

## SECTION C –CHEMISTRY; METALLURGY

### Notes

- (1) In section C, the definitions of groups of chemical elements are as follows:
  - Alkali metals: Li, Na, K, Rb, Cs, Fr
  - Alkaline earth metals: Ca, Sr, Ba, Ra
  - Lanthanides: elements with atomic numbers 57 to 71 inclusive
  - Rare earths: Sc, Y, Lanthanides
  - Actinides: elements with atomic numbers 89 to 103 inclusive
  - Refractory metals: Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W
  - Halogens: F, Cl, Br, I, At
  - Noble gases: He, Ne, Ar, Kr, Xe, Rn
  - Platinum group: Os, Ir, Pt, Ru, Rh, Pd
  - Noble metals: Ag, Au, Platinum group
  - Light metals: alkali metals, alkaline earth metals, Be, Al, Mg
  - Heavy metals: metals other than light metals
  - Iron group: Fe, Co, Ni
  - Non-metals: H, B, C, Si, N, P, O, S, Se, Te, noble gases, halogens
  - Metals: elements other than non-metals
  - Transition elements: elements with atomic numbers 21 to 30 inclusive, 39 to 48 inclusive, 57 to 80 inclusive, 89 upwards
- (2) Section C covers:
  - (a) pure chemistry, which covers inorganic compounds, organic compounds, macromolecular compounds, and their methods of preparation;
  - (b) applied chemistry, which covers compositions containing the above compounds, such as: glass, ceramics, fertilisers, plastics compositions, paints, products of the petroleum industry. It also covers certain compositions on account of their having particular properties rendering them suitable for certain purposes, as in the case of explosives, dyestuffs, adhesives, lubricants, and detergents;
  - (c) certain marginal industries, such as the manufacture of coke and of solid or gaseous fuels, the production and refining of oils, fats and waxes, the fermentation industry (e.g., brewing and wine-making), the sugar industry;
  - (d) certain operations or treatments, which are either purely mechanical, e.g., the mechanical treatment of leather and skins, or partly mechanical, e.g., the treatment of water or the prevention of corrosion in general;
  - (e) metallurgy, ferrous or non-ferrous alloys.
- (3)
  - (a) In the case of operations, treatments, products or articles having both a chemical and a non-chemical part or aspect, the general rule is that the chemical part or aspect is covered by section C.
  - (b) In some of these cases, the chemical part or aspect brings with it a non-chemical one, even though purely mechanical, because this latter aspect either is essential to the operation or treatment or constitutes an important element thereof. It has seemed, in fact, more logical not to dissociate the different parts or aspects of a coherent whole. This is the case for applied chemistry and for the industries, operations and treatments mentioned in Notes (1)(c), (d) and (e). For example, furnaces peculiar to the manufacture of glass are covered by class C03 and not by class F27.
  - (c) There are, however, some exceptions in which the mechanical (or non-chemical) aspect carries with it the chemical aspect, for example:
    - Certain extractive processes, in subclass A61K;
    - The chemical purification of air, in subclass A61L;
    - Chemical methods of fire-fighting, in subclass A62D;
    - Chemical processes and apparatus, in class B01;
    - Impregnation of wood, in subclass B27K;
    - Chemical methods of analysis or testing, in subclass G01N;
    - Photographic materials and processes, in class G03, and, generally, the chemical treatment of textiles and the production of cellulose or paper, in section D.
  - (d) In still other cases, the pure chemical aspect is covered by section C and the applied chemical aspect by another section, such as A, B or F, e.g., the use of a substance or composition for:
    - treatment of plants or animals, covered by subclass A01N;
    - foodstuffs, covered by class A23;
    - ammunition or explosives, covered by class F42.
  - (e) When the chemical and mechanical aspects are so closely interlocked that a neat and simple division is not possible, or when certain mechanical processes follow as a natural or logical continuation of a chemical treatment, section C may cover, in addition to the chemical aspect, a part only of the mechanical aspect, e.g., after-treatment of artificial stone, covered by class C04. In this latter case, a note or a reference is usually given to make the position clear, even if sometimes the division is rather arbitrary.

## CHEMISTRY

**C01 INORGANIC CHEMISTRY** (processing powders of inorganic compounds preparatory to the manufacturing of ceramic products C04B 35/00; fermentation or enzyme-using processes for the preparation of elements or inorganic compounds except carbon dioxide C12P 3/00; obtaining metal compounds from mixtures, e.g. ores, which are intermediate compounds in a metallurgical process for obtaining a free metal C21B, C22B; production of non-metallic elements or inorganic compounds by electrolysis or electrophoresis C25B)

Notes

- (1) In subclasses C01B to C01G, and within each of these subclasses, in the absence of an indication to the contrary, a compound is classified in the last appropriate place, e.g. potassium permanganate is classified only as a permanganate compound, in subclass C01G. [3]
- (2) Biocidal, pest repellent, pest attractant or plant growth regulatory activity of compounds or preparations is further classified in subclass A01P. [8]
- (3) Processes using enzymes or micro-organisms in order to: [5]
  - (i) liberate, separate or purify a pre-existing compound or composition, or to
  - (ii) treat textiles or clean solid surfaces of materials
 are further classified in subclass C12S. [5]

**C01B NON-METALLIC ELEMENTS; COMPOUNDS THEREOF**Notes

- (1) In this subclass, tradenames that are often found in scientific and patent literature have been used in order to define precisely the scope of the groups. [6]
- (2) Attention is drawn to the definitions of groups of chemical elements following the title of section C. [3]
- (3) Attention is drawn to Note (1) after class C01, which defines the last place priority rule applied in this class, i.e. in the range of subclasses C01B to C01G and within these subclasses. [8]
- (4) Therapeutic activity of compounds is further classified in subclass A61P. [7]

Subclass Index

HYDROGEN; HYDROGEN ISOTOPES;		CARBON, COMPOUNDS THEREOF .....	31/00
WATER; HYDRIDES .....	3/00; 4/00;	SILICON, COMPOUNDS THEREOF .....	33/00
	5/00; 6/00	SELENIUM OR TELLURIUM; BORON .....	19/00; 35/00
SYNTHESIS GAS .....	3/00	NOBLE GASES .....	23/00
HALOGENS OR THEIR COMPOUNDS .....	7/00, 9/00,	COMPOUNDS HAVING MOLECULAR	
	11/00	SIEVE PROPERTIES BUT NOT HAVING	
OXYGEN, OXIDES IN GENERAL; PER-		BASE-EXCHANGE PROPERTIES .....	37/00
COMPOUNDS .....	13/00; 15/00	COMPOUNDS HAVING MOLECULAR	
SULFUR, COMPOUNDS THEREOF .....	17/00	SIEVE AND BASE-EXCHANGE	
NITROGEN, COMPOUNDS THEREOF .....	21/00	PROPERTIES .....	39/00
PHOSPHORUS, COMPOUNDS THEREOF .....	25/00		

Hydrogen; Hydrides; Water; Synthesis gas from hydrocarbons

<b>3/00 Hydrogen; Gaseous mixtures containing hydrogen; Separation of hydrogen from mixtures containing it</b> (separation of gases by physical means B01D); <b>Purification of hydrogen</b> (production of water-gas or synthesis gas from solid carbonaceous material C10J; purifying or modifying the chemical compositions of combustible gases containing carbon monoxide C10K) [3]	3/06	. . by reaction of inorganic compounds containing electro-positively bound hydrogen, e.g. water, acids, bases, ammonia, with inorganic reducing agents (by electrolysis of water C25B 1/04) [3]
	3/08	. . . with metals [3]
	3/10	. . . by reaction of water vapour with metals [3]
	3/12	. . . by reaction of water vapour with carbon monoxide [3]
	3/14	. . . Handling of heat and steam [3]
	3/16	. . . using catalysts [3]
	3/18	. . . using moving solid particles [3]
	3/20	. . . by reaction of metal hydroxides with carbon monoxide [3]
	3/22	. . by decomposition of gaseous or liquid organic compounds (coking liquid carbonaceous materials C10B 55/00) [3]
3/02 . Production of hydrogen or of gaseous mixtures containing hydrogen [3]		
3/04 . . by decomposition of inorganic compounds, e.g. ammonia [3]		

