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UDC 661 Chemical products

Classification Décimale Universelle
CDU 661 Produits chimique

Dezimalklassifikation
DK 661 Chemische Erzeugnisse

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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 Lake Placid Education Foundation, New York, proprietors of the Dewey Decimal Classification, from which the UDC derives. The English full edition of the UDC is authorized by the International Federation for Documentation (FID), PO Box 90402, 2509 LK 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 BS 1000[661], which supersedes the 1971 edition, includes modifications authorized in 'Extensions and Corrections to the UDC' (FID publication no. 248) up to and including Series 11, No. 2, dated April 1982. Subsequent issues of 'Extensions and Corrections to the UDC' should be consulted to keep the schedule up to date. British Standards related to this Part of BS 1000 are listed on the inside back cover.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Scope

Under 661 is classed information about the production of chemical materials, and about the products themselves from the point of view of manufacture, application, etc.

Theoretical, experimental, analytical, inorganic and organic chemistry are classed under 54, the subdivisions of which may be freely combined by colon with the subdivisions of 661 whenever necessary.

Related subjects

53	Physics
54	Chemistry
552	Petrology. Petrography
553	Economic geology
613.6	Occupational hazards. Industrial health and hygiene
614.8	Accidents. Risks or hazards. Prevention, personal protection and safety
615	Pharmaceutics. Therapeutics. Toxicology
620.1	Materials testing. Defects of materials. Protection of materials
621.35	Electrochemical technology
621.56/.59	Refrigeration technology
621.6	Fluids handling, storage and distribution plant and equipment
621.794	Chemical finishing and surface treatments
622	Mining
623.45	Ammunition. Pyrotechnic devices. Atomic (nuclear), biological and chemical weapons
628.5	Measures against industrial and other nuisances
631.8	Fertilizers and manures. Growth substances
641.4	Preservation of foodstuffs in the home
648	Washing. Laundering. Cleaning
66.0	Chemical engineering, production and processing operations and plant
662	Explosives. Fuels
663	Industrial microbiology. Industrial mycology. Fermentation industry. Beverage industry. Stimulant industry
664	Manufacture and preservation of solid foods
665	Oils. Fats. Waxes. Polishes. Adhesives. Gums and natural resins
666	Glass. Ceramics. Enamels. Artificial stone. Cements
667	Colour industries

669	Metallurgy
691	Building materials. Building components
77	Photography and similar processes

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 combination 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 —2/—8 special auxiliaries listed under 62 and the —9 and .0 special auxiliaries listed under 66 are applicable throughout the schedule (except that —3 is not applicable to 661.185). They may be detached from the number under which they are listed and applied to any subdivision of 661 where the result forms a meaningful combination.

Special auxiliaries are also given under various subdivisions of 661. These are applicable only to subdivisions of the number under which they are listed.

An explanation of the use of the . . . 1/ . . . 9 numbers listed under 661.8 is given in the notes following 661.8.

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 ≅ '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.

SCHEDULE 661 CHEMICAL PRODUCTS

*Individual constituents may be
denoted by colon combination with
the subdivision of 546 and 547*

661.1	SPECIAL CHEMICAL INDUSTRIES	661.183.5	Other natural minerals. Natural oxides <i>Further particulars may be denoted by colon combination, e.g.</i> 661.183.5:679.857.8 Infusorial earth (diatomaceous earth)
661.12	PHARMACEUTICALS <i>Specific manufacturing processes may be denoted by the .01/.09 special auxiliaries listed under 66</i> <i>For specific pharmaceutical preparations → 615</i>	.55 .6 .7 .8	Chemically treated Synthetic silicates. Synthetic zeolites Silica gel Synthetic inorganic oxides. Activated alumina
.122	Industrial production of mixed powders, tablets, solutions, ointments etc.	.82 .9	Aluminium hydroxide gel Salts. Other inorganic materials
.123	Manufacture of products derived by chemical processing from vegetable and animal sources	.184	Semi-colloids Raw materials. Auxiliary materials
.124	Manufacture of products formed by chemical, biological and biochemical processes	.2 .22 .23 .24 .26 .27 .3	Water Clays, e.g. bentonite Filling materials, e.g. baryta, haematite Auxiliary materials Fluid mud with fibrous additions Production
661.13	CHEMICALS FOR THE ELECTROTECHNICAL INDUSTRY →621.35 Electrochemical technology	.32 .33 .34 .35 .36 .37 .4	Extraction of raw materials Working-up of raw and auxiliary materials Sieving Degassing Control of viscosity Control of relative density Regeneration →622.7 Treatment, processing of minerals
661.14	PHOTOCHEMICAL MATERIALS (OTHER THAN PLATES, FILMS, PAPERS) →77 Photography and similar processes	.5 .185	Special mixtures Surface-active agents →661.186 Industrial production of synthetic surface-active agents
.143	Luminescent and phosphorescent materials →628.9.03 Luminescent light sources 667.637.4 Coatings for special purposes 677.027.464 Fluorescent dyeing - Textiles		661.187 Soap industry
661.17	CHEMICO-TECHNICAL MIXTURES		
661.18	COLLOIDS. ADSORBENTS. SURFACE-ACTIVE AGENTS. DETERGENTS. WETTING, FOAMING, EMULSIFYING AND FLOTATION AGENTS. SOAPS. GLYCEROL →648.18 Washing and cleaning agents - Home economics	Special auxiliary subdivisions for 661.185 661.185-3 -32 -322 -323	Mixtures Additions not in themselves surface-active but capable of forming salts with surface-active agents, thus enhancing their surface-active properties Additions to anionic surface-active agents, yielding cations Inorganic cations (ammonia and ammonium compounds) Organic cations (amines and ammonia, aminoalcohols, quaternary ammonium compounds) Additions to cationic surface-active agents, yielding anions Inorganic anions Organic anions External appearance of products 661.185-4 ≈ 62-4
Special auxiliary subdivisions for 661.18			
661.18.03	Special manufacturing processes →661.186 Industrial production of synthetic surface-active agents	.2 .3	
.05	661.187 Soap industry Production 661.18.05 ≈ 541.18.05	-323	
Principal divisions (continued)			
661.182	Colloids 661.182 ≈ 541.182	.2 .3	
.183	Adsorbents	-4	
.1	Adsorbents with special properties		Principal divisions (continued)
.12	Ion-exchangers	661.185.1	Surface-active agents in general
.122	Derived from carbon	.12	Surface-active agents according to polar groups in or attached to the carbon chain 661.185.12 ≈ 661.185.222
.123	Derived from synthetic resins and other synthetic materials	.2 .21	Organic ionic agents Organic ionic agents in general 661.185.212 ≈ 661.185.222
.2	Cationic exchangers	.22	Anionic surface-active agents
.3	Anionic exchangers	.221	Anionic surface-active agents in general 661.185.221.2 ≈ 661.185.222
.124	Derived from natural and synthetic silicates	.222	Ionic group -COO
.2	Activated carbon	.1	Hydrocarbon derivatives containing the ionic group(s) only
.27	Bone black →665.938 Ivory black. Animal charcoal (bone black, bone charcoal)	.12 .13 .14	Aliphatic and alicyclic hydrocarbon derivatives Aryl and alkaryl hydrocarbon derivatives Heterocyclic compounds
.3	Other organic adsorbents		
.4	Natural silicates		
.44	Natural earths not chemically treated. Fuller's earth		
.45	Chemically treated earths		

