

INDEX OF SUBJECTS.

- Absorption spectra, analytical applications of, 331, 332.
Acetaldehyde, kinetics of hydration of, 51.
Acetanilide, *N*-nitroso-, rearrangement of, 118.
Acetic acid, colorimetric detn. of, 329.
Acetone, acetyl-, complexes with, 91.
free-radical photolysis of, 54.
Acetyl hypohalites, trifluoro-, use of, in halogenation, 143.
Acid-red 6B, as argentometric indicator, 318.
Acid-violet 4BL as argentometric indicator, 318.
Acids, aliphatic, unsaturated, 158.
dissociation constants of, 33.
saturated, 156.
Acraldehyde, polarographic detn. of, 323.
Actinometers, 53.
Actinometry (chemical dosimetry) in radiation chemistry, 67.
Actithiazic acid, structure of, 210.
Activity coefficients in electrolytes, 28.
Addition reactions, of 3 : 3 : 3-trifluoropropene and -propyne, 133.
Adenine hydrochloride, structure of, 373.
Adipic acid, α -amino-, as intermediate in lysine synthesis, 261.
Adsorption chromatography, 335.
D-Alanine as growth factor, 255.
Alanine, oxindolyl-, synthesis of, 163, 215.
Alanine, phenyl-, and utilisation of tryptophan, 263.
Alcohols, 153.
Aldehydes, 155.
Aldehyde-ammonia, structure of, 374.
Alginate, 245.
Alkaloids, 219.
Alkoxy-radicals, relative stabilities of, 126.
Alstonine, structure of, 223.
Alstyrine, 224.
Alumina, heats of wetting on, 27.
Aluminate ions, 31.
solutions, titration of, 316.
Aluminium, colorimetric detn. of, 327.
detection of, 310.
pptn. of, as hydroxide, 312.
test for, 330.
Aluminium chloride (basic), 89.
hypophosphite, 90.
iodides, 89.
rac-Aubreinolide, synthesis of, 183.
Amides, colorimetric detn. of, 329.
Amino-acids, 161.
biosynthesis of, 260.
crystal structure of, 376.
Ammonia, detn. of, 315.
Ammonium chloride, structure of, 351.
Ammonium heptafluorozincate, decomposition of, 93.
Ammonium thiocarbamate, use of, for pptn. of sulphides, 307.
Ammonium "trinitrate," structure of, 360.
Amylases, 238.
Amylomaltase, 239.
Amylopectin, structure of, 237.
Amyloses, 237.
 β -Amyrin, structure of, 187.
Analytical chemistry, 298.
Angustione, structure of, 119.
dehydro-, structure of, 189.
Anhydrides of fatty acids, preparation of, 146.
Anthracene, crystal structure of, 370.
Anthraquinone-2-sulphonate, sodium salt, reduction of, by titanous ion, 50.
Antimony, colorimetric detn. of, 328.
pptn. of, 313.
specific test for, 310.
Antimony pentafluoride, compounds of, 98.
Anti-thyroxine compounds, 293.
Aqueous media, radiation chemical reactions in, 71.
Arctigenin, synthesis of, 234.
Arginine, precursors of, 262.
Argon, energy of adsorption of, on rutile, 21.
Aromadendrin, identity of, with dihydrokämpferol, 232.
Aromatic substitution, homolytic, 121.
Arsenic, absorptiometric detn. of, 326.
titration of, by bromate, 315.
by cerium(IV), 329.
Arsenic sulphides, structure of, 350, 359.
Arsine, cross-term constants in, 12.
Artabotrine. See *isoCorydine*.
Asiatic acid, structure of, 188.
Asparagine in bacterial metabolism, 263.
Astilbin, structure of, 232.
Atom and group transfers, 44.
Atomic reactions, 39.
Axinite, crystal structure of, 361.
Ayanin, structure of, 232.
3-Aza-1 : 2-benzazulene, 176.
1-Azapyrene, 1 : 2-dihydro-2-keto-, isolation of, from coal tar, 211.
Azide, detn. of, 315.
Azide in "replacement" of adenylic acid, 283, 284.

- Azo-compounds, aliphatic, decomposition of, 115.
 Azoxy-compounds, aliphatic, 150, 163.
 Azulenes, 175.
- Bacterial nutrition, 252.
 Barium sulphate, pptn. of, in presence of iron, 312.
 slow pptn. of, 311.
 Barium titanate, structure of, 365.
 Bases, dissociation constants of, 33.
 Benzaldehyde phenylhydrazone, autoxidation product of, 127.
 Benzene derivatives, simple, crystal structure of, 375.
 Benzenediazoacetate, formation of, 118.
 Benzofurazan, structure of, 375.
 Benzoheptalene, octahydro-, 175.
 Benzoic acid, *p*-amino-, 257.
 4-hydroxy-3:5-di-iodo-, and derivatives as anti-thyroxine compounds, 294.
p-hydroxy-, as growth factor, 266.
 Benzophenone, 2-carboxy-2'-hydroxy-, dehydration of, 165.
 Benzoxazine derivatives, 211.
 Beryllium, colorimetric detn. of, 327.
 detn. of, as pyrophosphate, 312.
 titration of, 316.
 dialkyl derivatives of, 86.
 dimethyl-, crystal structure of, 369.
 oxide, hydration of, 86.
 Bimolecular gas reactions, 38.
 Biochemistry, 252.
 Biocytin, synthesis of, 256.
 Biogenesis of steroids, 201.
 Bioluminescence in the firefly, 288.
 Biosynthetic hydroxylation, steroid of, ring c, 195.
 Biotin, function of, 256.
 Bismuth, colorimetric detn. of, 320.
 detection of, 310.
 pptn. of, 310.
 Bismuth iodide, extraction of, by *iso*-butyl methyl ketone, 337.
 Bixin, methyl-, all-*trans*-, 153.
 formation of, 137.
 Blood coagulation, 273.
 Bond interactions, 7, 17.
 Borates, crystal structure of, 360.
 Boric acid, reagents for, 309.
