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Crystallography. Mineralogy

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Committee references OC/20/4, OC/20/4/12

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Amendments issued since publication

Amd. No.	Date of issue	Text affected
1367	January 1974	Indicated by a line in the margin
2742	October 1978	Indicated by a line in the margin

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Foreword

The English version of the Universal Decimal Classification (UDC) is being prepared and published as BS 1000 by the British Standards Institution (BSI) at the original joint request of the British Society for International Bibliography (BSIB) and the Association of Special Libraries and Information Bureaux (ASLIB), now amalgamated as Aslib. It has the approval of the Education Foundation, Lake Placid Club, New York, proprietors of the Dewey Decimal Classification, from which the UDC derives. The English Full Edition of the UDC is authorized by the Fédération Internationale de Documentation (FID), The Hague, Netherlands.

This section is part of the English Full Edition. It should be used in conjunction with the Abridged English Edition, BS 1000A, which refers to many other subjects of interest not listed in this schedule, and provides a conspectus of the whole scheme, together with an introduction to its use. For further practical information about the principles, application and utilization of the scheme, users should refer to BS 1000C.

This edition of UDC 54, which replaces the 1943 edition, includes modifications authorized in 'Extensions and Corrections to the UDC' up to and including Series 10, No. 1, dated June 1978. Subsequent issues of 'Extensions and Corrections to the UDC' should be consulted to keep the schedules up to date. British Standards related to this part of BS 1000 are listed on the inside back cover.

Scope

Section 54 deals with pure chemistry, crystallography and mineralogy, the last mainly from a chemical point of view. The industrial processes for the manufacture of chemicals are found in 66, Chemical technology. Inorganic chemicals and organic chemicals are classed under 546 and 547. Users are advised to study the introductions to these parts of the schedule. The applications of chemistry to various other sciences are classed under those sciences, for example 57 Biology, 61 Medicine, 63 Agriculture and 77 Photography.

Related subjects

53	Physics
55	Geology. Geophysics
615	Pharmaceutics. Therapeutics. Toxicology
622	Mining and mineral dressing
66/66.09	Chemical and related industries. Chemical technology
661	Production of chemicals (fine, heavy, etc)
669	Metallurgy
678	Macromolecular materials (rubbers and plastics)
77	Photography

Auxiliary signs and subdivisions

Full information about the common and special auxiliary signs and subdivisions (often abbreviated to 'common and special auxiliaries') will be found in BS 1000A and BS 1000C.

Colon sign of relation. For the classification of information for the public, as in abstracts and bibliographies, maximum use of colon combinations rather than of common or special auxiliaries is recommended. The use of the colon sign of relation is preferable for multiple entry systems, as it will help prevent the concealment of information. This usually results in longer notation, however, and for information for more restricted use, the application of auxiliaries, where available, may be simpler and more convenient provided that there is an adequate alphabetical subject index.

Common auxiliaries. The common auxiliaries of language = ..., form (0...), place (1/9), race and nationality (=...), time "...", point of view .00..., materials -03... and persons -05... are applicable throughout the UDC. However, they should be used mainly to express concepts not otherwise provided for in the schedules.

Special auxiliaries. The -1/-4 and .01/.08 special auxiliary subdivisions listed at 54 are applicable throughout the schedule where relevant. Special auxiliary subdivisions are also given at various main subdivisions of 54, e.g. 541.18, 548.713. For the use of special auxiliaries in 546 and 547, in particular the use of the apostrophe, the introductions to these parts of the schedule should be consulted.

Typographic presentation

Small type is used for cancelled numbers and text.

The arrow → means either 'see' or 'see also' according to the context.

The symbol $\cong$ 'subdivide as' means that the number preceding it may be subdivided in the same way as, and with meanings analogous to the subdivisions of, the number which follows it.

Note. This reprint, which incorporates amendments 1 and 2, indicates some cancelled numbers and texts by the word "cancelled".

SCHEDULE

54 CHEMISTRY. CRYSTALLOGRAPHY MINERALOGY

Special auxiliary subdivisions for 54

54-1	STATE OF SUBSTANCE	54-162.32	With water as accessory component. Hydrated
-11	State in relation to occurrence and treatment	.37	With organic accessory components
-112	Natural. Native. Raw. Untreated	-165	Solid solutions. Homogeneous solid phase
-114	Synthetic. Artificial. Prepared	-168	Colloidal state with solid dispersion medium
-116	Processed. Treated. Modified.		→541.182.8 Systems with solid substances as continuous phase—
-12	State in relation to atomic and molecular structure		Colloids
-121	Elementary	-17	Allotropic state
-123	Atomic	-171	Stable
-124	Molecular. Monomeric	-172	Metastable
-125	Isomeric	-18	Special states in relation to properties
-126	Polymerized	-182	Colloidal state in general
-127	Polycondensed		For details →541.182
-128	Ionic. Ionized	-183	Adsorbed
.2	Anions		For details →541.183
.4	e.g. 547.466.2-128.2 Anion of glycine	-185	Mixtures. Heterogeneous systems in more than one phase
	Cations	-188	Activated
	e.g. 547.466.2-128.4 Cation of glycine	-19	Alloys in general
-13	Gaseous state		
-132	Rarefied	54-3	SPECIAL TYPES OF COMPOUND
-133	Compressed	-31	Oxides
-134	Vapour state		The subdivisions -312/-318 listed at 547 are applicable only within that class
-135	Homogeneous gaseous phase containing more than one component		Acids
	54-135 ≅ 54-145	-32	Meta-acid type
-138	Colloidal state in the gaseous phase. Fluidized. Smokes. Aerosols	-323	Pyro-acid type
	→541.182.2/.3 Systems with gases as continuous phase—	-324	Ortho-acid type
	Colloids	-325	Bases. Hydroxides
-139	Supercritical fluid state	-36	Salts and analogous compounds
-14	Liquid state	-38	Basic salts
-141	Mobile	-381	Neutral salts
-142	Viscous	-383	Acid salts
-143	Molten	-384	Primary
-144	Mesomorphic, paracrystalline state	.1	Secondary
-145	Solutions. Homogeneous liquid phase	.2	Tertiary
	Degree of concentration, acidity etc	.3	Double salts. Complex compounds
.1	Dilute	-386	Peroxy compounds
.11	Concentrated	-39	
.12	Saturated	54-4	CHEMICALS. REAGENTS
.13	Supersaturated	-41	Reagents in general
.14	Acid solution	-412	Precipitating agents
.15	Basic solution	.1	Inorganic
.16	Neutral solution	.2	Organic
.2	Aqueous solutions. Pure water as solvent	-42	Standard solutions
	54-145.2 ≅ 54-145.1	-43	Indicators
.3	Inorganic liquid (other than water) as solvent	-432	Indicators for acids and bases
	54-145.3 ≅ 54-145.1	-434	Indicators for spot tests
.4	Organic liquid as solvent	-438	Indicators for colorimetric and photometric analyses
	54-145.4 ≅ 54-145.1	-44	Catalysts
-148	Colloidal state in the liquid phase. Colloidal suspensions. Emulsions. Sols. Gels. Foams	-45	Buffers. Buffer solutions
	→541.182.4/.6 Systems with liquids as continuous phase—	-48	Degree of purity of chemicals
	Colloids	-481	Analytical grade
-149	Coarse suspensions	-482	Very pure
-15	Mesomorphic state. Paracrystalline state →54-144	-483	Pure
-16	Solid state	-484	Purified. Technical
-161	Amorphous state	-485	Commercial. Crude
.6	Glassy	-8/-86	Salts or corresponding compounds →54-38/-386
-162	Crystalline state	-9/-94	Polymerized substances. Condensed substances →54-126/-127
.2	Crystalline state from the point of view of crystallographic structure	54.01	CHEMICAL SUBSTANCES AND SYSTEMS. ORIGIN. OCCURRENCE. PHASES
	546-162.2 ≅ 548.1.02, e.g.		For state of substance →54-1
.3	546.22-162.25 Rhombic sulphur		For phase details →541.12.01
	Crystalline state with accessory crystal components		

54.02	COMPOSITION. STRUCTURE. ISOTOPES ETC →541.18.02 Composition. Structure— Colloid chemistry	54.052	Mode of procedure, choice of method etc →541.18.052 Methods of dispersion— Colloid chemistry
.021	General composition and formula. Molecular formula. Symbols etc →003.62 Signs. Notation. Symbols 54.081 Units. Constants	.053	543.052 Procedure. Selection of sampling points. Errors etc—Analytical chemistry
.022	Structure and arrangement of atoms in the molecule. Structural formula →547.022 Structure of organic compounds from the point of view of linking of the carbon atoms	.055 .056	Design of method or procedure. Technique used →543.053 Technique and apparatus for taking and collecting samples
.024	Radicals →547.024 Organic radicals	.057 .058	Preparation by dry means. Grinding, fusing etc Preparation by wet means. Dissolving, extracting etc Synthesis Purification →54-48 Degree of purity of chemicals
.027	Isotopes in general <i>Specific isotopes are classed under the number for the element concerned, adding an asterisk and the mass number, e.g.</i> 546.26*14 Carbon 14 .791*235 Uranium 235	54.06	ANALYSIS, INVESTIGATION AND MANIPULATION IN GENERAL (OTHER THAN PREPARATIVE) 54.06 $\cong$ 543.06 →54.08 Measurement principles, methods, techniques and instrumentation
54.03	PHYSICAL PROPERTIES AND CONSTANTS. MECHANICAL AND PHYSICAL EFFECTS <i>For details →541.12.03</i> <i>Further particulars may be denoted by colon combination with the subdivisions of 53</i>	54.07	APPARATUS AND EQUIPMENT (FOR PREPARATION, SYNTHESIS, INVESTIGATION ETC) →54.05 Preparation, synthesis, purification etc <i>Further particulars may be denoted by colon combination with the subdivisions of 542 (for laboratory apparatus) or 66.01/.09 (for industrial apparatus)</i>
54.04	CHEMICAL PROPERTIES AND CONSTANTS <i>For details →541.18.04</i> <i>Further particulars may be denoted by colon combination with the subdivisions of 54</i>	54.08	MEASUREMENT PRINCIPLES, METHODS, TECHNIQUES AND INSTRUMENTATION 54.08 $\cong$ 53.08, e.g. 54.081 Units. Constants <i>Further particulars may be denoted by colon combination with the subdivisions of 531/539, e.g.</i> 54.08:531.75 Mass and density measurement →542.3 Measurement of mass and volume. Determination of mass and density etc 543.24 Volumetric analysis. Titration. Titrimetric methods
54.05	PREPARATION, SYNTHESIS, PURIFICATION ETC <i>Further particulars may be denoted by colon combination with the subdivisions of 542 (laboratory preparation) or 66.01/.09 (industrial preparation)</i>	.09	Uses. Applications use common auxiliaries .001.8 or .004
.051	General principles of procedure for production, sampling etc →541.18.051 Preparation—Colloid chemistry 543.051 General principles and theory of sampling		

Principal divisions

541 THEORETICAL CHEMISTRY

	<i>The following common auxiliary subdivisions of time are particularly applicable in 541:</i>
541"71"	Development
"72"	Simultaneity (several occurrences)
"73"	Sequence
"74"	Stability. Permanence. Steady state
"75"	Repetition
"76"	Direction
"761"	Reversibility (non-directional in time), e.g. 541.182.642"761" Reversible sols
"762"	Irreversibility (unidirectional in time)
"763"	Hysteresis. Delay. Lag
"77"	Spontaneity. Automatic action. Self-determination
"78"	Indeterminate. Indefinite

Special auxiliary subdivisions for 541

The special auxiliary subdivisions .08/.083 listed at 53 are applicable throughout 541

Principal divisions (continued)

541.1	PHYSICAL CHEMISTRY
541.11	THERMOCHEMISTRY →536 Heat. Thermodynamics (Relative) molar (molecular) heats. (Relative) atomic heats. Dulong and Petit's Law Exothermic and endothermic reactions in general. Heat of reaction in general →536.66 Heat of reaction Low temperature chemistry High temperature chemistry
.113	
.115	
.117	
.118	
541.12	CHEMICAL MECHANICS →533.7 Kinetic theory of gases 536.7 Thermodynamics

Special auxiliary subdivisions for 541.12

- 541.12.01 Natural state. Origin. Phases
 .011 One-phase systems
 .2 Solid
 .3 Liquid
 .4 Gas
 .012 Two-phase systems
 .2 Solids
 .3 Solid and liquid
 .4 Solid and gas
 .5 Liquids. Mixing and separation of liquids in general
 .6 Liquid and gas
 .013 Three-phase systems. Triple point
 .2 Solids
 .3 Solids and liquids
 .4 Solids and gases
 .5 Liquids
 .6 Liquids and gases
 .7 Liquid, solid and gas
 .014 Four-phase systems
 .015 Systems with more than four phases
 .017 Equilibria having maxima, minima or other characteristic curves. Eutectic. Dystectic. Peritectic
 .3 Azeotropy
 .03 Physical properties and constants. Mechanical and physical effects
 Effects other than those given below may be denoted by colon combination
 .031 Mechanical effects in general
 .032 Effect of intensive mixing
 .033 Effect of mechanical vibration
 .034 Effect of pressure in general
 .2 Effect of very high pressure
 .4 Effect of very low pressure
 .6 Effect of vapour pressure
 .035 Effect of concentration
 .2 Effect of very high concentration
 .4 Effect of very low concentration
 .036 Effect of temperature
 .037 Effect of electricity
 .038 Effect of environment
 .2 Effect of solvent
 .3 Effect of containing wall

Principal divisions (continued)

- 541.121/.123 Chemical statics [cancelled] → 541.121
 .121 Generalities on chemical statics. Equilibrium in general
 Further particulars may be denoted by colon combination, e.g.
 541.121:536.7 Thermodynamic theory of chemical equilibrium
 .122 Equilibrium of homogeneous systems
 .2 Equilibrium of solid systems
 .3 Equilibrium of liquid systems
 .4 Equilibrium of gaseous systems
 .123 Equilibrium of heterogeneous systems
 Further particulars may be denoted by special auxiliaries, e.g.
 541.123.012.5 Mixing and separation of liquids
 .1 Systems with one component
 .11 Water diagrams
 .2 Binary systems
 Further particulars may be denoted by special auxiliaries, e.g.
 541.123.2.034.6 Vapour pressure in binary systems. Raoult's Law
 .21 With water as one component. Aqueous solutions
 .22 Considerations of water of crystallization
 .23 With a non-aqueous solvent as one component
 .24 Binary metal systems
 .25 Binary silicate systems

541.123.28

- .3
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 .8/.9
 .81
 .124/.128
 .124

Solubility of a gas in a liquid

Further particulars may be denoted by special auxiliaries, e.g.

- 541.123.28.034 Henry's Law
 Ternary systems in general
 With water as one component
 With a non-aqueous solvent as one component
 Ternary metal systems
 Ternary silicate systems
 Solubility of gases in binary systems and in salt solutions
 Ternary systems with one component divided between two liquid phases. Partition coefficient. Nernst's Law
 Reciprocal salt pairs. Exchange of reciprocal salt pairs
 Hydrogen exchange
 Hydroxyl exchange
 Base exchange
 Other exchanges
 Quaternary systems
 With water as one component
 With a non-aqueous solvent as one component
 Quaternary metal systems
 Quaternary silicate systems
 Heterogeneous systems with more than four components
 Other heterogeneous systems
 Hygroscopicity in general
 Chemical dynamics [cancelled] → 541.124
 Generalities on chemical dynamics and on the mechanism of reactions
 → 543.87 Oxidizability. Saturation. Explosiveness. Stability. Reactivity

Further particulars may be denoted by special auxiliaries, e.g.

- 541.124-13 Gas reactions
 -16 Reactions of solids
 Commencement of reaction. Reaction initiation. Nucleation
 Coupled reactions. Chain reactions. Thermal activation, dissociation and ionization
 → 539.17 Chain reactions
 541.128.3 Various effects on catalytic reactions
 Limits of reactions
 Temperature limits and concentration limits may be denoted by the .03 special auxiliaries
 Spontaneous reactions. Explosions. Reaction range. Physico-chemical combustion phenomena
 Further particulars may be denoted by special auxiliaries, e.g.

- 541.126.011.2 Explosion of solids, e.g. trinitrotoluene
 .011.4 Gas explosions, e.g. town gas and air, chlorine and hydrogen
 .012.4 Dust explosions, e.g. air and coal dust
 → 662.21 Mode of action and special properties of explosives
 662.611 Theory and statics of combustion
 662.612 Dynamics of combustion
 Initiation. Velocity of ignition. Delayed ignition
 → 621.43.019.2 The explosive mixture. Combustibility. Limits of reaction—Internal combustion engines

- Limits of reaction. Explosion limits
 Velocity of reaction. Reaction constants
 Velocity of reaction
 Relationship between concentration and velocity of reaction. Law of mass action (Guldberg and Waage)

