JOURNAL: INDEX OF SUBJECTS, 1965

Δ

Acetals. Aspects of stereochemistry. Part XXII, structure, conformation, and absolute configuration of some carbohydrate benzylidene acetals containing fused ring systems, 3401.

New mixed acetal of 4-nitrobenzaldehyde, and α-ethoxy-4-nitrophenylacetic acid, 5747.

Acetylation, novel, 4456.

Acetylenes, phenyl-, substituent effects in the acid-catalysed hydration of, 384.

Activation of carbon-carbon triple bonds by cationic catalysts. Part II, interaction of stannic chloride with phenylacetylene and with pent-1-yne in benzene. 1016.

phenylacetylene and with pent-1-yne in benzene, 1016. Ethynyl-hydrogen bond. Part II, association of benzoylacetylene with aromatic hydrocarbons and with n-butyl ether studied by infrared and proton resonance spectroscopy and by calorimetry, 5914.

Molecular photoelectron spectroscopy. Part III, ionisation potentials of oxygen, carbon monoxide, nitric oxide, and

acetylene, 616.

Poly-cyclotrimerisation of alkadiynes and cycloalkadiynes on complex metal catalysts, 3160.

Macrocyclic compounds. Part IX, triple-bond migration in macrocyclic alkadiynes, 3118.

Reaction of acetylenic hydrocarbons with trialkylboranes,

Reaction of sodium phenylacetylide with phenyl isocyanate, 5762.

Acid-anhydrides. Hydrolysis of carboxylic anhydrides. Part VI, acid hydrolysis of cyclic anhydrides, 6174.

Maleic anhydride adducts with substituted benzenes. Factors governing orientation and reactivity in photoaddition to aromatic rings. Liquid-phase photolysis. Part VIII, 918.

Propionic anhydride, condensation of, with isatin, 1455.

Acidity function, Hammett, in aqueous iodic acid and aqueous periodic acid, 4111.

in strongly basic media. Part I, ionisation of phenols in concentrated methanolic sodium methoxide solutions, 676. Part II, reactions of four aromatic nitro-compounds in methanolic sodium methoxide, 2404.

Acids, decarboxylation of. Photochemical transformations. Part XVII, 2438.

viscosities of solutions of, in tri-n-butyl phosphate, 3477. Adsorption on carbon black from solutions of monocarb-

oxylic acids: the lower members, 4340.

Conductometric determination of basic dissociation constants of weak bases in sulphuric acid. Part II, basicities of monochloro-, dichloro-, and trichloro-acetic acid, 4300.

Decomposition of formic acid and methanol on coppernickel alloys, 5248.

Dissociation constants of 8-chloro-1-naphthoic acid and some derivatives, 5781.

Elimination of carbon monoxide from acid derivatives. Part II, Friedel-Crafts reactions (i) with $\alpha\alpha$ -dialkylglutaric anhydrides, (ii) involving cyclisation with elimination, 4566.

Esterification of aromatic acids with boron trifluoridemethanol, 5770.

α-Ethoxy-4-nitrophenylacetic acid, and a new mixed acetal of 4-nitrobenzaldehyde, 5747.

Malonic acid, condensations of with naphthalene-1,8-diamine and o-phenylenediamine, 7531.

Malonic acid, hydrogen isotope effect in the thermal decomposition of, 792.

Metabolism of 2,4-dichlorophenoxyacetic and 4-chloro-2-methylphenoxyacetic acids by Aspergillus niger. Fungal detoxication. Part VII, 1187. Acids (contd.):

Methylnaphthoic and acenaphthoic acids, kinetics of the reactions of, with diazodiphenylmethane, in ethanol or 2-n-butoxyethanol, 6310.

Optical rotatory dispersion. Part XV, monosubstituted succinic acids, 3928.

Oxidations of organic compounds by cobaltic salts. Part VI, kinetic and product studies of the oxidations of some carboxylic acids, 2796.

Preparation of sulphinylhydrazides and their conversion into carboxylic acids and carboxylic acid derivatives, 5386

Steric aspects of the intramolecular cyclisation of 2-aryl-cyclohexylacetic acids. Part II, 1495.

Structure of o-iodosobenzoic acid of certain derivatives,

Studies in the synthesis of long-chain hydroxy-acids. Part II, 5562.

Syntheses of long-chain acids. Part VI, acetylenic acids and cis,cis-docosa-5,13-dienoic acid, 894. Part VII, preparation and reduction of some alkadiynoic acids, 4373.

Synthetic aspects of free-radical addition. Part II, preparation of homologues by homolytic alkylation of acetic acid and related compounds, 1918.

Tetraenoic acid of Tecoma stans seed oil, 907.

Tracer studies in carboxylic acids. Part III, oxalic acid, 2197. Part IV, aminoacetic acid, 2669.

Vapour-phase hetero-association of trifluoroacetic acid with acetic acid, water, and dioxan, 2378.

Acyl chlorides. Acylation. Part XIV, comparison of the reactivities of acetyl and chloroacetyl chloride towards phenols in acetonitrile, 168.

Acyl halides. 2-Iodoethoxycarbonyl chloride. New amineprotecting group of possible value in peptide synthesis, 7136. Acridine, decahydro-1,8-dioxo-, derivatives of, 2263.

reaction of, with dimethyketen. Keten. Part II, 5877. syntheses and reactions. Part VI, new dehalogenation of 9-chloroacridine and its derivatives. Further acridine ionisation constants and ultraviolet spectra, 4653. Part VII, some binuclear acridines, 4657.

Actinomycin analogues, synthesis of. Part I, 3-benzyloxy-4-methyl-2-nitrobenzoyl-L-threonine and related com-

pounds, 3126.

Acylation. Part XIV, comparison of the reactivities of acetyl and chloroacetyl chloride towards phenols in acetonitrile, 168. Part XV, spontaneous and acid-catalysed hydrolysis of diacetyl sulphide, 1057. Part XVI, spontaneous and catalysed hydrolysis of diketen, 3778.

Adenochrome, mechanism of reduction by ascorbic acid, 4728.

Adsorption of surfactants by carbon blacks, effect of graphitization on, 911.

on carbon black from solutions of monocarboxylic acids: the lower members, 4340.

Behaviour of methyl esters of monocarboxylic acids adsorbed from organic solutions by carbon blacks: higher members, 3348.

Sorption of ammonia on silica xerogel surfaces, 240.

Sorption of oxytetracycline and chlorotetracycline by sulphonated polystyrene resins, 5570.

Alcohols, formylation of, using catalysts based on epoxides, 1539.

structural changes accompanying acylation. Lignans. Part IV, 3583.

Alcohol-amine systems, infrared spectra of. Hydrogen bonding in gaseous mixtures. Part V, 3080.

Decomposition of formic acid and methanol on coppernickel alloys, 5248.

Dehydration of aromatic carbinols by acids and its mechanistic implications, 6019.

Ĭ1 L 2

Alcohols (contd.):

Heptacosan-1-ol from the fruit of Citrullus colocynthis, 3488. Resolution of 1-trifluoromethylethanol, 4280.

Aldehydes. cis- and trans-Pent-2-enal, preparation of, 2988. convenient one-step conversion into nitriles, 1564.

Aldehyde reactions, intramolecular catalysis in. Mechanism of the reaction of phthalaldehydic acid with indoles,

Bridged ring systems. Part VII, acid-catalysed cyclisation of \(\beta\)-(1-ethoxycarbonyl-2-oxocyclohexyl)propionaldehyde, 5764.

Competitive oxidation of formaldehyde and glyoxal, 7388. Reaction between o-hydroxyaldehydes and diphenylethylenes, 2978.

Salicylaldehydes and phenols, mechanism of the anti-bacterial action of. Part IV, substituted salicylaldehydes, 438.

Toluene-p-benzaldehyde and benzene-sulphonylhydrazone derivatives, reaction with lead tetra-acetate, 1020.

Algar-Flynn-Oyamada (A.F.O.) reaction, course of, 3978. Alkaloids, bisbenzyltetrahydroisoquinoline -. Optical rota-

tory disperion. Part XIV, 2239.

of Datura meteloides, 4936.

of New Zealand Senecio species. Part II, senkirkine, 2492. of Physostigma venenosum. Part IV, synthesis of (±)eseramine, 3336.

of the Amaryllidaceae. Part XII, aromatic oxygenation patterns and stereochemistry of some trioxyaryl alkaloids of the hemiacetal and lactone series, 1991.

quinolylimidazole, synthesis of, and the structure of normacrorine, 3001.

Alkaloid biosynthesis. Part VIII, use of optically active precursors for investigations on the biosynthesis of morphine alkaloids, 3323. Part IX, ipecacuanha alka-

Alkaloid studies. Part XLVIII, structure of apparicine, a novel aspidosperma alkaloid, 4773.

Buxus. Part IV, isolation and structure elucidation of eight new alkaloids, cyclomicrophylline-A, -B, and -C, dihydrocyclomicrophylline-A and -F. cyclomicrophyllidine-A, dihydrocyclomicrophyllidine-A, and cyclomicrobuxine, from B. microphylla Sieb. et Zucc. var. suffruticosa Makino, 4512. Part V, constitution of cyclobuxoxazine, a new skeletal alkaloid containing a tetrahydro-oxazine ring, 4537. Part VI, constitutions of cyclomicrobuxine, cyclomicrobuxinine, and alkaloid-L, 6688.

Cularine and related compounds. Part XIII, total syntheses of (+)-cularimine and (+)-cularine, 5565.

Indole alkaloids. Part III, isolation of diaboline, and three new alkaloids, henningsamine, henningsoline, and rindline from Strychnos henningsii Gilg, 2812. Part IV, structure of henningsamine, 2814. Part V, structure of henningsoline, 2818.

Investigations on the biosynthesis of morphine alkaloids,

New aporphine alkaloids from Neolitsea pulchella, 2285. Origin of the C-1 fragment in indole alkaloids, 3990.

Phenol oxidation and biosynthesis. Part VIII, investigations on the biosynthesis of berberine and protopine, 6379.

Proton magnetic resonance spectral studies of some Amaryllidaceae alkaloids of the 5,10b-ethanophenanthridine series and of criwelline and tazettine, 2001.

Stereochemistry of the tropane alkaloids. Part XVII, correlation of valeroidine with S(-)-methoxysuccinic acid and of mono- and di-tigloyltropane-3,6-diol with its R(+)-antimer, 6830.

Structure of hunterburnine: X-ray analysis of hunterburnine β -methiodide, 6355.

Structure of chimonanthine: X-ray analysis of chimonanthine dihydrobromide, 5678.

Syntheses along biosynthetic pathways. Part I, synthesis of (+)-isothebaine, 4550.

Synthetic work in the aporphine field, 4014.

Synthetical studies relating to colchicine. Part III, route to 2-aryl-5-oxocyclohexane-β-propionic acids, 5189. Part IV, correction and some further experiments with 3',4',5'-trimethoxy-1,2-benzocyclohept-1-en-3- and -4-one, 5194.

Alkaloids (contd.):

The Senecio alkaloids. Part XVII, formation of the total alkaloid in the plant in relation to the synthesis of the "necine" base and "necic" acid, 2370. Part XVIII, structure of hygrophylline, the alkaloid from Senecio hygrophylus Dyer and Sm., 5707.

Alloxan, condensation of, with amines: formation of uramils (5-aminobarbituric acids), 5556.

reactions of, with aromatic amines: dioxindole-3-carboxyureides and oxindole-3-spiro-5'-oxazolidine-2',4'-diones, 5551.

Aluminium and gallium trihalides, infrared spectra of addition compounds of, 5850.

Complexes of organoaluminium compounds. Part I, ammonia complexes of ethylaluminium chlorides, 1092. Hydrolysis of the aluminium ion: ultracentrifugation and

acidity measurements, 4438.

Reactions of organoaluminium compounds with cyanides. Part I, phenyl cyanide, 2662. Part II, alkyl cyanides,

Some aryl-aluminium and -gallium compounds, 1038.

Amides, intramolecular reactions of. Part IV, promotion of elimination by a β -toluene-p-sulphonamido-group, 4556. Part V, polar effects on the nucleophilicity of amidogroups, 4558.

of dicarboxylic acids, action of sulphur monochloride on,

Electron-impact fragmentation of pentafluorobenzamide, 5742.

Trisdialkylaminoboranes: new reagents for the synthesis of enamines and amides, 5142.

Amines, aromatic, reactions of, with alloxan: dioxindole-3-carboxyureides and oxindole-3-spiro-5'-oxazolidine-2',4'-diones, 5551.

condensation of, with alloxan: formation of uramils (5aminobarbituric acids), 5556.

primary and secondary, oxidations with argentic picolinate. Metal ions and complexes in organic reactions. Part V, 4962.

primary, reaction of, with boron halides. Part I, alkylamines: preparation of borazoles and borazocines, 6421.

Amine-alcohol systems, infrared spectra of. Hydrogen bonding in gaseous mixtures. Part V, 3080.

Condensations of malonic acid with naphthalene-1,8-diamine and o-phenylenediamine, 7531.

Diethylamine and other bases, reaction with 3-bromo-4chromanone and with 4-chromone, 3610.

Dissociation constants of some naphthylamines and acenaphthenamines and their dimethyl derivatives, 5948.

Mechanisms of the reactions of primary and secondary amines with arylsulphonylhalogenoethylenes. Nucleophilic reactions in ethylenic derivatives. Part VIII, 2227. 3-Nitro-o-phenylenediamines: new route, 5119.

Reaction of di-(2-cyanoethyl)amines with ethyl oxalate, 1749.

Photolysis of diethylamine and triethylamine, 4822. Reactions of NN'-dimethyl-o-phenylenediamine with α-

aldols and α -ketols, 5270.

Rearrangement of aromatic N-nitroamines. Part IV, intramolecularity of the acid-catalysed rearrangements of N-nitro-1-naphthylamine and its N-methyl homologue, 6135. Part V, acid-catalysed rearrangements of N-nitro-1-naphthylamine and its N-methyl homologue, 7149. Part VI, thermal and photochemical rearrangements of N-methyl-N-nitro-1-naphthylamine, 7158.

Synthesis of previously inaccessible acylated enamines by desulphurisation of thiazolidines. Studies in organic sulphur compounds. Part XVII, 6253.

Trisdialkylaminoboranes: new reagents for the synthesis of enamines and amides, 5142.

Amino-acids and peptides, Part XXI, removal of the nitrogroup from nitroarginine and peptides of nitroarginine by electrolytic reductions, 782. Part XXII, synthesis of N^{α} -L-arginyl-L-lysylglycine, 786. Part XXIII, synthesis of peptides related to arginine-vasopressin, 6806. Part XXIV, use of esters of 1-hydroxypiperidine and of other NN-dialkylhydroxylamines in peptide synthesis and as selective acylating agents, 6814.

and peptides, cyto-active. Part XI, nitrogen mustard derivatives of glutamic acid and related compounds, 1907.

Amino-acids (contd.):

Acylimidazoles in the synthesis of protected amino-acid p-nitrophenyl esters, 3897.

O-Benzyl-3-nitrotyrosine and its use in the synthesis of peptides containing 3-nitrotyrosine, 7297.

Circular dichroism of N-thiobenzoyl-L-α-amino-acids in solution in ether and in methanol, 2825.

Correlation of the configurations of α -methyl- β -alanine and methylsuccinic acid, 5131.

Deuterium and tritium exchange reactions of phenols and the synthesis of labelled 3,4-dihydroxyphenylalanines,

N-2,4-Dinitro-6-sulphophenylamino-acids: acid hydrolysis, 6198.

DL-β-Fluoren-4-ylalanine, 2264.

Kinetics and mechanism of the removal of the N-benzyloxycarbonyl group from N-benzyloxycarbonylglycine ethyl ester and related compounds in acetic acid containing hydrobromic acid or sulphuric acid, 4403.

Optical rotatory dispersion. Part X, 294. Optical rotatory dispersion. Part XXI. Azomethines (I.), N-neopentylidene derivatives of α-amino-acid esters, 4503.

Peptides. Part XV, 4-methyleneproline and 4-hydroxy-methylproline, 3850.

Synthesis of actinomycin analogues. Part I, 3-benzyloxy-4-methyl-2-nitrobenzoyl-L-threonine and related compounds, 3126.

Aminochromes, chemistry of. Part VII, preparation of 6-hydroxyindole derivatives by the alkaline degradation of $amin ochrome\ semicarbazones,\ 3902.$

Amino-oxy-derivatives. Part V, some O-ethers of 2-sub-stituted 4,6-diamino-1,2-dihydro-1-hydroxy-1,3,5-triazines, 1829. Part VI, some quinazol-4-ones, 6278.

Ammonia, sorption of, on silica xerogel surfaces, 240. Analysis of organic compounds, submicro-methods for. Part XIX, determination of olefinic unsaturation, 1740. Part XX, determination of phosphorus and arsenic, 2044. Part XXII, Malaprade reaction, 3964. Part XXIII, periodate

oxidation of borohydride-reduced oligosaccharides, 4543. Aniline, 2-chloro-4-nitro-, crystal and molecular structure of. X-Ray studies of molecular overcrowding. Part V, 227.

Anilinium cation, electrophilic reactions of, 2210.

[18] Annulene, (cyclo-octadecanonaene), heat of combustion of, 216.

Anthracenes. Synthesis of 2-nitroanthracene and N-hydroxy-2-anthrylamine, 5377.

Anthracene, Friedel-Crafts acylation of, catalysis in, by iodine and iodine monochloride, and co-catalysis by hydrogen iodide, 5744.

Anthracene, reaction with benzyl radicals, 4396.

Antimony halides, interaction of, with nitroanilines in ether and in dichlorobenzene. Quantitative aspects of Lewis acidity. Part IV, 739.

Aphididae, colouring matters of. Part XXIV, enzymic conversion of protoaphin into xanthoaphin, 4363. Part XXV, comparison of aphid constituents with those of their host plants. Glyceride of sorbic acid, 5651. Part XXVI, chrysoaphins-sl and their reaction with periodate, 6923.

Aromatic compounds, reactions of, with 3-carboxyphenylsulphonyl chloride, 5766.

halogen substitution, kinetics and mechanisms of. Part XXI, Arrhenius parameters for the chlorination of biphenyl and some related compounds, 5739. Part XXII, chlorination of 4,5,9,10-tetrahydropyrene, of some diphenylalkanes and of some related compounds, 6893. polyfluoro-compounds. Part XX, nucleophilic reactions of

pentafluoronitrobenzene, 1045. Part XXI, reactions of the pentafluorobenzenediazonium ion, 2088. Part XXII, trans-metallation reactions of bispentafluorophenyl-mercury, 2094. Part XXIII, polyfluoro-azo-, -azoxy-, and -hydrazo-benzenes, 2621. Part XXIV, replacement reactions of perchloro-m-xylene, 2658. Part XXV, reactions of perchloro-m-xylene, 2658. nucleophilic replacement reactions of pentafluoro-toluene, -anisole, and -phenol, 5152. Part XXVI, nucleophilic replacement reactions of the tetrafluorobenzenes, 6327. Part XXVII, reactions of pentafluoro-aniline, -N-methylaniline, and -NN-dimethylaniline with nucleophiles, 6329.

Aromatic (contd.):

polyfluoro-compounds. Part XXIX, nucleophilic replacement reactions of pentafluorobenzoic acid, 6336.

substitution, homolytic. Part XXXII, some reactions with meta-substituted phenyl radicals, 101. Part XXXIII, reactions with arylazotriarylmethanes, 110.

substitution, substituent effects of positive poles in. Part I, nitration of the anilinium ion in 90-100% sulphuric acid, 6845. Part II, nitration of N-methylated anilinium ions, 6851.

Alkyl and substituted alkyl 2,4-dinitrobenzenesulphonates and polymethylene bis-2,4-dinitrobenzenesulphonates, 4458.

Alkylation of the aromatic nucleus. Part XII, isopropylation. Part XIII, p-xylene, 4097. Part XIV, naphthalene, 4101.

Aromatic hydrocarbon-sulphur dioxide binary mixtures. Sulphur dioxide. Part I, 5514.

reactivity. Part XXXI, effects of phosphorus-containing

substituents in protodesilylation, 6306.

Aroyl peroxides. Part II, decomposition of benzoyl peroxide in benzene, 995. Part III, decomposition of benzoyl peroxide in chlorobenzene and bromobenzene,

Benzoyl peroxide, reaction of, with nitrogen dioxide, 5757. Benzylic sulphur compounds, base-catalysed reactions of, 1271.

4-t-Butylthioacetophenone: ultraviolet absorption spectrum, and cyanohydrin dissociation constant, 4599.

Condensation of diketones with aromatic compounds. Part III, further reactions of α -diketones, 3040.

Conjugated cyclic hydrocarbons. Part VIII, benzo[cd]pyrenium cation: synthesis and reactivity, 5920.

Constituents of cigarette smoke. Part IX, pyrolysis of polyenes and the formation of aromatic hydrocarbons, 2892.

Direct phthalimidation of the aromatic nucleus, 3754.

2,3,6,7,10,11-Hexamethoxytriphenylene, 1517.

Kinetics of nucleophilic substitution in polyfluoro-aromatic compounds. Part I, reaction of sodium methoxide with some pentafluorophenyl-compounds, 6375.

Liquid-phase photolysis. Part VIII, preparation of adducts of maleic anhydride and substituted benzenes. Factors governing orientation and reactivity in photoaddition to aromatic rings, 918.

Mass spectra of diphenyl and dibenzo-compounds, 5935.

S_N Mechanism in aromatic compounds. Part XXXI, reactions of thiomethoxide ion in methanol with some fluoro- and iodo-nitrobenzenes, 5454.

4-Methylpyrene, preparation of, 5783.

Molecular polarisability. Carbon-halogen bond polarisabilities in some p-disubstituted benzenes, 3463.

Nitration of some substituted 1,4-dimethoxybenzenes, 2282.

o-Nitrotoluene, dissociation of, under electron impact, 6403.

Orientation in the nitration of trisubstituted benzenes,

Polycyclic biphenylenes. Part II, dibenzo[a,c]biphenylene, 5537.

Polycyclic hydrocarbons, kinetics of the addition of tetrafluorohydrazine, 6602.

Polyfluoroarenes. Part VII, photochemical reactions of trichlorosilane and trimethylsilane with hexafluorobenzene, 6702.

Preparation of polyfluoroaromatic compounds by the reaction of perhalogeno-aromatic compounds with potassium fluoride in sulpholan, 6265.

Preparation of unstable toluene-p-sulphonates, 6748.

Rate of displacement of toluene-p-sulphonate relative to bromide ion. New mechanistic criterion, 6753.

Reactions with asymmetrical diarylethylenes and diarylethanes. Part X, new synthesis of 4,4'-dialkoxy-diphenylacetylenes, -deoxybenzoins, and -benzils, 3994.

Reversible prototropic isomerisation of 1,3-arylphenylpropenes. Relative conjugating power of aryl substituents, 6710.

Unstable intermediates. Part XXVII, cations of hexamethylbenzene and durene, 1120.

Arsenic and phosphorus, determination of Submicromethods for the analysis of organic compounds. Part XX, 2044.

stereochemistry of. Part XIII, 10-chloro-5,10-dihydrophenarsazine, 730.

stereochemistry of. Part XVI, cacodylic acid, 4466.

Acceptor properties of metal halides. Part III, solvation effects of arsenic trichloride in the racemisation of α-methylbenzyl chloride in acetone, catalysed by mercuric chloride, 797.

Cyclic diarsines. Part IX, o-terphenyl derivatives containing nine-, ten-, eleven-, and twelve-membered di-

arsine ring systems, 6342.

Heats of formation and bond energies. Part XIII, arsenic tribromide, arsenious and arsenic oxides, and aqueous solutions of sodium arsenite and sodium arsenate, 4471.

Preparation of some tertiary di-o-halogenophenylarsines, 5132.

Transition-metal complexes with tertiary arsine oxides, infrared spectra (1000-200 cm.⁻¹) of, 1499.

Asperugin, a metabolic product of *Aspergillus rugulosus*. Biosynthesis of phenols, 4672.

Asperuloside, structure of. Chemistry of the Coprosma genus. Part XIII, 2595.

Atrovenetin, structure of, and X-ray analysis of atrovenetin orange trimethyl ether ferrichloride. Fungal metabolites. Part III, 1097.

Aucubin, synthetic intermediates of, ionisation constants, 3339.

Autoxidation in basic media. Part IV, hydrocarbon autoxidation, 3563.

Averythin, an anthraquinoid pigment from Aspergillus versicolor (Vuillemin) Tiraboschi. Studies in mycological chemistry. Part XVII, 3666.

Azepine, derivatives of, preparation, and reactions of, 2411.

Azo-compounds. 2,2'-Dianilinoazobenzene, 3892.

Physical properties and chemical constitution. Part XLIII, electric dipole moments of azobenzene, azopyridines, and azoquinolines, 5316.

Preparation and reactions of 2,2'-di-iodoazobenzene, 6972. Studies on the possible interconversion of phenylhydrazones and phenylazoalkanes. Part I. 2788. Part II. 3528.

and phenylazoalkanes. Part I, 2788. Part II, 3528. Ultraviolet absorption of some substituted azobenzene and symmetric 1,1'- and 2,2'-azonaphthalene derivatives, 5245.

Azomethines. Optical rotatory dispersion. Part XXI, N-neopentylidene derivatives of α -amino-acid esters, 4503. Part XXII, steroidal azomethines, 4508.

В

Beckmann rearrangement, use of formic acid in, 3881.

Benzacridines and dibenzacridines, carcinogenic, thiophen analogues of. Carcinogenic nitrogen compounds. Part XLV, 2646.

Benzimidazoles. Nucleophilic substitution reactions of 2-chlorobenzimidazoles. Part I, formation of benzimidazolin-2-ones and 2-alkoxybenzimidazoles, 236. Part II, formation of benzimidazoline-2-thiones and related compounds, 3132.

Vibrational frequency correlations in heterocyclic molecules. Part VIII, infrared spectra of virus inhibitors related to

benzimidazole, 2331.

Benzocyclobutane. 4-Hydroxybenzocyclobuten-1-one and its derivatives, 1390.

Benzocyclobutenes. Part III, conversion of some benzocyclobutenes into derivatives of benzocyclo-octatetraene and of biphenylene, 2549.

Benzocycloheptane. Synthetical studies relating to colchicine. Part IV, correction and some further experiments with 3',4',5'-trimethoxy-1,2-benzocyclohept-1-en-3- and -4-one, 5194.

Benzofuroxan, 4,6-dinitro-, potassium salt of, and 3,4-dimethyl-4-(3,4-dimethyl-5-isoxazolylazo)isoxazolin-5-one. Two explosive compounds, 5414.

furoxano- and furazano-. Heterocyclic rearrangements. Part IV, 5958.

Benzoin, resolution of, 435.

1,2,3-Benzothiadiazole. Part III, electrophilic substitution in 5- and 7-amino-1,2,3-benzothiadiazoles and the preparation of some substituted 1,2,3-benzothiadiazoles, 1023.

Part V, further investigations in the quaternisation of 1,2,3-benzothiadiazole. Propyl, hydroxyethyl, and polymethylene bis-1,2,3-benzothiadiazolium salts, 4464.

2,1,3-Benzothiadiazole, and 2,1,3-benzoselenadiazole, quaternisation of. Part I, preparation of methyland ethyl-2,1,3-benzothiadiazolium and -benzoselenadiazolium salts, 6769.

Benzothiazoles, amino-, protonation of, 2258.

electrophilic substitution in. Part II, bromination of the aminobenzothiazoles, 2248.

non-photosensitizing basic ethers of. Anti-microbial compounds in the heterocyclic series. Part IV, 954.

Benzo[b]thiophens, 5-substituted, related to gramine, synthesis of, 774.

Benzoxazepine. 2,3-Dihydro-1,4-benzoxazepin-5(4H)-ones and related compounds, 1137.

Benzoxazines and benzthiazines derived from anthranilic acid, 938

Benzthiazines and benzoxazines derived from anthranilic acid,

Beryllium. Alkylberyllium hydride complexes, and the infrared absorption of some beryllium hydrides and deuterides, 692.

Bicyclo[2,2,1]heptadiene, reaction of with methylphosphonous dichloride, 541.

Bicyclo[3,3,1]nonane system: X-ray analysis of 1-p-bromobenzenesulphonyloxymethyl-5-methylbicyclo[3,3,1]nonan-9-ol, 1844.

structural assignments in, by infrared spectroscopy. Bridged ring systems. Part V, 1243.

Bicyclopentyl derivative, cationic polymerisation of: mechanism of formation of deeply coloured, electrically conducting polymers, 3252.

Bile pigments, chemistry of. Part V, stereoisomerism of urobilins, 4085.1,1'-Binaphthyl series, optical activity in. Optically active

8,8'-dimethyl-1,1'-binaphthyl, 1412.

1,1'-Binaphthyl, two crystalline modifications of, 1543.

Biosynthesis, studies in relation to. Part XXXVII, structures derived from acetic acid by two pathways 1921

derived from acetic acid by two pathways, 1231.

Biosynthetic pathways, syntheses along. Part I, synthesis of (±)-isothebaine, 4550.

Biphenylenes. Part XIII, diacylation of biphenylene, 4930. Biphenyls, ortho-substituted azido- or azidomethyl-, decomposition of, 1252.

some applications of the Wiltig reaction to, 6311.

synthesis of, 2898.

Chemistry of fungi. Part XLVIII, derivatives of 2,2',4,4'-tetrahydroxybiphenyl, 4156.

Crystallographic data for the 2'-halogenobiphenyl-4-carboxylic acids and 4-acetyl-2'-halogenobiphenyls, 4208.

Friedel-Crefts sulphonation with hiphenyl 4.4' disulphonal

Friedel-Crafts sulphonation with biphenyl-4,4'-disulphonyl chloride, 4204.

