

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

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 omitted)

C01G COMPOUNDS CONTAINING METALS NOT COVERED BY SUBCLASSES [C01D](#) OR [C01F](#) (metal hydrides {monoborane, diborane or addition complexes thereof} [C01B 6/00](#); salts of oxyacids of halogens [C01B 11/00](#); peroxides, salts or 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](#); {compounds containing nitrogen, other non-metals and metal [C01B 21/082](#)}; metal amides [C01B 21/092](#); nitrites [C01B 21/50](#); {compounds of noble gases [C01B 23/0005](#)}; phosphides [C01B 25/08](#); salts of oxyacids of phosphorus [C01B 25/16](#); carbides [C01B 32/90](#); 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 cyanamide [C01C 3/16](#); thiocyanates [C01C 3/20](#))

1/00 Methods of preparing compounds of metals not covered by subclasses [C01B](#), [C01C](#), [C01D](#), or [C01F](#), in general (electrolytic production of inorganic compounds [C25B 1/00](#))

- 1/02 . Oxides
- 1/04 . Carbonyls
- 1/06 . Halides
- 1/08 . Nitrates
- 1/10 . Sulfates
- 1/12 . Sulfides
- 1/14 . Sulfites

3/00 Compounds of copper

- 3/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 3/006 . {Compounds containing, besides copper, two or more other elements, with the exception of oxygen or hydrogen}
- 3/02 . Oxides; Hydroxides
- 3/04 . Halides
- 3/05 . . Chlorides
- 3/06 . . Oxychlorides
- 3/08 . Nitrates
- 3/10 . Sulfates
- 3/12 . Sulfides
- 3/14 . Complexes with ammonia

5/00 Compounds of silver

- 5/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}

- 5/006 . {Compounds containing, besides silver, two or more other elements, with the exception of oxygen or hydrogen}

- 5/02 . Halides

7/00 Compounds of gold

- 7/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}

- 7/006 . {Compounds containing, besides gold, two or more other elements, with the exception of oxygen or hydrogen}

9/00 Compounds of zinc

- 9/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}

- 9/006 . {Compounds containing, besides zinc, two or more other elements, with the exception of oxygen or hydrogen}

- 9/02 . Oxides; Hydroxides

- 9/03 . . Processes of production using dry methods, e.g. vapour phase processes

