SECTION C — CHEMISTRY; METALLURGY

C01 INORGANIC CHEMISTRY

C01B NON-METALLIC ELEMENTS; COMPOUNDS THEREOF (fermentation or enzyme-using processes for the preparation of elements or inorganic compounds except carbon dioxide C12P 3/00; production of non-metallic elements or inorganic compounds by electrolysis or electrophoresis C25B)

Note(s) [3, 6, 7, 2006.01]

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.
2. Attention is drawn to the definitions of groups of chemical elements following the title of section C.
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-C01G and within these subclasses.
4. Therapeutic activity of compounds is further classified in subclass A61P.

Subclass index

HYDROGEN; HYDROGEN ISOTOPES; WATER; HYDRIDES....3/00, 4/00, 5/00, 6/00
SYNTHESIS GAS....3/00
HALOGENS OR THEIR COMPOUNDS....7/00, 9/00, 11/00
OXYGEN, OXIDES IN GENERAL; PER-COMPOUNDS....13/00, 15/00
SULFUR, COMPOUNDS THEREOF....17/00
NITROGEN, COMPOUNDS THEREOF....21/00
PHOSPHORUS, COMPOUNDS THEREOF....25/00
CARBON, COMPOUNDS THEREOF....32/00
SILICON, COMPOUNDS THEREOF....33/00
SELENIUM OR TELLURIUM; BORON....19/00, 35/00
NOBLE GASES....23/00
COMPOUNDS HAVING MOLECULAR SIEVE PROPERTIES BUT NOT HAVING BASE-EXCHANGE PROPERTIES....37/00
COMPOUNDS HAVING MOLECULAR SIEVE AND BASE-EXCHANGE PROPERTIES....39/00

Hydrogen; Hydrides; Water; Synthesis gas from hydrocarbons

3/00 Hydrogen; Gaseous mixtures containing hydrogen; Separation of hydrogen from mixtures containing it; Purification of hydrogen (production of water-gas or synthesis gas from solid carbonaceous material C10J) **[3, 2006.01]**

3/02 • Production of hydrogen or of gaseous mixtures containing hydrogen **[3, 2006.01]**

3/04 • • by decomposition of inorganic compounds, e.g. ammonia **[3, 2006.01]**

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, 2006.01]**

3/08 • • • with metals **[3, 2006.01]**

3/10 • • • • by reaction of water vapour with metals **[3, 2006.01]**

3/12 • • • by reaction of water vapour with carbon monoxide **[3, 2006.01]**

3/14 • • • • Handling of heat and steam **[3, 2006.01]**

3/16 • • • • using catalysts **[3, 2006.01]**

3/18 • • • • using moving solid particles **[3, 2006.01]**

3/20 • • • by reaction of metal hydroxides with carbon monoxide **[3, 2006.01]**

3/22 • • by decomposition of gaseous or liquid organic compounds **[3, 2006.01]**

3/24 • • • of hydrocarbons **[3, 2006.01]**

3/26 • • • • using catalysts **[3, 2006.01]**

3/28 • • • • using moving solid particles **[3, 2006.01]**

3/30 • • • • • using the fluidised bed technique **[3, 2006.01]**

3/32 • • by reaction of gaseous or liquid organic compounds with gasifying agents, e.g. water, carbon dioxide, air **[3, 2006.01]**

3/34 • • • by reaction of hydrocarbons with gasifying agents **[3, 2006.01]**

3/36 • • • • using oxygen or mixtures containing oxygen as gasifying agents **[3, 2006.01]**

3/38 • • • • using catalysts **[3, 2006.01]**

3/40 • • • • • characterised by the catalyst **[3, 2006.01]**

3/42 • • • • • using moving solid particles **[3, 2006.01]**

3/44 • • • • • • using the fluidised bed technique **[3, 2006.01]**

3/46 • • • • using discontinuously preheated non-moving solid materials, e.g. blast and run **[3, 2006.01]**

3/48 • • • • followed by reaction of water vapour with carbon monoxide **[3, 2006.01]**

3/50 • Separation of hydrogen or hydrogen containing gases from gaseous mixtures, e.g. purification (C01B 3/14 takes precedence) **[3, 2006.01]**

3/52 • • by contacting with liquids; Regeneration of used liquids **[3, 2006.01]**

3/54 • • • including a catalytic reaction **[3, 2006.01]**

3/56 • • by contacting with solids; Regeneration of used solids **[3, 2006.01]**

3/58 • • • including a catalytic reaction **[3, 2006.01]**

4/00 Hydrogen isotopes; Inorganic compounds thereof prepared by isotope exchange, e.g. $NH_3 + D_2 \rightarrow NH_2D + HD$ [1, 2, 2006.01]

5/00 Water [1, 2006.01]

5/02 • Heavy water; Preparation by chemical reaction of hydrogen isotopes or their compounds, e.g. $4ND_3+7O_2 \rightarrow 4NO_2+6D_2O$, $2D_2+O_2 \rightarrow 2D_2O$ **[1, 2006.01]**

