C01B

NON-METALLIC ELEMENTS; COMPOUNDS THEREOF; {METALLOIDS OR COMPOUNDS THEREOF NOT COVERED BY SUBCLASS C01C}

Definition statement

This place covers:

The chemical elements of hydrogen, halogen (fluorine, chlorine, bromine, iodine and astatine), oxygen, sulfur, phosphorus, silicon, nitrogen, boron, selenium, tellurium, and noble gases (helium, neon, argon, krypton, xenon and radon).

Compounds solely composed of any of the elements listed above.

Carbon and compounds of carbon with any of the elements listed above, with the proviso that said compounds cannot contain a carbon atom having direct bonding to another carbon atom, a carbon atom having direct bonding to a hydrogen atom or a halogen atom, or a carbon atom having direct bonding to a nitrogen atom by a single or double bond.

Compounds composed solely of one or more metal atoms and hydrogen.

Peroxides and salts of peroxyacids.

Magnesium, calcium, strontium, or barium sulfides or polysulfides.

Alkali metal sulfides or polysulfides.

Thiosulfates, dithionites and polythionates.

Compounds containing selenium or tellurium.

Azides, metal amides and nitrites.

Carbamic acid and salts thereof.

Binary compounds containing a metal and either N, C or P.

Salts of the oxyacids of halogen or phosphorus.

Compounds consisting only of carbon atoms, e.g. fullerenes, carbon nanotubes.

Phosgene and thiophosgene.

Compounds containing silicon such as silicates, silicon oxides or colloidal silica, e.g. dispersions, gels, hydroorganosols, organosols.

Compounds containing boron.

Substances having molecular sieve properties, but not having base-exchange properties.

Substances having a combination of molecular sieve and base-exchange properties, e.g. crystalline zeolites.

Synthesis, treatment or modification of any of the elements or compounds above by:

- chemical means, i.e. chemical reaction;
- physical means, e.g. concentration, dehydration, purification, separation, solidifying, granulation;
- addition of a stabilizer or preservative; or
- by the combination of chemical and physical means, with the proviso that the resultant product is proper for classification in this subclass.

Methods of preparing the following compounds, in general:

- halides;
- oxides or hydroxides;
- sulphides or polysulfides;
- sulfites;
- sulphates;
- nitrates; or
- carbonates or bicarbonates.

Apparatus:

- for preparation of sulfur trioxide or sulfuric acid by contact processes; or
- for preparation of nitric oxide by catalytic oxidation of ammonia or oxidation of nitrogen.

Relationships with other classification places

In Class C01, in the absence of an indication to the contrary, a compound is classified in the last appropriate subclass of this class. For example, lead oxide is classified in subclass C01G rather than in this subclass.

This subclass is a function oriented entry for the chemical elements and their compounds and does not cover the application or use of the elements and compounds under the subclass definition. For classifying such information other entries in IPC exist, for example:

- Compounds or compositions for preservation of the bodies of humans, animals, plants, or parts thereof, e.g. disinfectants, pesticides, herbicides, as pest repellents or attractants, and as plant growth regulators are classified in subclass A01N.
- Preparations for medical, dental, or toilet purposes are classified in subclass A61K.

Salts, adducts, or complexes formed between an inorganic compound of this subclass and an organic compound of class C07, are regarded as organic compounds and classified in class C07.

When a process produces multiple compounds only those which are intended or desired require classification and classification may be proper in multiple subclasses.

MULTIPLE CLASSIFICATION

Therapeutic activity of chemical compounds or medicinal preparations is further classified in subclass **A61P**.

Uses of cosmetics or similar toilet preparations are further classified in subclass A61Q.

Processes using enzymes or micro-organisms in order to:

- liberate, separate or purify a pre-existing compound or composition, or to
- treat textiles or clean solid surfaces of materials are further classified in subclass **C12S**.

References

Limiting references

This place does not cover:

Treatment of inorganic materials to enhance their pigmenting or filling properties; Preparation of carbon black	C09C
Intentional preparation of carbon dioxide by a fermentation process or the use of an enzyme	C12P 1/00
Preparation of elements or inorganic compounds except carbon dioxide, by a fermentation process or the use of an enzyme	C12P 3/00

Production of non-metallic elements or inorganic compounds by electrolysis or electrophoresis	C25B 1/00

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Processing powders of inorganic compounds preparatory to the manufacturing of ceramic products	C04B 35/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D
Chemical or physical processes, e.g. catalysts, colloid chemistry; their relevant apparatus	B01J
Inorganic fertilisers	C05D
Organic chemistry	C07
Alloys	C22C
Chemical libraries containing only inorganic compounds or inorganic materials	C40B 40/18
Methods of creating chemical libraries	C40B 50/00

Special rules of classification

In this subclass, in the absence of an indication to the contrary, a compound or a process of making a compound appropriate for this subclass is classified in the last appropriate place.

This subclass provides for products which are intended or desired. When a process produces multiple compounds only those which are intended or desired require a classification. However, by-products can be given an additional classification if they or the processes for obtaining them are considered of interest for search.

Inorganic salts of a compound, unless specifically provided for elsewhere, are classified as that compound.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Base-exchange	The replacement of one cation absorbed on a material by another.
Binary compound	A compound containing and limited to two distinct chemical elements.
Direct bonding	Requires a bond between two adjacent atoms.

Inorganic compound	A compound devoid of a carbon atom and containing a non-metallic element, or a compound containing a carbon atom, and satisfying one of the following criteria: the compound cannot have a carbon atom having direct bonding to another carbon atom, or the compound cannot have direct bonding between a carbon atom and a halogen or hydrogen atom, or the compound cannot have direct bonding between a carbon and a nitrogen atom by a single or double bond. The following are exceptions to the above and are to be considered as inorganic compounds: compounds consisting of only carbon atoms, (e.g. fullerenes), cyanogen, cyanogen halides, cyanamide, phosgene, thiophosgene, hydrocyanic acid, isocyanic acid, isothiocyanic acid, fulminic acid, unsubstituted carbamic acid, and salts of the previously mentioned acids and which contain the same limitations as to a carbon atom.
Isomorphous zeolites	Compounds isomorphous to zeolites wherein the aluminum or silicon atoms in the framework are partly or wholly replaced by atoms of other elements, e.g. by gallium, germanium, phosphorus or boron.
Metal	Any element other than a non-metal.
Metal hydride	Compound containing only metal and hydrogen.
Molecular sieve	Materials (e.g. zeolitic, mesoporous) having cavities and channels which by their size allow some molecules to pass through, but prevent others.
Non-metal	The elements of hydrogen, carbon, halogen (fluorine, chlorine, bromine, iodine and astatine), oxygen, sulfur, phosphorus, silicon, nitrogen, boron, selenium, tellurium and noble gases (helium, neon, argon, krypton, xenon and radon).
Preparation	Covers synthesis, purification, separation, stabilisation, or use of additives, unless a separate place is provided in the classification scheme.
Zeolites	(i) Cystalline 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.

C01B 3/00

Hydrogen; Gaseous mixtures containing hydrogen; Separation of hydrogen from mixtures containing it (separation of gases by physical means B01D); Purification of hydrogen (production of water gas or synthesis gas from solid carbonaceous material C10J; purifying or modifying the chemical compositions of combustible technical gases containing carbon monoxide C10K)

References

Limiting references

This place does not cover:

Preparation of hydrogen by using micro-organisms or enzymes	C12P
Electrolytic production of hydrogen	C25B 1/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Aspects relating to hydrogen or synthesis gas generation processes	C01B 2203/00
Separation of gases by physical means	B01D
Details relating to the reactors used in the generation of hydrogen or synthesis gas	B01J 8/00, B01J 19/00, B01J 2208/00, B01J 2219/00
Storing fluids in natural or artificial cavities or chambers in the earth	B65G 5/00
Production of water gas or synthesis gas from solid carbonaceous material	C10J
Purifying or modifying the chemical compositions of combustible technical gases containing carbon monoxide	C10K
Vessels for containing or storing compressed, liquefied or solidified gases; fixed-capacity gas-holders; filling vessels with, or discharging from vessels, compressed liquefied, or solidified gases	F17C
Pipe-line systems; pipe-lines	F17D

Special rules of classification

In this group symbols of groups B01J 2208/00 and B01J 2219/00 should be added, for details relating to the reactors used in the generation of hydrogen or synthesis gas.

In groups C01B 3/12 - C01B 3/18 and in groups C01B 3/22 - C01B 3/586, symbols of group C01B 2203/00 should be added, for aspects relating to hydrogen or synthesis gas preparation processes.

C01B 3/001

{characterised by the uptaking medium; Treatment thereof}

Special rules of classification

In all of the groups C01B 3/0026 - C01B 3/0084, the metallic storage materials may contain minor quantities of non-metals such as B, C, O, S, Se, Si; e.g. C01B 3/0036 "only containing iron and titanium" includes Fe-Ti compositions comprising a minor quantity of non-metals.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Rare-earth metal	one single metal or a combination of metals selected from the lanthanides, Sc or Y.

C01B 3/0015

{Organic compounds; Solutions thereof}

Definition statement

This place covers:

Reversible uptake of hydrogen characterised by the uptaking medium being organic compounds, solutions thereof, e.g. metal organic frameworks

C01B 3/0063

{only containing a rare earth metal and only one other metal}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

The "other metal"	is any other metal.

C01B 3/0084

{Solid storage mediums characterised by their shape, e.g. pellets, sintered shaped bodies, sheets, porous compacts, spongy metals, hollow particles, solids with cavities, layered solids}

Definition statement

This place covers:

Reversible uptake of hydrogen characterised by the shape of the solid storage uptaking medium, e.g. hydrogen storage in glass beads amongst others.

C01B 3/025

{Preparation or purification of gas mixtures for ammonia synthesis}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Integration of a hydrogen producing process with ammonia synthesis.	C01B 2203/068
Preparation or separation of ammonia.	C01C 1/02

C01B 3/04

by decomposition of inorganic compounds, e.g. ammonia {(C01B 3/0005 takes precedence)}

References

Limiting references

This place does not cover:

Reversible uptake of hydrogen by an appropriate medium	C01B 3/0005

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Decomposition (as opposed to reaction):	there is only one reactant involved.