- 541.127.3 Relationship between temperature and reaction velocity. Van't Hoff's Law. Temperature coefficient
- .4 Reaction equilibrium
- .128 Catalysis. Acceleration and retardation of reactions by catalysts
→541.146 Photocatalysis etc
542.97 Catalytic processes in general
- .1 Accelerating action. Positive catalysis
- .12 Homogeneous catalysis
- .13 Heterogeneous catalysis
- .135 Colloidal catalysis
- .2 Autocatalysis
- .24 Auto-oxidation. Spontaneous combustion
- .3 Various effects on catalytic action
- .34 Activation
- .35 Carriers
- .36 Stabilization
- .363 Promotion of stabilization
- .37 Dilution
- .4 Negative catalysis
- .5 Catalyst poisons
- .7 Periodic reactions
- 541.13 **ELECTROCHEMISTRY**
→537.3 Electrokinetics
621.35 Applied electrochemistry
For the electrochemical preparation of various products →661 and 669
- .131 Generalities. Faraday's Law. Electrochemical equivalent
- .132 Electrolytic dissociation. Ions
→537.56 Ionization of gases
543.257.1 Potentiometric analysis.
Determination of hydrogen ion concentration (pH value, acidity, alkalinity)
Further particulars may be denoted by special auxiliaries, e.g.
541.132.081.7 Electrolytic dissociation constant
- .3 Hydrogen ion concentration (pH)
- .4 Buffer operation. Buffers. Electrolytic dissociation
- .133 Conductivity and resistance of electrolytes
Further particulars may be denoted by special auxiliaries, e.g.
541.133.08 Measurement of resistance of electrolytes
- .1 Transport of ions. Velocity of migration
- .134 Electromotive force
- .2 Electrolytic solution pressure
- .3 Potential series
- .4 Concentration cells
- .5 Oxidation cells. Reduction cells
- .135 Electrolytes. Electrolysis. Polarization
→532.7 Kinetic theory of liquids etc
541.8 Generalities on solutions and solubility
- .1 Electrolysis of pure liquids. Pure liquids as electrolytes
- .2 Electrolysis of solutions. Electrolytic properties of solutions
- .21 Dilute solutions
- .22 Concentrated solutions
- .27 Special properties of organic electrolytes
- .3 Electrolysis of molten salts or oxides
- .4 Electrolytic phenomena in solid bodies
- .5 Electrodes and diaphragms
Materials may be denoted by the -03 common auxiliaries (Table 1(k))'.
- .52 Metal electrodes [*cancelled*] use 541.135.5-034
- .53 Glass electrodes [*cancelled*] use 541.135.5-033.5
- .6 Electrolytic polarization. Polarization current
- .61 Generalities. Polarization potential
→541.134 Electromotive force
- .62 Passivity phenomena
- .64 Depolarization
- 541.135.68 Unipolar conductivity. Erman effect
→541.135.27 Special properties of organic electrolytes
- .7 Effect of an alternating current on electrolysis
- .8 Other effects on electrolysis
- .85 Effect of light
- .86 Effect of temperature
- .88 Effect of a magnetic field
- .136 Cells. Accumulators
→621.35 Applied electrochemistry
- .1 Generalities. Terminal voltage
- .2 Various forms of primary cell
- .22 Standard cells. Normal cells
- .24 Concentration cells
- .3 Secondary cells. Accumulators
- .8 Effects on cells and accumulators
- .81 Effect of time
- .85 Effect of light
- .86 Effect of temperature
- .88 Effect of a magnetic field
- .138 Electrochemical reactions
- .2 Electrochemical oxidation. Galvanic corrosion
→620.193.7 Effect of electric currents etc—
Resistance to corrosion
- .3 Electrochemical reduction
- .139 Magnetochemistry. Effect of a magnetic field on chemical reactions
- 541.14 **PHOTOCHEMISTRY**
→535.217 Chemical effects. Activity—
Optics
- 535.37 Luminescence, fluorescence, phosphorescence and their spectra—Optics
- 612.014.44 Effect of light—Physiology
- 77.01 Theory, principles and nature of photographic phenomena
- .141 Generalities. Fundamental theory
- .1 Energetics of photochemistry. Velocity of reaction
- .11 Effect of temperature
- .12 Effect of wavelength
- .13 Effect of light intensity
- .14 Effect of time of exposure
- .2 Fundamental equations and laws
- .3 Minimum light intensity for photochemical action. Threshold value of energy
- .4 Primary process
- .5 Secondary process
- .6 Radiation theory in relation to chemical reactions
- .7 Excitation of molecules and atoms. Optical dissociation and ionization
→535.338.43 Optical dissociation of molecules
- .9 Measurement of quantity of photochemical energy. Actinometry
- .143 Specifically photochemical reversible reactions. Photochemical equilibrium
- .144 Specifically photochemical irreversible reactions
- .7 Photosynthesis in general
→581.132 Assimilation of carbon—Botany
- .8 Photodecomposition in general
- .145 Influence of light on non-specifically photochemical reactions. Photocatalysis
→541.128 Catalysis. Acceleration and retardation of reactions by catalysts
- .146 Photochemical secondary effects. Perrin's theory
- .5 Russell effect
- .147 Sensitivity
→771.53 Sensitized materials—
Photography
- .2 Optical sensitization
- .4 Chemical sensitization
- .5 Desensitization
- .7 Sensitometry

541.148 Various effects. Photovoltaic effect. Photo-electric effect. Becquerel effect

541.15 RADIATION CHEMISTRY. THE CHEMICAL EFFECTS OF EXTRANEEOUS RADIATIONS (OTHER THAN LIGHT) UPON SUBSTANCES, INCLUDING MIXTURES

For autogenous radiations (of radioactive substances) → 541.28

541.17 TOPOCHEMISTRY

541.18 COLLOID CHEMISTRY. CHEMISTRY OF ADSORPTION PHENOMENA. CAPILLARY CHEMISTRY

Physical properties and other aspects may be denoted by colon combination, e.g.

- 541.18:531.5 Increase of concentration in layers of different height
 :531.66 Effect of mechanical shock
 :531.7 Effect on colloids of the main dimensions
 :531.71 Measurement of the layer thickness
 :532 Colloids considered as liquids
 :532.5 Hydrodynamics of colloids
 :532.6 Capillary properties of colloids
 :532.7 Kinetic theory of colloids in so far as they are liquids. Particle number
 :532.71 Osmosis. Donnan equilibrium
 :533 Vapours and gases. Vapour pressure
 :534 Effect of oscillations. Acoustic properties of colloids
 :535 Colloid optics
 :535.6 Colour of colloids
 :536 Thermal phenomena in colloids
 :536.4 Effect of colloids on freezing point, boiling point etc
 :536.65 Latent heat of colloids
 :536.7 Thermodynamics of colloids
 :537 Electrical, magnetic and electromagnetic phenomena in colloids
 :539.26 Determination of structure by means of X-rays

Special auxiliary subdivisions for 541.18

- 541.18.02 Composition. Structure
 .025 Thixotropy
 .03 Physical properties and constants
Further particulars may be denoted by colon combination with the subdivisions of 53
 .04 Chemical properties and constants.
 Coagulation. Flocculation. Separation of phases
 .041 General matters. Phenomena occurring with alteration of the degree of dispersion in the sense that the particles coalesce
 .2 Flocculation
 .3 Coalescence
 .5 Rhythmic precipitation. Liesegang phenomena
 → 541.128.7 Periodic reactions
 .8 Coacervation
 .043 Mechanical separation of phases
 .3 By centrifuging
 → 621.928.3 Centrifuges etc
 .4 By shaking
 .5 By sedimentation
 .044 Phase separation by means of heat
 .045 Phase separation by increasing the concentration

- 541.18.045.2 By ultrafiltration
 .4 By evaporation
 .5 By desiccation
 .046 Coagulation by electrolytes and ultraparticles
 .7 By electrolytes
 .8 By ultraparticles
 .047 Coagulation by other physical means
 .3 With the aid of light
 .5 With the aid of an electric field
 .6 With the aid of an electric current
 .7 With the aid of an electric discharge
 .9 With the aid of magnetic processes
 .048 Coagulation with the aid of chemical agents
 .049 Coagulation by biological means
 .05 Preparation. Dispersion. Peptization
 Emulsification
 .051 General matters. Dispersion phenomena
 .2 Peptization
 .3 Formation of emulsions
 .8 Decoacervation
 .052 Methods of dispersion

Individual methods may be denoted by colon combination with the subdivisions of 542, e.g.

541.18.052:542 Chemical laboratory methods

:542.4 Thermal treatment, heating

:542.63 Mechanical shaking etc

:542.64 Dialysis

:542.66 Precipitation.

Centrifuging.

Sedimentation

:542.8 Physico-chemical and electrical methods

:542.87 Electrolysis

:542.9 Special chemical and biological methods

:542.98 Biological methods

.053/.059 Various methods of dispersion use 541.18.052 : 542

Principal divisions (continued)

541.182 Disperse systems. Colloids in the true sense

Special auxiliary subdivisions for 541.182

- 541.182.02 Structure
 .021 Colloidal particle composition and form
 .022 Low degree of dispersion → 541.182.023.2
 .023 Degree of disperse systems
 .2 Low disperse systems
 .4 High disperse systems
 .024 High degree of dispersion → 541.182.023.4
 .025 Thixotropy
 .026 Rheopexy

Principal divisions (continued)

- 541.182.2/.3 Systems with gases as continuous phase
 → 54-138 Colloidal state in the gaseous phase. Fluidized. Smokes. Aerosols
 .2 Disperse phase liquid. Mists
 .3 Disperse phase solid. Smoke. Dust
 .32 Systems of a gas and an amorphous solid use 541.182.3-161
 .33 Systems of a gas and a crystalline solid use 541.182.3-162
 .4/.6 Systems with liquids as continuous phase
 → 54-148 Colloidal state in the liquid phase. Colloidal suspensions. Emulsions
 Sols. Gels. Foams
 .4 Systems of two liquids. Emulsions → 541.182.41/.43
 .41 Disperse phase liquid
 .42 'Oil-in-water' emulsions (water-continuous emulsions)
 .43 'Water-in-oil' emulsions (oil-continuous emulsions)
 .45 Disperse phase gaseous. Foam systems
 .5 Gels. Gelatinizable solutions. Lyophilic colloids
 → 541.182.64

541.182.6	Disperse phase solid. Colloidal solutions	541.21	Generalities. Relationship between chemical properties of substances and their mass
.62	Systems of a liquid and an amorphous solid <i>use</i> 541.182.6-161	.22	Stoichiometric laws. Constant and multiple proportions. Equivalents. Law of volumes of gaseous compounds. Gay-Lussac's Law
.63	Systems of a liquid and a crystalline solid <i>use</i> 541.182.6-162	.23	Relative atomic mass (atomic weight) <i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.64	Lyophilic colloids		541.23.08 Determination of atomic weight
.642	Sols	.24	Relative molar mass (molecular weight) <i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.644	Gels		541.24.08 Determination of relative molar mass
.65	Lyophobic colloids. Suspensoids	.25	Relative atomic volume. Relative molar (molecular) volume. Stereochemistry
.7	Semicolloids. Transition systems to true colloids <i>Superfluous</i>	.251	Stereochemistry in general
.8	Systems with solid substances as continuous phase →54-168 Colloidal state with solid dispersion medium	.252	Relative atomic volume
.82	Disperse phase solid. Solid sols. Crystal sols	.253	Relative molar (molecular) volume
.83	Disperse phase liquid (e.g. butter, liquid rock inclusions)	.26	Other relationships between relative atomic mass and physical constants →541.113 (Relative) molar (molecular) heats. (Relative) atomic heats. Dulong and Petit's Law <i>Further particulars may be denoted by colon combination with the subdivisions of 53</i>
.84	Disperse phase gaseous. Solid colloidal foams		Parachor
.183	Contact systems. Adsorption. Surface chemistry		Chemical properties based on atomic structure →541.5 Valency. Bonds. Affinity
Special auxiliary subdivisions for 541.183			541.6 Chemical structure in general etc
541.183.02	Composition and structure of the adsorbent layer	.265	Radiochemistry. Study of the dependence of the chemical properties of radioactive elements on nuclear transformations →541.15 Radiation chemistry
.021	Composition of adsorbent layer	.27	546.79 Generalities on radioactive elements
.022	Structure of adsorbent layer. Monomolecular layers etc	.28	
.03	Physical properties, e.g. adsorptive capacity <i>Further particulars may be denoted by colon combination with the subdivisions of 53</i>		
Principal divisions (continued)			
541.183.1	Adsorbent substances with special properties		
.12	Ion exchangers 541.183.12 $\cong$ 661.183.12, e.g. 541.183.123 Derived from synthetic resins and other synthetic materials .2 Cation exchangers .3 Anion exchangers	541.4	CHEMICAL COMBINATION. CLASSES OF CHEMICAL COMPOUNDS
.2	Adsorption mechanism	.41	Generalities on chemical combination. Difference between chemical compounds and mixtures. The criterion of a chemical compound →541.12 Chemical mechanics
.21	Adsorption of ultramicro and larger particles		Intermetallic compounds or phases. Daltonide phases. Berthollide phases
.22	Adsorption of amicros	.412	Reactive and unreactive substances →542.92 Decomposition. Cracking
.23	Adsorption of molecules	.42	Classification of substances according to their reactivity
.24	Adsorption of ions and electrolytes	.427	Oxidizable substances in general
.25	Adsorption of liquids	.2	Combustible, flammable substances
.26	Adsorption of gases	.3	Flammable substances whose vapours ignite when raised above 20 °C
.3	Adsorption by means of liquids in general and isotropic liquids in particular 541.183.3 $\cong$ 541.183.2	.33	Easily flammable substances igniting at 20 °C or below
.4	Adsorption by means of anisotropic liquids 541.183.4 $\cong$ 541.183.2	.34	Spontaneously flammable substances. Pyrophoric substances, powders etc
.5	Adsorption by means of solids 541.183.5 $\cong$ 541.183.2	.35	Explosive materials, compounds and mixtures
.57	Adsorption by means of amorphous solids and gels	.6	Corrosive substances
.58	Adsorption by means of precipitates	.7	Liquid
.59	Adsorption by means of crystals	.72	Gaseous
.6	Mixed systems. Adsorption by means of ultraparticles	.73	Easily reacted with other substances
.61	Reciprocal adsorption by means of ultraparticles in general →541.18.046.8 Coagulation by ultraparticles	.8	Inert compounds. Unreactive compounds. Compounds reacting only with difficulty <i>Further particulars may be denoted by the -1 special auxiliaries, e.g.</i>
.611	Reciprocal adsorption of ultraparticles. Protective colloids	.428	541.428-13 Inert gases
.613	Gold number		Substances of generally low reactivity
.64	Adsorption of molecules by means of ultraparticles →541.18.046.7 Coagulation by electrolytes 541.18.052:542.87 Dispersion by electrolytes	.2	Specific reactions of inactive substances
.65	Adsorption of ions by means of ultraparticles	.4	Free elements <i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.7	Electroadsorption	.431	541.43-123 In the atomic state
541.2	ATOMIC THEORY →530.14 Atomism in general 539 Nuclear, atomic and molecular physics	.44	Bodies in the atomic state <i>use</i> 541.43-123
		.442	Hydrides
		.444	Hydracids →541.452 Generalities on acids
			Base-forming hydrides

- 541.45 Oxides. Acids. Bases
 .451 Generalities on oxides
 .452 Generalities on acids
 .1 Monobasic acids
 .2 Dibasic acids
 .3 Tribasic acids
 .9 Polybasic acids
 →541.442 Hydracids
 .454 Generalities on bases
 .456 Neutral oxides
 .457 Amphoteric oxides
 .459 Peroxides
 .48 Salts
 .481 Basic salts
 .483 Normal salts
 .484 Acid salts
 .486 Complex salts. Double salts
 .49 Complex compounds. Complex chemistry
- 541.5 VALENCY. BONDS. AFFINITY
 .51 Generalities on affinity. Valency from the point of view of atomic structure and the periodic system
 →541.27 Chemical properties based on atomic structure
 .515 Free radicals
 .52 Constant valency
 .53 Different valencies of the same element. Variable valency. Influence of temperature, pressure etc on valency
 .54 Auxiliary valencies. Werner valencies. Coordination valencies. Coordination number
 →541.572.5 Bonding by coordination
 .55 Consideration of the units of valency
 .552 Valency energies
 .553 Directivity of valencies. Spatial distribution of valencies
 →541.63 Generalities on stereochemistry
 .56 Electrovalency. Electroaffinity →541.573
 .57 Bonds
 .571 Principal bonds. Homopolar bonds. Covalent bonds. Covalency
 .1 Simple bonds
 .3 Double bonds
 .35 Conjugated double bonds
 .36 Thiele's oscillating double bonds
 .37 Armstrong's central double bonds
 .4 Triple and multiple bonds
 .45 Conjugated triple and multiple bonds
 .46 Thiele's oscillating triple and multiple bonds
 .5 Conjugated double bonds →541.571.35
 .6 Thiele's conjugated bonds →541.571.36, 541.571.46
 .7 Armstrong's central bonds →541.571.37
 .8 Semipolar bonds
 .9 Hydrogen bonds
 .572 Secondary bonds
 .5 Bonding by coordination
 →541.54 Auxiliary valencies. Werner valencies. Coordination valencies
 .52 Normal complexes
 .53 Penetration complexes
 .54 Inner complex compounds. Chelating group
 .6 Bonding by dipole forces
 .7 Bonding by van der Waals' forces
 .8 Bonding by resonance
 →541.624 Mesomerism
 .573 Ionogenic bonds. Electrovalency
 .574 Metallic bonds
- 541.6 CHEMICAL STRUCTURE IN GENERAL. CHEMICAL STRUCTURE IN RELATION TO THE PROPERTIES OF SUBSTANCES. CHEMISTRY OF HIGH POLYMERS
 →539.2 Structure of molecular systems
 .61 Generalities on structural formulae
 .612 Chains of atoms of a single element
 .614 Rings of atoms
- 541.62 Isomerism. Tautomerism
 →541.7 Generalities on allotropy etc
 .621 Generalities on isomerism. Structural isomerism
 .2 Structural isomerism
 .22 Position isomerism
 .3 Isomerism of complex compounds
 .32 Hydration isomerism
 .33 Ionization isomerism
 .623 Tautomerism. Desmotropism
 →541.651.5 Chromoisomerism. Homochromoisomerism
 .624 Mesomerism
 .63 Generalities on stereochemistry
 .632 Optical stereoisomerism. Separation of optical isomers (enantiomers)
 .634 Cis-trans isomerism
 .636 Steric hindrance
 .64 Macromolecular chemistry. Polymerization products. Polycondensation products. Polyaddition products
 →542.952/.954 Isomerization. Polymerization. Condensation.
 547.9 Natural substances. Substances of unknown composition
 66.095.2/.4 Isomerization. Polymerization. Condensation—
 Chemical technology
 678 Macromolecular materials (rubbers and plastics)
 .65 Relationships between structure and optical properties
 .651 Relationships between structure and colour or absorption of radiation
 .2 Chromogenic groups. Bathochromism. Hypsochromism
 .22 Chromophoric groups
 .23 Auxochromic groups
 .4 Variochromism. Polychromism. Panchromism. Chromotropy
 .5 Chromoisomerism. Homochromoisomerism
 .7 Halochromism
 .653 Relationships between chemical structure, magneto-optic rotation and rotation for polarized light
 .3 Inversion. Mutarotation
 .4 Walden inversion
 .654 Relationships between chemical structure and refractive index
 .66 Relationships between chemical structure and thermal properties, especially change of state (boiling point)
 →536.4 Effect of heat on the structure and volume of bodies
 .67 Relationships between chemical structure and electrical and magnetic properties
 .68 Relationships between chemical structure and mechanical properties
 .69 Relationships between chemical structure and physiological properties
 →543.92 Organoleptic reactions
 .693 Effect on taste
 .2 Sweetness
 .6 Bitterness
 .694 Effect on smell. Odoriphoric and aromatophoric groups
 .697 Effect on toxic and therapeutic properties
- 541.7 GENERALITIES ON ALLOTROPY. PHYSICAL ISOMERISM. VARIOUS CRYSTALLINE FORMS OF SIMILAR SUBSTANCES. POLYMORPHISM
 →535.56 Optical isomerism
 541.62 Chemical isomerism. Tautomerism
 548.33 Polymorphism

541.72 .73	Enantiotropy Monotropy	→532.77 Physical properties of solutions 532.8 Crystallization of liquids and of solutions
541.8	GENERALITIES ON SOLUTIONS AND SOLUBILITY →532.6 Surface phenomena. Surface tension. Capillarity 532.7 Kinetic theory of liquids 532.71 Osmosis 532.73 Solution. Phenomena of solution	541.12 Chemical mechanics 541.13 Electrochemistry
	541.9	CLASSIFICATIONS. DIFFERENT SYSTEMS OF CLASSIFICATION OF CHEMICAL ELEMENTS AND COMPOUNDS

542 PRACTICAL LABORATORY CHEMISTRY, PREPARATIVE AND EXPERIMENTAL

Special auxiliary subdivisions for 542

542.05	Preparative chemistry 542.05 $\cong$ 54.05
.06	Experimental and investigative chemistry, special techniques etc 542.06 $\cong$ 54.06, <i>e.g.</i> 542.6.063 Handling of microvolumes of liquids
.07	Apparatus and equipment (<i>only where necessary to distinguish from operations at 542.05/.06</i>)
.08	Measurement principles, methods and instruments, <i>e.g.</i> 542.3.08 Volumetric apparatus 542.468.08 Autoclave temperature

542.297.3
.35

Closing devices
Glass taps

Principal divisions (continued)