6/00 Hydrides of metals; Monoborane or diborane; Addition complexes thereof [1, 2, 2006.01]

6/02 • Hydrides of transition elements; Addition complexes thereof **[1, 2006.01]**

6/04 • Hydrides of alkali metals, alkaline earth metals, beryllium or magnesium; Addition complexes thereof **[1, 2006.01]**

6/06 • Hydrides of aluminium, gallium, indium, thallium, germanium, tin, lead, arsenic, antimony, bismuth or polonium; Monoborane; Diborane; Addition complexes thereof **[1, 2006.01]**

6/10 • • Monoborane; Diborane; Addition complexes thereof **[1, 2, 2006.01]**

6/11 • • • Preparation from boron or inorganic compounds containing boron and oxygen **[2, 2006.01]**

6/13 • • • Addition complexes of monoborane or diborane, e.g. with phosphine, arsine or hydrazine **[2, 2006.01]**

6/15 • • • • Metal borohydrides; Addition complexes thereof **[2, 2006.01]**

6/17 • • • • • Preparation from boron or inorganic compounds containing boron and oxygen **[2, 2006.01]**

6/19 • • • • • Preparation from other compounds of boron **[2, 2006.01]**

6/21 • • • • • • Preparation of borohydrides of alkali metals, alkaline earth metals, magnesium or beryllium; Addition complexes thereof, e.g. $LiBH_4.2N_2H_4$, NaB_2H_7 **[2, 2006.01]**

6/23 • • • • • • Preparation of borohydrides of other metals, e.g. aluminium borohydride; Addition complexes thereof, e.g. $Li[Al(BH_4)_3H]$ **[2, 2006.01]**

6/24 • Hydrides containing at least two metals, e.g. $Li(AlH_4)$; Addition complexes thereof (C01B 6/13-C01B 6/23 take precedence) **[1, 2, 2006.01]**

6/26 • • Preparation from the metal with the highest valency or from its oxides or salts of its oxyacids **[1, 2006.01]**

6/34 • Purification; Stabilisation **[1, 2006.01]**

Halogens; Compounds thereof

7/00 Halogens; Halogen acids [1, 2006.01]

7/01 • Chlorine; Hydrogen chloride **[2, 2006.01]**

7/03 • • Preparation from chlorides **[2, 3, 2006.01]**

7/04 • • • Preparation of chlorine from hydrogen chloride **[1, 3, 2006.01]**

7/05 • • • Preparation from ammonium chloride **[2, 3, 2006.01]**

7/07 • • Purification **[2, 3, 2006.01]**

7/075 • • • of liquid chlorine **[2, 3, 2006.01]**

7/09 • Bromine; Hydrogen bromide **[2, 2006.01]**

7/13 • Iodine; Hydrogen iodide **[2, 2006.01]**

7/14 • • Iodine **[1, 2, 2006.01]**

7/16 • • • Preparation from seaweed **[1, 2, 2006.01]**

7/19 • Fluorine; Hydrogen fluoride **[2, 2006.01]**

7/20 • • Fluorine **[1, 2, 2006.01]**

7/24 • Inter-halogen compounds **[1, 2006.01]**

9/00 General methods of preparing halides (particular individual halides, see the relevant groups in subclasses C01B-C01G according to the element combined with the halogen; electrolytic production of inorganic compounds C25B) **[1, 2006.01]**

9/02 • Chlorides **[1, 2006.01]**

9/04 • Bromides **[1, 2006.01]**

9/06 • Iodides **[1, 2006.01]**

9/08 • Fluorides **[1, 2006.01]**

11/00 Oxides or oxyacids of halogens; Salts thereof [1, 2006.01]

11/02 • Oxides of chlorine **[1, 2006.01]**

11/04 • Hypochlorous acid **[1, 2006.01]**

11/06 • • Hypochlorites, e.g. chlorinated lime **[1, 2006.01]**

11/08 • Chlorous acid **[1, 2006.01]**

11/10 • • Chlorites **[1, 2006.01]**

11/12 • Chloric acid **[1, 2006.01]**

11/14 • • Chlorates **[1, 2006.01]**

11/16 • Perchloric acid **[1, 2006.01]**

11/18 • • Perchlorates **[1, 2006.01]**

11/20 • Oxygen compounds of bromine **[1, 2006.01]**

11/22 • Oxygen compounds of iodine **[1, 2006.01]**

11/24 • Oxygen compounds of fluorine **[1, 2006.01]**

Oxygen; Oxides or hydroxides in general; Per-compounds

13/00 Oxygen; Ozone; Oxides or hydroxides in general [1, 2006.01]

13/02 • Preparation of oxygen (by liquefying F25J) **[1, 2006.01]**

13/08 • • from air with the aid of metal oxides, e.g. barium oxide, manganese oxide **[1, 2006.01]**

13/10 • Preparation of ozone **[1, 2006.01]**

13/11 • • by electric discharge **[2, 2006.01]**

13/14 • Methods for preparing oxides or hydroxides in general (particular individual oxides or hydroxides, see the relevant groups of subclasses C01B-C01G or C25B, according to the element combined with the oxygen or hydroxy group) **[1, 2006.01]**