C01B 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)

References

Limiting references

This place does not cover:

Electrolysis of water	C25B 1/04

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Reaction (as opposed to decomposition)	there are at least two reactants involved.
Silicon	is a metalloid and not a metal.

C01B 3/08

with metals

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Metals	only refers to pure metals or metal alloys. Metal hydrides or metal oxides are not covered by this term.
Silicon	is a metalloid and not a metal.

C01B 3/10

by reaction of water vapour with metals

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Metals	only refers to pure metals or metal alloys. Metal hydrides or metal oxides are not covered by this term.
Silicon	is a metalloid and not a metal.

C01B 3/22

by decomposition of gaseous or liquid organic compounds ({C01B 3/0005 takes precedence } ; coking liquid carbonaceous materials C10B 55/00)

Definition statement

This place covers:

Production of hydrogen or gaseous mixtures containing hydrogen by decomposition of gaseous or liquid organic compounds or by an incomplete decomposition.

For example, a dehydrogenation specifically meant for the production of hydrogen will also be classified in this group.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coking liquid carbonaceous materials	C10B 55/00

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "decomposition", "cracking" and "pyrolysis"

C01B 3/32

by reaction of gaseous or liquid organic compounds with gasifying agents, e.g. water, carbon dioxide, air

Special rules of classification

If the documents does not specify the type of gaseous or liquid organic compound further and if it is not mentioned whether a catalyst is used, classify in C01B 3/32.

If it concerns a catalytic process, but if the type of gaseous or liquid organic compound is not further specified, then classify in C01B 3/38 and subgroups or in C01B 3/40.

C01B 3/326

{characterised by the catalyst}

Definition statement

This place covers:

Production of hydrogen or of gaseous mixtures containing hydrogen by catalytic reaction of gaseous or liquid organic compounds other than hydrocarbons with gasifying agents characterised by the catalyst.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Preparation and regeneration of catalysts	B01J 21/00 - B01J 38/00

C01B 3/382

{Multi-step processes}

Definition statement

This place covers:

Multi-step process of hydrogen's or of gaseous mixtures containing hydrogen's production by catalytic reaction of hydrocarbons with gasifying agents, including also autothermal reforming.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus for autothermal reforming	B01J 8/00

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Catalytic multi-step process	A catalytic multi-step process, that generates a hydrogen containing gas from a hydrocarbon, is a process including at least one catalytic step.

C01B 3/384

{the catalyst being continuously externally heated}

Relationships with other classification places

Chemical or physical processes in general and their relevant apparatus are classified in B01J

Special rules of classification

This class is only to be allocated when the external heating is explicitly mentioned.

C01B 3/40

characterised by the catalyst

Definition statement

This place covers:

Production of hydrogen or of gaseous mixtures containing hydrogen by catalytic reaction of gaseous or liquid organic compounds other than hydrocarbons with gasifying agents characterised by the catalyst.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Preparation and regeneration of catalysts	B01J 21/00 - B01J 38/00

C01B 3/508

{by selective and reversible uptake by an appropriate medium, i.e. the uptake being based on physical or chemical sorption phenomena or on reversible chemical reactions (the appropriate mediums per se C01B 3/0005)}

Definition statement

This place covers:

This group covers separation or purification processes in which hydrogen or the hydrogen containing gas is removed from the gaseous mixtures

References

Limiting references

This place does not cover:

Reversible uptake of hydrogen by an appropriate medium.	C01B 3/0005
Impurity and not hydrogen or the hydrogen containing gas is removed from the gaseous mixture.	C01B 3/56

C01B 3/56

by contacting with solids; Regeneration of used solids {(C01B 3/508 takes precedence)}

Definition statement

This place covers:

The removal of one or more impurities from hydrogen or a hydrogen containing gas from the gaseous mixture.

References

Limiting references

This place does not cover:

Removal of hydrogen or hydrogen containing gas from the gaseous mixture.	C01B 3/508

C01B 4/00

Hydrogen isotopes; Inorganic compounds thereof prepared by isotope exchange, e.g. $NH_3 + D_2$ ---> $NH_2D + HD$ (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)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Separation of isotopes	B01D 59/00
Other chemical reactions to form compounds of hydrogen isotopes	C01

C01B 5/00

Water

Definition statement

This place covers:

This group only covers documents directed to the preparation of water, water being the product.

References

Limiting references

This place does not cover:

Arrangement of installations for producing fresh water, e.g. by evaporation and condensation of sea water.	B63J 1/00
Treatment of water	C02F
Fuel cell (production of electricity with water as side product)	H01M 8/00

C01B 6/00

Hydrides of metals {including fully or partially hydrided metals, alloys or intermetallic compounds (use of some thereof for reversible sorption of hydrogen C01B 3/0005, C01B 3/508); Compounds containing at least one metal-hydrogen bond, e.g. $(GeH_3)_2S$, SiH GeH}; Monoborane or diborane; Addition complexes thereof (higher hydrides of boron, substituted hydrides of boron C01B 35/00)

Definition statement

This place covers:

This group covers documents, in which metal hydrides are claimed per se and documents, in which the preparation of metal hydrides is disclosed.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Reversible uptake of hydrogen by an appropriate medium	C01B 3/0005
Higher hydrides of boron than monoborane or diborane, substituted hydrides of boron	C01B 35/00

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Metal hydride	Compound containing only metal or metal alloy and hydrogen.

C01B 7/00

Halogens; Halogen acids (oxyacids C01B 11/00)

References

Limiting references

This place does not cover:

Oxyacids of halogens and salts thereof	C01B 11/00

C01B 9/00

General methods of preparing halides (particular individual halides, see the relevant groups in C01B - C01G according to the element combined with the halogen; electrolytic production of inorganic compounds C25B)

References

Limiting references

This place does not cover:

Electrolytic production of inorganic compounds	C25B

Special rules of classification

Particular individual halides according to the element combined with the halogen are classified in the relevant groups C01B - C01G.

C01B 11/00

Oxides or oxyacids of halogens; Salts thereof

Definition statement

This place covers:

Oxides or oxyacids of halogens or salts thereof when claimed as such and the preparation thereof.

C01B 13/00

Oxygen; Ozone; Oxides or hydroxides in general

Definition statement

This place covers:

The preparation of oxygen, ozone, oxides and hydroxides.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Use or ozone for disinfecting	A61L

C01B 13/02

Preparation of oxygen (by liquefying F25J)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Enrichment of a gaseous mixture, in particular air, in oxygen or separation of oxygen from a gaseous mixture by an adsorption process	**B01D63/03**
Enrichment of a gaseous mixture, in particular air, in oxygen or separation of oxygen from a gaseous mixture by liquefying	F25J

C01B 13/0229

{Purification or separation processes}

Definition statement

This place covers:

Purification and separation processes related to the production of oxygen

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D

Special rules of classification

In groups C01B 13/0229 - C01B 13/0288, additional features relating to the purification or separation processes are indexed with symbols chosen from C01B 2210/0026 - C01B 2210/0098.

C01B 13/0288

{Combined chemical and physical processing}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D
Chemical or physical processes, e.g. catalysts, colloid chemistry; their relevant apparatus	B01J

Special rules of classification

In this group, processing steps are also classified with symbols chosen from C01B 2210/0001 - C01B 2210/0025.

C01B 13/10

Preparation of ozone

Special rules of classification

When ozone is produced by generation of a plasma, the document is classified in C01B 13/10 and not in C01B 13/11.

C01B 13/11

by electric discharge

Relationships with other classification places

Process for preparation of ozone and its apparatus are classified in C01B 13/11 subgroups.

Devices for providing corona discharge are classified in H01T 19/00 subgroups.

Process for preparation of ozone by ultra-violet light, the apparatus is also classified in B01J 19/123

Special rules of classification

When ozone is produced by generation of a plasma, the document is classified in C01B 13/10 and not in C01B 13/11.

In groups C01B 13/11 and C01B 13/115, additional features relating to the preparation of ozone by electrical discharge are classified with symbols chosen from C01B 2201/00 - C01B 2201/90.

C01B 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)

Definition statement

This place covers:

Methods for preparing (hydr)oxides in general, not specific to a particular (hydr)oxide

Relationships with other classification places

Particular individual oxides or hydroxides are classified in the relevant groups of subclasses C01B - C01G or C25B, according to the element combined with the oxygen or hydroxy group

References

Limiting references

This place does not cover:

Generic features dealing with the preparation of (hydr)oxides of sodium, potassium or alkali metals	C01D 1/00
Generic features dealing with the preparation of (hydr)oxides of metals not covered by C01B, C01D or C01F	C01G 1/02
Preparation of (hydr)oxides by electrolysis	C25B 1/00

Special rules of classification

Contrary to the strict interpretation of the wording of the groups of C01 does this group dealing with the preparation of (hydr)oxides also comprise the after-treatment (C01B 13/145) and the purification (C01B 13/16).

C01B 13/145

{After-treatment of oxides or hydroxides, e.g. pulverising, drying, decreasing the acidity}

References

Limiting references

This place does not cover:

The after treatment of oxides for improving the pigmenting or filling properties:	C09C 1/00

C01B 13/16

Purification

Definition statement

This place covers:

All methods for purification of oxides or hydroxides in general

References

Limiting references

This place does not cover:

The purification of specific oxides (see the relevant class of C01D-C01G), e.g.:

Of aluminium (hydr)oxides:	C01F 7/46
Of calcium, strontium or barium oxides:	C01F 11/16

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D

Special rules of classification

The purity of compounds in solid compounds in C01 is also covered by the group C01P 2006/80

C01B 13/18

by thermal decomposition of compounds, e.g. of salts or hydroxides

Definition statement

This place covers:

The decomposition by application of heat without the addition of other reactants. Starting solutions can be sprayed but the obtained dried precursor is subsequently in a separate step decomposed by heat.