 Boron, colorimetric detn. of, 326.
 crystal structure of, 356.
 spectrographic detn. of, 331.
 Boron compounds, deuterated, 88.
 Boron nitride, structure of, 355.
 trifluoride, complexes with, 88.
 trioxide, structure of, 360.
 Borohydrides, substituted, 88.
 Boron-nitrogen compounds, 88.
 Diborane, preparation of, 87.
 amino- and dimethylamino-, 89.
 β -Trichloroborazole, 88.
 "Branching factor," liver, 240.
 Brassic acid, preparation of, 156.
 Bridged benzene rings, 163.
 Bromide, oxidation of, 315.
- Bromide, potentiometric detn. of, 324.
 titration of, at great dilution, 318.
 Bromine monochloride, dissociation of, 104.
 Bromonium cations, 110.
 Bronzes, analysis of, 313, 317.
 Bufotinine, preparation of, 215.
*threo*Butane-2:3-diol, enantiomers of, 153.
 Butatriene, 150.
sec.-Butyl bromide, resolution of, 144.
*iso*Butyl chloride, dehydrochlorination of, 36.
tert.-Butyl hydroperoxide, thermal decomposition of, 128.
Butyribacterium rettgeri factor, 253.
 Butyrolactone, perfluoro-, reactions of, 203.
- Cadmium, colorimetric detn. of, 327.
 detection of, 310.
 detn. of, 312.
 potentiometric detn. of, 324.
 solubility of, in fused chlorides, 87.
 titration of, 316.
 Cæsium, potentiometric detn. of, 324.
 Cæsium hexasulphide, 85.
 Calcium, colorimetric detn. of, 327.
 detn. of, in presence of magnesium, 311.
 spectrographic detn. of, 331.
 Calcium acid malate as alkalimetric standard, 302.
 Calythrone, structure of, 189.
 Camphorsulphonic acid, resolution of, on silica gel, 144.
 Canthin-6-one, 224.
 Carbazone, diphenyl-, use of, as indicator, 318.
 Carbocyclic compounds, crystal structure of, 371.
 β -Carboline, 5-methoxy-1:9-dimethyl-, synthesis of, 224.
 Carbon blacks, pore-size distribution for, 23.
 Carbon dioxide, infra-red bands in, 15.
 resonance in, 11.
 Carbonyl chloride, photochemical formation of, 55.
 Carboxyl ions, C-O distance in, 377, 378.
 Carboxylic acids, crystal structure of, 375.
 Carnotite, crystal structure of, 364.
 β -Carotene, production of, from dehydro- β -carotene, 137.
 Carotenoids, 151.
 (+)-Carvomenthylamine, configuration of, 179.
 neoCarvomenthylamine, configuration of, 179.
 α -Caryophyllene. See Humulene.
 β -Caryophyllene, structure of, 180.
 α - and β -Caryophyllene alcohols, structure of, 181.
 Catalysed reactions, use of, in analysis, 341.
 Catalysts, poisoned, use of, in reduction, 137.
 Celluloses, 240.

- Cement, crystal structure of calcium silicate minerals in, 362.
 Cerium, acetylacetone complexes of, 91.
 pure, preparation of, 91.
 Cevagenine, 228.
 Chelate compounds, 81.
 crystal structure of, 367.
 Chloramine-T as titrimetric reagent, 314.
 Chloramphenicol, structure of, 380.
 Chloride, nephelometric detn. of, 330.
 potentiometric detn. of small amounts of, 324.
 titration of, by mercurous salts, 318.
 by mercuric salts, 318.
 Chlorine, crystal structure of, 354.
 Chlorine hydrate, crystal structure of, 369.
 Chlorine trifluoride, as fluorinating agent, 104.
 Chloritoid, crystal structure of, 361.
 Cholecalciferol, 266.
 Chlorocuprate ion in caesium salt, 85.
 Cholesterol, 7-dehydro-, formation of, 269.
*epi*Cholesteryl halides, 197.
 Chromate-phosphate complex ions, 102.
 Chromatographic analysis, definition of, 334.
 Chromium, colorimetric detn. of, 328.
 higher oxides of, 102.
 oxidation of, 316, 317.
 potentiometric detn. of, 325.
 ppm. of, as hydroxide, 313.
 univalent, 102.
 Chromium sesquioxide, hydration of, 101.
 trioxide, crystal structure of, 363.
 Chromyl fluoride, 101.
 Chrysoidine, *p*-ethoxy-, as acid-base indicator, 317.
 Cicutol, 154.
 Cicutoxin, 154.
 Citrulline, precursors of, 262.
 Clathrate compounds, 83.
 use of, 341.
 Clovane, structure of, 181.
 Cobalamin, cyano-, hydroxo-, and nitroso-(nitrito-), 266.
 Cobalt, colorimetric detn. of, 328.
 complex salts of, 107.
 resolution of, 107.
 crystal tests for, 332.
 detection of, by catalysis, 341.
 ppm. of, as double mercuric thiocyanate, 313.
 reagent for, 310.
 separation of, 336.
 Cobalt chloride, hydrates of, 106.
 complexes, use of, in optical resolution, 144.
 tetracarbonyl hydride, 108.
 dinitrotetrammincobalt ions, 83.
 nitrosylcobalt tricarbonyl, 108.
 Co-enzyme A, 280.
 Colorimetry, 325.
 Colubrine, α - and β -, relation of, to strychnine, 225.
 Complex ions, reactions of, 48.
 Complexes, organometallic, in analysis, 303.
 conductance methods of analysis, 325.
 conductivity phenomena in electrolytes, 28.
 Conessine, structure of, 227.
 Contact angle of liquids on solids, 24.
 Copolymerisation, 61.
 Copper, catalytic effect of, 341.
 colorimetric detn. of, 327.
 complexes of, with 1:10-phenanthrolines, 306.
 detection of traces of, 310.
 detn. of, 312.
 iodometric detn. of, effect of nitric acid in, 316.
 potentiometric detn. of, 324.
 Copper acetate, structure of, 368.
 dimethylglyoxime, structure of, 368.
 hydride, preparation of, 85.