661.185.222.2	Compounds containing, in addition to the ionic group(s), hydrophilic groups of the type -COH, -COC, -COOC	661.187-492 Soap powder. Soap granules
.3	Compounds containing, in addition to the ionic group(s), hydrophilic groups containing sulphur or sulphur and oxygen	-493.5 Soap flakes
.4	Compounds containing, in addition to the ionic group(s), hydrophilic groups containing nitrogen, or nitrogen and one or both of the elements sulphur and oxygen, e.g. carboxylic acid amides containing the -COO group, sulphamides containing the -COO group	661.187.047 Drying
.223	Ionic groups containing sulphur	.099 Final operations
.1	Ionic groups containing sulphur in general	Special auxiliary subdivisions for 661.187
.2	Sulphates	661.187.032 Preparation of the lye. Evaporation
.28	Compounds containing both the ionic groups -COOH and -OSO ₃ H, e.g. sulphonated fatty acids	.033 Saponification. Boiling
.3	Compounds containing linkages between -OSO ₃ H group and the carbon chain other than oxygen linkages, e.g. thiosulphates, sulphamic acid derivatives	.1 Cold and semi-cold saponification
.5	Sulphonates	.2 Boiling at atmospheric pressure
.58	Compounds containing both the ionic groups -COOH and -SO ₃ H, e.g. monoesters of sulphosuccinic acid	.4 Pressure saponification
.224	Ionic groups containing phosphorus	.6 Preparation in closed vessels with recovery of glycerol
.23	Cationic surface-active agents	.034 Liming. Salting out. Grinding. Adjusting
.232	Ammonium derivatives	.035 Artificial figging. Dyeing. Perfuming.
.233	Phosphonium derivatives	Filling
.235	Oxonium derivatives	.036 Draining. Emptying. Pumping out
.236	Sulphonium derivatives	.037 Shaping. Cooling
.4	Organic non-ionic agents	Moulding
.42	Compounds having hydrophilic groups containing oxygen, e.g. -COH, -CO, -COC, -COOC, e.g. polyhydroxy esters of fatty acids, polyethylene glycol condensates	.2 Pouring, pumping into cold presses
.43	Compounds having hydrophilic groups containing sulphur or sulphur and oxygen	.3 Cooling. Cold roll solidification
.44	Compounds having hydrophilic groups containing nitrogen or nitrogen and one or both of the elements sulphur and oxygen, e.g. carboxylic acid amides, sulphamides	.4 Cutting
.5	Inorganic agents	.5 Smoothing
.6	Detergents and cleansers in powder, liquid or paste form. Scouring powders	.6 Milling. Extrusion. Pressing of cake soap
.7	Wetting, foaming and emulsifying agents	.7 Other shaping operations
.8	Flotation agents	Principal divisions (continued)
.186	Industrial production of synthetic surface-active agents	661.187.2 Raw materials, e.g. fatty acids, rosin, alkalis
.1	Raw materials	.4 Production of soft soaps, potassium soaps
.2	Sulphonating agents	.43 Coloured soft soaps
.3	Continuous and batch processes	.44 White and transparent soft soaps.
.4	Sulphated fatty acids and esters. Alkyl sulphates	Alabaster soaps
.5	Sulphonated products. Alkyl sulphonates. Alkaryl sulphonates. Condensation products of fatty acids	.5 Production of hard soaps, sodium soaps
.6	Polycondensation products of ethylene oxide. Polyglycol ethers	.6 Production of Marseilles soaps
.187	Soap industry	.61 Primitive methods of preparation, e.g. from olive, sesame, ground nut and other similar oils in kettles or boilers
	<i>Further particulars may be denoted by the -4 special auxiliaries listed under 62 or by the .0 special auxiliaries listed under 66, e.g.</i>	.62 Cold preparation from coconut and palm kernel oils (copra)
	661.187-4 Shape and form of soap products	.7 Soaps according to composition
	-404 Liquid soap	.71 Tallow soaps. Lime soaps
	.9 Soft soap	.72 Rosin soaps
	-412 Bar soap. Cake soap	.73 Oleic acid and similar soaps
	-413 Soap in plate or sheet form	.74 Semi-cold soaps. Cold-stirred soaps
		.741 Coconut oil soaps
		.742 Curd soaps. Eschwege soaps
		.743 Semi-curd soaps
		.76 Soaps containing synthetic detergents or water-softening agents. Hard water soaps
		.762 Soaps with synthetic detergents
		.764 Soaps with water-softening agents
		.8 Soaps according to their use
		.83 Household soaps
		.84 Toilet, shaving and medicated soaps
		.842 —665.58 Cosmetics. Toilet requisites
		.2 Toilet soaps
		.843 Soaps with non-irritant additions, e.g. soaps with a high fat content, baby soaps
		.845 Shaving soaps
		.85 Medicated soaps
		.86 Abrasive soaps
		.88 Laundry soaps
		.89 Soaps for other uses, e.g. for wire drawing
		.188 —621.892 Lubricants. Oils. Greases
		.1 Other types of soap
		Glycerol industry
		.1 Glycerol
		.2 Recovery of glycerol from waste liquors in stearate production
		.21 Filtration
		.22 Concentration. Evaporation
		.3 Recovery of glycerol from spent lyes in soap making
		.31 Neutralization of alkali. Purification.
		.32 Filtration
		.33 Evaporation under reduced pressure
		.34 Desulphurization
		Purification of glycerol