542.1	CHEMICAL LABORATORIES. EQUIPMENT. ARRANGEMENT →727.5 Laboratories—Architecture
.12	Laboratory benches
.19	Hoods. Fume cupboards
542.2	LABORATORY APPARATUS AND TECHNIQUES IN GENERAL <i>For special apparatus →542.3/.9</i>
.21	Arrangement and assembly of apparatus and accessories
.22	Preparation of chemicals. Mechanical separation. Comminution. Pulverization. Elutriation
.221	Spatulas. Spoons
.222	Mortars. Pestles
.223	Mills
.23	Laboratory vessels. Funnels. Tubing. Stirrers
.231	Bottles. Flasks. Dishes. Funnels. Tubing. Stirrers <i>Apparatus in general is classed here, that made of glass and quartz glass in particular</i>
.2	Bottles. Reservoirs
.3	Flasks. Retorts. Test tubes
.5	Dishes. Crystallizing dishes. Basins. Beakers
.6	Funnels. Adapters
.7	Glass tubing. Glass joints →542.297.35 Glass taps
.8	Stirrers and stirring devices
.232	Porcelain vessels. Refractory vessels. Stoneware 542.232 $\cong$ 542.231
.233	Metal vessels 542.233 $\cong$ 542.231
.24	Stands. Tongs
.242	Stands. Hinged stands. Triangles. Tripods
.243	Tongs. Holders
.25	Glass, cork and rubber stoppers
.26	Flexible tubing. Caulking, packing materials
.263	Flexible tubing
.3	Rubber tubing [<i>cancelled</i>] use 542.263–036.4
.269	Mastic. Cement. Stearin
.29	Various accessories

542.4

MEASUREMENT OF MASS AND VOLUME. DETERMINATION OF MASS AND DENSITY. BALANCES. WEIGHTS. HYDROMETERS. DETERMINATION OF VOLUME. GAUGES AND GRADUATED VESSELS. PIPETTES. MEASURING CYLINDERS. VOLUMETRIC FLASKS. BURETTES

Further particulars may be denoted by colon combination with the subdivisions of 531.75
→531.73/.75 Volume, angle, mass and density measurement—
General mechanics

.41

APPLICATION OF HEAT AND COLD. BATHS. DRYING. DISTILLATION. THERMAL SEPARATION

→542.5 Flames. Blowlamps

Laboratory ovens and furnaces

542.41 $\cong$ 66.041

Heating by gas. Gas furnaces. Gas burners. Bunsen burners

Heating by alcohol, petrol etc. Special burners

Electrical heating. Electric furnaces

Indirect heating. Water baths. Steam baths. Sand baths etc

Thermal treatment. Operations and relevant apparatus

542.46 $\cong$ 66.046, *e.g.*

542.463 Cooling processes

.464 Roasting. Calcination (of solids)

.465 Fusion. Melting etc

.468 Pressure heating. Autoclave treatment

Drying techniques

542.47 $\cong$ 66.047

Distillation. Fractionation

542.48 $\cong$ 66.048

Other operations, especially thermal methods of separation

542.49 $\cong$ 66.049, *e.g.*

542.494 Phase separation by partial fusion

.496 Sublimation

542.5

FLAMES. BLOWLAMPS

Nature, composition of flames. Oxidizing flames. Reducing flames.

Compound flames

Blowpipes. Blowlamps

Blowpipes. Simple blowpipes. Gahn blowpipe

Gas blowlamps (glazier's lamp). Portable blowlamps

Oxygen blowlamps. Oxyhydrogen blowlamps.

Acetylene blowlamps

- 542.6 WORKING WITH LIQUIDS
 542.6 $\cong$ 66.06, *e.g.*
 542.61 Solution and solvents, extraction and solvent recovery
 .62 Solvents [*cancelled*] $\rightarrow$ 542.61
 .63 Mixing of liquids. Dilution. Homogenization
 .64 Dialysis. Dialysers
 .65 Solidification. Thickening
 .66 Clarification. Decantation. Sedimentation
 .67 Refining. Purification. Filtration
 .68 Expelling. Pressing
 .69 Other processes for liquids. Washing. Degassing etc
- 542.7 WORKING WITH GASES
 542.7 $\cong$ 66.07, *e.g.*
 542.71 Gas production and generation
 .73 Collection. Supply. Transfer
 .74 Cleaning. Purification. Drying. Solution
 .76 Storage. Gas holders
 .77 Rarefaction
 $\rightarrow$ 533.5 Vacuum technology—Physics
 .78 Compression. Liquefaction
- 542.8 PHYSICAL, PHYSICO-CHEMICAL AND ELECTRICAL OPERATIONS
 (*other than those included in 542.2/.7*)
 542.8 $\cong$ 66.08, *e.g.*
 542.85 Irradiation. Photochemical operations
 .87 Electrical, electrochemical and electrocapillary operations
- 542.9 OTHER CHEMICAL PROCESSES
 542.9 $\cong$ 66.09, *e.g.*
 542.91 Synthesis
 .92 Decomposition. Cracking
 .93 Reaction treatment with water or steam. Hydration. Dehydration. Hydrolysis
 .94 Reduction, hydrogenation and other processes
 .95 Organic chemical processes
 .96 Other reactions and processes
 .97 Catalysis. Accelerators. Activators. Stabilizers. Inhibitors. Retarders. Carriers
 .98 Biological processes
 .99 Final operations

543 ANALYTICAL CHEMISTRY

The chemical analysis of particular materials or classes of products may be denoted by colon combination, e.g.

543:553 Analysis of economic ores and minerals

:637.12 Analysis of milk

:662.6 Analysis of fuels

:678.012 Analysis of macromolecular materials

The determination of specific constituents may be denoted either by double colon combination, e.g.

543:669.14:546.26 The determination of carbon in steel

or by direct colon and the .06 special auxiliary, e.g.

669.14:546.26.06 The determination of carbon in steel

$\rightarrow$ 549.1 Determination of minerals and their properties

552.1 Determination of rocks. Physical and physico-chemical petrology

553.1 Determination and description of ores and of economic minerals

577.11 Chemical structure of living things

614.3 Sanitary inspection. Inspection of food

615.07 Analysis. Standardization. Identification—Pharmaceutics

620.1 Testing, defects of materials

Specific analytical techniques may be denoted by combining the subdivisions of 543 with the number for the constituent, e.g.

543.242.3:546.135–32 Iodometric determination of chloric acid

543.05 SAMPLING AND PREPARATION FOR ANALYSIS

Details of apparatus and equipment may be denoted by colon combination with the subdivisions of 542

General principles and theory of sampling.

Type of sample etc

Procedure. Selection of sampling points. Errors etc

Technique and apparatus for taking and collecting samples. Sampling tubes, bottles, vessels, etc

Preparation of samples by dry means. Grinding etc

Preparation of samples by wet means. Dissolving etc

Protection and storage of samples

543.06 ANALYTICAL PROCEDURE. SPECIAL TYPES AND TECHNIQUES OF ANALYSIS AND DETERMINATION OF CONSTITUENTS

Qualitative analysis. Detection. Identification.

Quantitative analysis. Estimation

Micro-analysis and semimicro-analysis (for very small amounts of the materials to be analysed)

Trace analysis. Detection and estimation of impurities.

Analysis by specific reactions

543.08 MEASUREMENT PRINCIPLES, METHODS AND APPARATUS. INSTRUMENTAL ANALYSIS

543.08 $\cong$ 53.08

Special auxiliary subdivisions for 543

543–1 STATE OF THE SUBSTANCE TO BE ANALYSED

543–1 $\cong$ 54–1

543–4 REAGENTS, INDICATORS ETC FOR ANALYSIS

543–4 $\cong$ 54–4

Principal divisions (continued)

543.2 SPECIAL CHEMICAL METHODS OF ANALYSIS

.21 Separation and determination by wet methods.

Wet assay. Gravimetric analysis

The separation of individual elements of a group from each other and from elements of other groups are included here

- 543.211/.215 Cation separation and determination
 .211 Group I. Metals precipitated by hydrochloric acid
 .212 Group II. Metals precipitated by hydrogen sulphide in (dilute) acid solution
 .213 Group III. Metals precipitated by ammonium sulphide in neutral solution (including rare earths)
 .214 Group IV. Alkaline earth metals
 .215 Group V. Alkali metals. Magnesium. Nitrogen bases
 .217 Anion separation and determination
 .1 Hydrochloric acid group
 .2 Nitrous acid group
 .3 Sulphurous acid group
 .4 Phosphoric acid group
 .5 Nitric acid group
 .6 Sulphuric acid group
 .7 Silicic acid group
 .219 Spot tests
 .22 Separation and determination by dry methods
 .221 Reactions on mixing and heating with dry reagents. Cupellation
 .224 Bead reactions. Bead tests
 .225 Blowpipe analysis
 .226 Thermal analysis
 .227 Analysis with thermobalance
 .24 Volumetric analysis. Titration. Titrimetric methods
 →543.25 Electroanalysis. Electrolytic and electrometric methods
 543.279 Gas volumetric analysis
Details of methods, instrumentation, equipment etc may be denoted by the .08 special auxiliaries
 .241 Alkalimetry. Acidimetry
 .2 Alkali estimation
 .5 Acid estimation
 .242 Oxidation and reduction methods
 .1 Chlorometry
 .2 Bromometry
 .3 Iodometry
 .5 With permanganate, dichromate
 .6 Other oxidation methods, e.g. use of ammoniacal cupric oxide
 .8 Reduction methods
 .81 With tin (II) (stannous) chloride
 .82 With iron salts. Ferrometry
 .243 Precipitation with silver salts (silver nitrate etc), e.g. Volhard method, Mohr method
 .244 Precipitation with salts other than silver salts
 .1 With cyanide solution, e.g. potassium cyanide solution
 .2 With ammonium molybdate
 .3 With barium salt solutions
 .4 With uranyl salt solutions
 .6 Complexometric titrations
 .25 Electroanalysis. Electrolytic and electrometric methods
 →537.363 Electrophoresis—Physics
 543.545 Electrophoretic analysis etc
 .251 Electrolytic precipitation
Electrodes etc may be denoted by colon combination with the subdivisions of 542.8 and/or 621.35.035.
 .252 Electrolytic gas liberation and measurement of gas
 →543.279 Gas volumetric analysis etc
 .253 Polarographic analysis
 →543.257.5 Conductometric titrations. Amperometry
 .257 Electrometric titrations
Details of methods, instrumentation, equipment etc may be denoted by the .08 special auxiliaries
- 543.257.1 Potentiometric analysis. Determination of hydrogen ion concentration (pH value, acidity, alkalinity)
 →541.132.3 Hydrogen ion concentration (pH)
 .2 Standard electrodes. Quinhydrone, calomel, hydrogen, oxygen, glass etc
 →541.135.5 Electrodes. Diaphragms—Electrochemistry
 542.8 Physical, physico-chemical and electrical operations
 621.3.035.2 Electrodes etc—Electrical engineering
 .3 Electrical circuit details. Potentiometers etc
 →621.317 Electrical measurement
 .5 Conductometric titrations. Amperometry
 .7 Coulometric titrations
 .258 Coulometric titrations [cancelled] →543.257.7
 .27 Gas (and air) sampling and analysis
 .271 Apparatus and technique in general. Combined apparatus and trains, e.g. Orsat, Haldane, Dumas
Details of methods, instrumentation, equipment etc may be denoted by the .08 special auxiliaries, e.g.
 543.271.08 Meters. Titrimeters etc
 .2 Detection papers. Devices for detection of gaseous impurities in air
 .272 Selective absorption and determination of specific gaseous constituents. Absorption trains and units
 .1 Oxygen determination
 .2 Hydrogen determination
 .3 Total nitrogen determination. Determination of oxides of nitrogen etc
Details of methods, instrumentation, equipment etc may be denoted by the .08 special auxiliaries, e.g.
 543.272.3.08 Nitrometers
 .31 Nitrogen
 .32 Oxides of nitrogen
 .35 Ammonia
 .36 Cyanogen and its inorganic derivatives
 .37 Organic nitrogen compounds
 .4 Halogen determination. Chlorine etc
 .5 Total sulphur determination
 .51 Oxides of sulphur
 .55 Hydrogen sulphide
 .57 Organic sulphur compounds. Carbon disulphide
 .6 Total carbon determination
 .61 Carbon monoxide
 .62 Carbon dioxide
 .7 Hydrocarbons determination
 .71 Acyclic saturated hydrocarbons. Alkanes (paraffins). Methane, ethane etc
 .72 Acyclic unsaturated (double bond) hydrocarbons. Alkenes (olefins). Ethylene etc
 .73 Alkynes (acetylenes). Acetylene etc
 .75 Cyclic, aromatic hydrocarbons. Benzene etc
 .76 Polycyclic hydrocarbons. Naphthalene etc
 .79 Tar gases
 .273 Analysis by combustion methods
 543.273 ≅ 543.272
Details of methods, instrumentation, equipment etc may be denoted by the .08 special auxiliaries, e.g.
 543.273.08 Combustion trains. Explosion pipettes etc
 .274 Other methods for determination of gaseous constituents. Gravimetric, titrimetric measurement of properties
 .275 Determination (and properties) of non-gaseous constituents in suspension in aerosols, smokes etc
 .1 Moisture, water content, e.g. by gravimetric means
 →533.275 Hygrometry

543.275.2	Liquid particles, droplets (other than of water)	543.424	Raman spectra. Raman lines
.3	Solid particles. Dust. Grit etc	.426	Fluorescence analysis
.278	Analysis of non-gaseous substances by volumetric, titrimetric or gravimetric determination of their gaseous decomposition products	.43	Colorimetric analysis. Nephelometric analysis
.279	Gas volumetric analysis. Estimation of gases generated during decomposition of the analysed substance	.432	Colorimetric analysis
		.436	Nephelometric (turbidimetric) analysis
		.45	Refractometric analysis
		.46	Interferometric analysis
		.47	Polarimetric analysis
543.3	WATER SAMPLING AND ANALYSIS	543.5	PHYSICAL-CHEMICAL METHODS OF ANALYSIS (OTHER THAN OPTICAL METHODS)
.31	Impurities and inorganic matter in general →543.38 Organic matter. Organic impurities	.51	Positive ray analysis. Mass spectrometry
.311	Total impurities	.52	Radiometric analysis
.312	Total inorganic impurities	.53	Radiochemical methods of analysis. Activation analysis (with radiations giving rise to radioactivity or nuclear reactions)
.314	Impurities in colloidal form		Capillary analysis. Adsorption analysis.
.315	Insoluble impurities	.54	Stalagmometry. Chromatography. Electrophoresis
.316	Turbidity	.541	Generalities. Special methods
.319	Alkalinity	.3	Elutriation methods
.32	Hardness	.5	Staining methods
.321	Permanent	.6	Development methods
.322	Temporary	.7	Retention analysis
.33	Iron, manganese and aluminium content	.542	Surface tension methods. Stalagmometry
.34/.344	Nitrogen content [cancelled] use 543.373/.373.7	.544	Chromatographic analysis
.35	Hydrogen sulphide content. Other sulphide content	.2	Adsorption chromatography, including displacement chromatography
.36	Silicate and other salt content.	.25	Gas adsorption chromatography
.361/.361.6	Halide content [cancelled] use 543.374	.4	Partition chromatography
.363	Silicate content	.42	Using solid phases, e.g. columns, paper
.37	Dissolved gas content	.44	Using counter-current distribution
	543.37 ≅ 543.272	.45	Gas-liquid partition chromatography (GLC)
.371	Aggressivity [cancelled] use 546.04...	.6	Ion-exchange chromatography
.38	Organic matter. Organic impurities	.8	Reaction chromatography
.381	Total organic impurities	.545	Electrophoretic analysis. Zone electrophoresis.
.382	Oxidizable matter	.4	Ionophoresis. Electrochromatography
.383	Oils. Fats	.6	Using powders, fibres or gels as media
.384	Proteins	.6	Using paper as medium. Paper electrophoresis
.39	Microbiological, bacteriological analysis and examination →576.8 Microbiology. Bacteriology. Parasitology		Analysis of rocks and minerals use 543:549 or 543:552/553
543.4	OPTICAL METHODS OF ANALYSIS	543.7	ANALYSIS OF INORGANIC SUBSTANCES
	→535 Optics	.71	Moisture or water content. Volatile constituents
	681.7 Optical apparatus and instruments, especially	.712	Moisture or water content 543.712 ≅ 543.812
	681.785 Instruments for measuring optical properties. Optical instruments for determining non-optical properties.	.713	Volatile constituents
.41	Simple visual methods. Colour reactions. Flame coloration	.714	Residue after drying
.42	Spectrum analysis. Spectroscopy. Spectrography etc →543.51 Positive ray analysis. Mass spectrometry Further particulars may be denoted by special auxiliaries, e.g. 543.42.061 Qualitative .062 Quantitative (spectrometry, spectrophotometry)	.716	Residue after combustion or ignition
.422	Absorption spectra (radiation of different wavelengths)	.717	Hygroscopicity
.2	Using radiofrequencies, microwaves	.72	Soluble constituents. Insoluble constituents
.25	Using high frequency electromagnetic waves (radio waves). Nuclear magnetic resonance (NMR) spectroscopy →539.143.43 Nuclear magnetic moments	.721	Soluble constituents, especially water-soluble
.27	Using ultra-high frequency electromagnetic waves (microwaves). Electron spin resonance spectroscopy	.722	Constituents soluble in liquids other than water
.4	Infra-red	.725	Insoluble constituents, especially water-insoluble
.5	Visible	.726	Constituents insoluble in liquids other than water
.6	Ultra-violet	.73	Inorganic impurities
.8	X-ray	.74	Organic impurities
.423	Emission spectra 543.423 ≅ 543.422	.77	Rational analysis
		.78	Determination of degree of advancement of an inorganic reaction, e.g. degree of combustion in cement production →543.888 Determination of degree of advancement of an organic reaction
		.79	Determination of the principal constituent
		543.8	ANALYSIS OF ORGANIC SUBSTANCES. DETERMINATION OF CONSTITUENTS AND REACTION PROPERTIES
		.81	Moisture or water content. Volatile constituents
		.812	Moisture or water content
		.2	Total moisture or water
		.3	External (adsorbed)
		.4	Internal (combined)