13/16 • • Purification **[3, 2006.01]**

13/18 • • by thermal decomposition of compounds, e.g. of salts or hydroxides **[3, 2006.01]**

13/20 • • by oxidation of elements in the gaseous state; by oxidation or hydrolysis of compounds in the gaseous state **[3, 2006.01]**

13/22 • • • of halides or oxyhalides **[3, 2006.01]**
13/24 • • • • in the presence of hot combustion gases **[3, 2006.01]**
13/26 • • • • in the presence of a fluidised bed **[3, 2006.01]**
13/28 • • • • using a plasma or an electric discharge **[3, 2006.01]**
13/30 • • • • Removal and cooling of the oxide containing suspension **[3, 2006.01]**
13/32 • • by oxidation or hydrolysis of elements or compounds in the liquid or solid state **[3, 2006.01]**
13/34 • • by oxidation or hydrolysis of sprayed or atomised solutions **[3, 2006.01]**
13/36 • • by precipitation reactions in solutions **[3, 2006.01]**

15/00 Peroxides; Peroxyhydrates; Peroxyacids or salts thereof; Superoxides; Ozonides [1, 2006.01]
15/01 • Hydrogen peroxide **[3, 2006.01]**
15/013 • • Separation; Purification; Concentration **[3, 2006.01]**
15/017 • • • Anhydrous hydrogen peroxide; Anhydrous solutions or gaseous mixtures containing hydrogen peroxide **[3, 2006.01]**
15/022 • • Preparation from organic compounds **[2, 2006.01]**
15/023 • • • by the alkyl-anthraquinone process **[3, 2006.01]**
15/024 • • • from hydrocarbons **[3, 2006.01]**
15/026 • • • from alcohols **[3, 2006.01]**
15/027 • • Preparation from water **[3, 2006.01]**
15/029 • • Preparation from hydrogen and oxygen **[3, 2006.01]**
15/03 • • Preparation from inorganic peroxy-compounds, e.g. from peroxysulfates **[3, 2006.01]**
15/032 • • • from metal peroxides **[3, 2006.01]**
15/037 • • Stabilisation by additives **[3, 2006.01]**
15/04 • Metal peroxides or peroxyhydrates thereof; Superoxides; Ozonides **[1, 3, 2006.01]**
15/043 • • of alkali metals, alkaline earth metals or of magnesium **[2, 3, 2006.01]**
15/047 • • of heavy metals **[2, 3, 2006.01]**
15/055 • Peroxyhydrates (C01B 15/04 takes precedence); Peroxyacids or salts thereof **[3, 2006.01]**
15/06 • • containing sulfur **[1, 3, 2006.01]**
15/08 • • • Peroxysulfates **[1, 3, 2006.01]**
15/10 • • containing carbon **[1, 3, 2006.01]**
15/12 • • containing boron **[1, 3, 2006.01]**
15/14 • • containing silicon **[1, 3, 2006.01]**
15/16 • • containing phosphorus **[1, 3, 2006.01]**