661.188.341	By acidification	661.253.3	Lead chambers
.342	By distillation under reduced pressure	.5	Gay-Lussac towers
.343	By dialysis	.6	Glover towers
.4	Recovery of glycerol from spent lyes in soap making in closed vessels	.7	Other tower systems
	—661.187.033.6 Preparation of soap in closed vessels with recovery of glycerol	.9	Processes not using towers
		.254	Purification of sulphuric acid
		.255	Concentration of sulphuric acid. Lead pans
.41	Filtration	.3	Simple closed plants
.42	Evaporation. Concentration	.4	Simple open plants
.5	Production of colourless technical glycerol	.5	Plants for the utilization of superheated gases
.55	Refining	.6	Vacuum plants
.6	Production of chemically-pure glycerol. Pharmaceutical glycerol	.256	Production of sulphuric acid monohydrate by freezing. Lunge process
.7	Other manufacturing processes	.257	Sulphur trioxide. Starck process using fuming sulphuric acid. Contact process
.72	Synthetic processes		Without application of heat
.74	Fermentation processes	.2	With application of heat
.8	Glycerol derivatives	.3	With heat exchange outside the contact vessel
.82	Glycerol triacetate	.4	Mixed systems
.84	Dichlorohydrin		Other processes
.85	Diglycerol. Polyglycerol	.5	Nitric/sulphuric acid (mixed acids)
		.258	
661.2	SULPHUR AND ITS DERIVATIVES	.259	
661.21	SULPHUR	661.3	ALKALIS. SODA AND POTASH INDUSTRIES
.211	Natural sulphur. Flowers of sulphur. Rod sulphur		
.212	Extraction of volcanic sulphur	661.31	POTASSIUM COMPOUNDS
.213	Refining of natural sulphur		—661.832 Potassium compounds in general. Potassium industry
.214	Extraction from pyrites		669.882.3 Extraction of metallic potassium
.215	Production from Laming mixture, Lux-Masse		Potassium carbonate. Potash
.216	Extraction of soda residues	.311	Extraction of potassium salts from the Stassfurt deposits
.217	Production from sulphurous acid and hydrogen sulphide	.1	By-products. Kieserite (magnesium sulphate). Mirabilite (Glauber's salt, hydrated sodium sulphate). Kainite (double salt of potassium and magnesium). Magnesium chloride
.218	Production from sulphurous acid and carbon. Other processes	.12	Potassium carbonate and magnesium potassium carbonate
.219	Colloidal sulphur		Potash from feldspar
661.22	CARBON DISULPHIDE		Potassium carbonate from sea water
.221	Production	.13	Potash from vegetable ash (wood ash)
.223	Purification	.2	Potash from sugar industry residues
661.23	HALOGEN COMPOUNDS OF SULPHUR	.3	Potash from seaweed (kelp)
.231	Sulphur chlorides	.4	Extraction of potassium salts from crude wool fat
661.24	SULPHUROUS ACID. SULPHITES. THIOSULPHATES ETC.	.5	Pure potassium carbonate from crude tartar or potassium acetate
.241	Sulphurous acid	.6	Potassium hydroxide (caustic potash).
.242	Roasting of sulphides or sulphur	.7	Potassium peroxide
.2	Roasting of pyrites (iron pyrites, mundic)	.8	Potassium hydroxide (caustic potash)
.3	Roasting of zinc sulphide (zinc blende, sphalerite)	.312	Potassium peroxide
.5	Roasting of sulphur	.1	661.312.2 ≈ 661.831.24
.8	Residues. Ash. Blue billy	.2	
.243	Production of sulphites from sulphates by reduction		SODIUM COMPOUNDS
.244	Production of liquid sulphurous acid	661.32	—661.833 Sodium compounds
.245	[cancelled] — 661.842.522		669.883.3 Extraction of metallic sodium
.246	[cancelled] — 661.833.523		Sodium carbonate. Soda
.247	Thiosulphates. Dithionates. Dithionites		Natural soda. Soda from mineral and vegetable sources. Crude soda. Soda ash. Soda from sugar beet
.1	Thiosulphates. Dithionates	.321	Production by the Leblanc process
.3	Dithionites	.1	Conversion of sodium sulphate into crude soda (black ash)
.248	Sulphur dioxide (sulphurous acid anhydride)		Extraction of sodium carbonate by leaching. Calcined soda
.249	Hydrogen sulphide. Sulphides	.2	Production of soda crystals
.1	Hydrogen sulphide	.21	Utilization of residues
.2	Sulphides. Disulphides etc.	.22	Ammonia-soda processes
.21	Sulphides	.23	Solvay process
.27	Disulphides	.24	Production of ammoniacal brine
.29	Polysulphides	.3	Precipitation of sodium bicarbonate
		.31	Calcination of sodium bicarbonate
661.25	SULPHURIC ACID	.32	
.251	Oleum (fuming sulphuric acid). Production from pyrites sulphur, sulphate, pyrosulphate, hydrogen sulphate (bisulphate)	.33	
		.34	
.252	Crude sulphuric acid		
.253	Lead chamber processes		

661.321.35	Recovery of ammonia from mother liquors, including decomposition of ammonium chloride solutions by lime	661.424	Treatment of mother liquor from salt gardens. Mixed salts
.36	Utilization of residual liquors	.2	[cancelled] → 661.424
.4	Extraction of soda from cryolite	.3	[cancelled] → 661.833.532
.5	Production of soda by electrolysis	.4	[cancelled] → 661.846
	—661.418 Production of chlorine and alkalis by electrolysis	.5	[cancelled] → 661.846.321.932
		.6	[cancelled] → 661.832.321
		.9	[cancelled, superfluous]
.7	Soda crystals (washing soda)	.426	[cancelled] → 661.833.321
.8	Sodium bicarbonate	.2	[cancelled] → 661.833.321.4
.322	Sodium hydroxide (caustic soda). Sodium peroxide	.3	[cancelled] → 661.833.321.045.5
.1	Sodium hydroxide (caustic soda)	.4	[cancelled] → 661.833.321.049.1
.11	Production from caustic liquor	.6	[cancelled] → 661.833.321.065.55
.12	Production from natrolite or soapstone (steatite)	.428	[cancelled] → 661.833.321.067
.2	Sodium peroxide	661.43	HYPOCHLORITES IN GENERAL
	661.322.2 ≈ 661.831.24	.431/.431.3	[cancelled] → 661.842.322.2
661.4	HALOGENS AND HALOGEN COMPOUNDS. INORGANIC PER-COMPOUNDS	.432	Stain-removing agents in general
	<i>For specific metal halo-compounds, halides etc. → 661.8...3</i>	.1	[cancelled] → 661.832.322.2
661.41	PRODUCTION OF CHLORINE	.2	[cancelled] → 661.833.322.2
.411	From manganese dioxide and hydrochloric acid	.3	[cancelled] → 661.862.322.2
.412	From manganese dioxide, common salt and sulphuric acid	.4	[cancelled] → 661.846.322.2
.8	Regeneration of manganese dioxide	.5	[cancelled] → 661.847.932.22
.413	Deacon process (oxidation of hydrogen chloride gas)	.433	Production of bleaching fluids by electrolysis of chlorides in solution
.414	From hydrochloric acid and nitric acid	661.44	CHLORATES IN GENERAL
.415	By means of calcium chloride and magnesium chloride	.441/.443	<i>For specific chlorates → 661.8...322.5</i>
.416	Production of liquid chlorine	.441/.441.5	[cancelled] → 661.832.322.5, 661.844.322.5
.417	Electrolysis of fused chlorides	.442/.442.2	[cancelled] → 661.832.322.5
.1	Using lead chloride (Lyte process)	.443	[cancelled] → 661.833.322.5
.2	Using sodium chloride, potassium chloride and lead chloride (Vautin process)	.445	[cancelled] → 661.844.322.5
.3	Using sodium chloride and lead chloride (Mulin process)	661.46	Production of chlorates by electrolysis
.9	Other processes	.461	BROMINE AND BROMINE COMPOUNDS
.418	Production of chlorine and alkalis by electrolysis	.1	<i>For specific metallic bromine compounds → 661.8...34</i>
	—661.433 Production of bleaching fluids by electrolysis of chlorides in solution	.2	Extraction of bromine
	661.445 Production of chlorates by electrolysis	.3	Extraction from salt marsh and mother liquors
.1	Electrolysis using diaphragms	.4	Extraction from kelp ash
.2	Electrolysis using mercury cathode, but no diaphragms	.5	Extraction from Stassfurt or Michigan mother liquors by treatment with chlorine.
.3	Electrolysis without mercury cathode or diaphragms	.6	Franck process
.4	Production of chlorine by electrolysis of hydrochloric acid without diaphragms	.7	Extraction in the gaseous state
.419	Hydrochloric acid. Hydrogen chloride	.462	Extraction in the liquid state
.1	Methods of producing hydrogen chloride	.463	Extraction by means of liquid chlorine
.12	Sulphate method	.464	Extraction by electrolysis
.13	Synthesis of hydrochloric acid from hydrogen and chlorine	.467	Bromides in general
.2	[cancelled] → 661.419.4.081.3	661.47	<i>For specific metallic bromides → 661.8...341</i>
.3	[cancelled] → 621.6...	.471	Hypobromites
.4	Production of hydrochloric acid	.1	Bromates
	<i>Further particulars may be denoted by the .0 special auxiliaries listed under 66, e.g.</i>	.2	Hydrogen bromide. Hydrobromic acid
	661.422.2.081.3 Absorption of hydrogen chloride gas	.3	IODINE AND IODINE COMPOUNDS
661.42	CHLORIDES	.4	<i>For specific metallic iodine compounds → 661.8...35</i>
.422	—664.41 Salt (sodium chloride)	.6	Extraction of iodine
.2	Production from sea water. Sea salt. Salt mixtures	.7	Extraction from kelp ash
	[cancelled] → 661.833.321.2/.3	.472	Extraction from seaweeds using potassium dichromate. Vitali process
		.2	Extraction from Chile saltpetre as copper iodide
		.3	Purification by sublimation
		.4	Utilization of mother liquors
		.6	Extraction from natural waters, e.g. in mineral oil drilling
		.7	Production of iodides in general
		.473	<i>For specific metallic iodides → 661.8...351</i>
		.474	Extraction from kelp mother liquors
		.477	Extraction from Chile saltpetre
			Hypoiodites
			Iodates
			Hydrogen iodide. Hydriodic acid
		661.48	FLUORINE AND FLUORINE COMPOUNDS
		.481	<i>For specific metallic fluorine compounds → 661.8...36</i>
		.482	Extraction of fluorine
			Fluorides