- 3/24 . . . of hydrocarbons [3]  
 3/26 . . . . using catalysts [3]  
 3/28 . . . . using moving solid particles [3]  
 3/30 . . . . . using the fluidised bed technique [3]  
 3/32 . . by reaction of gaseous or liquid organic compounds with gasifying agents, e.g. water, carbon dioxide, air [3]  
 3/34 . . . by reaction of hydrocarbons with gasifying agents [3]  
 3/36 . . . . using oxygen or mixtures containing oxygen as gasifying agents [3]  
 3/38 . . . . using catalysts [3]  
 3/40 . . . . . characterised by the catalyst [3]  
 3/42 . . . . . using moving solid particles [3]  
 3/44 . . . . . using the fluidised bed technique [3]  
 3/46 . . . . using discontinuously preheated non-moving solid materials, e.g. blast and run [3]  
 3/48 . . . . followed by reaction of water vapour with carbon monoxide [3]  
 3/50 . Separation of hydrogen or hydrogen containing gases from gaseous mixtures, e.g. purification (C01B 3/14 takes precedence) [3]  
 3/52 . . by contacting with liquids; Regeneration of used liquids [3]  
 3/54 . . . including a catalytic reaction [3]  
 3/56 . . by contacting with solids; Regeneration of used solids [3]  
 3/58 . . . including a catalytic reaction [3]  
**4/00 Hydrogen isotopes; Inorganic compounds thereof prepared by isotope exchange, e.g.  $\text{NH}_3 + \text{D}_2 \rightarrow \text{NH}_2\text{D} + \text{HD}$  (separation of isotopes B01D 59/00; other chemical reactions to form compounds of hydrogen isotopes, see the relevant groups for hydrogen compounds in class C01) [2]**  
**5/00 Water**  
 5/02 . Heavy water; Preparation by chemical reaction of hydrogen isotopes or their compounds, e.g.  $4\text{ND}_3 + 7\text{O}_2 \rightarrow 4\text{NO}_2 + 6\text{D}_2\text{O}$ ,  $2\text{D}_2 + \text{O}_2 \rightarrow 2\text{D}_2\text{O}$   
**6/00 Hydrides of metals; Monoborane or diborane; Addition complexes thereof** (higher hydrides of boron, substituted hydrides of boron C01B 35/00) [2]  
 6/02 . Hydrides of transition elements; Addition complexes thereof  
 6/04 . Hydrides of alkali metals, alkaline earth metals, beryllium or magnesium; Addition complexes thereof  
 6/06 . Hydrides of aluminium, gallium, indium, thallium, germanium, tin, lead, arsenic, antimony, bismuth or polonium; Monoborane; Diborane; Addition complexes thereof  
 6/10 . . Monoborane; Diborane; Addition complexes thereof [2]  
 6/11 . . . Preparation from boron or inorganic compounds containing boron and oxygen [2]  
 6/13 . . . Addition complexes of monoborane or diborane, e.g. with phosphine, arsine or hydrazine [2]  
 6/15 . . . . Metal borohydrides; Addition complexes thereof [2]  
 6/17 . . . . . Preparation from boron or inorganic compounds containing boron and oxygen [2]  
 6/19 . . . . . Preparation from other compounds of boron [2]

- 6/21 . . . . . Preparation of borohydrides of alkali metals, alkaline earth metals, magnesium or beryllium; Addition complexes thereof, e.g.  $\text{LiBH}_4 \cdot 2\text{N}_2\text{H}_4$ ,  $\text{NaB}_2\text{H}_7$  [2]  
 6/23 . . . . . Preparation of borohydrides of other metals, e.g. aluminium borohydride; Addition complexes thereof, e.g.  $\text{Li}[\text{Al}(\text{BH}_4)_3\text{H}]$  [2]  
 6/24 . Hydrides containing at least two metals, e.g.  $\text{Li}(\text{AlH}_4)$ ; Addition complexes thereof (C01B 6/13 to C01B 6/23 take precedence) [2]  
 6/26 . . Preparation from the metal with the highest valency or from its oxides or salts of its oxyacids  
 6/34 . Purification; Stabilisation

#### **Halogens; Compounds thereof**

- 7/00 Halogens; Halogen acids** (oxyacids C01B 11/00)  
 7/01 . Chlorine; Hydrogen chloride [2]  
 7/03 . . Preparation from chlorides [2,3]  
 7/04 . . . Preparation of chlorine from hydrogen chloride [3]  
 7/05 . . . Preparation from ammonium chloride [2,3]  
 7/07 . . Purification [2,3]  
 7/075 . . . of liquid chlorine [2,3]  
 7/09 . Bromine; Hydrogen bromide [2]  
 7/13 . Iodine; Hydrogen iodide [2]  
 7/14 . . Iodine [2]  
 7/16 . . . Preparation from seaweed [2]  
 7/19 . Fluorine; Hydrogen fluoride [2]  
 7/20 . . Fluorine [2]  
 7/24 . Inter-halogen compounds  
**9/00 General methods of preparing halides** (particular individual halides, see the relevant groups in subclasses C01B to C01G according to the element combined with the halogen; electrolytic production of inorganic compounds C25B)  
 9/02 . Chlorides  
 9/04 . Bromides  
 9/06 . Iodides  
 9/08 . Fluorides  
**11/00 Oxides or oxyacids of halogens; Salts thereof**  
 11/02 . Oxides of chlorine  
 11/04 . Hypochlorous acid  
 11/06 . . Hypochlorites, e.g. chlorinated lime  
 11/08 . Chlorous acid  
 11/10 . . Chlorites  
 11/12 . Chloric acid  
 11/14 . . Chlorates  
 11/16 . Perchloric acid  
 11/18 . . Perchlorates  
 11/20 . Oxygen compounds of bromine  
 11/22 . Oxygen compounds of iodine  
 11/24 . Oxygen compounds of fluorine

#### **Oxygen; Oxides or hydroxides in general; Per-compounds**

- 13/00 Oxygen; Ozone; Oxides or hydroxides in general**  
 13/02 . Preparation of oxygen (by liquefying F25J)  
 13/08 . . from air with the aid of metal oxides, e.g. barium oxide, manganese oxide  
 13/10 . Preparation of ozone  
 13/11 . . by electric discharge [2]