Mesomorphism and chemical constitution. Part XIII, di-, tri-, and tetra-substituted 4,4'-di-(p-n-alkoxybenzyl-ideneamino)biphenyls, 3706.

Bipyrroles. Part IV, some further reactions, 1460.

2,2-Bithienyls, monohalogeno-, synthesis of, 5134.

Boron, chemistry of. Part VI, new preparative methods and

decomposition studies relating to methyldiboranes, 3513. halides, reactions of, with primary amines. Part I, alkylamines: preparation of borazoles and borazocines, 6421.

Boron-phosphorus compounds. Part II, halogenation of 1,1,3,3,5,5-hexaphenylcyclotriphosphinoborine, 3171. Part III, reactions of white phosphorus with boron tribromide and boron tri-iodide, 3354.

Bis-(1,2-dimethylpropyl)borane, reaction of, with enol acetates, 3974.

Bonding and reactivity in triphenylphosphineborane, 899.

Boric acid derivatives as reagents in carbohydrate chemistry. Part III, interaction of phenylboronic acid with methyl xylofuranosides and the isolation of the four methyl xylosides, 858.

Boron (contd.):

Boric acid derivatives as reagents in carbohydrate chemistry. Part V, interaction of phenylboronic acid with methyl pentopyranosides: syntheses of 3- and 2,4-substituted ribose derivatives, 7425. Part VI, phenylboronic acid as a protecting group in disaccharide synthesis, 7429.

Borohydride derivatives of some complex nickel(II) amine

cations, 924.

Derivatives cyclotetrazenoborane (boratetrazole), N₄H₂BH, 6205.

Fission of silicon-sulphur bonds in organosilicon compounds by boron trichloride and phenylboron trichloride, 3045.

Heterocyclic organoboron compounds. Part III, synthesis of phenylboracyclopentane and the infrared spectra of this and other phenylboron compounds, 448.

Long-range proton-boron coupling in dimeric dimethylaminoboron dihalides, 1534.

Metal borides, reactions of, 545.

New preparation of aryldiazonium tetrafluoroborates, 6186. Phenylboronates of acyclic polyhydroxy-compounds, 3798.

Polyfluoroaryl organometallic compounds. Part II, pentafluorophenylboron halides and some derived compounds, 3933. Part III, potassium pentafluorophenyltrifluoroborate, 5144.

Preparation and some reactions of potassium phosphinidodiborane and potassium dimethylphosphinidobis(trimethylboron), 6290.

Propionyloxydifluoroborane, 1551.

Pseudohalides. Part II, preparation, characterisation, and reactions of 3-co-ordinate mononuclear iso- and isothiocyanatoboranes, 4256.

Reaction of acetylenic hydrocarbons with trialkylboranes,

Reactions of boron halides, phenylboron dichloride, and B-trichloroborazole with some organosilicon amines,

Reactions of diboron tetrahalides with acetylene. Part I, preparation and properties of 1,2-bisdichloroborylethylene, 3459.

Reduction of boric oxide to boron monoxide, 6644.

Study of metal borohydrides. Reaction of aluminium borohydride with various ligand molecules, 3923.

Thermochemistry of the complexes of boron trifluoride with dimethyl sulphoxide and ethyl acetate, and the thermal decomposition of the diphenyl sulphoxideboron trichloride complex, 7102.

Trisdialkylaminoboranes: new reagents for the synthesis

of enamines and amides, 5142.

Ultraviolet spectrum and electronic structure of tetraboron tetrachloride, B₄Cl₄, 6180.

Vibrational spectra of the tetrachloroborate and tetrabromoborate ions, 6589.

Bridged ring systems. Part IV, reactions involving bridge scission, 833. Part V, structural assignments in the bicyclo-[3,3,1]nonane system by infrared spectroscopy, 1243. Part VI, total synthesis of (\pm) -clovene, 1344. Part VII, acid-catalysed cyclisation of β -(1-ethoxycarbonyl-2-oxocyclohexyl)propionaldehyde, 5764.

Bromine. Alkylation-bromination of fluoreneamines with alkyl and aralkyl bromides in dimethyl sulphoxide,

4588.

Bromination of acetone in alkaline solution at low temperatures, 1166.

Bromination of but-2-enolides with N-bromosuccinimide,

Bromination of the aminobenzothiazoles. Electrophilic substitution in benzothiazole. Part II, 2248.

Molecular polarisability. Internal rotation in n-alkyl bromides and iodides, 5353.

Molecular polarisability. Molar Kerr constants of n-alkyl bromides, 4189.

Polarisations and apparent dipole moments of fourteen n-alkyl bromides between methyl and octadecyl in carbon tetrachloride, 4185.

Rates of reaction of cycloalkyl bromides and vinyl bromides. Gas phase reactions of sodium. Part II, 6323.

Verda's bromination method, 4601.

Byssochlamic acid, constitution and stereochemistry of. Nonadrides. Part IV, 1787.

Cæsium. Crystal structures of the acid salts of some monobasic acids. Part X, potassium, rubidium, and cæsium hydrogen di-trifluoroacetates, 2530.

Capillin, and related compounds, preparation of, and some substituted pent-4-en-4-yn-1-ones, 2983.

Caracurine-II, structure of: X-ray analysis of caracurine-II dimethiodide, 1663.

naphtho-Carbazoles, \mathbf{and} phenanthro-. Carcinogenic nitrogen compounds. Part XLIV, 2642.

Carbon. Molecular photoelectron spectroscopy. Part III, ionisation potentials of oxygen, carbon monoxide, nitric oxide, and acetylene, 616. Part IV, ionisation potentials and configurations of carbon dioxide, carbon oxysulphide, carbon disulphide, and nitrous oxide, 6350.

Thermal polymerisation of carbon suboxide, 3866.

Carbonium ions, stability of, 1542.

Carbostyrils, 3-aminohydro-, synthesis of, 1080.

Carotenoids and related compounds. Part XI, syntheses of δ -carotene and ϵ -carotene, 2019.

Caryophyllene series, transannular reactions in, 3154.

Catalysis by iodine and iodine monochloride, and co-catalysis by hydrogen iodide, in the Friedel-Crafts acylation of anthracene, 5744.

heterogeneous, in solution. Part II, effect of platinum on oxidation-reduction reactions, 78. Part III, heterogeneous catalysis and other types of interaction between metals and oxidation-reduction reactions, 97.

Activation of carbon-carbon triple bonds by cationic catalysts. Part II, interaction of stannic chloride with phenylacetylene and with pent-1-yne in benzene,

Catalytic action of anionic catalyses. Part X, reaction of ethyl-lithium with fluorene and 1,1-diphenylethylene,

Catalytic approaches to complex compounds of rhodium(III), 1951.

Catalytic power of pyridine and related Brönsted bases in the iodination of ketones and nitromethane, 1752.

Co-catalysis in Friedel-Crafts reactions. Part visible chromophores, 1761.

Decomposition of formic acid and methanol on coppernickel alloys, 5248.

Experiments towards the synthesis of corrins. Part IX, nature of the sodamide-catalysed dimerisation of 1pyrroline 1-oxides, 2337.

Formylation of alcohols, using catalysts based on epoxides,

Metal ions and complexes in organic reactions. Part IV, copper-promoted preparations of diaryl ethers and competing hydrogen-transfer processes, 4953.

Phosphorus-nitrogen compounds. Part X, aluminium chloride-catalysed cis-trans-isomerisation of non-geminal chlorodimethylamino- \mathbf{and} chloropiperidinocyclotriphosphazatrienes, 2223.

Platinum-catalysed oxidation of some 6-deoxyhexopyranosides, 2292.

Poly-cyclotrimerisation of alkadiynes and cycloalkadiynes on complex metal catalysts, 3160.

Polyfluoroheterocyclic compounds. Part V, catalytic reduction of perfluoro- and chlorofluoro-pyridines and the preparation of polyfluoropyridinecarboxylic acids,

Polymerisation of styrene by titanium tetrachloride. Part IV, kinetics of polymerisation in methylene dichloride, 5579.

Role of surface in the pyrolysis of 2-chlorobutane, 247. Synthesis of model intermediates related to thiaminecatalysed reactions, 4265.

Cephalosporanic acids. Part I, infrared absorption and proton magnetic resonance spectra of cephalosporin and penicillin analogues, 1595. Part II, displacement of the acetoxy-group by nucleophiles, 5015. Part III, reactions with pyridine-kinetics and mechanism, 7020.

Cephalosporin C, studies related to. Part III, synthetical route to 6H-1,3-thiazines and the synthesis of a new fragmentation product of a cephalosporanic acid derivative, 1262.

Cerium. Controlled oxidations of organic compounds with cerium(IV). Oxidation of benzyl alcohols to benzaldehydes, 5777.

Kinetics of oxidation of the ruthenium(II)-tris-o-phenanthroline complex by cerium(IV), 5749.

Chemiluminescence, effect of substituent orientation on, 3067.

Chlorine. Apparent conformations of dichlorodiphenyltrichloroethane (D.D.T.) and two derivatives in nonpolar solvents, 7094.

Chlorination of some n-alkanes and alkyl chlorides, 3599. 2-Chlorobutane, role of surface in the pyrolysis of, 247.

Dehydrochlorination reactions involving trifluoromethane, 824.

Hexachlorocyclopentadiene. Part IV, Diels-Alder adducts of 5,5-di(hydroxyalkoxy)-1,2,3,4-tetrachlorocyclopenta-1,3-dienes and related compounds, 4605. Part V, reaction with 1,2-diols and a base at high temperatures, 4744.

Kinetics of the pyrolysis of 1-chloropentane, 4423.

Reactions of hexachlorocyclopentadiene. Part III, 2',3',4',5'-tetrachloro-1,3-dioxolan-2-spirocyclopenta-2',4'-dienes and their adducts, 2305. Part IV, Diels-Alder adducts of 5,5-di(hydroxyalkoxy)-1,2,3,4-tetra-chlorocyclopenta-1,3-dienes and related compounds, 4605.

Reactions of hexachlorocyclopentadiene with some etheralcohols, 7141.

Synthesis and reactions of branched-chain hydrocarbons. Part XVII, N-chlorosulphonamides as chlorinating agents, 3228. Part XVIII, chlorination of 2,2,4-trimethylpentane, 3235.

Chromans, preparation of, from 1,3-diaryloxypropanes, 5718. Chroman, 3,4-dibromo- and 3,4-dichloro-2,2-dimethyl-, hydrolysis of, 5049.

Chroman, 8-hydroxy-, acetylation of, and a new series of dihydropyranochromones, 3882.

Chrom-3-en-6-ols. Action of pyridine on alk-2-enylbenzoquinones, 5060.

Chromen, 2,2-diphenyl- and 2,2-dimethyl-, dimerisation of. Part II, reaction between 3-(2-hydroxyphenyl)-1,3-diphenylpropan-1-one and 3-(2-hydroxyphenyl)-1,1-diphenylprop-2-en-1-ol, 5261.

Chromeno-oxazines, 7348.

Chromens and naphthopyrans, reaction with bromine and chlorine, 5266.

4-Chromone and 3-bromo-4-chromanone, reaction with diethylamine and other bases, 3610.

Chromono(2',3':3,2)benzofurans, 5140.

Chromatography of gases and vapours. Part IX, preparation of some mixed hexa-alkyldigermanes and the elucidation of their isomer ratios, 1197.

Chromium. Anionic chloroperoxy-complex of chromium(vI), 5753.

σ-Bonded organotransition-metal ions. Part I, formation of air-stable penta-aquopyridiomethylchromium(III) ions, 7029.

Molecular-orbital theory of organometallic compounds. Part V, far-infrared spectra of the tricarbonylarenechromiums, 2822.

Preparation, properties, and kinetics and mechanism of hydrolysis of some chloropentakis(alkylamine)chromium(III) salts, 6834.

Reactions of liquid sodium with transition-metal oxides. Part II, reduction of chromium trioxide to a ternary oxide of chromium(IV), 5534.

Reductions by chromium(II) of cobalt(III) complexes containing oxyanions of nitrogen, 3641.

Some magnetically normal chromium(II) salts, 3267. Cigarette smoke, constituents of. Part IX, pyrolysis of poly-

cigarette smoke, constituents of. Fart 1A, pyrolysis of polyenes and the formation of aromatic hydrocarbons, 2892. Cinnolines. Part VI, tautomerism and alkylation of 4-hydr-

oxycinnoline, 5391. Part VII, methylation of 4-hydroxy-6,7-dimethoxycinnoline-3-acetic acid, 6036.

new synthesis of. Part II, synthesis of 1-substituted 4-cinnolone-3-carboxylic acids, 1468.

Ionisation constants of heterocyclic substances. Part VII, 2260.

Polycyclic cinnoline derivatives. Part XVI, nitration of benzo[h]naphtho[1,2-c]cinnoline, 7088.

Gircular dichroism and conformations of nitro-steroids. Nitro-steroids. Part IV, 5002.

of N-thiobenzoyl-L- α -amino-acids in solution in ether and in methanol, 2825.

studies on terreic acid and its derivatives, 6587.

Givetone homologues, novel synthesis of Macrocyclic compounds. Part XI, 6679.

(±)-Clovene, total synthesis of Bridged ring systems. Part VI, 1344.

an alternative synthesis of, 1338.

Cobalamins, with sulphur-containing ligands, properties of, 2174.

Chemistry of vitamin B_{12} . Part III, proton magnetic resonance spectra of some cobalamins, 2859.

Cobalt. Acid-catalysed reactions of transition-metal complexes. Part III, acid-catalysed aquations of transazidochlorobisethylenediaminecobalt(III) and cis-nitrochlorobisethylenediaminecobalt(III) salts, 7320.

Bridging water in the oxygen-carrying NN'-ethylenebis(salicylideneiminato)cobalt(II) complex, 882.

Chemistry of the metal carbonyls. Part XXXIII, synthesis of tetracarbonyl- σ -tetrafluoroethylcobalt, and related reactions, 6519.

Cobalt(II) complexes of 2- and 4-vinylpyridines, 4669.

Crystal structure of black nitrosylpentammincobalt dichloride, 1364.

Crystal structure of carbonatopenta-amminecobalt(III) bromide hydrate, 3194.

Crystal structure of nitrosylpentamminecobalt dichloride (black form), 1359.

Deuterium isotope effect in octahedral substitutions. Part I, aquation of cis- and trans-dichloro- and cis- and trans-chloro-nitro-bis(ethylenediamine)cobalt(III) cations, 418.

Dissociation constants of some cobalt(II) ion-pairs from pH (glass electrode) measurements at 25°, 2456.

Influence of electrolytic dissociation upon rates of reactions. Part III, aquation of chloropentamminecobalt(III) in acidic salt solutions, 724.

Ion-pair constants of some chloropentamminecobalt(III) salts from pH (glass electrode) and solubility measurements, 720.

Kinetic studies of oxidation-reduction of cobalt-ethylenediaminetetra-acetic acid complexes. Part III, reduction of ethylenediaminetetra-acetatocobaltate(III) and related complexes by ferrous ion, 2116.

Kinetic study of the hydrolysis of sulphatobis(ethylene-diamine)cobalt(III) perchlorate, 7047.

S_N Mechanism in inorganic reactions. Part I, hydroxideion substitution in halogenopentamminecobalt(III) com-

ion substitution in halogenopentamminecobalt(III) complexes, 3207.

Mechanisms of octahedral substitution reactions in non-

aqueous solutions. Part III replacement of co-ordinated water in trans-aquonitrobis(ethylenediamine)cobalt(II) ions, 1204. Part IV, kinetics and steric course of chloride exchange in the cis-dichlorobis(ethylenedimaine)cobalt(III) cation in methanol, 4074.

Nucleophilic replacement at an octahedrally co-ordinated metal atom. Part III, basic hydrolyses of cis- and trans-di-isothiocyanato- isothiocyanatoammine-bisethylenediaminecobalt(III) salts, 3300.

Optically active co-ordination compounds. Part I, optical configurations of bisethylenediamine complexes of cobalt(III), 6084.

Oxidations of organic compounds by cobaltic salts. Part VI, kinetic and product studies of the oxidations of some carboxylic acids, 2796.

Preparation and magnetic susceptibility of nitrosylpentammine cobalt chloride (black), 6024.

Reduction of bistriphenylphosphine tricarbonyl cobalt(1) salts, 3890.

Reductions by chromium(II) of cobalt(III) complexes con-

taining oxyanions of nitrogen, 3641.

Thermodynamic dissociation constants of some cobalt(II)

Thermodynamic dissociation constants of some cobalt(II) ion-pairs determined at 25° by cation-exchange resin studies, 2452.

Transition metal-Schiff's base complexes. Part II, reaction of nitric oxide with some oxygen-carrying cobalt compounds, 4718.

Colour reactions, chemistry of. The Craven reaction, 974. tyrosine test of Gerngross, Voss, and Herfeld, 480

Complexes and metal ions in organic reactions. Part IV copper-promoted preparations of diaryl ethers and competing hydrogen-transfer processes, 4953. Part V, oxidations of primary and secondary amines with argentic picolinate, 4692.

between polyhydroxy-compounds and inorganic oxy-acids. Part V, tungstate complexes of acylic polyhydroxy-

compounds, 21.

charge-transfer. Part I, interaction with solvent, 2079.

containing bipyridyl, heats of formation of, 4168.

formed by adrenaline and related compounds with transition-metal ions. Part I, acid dissociation constants of the ligands, 2391.

halogeno-, relative stabilities Rh en $_2$ Cl $_2$ +-Br- equilibria, 5931. stabilities of. Part IV, trans-

molecular. Part I, crystal and molecular structure of the 1:1 adduct of benzotrifuroxan and 13,14-dithiatricyclo[8,2,1,14-7]tetradeca-4,6,10,12-tetraene, 4838. Part II, crystal structure of the 1:1 complex of bis-8-hydroxyquinolinatopalladium(11) and chloranil, 4851. Part III, crystal and molecular structure of the 1:2 molecular compound of bis-8-hydroxyquinolinatocopper(II) and picryl azide, 4867. Part IV, observations on the structure of the 1:1 molecular compound of bis-8-hydroxyquinolinatocopper(II) and benzotrifuroxan, 4882.

of metal-β-diketone. Part I, metal-carbon bonding in some platinum acetylacetonates, 6740.

of titanium, vanadium, and tin tetrahalides with the ligand

o-phenylenebisdiethylarsine, 5699.

of transition-metals with polyatomic ligands, structure and reactivity of. Part I, electron spin resonance spectra of [Mn(CN)₅NO]²⁻ and [Fe(CN)₅NO]³⁻, 410.

of transition-metals with tertiary arsine oxides, infrared spectra (1000-200 cm.-1) of, 1499.

pseudohalide, vibrational spectra of. Part I, tetrahedral isocyanate complexes, 262. Part II, planar and octahedral isocyanate complexes, 1286.

tetrahedral isocyanate. Vibrational spectra of pseudo-

halide complexes. Part I, 262.

transition-metal fluorocarbon. Part VII, some complexes of cobalt and rhodium with trifluoroethylene, chlorotrifluoroethylene, and hexafluorobut-2-yne, 6629.

Acid-catalysed reactions of transition-metal complexes. Part III, acid-catalysed aquations of trans-azidochlorobisethylenediaminecobalt(III) and cis-nitrochlorobis-

ethylenediaminecobalt(III) salts, 7320.

Actions of halogens on phosphine-substituted Group VI metal carbonyls. Part I, action of halogens on diphosphine-molybdenum and -tungsten carbonyls, 5486. Part II, novel synthesis of some phosphine oxide complexes, 6027.

Adducts of co-ordination compounds. Part I, adducts of

hydrogen halides, 4479.

Aliphatic tri(tertiary arsine)carbonyls. Part I, derivatives of Group VI and Group VII metals, 6564. Part II, halogen oxidation of Group VI tricarbonyl derivatives,

Amino-derivatives of metals and metalloids. Part I, preparation of aminostannanes, stannylamines, and stannazanes, 1944. Part II, amino-stannylation of unsaturated substrates, and the infrared spectra and structures of carbamato- and dithiocarbamato-trimethylstannanes and related compounds, 2157.

σ-Bonded organotransition-metal ions. Part I, formation of air-stable penta-aquopyridiomethylchromium(III) ions,

Bipyridyl and terpyridyl complexes from halides of Group

IVB elements, 3716.

Carboxylates of palladium, platinum, and rhodium, and their adducts, 3632.

Charge-transfer phenomena in some inorganic complexes. Part I, electronic conduction in some complex cyanides, 6164. Part II, physical properties of trithallium(1) hexacyanoferrate(III), 6170.

Chemistry of polynuclear compounds. Part III, magnetic properties of some carboxylic acid derivatives of copper-

 (Π) , 6464.

Complexes (contd.):

Chemistry of the metal carbonyls. Part XXX, transbromotetracarbonyl(triphenylphosphine)rhenium, 5259. Part XXXI, reactions between some fluoro-olefins and carbonylmetal anions, 5830. Part XXXII, isomerisation of allyl compounds and the dimerisation of norbornadiene, 6416. Part XXXIII, synthesis of tetracarbonyl-o-tetrafluoroethylcobalt, and related reactions, 6519.

Complex halides of transition metals. Part I, hexabromotungstates(v), 2274.

π-Complexes of 8-hydroxyquinoline and its metal complexes, 2579.

Co-ordination compounds having carboxylic esters as ligands. Part III, thermochemistry of the complexes

of ethyl acetate with Group III halides, 5826. Co-ordination number of transition-metal ions. complexes of nickel(II) halides with heterocyclic aromatic amines, 3276. Part IV, relative stabilities of some tetrahedral and octahedral complexes of cobalt(II) and nickel(II), 3284.

Crystal structures of anhydrous nitrates and their complexes. Part I, α form of copper(II) nitrate, 2925.

1,1'-Diaminobicyclohexyl, and the stability of its metal complexes, 603.

Diethyl sulphide complexes of ruthenium, rhodium, and iridium, 2627.

Dipyrromethene complexes of transition metals. Part I, tetrahedral complexes of cobalt(II), nickel(II), copper(II), and zinc(11), 5222.

Equilibrium between iron(II) and titanium (IV) in sulphuric acid, 2993.

Evaluation of equilibrium constants and extinction coefficients for weak charge-transfer complexes, 2048.

Intramolecular hydrogen bonds in some arene-metal carbonyl compounds, 1170.

Lattice types of some Na₂MF₆ complexes, 1559.

Magnetic behaviour of transition-metal phthalocyanines, 1821.

Metal complexes in solution. Part II, zinc malonate and phthalate, 1450.

Metal-metal bonds. Part II, further complexes containing gold-manganese bonds, 3407. Part III, formation of rhodium-mercury bonds from complex rhodium hydrides, 5331. Part IV, formation of iridium-mercury bonds by oxidation with mercury halides, 5337. Part V, complexes containing copper- and silver-metal linkages, 5343.

Octahedral metal diarsine chloro-complexes, low-frequency infrared spectra of, 1483.

Optical rotatory power of co-ordination compounds. Part III, absolute configurations of trigonal metal complexes, 2883. Part IV, spectroscopic and configurational assignments for bisdiamine complexes, 5094.

Optically active co-ordination compounds. Part I, optical configurations of bisethylenediamine complexes of cobalt-(III), 6084. Part II, isomers of tris-L-(+)-alanine complexes with cobalt(III) and rhodium(III), 6531.

Pentafluorophenyl derivatives of transition metals. Part IV, platinum(II) compounds, 5275.

of complexes Preparation and characterisation rhodium(III) and iridium(III) with di-2-pyridylamine,

Proton magnetic resonance spectra of ortho-phenanthroline and some of its metal complexes, 3185.

Proton magnetic resonance spectra of o-phenanthroline and some of its metal complexes in non-aqueous solution, **4706**.

Reaction of 1,2,5-triphenylphosphole and its oxide with metal carbonyls, 6406.

Reactions of co-ordinated ligands. Part II, reactions of co-ordinated alcohols, esters, and ethers, 4214.

Stereochemistry of eight co-ordination, 4736.

Studies on transition-metal peroxy-complexes. Part IV,

peroxyfluoro-complexes, 2182.

Substituted Group VI carbonyls. Part V, tritertiary arsine tricarbonyl complexes and their reaction with halogens, 4194. Part VI, derivatives containing 2,6-dimethyl-pyrazine and 2,2',2"-terpyridyl, 5346. Complexes (contd.):

Thermodynamic effects involved in the metal-ion chelation of histidine, histidine methyl ester, and 4(or 5)-imidazolylacetic acid, 742.

Thermodynamics of ion association. Part XII, EGTA complexes with divalent metal ions, 7353.

Transition-metal-carbon bonds. Part III, cyclopentadienyltrimethylplatinum(IV), 1529.

Part V, hydrido-cyclo-octa-1,5-diene complexes of iridium-(III), 4997.

Transition-metal complexes of triethylenetetramine. Part II, some $nickel(\pi)$ and $copper(\pi)$ derivatives, 6194.

Transition-metal complexes with aliphatic Schiff bases. Part VII, compounds formed by the reaction of copper(π) and nickel(π) dipropylenetriamine complexes with acetone, 5502.

Transition-metal quinoxaline complexes. Part II, copper(I) derivatives, 6639.

Transition metal-Schiff's base complexes. Part II, the reaction of nitric oxide with some oxygen-carrying cobalt compounds, 4718.

Transition-metal halide-methyl cyanide complexes. Part III, titanium, vanadium, and chromium, 537.

Vibrational spectra of some addition compounds of trimethylamine, 6595.

Visible and ultraviolet spectra of trigonal bipyramidal complexes of nickel(π), palladium(π), and platinum(π), 2771.

Conessine, synthesis of, experiments related to. Photochemical transformations. Part XVIII, 2444.

Copper. Colour isomerism and structure of copper coordination compounds. Part VIII, crystal structure of a second crystalline form of bis-salicylaldehydatocopper(π), 425.

Crystal structure of acetylacetonemono(o-hydroxyanil)-copper(π), 1979.

Crystal structure of copper(II) ethyl acetoacetate, 3746.

Crystal structures of anhydrous nitrates and their complexes. Part I, α form of copper(π) nitrate, 2925.

Magnetic and spectral properties of copper(π) benzoate complexes, 3894.

Magnetic properties of some carboxylic acid derivatives of copper(π). Chemistry of polynuclear compounds. Part III, 6464.

Metal-metal bonds. Part V, complexes containing copperand silver-metal linkages, 5343.

Molecular complexes. Part III, crystal and molecular structure of the 1:2 molecular compound of bis-8-hydroxyquinolinatocopper(II) and picryl azide, 4867. Part IV, observations on the structure of the 1:1 molecular compound of bis-8-hydroxyquinolinatocopper(II) and benzotrifuroxan, 4882.

Optical rotatory dispersion. Part XIX, series of acids, imidazolines, amidinium chlorides, and their copper complexes, related to mandelic acid, 4007.

Preparation of copper(Π) complexes from optically active α-hydroxy-amidines, 4004.

Quinoxaline complexes of copper(π), 4336.

Reactions of polyfluoroaryl bromides with cuprous salts in dimethylformamide, 3372.

Coprosma genus, chemistry of. Part XIII, structure of asperuloside, 2595.

Cortisone. Compounds related to the steroid hromones. Part XI, conversion of 4,5 α -dihydrocortisone 21-acetate into 16α -acetoxyprednisone 21-acetate, 130. Part XII, improved method for making 16α -acetoxy-4,5 α -dihydrocortisone 21-acetate, 142. Part XIII, preparation of 6α - and 6β -methylcortisone acetates, 148. Part XIV, $\Delta^{8(9)}$ -11-oxo-steroids in the 14α - and 14β -series, 156.

Coumarin. Chemistry of β-polycarbonyl compounds. Part I, cyclisation to furan and coumarin derivatives, 2543.

Coumarones. Synthesis of some 2-benzoylcoumaran-3-ones and some related ω -(2-methoxycarbonylphenoxy)aceto-phenones, 2361.

Craven reaction. Chemistry of colour reactions, 974.

Crystallography. Colour isomerism and structure of copper co-ordination compounds. Part VIII, crystal structure of a second crystalline form of bis-salicylaldehydatocopper(π), 425. Crystallography (contd.):

Complexes of mercury. Part I, X-ray analysis of 1,6-di, thiacyclodeca-cis-3-, cis-8-dienebis(mercuric chloride) 5988.

Crystal and molecular structure of a trigonal form of phosphobenzene B, (PC₆H₅)₆, 4789.

Crystal and molecular structure of benzoyl(triphenyl-phosphoranylidene)methyl chloride, 5658.

Crystal and molecular structure of benzoyl(triphenyl-phosphoranylidene) methyl iodide, 5641.

Crystal and molecular structure of dihydriodo- π -cyclopentadienylmolybdenum, 296.

Crystal and molecular structure of dithio-oxamide (rubeanic acid), 396.

Crystal and molecular structure of octaphenylcyclooctatetraene, 3136.

Crystal structure of acetylacetone-mono(o-hydroxyanil)-copper(II), 1979.

Crystal structure of an overcrowded aromatic compound: 3-bromo-1,8-dimethylnaphthalene, 528.

Crystal structure of carbonatopenta-amminecobalt(III) bromide hydrate, 3194.

Crystal structure of black nitrosylpentamminecobalt dichloride, 1364.

Crystal structure of copper(II) ethyl acetoacetate, 3746. Crystal structure of dipotassium bis(trimethylenedinitramine)nickelate(II) tetrahydrate, 5801.

Crystal structure of gallium trichloride, 1816.

Crystal structure of nitrosylpentamminecobalt dichloride (black form), 1359.

Crystal structure of trimethyl-(8-quinolinolato)-platinum-(iv), 6899.

Crystal structure of the acid salts of some monobasic acids. Part IX, rubidium hydrogen bisglycollate, 2521. Part X, potassium, rubidium, and cæsium hydrogen di-trifluoroacetates, 2530.

Crystal structure of tris-(o-diphenylarsinophenyl)arsineruthenium dibromide, 7471.

Crystal structures of anhydrous nitrates and their complexes. Part I, α form of copper(π) nitrate, 2925.

