation of iminium ion intermediates. Part 6, 536.
- an *ab initio* molecular orbital: conformations of furan-, pyrrole-, and pyridine-carbaldehydes, 1601.
- infrared spectroscopic, on imidazolidine-2-thione and -2-selone, 1529.
- mechanistic, of the decomposition of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by iron(II) and iron(III) ions stabilised by ethylenediamine-tetra-acetic acid, 1868.
- ¹H Nuclear magnetic resonance and X-ray, of dihedral bond angles in the *gauche* O-CH₂-CH₂-O moiety of cyclic 7,8-dihydrodibenzo[*f,h*][1,4]dioxecin, 1942.
- of autoxidation by spin trapping. Spin trapping of peroxy radicals by phenyl *N*-*t*-butyl nitron, 1770.
- MINDO/3, of the Cornforth rearrangement. Ground states of molecules. Part 35, 724.
- of the Hammett equation for the ionisation of substituted benzoic acids and phenols in dioxan-water mixtures, 1513.
- ab initio* SCF-MO, of the reaction intermediates formed by addition of thiohypochlorous acid to ethylene, 1019.
- theoretical, on the bridging ability of oxygen and sulphur in vinyl cations, 542.
- Styrenes** and tertiary amines, excited complex formation between, 2002.
- 4-substituted, substituent effects of the groups CH₂M-(CH₃)₃ (M = C to Pb) and M(CH₃)₃ (M = Si to Pb) from proton and carbon-13 chemical shift measurements on, 971.
- the triplet state of, 182.
- β -Styryl trifluoromethanesulphonates**, ring substituted, secondary kinetic deuterium isotope effects in the solvolysis of. Vinyl cations. Part 13, 1486.
- Substituent** at C-5 of the pyranose ring in catalysis by *E. coli*(*lacZ*)- β -galactosidase, role of, 1198.
- chemical shifts**, nuclear magnetic resonance, and substituent reactivity parameters in benzene derivatives, on the interpretation of linear correlations between, 769.
- effects** and benzene-induced shifts in the proton magnetic resonance spectra of *N*-(4-methoxybenzylidene)-anilines, 715.
- chloro-, non-additivity of: mechanism of the elimination. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 15, 1541.
- for reactions not following the Hammett relation, analysis of, 2033.
- in the biphenyl series. Part IV, the kinetics of piperidinobromination of 4'-substituted 3-bromo-nitro-biphenyls, 137.
- in the tricarbonylcyclobutadieneiron system, 907.
- methyl, non-additivity of: the reactivity selectivity principle. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part 14, 1537.
- of phosphorus- and arsenic-containing groups in aromatic substitution. Part 7, comparison of carboxy and phosphonic groups, 1479.
- on the acidities and rates of ionisation of protonated *meso*-tetra-arylporphyrins, 2076.
- of the groups CH₂M(CH₃)₃ (M = C to Pb) and M(CH₃)₃ (M = Si to Pb) from proton and carbon-13 chemical shift measurements on 4-substituted styrenes, 971.
- on carbon-13 chemical shifts in 1-substituted camphenilones and some derived *N*-nitro-imines, 125.
- on the distribution of spin density in the cation, neutral, and nitroxide radical of phenothiazine. Heterocyclic free radicals. Part 7, 517.
- ring-methyl. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part 9, 44.
- the transmission of across the fluorene and biphenyl systems. Stability of carbonium ions. Part 3, 426.
- transmission of across two aromatic rings connected by C-C and -C- linkages. Fluorine-19 nuclear magnetic resonance studies of aromatic compounds. Part 5, 1051.
- Substituents**, aromatic, effect of on the stereodynamics of hindered hydrazones. Conformational studies by dynamic nuclear magnetic resonance. Part 8, 1666.
- at phosphorus, electronic effects of on the rates of alkaline hydrolysis, and phosphorus-31 nuclear magnetic resonance and phosphoryl infrared stretching frequency studies. Heteroaryl-, heteroarylmethyl-, and substituted aryl-phosphonate esters. The chemistry of heteroarylphosphorus compounds. Part 7, 789.
- chlorine, in nucleophilic aromatic substitution, orienting effects of. Mechanisms for reactions of halogenated compounds. Part 2, 1774.
- effect of on the free energy of activation: further studies of barriers to rotation in some 3-arylcyclohexenone derivatives. Restricted rotation. Part 2, 356.
- electron-withdrawing, the effect of on the tautomerism between 1-aryl-3-methyltriazines and 3-aryl-1-methyltriazines, 17.
- oxa- and thia-, in five-membered S-linked heterocycles, σ_{Het} constants for, and effects of substituents in the *N*-linked aromatic ring: the acid dissociation of arenesulphonamides, 984.
- phenyl and vinyl, at the α -carbon atom, influence of. Decomposition of carbamates of tertiary alcohols. Part 3, 879.
- positively charged, a theoretical investigation of the effect of on product distribution in electrophilic aromatic substitution; evidence for a dominant field effect of the positive poles, 1066.