References

Limiting references

This place does not cover:

The one-step conversion of sprayed or atomized solutions	C01B 13/34

C01B 13/20

by oxidation of elements in the gaseous state; by oxidation or hydrolysis of compounds in the gaseous state

Definition statement

This place covers:

The oxidation or hydrolysis of metal (oxy)halides only.

References

Limiting references

This place does not cover:

Oxidation or hydrolysis of metal-organic compounds (e.g. alkoxides)	C01B 13/20

C01B 13/32

by oxidation or hydrolysis of elements or compounds in the liquid or solid state {or in non-aqueous solution, e.g. sol-gel process}

Definition statement

This place covers:

The oxidation or hydrolysis of (e.g. organic) metal compounds, in pure form ('in the liquid state' in subgroup C01B 13/326) or dissolved in a non-aqueous (e.g. alcohol) solution ('in solution'). The 'sol-gel process' is classified in here.

References

Limiting references

This place does not cover:

Precipitation reactions in aqueous solutions:	C01B 13/36

C01B 13/34

by oxidation or hydrolysis of sprayed or atomised solutions

References

Limiting references

This place does not cover:

Processes whereby after spraying a precursor is obtained (e.g. a salt) which is subsequently decomposed inot the oxide in a separate furnace:	C01B 13/18

C01B 13/36

by precipitation reactions in {aqueous} solutions {(C01B 13/328 takes precedence)}

Definition statement

This place covers:

Precipitation reactions, e.g. from a metal salt by adding a base like NaOH or NH_3

References

Limiting references

This place does not cover:

Groups comprises reactions in non-aqueous solutions. Hydrolysis of (organic) starting materials in e.g. alcohols by the sol-gel process, see C01B 13/32.

C01B 13/363

{Mixtures of oxides or hydroxides by precipitation}

Definition statement

This place covers:

Mixtures of oxides or hydroxides including mixed (hydr)oxides, i.e. plural metal oxides or hydroxides and also mixtures of metal oxides and hydroxides

C01B 13/366

{by hydrothermal processing}

Definition statement

This place covers:

Processes whereby a pressure above one bar is realised by heating an aqueous solution above 100°C in a closed container (autoclave).

Synonyms and Keywords

Closed reaction container	autoclave

C01B 15/00

Peroxides; Peroxyhydrates; Peroxyacids or salts thereof; Superoxides; Ozonides

Definition statement

This place covers:

Peroxides, peroxyhydrates, peroxyacids and salts thereof, superoxides and ozonides when claimed as such and the preparation processes thereof.

C01B 17/00

Sulfur; Compounds thereof

Definition statement

This place covers:

Compositions consisting of elemental sulfur or of sulfur compounds as far as not classified in groups following C01B 17/98 according to the other elements (like transition metals) present. This groups includes preparations of such compositions as well as after-treatments in general, thus in so far these are not limited to one specific application. Also included are apparatus specially adapted to the preparation.

C01B 17/02

Preparation of sulfur; Purification

Definition statement

This place covers:

Preparation of elemental sulfur only.

C01B 17/021

{Separation of sulfur from gases}

References

Limiting references

This place does not cover:

As part of the Claus process:	C01B 17/0447

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D

C01B 17/0221

{Melting}

Definition statement

This place covers:

e.g. block melting

C01B 17/0232

{Purification, e.g. degassing}

Definition statement

This place covers:

All types of removal of all kind of impurities irrespective the source of the sulfur.

References

Limiting references

This place does not cover:

Purification of sulfur obtained from materials comprising elemental sulfur:	C01B 17/027

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D

C01B 17/0237

{Converting into particles, e.g. by granulation, milling}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Granulation in general	B01J 2/00

C01B 17/0253

{from non-gaseous sulfur compounds other than sulfides or materials containing such sulfides}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Sulfur from H_2S or H_2S-containing gases:	C01B 17/04
Sulfur from SO_2 or SO_2-containing gases:	C01B 17/0473

C01B 17/027

Recovery of sulfur from material containing elemental sulfur, e.g. luxmasses {or sulfur containing ores}; Purification {of the recovered sulfur}

References

Limiting references

This place does not cover:

Purification of sulfur in general or obtained by other methods:	C01B 17/0232

C01B 17/04

from gaseous sulfur compounds including gaseous sulfides

Definition statement

This place covers:

All process whereby the sulfur source is a gaseous sulfur compound, e.g. H_2S, SO_2

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Catalytic removal of sulfur compounds from gas streams in general:	B01D 53/8603

C01B 17/0404

{by processes comprising a dry catalytic conversion of hydrogen sulfide-containing gases, e.g. the Claus process}

Definition statement

This place covers:

- This subgroup covers also other processes than the Claus process.
- This group includes also specific steps not classifiable in the subgroups C01B 17/0408 - C01B 17/0469 according to the characterising features of these steps, e.g. heat exchangers not being part of a combustion furnace.
- Features which relate to several separate steps of the Claus process are classified in C01B 17/0404, e.g. parts of flow sheets (like gas lines connecting separate steps).

References

Limiting references

This place does not cover:

Obtaining sulfur from gaseous compounds by wet processing:	C01B 17/05
Processes for the removal of H_2S from gas streams whereby the H_2S is present as an impurity:	B01D 53/8603

Special rules of classification

- Features relating to specific steps of the Claus process are classified in the subgroups C01B 17/0408-C01B 17/0456.
- Specific steps not classifiable in the subgroups according to the characterising features of these steps (e.g. heat exchangers not being part of a combustion furnace) are classified in C01B 17/0404.
- Features which relate to several separate steps of the Claus process are classified in C01B 17/0404, e.g. details of flow sheets (like gas lines connecting separate steps).

C01B 17/0408

{Pretreatment of the hydrogen sulfide containing gases}

Definition statement

This place covers:

All kind of operations applied to the feed gas, e.g. concentration by absorption, adsorption or purification (removal of non-sulfur components).

C01B 17/0413

{characterised by the combustion step}

Definition statement

This place covers:

E.g. the thermal step of the Claus process.

C01B 17/0417

{Combustion reactors}

Definition statement

This place covers:

Only constructional features of the reactor, including waste heat boilers and the like connected therewith.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Reactors in general:	B01J 8/00

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Combustion reactor	thermal Claus furnace

C01B 17/0421

{Multistage combustion}

Definition statement

This place covers:

Only multi-combustion in two separate furnaces.

Special rules of classification

Two oxidizer gas flows to one single reactor is classified in C01B 17/0413 (or C01B 17/0417 when it concerns the reactor).

C01B 17/043

{Catalytic converters}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Chemical or biological purification of engine exhaust gases	B01D 53/00
Reactors in general	B01J 8/00
Exhaust apparatus having means for purifying exhaust gases	F01N 3/00

C01B 17/0434

{Catalyst compositions}

Definition statement

This place covers:

The compositions are considered to include supports.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Catalytic compositions in general:	B01J

Special rules of classification

Mechanical adaptations of the catalytic reactor for comprising the catalyst are classified in C01B 17/043.

C01B 17/0439

{at least one catalyst bed operating below the dew-point of sulfur}

Definition statement

This place covers:

- All those processes whereby sulfur (liquid or solid) remains in or at the catalyst. This group comprises also measures for the regeneration of the sulfur-loaded catalyst.
- E.g. CBA (Cold Bed Absorption), MCRC (Maximum Claus Recovery Concept), Sulfreen or Maxisulf.
- Clinsulf can also be operated at sub-dew point conditions.

C01B 17/0443

{in a moving bed}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Moving bed	e.g. fluidized bed

C01B 17/0447

{Separation of the obtained sulfur}

Definition statement

This place covers:

Measures dealing with the separation of the elemental sulfur after one or more of the separate steps of e.g. the Claus process.

References

Limiting references

This place does not cover:

Purification of the separated sulfur	C01B 17/0232

C01B 17/0452

{Process control; Start-up or cooling-down procedures of the Claus process}

Definition statement

This place covers:

E.g. adjustment of ratio of gas stream components.

C01B 17/0456

{the hydrogen sulfide-containing gas being a Claus process tail gas}

Definition statement

This place covers:

Those processes whereby the tail gas from a Claus process plant are reused for obtaining sulfur, e.g. by concentration of H_2S or reduction of SO_2 present in the tail gas.

References

Limiting references

This place does not cover:

Removal of sulfur compounds from Claus tail gases without obtaining elemental sulfur:	B01D 53/8603

C01B 17/046

{without intermediate formation of sulfur dioxide}

Definition statement

This place covers:

- These processes are also indicated as selective oxidation or direct oxidation of H_2S.
- E.g. 'Superclaus'-processes comprising thermal and catalytic Claus steps combined with a selective oxidation step.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Without intermediate formation of sulfur	selective oxidation or direct oxidation

C01B 17/0465

{Catalyst compositions}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Catalysts in general:	B01J

C01B 17/0469

{at least one catalyst bed operating below the dew-point of sulfur}

Definition statement

This place covers:

E.g. Clauspol process.

References

Limiting references

This place does not cover:

Subdew-point process as part of the Claus process:	C01B 17/0439

C01B 17/0473

{by reaction of sulfur dioxide or sulfur trioxide containing gases with reducing agents other than hydrogen sulfide}

Definition statement

This place covers:

Reaction of SO_2 or SO_3 with all kind of reducing agents, gaseous, liquid or solid.

C01B 17/0478

{with hydrocarbons or mixtures containing them}

Definition statement

This place covers:

Reduction of SO_2, e.g. with natural gas.

C01B 17/0495

{by dissociation of hydrogen sulfide into the elements}

Special rules of classification

Classification is also accomplished in C01B 3/04 because of the produced hydrogen.

C01B 17/05

by wet processes

Definition statement

This place covers:

- This group comprises all processes comprising a liquid step, indpependent of the character of the liquid.
- E.g. iron chelate processes.

References

Limiting references

This place does not cover:

Removal of sulfur compounds from gases without obtaining elemental sulfur	B01D 53/52

C01B 17/06

from non-gaseous sulfides or materials containing such sulfides, e.g. ores

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Preparation of sulfur from sulfates	C01B 17/0253

C01B 17/16

Hydrogen sulfides

Definition statement

This place covers:

Preparation, separation or purification of binary hydrogen-sulfur compounds.