- 9/04 . Halides

- 9/06 . Sulfates

- 9/08 . Sulfides

11/00 Compounds of cadmium

- 11/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 11/006 . {Compounds containing, besides cadmium, two or more other elements, with the exception of oxygen or hydrogen}
- 11/02 . Sulfides
- 13/00 Compounds of mercury**
- 13/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 13/006 . {Compounds containing, besides mercury, two or more other elements, with the exception of oxygen or hydrogen}
- 13/02 . Oxides
- 13/04 . Halides
- 15/00 Compounds of gallium, indium or thallium**
- 15/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 15/006 . {Compounds containing, besides gallium, indium, or thallium, two or more other elements, with the exception of oxygen or hydrogen}
- 17/00 Compounds of germanium**
- 17/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 17/006 . {Compounds containing, besides germanium, two or more other elements, with the exception of oxygen or hydrogen}
- 17/02 . Germanium dioxide
- 17/04 . Halides of germanium
- 19/00 Compounds of tin**
- 19/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 19/006 . {Compounds containing, besides tin, two or more other elements, with the exception of oxygen or hydrogen}
- 19/02 . Oxides
- 19/04 . Halides
- 19/06 . . Stannous chloride
- 19/08 . . Stannic chloride
- 21/00 Compounds of lead**
- 21/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 21/006 . {Compounds containing, besides lead, two or more other elements, with the exception of oxygen or hydrogen}
- 21/02 . Oxides
- 21/04 . . Lead suboxide (Pb_2O)
- 21/06 . . Lead monoxide (PbO)
- 21/08 . . Lead dioxide (PbO_2)
- 21/10 . . Red lead (Pb_3O_4)
- 21/12 . Hydroxides
- 21/14 . Carbonates
- 21/16 . Halides
- 21/18 . Nitrates
- 21/20 . Sulfates
- 21/21 . Sulfides
- 21/22 . Plumbates; Plumbites
- 23/00 Compounds of titanium** {(preparation of Ti-compounds from ores or scraps C22B 34/12)}
- 23/001 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 23/002 . {Compounds containing, besides titanium, two or more other elements, with the exception of oxygen or hydrogen (C01G 23/001, C01G 23/003 take precedence)}
- WARNING**
- Group C01G 23/002 is impacted by reclassification into group C01G 23/003.
- Groups C01G 23/002 and C01G 23/003 should be considered in order to perform a complete search .
- 23/003 . {Titanates (C01G 23/001 takes precedence)}
- WARNING**
- Group C01G 23/003 is incomplete pending reclassification from group C01G 23/002.
- Groups C01G 23/002 and C01G 23/003 should be considered in order to perform a complete search .
- 23/005 . . {Alkali titanates}
- 23/006 . . {Alkaline earth titanates}
- 23/007 . {Titanium sulfides (C01G 23/001 takes precedence)}
- 23/008 . {Titanium- and titanyl sulfate (C01G 23/001 takes precedence)}
- 23/02 . Halides of titanium
- 23/022 . . {Titanium tetrachloride}
- 23/024 . . . {Purification of tetrachloride}
- 23/026 . . {Titanium trichloride}
- 23/028 . . {Titanium fluoride}
- 23/04 . Oxides; Hydroxides
- 23/043 . . {Titanium sub-oxides}
- 23/047 . . Titanium dioxide
- 23/0475 . . . {Purification}
- 23/053 . . . Producing by wet processes, e.g. hydrolysing titanium salts
- 23/0532 {by hydrolysing sulfate-containing salts}
- 23/0534 {in the presence of seeds}
- 23/0536 {by hydrolysing chloride-containing salts}
- 23/0538 {in the presence of seeds}
- 23/07 . . . Producing by vapour phase processes, e.g. halide oxidation
- 23/075 {Evacuation and cooling of the gaseous suspension containing the oxide; Desacidification and elimination of gases occluded in the separated oxide}
- 23/08 . . . Drying; Calcining {; After treatment of titanium oxide}
- 25/00 Compounds of zirconium**
- 25/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 25/006 . {Compounds containing, besides zirconium, two or more other elements, with the exception of oxygen or hydrogen}
- 25/02 . Oxides
- 25/04 . Halides
- 25/06 . Sulfates
- 27/00 Compounds of hafnium**
- 27/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}