Substituents, (contd.)

- the effect of on the photochemistry of phenazine *N*-oxides, 238.
- β -Substituents**, effect of on the rate of gas-phase decarboxylation of $\beta\gamma$ -unsaturated acids. Studies in decarboxylation. Part 10, 745.
- Substitution**, aromatic halogen, the kinetics and mechanisms of. Part 34, comments on the physical interpretation of high kinetic orders in bromine, 106.
- nucleophilic, catalysis in. Part 1, reactions of piperidine with 2,4-dinitrophenyl 4-nitrophenyl ether and 2,4-dinitrophenyl phenyl sulphone, 1316.
- substituent effects of phosphorus- and arsenic-containing groups in. Part 7, comparison of carboxy and phosphonic groups, 1479.
- at saturated carbon. Part 21, effect of alcoholic solvents on the enthalpy and entropy of the tetraethyltin-mercury(II) chloride transition state and of the *t*-butyl chloride solvolysis transition state; comparison with 1 : 1 electrolytes, 1028. Part 22, rate constants for the substitution of tetraethyltin by mercury(II) carboxylates in *t*-butyl alcohol, acetonitrile, acetone, and ethyl acetate, 1225.
- electrophilic aromatic. Exeter and City Universities: Part 16, the nitration of anisole, *o*-methylanisole, and *p*-methylanisole in aqueous sulphuric acid, 248. Part 17, products, kinetics, and mechanism of nitration in trifluoroacetic acid, 1688. Part 18, nitration of acetanilide and some analogues: a reconsideration, 1693.
- University of Sussex: Part 18, protiodetritiation of anthracene, coronene (dibenzo[*ghi,pqr*]perylene), and triphenylene in anhydrous trichloroacetic acid, 353. Part 19, protiodetritiation of 1,2-diphenylethane and 9,10-dihydrophenanthrene: effect of strain on aromatic reactivity, 866.
- electrophilic, in pyrroles. Part 2, reaction with diazonium ions in acid solution, 1452.
- electrophilic, on the thiophen ring. Part 5, the effect of methyl groups on the kinetics of hydrogen exchange in acidic media, 1998.
- homolytic aromatic, structural effects on the reactivity of carbon radicals in. Part 4, the nucleophilicity of bridgehead radicals, 87.
- α -methyl, the effect of: photochemistry of acyclic $\beta\gamma$ -unsaturated ketones, 1357.
- nucleophilic aromatic, orienting effects of chlorine substituents in. Mechanisms for reactions of halogenated compounds. Part 2, 1774.
- nucleophilic, of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles; comments on the work of Le Guillanton and Cariou. Nucleophilic attacks on carbon-carbon double bonds. Part 24, 1000.
- nucleophilic, of (*E*)- and (*Z*)-3-chloro-2-phenylpropenenitriles, stereochemistry of; criticism of a paper by Rappoport and Topol, 997.
- of *N*-arylbenzimidoyl cyanides by amines in acetonitrile and by alkoxides in alcohols. Nucleophilic attacks on carbon-nitrogen double bonds. Part 4, 659.
- the anion-catalysed, of alkylmercury(II) bromides by mercury(II) bromide in ethanol. Calculations of steric effects. Part 3, 221.
- ipso*-Substitution**, homolytic aromatic. Displacement of the acyl group in benzothiazoles by nucleophilic alkyl radicals, 1679.
- N*-Substitution** of indoles and carbazoles in Vilsmeier-Haack acetylation, kinetics and mechanism of, 1284.
- Succinic anhydride**, bis-*p*-cumenylmethylene-, (di-*p*-cumenylfulgide), the photochemistry of, 1.
- Sulphamates**, *N*-aryl-, protonation equilibria of using ultraviolet and nuclear magnetic resonance methods. Basicity of nitrogen-sulphur(VI) compounds. Part 2, 1180.
- studies of the protonation equilibria of using ^{13}C and ^1H nuclear magnetic resonance spectroscopic, potentiometric, and conductimetric methods, 580.
- Sulphinyl radicals**, aromatic and aliphatic. Electron spin resonance studies. Part 51, 497.
- Sulphonamides**, *N*-allyl, metal carbonyl-catalysed isomerisation of to *N*-prop-2-enyl and *N*-propylidene derivatives. Catalysed prototropic rearrangements. Part 3, 11.
- arene-, the acid dissociation of: σ_{Het} constants for thia- and oxa-substituents in five-membered *S*-linked heterocycles and effects of substituents in the *N*-linked aromatic ring, 984.
- Sulphonation**, aromatic. Part 54, sulphonation of polyethylbenzenes. On the Jacobsen rearrangement of the tetraethylbenzenesulphonic acids, 717. Part 55, reaction of polyisopropylbenzenes with concentrated aqueous sulphuric acid, 720. Part 56, the rearrangement of phenylsulphamic acid to aniliniumsulphonic acids in concentrated sulphuric acid: evidence for an intermolecular reaction pathway, 921. Part 57, phenylsulphamic acid in sulphuric acid: solvolysis *versus* sulphonation, 929. Part 58, protonation and sulphonation of methanesulphonanilide in aqueous sulphuric acid, 1003. Part 59, sulphonation of aniline in concentrated aqueous and fuming sulphuric acid, 1008. Part 60, sulphonation in the reactions of aromatic compounds with chlorosulphuric acid in nitromethane and in dichloromethane, 1548. Part 61, sulphonylation in the reaction of aromatic compounds with chlorosulphuric acid in nitromethane and in dichloromethane, 1557. Part 62, sulphonation of biphenyl in concentrated aqueous sulphuric acid, 1560. Part 63, sulphonation of *m*-aminobenzenesulphonic acid in fuming sulphuric acid. Formation of an overcrowded tetrasulphonic acid, 1863.
- Sulphones** and nitriles bearing β -onium substituents, formation and behaviour of carbanions derived from. Elimination and addition reactions. Part 33, 1920.
- nitriles, and ketones, polar effects on the ionisation of. Elimination and addition reactions. Part 31, 1909.
- Sulphonium salts** and quaternary ammonium salts, conductances of some in chloroform, 952.
- benzylidimethyl-, kinetics and mechanism of decomposition in chloroform, 958.
- Sulphonylation** in the reaction of aromatic compounds with chlorosulphuric acid in nitromethane and in dichloromethane. Aromatic sulphonation. Part 61, 1557.
- Sulphonyl groups**, leaving group abilities in alkene-forming eliminations activated by. Elimination and addition reactions. Part 30, 1898.
- isocyanates**, reaction of phosphetan oxides with, and related reactions, 1373.
- Sulphur** and oxygen, theoretical study on the bridging ability of in vinyl cations, 542.
- atom**, interaction between the carbonyl group and. Part 8, correlation between the basicity constants, corrected for steric effects, and Taft σ^* values for some ketones and nitriles, 2025.