Crystallographic data for 2,2-diphenyl-1-picrylhydrazyl, 7535.

Crystallographic data for the 2'-halogenobiphenyl-4-carboxylic acids and 4-acetyl-2'-halogenobiphenyls, 4208.

Fungal metabolites. Part III, structure of atrovenetin: X-ray analysis of atrovenetin orange trimethyl ether ferrichloride, 1097.

Intensity of ultraviolet light absorption by monocrystals. Part V, absorption by naphthacene at 295 and 78° k of plane-polarised light of wavelengths 1850—3200 Å, 2764.

Lattice types of some Na₂MF₆ complexes, 1559.

Molecular complexes. Part I, crystal and molecular structure of the 1:1 adduct of benzotrifuroxan and 13,14-dithiatricyclo[8,2,1,1^{1,4}]tetradeca-4,6,10,12-tetraene, 4839. Part II, crystal structure of the 1:1 complex of bis-8-hydroxyquinolinatopalladium(\(\pi\)) and chloranil, 4851. Part III, crystal and molecular structure of the 1:2 molecular compound of bis-8-hydroxyquinolinatocopper(\(\pi\)) and picryl azide, 4867. Part IV, observations on the structure of the 1:1 molecular compound of bis-8-hydroxyquinolinatocopper(\(\pi\)) and benzotrifuroxan, 4882.

Molecular conformations. Part I, bicyclo[3,3,1]nonane system: X-ray analysis of 1-p-bromobenzenesulphonyloxymethyl-5-methylbicyclo[3,3,1]nonan-9-ol, 1844.

Partial determination of the crystal structure of methyl 2-chloromercuri-2-deoxy-α-D-talopyranoside, 4025.

X-Ray determination of the molecular structure of a Wittig reagent: p-tolyl triphenylphosphoranylidenemethyl sulphone, 5785.

X-Ray diffractometric study of the ammonium nitratepotassium nitrate system, 2135.

X-Ray studies of molecular overcrowding. Part V, crystal and molecular structure of 2-chloro-4-nitroaniline, 227.

Sesquiterpenoids. Part II, stereochemistry of isophotosantonic lactone: X-ray analysis of 2-bromodihydroisophoto-α-santonic lactone acetate, 1584. Part III, stereochemistry of santonin: X-ray analysis of 2-bromo-α-santonin, 6041.

Crystallography (contd.):

Solid-phase reactions in silver fulminate, 1474.

Stereochemistry of arsenic. Part XVI, cacodylic acid, 4466.

Stereochemistry of β-diketo-complexes with trimethylplatinum(IV). Part IV, crystal structure of μ-ethylenediaminebis[trimethyl(acetylacetonato)platinum(IV)], 630.

Structure of caracurine-II: X-ray analysis of caracurine-II dimethiodide, 1663.

Structure of chimonanthine: X-ray analysis of chimonanthine dihydrobromide, 5678.

Structure of hunterburnine: X-ray analysis of hunterburnine β-methiodide, 6355.

Thermal decomposition of oxalates. Part IV, interrelation of crystalline phases in the thermal decomposition and dehydration of zinc oxalate, 2132.

Cyanamide, acid hydrolysis of 802.

1-Cyano-2,2-diethoxyethane, improved preparation: intermediate of cytosine, 1515.

Cyclic inorganic compounds. Part I, chlorine exchange reactions with chlorophosphonitriles, 1396. Part II, decabromopentaphosphonitrile, 5697.

Cycloalkenes, polyfluoro-. Part III, reactions with alcohols under ionic conditions to give ethers, 7358. Part IV, 1-bromononafluorocyclohexene and 1-bromo-2-methoxy-and 1-bromo-6-methoxy-octafluorocyclohexene, 7367. Part V, fluorination of alkoxy-polyfluorocyloalkenes by cobaltic fluoride, 7370.

Cyclobutane. Cyclobutadienes. Part I, addition of tetramethylcyclobutadiene to acetylenes and some preliminary experiments on tetraphenylcyclobutadiene, 194. Part II, palladium complexes from diphenylacetylene: reactions of tetraphenylcyclobutadiene, 1881. Part III, dimer of tetraphenylcyclobutadiene, 7052.

Cyclodiazoethane (3-methyldiazirine), photolysis of, 1700.

Cycloheptane. Deamination of the four epimeric 4-t-butyl-2-aminocyclohexanols and comments on the course of the deamination of cis-2-aminocyclohexanol and cis-2-aminocycloheptanol, 2513.

Cyclohexanes, fluoro-Part IX, lithium aluminium hydride reduction of 1H,2H,3H-heptafluorocyclohexene, a route to 1,2,3-trifluorobenzene, 3502. Part X, 1H,2H,4H,5H/-octafluorocyclohexane, 5491. Part XI, 1H,3H/2H-, 1H,2H/3H-, and 1H,2H,3H/-nonafluorocyclohexane, 5493.

Chemistry of hop constituents. Part XXVI, 2-acyl-4,4,6,6-tetra(3-methylbut-2-enyl)cyclohexane-1,3,5-triones (lupones), 6543.

addition to olefins. Synthetic aspects of free-radical addition. Part IV, 1939.

Conformation of hexamethylcyclohexane-1,3,5-trione, 1028. Cyclohexanone, Clemmensen reduction of. Part II, 5943.

Deamination of the four epimeric 4-t-butyl-2-aminocyclohexanols and comments on the course of the deamination of cis-2-aminocyclohexanol and cis-2-aminocycloheptanol, 2513.

1,1'-Diaminobicyclohexyl, and the stability of its metal complexes, 603.

2,3-Dimethylcyclohexanone and 2,3-dimethylcyclohexanol, 3022.

Electrophilic additions to alkenes. Part I, kinetics of the reaction of 2,4-dinitrobenzenesulphenyl bromide with cyclohexene in acetic acid solution, 5887.

Molecular polarisability. Conformational equilibria in 2-chloro- and 2-bromo-cyclohexanones, 3700.

Overcrowded polyalkylated cyclohexane-1,3,5-triols, their dehydration products, and bi- and tri-cyclic derivatives, 389.

Solute effects in the radiolysis of cyclohexane solutions. Effect of substituted aromatic compounds, 5402.

Synthetical studies relating to colchicine. Part III, route to 2-aryl-5-oxocyclohexane-β-propionic acids, 5189.

Two dimers of cyclohexanethione, 5953.

Cyclo-octanes. Crystal and molecular structure of octaphenylcyclo-octatetraene, 3136.

Heat of combustion of cyclo-octadecanonaene ([18]annulene), 216. Gyclopentanes, epoxy-, 4-substituted, conformation of, 5496. fluoro-. Part II, hexafluorocyclopentadiene, 808. Part III, isomeric 1H: 2H: 3H- and 1H: 2H: 4H-heptafluorocyclopentanes and the 1H: 2H: 3H: 4H-hexafluorocyclopentanes, 2382.

Acylcyclopentanetriones: comments on a recent synthesis, and observations from proton resonance on their enolisation and on isomerism in 5-methoxyhept-4-en-3-one, 2251.

Acylcylopentanones: synthesis of 3-acylcylopentane-1,2,4-triones; a correction, 2258.

Hexachlorocyclopentadiene. Part IV, Diels-Alder adducts of 5,5-di(hydroxyalkoxy)-1,2,3,4-tetrachlorocyclopenta-1,3-dienes and related compounds, 4605. Part V, reaction with 1,2-diols and a base at high temperatures, 4744.

Reactions of hexachlorocyclopentadiene. Part III, 2',3',4',5'-tetrachloro-1,3-dioxolan-2-spirocyclopenta-2',4'-dienes and their adducts, 2305.

Reactions of hexachlorocyclopentadiene with some etheralcohols, 7141.

Cyclopropanes, fluoroinated. Part III, reactions of methylene with mono-, 1,1-di-, and tri-fluoroethylene, 1141. Part IV, thermal isomerisation of 1,1-difluoro-, 1,1,2-trifluoro-, and 1,1,2,2-tetrafluorocyclopropane, 5710.

methyl substituted, maximum overlap hybridisation in, 5621.

Cyclopropanones and related compounds. Part I, adducts from reduction of di-(α-bromobenzyl)ketone in the presence of dipolarophiles, 2009.

1-Cyclopropyl-2-methylpropene, thermal isomerisation of, 345.

1,1-Diethylcyclopropane, thermal unimolecular isomerisation and decomposition of, 191.

Thermal unimolecular isomerisation of 1-isopropenyl-1-methylcyclopropane, 4289.

Cyclotriveratrylene, (10,15-dihydro-2,3,7,8,12,13-hexamethoxy-5H-tribenzo[a,d,g]cyclononene) and related compounds, 1685

Cycloveratril, structure of, 3864.

r

trans-Decalin, $1\beta,1'$ -epoxy- 10β -vinyl-, oxidation of, 5148. Decalin derivatives, isomerisation and dehydration of. Formation of 10-acetyl-trans- $\Delta^{1(2)}$ -octalin, 4975.

Dehydrocassamic acid, structure of, 403.

Diazaindenes ("Azaindoles"). Part III, synthetic approaches (preliminary results), 5874.

Diazirine, 3-t-butyl-, photolysis of, 3101.

3-methyl- (cyclodiazoethane), photolysis of, 1700.

Diazodiphenylmethane, kinetics of the reactions of, with some methylnaphthoic and acenaphthoic acids in ethanol or 2-n-butoxy-ethanol, 6310.

2-Diazoindane-1,3-dione from a novel cyclisation reaction of 2-cyano-ω-diazoacetophenone, 1428.

Diazaindolizines (Triazaindenes). Site of protonation, 2778.

Diazepines. Part III, some benzodiazepines, 3785.

Diazo-compounds, aliphatic, intermediates in the decomposition of. Part III, thermal decomposition of diphenyldiazomethane in acetonitrile, 2466.

Dibenzo[d,f]dioxepins, preparation of, and their use as synthetic intermediates, 1536.

Dicyclohexylcarbodi-imide: a new agent for carbohydrate epimerisation and isomerisation. Part I, psicose formation, 813.

Dihydrosterigmatocystin, nuclear magnetic resonance spectrum of: correction, 5784.

Di-isopropylcyanoacetic acid, ionisation functions of, in relation to hydration equilibria and the compensation law, 649.

Dimethyl sulphoxide, anhydrous hydrolysis in, 1290.

Dimroth rearrangement. Part IV, study of facilitation by electron-withdrawal. Alkylated 2-alkyliminopyrimidines, 5542. Part V, mechanism of the rearrangement of 1-alkyl-1,2-dihydro-2-iminopyrimidines in aqueous solution, 7071.

1,1-Dinitro-carbanion salts, infrared spectra of, 5838.

Dioxans. Molecular polarisability. Conformations of 2,3-diphenyl-1,4-dioxen and some 2,3-disubstituted 1,4-dioxans as solutes, 558.

1,3-Dioxolan, acid-catalysed hydrolysis of, 5769.

2-methyl-, the A_2B_2 proton resonance spectrum of, 256. 2-phenyl-, reaction of, with butyl-lithium, 6649.

Dipole moments and molar Kerr constants of twelve alkyl iodides. Molecular polarisability, 5349.

apparent, and polarisations of fourteen n-alkyl bromides between methyl and octadecyl in carbon tetrachloride, 4185.

electric, of nitrophenylpyridines. Physical properties and chemical constitution. Part XLII, 5311. Part XLIII, of azobenzene, azopyridines, and azoquinolines, 5316. Part XLIV, of dialkyl sulphides, disulphides, sulphoxides, and sulphones, 5323.

electric, of some aryl sulphides, sulphoxides, and sulphones. Physical properties and chemical consitution. Part XLV,

electrical, of some cyclic diketones. Physical properties and chemical constitution. Part XL. 2067.

Dipyrido[1,2-a:1',2'-d]pyrazidi-inium salts. Cyclic quater-

nary ammonium salts. Part II, 3885. Dipyrido[1,2-a: 2',1'-c]pyrazidi-inium salts, and their 6-alkyl and 6-aryl derivatives, synthesis of. Cyclic quaternary

ammonium salts. Part III, 5816. Dissociation constants, acid, of ligands. Complex formed by adrenaline and related compounds with transition-metal ions, 2391.

apparent, of various weak acids in mixed aqueous solvents, **4**582.

basic, of weak bases in sulphuric acid, conductometric determination of. Part II, basicities of monochloro-, dichloro-, and trichloro-acetic acid, 4300.

cyanohydrin, and ultraviolet spectrum of 4-t-butylthioacetophenone, 4599.

of 8-chloro-1-naphthoic acid and some derivatives, 5781. of some cobalt(II) ion-pairs from pH (glass electrode) measurements at 25°, 2456.

of some naphthylamines and acenaphthenamines and their dimethyl derivatives, 5948.

thermodynamic, of some cobalt(II) ion pairs determined at 25° by cation-exchange resin studies, 2452.

Acid-base properties of hydrogen peroxide-water mixtures, 3505.

1,3-Dithians, substituted, proton resonance spectra of. Conformational studies of six-membered heterocyclic compounds. Part I, 335.

Dithiols. Part XXII, isopropylidene derivatives and cyclic thiocarbonates from trans-dithiols and from trans-mercapto-alcohols, 1298.

Dithio-oxamide (rubeanic acid), crystal and molecular structure of, 396.

Dithiole series. Part II, reactions of 1,2- and 1,3-dithiolium salts with nucleophilic reagents, 32.

Dyes, and new intermediates. Part X, preparation and reactions of 2-n-alkylquinizarins, 626.

Ю

Electrochemistry. Electrodes, reversible, in tri-n-butyl phosphate solutions, 4209.

Ion-pair constants of some chloropentamminecobalt(III) salts from pH (glass electrode) and solubility measurements, 720.

Ion-pairs of cobalt(II), dissociation constants of, from pH (glass electrode) measurements at 25°, 2456.

Precise measurements with the glass electrode. Part IV, activity-coefficient of hydrochloric acid in mixtures with

calcium or manganese chloride at 25°, 4906. Solutions of electrolytes in liquid ammonia. Part I, transference numbers of potassium, sodium, lithium, and ammonium ions in nitrate solutions, 5730.

Studies in ion solvation in non-aqueous solvents and their aqueous mixtures. Part III, cell H2 HX AgX-Ag $(\hat{X} = Br \text{ or } I)$ in 20 and 45% mixtures of dioxan and water 25°, 4986.

Enols, and their anions, kinetics of the bromination of

Eperuic acid, stereochemistry of, 126.

Epoxides. Conformation of 4-substituted epoxycyclopentanes, 5496.

reactions, mechanism of. Part VII, reactions of 1,2-epoxybutane, 3,4-epoxybut-1-ene, 1,2-epoxy-3-chloropropane, and 1,2-epoxy-3-methoxypropane with chloride ion in water under neutral and acidic conditions, 644. Part VIII, effect of solvent variation on the reaction of benzylamine with 1,2-epoxyethylbenzene, 2569.

Mechanism of epoxide reactions. Part IX, reactions of 1,2epoxypropane and 3-chloro-1,2-epoxypropane with anions water under neutral conditions, 4780. Part X, reactions of (epoxyethyl)benzene with m-chloro-, 3,4-di-methyl-, and o-(hydroxymethyl)-benzylamine, 4784.

Equilibrium constants and extinction coefficients, evaluation of, for weak charge-transfer complexes, 2048.

Ergochrysin A, constitution of, and secalonic acid A, and secalonic acid B, chemistry of fungi, Part XLVII, 4144.

Ergoflavin, constitution of. Chemistry of fungi. Part XLVI, 4130.

Ergot, aliphatic amides from. Chemistry of fungi. Part XLIX, 4164.

Esters, acetylenic, reaction with cyanoacetic ester and pyridine, 4355.

aryl, photochemical decomposition of, 5162.

nitrophenyl, methanolysis of. Part II, kinetics of the methanolysis of 2,4-dinitrophenyl acetate, 6409.

Behaviour of methyl esters of monocarboxylic acids adsorbed from organic solutions by carbon blacks: higher members, 3348.

Carbonyl absorption in the infrared spectra of phenolic acetates, 3590.

Ethyl 6-[2-(4-ethoxycarbonylbutyl)-5-methoxyphenyl]-hexanoate, 3872.

Gallotannins. Part X, methanolysis of pyrocatechol monoesters, 6883.

Halogenolysis of methyl glycyrrhenate with lithium iodidedimethylformamide, 6655.

Hydrolysis of ethyl acetate in concentrated aqueous sulphuric acid, 3874.

Infrared spectra of pyrrolic esters, 5149.

Preparation of tetrahydrofurfuryl esters of certain monoand di-basic carboxylic acids, 7162.

Reaction of enol acetates with bis-(1,2-dimethylpropyl)borane, 3974.

Ethers, vinyl- and 1-chloroalkyl-, preparation of, 5225.

Dealkylation of alkyl aryl ethers and sulphides by diarylphosphide and -arsenide ions, 4120.

Ether-nitric acid systems, infrared spectra of. Hydrogen

bonding in gaseous mixtures. Part VI, 3085.
Kinetics of ionic polymerisation. Part XI, low-temperature polymerisation of isobutyl vinyl ether in n-hexanetoluene as solvent, 7405. Part XII, polymerisation of isobutyl vinyl ether at -40° in the solvent 50 : 50 n-hexanetoluene, 7412.

Metal ions and complexes in organic reactions. Part IV, copper-promoted preparations of diaryl ethers and competing hydrogen-transfer processes, 4953.

Preparation of 1-O-alk-1'-enyl ethers of glycerol, 2968.

Synthesis of some divinyl ethers, 1560.

Thermodynamic properties of organic oxygen compounds. Part XV, purification and vapour pressures of some ketones and ethers, 3697.

Europium, solutions of, in ammonia: solvated electrons. Unstable intermediates. Part XXXI, 3763.

Extinction coefficients and equilibrium constants, evaluation of, for weak charge-transfer complexes, 2048.

Extractives from East African timbers. Part I, 3495.

from Ebenaceae. Part I, naphthalene derivatives from Macassar Ebony (Diospyros celebica Bakh), 2355. Part II, naphthaldehydes from Diospyros ebenum Koen, 4292.

from hardwoods, chemistry of. Part XXXVII, synthesis of furoguaiacin ethers, 1572.

from woods. Part VII, extractives from Cephalosphaera usambarensis Warb, 1692.

(+)-Fisetinidol from Afzelia xylocarpa. 828.

Flavanone and its 5,6-benzo-derivative, some reactions of. 4-Pyrones. Part V, 494.

Flavesone, isolation and structure of, 3690.

Flavones from Lindera lucida, syntheses of, 2743.

Isolation of mikanin, epifriedelinol, and fumaric acid; the structure of mikanin. Constituents of Mikania cordata (Burm. f.) B. L. Robinson (compositae), 6371.

Fluoranthenes, monophenyl-, 5760.

Fluorenes. Alkylation-bromination of fluoreneamines with alkyl and aralkyl bromides in dimethyl sulphoxide, 4588. series, kinetic studies of. Part III, reaction of 2-substituted fluorenones with sodium borohydride, 4049.

Fluorene-1,2-quinone 2-acetamide, improved synthesis of, 5115.

Kinetic studies of the fluorene series. Part IV, acid-catalysed solvolysis of 4-substituted 9-diazofluorenes, 4221. Part V, reaction of 4-substituted fluorenones with sodium borohydride, 5518.

Fluorine nuclear magnetic resonance spectra of some per-

fluoroalkylhalogenophosphines, 777.

-phosphorus chemistry. Part XVI, chemistry of alkyland aryl-dialkylaminofluoro-phosphoranes and -phos-

phines, 5630.

Aromatic polyfluoro-compounds. Part XX, nucleophilic reactions of pentafluoronitrobenzene, 1045. Part XXI. reactions of the pentafluorobenzenediazonium ion, 2088. Part XXII, trans-metallation reactions of bispentafluorophenylmercury, 2094. Part XXIII, polyfluoro-azo-, azoxy-, and -hydrazo-benzenes, 2621. Part XXIV, replacement reactions of perchloro-m-xylene, 2658. Part XXV, nucleophilic replacement reactions of penta-fluorotoluene, -anisole, and -phenol, 5152. Part XXVI, nucleophilic replacement reactions of the tetrafluorobenzenes, 6326. Part XXVII, reactions of pentafluoroaniline, -N-methylaniline, and -NN-dimethylaniline with nucleophiles, 6329.

Aromatic polyfluoro-compounds. Part XXIX, nucleophilic replacement reactions of pentafluorobenzoic acids,

Electron impact studies of some aromatic fluorocarbons, 1520. Electronic structures of difluorocarbene and the difluoroamino-radical, 5406.

Estimation of the effective electronegativities of some fluoro-

alkyl groups, 1392.

Fluorinated cyclopropanes. Part III, reactions of methylene with mono-, 1,1-di-, and tri-fluoroethylene, 1141. Part IV, thermal isomerisation of 1,1-difluoro-, 1,1,2-trifluoro-, and 1,1,2,2-tetrafluoro-cyclopropane, 5710.

Fluorocyclohexanes. Part IX, lithium aluminium hydride reduction of 1H,2H,3H-heptafluorocyclohexene, a route to 1,2,3-trifluorobenzene, 3502. Part X, 1H,2H,4H,5H-octafluorocyclohexane, 5491. Part XI, 1H,3H/2H-, 1H,2H,3H/-nonafluorocyclohexane, 1H,2H/3H-, \mathbf{and} 5493.

Fluorocyclopentanes. Part II, hexafluorocyclopentadiene, 808. Part III, isomeric 1H:2H:3H- and 1H:2H:4Hheptafluorocyclopentanes and the 1H:2H:3H:4H-

hexafluorocyclopentanes, 2382.

Heterocyclic polyfluoro-compounds. Part IV, nucleophilic substitution in pentafluoropyridine: preparation and properties of some 4-substituted 2,3,5,6-tetrafluoropyridines, 575. Part V, high-resolution nuclear magnetic resonance spectra of pentafluoropyridine and its derivatives, 582. Part VI, preparation of pentafluoropyridine and chlorofluoropyridines from pentachloropyridine, 594. Part VII, direct vapour-phase fluorination of 2-fluoro-pyridine, 815. Part VIII, perfluoro-(2-, 3-, and 4methylpyridine) and tetrafluoroisonicotinic acid, 2720. Part IX, some reactions of perfluoro-(N-fluoromorpholine): preparation of perfluoro-5,6-dihydro-2H-1,4-oxazine and perfluoro-(3-methyloxazolidine), 6077.

Kinetics of nucleophilic substitution in polyfluoro-aromatic compounds. Part I, reaction of sodium methoxide with

some pentafluorophenyl-compounds, 6375.

Pentafluorophenyl derivatives, high-resolution fluorine magnetic resonance spectra of, 1117.

Fluorine (contd.):

Perfluoroalkyl derivatives of nitrogen. Part XII, reversible photochemical dimerisation of trifluoronitrosomethane and rearrangement of the O-nitroso-dimer to bistrifluoromethylamine, 1675. Part XIII, tristrifluoromethylhydroxylamine, 1681. Part XIV, 1,1,1-trifluoroazo-methane, 2266. Part XV, reaction of trifluoronitrosomethane with trifluoroethylene, vinylidene fluoride, vinyl fluoride, and ethylene, 2506. Part XVI reaction of trifluoronitrosomethane with butadiene and with isobutene, 4714. Part XVII, the reaction of N-bromobistrifluoromethylamine with olefins, 6141. Part XVIII, reaction of trifluoronitrosomethane with perfluorobutadiene and 3,4-dichlorohexafluorobut-1-ene, 6149. Part XIX, synthesis, pyrolysis, and nuclear magnetic resonance evidence for restricted inversion at the nitrogen atom of trisheptafluoro-n-propylhydroxylamine, 7202. Part XX, thermal decomposition of trifluoronitrosomethane, 7209.

Polyfluoroarenes. Part VII, photochemical reactions of trichlorosilane and trimethylsilane with hexafluoro-

benzene, 6702.

Polyfluoroaryl organometallic compounds. Part II, pentafluorophenylboron halides and some derived compounds, 3933. Part III, potassium pentafluorophenyltrifluoroborate, 5144.

Polyfluorocycloalkenes. Part III, reactions with alcohols under ionic conditions to give ethers, 7358. Part IV, 1-bromononafluorocyclohexene and 1-bromo-2-methoxyand 1-bromo-6-methoxy-octafluorocyclohexene, 7367. Part V, fluorination of alkoxy-polyfluorocycloalkenes by cobaltic fluoride, 7370.

Polyfluoroheterocyclic compounds. Part IV, compounds derived from 4-aminotetrafluoropyridine, 5040. Part V, catalytic reduction of perfluoro- and chlorofluororopyridines and the preparation of polyfluoropyridinecarboxylic acids, 5045.

Polyhalogeno-allenes. Part I, tetrafluoroallene, its dimer, and the reaction of the dimer with trifluoronitrosomethane, 978. Part II, reaction of tetrafluoroallene and trifluoronitrosomethane, 5602.

Preparation of polyfluoroaromatic compounds by the reaction of perhalogenoaromatic compounds with potassium fluoride in Sulpholan, 6264.

Resolution of 1 trifluoromethylethanol, 4280.

Silicon tetrafluoride as a fluorinating agent. Part II,

Transition-metal fluorocarbon complexes. Part VII, some complexes of cobalt and rhodium with tetrafluoroethylene, chlorotrifluoroethylene, and hexafluorobut-2-yne, 6629.

Friedel-Crafts acylation of anthracene, catalysis in, by iodine and iodine monochloride, and co-catalysis by hydrogen iodide, 5744.

reactions, co-catalysis in. Part VII, formation of ultraviolet chromophores, 310. Part VIII, visible chromophores, 1761.

reactions (i) with αα-dialkylglutaric anhydrides, (ii) involving cyclisation with elimination. Elimination of carbon monoxide from acid derivatives. Part II, 4566. sulphonylation with biphenyl-4,4'-disulphonyl chloride, 4204.

syntheses, structure and reaction of phthalanthranilic acid, 2165.

Fulminate, silver-, solid-phase reactions in, 1474.

Fulminate ion, structure of, 1513.

Fungal detoxication. Part VII, metabolism of 2,4-dichlorophenoxyacetic and 4-chloro-2-methylphenoxyacetic acids

by Aspergillus niger, 1187.

Fungal metabolites. Part III, structure of atrovenetin: X-ray analysis of atrovenetin orange trimethyl ether ferrichloride, 1097.

Fungi, chemistry of. Part II, constituents of three Endothia species, 2290

chemistry of. Part XLV, synthesis of sclerotinol, 4127. Part XLVI, constitution of ergoflavin, 4130. Part XLVII, constitution of ergochrysin A, secalonic acid A, and secalonic acid B, 4144. Part XLVIII, derivatives of 2,2',4,4'-tetrahydroxybiphenyl, 4156. Part XLIX, aliphatic amides from ergot, 4164. Part L, rosenonolactone, Fungi (contd.):

7246. Part LI, absolute configuration of C-13 in rosenonoand rosolo-lactone: rosololactone, 7257. Part LII, (—)-sclerotiorin, 7260.

of the order Sphæropsidales, pigments from two, 6642.

Furan chemistry, studies in. Part I, infrared spectra of 2,5 disubstituted furans, 6057.

Chemistry of β-polycarbonyl compounds. Part I, cyclisation to furan and coumarin derivatives, 2543.

Furano-compounds. Part III, synthesis of 5'-methyland 5',6'-dimethyl-furano(3',2': 4,3)xanthones, 1522.

Furoguaiacin ethers, synthesis of. Chemistry of extractives from hardwoods. Part XXXVII, 1572.

G

Gallium and aluminium trihalides, infrared spectra of addition compounds of, 5850.

and indium, tervalent, octahedral ditertiary arsine complexes of, 4199.

hydride adducts of trimethylphosphine and triphenylphosphine, 1400.

trichloride, crystal structure of, 1816.

trimethyl. Part V, reactions of trimethyl-aluminium, -gallium, and -indium with some primary and secondary phosphines and arsines, 3241. Part VI, infrared spectra and phase transitions of the dimethylamino-derivatives of dimethyl-aluminium, -gallium, and -indium, 3248.

Halogen derivatives of co-ordinated gallium hydride, 3426.

Nuclear magnetic resonance studies with gallium-71 isotope,

Some aryl-aluminium and -gallium compounds, 1038.

Gallotannins. Part IX, biosynthesis of gallic acid in Rhus typhina, 3008. Part X, methanolysis of pyrocatechol monoesters, 6883. Part XI, synthesis of m-digallic and m-trigallic acids and their derivatives, 6888. Part XII, phenolic constituents of Arctostaphylos uva-ursi L. Spreng, $\bar{7}312.$

Germanium. Diphenylphosphino-organogermanes, 4283.

Preparation of some mixed hexa-alkyldigermanes and the elucidation of their isomer ratios. Chromatography of gases and vapours. Part IX, 1197.

Trigermane, reaction of, with iodine, 5121.

Gas constant and the Ideal Gram Molecular Volume of gases,

Gibberella fujikuroi, new metabolites of. Part VII, preparation of some ring-в nor-derivatives, 1565. Part VIII,

gibberellin A_{12} , 1570. Part IX, gibberellin A_{13} , 3143. Gibberellic acid. Part XXVII, some functional derivatives and transformation products of gibberellic acid, 1605. Part XXVIII, some derivatives of gibberellins A4 and A_7 , 3539. Part XXIX, some transformation of gibberellin A_9 , 3550. Part XXX, preparation of 7-deoxygibberellins from gibberellic acid, 3555. Part XXXI, nuclear magnetic resonance spectra of some gibberellin derivatives,

synthesis of compounds related to. Part II, (±)-gibberic acid, 990.

Gibberellins. New metabolites of Gibberella fujikuroi. Part VII, preparation of some ring-B nor-derivatives, 1565. Part VIII, gibberellin A_{12} , 1570.