661.487	Hydrogen fluoride. Hydrofluoric acid	661.491.7.05	Production methods
.1	Extraction of hydrogen fluoride	Principal divisions (continued)	
.2	Extraction of hydrofluoric acid	661.491.71	Generalities
.488	Fluorosilicic acid. Fluorosilicates	.73	Combination with organic amino compounds
			<i>The compounds may be denoted by colon combination with the subdivisions of 547</i>
661.49	INORGANIC PER-COMPOUNDS.		
	PER-SALTS IN GENERAL		
.491	Hydrogen peroxide		
.1	Production of hydrogen peroxide	.75	Combination with polyhydric alcohols or their derivatives
.12	Direct synthesis from hydrogen and oxygen		<i>The compounds may be denoted by colon combination with the subdivisions of 547</i>
.123	Production by electrical processes		
.1	Static discharge		
.2	Brush and similar discharges	.76	Combination with salts of organic acids
.3	Production in a magnetic field	.77	Combination with other organic compounds
.7	Production by cathodic reduction of oxygen using hydrogen obtained by electrolysis		<i>The compounds may be denoted by colon combination with the subdivisions of 547</i>
.124	Production by means of light irradiation		
.13	Production by synthesis from water and steam	.78	Combination with inorganic compounds
.131	Production by passing steam over heat source (electric arc, heated carbon etc.)		<i>The compounds may be denoted by colon combination with the subdivisions of 661</i>
.134	Production by means of light irradiation	.492	Perchlorates
.135	Oxidation with ozone	.493	Percarbonates
.137	Oxidation with fluorine	.494	Persulphates
.14	Synthesis from metal peroxides or acids	.495	Perborates
.143	Synthesis from alkali peroxides		
.1	By means of hydrogen fluoride	661.5	NITROGEN COMPOUNDS. FIXATION OF NITROGEN
.2	By means of sulphuric acid or hydrogen sulphates		<i>For specific metallic nitrogen compounds → 661.8...41/...44</i>
.3	By means of orthophosphoric acid or hydrogen orthophosphates		
.145.1	Synthesis from alkaline earth peroxides	661.51	AMMONIA (NON-SYNTHETIC)
.2	By means of sulphuric acid	.511	Ammonia solution from ammonium chloride with calcium oxide
.3	By means of orthophosphoric acid		Ammonia from gas liquor
.32	By means of orthophosphoric acid and sulphuric acid	.512	Ammonia from combustion residues of coal, peat etc.
.33	By means of orthophosphoric acid and hydrochloric acid	.514	Ammonia from decomposed urine (spirits of urine)
.34	By means of orthophosphoric acid and chloride	.515	Ammonia from by dry distillation of animal matter (bone, horn, hide etc.). Bone oil (Dippel's oil). Ammonium carbonate (hartshorn salts). Spirits of hartshorn
.35	By means of orthophosphoric acid and hydrofluoric acid		Ammonia from molasses and sugar beet residues
.4	By means of hydrochloric acid		Ammonia from calcium cyanamide
.43	By means of hydrochloric acid and alkali sulphate	.516	Liquefied (liquid) ammonia
.5	By means of carbon dioxide		
.6	By means of nitric acid	.517	
.8	By means of other acids	.518	
.81	By means of arsenic acid		
.85	By means of oxalic acid	661.52	COMMERCIAL AMMONIUM SALTS
.15	Synthesis from per-acids or per-salts	.521	Ammonium chloride. Sublimation. Crystallization. Purification
.153	Synthesis from percarbonates		Production from gas liquor and hydrochloric acid
.154	Synthesis from persulphates or persulphuric acid	.1	Ammonium sulphate
.1	From solid persulphates, per-acids	.522	→631.841.1 Ammonium sulphate - Fertilizers
.3	By distillation of a solution of persulphate or persulphuric acid obtained by electrolysis	.1	Production from gas liquor and sulphuric acid (Grüneberg process)
	661.491.154.3 ≅ 621.3.035		Scrubber process
.155	Synthesis from perborates	.11	Saturater process
.16	Cyclic oxidation and reduction of readily reducible organic substances	.12	By direct method from coal distillation gas
.18	Other methods of preparation	.121	By indirect method from coal distillation gas
.182	Preparation from amalgams	.122	From synthetic ammonia
.2	Concentration		Dispersion process
.23	Concentration by distillation	.123	Production as by-product in the production of alcohol from unsaturated hydrocarbons
	→661.491.154.3 Synthesis by distillation of a solution of persulphate or persulphuric acid obtained by electrolysis	.13	Production from ammonia and sulphur-containing gases
		.14	Production by oxidation of ammonium sulphite
.25	Concentration by extraction	.2	Production by autoxidation of hydrogen sulphite
.3	Purification (other than distillation)	.21	Production from polythionates (Feld process)
.7	Solid additions for hydrogen peroxide and their production	.22	
		.23	