543.813	Volatile constituents	543.854.742	Disaccharides
.814	Residue after drying	.746	Starches
.817	Hygroscopticity	.748	Celluloses
.82	Constituents and properties obtained by heating to high temperatures	.75	Lower carbohydrates formed as a result of hydrolysis
.822	By combustion and ignition in air. Ash.	.76/.78	Hydrolysates of polysaccharides
	Inorganic content	.76	Pentoses, pentosans etc formed as a result of hydrolysis
.824	By distillation away from the air		543.854.76 $\cong$ 547.455.5
.2	Constituents volatile at high temperature		Hexoses formed as a result of hydrolysis
.4	Carbonized residue. Carbonizable constituents	.77	543.854.77 $\cong$ 547.455.6
.42	From oil. Conradson's coking test		Dextrins
.44	Muck's coking test. Heating in platinum crucible	.78	Upsaponifiable matter
.825	Other constituents or properties	.855	Soap content
.3	Soot-forming tendency	.856	Characteristic reactions
.83	Soluble constituents	.857	Phytosterols. Cholesterol
.831	Constituents soluble in water	.1	Elaidin test
.832	Constituents soluble in other liquids	.2	Drying power
.84	Elementary analysis	.3	Maumené reaction. Sulphuric acid treatment
.841	Generalities. Dennstedt methods in general	.4	Characteristic solution (miscibility) point
.8	Methods for the simultaneous determination of several elements	.5	Critical solution (miscibility) temperature, <i>e.g.</i> of fat/acetic acid (Valenta's number)
.842	Determination of carbon	.55	Colour reactions
.843	Determination of hydrogen	.6	Determination of other substances
.844	Determination of oxygen	.86	<i>Substances not given below may be denoted by colon combination with the subdivisions of 546 or 547</i>
.845	Determination of sulphur and its analogues		Aromatic constituents. Napthenic constituents
.8	By oxidation in a sealed tube (Carius method)	.862	Characteristic solution (miscibility) point
.846	Determination of nitrogen	.1	With aniline. Aniline point
.847	Determination of phosphorus and its analogues	.12	Aromatic constituents
.848	Determination of halogens	.2	Extraction with sulphuric acid
.8	By oxidation in a sealed tube (Carius method)	.22	Colour reaction with sulphuric acid, formaldehyde solution (formalin) etc
.849	Determination of other elements	.28	Napthenic constituents
.85	Determination of fat content. Ester value. Saponification value. Determination of oxygen-containing compounds	.3	By means of molecular refraction. Waterman's test
.851	Determination of ester value, neutral fat content, saponifiable matter	.34	Proteins
.1	Ester value	.865	Enzymes
.2	Neutral fat content	.866	Vitamins
.5	Saponification value	.867	Insoluble matter. Raw fibres
.852	Determination of free acids	.868	Various impurities. <i>e.g.</i> tar, resins
.1	Non-esterified fatty acids in general. Acid number (acid value)	.869	Oxidizability. Saturation. Explosiveness. Stability. Reactivity
.11	Hehner's number	.87	$\rightarrow$ 541.124/.128 Chemical dynamics
.2	Liquid and solid acids	.871	Saturation. Unsaturation
.3	Saturated acids	.2	Treatment with iodine. Iodine value
.4	Unsaturated acids. Iodine value etc	.3	Treatment with bromine. Bromine value
	$\rightarrow$ 543.871 Saturation. Unsaturation	.872	Oxidizability
.42	Bromide insoluble in diethyl ether-acetic acid mixture	.873	Flammability. Flash point
.43	Bromine value	.874	$\rightarrow$ 536.468 Flammability of various materials
.44	Iodine value	.875	Combustibility. Ignition temperature
.45	Thiocyanogen (sulphocyanogen) value	.876	Decomposition point
.46	Peroxide value	.878	Explosiveness. Stability
.47	Diene value	.88	Reactivity with various substances
.48	Hypochlorous acid value for fatty oils	.888	Specific reactions of various substances
.5	Oxy-acids		Determination of degree of advancement of an organic reaction
.6	Lactones		$\rightarrow$ 543.78 Determination of degree of advancement of an inorganic reaction
.7	Acids insoluble in water. Hehner's number $\rightarrow$ 543.852.1		Determination of the principal constituent
.8	Volatile acids	.89	
	$\rightarrow$ 543.813 Volatile constituents		
.82	Reichert-Meißl number		
.84	Polenske number		
.86	Kirschner number		
.853	Determination of monoglycerides, diglycerides	543.9	BIOLOGICAL ANALYSIS AND REACTIONS
.854	Determination of hydroxy compounds, carbonyl compounds		<i>Biological reactions for analytical purposes only are classed here</i>
.1	Hydroxy compounds		<i>For reactions of enzymes and vitamins</i>
.12	Non-esterified alcohols		$\rightarrow$ 577.15/.16
.15	Acetyl value		
.6	Carbonyl compounds		
.7	Carbohydrates		
.71	Lower carbohydrates. Dioses. Trioses. Tetroses	543.9-078	Biological diagnoses [cancelled]
.72	Pentoses. Pentosans etc		$\rightarrow$ 576.8.078
.73	Hexoses		
	543.854.73 $\cong$ 547.455.6		
.74	Decomposable, hydrolyzable carbohydrates in general	543.92	Organoleptic reactions
		.926	Characteristic smell

543.927	Characteristic taste	544.85	Reactions producing metallic mirrors → 543
.928	Characteristic feel	545	Quantitative analysis → 543.062
.929	Characteristic effect on the palate	-1/-5	Reagents, standard solutions, indicators, catalysts, buffers etc → 543-4
544	Qualitative analysis → 543.061		Gravimetric methods → 543.21
-1/-32	Reagents, Indicators → 543-4	.1/.177	Volumetric methods → 543.24
.1/.192	Analysis by the wet method → 543.21	.2/.244	Electroanalysis → 543.25
.2/.24	Analysis by the dry method → 543.22	.3/.38	Analysis by the dry method → 543.22
.3	Blowpipe analysis → 543.225	.4/.42	Gas analysis → 543.27
.4	Gas analysis → 543.27	.7/.79	Colorimetry → 543.43
.5	Colloid analysis → 543.54	.8/.813	Optical analysis → 543.4/.42, 543.51
.6/.68	Spectrum analysis, Flame coloration → 544.4/.42, 543.51	.82/.828	Microanalysis → 543.063
.8/.81	Colour reactions → 543.41, 543.857.6	.83	Capillary analysis, Adsorption analysis → 543.54
.83	Microanalysis → 543.063	.84/.844	

546 INORGANIC CHEMISTRY

Sequence of elements. Although the grouping of the elements in the following section no longer corresponds to modern chemical theory, it has been thought better to retain the classification given in earlier UDC editions for the sake of stability in existing bibliographic arrangements. It has been considered unnecessary to correct certain anomalies in the classification order of the halogens, the alkali metals, the platinum group and the elements of the second group. These anomalies present no difficulties from the bibliographic point of view.

At the end of this introduction to UDC 546, three synopses will be found:

- (1) The elements arranged according to their UDC numbers
- (2) The elements arranged according to their atomic numbers
- (3) The elements arranged alphabetically according to their symbols.

Principal subdivisions of each element. The principal subdivisions of each element are based on valency. In certain instances special subdivisions are allocated to hydrogen compounds of the element.

Extension principle. Because it is impracticable to enumerate every known compound in the tables, only a few examples of the classification of compounds are given; it is left to those who use the tables to decide the appropriate number for each compound. The principle of this extension is to consider a compound as the actual or hypothetical reaction of two oxides with each other, or of an oxide with a hydride. In this way a compound can be designated by the oxide or hydride radicals from which it is derived.

Rules for extension. To determine the UDC numbers of those compounds which can be considered to be derived from two or more oxides (or an oxide and a hydride), add to the UDC number of that oxide which comes highest in the decimal order the UDC numbers of the other oxides or hydrides in their ascending decimal order.

Numbering of compounds. The apostrophe should be used for combining the parts of a compound. To classify a binary compound, the number for the acid radical (anion) is added to the number for the metal radical (cation) but the second 546 is omitted, and replaced by an apostrophe.

Example 1. To classify lithium phosphite. The UDC number for lithium oxide is 546.34 (this number in the decimal order comes after that of phosphorus trioxide). The number for phosphorus trioxide is 546.183. These numbers are combined to give 546.34'183.

To number compounds containing several metallic radicals (cations) or acid radicals (anions) add to the UDC number of that metal which comes highest in the decimal order the numbers of the other metals, and then the numbers of the acids in their decimal order.

Example 2. The number for aluminium potassium sulphate is 546.623'32'226. This number is derived from

546.623 Derivatives of trivalent aluminium
546.32 Potassium
546.226 Sulphates

Example 3. The number of sodium aluminate is 546.623'33. This number is derived from

546.623 Derivatives of trivalent aluminium
546.33 Sodium

Example 4. The potassium salt of nitrosulphonic acid may be considered to be a derivative of potassium oxide 546.32, sulphur trioxide, 546.226, and trisubstituted ammonia 546.171.4. The resultant number for the compound is 546.32'171.4'226.

A still more detailed specification may be obtained by using the hyphen special auxiliaries. Thus the primary lithium phosphite would be 546.34'183-384.1, the auxiliary -384.1 denoting primary acid salts.

The main number for each element is also used for generalities on the compounds of the element. Thus 546.13 denotes chlorine and also its compounds. Alternatively, compounds may be denoted by addition of the -3 special auxiliary subdivisions.

Exceptions to the rules for extension. The sulphur and oxygen compounds of the halogens and the non-metals of the fifth group are classed in the main sections for these elements.

Duplicate classification. It is desirable to class complex compounds in duplicate under the principal section of the non-metal whose number comes last in the decimal order, e.g. the potassium salt of nitrosulphonic acid is classed first under 546.32'171.4'226, with a duplicate entry 546.226'171.4'32 under nitrosulphonic acid.

Hypothetical compounds. Certain hypothetical compounds given in the inorganic chemistry section occur as inorganic substituents in organic chemistry. The study of these inorganic substituents is classed under 546.

Collective studies. Studies of the collective properties of a group of elements are classed under the following UDC numbers:

Non-metals 546.1
Third and fourth groups 546.25
Fifth group 546.851
Sixth group 546.2
Seventh group 546.12

Metals 546.3**First group** 546.31

Alkali metals 546.311

Copper, silver and gold group 546.55

Second group 546.4

Beryllium and magnesium group 546.441

Alkaline earth metals 546.442

Zinc, cadmium and mercury group 546.443

Third group 546.6

Rare earths 546.65

Cerium group 546.651

Yttrium group 546.641

Gallium, indium and thallium group 546.68

Fourth group 546.8

Tin group 546.81

Titanium group 546.82

Fifth group

Antimony and bismuth group 546.852

Vanadium group 546.88

Sixth group

Chromium group 546.75

Seventh group

Manganese group 546.71

Eighth group 546.9

Iron group 546.71/.74

Ruthenium group 546.95/.98

Platinum group 546.91

Zerovalent elements 546.29

Radioactive elements 546.79

Doubtful elements 546.99

Isotopes. *The study of the entire group of isotopes of any element may be denoted by addition of the .027 special auxiliary subdivision, e.g.*

546.13 Chlorine

546.13.027 Isotopes of chlorine

Specific isotopes may be denoted by adding an asterisk followed by the mass number, e.g.

546.791*238 Uranium 238

Alloys. *Alloys are not classed with the elements from which they are formed, but are all collected together under 546.3–19.*

Naturally occurring compounds. *Naturally occurring compounds are classed under 549.*

Collective studies of the compounds of a certain element. *In instances where groups of compounds are to be classed together whatever their valency, they should be placed under those of the lowest valency. A work on iron oxides, for example, would come under 546.722–31.*

Elements in the order of their UDC numbers			
UDC number	Symbol	UDC number	Symbol
546.11	H	546.662	Gd
546.13	Cl	546.663	Tb
546.14	Br	546.664	Dy
546.15	I	546.665	Ho
546.16	F	546.666	Er
546.169	At	546.667	Tm
546.17	N	546.668	Yb
546.18	P	546.669	Lu
546.19	As	546.681	Ga
546.21	O	546.682	In
546.22	S	546.683	Tl
546.23	Se	546.711	Mn
546.24	Te	546.718	Tc
546.26	C	546.719	Re
546.27	B	546.72	Fe
546.28	Si	546.73	Co
546.289	Ge	546.74	Ni
546.291	He	546.76	Cr
546.292	Ne	546.77	Mo
546.293	Ar	546.78	W
546.294	Kr	546.791	U
546.295	Xe	546.794	Po
546.296	Rn	546.796	Pa
546.32	K	546.797	Ac
546.33	Na	546.799.3	Np
546.34	Li	546.799.4	Pu
546.35	Rb	546.799.5	Am
546.36	Cs	546.799.6	Cm
546.37	Fr	546.799.7	Bk
(546.39	NH ₄)	546.799.8	Cf
546.41	Ca	546.799.9	Es
546.42	Sr	546.799.90	Fm
546.431	Ba	546.799.91	Md
546.432	Ra	546.799.92	No
546.45	Be	546.799.93	Lw
546.46	Mg	546.811	Sn
546.47	Zn	546.815	Pb
546.48	Cd	546.821	Ti
546.49	Hg	546.831	Zr
546.56	Cu	546.832	Hf
546.57	Ag	546.841	Th
546.59	Au	546.86	Sb
546.62	Al	546.87	Bi
546.63	Sc	546.881	V
546.64	Y	546.882	Nb
546.654	La	546.883	Ta
546.655	Ce	546.92	Pt
546.656	Pr	546.93	Ir
546.657	Nd	546.94	Os
546.658	Pm	546.96	Ru
546.659	Sm	546.97	Rh
546.661	Eu	546.98	Pd

Elements in the order of their atomic numbers			
Atomic number and symbol	UDC number	Atomic number and symbol	UDC number
1 H	546.11	53 I	546.15
2 He	546.291	54 Xe	546.295
3 Li	546.34	55 Cs	546.36
4 Be	546.45	56 Ba	546.431
5 B	546.27	57 La	546.654
6 C	546.26	58 Ce	546.655
7 N	546.17	59 Pr	546.656
8 O	546.21	60 Nd	546.657
9 F	546.16	61 Pm	546.658
10 Ne	546.292	62 Sm	546.659
11 Na	546.33	63 Eu	546.661
12 Mg	546.46	64 Gd	546.662
13 Al	546.62	65 Tb	546.663
14 Si	546.28	66 Dy	546.664
15 P	546.18	67 Ho	546.665
16 S	546.22	68 Er	546.666
17 Cl	546.13	69 Tm	546.667
18 Ar	546.293	70 Yb	546.668
19 K	546.32	71 Lu	546.669
20 Ca	546.41	72 Hf	546.832
21 Sc	546.63	73 Ta	546.883
22 Ti	546.821	74 W	546.78
23 V	546.881	75 Re	546.719
24 Cr	546.76	76 Os	546.94
25 Mn	546.711	77 Ir	546.93
26 Fe	546.72	78 Pt	546.92
27 Co	546.73	79 Au	546.59
28 Ni	546.74	80 Hg	546.49
29 Cu	546.56	81 Tl	546.683
30 Zn	546.47	82 Pb	546.815
31 Ga	546.681	83 Bi	546.87
32 Ge	546.289	84 Po	546.794
33 As	546.19	85 At	546.169
34 Se	546.23	86 Rn	546.296
35 Br	546.14	87 Fr	546.37
36 Kr	546.294	88 Ra	546.432
37 Rb	546.35	89 Ac	546.797
38 Sr	546.42	90 Th	546.841
39 Y	546.64	91 Pa	546.796
40 Zr	546.831	92 U	546.791
41 Nb	546.882	93 Np	546.799.3
42 Mo	546.77	94 Pu	546.799.4
43 Tc	546.718	95 Am	546.799.5
44 Ru	546.96	96 Cm	546.799.6
45 Rh	546.97	97 Bk	546.799.7
46 Pd	546.98	98 Cf	546.799.8
47 Ag	546.57	99 Es	546.799.9
48 Cd	546.48	100 Fm	546.799.90
49 In	546.682	101 Md	546.799.91
50 Sn	546.811	102 No	546.799.92
51 Sb	546.86	103 Lw	546.799.93
52 Te	546.24	104	546.833
		105	546.884

Elements in the alphabetical order of their symbols					
Atomic number and symbol	UDC number	Atomic number and symbol	UDC number	Atomic number and symbol	UDC number
89 Ac	546.797	32 Ge	546.289	59 Pr	546.656
47 Ag	546.57	1 H	546.11	78 Pt	546.92
13 Al	546.62	2 He	546.291	94 Pu	546.799.4
95 Am	546.799.5	72 Hf	546.832	88 Ra	546.432
18 Ar	546.293	80 Hg	546.49	37 Rb	546.35
33 As	546.19	67 Ho	546.665	75 Re	546.719
85 At	546.169	49 In	546.682	45 Rh	546.97
79 Au	546.59	77 Ir	546.93	86 Rn	546.296
5 B	546.27	53 I	546.15	44 Ru	546.96
56 Ba	546.431	19 K	546.32	16 S	546.22
4 Be	546.45	36 Kr	546.294	51 Sb	546.86
83 Bi	546.87	57 La	546.654	21 Sc	546.63
97 Bk	546.799.7	3 Li	546.34	34 Se	546.23
35 Br	546.14	71 Lu	546.669	14 Si	546.28
6 C	546.26	103 Lw	546.799.93	62 Sm	546.659
20 Ca	546.41	12 Mg	546.46	50 Sn	546.811
48 Cd	546.48	25 Mn	546.711	38 Sr	546.42
58 Ce	546.655	42 Mo	546.77	73 Ta	546.883
98 Cf	546.799.8	101 Md	546.799.91	65 Tb	546.663
17 Cl	546.13	7 N	546.17	43 Tc	546.718
96 Cm	546.799.6	11 Na	546.33	52 Te	546.24
27 Co	546.73	41 Nb	546.882	90 Th	546.841
24 Cr	546.76	60 Nd	546.657	22 Ti	546.821
55 Cs	546.36	10 Ne	546.292	81 Tl	546.683
29 Cu	546.56	28 Ni	546.74	69 Tm	546.667
66 Dy	546.664	102 No	546.799.92	92 U	546.791
99 Es	546.799.9	93 Np	546.799.3	23 V	546.881
68 Er	546.666	8 O	546.21	74 W	546.78
63 Eu	546.661	76 Os	546.94	54 Xe	546.295
9 F	546.16	15 P	546.18	39 Y	546.64
26 Fe	546.72	91 Pa	546.796	70 Yb	546.668
100 Fm	546.799.90	82 Pb	546.815	30 Zn	546.47
87 Fr	546.37	46 Pd	546.98	40 Zr	546.831
31 Ga	546.681	61 Pm	546.658		
64 Gd	546.662	84 Po	546.794		