17/00 Sulfur; Compounds thereof [1, 2006.01]
17/02 • Preparation of sulfur; Purification **[1, 2006.01]**
17/027 • • Recovery of sulfur from material containing elemental sulfur, e.g. luxmasses; Purification **[3, 2006.01]**
17/033 • • • using a liquid extractant **[3, 2006.01]**
17/04 • • from gaseous sulfur compounds including gaseous sulfides **[1, 2006.01]**
17/05 • • • by wet processes **[3, 2006.01]**
17/06 • • from non-gaseous sulfides or materials containing such sulfides, e.g. ores **[1, 2006.01]**
17/10 • • Finely-divided sulfur, e.g. sublimed sulfur, flowers of sulfur **[1, 2006.01]**
17/12 • • Insoluble sulfur (mu-sulfur) **[1, 2006.01]**
17/16 • Hydrogen sulfides **[1, 2006.01]**
17/18 • • Hydrogen polysulfides **[1, 2006.01]**
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, see the relevant groups of subclasses C01F or C01G, according to the metal) **[1, 2006.01]**
17/22 • Alkali metal sulfides or polysulfides **[1, 2006.01]**
17/24 • • Preparation by reduction **[1, 2006.01]**
17/26 • • • with carbon **[1, 2006.01]**
17/28 • • • with reducing gases **[1, 2006.01]**
17/30 • • Preparation from sodium or potassium amalgam with sulfur or sulfides **[1, 2006.01]**
17/32 • • Hydrosulfides of sodium or potassium **[1, 2006.01]**
17/34 • • Polysulfides of sodium or potassium **[1, 2006.01]**
17/36 • • Purification **[1, 2006.01]**
17/38 • • Dehydration **[1, 2006.01]**
17/40 • • Making shaped products, e.g. granules **[1, 2006.01]**
17/42 • Sulfides or polysulfides of magnesium, calcium, strontium, or barium **[1, 2006.01]**
17/43 • • from oxides or hydroxides with sulfur or hydrogen sulfide **[1, 2006.01]**
17/44 • • by reduction of sulfates **[1, 2006.01]**
17/45 • Compounds containing sulfur and halogen, with or without oxygen **[1, 2006.01]**
17/46 • Compounds containing sulfur, halogen, hydrogen, and oxygen **[1, 2006.01]**
17/48 • Sulfur dioxide; Sulfurous acid **[1, 2006.01]**
17/50 • • Preparation of sulfur dioxide **[1, 2006.01]**
17/52 • • • by roasting sulfides (preliminary treatment of ores or scrap C22B 1/00) **[1, 2006.01]**
17/54 • • • by burning elemental sulfur **[1, 2006.01]**
17/56 • • • Separation; Purification **[1, 2006.01]**
17/58 • • • Recovery of sulfur dioxide from acid tar or the like **[1, 2006.01]**
17/60 • • • Isolation of sulfur dioxide from gases **[1, 2006.01]**
17/62 • Methods of preparing sulfites in general (particular individual sulfites, see the relevant groups of subclasses C01B-C01G, according to the cation) **[1, 2006.01]**
17/64 • Thiosulfates; Dithionites; Polythionates **[1, 2006.01]**
17/66 • • Dithionites **[1, 2006.01]**
17/69 • Sulfur trioxide; Sulfuric acid **[3, 2006.01]**
17/70 • • Stabilisation of gamma-form sulfur trioxide **[1, 2006.01]**
17/74 • • Preparation **[1, 3, 2006.01]**
17/76 • • • by contact processes **[1, 2006.01]**
17/765 • • • • Multi-stage SO_3-conversion **[3, 2006.01]**
17/77 • • • • Fluidised-bed processes **[3, 2006.01]**
17/775 • • • • Liquid phase contacting processes or wet catalysis processes **[3, 2006.01]**
17/78 • • • • characterised by the catalyst used **[1, 2006.01]**
17/79 • • • • • containing vanadium **[3, 2006.01]**
17/80 • • • • Apparatus **[1, 2006.01]**
17/82 • • • of sulfuric acid using a nitrogen oxide process **[1, 2006.01]**
17/84 • • • • Chamber process **[1, 2006.01]**
17/86 • • • • Tower process **[1, 2006.01]**
17/88 • • Concentration of sulfuric acid **[1, 2006.01]**
17/90 • • Separation; Purification **[1, 2006.01]**
17/92 • • • Recovery from acid tar or the like **[1, 2006.01]**
17/94 • • • Recovery from nitration acids **[1, 2006.01]**

17/96 • Methods for the preparation of sulfates in general (particular individual sulfates, see the relevant groups of subclasses C01B-C01G, according to the cation) **[1, 2006.01]**

17/98 • Other compounds containing sulfur and oxygen (persulfuric acids C01B 15/06; persulfates C01B 15/08) **[1, 2006.01]**

19/00 Selenium; Tellurium; Compounds thereof [1, 2006.01]

19/02 • Elemental selenium or tellurium **[3, 2006.01]**

19/04 • Binary compounds **[3, 2006.01]**

21/00 Nitrogen; Compounds thereof [1, 2006.01]

21/02 • Preparation of nitrogen (by decomposition of ammonia C01B 3/04) **[1, 2006.01]**

21/04 • Purification or separation of nitrogen (by liquefying F25J) **[1, 2006.01]**

21/06 • Binary compounds of nitrogen with metals, with silicon, or with boron **[1, 2006.01]**

21/064 • • with boron **[3, 2006.01]**

21/068 • • with silicon **[3, 2006.01]**

21/072 • • with aluminium **[3, 2006.01]**

21/076 • • with titanium or zirconium **[3, 2006.01]**

21/08 • Hydrazoic acid; Azides; Halogen azides **[1, 2006.01]**

21/082 • Compounds containing nitrogen and non-metals (C01B 21/06, C01B 21/08 take precedence) **[3, 2006.01]**

21/083 • • containing one or more halogen atoms **[3, 2006.01]**

21/084 • • • containing also one or more oxygen atoms, e.g. nitrosyl halides **[3, 2006.01]**