- Sulphuric acid**, aqueous, oxidative decarboxylation of aldono-lactones by cerium(IV) sulphate in; synthesis of D-arabinose, 685.
- protonation and sulphonation of methanesulphonaniline in. Aromatic sulphonation. Part 58, 1003.
- the nitration of anisole, *o*-methylanisole, and *p*-methylanisole in. Electrophilic aromatic substitution. Part 16, 248.
- concentrated aqueous and fuming, sulphonation of aniline in. Aromatic sulphonation. Part 58, 1008.
- concentrated aqueous, reaction of polyisopropylbenzenes with. Aromatic sulphonation. Part 55, 720.
- concentrated aqueous, sulphonation of biphenyl in. Aromatic sulphonation. Part 62, 1560.
- the rearrangement of phenylsulphamic acid to aniliniumsulphonic acids in: evidence for an intermolecular reaction pathway, 921.
- fuming, sulphonation of *m*-aminobenzenesulphonic acid in. Formation of an overcrowded tetrasulphonic acid. Aromatic sulphonation. Part 63, 1863.
- phenylsulphamic acid in: solvolysis *versus* sulphonation. Aromatic sulphonation. Part 57, 929.
- Sulphur(VI)-nitrogen** compounds, basicity of. Part 2, protonation equilibria of *N*-arylsulphamates using ultraviolet and nuclear magnetic resonance methods, 1180.
- Sulphur-oxygen** bond, chemistry of. Part 6, infrared and Raman spectra of some methyl-substituted trimethylene sulphites, 612.
- Synthesis** and kinetics of alkaline hydrolysis of heteroarylphosphinate esters and hydrolysis of heteroarylphosphine oxides. The chemistry of heteroarylphosphorus compounds. Part 10, 1705.
- and mass spectral fragmentation of some 1,2-disubstituted tricarbonyl- η -cyclopentadienylmanganese derivatives: 2-lithiation of tricarbonyl(η -*NN*-dimethylsulphamocyclopentadienyl)manganese, 703.
- and properties of 1,2-diaryl-4,5,6,7-tetrahydro-1*H*-1,3-diazepines and 1,2-diaryl-1,4,5,6,7,8-hexahydro-1,3-diazocines. Comparison with the five- and six-membered homologues, 2068.
- and properties of the inclusion compound 2-phenyl-3-*p*-(2,2,4-trimethylchroman-4-yl)phenyl-quinazolin-4(3*H*)-one; use of quartets in the crystal structure determination of the methylcyclohexane clathrate, 1427.
- and X-ray structural analysis of 4-*p*-hydroxyphenyl-2,2,4,7-tetramethylthiochroman, 1145.
- and X-ray structure of methyl 2-oxopyrimido[2,1-*b*]-benzothiazole-4-carboxylate from condensation of 2-aminobenzothiazole and dimethyl but-2-ynedioate, 1070.
- of D-arabinose; oxidative decarboxylation of aldono-lactones by cerium(IV) sulphate in aqueous sulphuric acid, 685.
- of organolithium compounds, the usefulness of ^{13}C - ^1H one-bond coupling constants as selectivity parameters in. Reactivity parameters. Part 2, 473.
- System**, a new 8 π -electron, evidence for the existence of, 1,3,5-thiadiazinide anion, 939.
- a stirred-flow, thermolysis of azoalkanes in, 1887.
- the tricarbonylcyclobutadieneiron, substituent effects in, 907.
- Systems**, water-methylene halide two-phase, halogen exchange between methylene halides and ionic halides in, 1462.
- T**