Special auxiliary subdivisions for 546

546-1	State of substance	546.133.2	Hypothetical oxide of divalent chlorine
	546-1 $\cong$ 54-1, e.g.	.3	Hypothetical oxide of trivalent chlorine.
	546-162.32 Water of crystallization	.134	Derivatives of chlorous acid HClO_2
-3	Special types of compounds	.135	Chlorine dioxide ClO_2 and its derivatives
	546-3 $\cong$ 54-3, e.g.		Derivatives of pentavalent chlorine. Chlorates
	546-31 Oxides		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	-32 Acids		546.135-32 Chloric acid HClO_3
	-36 Bases. Hydroxides	.136	Hypothetical derivatives of hexavalent chlorine
	-38 Salts and analogous compounds	.137	Derivatives of heptavalent chlorine. Perchlorates
	-39 Peroxy compounds		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
-4	Chemicals. Reagents. Purity etc		546.137-31 Chlorine heptoxide Cl_2O_7
	546-4 $\cong$ 54-4		-32 Perchloric acid HClO_4
-8/-86	Salts and analogous compounds $\rightarrow$ 54-38/-386		
-9/-94	Polymerized substances. Condensed substances $\rightarrow$ 54-126/-127		
546.01/.08	The .0 special auxiliary subdivisions are applicable to both 546 and 547	546.14	BROMINE
	546.01/.08 $\cong$ 54.01/.08, e.g.		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	546.02 Composition. Structure. Isotopes etc		547.14.027 Bromine isotopes
	.021 General composition and formula. Molecular formula. Symbols etc	.141	Hydrobromic acid HBr and its derivatives.
	.027 Isotopes	.142	Bromides
	.05 Preparation. Synthesis. Purification etc		Generalities on compounds with other non-metals
	.06 Analysis, investigation and manipulation in general (other than preparative)	.143.1	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	.07 Apparatus and equipment (for preparation, synthesis, investigation etc)	.2	546.142'13 With chlorine
	.08 Measurement principles, methods, techniques and instrumentation	.3	Oxide of monovalent bromine and its derivatives. Hypobromites
	546.08 $\cong$ 53.08, e.g.	.144	Hypothetical oxide of divalent bromine
	546.081 Units. Constants	.145	Hypothetical oxide of trivalent bromine
		.146	Bromine dioxide BrO_2 and its derivatives
		.147	Derivatives of pentavalent bromine. Bromates
			Hypothetical derivatives of hexavalent bromine
			Derivatives of heptavalent bromine
Principal divisions (continued)			
546.1	GENERALITIES ON NON-METALS (AND METALLOIDS)	546.15	IODINE
		.151	Hydriodic acid HI and its derivatives. Iodides
		.152	Generalities on compounds with other non-metals
546.11	HYDROGEN		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		546.152'13 With chlorine
	546.11-123 Atomic hydrogen		'14 With bromine
	<i>Isotopes of hydrogen may be denoted by adding an asterisk and the mass number, e.g.</i>	.153.1	Oxide of monovalent iodine and its derivatives.
	546.11*2 Deuterium	.2	Hypoiodites
	*3 Tritium	.3	Hypothetical oxide of divalent iodine
	$\rightarrow$ 54.027 Isotopes	.154	Hypothetical oxide of trivalent iodine
	546.212*2 Heavy water D_2O	.155	Iodine dioxide IO_2 and its derivatives
			Iodine pentoxide I_2O_5 and its derivatives.
546.12	GENERALITIES ON THE HALOGENS		Iodates
.121	Generalities on the halogen compounds and the hydrogen halides		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.1	Generalities on the hydrogen halides	.156	546.155-323 Iodic acid HIO_3
.13	Generalities on metal halides	.157	Hypothetical derivatives of hexavalent iodine
.3	Metal halides and sub-halides $\rightarrow$ 546.121.13		Derivatives of heptavalent iodine
546.13	CHLORINE. GENERALITIES ON METAL CHLORIDES	546.16	FLUORINE
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.161	Hydrogen fluoride HF and its derivatives.
	546.13-121 Elementary chlorine	.162	Fluorides
	.13.027 Chlorine isotopes		Generalities on compounds with other non-metals
	.13*35 Chlorine isotope with atomic number 35		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.131	Hydrochloric acid HCl and its derivatives. Chlorides		546.162'13 With chlorine
	Chlorides $\rightarrow$ 546.131		'14 With bromine
.132	Generalities on compounds with other non-metals	.163.1	'14'13 With bromine and chlorine
.133.1	Oxide of monovalent chlorine and its derivatives. Hypochlorites	.2	'15 With iodine
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.3	Oxide of monovalent fluorine and its derivatives. Hypofluorites
	546.133.1-31 Chlorine monoxide Cl_2O	.164	Hypothetical oxide of divalent fluorine
	-32 Hypochlorous acid HOCl	.165	Hypothetical oxide of trivalent fluorine
		.166	Fluorine dioxide FO_2 and its derivatives
		.167	Derivatives of pentavalent fluorine
			Hypothetical derivatives of hexavalent fluorine
			Derivatives of heptavalent fluorine

546.169	ASTATINE	546.172.76	Hydroxytriazenes containing the group N_3HOH
	546.169 $\cong$ 546.13, e.g.		Azoamino oxides containing the group N_3HO
	546.169.5 Derivatives of pentavalent astatine	.77	Derivatives of nitrogen trioxide. Nitrites
	.5-31 Astatine pentoxide At_2O_5	.173	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
546.17	NITROGEN		546.173-31 Nitrogen trioxide N_2O_3
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		-325 Nitrous acid HNO_2
	546.17-121 Elementary nitrogen	.174	546.173'131 Nitrogen trichloride NCl_3
	→546.851 Generalities on the non-metals of the fifth group	.175	'131-31 Nitrosyl chloride $NOCl$
.171	Hydrogen compounds of nitrogen		Nitrogen dioxide NO_2. Dinitrogen tetroxide N_2O_4
.1	Ammonia and its metal derivatives. Nitrides		Derivatives of nitrogen pentoxide. Nitrates
	<i>Ammonium derivatives are classed at 546.39</i>		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.2	Derivatives of ammonia in which one atom of hydrogen is replaced, excepting hydroxylamine and hydrazine	.176	546.175-31 Nitrogen pentoxide N_2O_5
.3	Derivatives of ammonia in which two atoms of hydrogen are replaced, excepting hydrazoic acid	.177	-323 Nitric acid HNO_3
.4	Derivatives of ammonia in which three atoms of hydrogen are replaced	546.18	Aqua regia. Mixtures of hydrochloric acid and nitric acid
.5	Hydrazine N_2H_4 and its derivatives		Pernitric acid HNO_4
.51	Addition compounds of hydrazine		PHOSPHORUS
.52	Derivatives of hydrazine in which one atom of hydrogen is replaced		546.18 $\cong$ 546.17, e.g.
.53	Derivatives of hydrazine in which two atoms of hydrogen are replaced		546.181.1 Phosphine PH_3 and its metal derivatives. Phosphides
.54	Derivatives of hydrazine in which three atoms of hydrogen are replaced		.8 Hydrides of formula $P_{12}H_6$
.55	Derivatives of hydrazine in which four atoms of hydrogen are replaced		.183 Phosphorus trioxide P_2O_3 and its derivatives. Phosphites
.6	Azo derivatives		.183-31 Phosphorus trioxide P_2O_3
.7	Derivatives containing three or more atoms of nitrogen		-325 Phosphorous acid H_3PO_3
.71	Triazane derivatives containing the group N_3H_4		.183'221 Phosphorus trisulphide P_2S_3 and its derivatives
.72	Triazene derivatives containing the group N_3H_2		.185 Phosphorus pentoxide P_2O_5 and its derivatives. Phosphates
.73	Tetrazane derivatives containing the group N_4H_5		.185-31 Phosphorus pentoxide P_2O_5
.74	Tetrazene derivatives containing the group N_4H_3		-325 Phosphoric acid H_3PO_4
.75	Chain or ring derivatives containing more than four atoms of nitrogen	546.19	.185'131 Phosphorus pentachloride P_2Cl_5
.8	Hydrazoic acid HN_3 and its derivatives. Azides		'131-31 Phosphorus oxychloride $POCl_3$
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		'221 Phosphorus pentasulphide P_2S_5
	546.171.8'171.15 The compound $N_2H_4 \cdot N_3H$		'221'31 Phosphorus sulphochloride $PSCl_3$
	'39 The compound NH_4N_3		ARSENIC
.172	Hydroxylamine NH_2OH and its derivatives	546.2	546.19 $\cong$ 546.17
.1	Addition compounds of hydroxylamine		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.2	Derivatives of hydroxylamine in which one atom of hydrogen is replaced	546.21	546.193'221 Arsenic trisulphide As_2S_3
.3	Derivatives of hydroxylamine in which two atoms of hydrogen are replaced		→546.86 Antimony
.4	Derivatives of HNO and of the hypothetical $HN(OH)_2$	.212	546.87 Bismuth
.5	Nitrous oxide N_2O and its derivatives		NON-METALS OF THE SIXTH GROUP
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		OXYGEN
	546.172.5-32 Hyponitrous acid $H_2N_2O_2$	.214	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.6	Nitric oxide NO and its derivatives	.215	546.21-121 Elementary oxygen
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.216	Water H_2O
	546.172.6-31 Nitric oxide	.217	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	-32 Nitrohydroxylamic acid $H_2N_2O_3$	546.22	546.212*2 Heavy water D_2O
.7	Other compounds with lower proportions of oxygen		Ozone O_3
.71	Hydroxyhydrazines containing the group $N(OH)NH_2$	.221	Hydrogen peroxide H_2O_2
.72	Diazo and isodiazo compounds containing the group N_2OH	.1	Derivatives of hexavalent oxygen
.73	Azoxy compounds containing the group N_2HO	.222	Air
.74	isoNitroamines containing the group N_2OHO	.2	→551.510.41 Chemical composition of the atmosphere—Meteorology
			SULPHUR
			<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
			546.22-121 Elementary sulphur
			Hydrogen sulphide and its derivatives. Sulphides
			Hydrogen sulphide H_2S
			Hydrogen persulphides. Polysulphides
			Hydrogen disulphide H_2S_2 and its derivatives

- 546.222.3 Hydrogen trisulphide H_2S_3 and its derivatives
 .4 Polysulphides
 .223.1 Derivatives of the hypothetical sulphur suboxide S_2O
Further particulars may be denoted by special auxiliaries, e.g.
 546.223.1'13 Sulphur monochloride S_2Cl_2
 .2 Derivatives of sulphur monoxide SO . Thio-sulphates
Further particulars may be denoted by special auxiliaries, e.g.
 546.223.2-325 Thiosulphurous acid $\text{H}_2\text{S}_2\text{O}_2$
 .2'13 Sulphur dichloride SCl_2
 .3 Derivatives of sulphur sesquioxide S_2O_3
Further particulars may be denoted by special auxiliaries, e.g.
 546.223.3-31 Sulphur sesquioxide S_2O_3
 .224 Derivatives of tetravalent sulphur. Sulphites
Further particulars may be denoted by special auxiliaries, e.g.
 546.224-31 Sulphur dioxide SO_2
 -324 Pyrosulphurous acid $\text{H}_2\text{S}_2\text{O}_5$
 -325 Sulphurous acid H_2SO_3
 .224'13 Sulphur tetrachloride SCl_4
 '173 Nitrosylsulphonic acid ONSO_3H
 '174 Hydroxynitrosylsulphonic acid $\text{HO}_2\text{NSO}_3\text{H}$
 .225 Compounds containing tetravalent and hexavalent sulphur
 .226 Sulphur trioxide SO_3 and its derivatives. Sulphates
Further particulars may be denoted by special auxiliaries, e.g.
 546.226-31 Sulphur trioxide SO_3
 -324 Pyrosulphuric acid $\text{H}_2\text{S}_2\text{O}_7$
 -325 Sulphuric acid H_2SO_4
 .226'131 Chlorine derivatives of sulphur trioxide
 '131-31 Sulphuryl chloride SO_3Cl_2
 -325 Chlorosulphonic acid SO_3HCl
 '161 Sulphur hexafluoride SF_6
 '161-31 Sulphuryl fluoride SO_2F_2
 '173 Nitrosulphonic acid (lead chamber crystals)
 →661.253 Lead chamber processes
 .227 Persulphuric acid $\text{H}_2\text{S}_2\text{O}_8$ and its derivatives
 .228 Polythionic acids
 .2 Dithionic acid $\text{H}_2\text{S}_2\text{O}_6$ and its derivatives
 .3 Trithionic acid $\text{H}_2\text{S}_3\text{O}_6$ and its derivatives
 .4 Tetrathionic acid $\text{H}_2\text{S}_4\text{O}_6$ and its derivatives
 .5 Pentathionic acid $\text{H}_2\text{S}_5\text{O}_6$ and its derivatives
- 546.23 SELENIUM
 546.23 $\cong$ 546.22
- 546.24 TELLURIUM
 546.24 $\cong$ 546.22
 →546.794 Polonium
- 546.25 GENERALITIES ON THE NON-METALS OF THE THIRD AND FOURTH GROUPS
- 546.26 CARBON
 →547 Organic chemistry
Further particulars may be denoted by special auxiliaries, e.g.
 546.26-162 Graphite. Diamond
 →549.211 Diamond
 549.212 Graphite
 .261 Hydrogen compounds of carbon and their derivatives. Carbides
- 546.262 Lower oxides of carbon and their derivatives
 .1-31 Carbon suboxide C_3O_2
 .3 Divalent carbon and its derivatives
Further particulars may be denoted by special auxiliaries, e.g.
 546.262.3-31 Carbon monoxide CO
 Hypothetical trivalent carbon
 Tetravalent carbon. Carbonates
Further particulars may be denoted by special auxiliaries, e.g.
 546.264-31 Carbon dioxide CO_2
 .264'131-31 Phosgene COCl_2
 Compounds of carbon with sulphur, selenium, tellurium and their derivatives, including those containing oxygen and halogens
 Sulphur compounds of carbon
 Carbon subsulphide C_3S_2
 Carbon monosulphide CS
 Carbon disulphide CS_2
 Carbon oxysulphide COS
 Compounds of carbon, sulphur and halogens
 Compounds of the type CS (Halogen) $_2$
 Thiophosgene CSCl_2
 Compounds of carbon and selenium, including those containing sulphur
 Compounds of carbon and tellurium, including those containing sulphur
 Cyanogen $\text{N}\equiv\text{C}-\text{C}\equiv\text{N}$
 →547.491 Cyanogen compounds
 Hydrocyanic acid HCN and its derivatives. Cyanides
 Cyanic acid $\text{N}\equiv\text{C}-\text{OH}$ and its derivatives. Cyanates
*iso*Cyanic acid $\text{O}=\text{C}=\text{NH}$ and its derivatives. *iso*Cyanates
 Fulminic acid $\text{C}\equiv\text{N}-\text{OH}$
 →662.412 Fulminates—Explosives
 Thiocyanic acid $\text{N}\equiv\text{C}-\text{SH}$ and its derivatives
*iso*Thiocyanic acid $\text{S}=\text{C}=\text{NH}$ and its derivatives
- 546.27 BORON
 Boron hydrides and their derivatives. Boranes. Borides
 Boron monoxide BO
 Trivalent boron and its derivatives. Borates
Further particulars may be denoted by special auxiliaries, e.g.
 546.273-31 Boron trioxide B_2O_3
 -324 Tetraboric acid $\text{H}_2\text{B}_4\text{O}_7$
 -325 Boric acid H_3BO_3
 .273'131 Boron trichloride BCl_3
 '171 Boron nitride BN
 '221 Boron trisulphide B_2S_3
- 546.28 SILICON
Further particulars may be denoted by special auxiliaries, e.g.
 546.28-121 Elementary silicon
 Silicon hydrides and their derivatives. Silicides
Further particulars may be denoted by special auxiliaries, e.g.
 546.281'261 Silicon carbide SiC
 Silicon dioxide and its derivatives. Silicates
Further particulars may be denoted by special auxiliaries, e.g.
 546.284-31 Silicon dioxide SiO_2
 -32 Hydrated acids derived from silicon dioxide in general
 -325 Silicic acid H_2SiO_3
 .284'161 Silicon tetrafluoride SiF_4
 '161-32 Fluorosilicic acid H_2SiF_6
 '221 Silicon disulphide SiS_2
 Derivatives of hexavalent silicon
 Organosilicon compounds. Silico-oxalic acid $\text{HOOSi}-\text{SiOOH}$
 →547.1'128 Silicones
 678.842 Silicones—Macromolecular materials

546.289

GERMANIUM

546.289 $\cong$ 546.28

→ 546.811 Tin

546.815 Lead

546.29

ZEROVALENT ELEMENTS

.291

Helium

.292

Neon

.293

Argon

.294

Krypton

.295

Xenon

.296

Radon

546.3

GENERALITIES ON METALS

Further particulars may be denoted by special auxiliaries, e.g.

546.3-19 Alloys

The UDC number for a particular alloy may be obtained by adding, by means of the apostrophe, the UDC numbers of the various metals, beginning with the highest number in the decimal order, omitting 546 in each case, e.g.

546.3-19 '47 '46 '34 Zinc-magnesium-lithium alloys

It is preferable, however, to classify alloys in 669

546.31

METALS OF THE FIRST GROUP

→ 546.55 Copper, silver and gold group

546.311

GENERALITIES ON THE ALKALI METALS

546.32

POTASSIUM

Further particulars may be denoted by special auxiliaries, e.g.

546.32-121 Metallic potassium

-31 Potassium oxide K_2O -36 Potassium hydroxide KOH -39 Potassium peroxide K_2O_2 546.32 '11 Potassium hydride KH

'121 Halogen compounds in general

'131 Potassium chloride KCl '133.1 Potassium hypochlorite $KOCl$ '135 Potassium chlorate $KClO_3$ '137 Potassium perchlorate $KClO_4$ '141 Potassium bromide KBr '145 Potassium bromate $KBrO_3$ '151 Potassium iodide KI '155 Potassium iodate KIO_3 '161 Potassium fluoride KF '171.1 Potassium nitride K_3N '171.8 Potassium azide KN_3 '173 Potassium nitrite KNO_2 '175 Potassium nitrate KNO_3

→ 553.638 Nitrates—

Economic geology
and mineralogy622.363.8 Nitrates—
Mining661.832.43 Potassium
nitrate—
Chemical
technology'183 Potassium phosphite KH_2PO_3

'185 Potassium phosphates

'185-384.1 Potassium dihydrogen
orthophosphate
 KH_2PO_4 .2 diPotassium hydrogen
orthophosphate
 K_2HPO_4 .3 triPotassium
orthophosphate K_3PO_4 '195 Potassium arsenates,
 KH_2AsO_4 , K_2HAsO_4 ,
 K_3AsO_4

546.33

SODIUM

546.33 $\cong$ 546.32

→ 546.47 '33 Sodium zincate

546.623 '33 Sodium aluminat

546.733 '33 '173 Sodium cobaltinitrite

546.766 '33-384 Sodium dichromate

546.776 '33 Sodium molybdate

546.814 '33 '221 Sodium thioantimonate

546.819 '33 Sodium plumbate

*Further particulars may be denoted by special auxiliaries, e.g.*546.33 '131 Sodium chloride $NaCl$ → 549.451.1 Halite
(rock salt)
—Mineralogy553.631 Rock salt—
Economic geology
and mineralogy661.426 Rock salt—
Chemical
technology'273 Sodium tetraborate $Na_2B_4O_7$ 546.32 '195 '221 Potassium thioarsenate
 K_3AsSO_3 '221 Potassium sulphide K_2S '222.2 Potassium disulphide K_2S_2

.4 Potassium polysulphides

'223.2 Potassium hyposulphite

 K_2SO_2 .3 Potassium hydrogen sulphite
 $KHSO_3$ '224 Potassium sulphite K_2SO_3 '226 Potassium sulphite K_2SO_4 '226-384.1 Potassium hydrogen
sulphate $KHSO_4$ '227 Potassium persulphate
 $K_2S_2O_8$

'228 Potassium polythionate

'231 Potassium selenide K_2Se '234 Potassium selenite K_2SeO_3 '236 Potassium selenate K_2SeO_4 '246 Potassium tellurate K_2TeO_4 '264 Potassium carbonate K_2CO_3 '264-384.1 Potassium hydrogen
carbonate $KHCO_3$ -39 Potassium percarbonate
 K_2CO_4 '267 Potassium cyanide KCN '268.2 Potassium cyanate $KCNO$.5 Potassium thiocyanate
 $KCNS$ '273 Potassium borate $K_2B_4O_7$ '273-39 Potassium perborate
 $KBO_2 \cdot H_2O_2 \cdot 3H_2O$ '281 Potassium silicide KSi '284 Potassium silicates $K_2O \cdot xSiO_2$ '284 '161 Potassium fluorosilicate
 K_2SiF_6

'289.4 Potassium germanates

→ 546.717 '32 Potassium
permanganate
546.719.7 '32 Potassium
perrhenate546.722 '32 '267 Potassium
ferro-
cyanide
546.723 '32 '267 Potassium
ferri-
cyanide546.817 '32 Potassium
plumbite546.865 '32 '221 Potassium
thio-
antimo-
nate546.865 '32-38 Potassium
pyroanti-
monate