21/086 • • containing one or more sulfur atoms **[3, 2006.01]**

21/087 • • containing one or more hydrogen atoms **[3, 2006.01]**

21/088 • • • containing also one or more halogen atoms **[3, 2006.01]**

21/09 • • • • Halogeno-amines, e.g. chloramine **[3, 2006.01]**

21/092 • • • containing also one or more metal atoms **[3, 2006.01]**

21/093 • • • containing also one or more sulfur atoms **[3, 2006.01]**

21/094 • • • • Nitrosyl containing acids **[3, 2006.01]**

21/096 • • • • Amidosulfonic acid; Salts thereof **[3, 2006.01]**

21/097 • • containing phosphorus atoms **[3, 2006.01]**

21/098 • • • Phosphonitrilic dihalides; Polymers thereof **[3, 2006.01]**

21/12 • • Carbamic acid; Salts thereof **[1, 2006.01]**

21/14 • • Hydroxylamine; Salts thereof **[1, 2006.01]**

21/16 • • Hydrazine; Salts thereof **[1, 2006.01]**

21/20 • Nitrogen oxides; Oxyacids of nitrogen; Salts thereof **[1, 2006.01]**

21/22 • • Nitrous oxide (N_2O) **[1, 2006.01]**

21/24 • • Nitric oxide (NO) **[1, 2006.01]**

21/26 • • • Preparation by catalytic oxidation of ammonia **[1, 2006.01]**

21/28 • • • • Apparatus **[1, 2006.01]**

21/30 • • • Preparation by oxidation of nitrogen **[1, 2006.01]**

21/32 • • • • Apparatus **[1, 2006.01]**

21/34 • • Nitrogen trioxide (N_2O_3) **[1, 2006.01]**

21/36 • • Nitrogen dioxide (NO_2, N_2O_4) (C01B 21/26, C01B 21/30 take precedence) **[1, 2006.01]**

21/38 • • Nitric acid **[1, 2006.01]**

21/40 • • • Preparation by absorption of oxides of nitrogen **[1, 2006.01]**

21/42 • • • Preparation from nitrates **[1, 2006.01]**

21/44 • • • Concentration **[1, 2006.01]**

21/46 • • • Purification; Separation **[1, 2006.01]**

21/48 • • Methods for the preparation of nitrates in general (particular individual nitrates, see the relevant groups of subclasses C01B-C01G, according to the cation) **[1, 2006.01]**

21/50 • • Nitrous acid; Salts thereof **[1, 2006.01]**

23/00 Noble gases; Compounds thereof (liquefying F25J) **[1, 2006.01]**

25/00 Phosphorus; Compounds thereof (C01B 21/00, C01B 23/00 take precedence; perphosphates C01B 15/16) **[1, 3, 2006.01]**

25/01 • Treating phosphate ores or other raw phosphate materials to obtain phosphorus or phosphorus compounds **[2, 2006.01]**

25/02 • Preparation of phosphorus **[1, 2006.01]**

25/023 • • of red phosphorus **[2, 2006.01]**

25/027 • • of yellow phosphorus **[2, 2006.01]**

25/04 • Purification of phosphorus **[1, 2006.01]**

25/043 • • of red phosphorus **[2, 2006.01]**

25/047 • • of yellow phosphorus **[2, 2006.01]**

25/06 • Hydrogen phosphides **[1, 2006.01]**

25/08 • Other phosphides **[1, 2006.01]**

25/10 • Halides or oxyhalides of phosphorus **[1, 2, 2006.01]**

25/12 • Oxides of phosphorus **[1, 2006.01]**

25/14 • Sulfur, selenium, or tellurium compounds of phosphorus **[1, 2006.01]**

25/16 • Oxyacids of phosphorus; Salts thereof (peroxyacids or salts thereof C01B 15/00) **[1, 2006.01]**

25/163 • • Phosphorous acid; Salts thereof **[2, 2006.01]**

25/165 • • Hypophosphorous acid; Salts thereof **[2, 2006.01]**

25/168 • • Pyrophosphorous acid; Salts thereof **[2, 2006.01]**

25/18 • • Phosphoric acid **[1, 2006.01]**

25/20 • • • Preparation from elemental phosphorus or phosphoric anhydride **[1, 2006.01]**

25/22 • • • Preparation by reacting phosphate containing material with an acid, e.g. wet process **[1, 2006.01]**

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, 2006.01]**

25/223 • • • • • only one form of calcium sulfate being formed **[3, 2006.01]**

25/225 • • • • • • Dihydrate process **[3, 2006.01]**

25/226 • • • • • • Hemihydrate process **[3, 2006.01]**

25/228 • • • • • one form of calcium sulfate being formed and then converted to another form **[3, 2006.01]**

25/229 • • • • • • Hemihydrate-dihydrate process **[3, 2006.01]**

25/231 • • • • • • Dihydrate-hemihydrate process **[3, 2006.01]**

25/232 • • • • • Preparation by reacting phosphate containing material with concentrated sulfuric acid and subsequently lixiviating the obtained mass, e.g. clincker process **[3, 2006.01]**

25/234 • • • Purification; Stabilisation; Concentration (purification concomitant with preparation C01B 25/22; preparation involving solvent-solvent extraction C01B 25/46) **[3, 2006.01]**
25/235 • • • • Clarification; Stabilisation to prevent post-precipitation of dissolved impurities **[3, 2006.01]**
25/237 • • • • Selective elimination of impurities **[3, 2006.01]**
25/238 • • • • • Cationic impurities **[3, 2006.01]**
25/24 • • Condensed phosphoric acids **[1, 2006.01]**
25/26 • • Phosphates (perphosphates C01B 15/16) **[1, 2006.01]**
25/28 • • • Ammonium phosphates **[1, 2006.01]**
25/30 • • • Alkali metal phosphates **[1, 2006.01]**
25/32 • • • Phosphates of magnesium, calcium, strontium, or barium **[1, 2006.01]**
25/34 • • • • Magnesium phosphates **[1, 2006.01]**
25/36 • • • Aluminium phosphates **[1, 2006.01]**
25/37 • • • Phosphates of heavy metals **[2, 2006.01]**
25/38 • • • Condensed phosphates **[1, 2006.01]**
25/39 • • • • of alkali metals **[3, 2006.01]**
25/40 • • • • Polyphosphates **[2, 2006.01]**
25/41 • • • • • of alkali metals **[3, 2006.01]**
25/42 • • • • Pyrophosphates **[2, 2006.01]**
25/44 • • • • Metaphosphates **[2, 2006.01]**
25/445 • • • • • of alkali metals **[3, 2006.01]**
25/45 • • • containing plural metal, or metal and ammonium **[3, 2006.01]**
25/455 • • • containing halogen **[3, 2006.01]**
25/46 • • Preparation involving solvent-solvent extraction **[2, 2006.01]**

