

**CPC****COOPERATIVE PATENT CLASSIFICATION****C01C**

**AMMONIA; CYANOGEN; COMPOUNDS THEREOF** ({metal hydrides, monoborane, diborane or addition complexes thereof [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](#); azides [C01B 21/08](#); {compounds other than ammonia or cyanogen, containing nitrogen, non-metals and optionally metals [C01B 21/082](#)}; metal imides or 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](#); compounds containing silicon [C01B 33/00](#); compounds containing boron [C01B 35/00](#))

**C01C 1/00**

**Ammonia; Compounds thereof** {([C01C 3/08](#), [C01C 3/14](#), [C01C 3/16](#), [C01C 3/20](#) take precedence)}

**NOTE**

Complex ammine salts, e.g.  $[\text{Pd}(\text{NH}_3)_4]\text{Cl}_2$ , are { also} classified in the relevant groups of subclasses [C01D](#) to [C01G](#), according to the metal

- [C01C 1/003](#) . {Storage or handling of ammonia}
- [C01C 1/006](#) .. {making use of solid ammonia storage materials, e.g. complex ammine salts}
- [C01C 1/02](#) . Preparation, {purification} or separation of ammonia
- [C01C 1/022](#) .. {Preparation of aqueous ammonia solutions, i.e. ammonia water}
- [C01C 1/024](#) .. {Purification}
- [C01C 1/026](#) .. {Preparation of ammonia from inorganic compounds}
- [C01C 1/028](#) ... {from ammonium sulfate or sulfite}
- [C01C 1/04](#) .. Preparation of ammonia by synthesis { in the gas phase }(preparation or purification of gas mixtures for ammonia synthesis { [C01B 3/025](#)})
- [C01C 1/0405](#) ... {from  $\text{N}_2$  and  $\text{H}_2$  in presence of a catalyst}
- [C01C 1/0411](#) .... {characterised by the catalyst}
- [C01C 1/0417](#) .... {characterised by the synthesis reactor, e.g. arrangement of catalyst beds and heat exchangers in the reactor (arrangement of several reactors [C01C 1/0405](#); fixed-bed reactors in general [B01J 8/02](#))}
- [C01C 1/0423](#) ..... {Cold wall reactors}
- [C01C 1/0429](#) ..... {Fluidized or moving bed reactors}
- [C01C 1/0435](#) ..... {Horizontal reactors}
- [C01C 1/0441](#) ..... {Reactors with the catalyst arranged in tubes}
- [C01C 1/0447](#) .... {Apparatus other than synthesis reactors}
- [C01C 1/0452](#) ..... {Heat exchangers}
- [C01C 1/0458](#) .... {Separation of  $\text{NH}_3$  (during purge gas treatment [C01C 1/0476](#))}
- [C01C 1/0464](#) ..... {by absorption in liquids, e.g. water}
- [C01C 1/047](#) ..... {by condensation}

- C01C 1/0476 . . . . {Purge gas treatment, e.g. for removal of inert gases or recovery of H<sub>2</sub>}
- C01C 1/0482 . . . . {Process control; Start-up or cooling-down procedures}
- C01C 1/0488 . . . . {Processes integrated with preparations of other compounds, e.g. methanol, urea or with processes for power generation}
- C01C 1/0494 . . . . {using plasma or electric discharge}
- C01C 1/08 . . Preparation of ammonia from nitrogenous organic substances
- C01C 1/083 . . . {from molasses (treatment of molasses in general [C13J](#))}
- C01C 1/086 . . . {from urea}
- C01C 1/10 . . Separation of ammonia from ammonia liquors, e.g. gas liquors {(as part of the ammonia synthesis process [C01C 1/04](#))}
- C01C 1/12 . . Separation of ammonia from gases and vapours {(as part of the ammonia synthesis process [C01C 1/04](#))}
- C01C 1/14 . . . Saturators
- C01C 1/16 . Halides of ammonium
- C01C 1/162 . . {Ammonium fluoride}
- C01C 1/164 . . {Ammonium chloride}
- C01C 1/166 . . {Ammonium bromide}
- C01C 1/168 . . {Ammonium iodide}
- C01C 1/18 . Nitrates of ammonium
- C01C 1/185 . . {Preparation}
- C01C 1/20 . Sulfides; Polysulfides
- C01C 1/22 . Sulfites of ammonium
- C01C 1/24 . Sulfates of ammonium ([C01C 1/14](#) takes precedence)
- C01C 1/242 . . Preparation from ammonia and sulfuric acid or sulfur trioxide
- C01C 1/244 . . Preparation by double decomposition of ammonium salts with sulfates
- C01C 1/245 . . Preparation from compounds containing nitrogen and sulfur
- C01C 1/246 . . . from sulfur-containing ammonium compounds
- C01C 1/247 . . . . by oxidation with free oxygen
- C01C 1/248 . . Preventing coalescing or controlling form or size of the crystals
- C01C 1/249 . . Deacidifying {or drying} the crystals
- C01C 1/26 . Carbonates or bicarbonates of ammonium
- C01C 1/28 . Methods of preparing ammonium salts in general