546.34	LITHIUM	546.56	COPPER
546.35	RUBIDIUM		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
546.36	CAESIUM	.561	546.56–121 Metallic copper
546.37	FRANCIUM		Derivatives of monovalent copper. Cuprous (copper (I)) compounds
546.39	AMMONIUM RADICAL		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	<i>Ammonium derivatives are classed here</i>		546.561–31 Cuprous oxide Cu_2O
	<i>For hydrogen derivatives of nitrogen → 546.17</i>		.561 '11 Cuprous hydride CuH
	→ 546.492 '39 '131 Ammonium chloro-mercurate	.562	'131 Cuprous chloride CuCl
	546.623 '39 '226 Ammonium alum (aluminium ammonium sulphate)		'221 Cuprous sulphide Cu_2S
	546.881.5 '39 Ammonium vanadate		Derivatives of divalent copper. Cupric (copper (II)) compounds
546.4	METALS OF THE SECOND GROUP		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
546.41	CALCIUM	546.57	546.562–31 Cupric oxide CuO
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.571	–36 Cupric hydroxide $\text{Cu}(\text{OH})_2$
	546.41–31 Calcium oxide		.562 '226 Cupric sulphate CuSO_4
	.41 '181.1 Calcium phosphide Ca_3P_2		'39 '226 Cuprammonium sulphate
	'221.1 Calcium hydrosulphide $\text{Ca}(\text{SH})_2$	.572	'39–36 Schweizer's reagent
	'261 Calcium carbide CaC_2	.573	
546.42	STRONTIUM	.578	
546.431	BARIUM	546.59	SILVER
546.432	RADIUM	.591	Derivatives of monovalent silver
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.593	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	546.432 027 Radium isotopes	546.6	546.571–31 Silver oxide Ag_2O
	.432*223 Radium with mass number 223	546.62	Derivatives of divalent silver
	→ 546.296 Radon	.621	Silver sesquioxide
.441	Generalities on the beryllium and magnesium group	.623	Silver suboxide
.442	Generalities on the alkaline earth metals		
.443	Generalities on the zinc, cadmium and mercury group		
546.45	BERYLLIUM		GOLD
546.46	MAGNESIUM		Derivatives of monovalent gold
546.47	ZINC		Derivatives of trivalent gold
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		→ 546.814 '59 '131 Purple of Cassius
	546.47 '33 Sodium zincate Na_2ZnO_2		
546.48	CADMIUM		METALS OF THE THIRD GROUP
546.49	MERCURY		→ 546.27 Boron
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		
	546.49–121 Metallic mercury	546.63	ALUMINIUM .
.491	Derivatives of monovalent mercury. Mercurous (mercury (I)) compounds	.631	Aluminium [<i>cancelled</i>] → 546.62 .
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.633	Derivatives of trivalent aluminium
	546.491 '175–381 Basic mercurous nitrates	546.64	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.492	Derivatives of divalent mercury. Mercuric (mercury (II)) compounds	.641	546.623 '226 Aluminium sulphate
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.643	$\text{Al}_2(\text{SO}_4)_3$
.5	Copper, silver and gold group → 546.55		'226–386 Alums in general
546.55	GENERALITIES ON THE COPPER, SILVER AND GOLD GROUP		'33 Sodium aluminate $\text{Na}_2\text{Al}_2\text{O}_4$
			'39 '226 Ammonium alum (aluminium ammonium sulphate)
			$\text{NH}_4\text{Al}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$
			SCANDIUM .
			Scandium [<i>cancelled</i>] → 546.63'
			Derivatives of trivalent scandium
			YTTRIUM .
			Yttrium [<i>cancelled</i>] → 546.64
			Derivatives of trivalent yttrium
			GENERALITIES ON THE RARE EARTHS
			546.651 / .659 $\cong$ 546.655
			GENERALITIES ON THE CERIUM GROUP
			Lanthanum
			Cerium
			Derivatives of trivalent cerium
			Derivatives of tetravalent cerium
			Praseodymium
			Neodymium
			Promethium
			Samarium
			GENERALITIES ON THE YTTERBIUM GROUP
			546.661 / .669 $\cong$ 546.655
			Europium
			Gadolinium
			Terbium

546.664	Dysprosium	546.72/.74	BASE METALS OF THE EIGHTH GROUP. IRON. COBALT. NICKEL
.665	Holmium		<i>For noble metals of the eighth group</i> → 546.9
.666	Erbium		
.667	Thulium		
.668	Ytterbium		
.669	Lutetium	546.72	IRON
		.722	Derivatives of divalent iron. Ferrous (iron (II)) compounds
			<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
546.68	GALLIUM, INDIUM AND THALLIUM GROUP		546.722-31 Ferrous oxide FeO
.681	Gallium		.722 '226 Ferrous sulphate FeSO ₄
.682	Indium		'32 '267 Potassium ferrocyanide
	546.682 ≈ 546.683		K ₄ [Fe(CN) ₆].3H ₂ O
.683	Thallium	.723	Derivatives of trivalent iron. Ferric (iron (III)) compounds
.1	Derivatives of monovalent thallium		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		546.723-31 Ferric oxide Fe ₂ O ₃
	546.683.1-31 Thallium (I) oxide Tl ₂ O		→ 549.517.2 Haematite
.3	Derivatives of trivalent thallium		553.331 Magnetite.
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		Haematite—
	546.683.3-31 Thallium (III) oxide Tl ₂ O ₃		Economic
	.3 '32 '226 Thallium potassium alum		geology and
			mineralogy
			662.341.11/.12 Magnetite
			Haematite
			—Mining
546.7	METALS OF THE SIXTH, SEVENTH AND EIGHTH GROUPS. RADIOACTIVE ELEMENTS		661.872.22 Haematite—
.71/.74	Iron and manganese group		Chemical
			technology
			.723-36 Ferric hydroxide Fe(OH) ₃
			.723 '267 Ferric cyanide Fe(CN) ₃
			'267-325 Ferricyanic acid
			'32 '267 Potassium ferricyanide
			K ₃ [Fe(CN) ₆]
			'722 Ferrosulfuric oxide Fe ₃ O ₄
			'722 '267 Ferric ferrocyanide
			(Prussian blue) Fe ₃ (CN) ₈
546.71	METALS OF THE SEVENTH GROUP		Carbonyl compounds of iron
			Derivatives of hexavalent iron. Iron (VI) compounds. Ferrates
			Derivatives of octavalent iron
546.711	MANGANESE		COBALT
.712	Derivatives of divalent manganese		Derivatives of divalent cobalt. Cobaltous (cobalt (II)) compounds
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.725	Derivatives of trivalent cobalt. Cobaltic (cobalt (III)) compounds
	546.712-31 Manganese (II) oxide MnO	.726	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.713	Derivatives of trivalent manganese		546.733 '32 '173 Complex nitrites of
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		potassium and cobalt
	546.713-31 Manganese (III) oxide Mn ₂ O ₃		'33 '173 Sodium cobaltinitrite
	.713 '712 Manganese (II, III) oxide Mn ₃ O ₄		Na ₃ [Co(NO ₂) ₆]
.714	Derivatives of tetravalent manganese	.733	'732-31 Cobaltocobaltic oxide
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		Carbonyl compounds of cobalt
	546.714-31 Manganese dioxide MnO ₂		Derivatives of octavalent cobalt
	→ 553.32 Manganese ores		<i>Only general questions are classed here.</i>
	661.871.16 Manganese dioxide—		<i>Complex salts are classed under 546.732 and 546.733</i>
	Chemical		
	technology		
	—383 Manganites in general	.735	
.716	Derivatives of hexavalent manganese. Manganates	.738	
.717	Derivatives of heptavalent manganese. Permanganates		
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>	546.74	NICKEL
	546.717-325 Permanganic acid HMnO ₄	.742	Derivatives of divalent nickel. Nickel (II) compounds
	.717 '32 Potassium permanganate KMnO ₄	.743	Derivatives of trivalent nickel. Nickel (III) compounds
546.718	TECHNETIUM		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
546.719	RHENIUM	.745	546.743 '742-31 Magnetic nickel oxide
	546.719 ≈ 546.711/.717, e.g.	.748	Ni ₃ O ₄
	546.719.7 Derivatives of heptavalent rhenium	546.75/.78	Carbonyl compounds of nickel
	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>		Derivatives of octavalent nickel
	546.719.7 '32 Potassium perrhenate KReO ₄	.75	METALS OF THE SIXTH GROUP
		546.76	Chromium group in general [cancelled] → 546.76
			CHROMIUM

- 546.762 Derivatives of divalent chromium. Chromous (chromium (II)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.762 '131 Chromous chloride CrCl_2
- .763 Derivatives of trivalent chromium. Chromic (chromium (III)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.763 '226 Chromic sulphate $\text{Cr}_2(\text{SO}_4)_3$
 '31 '226 Chrome alums in general
 '32 '226 Chromic potassium sulphate
 $\text{KCr}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$
- .765 Carbonyl compounds of chromium
- .766 Derivatives of hexavalent chromium. Chromates
Further particulars may be denoted by special auxiliaries, e.g.
 546.766 '33 Sodium chromate Na_2CrO_4
 '33-384 Sodium dichromate $\text{Na}_2\text{Cr}_2\text{O}_7$
- 546.77 MOLYBDENUM
- .772 Derivatives of divalent molybdenum
- .773 Derivatives of trivalent molybdenum
- .774 Derivatives of tetravalent molybdenum
- .775 Derivatives of pentavalent molybdenum
- .776 Derivatives of hexavalent molybdenum
Further particulars may be denoted by special auxiliaries, e.g.
 546.776 '33 Sodium molybdate Na_2MoO_4
- 546.78 TUNGSTEN
 546.78 $\cong$ 546.77
- 546.79 GENERALITIES ON THE ACTINIDES
 →539.16 Radioactivity. Radioactive decay
 539.18 Physics of single atoms
 541.28 Radiochemistry
 546.027 Isotopes
 546.841 Thorium
- 546.791 URANIUM
Isotopes may be denoted by special auxiliaries, e.g.
 546.791 *235 Uranium 235
- .2 Derivatives of divalent uranium
Further particulars may be denoted by special auxiliaries, e.g.
 546.791.2 '226 Sulphates
- .3 Derivatives of trivalent uranium
- .4 Derivatives of tetravalent uranium
- .5 Derivatives of pentavalent uranium
- .6 Derivatives of hexavalent uranium
Further particulars may be denoted by special auxiliaries, e.g.
 546.791.6 '161 Uranium hexafluoride UF_6
 '791.4 Uranium (IV, VI) oxide U_3O_8
- .792/.792.4 Members of the uranium family
- .793/.793.8 Radium A to radium E
- 546.794 POLONIUM
 546.794 $\cong$ 546.22
- .794.7/.9 Members of the radium family
- .795/.795.5 Actinium family. Uranium Y
- 546.796 PROTOACTINIUM
- .5 Derivatives of pentavalent protoactinium
Further particulars may be denoted by special auxiliaries, e.g.
 546.796.5-31 Protoactinium oxide Pa_2O_5
- 546.797 ACTINIUM
- .798.1/.9 Members of the actinium family
- 546.799 TRANSURANIC ACTINIDES
- .1 Uranium Z
- .3 Neptunium
- .4 Plutonium
- .5 Americium
- .6 Curium
- .7 Berkelium
- .8 Californium
- .9 Einsteinium
- .90 Fermium
- .91 Mendelevium
- .92 Nobelium
- .93 Lawrencium
- 546.8 METALS OF THE FOURTH GROUP
 →546.25 Generalities on the non-metals of the third and fourth groups
- 546.26 Carbon
- 546.27 Boron
- 546.28 Silicon
- 546.81 TIN. LEAD
- 546.811 TIN IN GENERAL
Further particulars may be denoted by special auxiliaries, e.g.
 546.811-121 Metallic tin
 -17 Allotropes of tin
 .811.027 Isotopes of tin
- .812 Derivatives of divalent tin. Stannous (tin (II)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.812-31 Stannous oxides SnO
- .814 Derivatives of tetravalent tin. Stannic (tin (IV)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.814-31 Stannic oxide SnO_2
 -323 metaStannic acid H_2SnO_3
 -325 Stannic acid H_4SnO_4
 .814 '221 Stannic sulphide SnS_2
 '33 '221 Sodium thiostannate Na_2SnS_3
 '59 '131 Purple of Cassius
- 546.815 LEAD IN GENERAL
Further particulars may be denoted by special auxiliaries, e.g.
 546.815-121 Metallic lead
- .816 Derivatives of monovalent lead. Plumbous (lead (I)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.816-31 Lead suboxide Pb_2O
- .817 Derivatives of divalent lead. Plumbic (lead (II)) compounds
Further particulars may be denoted by special auxiliaries, e.g.
 546.817-31 Lead oxide PbO
 →661.851.2 Litharge—
 Chemical technology
 -36 Lead hydroxide $\text{Pb}(\text{OH})_2$
 .817 '226 Lead sulphate PbSO_4
 '32 Potassium plumbite KHPbO_2
- .818 Derivatives of trivalent lead
Further particulars may be denoted by special auxiliaries, e.g.
 546.818-31 Lead trioxide Pb_2O_3
- .819 Derivatives of tetravalent lead
Further particulars may be denoted by special auxiliaries, e.g.
 546.819-31 Lead dioxide PbO_2
 .819 '33 Sodium plumbate Na_4PbO_4
 '817 Lead orthoplumbate Pb_3O_4

546.82	TITANIUM GROUP	546.87	BISMUTH 546.87 $\cong$ 546.86
546.821	TITANIUM IN GENERAL	546.88	VANADIUM, NIOBIUM AND TANTALUM GROUP
.822	Derivatives of divalent titanium	546.881	VANADIUM
.823	Derivatives of trivalent titanium <i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.2	Derivatives of divalent vanadium
.824	Derivatives of tetravalent titanium <i>Further particulars may be denoted by special auxiliaries, e.g.</i>	.3	Derivatives of trivalent vanadium
	546.823 '171 Titanium nitride TiN	.4	Derivatives of tetravalent vanadium
	546.824-31 Titanium dioxide TiO ₂	.5	Derivatives of pentavalent vanadium <i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	-325 metaTitanic acid H ₂ TiO ₃	546.881.5-323	metaVanadic acid HVO ₃
.826	Titanium peroxide	.5 '39	Ammonium vanadate NH ₄ VO ₃
546.83	ZIRCONIUM. HAFNIUM	546.882	NIOBIUM
546.831	ZIRCONIUM	546.882 $\cong$ 546.881, e.g.	546.882.5 '32 '161 Niobium potassium fluoride NbOF ₃ .2KF.H ₂ O
	546.831 $\cong$ 546.82, e.g.	546.883	TANTALUM
	546.831.4 Derivatives of tetravalent zirconium	.884	546.883 $\cong$ 546.881 Element with atomic number 105
	.4 '161 Zirconium fluoride ZrF ₄	546.9	ELEMENTS OF THE EIGHTH GROUP
	'32 '161 Zirconium potassium fluoride complexes	546.91	PLATINUM GROUP IN GENERAL
546.832	HAFNIUM	546.92	PLATINUM
	546.832 $\cong$ 546.82	.921	Derivatives of monovalent platinum
546.833	KURCHATOVIIUM (ATOMIC NUMBER 104)	.922	Derivatives of divalent platinum
.84	Thorium family	.923	Derivatives of trivalent platinum
546.841	THORIUM	.924	Derivatives of tetravalent platinum <i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	546.841 $\cong$ 546.82, e.g.	546.924 '161	Platinum tetrafluoride PtF ₄
	546.841.4 Derivatives of tetravalent thorium	'161-32	Fluoroplatinic acid H ₂ PtF ₆ .6H ₂ O
	.4-36 Thorium hydroxide Th(OH) ₄	'39 '161	Ammonium fluoroplatinate (NH ₄) ₂ PtF ₆
	.4 '131 Thorium tetrachloride ThCl ₄	Derivatives of hexavalent platinum	
.842/.843.9	Members of the thorium family	546.93	IRIDIUM
546.85	ELEMENTS OF THE FIFTH GROUP	546.93 $\cong$ 546.92	
546.851	GENERALITIES ON THE NON-METALS OF THE FIFTH GROUP	546.94	OSMIUM
	→ 546.17 Nitrogen	546.94 $\cong$ 546.92	
	546.18 Phosphorus	546.95	RUTHENIUM GROUP IN GENERAL
	546.19 Arsenic	546.96	RUTHENIUM
546.852	GENERALITIES ON THE METALS OF THE FIFTH GROUP	546.96 $\cong$ 546.92	
	→ 546.88 Vanadium, niobium and tantalum group	546.97	RHODIUM
546.86	ANTIMONY	546.97 $\cong$ 546.92	
	546.86 $\cong$ 546.17, e.g.	546.98	PALLADIUM
	546.861 Antimony hydrides	546.98 $\cong$ 546.92	
	.863 Derivatives of trivalent antimony	546.99	DOUBTFUL ELEMENTS. INDEFINABLE ELEMENTS
	.863-31 Antimony trioxide Sb ₂ O ₃		Elements of very low relative atomic mass (atomic weight)
	.863 '131 Antimony trichloride SbCl ₃		Elements of relative atomic mass (atomic weight) between one and 242
	'221 Antimony trisulphide Sb ₂ S ₃		Elements of very high relative atomic mass (atomic weight)
	→ 549.313.2 Stibnite (antimonite)		→ 52-36 Chemical composition.
	.865 Derivatives of pentavalent antimony		Abundances. Astronomy
	.865-31 Antimony pentoxide Sb ₂ O ₅	.991	
	.865 '221 Antimony pentasulphide Sb ₂ S ₅	.992	
	'32-38 Potassium pyroantimonate K[Sb(OH) ₆]	.993	
	'32 '221 Potassium thioantimonate		

547 ORGANIC CHEMISTRY

Basis of the classification. The classification of organic chemistry is based on the system adopted in 'Lehrbuch der Organischen Chemie' by Victor Meyer and Paul Jacobson.

Some modification of this system was necessary to render it suitable for a bibliographic classification. In certain sections also of the more recent volumes of this manual the order of succession of the compounds differs from that in the earlier volumes. These have been altered to restore the parallelism of the different sections. For example, the aldehydes and ketones have been placed before the carboxylic acids in the section of acyclic compounds as well as in that of cyclic compounds. The sections on monosubstituted acyclic compounds and on natural compounds have been completed from other sources.

Extension of the classification. When the number under which a compound should be classed has been determined, this may be further subdivided by:

- (1) '11/'19 subdivided in the same way as 546.1/.9
- (2) '2/'8 subdivided in the same way as 547.2/.8
- (3) -1/-4 listed at 54
- (4) .01/.08 listed at 54

Classification rules. Compounds which can be allocated more than one number should be classed under the number which comes last in the tables. Thus a compound containing an isocyclic ring and a heterocyclic ring is classed under heterocyclic compounds.

Collective studies of well-defined chemical compounds such as alcohols, amines etc are classed under the lowest appropriate number, e.g. a general treatise on ketones is classed under 547.284.

Collective studies of less definite groups or of so-called natural groups containing a large number of compounds are classed under 547.9. It should be noted that the compounds enumerated under each classification number are to be regarded as examples only.

Classification according to the condensed formula. To locate studies on compounds considered separately, a duplicate bibliographic series may be formed in which the said compounds are arranged according to the condensed formula following 547, e.g.

547 CH₄O Methanol

When the structure of a compound cannot be indicated exactly by a UDC number, it may be denoted by adding the letter C and the number of carbon atoms, e.g.