32/00 Carbon; Compounds thereof (C01B 21/00, C01B 23/00 take precedence; percarbonates C01B 15/10; carbon black C09C 1/48) **[2017.01]**
32/05 • Preparation or purification of carbon not covered by groups C01B 32/15, C01B 32/20, C01B 32/25, C01B 32/30 **[2017.01]**
32/10 • Carbon fluorides, e.g. $[CF]_n$ or $[C_2F]_n$ (graphite intercalation thereof C01B 32/22) **[2017.01]**
32/15 • Nanosized carbon materials **[2017.01]**
32/152 • • Fullerenes **[2017.01]**
32/154 • • • Preparation **[2017.01]**
32/156 • • • After-treatment **[2017.01]**
32/158 • • Carbon nanotubes **[2017.01]**
32/159 • • • single-walled **[2017.01]**
32/16 • • • Preparation **[2017.01]**
32/162 • • • • characterised by catalysts **[2017.01]**
32/164 • • • • involving continuous processes **[2017.01]**
32/166 • • • • in liquid phase **[2017.01]**
32/168 • • • After-treatment **[2017.01]**
32/17 • • • • Purification **[2017.01]**
32/172 • • • • Sorting **[2017.01]**
32/174 • • • • Derivatisation; Solubilisation; Dispersion in solvents **[2017.01]**
32/176 • • • • Cutting **[2017.01]**
32/178 • • • • Opening; Filling **[2017.01]**
32/18 • • Nanoonions; Nanoscrolls; Nanohorns; Nanocones; Nanowalls **[2017.01]**
32/182 • • Graphene **[2017.01]**
32/184 • • • Preparation **[2017.01]**
32/186 • • • • by chemical vapour deposition [CVD] **[2017.01]**
32/188 • • • • by epitaxial growth **[2017.01]**
32/19 • • • • by exfoliation **[2017.01]**
32/192 • • • • • starting from graphitic oxides **[2017.01]**
32/194 • • • After-treatment **[2017.01]**
32/196 • • • • Purification **[2017.01]**
32/198 • • • Graphene oxide **[2017.01]**
32/20 • Graphite **[2017.01]**
32/205 • • Preparation **[2017.01]**
32/21 • • After-treatment **[2017.01]**
32/215 • • • Purification; Recovery or purification of graphite formed in iron making, e.g. kish graphite **[2017.01]**
32/22 • • • Intercalation **[2017.01]**
32/225 • • • • Expansion; Exfoliation **[2017.01]**
32/23 • • • Oxidation **[2017.01]**
32/25 • Diamond **[2017.01]**
32/26 • • Preparation (by using ultra-high pressure B01J 3/06; by crystal growth C30B 29/04) **[2017.01]**
32/28 • • After-treatment, e.g. purification, irradiation, separation or recovery **[2017.01]**
32/30 • Active carbon **[2017.01]**
32/306 • • with molecular sieve properties **[2017.01]**
32/312 • • Preparation **[2017.01]**
32/318 • • • characterised by the starting materials **[2017.01]**
32/324 • • • • from waste materials, e.g. tyres or spent sulfite pulp liquor **[2017.01]**
32/33 • • • • from distillation residues of coal or petroleum; from petroleum acid sludge **[2017.01]**
32/336 • • • characterised by gaseous activating agents **[2017.01]**
32/342 • • • characterised by non-gaseous activating agents **[2017.01]**
32/348 • • • • Metallic compounds **[2017.01]**
32/354 • • After-treatment **[2017.01]**
32/36 • • • Reactivation or regeneration **[2017.01]**
32/366 • • • • by physical processes, e.g. by irradiation, by using electric current passing through carbonaceous feedstock or by using recyclable inert heating bodies **[2017.01]**
32/372 • • • Coating; Grafting; Microencapsulation **[2017.01]**
32/378 • • • Purification **[2017.01]**
32/384 • • • Granulation **[2017.01]**

Note(s) [2017.01]

In this group, the term “granulation” also covers methods of preparation of active carbon using carbonaceous precursors per se and binders, e.g. pitch.