13/14	. Methods for preparing oxides or hydroxides in general (particular individual oxides or hydroxides, <u>see</u> the relevant groups of subclasses C01B to C01G or C25B, according to the element combined with the oxygen or hydroxy group)	17/10	. . Finely-divided sulfur, e.g. sublimed sulfur, flowers of sulfur
13/16	. . Purification [3]	17/12	. . Insoluble sulfur (mu-sulfur)
13/18	. . by thermal decomposition of compounds, e.g. of salts or hydroxides [3]	17/16	. Hydrogen sulfides
13/20	. . by oxidation of elements in the gaseous state; by oxidation or hydrolysis of compounds in the gaseous state [3]	17/18	. . Hydrogen polysulfides
13/22	. . . of halides or oxyhalides [3]	17/20	. Methods for preparing sulfides or polysulfides, in general (ammonium sulfides or polysulfides C01C; sulfides or polysulfides of metals, other than alkali metals, magnesium, calcium, strontium, and barium, <u>see</u> the relevant groups of subclasses C01F or C01G, according to the metal)
13/24	. . . . in the presence of hot combustion gases [3]	17/22	. Alkali metal sulfides or polysulfides
13/26	. . . . in the presence of a fluidised bed [3]	17/24	. . Preparation by reduction
13/28	. . . . using a plasma or an electric discharge [3]	17/26	. . . with carbon
13/30	. . . . Removal and cooling of the oxide containing suspension [3]	17/28	. . . with reducing gases
13/32	. . by oxidation or hydrolysis of elements or compounds in the liquid or solid state [3]	17/30	. . Preparation from sodium or potassium amalgam with sulfur or sulfides
13/34	. . by oxidation or hydrolysis of sprayed or atomised solutions [3]	17/32	. . Hydrosulfides of sodium or potassium
13/36	. . by precipitation reactions in solutions [3]	17/34	. . Polysulfides of sodium or potassium
15/00	<b>Peroxides; Peroxyhydrates; Peroxyacids or salts thereof; Superoxides; Ozonides</b>	17/36	. . Purification
15/01	. Hydrogen peroxide [3]	17/38	. . Dehydration
15/013	. . Separation; Purification; Concentration [3]	17/40	. . Making shaped products, e.g. granules
15/017	. . . Anhydrous hydrogen peroxide; Anhydrous solutions or gaseous mixtures containing hydrogen peroxide [3]	17/42	. Sulfides or polysulfides of magnesium, calcium, strontium, or barium
15/022	. . Preparation from organic compounds [2]	17/43	. . from oxides or hydroxides with sulfur or hydrogen sulfide
15/023	. . . by the alkyl-anthraquinone process [3]	17/44	. . by reduction of sulfates
15/024	. . . from hydrocarbons [3]	17/45	. Compounds containing sulfur and halogen, with or without oxygen
15/026	. . . from alcohols [3]	17/46	. Compounds containing sulfur, halogen, hydrogen, and oxygen
15/027	. . Preparation from water [3]	17/48	. Sulfur dioxide; Sulfurous acid
15/029	. . Preparation from hydrogen and oxygen [3]	17/50	. . Preparation of sulfur dioxide
15/03	. . Preparation from inorganic peroxy-compounds, e.g. from peroxysulfates [3]	17/52	. . . by roasting sulfides (C22B 1/00 takes precedence)
15/032	. . . from metal peroxides [3]	17/54	. . . by burning elemental sulfur
15/037	. . Stabilisation by additives [3]	17/56	. . . Separation; Purification
15/04	. Metal peroxides or peroxyhydrates thereof; Superoxides; Ozonides [3]	17/58	. . . Recovery of sulfur dioxide from acid tar or the like
15/043	. . of alkali metals, alkaline earth metals or of magnesium [2,3]	17/60	. . . Isolation of sulfur dioxide from gases
15/047	. . of heavy metals [2,3]	17/62	. Methods of preparing sulfites in general (particular individual sulfites, <u>see</u> the relevant groups of subclasses C01B to C01G, according to the cation)
15/055	. Peroxyhydrates (C01B 15/04 takes precedence); Peroxyacids or salts thereof [3]	17/64	. Thiosulfates; Dithionites; Polythionates
15/06	. . containing sulfur [3]	17/66	. . Dithionites
15/08	. . . Peroxysulfates [3]	17/69	. Sulfur trioxide; Sulfuric acid [3]
15/10	. . containing carbon [3]	17/70	. . Stabilisation of gamma-form sulfur trioxide
15/12	. . containing boron [3]	17/74	. . Preparation [3]
15/14	. . containing silicon [3]	17/76	. . . by contact processes
15/16	. . containing phosphorus [3]	17/765	. . . . Multi-stage SO <sub>3</sub> conversion [3]
17/00	<b>Sulfur; Compounds thereof</b>	17/77	. . . . Fluidised-bed processes [3]
17/02	. Preparation of sulfur; Purification	17/775	. . . . Liquid phase contacting processes or wet catalysis processes [3]
17/027	. . Recovery of sulfur from material containing elemental sulfur, e.g. luxmasses; Purification [3]	17/78	. . . . characterised by the catalyst used
17/033	. . . using a liquid extractant [3]	17/79	. . . . containing vanadium [3]
17/04	. . from gaseous sulfur compounds including gaseous sulfides	17/80	. . . . Apparatus
17/05	. . . by wet processes [3]	17/82	. . . of sulfuric acid using a nitrogen oxide process
17/06	. . from non-gaseous sulfides or materials containing such sulfides, e.g. ores	17/84	. . . . Chamber process
		17/86	. . . . Tower process
		17/88	. . Concentration of sulfuric acid
		17/90	. . Separation; Purification
		17/92	. . . Recovery from acid tar or the like
		17/94	. . . Recovery from nitration acids

- 17/96 . Methods for the preparation of sulfates in general (particular individual sulfates, see the relevant groups of subclasses C01B to C01G, according to the cation)
- 17/98 . Other compounds containing sulfur and oxygen (persulfuric acids C01B 15/06; persulfates C01B 15/08)
- 19/00 Selenium; Tellurium; Compounds thereof** (phosphorus compounds C01B 25/14)
- 19/02 . Elemental selenium or tellurium [3]
- 19/04 . Binary compounds [3]
- 21/00 Nitrogen; Compounds thereof**
- 21/02 . Preparation of nitrogen (from ammonia C01B 3/04)
- 21/04 . Purification or separation of nitrogen (by liquefying F25J)
- 21/06 . Binary compounds of nitrogen with metals, with silicon, or with boron (azides C01B 21/08)
- 21/064 . . with boron [3]
- 21/068 . . with silicon [3]
- 21/072 . . with aluminium [3]
- 21/076 . . with titanium or zirconium [3]
- 21/08 . Hydrazoic acid; Azides; Halogen azides
- 21/082 . Compounds containing nitrogen and non-metals (C01B 21/06, C01B 21/08 take precedence) [3]
- 21/083 . . containing one or more halogen atoms [3]
- 21/084 . . . containing also one or more oxygen atoms, e.g. nitrosyl halides [3]
- 21/086 . . containing one or more sulfur atoms [3]
- 21/087 . . containing one or more hydrogen atoms [3]
- 21/088 . . . containing also one or more halogen atoms [3]
- 21/09 . . . . Halogeno-amines, e.g. chloramine [3]
- 21/092 . . . containing also one or more metal atoms [3]
- 21/093 . . . containing also one or more sulfur atoms [3]
- 21/094 . . . . Nitrosyl containing acids [3]
- 21/096 . . . . Amidosulfonic acid; Salts thereof [3]
- 21/097 . . containing phosphorus atoms [3]
- 21/098 . . . Phosphonitrilic dihalides; Polymers thereof [3]
- 21/12 . . Carbamic acid; Salts thereof
- 21/14 . . Hydroxylamine; Salts thereof
- 21/16 . . Hydrazine; Salts thereof
- 21/20 . Nitrogen oxides; Oxyacids of nitrogen; Salts thereof
- 21/22 . . Nitrous oxide ( $\text{N}_2\text{O}$ )
- 21/24 . . Nitric oxide (NO)
- 21/26 . . . Preparation by catalytic oxidation of ammonia
- 21/28 . . . . Apparatus
- 21/30 . . . Preparation by oxidation of nitrogen
- 21/32 . . . . Apparatus
- 21/34 . . Nitrogen trioxide ( $\text{N}_2\text{O}_3$ )
- 21/36 . . Nitrogen dioxide ( $\text{NO}_2$ ,  $\text{N}_2\text{O}_4$ ) (C01B 21/26, C01B 21/30 take precedence)
- 21/38 . . Nitric acid
- 21/40 . . . Preparation by absorption of oxides of nitrogen
- 21/42 . . . Preparation from nitrates
- 21/44 . . . Concentration
- 21/46 . . . Purification; Separation
- 21/48 . . Methods for the preparation of nitrates in general (particular individual nitrates, see the relevant groups of subclasses C01B to C01G, according to the cation)
- 21/50 . . Nitrous acid; Salts thereof
- 23/00 Noble gases; Compounds thereof** (liquefying F25J)
- 25/00 Phosphorus; Compounds thereof** (C01B 21/00, C01B 23/00 take precedence; perphosphates C01B 15/16) [3]
- 25/01 . Treating phosphate ores or other raw phosphate materials to obtain phosphorus or phosphorus compounds [2]
- 25/02 . Preparation of phosphorus
- 25/023 . . of red phosphorus [2]
- 25/027 . . of yellow phosphorus [2]
- 25/04 . Purification of phosphorus
- 25/043 . . of red phosphorus [2]
- 25/047 . . of yellow phosphorus [2]
- 25/06 . Hydrogen phosphides
- 25/08 . Other phosphides
- 25/10 . Halides or oxyhalides of phosphorus [2]
- 25/12 . Oxides of phosphorus
- 25/14 . Sulfur, selenium, or tellurium compounds of phosphorus
- 25/16 . Oxyacids of phosphorus; Salts thereof (peroxyacids or salts thereof C01B 15/00)
- 25/163 . . Phosphorous acid; Salts thereof [2]
- 25/165 . . Hypophosphorous acid; Salts thereof [2]
- 25/168 . . Pyrophosphorous acid; Salts thereof [2]
- 25/18 . . Phosphoric acid
- 25/20 . . . Preparation from elemental phosphorus or phosphoric anhydride
- 25/22 . . . Preparation by reacting phosphate containing material with an acid, e.g. wet process
- 25/222 . . . . with sulfuric acid, a mixture of acids mainly consisting of sulfuric acid or a mixture of compounds forming it in situ, e.g. a mixture of sulfur dioxide, water and oxygen [3]
- 25/223 . . . . . only one form of calcium sulfate being formed [3]
- 25/225 . . . . . Dihydrate process [3]
- 25/226 . . . . . Hemihydrate process [3]
- 25/228 . . . . . one form of calcium sulfate being formed and then converted to another form [3]
- 25/229 . . . . . Hemihydrate-dihydrate process [3]
- 25/231 . . . . . Dihydrate-hemihydrate process [3]
- 25/232 . . . . . Preparation by reacting phosphate containing material with concentrated sulfuric acid and subsequently lixiviating the obtained mass, e.g. clinker process [3]
- 25/234 . . . Purification; Stabilisation; Concentration (purification concomitant with preparation C01B 25/22; preparation involving solvent-solvent extraction C01B 25/46) [3]
- 25/235 . . . . Clarification; Stabilisation to prevent post-precipitation of dissolved impurities [3]
- 25/237 . . . . Selective elimination of impurities [3]
- 25/238 . . . . Cationic impurities [3]
- 25/24 . . Condensed phosphoric acids
- 25/26 . . Phosphates (perphosphates C01B 15/16)
- 25/28 . . . Ammonium phosphates
- 25/30 . . . Alkali metal phosphates
- 25/32 . . . Phosphates of magnesium, calcium, strontium, or barium
- 25/34 . . . . Magnesium phosphates
- 25/36 . . . . Aluminium phosphates
- 25/37 . . . . Phosphates of heavy metals [2]
- 25/38 . . . . Condensed phosphates
- 25/39 . . . . of alkali metals [3]
- 25/40 . . . . Polyphosphates [2]