Glauconic and glaucanic acids. Nonadrides. Part II, constitutions of. 1772. Part III, absolute configuration of, 1779.

Glyceride studies. Part II, component glycerides of seed oils containing saturated, oleic, and linoleic acids, 319.

Glycerides, synthesis of, use of trifluoroacetic anhydride, 4594.

Glycerol 1,2-carbonate, 1553.

Gold. Metathetical reactions of (tertiary phosphine) monohalogenogold(I): synthesis and properties of (triphenylphosphine sulphide)monochlorogold(1), 5751.

Grignard reagents, action of, on heterocyclic compounds. Part VI, Action of Grignard reagents on N-arylmaleimides and allied compounds, 2040.

Griseofulvin, analogue of, synthesis of, 6960. Griseofulvin analogues, synthesis of, 4939.

Guanidine derivatives, synthesis of, 856.

diamino-, addition products with carbodi-imides, and their cyclisation. Heterocyclic compounds from urea derivatives, 3912.

NN'-di(isopropylideneamino)-addition products with isothiocyanate esters, and their cyclisation. Heterocyclic compounds from urea derivatives. Part VIII, 4448.

Combretum leonense gum. Part I, partial hydrolysis of the gum, 2685. Part II, hydrolysis products from the methylated gum and the methylated arabinose-free degraded gum, 2693.

Gum Arabic, carboxyl-reduced, further oligosaccharides from, 3003.

Gum Ghatti (Indian gum). Part IV, acidic oligosaccharides from the gum, 2673. Part V, degradation of the periodate-oxidised gum, 2677. Plant gums of the genus Khaya. Part III, minor com-

ponent of Khaya senegalensis Gum, 2701.

Plant gums of the genus, Sterculia. Part I, main structural features of Sterculia urens gum, 2710. Part II, Sterculia caudata gum. 4318. Part III. Sterculia setigera and Cochlospermum gossypium gums, 4325.

Hæmoglobins, reactivity differences between. Part V, further studies on the ionisation of methæmoglobins, 3271. Halogens. Actions of halogens on phosphine-substituted Group VI metal carbonyls. Part I, action of halogens on diphosphine-molybdenum and -tungsten carbonyls,

5486. Part II, novel synthesis of some phosphine oxide

complexes, 6027.

Factors in the formation of isomerically and optical pure alkyl halides. Part IV, three dealkylation steps in phosphorus trihalide (Cl, Br, I)-alcohol systems, 2364.

Derivatives of co-ordinated gallium hydride, 3426.

Halogenation of naphthalene-2,7-diol, 3304. Kinetics and mechanisms of aromatic halogen substitution. Part XXI, Arrhenius parameters for the chlorination of biphenyl and some related compounds, 5739. Part XXII, chlorination of 4,5,9,10-tetrahydropyrene, of some di-

phenylalkanes, and of some related compounds, 6893. Kinetics of the reactions between the methyl halides and

potassium cyanide in aqueous solution, 7119.

Molecular polarisability. Study of internal rotation in the benzyl halides and related molecules from measurements of molar Kerr constants and dipole moments, 3619.

Polyhalogeno-allenes. Part I, tetrafluoroallene, its dimer, and the reaction of the dimer with trifluoronitrosomethane, 978. Part II, reaction of tetrafluoroallene and trifluoronitrosomethane, 5602.

Preparation of 1-bromo-1-fluoroethane and 1-bromo-

1,1-difluoroethane, 6661.

Pseudohalides. Part II, preparation, characterisation, and reactions of 3-co-ordinate mononuclear iso- and isothio-cyanatoboranes, 4256.

Reactions of polyfluoroaryl bromides with cuprous salts in dimethylformamide, 3372.

Some observations relating to substituent effects in halogenation. Part I, 2194.

Spectroscopic studies. Part VI, infrared and Raman spectra of 1,1-dichloro-2-fluoroethylene, 2-bromo-1,1-dichloroethylene, and bromotrichloroethylene, 7481.

Heterocycles, determination of Hammett σ-constants for. Applications of proton resonance spectroscopy to structural problems, 6707.

Action of Grignard reagents on heterocyclic compounds. Part VI, action of Grignard reagents on N-arylmaleimides

and allied compounds, 2040.

Addition reactions of heterocyclic compounds. Part XXI, nuclear magnetic resonance spectra of some quinolizines and their salts, and new adducts from alkylpyridines, 948. Part XXII, nuclear magnetic resonance spectra and structures, 2630. Part XXIII, formation of Kashimoto's compound from 1,2,3,4-tetramethoxycarbonylquinolizinium perchlorate and related reactions, 2633. Part XXIV, adducts from thiazoles, benzoxazoles, and 2methylbenzoselenazole with dimethyl acetylenedicarboxylate, 3200.

Heterocycles (contd.):

Anti-microbial compounds in the heterocyclic series. Part IV, non-photosensitising basic ethers in the benzothiazole series, 954.

Bond angles in nitrogen-containing heterocyclic molecules isoelectronic with benzene, 6592.

Carcinogenic nitrogen compounds. Part XLIV, naphtho-and phenanthro-carbazoles, 2642. Part XLV, thiophen analogues of carcinogenic benzacridines and dibenzacridines, 2646. Part XLVI, nitration of 2- and 3-acetamidophenanthrene, 4585. Part XLVII, γ -carbolines and 2,10-diaza-anthracenes isosteric with benzocarbazoles and benzacridines, 5458. Part XLVIII, benzo[b]carbazoles, carbazolocarbazoles, and carbazoloacridines from carbazole, 5464.

Conformational studies of six-membered heterocyclic compounds. Part I, proton resonance spectra of some

substituted 1,3-dithians, 335.

Conjugation in unsaturated systems containing hetero-atoms. Part II, refined treatment of isoxazole, the phenylisoxazoles, and benzisoxazoles, 3109.

4,10-Diazapyrenes, 3379.

Heterocyclic chemistry. Part II, nuclear magnetic reson-

ance studies of purines and pteridines, 623.

Heterocyclic compounds from urea derivatives. Part VI, synthesis and cyclisation of 1-amino-3-(NN'-diarylamidino)guanidines and some analogues, 932. Part VII, addition products of diaminoguanidine and carbodi-imides, and their cyclisation, 3912. Part VIII, addition products of NN'-di(isopropylideneamino)guanidine and isothiocyanate esters, and their cyclisation, 4448.

Heterocyclic compounds with bridgehead nitrogen atoms. Part II, condensation of diethyl β-oxoglutarate with electrophilic ethoxymethylene compounds;

of a 6-hydroxyquinolizin-4-one, 1629.

Heterocyclic polyfluoro-compounds. Part IV, nucleophilic substitution in pentafluoropyridine: preparation and properties of some 4-substituted 2,3,5,6-tetra-fluoropyridines, 575. Part V, high-resolution nuclear magnetic resonance spectra of pentafluoropyridine and its derivatives, 582. Part VI, preparation of pentafluoropyridine and chlorofluoropyridines from pentachloropyridine, 594. Part VII, direct vapourphase fluorination of 2-fluoropyridine, 815. Part VIII, perfluoro-(2-, 3-, and 4-methylpyridine) and tetrafluoro-isonicotinic acid, 2720. Part IX, reactions of perfluoro-(N-fluoromorpholine): preparation of perfluoro-5,6-dihydro-2H-1,4-oxazine and perfluoro-(3-methyloxazolidine), 6077.

Heterocyclic rearrangements. Part I, mechanism of a

ring expansion, 4226.

Heterocyclic rearrangements. Part IV, furoxano- and furazano-benzofuroxan, 5958.

Infrared absorption of substituents in heterocyclic systems. Part IX, amine-imine tautomerism by infrared spectroscopy, 5230.

Kinetics and mechanism of heteroaromatic nitration. Part II, pyrazole and imidazole, 1051.

One-step synthesis of 10-oxo-1,5-diazabicyclo[4,4,0]dec-

5-ene, 3487.

Oxygen heterocycles. Part XI, condensation of phenols with homophthalic acids and anhydrides, 6100. Part XII, synthesis of new polycyclic furans by means of 2,3-dichloro-1,4-naphthaquinone, 6105.

Polyfluoroheterocyclic compounds. Part IV, compounds derived from 4-aminotetrafluoropyridine, 5040. Part V, catalytic reduction of perfluoro- and chlorofluoro-pyridines and the preparation of polyfluoropyridinecarboxylic

acids, 5045.

Stability of N-heterocyclic oxime derivatives. Part I, decomposition of N-methylpyridinium 3- and 4-Oacetylaldoxime iodides in aqueous solution, 3729. Part II, decomposition of N-methylacetylpyridinium O-acetylketoxime iodides in aqueous solution, 3734.

Studies of heterocyclic compounds. Part I, synthesis of 6-substituted pyrrolo[2,1-b]thiazoles, 65. Part II, reaction of thioamides with γ-bromo-αβ-unsaturated

carbonyl compounds, 4271.

Heterocycles (contd.):

N-Substituted heterocyclic cations. Part V, use of proton magnetic resonance spectroscopy in the solution of some classical structural problems, 1372.

Synthesis of heterocyclic alkenes by the Horner reaction,

Syntheses of heterocyclic compounds. Part IX, action of manganese dioxide on heterocycles, 875. Part X, halogen-substituted N-oxides, 2096.

Vibrational frequency correlations in heterocyclic molecules. Part VIII, infrared spectra of virus inhibitors related to

benzimidazole, 2331.

Homopterocarpin, demethyl-, synthesis of, 1034.

Hop constituents, chemistry of. Part XXIII, structure of humulinic acid C and other acid-transformation products of humulinic acids, 1276. Part XXIV, structure of the isohumulinones, 1283.

chemistry of. Part XXVI, 2-acyl-4,4,6,6-tetra(3-methylbut-2-envl)cyclohexane-1,3,5-triones (Lupones), 6542. Part XXVII, further model compounds of hulupone

and humulinic acid, 6543.

Hopeaphenol, an extractive of the heartwood of Hopea odorata and Balanocarpus heimii, 406.

Humulinic acid and hulupone, further model compounds of. Chemistry of hop constituents. Part XXVII, 6543.

C, structure of, and other acid-transformation products of humulinic acids. Chemistry of hop constituents. Part XXIII, 1276.

Hydrazines. Derivatives of sulphanilohydrazide, 1132.

Hydrazones. Part VI, hydrazidic halide—acylhydrazide transformation, 2999.

Kinetics of the addition of tetrafluorohydrazine to polycyclic aromatic hydrocarbons, 6602.

Preparation of sulphinylhydrazines and their conversion into carboxylic acids and carboxylic acid derivatives,5386. Studies on the possible interconversion of phenylhydrazones and phenylazoalkanes. Part I, 2788. Part II, 3528.

Synthesis of alkoxy-1,2,3,4-tetrahydronaphthalene derivatives. Part II, 2-carboxyhydrazides, 3006.

Hydrocarbons, branched-chain, synthesis and reactions of. Part XVII, N-chlorosulphonamides as chlorinating agents, 3228. Part XVIII, chlorination of 2,2,4-trimethylpentane,

Hydrogen bonding in gaseous mixtures. Part I, infrared spectra of ether-hydrogen chloride systems, 497. Part II, infrared spectra of ether-hydrogen fluoride systems, 503. Part III, infrared spectra of complexes formed by hydrogen fluoride with carbonyl and other compounds, 510. Part IV, infrared intensities. Effect of deuterium substitution, 514. Part V, infrared spectra of amine-alcohol systems, 3080. Part VI, infrared spectra of ether-nitric-acid systems, 3085.

Hydrogenation of alkadienes. Part I, hydrogenation of buta-1,3-diene catalysed by the noble Group VIII metals, 3218. Hydrolysis, acid, of methyl 2,3-anhydro-D-hexopyranosides, 201. Hydroxylamine, reaction with cytosine and related compounds.

Nucleotides. Part XLVIII, 208. -sulphur dioxide reaction. Part I, 1747. Part II, 5233. Hydroxylamines, O-acyl N-substituted, studies on, 6608.

Hypotaurine, preparation and characterisation of, 826.

Ideal Gram Molecular Volume and gas constant of gases, 829. Imidazoles, purines, and pyrimidines. Part XXI, uracils and isocytosines, 1642. Part XXII, some 5-(alkylthio)uracils and derived sulphoxides and sulphones, 3987. Part XXIII, use of 5-phospho-β-D-ribosyl azide in a direct synthesis of nucleotides, 6864.

2-Amino-2-imidazolines and 2-amino-2-oxazolines. Part II, 474.

Attempted ring-closures of 2-(2-bromoethylthio)-2-imidazoline and the propyl homologue, 3457.

and pyrazole. Kinetics and mechanism of heteroaromatic nitration. Part II, 1051.

Imidazolic compounds from the reaction of pyruvaldehyde with ammonia, 3751.

1-Thiocarbamoylimidazolidine-2-thione, 1521.

Indazoles, 3-alkyl-l-aryl-, synthesis of. Reactions of lead tetra-acetate. Part III, 5177.

1-aryl, synthesis of. Reactions of lead tetra-acetate. Part II, 3048.

Indene, interaction with diphenylketen, 5473.

Indium and gallium, tervalent, octahedral ditertiary arsine complexes of, 4199.

Indoles, 3-amino-, autoxidation of, 3490.

mechanism of reaction with phthalaldehydic acid. Intramolecular catalysis in aldehydic reactions, 680.

structures of. Addition reactions of heterocyclic compounds. Part XXII, nuclear magnetic resonance spectra, 2630.

Chemistry of the aminochromes. Part VII, preparation of 6-hydroxyindole derivatives by the alkaline degradation of aminochrome semicarbazones, 3902.

Reaction of indole with free benzyl radicals, 4253.

Studies in the indole series. Part I, indolylalkylamines, 7165. Part II, indolylalkylhydroxylamines, 7179. Part III, Japp-Klingemann reaction, 7185.

Synthesis and properties of 2-p-dimethylaminophenyl-1,3,3-trimethyl-3H-indolium salts, 5819.

Indolizines. Part III, 2948.

Iodine. Allenes. Part VII, synthesis of iodoallenes and iodoacetylenes, 4348.

Catalysis by iodine and iodine monochloride and cocatalysis by hydrogen iodide, in the Friedel-Crafts acylation of anthracene. 5744.

ation of anthracene, 5744.
2-Iodoethoxycarbonyl chloride. New amine-protecting group of possible value in peptide synthesis, 7136.

Molecular polarisability. Molar Kerr constants and dipole moments of twelve alkyl iodides, 5349. Internal rotation in n-alkyl bromides and iodides, 5353.

Preparation and reactions of 2,2'-di-iodoazobenzene, 6972. Ion-association, thermodynamics of Part XII, EGTA complexes with divalent metal ions, 7353.

Association constants from contact charge-transfer spectra, 7534.

Ion-pairs of cobalt(II), dissociation constants of, from pH (glass electrode) measurements at 25°, 2456.

(glass of cobalt(π), thermodynamic dissociation constants of, determined at 25° by cation-exchange resin studies, 2452.

Ion-pair constants of some chloropentamminecobalt(III) salts from pH (glass electrode) and solubility measurements, 720.

Self-association and hydration of phenol in carbon tetrachloride, 1.

Vapour-phase hetero-association of trifluoroacetic acid with acetic acid, water, and dioxan, 2378.

Ion-exchange. Cation-exchange resins in aqueous monoethanolamine, swelling and exchange equilibria of, 325. Distribution of water in cation-exchange resins, 4330.

Thermodynamic dissociation constants of some cobalt(π) ion-pairs determined at 25° by cation-exchange resin studies, 2452.

Zeolite studies. Part V, dehydration behaviour of Na-P zeolites and some ion-exchanged derivatives, 4028.

Ionisation constant of thiocyanic acid, 4813.

constants, acid, comparison of p-t-butylphenol, o-t-butylphenol, and 2,4-di-t-butylphenol in water and methanol, 4603.

constants and ultraviolet spectra of acridine. Acridine syntheses and reactions. Part VI, new dehalogenation of 9-chloroacridine and its derivatives, 4653.

constants of heterocyclic substances. Part VII, cinnolines, 2260.

constants of the synthetic intermediates of aucubin, 3339. effect of co-ordination on. Part III, pyridine-2,6-diald-oxime and its iron(π) complex, 1149.

functions of di-isopropylcyanoacetic acid in relation to hydration equilibria and the compensation law, 649.

of methæmoglobins, further studies on Reactivity differences between hæmoglobins. Part V, 3271.

of phenols in concentrated methanolic sodium methoxide solutions. Acidity functions in strongly basic media. Part I, 676.

potentials and configurations of carbon dioxide, carbon oxysulphide, carbon disulphide, and nitrous oxide. Molecular photoelectron spectroscopy. Part IV, 6350.

Ionisation (contd.):

potentials of oxygen, carbon monoxide, nitric oxide, and acetylene. Molecular photoelectron spectroscopy. Part III, 616.

Acid-base function in non-aqueous solution. Part III, effect of chain length and freedom of ring rotation on the acid-base properties of some nitrogen bases in chlorobenzene, 6984.

Prediction of the strengths of some organic bases, 5590.

Protonation equilibria of amides in acetic acid solutions, 4399.

Iridium-triphenylphosphine compounds, 6974.

Far-infrared spectra of some halogeno-iridium(III) complexes; trans-effects in iridium(III) complexes, 6789.

Hydrido-complexes of iridium(III) stabilised by tertiary phosphines and arsines, 7391.

Metal-metal bonds. Part IV, formation of iridiummercury bonds by oxidation with mercury halides, 5337.

Transition-metal-carbon bonds. Part V, hydrido-cycloocta-1,5-diene complexes of iridium(III), 4997.

Iron pentacarbonyl, reaction of, with N-halogenobistrifluoromethylamines, 5774.

Adducts of iron(III) nitrate with oxides of nitrogen, 4978.

Alkylammonium and cæsium tetranitratoferrates, 5146. Electrical and optical properties of crocidolite and some

other iron compounds, 6368.

Electronic spectra and magnetic properties of some isothiocyanate complexes of manganese and iron, 268.

Ferrocene analogue of Malachite Green, 5759. Ferrocene derivatives. Part XIV, polyarylcyclopenta-

dienyliron compounds, 4312.
Iron(II) complex of pyridine-2,6-dialdoxime. Effect of

co-ordination on ionisation. Part III, 1149. Kinetics of reactions of ligand-substituted tris-(2,2-bi-

pyridyl)iron(II) complexes, 6061. Mössbauer spectrum of the tetrachloroferrate(II) ion, 6989. Preparation and electronic spectra of some tetrahedral

complexes of iron(II), 454. Substituent effects on alkali fission of ferroins, 4697.

Thermal decomposition of basic ferric salts of benzoic

acid and of phthalic acid, 4235. Vapour-phase reaction of iron pentacarbonyl with nitrogen

dioxide; iron(III) oxide nitrate, 4490.

Isatin, condensation with propionic anhydride, 1455.

4,5,6,7-tetrahydro-, and related compounds. Part II, tetrahydroisatins from 2-oxocyclohexylglyoxylic acid lactones, 1648.

Isatogens. Part II, 2,2'-pyridylisatogen, 1706.

Isodrin in the Diels-Alder reaction, 4646.

Isohumulinones, structure of. Chemistry of hop constituents.
Part XXIV, 1283.

Isoquinoline, 1-benzyl-, derivatives of, synthesis and oxidation, 3645.

Isothiazoles. Part V, some isothiazole analogues of histidine, histamine, and amphetamine, 3834. Part VI, phenylisothiazoles, 3842. Part VII, quaternary isothiazoles, 4577. Part VIII, reactions of 3-bromomethylisothiazoles, 7275. Part IX, isothiazolopyrimidines, 7277. Part X, sulphonic acid derivatives, 7283.

Isoxazoles. Conjugation in unsaturated systems containing hetero-atoms. Part II, refined treatment of isoxazole, the phenylisoxazoles, and the benzisoxazoles, 3109.

Structure of 3-alkyl-4-arylazoisoxazol-5-ones and related compounds, 3312.

Two explosive compounds; the potassium salt of 4,6-dinitrobenzofuroxan and 3,4-dimethyl-4-(3,4-dimethyl-5-isoxazolylazo)isoxalin-5-one, 5414.

J

Janovsky reaction, 4615.

K

Kashimoto's compound, formation from 1,2,3,4-tetramethoxy-carbonylquinolizinium perchlorate and related reactions. Addition reactions of heterocyclic compounds. Part XXIII, 2633.

Ketals, cyclohexylidene, of inositols. Cyclitols. Part XX, | Kinetics (contd.): 6662.

Aspects of stereochemistry. Part XIX, isopropylidene derivatives of some polyhydric alcohols. Observation on the hydrolytic behaviour and migration of cyclic ketals, 3382. Part XXI, absolute configuration of benzylidene derivatives of some acyclic polyhydric alcohols,

Keten. Part I, reaction of pyridine with keten, 3332. Part II, reaction of dimethylketen with acridine, 5877.

diphenyl-, addition to benzoquinone N-phenylimine, 3016. diphenyl-, interaction with indene, 5473.

Acylation. Part XVI, spontaneous and catalysed hydrolysis of diketen, 3778.

Ketones, aromatic, Schmidt reaction of, 4806.

α-halogenated, reaction with triphenylphosphine. Nucleophilic reactivity. Part VI, 1379.

reactions of, with oxidising agents. Part II, acetoxylation of 11- and 20-oxo-steroids with lead tetra-acetate in the presence of boron trifluoride, 6.

Bromination of di-isopropyl ketone in alkaline solution, 430. Chemistry of β-polycarbonyl compounds. Part I, cyclisation to furan and coumarin derivatives, 2543.

Condensation of diketones with aromatic compounds. Part III, further reactions of α-diketones, 3040.

Double pinacol-type rearrangement leading to a 1,4-diketone, 5123.

Hydrolysis of acetone 2-phenylsemicarbazone, 7444.

Occurrence of 1,2- or 1,4-addition in the reduction of some αβ-unsaturated ketones with metal hydrides, 5280.

Pent-4-en-2-yn-1-ones, substituted, \mathbf{and} capillin related compounds, preparation of, 2983.

Thermodynamic properties of organic oxygen compounds. Part XV, purification and vapour pressures of some ketones and ethers, 3697.

Kinetics and mechanism, and preparation and properties of chloropentakis(alkylamine)chromium(III) 6834.

and mechanisms of aromatic halogen substitution. Part XXI, Arrhenius parameters for the chlorination of biphenyl and some related compounds, 5739. Part XXII, chlorination of 4,5,9,10-tetrahydropyrene, of some diphenylalkanes, and of some related compounds, 6893.

and mechanism of heteroaromatic nitration. Part II,

pyrazole and imidazole, 1051.

and mechanism of the removal of the N-benzyloxycarbonyl group from N-benzyloxycarbonylglycine ethyl ester and related compounds in acetic acid containing hydrobromic acid or sulphuric acid, 4403.

and mechanism of the thermal decomposition of 4-methyl-

pent-1-ene, 7436.

of ionic polymerisation. Part XI, low-temperature polymerisation of isobutyl vinyl ether in n-hexane-toluene as solvent, 7405. Part XII, polymerisation of isobutyl vinyl ether at -40° in the solvent 50:50 n-hexanetoluene, 7412.

of nucleophilic substitution in polyfluoro-aromatic compounds. Part I, reaction of sodium methoxide with some pentafluorophenyl-compounds, 6375.

of oxidation of the ruthenium(II)-tris-o-phenanthroline complex by cerium(IV), 5749.

of reactions of ligand-substituted tris-(2,2'-bipyridyl)iron(II) complexes, 6061.

of the addition of tetrafluorohydrazine to polycyclic aromatic hydrocarbons, 6602.

of the bromination of some enols and their anions, 353.

of the isotopic exchange between 1-iodo-2,4-dinitronaphthalene and iodides in methanol, 4613.

of the oxidation of glycolic acid by ceric sulphate, 4054.

of the pyrolysis of 1-chloropentane, 4423.

of the reaction between arenes and hexacarbonylmolybdenum, 6873.

of the reaction between methyl iodide and the thiocyanate ion in aqueous solution, 2201.

of the reactions between the methyl halides and potassium cyanide in aqueous solution, 7119

of the reactions of diazodiphenylmethane with some methylnaphthoic and acenaphthoic acids in ethanol or 2-n-butoxy-ethanol, 6310.

Acid-catalysed polymerisation of cyclosiloxanes. Part I, kinetics of the polymerisation of octamethylcyclotetrasiloxane catalysed by anhydrous ferric chloride-hydrogen chloride, 2027.

Acid-catalysed reactions of transition-metal complexes. Part III, acid-catalysed aquations of trans-azidochlorobisethylenediaminecobalt(III) and cis-nitrochlorobisethylenediaminecobalt(III) salts, 7320.

Acid hydrolysis of cyanamide, 802.

Acylation. Part XVI, spontaneous and catalysed hydrolysis of diketen, 3778.

Aroyl peroxides. Part II, decomposition of benzoyl peroxide in benzene, 995. Part III, decomposition of benzoyl peroxide in chlorobenzene and bromobenzene, 7127.

Base-catalysed reactions of benzylic sulphur compounds, 1271.

Bromination of acetone in alkaline solution at low temperatures, 1166.

Bromination of di-isopropyl ketone in alkaline solution, 430. Catalytic power of pyridine and related Brönsted bases in the iodination of ketones and nitromethane, 1752.

Cationic and pseudocationic polymerisation of aromatic olefins. Part I, kinetics and mechanism of the pseudo-

cationic polymerisation of styrene by perchloric acid, 4826. Cephalosporanic acids. Part III, reactions with pyridinekinetics and mechanism, 7020.

Competitive oxidation of formaldehyde and glyoxal, 7388. Cyclic inorganic compounds. Part I, chlorine exchange reactions with the chlorophosphonitriles, 1396.

Decomposition of formic acid and methanol on coppernickel alloys, 5248.

Deuterium isotope effect in octahedral substitutions. Part I, aquation of cis- and trans-dichloro- and cisand trans.chloro-nitro-bis(ethylenediamine)cobalt(III) cations, 418.

Electrophilic additions to alkenes. Part I, kinetics of the reaction of 2,4-dinitrobenzenesulphenyl bromide with cyclohexene in acetic acid solution, 5887.

Effect of pressure on the rate of fast reactions, 4678.

Fluorinated cyclopropanes. Part III, reactions of methylene with mono-, 1,1-di-, and tri-fluoroethylene, 1141.

Gas-phase reactions of sodium. Part I, rates of reaction of methylchlorosilanes and the analogous carbon compounds, 5068. Part II, rates of reaction of cycloalkyl bromides and vinylbromides, 6323.

Heterocyclic rearrangements. Part I, mechanism of a ring expansion, 4226.

Homolytic substitution at a saturated carbon atom. Part III, kinetics of the gaseous reaction of nitric acid in nitrogen alone and in the presence of methane, 1063.

Hydrogen isotope effect in the thermal decomposition of malonic acid, 792.

Hydrogen isotope effects in olefin hydration. Relationship of isotope effects to the mechanism of proton transfer from the hydronium ion, 6718.

Hydrolysis of t-butyl chloride in water: temperaturedependence of the energy of activation, 1965.

Hydrolysis of 3,4-dibromo- and 3,4-dichloro-2,2-dimethylchroman, 5049.

Hydrolysis of ethyl acetate in concentrated aqueous sulphuric acid, 3874.

Hydrolysis of hydroxyalkyl phosphate esters: effect of changing ester group, 6558

Hydrolysis of hydroxyalkyl phosphate esters: epoxide route, 6547.

Hydroxylamine-sulphur dioxide reaction. Part I, 1747. Part II, 5233.

Influence of electrolytic dissociation upon rates of reactions. Part III, aquation of chloropentamminecobalt(III) in acidic salt solutions, 724.

Intermediates in the decomposition of aliphatic diazocompounds. Part III, thermal decomposition of diphenyldiazomethane in acetonitrile, 2466.

Kinetic studies of oxidation-reduction of cobalt-ethylenediaminetetra-acetic acid complexes. Part III, reduction of ethylenediaminetetra-acetatocobaltate(III) and related complexes by ferrous ion, 2116.

Kinetics (contd.):

Kinetic studies of the fluorene series. Part III, reaction of 2-substituted fluorenones with sodium borohydride, 4049. Part IV, acid-catalysed solvolysis of 4-substituted 9-diazofluorenes, 4221. Part V, reaction of 4substituted fluorenones with sodium borohydride, 5518.

Kinetic study of the hydrolysis of sulphatobis(ethylene-

diamine)cobalt(III) perchlorate, 7047.

Liquid-phase reactions at high pressures. Part XIV, kinetics of two reverse Menschutkin reactions, 2849. Part XV, effect of pressure on the rates of reverse Menschutkin reactions, 2854.

Mechanism of epoxide reactions. Part VIII, effect of solvent variation on the reaction of benzylamine with 1,2-

epoxyethylbenzene, 2569.

Mechanism of the hydrolysis of N-aryl-D-glucosylamines,

S_N Mechanism in aromatic compounds. Part XXXI, reactions of thiomethoxide ion in methanol with some fluoro- and iodo-nitrobenzenes, 5454.

S_N Mechanism in inorganic reactions. Part I, hydroxideion substitution in halogenopentamminecobalt(III) com-

plexes, 3207.

Mechanisms of octahedral substitution reactions in nonaqueous solutions. Part III, replacement of co-ordinated water in trans-aquonitrobis(ethylenediamine)cobalt(III) ions, 1204. Part IV, kinetics and steric course of chloride exchange in the cis-dichlorobis(ethylenediamine)cobalt(III) cation in methanol, 4074.

Mechanisms of substitution reactions of octahedral bis-(ditertiaryarsine) complexes. Part II, reduction of dichlorobis-(o-phenylenebisdimethylarsine)platinum(IV)

salts by thiocyanate ions, 5196.

Methanolysis of nitrophenyl esters. Part II, kinetics of the methanolysis of 2,4-dinitrophenyl acetate, 6409.