32/39 • • Apparatus for the preparation thereof **[2017.01]**
32/40 • Carbon monoxide **[2017.01]**
32/50 • Carbon dioxide **[2017.01]**
32/55 • • Solidifying **[2017.01]**
32/60 • Preparation of carbonates or bicarbonates in general (of percarbonates C01B 15/10; of specific carbonates or bicarbonates according to the cation C01B-C01G) **[2017.01]**
32/70 • Compounds containing carbon and sulfur, e.g. thiophosgene **[2017.01]**
32/72 • • Carbon disulfide **[2017.01]**
32/75 • • • Preparation by reacting sulfur or sulfur compounds with hydrocarbons **[2017.01]**
32/77 • • Carbon oxysulfide **[2017.01]**
32/80 • Phosgene **[2017.01]**

32/90 • Carbides **[2017.01]**
32/907 • • Oxycarbides; Sulfocarbides; Mixture of carbides **[2017.01]**
32/914 • • Carbides of single elements **[2017.01]**
32/921 • • • Titanium carbide **[2017.01]**
32/928 • • • Carbides of actinides **[2017.01]**
32/935 • • • Carbides of alkali metals, strontium, barium or magnesium **[2017.01]**
32/942 • • • Calcium carbide **[2017.01]**
32/949 • • • Tungsten or molybdenum carbides **[2017.01]**
32/956 • • • Silicon carbide **[2017.01]**
32/963 • • • • Preparation from compounds containing silicon **[2017.01]**
32/97 • • • • • Preparation from SiO or SiO_2 **[2017.01]**
32/977 • • • • • Preparation from organic compounds containing silicon **[2017.01]**
32/984 • • • • • Preparation from elemental silicon **[2017.01]**
32/991 • • • Boron carbide **[2017.01]**

33/00 **Silicon; Compounds thereof** (C01B 21/00, C01B 23/00 take precedence; persilicates C01B 15/14; carbides C01B 32/956) **[1, 3, 2006.01]**
33/02 • Silicon (forming single crystals or homogeneous polycrystalline material with defined structure C30B) **[1, 5, 2006.01]**
33/021 • • Preparation (chemical coating from the vapour phase C23C 16/00) **[5, 2006.01]**
33/023 • • • by reduction of silica or silica-containing material **[5, 2006.01]**
33/025 • • • • with carbon or a solid carbonaceous material, i.e. carbo-thermal process **[5, 2006.01]**
33/027 • • • by decomposition or reduction of gaseous or vaporised silicon compounds other than silica or silica-containing material **[5, 2006.01]**
33/029 • • • • by decomposition of monosilane **[5, 2006.01]**
33/03 • • • • by decomposition of silicon halides or halosilanes or reduction thereof with hydrogen as the only reducing agent **[5, 2006.01]**
33/031 • • • • • by decomposition of silicon tetraiodide **[5, 2006.01]**
33/033 • • • • by reduction of silicon halides or halosilanes with a metal or a metallic alloy as the only reducing agents **[5, 2006.01]**
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, 2006.01]**
33/037 • • Purification (by zone-melting C30B 13/00) **[5, 2006.01]**
33/039 • • • by conversion of the silicon into a compound, optional purification of the compound, and reconversion into silicon **[5, 2006.01]**
33/04 • Hydrides of silicon **[1, 2006.01]**
33/06 • Metal silicides **[1, 2006.01]**
33/08 • Compounds containing halogen **[1, 2006.01]**
33/10 • • Compounds containing silicon, fluorine, and other elements **[1, 2006.01]**
33/107 • • Halogenated silanes **[3, 2006.01]**
33/113 • Silicon oxides; Hydrates thereof **[3, 2006.01]**
33/12 • • Silica; Hydrates thereof, e.g. lepidoic silicic acid **[1, 3, 2006.01]**
33/14 • • • Colloidal silica, e.g. dispersions, gels, sols **[1, 3, 2006.01]**
33/141 • • • • Preparation of hydrosols or aqueous dispersions **[3, 2006.01]**
33/142 • • • • • by acidic treatment of silicates **[3, 2006.01]**
33/143 • • • • • • of aqueous solutions of silicates **[3, 2006.01]**
33/145 • • • • Preparation of hydroorganosols, organosols or dispersions in an organic medium **[3, 2006.01]**
33/146 • • • • After-treatment of sols (preparation of hydroorganosols, organosols or dispersions in an organic medium from hydrosols C01B 33/145) **[3, 2006.01]**
33/148 • • • • • Concentration; Drying; Dehydration; Stabilisation; Purification **[3, 2006.01]**
33/149 • • • • • Coating **[3, 2006.01]**
33/151 • • • • • by progressively adding a sol to a different sol, i.e. "build up" of particles using a "heel" **[3, 2006.01]**
33/152 • • • • Preparation of hydrogels **[3, 2006.01]**
33/154 • • • • • by acidic treatment of aqueous silicate solutions **[3, 2006.01]**
33/155 • • • • Preparation of hydroorganogels or organogels **[3, 2006.01]**
33/157 • • • • After-treatment of gels **[3, 2006.01]**
33/158 • • • • • Purification; Drying; Dehydrating **[3, 2006.01]**
33/159 • • • • • Coating or hydrophobisation **[3, 2006.01]**
33/16 • • • Preparation of silica xerogels **[1, 3, 2006.01]**
33/18 • • • Preparation of finely divided silica neither in sol nor in gel form; After-treatment thereof (treatment to enhance the pigmenting or filling properties C09C) **[1, 3, 2006.01]**
33/187 • • • • by acidic treatment of silicates **[3, 2006.01]**
33/193 • • • • • of aqueous solutions of silicates **[3, 2006.01]**
33/20 • Silicates (persilicates C01B 15/14) **[1, 2006.01]**
33/22 • • Magnesium silicates **[1, 2006.01]**
33/24 • • Alkaline earth metal silicates **[1, 2006.01]**
33/26 • • Aluminium-containing silicates **[1, 5, 2006.01]**
33/32 • • Alkali metal silicates (C01B 33/26 takes precedence) **[1, 3, 2006.01]**
33/36 • • having base-exchange properties but not having molecular sieve properties **[6, 2006.01]**
33/38 • • • Layered base-exchange silicates, e.g. clays, micas or alkali metal silicates of kenyaite or magadiite type **[6, 2006.01]**
33/40 • • • • Clays **[6, 2006.01]**
33/42 • • • • Micas **[6, 2006.01]**
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, 2006.01]**
33/46 • • • Amorphous silicates, e.g. so-called "amorphous zeolites" **[6, 2006.01]**