Special auxiliary subdivision for 661.491.7

661.522.3	Production using calcium sulphate	661.63	PHOSPHORUS. ACIDS OF
.31	Production from ammonium carbonate		PHOSPHORUS. PHOSPHATES.
.32	Production from gas liquor		PHOSPHORUS FERTILIZERS
.33	Production from synthetic ammonia		—631.85 Phosphate fertilizers
.34	Production from cyanamide		662.53 Matches
.4	Production using sulphates other than calcium sulphate	.631	Phosphorus
.523	Ammonium carbonate. Commercial ammonium carbonate (mixture of ammonium carbonate and ammonium hydrogen carbonate). Ammonium hydrogen carbonate	.1	Extraction from calcined bones.
.1	Production by dry distillation of bones	.2	Treatment with sulphuric acid.
.2	Production by sublimation of a mixture of ammonium chloride with calcium carbonate or barium carbonate	.3	Preparation of orthophosphoric acid
.524	Ammonium carbamate	.4	—661.634.2 Orthophosphoric acid
.525	Ammonium nitrate. Freezing salt mixtures	.5	Distillation and refining of crude phosphorus. Casting phosphorus in sticks
	—662.221 Nitrate powders - Explosives	.6	Extraction from natural phosphates
	662.34 Nitrate gunpowders and chlorate ('white') gunpowders	.7	Production in electric furnaces
.1	Production by double decomposition	.8	Simultaneous production of phosphorus and calcium carbide in electric furnaces
.2	Production by the action of gaseous oxides of nitrogen on ammonium salts	.632	Electrolytic production of phosphorus
.3	Production by neutralization of nitric acid with ammonia	.1	Extraction from sodium phosphates with silicic acid
.31	Both in solution	.11	Production of red phosphorus from ordinary white phosphorus
.32	Nitric acid in solution with gaseous ammonia	.12	Natural phosphates. Superphosphates
.322	At normal pressures	.13	—631.5 Phosphate fertilizers
.324	At high pressures	.14	661.842.455 Calcium phosphate
.326	Dispersion of nitric acid in gaseous ammonia	.15	Wet extraction of phosphorites (phosphate rock) or natural calcium phosphates
.33	Nitric acid gaseous with ammonia in solution	.16	With sulphuric acid
.34	Both in the gaseous state	.17	With nitric acid
.35	With Diver's solution (ammonium nitrate and ammonia)	.18	With hydrochloric acid
.526	Ammonium sulphate-nitrate	.19	With orthophosphoric acid
.1	From ammonium sulphate and ammonium nitrate	.2	With sulphurous acid or sulphur dioxide
.2	From ammonia and a mixture of sulphuric and nitric acids	.21	With carbonic acid or carbon dioxide
.528	Other ammonium salts	.22	With other acids or acid mixtures
	661.528.2/.9 ≈ 661.8...2/.9	.23	With salts or bases
	to denote salts not listed in 661.521/.526	.231	With mixtures of acids and salts
		.232	Production of superphosphates
		.233	From bone black
		.26	From phosphatic nodules, coprolite, guano
		.261	From natural phosphate or basic slags
		.262	Single superphosphates
		.267	Double superphosphates
		.7	Triple superphosphates
		.71	Other matters
661.53	AMMONIA SYNTHESIS	.72	Retrogradation
.531	Production from a mixture of hydrogen and nitrogen	.721	Treatment of superphosphates
.532	Normal pressure processes	.722	Utilization of waste gas
.534	High pressure processes		Phosphates from slag. Phosphorescent phosphates
661.54	CYANAMIDES, E.G. CALCIUM CYANAMIDE	.9	Preliminary treatment of slag. Slag flour
661.55	NITRIDES		Phosphorescent phosphates
661.56	NITRIC ACID AND SALTS. NITROUS ACID	.93	Calcium tetraphosphate
.561	Crude nitric acid from sodium nitrate and sulphuric acid	.634	Alkali and alkaline earth phosphates.
.562	Pure concentrated nitric acid	.2	Alkali silicophosphates (Rhenania, Vesta Wolter etc.)
.563	Fuming nitric acid		Phosphates of animal origin
.565	Synthesis from oxygen and nitrogen	.635	—664.932.7 Powdered meat. Meat flour
.566	Production by oxidation of ammonia in a vacuum		664.957 Fish meal
.1	At normal pressure		665.937.6 Bone meal
.2	[cancelled] —, 661.566.4		Guano
.3	At high pressures		Orthophosphoric acid. Other phosphorus-containing acids
.4	Mixture of ammonia with air or oxygen		Orthophosphoric acid
.569	Hydrazoic acid		For production of orthophosphoric acid from bones → 661.631.1
661.6	VARIOUS NON-METALS AND THEIR COMPOUNDS		Phosphorus-containing salts
			For specific metallic phosphorus compounds → 661.8...45
			Salts of alkali metals
			Monobasic phosphates
			Sodium dihydrogen orthophosphate
			Potassium dihydrogen orthophosphate
			Ammonium dihydrogen orthophosphate
			Mixtures. Double phosphates
			Dibasic phosphates
			disodium hydrogen orthophosphate
			dipotassium hydrogen orthophosphate
			diammonium hydrogen orthophosphate

661.635.224	Mixtures. Double phosphates	661.649	Other arsenic compounds
.23	Tribasic phosphates		
.231	trisodium orthophosphate	661.65	BORON COMPOUNDS
.232	tripotassium orthophosphate	.651	Boric acid (sassolite). Boracite. Rhodocite.
.233	tri ammonium orthophosphate		Ulexite (boronatocalcite). Hydroboracite.
.234	Mixtures. Double phosphates		Tincal (crude disodium tetraborate)
.4	Alkaline earth phosphates	.1	Extraction from fumaroles (soffioni)
.41	Calcium phosphates	.2	Production from ulexite by the action of hydrochloric acid, sulphuric acid or carbonic acid
.411	Calcium hydrogen orthophosphate		—661.652.6 Production of disodium tetraborate or boric acid by treatment with hydrofluoric acid or sodium fluoride
.412	Calcium tetrahydrogen diorthophosphate		
.413	tricalcium diorthophosphate		
.414	Double phosphates of calcium		
.42	Magnesium phosphates		
.424	Ammonium magnesium orthophosphate		
.5	Other metallic orthophosphates and analogous salts	.3	Production of pure boric acid (orthoboric acid)
.51	Monobasic phosphates		
.52	Dibasic phosphates	.4	Production of metaboric acid
.53	Tribasic phosphates	.652	disodium tetraborate (sodium borate; borax)
.6	Metaphosphates and pyrophosphates in general	.1	Natural disodium tetraborate
.64	Metaphosphates	.2	Purification of natural disodium tetraborate
.66	Pyrophosphates		
.68	Polyphosphates	.3	Preparation of disodium tetraborate from boric acid. Ordinary or prismatic disodium tetraborate
.636	Phosphides in general	.4	Purification of crude disodium tetraborate
	<i>For specific metallic phosphides — 661.8...451</i>	.5	Production from ulexite or colemanite (calcium borate). Treatment with sodium carbonate. Crystallization. Refining of crude disodium tetraborate. Treatment of mother liquors
.637	Phosphorus hydride. Phosphine		Production of disodium tetraborate or boric acid by treatment with hydrofluoric acid or sodium fluoride
.638	Phosphorus compounds containing halogens	.6	Production of octahedral disodium tetraborate
		.7	Borides in general
661.64	ARSENIC. ARSENATES. OXIDES AND SALTS OF ARSENIC		Other boron compounds
	<i>For specific metallic compounds of arsenic — 661.8...46</i>		
.641	Arsenic		CARBON AND ITS INORGANIC COMPOUNDS
.2	Production of arsenic		—661.7 Organic substances
.21	Production by sublimation of native arsenic	.655	661.8...62 Carbon compounds (inorganic)
.22	Production by heating arsenical pyrites (mispickel), arsenical iron etc.	.659	661.872.937.1 Ferrocyanides. Complex cyanides
.23	Production by reduction of arsenious acid	661.66	661.97 Carbon dioxide
.3	Uses of arsenic. Black arsenic. Fly killers. Use in lead shot and fireworks (Indian fire, white fire)		661.993 Carbon monoxide
	—662.4 Initiators. Detonators		Hydrocyanic acid
.642	Arsenic trioxide. Arsenites		Production of carbides in general
.1	Arsenic trioxide (white arsenic, commercial arsenic). Rat poison		<i>For specific metallic carbides — 661.8...621</i>
.11	Production as by-product in the working of arsenical minerals associated with ores of cobalt, nickel, silver, tin etc.	.664	Silicon carbide
	Condensation of reverberatory furnace vapours in chambers	.12	Production in electric furnaces
.12	Direct extraction from arsenical pyrites (mispickel). Silesian process	.2	Heavy metal carbides. Hardmetals
.121	Roasting arsenical pyrites. Arsenical soot (crude arsenic trioxide)		<i>Their use as cutting tool materials may be denoted by colon combination with the subdivisions of 621.9</i>
.122	Purification by sublimation. Vitreous arsenic (amorphous arsenic trioxide, arsenic glass)		—669.018.25 Exceptionally hard or wear-resisting metals, including hardmetals
.5	Arsenites		
.51	Monoarsenites	.3	Boron carbide
.52	Diarsenites	.666	Pure carbon
.53	Triarsenites		—661.183.2 Activated carbon
.643	Arsenic acid. Arsenic pentoxide.		665.777 Carbonaceous products - Mineral oil products
	Arsenates not included elsewhere		
.5	Arsenates and analogous compounds	.1	Production. Reduction of carbon monoxide etc.
.51	Monoarsenates		Graphite
.52	Diarsenates	.2	Mineral black
.53	Triarsenates	.3	Carbon blacks
.645	Compounds containing arsenic and sulphur in general	.4	Flameblack
.646	Arsenic disulphide. Realgar (ruby arsenic, red arsenic). Red glass from arsenic works	.42	Lampblack
		.43	Gas black
.647	Arsenic trisulphide. Orpiment (yellow arsenic). Yellow glass from arsenic works	.44	Coal black
		.45	Vegetable blacks
.648	Arsenic sesquisulphide. King's yellow (royal yellow)	.5	Charcoal black
		.52	Vine black
		.53	Peach stone black
		.54	

