

INDEX OF SUBJECTS, 1975

A

- Absolute configuration** and crystal structure of lycopodine hydrochloride, 93.
of (+)-*trans*-chrysanthemic acid. Crystal structure of a *p*-bromoanilide derivative, 1567.
- Absolute chemistry** and crystal structures of tecomanine methoperchlorate and 'alkaloid C' methiodide: two monoterpene alkaloids from *Tecoma stans*, 1124
- Absorption**, multiple, caused by Fermi resonance: the infrared bands of thiophen-2-carbaldehydes in the carbonyl region, 604.
infrared carbonyl, of 2-oxofurans: Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes, 13.
- Acenaphthene**, *t*-butyl-, anions. Electron spin resonance studies of aromatic hydrocarbon radical ions. Part IV, 1263.
- Acetaldehyde**, ethanol, and propan-2-ol, kinetics of reactions of toluene-*p*-diazonium ions with. Free-radical reductions of arenediazonium ions in aqueous solution. Part III, 751.
- Acetals**, benzaldehyde aryl methyl, general acid catalysed hydrolysis of, 1113.
nuclear magnetic resonance experiments on. Part LVIII, conformational studies of 4-methylene-1,3-dioxan, 1434.
- Acetamide**, *N*-*t*-butyl, and hydrogen chloride. Catalysis by hydrogen halides in the gas phase. Part XXVII, 314.
- Acetanilides**. Spectrophotometric determination of basicity constants. Part II, 706.
substituted, acid-catalysed hydrolysis of. Part II, 1357.
- Acetates**, phenylacetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates, the relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl. The nature of the transition state in ester pyrolysis. Part II, 1025.
- Acetic acid** and trifluoroacetic acid solvents, bromination in. Participation by neighbouring groups in addition reactions. Part III, 503.
- Acetic anhydride**, nitration of triptycene in, 945.
- Acetolysis** of secondary alkyl derivatives, nucleophilic assistance by solvent during. Classical carbonium ions. Part VII, 1458.
of some 2-adamantyl derivatives, rearrangement during. Classical carbonium ions. Part VI, 1452.
- Acetone** and creatinine (2-imino-1-methylimidazolidin-4-one), a kinetic study of the Janovsky complexes formed from. The Jaffé reaction. Part II, 853.
coupling of diazonium salts with, 1312.
some 3-benzoyl-1,1,1-trifluoro-. The acidities of weak acids, Part III, 1231.
- Acetonitrile** aqueous solutions, acid-catalysed exchange in: kinetics and mechanism of N-H and C-H isotopic exchange in pyrrole and indole, 1316.
substitution of (*E*)- α -chloro- β -nitrostyrene by anilines in. Nucleophilic attacks on carbon-carbon double bonds. Part XXI, 272.
transition state enthalpies of transfer from propanol to, in the reaction of imidazole with benzoyl and benzene-sulphonyl chlorides, 1486.
- Acetophenones**, some. The acidities of weak acids. Part II, 878.
- Acetylaceton**-metal complexes, vibrational M-O bands of, 1098.
- Acetylcholine** [methyl 3-(dimethylamino)propionate methiodide], crystal structure of the reversed carboxy-analogue of, 1107.
- Acid-base** function in non-aqueous solution. Part V, entropy changes due to intramolecular and solvation effects in aprotic solvents, 1057.
- Acidic media**, reactions of sulphenyl chlorides and disulphides in. Trapping of alkyl(bisalkylthio)sulphonium ion intermediates, 900.
- J_M Acidity** function values, corresponding, a nuclear magnetic resonance study of the addition of methanol and methoxide ions to substituted benzaldehydes, and, 185.
- Acidity** of tin tetrachloride, tellurium tetrachloride, and zirconium tetrabromide towards substituted anilines in dioxan, comparison of. Quantitative aspects of Lewis acidity. Part XIV, 1110.
- Acidities** of weak acids. Part I, a new method for determining pK_A values in the range 12-24, 54. Part II, some acetophenones, 878. Part III, some 3-benzoyl-1,1,1-trifluoroacetones, 1231.
- Acids**, concentrated, kinetics of intramolecular acylation of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in, 1525.
monobasic, crystal structure of some acid salts of. Part XVII, structure of sodium hydrogen diacetate, re-determined by neutron diffraction, 15.
weak, the acidities of. Part I, a new method for determining pK_A values in the range 12-24, 54. Part II, some acetophenones, 878. Part III, some 3-benzoyl-1,1,1-trifluoroacetones, 1231.
- salts** of some dibasic acids, crystal structure of. Part IX, potassium hydrogen *meso*-tartrate: a neutron diffraction study, 1549.
- solutions**, triple oxidations of some polyhydric phenols by cerium(IV) in, as observed by electron spin resonance spectroscopy, 850.
- Acrylates** and *trans*-crotonates, methyl and [³H₃]methyl, assignments of Raman and infrared spectra of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, 392.
- Acrylonitriles**, β -chloro- α -phenyl-, substitution of. Nucleophilic attacks on carbon-carbon double bonds. Part XXIII, 982.
- Activation** by a nitro-group, influence of steric interactions in the reaction area on. Nucleophilic substitution in five-membered rings, 1388.

Activation (*contd.*)

- volumes of some [2 + 2] and dipolar cycloadditions. Reaction studies at high pressure. Part I, 1555.
- Acyclic and cyclic dialkoxyalkyl radicals**, electron spin resonance study of the fragmentation of some. The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.
- Acylarylnitrosamines**. Part VIII, ^{15}N -labelling experiments and their relevance to the mechanisms of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds, 546.
- Acylation**, intramolecular of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in concentrated acids, kinetics of, 1525.
photochemical intramolecular, of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in methanol, 1529.
- Acyl chlorides**, aliphatic, ethanolsis of. Nucleophilic substitution at trigonal carbon. Part II, 963.
- β -Acyoxyalkyl radicals**, the mechanism of the 1,2-rearrangement of. Electron spin resonance study of the fragmentation of some cyclic and acyclic dialkoxyalkyl radicals, 77.
- Adamantane chemistry**. Part II, X-ray structure analysis of 5-chloromethyl-4-oxahomadamantan-5-ol, 74.
- Addition**, equilibrium, of nucleophiles to carbon-nitrogen double bonds. Kinetics of the addition of propane-thiol to benzylideneanilines in non-aqueous solutions, 134.
initiated by chlorine acetate, kinetics of. The kinetics and mechanisms of additions to olefinic substances. Part XII, 1150.
of bromine to position 6 in 2,3-dihydro-1,4-diazepinium salts, kinetics of. Diazepines. Part XIX, 325.
of bromoform and carbon tetrachloride to fluoroethylenes. Free radical addition to olefins, 320.
of methanol and methoxide ions to substituted benzaldehydes, and corresponding J_{M} acidity function values, a nuclear magnetic resonance study of, 185.
polar, to olefins. Part II, stereochemistry of addition of deuterium bromide to *cis*- and *trans*-*t*-butylstyrene. Rotamer populations of sterically crowded trisubstituted ethanes, 574.
reactions of vinyl-substituted quinone methides in aqueous solution. The chemistry of reactive lignin intermediates. Part II, 1584.
- Aggregates**, surfactant, interaction of sodium methoxide with 4-nitropyridine *N*-oxide in benzene in the presence of, 482.
- Alcohols and amines**, aliphatic, relative reactivities of towards aminyl radicals, 763.
and water, the effect of on the free energy of solutes and on the free energy of transition states in S_{N} and S_{E} reactions. Substitution at saturated carbon. Part XIX, 1856.
kinetics of the intramolecular displacement of, from *o*-hydroxyaminobenzoates, 1512.
radiation chemistry of. Part XXI, ultraviolet photolysis (λ 185 nm) of methoxyethanol in the liquid phase, 1338.
secondary, kinetics of oxidation of, by chloramine τ , 1590.
- Aldehyde conformations**, substituent effects on, as shown by long range coupling constants. Nuclear magnetic resonance conformational studies of *C*-substituted pyrrolecarbaldehydes. Part I, 333.
furan-2-carb-, and related aldehydes, Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in. Infrared carbonyl absorptions of 2-oxofurans, 13.
- Alicyclic radicals**, conformational interconversion and ring shape in five- and six-membered. Investigations of structure and conformation. Part V, 1083.
- Aliphatic acyl chlorides**, ethanolsis of. Nucleophilic substitution at trigonal carbon. Part II, 963.
alcohols and amines, relative reactivities of towards aminyl radicals, 763.
compounds, reactions of the methyl radical with some in aqueous solution. Electron spin resonance studies. Part XLV, 885.
radicals, sulphinyl- and sulphonyl-substituted. Electron spin resonance studies. Part XLVII, 1245.
sulphoxides, the formation of alkylsulphonyl radicals by the oxidation of, with the hydroxyl radical, and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part XLIV, 308.
- Alkali-metal cations**, ion-pairing of substituted 1,3-diphenylallyl carbanions with, 1661.
salts and cyclic polyethers, crystal structures of complexes between. Part VIII, complexes formed by caesium thiocyanate with (7*R*,9*R*,18*S*,20*S*)-6,7,9,10,17,18,20,-21-octahydro-7,9,18,20-tetramethyldibenzo[*b,k*]-[1,4,7,10,13,16]hexaoxacyclo-octadecin (tetramethyldibenzo-18-crown-6, isomer F) and its (18*R*,20*R*)-isomer (isomer G), 261.
of 9-substituted fluorenes in *t*-butyl alcohol solution, kinetic studies on the displacement of halide from benzyl halides by. Mechanistic studies in strongly basic media. Part VIII, 1090.
- 'Alkaloid C' methiodide** and tecomanine methoperchlorate, crystal structures and absolute stereochemistry of: two monoterpene alkaloids from *Tecoma stans*, 1124.
- Alkanesulphenyl chlorides**, dimeric cations from. The elusive nature of sulphenylium ions, 361.
- Alk-1-enes**, ω -phenyl, and some 1-methyl- ω -phenylalkyl toluene-*p*-sulphonates, phenyl participation in the generation of carbocations from the reactions of, in trifluoroacetic acid, 1664.
- Alkyl toluene-*p*-sulphonates**, 1,4-carbonyl participation in solvolysis of, 372.
- Alkylation**, intramolecular, of phenols. Part I, mechanism of phenoxide cyclisation, 1054. Part II, *ortho- versus para*-alkylation, 1291.
- Alkylbenzenes** and benzene at various temperatures, the interactions of chloroform with, proton magnetic resonance studies of. Molecular complexes. Part XIV, 956.
- Alkyl group structure**, effect of on dealkylation. Thermal dealkylation of 2,4-bisalkylamino-6-chloro-*s*-triazines, 1701.
- Alkylsulphonyl radicals**, the formation of, by the oxidation of aliphatic sulphoxides with the hydroxyl radical, and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part LXIV, 308.
- Alkylthioureas**, kinetics and equilibria of the *S*-nitrosation of, 1734.
- 3-Allylhex-5-enyl radical**, cyclisation of: mechanism, and implications concerning the structures of copolymers, 1726.
- Amidates**, phenylphosphon-, and amidothionates, aryl, aminolysis and base-catalysed hydrolysis of: reactions close to the *E1cB*-bimolecular nucleophilic mechanistic borderline, 1010.
- Amide hydrolysis**, an example of, *via* $S_{\text{N}}2$ displacement on the *N*-conjugate acid, general acid catalysed decomposition of *N*-nitroso-2-pyrrolidone. The chemistry of nitroso-compounds. Part IX, 153.

- Amides**, aromatic, reaction of with phenyl iodosylacetate: an oxidative rearrangement, 1161.
in concentrated aqueous solutions of perchloric acid, enthalpies of ionization deduced from the temperature dependence of indicator measurements for, 1411.
salt effects on the rates of protonation of, 942.
- Amines** and active methylene compounds, reactions of with buta-1,3-diene and isoprene: catalysis by nickel, cobalt, rhodium, and iridium complexes, 1133.
and alcohols, aliphatic, relative reactivities of towards aminyl radicals, 763.
base catalysis, leaving group effects, and solvent effects in several vinylic substitutions by. Nucleophilic attacks on carbon-carbon double bonds. Part XXII, 863.
- Amino-acid-manganese(II)** complexes in aqueous solution, electron paramagnetic resonance parameters and, 769.
- Aminobenzoates**, *o*-hydroxy, kinetics of the intramolecular displacement of alcohols from, 1512.
- β -Aminoenones**, nuclear magnetic resonance spectral study of, 665.
- Aminolysis** and base-catalysed hydrolysis of aryl phenylphosphonamides and amidothionates: reactions close to the E1cB-bimolecular nucleophilic mechanistic borderline, 1010.
and hydrolysis of benzoylglycine derivatives, the oxazolinone intermediate in, 947.
- Aminophosphoranyl** radicals in solution, an electron spin resonance study of the structure and reactivity of, 140.
- Aminyl** radicals, relative reactivities of aliphatic alcohols and amines towards, 763.
- Ammonium ions**, quaternary, conformational studies of. Part II, molecular mechanical calculation of conformation energies of β -substituted ethyltrimethylammonium ions, 118. Part III, conformational analyses of substituted piperidinium ions by ^1H nuclear magnetic resonance spectroscopy and evaluation of the contribution of electrostatic interaction energy in controlling conformation, 127.
salts, several (R-chloromethyl)dimethyl-, (Vilsmeier-Haack and Viehe reagents), a chlorine-35 quadrupole resonance study of. Nuclear magnetic resonance investigations of carbonium ion intermediates. Part III, 925.
- Amphetamine-2-benzoylbenzoic acid**, chiroptical properties and ion-pair equilibria in. Induced circular dichroism. Part III, 1520.
- Amphielectronic** ionization of a π -radical, a basis for correlating radical with nucleophilic and/or electrophilic reactivities, 165.
- 5 α -Androstan-3-one**, 17 β -hydroxy-17 α -methyl-2-oxa-, crystal and molecular structure of, 1361.
- 5 α -Androst-6-en-17 β -yl**, 2 α , $\text{d}\alpha$ -epithio-, *p*-bromobenzoate, crystal structure of, 993.
- Anilines**, benzylidene-, kinetics of the addition of propane-thiol to, in non-aqueous solutions. Equilibrium addition of nucleophiles to carbon-nitrogen double bonds, 134.
substituted, in dioxan, comparison of the acidity of tin tetrachloride, tellurium tetrachloride, and zirconium tetrabromide towards. Quantitative aspects of Lewis acidity. Part XIV, 1110.
substitution of (*E*)- α -chloro- β -nitrostyrene by, in acetonitrile. Nucleophilic attacks on carbon-carbon double bonds. Part XXI, 272.
trimethylsilyl-substituted *NN*-dimethyl-, radical anions of, 500.
- Anions**, *t*-butylacenaphthene. Electron spin resonance studies of aromatic hydrocarbon radical ions. Part IV, 1263.
dihalide, and related species as products in the radiolysis of organic halides. Unstable intermediates. Part CLIX, 1492.
enolate, in the cleavage of aryl esters of mesitoic acid, intramolecular participation by; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
sugar, interactions of cations with. Part I, crystal structures of calcium sodium galacturonate hexahydrate and strontium sodium galacturonate hexahydrate, 237.
- Anisole**, 2,3,5,6-tetrafluoro-, structure of, determined from the analysis of a nuclear magnetic resonance spectrum of a nematic solution, 1794.
- Annulene**, 1,6-methano[10]-, and 11,11-difluoro-1,6-methano[10]annulene, detritiation and desilylation of. Electrophilic aromatic substitution. Part XVI, 1287.
- Anthracene** and some *meso*-substituted hydrocarbon derivatives, sulphonation of: mechanism of methyl side-chain sulphonation. Aromatic sulphonation. Part XLIX, 966.
dibenz[*a,h*]-, orthorhombic, refinements of the crystal structure of, 1271.
9,10-dihydro-, and 1,4-dihydrobenzenes, proton nuclear magnetic resonance spectra and conformation in, 1544.
substituted, role of imperfections in the dimerisation of. Part II, 1,8-dichloro-10-methylanthracene, 84.
- Anthracen-7-ones**, benz[*de*]-, the photochemistry of. Part II, flash photolysis, 1259.
- Antibiotic**, grisorixin, an ionophorous one of the nigericin group. Part IV, complexation of monovalent cations, 907.
- Anticholinergic** agents, stereochemistry of. Part VI, crystal and molecular structure of hexasonium iodide, 467. Part VII, crystal and molecular structure of 3-(2-methylpiperidino)-1-phenylpropyl phenyl ether methiodide, 1074.
- Aprotic solvents**, entropy changes due to intramolecular and solvation effects in. The acid-base function in non-aqueous solution. Part V, 1057.
- Aqueous solution**, addition reactions of vinyl-substituted quinone methides in. The chemistry of reactive lignin intermediates. Part II, 1584.
deoxygenated and oxygenated, γ -radiolysis of *scyllo*-inositol in. Radiation chemistry of carbohydrates. Part V, 1334.
electron paramagnetic resonance parameters and equilibria of manganese(II)-amino-acid complexes in, 769.
free-radical reductions of arenediazonium ions in. Part III, kinetics of reactions of toluene-*p*-diazonium ions with ethanol, propan-2-ol, and acetaldehyde, 751.
kinetics and mechanism of the reaction between copper(II) and thiobenzamide in, 953.
oxidation of thiols and disulphides in: formation of RS^\cdot , RSO^\cdot , RSO_2^\cdot , RSSR^\cdot , and carbon radicals. Electron spin resonance studies. Part XLVI, 892.
Raman spectral investigation of the interactions between group II cations and ethylene glycol in, 1155.
reactions of 2-aminoindamines [2-amino-*N*-(4-aminophenyl)-*p*-benzoquinone di-imines] in. Benzoquinone imines. Part XII, 728.
of silver ions with thiobenzamides in, 1273.
of the methyl radical with some aliphatic compounds in. Electron spin resonance studies. Part XLV, 885.

Aqueous solutions (*contd.*)

- the kinetics and mechanism of the reaction between mercury(II) ions and thiobenzamides in, 778.
- the reactivity of phenyl isocyanate in, 1166.
- concentrated, of perchloric acid, enthalpies of ionization deduced from the temperature dependence of indicator measurements for amides in, 1411.
- of *p*-nitrophenyl β -D-glucopyranoside, radiolysis of. Radiation effects on aryl glycosides. Part VII, 1638.
- Arenediazonium** ions in aqueous solution, free-radical reductions of. Part III, kinetics of reactions of toluene-*p*-diazonium ions with ethanol, propan-2-ol, and acetaldehyde, 751.
- Arenes**, substituted, thermodynamic stabilities of hydroxy and methoxy Meisenheimer complexes of. Intermediates in nucleophilic aromatic substitution. Part XV, 1768.
- Arenesulphonamides**, *N*-chloro-, mechanism of the reaction of sulphides with, 509.
- Arenesulphonyl** chlorides, the hydrolysis of. Reactions of organic sulphur compounds. Part I, 637.
- Arenethiols**, substituted, a kinetic study of the nucleophilicity of, in reaction with *p*-nitrophenyl acetate, 212.
- Arethyl** fluorides, halogenation of. Directive effects in benzylic hydrogen atom abstraction. Part VI, 10.
- Aromatic** amides, reaction of, with phenyl iododisulphate: an oxidative rearrangement, 1161.
- and heteroaromatic nitration rates, standardisation of, 1600.
- aza rings, six-membered, excited states of. Part VIII, photochemical reactions, fluorescence and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems, 417.
- carbon-halogen bonds, reductive cleavage of, in the presence of deuterium oxide. Electrochemical reactions. Part XVIII, 215.
- cations and aromatic compounds, relative diffusion coefficients of. Justification for directly equating voltammetric potentials to formal potentials, 755.
- chlorination by peroxodisulphate and chloride ions. Cation radical trapping by copper(II) chloride, 1503.
- electrophilic reactivities *via* pyrolysis of 1-arylethyl acetates. Part X, pyridine *N*-oxide, 277. Part XI, the σ^+ value for the *m*-methyl substituent, 1463. Part XII, total reactivity of isoquinoline, 1783.
- hydrocarbon radical ions, electron spin resonance studies of. Part IV, *t*-butylacenaphthene anions, 1263.
- nitro-compounds, kinetics of the liquid-phase hydrogenation of, in the presence of tungsten carbide catalyst, 827.
- nucleophilic substitution, intermediates in. Part XIV, interaction of lyate ions with polynitronaphthalenes, 1751. Part XV, thermodynamic stabilities of hydroxy and methoxy Meisenheimer complexes of substituted arenes, 1768.
- phosphines, investigation of phosphorus-carbon bond lengths in. Part I. Crystal and molecular structures of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, 1737.
- reactivity. Part LIX, substituent effects of groups of type CH_2Y in acid cleavage of *p*- $\text{YCH}_3\text{-C}_6\text{H}_4\text{-SiMe}_3$ compounds and on the charge-transfer maxima of YCH_2Ph -tetracyanoethylene complexes, 874.
- substitution, electrophilic. Part XIII, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration, 648. Part XIV, kinetics of nitration of some aromatic sulphonic acids in sulphuric acid, 788. Part XVI, detritiation and desilylation of 1,6-methano[10]annulene and 11,11-difluoro-1,6-methano[10]annulene, 1287.
- sulphonation. Part XLIX, sulphonation of anthracene and some *meso*-substituted hydrocarbon derivatives: mechanism of methyl side-chain sulphonation, 966. Part L, sulphonation of the trimethylbenzenes: isomer distributions and hydrogen kinetic effect, 970. Part LI, sulphonation of 1,3,5-tri- and *m*- and *p*-di-*t*-butylbenzene, the three *t*-butylbenzenesulphonic acids, and 3,5-di-*t*-butylbenzenesulphonic acid, 1438.
- Aryl** acetates, nucleophilic and general base catalysis by pyridine and methylpyridine in the hydrolysis of, 660.
- and heteroaryl substituent effects in reductions and solvolysis reactions, 551.
- arylmercury sulphides, substituent effect in the reaction of, with picryl iodide, 1490.
- benzaldehyde methyl acetals, general acid catalysed hydrolysis of, 1113.
- esters of mesitoic acid, intramolecular participation by enolate anions in the cleavage of; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
- glycosides, radiation effects on. Part VII, radiolysis of aqueous solutions of *p*-nitrophenyl β -D-glucopyranoside, 1638.
- isothiocyanates, reactions of, with dicyclohexylcarbodiimide. Search for the mechanism of cycloaddition and cycloreversion, 1475.
- phenylphosphonamidates and amidothionates, aminolysis and base-catalysed hydrolysis of: reactions close to the *E*1cB-bimolecular nucleophilic mechanistic borderline, 1010.
- radicals containing unsaturated *ortho*-substituents, mechanism of cyclisation of, 795.
- ortho*-substituted, some intramolecular reactions of, 593.
- Arylacylnitrosamines**. Part VIII, ^{15}N -labelling experiments and their relevance to the mechanisms of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds, 546.
- Arylalkoxycarbenium** ions, stable, observations of: a nuclear magnetic resonance study, 1656.
- 3-Aryl-3H-diazirines**, the preparation and photolysis of, 686.
- 1-Arylethyl acetates**, electrophilic aromatic reactivities *via* pyrolysis of. Part X, pyridine *N*-oxide, 277. Part XI, the σ^+ value for the *m*-substituent, 1463. Part XII, total reactivity of isoquinoline, 1783.
- Assignment** and conformational properties of the exocyclic 5'-hydroxymethyl group of nucleosides by nuclear magnetic resonance spectroscopy, 1703.
- of Raman and infrared spectra of dimethyl, diethyl, and di-*n*-butyl fumarates and maleates. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VII, 400.
- of methyl and $[\text{^2H}_3]$ methyl acrylates and *trans*-crotonates. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, 392.
- proton resonance, with the aid of paramagnetic relaxation reagents, 567.

- Association constants** and ^1H and ^{13}C nuclear magnetic resonance shift measurements of some chloroform, trinitromethane, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in cyclohexane solution, 64.
- of 1,1-dimethoxy-complexes with cations. The stabilities of Meisenheimer complexes. Part X, 825.
- constants**, 1 : 1, 2 : 1 and apparent, for a series of electron donor-acceptor complexes involving 1,3,5-trinitrobenzene and tetrafluoro-*p*-benzoquinone (fluoranil), 1256.
- ipso*-Attack**, the consequences of, kinetics and isomer yields in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 948.
- Attacks**, nucleophilic, on carbon-carbon double bonds. Part XXI, substitution of (*E*)- α -chloro- β -nitrostyrene by anilines in acetonitrile, 272. Part XXII, base catalysis, leaving group effects, and solvent effects in several nucleophilic vinylic substitutions by amines, 863. Part XXIII, substitution of β -chloro- α -phenylacrylonitriles, 982.
- Autoxidation** of 5-methyl-5,6,7,8-tetrahydrofolic acid, 18.
- Aza-aromatic rings**, six-membered, excited states of. Part VIII, photochemical reactions, fluorescence, and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems, 417.
- Azepines**, 2-diethylamino-3*H*-, ring expansion to give. Reduction of nitro- and nitroso-compounds by tervalent phosphorus reagents. Part X, 554.
- Azulene** and benzofuran, semiempirical all-valence-electron calculations on the reactivity of, 366.
- and 1-nitroazulene, acid catalysed nitrosation of. The chemistry of nitroso-compounds. Part X, 1498.
- some 1- and 2-substituted, thermal rearrangement of, to naphthalenes, 1464.
- the thermal rearrangements of, to naphthalenes, 714.

B

- Band doubling**, carbonyl, in furan-2-carbaldehyde and related aldehydes, Fermi resonance *versus* rotational isomerism as the cause of. Infrared carbonpl absorptions of 2-oxofurans, 13.
- vibrational M-O, of acetylacetone-metal complexes, 1098.
- Barbituric acids**, some 5-monosubstituted, kinetics of protolytic and keto-enol reactions of, 819.
- Barrier** to internal rotation in 5-substituted pyrrole-5-carbaldehydes. Nuclear magnetic resonance conformational studies of *C*-substituted pyrrolecarbaldehydes. Part II, 337.
- to rotation in some 3-arylcyclohexenone derivatives. Studies in restricted rotation. Part I, 464.
- rotational, the prediction of and quantitative estimation of electronic interactions in mono- and di-substituted ethylenes. Infrared intensities as a quantitative measure of intramolecular interactions. Part XLIII, 1378.
- to rotation in highly substituted arylthio, alkyl- and arylsulphinyl, and arylsulphonyl *E*- and *Z*-sulphines. Chemistry of sulphines. Part XXVIII, 916.
- Base catalysis**, leaving group effects, and solvent effects in several nucleophilic vinylic substitutions by amines. Nucleophilic attacks on carbon-carbon double bonds. Part XXII, 863.
- cleavage** of substituted fluoren-9-yltrimethylsilanes and related compounds. Organosilicon compounds. Part LIII, 380.
- Basicity** of substituted benzamides towards metal halides. The validity of nuclear magnetic resonance chemical shifts as measures of Lewis acid strength. Quantitative aspects of Lewis acidity. Part XIII, 541.
- constants**, spectrophotometric determination of. Part II, acetanilides, 706. Part III, phenylureas, 1206.
- Behaviour**, physico-chemical, of sulphadiazine. Spectroscopic trends and conjugation in phenylsulphonylguanidine derivatives, 522.
- solvolytic, of *cis*- and *trans*-[5- $^2\text{H}_1$]cyclo-octyl *p*-bromobenzenesulphonate - a stereospecific, remote ϵ -deuterium isotope effect, 1647.
- Benzaldehyde** aryl methyl acetals, general acid catalysed hydrolysis of, 1113.
- effects of substituents on the rate of condensation of substituted phenacyl chlorides with. The Darzens condensation. Part III, 805.
- pentafluoro-, structure of, determined from nuclear magnetic resonance spectra of nematic solutions, 1508.
- nuclear magnetic resonance studies on. Part II, carbon-13 nuclear magnetic resonance studies of the barrier to internal rotation and the conformational equilibrium in *o*- and *m*-substituted benzaldehydes, 1682.
- substituted, a nuclear magnetic resonance study of the addition of methanol and methoxide ions to, and corresponding J_{M} acidity function values, 185.
- Benzamides**, *N*-alkyl-4-chloro-, acid catalysed hydrolysis of. Part II, 1203.
- basicity of substituted towards metal halides. The validity of nuclear magnetic resonance chemical shifts as measures of Lewis acid strength. Quantitative aspects of Lewis acidity. Part XIII, 541.
- Benzene** and some alkylbenzenes, the interactions of chloroform with at various temperatures, proton magnetic resonance studies of. Molecular complexes. Part XIV, 956.
- and some halogenobenzenes, the photochemical reactions of trifluoroiodomethane with. Reactions of trifluoromethyl radicals. Part I, 435.
- 1-(1-chloroethyl)-2-methylbenzene, the pyrolysis of. Gas-phase eliminations. Part XIV, 1194.
- o*-dichloro-, kinetics of the acid-catalysed *E* \rightarrow *Z*-isomerisation of *N*-neopentylthioformamide in. On the structure of thioamines and their derivatives. Part XXXIII, 528.
- 1,3-dinitro-, and methyl 1-ethylpyridine-4-carboxylate radical, electron transfer reaction between, 526.
- in the presence of surfactant aggregates, interaction of sodium methoxide with 4-nitropyridine *N*-oxide in, 482.
- 1,3,5-trinitro-, and tetrafluoro-*p*-benzoquinone (fluoranil), 1 : 1, 2 : 1, and apparent association constants for a series of electron donor-acceptor complexes involving, 1256.
- Benzenediazonium acetate**, ^{15}N -labelling experiments and their relevance to the mechanisms of formation of benzyne from and of the benzenediazonium ion from hydroxyazo-compounds. Acylarylnitrosamines. Part VIII, 546.