C01B 17/164

{Preparation by reduction of oxidic sulfur compounds}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

The preparation of elemental sulfur from SO_2 or SO_3	C01B 17/0473

C01B 17/167

{Separation}

Definition statement

This place covers:

Recovery of H_2S from gas streams.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus for separation in general	B01D

C01B 17/168

{Purification}

Definition statement

This place covers:

Removal of all kind of impurities (gaseous, liquid or solid) from H_2S.

References

Limiting references

This place does not cover:

The removal of large amounts of components qualified as impurities is regarded to represent a separation of H_2S from that gas stream (e.g. 70% impurity, 30% H_2S) and is classified in	C01B 17/167

C01B 17/18

Hydrogen polysulfides

Definition statement

This place covers:

All compounds H2S1+x, wherein x>0

C01B 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)

Definition statement

This place covers:

Methods for preparing sulfided or polysulfides in general, not specific to the chemical nature of the (poly)sulfide.

Relationships with other classification places

- Ammonium (poly)sulfides: C01C 1/20
- Methods relating to one specific metal sulfide are classified according to the metal: C01D, C01F or C01G

Special rules of classification

All documents in this group and its subgroups are classified in the C01P subgroups

C01B 17/22

Alkali metal sulfides or polysulfides

Special rules of classification

All documents in this group and its subgroups are classified in the C01P subgroups

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Polysulfides	all compounds Me2S1+x, with x>0

C01B 17/34

Polysulfides of sodium or potassium

Definition statement

This place covers:

All compounds Me2S1+x, with x>0, Me=Na,K

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Polysulfides	All compounds Me2S1+x, with x>0, Me=Na,K

C01B 17/42

Sulfides or polysulfides of magnesium, calcium, strontium, or barium

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Sulfates of these metals	C01F 11/46
Sulfites of these metals:	C01F 11/48

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Polysulfides:	all compounds MeS1+x, with x>0

C01B 17/45

Compounds containing sulfur and halogen, with or without oxygen

Special rules of classification

All documents in this group and its subgroups are indexed according to the C01P-scheme

C01B 17/48

Sulfur dioxide; Sulfurous acid

Definition statement

This place covers:

SO_2 and H_2SO_3

C01B 17/50

Preparation of sulfur dioxide

Definition statement

This place covers:

Process for the preparation and apparatus specifically adapted therefor.

C01B 17/504

{of ammonium sulfates (of ammonium sulfates containing sulfuric acid solutions C01B 17/585)}

References

Limiting references

This place does not cover:

Starting from ammonium sulfates containing sulfuric acid	C01B 17/585

C01B 17/52

by roasting sulfides (C22B 1/00 takes precedence)

References

Limiting references

This place does not cover:

Preliminary treatment of ores	C22B 1/00

C01B 17/54

by burning elemental sulfur

Definition statement

This place covers:

All combustion processes sulfur, as solid, liquid or gas

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Burners in general	F23D 14/00

Special rules of classification

Processes comprising the combustion of sulfur followed by the oxidation of SO_2 into SO_3 are classified according to the step which makes the contribution over the prior art. A (further not specified) burning of sulfur with a specific oxidation catalyst is classified in C01B 17/78. A well defined burning step with a common oxidation into SO_3 is classified in C01B 17/54. In case both steps make the invention is the document classified in both groups.

C01B 17/56

Separation; Purification

Definition statement

This place covers:

Preparation of sulfur dioxide by separation, purification.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D
Chemical or physical processes, e.g.sulfur removal form a waste gas	B01J

Special rules of classification

See also C01B 17/60

C01B 17/60

Isolation of sulfur dioxide from gases

Special rules of classification

See also C01B 17/56

C01B 17/62

Methods of preparing sulfites in general (particular individual sulfites, see the relevant groups of subclasses C01B - C01G, according to the cation)

Definition statement

This place covers:

Methods of preparing sulfites in general and not specific to the chemical nature of the sulfite.

References

Limiting references

This place does not cover:

Specific sulfites are classified according to the metal	C01B, C01D, C01F, C01G

C01B 17/625

{metabisulfites or pyrosulfites}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Metabisulfites or pyrosulfites	S 2O 52-

C01B 17/64

Thiosulfates; Dithionites; Polythionates

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Thiosulfates	S 2O 32-
Ithionites (=hydrosulfites)	S 2O 42-

C01B 17/66

Dithionites {or hydrosulfites ($S_2O_4^{2-}$)}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Dithionites (=hydrosulfites)	S 2O 42-

C01B 17/69

Sulfur trioxide; Sulfuric acid

Definition statement

This place covers:

All features in relation to SO_3 or H_2SO_4 not classifiable in the subgroups of C01B 17/69.

C01B 17/74

Preparation

Definition statement

This place covers:

All documents dealing with preparative features not classifiable in the subgroups of C01B 17/74.

C01B 17/76

by contact processes

Definition statement

This place covers:

All catalytic processes for the oxidation of SO_2 into SO_3. This group comprises features not classifiable in the subgroups of C01B 17/76.

In the contact processes the contact is the catalyst (a solid), it's then a gas/gas reactions in presence of a solid.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes and apparatus in general for separation	B01D
Chemical or physical processes	B01J

C01B 17/765

Multi-stage SO_3-conversion

Definition statement

This place covers:

All conversion which includes more than one catalyst bed ('contact'), irrespective of whether they are present in one convertor or in several convertors.

C01B 17/7655

{with intermediate absorption}

Definition statement

This place covers:

All processes where in addition to the final absorber at least one other SO_3-absorption is present between the catalytic beds.

C01B 17/901

{Recovery from spent acids containing metallic ions, e.g. hydrolysis acids, pickling acids (obtaining sulfur dioxide as an intermediate in sulfur trioxide recovery from sulfates, e.g. iron sulfates C01B 17/501, from spent acids C01B 17/58)}

Definition statement

This place covers:

The presence in the starting solution of metallic ions is essential

References

Limiting references

This place does not cover:

From sulfates whereby SO_2 is obtained	C01B 17/501
From spent acids	C01B 17/58

C01B 17/902

{by dialysis}

Special rules of classification

Removal of some specific impurities are classified in C01B 17/905-C01B 17/908.

C01B 17/903

{by liquid-liquid extraction}

Special rules of classification

Removal of some specific impurities are classified in C01B 17/905-C01B 17/908.

C01B 17/904

{by ion-exchange}

Relationships with other classification places

Separating processes in general involving the treatment of liquids with ion exchange materials as adsorbents are classified in **B01D15/04**

Special rules of classification

Removal of some specific impurities are classified in C01B 17/905-C01B 17/908.

C01B 17/905

{Removal of organic impurities}

Definition statement

This place covers:

Purification of sulfuric acid in which the impurity is present.

Special rules of classification

See also C01B 17/92 in case of a mixture of acid and organic compounds.

C01B 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)

Definition statement

This place covers:

Methods for the preparation of sulfates in general, and not specific to the chemical nature of the sulfate.

References

Limiting references

This place does not cover:

Processes or apparatus for the preparation of specific sulfates are classified according to the metal ion	C01B, C01D, C01F, C01G

C01B 17/965

{Pyrosulfates}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Pyrosulfate	2O 72-

C01B 17/98

Other compounds containing sulfur and oxygen (persulfuric acids C01B 15/06; persulfates C01B 15/08)

References

Limiting references

This place does not cover:

Persulfuric acid	C01B 15/06
Persulfates	C01B 15/08

C01B 19/00

Selenium; Tellurium; Compounds thereof (phosphorus compounds C01B 25/14)

References

Limiting references

This place does not cover:

Compounds containing also phosphorous	C01B 25/14

Special rules of classification

All documents in this group and its subgroups (so C01B 19/00 - C01B 19/04) are classified with symbols chosen from C01P-subgroups

C01B 19/002

{Compounds containing, besides selenium or tellurium, more than one other element, with -O- and -OH not being considered as anions}

Definition statement

This place covers:

The compounds classified in this group do have more than one element other than Se or Te, O and H not taken into account. The compounds with only one other element do find classification in the subgroups of this group.

References

Limiting references

This place does not cover:

Compounds of Se or Te with only one other element, O and H not taken into acount	C01B 19/004- C01B 19/04

C01B 19/007

{Tellurides or selenides of metals (C01B 19/002 takes precedence)}

References

Limiting references

This place does not cover:

Compounds of Se or Te with more than one metal or other element, except O or H	C01B 19/002

C01B 19/02

Elemental selenium or tellurium

Definition statement

This place covers:

This group comprises also mixtures of Se and Te.

C01B 19/04

Binary compounds {including binary selenium-tellurium compounds (C01B 19/004, C01B 19/005, C01B 19/007 take precedence)}

References

Limiting references

This place does not cover:

Oxides or hydroxides of Se or Te	C01B 19/004
Halides of Se or Te	C01B 19/005
Tellurides or selenides of metals	C01B 19/007

C01B 21/00

Nitrogen; Compounds thereof

Definition statement

This place covers:

All compounds of nitrogen insofar they are not classified according to the last place rule to groups after C01B 21/50, namely in C01C, C01D, C01F or C01G.

C01B 21/02

Preparation of nitrogen (by decomposition of ammonia {C01B 3/047})

Definition statement

This place covers:

Obtaining nitrogen by preparation or synthesis.

References

Limiting references

This place does not cover:

Obtaining nitrogen by decomposition of ammonia	C01B 3/047

Informative references

Attention is drawn to the following places, which may be of interest for search:

Separation of nitrogen from gas mixtures, e.g. air	C01B 21/04

C01B 21/04

Purification or separation of nitrogen (by liquefying F25J)

Relationships with other classification places

All purifications or gas separations involving a liquefaction step: F25J

References

Limiting references

This place does not cover:

Obtaining nitrogen by liquefaction or rectification	F25J 3/0257

C01B 21/0405

{Purification or separation processes}

References

Limiting references

This place does not cover:

Obtaining oxygen by separation	C01B 13/0229

Informative references

Attention is drawn to the following places, which may be of interest for search:

Gas separation in general:	B01D 53/00

Special rules of classification

During classification are additional features classified using the groups C01B 2210/00-C01B 2210/0098 . Example of such features is the type of impurity removed (C01B 2210/0043).