661.666.55	Ebony black	661.716.1 (cont'd)	<i>The constituents may be denoted by addition of the last digits in the subdivisions of 547.21,</i>
.56	Cork black		.1 Methane (CH ₄)
.6	Ivory black. Animal charcoal (bone black, bone charcoal)		.2 Ethane (C ₂ H ₆)
	—665.938 Ivory black. Animal charcoal (bone black, bone charcoal)		.3 Propane (C ₃ H ₈)
.668	Metal carbonyls in general		.4 Butane (C ₄ H ₁₀) etc., e.g.
661.67	ULTRAMARINE AND DERIVED PIGMENTS	.2	661.716.1.1.4 A mixture of CH ₄ and C ₄ H ₁₀
	—667 Colour industries (dyes, inks, paints etc.)		Mixtures of unsaturated hydrocarbons
.671	Natural ultramarine (lapis lazuli). Lazurite		<i>The constituents may be denoted by addition of the last digits in the subdivisions of 547.31,</i>
.672	Synthetic ultramarine (Guimet blue)		.32 Ethylene (C ₂ H ₄)
.1	Production from sodium sulphate.		.33 Propene (C ₃ H ₆)
	Calcination in crucibles. White ultramarine. Conversion into blue ultramarine		.34 Butene (C ₄ H ₈)
.2	Production from sodium carbonate (soda process). Calcination in crucibles or muffle furnace		.42 Acetylene (C ₂ H ₂) etc., e.g.
.3	Mixed processes		661.716.2.32.34 A mixture of C ₂ H ₄ and C ₄ H ₈
.4	Silicon ultramarine		661.716.2.32.34.42 A mixture of C ₂ H ₄ , C ₄ H ₈ and C ₂ H ₂
.673	Green ultramarine	.3	661.716.2.42.43 A mixture of C ₂ H ₂ and C ₃ H ₄
.674	Violet ultramarine		Mixtures of saturated hydrocarbons (C _n H _{2n+2}) with unsaturated hydrocarbons
.675	Red ultramarine		<i>The constituents may be denoted as in 661.716.1 and 661.716.2, the saturated constituents being given first</i>
661.68	SILICON AND ITS COMPOUNDS NOT MENTIONED ELSEWHERE		One saturated with one or more unsaturated, e.g.
	—661.183.6 Synthetic silicates.	.31	661.716.31.1.32.34 A mixture of CH ₄ , C ₂ H ₄ and C ₄ H ₈
.683	Sodium silicate. Water-glass		661.716.31.4.32.33.34 A mixture of C ₄ H ₁₀ , C ₂ H ₄ , C ₃ H ₆ and C ₄ H ₈
.684	Potassium silicate. Potassium water-glass		661.716.31.3.33 A mixture of C ₃ H ₈ and C ₃ H ₆
.685	Silicides		661.716.31.3.32.33.42 A mixture of C ₃ H ₈ , C ₂ H ₄ , C ₃ H ₆ and C ₂ H ₂
661.69	OTHER NON-METALS AND THEIR COMPOUNDS		661.716.31.4.42 A mixture of C ₄ H ₁₀ and C ₂ H ₂
.691	Selenium. Selenium compounds		Two saturated with one or more unsaturated, e.g.
.692	Tellurium. Tellurium compounds		661.716.32.1.2.34 A mixture of CH ₄ , C ₂ H ₆ and C ₄ H ₈
661.7	ORGANIC SUBSTANCES		661.716.32.3.4.34 A mixture of C ₃ H ₈ , C ₄ H ₁₀ and C ₄ H ₈
	<i>Organic products not given below may be denoted by colon combination with the subdivisions of 547</i>		661.716.32.1.2.33.42 A mixture of CH ₄ , C ₂ H ₆ , C ₃ H ₆ and C ₂ H ₂
	—615.3 Medicaments (drugs, medicines, remedies) according to their origin	.32	
	662.749.3 Coal tar and its processing		Three saturated with one or more unsaturated
	665.5 Essential oils. Perfumery. Cosmetics		Organic nitrogen compounds
	665.6/.7 Processes and products of the petroleum and allied industries		Nitro-compounds of hydrocarbons
661.71	SIMPLE ORGANIC COMPOUNDS		Aliphatic amines
.715	Hydrocarbons		Urea
.1	Aliphatic hydrocarbons in general		Organic compounds of various non-metals
.2	Saturated aliphatic hydrocarbons	.33	661.718 ≈ 547.24, e.g.
	661.715.2 ≈ 547.21	.717	661.718.1 Phosphorus compounds
.3	Unsaturated aliphatic hydrocarbons	.2	.2 Arsenic compounds
	661.715.3 ≈ 547.31	.3	.32 Antimony compounds
.4/.7	Cyclic hydrocarbons	.5	.33 Bismuth compounds
.4	Cyclic hydrocarbons in general	.718	.4 Boron compounds
.5	Monocyclic hydrocarbons other than benzene and its homologues		.5 Silicon compounds
.6	Polycyclic hydrocarbons other than those with exclusively aromatic nuclei		.6 Germanium compounds
	—662.749.3 Coal tar and its processing		Organic sulphur, selenium and tellurium compounds
.7	Hydrocarbons with exclusively aromatic nuclei		Sulphur compounds
	—662.753 Mineral oils	.719	Selenium compounds
.716	Specified combinations of aliphatic hydrocarbons		Tellurium compounds
.1	Mixtures of saturated hydrocarbons (C _n H _{2n+2})	.2	
		.3	
		.4	