- Taft σ^* values** for some ketones and nitriles, and correlation between the basicity constants, corrected for steric effects. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- Tautomerically mobile** 3-methyl-1-phenylpyrazolin-5-one and 1-phenylpyrazole: proton, carbon-13, and nitrogen-15 nuclear magnetic resonance studies of [^{15}N]azoles, 1024.
- Tautomeric azines**. Part 6, phthalazin-1(2*H*)-one, 1184.
- Tautomerism**, azo-hydrazone, oxidation by singlet oxygen of arylazonaphthols exhibiting, 747.
- between 1-aryl-3-methyltriazines and 3-aryl-1-methyltriazines, the effect of electron-withdrawing substituents on, 17.
- ring-chain. Part 6, base- and acid-catalysed rearrangement of pseudo to normal methyl 8-(3- or 4-substituted benzoyl)-1-naphthoates and 2-(3- or 4-substituted benzoyl)benzoates, 1927.
- valence, and crystal structure of 5-dimethyliminio-4,4-dimethyl- Δ^2 -thiazoline-2-thiolate. Cycloaddition reactions of heterocumulenes. Part 8, 466.
- Tellurin**, nitrophenoxa-, anion-radicals, electron spin resonance spectra and electronic structure of, 529.
- Tellurophen**, furan, thiophen, and selenophen, a comparative study of electric dipole moments of 2-substituted derivatives of, 769.
- Temperature effects** and solvent effects on the optical rotation and conformation of model carbohydrates. Polysaccharide conformation. Part 10, 191.
- Termination rate constants** for t-butyl radicals in solution, electron spin resonance measurements for, 1504.
- Tetra-acetic acid**, ethylenediamine-, a mechanistic study of the decomposition of phenylhydroxylamine to azoxybenzene and aniline and its catalysis by iron(II) and iron(III) stabilised by, 1868.
- Tetracycline species**, various, conformation of determined with the aid of a nuclear magnetic resonance relaxation probe, 1319.
- Tetrahydridoborate** (sodium borohydride) in water, dimethyl sulphoxide and their mixtures as solvents, reduction of carbonyl compounds by: products and kinetics, 1466.
- (sodium borohydride), tritiated, hydrogen isotope exchange in the aldehyde group during the reduction of benzaldehyde by, 1472.
- Tetrahydrofuran**, dimethyl sulphoxide, acetonitrile, and ethyl acetate, reaction of 2,4-dinitrophenyl phenyl ether with morpholines in, and of 1-chloro-2,4-dinitrobenzene with morpholine in ethyl acetate, 597.
- Tetrasulphonic acid**, an overcrowded, formation of. Sulphonation of *m*-aminobenzenesulphonic acid in fuming sulphuric acid. Aromatic sulphonation. Part 63, 1863.
- Thallium** salt of lonomycin, crystal and molecular structure of. Studies on the ionophorous antibiotics. Part 4, 494.
- Thallium(III)** ion promoted decomposition of thiobenzamides in aqueous solution, kinetics and mechanism of, 1366.
- Thermal racemisation** of *N*-unsubstituted and various *N*-substituted *S*-*o*-methoxyphenyl *S*-phenyl sulphimides by pyramidal inversion, 1783.
- Theoretical studies** and experimental studies on protonation of thioketones, 1516.
- Thermodynamic** and kinetic acidities in dimethyl sulphoxide. Part 2, acetylenic compounds, 407. Part 3, alcohols and phenols, 570.