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 32/991) **[1, 2, 2006.01]**

35/02 • Boron; Borides **[2, 2006.01]**
35/04 • • Metal borides **[2, 2006.01]**
35/06 • Boron halogen compounds **[2, 2006.01]**
35/08 • Compounds containing boron and nitrogen, phosphorus, oxygen, sulfur, selenium or tellurium **[2, 2006.01]**
35/10 • • Compounds containing boron and oxygen (C01B 35/06 takes precedence) **[2, 2006.01]**
35/12 • • • Borates **[2, 2006.01]**
35/14 • • Compounds containing boron and nitrogen, phosphorus, sulfur, selenium or tellurium **[2, 2006.01]**
35/16 • Compounds containing direct bonding between two boron atoms, e.g. $Cl_2B—BCl_2$ **[2, 2006.01]**
35/18 • Compounds containing three or more boron atoms, e.g. NaB_3H_8, $MgB_{10}Br_{10}$ (borazoles C01B 35/14) **[2, 2006.01]**

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, 2006.01]

37/02 • Crystalline silica-polymorphs, e.g. silicalites **[6, 2006.01]**
37/04 • Aluminophosphates [APO compounds] **[6, 2006.01]**
37/06 • Aluminophosphates containing other elements, e.g. metals, boron **[6, 2006.01]**
37/08 • • Silicoaluminophosphates [SAPO compounds] **[6, 2006.01]**

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) **[6, 2006.01]**

Note(s) [6]

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

- "zeolites" means:
  i. crystalline aluminosilicates with base-exchange and molecular sieve properties, having three dimensional, microporous lattice framework structure of tetrahedral oxide units;
  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.

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, 2006.01]**
39/04 • • using at least one organic template directing agent, e.g. an ionic quaternary ammonium compound or an aminated compound **[6, 2006.01]**
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, 2006.01]**
39/08 • • • the aluminium atoms being wholly replaced **[6, 2006.01]**
39/10 • • • the replacing atoms being phosphorus atoms **[6, 2006.01]**
39/12 • • • the replacing atoms being boron atoms **[6, 2006.01]**
39/14 • • Type A **[6, 2006.01]**
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, 2006.01]**
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, 2006.01]**
39/20 • • Faujasite type, e.g. type X or Y **[6, 2006.01]**
39/22 • • • Type X **[6, 2006.01]**
39/24 • • • Type Y **[6, 2006.01]**
39/26 • • Mordenite type **[6, 2006.01]**
39/28 • • Phillipsite or harmotome type, e.g. type B **[6, 2006.01]**
39/30 • • Erionite or offretite type, e.g. zeolite T **[6, 2006.01]**
39/32 • • Type L **[6, 2006.01]**
39/34 • • Type ZSM-4 or type Ω **[6, 2006.01]**
39/36 • • Pentasil type, e.g. types ZSM-5, ZSM-8 or ZSM-11 **[6, 2006.01]**
39/38 • • • Type ZSM-5 **[6, 2006.01]**
39/40 • • • • using at least one organic template directing agent **[6, 2006.01]**
39/42 • • Type ZSM-12 **[6, 2006.01]**
39/44 • • Ferrierite type, e.g. types ZSM-21, ZSM-35 or ZSM-38 **[6, 2006.01]**
39/46 • • Other types characterised by their X-ray diffraction pattern and their defined composition **[6, 2006.01]**
39/48 • • • using at least one organic template directing agent **[6, 2006.01]**
39/50 • Zeolites wherein inorganic bases or salts occlude channels in the lattice framework, e.g. sodalite, cancrinite, nosean, hauynite **[6, 2006.01]**
39/52 • • Sodalites **[6, 2006.01]**
39/54 • Phosphates, e.g. APO or SAPO compounds **[6, 2006.01]**