 See also Cuprous complexes.
 " Coprogen," 266.
 Coriolis coefficients, use of, to determine force constants, 10.
 Coroglaucigenin, 201.
 Corotoxigenin, 201.
 Corpavérine, structure of, 220.
 Corticosterone, 17-hydroxy- (hydrocortisone), 196.
 Cortisone, economic production of, 193.
 synthesis of, 190.
 isoCorydine, 223.
 Corynantheine, impurity in, 223.
 Corynanthidone, 223.
 Corynomycolic acid, synthesis of, 161.
 Crataegolic acid, constitution of, 189.
 Cresotic acids, dehydration of, 165.
 Crystallography, 343.
 Crystal growth, 343.
 Coulometry, 322.
 α -Cumyl hydroperoxide, thermal decomposition of, 129.
 Cuprous complexes, 86.
 Cyanide, colorimetric detn. of, 326.
 titration of, 315.
 Cyanogen chloride, C-Cl bond in, 12.
 Cyanuric acid, structure of, 374.
 Cyclisation of unsaturated terpenes, 182.
 Cyclophorase, 275.
 Cymarose, synthesis of, 141.
 Cystine, synthesis of, 162.
 Cytidine, deoxytetrahydro-, synthesis of, 220.
 Decapentaene, 151.
 Depolymerisation, 62.
 Deuterium cyanide, vibration frequencies of, 8.
 Dextrans, 241.
 Diamines, *N*-alkyl-, chelated compounds of copper and nickel with, 82.
 Diazo-compounds, decomposition of, 118.
 Diazomethane, bond interactions of, 7.
 1:2:4:5-Dibenzopentalecene, 175.
 3:4:5:6-Dibenzophenanthrene, structure of, 370.
 Di-*tert*-butyl peroxide, pyrolysis of, 38.

- Dicoumarin, anti-vitamin-K activity of, 273.
 Diethyl ketone, photolysis of, 54.
 Diethyl peroxide, kinetics of decomposition of, 38.
 Digitoxose, synthesis of, 141.
 Diketen, crystal structure of, 373.
 Dinitrosulphites, crystal structure of, 363.
 Diisopropenyl ether, isomerisation of, 37.
 Di-n-propyl ketone, photolysis of, 55.
 Diselenane, structure of, 375.
 1 : 4-Dithian, 2 : 5-diethoxy-, 208.
 n -Do-octacontane, $C_{82}H_{166}$, 150.
 Dose measurements, standardisation of, in radiation chemistry, 68.
 Dosimetry. *See* Actinometry.
 Double-bond reagents, 111.
 Double bonds, some reactions involving, 198.
 Dyes, ionophoretic separation of, 341.
 Eicosanonaene, 151.
 Electroanalysis, 321.
 "Electrochromatography," 339.
 Electron-transfer processes, 42.
 Electron-transfer reactions in aqueous solution, 46.
 Electrophoresis, 339.
 Electrolytes, strong, velocity of sound in, 28.
 Eleutherinol, structure of, 233.
 Emission spectroscopy, 330.
 Enol acetates, steroidal, formation of, 197.
 α -Enzyme, potato, properties of, 239.
 β -Enzyme, properties of, 236.
 Ergocalciferol, 266.
 Eriochrome Black T, instability of, as indicator, 304.
 β -Erythroidine, structure of, 225.
 apo - β -Erythroidine, structure of, 225.
 Erythropterin, structure of, 216.
 Ethane, 1 : 1- and 1 : 2-dichloro-, dehydrochlorination of, 36, 37.
 Ethyl chloride, dehydrochlorination of, 36.
 Ethyl radicals, reactions of, 40.
 Ethylene, bond interactions of, 7.
 interaction constants in, 13.
 polymerisation of, 150.
 Ethylenediamine-*NNN'N'-tetra-acetic acid*, synonyms for, 306.
 uses of, 304.
 Euphol (euphadienol), structure of, 186.
 Fat-soluble factors, miscellaneous, 273, 274.
 Febrifugine, structure of, 226.
 iso -Febrifugine, structure of, 226.
 Ferrate ion, crystal structure of, 364.
 Ferreirin, 233.
 Ferric and ferrous ions, kinetics of electron transfer between, 43.
 Ferric oxide gel, adsorption of liquids on, 23.
 Ferricyanide, test for, 310.
 titration of, 316.
 "Ferrocene." *See* Iron, dicyclopentadienyl.
 Ferrocyanide, titration of, 316.
 Ferrous-ferric system in radiation chemistry, 74.
 Fertility, 271.
 Films, physically adsorbed, on solids, 19.
 Flavaspidic acid, structure of, 189.
 Flavocorynanthryne, 224.
 Flavone derivatives, chromatographic data for, 231.
 colour reactions of, 231.
 iso Flavones, synthesis of, 233.
 Flavonoids, separation of, 339.
 Fluoranthene derivatives, 169.
 Fluorescence, 57.
 Fluorescein, dichloro-, stabilisation of solution of, 317.
 Fluoride, absorptiometric detn. of, 326.
 amperometric detn. of, 324.
 polarographic detn. of, 323.
 titration of, 315.
 Fluorides, complex, of transition metals, 104.
 Force constants, detn. of, 8.
 Force fields, 7.
 Formic acid, crystal structure of, 375.
 Free radicals, 113.
 formation of, by oxidation and reduction, 135.
 rearrangements of, 131.
 CR_3 , formation of, from $CR_3 \cdot CR_3$, 114.
 Free-radical reactions, 39.
 Folic acid group, 257.
 Formaldehyde, bond interactions of, 7.
 polarographic detn. of, 323.
 Fructosans, 243.
 Furan derivatives, 203.
 2 : 5-dihydro-2 : 5-dimethoxy-, reactions of, 155.
 2 : 5-dihydro-2-methylene-, 204.
 Furanoflavones, synthesis of, 232.
 Gadolinium, pure, preparation of, 91.
 Galactans, 242.
 Galactomannans, 242.
 Gallium oxide, polymorphism of, 90.
 Gas analysis, 340.