Thermodynamic (*contd.*)

- functions**, gas-phase, of conjugated compounds existing as a mixture of conformers, values for, 1304.
of proton ionisation of *para*-substituted benzenethiols, 149.
study and spectroscopic study of *cis*- and *trans*-penta-1,3-diene. Conformations of conjugated hydrocarbons, 1311.
- Thermodynamics** of protonation, the Hammett correlation and. The basicities of *N*-trimethylammonioacetamide and of substituted *N*-trimethylammonio benzamides, 1876.
of the acid dissociation of tertiary aliphatic ammonium ions in 60% w/w methanol-water solution and of the quinuclidinium ion in water, 102.
- Thermolysis** of azoalkanes in a stirred-flow system, 1887.
- Thiaborimamide** (*N*-{2-[(imidazol-4-yl)methylthio]ethyl}-*N'*-methylthiourea) and metiamide (*N*-methyl-*N'*-{2-[(5-methylimidazol-4-yl)methylthio]ethyl}thiourea), crystal and molecular structure of the histamine H₂-receptor antagonists, 68.
- 1,3,5-Thiadiazinide anion**, evidence for the existence of a new 8 π -electron system, 939.
- Thiamine-enzyme** model interactions, solvent effects on. 2,3,4-Trimethylthiazolium iodide, a model for interaction with negative charges, 1484.
- 1H-1,2,4,6-Thia(IV)triazine**, 3-chloro-5-cyclohexylamino-1-di-isopropylamino-, crystal and molecular structure of. Stereochemical investigations of heterocyclic compounds. Part 4, 1322.
- Thiazole**, 6-nitrobenzo-, and methoxide ion at 25 °C, kinetic studies on solvent effects in the reaction between. Ring opening and closing in heterocyclic compounds, 20.
- 1,3-Thiazolidin(e)-2-one**, -2-thione, and 2-selone and their 1-oxa-analogues, infrared study of, 324.
- Δ^2 -Thiazoline-2-thiolate**, 5-dimethyliminio-4,4-dimethyl-, crystal structure and valence tautomerism of. Cycloaddition reactions of heterocumulenes. Part 8, 466.
- Thiazolium iodide**, 2,3,4-trimethyl-, a model for interaction with negative charges. Solvent effects on thiamine-enzyme model interactions, 1484.
- Thiirans**, chiral, optical activity of the 260 nm transition of, 1105.
- Thioamides**, rates of hydrogen exchange in, 1385.
structure and mechanism of formation of intermediates in the reactions between COCl₂, POCl₃, or POCl₃ and, or between amides and CSCl₂ or PSCl₃. Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- Thiobenzamide** and covalent metal halides, equilibria between in diethyl ether solution. Quantitative aspects of Lewis acidity. Part 17, 592.
- Thiobenzamides** in aqueous solution, kinetics and mechanism of the thallium(III) ion promoted decomposition of, 1366.
- Thiocarbamates**, *O*-aryl *N*-phenyl-, kinetics and mechanism of the hydrolysis of, 650.
- Thiochroman**, 4-*p*-hydroxyphenyl-2,2,4,7-tetramethyl-, synthesis and X-ray structural analysis of, 1145.
- Thiocyanate** and thiourea, S-nitrosation of. Nitrosyl thiocyanate and the S-nitroso-adduct of thiourea as nitrosating agents, 128.
- β -Thiodan** in the solid state and in solution, structure and conformation of. Application of the infrared-X-ray method, 144.