C01B 21/0411

{Chemical processing only}

Definition statement

This place covers:

Those processes comprising only chemical methods as e.g. specified by the subgroups C01B 21/0416- C01B 21/0427.

C01B 21/0416

{by oxidation}

Definition statement

This place covers:

Chemical oxidation processes such as the removal of hydrogen by addition of oxygen to the feed gas. The impurity is oxidized.

C01B 21/0422

{by reduction}

Definition statement

This place covers:

Chemical reduction processes such as the removal of oxygen by addition of a reducing agent, like hydrogen. The impurity is reduced.

C01B 21/0433

{Physical processing only}

Definition statement

This place covers:

Those processes comprising only physical methods as e.g. specified by the subgroups C01B 21/0438- C01B 21/0488.

C01B 21/0438

{by making use of membranes}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Membranes as such:	B01D 61/00- B01D 71/00

Synonyms and Keywords

Pressure swing absorption	PSA

C01B 21/0455

{characterised by the adsorbent}

References

Limiting references

This place does not cover:

Solid sorbents compositions per se	B01J 20/00

C01B 21/0477

{Temperature swing adsorption}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TSA	temperature swing adsorption

C01B 21/0494

{Combined chemical and physical processing}

Definition statement

This place covers:

All processes comprising a sequence of steps each covered by the groups C01B 21/0411-C01B 21/0488

Special rules of classification

All processes comprising a sequence of steps each covered by the groups C01B 21/0411-C01B 21/0488 do get this symbol C01B 21/0494 in combination with symbols for the individual steps chosen from C01B 2210/00-C01B 2210/0025. Additional treatment steps which are the result of the main treatment operation are not recognised as separate step (e.g. removal of water by an adsorption step after the reductive treatment with hydrogen for the removal of oxygen during which the water is formed).

Groups for the type of impurity removed (C01B 2210/0043) are always applied as complete as possible.

C01B 21/06

Binary compounds of nitrogen with metals, with silicon, or with boron, {or with carbon, i.e. nitrides; Compounds of nitrogen with more than one metal, silicon or boron} (azides C01B 21/08)

References

Limiting references

This place does not cover:

Azides	C01B 21/08

Shaped bodies made of nitrides:	C04B 35/58 and subgroups

Special rules of classification

- A document specifying a series of binary compounds (e.g. more than 5) is classified in this group with groups chosen from C01B 21/06-C01B 21/076 for the individual compounds.
- All documents of this group and its subgroups up to C01B 21/0768 are fully classified with the symbols chosen from C01P subgroups.

C01B 21/0602

{with two or more other elements chosen from metals, silicon or boron}

Definition statement

This place covers:

E.g. mixed nitrides.

C01B 21/0605

{Binary compounds of nitrogen with carbon}

Definition statement

This place covers:

All compounds between carbon and nitrogen, CxNy

C01B 21/0632

{with gallium, indium or thallium}

Relationships with other classification places

Preparing single crystals of GaN: C30B

C01B 21/0641

{Preparation by direct nitridation of elemental boron}

Definition statement

This place covers:

Nitridation can take place by any nitrogen source, e.g. nitrogen, ammonia.

C01B 21/0645

{Preparation by carboreductive nitridation}

Definition statement

This place covers:

Processes whereby the boron oxide source is reduced with a carbon containing material like graphite or active carbon, carbon being elemental or not

C01B 21/0646

{Preparation by pyrolysis of boron and nitrogen containing compounds}

Definition statement

This place covers:

Processes in which the nitrogen is provided by the precursor, although the reaction can take place in an ammonia or nitrogen containing atmosphere.

C01B 21/0648

{After-treatment, e.g. grinding, purification (transformation of hexagonal into cubic or wurtzitic boron nitride C04B 35/5831)}

References

Limiting references

This place does not cover:

Transformation of hexagonal into cubic or wurtzitic BN	C04B 35/5831

C01B 21/0682

{Preparation by direct nitridation of silicon}

Definition statement

This place covers:

Nitridation can take place by any nitrogen source, e.g. nitrogen, ammonia.

C01B 21/0685

{Preparation by carboreductive nitridation}

Definition statement

This place covers:

Proce sses whereby the silicon oxide source is reduced with a carbon containing material like graphite or active carbon, carbon being elemental or not.

C01B 21/0722

{Preparation by direct nitridation of aluminium}

Definition statement

This place covers:

Nitridation can take place by any nitrogen source, e.g. nitrogen, ammonia.

C01B 21/0726

{Preparation by carboreductive nitridation}

Definition statement

This place covers:

Processes whereby the aluminium oxide source is reduced with a carbon containing material like graphite or active carbon, carbon being elemental or not.

C01B 21/0761

{Preparation by direct nitridation of titanium, zirconium or hafnium}

Definition statement

This place covers:

Nitridation can take place by any nitrogen source, e.g. nitrogen, ammonia.

C01B 21/0765

{Preparation by carboreductive nitridation}

Definition statement

This place covers:

Processes whereby the metal oxide source is reduced with a carbon containing material like graphite or active carbon, carbon being elemental or not.

C01B 21/0766

{Preparation by pyrolysis of nitrogen containing titanium, zirconium or hafnium compounds}

Definition statement

This place covers:

Processes whereby the nitrogen is provided by the precursor although these processes may be accomplished in an ammonia or nitrogen atmosphere.

C01B 21/082

Compounds containing nitrogen and non-metals {and optionally metals} (C01B 21/06, C01B 21/08 take precedence)

References

Limiting references

This place does not cover:

Binary compounds of nitrogen with metals, Si or B or compounds of nitrogen with more than one metal, Si or B	C01B 21/06
Hydrazoic acid, Azides or halogen azides	C01B 21/08

Special rules of classification

All documents of this group and its subgroups up to C01B 21/0828 are fully classified with the symbols chosen from C01P subgroups

C01B 21/0844

{Nitrosyl fluoride}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Nitrosyl fluoride	NOF

C01B 21/0846

{Nitrosyl chloride}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Nitrosyl chloride	NOCl

C01B 21/0923

{Metal imides or amides (silicon imides or amides C01B 21/087)}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Metal amide	$MeNH_2$
Metal imide	MeNH

C01B 21/0926

{of alkali metals}

Definition statement

This place covers:

E.g. lithium amide: $LiNH_2$; lithium imide: Li_2NH

C01B 21/0935

{Imidodisulfonic acid; Nitrilotrisulfonic acid; Salts thereof}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Imidodisulfonic acid	HSO_3NHSO_3H
Nitrilotrisulfonic acid	$N(SO_3H)3$

C01B 21/096

Amidosulfonic acid; Salts thereof

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Amidosulfonic acid	NH_2HSO_3

C01B 21/12

Carbamic acid {or thiocarbamic acid}; Salts thereof

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Carbamic acid	H_2NCOOH
Monothiocarbamic	H_2NCOSH or H_2NCSOH
Dithiocarbamic acid	H_2NCS_2H
Ammonium carbamate	$H_2NCOONH_4$

C01B 21/14

Hydroxylamine; Salts thereof

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Hydroxylamine:	NH_2OH

C01B 21/20

Nitrogen oxides; Oxyacids of nitrogen; Salts thereof

Definition statement

This place covers:

All oxides of nitrogen and their acids

C01B 21/206

{Nitric anhydride (N_2O_5) (C01B 21/203 takes precedence)}

References

Limiting references

This place does not cover:

Processes using a plasma or electric discharge	C01B 21/203

C01B 21/22

Nitrous oxide (N_2O) {(C01B 21/203 takes precedence)}

References

Limiting references

This place does not cover:

Processes using a plasma or electric discharge	C01B 21/203

C01B 21/24

Nitric oxide (NO) {(C01B 21/203 takes precedence)}

References

Limiting references

This place does not cover:

Processes using a plasma or electric discharge	C01B 21/203

C01B 21/265

{characterised by the catalyst}

Relationships with other classification places

Catalysts in general: B01J

C01B 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)

Definition statement

This place covers:

Methods for the preparation of nitrates in general and not specific to the chemical nature of the nitrate.

References

Limiting references

This place does not cover:

Methods relating to one specific metal nitrate are classified according to the cation	C01C, C01D, C01F or C01G

C01B 21/50

Nitrous acid; Salts thereof

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Nitrous acid	HNO_2

C01B 23/00

Noble gases; Compounds thereof (liquefying F25J; {noble gases obtained by rectification F25J 3/028})

Relationships with other classification places

Liquefaction or liquefying in general: F25J

References

Limiting references

This place does not cover:

Obtaining noble gases by processes including a liquefying step	F25J 3/028

C01B 23/001

{Purification or separation processes of noble gases}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Gas separation in general	B01D 53/00

Special rules of classification

During classification are additional features classified using the groups C01B 2210/00-C01B 2210/0098 . Example of such features is the type of impurity removed (C01B 2210/0043).

C01B 23/0015

{Chemical processing only}

Definition statement

This place covers:

Those processes comprising only chemical methods not covered by the subgroups C01B 23/0021-C01B 23/0031.

C01B 23/0021

{by oxidation}

Definition statement

This place covers:

Chemical oxidation processes such as removal of hydrogen by addition of oxygen to the feed gas. The impurity is oxidized.

C01B 23/0026

{by reduction}

Definition statement

This place covers:

Chemical reduction processes such as the removal of oxygen by addition of a reducing agent, like hydrogen. The impurity is reduced.

C01B 23/0036

{Physical processing only}

Definition statement

This place covers:

Those processes comprising only physical methods as e.g. specified by the subgroups C01B 23/0042-C01B 23/0089.

