

**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 [C13B 50/006](#))}
- 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

#### **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.

#### **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)}