- Benzenes**, 1,4-dihydro-, and 9,10-dihydroanthracenes, proton nuclear magnetic resonance spectra and conformation in, 1544.
- some tetra- and penta-fluoro-, electric dipole moments of, 903.
- para*-substituted, conjugation in and its relation to strain energies and σ -values. Infrared intensities as a quantitative measure of intramolecular interactions. Part XXXV, 443.
- trimethyl-, sulphonation of the: isomer distributions and hydrogen kinetic effect. Aromatic sulphonation. Part L, 970.
- Benzenesulphonyl** and benzoyl chlorides, the reaction of imidazole with, transition state enthalpies of transfer from propanol to acetonitrile in, 1486.
- Benzenethiols**, *meta*-substituted, thermodynamic functions of proton ionisation of, 1540.
- Benzenium**, pyridinium, pyrylium, and thiopyrylium cations, non-empirical calculations for, and a comparison of the last with phosphorin. The electronic structure of conjugated molecules, 841.
- Benzenoid** and heteroaromatic compounds, discussion of standard nitration rates for, 1624.
- Benzoate ions**, substituted, kinetics of the reactions of picryl chloride with, 242.
- Benzoates**, acetates, phenylacetates, phenyl carbonates, and *N*-phenylcarbamates, the relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl. The nature of the transition state in ester pyrolysis. Part II, 1025.
- 1,4-Benzodioxins**, nitro-2*H*,4*H*-1,3- and -2,3-dihydro-. Retro-Diels-Alder reaction in negative-ion mass spectrometry. Electron impact studies. Part XCIV, 724.
- Benzofuran** and azulene, semiempirical all-valence-electron calculations on the reactivity of, 366.
- Benzoic acids**, *p*-*n*-alkoxy-, an *X*-ray study of the. Part III, crystal structure of *p*-ethoxybenzoic acid, 1171. Part IV, crystal structure of *p*-*n*-butoxybenzoic acid, 1175.
- 2,4,6-trialkylated, kinetic comparison of the relative susceptibility to steric hindrance of an intra- and an inter-molecular cleavage of the ester bond in a series of 2- and 4-carbamoyl esters of, 1062.
- Benzoquinone imines**. Part XII, reactions of 2-aminoindamines [2-amino-*N*-(4-aminophenyl)-*p*-benzoquinone di-imines] in aqueous solution, 728.
- 1,2-Benzoquinone monohydroxyimine** free radicals, characterisation of. Investigation of photolysis of *o*-nitrophenols by electron spin resonance spectroscopy, 1380.
- p*-Benzoquinone**, electron nuclear double resonance and electron spin resonance studies of anion-radicals derived from, 258.
- tetrafluoro-, (fluoranil) and chrysene, crystal structure of the 1:1 molecular complex of, 1071.
- and 1,3,5-trinitrobenzene, 1:1, 2:1, and apparent association constants for a series of electron donor-acceptor complexes involving, 1256.
- Benzotriazole** and indazoles, reactivity of, towards *N*-methylation and analysis of the ¹H nuclear magnetic resonance spectra of indazoles and benzotriazoles, 1695.
- N*-chloro-, α -chlorination of sulphoxides by, kinetics of, 218.
- Benzylamine**, *N*-*p*-tolylsulphonyl-, 1-methyl-3-*p*-tolylsulphonylaminoindole, 1-methyl-3-*p*-tolylsulphonyliminoindoline-2-spirocyclopentane, and 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonylaminoquinoline, crystal and molecular structure of. Sulphone structures. Part II, 176.
- 2-Benzoylbenzoic acid**-amphetamine, chiroptical properties and ion-pair equilibria in. Induced circular dichroism. Part III, 1520.
- Benzyl halides**, kinetic studies on the displacement of halide from by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution. Mechanistic studies in strongly basic media. Part VIII, 1090.
- Benzyllic hydrogen atom abstraction**, directive effects in. Part VI, halogenation of arethyl fluorides, 10.
- Benzylideneamines**, *o*-nitro, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of to 2-substituted indazoles. Reduction of nitro- and nitroso-compounds by trivalent phosphorus reagents. Part XI, 1185.
- Bertzne**, ¹⁵N-labelling experiments and their relevance to the mechanisms of formation of from benzenediazonium acetate, and of the benzenediazonium ion from hydroxyazo-compounds. Acylarylnitrosamines. Part VIII, 546.
- Benzoyl** and benzenesulphonyl chlorides, the reaction of imidazole with, transition state enthalpies of transfer from propanol to acetonitrile in, 1486.
- Berlandin**, a guaianolide epoxide, *X*-ray crystallographic determination of the molecular structure of. Comments on the circular dichroism of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated ester side chains. Sesquiterpenoids. Part XX, 459.
- Bertya-5,12-diene-3,14-dione**, (5*E*,12*E*)-7 β -acetoxy-15 β -hydroxy- and (5*E*,12*E*)-7 β -acetoxy-, crystal structures of, 1684.
- Bicyclo[3.1.0]hexanes**, *exo*- and *endo*-6-bromo-3-oxa-, the preparation of and their stereospecific reactions with butyl-lithium, 197.
- Bicyclo[3.1.0]hex-2-ene**, *endo*-6-vinyl-, synthesis and thermolysis of rhodium and iridium complexes of. A metal-promoted vinylcyclopropane to cyclopropene rearrangement, 4.
- Bicyclo[3.3.1]nona-3,7-dien-2-ones**, 6-hydroxy, mechanism of the photorearrangement of, 412.
- cis*-Bicyclo[3.3.0]octane**, *endo*,*endo*-2,6-bis(phenylcarbamoyloxy)-, crystal and molecular structure of, 405.
- cis*-Bicyclo[4.2.0]octane**, crystal and molecular structure of a derivative. 1,2-Cycloaddition of $\alpha\beta$ -unsaturated esters to a biased enamine, 1804.
- Bifluorenylidene**, rearrangement of, to dibenzo[*g,p*]chrysene, 712.
- Bipyridyl radical cations**. Part I, electron spin resonance study of the dimerisation equilibrium of morphamquat radical cation in methanol, 1310. Part II, the reaction of morphamquat {bis-*N*-[(2,4-dimethylmorpholin-4-yl) carbonylmethyl]-4,4'-bipyridylum} radical cation with oxygen in methanol, 1831.
- 4,4'-Bipyridyl**, structure and conformation of, by nuclear magnetic resonance spectroscopy of a nematic solution, 1541.
- Bisformamide**, 1,1'-azo-, (azodicarbonamide), the thermal decomposition of, 46.
- Boiling point rule**, von Auwers'. A new approach, 740.
- Bond**, carbon-carbon, formation in aqueous and alcoholic solvents; intramolecular participation by enolate anions in the cleavage of aryl esters of mesitoic acid, 571.
- the C-N, dissociation energy in nitrosyl cyanide, 351.
- the S=O, chemistry of. Part IV, conformational analysis of ethylene sulphites, 190.

- Bonding** in thiophen, thiophen S-oxide, and thiophen SS-dioxide, non-empirical calculations of the nature of, 1223.
- Bond lengths**, carbon-phosphorus, in aromatic phosphines, investigation of. Part I, crystal and molecular structures of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, 1737.
- Bonds**, activated carbon-carbon double, mechanistic aspects of the cathodic hydrogenation of. Electro-organic reactions. Part III, 161.
- aromatic carbon-halogen, reductive cleavage of, in the presence of deuterium oxide Electrochemical reactions. Part XVIII, 215.
- carbon-nitrogen double, equilibrium addition of nucleophiles to. Kinetics of the addition of propanethiol to benzylideneanilines in non-aqueous solutions, 134.
- double, carbon-carbon, nucleophilic attacks on. Part XXI, substitution of (*E*)- α -chloro- β -nitrostyrene by anilines in acetonitrile, 272. Part XXII, base catalysis, leaving group effects, and solvent effects in several nucleophilic vinylic substitutions by amines, 863. Part XXIII, substitution of β -chloro- α -phenylacrylonitriles, 982.
- other than C-H, photoreduction of carbonyl triplets by. Semiempirical calculations. The kinetics of photochemical reactions. Part IV, 934.
- tin-sulphur, compounds with and related species, magnetic double resonance studies of tin-119 chemical shifts in, 1234.
- Bond scission** processes in sulphur compounds. Part IX, nucleophilic catalysis in the methanolysis of methyl *p*-nitrophenyl sulphate, 478.
- Borderline**, the *E1cB*-bimolecular nucleophilic mechanistic, reactions close to: aminolysis and base-catalysed hydrolysis of aryl phenylphosphoramidates and amidothionates, 1010.
- Boron trifluoride** and boron trichloride complexes with ethers, direct carbon-13 nuclear magnetic resonance study of, 1415.
- Bromides**, 2-thienylethyl, and toluene-*p*-sulphonates, kinetic study of *E2* eliminations from promoted by sodium ethoxide in ethanol, 821.
- Bromination** in acetic acid and trifluoroacetic acid solvents. Participation by neighbouring groups in addition reactions. Part III, 503.
- Bromoform** and carbon tetrachloride, addition of to fluoroethylenes. Free radical addition to olefins, 320.
- Buta-1,3-diene** and isoprene, reactions of amines and active methylene compounds with: catalysis by nickel, cobalt, rhodium, and iridium complexes, 1133.
- Butadiene-styrene** copolymers, monomer sequence in. Carbon-13 nuclear magnetic resonance spectroscopy of polymers. Part V, 27.
- styrene copolymers, peak assignment for. Carbon-13 nuclear magnetic resonance spectroscopy of polymers. Part IV, 21.
- substituted *cis,trans*-1,4-diphenyl-, iodine atom-catalysed isomerisation of, 1036.
- Butane**, 1,1,1,4,4,4-hexafluoro-, nuclear magnetic resonance spectral analysis and conformation of. Rotational isomerism. Part XIX, 535.
- some polychlorinated, rotamer populations in solution of: a molecular mechanics and nuclear magnetic resonance study. Rotational isomerism. Part XVIII, 699.
- But-2-ene** and peracetyl radicals, reaction of. Reactions of oxygenated radicals in the gas phase. Part I, 758.
- cyclohexene, norbornene, and stilbene, the stereochemistry of peroxymercuration of; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates. Oxy-metallation. Part XVIII, 531.
- Butenes** and peracetyl radicals, reactions of. Reactions of oxygenated radicals in the gas phase. Part II, 1715.
- t-Butoxyl radical**, reactivities of polystyrene and polypropylene toward. Effects of molecular weight, solvent, and temperature, 1221.
- t-Butyl alcohol** solution, kinetic studies on the displacement of halide from benzyl halides by alkali-metal salts of 9-substituted fluorenes in. Mechanistic studies in strongly basic media. Part VIII, 1090.
- t-Butylbenzene**, 1,3,5-tri- and *m*- and *p*-di-, the three *t*-butylbenzenesulphonic acids, and 3,5-di-*t*-butylbenzenesulphonic acid, sulphonation of. Aromatic sulphonation. Part LI, 1438.
- t-Butyl benzoates**, the Hammett correlation for pyrolysis of. The nature of the transition state in ester pyrolysis. Part III, 1802.
- Butyl-lithium**, the stereospecific reactions with, and the preparation of *exo*- and *endo*-6-bromo-3-oxabicyclo[3.1.0]-hexanes, 197.

C

- Caesium thiocyanate**, complexes formed with (7*R*,9*R*,18*S*-20*S*)-6,7,9,10,17,18,20,21-octahydro-7,9,18,20-tetramethylidibenzo[*b,k*][1,4,7,10,13,16]hexaoxacyclo-octadecin (tetramethyldibenzo-18-crown-6, isomer F) and its (18*R*,20*R*)-isomer (isomer G). Crystal structures of complexes between alkali-metal salts and cyclic polyethers. Part VIII, 261.
- Calcium sodium galacturonate hexahydrate** and strontium sodium galacturonate hexahydrate, crystal structures of. Interactions of cations with sugar anions, 237.
- Calculation**, molecular mechanical, of conformation energies of β -substituted ethyltrimethylammonium ions. Conformational studies of quaternary ammonium ions. Part II, 118.
- model, for thiocarbonyl systems, 559.
- molecular orbital, on the $C_2H_4SH^+$ cation, 1722.
- Monte Carlo, test of energy functions by for monosaccharides. Polysaccharide conformation. Part VIII, 830.
- of conformational energies for disaccharides and comparison with experiment. Polysaccharide conformation. Part IX, 836.
- non-empirical, for the benzenium, pyridinium, pyrylium, and thiopyrylium cations and a comparison of the last with phosphorin. The electronic structure of conjugated molecules, 841.
- of the electronic structure of some five-membered ring heterocycles containing sulphur and phosphorus: thiophen and phosphole, 974.
- of the nature of the bonding in thiophen, thiophen S-oxide, and thiophen SS-dioxide, 1223.
- of steric effects. Part II, the S_N2 halide exchange reactions, 1365.
- semiempirical all-valence-electron, on the reactivity of azulene and benzofuran, 366.
- Photoreduction of carbonyl triplets by bonds other than C-H. The kinetics of photochemical reactions. Part IV, 934.

- Camphenes**, 1-substituted, ^{13}C chemical shifts in, 539.
- Carbanions**, substituted 1,3-diphenylallyl, ion-pairing of with alkali-metal cations, 1661.
- Carbene chemistry**. Part VIII, the thermal decomposition of trichloromethyltrifluorosilane: a kinetic investigation, 1051.
- Carbocations**, phenyl participation in the generation of from the reactions of some 1-methyl- ω -phenylalkyl toluene-*p*-sulphonates and ω -phenylalk-1-enes in trifluoroacetic acid, 1664.
- Carbohydrates**, radiation chemistry of. Part V, γ -radiolysis of *scyllo*-inositol in oxygenated and deoxygenated aqueous solution, 1334. Part XIX, yields of trapped electrons and radicals in γ -irradiated frozen, concentrated, aqueous solutions of sugars, 614.
- Carbon-carbon bond formation** in aqueous and alcoholic solvents; intramolecular participation by enolate anions in the cleavage of aryl esters of mesitoic acid, 571.
- double bonds, activated, mechanistic aspects of the cathodic hydrogenation of. Electro-organic reactions. Part III, 161.
- phosphorus bond lengths in aromatic phosphines, investigation of. Part I, crystal and molecular structures of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, 1737.
- RS^\cdot , RSO^\cdot , RSO_2^\cdot , and RSSR^\cdot radicals, formation of: oxidation of thiols and disulphides in aqueous solution. Electron spin resonance studies. Part XLVI, 892.
- radicals, the trapping of. The competition of oxygen and iodine for the 1,1-diphenylethyl radical, 589.
- saturated, substitution at. Part XVIII, the effect of alcoholic solvents on rate constants for S_N and S_E reactions, 623. Part XIX, the effect of alcohols and water on the free energy of solutes and on the free energy of transition states in S_N and S_E reactions, 1856.
- trigonal, nucleophilic substitution at. Part II, ethanolytic of aliphatic acyl chlorides, 963.
- Carbonimidoyl dichlorides**, *N*-aryl- and *N*-aroyl-, sequential displacement of chloride in, 1046.
- Carbonium ion intermediates**, nuclear magnetic resonance investigations of. Part III, a chlorine-35 quadrupole resonance study of several (R-chloromethylene)-dimethylammonium salts (Vilsmeier-Haack and Viehe reagents), 925.
- classical. Part IV, absence of hydride shift in the solvolysis of 2-adamantyl toluene-*p*-sulphonate, 1446. Part V, stereochemistry of substitution in the solvolysis of 1-adamantyl and 2-methyl-2-adamantyl derivatives, 1447. Part VI, rearrangement during acetolysis of some 2-adamantyl derivatives, 1452. Part VII, nucleophilic assistance by solvent during acetolysis of secondary alkyl derivatives, 1458.
- Carbon tetrachloride** and bromoform, addition of to fluoroethylenes. Free radical addition to olefins. Part XV, 320.
- and cyclohexane, interaction between phenol and electron donors in, 793.
- Carbonyl infrared absorptions** of 2-oxofurans: Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes, 13.
- compounds**, conformations of some $\alpha\beta$ -unsaturated. Part V, assignments of Raman and infrared spectra of methyl and [$^2\text{H}_3$]methyl acrylates and *trans*-crotonates, 392. Part VI, comparison of out-of-plane olefinic CH deformation vibrations, 396. Part VII, assignments of Raman and infrared spectra of dimethyl, diethyl, and di-*n*-butyl fumarates and maleates, 400.
- some 2-substituted furan and thiophen, conformations of, 744.
- group** and a sulphur atom, interaction between. Part VI, some 3-thiacycloalkanones, 1294.
- region**, the infrared bands of thiophen-2-carbaldehydes in: multiple absorption caused by Fermi resistance, 604.
- triplets**, photoreduction of by bonds other than C-H. Semiempirical calculations. The kinetics of photochemical reactions. Part IV, 934.
- 1,4-Carbonyl participation** in solvolysis of alkyl toluene-*p*-sulphonates, 372.
- Carboxy-analogue**, reversed, of acetylcholine [methyl 3-(dimethylamino)propionate methiodide], crystal structure of, 1107.
- Carboxylic acids**, an electron spin resonance study of reactions of with the sulphate radical-anion, 697.
- oxo-, intra- and inter-molecular catalysis in the halogenation of some, 1343.
- Catalysis**, acid, of *E-Z* imine interconversion. Dynamic stereochemistry of imines and derivatives. Part V, 1535.
- by hydrogen halides in the gas phase. Part XXVII, *N*-*t*-butylacetamide and hydrogen chloride, 314.
- by nickel, cobalt, rhodium, and iridium complexes: reactions of amines and active methylene compounds with buta-1,3-diene and isoprene, 1133.
- intra- and inter-molecular, in the halogenation of some oxo-carboxylic acids, 1343.
- nucleophilic and general base, by pyridine and methylpyridines in the hydrolysis of aryl acetates, 660.
- in the methanolysis of methyl *p*-nitrophenyl sulphate. Bond scission processes in sulphur compounds. Part IX, 478.
- Catalysts**, properties of polyamide-based. Part I, hydrodehalogenation of chlorobenzene, 1479.
- rapid deuteration and tritiation of organic compounds using organo-metallic and elemental halides as, 1298.
- Cation**, the $\text{C}_2\text{H}_4\text{SH}^+$, molecular orbital calculations on, 1722.
- radicals** of 10-phenylphenoxazine and 10-phenylphenothiazine, an electron spin resonance investigation of. Heterocyclic free radicals. Part V, 1078.
- radical trapping** by copper(II) chloride. Aromatic chlorination by peroxodisulphate and chloride ions, 1503.
- association of 1,1-dimethoxy-complexes with. The stabilities of Meisenheimer complexes. Part X, 825.
- dimeric, from alkanesulphenyl chlorides. The elusive nature of sulphenylium ions, 361.
- glycopyranosyl, generation of in the spontaneous hydrolyses of 2,4-dinitrophenyl glycopyranosides. Evidence for the general intermediacy of glycopyranosyl cations in the acid-catalysed hydrolysis of methyl glycopyranosides, 1391.
- group II, and ethylene glycol in aqueous solutions, Raman spectral investigation of the interactions between, 1155.
- interaction of with sugar anions. Part I, crystal structures of calcium sodium galacturonate hexahydrate and strontium sodium galacturonate hexahydrate, 237.

Cation (*contd.*)

- monovalent, complexation of. Grisorixin, an ionophorous antibiotic of the nigericin group. Part IV, 907.
- Cerium(IV)** in acid solutions, triple oxidation of some polyhydric phenols by as observed by electron spin resonance spectroscopy, 850.
- Chain length**, effect of on the chemical ionisation mass spectra of methyl *n*-alkanoates, 1718.
- Charge transfer** complex, the diethyl ether-oxygen, photolysis at 254 nm of. Radiation chemistry of ethers. Part VI, 171.
- contributions to the stabilisation of the ground state of organic electron donor-acceptor complexes, 507.
- maxima of YCH_2Ph -tetracyanoethylene complexes, substituent effects of groups of type CH_2Y in acid cleavage of $p\text{-YCH}_2\text{-C}_6\text{H}_4\text{SiMe}_3$ compounds and on. Aromatic reactivity. Part LIX, 874.
- through-bond interaction in *N*-(*p*-methoxyphenylalkyl)-pyridinium ions, 579.
- transitions, intramolecular, optical activity of, 670.
- Chelates**, metal, of some *meso*-tetra-arylporphyrins, carbon-13 nuclear magnetic resonance spectra of. The nuclear magnetic resonance spectra of porphyrins. Part X, 204.
- Chemical shifts**, carbon-13, of 4-substituted tricyclenes, 734.
- tin-119, in compounds with tin-sulphur bonds and related species, magnetic double resonance studies of, 1234.
- Chiroptical properties** and ion-pair equilibria in 2-benzoylbenzoic acid-amphetamine. Induced circular dichroism. Part III, 1520.
- of lactones. Part I, rotatory strengths of electronic transitions in substituted and unsubstituted 1,4-dioxan-2,5-diones (dilactones), 1240. Part II, electronic rotatory strengths of the $n \rightarrow \pi^*$ transition in saturated γ - and δ -lactones, 1276.
- Chloramine T**, kinetics of oxidation of secondary alcohols by, 1590.
- Chloride** and peroxodisulphate ions, aromatic chlorination by. Cation radical trapping by copper(II) chloride, 1503.
- sequential displacement of in *N*-aryl- and *N*-aroyl-carbonimidoyl dichlorides, 1046.
- Chlorination**, aromatic, by peroxodisulphate and chloride ions. Cation radical trapping by copper(II) chloride, 1503.
- α -Chlorination** of sulfoxides by *N*-chlorobenzotriazole, kinetics of, 218.
- Chlorine acetate**, kinetics of addition initiated by. The kinetics and mechanisms of additions to olefinic substances. Part XII, 1150.
- Chlorobenzene**, hydrodehalogenation of. Properties of polyamide-based catalysts. Part I, 1479.
- Chloroform**, the interactions of with benzene and some alkylbenzenes at various temperatures, proton magnetic resonance studies of. Molecular complexes. Part XIV, 956.
- trinitromethane, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in cyclohexane solution, ^1H and ^{13}C nuclear magnetic resonance shift measurements and association constants of some, 64.
- (+)-trans-Chrysanthemic acid**, absolute configuration of. Crystal structure analysis of a *p*-bromoanilide derivative, 1567.

- Chrysene** and tetrafluoro-*p*-benzoquinone (fluoranil), crystal structure of the 1:1 molecular complex of, 1071.
- [*g,p*]Chrysene**, dibenzo, rearrangement of bifluorenylidene to, 712.
- trans-Cinnamic acid**, *p*-chloro-, and β -(*p*-chlorophenyl)-propionic acid, structure refinement and molecular packing of, 68.
- Cinnamic acid**, electron spin resonance study of the stereochemistry of radicals related to, 1189.
- α -*trans*- and *p*-methoxy-, crystal structures of, and their relation to thermal mesomorphism, 1835.
- Cleavage**, acid, of $p\text{-YCH}_2\text{-C}_6\text{H}_4\text{SiMe}_3$ compounds, substituent effects of groups of type CH_2Y in and on the charge-transfer maxima of YCH_2Ph -tetracyanoethylene complexes. Aromatic reactivity. Part LIX, 874.
- an intra- and an inter-molecular, of the ester bond in a series of 2- and 4-carbamoylphenyl esters of 2,4,6-trialkylated benzoic acids, kinetic comparison of the relative susceptibility to steric hindrance of, 1062.
- base, of substituted fluoren-9-yltrimethylsilanes and related compounds. Organosilicon compounds. Part LIII, 380.
- of aryl esters of mesitoic acid, intramolecular participation by enolate anions in; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
- photochemical, of the cyclopropane ring of 6,20-epoxy-lathyril {1,11-diacetoxy-3,6,6,14-tetramethyl-13-phenylacetoxy(tricyclo-[10.3.0.0^{5,7}]pentadec-3-ene-10-spiro-2'-oxiran)-2-one}, 1253.
- reductive, of aromatic carbon-halogens bonds in the presence of deuterium oxide. Electrochemical reactions. Part XVIII, 215.
- Cobalt**, nickel, rhodium, and iridium complexes, catalysis by: reactions of amines and active methylene compounds with buta-1,3-diene and isoprene, 1133.
- Competition** of oxygen and iodine for the 1,1-diphenylethyl radical. The trapping of carbon radicals, 589.
- Complex**, the diethyl ether-oxygen charge transfer, photolysis at 254 nm of. Radiation chemistry of ethers. Part VI, 171.
- Complexation** of monovalent cations. Grisorixin, an ionophorous antibiotic of the nigericin group. Part IV, 907.
- Complexes**, a series of electron donor-acceptor, 1:1, 2:1, and apparent association constants for involving 1,3,5-trinitrobenzene and tetrafluoro-*p*-benzoquinone (fluoranil), 1256.
- donor-acceptor, ^{35}Cl nuclear quadrupole resonance of, 453.
- organic electron donor-acceptor, charge-transfer contributions to the stabilisation of the ground state of, 507.
- Compounds**, $p\text{-YCH}_2\text{-C}_6\text{H}_4\text{SiMe}_3$, substituent effects of groups of type CH_2Y in acid cleavage of and on the charge-transfer maxima of YCH_2Ph -tetracyanoethylene complexes. Aromatic reactivity. Part LIX, 874.
- Condensation**, the Darzens. Part III, effects of substituents on the rate of condensation of substituted phenacyl chlorides with benzaldehyde, 805.
- Configuration**, absolute, and structure of plenolin: X-ray analysis of plenolin *p*-iodobenzoate, 487. florilenalin: X-ray analysis of 4-*O*-acetyl-2-*O*-iodobenzoylflorilenalin, 492.
- Conformation** and circular dichroism of uronic acid residues in glycosides and polysaccharides, 1418.

Conformation (*contd.*)

- and crystal structure of 17 α -ethynyl-17 β -hydroxy-6,6-dimethyl-6-sila-5 α -estr-1(10)-en-3-one, 1180.
- and nuclear magnetic resonance spectral analysis of 1,1,1,4,4,4-hexafluorobutane. Rotational isomerism. Part XIX, 535.
- and proton nuclear magnetic resonance spectra in 1,4-dihydrobenzenes and 9,10-dihydroanthracenes, 1544.
- and structure, investigations of. Part V, conformational interconversion and ring shape in five- and six-membered alicyclic radicals, 1083.
- of 4,4'-bipyridyl by nuclear magnetic resonance spectroscopy of a nematic solution, 1541.
- and the stereochemistry of the germacranolide glaucolide A, X-ray crystallographic determination of. Sesquiterpenoids. Part XIX, 455.
- and the structure of an oxide from helenalin, X-ray determination of, 496.
- molecular, of S-4-nitrophenyl *OO*-diphenyl thiophosphate: X-ray crystal structure analysis, 57.
- new, of a friedelin-type triterpene: X-ray structure of 3-*O*-acetyl-16-*O*-*p*-bromobenzoylpachysandiol B. Studies of the neutral constituents of *Pachysandra terminalis* Sieb. et Zucc. Part IV, 610.
- polysaccharide. Part VIII, test of energy functions by Monte Carlo calculations for monosaccharides, 830. Part IX, Monte Carlo calculations for conformational energies for disaccharides and comparison with experiment, 836.
- the molecular, of cyclo- β -alanyl, 43.
- Conformational analysis** by carbon-13 nuclear magnetic resonance spectroscopy. Part I, hexahydro-3*H*-oxazolo[3,4-*a*]pyridines, 51.
- of aryl- and alkyl-thio-, aryl- and alkyl-sulphinyl, and aryl and alkyl-sulphonyl sulphines by means of nuclear magnetic resonance and dipole moments. Chemistry of sulphines. Part XXVII, 352.
- of ethylene sulphites. Chemistry of the S-O bond. Part IV, 190.
- of saturated heterocycles. Part LXX, nitrogen inversions in 1,3,4-oxadiazolidines, 1191.
- of substituted piperidinium ions by ¹H nuclear magnetic resonance spectroscopy and evaluation of the contribution of electrostatic interaction energy in controlling conformation. Conformational studies of quarternary ammonium ions. Part III, 127.
- differences**, large, between ground and excited states of sterically hindered stilbenes: implications regarding Stokes shifts and viscosity or temperature dependence of fluorescence yields. Emission of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.
- equilibria** in *N*-alkyl-*cis*-decahydroquinolines, 111.
- equilibrium**, carbon-13 nuclear magnetic resonance studies of, and of the barrier to internal rotation in *o* and *m*-substituted benzaldehydes. Nuclear magnetic resonance studies on benzaldehydes. Part II, 1682.
- in fluorosulphonyl ethanes, a nuclear magnetic resonance study of, 1100.
- properties** and assignment of the exocyclic 5'-hydroxymethyl group of nucleosides by nuclear magnetic resonance spectroscopy, 1703.
- studies**, of 2,3-diacyl-5-nitrocyclopentadienes: delocalized systems with very short intramolecular O...H...O hydrogen bonds. Crystal and molecular structures of 2,3-diacetyl- and 2,3-dibenzoyl-5-nitrocyclopentadiene, 998.
- studies** of 4-methylene-1,3-dioxan. Nuclear magnetic resonance experiments on acetals. Part LVIII, 1434.
- of quarternary ammonium ions. Part II, molecular mechanical calculation of conformation energies of β -substituted ethyltrimethylammonium ions, 118.
- Part III, conformational analysis of substituted piperidinium ions by ¹H nuclear magnetic resonance spectroscopy and evaluation of the contribution of electrostatic interaction energy in controlling conformation, 127.
- Conformations**, aldehyde, substituent effects on as shown by long range coupling constants. Nuclear magnetic resonance conformational studies on *C*-substituted pyrrolecarbaldehydes. Part I, 333.
- and ¹H nuclear magnetic resonance parameters of some chloro-1,4-dioxans and 5-chloro-2,3-dihydro-1,4-dioxin. Halogeno-1,4-dioxans and their derivatives. Part VII, 959.
- of some 2-substituted furan and thiophen carbonyl compounds, 744.
- of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, assignments of Raman and infrared spectra of methyl and [²H₃]methyl acrylates and *trans*-crotonates, 392.
- Part VI, comparison of out-of-plane olefinic CH deformation vibrations, 396.
- Part VII, assignments of Raman and infrared spectra of dimethyl, diethyl, and di-*n*-butyl fumerates and maleates, 400.
- of the episantonins: crystal structures of 2-bromo-6-*epi*- α -santonin and 2-bromo-6-*epi*- β -santonin. Sesquiterpenoids. Part XXI, 1826.
- Conjugation** and spectroscopic trends in phenylsulphonylguanidine derivatives. Physico-chemical behaviour of sulphur drugs, 522.
- in *para*-substituted benzenes and its relation to strain energies and σ -values. Infrared intensities as a quantitative measure of intramolecular interactions. Part XXXV, 443.
- Constituents**, neutral of *Pachysandra terminalis* Sieb. et Zucc, studies on. Part IV, X-ray structure of 3-*O*-acetyl-16-*O*-*p*-bromobenzoylpachysandiol B: new conformation of a friedelin-type triterpene, 610.
- Co-ordination**, intramolecular, in β -peroxyalkylmercury trifluoroacetates; the stereochemistry of peroxymercuration of cyclohexene, norbornene, but-2-ene, and stilbene. Oxymetalation. Part VIII, 531.
- Copper(II) chloride**, cation radical trapping by. Aromatic chlorination by peroxodisulphate and chloride ions, 1503.
- ions and thiobenzamide in aqueous solution, kinetics and mechanism of the reaction between, 953.
- ortho-Correlations**, linear free energy, in the thiophen series. Part I, the kinetics of piperidinodebromination of some 2-bromo-3-*X*-5-nitrothiophens in methanol, 620.
- Coupling** of diazonium salts with acetone, 1312.
- constant**, geminal, J_{gem} , relationship between the magnitude of and the spatial orientation of α - and β -substituents, 1395, 1400.
- and isotope effects, and calculation of ² J_{HH} coupling constants. Tritium nuclear magnetic resonance effects. Part III, 449.
- long range, substituent effects on aldehyde conformations as shown by. Nuclear magnetic resonance

Coupling (contd.)

conformational studies on *C*-substituted pyrrole-carbaldehydes. Part I, 333.