547.462.8 C₉ Aliphatic dicarboxylic acids with triple bonds and nine carbon atoms

Note on terminology. For the sake of brevity in the schedule and because of difficulties in describing a number of allied concepts by one word, the word 'monosubstituted' when applied to a compound or series of compounds means that that compound or series of compounds contains one substituent of the type described and no other.

Special auxiliary subdivisions for 547

547-312	Anhydrides
-313	Lactides
-314	Lactones
-317	Diketopiperazines
-318	Lactams
547.01/.08	These special auxiliaries, which are listed at 54, are also applicable to 547, e.g.
	547.02 Composition. Structure. Isotopes etc
	.021 General composition and formula. Molecular formula. Symbols etc
	.022 Structure and arrangement of atoms in the molecule. Structural formula
	.024 Radicals, e.g. alkyl, aryl
547'0	Details of the structure of organic compounds
	These special auxiliaries are developed at various places in 547, e.g. at 547.53

Principal divisions (continued)

547.1	GENERALITIES
	Theoretical aspects may be denoted by colon combination with the subdivisions of 541.
	Further particulars may be denoted by special auxiliaries, e.g.
	547.1'128 Silicones
	547.1'13 Organometallic compounds in general
.12	Carbon bonds. Arrangement of carbon atoms in the molecule
.14	Comparison of cyclic and acyclic compounds

547.2	GENERALITIES ON ACYCLIC COMPOUNDS
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547.21

SATURATED HYDROCARBONS.

ALKANES (PARAFFINS) C_nH_{2n+2}

Further particulars may be denoted by special auxiliaries, e.g.

547.21.024 Alkyl groups

.211	Methane CH ₄
.212	Ethane C ₂ H ₆
.213	Propane C ₃ H ₈
.214	Butane C ₄ H ₁₀
.215	Pentane C ₅ H ₁₂
.216	Hexane C ₆ H ₁₄
.217.1	Heptane C ₇ H ₁₆
.2	Octane C ₈ H ₁₈
.3	Nonane C ₉ H ₂₀
.4	Decane C ₁₀ H ₂₂
.5	Undecane C ₁₁ H ₂₄
.6	Dodecane C ₁₂ H ₂₆
.7	Tridecane C ₁₃ H ₂₈
.8	Tetradecane C ₁₄ H ₃₀
.9	Pentadecane C ₁₅ H ₃₂
.218.1	Hexadecane C ₁₆ H ₃₄
.2	Heptadecane C ₁₇ H ₃₆
.3	Octadecane C ₁₈ H ₃₈
.4	Nonadecane C ₁₉ H ₄₀
.5	Eicosane C ₂₀ H ₄₂
.6	Heneicosane C ₂₁ H ₄₄
.7	Docosane C ₂₂ H ₄₆
.8	Tricosane C ₂₃ H ₄₈
.9	Tetracosane C ₂₄ H ₅₀
.219	Saturated hydrocarbons with 25 or more carbon atoms
.1	With 25 to 33 carbon atoms
.11	C ₂₅ H ₅₂
.12	C ₂₆ H ₅₄
.13	C ₂₇ H ₅₆
.14	C ₂₈ H ₅₈
.15	C ₂₉ H ₆₀
.16	Triacotane C ₃₀ H ₆₂
.17	C ₃₁ H ₆₄
.18	C ₃₂ H ₆₆

547.219.19	C ₃₃ H ₆₈	547.234.1	Primary hydrazines
.2	With 34 to 42 carbon atoms		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.21	C ₃₄ H ₇₀		547.234.1'122.6 Sulphurous acid derivatives of hydrazine
.22	C ₃₅ H ₇₂		'212 Ethylhydrazine
.23	C ₃₆ H ₇₄		C ₂ H ₅ .NH.NH ₂
.24	C ₃₇ H ₇₆		
.25	C ₃₈ H ₇₈		
.26	C ₃₉ H ₈₀	.2	Secondary hydrazines
.27	Tetracontane C ₄₀ H ₈₂	.22	Asymmetrical secondary hydrazines
.28	C ₄₁ H ₈₄		R'R''N.NH ₂
.29	C ₄₂ H ₈₆		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.3	With 43 to 51 carbon atoms		547.234.22'211 Asymmetrical dimethylhydrazine
	547.219.3 $\cong$ 547.219.2, e.g.		
	547.219.38 Pentacontane C ₅₀ H ₁₀₂		
.4	With 52 to 60 carbon atoms	.23	Symmetrical secondary hydrazines
	547.219.4 $\cong$ 547.219.2, e.g.		R.NH.NH.R
	547.219.49 Hexacontane C ₆₀ H ₁₂₂		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.5	With 61 to 69 carbon atoms		547.234.23'211 Symmetrical dimethylhydrazine
	547.219.5 $\cong$ 547.219.2		
.6	With 70 to 78 carbon atoms		
	547.219.6 $\cong$ 547.219.2	.3	Trialkylazonium bases and derivatives of the -OH group
.7	With 79 to 87 carbon atoms		547.234.3 $\cong$ 547.21
	547.219.7 $\cong$ 527.219.2	.235	Other nitrogen derivatives containing two nitrogen atoms
.8	With 88 to 96 carbon atoms		
	547.219.8 $\cong$ 547.219.2	.2	Azo compounds
.91	With 97 to 105 carbon atoms		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	547.219.91 $\cong$ 547.219.2		547.235.2'211 Azomethane
.92	With 106 to 114 carbon atoms	.3	Hydroxyhydrazines
	547.219.92 $\cong$ 547.219.2	.4	Diazo and isodiazo compounds
.93	With 115 to 123 carbon atoms	.41	Diazo compounds and isodiazo compounds in general. Composition of aliphatic diazo compounds
	547.219.93 $\cong$ 547.219.2		So-called aliphatic diazo compounds. Azoalkyls
547.22	MONOHALOGENO DERIVATIVES OF SATURATED HYDROCARBONS	.42	Diazomethane
		.421	Diazonium compounds
		.44	<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
			547.235.442-36 C ₂ H ₅ .N ₂ OH
			.442'113.1 C ₂ H ₅ .N ₂ Cl
		.5	Azoxy compounds containing the group -N ₂ OH
		.6	Isonitramines with the group -N ₂ O ₂ H
		.236	Nitrogen derivatives containing three nitrogen atoms
		.1	Triazines with the group -N ₃ H ₄
		.2	Triazenes with the group -N ₃ H ₂
		.3	Hydroxytriazenes with the group -N ₃ H.OH
		.4	Azoamidoxides with the group -N ₃ H ₂ O
		.237	Derivatives with nitrogen groups containing four or more nitrogen atoms
		.1	Tetrazanes
		.2	Tetrazenes
		.3	Substances with more than four nitrogen atoms in the substituent, e.g. bisdiazamino compounds, octazones
		.238	Hydroxylamines
		.239	isoNitriles. Nitriles
		.1	isoNitriles (isocyanides)
		.2	Nitriles (cyanides)
			547.239.2 $\cong$ 547.29
547.221	Fluoro derivatives	547.24	MONOSUBSTITUTED DERIVATIVES OF SATURATED HYDROCARBONS, CONTAINING NON-METALS OTHER THAN OXYGEN, SULPHUR, SELENIUM AND TELLURIUM DIRECTLY LINKED TO CARBON
	547.221 $\cong$ 547.21		
.222	Chloro derivatives		
	547.222 $\cong$ 547.21		
.223	Bromo derivatives		
	547.223 $\cong$ 547.21		
.224	Alkyl iodides		
	547.224 $\cong$ 547.21		
.225	Iodoso compounds		
.226	Iodo compounds		
.227	Iodonium compounds		
547.23	MONOSUBSTITUTED DERIVATIVES OF SATURATED HYDROCARBONS CONTAINING NITROGEN DIRECTLY LINKED TO CARBON		
	<i>For the structure of the inorganic groups</i>		
	$\rightarrow$ 546.17		
.231	Nitroso derivatives		
	547.231 $\cong$ 547.21		
.232	Nitro derivatives		
	547.232 $\cong$ 547.21		
.233	Amines. Quaternary ammonium compounds		
.1	Primary amines	.241	Phosphorus derivatives
	547.233.1 $\cong$ 547.21		547.241 $\cong$ 547.23
.2	Secondary amines	.242	Arsenic derivatives
	547.233.2 $\cong$ 547.21		547.242 $\cong$ 547.23
.3	Tertiary amines	.243	Antimony and bismuth derivatives
	547.233.3 $\cong$ 547.21	.2	Antimony derivatives
.4	Quaternary ammonium compounds		547.243.2 $\cong$ 547.23
	547.233.4 $\cong$ 547.21	.3	Bismuth derivatives
.234	Hydrazines		547.243.3 $\cong$ 547.23

- 547.244 Boron derivatives
 .245 Silicon derivatives
 .246 Germanium derivatives
- 547.25 MONOSUBSTITUTED ORGANO-METALLIC DERIVATIVES OF SATURATED HYDROCARBONS
547.25 is subdivided broadly as 546 up to the point of valency of the metal. Further particulars may be denoted by '11/'19 (subdivided as 546.1/.9), '2/'8 (subdivided as 547.2/.8) and -1/-4 (listed at 54), e.g.
 547.254.6 '114.1 '212 Monofunctional organometallic derivative
 C_2H_5MgBr
- .253.1 Alkali metal derivatives in general
 .2 Potassium
 .3 Sodium
 .4 Lithium
 .5 Rubidium
 .6 Caesium
- .254 Metals of the second group
 .1 Calcium
 .2 Strontium
 .31 Barium
 .32 Radium
 .5 Beryllium
 .6 Magnesium
 .7 Zinc
 .8 Cadmium
 .9 Mercury
- .255.6 Copper
 .7 Silver
 .9 Gold
- .256.2 Aluminium
 .3 Scandium
 .4 Yttrium
 .5 Organic derivatives of the rare earths from lanthanum to samarium
 .6 Organic derivatives of the rare earths from europium to lutetium
- .81 Gallium
 .82 Indium
 .83 Thallium
- .257.1 Manganese
 .2 Iron
 .3 Cobalt
 .4 Nickel
 .6 Chromium
 .7 Molybdenum
 .8 Tungsten
 .9 Uranium
- .258.11 Tin
 .15 Lead
 .2 Titanium
 .31 Zirconium
 .32 Hafnium
 .4 Thorium
 .81 Vanadium
 .82 Niobium
 .83 Tantalum
- .259.2 Platinum
 .3 Iridium
 .4 Osmium
 .6 Ruthenium
 .7 Rhodium
 .8 Palladium
- 547.26 SATURATED MONOHYDRIC ALCOHOLS
Included in this section are the saturated hydrocarbon derivatives which have sulphur, selenium or tellurium bound directly to the carbon.
Further particulars may be denoted by apostrophe combination, e.g.
 547.26 '11 Esters derivatives in general.
 Esters
- 547.26 '11.05 Esterification in general
 '113 Esters of acids containing chlorine
 → 547.22 Monofunctional halogen derivatives of saturated hydrocarbons
 '117 Esters of acids containing nitrogen
 547.26 '117 $\cong$ 546.17
 '118 Esters of acids containing phosphorus
 '119 Esters of acids containing arsenic
 547.26 '119 $\cong$ 546.19
 '122 Esters of acids containing sulphur
 547.26 '122 $\cong$ 546.22
 '123 Esters of acids containing selenium
 '124 Esters of acids containing tellurium
 '127 Esters of acids containing boron
 '128 Esters of acids containing silicon or germanium
 '13 Organometallic compounds in which the metal atom is attached to oxygen in general
 547.26 '131/'199 $\cong$ 546.31/.99, e.g.
 547.26 '132 Potassium alkoxide
- .260.2 -OH groups in general
 .261 Methanol (methyl alcohol)
 .262 Ethanol (ethyl alcohol)
 .263 Propanols (propyl alcohols)
 .264 Butanols (butyl alcohols)
 .265 Pentanols (pentyl alcohols, amyl alcohols)
 .266 Hexanols (hexyl alcohols)
 .267 Heptanols (heptyl alcohols)
 .268 Octanols (octyl alcohols) and higher alcohols
 .1 Alcohols with 8 to 16 carbon atoms
 .11 Octanols (octyl alcohols), e.g. caprylic alcohol
 .12 Nonanols (nonyl alcohols)
 .13 Decanols (decyl alcohols)
 .14 Undecanols (undecyl alcohols)
 .15 Dodecanols (dodecyl alcohols), e.g. lauryl alcohol
 .16 Tridecanols (tridecyl alcohols)
 .17 Tetradecanols (tetradecyl alcohols), e.g. myristyl alcohol
 .18 Pentadecanols (pentadecyl alcohols)
 .19 Hexadecanols (hexadecyl alcohols), e.g. cetyl (palmityl) alcohol
 .2 Alcohols with 17 to 25 carbon atoms
 .21 Heptadecanols (heptadecyl alcohols)
 .22 Octadecanols (octadecyl alcohols), e.g. stearyl alcohol
 .23 Nonadecanols (nonadecyl alcohols)
 .24 Eicosanols (eicosyl alcohols)
 .25 Heneicosanols (heneicosyl alcohols)
 .26 Docosanols (docosyl alcohols)
 .28 Tetracosanols (tetracosyl alcohols)
 .3 Alcohols with 26 to 34 carbon atoms
 .31 Hexacosanols
 .32 Heptacosanols
 .33 Octacosanols
 .35 Triacontanols
 .355 With 30 or 31 carbon atoms. Alcohols originating from beeswax or carnauba wax. Myricyl alcohol. Melissyl alcohol
 .36 Hentriacontanol
 .37 With 32 carbon atoms
 .38 With 33 carbon atoms
 .39 With 34 carbon atoms
 .4 Alcohols with 35 to 43 carbon atoms
 .41 Pentatriacontanol

547.268.5	Alcohols with 44 to 52 carbon atoms	547.279.53	Sulphones
.57	With 50 carbon atoms		547.279.53 $\cong$ 547.271/.272
.58	With 51 carbon atoms	.8	Selenium-containing derivatives
.6	Alcohols with 53 to 61 carbon atoms	.9	Tellurium-containing derivatives
.63	With 55 carbon atoms		
.7	Alcohols with 62 to 70 carbon atoms		
.8	Alcohols with 71 to 79 carbon atoms	547.28	SATURATED MONOALDEHYDES AND MONOKETONES. SULPHUR-CONTAINING, SELENIUM-CONTAINING AND TELLURIUM-CONTAINING DERIVATIVES
.9	Alcohols with 80 or more carbon atoms		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.269	Monosubstituted derivatives of saturated hydrocarbons, containing sulphur, selenium or tellurium bound directly to the carbon		547.28.02 Constitution of carbonyl groups
.1	Mercaptans		.28 '122.3 Bisulphite compounds
	547.269.1 $\cong$ 547.26		Saturated monoaldehydes
.3	Sulphonic acids. Sulphonic acids substituted in the -SO ₃ H group	.281	547.281 $\cong$ 547.211/.218
.31	Sulphonic acids not substituted in the -SO ₃ H group		Formaldehyde
	547.269.31 $\cong$ 547.21	.1	Acetaldehyde and its polymers
	<i>Metallic sulphonates may be denoted by '13/'199</i>	.2	Acetaldehyde
	<i>Sulphonic acid esters may be denoted by '26</i>	.21	Paraldehyde
.35	Sulphonic acids substituted in the -SO ₃ H group other than metallic sulphonates and sulphonic acid esters	.22	Metaldehyde
.351	Sulphonic halides	.23	Tetraldehyde
	547.269.351.1/.5 $\cong$ 547.412.21/.25	.24	Thioaldehydes. Selenoaldehydes. Telluroaldehydes
.352	Sulphamides and derivatives substituted in the -NH ₂ group	.283	Thioaldehydes
.1	Sulphamides	.2	Selenoaldehydes
	547.352.1 $\cong$ 547.21	.3	Telluroaldehydes
.2	Sulphonic halogenamides	.4	Saturated monoketones
.21	Sulphonic monohalogenamides	.284	547.284 $\cong$ 547.26/.268, e.g.
	547.269.352.211/.215 $\cong$ 547.412.21/.25		547.284.3 With 3 carbon atoms (propanone, acetone)
.22	Sulphonic dihalogenamides		.4 With 4 carbon atoms (butanones), e.g. ethyl methyl ketone
	547.269.352.221/.226 $\cong$ 547.412.21/.26		.5 With 5 carbon atoms (pentanones)
.4	Thiosulphonic acids		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.5	Thiosulphuric acids		547.284.5 '211 Methyl propyl ketone
.6	Sulphinic acids		'212 Diethyl ketone
.8	Selenium-containing derivatives		547.284.6 With 6 carbon atoms (hexanones)
.81	Selenium mercaptans		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.82	Selenones		547.284.6 '211 Butyl methyl ketone
.83	Selenonic acids		Thioketones. Selenoketones. Telluroketones
.85	Seleninic acids		Thioketones
.9	Tellurium-containing derivatives		547.286.2 $\cong$ 547.284
	547.269.9 $\cong$ 547.269.8	.2	Selenoketones
		.3	547.286.3 $\cong$ 547.284
547.27	ETHERS OF THE SATURATED HYDROCARBONS. SULPHUR-CONTAINING, SELENIUM-CONTAINING AND TELLURIUM-CONTAINING DERIVATIVES OF ETHERS	.4	Telluroketones
	547.27 $\cong$ 547.26, simple (symmetrical) ethers being denoted by addition of .1, and compound (asymmetrical) ethers being denoted by the subdivisions of '26, subdivided as 547.26, e.g.	.288	547.286.4 $\cong$ 547.284
	547.271 Dimethyl ether		Condensation products of aldehydes and ketones with ammonia, hydrazine etc
	.272 Ethyl ethers	.1	Ammonium compounds
	.272 '261 Ethyl methyl ether	.15	Hexamine (hexamethylenetetramine)
	.272.1 Diethyl ether	.2	Amino compounds
	.273 Propyl ethers	.3	Hydrazine compounds. Hydrazones. Aldazines.
	.273 '261 Methyl propyl ether	.4	Ketazines. Semicarbazones
	.273 '262 Ethyl propyl ether		Hydroxylamine compounds. Oximes
	.273.1 Dipropyl ether		
.279	Sulphur-containing, selenium-containing and tellurium-containing derivatives of ethers	547.29	MONOBASIC SATURATED CARBOXYLIC ACIDS
.1	Alkyl sulphides (alkyl thioethers)		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
	547.279.1 $\cong$ 547.261/.268		547.29-312 Anhydrides
.2	Sulphonium compounds	.291	-39 Peroxides
.3	Disulphides	.292	.29.02 Structure of the carboxyl group
	547.279.3 $\cong$ 547.271/.273	.293	<i>Esters may be denoted by apostrophe combination with the subdivisions '26...</i>
.4	Polysulphides	.294	Formic acid
.5	Sulphoxides. Sulphones	.295	Acetic acid
.52	Sulphoxides	.1	Propionic acid
	547.279.52 $\cong$ 547.271/.272	.2	Butyric acids
		.3	Acids with 5 to 20 carbon atoms
			Pentonic acids (valeric acids)
			Hexoic acids, e.g. caproic acid
			Heptoic acids, e.g. oenanthic acid