- 25/41 . . . . . of alkali metals [3]
- 25/42 . . . . . Pyrophosphates [2]
- 25/44 . . . . . Metaphosphates [2]
- 25/445 . . . . . of alkali metals [3]
- 25/45 . . . . . containing plural metal, or metal and ammonium [3]
- 25/455 . . . . . containing halogen [3]
- 25/46 . . . Preparation involving solvent-solvent extraction (solvent extraction in general B01D 11/00) [2]
- 31/00 Carbon; Compounds thereof** (C01B 21/00, C01B 23/00 take precedence; percarbonates C01B 15/10; carbon black C09C 1/48; gas carbon production C10B) [3]
- 31/02 . . . Preparation of carbon (by using ultra-high pressure, e.g. for the formation of diamonds, B01J 3/06; by crystal growth C30B); Purification
- 31/04 . . . Graphite
- 31/06 . . . Diamond
- 31/08 . . . Active carbon
- 31/10 . . . Preparation by using gaseous activating agents
- 31/12 . . . Preparation by using non-gaseous activating agents
- 31/14 . . . Granulation (apparatus B01J 2/00)
- 31/16 . . . Preparation of ion-exchanging materials from carbonaceous material
- 31/18 . . . Carbon monoxide (metal carbonyls C01G)
- 31/20 . . . Carbon dioxide
- 31/22 . . . Solidifying
- 31/24 . . . Methods for the preparation of carbonates or bicarbonates in general (percarbonates C01B 15/10; particular individual carbonates, *see* the relevant groups of subclasses C01B to C01G, according to the cation)
- 31/26 . . . Compounds containing carbon and sulfur, e.g. carbon disulfide, carbon oxysulfide; Thiophosgene
- 31/28 . . . Phosgene
- 31/30 . . . Carbides (alloys C22)
- 31/32 . . . Calcium carbide
- 31/34 . . . Tungsten or molybdenum carbides
- 31/36 . . . Carbides of silicon or boron
- 33/00 Silicon; Compounds thereof** (C01B 21/00, C01B 23/00 take precedence; persilicates C01B 15/14; carbides C01B 31/36) [3]
- 33/02 . . . Silicon (forming single crystals or homogeneous polycrystalline material with defined structure C30B) [5]
- 33/021 . . . Preparation (chemical coating from the vapour phase C23C 16/00) [5]
- 33/023 . . . . . by reduction of silica or silica-containing material [5]
- 33/025 . . . . . with carbon or a solid carbonaceous material, i.e. carbo-thermal process [5]
- 33/027 . . . . . by decomposition or reduction of gaseous or vaporised silicon compounds other than silica or silica-containing material [5]
- 33/029 . . . . . by decomposition of monosilane [5]
- 33/03 . . . . . by decomposition of silicon halides or halosilanes or reduction thereof with hydrogen as the only reducing agent [5]
- 33/031 . . . . . by decomposition of silicon tetraiodide [5]
- 33/033 . . . . . by reduction of silicon halides or halosilanes with a metal or a metallic alloy as the only reducing agents [5]
- 33/035 . . . . . by decomposition or reduction of gaseous or vaporised silicon compounds in the presence of heated filaments of silicon, carbon or a refractory metal, e.g. tantalum or tungsten, or in the presence of heated silicon rods on which the formed silicon is deposited, a silicon rod being obtained, e.g. Siemens process [5]
- 33/037 . . . Purification (by zone-melting C30B 13/00) [5]
- 33/039 . . . . . by conversion of the silicon into a compound, optional purification of the compound, and reconversion into silicon [5]
- 33/04 . . . Hydrides of silicon
- 33/06 . . . Metal silicides (alloys C22)
- 33/08 . . . Compounds containing halogen
- 33/10 . . . Compounds containing silicon, fluorine, and other elements
- 33/107 . . . Halogenated silanes [3]
- 33/113 . . . Silicon oxides; Hydrates thereof [3]
- 33/12 . . . Silica; Hydrates thereof, e.g. lepidotic silicic acid [3]
- 33/14 . . . . . Colloidal silica, e.g. dispersions, gels, sols [3]
- 33/141 . . . . . Preparation of hydrosols or aqueous dispersions [3]
- 33/142 . . . . . by acidic treatment of silicates [3]
- 33/143 . . . . . of aqueous solutions of silicates [3]
- 33/145 . . . . . Preparation of hydroorganosols, organosols or dispersions in an organic medium [3]
- 33/146 . . . . . After-treatment of sols (preparation of hydroorganosols, organosols or dispersions in an organic medium from hydrosols C01B 33/145) [3]
- 33/148 . . . . . Concentration; Drying; Dehydration; Stabilisation; Purification [3]
- 33/149 . . . . . Coating [3]
- 33/151 . . . . . by progressively adding a sol to a different sol, i.e. "build up" of particles using a "heel" [3]
- 33/152 . . . . . Preparation of hydrogels [3]
- 33/154 . . . . . by acidic treatment of aqueous silicate solutions [3]
- 33/155 . . . . . Preparation of hydroorganogels or organogels [3]
- 33/157 . . . . . After-treatment of gels [3]
- 33/158 . . . . . Purification; Drying; Dehydrating [3]
- 33/159 . . . . . Coating or hydrophobisation [3]
- 33/16 . . . Preparation of silica xerogels [3]
- 33/18 . . . Preparation of finely divided silica neither in sol nor in gel form; After-treatment thereof (preparation of aerogels by dehydrating gels C01B 33/158; treatment to enhance the pigmenting or filling properties C09C) [3]
- 33/187 . . . . . by acidic treatment of silicates [3]
- 33/193 . . . . . of aqueous solutions of silicates [3]
- 33/20 . . . Silicates (persilicates C01B 15/14)
- 33/22 . . . Magnesium silicates
- 33/24 . . . Alkaline earth metal silicates
- 33/26 . . . Aluminium-containing silicates [5]
- 33/32 . . . Alkali metal silicates (C01B 33/26 takes precedence) [3]
- 33/36 . . . having base-exchange properties but not having molecular sieve properties (regeneration thereof B01J 49/00) [6]
- 33/38 . . . Layered base-exchange silicates, e.g. clays, micas or alkali metal silicates of kenyaite or magadiite type [6]