 Gelsemine, reactions of, 224.
 Germacrol, structure of, 180.
 Germanicol, 188.
 Germanium, alkyls of, 92.
 colorimetric detn. of, 327.
 detn. of, 312.
 Germanous oxide, properties of, 95.
 Gladiolic acid, structure of, 235.
 Glucose, alternative path of oxidation of, 290.
 polarographic detn. of, 323.
 α -D-Glucose, crystal structure of, 379.
 Glutamine in bacterial metabolism, 263.
 Glyceraldehyde phosphate, oxidation of, 281.
 Glycerides, synthesis of, 161.
 Glycerol, colorimetric detn. of, 329.
 Glycogen, structure of, 237.

- Glycogens, 240.
 Gold, colorimetric detn. of, 327.
 pptn. of, 312.
 titration of, 316.
 Gold imides, 86.
 Gossypol, complex of, with molybdenum, 310.
 Graphite, crystal structure of, 355.
 Growth factors, inhibitory interrelationships of, 265.
 Guaran, structure of, 242.
 Gums, 244.
- Hafnium, concentration of, 94.
 distinction of, from zirconium, 333.
 Halides, detn. of, by electroanalysis, 321.
 nephelometric detn. of, 330.
 structures of, 365, 366.
 Halogenation, 143.
 Halogeno-compounds, 154.
 organic, reduction of, 320.
 Hecogenin, 200.
n-Hectane, $C_{100}H_{202}$, 150.
 Hemicelluloses, 244.
n-Heptane, first-order phase changes of, on surfaces, 20.
 Hepta-2 : 4 : 6-trienoic acid, methyl ester, 158.
*cyclo*Heptatrienylum ion, 172.
*iso*Herculin, 159.
 Heterocyclic compounds, 202.
*cyclo*Hexane, α - and β -1-chloromercuri-2-methoxy-, structure of, 372.
*cyclo*Hexene, disproportionation of, 139.
 Hex-5-enic acid, 5-methyl-, synthesis of, 158.
 Homoferreirin, 233.
 Homolytic addition, stereochemistry of, 134.
 "Hot spots," 74.
 Humulène (α -caryophyllene), structure of, 182.
 Humulone, synthesis of, 189.
 Hyaluronic acid, 245.
 Hydration numbers of rare-earth ions, 29.
 Hydrazine, absorptiometric detn. of, 326.
 complexes of, 95.
 fluorimetric detn. of, 330.
 structure of, 357.
 Hydrazine sulphate, structure of, 358.
 Hydrocarbons, aliphatic, 150.
 crystal structure of, 370.
 Hydrocortisone. *See* Corticosterone, 17-hydroxy-.
 Hydrogen, transfer of, in organic reactions, 138.
 Hydrogen bonds in crystals, 352.
 Hydrogen cyanide, vibration frequencies of, 8.
 Hydrogen halides, photolysis of, 55.
 Hydrogen peroxide, catalytic decomposition of, 100.
 formation and destruction of, by radiation systems, 76.
 mechanism of oxidation of, 100.
 reactions of, 50.
 structure of, 357.
- Hydrogenation, catalytic, 137.
 Hydroperoxides, 127.
 Hydroxylamine, titration of, 315.
 8-Hydroxyquinaldine, analytical uses of, 307.
 Hypericin, synthesis of, 170.
 Hypobromites, solid, isolation of, 105.
 Hypochlorite, titration of, 315.
 Hypophosphate, potentiometric detn. of, 324.
 Hypophosphorous acid, existence of two forms of, 44.
 use of, for reduction of diazonium salts, 120.
- Iminopyrrolidines, formation of, 206.
 Indium, detn. of, 307.
 solvent extraction of, 337.
 Indium, bistripyridyl-, salts of, 90.
 Indole, derivatives of, 213.
 Fischer synthesis of, mechanism of, 213.
 Infra-red bands, intensities of, 15.
 Initiators in polymerisation, 58.
 Inorganic chemistry, 81.
 Inorganic gravimetric analysis, 311.
 Inorganic qualitative analysis, new schemes for, 308.
 Interaction constants, 11.
 Iodide, specific test for, 309.
 titration of, by permanganate, 315.
 titration of, at great dilution, 318.
 Iodine, amperometric detn. of, 324.
 detn. of, in organic compounds, 320.
 Iodometry, definition of, 301.
 Ion exchange, application of, in analysis, 336.
 Ionising irradiation of water, yields in, 72.
 Ionophoresis, 339.
 Ion-pair formation in salts, 32.
 "retrolynylidene" rearrangement, 151.
 Ipomeamarone, structure of, 230.
 Iron, catalytic effect of, 341.
 colorimetric detn. of, 328.
 detn. of, in presence of copper, 316.
 dicyclopentadienyl- ("ferrocene"), 84, 171, 370.
 potentiometric detn. of, in chromite, 325.
 precipitation of, 310, 312, 313.
 spectrographic detn. of, 331.
 tris-2 : 2'-dipyridyl-, enantiomeric complexes of, 108.
 Iron tetracarbonyl dihydride, 108.
 See also Ferric and Ferrous.
 Isotope effects on rates of reaction, 52.
 Jervine, relation of, to veratramine, 230.
 Jervine, structure of, 200.
- Karl Fischer reagent, 341.
 Katuranin, identity of, with dihydro-kämpferol, 232.
 α -Kessyl alcohol, structure of, 180.
 Keten, bond interactions of, 7.
 photolysis of, 54.
 Ketones, 155.

- Ketones, synthesis of, 146.
 Khellin, formation of, from visnagin, 234.
 Kinetics of homogeneous gas reactions, 34.
 Kjeldahl digestion process, 320.
 α - and β -Kosin, structure of, 189.
 Kynurenin, 3 : 4-dihydroxy-, synthesis of, 162.
- Lactic acid, partial resolution of, by inorganic complexes, 82.
 resolution of, by cobalt complex, 144.
 Lactobacillic acid, 159.
 Laminaribiose, structure of, 242.
 Laminarin, structure of, 242.