**NOTE**

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.

Salts of polybasic acids with ammonium and a metal as cations are classified as though the ammonium were hydrogen.

**C01C 3/00****Cyanogen; Compounds thereof**

- C01C 3/001 . {Preparation by decomposing nitrogen-containing organic compounds, e.g. molasse waste or urea (by distillation of carbamates [C01C 3/02](#), [C01C 3/08](#), [C01C 3/14](#), [C01C 3/16](#); by decomposing formamide or ammonium formate [C01C 3/0204](#))}
- C01C 3/002 . {Synthesis of metal cyanides or metal cyanamides from elementary nitrogen and carbides}
- C01C 3/003 . {Cyanogen}
- C01C 3/004 . {Halogenides of cyanogen}
- C01C 3/005 . {Thiocyanogen}
- C01C 3/006 . {Sulfurdicyanide}
- C01C 3/007 . {Ammonium cyanide}
- C01C 3/008 . {Cyanazide}
- C01C 3/02 . Preparation, {separation or purification} of hydrogen cyanide {([C01C 3/001](#) takes precedence)}
- C01C 3/0204 .. {from formamide or from ammonium formate}
- C01C 3/0208 .. {Preparation in gaseous phase}
- C01C 3/0212 ... {from hydrocarbons and ammonia in the presence of oxygen, e.g. the Andrussov-process}
- C01C 3/0216 .... {characterised by the catalyst used}
- C01C 3/022 .... {Apparatus therefor}
- C01C 3/0225 ..... {characterised by the synthesis reactor}
- C01C 3/0229 ... {from hydrocarbons and ammonia in the absence of oxygen, e.g. HMA-process}
- C01C 3/0233 .... {making use of fluidised beds, e.g. the Shawinigan-process}
- C01C 3/0237 ... {from carbon monoxide and ammonia}
- C01C 3/0241 ... {from alcohols or aldehydes}
- C01C 3/0245 ... {from organic nitriles, e.g. acetonitrile}
- C01C 3/025 ... {by using a plasma}
- C01C 3/0254 .. {from cyanates or from thiocyanates}
- C01C 3/0258 .. {from cyanamides or derivatives thereof}
- C01C 3/0262 .. {from cyanides}
- C01C 3/0266 ... {from simple alkali or alkaline earth metal cyanides}
- C01C 3/027 .... {Alkali metal cyanides}
- C01C 3/0275 .... {Alkaline earth metal cyanides}
- C01C 3/0279 ... {from ammonium cyanide}
- C01C 3/0283 ... {from simple or complex cyanides of the noble metals}
- C01C 3/0287 ... {from simple or complex cyanides of other transition metals, e.g. from iron cyanides}
- C01C 3/0291 ... {from simple or complex cyanides of other metals}
- C01C 3/0295 .. {Purification}
- C01C 3/04 .. Separation from gases
- C01C 3/06 . Stabilisation of hydrogen cyanide
- C01C 3/08 . Simple or complex cyanides of metals {([C01C 3/001](#), [C01C 3/002](#) take precedence)}
- C01C 3/10 .. Simple alkali metal cyanides

- C01C 3/11
  - .. Complex cyanides
- C01C 3/12
  - .. Simple or complex iron cyanides
- C01C 3/14
  - . Cyanic {or isocyanic} acid; Salts thereof {(C01C 3/001 takes precedence)}
- C01C 3/145
  - .. {Isocyanic acid; Salts thereof}
- C01C 3/16
  - . Cyanamide; Salts thereof {(C01C 3/001, C01C 3/002 takes precedence); dicyandiamide C07C 279/28}
- C01C 3/18
  - .. Calcium cyanamide
- C01C 3/20
  - . Thiocyanic acid; Salts thereof {(C01C 3/001 takes precedence)}