C09C

TREATMENT OF INORGANIC MATERIALS, OTHER THAN FIBROUS FILLERS, TO ENHANCE THEIR PIGMENTING OR FILLING PROPERTIES (preparation of inorganic compounds or non-metallic elements C01; treatment of materials specially adapted to enhance their filling properties in mortars, concrete or artificial stone C04B 14/00, C04B 18/00, C04B 20/00); PREPARATION OF CARBON BLACK; [N: Preparation of inorganic materials which are no single chemical compounds and which are mainly used as pigments or fillers]

Definition statement

This subclass/group covers:

The treatment of inorganic compounds other than fibrous fillers, to enhance their pigmenting or filling properties;

Preparation of carbon black.

Preparation of inorganic materials being no single chemical compounds and used as pigments or fillers.

References relevant to classification in this subclass

This subclass/group does not cover:

Treatment by polymerisation onto particle is classified in C08F 292/00.

Only treatment by already polymerised agents is classified in C09C.

Special rules of classification within this subclass

The following IPC groups are not used in the internal CPC classification scheme. Subject matter covered by these groups is classified in the following CPC groups: IPC group **C09C1/68** is covered by CPC group C09K 3/14.

Whenever in groups C09C 1/00 to C09C 1/66 the materials consist of a particulate core bearing a coating or any other deposit, classification is done only according to the composition of the core, unless otherwise stated, e.g. C09C 1/0015, C09C 1/0078. Preparations of materials which are no single chemical compounds, mainly comprising ceramic pigments (C09C 1/0009),consisting of solid solutions or polycristalline structures, and compounds defined as composite materials (C09C 1/0081).Preparation and treatment steps are not always easy to distinguish from each other, e.g. preparation in the presence of treating agents (by precipitation or calcination), precise reacting conditions, affecting pigmentary effects. It is common practice to include these complex topics in C09C 1/00 while avoiding redundancy.

The last appropriate place rule applies.

When classifying in this subclass, symbols of C01P and are used to identify structural or physical aspects of solid inorganic compounds.

In case a group is indicated as indexed, the subgroups thereof are also indexed.

The symbols of C01P group deals with Structural and Physical Aspects of Solid Inorganic Compounds classified in subclasses C01B to C01G and C09C.These aspects include crystal-structural characteristics, particle morphology and physical properties.

The CPC definition of C01P has been icorporated at the end of this definition.

Exception from the last appropriate place rule:

Dopant: A dopant, also called a doping agent, is a trace impurity element that is inserted into a substance (in very low concentrations) in order to alter the physical properties of the substance. For the purpose of classification, a dopant is considered as such, when it's concentration is less than 5% (wt, vol, at.) or when mentioned as such in the patent document to be classified.

In such a case, the compound is classified ignoring the dopant(s) and the last appropriate place rule does not apply in view of the dopant(s). In case of doubts, the document is given the classification symbol relating to the last appropriate place rule by taking into account the dopant(s) and in the appropriate class, without taking into account the dopant(s).

C09C 1/00

Treatment of specific inorganic materials other than fibrous fillers (luminescent or tenebrescent materials C09K); Preparation of carbon black

Definition statement

This subclass/group covers:

Treatment of specific inorganic materials other than fibrous fibers and preparation of carbon black

References relevant to classification in this group

This subclass/group does not cover:

Lake pigmentsDyes	C09B
Luminescent or tenebrescent materials	C09K

Informative references

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

For the inorganic products itself	C01G
Aluminium oxide	C01F
Silica, silicates	C01B 33/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Pigment	A material that changes the color of reflected or transmitted light as the result of wavelength-selective absorption. This physical process differs from fluorescence, phosphorescence, and other forms of luminescence, in which a material emits light.A distinction is usually made between a pigment (inorganic), which is insoluble in the vehicle (resulting in a suspension), and a dye (organic), which either is itself a liquid or is soluble in its vehicle (resul ting in a solution). References : G. Buxbaum (Ed.), Industrial Inorganic Pigments, Wiley VCh.(1998) H.M. Smith (Ed.), High Performance Pigments, Wiley VCh.(2002)