Non-stationary states in the polymerisation of trioxan,

Nucleophilic displacement reactions in aromatic systems. Part IX, kinetics of the reactions of 2-, 6-, or 8-chloro-9-methylpurine with piperidine in ethanol, 3017.

Nucleophilic displacements in dimethyl-1-phenylethyl-

sulphonium ion, 823.

Nucleophilic reactions in ethylenic derivatives. Part VIII, mechanisms of the reactions of primary and secondary amines with arylsulphonylhalogenoethylenes, 2227.

Nucleophilic reactivity. Part VI, reaction between triphenylphosphine and α-halogenated ketones, 1379.

Nucleophilic replacement at an octahedrally co-ordinated metal atom. Part III, basic hydrolyses of cis- and transdi-isothiocyanato- and isothiocyanatoammine-bisethylenediaminecobalt(III) salts, 3300.

Nucleophilic substitution at a metal-bearing carbon atom. Part II, kinetics and mechanism of the reaction between mercuric chloride and diazodiphenylmethane, 5969.

Nucleophilic substitution reactions of 2-chlorobenzimidazoles. Part I, formation of benzimidazolin-2-ones and 2-alkoxybenzimidazoles, 236.

Observations relating to substituent effects in halogenation. Part I, 2194.

Organosilicon compounds. Part XXXV, effects of some phosphorus-containing substituents on the rates of cleavage of benzyltrimethylsilanes, 4994.

Oxidation of uranium(IV) by thallium(III) over an extended concentration range in aqueous perchloric acid solutions,

Oxidations of organic compounds by cobaltic salts. Part VI, kinetic and product studies of the oxidations of some carboxylic acids, 2796.

Phosphorus-nitrogen compounds. Part XI, kinetic investigations of the reactions of chlorocyclophosphazenes with piperidine and diethylamine in toluene, 4059.

Polymerisation of styrene by titanium tetrachloride. IV, kinetics of polymerisation in methylene dichloride,

Preparation of unstable toluene-p-sulphonates, 6748. Pyrimidine reactions. Part XII, thermal rearrangement of 2-alkoxypyrimidines, 4911.

Pyrolyses of ethyl cyanide, t-butyl cyanide, cumyl cyanide, and acetamide, and bond strengths in cyanides, 5074.

Kinetics (contd.):

Pyrolysis studies. Part XVI, mechanistic study of the pyrolysis of β-hydroxy-olefins, 7242.

Radical selectivity: initial stages of alkane oxidations, 3491.

Rate constants from calculated equilibrium constants, 3868. Rate of displacement of toluene-p-sulphonate relative to bromide ion. New mechanistic criterion, 6753.

Rates and mechanism of substitution reactions of fiveco-ordinate platinum(II) complexes, 5521.

 $k_{\rm OTs}/k_{\rm Br}$ Ratios and the separation of charges in the transition states of solvolytic displacements, 6763.

Reaction of hydrogen atoms with nitrous oxide, 5724. Reaction of some cis-dienes with aromatic thiols, 4894.

Reactions of methoxyl, ethoxyl, and t-butoxyl with nitric oxide and with nitrogen dioxide, 6965.

Reactions of methyl radicals with formamide, N-methyl-

and NN-dimethyl-formamide, 1386.

Reactions of the isopropoxyl radical. Part I, pyrolysis of isopropyl of isopropyl nitrite in a static system at 175-200°, 4416.

Rearrangement of aromatic N-nitroamines. Part V. acid-catalysed rearrangements of N-nitro-1-naphthylamine and its N-methyl homologue, 7149. Part VI, thermal and photochemical rearrangements of N-methyl-N-nitro-1-naphthylamine, 7158.

Re-examination of the stereochemistry of quinolizidine and the methylquinolizidines through measurement of their rates of quaternisation and those of the hexahydro-

julolidines, 6797.

Reversible prototropic isomerisation of 1,3-arylphenyl-propenes. The relative conjugating power of aryl substituents, 6710.

Salt effects on the rate of nitration of benzenesulphonic acid in solvent sulphuric acid, 6524.

Secondary hydrogen isotope effects. Part III, mechanism of N-nitration, 2560.

Solid-phase reactions in silver fulminate, 1474.

Stability of carbonium ions. Part II, 1542.

Stability of N-heterocyclic oxime derivatives. Part I, decomposition of N-methylpyridinium 3- and 4-o-acetylaldoxime iodides in aqueous solution, 3729. Part II, decomposition of N-methylacetylpyridinium O-acetylketoxime iodides in aqueous solution, 3734.

Studies in decarboxylation. Part II, kinetic evidence for the mechanism of thermal decarboxylation of By-un-

saturated acids, 6202.

Substituent effects of positive poles in aromatic substitution. Part I, nitration of the anilinium ion in 90-100% sulphuric acid, 6845. Part II, nitration of N-methylated anilinium ions, 6851.

Substituent effects on alkali fission of ferroins, 4697.

Thermal decomposition of nickel benzoate and of the nickel salt of cyclohexanecarboxylic acid, 6188.

Thermal decomposition of some perbenzoyl aryl carbonates in benzene, 2459.

Thermal isomerisation of 1-cyclopropyl-2-methylpropene, 345.

Thermal unimolecular isomerisation and decomposition of 1,1-diethylcyclopropane, 191.

Thermal unimolecular isomerisation of 1-isopropenyl-1methylcyclopropane, 4289.

Thermal unimolecular isomerisation of cis-2-methylpenta-1,3-diene, 4770.

Tracer studies in carboxylic acids. Part III, oxalic acid, 2197. Part IV, aminoacetic acid, 2669.

Tracer studies in ester hydrolysis. Part XIV, hydrolysis of bornyl and isobornyl acetates, 3290.

Values of $\log K$, ΔH° , and ΔS° , at 25° for stepwise replacement of Cl⁻ by OH⁻ in mercuric chloride, HgCl₂(aq), 4231.

Lactamidines and atrolactamidines, resolution of substituted

derivatives, by means of the mandelic acids, 770. Lactones. Part VII, synthesis of 5-hydroxy-7-methoxyphthalide, 4592.

novel synthesis of. Photochemical transformations. Part XVI, 181.

Lactones (contd.):

Bromination of but-2-enolides with N-bromosuccinimide,

By-product from the preparation of dehydroacetic acid-Fleischmann's "pyrone-lactone", 2283.

Chemistry of fungi. Part I, rosenonolactone, 7246. Part LI, absolute configuration of C-13 in rosenonoand rosolo-lactone: rosololactone, 7257.

Infrared studies with terpenoid compounds. Part II, carbonyl absorptions of γ -lactones, 3958.

Optical rotatory dispersion. Part XXIV, 7211.

Optical rotatory dispersion. Part XXVI, some bridged ring lactones, 7229. Part XXVII, the Hudson lactone rule, 7237.

Tetranortriterpenoids. Part I, [Bicyclononanolides. Part I] constitution of swietenine, 6935.

Lambertellin, structure of, 5927.

Laminarin, constitution of. Part IV, minor component sugars, 220. Part V, location of 1,6-glucosidic linkages, 885.

Lead tetra-acetate, reaction with the toluene-p- and benzenesulphonylhydrazone of benzaldehyde, 1020.

tetra-acctate, reactions of. Part II, new synthesis of l-arylindazoles, 3048. Part III, synthesis of 3-alkyl-1-arylindazoles, 5177.

Reaction of vinyl-lead compounds with sodium in liquid ammonia, 6659.

Leguminous fish-poison plants, active principles of. Part X, toxicarol isoflavone, 4203.

Lewis acidity, quantitative aspects of. Part IV, interaction of antimony halides with nitroanilines in ether and in dichlorobenzene, 739.

Lignans. Part III, synthesis of 1-arylnaphthalenes related to podophyllotoxin, 3578. Part IV, structural changes accompanying the acylation of alcohols, 3583. Part V, (-)-olivil and (+)-cyclo-olivil, 3586.

Liquid metals. Part X, solutions of hydrogen in liquid sodium, 116. Part XI, welting of chromium, molybdenum, and tungsten by liquid sodium, 1437.

Lithium aluminium hydride reduction of phenyl vinyl ketoxime, 892.

butyl-, reaction of, with 2-phenyl-1,3-dioxolan, 6649.

ethyl-, reaction of, with fluorene and 1,1-diphenylethylene. Catalytic action of anionic catalyses. Part X, 5110.

Compounds of silicon. Part IV, reactions of hexamethyldisilaryl-lithium with chlorosilanes, 2997.

Reactions of pyrimidin-5-yl-lithium compounds, 5467.

Macrocycles. Macrocyclic compounds. Part VIII, conformations of symmetrical cyclic diesters and dilactones, 72. Part IX, triple-bond migration in macrocyclic alkadiynes, 3118. Part X, macrocyclic hydrocarbons containing conjugated diene systems, 6674. Part XI, novel synthesis of civetone homologues, 6679.

Macrocyclic musk compounds. Part VII, new syntheses of civetonedicarboxylic acid and its conversion into trans-civetone, 3475. Part VIII, new syntheses of cyclohexadecanone and dihydroambrettolide from hydno-

carpic acid, 4580.

Magnesium citrate complexes, stability constants of, 3905. Reaction of pentafluorophenylmagnesium bromide with pentafluoronitrobenzene in tetrahydrofuran, 1864.

Malaprade reaction. Submicro-methods for the analysis of organic compounds. Part XXII, 3964.

Magnus's Green salt, and related compounds, metal-metal interaction in, 713.

Mandelamidines, halogen-substituted, resolution of, and optical stability of their mandelate salts at elevated temperatures, 1658.

Manganese dioxide, action of, on heterocycles. Syntheses of heterocyclic compounds. Part IX, 875.

Cationic carbonyl complexes of manganese(1), 700.

Electronic spectra and magnetic properties of some isothiocyanate complexes of manganese and iron, 268.

Organoselenium derivatives of metal carbonyls. Part I, complexes derived from manganese pentacarbonyl hydride, 7515.

Megoura viciae Buckton, constituents of, 1562.

Mellitic acid, thermal decomposition of salts of. Part I, aluminium mellitate and natural mellite, 5433.

Menschutkin reactions. Liquid-phase reactions at high pressures. Part XIV, kinetics of two reverse Menschutkin reactions, 2849. Part XV, effect of pressure on the rates of reverse Menschutkin reactions, 2854.

Mepacrine, reaction of, with thiols, 7261.

Mercury, complexes of. Part I, X-ray analysis of 1,6dithiacyclodeca-cis-3,cis-8-dienebis(mercuric chloride),

Complex salts derived from organomercury halides and related compounds, and their disproportionation, 1857.

Derivatives of some tertiary amides with mercuric chloride, 3011.

Metal-metal bonds. Part III, formation of rhodiummercury bonds from complex rhodium hydrides, 5331. Part IV, formation of iridium-mercury bonds by oxidation with mercury halides, 5337.

Reaction of organomercury compounds with covalent selenocyanates, 2395.

Reactions and derivatives of bis(trifluoromethylseleno)mercury, 940.

Some oxyanion complexes of mercury(II), 1877.

Trans-metallation reactions of bispentafluorophenylmercury. Aromatic polyfluoro-compounds. Part XXII, 2094.

Mesomorphism and chemical constitution. Part XIII. di-. tri-, and tetra-substituted 4,4'-di-(p-n-alkoxybenzylideneamino) biphenyls, 3706.

Metal halides, acceptor properties of. Part III, solvation effects of arsenic trichloride in the racemisation of α-methylbenzyl chloride in acetone, catalysed by mercuric chloride, 797.

Mikania cordata (Burm. f.) B. L. Robinson (Compositae), constituents of. Isolation of mikanin, epifriedelinol, and fumaric acid; structure of mikanin, 6371.

Minerals, soil, chemistry of. Part I, hydrothermal crystallisation of some alkaline Al₂O₃-SiO₂-P₂O₅ compositions, 6616. Part II, reactions of phosphates with kaolin and faujasite, 6621.

Molecular conformations. Part I, bicyclo[3,3,1]nonane system: X-ray analysis of 1-p-bromobenzenesulphonyloxymethyl-5-methylbicyclo[3,3,1]nonan-9-ol, 1844. Part II, conformations and valency angles of five- and sixmembered rings, 5974.

Molecular orbitals, localised, in self-consistent-field wave functions. Part VII, electron delocalisation and "sigma-conjugation", 3026.

Electronic structures of difluorocarbene and the difluoroamino-radical, 5406.

"Island" and cyclic delocalisation in p_{π} - d_{π} systems, 4682. Maximum overlap hybridisation in methyl substituted cyclopropanes, 5621.

Molecular orbital theory of organometallic compounds. Part V, far-infrared spectra of the tricarbonylarenechromiums, 2822.

Size of d-orbitals and valence-state promotion energies in sulphur, 6827.

Splitting of terms by low-symmetry ligand-field components, 4887.

Molecular polarisability. Anisotropic polarisability of the cyano-group from molar Kerr constants and dipole moments of eight nitriles, 2499.

Apparent conformations of dichlorodiphenyltrichloroethane (D.D.T.) and two derivatives in non-polar solvents, 7094.

Apparent conformations of thianthren and of three of its oxides as solutes in benzene, 571.

Carbon-halogen bond polarisabilities in some p-disubstituted benzenes, 3463.

Conformational equilibria in 2-chloro- and 2-bromo-cyclo-

hexanones, 3700. Conformations of certain amides as solutes in dioxan, 3179. Conformations of certain diphenyl- and triphenyl-methanes

as solutes in non-polar media, 5810. Conformations of 2,3-diphenyl-1,4-dioxen and some 2,3-di-

substituted 1,4-dioxans as solutes, 558. Conformations of five cyclic olefins, 553.

Molecular polarisability (contd.):

Dipole moments, molar Kerr constants and apparent conformations of certain α-substituted carbonyl compounds,

Molar Kerr constants and conformations of citrals and the corresponding ψ -ionones as solutes in benzene, 5529.

Molar Kerr constants and dipole moments of twelve alkyl iodides, 5349. Internal rotation in n-alkyl bromides and iodides, 5353.

Molar Kerr constants of n-alkyl bromides, 4188.

Molar Kerr constants of gases, 3520.

Study of internal rotation in the benzyl halides and related molecules from measurements of molar Kerr constants and dipole moments, 3619.

Molybdenum complexes, paramagnetism of, 6634.

hexacarbonyl-, reaction of, with arenes, kinetics of, 6873. Complex compounds of quadrivalent and tervalent molybdenum, 1636.

Crystal and molecular structure of dihydridodi-π-cyclopentadienylmolybdenum, 296.

Seven-co-ordinate halogenocarbonyl anions of molybdenum(II) and tungsten(II), 3494.

Muramic acid, synthesis of, 2975.

Mycological chemistry, studies in. Part XVII, averythin, an anthraquinoid pigment from Aspergillus versicolor (Vuillemin) Tiraboschi, 3666.

Mycotoxins. Part II, constitution of ochratoxins A, B, and C, metabolites of Aspergillus ochraceus Wilh., 7083.

Naphthalenes, 1-aryl-, related to podophyllotoxin, synthesis of. Lignans. Part III, 3578.

Alkylation of the aromatic nucleus. Part XIV, 4101.

3,7-Dialkylnaphthalene-1-sulphonic acids. Preparation, properties, and nuclear magnetic resonance studies, 2324.

Ebenaceae extractives. Part I, naphthalene derivatives from Macassar Ebony (Diospyros celebica Bakh), 2355.

Kinetics of the isotopic exchange between 1-iodo-2,4-dinitronaphthalene and iodides in methanol, 4613.

3-Methylnaphthalene-1,8-diol from Diospyros mollis, 1533. 3-bromo-1,8-dimethyl-. Crystal structure of an overcrowded aromatic compound, 528.

compounds. Physical properties and chemical constitution. Part XLI, 2072.

2,7-diol, halogenation of, 3304.

8-Nitro-1-naphthol, 1526.

Reduction of 1-chloro- and 1,4-dichloro-5-nitronaphthalene,

Synthesis of alkoxy-1,2,3,4-tetrahydronaphthalene derivatives. Part I, 2-amino-, alkylamino-, and dialkylaminoderivatives, 2636. Part II, 2-carboxyhydrazides, 3006.

Synthesis of 1,2,3,4-tetrahydro-7-hydroxy-4-isopropyl-1,6dimethylnaphthalene. Degradation product of copaene, 3319.

Naptho[2,3-b]furan, 2,3-dihydro-2-methyl-, and its 4- and 9-

methoxy-derivatives, 1545. Naphtho(2',3':2,3)pyran, 6,6-diphenyl-6H- and 4,6-diphenyl-4H-, 6646.

Naphthopyrans and chromens, reactions of, with bromine and chlorine. Part III, 5266.

Naphtho[2,1,-b]thiophen and 11-thiabenzo[a]fluorene, synthesis of methyl derivatives of, by photocyclisation of stilbene isosters, 6221.

Narcotine and narcotoline, absolute stereochemistry of, 1087. Nickel-thiourea complexes. Part I, infrared absorption spectra, 2036.

tritertiary phosphine monocarbonyl complexes of, 812.

Borohydride derivatives of some complex nickel(II) amine cations, 924.

Co-ordination number of transition-metal ions. Part III, complexes of nickel(II) halides with heterocyclic aromatic amines, 3276. Part IV, relative stabilities of some tetrahedral and octahedral complexes of cobalt(II) and nickel(II), 3284.

Crystal structure of dipotassium bis(trimethylenedinitramine)nickelate(II) tetrahydrate, 5801.

Nickel (contd.):

Some complexes of ditertiary phosphines with nickel(II) and nickel(III), 3238.

Thermal decomposition of nickel benzoate and of the nickel salt of cyclohexanecarboxylic acid, 6188.

Trigonal-bipyramidal nickel(II) complexes with quadridentate phosphines and arsines, 1293.

Nicotine 1'-oxide, and related compounds, thermal rearrangement of, 1653.

Niobium and tantalum, halides of. Part VIII, densities, viscosities, and self-ionisation of niobium and tantalum pentafluorides, 761. Part IX, dimethyl ether, diethyl ether, dimethyl sulphide, diethyl sulphide, and tetra-

hydrothiophen complexes of the pentafluorides, 765. pentachloride, state in solution, 2871.

Eight-co-ordinate complexes of niobium(IV), 2865.

Reactions of niobium(v) and tantalum(v) chlorides and bromides with some cyclic ethers and thioethers, 2449. Seven-co-ordinate complexes of niobium(v) and tantalum(v),

2877.

Nitriles, convenient one-step synthesis from aldehydes, 1564. Pyrolyses of ethyl cyanide, t-butyl cyanide, cumyl cyanide, and acetamide, and bond strengths in cyanides, 5074.

Reaction of di-(2-cyanoethyl)amines with ethyl oxalate, 1749.

Reactions of organoaluminium compounds with cyanides. Part I, phenyl cyanide, 2662. Part II, alkyl cyanides, 5083. Spectroscopic studies. Part V, spectra and structure of monohalogenoacetonitriles, 4632.

Nitrobenzenes, substituted, reduction of. Part II, reduction of some aromatic nitro-compounds with reducing sugars, 1547.

Nitroethane, neutralisation of. Base catalysis in solvent mixtures. Part I, 3606.

Nitrogen dioxide, reaction of, with benzoyl peroxide, 5756. dioxide, vapour-phase reaction of, with iron pentacarbonyl; iron(III) oxide nitrate, 4490.

oxides, adducts of, with iron(III) nitrate, 4978.

perfluoroalkyl derivatives of. Part XII, reversible photochemical dimerisation of trifluoronitrosomethane and rearrangement of the O-nitroso-dimer to bistrifluoromethylnitramine, 1675. Part XIII, tristrifluoromethylhydroxylamine, 1681. Part XIV, 1,1,1-Trifluoroazomethane, 2266. Part XV, reaction of trifluoronitrosomethyles. methane with trifluoroethylene, vinylidene fluoride, vinyl fluoride, and ethylene, 2506. Part XVI, reaction of trifluoronitrosomethane with butadiene and with isobutene, 4714. Part XVII, reaction of N-bromobistrifluoromethylamine with olefins, 6141. Part XVIII, reaction of trifluoronitrosomethane with perfluorobutadiene and 3,4-dichlorohexafluorobut-1-ene, 6149. Part XIX, synthesis, pyrolysis, and nuclear magnetic resonance evidence for restricted inversion at the nitrogen atom of trisheptafluoro-n-propylhydroxylamine, 7203. Part XX, thermal decomposition of trifluoronitrosomethane, 7209. -phosphorus compounds. Part IX, reaction of dimethyl-

amine with hexachlorocyclotriphosphazatriene: replacement pattern and the structure of the products, 2215. Part X, aluminium chloride-catalysed cis-trans-isomerisation of non-geminal chlorodimethylamino- and chloropiperidino-cyclotriphosphazatrienes, 2223. Part kinetic investigations of the reactions of chlorocyclophosphazenes with piperidine and diethylamine in toluene, 4059. Part XII, cis-trans-isomerisation of non-geminal amin och lorocy clot riphosphazat rienessubstituted ammonium chlorides, 4067. Part XIII, phenoxyp-bromophenoxychlorocyclotriphosphazatrienes, Part XIV, reaction of benzoyl chloride with hexaethoxycyclotriphosphazatriene and octaethoxycyclotetraphosphazatetraene, 4799. Part XV, ¹H nuclear magnetic resonance and infrared spectra of some mononuclear phosphorus(v) compounds containing the P-NMe₂ grouping, 4802. Part XVI, reactions of hexachlorocyclotriphosphazatriene with t-butylamine, 5032. Part XVII, ¹H and ³¹P nuclear magnetic resonance spectra of dimethylamino-derivatives of hexachlorocyclotri-phosphazatriene, 7193. Part XVIII, further studies on the alkyl halide-catalysed rearrangements of alkoxycyclophosphazenes, 7432.

Nitrogen (contd.):

Derivatives cyclotetrazenoborane (boratetrazole), N₄H₂BH, 6205.

Electronic structure of tetranitrogen tetrasulphide, N₄S₄. Electronic structures of difluorocarbene and the difluoroamino-radical, 5406.

Ionisation constant of thiocyanic acid, 4813.

Molecular photoelectron spectroscopy. Part III, ionisation potentials of oxygen, carbon monoxide, nitric oxide, and acetylene, 616. Part IV, ionisation potentials and configurations of carbon dioxide, carbon oxysulphide, carbon disulphide, and nitrous oxide, 6350.

Nitric acid-ether systems, infrared spectra of.

bonding in gaseous mixtures. Part VI, 3085.

Orientation in the nitration of trisubstituted benzenes, 795. Nitric esters. Part I, characterisation of the isomeric glycerol dinitrates, 1319. Part II, characterisation of the isomeric glycerol mononitrates, 1325.

Reactions of methoxyl, ethoxyl, and t-butoxyl, with nitric oxide and with nitrogen dioxide, 6965.

Selective reactivity of dinitrogen tetroxide with water in salt hydrates, 819.

Structure and basicity. Part III, basicity of homogeneously substituted cyclotriphosphazatrienes and cyclotetraphosphazatetraenes, 2804.

Tin(IV) nitrate: relation between structure and reactivity

of metal nitrates, 598.

p-Nitrosoanilines, interaction with potassium cyanide, 1549. Nitroso-compounds, aromatic, nuclear magnetic resonance

studies of, 6032. Nonadrides. Part I, introduction and general survey, 1769.

Part II, constitutions of glauconic and glaucanic acids, 1772. Part III, absolute configuration of glauconic and glaucanic acids, 1779. Part IV, constitution and stereochemistry of byssochlamic acid, 1787.

Norbornene, stereospecific photoaddition of formamide to, 800.

Nucleosides. Part I, O-glucosides of cytosine and their rearrangement to N-glucosides, 6125. Part II, further studies with O-glycosides of cytosine, 6130. Part III, synthesis of 1-methyl-2'-deoxycytidine, and comments on the n.m.r. spectra of cytosine nucleosides, 6134.

Nucleotides. Part XLVIII, reaction of hydroxylamine with cytosine and related compounds, 208. Part XLIX, reduction of the adduct of periodate-oxidised adenosine-5'

phosphate and methylamine, 5072.

direct synthesis of, use of 5-phospho-β-D-ribosyl azide. Purines, pyrimidines, and imidazoles. Part XXIII, 6864. Activation of sulphuric acid esters by use of ethoxy-acetyl-

ene in the synthesis of adenosine-5' sulphatophosphate,

6209.

 $trans-\Delta^{1(2)}$ -Octalin, 10-acetyl-, formation of. Isomerisation and dehydration of some decalin derivatives, 4975.

 $\Delta^{1(9)}$ -Octalin, 10-acetyl-, further reactions of, 4933.

Nuclear methylated diethylstilbæstrols as possible anti-œstrogens, 6509.

Olefins, aromatic, cationic and pseudocationic polymerisation of aromatic olefins. Part I, kinetics and mechanism of the pseudocationic polymerisation of styrene by perchloric acid, 4826.

hydroxylation with silver iodide dibenzoate (Prévost

reaction), 5203.
Addition of benzyl radicals to olefinic systems, 6730. Allenes. Part VI, absolute configuration of 3,4,4-trimethylpent-1-yn-3-ol and 1-chloro-3,4,4-trimethylpenta-1,2-diene, 2553. Part VII, synthesis of iodoallenes and iodoacetylenes, 4348. Part VIII, new method for the synthesis of allenynes, 4659. Part IX, carbenes from 1-halogenoallenes, 5625. Part X, Claisen-Cope rearrangement of propargyl vinyl systems, 6784.

Chemistry of the metal carbonyls. Part XXXII, isomerisation of allyl compounds and the dimerisation of norborn-

adiene, 6416.

Constituents of cigarette smoke. Part IX, pyrolysis of polyenes and the formation of aromatic hydrocarbons, 2892. Olefins (contd.):

Determination of olefinic unsaturation. Submicro-methods for the analysis of organic compounds. Part XIX, 1740. cis-Dienes, reaction with aromatic thiols, 4895.

Electrophilic additions to alkenes. Part I, kinetics of the reaction of 2,4-dinitrobenzenesulphenyl bromide with cyclohexene in acetic acid solution, 5887.

Hydrogen isotope effects in olefin hydration. Relationship of isotope effects to the mechanism of proton transfer from the hydronium ion, 6718.

Hydrogenation of alkadienes. Part I, hydrogenation of buta-1,3-diene catalysed by the noble Group VIII metals,

Isobutene, low-temperature polymerisation of. Part VI, polymerisation by titanium tetrachloride and water in methylene dichloride, 275.

Kinetics and mechanism of the thermal decomposition of 4-methylpent-1-ene, 7436.

Liquid-phase oxidation of hex-1-ene, 2372.

Olefin synthesis, development in: reaction of some allylic mesitoates with aliphatic Grignard reagents, 702.

Polyhalogeno-allenes. Part I, tetrafluoroallene, its dimer, and the reaction of the dimer with trifluoronitroso-methane, 978. Part II, reaction of tetrafluoro-allene with trifluoronitrosomethane, 5602.

Polymerisation of styrene by titanium tetrachloride. Part IV, kinetics of polymerisation in methylene dichloride,

Preparation of some substituted stilbenes, 3887.

Pyrolysis of but-1-ene, and the resonance energy of the allyl radical, 6652.

Pyrolysis studies. Part XVI, mechanistic study of the pyrolysis of β-hydroxy-olefins, 7242.

Reaction between diphenylethylenes and o-hydroxyaldehydes, 2978.

Reaction of sulphur and sulphur compounds with olefinic substances. Part XIV, reaction of sulphur and of dibenzyl tetrasulphide with 2-methylpent-2-ene and cisand trans-3-methylpent-2-ene, 6390.

Spectroscopic studies on carbonium ions derived from aromatic olefins. Part I, styrene and related olefins, 4765.

Styrene-divinylbenzene copolymers made in the presence of non-solvating diluents. Solvent-modified polymer networks. Part IV, 304.

Synthesis of heterocyclic alkenes by the Horner reaction,

Thermal unimolecular isomerisation of cis-2-methylpenta-1,3-diene, 4770.

-)-Olivil and (+)-cyclo-olivil. Lignans. Part V, 3586.

Optical activity in the 1,1'-binaphthyl series. Optically active 8,8'-dimethyl-1,1'-binaphthyl, 1412.

Optical rotatory power co-ordination compounds. Part III, absolute configurations of trigonal metal complexes, 2883. Part IV, spectroscopic and configurational assignments for bisdiamine complexes, 5094.

Resolution of some halogen-substituted mandelamidines and a study of the optical stability of their mandelate salts at elevated temperatures, 1658.

Optical rotatory dispersion. Part X, amino-acids, 294.

Part XIV, bisbenzyltetrahydroisoquinoline alkaloids, 2239. Part XV, mono-substituted succinic acids, 3928.

Part XIX, series of acids, imidazolines, amidinium chlorides, and their copper complexes, related to mandelic acid, 4007. Part XXI. Azomethines (I.), N-neopentylidene derivatives of α-amino-acid esters, 4503. Part XXII, steroidal azomethines, 4508.

Part XXIV, lactones, 7211.

Part XXVI, some bridged ring lactones, 7229. Part XXVII, the Hudson lactone rule, 7237.

Nitro-steroids. Part III, 3152.

Organometallic compounds, electronic spectra of. Part I, phenyl compounds of Group IV containing a chromophoric metal-metal linkage, 4690.

polyfluoroaryl-. Part III, potassium pentafluorophenyl-

trifluoroborate, 5144.

Alkynyl derivatives of the Group IVB elements, 4608.

σ-Bonded organotransition-metal ions. Part I, formation of air-stable penta-aquopyridiomethylchromium(III) ions, 7029.

Organometallic (contd.):

Intramolecular hydrogen bonds in some arene-metal car-

bonyl compounds, 1170. Nucleophilic substitution at a metal-bearing carbon atom. Part II, kinetics and mechanism of the reaction between mercuric chloride and diazodiphenylmethane, 5969.