C01B 23/0042

{by making use of membranes}

References

Limiting references

This place does not cover:

Membranes as such:	B01D 61/00- B01D 71/00

Synonyms and Keywords

Pressure swing absorption	PSA

C01B 23/0057

{characterised by the adsorbent}

References

Limiting references

This place does not cover:

Solid sorbent compositions	B01J 20/00

C01B 23/0078

{Temperature swing adsorption}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TSA	temperature swing adsorption

C01B 23/0094

{Combined chemical and physical processing}

Definition statement

This place covers:

All processes comprising a sequence of steps each covered by the groups C01B 23/0015-C01B 23/0089

Special rules of classification

All processes comprising a sequence of steps each covered by the groups C01B 23/0015-C01B 23/0089 do get this symbol C01B 23/0094 in combination with symbols for the individual steps chosen from C01B 2210/00-C01B 2210/0025. Additional treatment steps which are the result of the main treatment operation are not recognised as separate step (e.g. removal of water by an adsorption step after the reductive treatment with hydrogen for the removal of oxygen during which the water is formed).

Groups for the type of impurity removed (C01B 2210/0043) or the type of noble gas obtained (C01B 2210/0029) are always applied as complete as possible.

C01B 25/00

Phosphorus; Compounds thereof ({C01B 6/00} , C01B 21/00, C01B 23/00 take precedence; perphosphates C01B 15/16)

Definition statement

This place covers:

Elemental phosphorus and compounds thereof. Included in this group are processes and apparatus used in obtaining these products. Also included in this group are processes and apparatus for after-treatments in general.of phosphorous compounds and not related to a specific phosphorous compound.

References

Limiting references

This place does not cover:

Hydrides of metals and phosphorus	C01B 6/00
Perphosphates	C01B 15/16
Compounds containing nitrogen and phosphorus	C01B 21/00
Compounds containing noble gases and phosphorus	C01B 23/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Phosphates for prostheses or for coating prostheses	A61L 27/00

C01B 25/006

{Stabilisation (C01B 25/04 takes precedence)}

References

Limiting references

This place does not cover:

Purification of phosphorus	C01B 25/04

C01B 25/16

Oxyacids of phosphorus; Salts thereof (peroxyacids or salts thereof C01B 15/00)

References

Limiting references

This place does not cover:

Peroxyacids of phosphorus or salts thereof	C01B 15/00

Special rules of classification

- Carbonated apatites classified in C01B 25/16
- Thiophosphates classified in C01B 25/16

C01B 25/234

Purification; Stabilisation; Concentration (purification concomitant with preparation C01B 25/22; preparation involving solvent-solvent extraction C01B 25/46)

References

Limiting references

This place does not cover:

Purification concomitant with preparation of phosphoric acid	C01B 25/22
If the preparation of phosphoric acid involves a solvent-solvent extraction	C01B 25/46

C01B 25/237

Selective elimination of impurities {(C01B 25/2343 takes precedence)}

References

Limiting references

This place does not cover:

Concentration concomitant with selective elimination of impurities	C01B 25/2343

C01B 25/26

Phosphates (perphosphates C01B 15/16)

References

Limiting references

This place does not cover:

Perphosphates	C01B 15/16

C01B 25/301

{Preparation from liquid orthophosphoric acid or from an acid solution or suspension of orthophosphates (using ion-exchangers C01B 25/30)}

References

Limiting references

This place does not cover:

Preparation of alkali metal phosphates using ion-exchangers	C01B 25/30

C01B 25/32

Phosphates of magnesium, calcium, strontium, or barium

References

Limiting references

This place does not cover:

Carbonate-containing phosphates, e,g, carbonated apatite	C01B 25/16
Fluorine-containing phosphates, e.g. fluoroapatite	C01B 25/455

C01B 25/321

{Methods for converting an alkaline earth metal ortho-phosphate into another ortho-phosphate (by reaction, e.g. of phosphate rock with phosphoric acid C01B 25/322)}

References

Limiting references

This place does not cover:

Methods by reaction, e.g. phosphate rock, with phosphoric acid	C01B 25/322

C01B 25/325

{Preparation by double decomposition}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Double decomposition	Method which consists of adding a Me cation salt solution (Me: Mg, Sr or Ca) to a solution of PO_4 anion salt

C01B 25/327

{After-treatment (increasing the phosphate content of ores C01B 25/32)}

References

Limiting references

This place does not cover:

Increasing the phosphate content of ores	C01B 25/32

C01B 25/37

Phosphates of heavy metals

Definition statement

This place covers:

Also classified here are rare earth phosphates

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Heavy metals	Phosphates of metals other than light metals, i.e. alkali metals, alkaline earth metals, Be, Al and Mg.

C01B 25/453

{having molecular-sieve properties}

Special rules of classification

This group is no longer used for the classification of new documents. New documents should be classified to the appropriate subgroups of C01B 37/00 and C01B 39/00

C01B 25/455

containing halogen {(completely halogenated alkali metal phosphates C01D, e.g. lithium hexafluorophosphate C01D 15/005)}

References

Limiting references

This place does not cover:

Completely halogenated alkali metal phosphates	C01D
E.g. lithium hexafluorophosphate	C01D 15/005

C01B 25/46

Preparation involving solvent-solvent extraction (solvent extraction in general B01D 11/00)

References

Limiting references

This place does not cover:

Solvent extraction in general	B01D 11/00

C01B 25/461

{the phosphoric acid present in the medium obtained after reaction being first extracted from the liquid phase formed or separated then re-extracted as free acid by using water or as a phosphate by using a basic compound (selective extraction of impurities contained in acid C01B 25/237)}

References

Limiting references

This place does not cover:

Selective extraction of impurities contained in acid	C01B 25/237

Special rules of classification

- The extracting agent may be diluted with a compound or a mixture of compounds which are not solvents for phosphoric acid, e.g. a hydrocarbon.
- Documents which belong to more than one subgroup of C01B 25/462 - C01B 25/466 are classified in combination, C-set used, e.g. C01B 25/462,C01B 25/463,C01B 25/465.

C01B 25/468

{the extraction being performed on the reaction slurry itself, i.e. without separating the acid (C01B 25/232 takes precedence)}

Special rules of classification

C01B 25/232 takes precedence

C01B 31/00

Carbon; Compounds thereof ({C01B 6/00} , C01B 21/00, C01B 23/00 take precedence; percarbonates C01B 15/10; carbon black C09C 1/48; gas carbon production C10B)

Definition statement

This place covers:

Carbon and compounds thereof. Included in this group are processes and apparatus used in obtaining these products. Also included in this group are processes and apparatus for after-treatments in general, as far as these after-treatments are not limited to a specific type of carbon compound

Preparation of carbonyl fluoride or carbonyl bromide.

References

Limiting references

This place does not cover:

Compounds of carbon and hydrides of metals	C01B 6/00
Percarbonates	C01B 15/00
Compounds of carbon and nitrogen	C01B 21/00
Compounds of carbon and nobles gases	C01B 23/00
Carbon black	C09C 1/48
Gas carbon production	C10B

C01B 31/005

{Carbon fluorides, e.g. (CF)n or (C2F)n (preparation of intercalation compounds of graphite with fluorine C01B 31/0415)}

Special rules of classification

Preparation of intercalation compounds of graphite are now classified in C01B 31/0415. Group C01B 31/005 is therefore no longer to be used for classification of documents directed to the preparation of intercalation compounds of graphite. The terms "Preparation of intercalation compounds of graphite" cannot be deleted from C01B 31/005 until complete reclassification of relevant documents towards C01B 31/0415.

C01B 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; {After-treatment}

Definition statement

This place covers:

In particular documents relating carbon products not referred to in C01B 31/0206-C01B 31/14, e.g. carbon gel, carbon aerogel, mesoporous carbon, ordered porous carbon or carbon.

References

Limiting references

This place does not cover:

Carbon obtained by using ultra high pressure, e.g. for the formation of diamond	B01J 3/06
Single crystal or homogeneous polycrystalline carbon obtained by crystal growth	C30B

C01B 31/0213

{Fullerenes}

Definition statement

This place covers:

All types fullerenes, their preparation; after-treatments thereof e.g. purification, sorting, functionalization, dispersion in solvents

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Fullerene	Molecule composed entirely of carbon in the form of a hollow sphere
Buckminsterfullerene	Spherical molecule with the formula C_{60}
Endohedral fullerene	Fullerene comprising an element inserted into the fullerene cage

Synonyms and Keywords

Fullerene	Buckyball

C01B 31/022

{Carbon nanotubes}

References

Limiting references

This place does not cover:

Specific uses of carbon nanotubes

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating by vacuum evaporation, by sputtering or by ion implantation of the coating material	C23C 14/00
Chemical coating by decomposition of gaseous compounds, without leaving reaction products of surface material in the coating	C23C 16/00

Special rules of classification

All documents in C01B 31/022-C01B 31/0293 are classified with symbols chosen from C01B 2202/00 - C01B 2202/36 to report structural aspects or properties of carbon nanotubes.

Mere references to "carbon nanotubes" in a document in the absence of other details do not lead to a classification in C01B 31/022. For example, a reference to a "carbon nanotube" grown on a substrate used for a semiconductor device is not sufficient for requiring a classification in C01B 31/022. If, however, the document includes specific details on how the nanotube is produced, treated, modified or purified which do not seem trivial, then the classifier should give should classify this document in C01B 31/022-C01B 31/0286. In other terms, documents referring to carbon nanotubes are not automatically classified in C01B 31/00 unless there is emphasis e.g. on the nanotube growing technique or the after-treament.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Carbon nanotubes	Described as graphene sheets rolled up into the shape of a cylinder

Synonyms and Keywords

Nanotubes	Buckytubes

C01B 31/0233

{characterized by the catalyst}

Definition statement

This place covers:

Included are documents mentioning to different degrees of emphasis the catalyst where nanotubes were grown from (e.g. composition, distribution, particle size, morphology).

C01B 31/024

{being a continuous process}

References

Limiting references

This place does not cover:

Production of carbon nanotubes in batches	C01B 31/0226, C01B 31/0233 or C01B 31/0246

C01B 31/0253

{After-treatments}

Definition statement

This place covers:

After-treatments not addressed in C01B 31/0253-C01B 31/0286, e.g. coating of carbon nanotubes.