 Lanostadienol (lanosterol), structure of, 184, 201.
 Lanostenol (dihydrolanosterol), stereochemical detail of, 379.
 Lanthanons, 91.
 silicides of, 92.
 Lanthanum, pure, preparation of, 91.
 Lavandulol, synthesis of, 153, 179.
cycloLavandulol, synthesis of, and of derivatives, 179.
 Lead, colorimetric detn. of, 328.
 detn. of, 307, 313, 341.
 slow pptn. of, as phosphate, 311.
 spectrographic detn. of, 331.
 test for, 330.
 Lead iodide, extraction of, by methyl *iso*-propyl ketone, 337.
isoLeucine, precursors of, 262.
Leuconostoc citrovorum factor, 257.
 Leucovorin, 257.
 Linoleic acid, decarboxylation of, 159.
 in diet, 274.
 Linolenic acid, in diet, 274.
 α -Lipoic (thiotic) acid, 158.
 structure of, 209.
 α - and β -Lipoic acid, 253.
 "Lipothiamide," 254.
 Lithiophorite, structure of, 365.
 Lithium, spectrographic detn. of, 330.
 Lithium aluminium hydride, preparation of, 84.
 uses of, 139.
 borohydride, preparation and use of, 141.
 hydroperoxide, 85.
 Liver, degeneration of, 271.
 α -Longinemic acid, constitution of, 157.
 Luminol as chemiluminescent indicator, 329.
 Lumisterol, stereochemical detail of, 379.
 Lupeol, structure of, 188.
 Lupulone, synthesis of, 189.
 Lysine, 261.
 α - or β -Lysine, 162.
- Macromolecules, 235.
 Macrozamin, 163.
 Magnesium, colorimetric detn. of, 327.
 potentiometric detn. of, 324.
 Magnesium cyanide, preparation of, 87.
 Maleic acid, crystal structure of, 376.
 Mandelic acid, resolution of, on silica gel, 144.
- Manganese, colorimetric detn. of, 310, 327.
 electroanalytical detn. of, 322.
 potentiometric detn. of, 325.
 Manganese dioxide, active, preparation and assessment of, 142.
 sulphate, systems involving, 105.
 Manogenin, 200.
 Marrubiin, probable structure of, 182.
 Menadione, 272.
 $(+)$ -*iso*- and $(-)$ -*neoMenthol*, formation of, from $(-)$ -*cis*- and $(+)$ -*trans*-piperitol, 179.
 $(-)$ -Menthyl chloride, homogeneous decomposition of, 37.
 Mercuric complexes, 87.
 Mercurous complexes, 87.
 Mercurous ion, detection of, 341.
 Mercury, colorimetric detn. of, 327.
 detection of, 310.
 micro-detn. of, as mercurous chloride, 312.
 Mercury compounds, crystal structure of, 367.
 Aminomeric chloride, use of, in separations, 307.
 Metanethole and related dimers, structure of, 166.
 Methionine, biosynthesis of, 261.
 Methane, potential constants of, 14.
 Methanol, colorimetric detn. of, 329.
 Methylamine, photolysis of, 56.
 Methyl chloride, interaction constants in, 12.
 Methyl fluoride, hydrolysis of, 51.
 Methyl halides, infra-red bands in, 17.
 Methyl nitrite, photolysis of, 56.
 Methyl oleate, autoxidation product of, 127.
 Methylene-blue, effect of radiations on, 78.
 Microscopy, chemical, 332.
 Moisture, detn. of, 341.
 Molecular compounds, crystal structure of, 368.
 Molecules, isotopic, force constants of, 8.
 $para$ Molybdate ion, structure of, 364.
 Molybdenum, colorimetric detn. of, 328.
 complex of, with gossypol, 310.
 separation of, 313.
 Molybdic oxide systems, 102.
 Monocrotalic acid, structure of, 157.
 Monolayers, phase changes in, 20.
 Monosilane, preparation of, 92.
 Montmorillonite, adsorption of water on, 22.
 Morphine, synthesis of, 221.
 Mucilages, 244.
 Muconic acid, β -methyl-, isomers of, 152, 158.
 Muningin, structure of, 232.
 Muscular dystrophy and vitamin E, 272.
 "Mycodextran," constitution of, 242.
 Mycomycin, structure of, 160.
 iso Mycomycin, structure of, 160.
- Naphthalene, crystal structure of, 370.
 octamethyl-, structure of, 370.

- " Naphthalene tetrachloride," structure of, 372.
 Naphthidine- and 3 : 3'-dimethylnaphthidine-sulphonic acid as oxidation-reduction indicators, 318.
 " *cis*-Naphthodioxan," structure of, 373.
 Neodymium, pure, preparation of, 91.
 Nephelometry, 330.
 Nickel, chelated compounds of, with arsines, 106.
 colorimetric detn. of, 328.
 detn. of, 316.
 Nickel carbonyl, structure of, 359.
 cyanide, complex of, with ammonia and benzene, 106.
 dimethylglyoxime, crystal structure of, 368.
 Nicotine thiocyanate, use of, in microscopy, 332.
 Niobium, colorimetric detn. of, 329.
 extraction of, from uranium alloys, 337.
 separation of, from tantalum, 99, 313.
 spectrographic detn. of, 331.
 Niobium chlorides, 99, 100.
 mononitride, 99.
 pentoxide, reduction of, 100.
 Nitrate, absorptiometric detn. of, 326.
 crystal tests for, 332.
 identification of, 309.
 precipitants for, 311.
 Nitric acid, crystal structure of, 360.
 Nitric oxide, crystal structure of, 359.
 Nitrite, crystal tests for, 332.
 detn. of, 311.
 Nitrite ion, structure of, 359.
 Nitrogen, adsorption of, in copper, 22.
 energy of adsorption of, in graphite, 21.
 trifluoride, bond-bond constant in, 14.
 Dinitrogen pentoxide, crystal structure of, 359.
 Dinitrogen tetrasulphide, 98.
 Dinitrogen tetroxide as solvent, 96.
 Nitrosyl compounds, 97.
 Nitryl chloride, 97.