- Thiohalides**, structure and mechanism of formation of intermediates in the reactions between amides and, or between thioamides and COCl₂, POCl₃, or PSCl₃. Nuclear magnetic resonance investigations of iminium ion intermediates. Part 7, 1243.
- Thiohypochlorous acid**, *ab initio* SCF-MO study of the reaction intermediates formed by addition of to ethylene, 1019.
- Thioketones**, angular *versus* linear transition state in nucleophilic reactions of, 1169.
experimental and theoretical studies on protonation of, 1516.
- Thiols**, alkane-, the pyrolysis of. Part 1, kinetics of the pyrolysis of butane-1-thiol, butane-2-thiol, and 2-methylpropane-2-thiol, 439.
the structure of intermediates formed in the radiolysis of. Unstable intermediates. Part 178, 2005.
- Thiophen**, benzothiophen, furan, and benzofuran, 1,3-cycloadditions of 3,5-dichloro-2,4,6-trimethylbenzotriazole oxide to, 706.
furan, selenophen, and tellurophen, a comparative study of electric dipole moments of 2-substituted derivatives of, 775.
ring, electrophilic substitution on the. Part 5, the effect of methyl groups on the kinetics of hydrogen exchange in acidic media, 1998.
- Thiophens**, bromo- and iodo-, photoelectron spectra of, 1413.
- Thiourea** and thiocyanate ion, S-nitrosation of. Nitrosyl thiocyanate and the S-nitroso-adduct of thiourea as nitrosating agents, 128.
N-methyl-*N'*-(2-[(5-methylimidazol-4-yl)methylthio]ethyl)-, (metiamide) and *N*-[2-[(imidazol-4-yl)methylthio]ethyl]-*N'*-methylthiourea (thiaborimamide), crystal and molecular structure of the histamine H₂-receptor antagonists, 68.
kinetics and mechanisms of reaction of with cyclohexyl toluene-*p*-sulphonate in various solvents. Eliminations promoted by weak bases. Part 8, 298.
- Thioxanthen**, 9,9-dimethyl-, and 10,10-dimethylphenothiasilin, -germin, and -stannin derivatives, oxidation rates, carbon-13 nuclear magnetic resonance, and photoelectron spectra of. Group IV_B heterocyclic compounds, 689.
- Tin**, methyl- and *n*-butyl-, alkoxides, a nuclear magnetic double resonance study of: auto-association in organometallic compounds, 242.
tetraethyl-, -mercury(II) chloride transition state and the *t*-butyl chloride solvolysis transition state, effect of alcoholic solvents on the enthalpy and entropy of; comparison with 1:1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
rate constants for the substitution of by mercury(II) carboxylates in *t*-butyl alcohol, acetonitrile, acetone, and ethyl acetate. Substitution at saturated carbon. Part 22, 1225.
- Tocinoic acid**, oxytocin, and oxytocinoic acid in aqueous solution, nuclear magnetic resonance conformational studies of the C $_{\alpha}$ -C $_{\beta}$ fragments of, 477.
- Toluene**, α -4-dinitro-, kinetics of proton and deuteron transfer from to 1,8-bis(dimethylamino)naphthalene in alcoholic solvents, 814.
- Toluene**, *t*-butylbenzene, and 4-substituted 1-phenylbicyclo[2.2.2]octanes, nitration of with nitric acid-acetic anhydride. Evidence for a π -inductive effect, 2042.
- Toluene-*p*-sulphonates**, *endo*- and *exo*-bicyclo[3.2.1]octan-3-yl, solvolysis of. Part 2, rates and deuterium kinetic isotope effects, 1991.