Creatinine (2-imino-1-methylimidazolidin-4-one) and acetone, a kinetic study of the Janovsky complexes formed from. The Jaffé reaction. Part II, 853.

trans-Crotonates and acrylates, methyl and [$^2\text{H}_3$]methyl, assignments of Raman and infrared spectra of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, 392.

Crotonic esters, 3-amino-, infrared and nuclear magnetic resonance absorption and isomerism of. Part III, 1561.

Crystal and molecular structure of *trans*-4-aminocrotonic acid, 1059.

of a *cis*-bicyclo[4.2.0]octane derivative. 1,2-Cycloaddition of $\alpha\beta$ -unsaturated esters to a biased enamine, 1804.

of *endo,endo*-2,6-bis(phenylcarbamoyloxy)-*cis*-bicyclo[3.3.0]octane, 405.

of 8 α -bromo-1,2,3,5,6,7,8,8 α -octahydro-1,3,-dioxoisquinoline-4-carbonitrile, 1597.

of 2-(*m*-bromophenyl)-3-methyl-4-(trifluoroacetyl)oxazolium 5-oxide, a mesoionic oxazolone, 1280.

of eupatolide, the major cytotoxic principle from *Eupatorium formosanum* HAY, 1798.

of goniotalamin [(+)-(6*S*)-5,6-dihydro-6-styryl-2-pyrone], 368.

of hexasonium iodide. Stereochemistry of anticholinergic agents. Part VI, 467.

of 17 β -hydroxy-17 α -methyl-2-oxa-5 α -androstan-3-one, 1361.

of 3-(2-methylpiperidino)-1-phenylpropyl phenyl ether methiodide. Stereochemistry of anticholinergic agents. Part VII, 1074.

of parthemollin {3,3 α ,4,5,6,8 α -hexahydro-7-(1-hydroxy-3-oxobutyl)-6-methyl-3-methylenecyclopenta[*b*]-furan-2-one}, 440.

of pteridine, redetermination of, 40.

of silver sulphadiazine (N¹-pyrimidin-2-ylsulphanilamide), 1021.

of the 2:3 complex of *N*-methylphenazinium with $\alpha\alpha\alpha'$ -tetracyanoquinodimethane, [(nmp)₂]²⁺[(tcnq)₃]²⁻, 1146.

of the 1:2 complex of methyltriphenylphosphonium with $\alpha\alpha\alpha'$ -tetracyano-3,7-naphthoquinodimethane, (Ph₃PMe)⁺[(tnap)₂]⁻, 1141.

of the enol form of 1,1'-diphenyl-2,2'-dithiobis(butane-1,3-dione), 1818.

of *N*-*p*-tolylsulphonylbzylamine, 1-methyl-3-*p*-tolylsulphonylaminoindole, 1-methyl-3-*p*-tolylsulphonyliminoindoline-2-spirocyclopentane, and 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonyliminoquinoline. Sulphone structures. Part II, 176.

of tricarbonyl-(8,8-dibromobicyclo[5.1.0]octa-2,4-diene)iron, 88.

of 2,3-diacetyl- and 2,3-dibenzoyl-5-nitrocyclopentadiene. Conformational studies of 2,3-diacetyl-5-nitrocyclopentadienes: delocalized systems with very short intramolecular O...H...O hydrogen bonds, 998.

of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide. Investigation of phosphorus-carbon bond lengths in aromatic phosphines. Part I, 1737.

of two resonance-stabilized Wittig reagents 2-carboxy-1-methoxycarbonylethyltriphenylphosphorane and its *t*-butyl ester. Structural investigations of ylides. Part VI, 1030.

structure analysis, X-ray: molecular conformation of *S*-4-nitrophenyl *OO*-diphenyl thiophosphate, 57.

and absolute configuration of lycopodine hydrochloride, 93.

and conformation of 17 α -ethynyl-17 β -hydroxy-6,6-dimethyl-6-sila-5 α estr-1(10)-en-3-one, 1180.

of a *p*-bromoanilide derivative. Absolute configuration of (+)-*trans*-chrysanthemic acid, 1567.

of *p*-*n*-butoxybenzoic acid. An X-ray study of the *p*-*n*-alkoxybenzoic acids. Part IV, 1175.

of 5-[(3-chlorobenzyl)dimethylammonio]tetrazolide. Tetrazole studies. Part III, 1200.

of 2 α ,3 α -epithio-5 α -androst-6-en-17 β -yl *p*-bromobenzoate, 993.

of *p*-ethoxybenzoic acid. An X-ray study of the *p*-*n*-alkoxybenzoic acids. Part III, 1171.

of orthorhombic dibenz[*a,h*]anthracene, refinements of, 1271.

of oxotremorine sesquioxalate, 1-[4-(2-oxopyrrolidin-1-yl)but-2-ynyl]pyrrolidinium sesquioxalate, 774.

of *N*-(5-*O*-phosphopyridoxyl)-*L*-tyrosine heptahydrate, 60.

of some acid salts of monobasic acids. Part XVII, structure of sodium hydrogen diacetate, redetermined by neutron diffraction, 15.

of the acid salts of some dibasic acids. Part IX, potassium hydrogen *meso*-tartrate: a neutron diffraction study, 1549.

of the 1:1 molecular complex of chrysene and tetrafluoro-*p*-benzoquinone (fluoranil), 1071.

of the photoaddition product of iodoform and 3,4,5-trimethylphenol, 600.

of the reversed carboxy-analogue of acetylcholine [methyl 3-(dimethylamino)propionate methiodide], 1107.

X-ray, of hexahydro-1,4-dimethyl-*s*-tetrazine, 270.

X-ray, of 1,3,6,8-tetraoxacyclodecane, 1129.

and absolute stereochemistry of tecomanine methoperchlorate and 'alkaloid C' methiodide: two monoterpene alkaloids from *Tecoma stans*, 1124.

of (5*E*,12*E*)-7 β -acetoxy-15 β -hydroxybertya-5,12-diene-3,14-dione and (5*E*,12*E*)-7 β -acetoxybertya-5,12-diene-3,14-dione, 1684.

of α -*trans*- and *p*-methoxy-cinnamic acids and their relation to thermal mesomorphism, 1835.

of 2-bromo-6-*epi*- α -santonin and 2-bromo-6-*epi*- β -santonin: conformations of the episantonins. Sesquiterpenoids. Part XXI, 1826.

of calcium sodium galacturonate hexahydrate and strontium sodium galacturonate hexahydrate. Interactions of cations with sugar anions, 237.

of complexes between alkali-metal salts and cyclic polyethers. Part VIII, complexes formed by caesium thiocyanate with (7*R*,9*R*,18*S*,20*S*)-6,7,9,10,17,18,20,21-octahydro-7,9,18,20-tetramethyldibenzo[*b,k*][1,4,7,10,13,16]hexaoxacyclo-octadecin (tetramethyldibenzo-18-crown-6, isomer F) and its (18*R*,20*R*)-isomer (isomer G), 261.

Cyanoporphyrins. Co-ordinating and electrochemical properties, 1321.

- Cyclic** and acyclic dialkoxyalkyl radicals, electron spin resonance study of the fragmentation of some. The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.
- Cyclisation**, mechanism of phenoxide. Intramolecular alkylation of phenols. Part I, 1054.
of 3-allylhex-5-enyl radical: mechanism, and implications concerning the structures of cyclopolymers, 1726.
of aryl radicals containing unsaturated *ortho*-substituents, mechanism of, 795.
the oxidative, of formazans to tetrazolium salts, 104.
- Cycloaddition** and cycloreversion, search for the mechanism of. Reactions of aryl isothiocyanates with dicyclohexylcarbodi-imide, 1475.
electron deficient diene, stereoselectivity and stereospecificity in with norbornadiene and 7-*t*-butoxynorbornadiene: results and MINDO/2 theoretical study, 1004.
some [2 + 2] and dipolar, activation volumes of. Reaction studies at high pressure. Part I, 1555.
- 1,2-Cycloaddition** of $\alpha\beta$ -unsaturated esters to a biased enamine. Crystal and molecular structure of a *cis*-bicyclo[4.2.0]octane derivative, 1804.
- Cyclo- β -alanyl**, the molecular conformation of, 43.
- [5- 3 H]₁Cyclo-octyl *p*-bromobenzenesulphonate**, *cis*- and *trans*-, solvolytic behaviour of—a stereospecific, remote ϵ -deuterium isotope effect, 1647.
- Cycloalkenols**, benzo-, a stereoelectronic effect in the rates of quinone dehydrogenation of. Applications of high potential quinones. Part IX, 1307.
- Cyclodecane**, 1,3,6,8-tetraoxa-, X-ray crystal structure of, 1129.
- Cyclohepta[b]furan-2-one**, 3,3a,4,5,6,8a-hexahydro-7-(1-hydroxy-3-oxobutyl)-6-methyl-3-methylene-, (parthemollin), crystal and molecular structure of, 440.
- Cyclohexane** solution, 1 H and 13 C nuclear magnetic resonance shift measurements and association constants of some chloroform, trinitromethane, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in, 64.
and carbon tetrachloride, interaction between phenol and electron donors in, 793.
- Cyclohexene**, norbornene, but-2-ene, and stilbene, the stereochemistry of the peroxymercuration of; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates. Oxymetallation. Part VIII, 531.
- Cyclohexenone**, 3-aryl-, derivatives, barrier to rotation in some. Studies in restricted rotation. Part I, 464.
- N-Cyclohexylthiobenzamide** and tetrachlorogold(III) ions, reactions between, 1351.
- Cyclo-octadecan**, (7*R*,9*R*,18*S*,20*S*)-6,7,9,10,17,18,20,21-octahydro-7,9,18,20-tetra-methylidibenzo[*b,k*][1,4,7,10,13,16]hexaoxa-, (tetramethylidibenzo-18-crown-6, isomer F) and its (18*R*,20*R*)-isomer (isomer G), complexes formed by caesium thiocyanate with. Crystal structures of complexes between alkali-metal salts and cyclic polyethers. Part VIII, 261.
crystal structure of, 266.
- Cyclopenta-1,3-diene**, 1,2,3,4-tetraphenyl-, radical anion, reactions of. Radical-anion intermediates. Part VII, 1304.
- Cyclopentadienes**, 2,3-diacetyl-5-nitro-, conformational studies of: delocalized systems with very short intramolecular O...H...O hydrogen bonds. Crystal and molecular structures of 2,3-diacetyl- and 2,3-dibenzoyl-5-nitrocyclopentadiene, 998.
- Cyclopentane**, 1-methyl-3-*p*-tolylsulphonyliminoindoline-2-spiro-, *N-p*-tolylsulphonylbenzylamine, 1-methyl-3-*p*-tolylsulphonylaminoindole, and 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonyliminoquinoline, crystal and molecular structure of. Sulphone structures. Part II, 176.
- Cyclopolymers**, mechanism and implications concerning the structures of: cyclisation of 3-allyl-5-enyl radical, 1726.
- Cyclopropane** ring of 6,20-epoxylathyril [1,11-diacetoxy-3,6,6,14-tetramethyl-13-phenylacetoxyl(tricyclo-[10.3.0.0^{5,7}]pentadec-3-ene-10-spiro-2'-oxiran)-2-one], photochemical cleavage of, 1253.
vinyl-, to cyclopropane rearrangement, a metal-promoted. Synthesis and thermolysis of rhodium and iridium complexes of *endo*-6-vinylbicyclo[3.1.0]hex-2-ene, 4.
- Cycloreversion** and cycloaddition, search for the mechanism of. Reactions of aryl isothiocyanates with dicyclohexylcarbodi-imide, 1475.
- Cytotoxic principle**, the major, from *Eupatorium formosanum* HAY, eupatolide, crystal and molecular structure, 1798.

D

- Darzens condensation**, the. Part III, effects of substituents on the rate of condensation of substituted phenacyl chlorides with benzaldehyde, 805.
- DDT** (1,1,1-trichloro-2,2-bis-(*p*-chlorophenylethane), chloroform, trinitromethane and pentachloroethane in cyclohexane solution, 1 H and 13 C nuclear magnetic resonance shift measurements and association constants of some, 64.
- Dealkylation**, effect of alkyl group structure on. Thermal dealkylation of 2,4-bisalkylamino-6-chloro-*s*-triazines, 1701.
thermal, of 2,4-bisalkylamino-6-chloro-*s*-triazines. Effect of alkyl group structure on dealkylation, 1701.
- Decomposition**, general acid catalysed, of *N*-nitroso-2-pyrrolidone, an example of amide hydrolysis *via* S_N2 displacement on the *N*-conjugate acid. The chemistry of nitroso-compounds. Part IX, 153.
of some Δ^1 -pyrazolines, kinetics of, 1791.
the thermal, of *cis*- and *trans*-2-methoxy-4-methyl-2,4-dihydro-2*H*-pyran, 1.
of azodicarbonamide (1,1'-azobisformamide), 46.
of trichloromethyltrifluorosilane: a kinetic investigation. Carbene chemistry. Part VIII, 1051.
- Dehalogenation** reactions of vicinal dihalides. Part IV, kinetics of amine-promoted eliminations of 1-chloro-2-iodo-1,2-diphenylethane in aqueous dioxan, 802.
- Dehydrogenation**, quinone, of benzocycloalkenols, a stereoelectronic effect in the rates of. Applications of high potential quinones. Part IX, 1307.
- Dehydrohalogenation** of *threo*- and *erythro*-1-chloro- and 1-bromo-1,2-diphenyl-2-*p*-tolylsulphonylethanes. A survey of the stereochemical course, 221.
- Denitrosation** and the Fischer-Hepp rearrangement, kinetics and mechanism of. Part VI, the relative reactivity of a number of nitrogen-containing species towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement, 655.
kinetics and mechanism of the Fischer-Hepp rearrangement and. Part V, the mechanism of denitrosation, 107.

- Derivatives**, 2-adamantyl and 2-methyl-2-adamantyl, stereochemistry of substitution in the solvolysis of. Classical carbonium ions. Part V, 1447.
secondary alkyl, nucleophilic assistance by solvent during acetolysis of. Classical carbonium ions. Part VII, 1458.
some 2-adamantyl, rearrangement during acetolysis of. Classical carbonium ions. Part VI, 1452.
- Desilylation** and detritiation of 1,6-methano[10]annulene and 11,11-difluoro-1,6-methano[10]annulene. Electrophilic aromatic substitution. Part XVI, 1287.
- Desulphuration** of ethylthiourea, kinetics of, in sodium hydroxide studied by a radiochromatographic method, 169.
- pK_{BH} Determination** of sulphonic acids; a nuclear magnetic resonance study of organic sulphonic acids and 1H nuclear magnetic resonance standards. Solutes in sulphuric acid. Part VI, 226.
- Deuteriation** and tritiation, rapid, of organic compounds using organo-metallic and elemental halides as catalysts, 1298.
- Deuterium bromide**, stereochemistry of addition of to *cis*- and *trans*-*t*-butylstyrene. Rotamer populations of sterically crowded trisubstituted ethanes. Polar addition to olefins. Part II, 574.
oxide, reductive cleavage of aromatic carbon-halogen bonds in the presence of. Electrochemical reactions. Part XVIII, 215.
- Dialkoxylalkyl radicals**, cyclic and acyclic, electron spin resonance study of the fragmentation of some. The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.
- Dialkyl and diaryl disulphides**, some, and diphenyl disulphone, dipole moments and dielectric relaxation times of, 695.
- Diazepines**. Part XIX, kinetics of addition of bromine to position 6 in 2,3-dihydro-1,4-diazepinium salts, 325.
- Diazines**, chloro-, chlorine-35 nuclear magnetic resonance spectra of, 1250.
- 3H-Diazirines**, 3-aryl-, the preparation and properties of, 686.
- Diazo-coupling** to indoles, the mechanism of, and the effect of steric hindrance on the rate-limiting step, 1209.
- Diazonium salts**, coupling of with acetone, 1312.
- Dibasic acids**, crystal structure of the acid salts of some. Part IX, potassium hydrogen *meso*-tartrate: a neutron diffraction study, 1549.
- Dicarbonamide**, azo-, (1,1'-azobisformamide), the thermal decomposition of, 46.
- Dichloroacetic acid** in toluene at 35°, hydrogen-bonded species of the complex of 4-methylpyridine with, 250.
- Dichroism**, induced circular. Part III, chiroptical properties and ion-pair equilibria in 2-benzoylbenzoic acid-amphetamine, 1520.
circular, and conformation of uronic acid residues in glycosides and polysaccharides, 1418.
of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated ester side chains, comments on. X-Ray crystallographic determination of the molecular structure of berlandin, a guaianolide epoxide. Sesquiterpenoids. Part XX, 459.
- Dicyclohexylcarbodi-imide**, reactions of aryl isothiocyanates with. Search for the mechanism of cycloaddition and cycloreversion, 1475.
- Dielectric relaxation times** and dipole moments of some dialkyl and diaryl disulphides and diphenyl disulphides, 695.
- Diels-Alder reaction**, -retro, in negative-ion mass spectrometry. Nitro-2*H*,4*H*,1,3- and -2,3-dihydro-1,4-benzodioxins. Electron impact studies. Part XCIV, 724.
of triazolinediones, substituent and solvent effects on, 1325.
- 1,3-Diene**, a proximate, influence of upon the photoreactivity of some $\alpha\beta$ -unsaturated ketones, 519.
- Dienes**, conjugated, and nitric oxide, studies on the reactions between, 1808.
- Dienones**, non-conjugated, photochemistry of. Part V, photolysis of (*E*)- β -ionone and its isomeric α -pyran, 1283.
- Diffusion coefficients**, relative, of aromatic cations and aromatic compounds. Justification for directly equating voltammetric potentials to formal potentials, 755.
- Dihalide anions** and related species as products in the radiolysis of organic halides. Unstable intermediates. Part CLIX, 1492.
vicinal, dehalogenation reactions of. Part IV, kinetics of amine-promoted eliminations of 1-chloro-2-iodo-1,2-diphenylethane in aqueous dioxan, 802.
- Dilactones** (1,4-dioxan-2,5-diones), substituted and unsubstituted, rotatory strengths of electronic transitions in. Chiroptical properties of lactones. Part I, 1240.
- Dimerization** of substituted anthracenes, the role of imperfections in. Part II, 1,8-dichloro-10-methylanthracene, 84.
- Dimethane**, $\alpha\alpha\alpha'$ -tetracyano-3,7-naphthoquino-, crystal and molecular structure of the 1:2 complex of methyltriphenylphosphonium with, $(Ph_3PMe)^+[(tnap)_2]^-$, 1141.
 $\alpha\alpha\alpha'$ -tetracyanoquino-, the 3:2 complex of with *N*-methylphenazinium, $[(nmp)_2]^{2+}[(tcnq)_3]^{2-}$, crystal and molecular structure of, 1146.
- 1,1-Dimethoxy-complexes**, association of with cations. The stabilities of Meisenheimer complexes. Part X, 825.
- Dimethyl sulphoxide**, reaction of with the hydroxyl radical. Electron spin resonance studies. Part XLIII, 303.
-methanol, 1H nuclear magnetic resonance studies on the reaction between 6-nitrobenzothiazole and methoxide ion in. Ring opening and closing in heterocyclic compounds, 1472.
-water, 50.2 mole%, the substituent dependence of the primary deuterium kinetic isotope effect in elimination from phenethyl bromides and dimethyl(phenethyl)sulphonium bromides in, 234.
- Dioxan**, aqueous, kinetics of amine-promoted eliminations of 1-chloro-2-iodo-1,2-diphenylethane in. Dehalogenation reactions of vicinal dihalides. Part IV, 802.
comparison of the acidity of tin tetrachloride, tellurium tetrachloride, and zirconium tetrabromide towards substituted anilines in. Quantitative aspects of Lewis acidity. Part XIV, 1110.
- 1,3-Dioxan**, 4-methylene-, conformational studies of. Nuclear magnetic resonance experiments on acetals. Part LVIII, 1434.
- 1,4-Dioxan-2,5-diones** (dilactones), substituted and unsubstituted, rotatory strengths of electronic transitions in. Chiroptical properties of lactones. Part I, 1240.
- 1,4-Dioxans**, halogeno-, and their derivatives. Part VII, conformations and 1H nuclear magnetic resonance parameters of some chloro-1,4-dioxans and 5-chloro-2,3-dihydro-1,4-dioxin, 959.

- 1,4-Dioxin**, 5-chloro-2,3-dihydro-, and some chloro-1,4-dioxans, conformations and ^1H nuclear magnetic resonance parameters of. Halogeno-1,4-dioxans and their derivatives. Part VII, 959.
- Dipeptides**, determination of pK values of peptide groups in, from nuclear magnetic resonance kinetic studies, 784.
- Diphenyl disulphone** and some dialkyl and diaryl disulphides, dipole moments and dielectric relaxation times of, 695.
- 1,1-Diphenylethyl radical**, the competition of oxygen and iodine for the. The trapping of carbon radicals, 589.
- Diphenylmethyl cations**, substituted. Part I, acid-base equilibria, 607.
- Dipole moments** and dielectric relaxation times of some dialkyl and diaryl disulphides and diphenyl disulphone, 695.
and nuclear magnetic resonance spectra, conformational analysis of aryl- and alkyl-thio, aryl- and alkyl-sulphinyl, and aryl- and alkyl-sulphonyl sulphines by means of. Chemistry of sulphines. Part XXVII, 352.
electric, of some tetra- and penta-fluorobenzenes, 903.
of methyl- and trifluoromethyl-substituted methyl benzoates, 1587.
- Disaccharides**, Monte Carlo calculation of conformational energies for, and comparison with experiment. Polysaccharide conformation. Part IX, 836.
- Displacement**, intramolecular, of alcohols from *o*-hydroxyaminobenzoates, kinetics of, 1512.
of halide from benzyl halides by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution, kinetic studies on. Mechanistic studies in strongly basic media. Part VIII, 1090.
 S_N2 , on the *N*-conjugate acid, general acid catalysed decomposition of *N*-nitroso-2-pyrrolidone, an example of amide hydrolysis *via*. The chemistry of nitroso-compounds. Part IX, 153.
sequential, of chloride in *N*-aryl- and *N*-aroyl-carbonimidoyl dichlorides, 1046.
- Disulphides** and thiols in aqueous solution, oxidation of: formation of RS^\cdot , RSO^\cdot , RSO_2^\cdot , RSSR^\cdot , and carbon radicals. Electron spin resonance studies. Part XLVI, 892.
some dialkyl and diaryl, and diphenyl disulphone, dipole moments and dielectric relaxation times of, 695.
- Dithiobis(butane-1,3-dione)**, 1,1'-diphenyl-2,2'-, crystal and molecular structure of the enol form of, 1818.
- Drugs**, sulpha, physico-chemical behaviour of. Spectroscopic trends and conjugation in phenylsulphonylguanidine derivatives, 522.
- philic substitution of 2-chloroquinoxaline with hydroxide ion, 421.
ring-size, in the oxidation and reduction of some cyclic sulphoxides, 408.
solvent, on the Menschutkin reaction of tripropylamine with methyl iodide, application of reaction field theory to the calculation of, 1677.
on exchange and hydrolysis reactions. The reactivity of *O*-acylglycosyl halides. Part XII, 1138.
steric, calculations of. Part II, the S_N2 halide exchange reactions, 1365.
substituent and solvent, on the Diels-Alder reactions of triazolinediones, 1325.
of groups of type CH_2Y in acid cleavage of *p*- $\text{YCH}_2\text{-C}_6\text{H}_4\text{SiMe}_3$ compounds and on the charge-transfer maxima of YCH_2Ph -tetracyanoethylene complexes. Aromatic reactivity. Part LIX, 874.
on aldehyde conformations as shown by long range coupling constants. Nuclear magnetic resonance conformational studies of *C*-substituted pyrrole-carbaldehydes. Part I, 333.
substitution, in kinetically controlled reactions, 1196.
- Electrochemical reactions**. Part XVIII, reductive cleavage of aromatic carbon-halogen bonds in the presence of deuterium oxide, 215.
- Electron donor-acceptor complexes**, organic, charge-transfer contributions to the stabilisation of the ground state of, 507.
donors and phenol in cyclohexane and carbon tetrachloride, interaction between, 793.
- Electronic absorption and fluorescence spectra of *trans*-1-(4-*NN*-dimethylaminophenyl)-2-nitroethylene**, influence of solvent on, 287.
effects, intramolecular, importance of on the value of α : synthesis of alkoxotellurium(IV) fluorides, $(\text{RO})_x\text{TeF}_{6-x}$, 312.
transmission of by the oxiran ring. Ionization constants of *meta*- and *para*-substituted 2,3-epoxy-3-phenylpropionic acids in 50% ethanol, 371.
spectra, synthesis, and photoisomerisation of naphthylpyridylethylenes, 1712.
- Electron impact studies**. Part XCIV, retro-Diels-Alder reaction in negative-ion mass spectrometry. Nitro-2*H*,4*H*-1,3- and -2,3-dihydro-1,4-benzodioxins, 724.
- nuclear double resonance** and electron spin resonance studies of anion-radicals derived from *p*-benzoquinone, 258.
- paramagnetic resonance** parameters and equilibria of manganese(II)-amino-acid complexes in aqueous solution, 769.
- spin** and nuclear magnetic resonance spectroscopy, nitrosyliron complexes with mercapto-purines and -pyrimidines studied by, 423.
- resonance** investigation of the cation-radicals of 10-phenylphenoxazine and 10-phenylphenothiazine. Heterocyclic free radicals. Part V, 1078.
- resonance spectroscopy**, investigation of photolysis of *o*-nitrophenols by. Characterisation of 1,2-benzoquinone monohydroxyimine free radicals, 1380.
- resonance spectroscopy**, triple oxidations of some polyhydric phenols by cerium(IV) in acid solutions as observed by, 850.
- resonance spectrum** of the xanthen radical anion, 1652.
- resonance studies**. Part XLIII, reaction of dimethyl sulphoxide with the hydroxyl radical, 303. Part

E

- Effects**, aryl and heteroaryl substituent, in reductions and solvolysis reactions, 551.
directive, in benzylic hydrogen atom abstraction. Part VI, halogenation of arethyl fluorides, 10.
intramolecular and solvation, in aprotic solvents, entropy changes due to. The acid-base function in non-aqueous solution. Part V, 1057.
leaving group, base catalysis, and solvent effects in several nucleophilic vinylic substitutions by amines. Nucleophilic attacks on carbon-carbon double bonds. Part XXII, 863.
micellar, on heteroaromatic compounds. Part I, nucleo-

Electron (*contd.*)

- XLIV, the formation of alkylsulphonyl radicals by the oxidation of aliphatic sulphoxides with the hydroxyl radical and by the reaction of alkyl radicals with sulphur dioxide, 308. Part XLV, reactions of the methyl radical with some aliphatic compounds in aqueous solution, 885. Part XLVI, oxidation of thiols and disulphides in aqueous solution: formation of RS^{\cdot} , RSO^{\cdot} , RSO_2^{\cdot} , $RSSR^{\cdot}$, and carbon radicals, 892. Part XLVII, sulphinyl- and sulphonyl-substituted aliphatic radicals, 1245.
- resonance studies of aromatic hydrocarbon radical ions.** Part IV, *t*-butylacenaphthene anions, 1263.
- resonance study of radicals obtained from the oxidation of naturally occurring hydroxypyrones,** 101.
- resonance study of reactions of carboxylic acids with the sulphate radical-anion,** 697.
- resonance study of the dimerisation equilibrium of morphamquat radical cation in methanol.** Bipyridyl radical cations. Part I, 1310.
- resonance study of the fragmentation of some cyclic and acyclic dialkoxyalkyl radicals.** The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.
- resonance study of the radical anions derived from *cis*- and *trans*-1,2-bis(diphenylphosphinyl)ethylene.** Reactions of radical anions. Part XV, 643.
- resonance study of the stereochemistry of radicals related to cinnamic acid,** 1189.
- resonance study of the structure and reactivity of aminophosphoranyl radicals in solution,** 140.
- Electrons, trapped, and radicals, yields of in γ -irradiated, frozen, concentrated, aqueous solutions of sugars.** Radiation chemistry of carbohydrates. Part XIX, 614.
- Electro-organic reactions.** Part III, mechanistic aspects of the cathodic hydrogenation of activated carbon-carbon double bonds, 161.
- Electrophilic aromatic reactivities via pyrolysis of 1-aryl-ethyl acetates.** Part X, pyridine *N*-oxide, 277. Part XI, the σ^+ value for the *m*-methyl substituent, 1463. Part XII, total reactivity of isoquinoline, 1783.
- substitution. Part XIII, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration, 648. Part XIV, kinetics of nitration of some aromatic sulphonic acids in sulphuric acid, 788. Part XVI, detritiation and desilylation of 1,6-methano[10]annulene and 11,11-difluoro-1,6-methano[10]annulene, 1287.
- Electrostatic interaction energy, evaluation of the contribution of in controlling conformation and conformational analysis of substituted piperidinium ions by 1H nuclear magnetic resonance spectroscopy.** Conformational studies of quarternary ammonium ions. Part III, 127.
- Elimination from phenethyl bromides and dimethyl-(phenethyl)sulphonium bromides in 50.2 mole% dimethyl sulphoxide-water, the substituent dependence of the primary deuterium kinetic isotope effect in,** 234.
- of trifluoroethoxide ion from α,α -dinitro- β,β -diphenyl- β -(trifluoroethoxy)ethanide anion and the non-reactivity of the β -cyano- α,α -dinitro- β,β -diphenylethanide anion, *E1cB* and *E2cB* mechanisms in, 628.
- the sodium hydroxide-catalysed *E2*, of hydrogen bromide from *p*-acetyl- and *p*-nitro-phenethyl bromide, solvent dependence of the primary deuterium kinetic isotope effect in, 1218.
- reactions.** Part II, base-catalysed formation of stilbene derivatives from α -phenyl- and α -(4-nitrobenzyl)-substituted 4-nitrobenzyl chloride, 384.
- of 2-chloro-1-phenylpropane in different solvent-base systems, stereochemistry of, 1669.
- of 1,2-diaryl-1-chloroethanes promoted by sodium ethoxide in ethanol. The kinetic effects of α - and β -phenyl substituents, 329.
- amine-promoted, of 1-chloro-2-iodo-1,2-diphenylethane in aqueous dioxan. Dehalogenation reactions of vicinal dihalides. Part IV, 802.
- E2*, from 2-thienylethyl bromides and toluene-*p*-sulphonates promoted by sodium ethoxide in ethanol, kinetic study of, 821.
- gas-phase. Part XIV, the pyrolysis of 1-(1-chloroethyl)-2-methylbenzene, 1194.
- Emissions of sterically hindered stilbene derivatives and related compounds.** Part IV, large conformational differences between ground and excited states of sterically hindered stilbenes: implications regarding Stokes shifts and viscosity or temperature dependence of fluorescence yields, 1569.
- Enamine, a biased, 1,2-cycloaddition of $\alpha\beta$ -unsaturated esters to.** Crystal and molecular structure of a *cis*-bicyclo[4,2,0]octane derivative, 1804.
- β -sulphonyl. An *X*-ray and 1H nuclear magnetic resonance study of the stereochemistry of the isomeric β -chloromethylsulphonyl- β -methyl- α -morpholino-styrenes, 809.
- Energies, conformation, of β -substituted ethyltrimethylammonium ions, molecular mechanical calculation of.** Conformational studies of quarternary ammonium ions. Part II, 118.
- conformational, Monte Carlo calculations of for disaccharides, and comparison with experiment. Polysaccharide conformation. Part IX, 836.
- Energy, electrostatic interaction, evaluation of the contribution of in controlling conformation and conformational analyses of substituted piperidinium ions by 1H nuclear magnetic resonance spectroscopy.** Conformational studies of quarternary ammonium ions. Part III, 127.
- reverse activation, partitioning between kinetic and internal energy in reactions of some simple organic ions, 881.
- the C-N bond dissociation, in nitrosyl cyanide, 351.
- functions, test of by Monte Carlo calculations for monosaccharides.** Polysaccharide conformation. Part VIII, 830.
- Enolate anions in the cleavage of aryl esters of mesitoic acid, intramolecular participation in; carbon-carbon bond formation in aqueous and alcoholic solvents,** 571.
- Enthalpies of ionization deduced from the temperature dependence of indicator measurements for amides in concentrated aqueous solutions of perchloric acid,** 1411.
- transition state, of transfer from propanol to acetonitrile in the reaction of imidazole with benzoyl and benzene-sulphonyl chloride, 1486.
- Entropy changes due to intramolecular and solvation effects in aprotic solvents.** The acid-base function in non-aqueous solvents. Part V, 1057.