- 33/40 . . . . Clays [6]  
 33/42 . . . . Micas [6]  
 33/44 . . . . Products obtained from layered base-exchange silicates by ion-exchange with organic compounds such as ammonium, phosphonium or sulfonium compounds or by intercalation of organic compounds, e.g. organoclay material [6]  
 33/46 . . . . Amorphous silicates, e.g. so-called "amorphous zeolites" (crystalline zeolites C01B 39/00) [6]  
 35/00 **Boron; Compounds thereof** (monoborane, diborane, metal borohydrides or addition complexes thereof C01B 6/00; perborates C01B 15/12; binary compounds with nitrogen C01B 21/06; phosphides C01B 25/08; carbides C01B 31/36; alloys containing boron C22) [2]  
 35/02 . Boron; Borides [2]  
 35/04 . . Metal borides [2]  
 35/06 . Boron halogen compounds [2]  
 35/08 . Compounds containing boron and nitrogen, phosphorus, oxygen, sulfur, selenium or tellurium [2]  
 35/10 . . Compounds containing boron and oxygen (C01B 35/06 takes precedence) [2]  
 35/12 . . . Borates [2]  
 35/14 . . Compounds containing boron and nitrogen, phosphorus, sulfur, selenium or tellurium [2]  
 35/16 . Compounds containing direct bonding between two boron atoms, e.g.  $\text{Cl}_2\text{B}-\text{BCl}_2$  [2]  
 35/18 . Compounds containing three or more boron atoms, e.g.  $\text{NaB}_3\text{H}_8$ ,  $\text{MgB}_{10}\text{Br}_{10}$  (borazoles C01B 35/14) [2]

**Compounds characterised primarily by their physical or chemical properties, rather than by their chemical constitution** [6]

- 37/00 **Compounds having molecular sieve properties but not having base-exchange properties** [6]  
 37/02 . Crystalline silica-polymorphs, e.g. silicalites [6]  
 37/04 . Aluminophosphates (APO compounds) [6]  
 37/06 . Aluminophosphates containing other elements, e.g. metals, boron [6]  
 37/08 . . Silicoaluminophosphates (SAPO compounds) [6]  
 39/00 **Compounds having molecular sieve and base-exchange properties, e.g. crystalline zeolites; Their preparation; After-treatment, e.g. ion-exchange or dealumination** (treatment to modify the sorption properties, e.g. shaping using a binder, B01J 20/10; treatment to modify the catalytic properties, e.g. combination of treatments to make the zeolites appropriate to their use as a catalyst, B01J 29/04; treatment to improve the ion-exchange properties B01J 39/14; regeneration or reactivation of ion-exchange properties B01J 49/00; preparation of stabilised suspensions used in detergents C11D 3/12) [6]

**Note**

In this group, the following term is used with the meaning indicated: [6]

- "zeolites" means: [6]  
 (i) crystalline aluminosilicates with base-exchange and molecular sieve properties, having three dimensional, microporous lattice framework structure of tetrahedral oxide units; [6]  
 (ii) compounds isomorphous to those of the former category, wherein the aluminium or silicon atoms in the framework are partly or wholly replaced by atoms of other elements, e.g. by gallium, germanium, phosphorus or boron. [6]  
 39/02 . Crystalline aluminosilicate zeolites; Isomorphous compounds thereof; Direct preparation thereof; Preparation thereof starting from a reaction mixture containing a crystalline zeolite of another type, or from preformed reactants: After-treatment thereof [6]  
 39/04 . . using at least one organic template directing agent, e.g. an ionic quaternary ammonium compound or an aminated compound [6]  
 39/06 . . Preparation of isomorphous zeolites characterised by measures to replace the aluminium or silicon atoms in the lattice framework by atoms of other elements [6]  
 39/08 . . . the aluminium atoms being wholly replaced [6]  
 39/10 . . . the replacing atoms being phosphorus atoms [6]  
 39/12 . . . the replacing atoms being boron atoms [6]  
 39/14 . . Type A, as exemplified by patent documents US A 2,882,243 and GB A 1,035,644 [6]  
 39/16 . . . from aqueous solutions of an alkali metal aluminate and an alkali metal silicate excluding any other source of alumina or silica but seeds [6]  
 39/18 . . . from a reaction mixture containing at least one aluminium silicate or aluminosilicate of a clay type, e.g. kaolin or metakaolin or its exotherm modification or allophane [6]  
 39/20 . . Faujasite type, e.g. type X or Y, as exemplified by patent documents US A 2,882,244 and US A 3,130,007, respectively [6]  
 39/22 . . . Type X [6]  
 39/24 . . . Type Y [6]  
 39/26 . . Mordenite type [6]  
 39/28 . . Phillipsite or harmotome type, e.g. type B, as exemplified by patent document US A 3,008,803 [6]  
 39/30 . . Erionite or offretite type, e.g. zeolite T, as exemplified by patent document US A 2,950,952 [6]  
 39/32 . . Type L, as exemplified by patent document US A 3,216,789 [6]  
 39/34 . . Type ZSM-4, as exemplified by patent document GB A 1,117,568 or type, as exemplified by patent document GB A 1,178,186 [6]  
 39/36 . . Pentasil type, e.g. types ZSM-5, ZSM-8 or ZSM-11, as exemplified by patent documents US A 3,702,886, GB A 1,334,243 and US A 3,709,979, respectively [6]  
 39/38 . . . Type ZSM-5 [6]  
 39/40 . . . . using at least one organic template directing agent [6]  
 39/42 . . Type ZSM-12, as exemplified by patent document US A 3,832,449 [6]  
 39/44 . . Ferrierite type, e.g. types ZSM-21, ZSM-35 or ZSM-38, as exemplified by patent documents US A 4,046,859, US A 4,016,245 and US A 4,046,859, respectively [6]

**C01B – C01D**

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| <p>39/46 . . Other types characterised by their X-ray diffraction pattern and their defined composition [6]</p> <p>39/48 . . . using at least one organic template directing agent [6]</p> | <p>39/50 . Zeolites wherein inorganic bases or salts occlude channels in the lattice framework, e.g. sodalite, cancrinite, nosean, hauynite [6]</p> <p>39/52 . . Sodalites [6]</p> <p>39/54 . Phosphates, e.g. APO or SAPO compounds [6]</p> |
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**C01C AMMONIA; CYANOGEN; COMPOUNDS THEREOF** (salts of oxyacids of halogens C01B 11/00; peroxides, salts of peroxyacids C01B 15/00; thiosulfates, dithionites, polythionates C01B 17/64; compounds containing selenium or tellurium C01B 19/00; azides C01B 21/08; metal amides C01B 21/092; nitrites C01B 21/50; phosphides C01B 25/08; salts of oxyacids of phosphorus C01B 25/16; compounds containing silicon C01B 33/00; compounds containing boron C01B 35/00)

**Notes**

- (1) Attention is drawn to Note (1) after class C01, which defines the last place priority rule applied in this class, i.e. in the range of subclasses C01B to C01G and within these subclasses. [8]
- (2) Therapeutic activity of compounds is further classified in subclass A61P. [7]