 Pernitrous acid, 97.
 Nitroparaffins, colorimetric detn. of, 329.
 Nitrosyldisulphonate ion, decomposition of, in water, 48.
 Non-aqueous solvents, use of, in analysis, 341.
 Non-aqueous systems, radiation chemical reactions in, 68.
 Nona-*trans*-2 : *cis*-6-dienal, synthesis of, 155.
 Non-benzenoid aromatic compounds, 174.
 " *c*-Noremetine," synthesis of, 220.
 Nucleic acids, 246.
 Nucleosides, 264.
 Nucleotides, 217, 264.
cis-Octadec-11-enoic acid, occurrence of, 159.
trans-Octadec-11-enoic acid, (vaccenic acid), synthesis of, 159.
 Octadec-12-enoic acid, 9-hydroxy-, isolation of, 159.
 Octa-3 : 5-diene-2 : 7-dione, preparation of, 155.
 Octane, 2-chloro-, resolution of, by means of urea complex, 144.
 cycloOctatetraene, crystal structure of, 372.
 Oenanthesol, 154.
 Oenanthesone, 154.
 Oenanthesoxin, 154.
 α -Olefins, dimerisation of, 150.
 Orbital force field, 14.
 Ornithine, precursors of, 262.
 Orotic acid, 264.
 Osmium, colorimetric detn. of, 329.
 pptn. of, 314.
 Oxalate-permanganate reaction, 47.
 Oxalic acid, crystal structure of, 376.
 titration of, 321.
 1-Oxa-4-mercuracyclohexane, structure of, 373.
 1-Oxaspiro[3 : 5]nonan-3-one, 203.
 1 : 4-Oxathien, 208.
 Oxazoline derivatives, 208.
 Oxidation, organic, 142.
 Oxidation, uncoupling of, and phosphorylation, 282.
 Oximes, crystal structure of, 378.
 Oxiran ring, fission of, 202.
 Oxygen, detn. of, in tin, 326.
 Oxygen isotopes, production and determination of abundance of, 100.
 Ozone, detn. of, 315.
 Ozonisation, 111.
 pH, definition of, 317.
 determination of, 317.
 Padmakastien, structure of, 233.
 Palladium, colorimetric detn. of, 329.
 complex fluorides of, 109.
 detn. of, 342.
 pptn. of, 314.
 Tetracyanopalladic(II) acid, 109.
 Pantothine, 254.
 Pantotheine, 162, 254.
 Pantothenic acid, 254.
 " Paracyclopahne," 164.
 Paraffin wax, wetting of, by liquids, 25, 26.
 Paraffins, thermal decomposition of, 37.
 Partition chromatography, 337.
 Patulinic acid, deoxydihydro-, 205.
 Pectic substances, 244.
 Pellitorine, structure of, 160.
 Penicilliopepsin, probable structure of, 171.
 Pentalenes, 174.
 cycloPentanespiro-2- ψ -indoxyl, 127.
 Pentathionate ion, decomposition of, 47.
 Pentose metabolism, 290.
 Peptides, 263.
 Peptides, biosynthesis of, 260.
 crystal structure of, 376.
 degradation of, 148.
 syntheses of, 146, 147.
 Periodate, oxidation by, effect of light on, 142.
 Permanganate-oxalate reaction, 47.
 Peroxides, acyl, 124.

- Peroxides, alkyl, 124.
decomposition of, 124.
detn. of, 315.
potentiometric detn. of, 324.
- Petroselinic acid, synthesis of, 158.
- 1 : 10-Phenanthroline and methyl derivatives, complexes of, with copper, 306.
- Phenazine, crystal structure of, 374.
"Phenonium" ion, 111.
- Phenylalanine and utilisation of tryptophan, 263.
- Phenylneopentyl radical, rearrangement of, 132.
- Phenyl radical, reactions of, 41.
- Phosphate, mechanism of uptake of, 278.
potentiometric detn. of, 324.
bond energy, utilisation of, 285.
metabolism, 275.
transfer, catalyses of, 290.
- Phosphates, crystal structure of, 362.
- Phosphatides, 161.
- Phosphine, cross-term constants in, 12.
- Phosphorescence, 57.
- Phosphorus, colorimetric detn. of, 326.
detn. of, 311.
mixed halides of, 98.
- Phosphorylation, oxidative, 275.
uncoupling of, and oxidation, 282.
- Photochemistry, 53.
- Photosensitised reactions, 57.
- Physical separation methods of analysis, 333.
- Piazzenole, structure of, 375.
- Piazthiole, structure of, 375.
- Pimelic acid, as growth factor, 256.
formation of, 145.
- Pimelic acid, $\alpha\alpha'$ -diamino-, as intermediate in lysine synthesis, 261.
- (-)-Pipcolinic acid, 207.
- Platinum, dichlorodiethylene-, preparation of, 82.
pptn. of, 314.
Potassium dinitro-(*N*-ethyl-*N*-methyl-glycine)platinate(II), 109.
- Pleiadene, 175.
- Plutonium, electrodeposition of, on platinum, 322.
- Polarography, 322.
- Polycyclic compounds, 168.
- Polymerisation, anionic, 63.
cationic, 62.
nomenclature of, 58.
- Polypeptide, cyclic, first synthesis of, 147.
- Polysaccharides, 235.
from fresh-water algae, 246.
- Poly-yne acids, naturally occurring, 160.
- Potassium, amperometric detn. of, 324.
colorimetric detn. of, 327.
detn. of, as tetraphenylboron compound, 312, 315.
polarographic detn. of, 323.
precipitants for, 310.
spectrographic detn. of, 331.
- Potassium hydrogen carbonate, crystal structure of, 375.
- Potassium hydrogen (di)fluoride, structure of, 351.
- Potassium hypobromite, solid, isolation of, 105.
- Potassium sulphamate, crystal structure of, 363.
- Potassium xanthate, use of, for precipitation of sulphides, 309.
- Potato phosphorylase, preparation of, 238.
- Potentiometric titration, 324.