Pentafluorophenyl derivatives of transition metals. Part

IV, platinum(II) compounds, 5275.

Transition metal-carbon bonds. Part III, cyclopentadienyltrimethylplatinum(IV), 1529.

Transition-metal-carbon bonds. Part V, hydrido-cycloocta-1,5-diene complexes of iridium(III), 4997.

Organometallic reactions. Part I, addition of tin alkoxides to isocyanates, 5238. Part II, addition of bistrialkyltin oxides to isocyanates, 6245. Part III, trimerisation of isocyanates by organotin alkoxides and oxides, 6858.

Transition-metal fluorocarbon complexes. Part VII, some complexes of cobalt and rhodium with tetrafluoroethylene, chlorotrifluoroethylene, and hexafluorobut-2-yne, 6629.

Osmium nitrido-complexes, infrared spectra and structures of,

1,3,4-Oxadiazoles, fluorine-containing, mass spectra of, 6842.
Oxalate, co-ordinated, reactivity of. Part IV, racemisation of sodium trisoxalatorhodium(III), 2280.

Oxalates, thermal decomposition of. Part IV, interrelation of crystalline phases in the thermal decomposition and dehydration of zinc oxalates, 2132.

Oxalic acid. Tracer studies in carboxylic acids. Part III, 2197.

Oxazoline. 2-Amino-2-oxazolines and 2-amino-2-imidazolines,

Oxidation, competitive, of formaldehyde and glyoxal, 7388. of alkoxyphenols. Part II, reactions of 4-methoxy-2and -3-t-butylphenols with various oxidising agents, 2904. Part III, 2-methoxy-6-t-butylphenol, 2-methoxy-5-t-butylphenol, and 2-methoxy-4-t-butylphenol, 2914. Part IV, 4-methoxy-2,5-di-t-butylphenol, 2921.

liquid-phase, of hex-1-ene, 2372.

of alkoxy-phenols. Part V, examples of cross-coupling **3660**.

periodate. Part VIII, oxidation products from methyl pentopyranosides, 2271. Part IX, azido-sugars, 3870. platinum-catalysed, of 6-deoxyhexopyranosides, 2292.

Controlled oxidations of organic compounds with cerium(IV). Oxidation of benzyl alcohols to benzaldehydes, 5777.

Oxidations of organic compounds with cobaltic salts. Part VI, kinetic and product studies of the oxidations of some carboxylic acids, 2796.

Radical selectivity: initial stages of alkane oxidations, 3491. Oxidising agents, reactions of, with ketones. Part II, acetoxylation of 11- and 20-oxo-steroids with lead tetra-acetate in the presence of boron trifluoride, 6.

Oximes, reduction of, by hydrazine-Raney nickel, 822. Phenyl vinyl ketoxime, reduction of, with lithium aluminum

hydride, 892. Oxindoles. Reactions of alloxan with aromatic amines: dioxindole-3-carboxyureides and oxindole-3-spiro-5'-oxazolidine-2',4'-diones, 5551.

Oxirans, substituted, nuclear magnetic resonance spectra of,

Oxygen, carbon monoxide, nitric oxide, and acetylene, ionisation potentials of. Molecular photoelectron spectroscopy. Part III, 616.

Oxytocin and 4-glycine oxytocin, 4923.

Palladium. Complexes of palladium(II) and platinum(II) with mixed phosphorus-nitrogen ligands, 5210

Cyclobutadienes. Part II, palladium complexes from diphenylacetylene: reactions of tetraphenylcyclobutadiene, 1881.

Five co-ordinate palladium(II) and platinum(II), 3060.

Molecular complexes. Part II, crystal structure of the 1:1 complex of bis-8-hydroxyquinolinatopalladium(II) and chloranil, 4851.

Sulphur and selenium co-ordinate link: five-co-ordination in complexes of bivalent palladium and platinum, 5371.

Peltogynol, the leucoanthocyanidin, absolute configuration of,

Penicillin derivatives, 2127.

Derivatives of 6-aminopenicillanic acid. Part VIII, further analogues of 3-o-chlorophenyl-5-methyl-4-isoxazolylpenicillin, 5976. Part IX, 2,4-di- and 2,4,5-trisubstituted-3-furylpenicillins, 5984.

Infrared absorption and proton magnetic resonance spectra of cephalosporin and penicillin analogues, 1595.

Penicillin V, N-alkyl derivatives of, 3616.

Peniocerol (cholest-8-ene-3β,6α-diol), the cactus sterol, structure of, 1160.

Peptides. Part XV, 4-methyleneproline and 4-hydroxymethylproline, 3850. Part XVI, experiments related to acyl cyanides, 4393. Part XVII, synthesis of peptides and polymers of some sterically hindered amino-acids via oxazolone intermediates, 6227. Part XVIII, derivatives of 1-aminocyclohexanecarboxylic acid, 6239.

and amino-acids. Part XXI, removal of the nitro-group from nitroarginine and peptides of nitroarginine by electrolytic reductions, 782. Part XXII, synthesis of Nα-L-arginyl-L-lysylglycine, 786. Part XXIII, synthesis of peptides related to arginine-vasopressin, 6806. Part XXIV, use of esters of 1-hydroxypiperidine and of other NN-dialkylhydroxylamines in peptide synthesis and as selective acylating agents, 6814.

and amino-acids, cyto-active. Part XI, nitrogen mustard derivatives of glutamic acid and related compounds, 1907. Angolide, a naturally-occurring cyclotetradepsipeptide

with a twelve-membered ring, 4664.

Balenine, a dipeptide occurring in whale-meat extract, isolation and synthesis of, 4969.

O-Benzyl-3-nitrotyrosine and its use in the synthesis of peptides containing 3-nitrotyrosine, 7297.

Cyclo-dimerisation of glycyl-L-prolylglycine, 3479.

L-Glutamyl-y-aminobutyric acid and related compounds, 7305.

2-Iodoethoxycarbonyl chloride. New amine-protecting group of possible value in peptide synthesis, 7136.

Polypeptides. Part XII, synthesis and oxidation of Lcysteinyl-6-aminohexanoyl-L-cysteine and L-cysteinyl-11-aminoundecanoyl-L-cysteine, 4246.

Substituted diphenylmethyl protecting groups in peptide synthesis, 7285.

Synthesis of polypeptides with known repeating sequence of amino-acids related to anthrax polypeptide. Synthesis of poly-β-L- and -D-glutamyl-alanine through the pentachlorophenyl active ester, 6777.

Phenanthrenes. Carcinogenic nitrogen compounds. Part XLVI, nitration of 2- and 3-acetamidophenanthrene,

Phenanthridines. Studies in the phenanthridine series: preparation of some methylphenanthridines and aminoderivatives, 3032.

Studies in the phenanthridine series. Part II, 4426.

Phenanthrene chemistry. Part IV, addition reactions of phenanthrene, 2587.

o-Phenanthroline, and some of its metal complexes, proton magnetic resonance spectra of, 3185.

and some of its metal complexes in non-aqueous solution, proton magnetic resonance spectra of, 4706.

Phenols and salicylaldehydes, mechanism of the antibacterial action of. Part IV, substituted salicylaldehydes, 438.

biosynthesis of. Part IX, asperugin, a metabolic product of Aspergillus rugulosus, 4673.

deuterium and tritium exchange reactions of, and synthesis of labelled 3,4-dihydroxyphenylalanines, 6914.

hydrogen bonding in. Part II, alkyl substituted bis(hydroxyphenyl) alkanes (dinuclear novolaks), 5906.

Benzylation of resorcinol, 4972.

Comparison of the acid ionisation constants of p-t-butylphenol, o-t-butylphenol, and 2,4-di-t-butylphenol in water and methanol, 4603.

Oxidation of alkoxyphenols. Part II, reactions of 4-methoxy-2-and 3-t-butylphenols with various oxidising agents, 2904. Part III, 2-methoxy-6-t-butylphenol, 2-methoxy-5-t-butylphenol, and 2-methoxy-4-t-butylphenol, 2914. Part IV, 4-methoxy-2,5-di-t-butylphenol, 2921. Part V, examples of cross-coupling, 3660.

Phenols (contd.):

in carbon tetrachloride, self-association and hydration of, 1. Phenol oxidation and biosynthesis. Part VIII, investigations on the biosynthesis of berberine and protopine,

Polyhydric phenols, benzenesulphonic esters of, partial hydrolysis, 2651.

Phenoxide ions, alkylation of, 1892.

Phosphorus and arsenic, determination of. Submicromethods for the analysis of organic compounds. Part

-boron compounds. Part II, halogenation of 1,1,3,3,5,5hexaphenylcyclotriphosphinoborine, 3171. Part III, reactions of white phosphorus with boron tribromide and boron tri-iodide, 3354.

compounds, photochemistry of. Part II, far-ultraviolet absorption spectra of some phosphorus oxyanions in aqueous solution, 1440. Part III, photolysis of ethyl dihydrogen phosphate in aqueous solution, 5380.

-fluorine chemistry, Part XVI, chemistry of alkyl- and aryl-dialkylaminofluoro-phosphoranes and -phosphines,

iodides, thermochemistry of, 746.

-nitrogen compounds. Part IX, reaction of dimethylamine with hexachlorocyclotriphosphazatriene: replacement pattern and the structure of the products, 2215. Part X, aluminium chloride-catalysed cis-transisomerisation of non-geminal chlorodimethylamino- and chloropiperidino-cyclotriphosphazatrienes, 2223. Part XI, kinetic investigations of the reactions of chlorocyclophosphazenes with piperidine and diethylamine in toluene, 4059. Part XII, cis-trans-isomerisation of non-geminal aminochlorocyclotriphosphazatrienes by substituted ammonium chlorides, 4067. Part XIII, phenp-bromophenoxy-chlorocyclotriphosphazatrienes, 4070. Part XIV, reaction of benzoyl chloride with hexaethoxy cyclotetraphosphazatetraene, 4799. Part XV, $^1\!H$ nuclear magnetic resonance and infrared spectra of some mononuclear phosphorus(v) compounds containing P-NMe₂ grouping, 4802. Part XVI, reactions of hexachlorocyclotriphosphazatriene with t-butylamine, 5032. Part XVII, ¹H and ³¹P nuclear magnetic resonance spectra of dimethylamino-derivatives of hexachloro-cyclotriphosphazatriene, 7193. Part XVIII, further studies on the alkyl halide-catalysed rearrangements of alkoxycyclophosphazenes, 7432.

organo-, chemistry. Part III, reactions of phosphaalkenes with nucleophiles and as intermediates in polymer synthesis, 6875. Part IV, phospha-alkenes as intermediates in the reaction of 1,1,2,2-tetrafluoroethylphosphine with dimethylamine or aniline, 6879.

pentabromide, thermodynamic functions of, 40.

thionitride, reaction with hydrogen, chlorine, hydrogen chloride, and aluminium chloride, 3857.

Action of bases on 2-hydroxyethyltriphenylphosphonium iodide, 6055.

Bonding and reactivity in triphenylphosphineborane, 899. Crystal and molecular structure of a trigonal form of phos-

phobenzene B, $(PC_6H_5)_6$, 4789. Crystal and molecular structure of benzoyl(triphenyl-

phosphoranylidene)methyl chloride, 5658. Crystal and molecular structure of benzoyl(triphenyl-

phosphoranylidene) methyl iodide, 5640. Cyclic inorganic compounds. Part II, decabromopenta-

phosphonitrile, 5697. Dealkylation of alkyl aryl ethers and sulphides by diaryl-

phosphide and -arsenide ions, 4120. Derivatives of 4-(dihydroxyphosphinyloxy)phenyldiphenyl-

methane and related free radical, 5108.

Factors in the formation of isomerically and optically pure alkyl halides. Part IV, three dealkylation steps in phosphorus trihalide (Cl, Br, I)-alcohol systems, 2364.

Fluorine nuclear magnetic resonance spectra of some perfluoroalkylhalogenophosphines, 777.

Hydrolysis of hydroxyalkyl phosphate esters: effect of changing ester group, 6558.

Hydrolysis of hydroxyalkyl phosphate esters: epoxide route, 6547.

Phosphorus (contd.):

Isosteric non-hydrolysable phosphatidic acid analogue,

Mechanism of methyl-group migration from oxygen to phosphorus in m-methoxyphenylphenylphosphine, 4115. Methods of formation of phosphorus-carbon bonds: tertiary phosphine oxides, 6638.

Phosphonitrilic derivatives. Part XII, heats of polymerisation of cyclic phosphonitrilic chlorides, 2112

Preparation and ammonolysis of potassium phosphinide and potassium dimethylphosphinide, 6288.

Preparation and some reactions of potassium phosphinidodiborane and potassium dimethylphosphinidobis(trimethylboron), 6290.

Preparation of unsymmetrical tertiary phosphine oxides from diethyl phosphite, 5771.

Reaction between triphenylphosphine and α-halogenated ketones. Nucleophilic reactivity. Part VI, 1379.

Reaction of methylphosphonous dichloride with bicyclo-[2,2,1]heptadiene, 541.

Reaction of triphenylphosphine with α -bromo-ketones, 5129. Reaction of 1,2,5-triphenylphosphole and its oxide with metal carbonyls, 6406.

Reactions of tertiary phosphines with sulphur dioxide, 5516. Reactivity of organophosphorus compounds. Part XIX, reduction of nitro-compounds by triethyl phosphite: convenient new route to carbazoles, indoles, indazoles, triazoles, and related compounds, 4831.

Some applications of the Wittig reaction in the biphenyl series, 6311.

Stereochemistry of some addition compounds of the PCl₁+ ion, 7421.

Structure and basicity. Part III, basicity of homogeneously substituted cyclotriphosphazatrienes and cyclotetraphosphazatetraenes, 2804.

Studies in phosphorylation. Part XXVI, mechanism of phosphorylation by monoesters of phosphoramidic acid, 46. Part XXVII, nucleophilic displacements on methyl hydrogen N-cyclohexylphosphoramidothioate, Part XXVIII, formation of pyrophosphates from phosphoramidate monoesters, 5509.

X-Ray determination of the molecular structure of a Wittig reagent: p-tolyl triphenylphosphoranylidenemethyl sulphone, 5785.

Sulphoxides. Part I, oxidation of tervalent phosphorus compounds by dimethyl sulphoxide, 4296

Synthesis of D- and L-2-amino-2-carboxyethyl 2-N'-phosphonoguanidinoethyl hydrogen phosphate (phospholombricine), 12.

Synthesis and chemistry of phospholes, 2184. Tetraphenyldiphosphine monoxide, 3500.

Tritertiary phosphine monocarbonyl complexes of nickel,

Photochemistry of phosphorus compounds. Part II, farultraviolet absorption spectra of some phosphorus oxyanions in aqueous solution, 1440. Part III, photolysis of ethyl dihydrogen phosphate in aqueous solution, 5380.

organic. Part II, some photosensitive protecting groups, 4758. Part III, effect of light on some Diels-Alder systems, 5183.

Liquid-phase photolysis. Part VIII, preparation of adducts of maleic anhydride and substituted benzenes. Factors governing orientation and reactivity in photoaddition to aromatic rings, 918.

Perfluoroalkyl derivatives of nitrogen. Part XII, reversible photochemical dimerisation of trifluoronitrosomethane and rearrangement of the o-nitroso-dimer to bistrifluoromethylamine, 1675. Part XIII, tristrifluoromethylhydroxylamine, 1681.

Photochemical and non-photochemical reaction of bromide ion with p-nitrobenzenediazonium ion in dimethyl sulphoxide, 805.

Photochemical decomposition of some aryl esters, 5162.

Photochemical transformations. Part XVI, novel synthesis of lactones, 181. Part XVII, improved methods for the decarboxylation of acids, 2438. Part XVIII, experiments related to the synthesis of conessine, 2444. XIX, some photosensitive protecting groups, 3571.

Photolysis of 3-t-butyldiazirine, 3101.

Photochemistry (contd.):

Photolysis of diethylamine and triethylamine, 4822.

Photolysis of 3-methydiazirine (cyclodiazoethane), 1700.

Photo-oxygenation of 3-acetoxyergosta-3,5,7,22-tetraene and related compounds, 6991.

Polyfluoroarenes. Part VII, photochemical reactions of trichlorosilane and trimethylsilane with hexafluorobenzene, 6702.

Rearrangement of aromatic N-nitroamines. Part VI, thermal and photochemical rearrangements of N-methyl-N-nitro-1-naphthylamine, 7158.

Stereospecific photoaddition of formamide to norbornene, 800.

Synthesis and reactions of branched-chain hydrocarbons. Part XVII, N-chlorosulphonamides as chlorinating agent, 3228. Part XVIII, chlorination of 2,2,4-trimethylpentane, 3235.

Synthesis of methyl derivatives of naphtho[2,1-b]thiophen and 11-thiabenzo[a]fluorene by photocyclisation of stilbene isosters, 6221.

Photometry. Co-catalysis in Friedel-Crafts reactions. Part VIII, visible chromophores, 1761.

Phthalaldehydic acid, and related compounds, condensation of, with various heterocyclic systems, 687.

mechanism of reaction with indoles. Intramolecular catalysis in aldehyde reactions, 680.

Phthalanthranilic acid, its structure and reaction in Friedel-Crafts syntheses, 2165.

Physical properties and chemical constitution. Part XL, electrical dipole moments of some cyclic diketones, 2067. Part XLI, naphthalene compounds, 2072. Part XLII, electric dipole moments of nitrophenylpyridines, 5311. Part XLIII, electric dipole moments of azobenzene, azopyridines, and azoquinolines, 5316. Part XLIV, electric dipole moments of some dialkyl sulphides, disulphides, sulphoxides, and sulphones, 5323. Part XLV, electric dipole moments of some aryl sulphides, sulphoxides, and sulphones, 5860.

Piceatannol, constitution of, 4579.

Piperidine, kinetics of reactions with 2-, 6-, or 8-chloro-9-methylpurine in ethanol. Nucleophilic displacement reactions in aromatic systems. Part IX, 3017.

Preparation of N-t-butyl-4-piperidone, 2270.

Proton magnetic resonance in some substituted epimeric piperidin-4-ols, 3467.

Platinum, triphenylgermyl-, complexes, 5422.

Alkylplatinum chlorides, 5737.

Complexes of palladium(II) and platinum(II) with mixed phosphorus-nitrogen ligands, 5210.

Crystal structure of trimethyl-(8-quinolinato)-platinum(IV), 6899.

Five co-ordinate palladium(II) and platinum(II), 3060.

Improved preparative method for complexes $[Pt_2Cl_4(R_3M)_2]$ (M = P or As), 7533.

Infrared spectra of trimethyl- and triethyl-platinum chlorides, 5737.

Mechanisms of substitution reactions of octahedral bis-(ditertiaryarsine) complexes. Part II, reduction of dichlorobis-(o-phenylenebisdimethylarsine)platinum(IV) salts by thiocyanate ions, 5196.

Metal-β-diketone complexes. Part I, metal-carbon bonding in some platinum acetylacetonates, 6740.

Pentafluorophenyl derivatives of transition metals. Part IV, platinum(II) compounds, 5275.

Phosphine and phosphite complexes of platinum(II) fluoride, 1376.

Proton magnetic resonance spectra of some complex platinum hydrides, 3879.

platinum hydrides, 3879. Rates and mechanism of substitution reactions of five-

co-ordinate platinum(Π) complexes, 5521. Relative signs of the spin-spin coupling constants $J(^{195}\text{Pt-CH}_3)$ and $J(^{195}\text{Pt-CH}_2)$ in triethylplatinum

chloride tetramer, 6664. Stereochemistry of β -diketo-complexes with trimethyl-platinum(IV). Part IV, crystal structure of μ -ethyl-enediaminebis[trimethyl(acetylacetonato)platinum(IV)],

630. Sulphur and selenium co-ordinate link: five-co-ordination in complexes of bivalent palladium and platinum, 5371. Platinum (contd.):

Transition metal-carbon bonds. Part III, cyclopentadienyltrimethylplatinum(IV), 1529.

Pleiadene-7,12-dione, 7,12-dihydro-, and related compounds, ring-c expansion and fine structure of. Transannular reactions of 7-, 8-, and 9-membered rings fused to planar systems, 7500.

Podophyllotoxin-analogues. Lignans. Part III, synthesis of

1-arylnaphthalenes, 3578.

Polarography of quinoline derivatives. Part VIII, reduction waves of certain 8-substituted quinaldines and quinaldinic acids, 1506. Part IX, amperometric titrations with 8-hydroxyquinaldinic acid, 1511.

Polarographic reduction of complexes of rhodium(III), 4107.

Polymers. Acid-catalysed polymerisation of cyclosiloxanes.

Part I, kinetics of the polymerisation of octamethylcyclotetrasiloxane catalysed by anhydrous ferric chloridehydrogen chloride, 2027.

Cationic and pseudocationic polymerisation of aromatic olefins. Part I, kinetics and mechanism of the pseudocationic polymerisation of styrene by perchloric acid, 4826

Cationic polymerisation of a bicyclopentyl derivative: mechanism of formation of deeply coloured, electrically conducting polymers, 3252.

Kinetics of ionic polymerisation. Part XI, low-temperature polymerisation of isobutyl vinyl ether in n-hexane-toluene as solvent, 7405. Part XII, polymerisation of isobutyl vinyl ether at -40° in the solvent 50:50 n-hexane-toluene, 7412.

Low-temperature polymerisation of isobutene. Part VI, polymerisation by titanium tetrachloride and water in methylene dichloride, 275.

Non-stationary states in the polymerisation of trioxan, 1478.

Phosphonitrilic derivatives. Part XII, heats of polymerisation of the cyclic phosphonitrilic chlorides, 2112.

Poly-cyclotrimerisation of alkadiynes and cycloalkadiynes on complex metal catalysts, 3160.

Polyesters from the anhydrosulphites of α -hydroxy-acids, 791.

Polymer networks, solvent modified. Part IV, styrenedivinylbenzene copolymers made in the presence of non-solvating diluents, 304.

Polymerisation of styrene by titanium tetrachloride. Part IV, kinetics of polymerisation in methylene dichloride, 5579.

Reactions of phospha-alkenes with nucleophiles and as intermediates in polymer synthesis. Organophosphorus chemistry. Part III, 6875.

Thermal polymerisation of carbon suboxide, 3866.

Polyoxymethylene compounds. Part II, 1012.

Polysaccharides synthesised by Monodus subterraneus. Part II, cell-wall glucan, 3014.

water-soluble, of *Cladophora rupestris* and of *Chaetomorpha* spp. Part II, site of ester sulphate groups and the linkage between the galactose residues, 2958.

Carbohydrates of *Phaeodactylum tricornutum*. Part I, preliminary examination of the organism, and characterisation of low molecular weight material and of a glucan, 7035. Part II, a sulphated glucuronomannan, 7042.

Carrageenans. Part IÎ, positions of the glycosidic linkages and sulphate esters in λ-carrageenan, 3535.

α-1,4-Glucosans. Part XIX, action of acid on maltose and starch-type polysaccharides, 2150.

Isolation of crystalline 3-O-α-D-galactopyranosyl-L-arabinose from a polysaccharide found in *Watsonia* corm-sacs, 2987

Plant gums of the genus Sterculia. Part II, Sterculia caudata gum, 4318. Part III, Sterculia setigera and Cochlospermum gossypium gums, 4325.

Cocmosperium gossprum gums, 4525.
Porphyran: a polysaccharide with a masked repeating structure, 5880.

Structure of alginic acid. Part V, isolation and unambiguous characterisation of some hydrolysis products of the methylated polysaccharide, 1182.

Studies on dextrans and dextransaes. Part V, synthesis of the three carboxylic acids derived from methyl β -malto-

side, 5157.

Porphyrins. Corrins, experiments towards the synthesis of. Part IX, nature of the sodamide-catalysed dimerisation of 1-pyrroline 1-oxides, 2337.

Corroles. Part I, synthesis, 1620.

Nitration and hydroxylation of atioporphyrin I, 4303. Properties of cobalamins with sulphur-containing ligands,

Potassium cyanide, interaction with p-nitrosoanilines, 1549. Crystal structures of the acid salts of some monobasic acids. Part X, potassium, rubidium, and cæsium hydrogen

di-trifluoroacetates, 2530.

Potentiometry. Fluorescence of mono- and bis-(8-quinolato-5-sulphuric acid)zincate(II) anions in aqueous solution,

Prévost reaction. Hydroxylation of olefins with silver iodide dibenzoate, 5203.

Primocarcin and analogues, synthesis of, 470.

Pristimerin chromophore, synthetical approaches to, 361.

Propoxyphene-analogues, 1,2-diaryl-4-dimethylamino-3methylbutan-2-ols, 4092.

Protactinium. Protactinium(v) surphates and selenates, 176. Protoaphin, enzymic converson into xanthoaphin. Colouring

matters of the Aphididae. Part XXIV, 4363.

Pteridine studies. Part XXVIII, some 6- and 7-substituted pteridines, 27. Part XXIX, methylation of 7-amino- and 4,7-diamino-pteridine, 1175. Part XXX, some Michael-type addition reactions of 7-hydroxypteridine, 6930.

2,4-Diamino-7-hydroxymethylpteridine and related compounds, 1530.

Pyrimidine reactions. Part X, methylation of triaminopyrimidines; conversion of the resulting imines into pteridines, 3770.

Purines, pyrimidines, and imidazoles. Part XXI, uracils and isocytosines, 1642. Part XXII, some 5-(alkylthio)uracils and derived sulphoxides and sulphones, 3987. Part XXIII, use of 5-phospho-β-D-ribosyl azide in a direct synthesis of nucleotides, 6864.

Nucleophilic displacement reactions in aromatic systems. Part IX, kinetics of the reactions of 2-, 6-, or 8-chloro-9-methylpurine with piperidine in ethanol, 3017.

Pyrazines. Part II, preparation and reactions of 2,3-, 2,5-, and 2,6-disubstituted pyrazines, 6681.

Pyrazole and imidazole. Kinetics and mechanism of heteroaromatic nitration. Part II, 1051.

Reactions of some unsaturated pyrazole compounds, 3862. Pyrethrins and related compounds. Part VI, structures of

the "enols" of pyrethrolone, 3097. Pyridazines. Part II, action of Grignard reactions on 6-aryl-2,3,4,5-tetrahydro- and -2,3-dihydropyridazin-3-ones, 3342.

Part III, synthesis of 6-aryl-2,3,4,5-tetrahydro- and -2,3-dihydro-pyridazin-3-ones and 3,6-diarylpyridazines, 7005.

Pyridines, nitrophenyl-, electric dipole moments of Physical

properties and chemical constitution. Part XLII, 5311. potentially tautomeric. Part V, phenyl 2-, 3-, and 4-picolyl sulphones, 3090. Part VI, 2-, 3-, and 4-phenacyloyridines, 3093.

Addition reactions of heterocyclic compounds. Part XXI, nuclear magnetic resonance spectra of some quinolizines and their salts, and new adducts from alkylpyridines, 948

Applications of proton resonance spectroscopy to structural problems. Part XXI, cations of thiopyridones and aminopyridines, 3825.

Congeners of pyridine-4-carboxyhydrazide. derivatives of 1,2,3-thiadiazole, 5166. Part II,

Heterocyclic polyfluoro-compounds. Part IV, nucleophilic substitution in pentafluoropyridine: preparation and properties of some 4-substituted 2,3,5,6-tetrafluoropyridines, 575. Part V, high-resolution nuclear magnetic resonance spectra of pentafluoropyridine and its derivatives, 582. Part VI, preparation of pentafluoropyridine chlorofluoropyridines from pentachloropyridine, and

Polyfluoroheterocyclic compounds. Part IV, compounds derived from 4-aminotetrafluoropyridine, 5040. Part V, catalytic reduction of perfluoro- and chlorofluoro-pyridines and the preparation of polyfluoropyridinecarboxylic acids, 5045.

Pyridines (contd.):

Pyridine and cyanoacetic ester, reaction with acetylenic esters, 4355.

Pyridine, reaction with keten. Keten. Part I, 3332

Pyridine-2,6-dialdoxime and its iron(II) complex. Effect of co-ordination on ionisation, 1149.

Stability of N-heterocyclic oxime derivatives. Part I, decomposition of N-methylpyridinium 3- and 4-O-acetylaldoxime iodides in aqueous solution, 3729. Part II, decomposition of N-methylacetylpyridinium O-acetylketoxime iodides in aqueous solution, 3734.

Synthesis of glycosylpyridinium compounds from glycosylamines and from glycosyl halides, 610.

Pyrido [3,2-d] pyrimidin-4(3H)-ones, 4240.

Part XIV, synthesis of 2,5-dihydroxy-Pyrimidines. pyrimidine, 7116.

hydro-. Part IV, catalytic reduction of substituted

pyrimidines, 1406.

purines, and imidazoles. Part XXI, uracils and isocytosines, 1642. Part XXII, some 5-(alkylthio)uracils and derived sulphoxides and sulphones, 3987. Part XXIII, use of 5-phospho-β-D-ribosyl azide in a direct synthesis of nucleotides, 6864.

Dimroth rearrangement. Part IV, study of facilitation by electron-withdrawal. Alkylated 2-alkyliminopyrimidines, 5542. Part V, mechanism of the rearrangement of 1-alkyl-1,2-dihydro-2-iminopyrimidines in aqueous solution, 7071.

Isolation of a hitherto undescribed sulphate of cytosine and an improved preparation of the intermediate 1-cyano-2,2-diethoxyethane, 1515.

Nuclear methylation of some 6-substituted 4-amino-

pyrimidines: a correction, 832.

Nucleosides. Part I, O-glucosides of cytosine and their rearrangement to N-glucosides, 6125. Part II, further studies with O-glycosides of cytosine, 6130. Part III, synthesis of 1-methyl-2'-deoxycytidine, and comments on the n.m.r. spectra of cytosine nucleosides, 6134.

Preparation of some 4,6-disubstituted pyrimidine-5-carboxylic acids, 6695.