References

Limiting references

This place does not cover:

Coatings of a carbon nanotube layer or film with e.g. metallic layer or oxide layer (layered product)	B32B

C01B 31/0266

{Sorting}

Definition statement

This place covers:

All methods for sorting or isolating as-grown mixtures of carbon nanotubes according to e.g. their (n, m) structural form, diameter, bandgap or electronic type (metallic versus semiconducting).

C01B 31/0286

{Opening or filling}

Special rules of classification

A document mentioning the storage of a gas using the physisorption and chemisorption properties of carbon nanotubes should be classified in the class concerned, for example a document addressing the storage of hydrogen should be classified in C01B 3/00. This document should also be circulated to the sorbent field (B01J 20/00).

C01B 31/0293

{Other structures, e.g. nano-onions, nano-scrolls, nano-horns, nano-cones or nano-walls}

Definition statement

This place covers:

All nanosized carbon materials different from fullerenes and nanotubes, which are characterized by a specific structural aspect.

C01B 31/0415

{Intercalation}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Group C01B 31/0415 is not complete pending a reclassification. See also	C01B 31/005

C01B 31/043

{Graphitic oxides, graphitic acids or salts thereof}

Definition statement

This place covers:

Graphene oxide.

C01B 31/0438

{Graphene}

Definition statement

This place covers:

The production of graphene aerogel.

References

Limiting references

This place does not cover:

Production of graphene oxide and graphene oxide arerogel	C01B 31/043 in combination with symbol C01B 2204/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Groups C01B 31/0438 - C01B 31/0492 are not complete pending a reclassification. See also	C01B 31/04

Special rules of classification

All documents in groups C01B 31/0438 - C01B 31/0492 are classified with symbols chosen from C01B 2204/00 - C01B 2204/32 to report structural aspects or properties of graphene.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Graphene	one-atom-thick planar sheet of sp2-bonded carbon atoms that are densely packed in a honeycomb crystal lattice or small stacks thereof

C01B 31/0453

{by CVD}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating by vacuum evaporation, by sputtering or by ion implantation of the coating material	C23C 14/00
Chemical coating by decomposition of gaseous compounds, without leaving reaction products of surface material in the coating	C23C 16/00

C01B 31/0484

{After-treatments}

Definition statement

This place covers:

E.g. sorting, derivatisation, dispersion of graphene.

C01B 31/06

Diamond

References

Limiting references

This place does not cover:

Formation of diamonds using ultra-high pressure	B01J 3/06
Single crystal or polycrystalline structure in which the grains are aligned in a preferential direction	C30B

C01B 31/08

Active carbon

Definition statement

This place covers:

Carbon activated by heating to high temperature in the presence of an activating agent for producing an internal porous particle structure.

C01B 31/083

{After-treatment, e.g. purification (granulation C01B 31/14)}

References

Limiting references

This place does not cover:

Granulation of activated carbon	C01B 31/14

C01B 31/085

{with "molecular sieve" properties}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

CMS	Carbon molecular sieve

C01B 31/087

{Reactivation or regeneration (by a physical process C01B 31/086)}

References

Limiting references

This place does not cover:

Reactivation or regeneration by a physical process, e.g. by irradiation, by using electric current passing through a carbonaceous feedstock, by using recyclable inert heating bodies	C01B 31/086

C01B 31/088

{Apparatus (C01B 31/086 takes precedence)}

Special rules of classification

C01B 31/086 takes precedence

C01B 31/089

{Making shaped products, e.g. fibres, spheres, membranes, foam, or the like (granulation C01B 31/14)}

References

Limiting references

This place does not cover:

Granulation of activated carbon	C01B 31/14

C01B 31/10

Preparation by using gaseous activating agents {(C01B 31/086, C01B 31/088 take precedence)}

Definition statement

This place covers:

Gaseous activation by means of combined-oxygen containing gases, such as steam and CO_2.

Special rules of classification

C01B 31/086 and C01B 31/088 take precedence

C01B 31/12

Preparation by using non-gaseous activating agents {(C01B 31/086, C01B 31/088 take precedence)}

Definition statement

This place covers:

Activation in the presence of non-gaseous activating agents e.g., $ZnCl_2$, H_3PO_4 or KOH

Special rules of classification

C01B 31/086 and C01B 31/088 take precedence.

C01B 31/125

{Preparation by impregnation with a metallic compound}

Definition statement

This place covers:

Activation in the presence of a metallic compound, e.g. $ZnCl_2$

C01B 31/14

Granulation (apparatus B01J 2/00)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Granulation in general	B01J 2/00

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

The term granulation covers:	The methods of preparation of active carbon using carbonaceous precursors per se and binders, e.g. pitch, and producing the granules.

C01B 31/18

Carbon monoxide (metal carbonyls C01G)

Definition statement

This place covers:

Metal carbonyls	C01G

C01B 31/24

Methods for the preparation of carbonates or bicarbonates in general (percarbonates C01B 15/10; particular individual carbonates, see the relevant groups in C01B - C01G according to the cation)

References

Limiting references

This place does not cover:

Particular individual carbonates, according to the cation	C01B - C01G
Percarbonates	C01B 15/10

C01B 31/28

Phosgene

References

Limiting references

This place does not cover:

Carbonyl difluoride	C01B 31/00

C01B 31/30

Carbides (alloys C22)

References

Limiting references

This place does not cover:

Alloys	C22C

C01B 31/301

{Oxycarbides, sulfocarbides or mixtures of carbides with other bodies, e.g. graphite; Carbides of other non-metals, e.g. silicocarbides, borocarbides}

Special rules of classification

Mixture of carbides, other than those covered by group C01B 31/308, and belonging to more than one of the groups C01B 31/303 - C01B 31/36 are classified in C01B 31/301.

C01B 33/00

Silicon; Compounds thereof ({C01B 6/00} , C01B 21/00, C01B 23/00 take precedence; persilicates C01B 15/14; carbides C01B 31/36)

References

Limiting references

This place does not cover:

Persilicates	C01B 15/14
Carbides	C01B 31/36

Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus for producing silicon or a compound thereof according to C01B 33/00 - C01B 33/46	B01J 3/00, B01J 4/00

Special rules of classification

C01B 6/00, C01B 21/00 and C01B 31/36 take precedence

C01B 33/02

Silicon (forming single crystals or homogeneous polycrystalline material with defined structure C30B)

References

Limiting references

This place does not cover:

Single crystals or homogeneous polycrystalline material with a defined structure	C30B

C01B 33/021

Preparation (chemical coating from the vapour phase C23C 16/00)

Definition statement

This place covers:

- Silicon nanotubes

- Silicon nanowires without any emphasis on the crystalline structure

References

Limiting references

This place does not cover:

Chemical coating by decomposition of gaseous precursor	C23C 16/00
Silicon nanowires (often grown by the methods for the growth of single crystal whiskers) where there is emphasis on the crystalline nature	C30B

C01B 33/037

Purification (by zone-melting C30B 13/00)

References

Limiting references

This place does not cover:

Purification by zone melting	C30B 13/00

C01B 33/04

Hydrides of silicon

Definition statement

This place covers:

Hydrides of silicon in the strict meaning of the term.

C01B 33/06

Metal silicides (alloys C22)

References

Limiting references

This place does not cover:

Alloys	C22

C01B 33/113

Silicon oxides; Hydrates thereof {(preparing monoxide by reduction of siliceous material C01B 33/182)}

References

Limiting references

This place does not cover:

Preparation of silicon monoxide by reduction of siliceous material	C01B 33/182

C01B 33/12

Silica; Hydrates thereof, e.g. lepidoic silicic acid

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Lepidoid acid	Acid which has a two-dimensional structure. The term "lepidoid" is a generic word for a compound wherein planar bonding predominates and two-dimensional network structures are formed. This lepidoid silicic acid is a special type of polymer silicic acid, wherein its crystalline structure is built up of siloxane bondings.

C01B 33/146

After-treatment of sols ({preparation of hydrosols or aqueous dispersions from hydroorganosols, organosols or dispersions in an organic medium C01B 33/141}; preparation of hydroorganosols, organosols or dispersions in an organic medium from hydrosols {or aqueous dispersions} C01B 33/145)

References

Limiting references

This place does not cover:

Preparation of hydrosols or aqueous dispersions from hydroorganosols, organosols or dispersions in an organic medium	C01B 33/141
Preparation of hydroorganosols, organosols or dispersions in an organic medium from hydrosols or aqueous dispersions	C01B 33/145

C01B 33/148

Concentration; Drying; Dehydration; Stabilisation; Purification {(C01B 33/1465 takes precedence)}

Special rules of classification

C01B 33/1465 takes precedence.

C01B 33/1585

{Dehydration into aerogels}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Silica aerogel	What remains after the extraction of the liquid from the framework of the silica gel in a way that preserves the gel framework's original volume. This is most often achieved by supercritical extraction.

C01B 33/16

Preparation of silica xerogels

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Xerogel	What remains when the liquid part of a wet gel is extracted by evaporation or similar methods. The shrinkage during extraction is often important.

C01B 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)

References

Limiting references

This place does not cover:

Preparation of a silica aerogel by dehydrating a wet gel	C01B 33/158
Treatments of finely divided silica to enhance the pigmenting or filling properties	C09C

C01B 33/20

Silicates (persilicates C01B 15/14; {containing aluminium C01B 33/26})

References

Limiting references

This place does not cover:

Persilicates	C01B 15/14
Silicates containing aluminium	C01B 33/26

C01B 33/28

{Base exchange silicates, e.g. zeolites (regeneration B01J 49/00)}

Special rules of classification

C01B 33/28 - C01B 33/2892: no longer to be used but cannot be deleted until splitting of groups to C01B 39/00 is completed. Use C01B 39/00 for classification

C01B 33/32

Alkali metal silicates ({C01B 33/24} , C01B 33/26 take precedence)

Special rules of classification

C01B 33/26 takes precedence.