- Episantonins**, conformations of: crystal structure of 2-bromo-6-*epi*- α -santonin and 2-bromo-6-*epi*- β -santonin. Sesquiterpenoids. Part XXI, 1826.
- Epoxide**, X-ray crystallographic determination of the molecular structure of berlandin, a guaianolide. Comments on the circular dichroism of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated ester side chains. Sesquiterpenoids. Part XX, 459.
- carbon-13 nuclear magnetic resonance spectra of some, 861.
- Equilibria**, acid-base. Substituted diphenylmethyl cations. Part I, 607.
- and kinetics of the *S*-nitrosation of alkylthioureas, 1734.
- ion-pair, and chiroptical properties in 2-benzoylbenzoic acid-amphetamine. Induced circular dichroism. Part III, 1520.
- of manganese(II)-amino-acid complexes in aqueous solution, electron paramagnetic resonance parameters and, 769.
- protolytic, photochemical reactions, and fluorescence in *N*-alkylated phenazinium ion-phenazyl free radical systems. Excited states of six-membered aza-aromatic rings. Part VIII, 417.
- Equilibrium** addition to nucleophiles to carbon-nitrogen double bonds. Kinetics of the addition of propane-thiol to benzylideneanilines in non-aqueous solutions, 134.
- the dimerisation, of morphamquat radical cation in methanol, electron spin resonance study of. Bipyridyl radical cations. Part I, 1310.
- Ester bond**, kinetic comparison of the relative susceptibility to steric hindrance of an intra- and an inter-molecular cleavage of in a series of 2- and 4-carbamoylphenyl esters of 2,4,6-trialkylated benzoic acids, 1062.
- pyrolysis, the nature of the transition state in. Part II, the relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl acetates, phenylacetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates, 1025. Part III, the Hammett correlation for pyrolysis of *t*-butyl benzoates, 1802.
- aryl, of mesitoic acid, intramolecular participation by enolate anions in the cleavage of; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
- $\alpha\beta$ -unsaturated, 1,2-cycloaddition of to a biased enamine. Crystal and molecular structure of a *cis*-bicyclo[4.2.0]-octane derivative, 1804.
- Ethane**, 1-chloro-2-iodo-1,2-diphenyl-, in aqueous dioxan, kinetics of amine-promoted eliminations in. Dehalogenation reactions of vicinal dihalides. Part IV, 802.
- pentachloro- and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)-, (DDT), chloroform, and trinitromethane in cyclohexane solution, ¹H and ¹³C nuclear magnetic resonance shift measurements and association constants of some, 64.
- bridges** between trivalent phosphorus atoms, carbon-13 nuclear magnetic resonance spectra of some polyphosphines with, 938.
- Ethanide**, α,α -dinitro- β,β -diphenyl- β -(trifluoroethoxy), anion, E1cB and E2cB mechanisms in the elimination of trifluoroethoxide ion from and the non-reactivity of the β -cyano- α,α -dinitro- β,β -diphenylethanide anion, 628.
- Ethanes**, *threo*- and *erythro*-1-chloro- and 1-bromo-1,2-diphenyl-2-*p*-tolylsulphonyl-, dehydrohalogenation of. A survey of the stereochemical course, 221.
- 1,2-diaryl-1-chloro-, elimination reaction of promoted by sodium ethoxide in ethanol. The kinetic effects of α - and β -phenyl substituents, 329.
- fluorosulphonyl-, a nuclear magnetic resonance study of the conformational equilibrium in, 1100.
- sterically crowded trisubstituted, rotamer populations of. Stereochemistry of addition of deuterium bromide to *cis*- and *trans*-*t*-butylstyrene. Polar addition to olefins. Part II, 574.
- Ethanol**, 50%, ionization constants of *meta*- and *para*-substituted 2,3-epoxy-3-phenylpropionic acids in. Transmission of electronic effects by the oxiran ring, 371.
- kinetic study of *E2* eliminations from 2-thienylethyl bromides and toluene-*p*-sulphonates promoted by sodium ethoxide in, 821.
- methoxy-, in the liquid phase, ultraviolet photolysis (λ 185 nm) of. Radiation chemistry of alcohols. Part XXI, 1338.
- propan-2-ol, and acetaldehyde, kinetics of reactions of toluene-*p*-diazonium ions with. Free-radical reductions of arenediazonium ions in aqueous solutions. Part III, 751.
- substituted *N*-methylpyridinium and *N*-methylquinolinium salts with piperidine in, and in water. Kinetics of reactions in heterocycles. Part XIII, 1267.
- Ethanolysis** of aliphatic acyl chlorides. Nucleophilic substitution at trigonal carbon. Part II, 963.
- Ethers**, boron trifluoride and boron trichloride complexes with, direct carbon-13 nuclear magnetic resonance study of, 1415.
- radiation chemistry of. Part VI, photolysis at 254 nm of the diethyl ether-oxygen charge transfer complex, 171.
- Ethylene**, *cis*- and *trans*-1,2-bis(diphenylphosphinyl), an electron spin resonance study of the radical anions derived from. Reactions of radical anions. Part XV, 643.
- trans*-1-(4-*NN*-dimethylaminophenyl)-2-nitro-, influence of solvent on the electronic absorption and fluorescence spectra of, 287.
- tetracyano-, -YCH₂Ph complexes, substituent effects of groups of type CH₂Y in acid cleavage of *p*-YCH₂-C₆H₄-SiMe₃ compounds and on the charge maxima of. Aromatic reactivity. Part LIX, 874.
- glycol** and group II cations in aqueous solutions, Raman spectral investigation of the interactions between, 1155.
- 1,2-disubstituted. Infrared intensities as a quantitative measure of intramolecular interactions. Part XLII, 1371.
- fluoro-, addition of fluoridomethane to. Free radical addition to olefins. Part XVII, 1846.
- mono- and di-substituted, quantitative estimation of electronic interactions in, and the prediction of rotational barriers. Infrared intensities as a quantitative measure of intramolecular interactions. Part XLIII, 1378.
- naphthylpyridyl-, synthesis, electronic spectra, and photoisomerisation of, 1712.
- sulphites**, conformational analysis of. Chemistry of the S=O bond. Part IV, 190.
- Eupatolide**, the major cytotoxic principle from *Eupatorium formosanum* HAY, crystal and molecular structure, 1798.

Exchange, acid-catalysed in aqueous acetonitrile solutions: kinetics and mechanism of N-H and C-H isotopic exchange in pyrrole and indole, 1316.

reactions, hydrogen isotope, kinetics of. Part XXX, steric course of γ -radiation-induced exchange between water and tartaric acids, 1595.

Excited state energies in unsaturated nitro-compounds. The photoluminescence of some β -nitrostyrenes, 1576.

Experiments, ^{15}N -labelling, and their relevance to the mechanisms of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds. Acylarylnitrosamines. Part VIII, 546.

F

Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes: infrared carbonyl absorptions in 2-oxofurans, 13.

multiple absorption caused by: the infrared bands of thiophen-2-carbaldehydes in the carbonyl region, 604.

Fischer-Hepp rearrangement and denitrosation, kinetics and mechanism of. Part V, the mechanism of denitrosation, 107. Part VI, the relative reactivity of a number of nitrogen-containing species towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement, 655.

Fluorescence yields, viscosity and temperature dependence of, implications regarding Stokes shifts: large conformational differences between ground and excited states of sterically hindered stilbenes. Emissions of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.

Fluoren-9-yltrimethylsilanes, substituted, and related compounds, base cleavage of. Organosilicon compounds. Part LIII, 380.

Florilenalin, structure and absolute configuration of: X-ray analysis of 4-*O*-acetyl-2-*O*-*p*-iodobenzoylflorilenalin, 492.

Fluoranyl (tetrafluoro-*p*-benzoquinone) and chrysene, crystal structure of the 1:1 molecular complex of, 1071. (tetrafluoro-*p*-benzoquinone) and 1,3,5-trinitrobenzene, 1:1, 1:2, and apparent association constants for a series of electron donor-acceptor complexes involving, 1256.

Fluorenes, alkali-metal salts of 9-substituted, kinetic studies on the displacement of halide from benzyl halides by in *t*-butyl alcohol solution. Mechanistic studies in strongly basic media. Part VIII, 1090.

Fluorescence and electronic absorption spectra of *trans*-1-(4-*NN*-dimethylaminophenyl)-2-nitroethylene, influence of solvent on, 287.

photochemical reactions, and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems. Excited states of six-membered aza-aromatic rings. Part VIII, 417.

Fluorides, arethyl, halogenation of. Directive effects in benzylic hydrogen atom abstraction. Part VI, 10.

Fluoroethylenes, addition of bromoform and carbon tetrachloride to. Free radical addition to olefins. Part XV, 320.

Folic acid, 5-methyl-5,6,7,8-tetrahydro-, autoxidation of, 18.

Formaldehyde-lithium ion pair, an *ab-initio* investigation of. Theoretical studies on ion pairs, 194.

Formation, base-catalysed, of stilbene derivatives from α -phenyl- and α -(4-nitrobenzyl)-substituted 4-nitrobenzyl chloride. Elimination reactions. Part II, 384.

of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds, ^{15}N -labelling experiments and their relevance to the mechanisms of. Acylarylnitrosamines. Part XIII, 546.

of positive ions and other primary species in the oxidation of sulphides by hydroxyl radicals, 675.

of RS^{\cdot} , RSO^{\cdot} , RSO_2^{\cdot} , RSSR^{\cdot} , and carbon radicals: oxidation of thiols and disulphides in aqueous solution. Electron spin resonance studies. Part XLVI, 892.

Formazans, the oxidative cyclization of to tetrazolium salts, 104.

Fourier transform ^{13}C nuclear magnetic resonance studies of steroids. Part I, some substituted 17 β -(2,5-dihydro-5-oxo-3-furyl) steroids, 344.

Fragmentation of some cyclic and acyclic dialkoxyalkyl radicals, electron spin resonance study of the. The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.

Free energy, linear, relationships in the thiophen series.

Part I, leaving group effect in piperidino-substitution in methanol of some 2-*L*-3-nitro-5-*X*-thiophens, 989.

of solutes and the free energy of transition states in S_{N} and S_{E} reactions, the effect of alcohols and water on. Substitution at saturated carbon. Part XIX, 1856.

Freilingyne[(4*Z*,6*E*)-9-(3-furyl)-2,6-dimethylnona-2,4,6-trien-8-yn-4-olide], stereochemistry of by X-ray analysis, 1863.

Free radical addition to olefins. Part XV, addition of bromoform and carbon tetrabromide to fluoroethylenes, 320. Part XVI, photolysis of difluoroiodomethane in the presence of olefins, 1841. Part XVII, addition of fluoroiodomethane to fluoroethylenes, 1846.

phenazyl-,phenazinium ion systems, *N*-alkylated, photochemical reactions, fluorescence, and protolytic equilibria in. Excited states of six-membered aza-aromatic rings. Part VIII, 417.

reductions of arenediazonium ions in aqueous solution.

Part III, kinetics of reactions of toluene-*p*-diazonium ions with ethanol, propan-2-ol, and acetaldehyde, 751.

1,2-benzoquinone monohydroxyimine, characterisation of. Investigation of photolysis of *o*-nitrophenols by electron spin resonance spectroscopy, 1380.

heterocyclic. Part V, an electron spin resonance investigation of the cation-radicals of 10-phenylphenoxazine and 10-phenylphenothiazine, 1078.

Fumarates and maleates, dimethyl, diethyl, and di-*n*-butyl, assignments of Raman and infrared spectra of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VII, 400.

Function, the acid-base, in non-aqueous solution. Part V, entropy changes due to intramolecular and solvation effects in aprotic solvents, 1057.

Furan and thiophen carbonyl compounds, conformations of some 2-substituted, 744.

-2(3*H*)-one, 3-(2-hydroxybenzylidene)-4,5-dihydro-, kinetics of intramolecular acylation of, in concentrated acids, 1525.

-2(3*H*)-one, 3-(2-hydroxybenzylidene)-4,5-dihydro-, photochemical intramolecular acylation of, in methanol, 1529.

Furan (*contd.*)

2-oxo-, infrared carbonyl absorptions in: Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes, 13.

Furazans, 4-nitro-7-X-benzo-, nucleophilic reactivity of methoxide ion at C-5 of: a kinetic and thermodynamic investigation of Meisenheimer complexes, 1469.

G

Gases, reaction of with organic solids, role of molecular packing and structural defects in: ozonolysis of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, 584.

Gas phase, catalysis by hydrogen halides in the. Part XXVII, *N*-*t*-butylacetamide and hydrogen chloride, 314.

pyrolysis of some primary and secondary thionacetates, 317.

reactions of oxygenated radicals in. Part I, reaction of peracetyl radicals and but-2-ene, 758. Part II, reactions of peracetyl radicals and butenes, 1715.

Galacturonate hexahydrate, calcium sodium and strontium sodium, crystal structures of. Interactions of cations with sugar anions, 237.

Generation of carbocations from the reactions of some 1-methyl- ω -phenylalkyl toluene-*p*-sulphonates and ω -phenylalk-1-enes in trifluoroacetic acid, phenyl participation in, 1664.

Glaucolide A, the germacranolide, X-ray crystallographic determination of the stereochemistry and conformation of. Sesquiterpenoids. Part XIX, 455.

β -D-Glucopyranoside, *p*-nitrophenyl, radiolysis of aqueous solutions of. Radiation effects on aryl glycosides. Part VII, 1638.

α -D-Glucose 6-phosphate, disodium, in aqueous solution under nitrogen or oxygen, photolysis of. The photochemistry of phosphorus compounds. Part X, 34.

Glycine, benzoyl-, derivatives, the oxazolinone intermediate in the hydrolysis and aminolysis of, 947.

Glycopyranosides, 2,4-dinitrophenyl, generation of glycopyranosyl cations in the spontaneous hydrolyses of. Evidence for the general intermediacy of glycopyranosyl cations in the acid-catalysed hydrolyses of methyl glycopyranosides, 1391.

Glycosides and polysaccharides, conformation and circular dichroism of uronic acid residues in, 1418.

aryl, radiation effects on. Part VII, radiolysis of aqueous solutions of *p*-nitrophenyl β -D-glucopyranoside, 1638.

Glycosyl, *O*-acyl-, halides, the reactivity of. Part XII, solvent effects on exchange and hydrolysis reactions, 1138.

Gold(III) ions, tetrachloro-, and *N*-cyclohexylthiobenzamide, reactions between, 1351.

Goniothalamine [(+)-(6*S*)-5,6-dihydro-6-styryl-2-pyrone], crystal and molecular structure of, 368.

Grisorixin, an ionophorous antibiotic of the nigericin group. Part IV, complexation of monovalent cations, 907.

Ground state of organic electron donor-acceptor complexes, charge-transfer contributions to the stabilisation of, 507.

Group, the exocyclic 5'-hydroxymethyl of nucleosides, assignment and conformational properties of by nuclear magnetic resonance spectroscopy, 1703.

of type CH₂Y, substituent effects of in acid cleavage of

p-YCH₂·C₆H₄SiMe₃ compounds and on the charge-transfer maxima of YCH₂Ph-tetracyanoethylene complexes. Aromatic reactivity. Part LIX, 874.

Guanidine, phenylsulphonyl-, derivatives, spectroscopic trends and conjugation in. Physico-chemical behaviour of sulpha drugs, 522.

H

Halide, kinetic studies on the displacement of from benzyl halides by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution. Mechanistic studies in strongly basic media. Part VIII, 1090.

hydrogen, in the gas phase, catalysis by. Part XXVII, *N*-*t*-butylacetamide and hydrogen chloride, 314.

metal, the basicity of substituted benzamides towards. The validity of nuclear magnetic resonance chemical shifts as measures of Lewis acid strength. Quantitative aspects of Lewis acidity. Part XIII, 541.

organic, dihalide anions and related species as products in the radiolysis of. Unstable intermediates. Part CLIX, 1492.

organo-metallic and elemental, rapid deuteration and tritiation of organic compounds using, as catalysts, 1298.

Halogenation of arethyl fluorides. Directive effects in benzylic hydrogen atom abstraction. Part VI, 10.

of some oxo-carboxylic acids, intra- and inter-molecular catalysis in, 1343.

Halogenobenzenes, some, and benzene, the photochemical reactions of trifluoriodomethane with. Reactions of trifluoromethyl radicals. Part I, 435.

Hammett correlation for pyrolysis of *t*-butyl benzoates. The nature of the transition state in ester pyrolysis. Part III, 1802.

Helenalin, X-ray determination of the structure and conformation of an oxide from, 496.

Heteroaromatic compounds, micellar effects on. Part I, nucleophilic substitution of 2-chloroquinoline with hydroxide ion, 421.

the kinetics and mechanism of the electrophilic substitution of. Part XL, the standardisation of aromatic and heteroaromatic nitration rates, 1600. Part XLI, nitration of 3-hydroxy-1-phenylpyrazoles, 1609. Part XLII, the nitration of thiazoles and thiazolones, 1614. Part XLIII, the nitration of isothiazoles, 1620. Part XLIV, discussion of standard nitration rates for benzenoid and heteroaromatic compounds, 1624. Part XLVII, nitration of phenylisoxazoles, 1627. Part XLVIII, nitration of pyrazoles in the 3- and 5-positions, 1632.

hydrogen exchange reactions. Part VIII, the ionisation of 1,3-dimethylindolin-2-one, 1822.

Heteroaryl and aryl substituent effects in reductions and solvolysis reactions, 551.

Heterocycles, kinetics of reactions in. Part XII, substituted *N*-methylquinolinium and *N*-methylisoquinolinium salts with hydroxide ions, 298. Part XIII, substituted *N*-methylpyridinium and *N*-methylquinolinium salts with piperidine in water and ethanol, 1267. Part XIV, reactions of 2- and 4-amino-, -methylamino-, and -dimethylamino-pyridine methiodides and 2-methylthiopyrimidine methiodide with hydroxide ions in water, 1385.

Heterocycles (*contd.*)

- saturated, the conformational analysis of. Part LXX, nitrogen inversions in 1,3,4-oxadiazolidines, 1191.
- some five-membered ring, containing sulphur and phosphorus, non-empirical calculations of the electronic structure of: thiophen and phosphole, 974.
- Heterocyclic compounds**, ring opening and closing in. ¹H Nuclear magnetic resonance studies on the reaction between 6-nitrobenzothiazole and methoxide ion in dimethyl sulphoxide-methanol, 1472.
- free radicals**. Part V, an electron spin resonance investigation of the cation-radicals of 10-phenylphenoxazine and 10-phenylphenothiazine, 1078.
- Hexasonium iodide**, crystal and molecular structure of. Stereochemistry of anticholinergic agents. Part VI, 467.
- High pressure**, reaction studies at. Part I, activation volumes of some [2 + 2] and dipolar cycloadditions, 1555.
- Histidines** and imidazoles, ring-fluorinated, ¹⁹F and ¹H nuclear magnetic resonance studies of, 928.
- Homoadamantan-5-ol**, 5-chloromethyl-4-oxa-, X-ray structure analysis of. Adamantane chemistry. Part II, 74.
- Hydride shift**, absence of in the solvolysis of 1- and 2-adamantyl toluene-*p*-sulphonate, Classical carbonium ions. Part IV, 1446.
- Hydrocarbon** derivatives, some *meso*-substituted, and anthracene, sulphonation of: mechanism of methyl side-chain sulphonation. Aromatic sulphonation. Part L, 966.
- radical ions, aromatic, electron spin resonance studies of. Part IV, *t*-butylacenaphthene anions, 1263.
- Hydrodehalogenation** of chlorobenzene. Properties of polyamide-based catalysts. Part I, 1479.
- Hydrogenation**, cathodic, of activated carbon-carbon double bonds, mechanistic aspects of. Electro-organic reactions. Part III, 161.
- the liquid-phase, of aromatic nitro-compounds, kinetics of in the presence of tungsten carbide catalyst, 827.
- Hydrogen atom abstraction**, benzylic, directive effects in. Part VI, halogenation of arethyl fluorides, 10.
- randomization, unimolecular gas-phase, within 2-methylpropane radical cations, 98.
- bonds**, delocalized systems with very short intramolecular O...H...O: conformational studies of 2,3-diacyl-5-nitrocyclopentadienes. Crystal and molecular structures of 2,3-diacetyl- and 2,3-dibenzoyl-5-nitrocyclopentadiene, 998.
- bromide**, solvent dependence of the primary deuterium kinetic isotope effect in the sodium hydroxide-catalysed E2 elimination of from *p*-acetyl- and *p*-nitro-phenethyl bromide, 1218.
- chloride** and *N*-*t*-butylacetamide. Catalysis by hydrogen halides in the gas phase. Part XXVII, 314.
- exchange** reactions, heteroaromatic. Part VIII, the ionisation of 1,3-dimethylindolin-2-one, 1822.
- Hydrolyses**, spontaneous, of 2,4-dinitrophenyl glycopyranosides, generation of glycopyranosyl cations in. Evidence for the general intermediacy of glycopyranosyl cations in the acid-catalysed hydrolyses of methyl glycopyranosides, 1391.
- Hydrolysis**, acid catalysed, and protonation behaviour of 4,5-diarylisosynndones. Mesoionic compounds. Part IV, 230.
- of *N*-alkyl-4-chlorobenzamides. Part II, 1203.
- of substituted acetanilides. Part II, 1357.
- alkaline, of some sulphinate esters, kinetics and oxygen-18 tracer studies of. Nucleophilic substitution at sulphinyl sulphur, 858.
- amide, an example of *via* S_N2 displacement of the *N*-conjugate acid, general acid catalysed decomposition of *N*-nitroso-2-pyrrolidone. The chemistry of nitroso-compounds. Part IX, 153.
- and aminolysis of benzoylglycine derivatives, the oxazolinone intermediate in, 947.
- base-catalysed, and aminolysis of aryl phenylphosphonamidates and amidothionates: reactions close to the E1cB-bimolecular nucleophilic mechanistic borderline, 1010.
- general acid catalysed, of benzaldehyde aryl methyl acetals, 1113.
- of arenesulphonyl chlorides. Reactions of organic sulphur compounds. Part I, 637.
- of aryl acetates, nucleophilic and general base catalysis by pyridine and methylpyridines in, 660.
- of imidoyl chlorides, mechanism of, 429.
- of phthalic and 3,6-dimethylphthalic anhydrides, 282.
- of 2,2,2-trifluoroethyl hydrogen 3,6-dimethylphthalate, 285.
- Hydroxide ion**, nucleophilic substitution of 2-chloroquinoxaline with. Micellar effects of heteroaromatic compounds. Part I, 421.
- in water, reactions of 2- and 4-amino-, -methylamino-, and -dimethylamino-pyridine methiodides and 2-methylthiopyrimidine with. Kinetics of reactions in heterocycles. Part XIV, 1385.
- substituted *N*-methylquinolinium and *N*-methylisoquinolinium salts with. Kinetics of reactions in heterocycles. Part XII, 298.
- Hydroxyazo-compounds**, ¹⁵N-labelling experiments and their relevance to the mechanisms of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from. Acylarylnitrosamines. Part VIII, 546.
- Hydroxyl radical**, reaction of dimethyl sulphoxide with. Electron spin resonance studies. Part XLIII, 303.
- the formation of alkylsulphonyl radicals by the oxidation of aliphatic sulphoxides with and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part XLIV, 308.
- formation of positive ions and other primary species in the oxidation of sulphides by, 675.
- Hydroxylation**, non-enzymatic, tetrahydrobiopterin-mediated, of phenylalanine, 245.
- 8-Hydroxyquinoline**, kinetics and mechanism of the iodination of, 1873.

I

- Imazolidin-4-one**, 2-imino-1-methyl-, (creatinine) and acetone, a kinetic study of the Janovsky complexes formed from. The Jaffé reaction. Part II, 853.
- Imidazole**, the reaction with benzoyl and benzenesulphonyl chlorides, transition state enthalpies of transfer from propanol to acetonitrile in, 1486.
- and histidines, ring-fluorinated, ¹⁹F and ¹H nuclear magnetic resonance studies of, 928.
- Imidoyl chlorides**, mechanism of hydrolysis of, 429.
- Imines** and derivatives, dynamic stereochemistry of. Part V, acid catalysis of *E-Z* imine interconversion, 1535.

Imines (contd.)

Stereochemistry of the peroxyacid-imine route to oxaziridines, 1813.

benzoquinone. Part XII, reactions of 2-aminoindamines [2-amino-*N*-(4-aminophenyl)-*p*-benzoquinone di-imines] in aqueous solution, 728.

Imperfections in the dimerization of substituted anthracenes, the role of. Part II, 1,8-dichloro-10-methylanthracene, 84.

Indamines, 2-amino-, [2-amino-*N*-(4-aminophenyl)-*p*-benzoquinone di-imines], reactions of, in aqueous solution. Benzoquinone imines. Part XII, 728.

Indazoles and benzotriazole, reactivity of, towards *N*-methylation and analysis of the ¹H nuclear magnetic resonance spectra of indazoles and benzotriazoles, 1695.

2-substituted, a kinetic study of the effects of varying the reagent and the nitro-compounds in the conversion of *o*-nitrobenzylideneamines to. Reduction of nitro- and nitroso-compounds by tervalent phosphorus reagents. Part XI, 1185.

Indicator measurements for amides in concentrated aqueous solutions of perchloric acid, enthalpies of ionization deduced from the temperature dependence of, 1411.

INDO theoretical studies of 4-aminopyridine and protonated 4-aminopyridine, 1776.

Indole and pyrrole, kinetics and mechanism of N-H and C-H isotopic exchange in: acid-catalysed exchange in aqueous acetonitrile solutions, 1316.

1-methyl-3-*p*-tolylsulphonylamino-, *N*-*p*-tolylsulphonylbenzylamine, 1-methyl-3-*p*-tolylsulphonyliminoindoline-2-spirocyclopentane, and 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonyliminoquinoline, crystal and molecular structure of. Sulphone structures. Part II, 176.

the mechanism of diazo-coupling to, and the effect of steric hindrance on the rate-limiting step, 1209.

Indolin-2-one, 1,3-dimethyl-, the ionisation of. Heteroaromatic hydrogen exchange reactions. Part VIII, 1822.

Infrared and nuclear magnetic resonance absorption and isomerism of 3-aminocrotonic esters. Part III, 1561. and Raman spectra of dimethyl, diethyl, and di-*n*-butyl fumarates and maleates, assignments of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VII, 400.

of methyl and [²H₃]methyl acrylates and *trans*-crotonates, assignments of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, 392.

bands of thiophen-2-carbaldehydes in the carbonyl region: multiple absorption caused by Fermi resonance, 604.

carbonyl absorptions of 2-oxofurans: Fermi resonance *versus* rotational isomerism as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes, 13.

intensities as a quantitative measure of intramolecular interactions. Part XXXV, conjugation in *para*-substituted benzenes and its relation to strain energies and σ -values, 443. Part XLII, 1,2-disubstituted ethylenes, 1371. Part XLIII, quantitative estimation of electronic interactions in mono- and di-substituted ethylenes and the prediction of rotational barriers, 1378.

scyllo-Inositol in deoxygenated and oxygenated aqueous solution, γ -radiolysis of. Radiation chemistry of carbohydrates. Part V, 1334.

Interaction between the carbonyl group and a sulphur atom. Part VI, some 3-thiacycloalkanones, 1294.

of sodium methoxide with 4-nitropyridine *N*-oxide in benzene in the presence of surfactant aggregates, 482. through-bond charge-transfer, in *N*-(*p*-methoxyphenyl-alkyl)pyridinium ions, 579.

between group II cations and ethylene glycol in aqueous solutions, Raman spectral investigation of, 1155.

intramolecular, infrared intensities as a quantitative measure of. Part XXXV, conjugation in *para*-substituted benzenes and its relation to strain energies and σ -values, 443. Part XLII, 1,2-disubstituted ethylenes, 1371. Part XLIII, quantitative estimation of electronic interactions in mono- and di-substituted ethylenes and the prediction of rotational barriers, 1378.

of cations with sugar anions. Part I, crystal structures of calcium sodium galacturonate hexahydrate and strontium sodium galacturonate hexahydrate, 237.

steric, influence of in the reaction area on activation by a nitro-group. Nucleophilic substitution in five-membered rings, 1388.

Interconversion, conformational, and ring shape in five- and six-membered alicyclic radicals. Investigations of structure and conformation. Part V, 1083.

Intermediates in nucleophilic aromatic substitution. Part XIV, interaction of lyate ions with polynitronaphthalenes, 1751. Part XV, thermodynamic stabilities of hydroxy and methoxy Meisenheimer complexes of substituted arenes, 1768.

unstable. Part CLIX, dihalide anions and related species as products in the radiolysis of organic halides, 1492.

ab-initio Investigation of the lithium-formaldehyde ion pair. Theoretical studies on ion pairs, 194.

Investigation, theoretical *ab initio*, nematic phase nuclear magnetic resonance, and ultrasonic relaxation of internal rotation in pyridine-2-carbaldehyde, 1673.

Iodination of 8-hydroxyquinoline, kinetics and mechanism of, 1873.

Iodine and oxygen, the competition of for the 1,1-diphenylethyl radical. The trapping of carbon radicals, 589. atom-catalysed isomerisation of substituted *cis,trans*-1,4-diphenylbutadienes, 1036.

cis,trans,trans- and *trans,cis,trans*-1,6-diphenylhexa-1,3,5-trienes and of *trans,cis,trans,trans*-1,8-diphenylocta-1,3,5,7-tetraene, 1042.

Iodoform and 3,4,5-trimethylphenol, crystal structure of the photoaddition product of, 600.