Pyrimidine reactions. Part VII, methylation of substituted 2,4-diaminopyrimidines, 755.

Pyrimidine reactions. Part X, methylation of triaminopyrimidines; conversion of the resulting imines into pteridines, 3770.

Pyrimidine reactions. Part XII, thermal rearrangement of 2-alkoxypyrimidines, 4911.

Reaction of hydroxylamine with cytosine and related compounds, 208.

Pyrimido[3,4-a]benzimidazole: novel ring system, 5125.

4-Pyrones. Part V, some reactions of flavanone and its 5,6-benzo-derivative, 494.

Pyrroles and related compounds. Part V, syntheses of some pyrromethanes, tripyrranes, and porphyrins, 1328. Part VI, pyrrolylethylenes, 4385. Part VII, synthesis of pyrroles from esters of toluene-p-sulphonylglycine, 4389.

Applications of proton resonance spectroscopy to structural problems. Part XXII, 3-amino-4-cyanopyrrolines and their transformation products, 4546.

Dipyrromethene salts, reaction of, with methyl ketones and with dicyanomethane, 7001.

Experiments towards the synthesis of corrins. Part IX, nature of the sodamide-catalysed dimerisation of 1pyrroline 1-oxides, 2337.

Infrared spectra of pyrrolic esters, 5149.

Methyl pyrrole-2-carboxylate and related pyrroles, halogenation of, 459.

Nitroxide radicals. Part I, chemistry of azo-1-pyrroline 1-oxides, 1224.

Self-condensation of 3,4-dialkylpyrroles, 1518.

Some reactions of 2-2'-pyrrolyl-1-pyrrolines, 2614.

Studies in the pyrroline series. Part IV, ultraviolet absorption of the unconjugated azomethine group, 2313.

Pyrrolo[1,2-a]quinoxalines, further syntheses and properties of, 3678.

Pyrrolo[2,1-b]thiazoles, 6-substituted-, synthesis of. Studies of heterocyclic compounds. Part I, 65. Pyrrolo[2,1-b]thiazolium cations, structure of. Nuclear mag-

netic resonance. Part III, 4368.

Quaternary ammonium salts, cyclic. Part II, dipyrido-[1,2-a:1',2'-d]pyrazidi-inium salts, 3885. Part III, synthesis of dipyrido[1,2-a: 2',1'-c]pyrazidi-inium salts and their 6-alkyl and 6-aryl derivatives, 5816.

cyclic, stereoisomeric pairs of. Part I, stereospecificity in quaternisations of N-alkylcamphidines, 2-methylpyrrolidenes, 2-methyl- and 4-phenylpiperidines, trans-decahydroquinolines, and tropanes, and configurations of the diastereoisomeric salts, 1711. Part II, configurational analysis by proton magnetic resonance spectroscopy, 1726. Part III, examination of differential reactivity of certain N-ethyl-N-methyl pairs in nucleophilic substitution reactions, 1729. Part IV, interconversion of N-benzyl-N-methyl quaternary iodides in hot chloroform, and general theoretical discussion of reactions involving a change between co-ordination numbers 3 and 4 at a sixring atom, 1733. Part V, derivatives of 4-aza-5αcholestane, 5439.

Quinazolines. Part VI, 2,2'- and 4,4'-biquinazolinyls, 1258. Part VII, steric effects in 4-alkylquinazolines, 5360.

Amino-oxy-derivatives. Part VI, some quinazol-4-ones, 6278.

Quinic acid, 4-dehydro-, 5755.

Quinizarins, 2-n-alkyl-, reactions of. New intermediates and dyes, 626.

Quinolines, halogeno-, preparation and nuclear magnetic resonance of. Nearly degenerate ABX spectra, 6004. 3-phenyl-, rearrangements in the oxidation of, 871.

Polycyclic reduction products of 6-nitroquinoline, 799.

Quaternary salts of 6-dialkylaminoquinolines, 4430. Quinoline derivatives, polarography of. Part VIII, reduction waves of certain 8-substituted quinaldines and quinaldinic acids, 1506. Part IX, amperometric titrations

with 8-hydroxyquinaldinic acid, 1511. Quinolizidines. Re-examination of the stereochemistry of quinolizidine and the methylquinolizidines through measure-

ment of their rates of quaternisation and those of the hexahydrojulolidines, 6797.

Quinolizines. Addition reactions of heterocyclic compounds. Part XXI, nuclear magnetic resonance spectra of some quinolizines and their salts, and new adducts from alkylpyridines, 948.

Addition reactions of heterocyclic compounds. Part XXIII, formation of Kashimoto's compound from 1,2,3,4-tetramethoxycarbonylquinolizinium perchlorate and related reactions, 2633.

Synthesis of a 6-hydroxyquinolizin-4-one; condensation of diethyl β -oxoglutarate with electrophilic ethoxymethylene compounds. Heterocyclic compounds with bridgehead nitrogen atoms. Part II, 1629.

Quinones, naturally occurring. Part VI, spinochrome D,

Benzoquinones, alk-2-enyl-, action of pyridine on. Chrom-3-en-6-ols, 5060.

Naphthaquinone chemistry. Part IV, reactions of phosphines with vicinal bisazides, 1003. Part V, reactions of azidonaphthaquinone with phosphite esters, 2727.

1,4-Quinones, interaction of, with sydnones, 5871. Some derivatives of 1-aza-anthracene-9,10-quinone, 6074.

R

Radicals, aryloxy-. Part IV, electron spin resonance spectra of some ortho-monobenzosemiquinones and secondary radicals derived therefrom, 1488.

benzyl, derived from cyclic acetals of hydrobenzoin, 6737. benzyl, reaction with anthracene, 4396.

difluoroamino-, reactions of. Part I, hydrogen abstraction from acetone and the strength of the C-H bond in acetone, 5080.

free benzyl, reaction with indole, 4253.

iminoxybenzoquinone-, electron spin resonance spectra of, 4628.

nitroxide. Part I, chemistry of azo-1-pyrroline 1-oxides,

vinyl, preparation and reactions of, 6870.

Radicals (contd.):

Addition of benzyl radicals to olefinic systems, 6730.

Aroyl peroxides. Part II, decomposition of benzoyl peroxide in benzene, 995. Part III, decomposition of benzoyl peroxide in chlorobenzene and bromobenzene,

o-Biphenylyl radical as an arylating agent. Synthetical experiments in the o-terphenyl series, 2649.

Crystallographic data for 2,2-diphenyl-1-picrylhydrazyl,

Derivatives of 4-(dihydroxyphosphinyloxy)phenyldiphenylmethane and a related free radical, 5108.

Determination and reaction of 2,2-diphenyl-1-picrylhydrazyl with thiosalicylic acid, 5567.

Electron spin resonance spectra of some hydroxylamine freeradicals, 751.

Free-radical addition of phosphine to allene, 3901.

Homolytic aromatic substitution. Part XXXII, reactions with meta-substituted phenyl radicals, 101. Part XXXIII, reactions with arylazotriarylmethanes, 110.

Homolytic substitution at a saturated carbon atom. Part III, kinetics of the gaseous reaction of nitric acid in nitrogen alone and in the presence of methane, 1063.

Preparation of 1-bromo-1-fluoroethane and 1-bromo-1,1-difluoroethane, 6661.

Production of free radicals in the reaction of Grignard reagents with organic halides in the presence of cobaltous chloride, 7062.

Pyrolysis of but-1-ene, and the resonance energy of the allyl radical, 6652.

Radical selectivity: initial stages of alkane oxidations, 3491. Reaction of hydrogen atoms with nitrous oxide, 5724.

Reactions of aryl radicals with aliphatic compounds. III, reactions of phenyl radicals with bromotrichloromethane, 2402. Part IV, quantitative study of abstraction from chloroform, carbon tetrachloride, and bromotrichloromethane, 3939. Part V, reactions with methylene dibromide and bromoform, 3950.

Reactions of methoxyl, ethoxyl, and t-butoxyl with nitric oxide and with nitrogen dioxide, 6965.

Reactions of methyl radicals with formamide, N-methyl- and NN-dimethyl-formamide, 1386.

Reactions of the isopropoxyl radical. Part I, pyrolysis of

isopropyl nitrite in a static system at $175-200^{\circ}$, 4417. Synthetic aspects of free-radical addition. Part II, preparation of homologues by homolytic alkylation of acetic acid and related compounds, 1918. Part III, intramolecular radical-addition reactions, 1932. Part IV, addition of cyclohexane to olefins, 1939.

Thermal decomposition of some perbenzoyl aryl carbonates in benzene, 2458.

Unstable intermediates. Part XXVI, aliphatic carbonium ions: condensation with acetic acid, 378. Part XXVII, cations of hexamethylbenzene and durene, 1120. Part XXVIII, solvated electrons: rigid organic solvents, 1127. Part XXIX, sigma and pi radicals, 2276. Part XXX, solvated electrons: line-shapes of electronic absorption bands, 3759. Part XXXI, solvated electrons: solutions of europium in ammonia, 3763. Part XXXII, electron spin resonance study of the radicals $N_2H_4^+$, $C_2(CN)_4^-$, and 1,1-diphenyl-2-picrylhydrazyl, 6504. Part XXXIII, solvated electrons: electron spin resonance of solutions of potassium in ethylamine, 6656.

Radiochemistry. Chemical effects of γ -radiation on organic systems. Part II, addition of tertiary amines to alkenes, 5704.

Post-irradiation reactions in neutron-irradiated liquid bromobenzene, 4751.

y-Radiation, chemical effects on organic systems. Part XI, action of radiation on triethylamine, diethylamine, n-butylamine, and 1-methylpiperidine, 4434.

Solute effects in the radiolysis of cyclohexane solutions. Effect of substituted aromatic compounds, 5402.

Redox. Heterogeneous catalysis in solution. Part II, effect of platinum on oxidation-reduction reactions, 78. Part III, heterogeneous catalysis and other types of interaction between metals and oxidation-reduction reactions, 97.

Reduction, Clemmensen. Part II, cyclohexenones, 5943. of oximes by hydrazine-Raney nickel, 822.

Reduction (contd.):

of phenyl vinyl ketoxime with lithium aluminium hydride,

of substituted nitrobenzenes. Part II, reduction of some aromatic nitro-compounds with reducing sugars, 1547. with Raney alloy in acid solution, 5775.

Occurrence of 1,2- or 1,4-addition in the reduction of some αβ-unsaturated ketones with metal hydrides, 5280.

Reducing reactions of tin(II) in aqueous solution. Part III, reduction of various common oxidising agents, 5890.

Rhenium, carbonyldi(tertiary arsine) complexes of, 550.

β-diketone complexes of, 490.

Chemistry of the metal carbonyls. Part XXX, transbromotetracarbonyl(triphenylphosphine)rhenium, 5259.

Rhodanine and related compounds. Reaction of silver(1) ions with organic reagents containing the HN-C=S grouping. Part I, 3738.

new derivatives of, synthesis of, 5127.

Rhenium. Bonding in tervalent rhenium Re₃X_{9+n}ⁿ⁻ anions,

Rhodium. Bridge-splitting and replacement reactions of rhodium carbonyl chloride, 1900.

Catalytic approaches to complex compounds of rhodium(III), 1951.

Magnetochemistry of the hexachlororhodate(IV) ion, 4724. Metal-metal bonds. Part III, formation of rhodiummercury bonds from complex rhodium hydrides, 5331.

Polarographic reduction of complexes of rhodium(III),

Reactivity of co-ordinated oxalate. Part IV, racemisation of sodium trisoxalatorhodium(III), 2280.

Relative stabilities of halogeno-complexes. Part IV, trans-Rh en₂Cl₂+-Br- equilibria, 5931.

Ribonucleic acid, permanganate-oxidised, preparation of, and its hydrolysis with pancreatic ribonuclease, 3998.

Rubeanic acid, (dithio-oxamide), crystal and molecular struc-

Rubidium. Crystal structures of the acid salts of some mono-Part IX, rubidium hydrogen bisglycollate, basic acids. 2521. Part X, potassium, rubidium, and cæsium hydrogen di-trifluoroacetates, 2530.

Ruthenium. Crystal structure of tris-(o-diphenylarsinophenyl)arsineruthenium dibromide, 7471.

Kinetics of oxidation of the ruthenium(II)-tris-o-phenthroline

complex by cerium(IV), 5749. Tautomerism of arene and ditertiary phosphine complexes of ruthenium(0), and the preparation of new types of hydrido-complexes of ruthenium(II), 843.

Schiff bases, syntheses of. Removal of toluene-p-sulphonyl groups from sulphonamides. Part I, 485.

Schmidt Reaction with aromatic ketones, 4806.

Sclerotinol, synthesis of. Chemistry of fungi. Part XLV, 4127.

-)-Sclerotiorin. Chemistry of fungi. Part LII, 7260.

Secalonic acid A and B, and ergochrysin A, constitution of. Chemistry of fungi. Part XLVII, 4144.

Selenium and sulphur co-ordinate link: five-co-ordination in complexes of bivalent palladium and platinum, 5371.

pentafluoroethyl derivatives of, 7511.

Infrared spectra and structures of some complexes of 1,4-diselenan, 2063.

Organoselenium derivatives of metal carbonyls. Part I, complexes derived from manganese pentacarbonyl hydride, 7515.

Preparation and structure of 1,3,5-triselenan, 807.

Quaternisation of 2,1,3-benzothiadiazole and 2,1,3-benzoselenadiazole. Part I, preparation of methyl- and ethyl-2,1,3-benzothiadiazolium and -benzoselenadiazolium salts,

Reaction of organomercury compounds with covalent selenocyanates, 2395.

Reactions and derivatives of bis(trifluoromethylseleno)mercury, 940.

Solutions in selenic acid. Part II, transport-number measurements in selenic acid solutions, 3796.

Silicon, compounds of. Part IV, reactions of hexamethyldisilazyl-lithium with chlorosilanes, 2997. Part V, octaisopropylsilsesquioxane, its bromination, and ¹H nuclear magnetic resonance spectroscopy, 7325.

polyfluoroalkyl compounds of. Part VI, reaction of 3,3,3trifluoropropene with, and the conversion of the products into silicones and polysiloxanes, 2101. Part VII, thermal and hydrolytic stabilities of α -, β -, and γ -fluorine-substituted alkylpolysiloxanes, 2107.

tetrafluoride as a fluorinating agent. Part II, 827.

tetrahalides, stereochemistry of addition compounds,

Acid-catalysed polymerisation of cyclosiloxanes. Part I, kinetics of the polymerisation of octamethylcyclotetrasiloxane catalysed by anhydrous ferric chloride-hydrogen chloride, 2027.

Aromatic reactivity. Part XXXI, effects of phosphoruscontaining substituents in protodesilylation, 6306.

Fission of silicon-sulphur bonds in organosilicon compounds by boron trichloride and phenylboron dichloride, 3045.

Gas-phase reactions of halogenoalkylsilanes. Part III, 2-chloroethyldiethylchlorosilane, 5481.

Organosilicon amines, reactions of, with boron halides, phenylboron dichloride, and B-trichloroborazole, 62.

Organosilicon compounds. Part XXX, stereochemistry of the cleavage of a silicon-aryl bond by bromine, 521.

Organosilicon compounds. Part XXXV, effects of some phosphorus-containing substituents on the rates of cleavage of benzyltrimethylsilanes, 4994.

Polyfluoroarenes. Part VII, photochemical reactions of trichlorosilane with hexafluorobenzene, 6702.

Preparation and reactions of 1,3-dithia-2-silacyclopentane derivatives, 7098.

Reactions of aminosilanes and disilazanes with halogenocompounds of phosphorus and arsenic, 57.

Relative stabilities of some complexes of dimethylaminosilanes and -methanes with Lewis acids, 4043.

Synthesis of aryl-substituted p-disilylbenzenes, 2269.

Thermal dehydration of silica xerogel, effect of sodium tungstate additions, 3854.

Silver fulminate, solid-phase reactions in, 1474.

Metal-metal bonds. Part V, complexes containing copperand silver-metal linkages, 5343.

Oxidations of primary and secondary amines with argentic picolinate. Metal ions and complexes in organic reactions. Part V, 4962.

Reaction of silver(I) ions with organic reagents containing the HN-C=S grouping. Part I, rhodanine and related compounds, 3738.

Sodium, gas-phase reactions of. Part I, rates of reaction of methylchlorosilanes and the analogous carbon compounds, 5068. Part II, rates of reaction of cycloalkyl bromides and vinyl bromides, 6323.

in liquid ammonia, reaction of, with vinyl-lead compounds, $66\overline{5}9.$

liquid, reactions of, with transition-metal oxides. Part I, dioxides of molybdenum, tungsten, and uranium, 4483. Part II, reduction of chromium trioxide to a ternary oxide of chromium(IV), 5534.

silicate, hydrolysis of: ultracentrifugation in chloride solutions, 4444.

Spectra. charge-transfer: contact, association constants from, 7534.

electronic: and magnetic properties of some isothiocyanate complexes of manganese and iron, 268.

and preparation of some tetrahedral complexes of iron(11), 454.

of organometallic compounds. Part I, phenyl compounds of Group IV containing a chromophoric metalmetal linkage, 4690.

Unstable intermediates. Part XXX, solvated electrons: line shapes of electronic absorption bands, 3759.

electron spin resonance: of some iminoxy-benzoquinone radicals, 4628.

of some ortho-monobenzosemiquinones and secondary radicals derived therefrom. Aryloxy-radicals. Part IV, 1488.

Some hydroxylamine free radicals, 751.

Spectra (contd.):

electron spin resonance: Structure and reactivity of transition-metal complexes with polyatomic ligands. Part I, $[Mn(CN)_5NO]^{2-}$ and $[Fe(CN)_5NO]^{3-}$ 410. Unstable intermediates. Part XXXII, radicals $N_2H_4^-$,

 $C_2(CN)_4$, and 1,1-diphenyl-2-picrylhydrazyl, 6504. Part XXXIII, solvated electrons: electron spin resonance of solutions of potassium in ethylamine, 6656.

infrared: and ¹H nuclear magnetic resonance spectra of some mononuclear phosphorus(v) compounds containing the P-NMe₂ grouping, 4802.

and Raman spectra of 1,1-dichloro-2-fluoroethylene, 2-bromo-1,1-dichloroethylene, and bromotrichloroethylene. Spectroscopic studies. Part VI, 7481. of pyrrolic esters, 5149.

of some trifluoromethanesulphenylureas, 6613.

and structures of osmium nitrido-complexes, 3694. and structures of some complexes of 1,4-diselenan, 2063.

and synthesis of phenylboracyclopentane, and other phenylboron compounds. Heterocyclic organoboron compounds. Part III, 448.

of 1,1-dinitro-carbanion salts, 5838.

of 2,5-disubstituted furans. Studies in furan chemistry. Part I, 6057.

of some addition compounds of aluminium and gallium trihalides, 5850.

of some beryllium hydrides and deuterides, and some alkylberyllium hydride complexes, 692.

of terpenoid compounds. Part I, hydrogen bonding in cedrelone and related compounds, 1235.

of trimethyl- and triethyl-platinum chlorides, 5737.

Amino-derivatives of metals and metalloids. Part II, amino-stannylation of unsaturated substrates, and the infrared spectra and structures of carbamato- and dithiocarbamato-trimethylstannanes and related compounds, 2157.

Carbonyl absorption of phenolic acetates, 3590. Cephalosporanic acids. Part I, infrared absorption and proton magnetic resonance spectra of cephalosporin and penicillin analogues, 1595.

Ethynyl-hydrogen bond. Part II, association of benzoylacetylene with aromatic hydrocarbons and with n-butyl ether studied by infrared and proton resonance spectroscopy and by calorimetry, 5914.

Far-infrared spectra of some halogeno-iridium(III) complexes; trans-effects in iridium(III) complexes, 6789.

Hydrogen bonding in gaseous mixtures. Part I, infrared spectra of ether-hydrogen chloride systems, 497. Part II, infrared spectra of ether-hydrogen fluoride systems, 503. Part III, infrared spectra of complexes formed by hydrogen fluoride with carbonyl and other compounds, 510. Part IV, infrared intensities. Effect of deuterium substitution, 514. Part V, infrared spectra of amine-alcohol systems, 3080. Part VI, infrared spectra of ether-nitric acid systems, 3085.

Infrared absorption of substituents in heterocyclic systems. Part IX, amine-imine tautomerism by infra-

red spectroscopy, 5230.

Infrared spectra (1000-200 cm.-1) of some transitionmetal complexes with tertiary arsine oxides, 1499.

Infrared studies with terpenoid compounds. Part II, carbonyl absorptions of y-lactones, 3958.

Low-frequency infrared spectra of some octahedral metal diarsine chloro-complexes, 1483.

Molecular-orbital theory of organometallic compounds. Part V, far-infrared spectra of the tricarbonylarenechromium, 2822.

Nickel-thiourea complexes. Part I, 2036.

Preparation and spectra of uranium pentachloride complexes, 5217.

Structural assignments in the bicyclo[3,3,1]nonane system. Bridged ring systems. Part V, 1243.

Tin(IV) fluoride complexes, 3174.

Vibrational frequency correlations in heterocyclic molecules. Part VIII, infrared spectra of virus inhibitors related to benzimidazole, 2331.

mass: and organic analysis. Part VI, mass spectra of menthone, isomenthone, and carvomenthone, 6478. of diphenyl and dibenzo-compounds, 5934.

Spectra (contd.):

mass: of some fluorine-containing 1,3,4-oxadiazoles, 6842. Dissociation of o-nitrotoluene under electron impact, 6403. Electron-impact fragmentation of pentafluorobenzamide,

Electron impact studies of some aromatic fluorocarbons, 1520.

Indole alkaloids. Part IV, structure of henningsamine, 2814. Part V, structure of henningsoline, 2818.

Mössbauer: of the tetrachloroferrate(II) ion, 6989.

nuclear magnetic resonance: of dihydrosterigmatocystin: correction, 5784.

of polyvanadate equilibria by use of vanadium-51, 864. of purines and pteridines. Heterocyclic chemistry.

Part III, 623. of some aromatic nitroso-compounds, 6032.

of some gibberellin derivatives. Gibberellic acid. Part XXXI, 5036.

of some halogenoquinolines and preparation of. Nearly degenerate $AB\bar{X}$ spectra, 6004.

of some quinolizines and their salts, and new adducts from alkylpyridines. Addition reactions of heterocyclic compounds. Part XXI, 948.

of 2-substituted thiazoles and thiazolium salts, 4597.

studies with the gallium-71 isotope, 4410.

Addition reactions of heterocyclic compounds. Part XXII, structures of some indoles, 2630.

Comment on the "through-space" contribution to

fluorine-fluorine coupling constants, 3483.

Compounds of silicon. Part V, octaisopropylsilsesquioxane, its bromination, and ¹H nuclear magnetic resonance spectroscopy, 7325.

3,7-Dialkylnaphthalene-1-sulphonic acids, 2324.

Fluorine nuclear magnetic resonance spectra of some perfluoroalkylhalogenophosphines, 777.

Heterocyclic polyfluoro-compounds. Part IV, highresolution nuclear magnetic resonance spectra of pentafluoropyridine and its derivatives, 582.

High-resolution fluorine magnetic resonance spectra of some pentafluorophenyl derivatives, 1117.

Long-range effects in nuclear magnetic resonance. Specific shielding by aryl groups in some flexible systems, 5714.

Long-range proton-boron coupling in dimeric dimethylaminoboron dihalides, 1534.

Nuclear magnetic resonance. Part III, structure of pyrrolo[2,1-b]thiazolium cations, 4368.

Perfluoroalkyl derivatives of nitrogen. Part XIX, synthesis, pyrolysis, and nuclear magnetic resonance evidence for restricted inversion at the nitrogen atom of trisheptafluoro-n-propylhydroxylamine, 7203.

Phosphorus-nitrogen compounds. Part XVII, ¹H and ³¹P nuclear magnetic resonance spectra of dimethylamino-derivatives of hexachlorocyclotriphosphazatri-

ene, 7193. A_2B_2 Proton resonance spectrum of 2-methyl-1,3-dioxolan, 256.

Relative signs of the spin-spin coupling constants $J(^{195}\text{Pt-CH}_3)$ and $J(^{195}\text{Pt-CH}_2)$ in triethylplatinum chloride tetramer, 6664.

Steroids. Part XXIV, preparation of some 6-substituted 4-methylcholest-4-enes, 2476. Part XXV, stereochemistry of ring a of some steroidal α -halogenoketones, 2483. Part XXVI, virtual allylic coupling in the 60 Mc. n.m.r. spectrum of 7,7-ethylenedithio-cholest-4-en-3-one, 2489.

Structure and conformation of some monosaccharides in solution, 52.

Studies in the steroid group. Part LXXVI, methylation of enol acetates and bromo-ketones. Nuclear magnetic resonance spectra of 11-keto-steroids, 2933.

Substituted oxirans, 810. Thallium-proton spin-spin coupling constants, 637.

proton magnetic resonance: and conformations of cyclic compounds. Part II, p.m.r. spectra of the conducitols, 6268.

and infrared spectra of some mononuclear phosphorus(v) compounds containing the P-NMe2 grouping. Phosphorus-nitrogen compounds, 4802.

Spectra (contd.):

proton magnetic resonance: in some substituted epimeric piperidin-4-ols, 3467.

of 11-oxo-steroids. Compounds related to the steroid hormones. Part XV, 7328.

of o-phenanthroline and some of its metal complexes, 3185.

of o-phenanthroline and some of its metal complexes in nonaqueous solution, 4706.

of some complex platinum hydrides, 3879.

solution of some classical structural problems. N-Substituted heterocyclic cations. Part V, 1372.

Acylcyclopentanetriones: comments on a recent synthesis, and observations from proton resonance on their enolisation and on isomerism in 5-methoxyhept-4-en-3-one, 2251.

Applications of proton resonance spectroscopy to structural problems. Part XVI, structure of dialkanesul. phonyl derivatives of 2-aminothiazole, 1219. Part XXI, cations of thiopyridones and aminopyridines, 3825. Part XXII, 3-amino-4-cyanopyrrolines and their transformation products, 4546. Part XXIII, determination of Hammett σ-constants for heterocycles, 6707.

Cephalosporanic acids. Part I, infrared absorption and proton magnetic resonance spectra of cephalosporin

and penicillin analogues, 1595.

Chemistry of vitamin B_{12} . Part III, proton magnetic resonance spectra of some cobalamins, 2859.

Conformational studies of six-membered heterocyclic compounds. Part I, some substituted 1,3-dithians.

Ethynyl-hydrogen bond. Part II, association of benzoylacetylene with aromatic hydrocarbons and with n-butyl ether studied by infrared and proton resonance spectroscopy and by calorimetry, 5914.
Organozine compounds. Part I, proton magnetic reson-

ance spectra of some etherates of dimethyl- and di-

phenyl-zinc, 5476.

Some Amaryllidaceae alkaloids of the 5,10b-ethanophenanthridine series and of criwelline and tazettine,

Stereoisomeric pairs of cyclic quaternary ammonium salts. Part II, configurational analysis, 1726.

Raman: and infrared spectra of 1,1-dichloro-2-fluoroethylene, 2-bromo-1,1-dichloroethylene, and bromotrichloroethylene. Spectroscopic studies. Part VI, 7481. Adducts of tin tetrachloride, 2995.

ultraviolet: and cyanohydrin dissociation constant of

4-t-butylthioacetophenone, 4599. and electronic structure of tetraboron tetrachloride,

B₄Cl₄, 6180. and ionisation constants of acridine. Acridine syntheses and reactions. Part VI, new dehalogenation of 9-chloroacridine and its derivatives, 4653.

and visible spectra of trigonal bipyramidal complexes of nickel(II), palladium(II), and platinum(II), 2771

Co-catalysis in Friedel-Crafts reactions. Part VII, formation of ultraviolet chromophores, 310

Far-ultraviolet absorption spectra of some phosphorus oxyanions in aqueous solution. Photochemistry of phosphorus compounds. Part II, 1440.

Intensity of ultraviolet light absorption by monocrystals. Part V, absorption by naphthacene at 295 and 78° K of plane-polarized light of wavelengths 1850-3200 A, 2764.

Preparation and spectra of uranium pentachloride complexes, 5217.

Studies in the pyrroline series. Part IV, the unconjugated azomethine group, 2313.

Ultraviolet absorption of some substituted azobenzene and symmetric 1,1'- and 2,2'-azonaphthalene derivatives, 5245.

vibrational: of pseudohalide complexes. Part I, tetrahedral isocyanate complexes, 262. Part II, planar and octahedral isocyanate complexes, 1286.

of some addition compounds of trimethylamine, 6595. of tetrachloroborate and tetrabromoborate ions, 6589.

visible: and ultraviolet spectra of trigonal bipyramidal complexes of nickel(II), palladium(II), and platinum(II), 277Î.

Spectroscopy, molecular photoelectron. Part III, ionisation potentials of oxygen, carbon monoxide, nitric oxide, and acetylene, 616. Part IV, ionisation potentials and configurations of carbon dioxide, carbon oxysulphide, carbon disulphide, and nitrous oxide, 6350.

Soret coefficients for solutions of carbon tetrachloride in benzene, measurement of, by a modified type of thermal-

diffusion cell, 6576.

Spectral and magnetic properties of copper(II) benzoate complexes, 3894.

Spectroscopic studies. Part V, spectra and structure of monohalogenoacetonitriles, 4632. Part VI, infrared and Raman spectra of 1,1-dichloro-2-fluoroethylene, 2-bromo-1,1-dichloroethylene, and bromotrichloroethylene, 7481.

on carbonium ions derived from aromatic olefins. Part I, styrene and related olefins, 4765.

Spiro[3,3]heptane, 2281. Spinochrome D. Naturally occurring quinones. Part VI, 2141.

Stability constants, application of weighted least-squares methods to the computation of, 1896.

of magnesium citrate complexes, 3905.