27/006	• {Compounds containing, besides hafnium, two or more other elements, with the exception of oxygen or hydrogen}	33/006	• {Compounds containing, besides niobium, two or more other elements, with the exception of oxygen or hydrogen}
27/02	• Oxides	35/00	Compounds of tantalum
27/04	• Halides	35/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
27/06	• Sulfates	35/006	• {Compounds containing, besides tantalum, two or more other elements, with the exception of oxygen or hydrogen}
28/00	Compounds of arsenic	35/02	• Halides
28/001	• {Preparation involving a solvent-solvent extraction, an adsorption or an ion-exchange}	37/00	Compounds of chromium
28/002	• {Compounds containing, besides arsenic, two or more other elements, with the exception of oxygen or hydrogen (C01G 28/001 takes precedence)}	37/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
28/004	• . {containing halogen}	37/006	• {Compounds containing, besides chromium, two or more other elements, with the exception of oxygen or hydrogen}
28/005	• {Oxides; Hydroxides; Oxyacids (C01G 28/001 takes precedence)}	37/02	• Oxides or hydrates thereof
28/007	• {Halides (C01G 28/001 takes precedence)}	37/027	• . Chromium dioxide
28/008	• {Sulfides (C01G 28/001 takes precedence)}	37/033	• . Chromium trioxide; Chromic acid
28/02	• Arsenates; Arsenites {(C01G 28/001 takes precedence)}	37/04	• Chromium halides
28/023	• . {of ammonium, alkali or alkaline-earth metals or magnesium}	37/06	• . Chromylhalides
28/026	• . {containing at least two metals}	37/08	• Chromium sulfates
29/00	Compounds of bismuth	37/10	• . Chrome alum
29/003	• {Preparations involving a liquid-liquid extraction, an adsorption or an ion-exchange}	37/14	• Chromates; Bichromates
29/006	• {Compounds containing, besides bismuth, two or more other elements, with the exception of oxygen or hydrogen}	39/00	Compounds of molybdenum
30/00	Compounds of antimony	39/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
30/001	• {Preparation involving a solvent-solvent extraction, an adsorption or an ion-exchange}	39/006	• {Compounds containing, besides molybdenum, two or more other elements, with the exception of oxygen or hydrogen}
30/002	• {Compounds containing, besides antimony, two or more other elements, with the exception of oxygen or hydrogen (C01G 30/001 takes precedence)}	39/02	• Oxides; Hydroxides
30/003	• . {containing halogen}	39/04	• Halides
30/004	• {Oxides; Hydroxides; Oxyacids (C01G 30/001 takes precedence)}	39/06	• Sulfides
30/005	• . {Oxides}	41/00	Compounds of tungsten
30/006	• {Halides (C01G 30/001 takes precedence)}	41/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
30/007	• . {of binary type SbX ₃ or SbX ₅ with X representing a halogen, or mixed of the type SbX ₃ X' ₂ with X, X' representing different halogens}	41/006	• {Compounds containing, besides tungsten, two or more other elements, with the exception of oxygen or hydrogen}
30/008	• {Sulfides (C01G 30/001 takes precedence)}	41/02	• Oxides; Hydroxides
30/02	• Antimonates; Antimonites {(C01G 30/001 takes precedence)}	41/04	• Halides
30/023	• . {of ammonium, alkali or alkaline-earth metals or magnesium}	43/00	Compounds of uranium
30/026	• . {containing at least two metals}	43/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
31/00	Compounds of vanadium	43/006	• {Compounds containing, besides uranium, two or more other elements, with the exception of oxygen or hydrogen}
31/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}	43/01	• Oxides; Hydroxides
31/006	• {Compounds containing, besides vanadium, two or more other elements, with the exception of oxygen or hydrogen}	43/025	• . Uranium dioxide
31/02	• Oxides	43/04	• Halides of uranium
31/04	• Halides	43/06	• . Fluorides
33/00	Compounds of niobium	43/063	• . . {Hexafluoride (UF ₆)}
33/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}	43/066	• . . . {Preparation}
		43/08	• . Chlorides
		43/10	• . Bromides
		43/12	• . Iodides
		45/00	Compounds of manganese
		45/003	• {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}