661.72	ALCOHOLS AND THEIR DERIVATIVES	661.725.03	Production processes. Equipment
.721	Methanol (methyl alcohol)		<i>Microbiological processes may be denoted by colon combination with the subdivisions of 663</i>
.1	Production by rectification of wood spirit		—665.53 Principal constituents of essential oils
.2	Processing of vinasse for potassium salts		
.4	Synthetic production of methanol		
.41	From carbon monoxide, carbon dioxide and hydrogen	.031	Chemically pure processes
.42	From methane	.3	From water gas and other gas mixtures that contain oxides of carbon in addition to hydrogen
.421	Halogenation of methane. Saponification of esters		
.422	Oxidation of methane	.32	From water gas and other carbon monoxide/hydrogen mixtures
.722	Ethanol (ethyl alcohol). Denatured alcohol	.33	From carbon dioxide/hydrogen mixtures
.1	Denatured alcohol. Denaturing processes	.4	From hydrocarbons
.2	Synthetic production of ethanol	.42	From saturated hydrocarbons by oxidation
.21	From acetylene	.43	From saturated hydrocarbons by other processes
.22	From ethylene	.45/.47	From olefins and other unsaturated hydrocarbons
.221	By absorption in acids and saponification of the ester	.45	By treatment with acids and by hydrolysis
.1	Absorption in sulphuric acid	.46	By catalytic addition of water
.11	Production from ethylsulphuric acid	.47	By oxidation
.12	Saponification	.6	From aldehydes or ketones
.15	Treatment of residual acid	.63	By reduction
.2	Absorption in other acids	.65	By Grignard reaction and hydrolysis
.225	By catalytic hydrogenation	.7	From carboxylic acids or their esters or salts
.24	From carbon monoxide, carbon dioxide and hydrogen	.73	By reduction
.26	From ethane		
.262	Oxidation of ethane		
.723	Halogen derivatives of simple hydrocarbons	Principal divisions (continued)	
	661.723-13/-16 $\approx$ 546.13/.16	661.725.2	Propan-1-ol (propyl alcohol)
	661.723-13 Chlorine derivatives	.3	Propan-2-ol (isopropyl alcohol)
	-14 Bromine derivatives	.4	Butanols (butyl alcohols)
	-15 Iodine derivatives	.5	Amyl alcohols
	-16 Fluorine derivatives	.6	—663.551.7 Fusel oil
.1	Generalities		Higher monohydric saturated aliphatic alcohols (with more than five carbon atoms)
.2	Halogen derivatives with one carbon atom	.66	Hexanols (hexyl alcohols)
.21	CH ₃ (Hlg)	.67	Heptanols (heptyl alcohols)
.22	CH ₂ (Hlg) ₂	.68	Octanols (octyl alcohols) and higher alcohols
.23	CH(Hlg) ₃		661.725.68 $\approx$ 547.268
.24	C(Hlg) ₄	.7	Monohydric unsaturated aliphatic alcohols
.3	Chloral hydrate	.8	Polyhydric alcohols. Cyclic alcohols
.6	Halogen derivatives with two carbon atoms	.81	Polyhydric alcohols
.61	Monohalogen derivatives		—661.188 Glycerol industry
.611	CH ₃ CH ₂ (Hlg)	.85	Cyclic alcohols
.612	CH ₂ CH(Hlg)		—665.53 Principal constituents of essential oils
.62	Dihalogen derivatives. Dichloroethylene		
.621	CH ₃ CH(Hlg) ₂	.9	Mixtures of alcohols
.622	CH ₂ (Hlg).CH ₂ (Hlg)	.92	Of alcohols with different numbers of carbon atoms
.623	CH ₂ C(Hlg) ₂		Of alcohols with the same number of carbon atoms
.624	CH(Hlg).CH(Hlg)	.93	Ethers other than diethyl ether. Esters of alcohols (other than methanol and ethanol) with inorganic acids containing oxygen
.63	Trihalogen derivatives. Trichloroethylene		661.726 $\approx$ 661.725
.631	C(Hlg) ₃ CH ₃	.726	—661.724 Sulphuric ether. Diethyl ether
.632	C ₂ (Hlg).CH(Hlg) ₂		
.633	C(Hlg) ₂ .CH(Hlg)		
.64	Tetrahalogen derivatives.		
	Tetrachloroethane	.727	Aldehydes. Ketones
.641	C(Hlg) ₃ .CH ₂ (Hlg)	.1	Formaldehyde
.642	CH(Hlg) ₂ .CH(Hlg) ₂	.2	Acetaldehyde
.643	C(Hlg) ₂ .C(Hlg) ₂	.22	Paraldehyde
.65	Pentahalogen derivatives.	.24	Metaldehyde
	Pentachloroethane. CH(Hlg) ₂ .C(Hlg) ₃	.3	Other aldehydes
.66	Hexahalogen derivatives.	.4	Acetone
	Hexachloroethane. C(Hlg) ₃ .C(Hlg) ₃	.5	Acetone-oil. Mixtures of acetone and higher ketones
.7	Saturated derivatives with more than two carbon atoms	.6	Other ketones. Butanone (ethyl methyl ketone)
	661.723.7 $\approx$ 547.21		
.8	Unsaturated derivatives with more than two carbon atoms	.728	Cellulose. Cellulose derivatives
	661.723.8 $\approx$ 547.31		—547.458.8 Cellulose and other carbohydrates of cell membranes
.724	Sulphuric ether. Diethyl ether		
.725	Alcohols other than methanol and ethanol. Polyhydric alcohols		676.1 Pulp
Special auxiliary subdivisions for 661.725			
661.725-11/-12	Esters of alcohols with inorganic acids containing oxygen and their salts		
	661.725-11/-12 $\approx$ 547.26'11/'12		

661.728 (cont'd)	677.46 Man-made fibres from cellulose or other polysaccharides	661.731.55	Pasteur process
	678.54 Plastics based on cellulose or its derivatives	.56	Döbereiner process with platinum black
.02	Conversion. Processing	.6	Production by oxidation of acetaldehyde or other synthetic substances
	<i>Further particulars may be denoted by colon combination, e.g.</i>	.7	Acetic ester. Ethyl acetate
	661.728.02:676.02 Methods, processes	.8	Amyl ester. Amyl acetate
	:676.05 Plant, equipment	.9	Other esters
.3	Raw materials for conversion	.732	Monobasic aliphatic carboxylic acids and their esters
	<i>Further particulars may be denoted by colon combination, e.g.</i>	.1	Formic acid
	661.728.3:676.1 Pulps	.19	Esters of formic acid
	:677 Textiles and wastes	.4	Propionic acid
.31/.39	<i>[cancelled] — 661.728.3:67</i>	.5	Butyric acid
.4	Auxiliary materials	.51	Production of butyric acid
.6	<i>[cancelled] — 661.728.3, 661.728.7</i>	.59	Esters of butyric acid
.7	Cellulose as a compound (from the technical point of view)	.6	Valeric acid and its esters (fruit essence)
.8	Cellulose derivatives (cellulose ester, nitrate, cuprammonium etc.)	.61	Production by means of potassium dichromate
.81	Cellulose formate	.62	Production by means of potassium permanganate
.82	Cellulose acetate	.63	Ethyl ester of valeric acid (ethyl valerate)
.84	Cellulose xanthate. Viscose	.64	Methyl ester of valeric acid (methyl valerate)
.85	Other organic esters	.7	Saturated aliphatic monocarboxylic acids with more than five carbon atoms
.853	Cellulose tripropionate	.8	Unsaturated aliphatic monocarboxylic acids and their derivatives
.854	Cellulose butyrate	.9	Higher fatty acids
.855	Esters of substituted monocarboxylic acids, e.g. cellulose glycollate	.733	Other aliphatic carboxylic acids and their derivatives
.856	Esters of dicarboxylic acids, e.g. cellulose pelargonate	.1	—661.734.1 Citric acid
.858	Esters of two or more organic acids	.11	Oxalic acid and its salts
.3	Cellulose acetopropionate	.12	Production by means of sawdust and alkalis
.4	Cellulose acetobutyrate	.13	Production by means of sodium formate
.86	Cellulose nitrate	.14	Acid potassium salt (salt of sorrel)
.862	Soluble in alcohol	.19	Double oxalate of potassium and antimony
.863	Soluble in esters	.2	Esters of oxalic acid
.87	Other inorganic acid esters	.21	Lactic acid and its salts
.88	Cuprammonium derivatives	.22	Production by fermentation of sugar and cheese
.89	Other cellulose derivatives	.23	Production by the action of soda on invert sugar
.892	Cellulose ethers	.24	Production by fermentation using the Jaquemin process
.1	Methyl cellulose	.29	Antimony lactate
.2	Ethyl cellulose	.3	Esters of lactic acid
.22	Oxyethyl cellulose	.31	Tartaric acid and its salts
.4	Butyl cellulose	.32	Tartaric acid
.6	Benzyl cellulose	.34	Calcium tartrate
.729	Organic peroxides	.39	Production of tartaric acid by means of fluorosilicic acid
661.73	ORGANIC ACIDS, THEIR SALTS, ESTERS ETC. OTHER THAN PEROXIDES	.4	Esters of tartaric acid
	—665.12 Fatty acids. Generalities on stearic acid production	.41	Gluconic acid
	665.666.4 Removal of sulphur-containing materials - Mineral oils	.42	Production by chemical oxidation of glucose and other sugars
Special auxiliary subdivision for 661.73		.43	Production by electrolytic oxidation of glucose and other sugars
661.73.03	Production processes	.431	Production by biochemical oxidation of glucose and other sugars
Principal divisions (continued)		.432	With fungi
661.731/.732.7	Saturated aliphatic monocarboxylic acids and their derivatives	.45	With bacteria
.731	Acetic acid. Acetates. Vinegar	.46	Lactones of gluconic acid
	—663.242 Wine vinegar	.47	Supersaturated solutions of calcium gluconate
	663.478.3 Malt vinegar	.734	Other gluconates
.1	Production from calcium acetate from the carbonization of wood	.1	Citric acid. Tannin. Tannic acid
.2	Production of table vinegar by rectification with lead chromate	.11	Citric acid
.3	Production of glacial acetic acid by means of sodium acetate	.12	Extraction and concentration of lemon juice
.4	Production of acetic anhydride	.13	Production of citric acid from lemon juice or other juices. Reduction of calcium citrate
.5	Production of acetic acid by oxidation of ethanol	.14	Purification of citric acid
.52	Original Orleans process. Hengstenberg's modification	.16	Anhydrous citric acid
.523	Accelerated Orleans or Agobert process	.17	Synthetic production of citric acid
.53	Rapid acetic acid production (German process)	.2	Calcium citrate
.54	Luxembourg or Michaelis process. Rotary acetifiers		Tannin. Tannic acid