**1/00 Ammonia; Compounds thereof**

- 1/02 . Preparation or separation of ammonia
- 1/04 . . Preparation of ammonia by synthesis (preparation or purification of gas mixtures for ammonia synthesis C01B 3/02)
- 1/08 . . Preparation of ammonia from nitrogenous organic substances
- 1/10 . . Separation of ammonia from ammonia liquors, e.g. gas liquors
- 1/12 . . Separation of ammonia from gases and vapours
- 1/14 . . . Saturators
- 1/16 . Halides of ammonium
- 1/18 . Nitrates of ammonium
- 1/20 . Sulfides; Polysulfides
- 1/22 . Sulfites of ammonium
- 1/24 . Sulfates of ammonium (C01C 1/14 takes precedence)
- 1/242 . . Preparation from ammonia and sulfuric acid or sulfur trioxide [2]
- 1/244 . . Preparation by double decomposition of ammonium salts with sulfates [2]
- 1/245 . . Preparation from compounds containing nitrogen and sulfur [2]
- 1/246 . . . from sulfur-containing ammonium compounds [2]
- 1/247 . . . . by oxidation with free oxygen [2]
- 1/248 . . Preventing coalescing or controlling form or size of crystals [2]
- 1/249 . . Deacidifying the crystals [2]
- 1/26 . Carbonates or bicarbonates of ammonium

- 1/28 . Methods of preparing ammonium salts in general

**Notes**

- (1) This group does not cover ammonium salts of complex acids (other than complex cyanides) containing a metal in the anion, which are covered by the relevant groups of subclasses C01D to C01G, according to the metal.
- (2) Salts of polybasic acids with ammonium and a metal as cations are classified as though the ammonium were hydrogen.
- (3) Complex ammine salts are classified in the relevant groups of subclasses C01D to C01G, according to the metal.

**3/00 Cyanogen; Compounds thereof**

- 3/02 . Preparation of hydrogen cyanide
- 3/04 . . Separation from gases
- 3/06 . Stabilisation of hydrogen cyanide
- 3/08 . Simple or complex cyanides of metals
- 3/10 . . Simple alkali metal cyanides [3]
- 3/11 . . Complex cyanides [3]
- 3/12 . . Simple or complex iron cyanides [2]
- 3/14 . Cyanic acid; Salts thereof
- 3/16 . Cyanamide; Salts thereof (dicyandiamide C07C 279/28)
- 3/18 . . Calcium cyanamide
- 3/20 . Thiocyanic acid; Salts thereof

**C01D COMPOUNDS OF ALKALI METALS, I.E. LITHIUM, SODIUM, POTASSIUM, RUBIDIUM, CAESIUM, OR FRANCIUM** (metal hydrides C01B 6/00; salts of oxyacids of halogens C01B 11/00; peroxides, salts of peroxyacids C01B 15/00; sulfides or polysulfides C01B 17/22; thiosulfates, dithionites, polythionates C01B 17/64; compounds containing selenium or tellurium C01B 19/00; binary compounds of nitrogen with metals C01B 21/06; azides C01B 21/08; metal amides C01B 21/092; nitrites C01B 21/50; phosphides C01B 25/08; salts of oxyacids of phosphorus C01B 25/16; carbides C01B 31/30; compounds containing silicon C01B 33/00; compounds containing boron C01B 35/00; cyanides C01C 3/08; salts of cyanic acid C01C 3/14; salts of cyanamide C01C 3/16; thiocyanates C01C 3/20)

**Notes**

- (1) Attention is drawn to Note (1) after class C01, which defines the last place priority rule applied in this class, i.e. in the range of subclasses C01B to C01G and within these subclasses. [8]



(2) Therapeutic activity of compounds is further classified in subclass A61P. [7]

<b>1/00</b>	<b>Oxides or hydroxides of sodium, potassium, or alkali metals in general [2]</b>	<b>7/00</b>	<b>Carbonates of sodium, potassium, or alkali metals in general [2]</b>
1/02	. Oxides	7/02	. Preparation by double decomposition
1/04	. Hydroxides	7/04	. . with a fluoride or silico-fluoride (C01D 1/24 takes precedence)
1/20	. . Preparation by reacting oxides or hydroxides with alkali metal salts	7/06	. Preparation <u>via</u> sodium or potassium magnesium carbonate
1/22	. . . with carbonates or bicarbonates	7/07	. Preparation from the hydroxides [2]
1/24	. . . from or <u>via</u> fluorides or silico-fluorides	7/08	. Preparation from or <u>via</u> cyano compounds of sodium or potassium (C01D 1/26 takes precedence)
1/26	. . Preparation from or <u>via</u> cyano compounds, e.g. cyanides, cyanamides	7/10	. Preparation of bicarbonates from carbonates (ammonia-soda process C01D 7/18)
1/28	. . Purification; Separation	7/12	. Preparation of carbonates from bicarbonates
1/30	. . . by crystallisation	7/14	. Preparation of sesquicarbonates
1/32	. . . by adsorption or precipitation	7/16	. Preparation from compounds of sodium or potassium with amines and carbon dioxide
1/34	. . . with selective solvents	7/18	. Preparation by the ammonia-soda process
1/36	. . . by oxidation	7/22	. Purification
1/38	. . . by dialysis	7/24	. . Crystallisation
1/40	. . . by electrolysis	7/26	. . by precipitation or adsorption
1/42	. . Concentration; Dehydration	7/28	. . with selective solvents
1/44	. . Preparation in the form of granules, pieces, or other shaped products	7/30	. . by oxidation
		7/32	. . by dialysis
<b>3/00</b>	<b>Halides of sodium, potassium, or alkali metals in general [2]</b>	7/34	. . by electrolysis
3/02	. Fluorides	7/35	. Varying the content of water of crystallisation or the specific gravity [2]
3/04	. Chlorides	7/37	. . Densifying sodium carbonate [2]
3/06	. . Preparation by working up brines, seawater or spent lyes	7/38	. Preparation in the form of granules, pieces, or other shaped products
3/08	. . Preparation by working up natural or industrial salt mixtures or siliceous minerals	7/40	. . Influencing the crystallisation process
3/10	. Bromides	7/42	. Preventing the absorption of moisture or caking
3/12	. Iodides		
3/14	. Purification	<b>9/00</b>	<b>Nitrates of sodium, potassium, or alkali metals in general [2]</b>
3/16	. . by precipitation or adsorption	9/02	. Preparation by working-up natural salt mixtures
3/18	. . with selective solvents	9/04	. Preparation with liquid nitric acid
3/20	. . by melting	9/06	. Preparation with gaseous nitric acid or nitrogen oxides
3/22	. Preparation in the form of granules, pieces, or other shaped products	9/08	. Preparation by double decomposition
3/24	. . Influencing the crystallisation process	9/10	. . with ammonium nitrate
3/26	. Preventing the absorption of moisture or caking of the crystals	9/12	. . with nitrates of magnesium, calcium, strontium, or barium
		9/14	. . of salts of potassium with sodium nitrate
<b>5/00</b>	<b>Sulfates or sulfites of sodium, potassium, or alkali metals in general [2]</b>	9/16	. Purification
5/02	. Preparation of sulfates from alkali metal salts and sulfuric acid or bisulfates; Preparation of bisulfates	9/18	. Preparation in the form of shaped products, e.g. granules
5/04	. Preparation of sulfates with the aid of sulfurous acid or sulfites, e.g. Hargreaves process	9/20	. Preventing the absorption of moisture or caking
5/06	. Preparation of sulfates by double decomposition		
5/08	. . with each other or with ammonium sulfate	<b>13/00</b>	<b>Compounds of sodium or potassium not provided for elsewhere [2]</b>
5/10	. . with sulfates of magnesium, calcium, strontium, or barium		
5/12	. Preparation of double sulfates of magnesium with sodium or potassium [2]	<b>15/00</b>	<b>Lithium compounds [2]</b>
5/14	. Preparation of sulfites (C01D 5/04 takes precedence)	15/02	. Oxides; Hydroxides [2]
5/16	. Purification	15/04	. Halides [2]
5/18	. Dehydration	15/06	. Sulfates; Sulfites [2]
		15/08	. Carbonates; Bicarbonates [2]
		15/10	. Nitrates [2]
		<b>17/00</b>	<b>Rubidium, caesium, or francium compounds [2]</b>