- 45/006 . {Compounds containing, besides manganese, two or more other elements, with the exception of oxygen or hydrogen ([manganates, manganites or permanganates C01G 45/12](#))}
- 45/02 . Oxides; Hydroxides
- 45/04 . Carbonyls
- 45/06 . Halides
- 45/08 . Nitrates
- 45/10 . Sulfates
- 45/12 . Manganates {manganites or} permanganates
- 45/1207 . . {Permanganates ([MnO]₄⁻) or manganates ([MnO]₄²⁻)}
- 45/1214 . . . {containing alkali metals}
- 45/1221 . . {Manganates or manganites with a manganese oxidation state of Mn(III), Mn(IV) or mixtures thereof}
- 45/1228 . . . {of the type [MnO₂]ⁿ⁻, e.g. LiMnO₂, Li[MxMn_{1-x}O₂]}
- 45/1235 . . . {of the type [Mn₂O₄]²⁻, e.g. Li₂Mn₂O₄, Li₂[MxMn_{2-x}O₄]}
- 45/1242 . . . {of the type [Mn₂O₄]⁻, e.g. LiMn₂O₄, Li[MxMn_{2-x}O₄]}
- 45/125 . . . {of the type [MnO₃]ⁿ⁻, e.g. Li₂MnO₃, Li₂[MxMn_{1-x}O₃], (La,Sr)MnO₃}
- 45/1257 {containing lithium, e.g. Li₂MnO₃, Li₂[MxMn_{1-x}O₃]}
- 45/1264 {containing rare earth, e.g. La_{1-x}CaxMnO₃, LaMnO₃}
- 45/1271 . . . {of the type [Mn₂O₈]ⁿ⁻, e.g. (LaSr₃)Mn₂O₈}
- 45/1278 . . . {of the type [Mn₂O₇]ⁿ⁻, e.g. (Sr_{2-x}Ndx)Mn₂O₇, Ti₂Mn₂O₇}
- 45/1285 . . . {of the type [Mn₂O₅]ⁿ⁻}
- 45/1292 . . . {of the type [Mn₅O₁₂]ⁿ⁻}
- 47/00 Compounds of rhenium**
- 47/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 47/006 . {Compounds containing, besides rhenium, two or more other elements, with the exception of oxygen or hydrogen}
- 49/00 Compounds of iron**
- 49/0009 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 49/0018 . {Mixed oxides or hydroxides, ([C01G 49/0009 takes precedence](#))}
- 49/0027 . . {containing one alkali metal}
- 49/0036 . . {containing one alkaline earth metal, magnesium or lead}
- 49/0045 . . {containing aluminium}
- 49/0054 . . {containing one rare earth metal, yttrium or scandium}
- 49/0063 . . {containing zinc}
- 49/0072 . . {containing manganese}
- 49/0081 . . {containing iron in unusual valence state [IV, V, VI]}
- 49/009 . {Compounds containing, besides iron, two or more other elements, with the exception of oxygen or hydrogen}
- 49/02 . Oxides; Hydroxides {([C01G 49/0018 takes precedence](#))}
- 49/04 . . Ferrous oxide (FeO)
- 49/06 . . Ferric oxide (Fe₂O₃)
- 49/08 . . Ferroso-ferric oxide (Fe₃O₄)

- 49/10 . Halides {([C01G 49/0018 takes precedence](#))}
- 49/12 . Sulfides {([C01G 49/0018 takes precedence](#))}
- 49/14 . Sulfates {([C01G 49/0018 takes precedence](#))}
- 49/16 . Carbonyls {([C01G 49/0018 takes precedence](#))}
- 51/00 Compounds of cobalt**
- 51/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 51/006 . {Compounds containing, besides cobalt, two or more other elements, with the exception of oxygen or hydrogen ([cobaltates C01G 51/40](#))}
- 51/02 . Carbonyls
- 51/04 . Oxides; Hydroxides
- 51/06 . Carbonates
- 51/08 . Halides
- 51/085 . . {Chlorides}
- 51/10 . Sulfates
- 51/12 . Complexes with ammonia
- 51/30 . {Sulfides}
- 51/40 . {Cobaltates}
- 51/42 . . {containing alkali metals, e.g. LiCoO₂}
- 51/44 . . . {containing manganese}
- 51/50 {of the type [MnO₂]ⁿ⁻, e.g. Li(CoxMn_{1-x})O₂, Li(MyCoxMn_{1-x-y})O₂}
- 51/52 {of the type [Mn₂O₄]²⁻, e.g. Li₂(CoxMn_{2-x})O₄, Li₂(MyCoxMn_{2-x-y})O₄}
- 51/54 {of the type [Mn₂O₄]⁻, e.g. Li(CoxMn_{2-x})O₄, Li(MyCoxMn_{2-x-y})O₄}
- 51/56 {of the type [MnO₃]²⁻, e.g. Li₂[CoxMn_{1-x}O₃], Li₂[MyCoxMn_{1-x-y}O₃]}
- 51/58 {of the type [Mn₂O₈]ⁿ⁻}
- 51/60 {of the type [Mn₂O₇]ⁿ⁻}
- 51/62 {of the type [Mn₂O₅]ⁿ⁻}
- 51/64 {of the type [Mn₅O₁₂]ⁿ⁻}
- 51/66 . . {containing alkaline earth metals, e.g. SrCoO₃}
- 51/68 . . . {containing rare earth, e.g. La_{0.3}Sr_{0.7}CoO₃}
- 51/70 . . {containing rare earth, e.g. LaCoO₃ ([C01G 51/68 takes precedence](#))}
- 53/00 Compounds of nickel**
- 53/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 53/006 . {Compounds containing, besides nickel, two or more other elements, with the exception of oxygen or hydrogen ([nickelates C01G 53/40](#))}
- 53/02 . Carbonyls
- 53/04 . Oxides; Hydroxides
- 53/06 . Carbonates
- 53/08 . Halides
- 53/09 . . Chlorides
- 53/10 . Sulfates
- 53/11 . Sulfides
- 53/12 . Complexes with ammonia
- 53/40 . {Nickelates}
- WARNING**
- Groups [C01G 53/40](#) - [C01G 53/70](#) are not complete pending a reorganisation, see also [C01G 53/006](#) and [C01G 53/00](#)
- 53/42 . . {containing alkali metals, e.g. LiNiO₂}
- 53/44 . . . {containing manganese}
- 53/50 {of the type [MnO₂]ⁿ⁻, e.g. Li(NixMn_{1-x})O₂, Li(MyNixMn_{1-x-y})O₂}