661.734.21	Production of tannin from oak galls or aqueous tannin	661.8...242	Peroxide
.22	Alcoholic tannin	...244	Hydroperoxide
.23	Ethereal tannin	...27	Salts with a metal as part of the anion
661.78	ORGANOMETALLIC COMPOUNDS	661.8...3	HALOGEN COMPOUNDS. CYANIDE COMPOUNDS. HYDRIDE
.781	Cacodyl (tetramethyldiarsine)	...32	Chlorine compounds
.783/.789	Various organometallic compounds	...321	Chloride
	661.783/.789 $\approx$ 546.3/.9, e.g.		<i>For chlorides in general $\rightarrow$ 661.42</i>
	661.784.7 Zinc ethyl	...322	Oxychlorine compounds
		.2	Hypochlorite
661.8	METALLIC COMPOUNDS IN GENERAL.		<i>For hypochlorites in general $\rightarrow$ 661.43</i>
	SALTS. MINERAL COMPOUNDS	.3	Chlorite
	<i>The main subdivisions of 661.8 may each be subdivided using the following ...1/...9 numbers. To denote specific compounds (oxides, bases, salts) add these affixes to the main subdivisions. Basic salts may be distinguished by adding the figure 8, complex and double salts by adding the figure 9, and further subdividing as 546. When denoting double salts, the higher main subdivision from 661.8 should be chosen.</i>	.5	Chlorate
	<i>Example 1</i>	.7	<i>For chlorates in general $\rightarrow$ 661.44</i>
	661.846.532.932 Double sulphate of potassium and magnesium	...34	Perchlorate
	<i>derived from</i>		<i>For inorganic per-compounds in general $\rightarrow$ 661.49</i>
	661.846 Magnesium	...35	Bromine compounds
	(higher than 661.832 Potassium)		661.8...34 $\approx$ 661.8...32
	661.8...532 Sulphates		<i>For bromine compounds in general $\rightarrow$ 661.46</i>
	661.846.532 Magnesium sulphate	...35	Iodine compounds
	661.846.532.9 Double salts of magnesium sulphate		661.8...35 $\approx$ 661.8...32
	546.32 Potassium	...36	<i>For iodine compounds in general $\rightarrow$ 661.47</i>
	<i>Example 2</i>		Fluorine compounds
	661.842.455.916.1 Calcium fluoride phosphate	661.8...4	661.8...36 $\approx$ 661.8...32
	<i>derived from</i>	...41	<i>For fluorine compounds in general $\rightarrow$ 661.48</i>
	661.842 Calcium		Cyanide compounds
	661.8...455 Phosphate	...37	Cyanide
	(higher than 661.8...361 Fluoride)	...371	Isocyanate
	661.842.455 Calcium phosphate	...372	Cyanate
	661.842.455.9 Double salts of calcium phosphate	...373	Fulminate
	546.161 Fluoride	...374	Thiocyanate
	<i>To denote salts having a metal as part of the anion (acid radical) add the affix 27 to the number for the metal, further subdividing as 546, e.g.</i>	...38	Hydride
	661.877.274.1 Calcium molybdate	...39	
	<i>derived from</i>		PENTAVALENT ELEMENT COMPOUNDS
	661.877.27 Molybdate	...41	Nitride
	546.41 Calcium		<i>For nitrogen compounds in general $\rightarrow$ 661.5</i>
	Oxy-salts of the type MeOX_2 (vanadyl salt, zirconyl salt etc.) should be treated as basic salts, e.g.	...42	Nitrite
	661.888.136.18 Vanadyl fluoride	...43	Nitrate
	VOF_2	...44	Other nitrogen compounds
	<i>For production of salts without reference to specific cations $\rightarrow$ 661.2/.6</i>	...443	Azide
	<i>For metal hydrides $\rightarrow$ 661.968</i>	...45	Phosphorus compounds
	<i>For pigments $\rightarrow$ 667.622.1</i>	...451	<i>For phosphorus compounds in general $\rightarrow$ 661.63</i>
	<i>For metallurgy $\rightarrow$ 669</i>	...452	Phosphide
Special auxiliary subdivisions for 661.8		...453	Hypophosphite
661.8-11/-18	Valency (of the metallic element in the compound), e.g.	...454	Phosphite
-11	Monovalent	...455	Metaphosphate
-12	Divalent	.1	Orthophosphate
-13	Trivalent	.2	Monobasic phosphate
		.3	Dibasic phosphate
661.8...1	COMPOUNDS OF SPECIAL IMPORTANCE	...456	Tribasic phosphate
661.8...2	OXIDES	...457	Pyrophosphate
...22	Oxide	...458	Superphosphate
...23	Hydroxide	...46	Tetraphosphate. Polyphosphate
...24	Peroxide. Hydroperoxide	...461	Arsenic compounds
		...463	<i>For arsenic compounds in general $\rightarrow$ 661.64</i>
		...465	Arsenide
		.1	Arsenite
		.2	Arsenate
		.3	Monoarsenate
		...47	Diarsenate
		...475	Triarsenate
		...478	Antimony compounds
		...48	[cancelled] $\rightarrow$ 661.886.27
		...485	Thioantimonate
			[cancelled] $\rightarrow$ 661.887
			[cancelled] $\rightarrow$ 661.887.27
661.8...1	COMPOUNDS OF SPECIAL IMPORTANCE	661.8...5	SULPHUR, SELENIUM AND TELLURIUM COMPOUNDS
661.8...2	OXIDES		<i>For sulphur compounds in general $\rightarrow$ 661.2</i>
...22	Oxide	...51	Sulphide. Disulphide
...23	Hydroxide		
...24	Peroxide. Hydroperoxide		