C09C 1/0003

[N: Compounds of molybdenum (C09C 1/0015 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigment exhibiting interference colours	C09C 1/0015

Informative references

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

Compounds of molybdenum	C01G 39/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0006

[N: containing bismuth and vanadium (C09C 1/0015 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigment exhibiting interference colours	C09C 1/0015

Informative references

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

Compounds containing vanadium and bismuth	C01G 31/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0009

[N: Pigments for ceramics (C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Ceramics	C04B
Pigment exhibiting interference colours	C09C 1/0015
Pigments consisting of flaky, non-metallic substrates characterised by a surface-region containing free metal	C09C 1/0078

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0012

[N: containing zirconium and silicon]

Informative references

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

Compounds of zirconium	C01G 25/00
Silicates	C01B 33/00

Special rules of classification within this group

Classification in C01P subgroup shall be applied.

C09C 1/0015

[N: Pigments exhibiting interference colours, e.g. transparent platelets of appropriate thinness or flaky substrates, e.g. mica, bearing appropriate thin transparent coatings (C09C 1/0078, C09C 1/62 take precedence)]

Definition statement

This subclass/group covers:

Pigments with interference colours, e.g. pearlescent pigments, interference

pigments, luster pigments, optical variable pigments (OVP), effect pigments.

In general interference pigments consist of one substrate coated with one or more optically active layers. The optical active layers have a high or low refractive indices. A comprehensive list of inorganic compounds and their refractive indices can be found in "Sample dispersion & refractive index guide", Malvern Instruments Ltd. 1997.

Protective layers or functional layers applied on said interference pigments consist in general of metal oxides, silica, fatty acids, polymers, silanes etc. and are deemed not to affect the optical properties of the core pigment on which they are applied. Therefore and for the purpose of classification this layers are considered as being not optically active.

A rutilization promoting layer (mostly SnO2) is also not considered as being optically active if not otherwise stated. Also other layers, like adhesion promoting layers etc. are also considered as optically not active

References relevant to classification in this group

This subclass/group does not cover:

Pigments consisting of flaky, non-metallic substrates characterised by a surface-region containing free metal	C0C1/00G
Metallic pigments or fillers	C09C 1/62

Special rules of classification within this group

Classification in C01P and C09C 2200/00- subgroups shall be applied.

C09C 1/0018

[N: uncoated and unlayered plate-like particles]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising uncoated and unlayered plate-like particles,e.g. Substrate materials suitable for use as substrate for pigments exhibiting interference colours.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied

C09C 1/0021

[N: comprising a core coated with only one layer having a high or low refractive index]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a core coated with only layer having a high or low refractive index, e.g. pearlescent pigments consisting of a substrate and only one optically active layer, e.g. [SiO2-(substrate)-SiO2], [TiO2-(substrate)-TiO2], but also [(substrate)-Fe2O3], [(substrate)-SiO2].

These pigments can comprise non optically active layers like protective or functional layers (see definition statement C09C 1/0015).

These pigments can also comprise a substrate comprising.a protective- or a adhesion promoting layer, which cannot be considered as being optically active, e.g. a substrate comprising an metallic aluminium flake coated with a protective layer to prevent corrosion (e.g. silica, aluminium oxide etc.).

A rutilization promoting layer (mostly SnO2) is also not considered as being optically active if not otherwise stated.

References relevant to classification in this group

This subclass/group does not cover:

Metallic effect pigments showing no interference colours	C09C 1/62

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0024

[N: comprising a stack of coating layers with alternating high and low refractive indices, wherein the first coating layer on the core surface has the high refractive index]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices, the first coating layer on the

core surface having high refractive index, e.g Pearlescent pigments consisting of a substrate and with alternating optically active layers, e.g. [SiO2-TiO2-(substrate)-TiO2- SiO2] (Low-High-Substrate-High-Low), but also [(substrate)-TiO2- SiO2-Fe2O3].

These pigments can further comprise non optically active layers like protective or functional layers (see definition statement C09C 1/0015).

These pigments can also comprise a substrate comprising.a protective- or a adhesion promoting layer, which cannot be considered as being optically active, e.g. a substrate comprising an metallic aluminium flake coated with a protective layer to prevent corrosion (e.g. silica, aluminium oxide etc.).