- Toluene-*p*-sulphonyl isocyanate**, reaction of acyclic phosphine oxides with, and related reactions, 1379.
- Tosylhydrazone** norborn-5-en-2-one and norbornan-2-one, sodium salts of, kinetic studies of the decomposition of, 1490.
- Transcyanation** and arylation in the pyrolysis of benzonitrile. Vapour phase chemistry of arenes. Part 6, 1062.
- Transfer agents**, acyl, *N*-hydroxy-compounds as. Part 1, kinetics and mechanism of nucleophilic displacements on 1-hydroxybenzotriazole esters and crystal and molecular structure of 1-benzoyloxybenzotriazole, 224. Part 2, kinetics and mechanism of hydrolysis and aminolysis of 1-hydroxypyrazole and 1-hydroxyimidazole esters, 231.
- reactions**, acyl, strain effects in. Part 4, kinetic analysis of the reaction of imidazole buffer solutions with β -propiolactone using a novel graphical method for branched, series reactions, 1492.
- base-catalysed 1,3-proton, and base-promoted elimination reactions, extreme deuterium isotope effects as evidence of ion-pair intermediates in, 1569.
- Transition metal ions**, electrophilic catalysis by, and the irrelevance of intramolecular participation by the pyridyl group: hydrolysis of 2-pyridylphosphonic acid mono- and di-esters, 418.
- inhibition of oxidative induced decomposition of (α' -diphenyl)azoethane by. Interactions of metal ions with α -phenylethylperoxyl radical, 59.
- state**, a four-membered, mechanism of an intramolecular [1,3] acyl group migration *via*. Isomerisation of (*E*)-*O*-acyl isoamides to *N*-acyl amides, 1085.
- angular *versus* linear, in nucleophilic reactions of thio-ketones, 1169.
- the tetraethyltin-mercury(II) chloride, and the *t*-butyl chloride solvolysis transition state, effect of alcoholic solvents on the enthalpy and entropy of; comparison with 1:1 electrolytes. Substitution at saturated carbon. Part 21, 1028.
- Transition**, the 260 nm, of chiral thiirans, optical activity of, 1105.
- Transmission** of substituent effects across the fluorene and biphenyl systems. Stability of carbonium ions. Part 3, 426.
- across two aromatic rings connected by C-C and -C- linkages. Fluorine-19 nuclear magnetic resonance studies of aromatic compounds. Part 5, 1051.
- s-Triazine**, triphenyl-, conformation of, 1818.
- Triazines**, 1-aryl-3-methyl- and 3-aryl-1-methyl-, the effect of electron-withdrawing substituents on the tautomerism between, 17.
- 1,2,3-Triazoles**, some 1-(α -aroyloxyarylideneamino)-4,5-dimethyl-, dipole moments and conformation of, 1779.
- Tricarbonylchromium**, 1-*p*-tolylethyl-, and di-*p*-tolylmethyl-, cations, carbon-13 nuclear magnetic resonance spectra of, 483.
- Trichloroacetate ion** in water-methanol solutions, kinetics of the alkaline decarboxylation of. Solvolysis rates in aqueous-mixed solutions. Part 4, 1237.
- Triethylamine**, mechanism of oxidation of: photosensitised oxidation of amines, 173.
- Trifluoroacetic acid**, anhydrous, protiodetritiation of anthracene, coronene (dibenzo[*ghi,pqr*]perylene), and triphenylene in. Electrophilic aromatic substitution. Part 18, 353.
- products, kinetics, and mechanism of nitration in. Electrophilic aromatic substitution. Part 17, 1688.
- Trimethyl sulphites**, infrared and Raman spectra of some methyl-substituted. Chemistry of the S=O bond. Part 6, 612.
- Triphenylene**, anthracene, and coronene (dibenzo[*ghi,pqr*]perylene), protiodetritiation of in anhydrous trifluoroacetic acid. Electrophilic aromatic substitution. Part 18, 353.
- Triphenylphosphine** and other neutral bases, *E2C* and *E2H* reactions of cyclohexyl toluene-*p*-sulphonate with. Eliminations promoted by weak bases. Part 7, 293.
- Triplet** state of styrenes, 182.
- Terpene**, a new cyclopropane, crystal and molecular structure of: passifloric acid methyl ester [methyl (2*R*,2*S*)-22,31-epoxy-1 α ,3 β -24,31-tetrahydroxy-24-methyl-9,19-cyclo-9 β -lanostan-28-oate], 605.
- Trityl hexafluoro-arsenate** and -antimonate in polar solvents, ion-pair dissociation equilibria for, 1729.
- Tropene derivatives**, evidence for non-chair conformations in: carbon-13 magnetic resonance, 1202.