Ionisation, ampielectronic, of a π -radical, a basis for correlating radical with nucleophilic and/or electrophilic reactivities, 165.

constants of *meta*- and *para*-substituted 2,3-epoxy-3-phenylpropionic acids in 50% ethanol. Transmission of electronic effects by the oxiran ring, 371.

enthalpies of, deduced from the temperature dependence of indicator measurements for amides in concentrated aqueous solutions of perchloric acid, 1411.

of 1,3-dimethylindolin-2-one. Heteroaromatic hydrogen exchange reactions. Part VIII, 1822.

(*E*)- β -Ionone and its isomeric α -pyran, photolysis of. Photochemistry of non-conjugated dienones. Part V, 1283.

Ion-pairing of substituted 1,3-diphenylallyl carbanions with alkali-metal cations, 1661.

Ion-pairing (*contd.*)

- pairs, theoretical studies on. An *ab-initio* investigation of the lithium-formaldehyde ion pair, 194.
- non-classical, the intervention of, in the solvolysis of *endo*-bicyclo[3.2.1]octan-2-yl toluene-*p*-sulphonate, secondary kinetic isotope effects and, 1850.
- some simple organic, partitioning of reverse activation energy between kinetic and internal energy in reactions of, 881.
- two tertiary, experimental techniques and results for. The polarography of some oxonium ions in methylene chloride. Part I, 1532.
- Iridium** and rhodium complexes of *endo*-6-vinylbicyclo[3.1.0]hex-2-ene, synthesis and thermolysis of. A metal-promoted vinylcyclopropane to cyclopropene rearrangement, 4.
- nickel, cobalt, and rhodium complexes, catalysis by: reactions of amines and active methylene compounds with buta-1,3-diene and isoprene, 1133.
- Iron**, nitrosyl-, complexes with mercapto-purines and -pyrimidines studied by nuclear magnetic and electron spin spectroscopy, 423.
- tricarboxyl-(8,8-dibromobicyclo[5.1.0]octa-2,4-diene)-, crystal and molecular structure of, 88.
- Isomer** distributions and hydrogen kinetic effect: sulphonation of the trimethylbenzenes. Aromatic sulphonation. Part L, 970.
- yields, kinetics, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 948.
- F**, tetramethyldibenzo-18-crown-6, {(7*R*,9*R*,18*S*,20*S*)-6,7,9,10,17,18,20,21-octahydro-7,9,18,20-tetramethyldibenzo[*b,h*][1,4,7,10,13,16]hexaoxacyclo-octadecin} and its (18*R*,20*R*)-isomer (isomer G), complexes formed by caesium thiocyanate with. Crystal structures of complexes between alkali-metal salts and cyclic polyethers. Part VIII, 261.
- crystal structure of, 266.
- Isomerisation** of 2,2,3-trimethyl-levulinic acid, a relaxation study of, 1349.
- iodine atom-catalysed, of substituted *cis,trans*-1,4-diphenylbutadienes, 1036.
- cis,trans,trans*- and *trans,cis,trans*-1,6-diphenylhexa-1,3,5-trienes and of *trans,cis,trans,trans*-1,8-diphenylocta-1,3,5,7-tetraene, 1042.
- the acid-catalysed *E* \rightarrow *Z*, of *N*-neopentylthioformamide in *o*-dichlorobenzene, kinetics of. On the structure of thioamides and their derivatives. Part XXXIII, 528.
- Isomerism** of 3-aminocrotonic esters, infrared and nuclear magnetic resonance absorption and. Part III, 1561.
- rotational, *versus* Fermi resonance as the cause of carbonyl band doubling in furan-2-carbaldehyde and related aldehydes. Infrared carbonyl absorptions of 2-oxofurans, 13.
- Part XIX, nuclear magnetic resonance spectral analysis and conformation of 1,1,1,4,4,4-hexafluorobutane, 535.
- Isoprene** and buta-1,3-diene, reactions of amines and active methylene compounds with: catalysis by nickel, cobalt, rhodium, and iridium complexes, 1133.
- Isoquinoline**, total reactivity of. Electrophilic aromatic

reactivities *via* pyrolysis of 1-arylethyl acetates. Part XII, 1783.

-4-carbonitrile, 8a-bromo-1,2,3,4,5,6,7,8,8a-octahydro-1,3-dioxo-, crystal and molecular structure, 1597.

Isoquinolinium, *N*-methyl-, and *N*-methylquinolinium salts, substituted, with hydroxide ions. Kinetics of reactions in heterocycles. Part XII, 298.

Isosydones, 4,5-diaryl, acid catalysed hydrolysis and protonation behaviour of. Mesoionic compounds. Part IV, 230.

Isothiazoles, the nitration of. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLIII, 1620.

Isothiocyanates, aryl, reactions of with dicyclohexylcarbodiimide. Search for the mechanism of cycloaddition and cycloreversion, 1475.

Isotope effect, a stereospecific, remote ϵ -deuterium, solvolytic behaviour of *cis*- and *trans*- [5- $^2\text{H}_1$] cyclo-octyl *p*-bromobenzenesulphonate, 1647.

hydrogen kinetic, and isomer distributions: sulphonation of the trimethylbenzenes. Aromatic sulphonation. Part L, 970.

the primary deuterium kinetic, in elimination from phenethyl bromides and dimethyl(phenethyl) sulphonium bromides in 50.2% dimethyl sulphoxide-water, the substituent dependence of, 234.

solvent dependence of in the sodium hydroxide-catalysed *E2* elimination of hydrogen bromide from *p*-acetyl- and *p*-nitro-phenethyl bromide, 1218.

and coupling constants, and calculation of $^2J_{\text{HH}}$ coupling constants. Tritium nuclear magnetic resonance spectroscopy. Part III, 449.

secondary kinetic, and the intervention of non-classical ions in the solvolysis of *endo*-bicyclo[3.2.1]octan-2-yl toluene-*p*-sulphonate, 1850.

Isotopic exchange, N-H and C-H, in pyrrole and indole, kinetics and mechanism of: acid-catalysed exchange in aqueous acetonitrile solutions, 1316.

J

Jaffé reaction, the. Part II, a kinetic study of the Janovsky complexes formed from creatinine (2-imino-1-methylimidin-4-one) and acetone, 853.

K

Ketones, some $\alpha\beta$ -unsaturated, influence of a proximate 1,3-diene upon the photoreactivity of, 519.

Kinetic and thermodynamic investigation of Meisenheimer complexes: nucleophilic reactivity of methoxide ion at C-5 of 4-nitro-7-X-benzofurazans, 1469.

study of the nucleophilicity of substituted arenethiols in reaction with *p*-nitrophenyl acetate, 212.

comparison of the relative susceptibility to steric hindrance of an intra- and an inter-molecular cleavage of the ester bond in a series of 2- and 4-carbamoylphenyl esters of 2,4,6-trialkylated benzoic acids, 1062.

effects of α - and β -phenyl substituents. Elimination reactions of 1,2-diaryl-1-chloroethanes promoted by sodium ethoxide in ethanol, 329.

investigation: the thermal decomposition of trichloromethyltrifluorosilane. Part VIII, 1051.

Kinetic (*contd.*)

- isotope effects, secondary, and the intervention of non-classical ions in the solvolysis of *endo*-bicyclo[3.2.1]-octan-2-yl toluene-*p*-sulphonate, 1850.
- and equilibria of the *S*-nitrosation of alkylthioureas, 1734.
- and oxygen-18 tracer studies of the alkaline hydrolysis of some sulphinate esters. Nucleophilic substitution at sulphinyl sulphur, 858.
- isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 948.
- of addition of bromine to position 6 in 2,3-dihydro-1,4-diazepinium salts. Diazepines. Part XIX, 325.
- of amine-promoted eliminations of 1-chloro-2-iodo-1,2-diphenylethane in aqueous dioxan. Dehalogenation reactions of vicinal dihalides. Part IV, 802.
- of α -chlorination of sulphoxides by *N*-chlorobenzotriazole, 218.
- of desulphuration of ethylthiourea in sodium hydroxide studied by a radiochromatographic method, 169.
- of hydrogen isotope exchange reactions. Part XXX, steric course of γ -radiation-induced exchange between water and tartaric acids, 1595.
- of intramolecular acylation of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in concentrated acids, 1525.
- of nitration of some aromatic sulphonic acids in sulphuric acid. Electrophilic aromatic substitution. Part XIV, 788.
- of oxidation of secondary alcohols by chloramine T, 1590.
- of photochemical reactions. Part IV, photoreduction of carbonyl triplets by bonds other than C-H. Semi-empirical calculations, 934.
- of piperidinobromination of some 2-bromo-3-X-5-nitrothiophens in methanol. Linear free energy *ortho*-correlations in the thiophen series. Part I, 620.
- of protolytic and keto-enol reactions of some 5-mono-substituted barbituric acids, 819.
- of reactions in heterocycles. Part XII, substituted *N*-methylquinolinium and *N*-methylisoquinolinium salts with hydroxide ions, 298. Part XIII, substituted *N*-pyridinium and *N*-methylquinolinium salts with piperidine in water and in ethanol, 1267. Part XIV, reactions of 2- and 4-amino-, -methylamino-, and -dimethylamino-pyridinemethiodides and 2-methylthiopyrimidine methiodide with hydroxide ions in water, 1385.
- of toluene-*p*-diazonium ions with ethanol, propan-2-ol, and acetaldehyde. Free-radical reductions of arenediazonium ions in aqueous solution. Part III, 751.
- of the acid-catalysed *E* \rightarrow *Z*-isomerisation of *N*-*neo*-pentylthioformamide in *o*-dichlorobenzene. On the structure of thioamides and their derivatives. Part XXXIII, 528.
- of the addition of propanethiol to benzylideneanilines in non-aqueous solutions. Equilibrium addition of nucleophiles to carbon-nitrogen double bonds, 134.
- of the decomposition of some Δ^1 -pyrazolines, 1791.
- of the intramolecular displacement of alcohols from *o*-hydroxyaminobenzoates, 1512.
- of the liquid-phase hydrogenation of aromatic nitro-compounds in the presence of tungsten carbide catalyst, 827.
- of the reactions of picryl chloride with substituted benzoate ions, 242.
- and mechanism** of iodination of 8-hydroxyquinoline, 1873.
- of the electrophilic substitution of heteroaromatic compounds. Part XL, the standardisation of aromatic and heteroaromatic nitration rates, 1600. Part XLI, nitration of 3-hydroxy-1-phenylpyrazoles, 1609. Part XLII, the nitration of thiazoles and thiazolones, 1614. Part XLIII, the nitration of isothiazoles, 1620. Part XLIV, discussion of standard nitration rates for benzenoid and heteroaromatic compounds, 1624. Part XLVII, nitration of phenylisoxazoles, 1627. Part XLVIII, nitration of pyrazoles in the 3- and 5-positions, 1632.
- of the Fischer-Hepp rearrangement and denitrosation. Part V, the mechanism of denitrosation, 107. Part VI, the relative reactivity of a number of nitrogen-containing species towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement, 655.
- of the N-H and C-H isotopic exchange in pyrrole and indole: acid-catalysed exchange in aqueous acetonitrile solutions, 1316.
- of the reaction between copper(II) ions and thiobenzamide in aqueous solution, 953.
- of the reaction between mercury(II) ions and thiobenzamides in aqueous solution, 778.
- of the reaction of methyl iodide with silver perchlorate in nitromethane, 911.
- of additions to olefinic substances. Part XII, kinetics of addition initiated by chlorine acetate, 1150.
- Rearrangements of azoxynaphthalenes in sulphuric acid. The Wallach rearrangement. Part XIV, 471.
- studies**, nuclear magnetic resonance, determination of p*K* values of peptide groups in dipeptides from, 784.
- on the displacement of halide from benzyl halides by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution. Mechanistic studies in strongly basic media. Part VIII, 1090.
- of the effects of varying the reagent and the nitro-compound in the conversion of *o*-nitrobenzylideneamines to 2-substituted indazoles. Reduction of nitro- and nitroso-compounds by trivalent phosphorus reagents. Part XI, 1185.
- of *E*2 eliminations from 2-thienylethyl bromides and toluene-*p*-sulphonates promoted by sodium ethoxide in ethanol, 821.
- of the Janovsky complexes formed from creatinine (2-imino-1-methylimidazolidin-4-one) and acetone. The Jaffé reaction. Part II, 853.

L

- Lactones**, chiroptical properties of. Part I, rotatory strengths of electronic transitions in substituted and unsubstituted 1,4-dioxan-2,5-diones (dilactones), 1240. Part II, electronic rotatory strengths of the $n \rightarrow \pi^*$ transition in saturated γ - and δ -lactones, 1276.
- γ -**Lactones**, sesquiterpenoid α -methylene with $\alpha\beta$ -unsaturated ester side chains, comments on the circular dichroism of. X-Ray crystallographic determination of

γ -Lactones (*contd.*)

- the molecular structure of berlandin, a guaianolide epoxide. Sesquiterpenoids. Part XX, 459.
- Lathryol**, 6,20-epoxy, {1,11-diacetoxy-3,6,6,14-tetramethyl-13-phenylacetoxy(tricyclo[10.3.0.0.^{6,7}])pentadec-3-ene-10-spiro-2'-oxiran)-2-one}, photochemical cleavage of the cyclopropane ring of, 1253.
- Leaving group** effect in piperidino-substitution in methanol of some 2-L-3-nitro-5-X-thiophens. Linear free energy relationships in the thiophen series. Part I, 989.
- Levulinic acid**, 2,2,3-trimethyl-, a relaxation study of the isomerisation of, 1349.
- Lewis acidity**, quantitative aspects of. Part XIII, basicity of substituted benzamides towards metal halides. The validity of nuclear magnetic resonance chemical shifts as measures of Lewis acid strength, 541. Part XIV, comparison of the acidity of tin tetrachloride, tellurium tetrachloride, and zirconium tetrabromide towards substituted anilines in dioxan, 1110.
- Lignin**, reactive intermediates, the chemistry of. Part II, addition reactions of vinyl-substituted quinone methides in aqueous solution, 1584.
- Liquid phase**, ultraviolet photolysis (λ 185 nm) of methoxyethanol in the. Radiation chemistry of alcohols. Part XXI, 1338.
- Lithium-formaldehyde** ion pair, an *ab-initio* investigation of. Theoretical studies on ion pairs, 194.
- Lyate ions**, interaction of, with polynitronaphthalenes. Intermediates in nucleophilic aromatic substitution. Part XIV, 1751.
- Lycopodine hydrochloride**, crystal structure and absolute configuration, 93.

M

- Magnetic double resonance** studies of tin-119 chemical shifts in compounds with tin-sulphur bonds and related species, 1234.
- Maleates** and fumarates, dimethyl, diethyl, and di-n-butyl, assignments of Raman and infrared spectra of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VII, 400.
- Manganese(II)-amino-acid** complexes in aqueous solution, electron paramagnetic resonance parameters and, 769.
- Mass spectra**, chemical ionisation, of methyl n-alkanoates, effect of chain length on, 1718.
- spectrometry**, negative-ion, retro-Diels-Alder in. Nitro-2H,4H-1,3- and -2,3-dihydro-1,4-benzodioxins. Electron impact studies. Part XCIV, 724.
- Mechanism**, and implications concerning the structures of copolymers: cyclisation of 3-allylhex-5-enyl radical, 1726.
- an intermolecular, the relative reactivity of a number of nitrogen-containing species towards nitrosation, and further evidence against, for the rearrangement. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part VI, 655.
- of aromatic nitration, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for. Electrophilic aromatic substitution. Part XIII, 648.
- of cyclization of aryl radicals containing unsaturated *ortho*-substituents, 795.
- of cycloaddition and cycloreversion, search for the. Reactions of aryl isothiocyanates with dicyclohexylcarbodi-imide, 1475.
- of denitrosation. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part V, 107.
- of diazo-coupling to indoles and the effect of steric hindrance on the rate-limiting step, 1209.
- of hydrolysis of imidoyl chlorides, 429.
- of methyl side-chain sulphonation: sulphonation of anthracene and some *meso*-substituted hydrocarbon derivatives. Aromatic sulphonation. Part XLIX, 966.
- of phenoxide cyclisation. Intramolecular alkylation of phenols. Part I, 1054.
- of photorearrangement of 6-hydroxybicyclo[3.3.1]nona-3,7-dien-2-ones, 412.
- of 1,2-rearrangement of β -acyloxyalkyl radicals. Electron spin resonance study of the fragmentation of some cyclic and acyclic dialkoxyalkyl radicals, 77.
- of the reaction of sulphides with *N*-chloroarenesulphonamides, 509.
- rate, steric course, and product distribution: retentive solvolysis of optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in phenolic solvents. Retentive solvolysis. Part X, 1426.
- E1cB* and *E2cB*, in the elimination of trifluoroethoxide ion from α,α -dinitro- β,β -diphenyl- β -(trifluoroethoxy)ethanide anion and the non-reactivity of the β -cyano- α,α -dinitro- β,β -diphenylethanide anion, 628.
- of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds, ¹⁵N-labelling experiments and their relevance to. Acylarylnitrosamines. Part VIII, 546.
- of ring opening of oxirans by acids in aqueous and non-aqueous solvents, 1119.
- Mechanistic aspects** of the cathodic hydrogenation of activated carbon-carbon double bonds. Electro-organic reactions. Part III, 161.
- studies** in strongly basic media. Part VIII, kinetic studies on the displacement of halide from benzyl halides by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution, 1090.
- Media**, strongly basic, mechanistic studies in. Part VIII, kinetic studies on the displacement of halide from benzyl halides by alkali-metal salts of 9-substituted fluorenes in *t*-butyl alcohol solution, 1090.
- Meisenheimer complexes**, a kinetic and thermodynamic investigation of: nucleophilic reactivity of methoxide ion at C-5 of 4-nitro-7-X-benzofurazans, 1469.
- of substituted arenes, thermodynamic stabilities of hydroxy and methoxy. Intermediates in nucleophilic aromatic substitution. Part XV, 1768.
- the stabilities of. Part X, association of 1,1-dimethoxy-complexes with cations, 825.
- Menschutkin reaction** of tripropylamine with methyl iodide, application of reaction field theory to the calculation of solvent effects on, 1677.
- Mercury(II) ions** and thiobenzamides in aqueous solution, the kinetics and mechanism of the reaction between, 778.
- Mercury**, β -peroxyalkyl-, trifluoroacetates, intramolecular co-ordination in; the stereochemistry of peroxymercuriation of cyclohexene, norbornene, but-2-ene, and stilbene. Oxymetallation. Part VIII, 531.
- Mesoionic compounds**. Part IV, acid catalysed hydrolysis and protonation behaviour of 4,5-diarylisosydones, 230.

- Mesoitoic acid**, intramolecular participation by enolate anions in the cleavage of aryl esters of; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
- Mesomorphism**, thermal, crystal structures of α -*trans*- and *p*-methoxy-cinnamic acids and their relation to, 1835.
- Metal-acetylacetonone complexes**, vibrational M-O bands of, 1098.
- Methane**, difluoroiodo-, photolysis of, in the presence of olefins. Free radical addition to olefins. Part XVI, 1841.
- fluoroiodo-, addition of to fluoroethylenes. Free radical addition to olefins. Part XVII, 1846.
- trifluoroiodo-, the photochemical reaction of, with benzene and some halogenobenzenes. Reactions of trifluoromethyl radicals. Part I, 435.
- trinitro-, chloroform, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in cyclohexane solution, ^1H and ^{13}C nuclear magnetic resonance shift measurements and association constants of some, 64.
- Methanol** and methoxide ions, a nuclear magnetic resonance study of the addition of, to substituted benzaldehydes, and corresponding J_{M} acidity function values, 185.
- electron spin resonance study of the dimerisation equilibrium of morphamquat radical cation in. Bipyridyl radical cations. Part I, 1310.
- photochemical intramolecular acylation of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in, 1529.
- piperidino-substitution in, of some 2-L-3-nitro-5-X-thiophens, leaving group effect in. Linear free energy relationships in the thiophen series. Part I, 989.
- the kinetics of piperidinodebromination of some 2-bromo-3-X-5-nitrothiophens in. Linear free energy *ortho*-correlations in the thiophen series. Part I, 620.
- the cation of morphamquat {bis-*N*-[(2,6-dimethylmorpholin-4-yl)carbonylmethyl]-4,4'-bipyridylium} radical cation with oxygen in. A study of bipyridyl radical cations. Part II, 1831.
- Methanolysis**, competing, and phenolysis of optically active 1-phenylethyl chloride in sterically hindered 2,6-dialkylphenol solvents, 253.
- of methyl *p*-nitrophenyl sulphate, nucleophilic catalysis in. Bond scission processes in sulphur compounds. Part IX, 478.
- Methoxide ion** and 6-nitrobenzothiazole, ^1H nuclear magnetic resonance studies on the reaction between in dimethyl sulphoxide-methanol. Ring opening and closing in heterocyclic compounds, 1472.
- at C-5 of 4-nitro-7-X-benzofurazans, nucleophilic reactivity of: a kinetic and thermodynamic investigation of Meisenheimer complexes, 1469.
- Methyl n-alkanoates**, effect of chain length on the chemical ionisation mass spectra of, 1718.
- N-Methylation**, reactivity of indazoles and benzotriazoles towards and analysis of the ^1H nuclear magnetic resonance spectra of indazoles and benzotriazoles, 1695.
- Methyl benzoates**, methyl- and trifluoromethyl-substituted, dipole moments of, 1587.
- Methylene chloride**, the polarography of some oxonium ions in. Part I, experimental techniques and results for two tertiary ions, 1532.
- compounds, active, and amines, reactions of, with buta-1,3-diene and isoprene: catalysis by nickel, cobalt, rhodium, and iridium complexes, 1133.
- Methyl iodide**, kinetics and mechanism of the reaction of, with silver perchlorate in nitromethane, 911.
- iodide**, the Menschutkin reaction of, with tripropylamine, application of reaction field theory to the calculation of solvent effects on, 1677.
- radical**, reactions of, with some aliphatic compounds in aqueous solution. Electron spin resonance studies. Part XLV, 885.
- Molecular complexes**. Part XIV, proton magnetic resonance studies of the interactions of chloroform with benzene and some alkylbenzenes at various temperatures, 956.
- conformation** of *S*-4-nitrophenyl *OO*-diphenyl thiophosphate: X-ray crystal structure analysis, 57.
- mechanical calculation** of conformation energies of β -substituted ethyltrimethylammonium ions. Conformational studies of quaternary ammonium ions. Part II, 118.
- mechanics** and nuclear magnetic resonance study: rotamer populations in solution of some polychlorinated butanes. Rotational isomerism. Part XVIII, 699.
- orbital** and strain energy investigations of the photocyclisation of 1,2-di- β -naphthylethylene, 1515.
- calculations** on the $\text{C}_2\text{H}_4\text{SH}^+$ cation, 1722.
- packing** and structural defects, role of, in reactions of gases with organic solids: ozonolysis of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, 584.
- and structure refinement of *p*-chloro-*trans*-cinnamic acid and β -(*p*-chlorophenyl)propionic acid, 68.
- structure** of berlandin, a guaianolide epoxide, X-ray crystallographic determination of. Comments on the circular dichroism of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated ester side chains. Sesquiterpenoids. Part XX, 459.
- weight**, solvent, and temperature, effects of. Reactivities of polystyrene and polypropylene toward *t*-butoxyl radical, 1221.
- Molecules**, conjugated, the electronic structure of. Non-empirical calculations for the benzenium, pyridinium, pyrylium, and thiopyrylium cations and a comparison of the last with phosphorin, 841.
- organic, physical and chemical quenching of excited uranyl ion by studied by fluorimetric and laser flash photometric methods, 1867.
- Monomer** sequence in styrene-butadiene copolymers. Carbon-13 nuclear magnetic resonance spectroscopy of polymers. Part V, 27.
- Monosaccharides**, test of energy functions by Monte Carlo calculations for. Polysaccharide conformation. Part VIII, 830.
- Morphamquat**, {bis-*N*-[(2,6-diethylmorpholin-4-yl)carbonylmethyl]-4,4'-bipyridylium} radical cation, the reaction of with oxygen in methanol. A study of bipyridyl radical cations. Part II, 1831.
- radical cations in methanol, electron spin resonance study of the dimerisation equilibrium of. Bipyridyl radical cations. Part I, 1310.
- Morpholines**, piperidines, piperidones, and piperazines, ultrasonic relaxation associated with nitrogen and ring inversion in some, 1642.

Naphthalenes, azoxy-, rearrangements of in sulphuric acid. Kinetics and mechanisms. The Wallach rearrangement. Part XIV, 471.

Naphthalenes (*contd.*)

thermal rearrangement of some 1- and 2-substituted azulenes to, 1464.

the thermal rearrangements of azulenes to, 714.

Naphthylethylene, 1,2-di- β -, molecular orbital and strain energy investigations of the photocyclisation of, 1515.

Neighbouring groups in addition reactions, participation by. Part III, bromination in acetic acid and trifluoroacetic acid solvents, 503.

Nematic phase nuclear magnetic resonance, ultrasonic relaxation, and theoretical *ab initio* investigation of internal rotation in pyridine-2-carbaldehyde, 1673.

solution, structure and conformation of 4,4'-bipyridyl by nuclear magnetic resonance spectroscopy of, 1541.

structure of 2,3,5,6-tetrafluoroanisole determined from the analysis of a nuclear magnetic resonance spectrum of, 1794.

structure of pentafluorobenzaldehyde determined from nuclear magnetic resonance spectra of, 1508.

Neutron diffraction, structure of sodium hydrogen diacetate redetermined by. Crystal structure of some acid salts of monobasic acids. Part XVII, 15.

study: 3-methyl-5-phenylpyrazole, 1068.

potassium hydrogen *meso*-tartrate. Crystal structure of the acid salts of some dibasic acids, 1549.

Nickel, cobalt, rhodium, and iridium complexes, catalysis by: reactions of amines and active methylene compounds with buta-1,3-diene and isoprene, 1133.

Nigericin group, grisorixin, an ionophorous antibiotic of the. Part IV, complexation of monovalent cations, 907.

Nitration of 3-hydroxy-1-phenyl-pyrazoles, thiazoles and thiazolones, isothiazoles, phenylisoxazoles, and pyrazoles in the 3- and 5-positions. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLI, 1609. Part XLII, 1614. Part XLIII, 1620. Part XLVII, 1627. Part XLVIII, 1632.

of some aromatic sulphonic acids in sulphuric acid, kinetics of. Electrophilic aromatic substitution. Part XIV, 788.

of toluene and polymethylbenzenes in aqueous sulphuric acid, kinetics, isomer yields, and the consequences of *ipso*-attack in, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 648.

of triptycene in acetic anhydride, 945.

rates, aromatic and heteroaromatic, standardisation of, 1600.

standard, discussion of, for benzenoid and heteroaromatic compounds, 1624.

Nitric oxide and conjugated dienes, studies on the reactions between, 1808.

Nitro- and nitroso-compounds, reduction of by tervalent phosphorus reagents. Part X, ring expansion to give 2-diethylamino-3*H*-azepines, 554. Part XI, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of *o*-nitrobenzylideneamines to 2-substituted indazoles, 1185.

1-Nitroazulene and azulene, acid catalysed nitrosation of. The chemistry of nitroso-compounds. Part X, 1498.

Nitrobenzenes, *o*- and *p*-halogeno-, reactivity of thiophenoxide ion toward, 389.

***p*-Nitrobenzoates**, optically active *para*-substituted 1-phenylethyl, retentive solvolysis of, in phenolic solvents:

rate, steric course, product distribution, and mechanism. Retentive solvolysis. Part X, 1426.

4-Nitrobenzyl chloride, α -phenyl- and α -(4-nitrobenzyl)-substituted, base-catalysed formation of stilbene derivatives from. Elimination reactions. Part II, 384.

Nitro-compounds, aromatic, kinetics of the liquid-phase hydrogenation of in the presence of tungsten carbide catalyst, 827.

unsaturated, excited state energies in. The photoluminescence of some β -nitrostyrenes, 1576.

Nitrogen and ring inversion, ultrasonic relaxation associated with in some piperidines, piperidones, morpholines, and piperazines, 1642.

inversions in 1,3,4-oxadiazolidines. The conformational analysis of saturated heterocycles. Part LXX, 1191.

or oxygen, photolysis of disodium α -D-glucose 6-phosphate in aqueous solution under. The photochemistry of phosphorus compounds. Part X, 34.

Nitro-group, influence of steric interactions in the reaction area on activation by. Nucleophilic substitution in five-membered rings, 1388.

Nitromethane, kinetics and mechanism of the reaction of methyl iodide with silver perchlorate in, 911.

***o*-Nitrophenols**, investigation of photolysis of, by electron spin resonance spectroscopy. Characterisation of 1,2-benzoquinone monohydroxyimine free radicals, 1380.

***p*-Nitrophenyl sulphate**, methyl, nucleophilic catalysis in the methanolysis of. Bond scission processes in sulphur compounds. Part IX, 478.

acetate, a kinetic study of the nucleophilicity of substituted arenethiols in reaction with, 212.

4-Nitropyridine *N*-oxide in benzene in the presence of surfactant aggregates, interaction of sodium methoxide with, 482.

Nitrosamines, acylaryl-. Part VIII, ¹⁵N-labelling experiments and their relevance to the mechanisms of formation of benzyne from benzenediazonium acetate and of the benzenediazonium ion from hydroxyazo-compounds, 546.

Nitrosation, acid catalysed, of azulene and 1-nitroazulene. The chemistry of nitroso-compounds. Part X, 1498.

the relative reactivity of a number of nitrogen-containing species towards, and further evidence against an intermolecular mechanism for the rearrangement. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part VI, 655.

***S*-Nitrosation** of alkylthioureas, kinetics and equilibria of, 1734.

Nitroso-compounds, the chemistry of. Part IX, general acid-catalysed decomposition of *N*-nitroso-2-pyrrolidone, an example of amide hydrolysis *via* S_N2 displacement on the *N*-conjugate acid, 153. Part X, acid catalysed nitrosation of azulene and 1-nitroazulene, 1498.

and nitro-compounds, reduction by tervalent phosphorus reagents. Part X, ring expansion to give 2-diethylamino-3*H*-azepines, 554. Part XI, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of nitrobenzylideneamines to 2-substituted indazoles, 1185.

Nitrosyl cyanide, the C-N bond dissociation energy in, 351.

3-X-5-Nitrothiophens, 2-bromo-, in methanol, the kinetics of piperidinobromination of some. Linear free energy *ortho*-correlations in the thiophen series. Part I, 620.

5-Nitrotoluene- α -sulphonic acid sultone, 2-hydroxy, reaction with nucleophiles, 1778.