- 547.295.4 Octoic acids, *e.g.* caprylic acid
 .5 Nonoic acids, *e.g.* pelargonic acid
 .6 Decoic acids, *e.g.* capric acid
 .7 Acids with 11 to 13 carbon atoms
 .71 Undecoic acids
 .72 Dodecoic acids, *e.g.* lauric acid
 .73 Tridecoic acids
 .8 Tetradecoic acids, *e.g.* myristic acid
 .9 Acids with 15 to 20 carbon atoms
 .91 Pentadecoic acids
 .92 Hexadecoic acids, *e.g.* palmitic acid
 .93 Heptadecoic acids, *e.g.* margaric acid
 .94 Octadecoic acids, *e.g.* stearic acid
 .95 Nonadecoic acids
 .96 Eicosoic acids, *e.g.* arachidic acid
 .296 Acids with more than 20 carbon atoms
 .1 Acids with 21 to 29 carbon atoms
 .11 Heneicosoic acids
 .12 Decosoic acids, *e.g.* behenic acid
 .13 Tricosoic acids
 .14 Tetracosoic acids, *e.g.* lignoceric acid
 .15 Pentacosoic acids
 .16 Hexacosoic acids
 .17 Heptacosoic acids
 .18 Octacosoic acids
 .19 Nonacosoic acids
 .2 Acids with 30 to 38 carbon atoms
 .21 Triacontic acids
 .215 Melissic acids with 30 or 31 carbon atoms → 547.296.21
 .22 Hentriacontic acids
 .23 Acids with 32 carbon atoms
 .24 Acids with 33 carbon atoms
 .25 Acids with 34 carbon atoms
 .26 Acids with 35 carbon atoms
 .27 Acids with 36 carbon atoms
 .28 Acids with 37 carbon atoms
 .29 Acids with 38 carbon atoms
 .3 Acids with 39 to 47 carbon atoms
 547.296.3 ≅ 547.296.2
 .4 Acids with 48 to 56 carbon atoms
 547.296.4 ≅ 547.296.2
 .5 Acids with 57 to 65 carbon atoms
 547.296.5 ≅ 547.296.2
 .297 Halides of acid radicals. Acyl halides
 547.297.1/.6 ≅ 547.291/.296
 .298 Carboxylic acids which are substituted in the carboxyl group by ammonia, hydrazine etc
 .1 Ammonia derivatives. Acid amides
 547.298.11/.16 ≅ 547.291/.296
 547.298.2/.5 ≅ 547.29
 .2 Iminoethers
 .3 Amidohalides. Imidohalides
 .4 Thioamides
 .5 Amidines
 .6 Hydrazine derivatives
 .61 Hydrazides
 547.298.61 ≅ 547.29
 .62 Hydrazidines
 547.298.62 ≅ 547.29
 .7 Hydroxylamine derivatives
 .71 Hydroxamic acids. Hydroxamic acids
 547.298.71 ≅ 547.29
 .72 Amidoximes
 547.298.72 ≅ 547.29
 .73 Oxyamidoximes
 .8 Derivatives of hydrazoic acids and other derivatives which are substituted by hydrogen in the carboxyl group
 .299 Sulphur-containing, selenium-containing and tellurium-containing analogues of the carboxylic acids
- 547.31 UNSATURATED HYDROCARBONS
 .311 Generalities on the double bond
 → 541.571.3 Double bonds—Theoretical chemistry
 .312 Generalities on the triple bond
 → 541.571.4 Triple and multiple bonds—Theoretical chemistry
 .313 Hydrocarbons of the series C_nH_{2n} . Olefins (alkenes)
 547.313 ≅ 547.21, *e.g.*
 547.313.2 Ethylene C_2H_4
 .3 Propene (propylene) C_3H_6
 .4 Butenes (butylenes) C_4H_8
 .5 Pentenes C_5H_{10}
 .314 Hydrocarbons of the series C_nH_{2n-2} with a triple bond
 547.314 ≅ 547.21, *e.g.*
 547.314.2 Acetylene C_2H_2
 547.314.2'13 Metallic derivatives of acetylene
 .315 Hydrocarbons of the series C_nH_{2n-2} with two double bonds
 .1 Hydrocarbons with cumulative double bonds, *e.g.* allene
 547.315.1 ≅ 547.21
 .2 Hydrocarbons with conjugated double bonds, *e.g.* divinyl, piperylene, isoprene
 547.315.2 ≅ 547.21
 .3 Hydrocarbons with isolated double bonds, *e.g.* diallyl
 547.315.3 ≅ 547.21
 .316 Hydrocarbons of the series C_nH_{2n-4}
 .2 Generalities
 547.316.2 ≅ 547.21
 .4 Hydrocarbons with one double bond and one triple bond
 547.316.4 ≅ 547.21
 .6 Hydrocarbons with three double bonds
 547.316.6 ≅ 547.21
 .317 Hydrocarbons of the series C_nH_{2n-6}
 .2 Generalities
 547.317.2 ≅ 547.21
 .4 With two double bonds and one triple bond
 547.317.4 ≅ 547.21
 .6 With four double bonds
 547.317.6 ≅ 547.21
 .8 With two triple bonds, *e.g.* diacetylene
 547.317.8 ≅ 547.21
 .318 Hydrocarbons with higher degrees of unsaturation
 547.318 ≅ 547.21
- 547.32 MONOHALOGENO DERIVATIVES OF UNSATURATED HYDROCARBONS
Further particulars may be denoted by special auxiliaries, e.g.
 547.32.021 Classification according to general composition
 547.32.021 ≅ 547.31
 Fluoro derivatives
 547.321 ≅ 547.31
 Chloro derivatives
 547.322 ≅ 547.31
 Bromo derivatives
 547.323 ≅ 547.31
 Iodo derivatives
 547.324 ≅ 547.31
- 547.33 MONOSUBSTITUTED DERIVATIVES OF UNSATURATED HYDROCARBONS CONTAINING NITROGEN DIRECTLY LINKED TO CARBON
For certain inorganic groups containing nitrogen → 546.17
 Nitroso derivatives
 547.331 ≅ 547.21
- 547.3 ACYCLIC UNSATURATED HYDROCARBONS AND THEIR MONOSUBSTITUTED DERIVATIVES

547.332	Nitro derivatives 547.332 $\cong$ 547.21	547.367	Sulphur-containing analogues of the unsaturated alcohols. Unsaturated mercaptans (thiols)
.333	Amines. Quaternary ammonium compounds	.368	Other sulphur-containing unsaturated compounds. Unsaturated sulphonic and sulphinic acids
.1	Primary amines	.369	Selenium and tellurium analogues
.2	Secondary amines 547.333.2 $\cong$ 547.31	.1	Selenium analogues
.3	Tertiary amines	.2	Tellurium analogues
.4	Quaternary ammonium compounds		
.334	Hydrazines 547.334 $\cong$ 547.234		
.335	Other nitrogen derivatives containing two nitrogen atoms	547.37	UNSATURATED ETHERS
.2	Azo compounds	.371	Ethers with one double bond
.3	Hydroxyhydrazines	.372	Ethers with one triple bond
.4	Diazo and isodiazo compounds	.373	Ethers with two double bonds
.5	Azoxy compounds containing the group $-N_2OH$	.374	Less saturated ethers
.6	isoNitramines containing the group $-N_2O_2H$	.379	Sulphur, selenium and tellurium analogues of unsaturated ethers
.336	Nitrogen derivatives containing three nitrogen atoms	.1	Thioethers
.1	Triazanes containing the group $-N_3H_4$	.2	Sulphonium compounds
.2	Triazenes containing the group $-N_3H_2$	.3	Disulphides
.3	Hydroxytriazenes containing the group $-N_3HOH$	.4	Polysulphides
.4	Azoamidoxides containing the group $-N_3H_2O$	.5	Sulphoxides. Sulphones
.337	Nitrogen derivatives containing four or more nitrogen atoms	.52	Sulphoxides
.1	Tetrazanes containing the group $-N_4H_4$	.53	Sulphones
.2	Tetrazenes containing the group $-N_4H_2$	.8	Selenium-containing analogues
.3	Compounds containing more than four nitrogen atoms in the substituent group, e.g. bisdiazoamino compounds, octazones	.9	Tellurium-containing analogues
.338	Hydroxylamines		
.339	isoNitriles. Nitriles	547.38	UNSATURATED MONOALDEHYDES AND MONOKETONES. KETENES
.1	isoNitriles (isocyanides)		<i>Further particulars may be denoted by special auxiliaries, e.g.</i>
.2	Nitriles (cyanides) 547.339.2 $\cong$ 547.39	.381	547.38 '122.3 Bisulphite compounds
			Aldehydes of the ethylene series, e.g. acrolein, crotonaldehyde, tigraldehyde, citronellal, rhodinal
547.34	MONOSUBSTITUTED DERIVATIVES OF UNSATURATED HYDROCARBONS, CONTAINING NON-METALS OTHER THAN OXYGEN, SULPHUR, SELENIUM AND TELLURIUM DIRECTLY LINKED TO CARBON	.382	547.381 $\cong$ 547.21
.341	Phosphorus derivatives 547.341 $\cong$ 547.33	.1	Less saturated aldehydes
.342	Arsenic derivatives 547.342 $\cong$ 547.33	.2	Aldehydes with one triple bond, e.g. propiolic aldehyde
.343	Antimony derivatives 547.343 $\cong$ 547.33	.3	547.382.1 $\cong$ 547.21
.344	Boron derivatives	.383	Aldehydes with two double bonds, e.g. citral
.345	Silicon derivatives	.384	547.382.2 $\cong$ 547.315
.346	Germanium derivatives		Other unsaturated aldehydes
547.35	MONOSUBSTITUTED ORGANO-METALLIC DERIVATIVES OF UNSATURATED HYDROCARBONS 547.35 $\cong$ 547.25	.385	Unsaturated thioaldehydes, selenoaldehydes and telluroaldehydes
547.36	UNSATURATED MONOHYDRIC ALCOHOLS	.1	Unsaturated ketones of the ethylene series, e.g. vinylalkyl ketones, ethylideneacetone, mesityl oxide, allylalkyl ketones, allyl acetone, methylheptenone
.361	Derivatives of the ethylene series, e.g. vinyl alcohol (neurine), allyl alcohol, propenyl alcohol, butenol, phytol, oleyl alcohol 547.361 $\cong$ 547.21, e.g. 547.361.2 Vinyl alcohol	.2	547.384 $\cong$ 547.284
.362	Derivatives of the acetylene series 547.362 $\cong$ 547.21, e.g. 547.362.3 Propargyl alcohol	.385	Less saturated ketones
.363	Derivatives of the series $C_nH_{2n-2}O$ containing no triple bonds 547.363 $\cong$ 547.315	.1	Ketones with one triple bond, e.g. pentylacetylacetylene
.364	Derivatives of the series $C_nH_{2n-4}O$ 547.364 $\cong$ 547.316	.2	547.385.1 $\cong$ 547.284
.365	Derivatives of the series $C_nH_{2n-6}O$	.3	Ketones with two double bonds, e.g. diallyl acetone, phorone
.366	Less saturated monohydric alcohols	.386	547.385.2 $\cong$ 547.315
			Other unsaturated ketones, e.g. pseudoionone
		.387	Unsaturated thioketones, selenoketones and telluroketones
		.388	Ketenes, e.g. dimethylketene
		.1	Condensation products of unsaturated aldehydes and ketones with ammonia, hydrazine etc
		.2	Derivatives of ammonia
		.3	Derivatives of amines
		.4	Derivatives of hydrazine. Hydrazones. Aldazines. Ketazines. Semicarbazones
			Derivatives of hydroxylamine. Oximes
		547.39	MONOBASIC UNSATURATED CARBOXYLIC ACIDS
		.391	Acids of the series $C_nH_{2n-2}O_2$ in general
		.1	Acrylic acid
		.2	Vinylacetic acid
		.3	Crotonic acid. Methacrylic acid
		.4	$C_5H_8O_2$ acids

- 547.391.5 C₆H₁₀O₂ acids
 .7 C₇H₁₂O₂ acids
 .8 C₈H₁₄O₂ to C₁₀H₁₈O₂ acids
 .82 C₈ acids
 .83 C₉ acids
 .84 C₁₀ acids, *e.g.* rhodinic acid (citronellic acid)
 .9 C₁₁H₂₀O₂ to C₁₄H₂₆O₂ acids
 .92 C₁₁ acids, *e.g.* undecylenic acid
 .93 C₁₂ acids
 .94 C₁₃ acids
 .95 C₁₄ acids
 .392 C₁₅H₂₈O₂ and higher acids
 .1 C₁₅ acids, *e.g.* cimicinic acid
 .2 C₁₆ acids
 .3 C₁₇ acids
 .4 C₁₈ acids, *e.g.* oleic acid, elaidinic acid
 .5 C₁₉ acids. C₂₀ acids
 .51 C₁₉ acids
 .52 C₂₀ acids
 .6 Acids with more than twenty carbon atoms
 547.392.6 $\cong$ 547.296, *e.g.*
 547.392.611 C₂₁ acids
 .612 C₂₂ acids, *e.g.* brucillic acid, brassidinic acid, cetoleinic acid
 .393 Acids of the propiolic acid series, *e.g.* tetrolic acid, dehydroundecylic acids, undecolic acids, stearolic acid, tariric acid, behenolic acid
 547.393 $\cong$ 547.29, *e.g.*
 547.393.4 Tetrolic acid
 .51 C₅H₆O₂ acids
 .571 Dehydroundecylic acids.
 Undecolic acid
 .594 Stearolic acid. Tariric acid
 .612 Behenolic acid
 .394 Unsaturated acids with two double bonds, containing up to fourteen carbon atoms
 547.394 $\cong$ 547.391
 .395 Unsaturated acids with two double bonds, containing more than fourteen carbon atoms
 547.395 $\cong$ 547.392
 .396 C_nH_{2n-6}O₂ acids, *e.g.* citrylideneacetic acids, linoleic acids, *isolinoleic* acids. Acids with higher degrees of unsaturation
 .397 Halogeno derivatives of the unsaturated acids
 .398 Unsaturated acids with derivatives of ammonia, hydrazine etc substituted in the carboxyl group
 547.398 $\cong$ 547.298, *e.g.*
 547.398.1 Ammonia derivatives in the carboxyl group. Amides
 .2 Iminoethers
 .3 Amidohalogen and imidohalogen derivatives
 .4 Thioamides
 .5 Amidines
 .6 Hydrazine derivatives in the carboxyl group
 .7 Hydroxylamine derivatives in the carboxyl group
 .8 Hydrazoic acid derivatives or other nitrogen-containing derivatives in the carboxyl group
 .399 Sulphur, selenium and tellurium analogues
- 547.4 POLYSUBSTITUTED ACYCLIC COMPOUNDS
- 547.41 COMPOUNDS NOT CONTAINING OXYGEN DIRECTLY LINKED TO CARBON
 .411 Generalities on the polyhalogeno compounds
 .412 Polyhalogeno derivatives of saturated hydrocarbons
 .412.1 Polyhalogeno derivatives of methane
 .412.11 Dihalogeno derivatives (CH₂Halogen₂)
 .112 Difluoromethane (CH₂F₂)
 .113 Dichloromethane (CH₂Cl₂)
- 547.412.114 Dibromomethane (CH₂Br₂)
 .115 Di-iodomethane (CH₂I₂)
 .116 Derivatives with dissimilar halogen atoms
 .23 Chlorofluoromethane (CH₂ClF)
 .24 Bromofluoromethane (CH₂BrF)
 .25 Fluoroiodomethane (CH₂FI)
 .34 Bromochloromethane (CH₂BrCl)
 .35 Chloroiodomethane (CH₂ClI)
 .45 Bromoiodomethane (CH₂BrI)
 .412.12 Trihalogeno derivatives (CHHalogen₃). Mixed trihalogeno compounds
 .122 Trifluoromethane (CHF₃)
 .123 Chloroform (CHCl₃)
 .124 Bromoform (CHBr₃)
 .125 Iodoform (CHI₃)
 .126 Trihalogeno derivatives with two different halogen atoms
 .23 Chlorodifluoromethane (CHClF₂)
 .24 Bromodifluoromethane (CHBrF₂)
 .25 Difluoroiodomethane (CHF₂I)
 .32 Dichlorofluoromethane (CHCl₂F)
 .34 Bromodichloromethane (CHBr₂Cl)
 .35 Dichloroiodomethane (CHCl₂I)
 .42 Dibromofluoromethane (CHBr₂F)
 .43 Dibromochloromethane (CHBr₂Cl)
 .45 Dibromoiodomethane (CHBr₂I)
 .52 Fluorodi-iodomethane (CHF₂I)
 .53 Chlorodi-iodomethane (CHCl₂I)
 .54 Bromodi-iodomethane (CHBr₂I)
 .127 Trihalogeno derivatives with three different halogen atoms
 .234 Bromochlorofluoromethane (CHBrClF)
 .235 Chlorofluoroiodomethane (CHClFI)
 .245 Bromofluoroiodomethane (CHBrFI)
 .345 Bromochloroiodomethane (CHBrClI)
 .412.13 Tetrahalogeno derivatives
 → 547.412.72 Tetrahalogeno derivatives of ethane and its homologues
 .132 Carbon tetrafluoride (CF₄)
 .133 Carbon tetrachloride (CCl₄)
 .134 Carbon tetrabromide (CBr₄)
 .135 Carbon tetraiodide (CI₄)
 .136 Tetrahalogeno derivatives with two different halogen atoms in the ratio 3:1
 .23 Chlorotrifluoromethane (CClF₃)
 .24 Bromotrifluoromethane (CBrF₃)
 .25 Trifluoroiodomethane (CF₃I)
 .32 Trichlorofluoromethane (CCl₃F)
 .34 Bromotrichloromethane (CBrCl₃)
 .35 Trichloroiodomethane (CCl₃I)
 .42 Tribromofluoromethane (CBr₃F)
 .43 Tribromochloromethane (CBr₃Cl)
 .45 Tribromoiodomethane (CBr₃I)
 .52 Fluorotri-iodomethane (CFI₃)
 .53 Chlorotri-iodomethane (CClI₃)
 .54 Bromotri-iodomethane (CBrI₃)
 .137 Tetrahalogeno derivatives with two different halogen atoms in the ratio 2:2
 .23 Dichlorodifluoromethane (CCl₂F₂)
 .24 Dibromodifluoromethane (CBr₂F₂)
 .25 Difluorodi-iodomethane (CF₂I₂)
 .34 Dibromodichloromethane (CBr₂Cl₂)
 .35 Dichlorodi-iodomethane (CCl₂I₂)
 .45 Dibromodi-iodomethane (CBr₂I₂)
 .138 Tetrahalogeno derivatives with three different halogen atoms in the ratio 2:1:1
 .234 Bromochlorodifluoromethane (CBrClF₂)
 .235 Chlorodifluoroiodomethane (CClF₂I)
 .245 Bromodifluoroiodomethane (CBrF₂I)
 .324 Bromodichlorofluoromethane (CBrCl₂F)
 .325 Dichlorofluoroiodomethane (CCl₂FI)
 .345 Bromodichloroiodomethane (CBrCl₂I)
 .423 Dibromochlorofluoromethane (CBr₂ClF)
 .425 Dibromofluoroiodomethane (CBr₂FI)
 .435 Dibromochloroiodomethane (CBr₂ClI)
 .523 Chlorofluorodi-iodomethane (CClFI₂)
 .524 Bromofluorodi-iodomethane (CBrFI₂)
 .534 Bromochlorodi-iodomethane (CBrClI₂)