U

- Ultraviolet methods** and nuclear magnetic resonance methods, protonation equilibria of *N*-arylsulphamates using. Basicity of nitrogen-sulphur(VI) compounds. Part 2, 1180.
- Unimolecular decomposition**, thermal, of 2-ethoxy-3,4-dihydro-2*H*-pyran, 870.
- Unsaturated compounds**, mechanism of the permanganate oxidation of. Part 7, kinetics of the oxidation of propiolic and phenylpropiolic acids, 630. Part 8, kinetics of the oxidation of halogenomaleic acids, 1794.
- Urea**, mechanistic studies in the chemistry of. Part 2, reaction with benzil, 4,4'-dimethylbenzil, and 4,4'-dimethoxybenzil, 1952.

V

- Values** derived from published *ab initio* molecular orbital calculations, comparison of various isodesmic and homodesmotic reaction heats with, 1036.
- various pH, hydration and self-association of adenosine triphosphate, adenosine diphosphate, and their 1:1 complexes with magnesium(II) at: infrared investigations, 1824.
- σ^* **Values**, Taft, for some ketones and nitriles, and correlation between basicity constants, corrected for steric effects. Interaction between the carbonyl group and a sulphur atom. Part 8, 2025.
- σ_p **Values**, the Hammett, for the hydroxymethyl and formyl groups, a re-evaluation of, 993.
- Vapour phase chemistry** of arenes. Part 6, arylation and transcyanation in the pyrolysis of benzonitrile, 1062.
- Vilsmeier-Haack acetylation**, kinetics and mechanism of *N*-substitution of indoles and carbazoles in, 1284.
- Vinyl aromatic compounds**, mono-, di-, and tri-cyano-, structural effects on the electrochemistry and charge distribution of, 1643.
- cations**. Part 13, secondary kinetic deuterium isotope effects in the solvolysis of ring-substituted β -styryl trifluoromethanesulphonates, 1486.
- theoretical study on the bridging ability of oxygen and sulphur in, 542.

Vinyl aromatic compounds, (contd.)

- radicals**, intramolecular reactions of, and radical addition to alkynes, electron spin resonance studies of, 827.
- substituents** and phenyl substituents at the α -carbon atom, influence of. Decomposition of carbamates of tertiary alcohols. Part 3, 879.
- Vitamin D₃**, 25-hydroxy, monohydrate, crystal structure of. A stereochemical analysis of vitamin D molecules, 393.

W

- Water**, alcohols, phenols, and carboxylic acids, rates of reactions of quinone methides with. The chemistry of reactive lignin intermediates. Part 5, 1737.
- and methanol, products of addition of to vinyl-substituted quinone methides. The chemistry of reactive lignin intermediates. Part 3, 616.
- dimethyl sulphoxide, and their mixtures as solvents, reduction of carbonyl compounds by sodium borohydride (tetrahydridoborate) in: products and kinetics, 1466.
- geometry and electronic structure of intimate and solvent-separated ion pairs of fluoromethane in, 162.
- kinetic study of the decarboxylation of 5-amino-1,3,4-oxadiazole-2-carboxylic acid to 2-amino-1,3,4-oxadiazole in as a function of proton activity, 639.
- methanol solutions**, kinetics of the alkaline decarboxyl-

- ation of trichloroacetate ion in. Solvolysis rates in aqueous-mixed solvents. Part 4, 1237.
- methylene halide** two-phase systems, halogen exchange between methylene halides and ionic halides in, 1462.
- the quinuclidinium ion in and tertiary aliphatic ammonium ions in 60% w/w methanol-water solution, thermodynamics of the acid dissociation of, 102.
- Wave**, the first voltammetric, anodic oxidation of methylbenzenes at potentials in, 1952.
- Work** of Le Guillanton and Cariou, comments on; nucleophilic substitution of (*E*)- and (*Z*)-3-chloro-2-phenylpropionitriles. Nucleophilic attacks on carbon-carbon bonds. Part 24, 1000.

X

- Xanthates**, kinetics and mechanism of the oxidation of with iodine in aqueous solution, 113.

Z

- Zinc**, palladium and magnesium porphin, a comparison between the magnetic circular dichroism and Shpol'skii spectra of. Magnetic circular dichroism studies. Part 45, 337.