- Nona-2,4,6-trien-8-yn-4-olide**, (4*Z*,6*E*)-9-(3-furyl)-2,6-dimethyl-, (freelinyne), stereochemistry of, by *X*-ray analysis, 1863.
- Non-reactivity** of the β -cyano- α,α -dinitro- β,β -diphenylethanide anion, *E1cB* and *E2cB* mechanisms in the elimination of trifluoroethoxide ion from α,α -dinitro- β,β -diphenyl- β -(trifluoroethoxy)ethanide anion and the, 628.
- Norbornadiene** and 7-*t*-butoxynorbornadiene, stereoselectivity and stereospecificity in electron deficient diene cycloadditions with: results and MINDO/2 theoretical study, 1004.
- Norbornene**, cyclohexene, but-2-ene, and stilbene, the stereochemistry of peroxymercuration of; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates. Oxymetallation. Part VIII, 531.
- Norditerpene dilactone**, *X*-ray determination of the structure of podolide, an antileukemic, 1482.
- Nuclear magnetic** and electron spin resonance spectroscopy, nitrosyliron complexes with mercapto-purines and -pyrimidines studied by, 423.
- resonance** and a molecular mechanics study: rotamer populations in solution of some polychlorinated butanes. Rotational isomerism. Part XVIII, 699.
- ^1H , and an *X*-ray study of the stereochemistry of the isomeric β -chloromethylsulphonyl- β -methyl- α -morpholinostyrenes. β -Sulphonylenamines, 809.
- and infrared absorption and isomerism of 3-amino-crotonic esters. Part III, 1561.
- ^1H and ^{13}C , shift measurements and association constants of some chloroform, trinitromethane, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in cyclohexane solution, 64.
- chemical shifts, the validity of as measures of Lewis acid strength. Basicity of substituted benzamides towards metal halides. Quantitative aspects of Lewis acidity. Part XIII, 541.
- conformational studies of *C*-substituted pyrrolocarbaldehydes. Part I, substituent effects on aldehyde conformations as shown by long range coupling constants, 333. Part II, barrier to internal rotation in 5-substituted pyrrole-2-carbaldehydes, 337.
- direct carbon-13, study of boron trifluoride and boron trichloride complexes with ethers, 1415.
- experiments on acetals. Part LVIII, conformational studies of 4-methylene-1,3-dioxan, 1434.
- ^{13}C , Fourier transform studies of steroids. Part I, some substituted 17 β -(2,4-dihydro-5-oxo-3-furyl) steroids, 344.
- investigations of carbonium ion intermediates. Part III, a chlorine-35 quadrupole resonance study of several (R-chloromethylene)dimethylammonium salts (Vilsmeier-Haack and Viehe reagents), 925.
- kinetic studies, determination of *pK* values of peptide groups in dipeptides from, 784.
- nematic phase, ultrasonic relaxation, and theoretical *ab initio* investigation of internal rotation in pyridine-2-carbaldehyde, 1673.
- parameters, ^1H , and conformations of some chloro-1,4-dioxans and 5-chloro-2,3-dihydro-1,4-dioxin. Halogeno-1,4-dioxans and their derivatives. Part VII, 959.
- spectra and dipole moments, conformational analysis of aryl- and alkyl-thio, aryl- and alkyl-sulphinyl, and aryl- and alkyl-sulphonyl sulphines by means of. Chemistry of sulphines. Part XXVII, 352.
- spectra, carbon-13, of some epoxides, 861.
- spectra, carbon-13, of some polyphosphines with ethane bridges between trivalent phosphorus atoms, 938.
- spectral analysis and conformation of 1,1,1,4,4,4-hexafluorobutane. Rotational isomerism. Part XIX, 535.
- spectral study of β -aminoenones, 665.
- spectra, ^1H , of indazoles and benzotriazoles, analysis of and reactivity of indazoles and benzotriazoles towards *N*-methylation, 1695.
- spectra of nematic solutions, structure of pentafluorobenzaldehyde determined from, 1508.
- spectra of porphyrins. Part X, carbon-13 nuclear magnetic resonance spectra of some *meso*-tetra-aryl-porphyrins and their metal chelates, 204.
- spectra, proton, and conformation in 1,4-dihydrobenzenes and 9,10-dihydroanthracenes, 1544.
- spectroscopy, assignment and conformational properties of the exocyclic 5'-hydroxymethyl group of nucleosides by, 1703.
- spectroscopy, carbon-13, conformational analysis by. Part I, hexahydro-3*H*-oxazolo[3,4-*a*]pyridines, 51.
- spectroscopy, ^1H , conformational analyses of substituted piperidinium ions by and evaluation of the contribution of electrostatic interaction energy in controlling conformation. Conformational studies of quaternary ammonium ions. Part III, 127.
- spectroscopy, carbon-13, of polymers. Part IV, peak assignment for styrene-butadiene copolymers, 21. Part V, monomer sequence in styrene-butadiene copolymers, 27.
- spectroscopy, tritium. Part III, coupling constants and isotope effects, and calculation of $^2J_{\text{HH}}$ coupling constants, 449.
- spectrum of a nematic solution, structure of 2,3,5,6-tetrafluoroanisole determined from the analysis of, 1794.
- studies, ^{19}F and ^1H , of ring-fluorinated imidazoles and histidines, 928.
- studies on benzaldehydes. Part II, carbon-13 nuclear magnetic resonance studies of the barrier to internal rotation and the conformational equilibrium in *o*- and *m*-substituted benzaldehydes, 1682.
- ^1H , studies on the reaction between 6-nitrobenzothiazole and methoxide ion in dimethyl sulphoxide-methanol. Ring opening and closing in heterocyclic compounds, 1472.
- study, dynamic, of ring inversion occurring in 1,4-oxathian, -selanan, and -telluran, 1354.
- study: observation of stable arylalkoxycarbenium ions, 1656.
- study of organic sulphonic acids and ^1H nuclear magnetic resonance standards; *pK*_{BH} determination of sulphonic acids. Solutes in sulphuric acid. Part VI, 226.
- study of the addition of methanol and methoxide ions to substituted benzaldehydes, and corresponding *J*_M acidity function values, 185.
- study of the conformational equilibrium in fluorosulphonylethanes, 1100.
- temperature-dependent spectra of five different groups of protons, hindered internal rotation in 3,4-diisopropyl- Δ^4 -thiazoline-2-thione from: a methodological study, 1690.

- Nuclear quadrupole resonance**, ^{35}Cl , of donor-acceptor complexes, 453.
spectra, chlorine-35, of chlorodiazines, 1250.
- Nucleophiles**, equilibrium addition of to carbon-nitrogen double bonds. Kinetics of the addition of propane-thiol to benzylideneanilines in non-aqueous solutions, 134.
reaction of 2-hydroxy-5-nitrotoluene- α -sulphonic acid sultone with, 1778.
- Nucleophilic aromatic substitution**, Intermediates in. Part XIV, interaction of lyate ions with polynitronaphthalenes, 1751. Part XV, thermodynamic stabilities of hydroxy and methoxy Meisenheimer complexes with substituted arenes, 1768.
assistance by solvent during acetolysis of secondary alkyl derivatives. Classical carbonium ions. Part VII, 1458.
- Nucleophilicity** of substituted arenethiols in reaction with *p*-nitrophenyl acetate, a kinetic study of, 212.
- Nucleosides**, assignment and conformational properties of the exocyclic 5'-hydroxymethyl group of, by nuclear magnetic resonance spectroscopy, 1703.

O

- Olefinic CH deformation vibrations**, out-of-plane, comparison of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VI, 396.
substances, the kinetics and mechanisms of additions to. Part XII, kinetics of addition initiated by chlorine acetate, 1150.
- Olefins**, free radical addition to. Part XV, addition of bromoform and carbon tetrachloride to fluoroethylenes, 320. Part XVI, photolysis of difluoriodomethane in the presence of olefins, 1841. Part XVII, addition of fluoriodomethane to fluoroethylenes, 1846.
polar additions to. Part II, stereochemistry of addition of deuterium bromide to *cis*- and *trans*-*t*-butylstyrene. Rotamer populations of sterically crowded trisubstituted ethanes, 574.
- Optical activity** of intramolecular charge-transfer transitions, 670.
- Organic electron donor-acceptor complexes** charge-transfer contributions to the stabilisation of the ground state of, 507.
- Organosilicon compounds**. Part LIII, base cleavage of substituted fluorene-9-yltrimethylsilanes and related compounds, 380.
- Oxaziridines**, stereochemistry of the peroxyacid-imine route to. Dynamic stereochemistry of imines and derivatives, 1813.
- Oxazolinone** intermediate in the hydrolysis and aminolysis of benzoylglycine derivatives, 947.
- Oxazolone**, a mesoionic, 2-(*m*-bromophenyl)-3-methyl-4-(trifluoroacetyl)oxazolium 5-oxide, crystal and molecular structure, 1280.
- Oxidation** and reduction of some cyclic sulphoxides, ring-size effects in, 408.
of aliphatic sulphoxides with the hydroxyl radical, the formation of alkylsulphonyl radicals by, and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part XLIV, 308.
of naturally occurring hydroxypyrones, electron spin resonance study of radicals obtained from, 101.
of secondary alcohols by chloramine T, kinetics of, 1590.
of sulphides by hydroxyl radicals, formation of positive ions and other primary species in, 675.
of thiols and disulphides in aqueous solution: formation of RS^+ , RSO^+ , RSO_2^+ , RSSR^+ , and carbon radicals. Electron spin resonance studies. Part XLVI, 892.
triple, of some polyhydric phenols by cerium(IV) in acid solutions as observed by electron spin resonance spectroscopy, 850.
- Oxide** from helenalin, X-ray determination of the structure and conformation of, 496.
- Oxiran** ring, transmission of electronic effects by. Ionization constants of *meta*- and *para*-substituted 2,3-epoxy-3-phenylpropionic acids in 50% ethanol, 371.
mechanisms of ring opening of by acids in aqueous and non-aqueous solvents, 1119.
- Oxonium ions**, the polarography of some in methylene chloride. Part I, experimental techniques and results for two tertiary ions, 1532.
- Oxotremorine sesquioxalate**, 1-[4-(2-oxopyrrolidin-1-yl)but-2-ynyl]pyrrolidinium sesquioxalate, crystal structure of, 774.
- Oxygen** and iodine, the competition of for the 1,1-diphenylethyl radical. The trapping of carbon radicals, 589.
or nitrogen, photolysis of disodium α -D-glucose 6-phosphate in aqueous solution under. The photochemistry of phosphorus compounds. Part X, 34.
the reaction of morphamquat {bis-*N*-[(2,6-dimethylmorpholin-4-yl)carbonylmethyl]-4,4'-bipyridylium} radical cation with in methanol. A study of bipyridyl radical cations. Part II, 1831.
- Oxymetallation**. Part VIII, the stereochemistry of peroxymercuration of cyclohexene, norbornene, but-2-ene, and stilbene; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates, 531.
- Ozonolysis** of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene: role of molecular packing and structural defects in reactions of gases with organic solids, 584.

P

- Pachysandra terminalis** Sieb. et Zucc, studies on the neutral constituents of. Part IV, X-ray structure of 3-*O*-acetyl-16-*O*-*p*-bromobenzoylpachysandiol B: new conformation of a friedelin-type triterpene, 610.
- Paramagnetic electron resonance** parameters and equilibria of manganese(II)-amino-acid complexes in aqueous solution, 769.
- Parameters**, electron paramagnetic resonance, and equilibria of manganese(II)-amino-acid complexes in aqueous solution, 769.
- Parthemollin** {3,3a,4,5,6,8a-hexahydro-7-(1-hydroxy-3-oxobutyl)-6-methyl-3-methylenecyclohepta[b]furan-2-one}, crystal and molecular structure of, 440.
- Participation** by neighbouring groups in addition reactions. Part III, bromination in acetic acid and trifluoroacetic acid solvents, 503.
intramolecular, by enolate anions in the cleavage of aryl esters of mesitoic acid; carbon-carbon bond formation in aqueous and alcoholic solvents, 571.
- Partitioning** of reverse activation energy between kinetics and internal energy in reactions of some simple organic ions, 881.

- Peak assignment** for styrene-butadiene copolymers. Carbon-13 nuclear magnetic resonance spectroscopy of polymers. Part IV, 21.
- Peptide groups** in dipeptides, determination of pK values of from nuclear magnetic resonance kinetic studies, 784.
- Peracetyl radicals** and but-2-ene, reaction of. Reactions of oxygenated radicals in the gas phase. Part I, 758.
- and butenes, reactions of. Reactions of oxygenated radicals in the gas phase. Part II, 1715.
- Perchloric acid**, concentrated aqueous solutions of, enthalpies of ionization deduced from the temperature dependence of indicator measurements for amides in, 1411.
- Peroxyacid-imine route** to oxaziridines, stereochemistry of. Dynamic stereochemistry of imines and derivatives. Part VI, 1813.
- Peroxodisulphate** and chloride ions, aromatic chlorination by. Cation radical trapping by copper(II) chloride, 1503.
- Peroxymercuration** of cyclohexane, norbornene, but-2-ene, and stilbene, the stereochemistry of; intramolecular coordination in β -peroxyalkylmercury trifluoroacetates. Oxymetallation. Part VIII, 531.
- Phenacyl chlorides**, substituted, effects of substituents on the rate of condensation of with benzaldehyde. The Darzens condensation. Part III, 805.
- Phenazinium ion-phenazyl** free radical systems, *N*-alkylated, photochemical reactions, fluorescence, and protolytic equilibria in. Excited states of six-membered aza-aromatic rings. Part VIII, 417.
- N*-methyl-, the 2:3 complex of with $\alpha\alpha\alpha'\alpha'$ -tetracyanoquinodimethane, $[(nmp)_2]^{2+}[(tcnq)_3]^{2-}$, crystal and molecular structure of, 1146.
- Phenethyl bromide**, *p*-acetyl- and *p*-nitro-, solvent dependence on the primary deuterium kinetic isotope effect in the sodium hydroxide-catalysed *E2* elimination of hydrogen bromide from, 1218.
- and dimethyl(phenethyl)-sulphonium bromides in 50.2 mole% dimethyl sulphoxide-water, the substituent dependence of the primary deuterium kinetic isotope effect in elimination from, 234.
- Phenol** and electron donors in cyclohexane and carbon tetrachloride, interaction between, 793.
- 3,4,5-trimethyl-, and iodoform, crystal structure of the photoaddition product of, 600.
- intramolecular alkylation of. Part I, mechanism of phenoxide cyclisation, 1054. Part II, *ortho*- versus *para*-alkylation, 1291.
- some polyhydric, triple oxidations of by cerium(IV) in acid solutions as observed by electron spin resonance spectroscopy, 850.
- Phenolysis** and competing methanolysis of optically active 1-phenylethyl chloride in sterically hindered 2,6-dialkylphenol solvents, 253.
- Phenothiazine**, 10-phenyl-, and 10-phenyl-phenoxazine, an electron spin resonance investigation of the cation radicals of. Heterocyclic free radicals. Part V, 1078.
- Phenoxazine**, 10-phenyl-, and 10-phenyl-phenothiazine, an electron spin resonance investigation of the cation-radicals of. Heterocyclic free radicals. Part V, 1078.
- Phenoxide** cyclisation, mechanism of. Intramolecular alkylation of phenols. Part I, 1054.
- Phenyl** participation in the generation of carbocations from the reactions of some 1-methyl- ω -phenylalkyl toluene-*p*-sulphonates and ω -phenylalk-1-enes in trifluoroacetic acid, 1664.
- Phenylacetates**, acetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates, the relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl. The nature of the transition state in ester pyrolysis. Part II, 1025.
- Phenylalanine**, non-enzymatic, tetrahydrobiopterin-mediated hydroxylation of, 245.
- 1-Phenylethyl chloride**, optically active, in sterically hindered 2,6-dialkylphenol solvents, phenolysis and competing methanolysis of, 253.
- Phenyl iodosylacetate**, reaction of aromatic amides with: an oxidative rearrangement, 1161.
- isocyanate** in aqueous solution, the reactivity of, 1166.
- Phenylisoxazoles**, the nitration of. The kinetics and mechanism of the electrophilic substitution of hetero-aromatic compounds. Part XLVII, 1627.
- Phosphines**, aromatic, investigation of phosphorus-carbon bond lengths in. Part I, crystal and molecular structures of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, 1737.
- Phosphole** and thiophen: non-empirical calculations of the electronic structure of some five-membered ring heterocycles containing sulphur and phosphorus, 974.
- Phosphonium**, methyltriphenyl-, 1:2 complex of with $\alpha\alpha\alpha'\alpha'$ -tetracyano-3,7-naphthoquinodimethane, $(Ph_3-PMe)^+[(tnaq)_2]^-$, crystal and molecular structure of, 1141.
- Phosphorane**, 2-carboxy-1-methoxycarbonyl ethyltriphenyl-, and its *t*-butyl ester, two resonance-stabilized Wittig reagents, crystal and molecular structures of. Structural investigations of ylides. Part VI, 1030.
- Phosphorin**, non-empirical calculations for the benzenium, pyridinium, pyrylium, and thiopyrylium cations and a comparison of the last with. The electronic structure of conjugated molecules, 841.
- Phosphorus** and sulphur, non-empirical calculations of the electronic structure of some five-membered ring heterocycles containing: thiophen and phosphole, 974.
- tervalent, reagents, reduction of nitro- and nitroso-compounds by. Part X, ring expansion to give 2-diethylamino-3*H*-azepines, 554. Part XI, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of *o*-nitrobenzylidencamines to 2-substituted indazoles, 1185.
- atoms**, trivalent, carbon-13 nuclear magnetic resonance spectra of some polyphosphines with ethane bridges between, 938.
- carbon bond lengths** in aromatic phosphines, investigation of. Part I, crystal and molecular structures of tri-*o*-tolyl-phosphine, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, 1737.
- compounds**, the photochemistry of. Part X, photolysis of disodium α -D-glucose 6-phosphate in aqueous solution under nitrogen or oxygen, 34.
- Photoaddition** product of iodoform and 3,4,5-trimethylphenol, crystal structure of, 600.
- Photochemical acylation**, intramolecular, of 3-(2-hydroxybenzylidene)-4,5-dihydrofuran-2(3*H*)-one in methanol, 1529.
- reactions**, fluorescence, and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems. Excited states of six-membered aza-aromatic rings. Part VIII, 417.
- of trifluoroiodomethane with benzene and some halogenobenzenes. Reactions of trifluoromethyl radicals. Part I, 435.

- Photochemical** (*contd.*)
the kinetics of. Part IV, photoreduction of carbonyl triplets by bonds other than C-H. Semiempirical calculations, 934.
- Photochemistry** of benz[*de*]anthracen-7-ones. Part II, flash photolysis, 1259.
of non-conjugated dienones. Part V, photolysis of (*E*)- β -ionone and its isomeric α -pyran, 1283.
- Photocyclisation** of 1,2-di- β -naphthylethylene, molecular orbital and strain energy investigations of, 1515.
- Photoisomerisation**, synthesis, and electronic spectra of naphthylpyridylethylenes, 1712.
- Photoluminescence** of some β -nitrostyrenes. Excited state energies in unsaturated nitro-compounds, 1576.
- Photolysis** and the preparation of 3-aryl-3*H*-diazirines, 686.
at 254 nm of the diethyl ether-oxygen charge transfer complex. Radiation chemistry of ethers. Part VI, 171.
of disodium α -D-glucose 6-phosphate in aqueous solution under nitrogen or oxygen. The photochemistry of phosphorus compounds. Part X, 34.
flash. The photochemistry of benz[*de*]anthracen-7-ones. Part II, 1259.
fluorimetric and laser flash methods, physical and chemical quenching of excited uranyl ion by organic molecules studied by, 1867.
of difluoroiodomethane in the presence of olefins. Free radical addition to olefins. Part XVI, 1841.
of (*E*)- β -ionone and its isomeric α -pyran. Photochemistry of non-conjugated dienones. Part V, 1283.
of *o*-nitrophenols by electron spin resonance spectroscopy, investigation of. Characterisation of 1,2-benzoquinone monohydroxyimine free radicals, 1380.
ultraviolet (λ 185 nm), of methoxyethanol in the liquid phase. Radiation chemistry of alcohols. Part XXI, 1338.
- Photoreactivity** of some $\alpha\beta$ -unsaturated ketones, influence of a proximate 1,3-diene upon, 519.
- Photoreduction** of carbonyl triplets by bonds other than C-H. Semiempirical calculations. The kinetics of photochemical reactions. Part IV, 934.
- Photorearrangement** of 6-hydroxybicyclo[3.3.1]nona-3,7-dien-2-ones, mechanism of, 412.
- Phthalate**, 2,2,2-trifluoroethyl hydrogen 3,6-dimethyl-, hydrolysis of, 285.
- Phthalic** and 3,6-dimethylphthalic anhydrides, hydrolysis of, 282.
- Picryl chloride**, kinetics of the reaction of with substituted benzoate ions, 242.
iodide, substituent effect in the reaction of aryl aryl-mercury sulphides with, 1490.
- Piperazines**, piperidones, piperidines, and morpholines, ultrasonic relaxation associated with nitrogen and ring inversion in some, 1642.
- Piperidine** in water and in ethanol, substituted *N*-methylpyridinium and *N*-methylquinolinium salts with. Kinetics of reactions in heterocycles. Part XIII, 1267.
- Piperidino-substitution** in methanol of some 2-L-3-nitro-5-X-thiophens, leaving group effect in. Linear free energy relationships in the thiophen series. Part I, 989.
- Piperidinium** ions, substituted, conformational analysis of by ^1H nuclear magnetic resonance spectroscopy and evaluation of the contribution of electrostatic interaction energy in controlling conformation. Conformational studies of quaternary ammonium ions. Part III, 127.
- Piperidinodebromination** of some 2-bromo-3-X-5-nitrothiophens in methanol, the kinetics of. Linear free energy *ortho*-correlations in the thiophen series. Part I, 620.
- Plenolin**, structure and absolute configuration of: X-ray analysis of plenolin *p*-iodobenzoate, 487.
- Podolide**, an antileukemic norditerpene dilactone, X-ray determination of the structure of, 1482.
- Polarography** of some oxonium ions in methylene chloride. Part I, experimental techniques and results for two tertiary ions, 1532.
- Polyamide-based catalysts**, properties of. Part I, hydrodehalogenation of chlorobenzene, 1479.
- Polyethers**, cyclic, and alkali-metal salts, crystal structures of complexes between. Part VIII, complexes formed by caesium thiocyanate with (7*R*,9*R*,18*S*,20*S*)-6,7,9,10,17-, 18,20,21-octahydro-7,9,18,20-tetramethyldibenzo[*b,k*]-[1,4,7,10,13,16]hexaoxacyclo-octadecin (tetramethyldibenzo-18-crown-6, isomer F) and its (18*R*,20*R*)-isomer (isomer G), 261.
- Polymers**, carbon-13 nuclear magnetic resonance spectroscopy of. Part IV, peak assignment for styrene-butadiene copolymers, 21. Part V, monomer sequence in styrene-butadiene copolymers, 27.
- Polymethylbenzenes** and toluene in aqueous sulphuric acid, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 648.
- Polynitronaphthalenes**, interaction of with lyate ions. Intermediates in nucleophilic aromatic substitution. Part XIV, 1751.
- Polyphosphines** with ethane bridges between trivalent phosphorus atoms, carbon-13 nuclear magnetic resonance spectra of some, 938.
- Polypropylene** and polystyrene, reactivities of toward *t*-butoxyl radical. Effects of molecular weight, solvent, and temperature, 1221.
- Polysaccharide** conformation. Part VIII, test of energy functions by Monte Carlo calculations for monosaccharides, 830. Part IX, Monte Carlo calculations of conformational energies for disaccharides and comparison with experiment, 836.
and glycosides, conformation and circular dichroism of uronic acid residues in, 1418.
- Populations**, rotamer, of sterically crowded trisubstituted ethanes. Stereochemistry of addition of deuterium bromide to *cis*- and *trans*-*t*-butylstyrene. Polar additions to olefins. Part II, 574.
- Porphyryns**, the nuclear magnetic resonance spectra of. Part X, carbon-13 nuclear magnetic resonance spectra of some *meso*-tetra-arylporphyryns and their metal chelates, 204.
- Position 6** in 2,3-dihydro-1,4-diazepinium salts, kinetics of addition of bromine to. Diazepines. Part XIX, 325.
- Positive ions** and other primary species, formation of in the oxidation of sulphides by hydroxyl radicals, 675.
- Potassium hydrogen meso-tartrate**: a neutron diffraction study. Crystal structure of the acid salts of some dibasic acids. Part IX, 1549.
- Potentials**, formal, justification for directly equating voltammetric potentials to. Relative diffusion coefficients of aromatic cations and aromatic compounds, 755.
- Preparation** and photolysis of 3-aryl-3*H*-diazirines, 686.
of *exo*- and *endo*-6-bromo-3-oxabicyclo[3.1.0]hexanes and their stereospecific reactions with butyl-lithium, 197.

- Processes**, bond scission, in sulphur compounds. Part IX, nucleophilic catalysis in the methanolysis of methyl *p*-nitrophenyl sulphate, 478.
- Product distribution**, rate, steric course, and mechanism: retentive solvolysis of optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in phenolic solvents. Retentive solvolysis. Part X, 1426.
- Propane**, 2-chloro-1-phenyl-, different solvent-base systems, stereochemistry of elimination reactions of, 1669.
2-methyl-, radical cations, unimolecular gas-phase hydrogen randomization within, 98.
- Propan-2-ol**, ethanol, and acetaldehyde, kinetics of reactions of toluene-*p*-diazonium ions with. Free-radical reductions of arenediazonium ions in aqueous solution. Part III, 751.
- Propanol**, transition state enthalpies of transfer from to acetonitrile in the reaction of imidazole with benzoyl and benzenesulphonyl chlorides, 1486.
- Propanethiol**, kinetics of the addition of to benzylidencanilines in non-aqueous solutions. Equilibrium addition of nucleophiles to carbon-nitrogen double bonds, 134.
- Properties**, basic, of cyclic sulphides and sulphoxides, 341.
chiroptical, of lactones. Part I, rotatory strengths of electronic transitions in substituted and unsubstituted 1,4-dioxan-2,5-diones (dilactones), 1240. Part II, electronic rotatory strengths of the $\pi n \rightarrow \pi^*$ transition in saturated γ - and δ -lactones, 1276.
conformational, and structure of some radicals from thiazolyl derivatives, 293.
co-ordinating and electrochemical. Cyanoporphyrins, 1321.
- Propionate**, methyl 3-(dimethylamino)-, methiodide, (acetylcholine), crystal structure of the reversed carboxy-analogue of, 1107.
- Propionic**, β -(*p*-chlorophenyl)-, acid and *p*-chloro-*trans*-cinnamic acid, structure refinement and molecular packing of, 68.
2,3-epoxy-3-phenyl-, acids in 50% ethanol, ionization constants of *meta*- and *para*-substituted. Transmission of electronic effects by the oxiran ring, 371.
- Propyl**, 3-(2-methylpiperidino)-1-phenyl-, phenyl ether methiodide, crystal and molecular structure of. Stereochemistry of anticholinergic agents. Part VII, 1074.
- Protonation** of amides, salt effects on the rates of, 942.
behaviour and acid catalysed hydrolysis of 4,5-diarylisoydnones. Mesoionic compounds. Part IV, 230.
- Proton magnetic resonance** studies of the interactions of chloroform with benzene and some alkylbenzenes at various temperatures. Molecular complexes. Part XIV, 956.
nuclear magnetic resonance spectra and conformation in 1,4-dihydrobenzenes and 9,10-dihydroanthracenes, 1544.
resonance assignments with the aid of paramagnetic relaxation reagents, 567.
ionisation of *meta*-substituted benzenethiols, thermodynamic functions of, 1540.
hindered internal rotation in 3,4-di-isopropyl- Δ^4 -thiazoline-2-thione from temperature-dependent nuclear magnetic resonance spectra of five different groups of: a methodological study, 1690.
- Pseudoaromatic compounds**. Part XXII, reactions of 2-functionalised tropones with sodium toluene-*p*-thiolate, 1636.
- Pteridine**, redetermination of the crystal and molecular structure of, 40.
- Purines**, mercapto-, and -pyrimidines, nitrosyliron complexes with studied by nuclear magnetic and electron spin resonance spectroscopy, 423.
- α -Pyran**, (*E*)- β -ionone and its isomeric, photolysis of. Photochemistry of non-conjugated dienones. Part V, 1283.
- 2H-Pyran**, *cis*- and *trans*-2-methoxy-4-methyl-3,4-dihydro-, the thermal decomposition of, 1.
- Pyrazole**, 3-methyl-5-phenyl-: a neutron diffraction study, 1068.
3-hydroxy-1-phenyl-, nitration of. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLI, 1609.
nitration of in the 3- and 5-positions. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLVIII, 1632.
- Δ^1 -Pyrazolines**, kinetics of the decomposition of some, 1791.
- Pyridine**, 4-amino- and protonated 4-amino-, INDO theoretical studies of, 1776.
2- and 4-amino-, -methylamino-, and -dimethylamino-, methiodides and 2-methylthiopyrimidine methiodide, reactions of with hydroxide ions in water. Kinetics of reactions in heterocycles. Part XIV, 1385.
and methylpyridines in the hydrolysis of aryl acetates, nucleophilic and general base catalysis by, 660.
4-methyl-, the complex of with dichloroacetic acid in toluene at 35°, hydrogen-bonded species of, 250.
-2-carbaldehyde, nematic phase nuclear magnetic resonance, ultrasonic relaxation, and theoretical *ab initio* investigation of internal rotation in, 1673.
-4-carboxylate, methyl 1-ethyl-, radical and 1,3-dinitrobenzene, electron transfer reaction between, 526.
N-oxide. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part X, 277.
hexahydro-3H-oxazolo[3,4-*a*]-. Conformational analysis by carbon-13 nuclear magnetic resonance spectroscopy. Part I, 51.
- Pyridinium**, benzenium, pyrylium, and thiopyrylium cations, non-empirical calculations for and a comparison of the last with phosphorin. The electronic structure of conjugated molecules, 841.
N-(*p*-methoxyphenylalkyl)-, ions, through-bond charge-transfer interaction in, 579.
N-methyl, and N-methylquinolinium, substituted, salts with piperidine in water and in ethanol. Kinetics of reactions in heterocycles. Part XIII, 1267.
- Pyrimidine**, 2-methylthio-, methiodide and 2- and 4-amino-, -methylamino, and -dimethylamino-pyridine methiodides, reactions of with hydroxide ions in water. Kinetics of reactions in heterocycles. Part XIV, 1385.
mercapto-, and -purines, nitrosyliron complexes with studied by nuclear magnetic and electron spin resonance spectroscopy, 423.
- N¹-Pyrimidin-2-ylsulphanilamide** (silver sulphadiazine), crystal and molecular structure of, 1021.
- 4-Pyridylmethyl** and the 2- and 5-pyrimidylmethyl cations and radicals, theoretical study of, 1581.
- Pyrolysis**, ester, the nature of the transition state in. Part II. The relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl acetates, phenylacetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates, 1025. Part III, the Hammett correlation for pyrolysis of *t*-butyl benzoates, 1802.
of 1-arylethyl acetates, electrophilic aromatic reactivities

Pyrolysis (*contd.*)

- via.* Part X, pyridine *N*-oxide, 277. Part XI, the σ^+ value for the *m*-substituent, 1463. Part XII, total reactivity of isoquinoline, 1783.
- of 1-(1-chloroethyl)-2-methylbenzene. Gas-phase eliminations. Part XIV, 1194.
- the gas-phase, of some primary and secondary thionacetates, 317.
- Pyrone**, (+)-(6*S*)-5,6-dihydro-6-styryl-2-, (goniothalamine), crystal and molecular structure of, 368.
- naturally occurring hydroxy-, electron spin resonance study of radicals obtained from the oxidation of, 101.
- Pyrrole** and indole, kinetics and mechanism of N-H and C-H isotopic exchange in: acid-catalysed exchange in aqueous acetonitrile solutions, 1316.
- Pyrrolicarbaldehydes**, *C*-substituted, nuclear magnetic resonance conformational studies of. Part I, substituent effects on aldehyde conformations as shown by long range coupling constants, 333. Part II, barrier to internal rotation in 2-substituted pyrrole-2-carbaldehydes, 337.
- Pyrrolidinium**, 1-[4-(2-oxopyrrolidin-1-yl)but-2-ynyl]-, sesquioxalate, oxotremorine sesquioxalate, crystal structure of, 774.
- 2-Pyrrolidone**, *N*-nitroso-, general acid catalysed decomposition of, an example of amide hydrolysis *via* S_N2 displacement on the *N*-conjugate acid. The chemistry of nitroso-compounds. Part IX, 153.
- Pyrylium**, benzenium, pyridinium, and thiopyrylium cations, non-empirical calculations for and a comparison of the last with phosphorin. The electronic structure of conjugated molecules, 841.