- Praseodymium, acetylacetone complexes of, 91.
pure, preparation of, 91.
separation of, from lanthanum, 311.
- Progocalciferol, 267.
- Proline, biosynthesis of, 206.
precursors of, 262.
- cycloPropane, isomerisation of, 37.
derivatives, synthesis of, 177.
- cycloPropene, bond lengths in, 177.
- Propionic acid, α -chloro-, partial resolution of, by inorganic complexes, 82.
resolution of, by cobalt complexes, 144.
- isoPropyl chloride, dehydrochlorination of, 36.
- Proteins, 250.
crystal structure of, 380.
- Protogen, 252.
- Protogen A, 209.
- Protokosin, formula and structure of, 189.
- Provitamin D, 268.
- Pseudomonas aeruginosa*, antibiotics from, 210.
- Psilomelane, crystal structure of, 365.
- Pteridine derivatives, 216.
- PteroIyglutamic acid, 4-amino- and 4-amino-10-methyl-, 258.
- Purines, 264.
- Putrescine as growth factor, 266.
- Pyracene, 175.
- Pyran derivatives, 204.
- Pyrazine, tetramethyl-, crystal structure of, 374.
- Pyridine derivatives, 206.
- Pyridinotropolones, formation of, 210.
- Pyridoxine derivatives, 255.
- Pyrimidine derivatives, 208.
- Pyrimidines, 264.
- Pyrrole derivatives, 205.
- Pyruvate-oxidation factor, 252.
- Quinaldine, 8-hydroxy-, steric effect of, 81.
- Quinazoline derivatives, 211.
- Quinocol, structure of, 374.
- Quinoline, 8-hydroxy-, test for, 330.
- Quinoline derivatives, 210.
- Quinoxaline derivatives, 211.
- Radiation chemistry, 64.
- Radioactivation, 340.
- Radiochemical analysis, 339.
- Reactions in solution, 41.
- Redox systems, 34.
- Reduction methods in organic chemistry, 137.

- Resolutions, optical, 143.
 Rhodium, colorimetric detn. of, 328.
 detn. of, 313.
 Rhodium, colorimetric detn. of, 329.
 Rhoifolin, structure of, 232.
 Rhombifoline, structure of, 220.
 Ribonucleic acids, 247.
 Rickets, 269.
 Rubidium, potentiometric detn. of, 324.
 spectrographic detn. of, 330.
*iso*Rubijervine, 229.
 Rubremetines, dihydro-, 220.
 Ruthenium, colorimetric detn. of, 329.
 complexes of, with thiosemicarbazides, 109.
 dicyclopentadienyl- ("Ruthenocene"), 84.
 higher oxidation states of, 109.
 sexavalent state of, stability of, 108.
 tetroxide, reduction of, 108.
 trinuclear compounds of, 108.
 "Ruthenocene". *See* Ruthenium, di-cyclopentadienyl-.
- Salicylic acid, acetyl-, as alkalimetric standard, 301.
 Salt solutions, incomplete dissociation in, 30.
 ψ -Santonin, structure of, 180.
 Scandium, detn. of, 307.
 Screw-dislocation in crystals, 343.
 Sedimentation analysis, 341.
 Selenium, crystal structure of, 354.
 Selenium compounds, 101.
 Selenium-thorium system, 94.
 Serpentine (alkaloid), structure of, 223.
 Shikimic acid, 260.
 Silica gel, adsorption of liquids on, 24.
 heat of wetting on, 27.
 use of, in optical resolution, 144.
 Silicates, crystal structure of, 360.
 Silicon, colorimetric detn. of, 327.
 Silicon alkyls, 92.
 oxyhydride, 92.
 Silver, catalytic effect of, 341.
 colorimetric detn. of, 327.
 detn. of, 312.
 Silver fluorides, anhydrous, preparation of, 104.
 tetrafluoroborate, preparation of, 104.
 Skatole, 2-phenyl-, ozonide of, 214.
 Sodium, spectrographic detn. of, 330.-
 Sodium borohydride, preparation and use of, 141.
 hypobromite, solid, isolation of, 105.
 α - and β -oxyhyponitrite, 97.
 silicates, 92.
 thiosulphate, crystal structure of, 363.
 solutions, stability of, 314.
 Solamargine, 227.
 Solanocapsine, 228.
 Solasodine, stereochemical configuration of, 227.
 Solid-liquid interface, thermodynamics of, 18.
 Solids, porous, 22.
 "Solubilisation titration," 321.
- Sound, velocity of, in electrolytes, 28.
 Spectra, infra-red, of fatty acids, 144.
 Spectrophotometric methods, 144.
 Sphingosine, configuration of, 161.
 dihydro-, resolution of, 161.
 Spreading pressure, 19.
 Starch, maple-sapwood, constitution of, 236.
 Stearic acids, 9 : 10-dihydroxy-, isomeric, 157.
 Sterculic acid, 159, 177.
 Stereochemistry of polycyclic compounds, 183.
 Steroid ring D, method of building, 193.
 Steroids, 190.
 absorption spectra of, 145.
 naturally recurring, 200.
 physical properties of, 201.
 stereochemistry of, 202.
 3 : 5-cycloSteroids, 199.
 Structure analysis, technique of, 345.
 Sucrose, reactions of, 243.
 Sugars, separation of, 339.
 Sulphamic acid, as alkalimetric standard, 301.
 crystal structure of, 363.
 Sulphates, conductimetric detn. of, 325.
 crystal structure of, 362.
 gravimetric reagent for, 312.
 indirect titration of, 315.
 polarographic detn. of, 323.
 See also under Barium.
 Sulphite, detn. of, 315.
 Sulphur, chlorides of, 100.
 colorimetric detn. of, 309, 326.
 trifluoromethyl derivatives of, 100.
 Sulphur compounds, wet oxidation of, 319.
 Sulphur nitride, structure of, 358.
 Sulphur radicals, 136.
 Surface chemistry, 18.
- Tantalum, extraction of, from uranium alloys, 337.
 precipitation of, by tartaric acid, 313.
 separation of, from niobium, 99, 313.
 spectrographic detn. of, 331.