C01B 33/325

{After-treatment, e.g. purification or stabilsation of solutions, granulation; Dissolution; Obtaining solid silicate, e.g. from a solution by spray-drying, flashing off water or adding a coagulant}

References

Limiting references

This place does not cover:

Obtaining a silicate, e.g. as a hydrate of a crystalline silicate from a solution or a hydrate melt by heating or cooling with or without seeding (not considered as an after-treatment)	C01B 33/32

C01B 33/36

having base-exchange properties but not having molecular sieve properties (regeneration thereof B01J 49/00)

References

Limiting references

This place does not cover:

Compounds having base-exchange properties and having molecular sieve properties	C01B 39/00

C01B 33/38

Layered base-exchange silicates, e.g. clays, micas or alkali metal silicates of kenyaite or magadiite type {(activation of naturally occurring clays B01J 20/12; pillared layered base-exchange silicates B01J 29/049)}

References

Limiting references

This place does not cover:

Activation of naturally occurring clays	B01J 20/12
Pillared layered base-exchange silicates	B01J 29/049
Hydrotalcite (layered anion-exchange compound of formula $Mg_6Al_2(CO_3)(OH)16•4(H_2O)$	C01F 7/005

C01B 33/40

Clays

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Clays	phyllosilicate minerals that contain large percentages of water trapped between their silica sheets

C01B 33/42

Micas; {Interstratified clay-mica products (delaminated mica or vermiculite platelets obtained by a process involving cation-exchange C04B 14/208)}

References

Limiting references

This place does not cover:

Delaminated mica or vermiculite platelets obtained by a process involving cation-exchange	C04B 14/208

Special rules of classification

Also classified here are documents interstratified clay-mica products.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Mica	phyllosilicate mineral having a layered or platy structure, composed of sheets of silicate tetrahedrons. two tetrahedral layers sandwich small metal ions such as aluminum in an octahedral layer

C01B 33/46

Amorphous silicates, e.g. so-called "amorphous zeolites" (crystalline zeolites C01B 39/00)

Relationships with other classification places

Catalysts comprising molecular sieves are classified in the group B01J 29/00. B01J 32/00 concerning catalyst carriers is not used but is covered by appropriate groups of B01J 21/00 - B01J 29/00

Solid sorbent composition comprising synthetic zeolitic molecular sieves are classified in B01J 20/00

References

Limiting references

This place does not cover:

Crystalline silicates having molecular sieve properties	C01B 39/00

C01B 37/00

Compounds having molecular sieve properties but not having base-exchange properties

Relationships with other classification places

Compounds classified in main group C01B 37/00 are also classified in other groups of class C01 according to their composition.

Metal organic framework materials (MOFs) is classified in C01B 39/00 or C01B 37/00 depending on their base-exchange properties

MOFs are also classified in C07F.

C01B 37/005

{Silicates, i.e. so-called metallosilicalites or metallozeosilites}

Definition statement

This place covers:

Silicates, metallosilicalites, metallozeosilites

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TS-1 or titanosilicalite-1	MFI-type compound in which some of the silicon atoms are substituted with titanium atoms
TS-2 or titanosilicalite-2	MEL-type compound in which some of the silicon atoms are substituted with titanium atoms

C01B 37/02

Crystalline silica-polymorphs, e.g. silicalites {dealuminated aluminosilicate zeolites}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Dealuminated aluminosilicate	C01B 39/026

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Silicalite or silicalite-1	MFI-type polymorph of silica
Silicalite-2	MEL-type polymorph of silica

C01B 37/06

Aluminophosphates containing other elements, e.g. metals, boron

Definition statement

This place covers:

aluminophosphates including other elements incorporated into the framework

C01B 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)

Special rules of classification

Compounds classified in main group C01B 39/00 are also classified in other groups of class C01 according to their composition

Metal organic framework materials (MOFs) are classified in C01B 39/00 or C01B 37/00 depending on their base-exchange properties

MOFs are also classified in C07F.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Zeolites	(i) Crystalline aluminosilicates with base-exchange properties, having three dimensional prous lattice framework 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. Ga, Ge, P or B.

C01B 39/02

Crystalline aluminosilicate zeolites; Isomorphous compound 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

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Organic additive, organic template directing agent, templating agent, template, structure directing agent (SDA), structuring agent	Any component present in the reaction mixture, which directs the formation of the framework about it.

C01B 39/026

{After-treatment}

Definition statement

This place covers:

Dealumination of an aluminosilicate zeolite and ion-exchange. Also classified there are documents in which there is a particular emphasis on a process for removing an organic structure directing agent occluded within the as-synthesized zeolite framework. If the removing of the organic structure directing agent is not the invention, only mentioned in the document, it's not classified.

The normal steps of zeolite preparation like synthesis mixture, washing, calcination are not considered as post treatment.

References

Limiting references

This place does not cover:

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

C01B 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, {i.e. by direct or secondary synthesis}

Definition statement

This place covers:

Preparation isomorphous zeolites (i.e. wherein the aluminium or silicon atoms in the framework are partly or wholly replaced by atoms of other elements, e.g. Ga, Ge, P or B) obtained by direct or secondary synthesis.

C01B 39/14

Type A

Definition statement

This place covers:

Zeolite of LTA structure

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/145

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code LTA	type A, Linde A or Linde type A as exemplified in patent document US2882243

C01B 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 {(C01B 39/145 takes precedence)}

Special rules of classification

C01B 39/145 takes precedence

C01B 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 {(C01B 39/145 takes precedence)}

Special rules of classification

C01B 39/145 takes precedence

C01B 39/20

Faujasite type, e.g. type X or Y

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/205

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code FAU	Faujasite
Type X (framework topology code FAU)	Linde X or Linde type X exemplified by patent document US2882244
Type Y (framework topology code FAU)	Linde Y or Linde type Y exemplified by patent document US3130007)

C01B 39/22

Type X {(C01B 39/205 takes precedence)}

References

Limiting references

This place does not cover:

Synthesis using a template directing agent	C01B 39/205

Special rules of classification

C01B 39/205 takes precedence

C01B 39/24

Type Y {(C01B 39/205 takes precedence)}

References

Limiting references

This place does not cover:

Synthesis using a template directing agent	C01B 39/205

Special rules of classification

C01B 39/205 takes precedence

C01B 39/26

Mordenite type {(C01B 39/023, C01B 39/026, C01B 39/06 take precedence)}

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/265

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code MOR	Mordenite

C01B 39/28

Phillipsite or harmotome type {(C01B 39/023, C01B 39/026, C01B 39/06 take precedence)}

Definition statement

This place covers:

documents dealing with harmotome or phillipsite type materials.

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code PHI	Phillipsite
Harmotome	natural zeolite with framework topology code PHI

C01B 39/30

Erionite or offretite type, e.g. zeolite T

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/305

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Zeolite T (Framework topology code: ERI/OFF	or Linde T exemplified by patent document US2950952
Framework topology code ERI	Erionite
Framework topology code OFF	Offretite

C01B 39/32

Type L

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Type L (Framework topology code LTL)	Linde L or Linde type L exemplified in patent document US3216789

C01B 39/34

Type ZSM-4

Definition statement

This place covers:

Zeolites with framework topology code MAZ.

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

ZSM4 (Framework topology code MAZ)	exemplified by patent document GB1117568
Omega (Framework topology code MAZ)	exemplified by patent document GB1178186
Framework topology MAZ	Mazzite

C01B 39/36

Pentasil type, e.g. types ZSM-5, ZSM-8 or ZSM-11

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence.

C01B 39/365

{Type ZSM-8; Type ZSM-11; ZSM 5/11 intermediate}

Definition statement

This place covers:

only the identified type ZSM-8, ZSM-11, ZSM5/11 intermediate

The mixture of MFI and MEL frameworks, any intergrowth of MFI and MEL frameworks are classified in C01B 39/36

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

ZSM-8 (framework topology code MFI/MEL)	exemplified by patent document US3702886; thought to be an intergrowth of ZSM-5 with ZSM-11
ZSM-11 (framework topology code MEL)	exemplified by patent document US3709979
ZSM-5/11 (framework topology code MFI/MEL)	intergrowth product of the ZSM-5 and ZSM-11; exemplified by patent document US4289607
Framework topology code MFI	ZSM-5
Framework topology code MEL	ZSM-11

C01B 39/38

Type ZSM-5

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/40

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

ZSM-5 (Framework topology code MFI)	exemplified by patent document US3702886

C01B 39/42

Type ZSM-12

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code MTW	ZSM-12 exemplified by patent document US3832449

C01B 39/44

Ferrierite type, e.g. types ZSM-21, ZSM-35 or ZSM-38

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/445

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Framework topology code FER	Ferrierite
ZSM-21 (Framework topology code FER)	exemplified by patent document US4046859
ZSM-35 (Framework topology code: FER)	exemplified by patent document US4046859
ZSM-38 (Ferrierite-type)	exemplified by patent document US4016245

C01B 39/46

Other types characterised by their X-ray diffraction pattern and their defined composition {(C01B 39/023, C01B 39/026, C01B 39/06 take precedence)}

Definition statement

This place covers:

zeolites with specific X-ray diffraction pattern and defined composition not classifiable in the subgroups C01B 39/14 - C01B 39/445

References

Limiting references

This place does not cover:

Preparation using at least one organic template	C01B 39/48

Special rules of classification

Groups C01B 39/023, C01B 39/026 and **C01B36/06** take precedence

C01B 39/50

Zeolites wherein inorganic bases or salts occlude channels in the lattice framework, e.g. sodalite, cancrinite, nosean, hauynite {(ultramarine C09C 1/32)}

References

Limiting references

This place does not cover:

Ultramarine ($Na_8[(AlO_2)_6(SiO_2)_6]S_2$	C09C 1/32

C01B 39/52

Sodalites

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Sodalite	idea unit cell content: $Na_8[(AlO_2)_6(SiO_2)_6]Cl_2$

C01B 39/54

Phosphates, e.g. APO or SAPO compounds

Relationships with other classification places

Catalysts compositions are classified in the groups B01J 21/00 - B01J 29/00. B01J 32/00 concerning catalyst carriers is not used but is covered by appropriate groups of B01J 21/00 - B01J 29/00

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

APO or SAPO with non clearly defined base-exchange properties	C01B 37/04- C01B 37/08