- 53/52 {of the type $[\text{Mn}_2\text{O}_4]^{2-}$, e.g. $\text{Li}_2(\text{NixMn}_{2-x})\text{O}_4$, $\text{Li}_2(\text{MyNixMn}_{2-x-y})\text{O}_4$ }
- 53/54 {of the type $[\text{Mn}_2\text{O}_4]^-$, e.g. $\text{Li}(\text{NixMn}_{2-x})\text{O}_4$, $\text{Li}(\text{MyNixMn}_{2-x-y})\text{O}_4$ }
- 53/56 {of the type $[\text{MnO}_3]^{2-}$, e.g. $\text{Li}_2[\text{NixMn}_{1-x}\text{O}_3]$, $\text{Li}_2[\text{MyNixMn}_{1-x-y}\text{O}_3]$ }
- 53/58 {of the type $[\text{Mn}_2\text{O}_8]^{n-}$ }
- 53/60 {of the type $[\text{Mn}_2\text{O}_7]^{n-}$ }
- 53/62 {of the type $[\text{Mn}_2\text{O}_5]^{n-}$ }
- 53/64 {of the type $[\text{Mn}_5\text{O}_{12}]^{n-}$ }
- 53/66 . . {containing alkaline earth metals, e.g. SrNiO_3 , SrNiO_2 }
- 53/68 . . . {containing rare earth, e.g. $\text{La}_{1.62}\text{Sr}_{0.38}\text{NiO}_4$ }
- 53/70 . . {containing rare earth, e.g. LaNiO_3 ([C01G 53/68 takes precedence](#))}
- 55/00 Compounds of ruthenium, rhodium, palladium, osmium, iridium, or platinum**
- 55/001 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 55/002 . {Compounds containing, besides ruthenium, rhodium, palladium, osmium, iridium, or platinum, two or more other elements, with the exception of oxygen or hydrogen ([C01G 55/007 takes precedence](#))}
- 55/004 . {Oxides; Hydroxides}
- 55/005 . {Halides}
- 55/007 . {Compounds containing at least one carbonyl group}
- 55/008 . . {Carbonyls}
- 56/00 Compounds of transuranic elements**
- 56/001 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 56/002 . . {by adsorption or by ion-exchange on a solid support}
- 56/003 . {Compounds comprising, besides transuranic elements, two or more other elements, with the exception of oxygen or hydrogen ([C01G 56/001 takes precedence](#))}
- 56/004 . {Compounds of plutonium ([C01G 56/001 takes precedence](#))}
- 56/005 . . {Oxides; Hydroxides}
- 56/006 . . {Halides}
- 56/007 . {Compounds of transuranic elements ([C01G 56/001 and C01G 56/004 take precedence](#))}
- 56/008 . . {Compounds of neptunium}
- 56/009 . . {Compounds of americium}
- 99/00 Subject matter not provided for in other groups of this subclass**
- 99/003 . {Preparation involving a liquid-liquid extraction, an adsorption or an ion-exchange}
- 99/006 . {Compounds containing, besides a metal not provided for elsewhere in this subclass, two or more other elements other than oxygen or hydrogen ([C01G 99/003 takes precedence](#))}