A rutilization promoting layer (mostly SnO2) is also not considered as being optically active if not otherwise stated.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0027

[N: One layer consisting of at least one sub-stoichiometric inorganic compound]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices, the first coating layer on the core surface having high refractive index and one layer consisting of at least one sub-stoichiometric inorganic compound, typically used substoechiometric compounds are non-stoechiometric titanium or silicon oxide, like TiOx, SiOx with 0<x<2.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

In case said layer is defined to be a light adsorbing layer it has to be classified also in C09C 1/003

C09C 1/003

[N: comprising at least one light-absorbing layer]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices, the first coating layer on the core surface having high refractive index and with at least one light-absorbing layer, e.g.a light-absorbing layer is often a compound having an own colour, e.g. metallic oxides, alloys, dyes etc.

Special rules of classification within this group

Symbols from C01P and C09C 2200/00 groups are used for classification.

C09C 1/0033

[N: consisting of a metal or an alloy]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shll be applied.

C09C 1/0036

[N: consisting of at least one dye]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0039

[N: consisting of at least one coloured inorganic material]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices, the first coating layer on the core surface having high refractive index and with at least one light-absorbing layer consisting of one coloured inorganic material, e.g. typically a coloured metal oxide, e.g. iron oxide

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0042

[N: Sub-stoichiometric inorganic materials]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0045

[N: consisting of a carbonaceous material, e.g. carbon black, graphite, SWNT, MWNT incorporated within an inorganic material]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

SWNT	single-walled carbon nanotubes
MWNT	multi-walled carbon nanotubes

C09C 1/0048

[N: comprising at least one optically active layer with at least one organic material layer, e.g. liquid crystal polymers]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0051

[N: comprising a stack of coating layers with alternating low and high refractive indices, wherein the first coating layer on the core surface has the low refractive index]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices with the first coating layer on the core surface having the low refractive index, e.g. pearlescent pigments consisting of a substrate and with alternating optically active layers, e.g. [TiO2-SiO2-(substrate)-SiO2- TiO2] (Low-High-Substrate-High-Low), but also

[(substrate)-TiO2- SiO2-Fe2O3].

These pigments can further comprise non optically active layers like protective or functional layers (see definition statement C09C 1/0015).

These pigments can also comprise a substrate comprising.a protective- or a adhesion promoting layer, which cannot be considered as being optically active, e.g. a substrate comprising an metallic aluminium flake coated with a protective layer to prevent corrosion (e.g. silica, aluminium oxide etc.).

A rutilization promoting layer (mostly SnO2) is also not considered as being optically active if not otherwise stated.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

C09C 1/0054

[N: one layer consisting of at least one sub-stoichiometric inorganic compound]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices with one layer consisting of at least one sub-stoichionetric inorganic compound, e.g. non-stoechiometric titanium or silicon oxide, like TiOx, SiOx with 0<x<2.

In case said layer is a light adsorbing layer, see C09C 1/0057

Special rules of classification within this group

Classification in C01P and C09C 2200/00 subgroups shall be applied.

In case the layer is a light adsorbing layer, see C09C 1/0057

C09C 1/0057

[N: comprising at least one light-absorbing layer]

Definition statement

This subclass/group covers:

Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices with the first coating layer on the core surface having the low refractive index and comprising at least one light-absorbing layer, e.g. light-absorbing layer is often a compound having an

own colour, e.g. metallic oxides, alloys, dyes etc.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shall be applied.

C09C 1/006

[N: consisting of a metal or an alloy]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 shall be applied.

C09C 1/0063

[N: consisting of at least one dye]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shall be applied.

C09C 1/0066

[N: consisting of at least one coloured inorganic material]

Definition statement

This subclass/group covers:
Typically a coloured metal oxide, e.g. iron oxide

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shal be applied.