Q

- Quadrupole resonance** study, a chlorine-35, of several (*R*-chloromethylene)dimethylammonium salts (Vilsmeier-Haack and Viehe reagents). Nuclear magnetic resonance investigations of carbonium ion intermediates. Part III, 925.
- Quenching**, physical and chemical of excited uranyl ion by organic molecules studied by fluorimetric and laser flash photolysis methods, 1867.
- Quinoline**, 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonylimino-, *N-p*-tolylsulphonylbenzylamine, 1-methyl-3-*p*-tolylsulphonylaminodole, and 1-methyl-3-*p*-tolylsulphonylimino-2-spirocyclopentane, crystal and molecular structure of. Sulphone structures. Part II, 176.
- N*-alkyl-*cis*-decahydro-, conformational equilibria in, 111.
- Quinolinium**, *N*-methyl-, and *N*-methylpyridinium, substituted, salts with piperidine in water and in ethanol. Kinetics of reactions in heterocycles. Part XIII, 1267.
- N*-methyl-, and *N*-methylisoquinolinium salts, substituted, with hydroxide ions. Kinetics of reactions in heterocycles. Part XII, 298.
- Quinone methides**, vinyl-substituted, addition reactions of in aqueous solution. The chemistry of reactive lignin intermediates. Part II, 1584.
- Quinones**, application of high potential. Part IX, a stereo-electronic effect in the rates of quinone dehydrogenation of benzocycloalkenols, 1307.
- Quinoxaline**, 2-chloro-, nucleophilic substitution of with hydroxide ion. Micellar effects on heteroaromatic compounds. Part I, 421.

R

- Radiation chemistry** of alcohols. Part XXI, ultraviolet photolysis (λ 185 nm) of methoxyethanol in the liquid phase, 1338.
- of carbohydrates. Part V, γ -radiolysis of *scyllo*-inositol in deoxygenated and oxygenated aqueous solution, 1334. Part XIX, yields of trapped electrons and radicals in γ -irradiated, frozen, concentrated, aqueous solutions of sugars, 614.
- of ethers. Part VI, photolysis at 254 nm of the diethyl-ether-oxygen charge transfer complex, 171.
- effects on aryl glycosides. Part VII, radiolysis of aqueous solutions of *p*-nitrophenyl β -D-glucopyranoside, 1638.
- π -Radical, amphotronic ionization of a, a basis for correlating radical with nucleophilic and/or electrophilic reactivities, 165.
- Radical**, methyl 1-ethylpyridine-4-carboxylate, and 1,3-dinitrobenzene, electron transfer reaction between, 526.
- anion intermediates. Part VII, reactions of the 1,2,3,4-tetraphenylcyclopenta-1,3-diene radical anion, 1304.
- the sulphate, an electron spin resonance study of reactions of carboxylic acids with, 697.
- derived from *p*-benzoquinone, electron nuclear double resonance and electron spin resonance studies on, 258.
- of trimethylsilyl-substituted *NN*-dimethylanilines, 500.
- reactions of. Part XV, an electron spin resonance study of the radical anions derived from *cis*- and *trans*-1,2-bis(diphenylphosphinyl)ethylene, 643.
- cations**, bipyridyl. Part I, electron spin resonance study of the dimerisation equilibrium of morphamquat radical cation in methanol, 1310. Part II, the reaction of morphamquat [bis-*N*-[(2,4-dimethylmorpholin-4-yl)carbonylmethyl]-4,4'-bipyridylium] radical cation with oxygen in methanol, 1831.
- 2-methylpropane, unimolecular gas-phase hydrogen randomisation within, 98.
- ions**, electron spin resonance studies of aromatic hydrocarbon. Part IV, *t*-butylacenaphthene anions, 1263.
- aminophosphoryl, in solution, an electron spin resonance study of the structure and reactivity of, 140.
- and trapped electrons, yields of in γ -irradiated, frozen, concentrated, aqueous solutions of sugars. Radiation chemistry of sugars. Part XIX, 614.
- from thiazolyl derivatives, structure and conformational properties of some, 293.
- hydroxyl, formation of positive ions and other primary species in the oxidation of sulphides by, 675.
- obtained from the oxidation of naturally occurring hydroxypyrones, electron spin resonance study of, 101.
- oxygenated, reactions of in the gas phase. Part I, reaction of peracetyl radicals and but-2-ene, 758. Part II, reactions of peracetyl radicals and butenes, 1715.
- reactions of trifluoromethyl. Part I, the photochemical reactions of trifluoriodomethane with benzene and some halogenobenzenes, 435.
- related to cinnamic acid, electron spin resonance study of the stereochemistry of, 1189.
- RS^+ , RSO^+ , RSO_2^+ , $RSSR^+$, and carbon, formation of: oxidation of thiols and disulphides in aqueous solution. Electron spin resonance studies. Part XLVI, 892.

Radical (*contd.*)

- some cyclic and acyclic dialkoxyalkyl, electron spin resonance study of the fragmentation of. The mechanism of 1,2-rearrangement of β -acyloxyalkyl radicals, 77.
- Radiochromatographic** method, kinetics of desulphuration of ethylthiourea in sodium hydroxide studied by, 169.
- Radiolysis** of aqueous solutions of *p*-nitrophenyl β -D-glucopyranoside. Radiation effects on aryl glycosides. Part VII, 1638.
- of organic halides, dihalide anions and related species as products in the. Unstable intermediates. Part CLIX, 1492.
- γ -Radiolysis** of *scyllo*-inositol in deoxygenated and oxygenated aqueous solution. Radiation chemistry of carbohydrates. Part V, 1334.
- Raman and infrared spectra** of dimethyl, diethyl, and di-n-butyl fumarates and maleates, assignments of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VII, 400.
- of methyl and [$^2\text{H}_3$]methyl acrylates and *trans*-crotonates, assignments of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part V, 392.
- spectral investigation** of the interactions between group II cations and ethylene glycol in aqueous solutions, 1155.
- Randomization**, unimolecular gas-phase hydrogen, within 2-methylpropane radical cations, 98.
- Rate** of condensation of substituted phenacyl chlorides with benzaldehyde, effects of substituents on. The Darzens condensation. Part III, 805.
- steric course, product distribution, and mechanism: retentive solvolysis of optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in phenolic solvents. Retentive solvolysis. Part X, 1426.
- constants** for S_N and S_E reactions, the effect of alcoholic solvents on. Substitution at saturated carbon. Part XVIII, 623.
- of protonation of amides, salt effects on, 942.
- of quinone dehydrogenation of benzocycloalkenols, a stereoelectronic effect in. Applications of high potential quinones. Part IX, 1307.
- the relative, of pyrolysis of ethyl, isopropyl, and *t*-butyl acetates, phenylacetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates. The nature of the transition state in ester pyrolysis. Part II, 1025.
- Reaction**, electron transfer, between 1,3-dinitrobenzene and methyl 1-ethylpyridine-4-carboxylate radical, 526.
- of methyl iodide with silver perchlorate in nitromethane, kinetics and mechanism of the, 911.
- of sulphides with *N*-chloroarenesulphonamides, mechanism of, 509.
- area**, influence of steric interactions in on activation by a nitro-group. Nucleophilic substitution in five-membered rings, 1388.
- field theory**, application of to the calculation of solvent effects on the Menshutkin reaction of tripropylamine with methyl iodide, 1677.
- addition, participation by neighbouring groups in. Part III, bromination in acetic acid and trifluoroacetic acid solvents, 503.
- S_N and S_E , the effect of alcohols and water on the free energy of solutes and on the free energy of transition states in. Substitution at saturated carbon. Part XIX, 1856.
- between nitric oxide and conjugated dienes, studies on, 1808.
- tetrachlorogold(III) ions and *N*-cyclohexylthiobenzamide, 1351.
- close to the $E1cB$ -bimolecular nucleophilic mechanistic borderline: aminolysis and base-catalysed hydrolysis of aryl phenylphosphonamidates and amidothionates, 1010.
- electro-organic. Part III, mechanistic aspects of the cathodic hydrogenation of activated carbon-carbon double bonds, 161.
- in heterocycles, kinetics of. Part XII, substituted *N*-methylquinolinium and *N*-methylisoquinolinium salts with hydroxide ions, 298. Part XIII, substituted *N*-methylpyridinium and *N*-methylquinolinium salts with piperidine in water and in ethanol, 1267. Part XIV, reactions of 2- and 4-amino-, -methylamino-, and -dimethylamino-pyridine methiodides and 2-methylthiopyrimidine methiodide with hydroxide ions in water, 1385.
- exchange and hydrolysis, solvent effects on. The reactivity of *O*-acylglycosyl halides. Part XII, 1138.
- kinetically controlled, substitution effects in, 1196.
- of amines and active methylene compounds with buta-1,3-diene and isoprene: catalysis by nickel, cobalt, rhodium, and iridium complexes, 1133.
- of 2-aminoindamines [2-amino-*N*-(4-aminophenyl)-*p*-benzoquinone di-imines] in aqueous solution. Benzoquinone imines. Part XII, 728.
- of carboxylic acids with the sulphate radical-anion, an electron spin resonance study of, 697.
- of gases with organic solids, role of molecular packing and structural defects in: ozonolysis of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, 584.
- of organic sulphur compounds. Part I, the hydrolysis of arenesulphonyl chlorides, 637.
- of oxygenated radicals in the gas phase. Part I, reaction of peracetyl radicals and but-2-ene, 758. Part II, reactions of peracetyl radicals and butenes, 1715.
- of picryl chloride with substituted benzoate ions, kinetics of, 242.
- of radical anions. Part XV, an electron spin resonance study of the radical anions derived from *cis*- and *trans*-1,2-bis(diphenylphosphinyl)ethylene, 643.
- of silver ions with thiobenzamides in aqueous solution, 1273.
- of some simple organic ions, partitioning of reverse activation energy between kinetic and internal energy in, 881.
- of sulphenyl chlorides and disulphides in acidic media. Trapping of alkyl(bisalkylthio)sulphonium ion intermediates, 900.
- of the methyl radical with some aliphatic compounds in aqueous solution. Electron spin resonance studies. Part XLV, 885.
- the S_N2 halide exchange. Calculations of steric effects. Part II, 1365.
- of the 1,2,3,4-tetraphenylcyclopenta-1,3-diene radical anion. Radical-anion intermediates. Part VII, 1304.
- of trifluoromethyl radicals. Part I, the photochemical reactions of trifluoroiodomethane with benzene and some halogenobenzenes, 435.
- protolytic and keto-enol, of some 5-monosubstituted barbituric acids, kinetics of, 819.

Reaction (contd.)

- some intramolecular of *ortho*-substituted aryl radicals, 593.
- stereospecific, with butyl-lithium and the preparation of *exo*- and *endo*-6-bromo-3-oxabicyclo[3.1.0]hexanes, 197.
- studies at high pressure. Part I, activation volumes of some [2 + 2] and dipolar cycloadditions, 1555.
- Reactivities**, electrophilic aromatic, *via* pyrolysis of 1-arylethyl acetates. Part X, pyridine *N*-oxide, 277. Part XI, the σ^+ value for the *m*-methyl substituent, 1463. Part XII, total reactivity of isoquinoline, 1783.
- nucleophilic and/or electrophilic, amphi-electronic ionization of a π -radical, a basis for correlating radical with, 165.
- of polystyrene and polypropylene toward *t*-butoxyl radical. Effects of molecular weight, solvent, and temperature, 1221.
- relative, of aliphatic alcohols and amines towards aminyl radicals, 763.
- Reactivity** and structure of aminophosphoranyl radicals in solution, an electron spin resonance study of, 140.
- aromatic. Part LIX, substituent effects of groups of type CH_2Y in acid cleavage of *p*- $\text{YCH}_2\text{-C}_6\text{H}_4\text{SiMe}_3$ compounds and on the charge-transfer maxima of $\text{YCH}_2\text{Ph-tetracyanoethylene}$ complexes, 874.
- nucleophilic, of the methoxide ion at C-5 of 4-nitro-7-X-benzofurans: a kinetic and thermodynamic investigation of Meisenheimer complexes, 1469.
- of *O*-acylglycosyl halides. Part XII, solvent effects on exchange and hydrolysis reactions, 1138.
- of azulene and benzofuran, semiempirical all-valence-electron calculations on, 366.
- of phenyl isocyanate in aqueous solution, 1166.
- of thiophenoxide ion towards *o*- and *p*-halogenonitrobenzenes, 389.
- the relative, of a number of nitrogen-containing species towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part VI, 655.
- Reagents**, paramagnetic relaxation, proton resonance assignments with the aid of, 567.
- tervalent phosphorus, reduction of nitro- and nitroso-compounds by. Part X, ring expansion to give 2-diethylamino-3*H*-azepines, 554. Part XI, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of *o*-nitrobenzylideneamines to 2-substituted indazoles, 1185.
- Rearrangement**, an oxidative: reaction of aromatic amides with phenyl iodosylacetate, 1161.
- during acetolysis of some 2-adamantyl derivatives. Classical carbonium ions. Part VI, 1452.
- of bifluorenylidene to dibenzo[*g,p*]chrysene, 712.
- the Fischer-Hepp, and denitrosation, kinetics and mechanism of. Part V, the mechanism of denitrosation, 107. Part VI, the relative reactivity of a number of nitrogen-containing species towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement, 655.
- thermal, of some 1- and 2-substituted azulenes to naphthalenes, 1464.
- of azoxynaphthalenes in sulphuric acid. Kinetics and mechanisms. The Wallach rearrangement. Part XIV, 471.
- the thermal, of azulenes to naphthalenes, 714.

1,2-Rearrangement of β -acyloxyalkyl radicals, the mechanism of. Electron spin resonance study of the fragmentation of some cyclic and acyclic dialkoxyalkyl radicals, 77.

Reduction and oxidation of some cyclic sulphoxides, ring-size effects in, 408.

of nitro- and nitroso-compounds by trivalent phosphorus reagents. Part X, ring expansion to give 2-diethylamino-3*H*-azepines, 554. Part XI, a kinetic study of the effects of varying the reagent and the nitro-compound in the conversion of *o*-nitrobenzylideneamines to 2-substituted indazoles, 1185.

and solvolysis reactions, aryl and heteroaryl substituent effects in, 551.

free-radical, of arenediazonium ions in aqueous solution.

Part III, kinetics of reactions of toluene-*p*-diazonium ions with ethanol, propan-2-ol, and acetaldehyde, 751.

Relationships, structure-reactivity, on the theory of, 1016.

Relaxation, ultrasonic, associated with nitrogen and ring inversion in some piperidines, piperidones, morpholines, and piperazines, 1642.

nematic phase nuclear magnetic resonance, and theoretical *ab initio* investigation of internal rotation in pyridine-2-carbaldehyde, 1673.

study of the isomerisation of 2,2,3-trimethyl-levulinic acid, 1349.

times, dielectric, and dipole moments of some dialkyl and diaryl disulphides and diphenyl disulphone, 695.

Rhodium, nickel, cobalt, and iridium complexes, catalysis by: reactions of amines and active methylene compounds with buta-1,3-diene and isoprene, 1133.

and iridium complexes of *endo*-6-vinylbicyclo[3.1.0]hex-2-ene, synthesis and thermolysis of. A metal-promoted vinylcyclopropane to cyclopropene rearrangement, 4.

Ring expansion to give 2-diethylamino-3*H*-azepines. Reduction of nitro- and nitroso-compounds by trivalent phosphorus reagents. Part X, 554.

inversion and nitrogen, ultrasonic relaxation associated with in some piperidines, piperidones, morpholines, and piperazines, 1642.

occurring in 1,4-oxa-thian, -selenan, and -telluran, a dynamic nuclear magnetic resonance study of, 1354.

opening and closing in heterocyclic compounds. ^1H nuclear magnetic resonance studies on the reaction between 6-nitrobenzothiazole and methoxide ion in dimethyl sulphoxide-methanol, 1472.

mechanisms of, of oxirans by acids in aqueous and non-aqueous solvents, 1119.

Ring, five-membered, nucleophilic substitution in. Influence of steric interactions in the reaction area on activation by a nitro-group, 1388.

nucleophilic substitutions in. Primary steric effects in thiophen derivatives, 816.

six-membered aza-aromatic, excited states of. Part VIII, photochemical reactions, fluorescence, and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems, 417.

shape and conformational interconversion in five- and six-membered alicyclic radicals. Investigations of structure and conformation. Part V, 1083.

Rotamer populations in solution of some polychlorinated butanes: a molecular mechanics and nuclear magnetic resonance study. Rotational isomerism. Part XVIII, 699.

- Rotation**, barriers to in highly substituted arylthio, alkyl- and aryl-sulphinyl, and arylsulphonyl *E*- and *Z*-sulphines. Chemistry of sulphines. Part XXVIII, 916.
- hindered internal, in 3,4-di-isopropyl- Δ^4 -thiazoline-2-thione from temperature-dependent nuclear magnetic resonance spectra of five different groups of protons: a methodological study, 1690.
- internal, barrier to in 5-substituted pyrrole-2-carbaldehydes. Nuclear magnetic resonance conformational studies of *C*-substituted pyrrole-2-carbaldehydes. Part II, 337.
- carbon-13 nuclear magnetic resonance studies of the barrier to, and the conformational equilibrium in *o*- and *m*-substituted benzaldehydes. Nuclear magnetic resonance studies on benzaldehydes. Part II, 1682.
- nematic phase nuclear magnetic resonance, ultrasonic relaxation and theoretical *ab initio* investigation of in pyridine-2-carbaldehyde, 1673.
- restricted, studies in. Part I, barrier to rotation in some 3-arylcyclohexenone derivatives, 464.
- Rotational isomerism**. Part XVIII, rotamer populations in solution of some polychlorinated butanes: a molecular mechanics and nuclear magnetic resonance study, 699.

S

- Salt effects on the rates of protonation of amides**, 942.
- acid, of monobasic acids, crystal structure of. Part XVII, structure of sodium hydrogen diacetate, re-determined by neutron diffraction, 15.
- Santonin**, 2-bromo-6-*epi*- α - and - β -: conformations of the episantonins. Sesquiterpenoids. Part XXI, 1826.
- Selenan**, 1,4-oxa-, -thian, and -telluran, a dynamic nuclear magnetic resonance study of ring inversion occurring in, 1354.
- Sesquiterpenoids**. Part XIX, X-ray crystallographic determination of the stereochemistry and conformation of the germacranolide glaucolide A, 455. Part XX, X-ray crystallographic determination of the molecular structure of berlandin, a guaianolide epoxide. Comments on the circular dichroism of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated ester side chains, 459. Part XXI, conformations of the episantonins: crystal structures of 2-bromo-6-*epi*- α -santonin and 2-bromo-6-*epi*- β -santonin, 1826.
- Shift measurements**, ^1H and ^{13}C nuclear magnetic resonance, and association constants of some chloroform, trinitromethane, pentachloroethane, and 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane (DDT) complexes in cyclohexane solution, 64.
- Shifts**, ^{13}C chemical, of 1-substituted camphenes, 539.
- nuclear magnetic resonance chemical, the validity of as measures of Lewis acid strength. Basicity of substituted benzamides towards metal halides. Quantitative aspects of Lewis acidity. Part XIII, 541.
- Side chains**, $\alpha\beta$ -unsaturated ester, sesquiterpenoid α -methylene γ -lactones, comments on the circular dichroism of. X-Ray crystallographic determination of the molecular structure of berlandin, a guaianolide epoxide. Sesquiterpenoids. Part XX, 459.
- 6-Sila-5 α -estr-1(10)-en-3-one**, 17 α -ethynyl-17 β -hydroxy-6,6-dimethyl-, crystal structure and conformation of, 1180.
- Silane**, trichloromethyltrifluoro-, the thermal decomposition of: a kinetic investigation. Carbene chemistry. Part VIII, 1051.
- fluoren-9-yltrimethyl-, substituted, and related compounds, base cleavage of. Organosilicon compounds. Part LIII, 380.
- Silver ions**, reactions of with thiobenzamides in aqueous solution, 1273.
- perchlorate**, kinetics and mechanism of the reaction of with methyl iodide in nitromethane, 911.
- sulphadiazine** (*N*¹-pyrimidin-2-ylsulphanilamide), crystal and molecular structure of, 1021.
- Sodium ethoxide** in ethanol, elimination reactions of 1,2-diaryl-1-chloroethanes promoted by. The kinetic effects of α - and β -phenyl substituents, 329.
- kinetic study of *E2* eliminations from 2-thienylethyl bromides and toluene-*p*-sulphonates promoted by, 821.
- hydrogen diacetate**, structure of, re-determined by neutron diffraction. Crystal structure of some acid salts of monobasic acids. Part XVII, 15.
- methoxide**, interaction of with 4-nitropyridine *N*-oxide in benzene in the presence of surfactant aggregates, 482.
- toluene-*p*-thiolate**, reactions of 2-functionalised tropones with. Pseudoaromatic compounds. Part XXII, 1636.
- Solids**, organic, role of molecular packing and structural defects in reactions of gases with: ozonolysis of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, 584.
- Solutes** in sulphuric acid. Part VI, a nuclear magnetic resonance study of organic sulphonic acids and ^1H nuclear magnetic resonance standards; pK_{BH} determination of sulphonic acids, 226.
- the effect of alcohols and water on the free energy of and on the free energy of transition states in S_{N} and S_{E} reactions. Substitution at saturated carbon. Part XIX, 1856.
- Solution**, non-aqueous, the acid-base function in. Part V, entropy changes due to intramolecular and solvation effects in aprotic solvents, 1057.
- γ -irradiated, frozen, concentrated, aqueous, of sugars, yields of trapped electrons and radicals in. Radiation chemistry of carbohydrates. Part XIX, 614.
- Solvent**, molecular weight, and temperature, effects of. Reactivities of polystyrene and polypropylene toward *t*-butoxyl radical, 1221.
- nucleophilic assistance by during acetolysis of secondary alkyl derivatives. Classical carbonium ions. Part VII, 1458.
- dependence** of the primary deuterium kinetic isotope effect in the sodium hydroxide-catalysed *E2* elimination of hydrogen bromide from *p*-acetyl- and *p*-nitrophenethyl bromide, 1218.
- alcoholic, the effect of on rate constants for S_{N} and S_{E} reactions. Substitution at saturated carbon. Part XVIII, 623.
- aqueous and alcoholic, carbon-carbon bond formation in; intramolecular participation by enolate anions in the cleavage of aryl esters of mesitoic acid, 571.
- and non-aqueous, mechanisms of ring opening of oxirans by acids in, 1119.
- phenolic, retentive solvolysis of optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in: rate, steric course, product distribution, and mechanism. Retentive solvolysis. Part X, 1426.

Solvent (*contd.*)

sterically hindered 2,6-dialkylphenol, phenolysis and competing methanolysis of optically active 1-phenylethyl chloride in, 253.

Solvolytic of 2-adamantyl and 2-methyl-2-adamantyl derivatives, stereochemistry of substitution in. Classical carbonium ions. Part V, 1447.

of 1- and 2-adamantyl toluene-*p*-sulphonate, absence of hydride shift in. Classical carbonium ions. Part IV, 1446.

of alkyl toluene-*p*-sulphonates, 1,3-carbonyl participation in, 372.

of *endo*-bicyclo[3.2.1]octan-2-yl toluene-*p*-sulphonate, secondary kinetic isotope effects and the intervention of non-classical ions in, 1850.

reactions and reductions, aryl and heteroaryl substituent effects in, 551.

retentive. Part IX, phenolysis and competing methanolysis of optically active 1-phenylethyl chloride in sterically hindered 2,6-dialkylphenol solvents, 253. Part X, retentive solvolysis in optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in phenolic solvents: rate, steric course, product distribution, and mechanism, 1426.

Spatial orientation, relationship between the magnitude of J_{gem} and of α - and β -substituents, 1395, 1400.**Species**, hydrogen-bonded, of the complex of 4-methylpyridine with dichloroacetic acid in toluene at 35°, 250.

nitrogen-containing, the relative reactivity of a number of towards nitrosation, and further evidence against an intermolecular mechanism for the rearrangement. Kinetics and mechanism of the Fischer-Hepp rearrangement and denitrosation. Part VI, 655.

other primary, and positive ions, formation of in the oxidation of sulphides by hydroxyl radicals, 675.

Spectral study, nuclear magnetic resonance, of β -aminoenones, 665.**Spectrophotometric determination** of basicity constants. Part II, acetanilides, 706. Part III, phenylureas, 1206.**Stabilisation** of the ground state of organic electron donor-acceptor complexes, charge-transfer contributions to, 507.**Stabilities** of Meisenheimer complexes. Part X, association of 1,1-dimethoxy-complexes with cations, 825.

thermodynamic, of hydroxy and methoxy Meisenheimer complexes of substituted arenes. Intermediates in nucleophilic aromatic substitution. Part XV, 1768.

Standardisation of aromatic and heteroaromatic nitration rates, 1600.**Standards**, ^1H nuclear magnetic resonance, and a nuclear magnetic resonance study of organic sulphonic acids; pK_{BH} determination of sulphonic acids. Solutes in sulphuric acid. Part VI, 226.**States**, excited, of six-membered aza-aromatic rings. Part VIII, photochemical reactions, fluorescence, and protolytic equilibria in *N*-alkylated phenazinium ion-phenazyl free radical systems, 417.

ground and excited, of sterically hindered stilbenes, large conformational differences between: implications regarding Stokes shifts and viscosity or temperature dependence of fluorescence yields. Emissions of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.

Step, the rate-limiting, the effect of steric hindrance on, and the mechanism of diazo-coupling to indoles, 1209.

Stereochemical course, a survey of. Dehydrohalogenation of *threo*- and *erythro*-1-chloro- and 1-bromo-1,2-diphenyl-2-*p*-tolylsulphonylethanes, 221.

Stereochemistry and conformation of the germacranolide glucolide A, X-ray determination of. Sesquiterpenoids. Part XIX, 455.

dynamic, of imines and derivatives. Part V, acid catalysis of *E-Z* imine interconversion, 1535. Part VI, stereochemistry of the peroxyacid-imine route to oxaziridines, 1813.

of addition of deuterium bromide to *cis*- and *trans*-*t*-butylstyrene. Rotamer populations of sterically crowded trisubstituted ethanes. Polar additions to olefins. Part II, 574.

of anticholinergic agents. Part VI, crystal and molecular structure of hexasonium iodide, 467. Part VII, crystal and molecular structure of 3-(2-methylpiperidino)-1-phenylpropyl phenyl ether methiodide, 1074.

of elimination reactions of 2-chloro-1-phenylpropane in different solvent-base systems, 1669.

of freelingyne [(4*Z*,6*E*)-9-(3-furyl)-2,6-dimethylnona-2,4,6-trien-8-yn-4-olide] by X-ray analysis, 1863.

of peroxymercuration of cyclohexene, norbornene, but-2-ene, and stilbene; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates. Oxymetallation. Part VIII, 531.

of radicals related to cinnamic acid, electron spin resonance study of, 1189.

of substitution in the solvolysis of 2-adamantyl and 2-methyl-2-adamantyl derivatives. Classical carbonium ions. Part V, 1447.

of the isomeric β -chloromethylsulphonyl- β -methyl- α -morpholinostyrenes, an X-ray and ^1H nuclear magnetic resonance study of. β -Sulphonylenamines, 809.

Stereoelectronic effect in the rate of quinone dehydrogenation of benzocycloalkenols. Applications of high potential quinones. Part IX, 1307.**Stereoselectivity** and stereospecificity in electron deficient diene cycloadditions with norbornadiene and 7-*t*-butoxynorbornadiene: results and MINDO/2 theoretical study, 1004.**Sterically hindered** stilbene derivatives and related compounds, emissions of. Part IV, large conformational differences between ground and excited states of sterically hindered stilbenes: implications regarding Stokes shifts and viscosity or temperature dependence of fluorescence yields, 1569.**Steric course** of γ -radiation-induced exchange between water and tartaric acids. Kinetics of hydrogen isotope exchange reactions. Part XXX, 1595.

rate, product distribution, and mechanism: retentive solvolysis of optically active *para*-substituted 1-phenylethyl *p*-nitrobenzoates in phenolic solvents. Retentive solvolysis. Part X, 1426.

effects, primary, in thiophen derivatives. Nucleophilic substitutions in five-membered rings, 816.

hindrance, kinetic comparison of the relative susceptibility to of an intra- and an inter-molecular cleavage of the ester bond in a series of 2- and 4-carbamoylphenyl esters of 2,4,6-trialkylated benzoic acids, 1062.

the effect of on the rate-limiting step and the mechanism of diazo-coupling to indoles, 1209.

Steroids, Fourier transform ^{13}C nuclear magnetic resonance studies of. Part I, some substituted 17-(2,5-dihydro-5-oxo-3-furyl) steroids, 344.