 Tantalum pentachloride, mixed crystals of, with niobium pentachloride, 99.
 pentoxide, reduction of, 100.
 Taric acid, synthesis of, 158.
 Tartaric acid, detn. of, 321.
 partial resolution of, by inorganic complexes, 82.
 resolution of, by cobalt complex, 144.
 Technetium, heptasulphide, 105.
 pertechnetate ion, 105.
 separation of, 105.
 Tellurium, compounds of, 101.
 tetrachloride as an "acid," 101.
 Terpenes, 178.
 Tetradecaheptaene, 151.
 Tetrametaphosphoric acid, 85.
 Tetrathionate, polarographic detn. of, 323.
 Thallic iodide, preparation of, 90.
 Thallic ions, reactions of, 90.

- Thallous sulphate, double salts of, 91.
 Thebaine derivatives, 222.
 Thermodynamics, adsorption, 21.
 Thia-adamantane, 212.
 Thiazoline derivatives, 208.
 Thiochrome, formation of, from aneurin, 137.
 Thiocyanate, extraction and identification of, 309.
 potentiometric detn. of, 324.
 " Thiocic acids," 253.
 See also α -Lipoic acid.
 Thiosulphatimetry, definition of, 301.
 Thiourea complexes, 143.
 Thorium, colorimetric detn. of, 328.
 detn. of, 307.
 potentiometric detn. of, 325.
 precipitation of, 311, 313, 317.
 Thorium carbide, crystal structure of, 351.
 hydride, crystal structure of, 351.
 Thorium-selenium systems, 94.
 Thyroid hormone, 291.
 L-Thyronine, 3 : 5 : 3'-tri-iodo-, 292.
 Thyroxine, 284.
 new synthesis of, 295.
 Tin, alkaliometric titration of, 317.
 colorimetric detn. of, 328.
 detn. of, in bronzes, 313.
 iodometric titration of, 317.
 Tin, grey, 95.
 Titanium, colorimetric detn. of, 328.
 precipitation of, 310.
 Titanium alkoxides, 82.
 derivatives, 93.
 Titrimetry, definition of, 301.
 δ -Tocopherol, 270.
 Tocopherols, antioxidant activity of, 270.
 medicinal use of, 272.
 Tolane, 4 : 4'-diamino-, solubility of sulphate of, 307.
 Toluene-*p*-sulphonates of steroids, reduction of, by lithium aluminium hydride, 140.
 Tomatidine, 228.
 Tracers, non-radioactive, 340.
 Trachelanthic acid, structure of, 157.
 Transport numbers in electrolytes, 28.
 Trans-uranic elements, 103.
 Triacetylene, dimethyl- (octa-2 : 4 : 6-triene), crystal structure of, 371.
 Triazine derivatives, 209.
 Trichlorophosphazosulphuryl chloride, 101.
 Triphenylmethyl, reaction of with nitrobenzene, 115.
 infra-red spectrum of, 115.
 Tri-o-thymotide, optical resolution of, 143.
 use of, in effecting optical resolution, 144.
 Tropolone, crystal structure of, 372.
 Tropolones, 172.
 Tryptophan and its 4-methyl derivative, antagonism of, 263.
 Tungsten, colorimetric detn. of, 328.
 detection of, 310.
- Tungsten, potentiometric titration of, 325.
 paraTungstate ion, structure of, 364.
 Tungsten bronzes, structure of, 102.
 Tyrosine and utilisation of tryptophan, 263.
- Unimolecular gas reactions, 36.
 Uranium, potentiometric detn. of, 325.
 β -Uranium, structure of, 357.
 Uranium hydride, structure of, 351.
 Uranium salts, 103.
 Uranyl, detn. of, 307.
 Urea, crystal structure of, 353.
 complex of, with *erythro*-9 : 10-dihydroxy stearic acid, 157.
 complexes, use of, in separations, 143.
 in effecting optical resolution, 144.
 Ureidosuccinic acid, 264.
 Uridine, 265.
 Urorosein, structure of, 214.
- Valine, precursors of, 262.
 Vanadate, titration of, 317.
 Vanadium, colorimetric detn. of, 329.
 detn. of, by centrifugation, 341.
 potentiometric detn. of, 325.
 precipitation of, 313.
 Vanadium mono-boride, -nitride, and -oxide, 99.
 pentoxide, crystal structure of, 364.
 Veratramine, relationship of, with jervine, 230.
- Vinylidacetylene, formation of, 151.
 Visnagin, conversion of, into khellin, 234.
 Vitamin A₁ acetate, 151.
 Vitamin B complex, 252.
 Vitamin B₆ group, 255.
 Vitamin B₁₂, 259.
 *pseudo*Vitamin B₁₂, 218.
 Vitamins D, assay of, 266.
 Vitamins E, 270.
 Vitamin K, 272.
 Vitamins, higher forms of B-group, 260.
 Vitamins, nomenclature of, 266.
 Volumetric, definition of, 301.
- Water, first-order phase changes of, on graphite, 20.
 Wetting, heats of, 26.
 " Windaus acid," partial synthesis of, 193.
- Xanthopterin, 216.
 β -dihydro-, structure of, 216.
 Ximenynic acid, structure of, 159.
 Xylan, 243.
- Yield, expression of, in radiation chemistry, 68.
- Yobyrine, formation of, 224.
 (\pm)-*allo*Yohimbane, resolution of, 223.
 Yohimbyl alcohol, dehydrogenation of, 224.
- Zeorin, characterisation of, 189.

Zinc, amperometric titration of, 324.
colorimetric detn. of, 327.
detection of, 310.
detn. of, in soils, 337.
titration of, 316, 318.
nephelometric detn. of, 330.
Zincate ions, 31.
Zirconium, colorimetric detn. of, 328.

Zirconium, complexes of, with 2-nitroso-1-naphthol, 93.
distinction of, from hafnium, 333.
precipitation of, 313.
purification of, 93.
Zirconium alkoxides, 82, 93.
hydride, crystal structure of, 351.
salts, hydrolysis of, 93.