**C01F COMPOUNDS OF THE METALS BERYLLIUM, MAGNESIUM, ALUMINIUM, CALCIUM, STRONTIUM, BARIUM, RADIUM, THORIUM, OR OF THE RARE-EARTH METALS** (metal hydrides C01B 6/00; salts of oxyacids of halogens C01B 11/00; peroxides, salts of peroxyacids C01B 15/00; sulfides or polysulfides of magnesium, calcium, strontium, or barium C01B 17/42; thiosulfates, dithionites, polythionates C01B 17/64; compounds containing selenium or tellurium C01B 19/00; binary compounds of nitrogen with metals C01B 21/06; azides C01B 21/08; metal amides C01B 21/092; nitrites C01B 21/50; phosphides C01B 25/08; salts of oxyacids of phosphorus C01B 25/16; carbides C01B 31/30; compounds containing silicon C01B 33/00; compounds containing boron C01B 35/00; compounds having molecular sieve properties but not having base-exchange properties C01B 37/00; compounds having molecular sieve and base-exchange properties, e.g. crystalline zeolites, C01B 39/00; cyanides C01C 3/08; salts of cyanic acid C01C 3/14; salts of cyanamide C01C 3/16; thiocyanates C01C 3/20)

### Notes

- (1) Attention is drawn to Note (1) after class C01, which defines the last place priority rule applied in this class, i.e. in the range of subclasses C01B to C01G and within these subclasses. [8]  
 (2) Therapeutic activity of compounds is further classified in subclass A61P. [7]

<b>1/00</b>	<b>Methods of preparing compounds of the metals beryllium, magnesium, aluminium, calcium, strontium, barium, radium, thorium, or the rare earths, in general</b>	7/10	. . . by treating aluminous minerals with alkali sulfates and reducing agents
		7/12	. . . Alkali metal aluminates from alkaline earth metal aluminates
<b>3/00</b>	<b>Compounds of beryllium</b>	7/14	. . . Aluminium oxide or hydroxide from alkali metal aluminates
3/02	. Oxides; Hydroxides [3]	7/16	. . Preparation of alkaline earth metal aluminates; Aluminium oxide or hydroxide therefrom
<b>5/00</b>	<b>Compounds of magnesium</b>	7/18	. . . Aluminium oxide or hydroxide from alkaline earth metal aluminates
5/02	. Magnesia	7/20	. . Preparation of aluminium oxide or hydroxide from aluminous ores with acids or salts
5/04	. . by oxidation of metallic magnesium	7/22	. . . with halides
5/06	. . by thermal decomposition of magnesium compounds (calcining magnesite or dolomite C04B 2/10)	7/24	. . . with nitric acid or nitrogen oxides
5/08	. . . by calcining magnesium hydroxide	7/26	. . . with sulfuric acids or sulfates
5/10	. . . by thermal decomposition of magnesium chloride with water vapour	7/28	. . . with sulfurous acid
5/12	. . . by thermal decomposition of magnesium sulfate, with or without reduction	7/30	. . Preparation of aluminium oxide or hydroxide by thermal decomposition of aluminium compounds
5/14	. Magnesium hydroxide	7/32	. . . of sulfates
5/16	. . by treating magnesia, e.g. calcined dolomite, with water or solutions of salts not containing magnesium	7/34	. . Preparation of aluminium hydroxide by precipitation from solutions containing aluminium salts
5/20	. . by precipitation from solutions of magnesium salts with ammonia	7/36	. . . from organic aluminium salts
5/22	. . from magnesium compounds with alkali hydroxides or alkaline earth oxides or hydroxides	7/38	. . Preparation of aluminium oxide by thermal reduction of aluminous minerals
5/24	. Magnesium carbonates	7/40	. . . in the presence of aluminium sulfide
5/26	. Magnesium halides	7/42	. . Preparation of aluminium oxide or hydroxide from metallic aluminium, e.g. by oxidation
5/28	. . Fluorides	7/44	. . Dehydration of aluminium hydroxide
5/30	. . Chlorides	7/46	. . Purification of aluminium oxide, aluminium hydroxide or aluminates [5]
5/32	. . . Preparation of anhydrous magnesium chloride by chlorinating magnesium compounds	7/47	. . . of aluminates [5]
5/34	. . . Dehydrating magnesium chloride containing water of crystallisation	7/48	. Aluminium halides
5/36	. . Bromides	7/50	. . Fluorides
5/38	. Magnesium nitrates	7/52	. . . Double compounds containing both fluorine and other acid groups
5/40	. Magnesium sulfates (double sulfates of magnesium with sodium or potassium C01D 5/12, with other alkali metals C01D 15/06, C01D 17/00) [3]	7/54	. . . Double compounds containing both aluminium and alkali metals or alkaline earth metals
5/42	. Magnesium sulfites	7/56	. . Chlorides (containing fluorine C01F 7/52) [3]
		7/58	. . . Preparation of anhydrous aluminium chloride
		7/60	. . . from oxygen-containing aluminium compounds
<b>7/00</b>	<b>Compounds of aluminium</b>	7/62	. . . Purification
7/02	. Aluminium oxide; Aluminium hydroxide; Aluminates	7/64	. . Bromides (containing fluorine C01F 7/52) [3]
7/04	. . Preparation of alkali metal aluminates; Aluminium oxide or hydroxide therefrom	7/66	. Aluminium nitrates (containing fluorine C01F 7/52) [3]
7/06	. . . by treating aluminous minerals with alkali hydroxide	7/68	. Aluminium compounds containing sulfur (containing fluorine C01F 7/52) [3]
7/08	. . . by treating aluminous minerals with sodium carbonate		

7/70	. . Sulfides	11/28	. . . by chlorination of alkaline earth metal compounds
7/72	. . Sulfites	11/30	. . . Concentrating; Dehydrating; Preventing the absorption of moisture or caking
7/74	. . Sulfates	11/32	. . . Purification
7/76	. . . Double salts, e.g. alums	11/34	. . Bromides
<b>11/00</b>	<b>Compounds of calcium, strontium, or barium</b> (C01F 7/00 takes precedence) [3]	11/36	. Nitrates
11/02	. Oxides or hydroxides (production of lime C04B 2/00)	11/38	. . Preparation with nitric acid or nitrogen oxides
11/04	. . by thermal decomposition	11/40	. . Preparation by double decomposition with nitrates
11/06	. . . of carbonates	11/42	. . Double salts (with magnesium C01F 5/38)
11/08	. . by reduction of sulfates	11/44	. . Concentrating; Crystallising; Dehydrating; Preventing the absorption of moisture or caking
11/10	. . from sulfides	11/46	. Sulfates (dehydration of gypsum C04B 11/02)
11/12	. . from silicates	11/48	. Sulfites
11/16	. . Purification	<b>13/00</b>	<b>Compounds of radium</b>
11/18	. Carbonates	<b>15/00</b>	<b>Compounds of thorium</b>
11/20	. Halides	<b>17/00</b>	<b>Compounds of the rare-earth metals, i.e. scandium, yttrium, lanthanum, or the group of the lanthanides</b>
11/22	. . Fluorides		
11/24	. . Chlorides		
11/26	. . . from sulfides		

**C01G COMPOUNDS CONTAINING METALS NOT COVERED BY SUBCLASSES C01D OR C01F** (metal hydrides C01B 6/00; salts of oxyacids of halogens C01B 11/00; peroxides, salts of peroxyacids C01B 15/00; thiosulfates, dithionites, polythionates C01B 17/64; compounds containing selenium or tellurium C01B 19/00; binary compounds of nitrogen with metals C01B 21/06; azides C01B 21/08; metal amides C01B 21/092; nitrites C01B 21/50; phosphides C01B 25/08; salts of oxyacids of phosphorus C01B 25/16; carbides C01B 31/30; compounds containing silicon C01B 33/00; compounds containing boron C01B 35/00; compounds having molecular sieve properties but not having base-exchange properties C01B 37/00; compounds having molecular sieve and base-exchange properties, e.g. crystalline zeolites, C01B 39/00; cyanides C01C 3/08; salts of cyanic acid C01C 3/14; salts of cyanamide C01C 3/16; thiocyanates C01C 3/20)