- trans-Stilbene** and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, ozonolysis of. Role of molecular packing and structural defects in reactions of gases with organic solids, 584.
- cyclohexene, norbornene, and but-2-ene, the stereochemistry of peroxymercuration of; intramolecular co-ordination in β -peroxyalkylmercury trifluoroacetates. Oxymetallation. Part VIII, 531.
- derivatives**, base-catalysed formation of, from α -phenyl- and α -(4-nitrobenzyl)-substituted 4-nitrobenzyl chloride. Elimination reactions. Part II, 384.
- sterically hindered, and related compounds, emissions of. Part IV, large conformational differences between ground and excited states of sterically hindered stilbenes: implications regarding Stokes shifts and viscosity or temperature dependence of fluorescence yields, 1569.
- Stokes shifts** and viscosity or temperature dependence of fluorescence yields, implications regarding: large conformational differences between ground and excited states of sterically hindered stilbenes. Emissions of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.
- Strain energies** and σ -values, conjugation in *para*-substituted benzenes and its relation to. Infrared intensities as a quantitative measure of intramolecular interactions. Part XXV, 443.
- and molecular orbital investigations of the photocyclisation of 1,2-di- β -naphthylethylene, 1515.
- Strengths**, electronic rotatory, of the $n \rightarrow \pi^*$ transition in saturated γ - and δ -lactones. Chiroptical properties of lactones. Part II, 1276.
- rotatory, of electronic transitions in substituted and unsubstituted 1,4-dioxan-2,5-diones (dilactones). Chiroptical properties of lactones. Part I, 1240.
- Strontium sodium galacturonate hexahydrate** and calcium sodium galacturonate hexahydrate, crystal structures of. Interactions of cations with sugar anions, 237.
- Structural defects** and molecular packing, role of in reactions of gases with organic solids: ozonolysis of *trans*-stilbene and $\alpha\beta$ -diethyl-4,4'-dihydroxystilbene, 584.
- investigations** of ylides. Part VI, crystal and molecular structures of two resonance-stabilized Wittig reagents 2-carboxy-1-methoxycarbonyl ethyltriphenylphosphorane and its *t*-butyl ester, 1030.
- Structure** and absolute configuration of plenolin: *X*-ray analysis of plenolin *p*-iodobenzoate, 487. Of florilenalin: *X*-ray analysis of 4-*O*-acetyl-2-*O*-*p*-iodobenzoyl florilenalin, 492.
- and conformational properties of some radicals from thiazolyl derivatives, 293.
- and conformation, investigations of. Part V, conformational interconversion and ring shape in five- and six-membered alicyclic radicals, 1083.
- of an oxide from helenalin, *X*-ray determination of, 496.
- of 4,4'-bipyridyl by nuclear magnetic resonance spectroscopy of a nematic solution, 1541.
- and reactivity of aminophosphoranyl radicals in solution, an electron spin resonance study of, 140.
- of pentafluorobenzaldehyde determined from nuclear magnetic spectra of nematic solutions, 1508.
- of podolide, an antileukemic norditerpene dilactone, *X*-ray determination of, 1482.
- of 2,3,5,6-tetrafluoroanisole determined from the analysis of a nuclear magnetic resonance spectrum of a nematic solution, 1794.
- of thioamides and their derivatives. Part XXXIII, kinetics of the acid-catalysed *E* \rightarrow *Z*-isomerisation of *N*-neopentylthioformamide in *o*-dichlorobenzene, 528.
- the electronic, of conjugated molecules. Non-empirical calculations for the benzenium, pyridinium, pyrylium and thiopyrylium cations and a comparison of the last with phosphorin, 841.
- of some five-membered ring heterocycles containing sulphur and phosphorus, non-empirical calculations of: thiophen and phosphole, 974.
- analysis**, *X*-ray, of 5-chloromethyl-4-oxahomoadamantan-5-ol. Adamantane chemistry. Part II, 74.
- refinement** and molecular packing of *p*-chloro-*trans*-cinnamic acid and β -(*p*-chlorophenyl)propionic acid, 68.
- of copolymers, mechanism, and implications concerning: cyclisation of 3-allylhex-5-enyl radical, 1726.
- Studies**, theoretical, on ion pairs. An *ab-initio* investigation of the lithium-formaldehyde ion pair, 194.
- MINDO/S theoretical, and results: stereoselectivity and stereospecificity in electron deficient diene cycloadditions with norbornadiene and 7-*t*-butoxynorbornadiene, 1004.
- theoretical, of the 4-pyridylmethyl and the 2- and 5-pyrimidylmethyl cations and radicals, 1581.
- Styrene**, *cis*- and *trans*-*t*-butyl, stereochemistry of addition of deuterium bromide to. Rotamer populations of sterically crowded trisubstituted ethanes. Polar addition to olefins. Part II, 574.
- butadiene copolymers**, monomer sequence in. Carbon-13 nuclear magnetic resonance spectroscopy of polymers. Part V, 27.
- peak assignment for. Carbon-13-nuclear magnetic resonance spectroscopy of polymers. Part VI, 21.
- (*E*)- α -chloro- β -nitro-, substitution of, by anilines in acetonitrile. Nucleophilic attacks on carbon-carbon double bonds. Part XXI, 272.
- some β -nitro-, the photoluminescence of. Excited state energies in unsaturated nitro-compounds, 1576.
- the isomeric β -chloromethylsulphonyl- β -methyl- α -morpholino-, an *X*-ray and ^1H nuclear magnetic resonance study of the stereochemistry of. β -Sulphonylenamines, 809.
- Substituent**, the *m*-methyl, the σ^+ value for. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part XI, 1463.
- dependence** of the primary deuterium kinetic isotope effect in elimination from phenethyl bromides and dimethyl(phenylethyl)sulphonium bromides in 50.2 mole% dimethyl sulphoxide-water, 234.
- effect** in the reaction of aryl arylmercury sulphides with picryl iodide, 1490.
- of on the rate of condensation of substituted phenacyl chlorides with benzaldehyde. The Darzens condensation. Part III, 805.
- α - and β -phenyl, the kinetic effects of. Elimination reactions of 1,2-diaryl-1-chloroethanes promoted by sodium ethoxide in ethanol, 329.
- α - and β -Substituents**, relationship between the magnitude of J_{gem} and the spatial orientation of, 1395, 1400.

- ortho-Substituents**, unsaturated, mechanism of cyclization of aryl radicals containing, 795.
- Substitution at saturated carbon**. Part XVIII, the effect of alcoholic solvents on rate constants for S_N and S_E reactions, 623. Part XIX, the effect of alcohols and water on the free energy of solutes and on the free energy of transition states in S_N and S_E reactions, 1856.
- electrophilic aromatic. Part XIII, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in aqueous sulphuric acid, and their significance for the mechanism of aromatic nitration, 648. Part XIV, kinetics of nitration of some aromatic sulphonic acids in sulphuric acid, 788. Part XVI, detritiation and desilylation of 1,6-methano[10]annulene and 11,11-difluoro-1,6-methano[10]annulene, 1287.
- nucleophilic aromatic, intermediates in. Part XIV, interaction of lyate ions with polynitronaphthalenes, 1751. Part XV, thermodynamic stabilities of hydroxy and methoxy Meisenheimer complexes of substituted arenes, 1768.
- at sulphinyl sulphur. Kinetics and oxygen-18 tracer studies of the alkaline hydrolysis of some sulphinate esters, 858.
- at trigonal carbon. Part II, ethanolysis of aliphatic acyl chlorides, 963.
- in five-membered rings. Influence of steric interactions in the reaction area on activation by a nitro-group, 1388.
- in five-membered rings. Primary steric effects in thiophen derivatives, 816.
- of 2-chloroquinoxaline with hydroxide ion. Micellar effects on heteroaromatic compounds. Part I, 421.
- of (*E*)- α -chloro- β -nitrostyrene by anilines in acetonitrile. Nucleophilic attacks on carbon-carbon double bonds. Part XXI, 272.
- of β -chloro- α -phenylacrylonitriles. Nucleophilic attacks on carbon-carbon double bonds. Part XXIII, 982.
- stereochemistry of, in the solvolysis of 2-adamantyl and 2-methyl-2-adamantyl derivatives. Classical carbonium ions. Part V, 1447.
- the electrophilic, of heteroaromatic compounds, kinetics and mechanism of. Part XL, the standardisation of aromatic and heteroaromatic nitration rates, 1600. Part XLI, nitration of 3-hydroxy-1-phenylpyrazoles, 1609. Part XLII, the nitration of thiazoles and thiazolones, 1614. Part XLIII, the nitration of isothiazoles, 1620. Part XLIV, discussion of standard nitration rates for benzenoid and heteroaromatic compounds, 1624. Part XLVII, nitration of phenylisoxazoles, 1627. Part XLVIII, nitration of pyrazoles in the 3- and 5-positions, 1632.
- several nucleophilic vinylic, by amines, base catalysis, leaving group effects, and solvent effects in. Nucleophilic attacks on carbon-carbon double bonds. Part XXII, 863.
- Sugars**, yields of trapped electrons and radicals in γ -irradiated, frozen, concentrated, aqueous solutions of. Radiation chemistry of carbohydrates. Part XIX, 614.
- anions**, interactions of cations with. Part I, crystal structures of calcium sodium galacturonate hexahydrate and strontium sodium galacturonate hexahydrate, 237.
- Sulphate radical-anion**, an electron spin resonance study of reactions of carboxylic acids with, 697.
- Sulphenyl chlorides and disulphides**, reactions of, in acidic media. Trapping of alkyl(bisalkylthio)sulphonium ion intermediates, 900.
- Sulphenylium ions**, the elusive nature of. Dimeric cations from alkanesulphenyl chlorides, 361.
- Sulphides**, formation of positive ions and other primary species in the oxidation of by hydroxyl radicals, 675. mechanism of the reaction of, with *N*-chloroarenesulphonamides, 509. and sulphoxides, cyclic, basic properties of, 341.
- Sulphinates**, kinetics and oxygen-18 tracer studies of the alkaline hydrolysis of some. Nucleophilic substitution at sulphinyl sulphur, 858.
- Sulphines**, chemistry of. Part XXVII, conformational analysis of aryl- and alkyl-thio, aryl- and alkyl-sulphinyl, and aryl- and alkyl-sulphonyl sulphines by means of nuclear magnetic resonance spectra and dipole moments, 352. Part XXVIII, barriers to rotation in highly substituted arylthio, alkyl- and aryl-sulphinyl, and aryl-sulphonyl *E*- and *Z*-sulphines, 916.
- Sulphonation**, aromatic. Part XLIX, sulphonation of anthracene and some *meso*-substituted hydrocarbon-derivatives: mechanism of methyl side-chain sulphonation, 966. Part L, sulphonation of the trimethylbenzenes: isomer distributions and hydrogen kinetic effect, 970. Part LI, sulphonation of 1,3,5-tri- and *m*- and *p*-di-*t*-butylbenzene, the three *t*-butylbenzenesulphonic acids, and 3,5-di-*t*-butylbenzenesulphonic acid, 1438.
- Sulphone structures**. Part II, crystal and molecular structure of *N-p*-tolylsulphonylbenzylamine, 1-methyl-3-*p*-tolylsulphonylaminoindole, 1-methyl-3-*p*-tolylsulphonyliminoindoline-2-spirocyclopentane, and 1,2,3,4-tetrahydro-1,2,4-trimethyl-4-*p*-tolylsulphonylamino-3-*p*-tolylsulphonyliminoquinoline, 176.
- Sulphonic acids**, some aromatic, kinetics of nitration of in sulphuric acid. Electrophilic aromatic substitution. Part XIV, 788.
- Sulphonium**, dimethyl(phenethyl)-, bromides and phenethyl bromides in 50.2 mole% dimethyl sulphoxide-water, the substituent dependence of the primary deuterium kinetic isotope effect in elimination from, 234.
- ion**, alkyl(bisalkylthio)-, intermediates, trapping of. Reactions of sulphenyl chlorides and disulphides in acidic media, 900.
- Sulphonylalkyl radicals**, the formation of, by the oxidation of aliphatic sulphoxides with the hydroxyl radical and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part XLIV, 308.
- Sulphoxides**, aliphatic, the formation of alkylsulphonyl radicals by the oxidation of, with the hydroxyl radical and by the reaction of alkyl radicals with sulphur dioxide. Electron spin resonance studies. Part XLIV, 308. and sulphides, cyclic, basic properties of, 341. α -chlorination of, by *N*-chlorobenzotriazole, kinetics of, 218. some cyclic, ring-size effects in the oxidation and reduction of, 408.
- Sulphur and phosphorus**, non-empirical calculations of the electronic structure of some five-membered ring heterocycles containing: thiophen and phosphole, 974.

Sulphur (*contd.*)

- sulphinyl, nucleophilic substitution at. Kinetic and oxygen-18 tracer studies of the alkaline hydrolysis of some sulphinate esters, 858.
- atom and the carbonyl group, interaction between. Part VI, some 3-thiacycloalkanones, 1294.
- compounds, bond scission processes in. Part IX, nucleophilic catalysis in the methanolysis of methyl *p*-nitrophenyl sulphate, 478.
- organic, reactions of. Part I, the hydrolysis of arene-sulphonyl chlorides, 637.
- dioxide, the formation of alkylsulphonyl radicals by the reaction of alkyl radicals with, and by the oxidation of aliphatic sulphoxides with the hydroxyl radical. Electron spin resonance studies. Part XLIV, 308.
- Sulphuric acid**, aqueous, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of toluene and polymethylbenzenes in, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 648.
- kinetics of nitration of some aromatic sulphonic acids in. Electrophilic aromatic substitution. Part XIV, 788.
- rearrangements of azoxynaphthalenes in. Kinetics and mechanisms. The Wallach rearrangement. Part XIV, 471.
- solutes in. Part VI, a nuclear magnetic resonance study of organic sulphonic acids and ¹H nuclear magnetic resonance standards; pK_{BH} determination of sulphonic acids, 226.
- Synthesis** and thermolysis of rhodium and iridium complexes of *endo*-6-vinylbicyclo[3.1.0]hex-2-ene. A metal-promoted vinylcyclopropane to cyclopentene rearrangement, 4.
- electronic spectra, and photoisomerisation of naphthylpyridylethylenes, 1712.
- of alkoxotellurium(vi) fluorides, (RO)_xTeF_{6-x}: importance of intramolecular electronic effects on the value of α , 312.
- Systems**, delocalized, with very short intramolecular O...H...O hydrogen bonds: conformational studies of 2,3-diacetyl-5-nitrocyclopentadienes. Crystal and molecular structures of 2,3-diacetyl- and 2,3-dibenzoyl-5-nitrocyclopentadiene, 998.

T

- Tartaric acid** and water, steric course of γ -radiation-induced exchange between. Kinetics of hydrogen isotope exchange reactions. Part XXX, 1595.
- Tecomanine methoperchlorate** and 'alkaloid C' methiodide, crystal structures and absolute stereochemistry of: two monoterpene alkaloids from *Tecoma stans*, 1124.
- Telluran**, 1,4-oxa-, -thian, and -selenan, a dynamic nuclear magnetic resonance study of ring inversion occurring in, 1354.
- Tellurium(vi)**, alkoxo-, fluorides (RO)_xTeF_{6-x}, synthesis of: importance of intramolecular electronic effects on the value of α , 312.
- tetrachloride, tin tetrachloride, and zirconium tetrabromide, comparison of the acidity of, towards substituted anilines in dioxan. Quantitative aspects of Lewis acidity. Part XIV, 1110.
- Temperature**, molecular weight, and solvent, effects of. Reactivities of polystyrene and polypropylene towards *t*-butoxyl radical, 1221.
- or viscosity dependence of fluorescence yields, implications regarding Stokes shifts and: large conformational differences between ground and excited states of sterically hindered stilbenes. Emissions of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.
- dependence** of indicator measurements for amides in concentrated aqueous solutions of perchloric acid, enthalpies of ionization deduced from, 1411.
- 1,3,5,7-Tetraene**, *trans,cis,trans,trans*-1,8-diphenylocta-, and *cis,trans,trans*- and *trans,cis,trans*-1,6-diphenylhexa-1,3,5-trienes, iodine atom-catalysed isomerisations of, 1042.
- s-Tetrazine**, hexahydro-1,4-dimethyl-, X-ray crystal structure of, 270.
- Tetrazole** studies. Part III, crystal structure of 5-[(3-chlorobenzyl)dimethylammonio]tetrazolide, 1200.
- Tetrazolium** salts, the oxidative cyclization of formazans to, 104.
- Thermodynamic** and kinetic investigation of Meisenheimer complexes: nucleophilic reactivity of methoxide ion at C-5 of 4-nitro-7-X-benzofurazans, 1469.
- functions** of proton ionisation of *meta*-substituted benzenethiols, 1540.
- Thermolysis** and synthesis of rhodium and iridium complexes of *endo*-6-vinylbicyclo[3.1.0]hex-2-ene. A metal-promoted vinylcyclopropane to cyclopentene rearrangement, 4.
- 3-Thiacycloalkanones**, some. Interaction between the carbonyl group and a sulphur atom. Part VI, 1294.
- Thian**, 1,4-oxa-, -selenan, and -telluran, a dynamic nuclear magnetic resonance study of ring inversion occurring in, 1354.
- Thiazole**, 6-nitrobenzo-, and methoxide ion, ¹H nuclear magnetic resonance studies of the reaction between in dimethyl sulphoxide-methanol. Ring opening and closing in heterocyclic compounds, 1472.
- and thiazolones, the nitration of. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLII, 1614.
- Δ^4 -Thiazoline-2-thione**, 3,4-di-isopropyl-, hindered internal rotation in, from temperature-dependent nuclear magnetic resonance spectra of five different groups of protons: a methodological study, 1690.
- Thiazolones** and thiazoles, the nitration of. The kinetics and mechanism of the electrophilic substitution of heteroaromatic compounds. Part XLII, 1614.
- Thiazolyl derivatives**, structure and conformational properties of some radicals from, 293.
- Thioamides** and their derivatives, on the structure of. Part XXXIII, kinetics of the acid-catalysed *E* \rightarrow *Z*-isomerisation of *N*-neopentylthioformamide in *o*-dichlorobenzene, 528.
- Thiobenzamide** and copper(II) ions in aqueous solution, kinetics and mechanism of the reaction between, 953.
- and mercury(II) ions in aqueous solution, the kinetics and mechanism of the reaction between, 778.
- reactions of silver ions with in aqueous solution, 1273.
- Thiocarbonyl systems**, model calculations on, 559.
- Thioformamide**, *N*-neopentyl-, in *o*-dichlorobenzene, kinetics of the acid-catalysed *E* \rightarrow *Z* isomerisation of. On the structure of thioamides and their derivatives. Part XXXIII, 528.

- Thiols and disulphides, oxidation of, in aqueous solution:** formation of RS^{\cdot} , RSO^{\cdot} , RSO_2^{\cdot} , $RSSR^{\cdot}$, and carbon radicals, Electron spin resonance studies. Part XLVI, 892.
- Thionacetates, some primary and secondary, the gas-phase pyrolysis of some, 317.**
- Thionates, amido-, and phenylphosphonamidates, aryl, aminolysis and base-catalysed hydrolysis of: reactions close to the $E1cB$ -bimolecular nucleophilic mechanistic borderline, 1010.**
- Thiophen and furan carbonyl compounds, conformations of some 2-substituted, 744.**
and phosphole: non-empirical calculations of the electronic structure of some five-membered ring heterocycles containing sulphur and phosphorus, 974.
- thiophen S -oxide, and thiophen SS -dioxide, non-empirical calculations of the nature of the bonding in, 1223.
- 2-carbaldehydes, the infrared bands of, in the carbonyl region: multiple absorption caused by Fermi resonance, 604.**
- derivatives, primary steric effects in. Nucleophilic substitutions in five-membered rings, 816.**
- series, linear free energy *ortho*-correlations in. Part I, the kinetics of piperidinobromination of some 2-bromo-3-X-5-nitrothiophens in methanol, 620.**
linear free energy relationships in. Part I, leaving group effect in piperidino-substitution in methanol of some 2-L-3-nitro-5-X-thiophens, 989.
- Thiophenoxide ion, reactivity of toward *o*- and *p*-halogeno-nitrobenzenes, 389.**
- Thiophosphate, S -4-nitrophenyl OO -diphenyl, molecular conformation of. X -Ray crystal structure analysis, 57.**
- Thiopyrylium, benzenium, pyridinium, and pyrylium cations, non-empirical calculations for and a comparison of the first with phosphorin. The electronic structure of conjugated molecules, 841.**
- Thiourea, ethyl, kinetics of desulphuration of in sodium hydroxide studied by a radiochromatographic method, 169.**
- Through-bond charge-transfer interaction in N -(*p*-methoxyphenylalkyl)pyridinium ions, 579.**
- Tin tetrachloride, tellurium tetrachloride, and zirconium tetrabromide, comparison of the acidity of towards substituted anilines in dioxan. Quantitative aspects of Lewis acidity. Part XIV, 1110.**
- Toluene and polymethylbenzenes in aqueous sulphuric acid, kinetics, isomer yields, and the consequences of *ipso*-attack in the nitration of, and their significance for the mechanism of aromatic nitration. Electrophilic aromatic substitution. Part XIII, 648.**
at 35° , hydrogen-bonded species of the complex of 4-methylpyridine with dichloroacetic acid in, 250.
- p*-diazonium ions, kinetics of reaction of, with ethanol, propan-2-ol, and acetaldehyde. Free-radical reductions of arenediazonium ions in aqueous solution. Part III, 751.**
- p*-sulphonate, 1- and 2-adamantyl, absence of hydride shift in the solvolysis of. Classical carbonium ions. Part IV, 1446.**
endo-bicyclo[3.2.1]octan-2-yl, secondary kinetic isotope effects and the intervention of non-classical ions in the solvolysis of, 1850.
and 2-thienylethyl bromides, kinetic study of $E2$ eliminations from promoted by sodium ethoxide in ethanol, 821.
alkyl, 1,4-carbonyl participation in solvolysis of, 372.
- some 1-methyl- ω -phenylalkyl, phenyl participation in the generation of carbocations in the reactions of, and ω -phenylalk-1-enes in trifluoroacetic acid, 1664.
- Tracer studies, oxygen-18, and kinetics of the alkaline hydrolysis of some sulphinate esters. Nucleophilic substitution at sulphinyl sulphur, 858.**
- Transfer from propanol to acetonitrile in the reaction of imidazole with benzoyl and benzenesulphonyl chlorides, transition state enthalpies of, 1486.**
- Transition, the $n \rightarrow \pi^*$, in saturated γ - and δ -lactones, electronic strengths of. Chiroptical properties of lactones. Part II, 1276.**
electronic, rotatory strengths of in substituted and unsubstituted 1,4-dioxan-2,5-diones (dilactones). Chiroptical properties of lactones. Part I, 1240.
intramolecular charge-transfer, optical activity of, 670.
- state enthalpies of transfer from propanol to acetonitrile in the reaction of imidazole with benzoyl and benzenesulphonyl chlorides, 1486.**
in ester pyrolysis, the nature of. Part II, the relative rates of pyrolysis of ethyl, isopropyl, and *t*-butyl acetates, phenylacetates, benzoates, phenyl carbonates, and *N*-phenylcarbamates, 1025. Part III, the Hammett correlation for pyrolysis of *t*-butyl benzoates, 1802.
in S_N and S_E reactions, the effect of alcohols and water on the free energy of solutes and on the free energy of. Substitution at saturated carbon. Part XIX, 1856.
- Transmission of electronic effects by the oxiran ring. Ionization constants of *meta*- and *para*-substituted 2,3-epoxy-3-phenylpropionic acids in 50% ethanol, 371.**
- Trapping of alkyl(bisalkylthio)sulphonium ion intermediates. Reactions of sulphenyl chlorides and disulphides in acidic media. 900.**
of carbon radicals. The competition of oxygen and iodine for the 1,1-diphenylethyl radical, 589.
- Trends, spectroscopic, and conjugation in phenylsulphonylguanidine derivatives. Physico-chemical behaviour of sulpha drugs, 522.**
- s-Triazines, 2,4-bisalkylamino-6-chloro-, thermal dealkylation of. Effect of alkyl group structure on dealkylation, 1701.**
- Triazolinediones, substituent and solvent effects in the Diels-Alder reactions of, 1325.**
- Tricyclenes, 4-substituted, carbon-13 chemical shifts of, 734.**
- 1,3,5-Trienes, *cis,trans,trans*- and *trans,cis,trans*-1,6-diphenylhexa-, and *trans,cis,trans,trans*-1,8-diphenylocta-1,3,5,7-tetraene, iodine atom-catalysed isomerisations of, 1042.**
- Trifluoroacetic acid and acetic acid solvents, bromination in. Participation by neighbouring groups in addition reactions. Part III, 503.**
phenyl participation in the generation of carbocations from the reactions of some 1-methyl- ω -phenylalkyl toluene-*p*-sulphonates and ω -phenylalk-1-enes in, 1664.
- Trifluoroethoxide ion, $E1cB$ and $E2cB$ mechanisms in the elimination of from α,α -dinitro- β,β -diphenyl- β -(trifluoroethoxy)ethanide anion and the non-reactivity of the β -cyano- α,α -dinitro- β,β -diphenylethanide anion, 628.**
- Trifluoromethyl radicals, reactions of. Part I, the photochemical reactions of trifluoroiodomethane with benzene and some halogenobenzenes, 435.**
- Tripropylamine, the Menshutkin reaction of, with methyl iodide, application of reaction field theory to the calculation of solvent effects on, 1677.**

- Triptycene**, nitration of in acetic anhydride, 945.
- Triterpene**, a friedelin-type, new conformation of: *X*-ray structure of 3-*O*-acetyl-16-*O*-*p*-bromobenzoylpachysandiol B. Studies on the neutral constituents of *Pachysandra terminalis* Sieb. et Zucc. Part IV, 610.
- Tritiation** and deuteration, rapid, of organic compounds using organometallic and elemental halides as catalysts, 1298.
- Tri-*o*-tolyl-phosphine**, -phosphine oxide, -phosphine sulphide, and -phosphine selenide, crystal and molecular structures of. Investigation of phosphorus-carbon bond lengths in aromatic phosphines. Part I, 1737.
- Tropones**, 2-functionalised, reactions of with sodium toluene-*p*-thiolate. Pseudoaromatic compounds. Part XXII, 1636.
- Tungsten carbide** catalyst, kinetics of the liquid-phase hydrogenation of aromatic nitro-compounds in the presence of, 827.
- L-Tyrosine**, *N*-(5-*O*-phosphopyridoxyl)-, heptahydrate, crystal structure of, 60.

U

- Unimolecular** gas-phase hydrogen randomization within 2-methylpropane radical cations, 98.
- Uranyl ion**, excited, physical and chemical quenching of by organic molecules studied by fluorimetric and laser flash photolysis methods, 1867.
- Ureas**, phenyl-. Spectrophotometric determination of basicity constants. Part III, 1206.
- Uronic acid** residues in glycosides and polysaccharides, conformation and circular dichroism, 1418.

V

- Value**, the σ^+ , of the *m*-methyl substituent. Electrophilic aromatic reactivities *via* pyrolysis of 1-arylethyl acetates. Part XI, 1463.
- J_M acidity function, corresponding, a nuclear magnetic resonance study of the addition of methanol and methoxide ions to substituted benzaldehydes, and, 185.
- pK_a , a new method for determining in the range 12–24. The acidities of weak acids. Part I, 54.
- pK of peptide groups in dipeptides from nuclear magnetic resonance kinetic studies, determination of, 784.
- σ -Values** and strain energies, conjugation in *para*-substituted benzenes and its relation to. Infrared intensities as a quantitative measure of intramolecular interactions. Part XXV, 443.
- Vilsmeier-Haack** and Viehe reagents [several (R-chloromethylene)dimethylammonium salts], a chlorine-35 quadrupole resonance study of. Nuclear magnetic resonance investigations of carbonium ion intermediates. Part III, 925.
- Viscosity** or temperature dependence of fluorescence yields, implications regarding Stokes shifts and: large conformational differences between ground and excited states of sterically hindered stilbenes. Emissions of sterically hindered stilbene derivatives and related compounds. Part IV, 1569.
- Von Auwers'** boiling point rule. A new approach, 740.

- Vibrations**, out-of-plane olefinic CH deformation, comparison of. Conformations of some $\alpha\beta$ -unsaturated carbonyl compounds. Part VI, 396.

W

- Wallach rearrangement**, the. Part XIV, rearrangements of azoxynaphthalenes in sulphuric acid. Kinetics and mechanisms, 471.
- Water** and alcohols, the effect of on the free energy of solutes and on the free energy of transition states in S_N and S_E reactions. Substitution at saturated carbon. Part XIX, 1856.
- and tartaric acids, steric course of γ -radiation-induced exchange between. Kinetics of hydrogen isotope exchange reactions. Part XXX, 1595.
- hydroxide ions in, reactions of 2- and 4-amino-, -methylamino-, and -dimethylamino-pyridine methiodides and 2-methylthiopyrimidine methiodide with. Kinetics of reactions in heterocycles. Part XIV, 1385.
- substituted *N*-methylpyridinium and *N*-methylquinolinium salts with piperidine in, and in ethanol. Kinetics of reactions in heterocycles. Part XIII, 1267.
- Wittig reagents**, two resonance-stabilized, 2-carboxy-1-methoxycarbonylethyltriphenylphosphorane and its *t*-butyl ester, crystal and molecular structures of. Structural investigations of ylides. Part VI, 1030.

X

- Xanthen** radical anion, electron spin resonance spectrum of, 1652.
- X-Ray** analysis of 4-*O*-acetyl-2-*O*-*p*-iodobenzoylflorilenalin: structure and absolute configuration of florilenalin, 492.
- of plenolin *p*-iodobenzoate: structure and absolute configuration of plenolin, 487.
- stereochemistry of freelingyne [(4*Z*,6*E*)-9-(3-furyl)-2,6-dimethylnona-2,4,6-trien-8-yn-4-olide] by, 1863.
- and 1H nuclear magnetic resonance study of the stereochemistry of the isomeric β -chloromethylsulphonyl- β -methyl- α -morpholinostyrenes. β -Sulphonylenamines, 809.
- crystal structure of 1,3,6,8-tetraoxacyclodecane, 1129.
- crystallographic determination of the stereochemistry and conformation of the germacranolide glaucolide A. Sesquiterpenoids. Part XIX, 455. Of the molecular structure of berlandin, a guaianolide epoxide. Comments on the circular dichroism of sesquiterpenoid α -methylene γ -lactones with $\alpha\beta$ -unsaturated side chains. Sesquiterpenoids. Part XX, 459.
- determination of the structure and conformation of an oxide from helenalin, 496.
- of the structure of podolide, an antileukemic norditerpene dilactone, 1482.
- structure of 3-*O*-acetyl-16-*O*-*p*-bromobenzoylpachysandiol B: new conformation of a friedelin-type triterpene. Studies on the neutral constituents of *Pachysandra terminalis* Sieb. et Zucc. Part IV, 610.
- study of the *p*-*n*-alkoxybenzoic acids. Part III, crystal structure of *p*-ethoxybenzoic acid, 1171. Part IV, crystal structure of *p*-*n*-butoxybenzoic acid, 1175.

Y

Ylides, structural investigations of. Part VI, crystal and molecular structures of two resonance-stabilized Wittig reagents 2-carboxy-1-methoxycarbonylethyltriphosphorane and its t-butyl ester, 1030.

Z

Zirconium tetrabromide, tin tetrachloride, and tellurium tetrachloride, comparison of the acidity of towards substituted anilines in dioxan. Quantitative aspects of Lewis acidity. Part XIV, 1110.