Stereochemistry, aspects of. Part XIX, isopropylidene derivatives of some polyhydric alcohols. Observations on the hydrolytic behaviour and migration of cyclic ketals, 3382. Part XX, reaction of 3-O-methyl-D-glucitol with acetone and benzaldehyde, 3388. Part XXI, absolute configuration of benzylidene derivatives of some acyclic polyhydric alcohols, 3394. Part XXII, structure, conformation, and absolute configuration of some carbohydrate benzylidene acetals containing fused ring systems, 3401.

Steroids. Part XXIV, preparation and nuclear magnetic resonance spectra of some 6-substituted 4-methylcholest-4-enes, 2476. Part XXV, stereochemistry of ring a of some steroidal α-halogeno-ketones, 2483. Part XXVI, virtual allylic coupling in the 60 Mc. n.m.r. spectrum of

7,7-ethylenedithiocholest-4-en-3-one, 2489.

and Walden inversion. Part LIV, Grignard oxygenation of epicholesteryl bromide and partial synthesis of 3α-hydroxycholest-6-ene, 2349. Part LV, 2α- and 2β-chloro-5αcholestane, and 3α-chloro-5-methyl-5β-cholestane, 6450. Part LVI, bromination of 5β-cholestan-3-one, 6458.

11- and 20-oxo-, acetoxylation of with lead tetra-acetate, in the presence of boron trifluoride. Reactions of ketones with oxidising agents, 6.

containing ring a aromatic. Part VII, oxidative cleavage of 1-hydroxy-4-methyl-1,3,5(10)-triene steroids, 3052.

of unnatural configuration. Part IX, oxidation of 9α lumisterol (pyrocalciferol) and 9β -ergosterol (isopyrocalciferol) with perbenzoic acid, 2054.

urinary, and related compounds. Part VI, 16,20-disubstituted 5\alpha-pregnanes carrying no other substituents in the phenanthrene nucleus, 1306.

8-Aza-steroids. Part I, synthesis of 8-azaæstrone, 4900. Aza-steroids. Part IX, approaches to the partial synthesis of 11-azaprogesterone, 1971. Part X, 4-aza-3-oxo-A-homo-5α-cholest-1-ene, 5868.

Convenient synthesis of [9,19-3H2]cholecalciferol 3,5-dinitrobenzoate and the mechanism of the precholecalciferol = calciferol reaction, 5964.

Hydroxy-steroids. Part III, preparation of lupane-1,2- and ·2,3-diols, 4379.

Methylation and formylation of 5β-lumista-7,22-dien-3-one,

Methylation of lumistan-3-ones, 7199.

Methylation of 3-oxo-B-norcholestanes, 6117.

Nitro-steroids. Part II, new route to nitro-steroids, 2601. Part III, optical rotatory dispersion studies, 3152. Part IV, circular dichroism and conformation of nitro-steroids, 5002.

Photo-oxygenation of 3-acetoxyergosta-3,5,7,22-tetraene and related compounds, 6991.

Racemic 17β-hydroxy-17α-vinylæstr-5(10)-en-3-one, 5772.

Stereochemistry of the 3-hydroxymethyl-A-norcholestanes and related compounds, 5416.

Stereoisomeric pairs of cyclic quaternary ammonium salts. Part V, derivatives of 4-aza-5α-cholestane, 5439.

Steroid hydantoins, 5117.

Steroids (contd.):

Steroidal ketones, formylation of, with phosphorus oxychloride and dimethylformamide, 788.

Studies in the steroid group. Part LXXVI, methylation of enol acetates and bromo-ketones. Nuclear magnetic resonance spectra of 11-keto-steroids, 2933.

Steroid hormones. Part XIII, 13-aza- and 13-aza-D-homoanalogues of equilenin methyl ether, 3007. Part XIV, further tropone and tropolone analogues, 5737. Part XV, (\pm) -8 α -androst-4-ene-3,17-dione from 8 α - α -estrone methyl ether, 5139.

compounds related to. Part XI, conversion of 4,5α-dihydrocortisone 21-acetate into 16α-acetoxyprednisone 21-acetate, 130. Part XII, improved method for making 16α-acetoxy-4,5α-dihydrocortisone 21-acetate, 142. Part XIII, preparation of 6α - and 6β -methylcortisone acetates, 148. Part XIV, $\Delta^{8(9)}$ -11-oxo-steroids in the 14 α - and 14β -series, 156. Part XV, proton magnetic resonance spectra of 11-oxo-steroids, 7328.

hydroaromatic. Part XI, steroid with an angular aromatic

ring, 1552.

Stick lac, pigments of. Part I, isolation and preliminary examination, 6067.

Structure and basicity. Part III, basicity of homogeneously substituted cyclotriphosphazatrienes and cyclotetraphosphazatetraenes, 2804.

Sugars, amino-, synthesis from glycopyranosiduloses, 3448. azido- Periodate oxidation. Part IX, 3870.

branched-chain. Part III, introduction of branching into methyl 3,4-o-isopropylidene-β-L-arabinoside and the synthesis of L-hamemelose, 3433. Part IV, synthesis of D-hamemelose and D-epihamamelose, 3446. Part V, structure and reactivity of anhydro-sugars, 7378. Part VI, synthesis of branched-chain deoxy-sugars, 7378. phosphorylated. Part X, simple synthesis of 3-deoxy-D-

erythro-pentose 5-(dihydrogen phosphate), 2944.

Aminosaccharides. Part II, synthesis of 6-o-(2-amino-2deoxy-a-D-glucopyranosyl)-D-galactose hydrochloride and 6-o-(2-amino-2-deoxy - β-D-glucopyranosyl)-D-galactose hydrochloride and derivatives, 6910.

Aspects of stereochemistry. Part XIX, isopropylidene derivatives of some polyhydric alcohols. Observations on the hydrolytic behaviour and migration of cyclic ketals. Part XX, reaction of 3-o-methyl-D-glucitol with acetone and benzaldehyde, 3388. Part XXI, absolute configuration of benzylidene derivatives of some acyclic polyhydric alcohols, 3394. Part XXII, structure, conformation, and absolute configuration of some carbohydrate benzylidene acetals containing fused ring systems, 3401.

Behaviour of derivatives of 3,4-anhydrogalactose towards

acidic reagents. Part III, 6316.

Benzoate displacements on 3-o-toluene-p-sulphonyl-D-glucose derivatives: new synthesis of D-allose, 2236.

Boric acid derivatives as reagents in carbohydrate chemistry. Part III, interaction of phenylboronic acid with xylofuranosides and the isolation of the four methyl xylosides,

Borie acid derivatives as reagents in carbohydrate chemistry. Part V, interaction of phenylboronic acid with methyl pentapyranosides: syntheses of 3- and 2,4-substituted ribose derivatives, 7425. Part VI, phenylboronic acid as a protecting group in disaccharide synthesis, 7429.

4,6-O-Butylidene acetals of D-glucose and D-glucitol, 7453. Carbohydrate components of antibiotics. Part IV, configurational correlation of desosamine and chalcose, 2318.

Carbohydrates of Phaedactylum tricornutum. Part I, preliminary examination of the organism, and characterisation of low molecular weight material and of a glucan, 7035. Part II, a sulphated glucuronomannan, 7042.

Combretum leonense Gum. Part I, partial hydrolysis of the gum, 2685. Part II, hydrolysis products from the methylated gum and the methylated arabinose-free degraded gum, 2693.

Cyclitols. Part XVI, toluene-p-sulphonyl derivatives of myoinositol. Acetyl migration in anhydrous pyridine solution, 5252. Part XVII, selectivity of protecting groups: tetrahydropyranyl ethers, 5255. Part XVIII, acetyl migration: equilibrium between axial and Sugars (contd.):

equatorial acetates, 6494. Part XIX, control of acetyl migration during methylation of partially acetylated cyclitols, 6501. Part XX, cyclohexylidene ketals of inositols, 6662. Part XXI, benzyl ethers of myoinositol. Aromatisation of a tosyl derivative of myoinositol, 6949.

Determination of reducing oligosaccharides with alkaline iodine, 1554.

Dicyclohexylcarbodi-imide: a new agent for carbohydrate epimerization and isomerization. Part I, psicose formation, 813.

2,3-Dideoxy-2,3-epithioglycosides, 6666.

Diethylsulphonyl derivatives of D-glycero-L-manno-heptose and D-glycero-L-gluco-heptose, 1154.

Dimeric hemiacetal from the periodate oxidation of methyl α-D-glucopyranoside, 1555.

Displacement reactions of galactose 6-sulphonate derivatives, 3496.

Further oligosaccharides from carboxyl-reduced gum arabic, 3003.

Glucitol, butylidene derivatives of, 121.

α-1,4-Glucosans. Part XIX, action of acid on maltose and starch-type polysaccharides, 2150.

Glycosylureas. Part II, synthesis and properties of 2-deoxy-D-ribosylureas, 2463.

Gum Ghatti (Indian gum). Part IV, acidic oligosaccharides from the gum, 2673. Par periodate-oxidised gum, 2677. Part V, degradation of the

Isolation of crystalline 3-O-α-D-galactopyranosyl-L-arabinose from a polysaccharide found in Watsonia corm-sacs, 2287.

Mechanism of the hydrolysis of N-aryl-D-glucosylamines, 4497. Method of obtaining crystalline anhydrous αα-trehalose,

3489.Methyl 2,3-anhydro-D-hexopyranosides, acid hydrolysis of,

New syntheses of 2-amino-2-deoxy-D-allose (D-allosamine),

2-amino-2-deoxy-D-ribose(D-ribosamine), and 2-amino-2deoxy-D-xylose (D-xylosamine), 1351.

Nitrogen-containing carbohydrate derivatives. ring-opening reactions of epimino-sugars, 3828.

Nitrogen-containing carbohydrate derivatives. Part IX, synthesis of 2,3-diamino-2,3-dideoxyhexose derivatives,

Partial determination of the crystal structure of methyl 2-chloromercuri-2-deoxy-α-D-talopyranoside, 4025.

Periodate oxidation. Part VIII, oxidation products from methyl pentopyranosides, 2271.

Periodate oxidation of borohydride-reduced oligosaccharides. Submicro-methods for the analysis of organic compounds. Part XXIII, 4543.

Plant gums of the genus Sterculia. Part I, main structural features of Sterculia urens gum, 2710.

Platinum-catalysed oxidation of some 6-deoxyhexopyranosides, 2292.

Proton magnetic resonance spectra and conformations of cyclic compounds. Part II, p.m.r. spectra of the conduritols, 6268.

Radiation chemistry of carbohydrates. Part XV, mechanism of self-decomposition of [14C]D-glucose, 2654.

Reactions at position 1 of carbohydrates. Part VII, action of potassium hydroxide on aryl 2-deoxy-α-D-glucopyranosides, 3484.

Reactions of NN'-dimethyl-o-phenylenediamine with α aldols and α -ketols, 5270.

Reduction of some aromatic nitro-compounds with reducing sugars. Reduction of substituted nitrobenzenes. Part II, 1547.

Ring-opening reactions of 2,3-epimino-derivatives pyranosides, 2736.

Scope and mechanism of carbohydrate osotriazole formation. Part XIV, o-halogenophenyl and other triazole derivatives, 1524.

Seed mucilage of Lepidium sativum (Cress). Part I, identification of the components and some neutral oligosaccharides derived from the mucilage, together with the examination of a pentosan fraction, 5288. Part II, products of hydrolysis of the methylated mucilage and the methylated degraded mucilage, 5300.

Sugars (contd.):

Structure and conformation of some monosaccharides in solution, 52.

Structure of some N-aryl-D-glucosylamines, 4492.

Synthesis of 6-deoxy-L-talose, 1912.

Synthesis of 2-O- α -D-glucosaminylglycerol and 2-O- β -D-glucosaminylglycerol, 375.

Synthesis of glycosylpyridinium compounds from glycosylamines and from glycosyl halides, 610.

Synthesis of ribitol 1,5-diphosphate and of a polymeric ribitol phosphodiester, 1213.

2,3,4,6-Tetra- \hat{O} -benzyl- \hat{D} -galactosyl chloride and its use in the synthesis of α - and β -D-galactopyranosides, 1419.

Unsaturated carbohydrates. Part III, rearrangement reaction in the 2-hydroxyglycal series: further exceptions to Hudson's isorotation rule, 2830.

Use of the allyl ether as a protecting group in a new synthesis of L-lyxose, 2205.

Sulochrin, monomethyl-, and trypacidin, production of, by Aspergillus fumigatus, 6658.

Sulphonamides, removal of toluene-p-sulphonyl groups from. Part I, synthesis of Schiff bases, 485. Part II, phenylglyoxal anil dimers, 7105.

Sulphonate esters, nucleophilic substitution reactions of primary and secondary derivatives, 1616.

Sulphur and selenium co-ordinate link: five-co-ordination in complexes of bivalent palladium and platinum, 5371. dioxide. Part I, phase diagrams of some aromatic hydro-

dioxide. Part I, phase diagrams of some aromatic hydrocarbon-sulphur dioxide binary mixtures, 5514. Part II, reactions of tertiary phosphines with sulphur dioxide, 5516.

dioxide-hydroxylamine reaction, 1747.

monochloride, action on amides of dicarboxylic acids, 4583.

size of d-orbitals and valence-state promotion energies in,

Aromatic thiols, reaction with some cis-dienes, 4894.

Comparison of the acid-catalysed hydrolyses of enedial sulphites, and related compounds, 5779.

Cyclic trisulphides from Bunte salts, 2901.

Interaction of alkyl titanates with sulphuryl and thionyl chlorides, 3687.

Physical properties and chemical constitution, Part XLIV, electric dipole moments of some dialkyl sulphides, disulphides, sulphoxides, and sulphones, 5323. Part XLV, electric dipole moments of some aryl sulphides, sulphoxides, and sulphones, 5860.

Preparation of phenyl fluorosulphinate, 5741.

Reaction of sulphur and sulphur compounds with olefinic substances. Part XIV, reaction of sulphur and of dibenzyl tetrasulphide with 2-methylpent-2-ene and cisand trans-3-methylpent-2-ene, 6390.

Reactions of 3-carboxyphenylsulphonyl chloride with aromatic compounds, 5767.

Salt effects on the rate of nitration of benzenesulphonic acid in solvent sulphuric acid, 6524.

Studies in organic sulphur compounds. Part XVII, synthesis of previously inaccessible acylated enamines by desulphurisation of thiazolidines, 6253.

Sulphoxides. Part I, oxidation of tervalent phosphorus compounds by dimethyl sulphoxide, 4296. Part II, reactions of dimethyl sulphoxide with inorganic and organic acid halides, 6250.

Surfactants, adsorption of by carbon blacks, effect of graphitisation on, 911.

Sydnones, interaction of, with 1,4-quinoues, 5871.

T

Tantalum and niobium, halides of. Part VIII, densities, viscosities, and self-ionisation of niobium and tantalum pentafluorides, 761. Part IX, dimethyl ether, diethyl sulphide, diethyl sulphide, and tetrahydrothiophen complexes of the pentafluorides, 765.

Reactions of niobium(v) and tantalum(v) chlorides and bromides with some cyclic ethers and thioethers, 2449.

Seven co-ordinate complexes of niobium(v) and tantalum(v), 2877.

Terpenes. Autoxidation of limonene, 2990.

Constituents of cigarette smoke. Part IX, pyrolysis of polyenes and the formation of aromatic hydrocarbons, 2892.

Diterpenes. Part IX, bromo-derivatives in the (+)-phyllocladene and (—)-isokaurene series, 6212.

Diterpenes of Dacrydium colensoi. Part II, 3846.

Experiments in the synthesis of bicyclic diterpenes, 3012. Experiments in the synthesis of structures related to ring a of the triterpenes, 2340.

Infrared studies of terpenoid compounds. Part I, hydrogen bonding in cedrelone and related compounds, 1235. Part II, carbonyl absorptions of y-lactones, 3959.

Mass spectra and organic analysis. Part VI, mass spectra of menthone, isomenthone, and carvomenthone, 6478.

Sesquiterpenoids. Part II, stereochemistry of isophotosantonic lactone: X-ray analysis of 2-bromodihydroisophoto- α -santonic lactone acetate, 1584. Part III, stereochemistry of santonin: X-ray analysis of 2-bromo- α -santonin, 6041.

Studies on sesquiterpenoids. Part XI, structure and stereochemistry of xanthumin, a stereoisomer of xanthinin, 7009.

Synthesis of 1,2,3,4-tetrahydro-7-hydroxy-4-isopropyl-1,6dimethylnaphthalene. Degradation product of copaene, 3319.

Synthetical studies on terpenoids. Part X, stereospecific syntheses of (\pm) -clovan-9-one and (\pm) -clovane, 2749.

Terpene synthesis. Part V, benzyloxymethylation as a route to both the 1α - and 1β -hydroxymethyl derivatives of 1,4a-dimethyl- $\Delta^{8.8a}$ -octal-2-one, 4273.

Tetranortriterpenoids. Part I, [Bicyclononanolides. Part I.], constitution of swietenine, 6935.

Tracer studies in ester hydrolysis. Part XIV, hydrolysis of bornyl and isobornyl acetates, 3290.

Triterpenoids from New Zealand plants. Isolation of ursolic acid from Gaultheria subcorymbosa Col., 4611.

o-Terphenyl series, synthetical experiments in. Part III, o-biphenylyl radical as an arylating agent, 2649.

Terreic acid and its derivatives, circular dichroism studies on, 6587.

 $[19^{-14}C]$ Testosterone, synthesis of, 1356.

Tetracycline, oxy- and chloro-, sorption of, by sulphonated polystyrene resins, 5570.

Thallium-proton spin-spin coupling constants, 637.

Chemistry of organothallium compounds. Part I, preparations and properties of bis(pentafluorophenyl)thallium(III) compounds, 3411. Part II, complexes of bis(pentafluorophenyl)thallium(III) compounds with some neutral unidentate ligands, 6107.

Oxidation of uranium(v) by thallium(III) over an extended concentration range in aqueous perchloric acid solutions, 5596.

The [Me₂Tlpy]⁺ ion, 3860.

Thermal diffusion factors in the benzene-methanol system, 3613.

Thermochemistry of phosphorus iodides, 746.

of the complexes of boron trifluoride with dimethyl sulphoxide and ethyl acetate, and the thermal decomposition of the diphenyl sulphoxide-boron trichloride complex, 7102.

of the complexes of ethyl acetate with Group III halides. Co-ordination compounds having carboxylic esters as ligands. Part III, 5826.

Ethynyl-hydrogen bond. Part II, association of benzoylacetylene with aromatic hydrocarbons and with n-butyl ether studied by infrared and proton resonance spectroscopy and by calorimetry, 5914.

Heat of combustion of cyclo-octadecanonaene ([18]annulene), 216.

Heats of formation and bond energies. Part XIII, arsenic tribromide, arsenious and arsenic oxides, and aqueous solutions of sodium arsenite and sodium arsenate, 4471.

Heats of formation of complex ions containing bipyridyl, 4168.

Heats of formation of dimethyl, diethyl, and di-t-butyl peroxide, 6970.

Improvements in temperature measurement for a recently described heat-of-mixing calorimeter, 2837.

Thermochemistry (contd.):

Lattice energies and heats of formation of first-row transition-metal fluorides: stabilities of the vanadium fluorides,

Phosphonitrilic derivatives. Part XII, heats of polymerisation of the cyclic phosphonitrilic chlorides, 2112.

Thermodynamics of ion association. Part XII, EGTA complexes with divalent metal ions, 7353.

Chemistry of vitamin B_{12} . Part IV, thermodynamic transeffect, 6485.

Co-ordination number of transition-metal ions. Part IV relative stabilities of some tetrahedral and octahedral complexes of cobalt(II) and nickel(II), 3284.

Cyclitols. Part XV, stereospecific epimerization of cyclitols: conformational free energies, 1807.

Dissociation constants of some cobalt(II) ion-pairs determined at 25° by cation-exchange resin studies, 2452.

Thermodynamic effects involved in the metal-ion chelation of histidine, histidine methyl ester, and 4(or 5)-imidazolylacetic acid, 742.

Thermodynamic functions of phosphorus pentabromide, 40. Thermodynamic properties of organic oxygen compounds. Part XV, purification and vapour pressures of some ketones and ethers, 3697.

Values of log K, ΔH^0 , and ΔS^0 at 25° for stepwise replacement of Cl⁻ by OH⁻ in mercuric chloride, HgCl₂(aq), 4231.

11-Thiabenzo[a] fluorene and naphtho[2,1-b]thiophen, synthesis of methyl derivatives of, by photocyclisation of stilbene isosters, 6221.

Thiacyclobutane, 3-chloromethyl-3-hydroxymethyl-, 1528.

Thiadiazoles, 1,2,3-, derivatives of congeners of pyridine-4carboxyhydrazide. Part II, 5166.

Thianthren and three of its oxides. Molecular polarisability: apparent conformations as solutes in benzene, 571.

Nuclear magnetic resonance spectra of 2-substi-Thiazoles. tuted thiazoles and thiazolium salts, 4597.

Structure of dialkanesulphonyl derivatives of 2-aminothiazole. Applications of proton resonance spectroscopy to structural problems. Part XVI, 1219.

Thiocarbamates, 2-butyl-4,6-dinitrophenyl-, isomerisation of, 7338.

Thiocyanates, thiocyanogen, and isothiocyanates. Part IV, addition, substitution, and substitutive reduction between triphenylmethyl isothiocyanate and alcohols or amines, 5366.

Thiophens, di(thienylthio)-. Condensation of thiophen thiols with dibromothiophens, 7018.

naturally occurring. Bithienyl derivatives from Tagetes minuta L., 7109.

1-Thio-4-pyrone, 3037.

Thorium oxyiodide, 1432.

Amide complexes of thorium(IV) and uranium(IV) iodides, 3594.

Iodo-complexes of thorium(IV) and uranium(IV), 350. Tin alkoxides, addition of, to isocyanates. Organometallic

reactions. Part I, 5238. tetrachloride, adducts of, Raman spectra of, 2995.

Alkylthio-compounds of tin, preparation and properties of, Amino-derivatives of metal and metalloids. Part I, pre-

paration of aminostannanes, stannylamines, and stannazanes, 1944. Part II, amino-stannylation of unsaturated substrates, and the infrared spectra and structures of carbamato- and dithiocarbamato-trimethylstannanes and related compounds, 2157.

Chelates formed by tin(II) with citric and tartaric acids, and their interaction with certain transition-metal ions, 2145. Formation of complex tin(II) species in molten tin(II)

fluoride, 3876.

Organometallic reactions. Part II, addition of bistrialkyltin oxides to isocyanates, 6245. Part III, trimerisation of isocyanates by organotin alkoxides and oxides, 6858.

Reaction between tetra-aryltins and some non-metal fluorides, 2278.

Reducing reactions of tin(II) in aqueous solution. Part III, reduction of various common oxidising agents, 5891.

Some organotin isocyanates and their hydrolysis products, 5055.

Structure of trans-tetrachlorobis(bistetrahydrothiophen)tin(IV) in the solid state and in solution, 1581.

Tin (contd.):

Tin(IV) fluoride complexes and their infrared spectra, 3174. Tin(IV) nitrate: relation between structure and reactivity of metal nitrates, 598.

Titanium, β-diketone complexes of, 2840.

tetrachloride, interaction of, with chlorosulphuric acid and its esters, 342.

Charge transfer from inorganic ions to titanium(IV), 2991. Interaction of alkyl titanates with sulphuryl and thionyl chlorides, 3687.

Metal-metal bond in binuclear di-π-cyclopentadienyltitanium(III) chloride, 4709.

Totarol, some derivatives of, 415.

Toxicarol isoflavone. Active principles of leguminous fishpoison plants. Part X, 4203.

Tracer studies in carboxylic acids. Part III, oxalic acid, 2197. Part IV, aminoacetic acid, 2669.

in ester hydrolysis. Part XIV, hydrolysis of bornyl and isobornyl acetates, 3290.

Triazaindenes (Diazaindolizines). Site of protonation, 2778. 1,4,6-Triazanaphthalene, 3-methyl-, unambiguous synthesis of, 1558.

Triazines. Part II, interaction of diguanide with isothiocyanate esters, 6297.

1,3,5-. Part V, reactions of cyanuric chloride with NN-dialkylanilines, -toluidines, and -xylidines, 5446. Part VI, reaction of hexamethyldisilazyl-lithium with cyanuric chloride, 5453.

1,3,5-, substituted, 1113.

Amino-oxy-derivatives. Part V, some O-ethers of 2-substituted 4,6-diamino-1,2-dihydro-1-hydroxy-1,3,5-triazines, 1829.

Triazole. Scope and mechanism of carbohydrate osotriazole formation. Part XIV, o-halogenophenyl and other triazole derivatives, 1524.

s-Triazolopyrimidines. Part II, synthesis as potential therapeutic agents, 3357. Part III, synthesis as potential therapeutic agents, 3369.

Trimethylamine-benzimide, thermolysis of; new rearrangement of the Curtius-Hofmann type, 880.

Trimethylenemethyl, C(CH₂)₃, electronic structure of, 1798.

Trioxan, non-stationary states in the polymerisation of, 1478. Trypacidin and monomethylsulochrin, production by Aspergillus fumigatus, 6658.

Tropane and N-alkylnortropane derivatives, stereospecific, preparation of, 5112.

Tropine, and 3-halogenotropanes, conformations of, and their hydrohalides as solutes, 3473.

and related bases, reactions with acid chlorides, 2723.

Tropone and tropolone analogues. Steroid hormones. Part XIV, 5137.

Tryptamine, melting point and structure of, 3498.

Synthesis of some 5-substituted-2-methyltryptamines and their N-mono- and -di-alkyl derivatives, 1424.

Tungsten. Complex halides of transition metals. Part I, hexabromotungstates(v), 2274.

Complexes between polyhydroxy-compounds and inorganic oxy-acids. Part V, tungstate complexes of acylic polyhydroxy-compounds, 21.

Seven-co-ordinate halogenocarbonyl anions of molybdenum(II) and tungsten(II), 3494.

Tyrosine test of Gerngross, Voss, and Herfeld: chemistry of colour reactions, 480.

Unstable intermediates. Part XXVI, aliphatic carbonium ions: condensation with acetic acid, 378. Part XXVII, cations of hexamethylbenzene and durene, 1120. Part XXVIII, solvated electrons: rigid organic solvents, 1127. Part XXIX, sigma and pi radicals, 2276. Part XXX, solvated electrons: line shapes of electronic absorption bands, 3759. Part XXXI, solvated electrons: solutions of europium in ammonia, 3763. Part XXXII, electron spin resonance study of the radicals N₂H₄+, C₂(CN)₄-, and 1,1-diphenyl-2-picrylhydrazyl, 6504. Part XXXIII, solvated electrons: electron spin resonance of solutions of potassium in ethylamine, 6656.

Uramils (5-aminobarbituric acids), formation of: condensation of amines with alloxan, 5556.

Uranium pentachloride complexes, preparation and spectra of, 5217.

Amide complexes of thorium(IV) and uranium(IV) iodides,

Iodo-complexes of thorium(IV) and uranium(IV), 350.

Oxidation of uranium(IV) by thallium(III) over an extended concentration range in aqueous perchloric acid solutions, 5596.

Ureas. Dimethylsulphoxylideneureas and dimethylsulphoxylidenethioureas, 3004.

Glycosylureas. Part II, synthesis and properties of 2-deoxy-p-ribosylureas, 2463.

Heterocyclic compounds from urea derivatives. Part VIII, addition products of NN'-di(isopropylideneamino)guanidine and isothiocyanate esters, and their cyclisation, 4448. N-Linked thiopseudourea zwitterions, 6650.

Symmetrical disubstituted ureas, 3971.

Urea derivatives, heterocyclic compounds from. Part VI, synthesis and cyclisation of 1-amino-3-(NN'-diaryl-amidino)guanidines and some analogues, 932.

Urinary steroids and related compounds. Part VI, 16,20-disubstituted 5α-pregnanes carrying no other substituents in the phenanthrene nucleus, 1306.

v

Vanadium. Lattice energies and heats of formation of firstrow transition-metal fluorides: stabilities of the vanadium fluorides, 444.

Nuclear magnetic resonance study of polyvanadate equilibria by use of vanadium-51, 864.

Reaction of dimesitylenevanadium with carbon monoxide 819.

Some chloro-complexes of vanadium(IV), 4915.

Viridin. Part I, isolation and characterisation, 3803. Part II, oxidation by chromic acid, 3811.

Viscosities of solutions of acids in tri-n-butyl phosphate, 3477. Vitamins. Vitamin B_{12} , chemistry of. Part III, proton magnetic resonance spectra of some cobalamins, 2859. Part IV, thermodynamic trans-effect, 6485.

Convenient synthesis of [9,19-3H₂]cholecalciferol 3,5-dinitrobenzoate, and the mechanism of the precalciferol

calciferol reaction, 5964.

Properties of cobalamins with sulphur-containing ligands, 2174.

W

Water bug, Sigara falleni (Fieb.), odoriferous secretion of, 2955. Withania somnifera Dun., constituents of. Part IV, structure of withaferin A, 7517.

\mathbf{z}

Zeolite studies. Part V, dehydration behaviour of Na-P zeolites and some ion-exchanged derivatives, 4028.

Zinc malonate and phthalate. Studies on metal complexes in solution. Part II, 1450.

Alkoxy-, thio-, and amino-derivatives of methylzinc, 1870. Complexes of amines with zinc dialkyldithiocarbamates. Part II, study of the influence of amine structure on the stability of complexes of zinc dimethyldithiocarbamate, 5613.

Organozinc compounds. Part I, proton magnetic resonance spectra of some etherates of dimethyl- and diphenyl-zinc, 5476

Potentiometric study of the fluorescence of mono- and bis-(8-quinolato-5-sulphonic acid)zincato(II) anions in aqueous solution, 2084.

Zirconium t-butoxide, reactions of, with acetyl chloride, and reactions of zirconium tetrachloride with t-butyl acetate, 43.