#### Notes

- (1) Attention is drawn to Note (1) after class C01, which defines the last place priority rule applied in this class, i.e. in the range of subclasses C01B to C01G and within these subclasses. [8]
- (2) Therapeutic activity of compounds is further classified in subclass A61P. [7]

#### Subclass Index

GENERAL METHODS OF PREPARATION.....	1/00	Ni Nickel .....	53/00
METALLIC COMPOUNDS, IN		Os Osmium.....	55/00
ALPHABETICAL ORDER OF THE		Pb Lead.....	21/00
SYMBOL FOR THE METAL		Pd Palladium .....	55/00
Ag Silver .....	5/00	Pt Platinum .....	55/00
As Arsenic.....	28/00	Re Rhenium.....	47/00
Au Gold.....	7/00	Rh Rhodium .....	55/00
Bi Bismuth .....	29/00	Ru Ruthenium .....	55/00
Cd Cadmium.....	11/00	Sb Antimony.....	30/00
Co Cobalt .....	51/00	Sn Tin .....	19/00
Cr Chromium .....	37/00	Ta Tantalum .....	35/00
Cu Copper.....	3/00	Ti Titanium .....	23/00
Fe Iron .....	49/00	Tl Thallium.....	15/00
Ga Gallium.....	15/00	U Uranium.....	43/00
Ge Germanium.....	17/00	V Vanadium .....	31/00
Hf Hafnium .....	27/00	W Tungsten .....	41/00
Hg Mercury.....	13/00	Zn Zinc .....	9/00
In Indium.....	15/00	Zr Zirconium .....	25/00
Ir Iridium.....	55/00		
Mn Manganese.....	45/00	COMPOUNDS OF TRANSURANIC	
Mo Molybdenum .....	39/00	ELEMENTS.....	56/00
Nb Niobium .....	33/00	COMPOUNDS OF METALS NOT	
		COVERED BY THE PRECEDING GROUPS .....	57/00

<b>1/00</b>	<b>Methods of preparing compounds of metals not covered by subclasses C01B, C01C, C01D, C01E, in general</b> (electrolytic production of inorganic compounds C25B 1/00) [2]	<b>23/00</b>	<b>Compounds of titanium</b>
1/02	. Oxides	23/02	. Halides of titanium
1/04	. Carbonyls	23/04	. Oxides; Hydroxides [3]
1/06	. Halides	23/047	. . Titanium dioxide [3]
1/08	. Nitrates	23/053	. . . Producing by wet processes, e.g. hydrolysing titanium salts [3]
1/10	. Sulfates	23/07	. . . Producing by vapour phase processes, e.g. halide oxidation [3]
1/12	. Sulfides	23/08	. . . Drying; Calcining [3]
1/14	. Sulfites		
<b>3/00</b>	<b>Compounds of copper</b>	<b>25/00</b>	<b>Compounds of zirconium</b>
3/02	. Oxides; Hydroxides	25/02	. Oxides
3/04	. Halides	25/04	. Halides
3/05	. . Chlorides [3]	25/06	. Sulfates
3/06	. . Oxychlorides		
3/08	. Nitrates	<b>27/00</b>	<b>Compounds of hafnium</b>
3/10	. Sulfates	27/02	. Oxides
3/12	. Sulfides	27/04	. Halides
3/14	. Complexes with ammonia	27/06	. Sulfates
<b>5/00</b>	<b>Compounds of silver</b>	<b>28/00</b>	<b>Compounds of arsenic [3]</b>
5/02	. Halides [3]	28/02	. Arsenates; Arsenites [3]
<b>7/00</b>	<b>Compounds of gold</b>	<b>29/00</b>	<b>Compounds of bismuth</b>
<b>9/00</b>	<b>Compounds of zinc</b>	<b>30/00</b>	<b>Compounds of antimony [3]</b>
9/02	. Oxides; Hydroxides [3]	30/02	. Antimonates; Antimonites [3]
9/03	. . Processes of production using dry methods, e.g. vapour phase processes [3]	<b>31/00</b>	<b>Compounds of vanadium</b>
9/04	. Halides	31/02	. Oxides [3]
9/06	. Sulfates	31/04	. Halides [3]
9/08	. Sulfides	<b>33/00</b>	<b>Compounds of niobium</b>
<b>11/00</b>	<b>Compounds of cadmium</b>	<b>35/00</b>	<b>Compounds of tantalum</b>
11/02	. Sulfides [3]	35/02	. Halides [3]
<b>13/00</b>	<b>Compounds of mercury</b>	<b>37/00</b>	<b>Compounds of chromium</b>
13/02	. Oxides	37/02	. Oxides or hydrates thereof
13/04	. Halides	37/027	. . Chromium dioxide [3]
<b>15/00</b>	<b>Compounds of gallium, indium, or thallium</b>	37/033	. . Chromium trioxide; Chromic acid [3]
<b>17/00</b>	<b>Compounds of germanium</b>	37/04	. Chromium halides
17/02	. Germanium dioxide	37/06	. . Chromylhalides
17/04	. Halides of germanium	37/08	. Chromium sulfates
<b>19/00</b>	<b>Compounds of tin</b>	37/10	. . Chrome alum
19/02	. Oxides	37/14	. Chromates; Bichromates
19/04	. Halides	<b>39/00</b>	<b>Compounds of molybdenum</b>
19/06	. . Stannous chloride	39/02	. Oxides; Hydroxides [3]
19/08	. . Stannic chloride	39/04	. Halides [3]
<b>21/00</b>	<b>Compounds of lead</b>	39/06	. Sulfides [3]
21/02	. Oxides	<b>41/00</b>	<b>Compounds of tungsten</b>
21/04	. . Lead suboxide (Pb <sub>2</sub> O)	41/02	. Oxides; Hydroxides [3]
21/06	. . Lead monoxide (PbO)	41/04	. Halides [3]
21/08	. . Lead dioxide (PbO <sub>2</sub> )	<b>43/00</b>	<b>Compounds of uranium</b>
21/10	. . Red lead (Pb <sub>3</sub> O <sub>4</sub> )	43/01	. Oxides; Hydroxides [3]
21/12	. Hydroxides	43/025	. . Uranium dioxide [3]
21/14	. Carbonates	43/04	. Halides of uranium
21/16	. Halides	43/06	. . Fluorides
21/18	. Nitrates	43/08	. . Chlorides
21/20	. Sulfates	43/10	. . Bromides
21/21	. Sulfides [3]	43/12	. . Iodides
21/22	. Plumbates; Plumbites	<b>45/00</b>	<b>Compounds of manganese</b>
		45/02	. Oxides; Hydroxides
		45/04	. Carbonyls
		45/06	. Halides

- 45/08 . Nitrates
- 45/10 . Sulfates
- 45/12 . Manganates; Permanganates

**47/00 Compounds of rhenium**

**49/00 Compounds of iron**

- 49/02 . Oxides; Hydroxides
- 49/04 . . Ferrous oxide (FeO)
- 49/06 . . Ferric oxide (Fe<sub>2</sub>O<sub>3</sub>)
- 49/08 . . Ferroso-ferric oxide (Fe<sub>3</sub>O<sub>4</sub>)
- 49/10 . Halides
- 49/12 . Sulfides
- 49/14 . Sulfates
- 49/16 . Carbonyls

**51/00 Compounds of cobalt**

- 51/02 . Carbonyls
- 51/04 . Oxides; Hydroxides
- 51/06 . Carbonates

- 51/08 . Halides
- 51/10 . Sulfates
- 51/12 . Complexes with ammonia

**53/00 Compounds of nickel**

- 53/02 . Carbonyls
- 53/04 . Oxides; Hydroxides
- 53/06 . Carbonates
- 53/08 . Halides
- 53/09 . . Chlorides [3]
- 53/10 . Sulfates
- 53/11 . Sulfides [3]
- 53/12 . Complexes with ammonia

**55/00 Compounds of ruthenium, rhodium, palladium, osmium, iridium, or platinum**

**56/00 Compounds of transuranic elements**

**57/00 Compounds of metals not covered elsewhere in this subclass**