C09C 1/0069

[N: Sub-stoichiometric inorganic materials]

Definition statement

This subclass/group covers:
Pigments exhibiting interference colours comprising a stack of coating layers with alternating high and low refractive indices with the first coating layer on the core surface having the low refractive index and comprising at least one light-absorbing layer consisting of sub-stoichiometric coloured inorganic material,e.g. substoechiometric compounds are non-stoechiometric titanium

or silicon oxide, like TiOx, SiOx with 0<x<2.

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shall be applied.

C09C 1/0072

[N: consisting of a carbonaceous material, e.g. carbon black, graphite, SWNT, MWNT incorporated within an inorganic material]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shall be applied.

C09C 1/0075

[N: comprising at least one optically active layer with at least one organic material layer, e.g. liquid crystal polymers]

Special rules of classification within this group

Classification in C01P and C09C 2200/00 groups shall be applied.

C09C 1/0078

[N: Pigments consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal]

Definition statement

This subclass/group covers:

Pigments consisting of non metallic substrates having a surface-region comprising only metal, e.g. a substrate consisting a silicate, mica, a metal oxide material coated with a metallic layer.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0081

[N: Composite particulate pigments or fillers, i.e. containing at least two solid phases, except those consisting of coated particules of one compound (C09C 1/0015, C09C 1/0078 take

precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0084

[N: containing titanium dioxide]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0087

[N: only containing titanium dioxide and silica or silicate]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/009

[N: whose phases only contain calcium, magnesium and carbonate ions and may contain hydroxyl ions]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0093

[N: whose phases only contain calcium ions, carbonate ions

and silicate ions or silica]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/0096

[N: Compounds of antimony (C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of antimony	C01G 30/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/02

Compounds of alkaline earth metals or magnesium [N: (C09C 1/0003, C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence; dolomitic solids C09C 1/009)]

References relevant to classification in this group

This subclass/group does not cover:

Treatment of molybdenum compounds	C09C 1/0003

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078
Dolomitic solids	C09C 1/009

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/021

[N: Calcium carbonates]

Informative references

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

Compounds of calcium	C01F 11/18

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/025

[N: Calcium sulfates]

Informative references

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

Gypsum	C01F 11/46

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/027

[N: Barium sulfates]

Informative references

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

Compounds of barium	C01F 11/46

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/028

[N: Compounds containing only magnesium as metal]

Informative references

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

Compounds of magnesium	C01F 5/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/04

Compounds of zinc [N: (C09C 1/0003, C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Treatment of molybdenum compounds	C09C 1/0003
Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference	C09C 1/0015

colours	
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of zinc	C01G 9/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/043

[N: Zinc oxide]

Informative references

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

Zinc oxide	C01G 9/02, C01G 9/03

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/046

[N: containing phosphorus]

Definition statement

This subclass/group covers:

Treatment of zinc compounds containing phosphorous to enhance their pigmenting or filling properties, e.g Zinc phosphate pigments which are as anticorrosion pigments

Informative references

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

Compounds comprising phosphate anions	C01B 25/16

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/06

Lithopone

Definition statement

This subclass/group covers:

lithopone, brilliant white pigment used in paints, inks, leather, paper, linoleum, and face powder. Lithopone was developed in the 1870s as a substitute or supplement for lead carbonate (white lead), to overcome its drawbacks of toxicity, poor weathering, and darkening in atmospheres that contain sulfur compounds. Lithopone is an insoluble mixture of barium sulfate and zinc sulfide that precipitates upon mixing solutions of barium sulfide and zinc sulfate. The precipitate is recovered by filtration, then calcined (roasted) at temperatures above 600° C (1,112° F). Although lithopone has been replaced in many applications by titanium dioxide, introduced after World War I, it is still widely used in a number of products, such as water paints.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/08

Zinc chromate

Definition statement

This subclass/group covers:

Treatment of zinc chromate to enhance their pigmenting or filling properties, e.g like zinc phosphate the zinc chromate is an anticorrosive pigment

Informative references

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

Compounds of chromium	C01G 37/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/10

Compounds of cadmium [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

Definition statement

This subclass/group covers:

Treatment of cadmium compounds to enhance their pigmenting or filling properties, e.g cadmium pigments have particularly brilliant red and yellow colours.

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of cadmium	C01G 11/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Cadmium y ellow	pure CdS or mixed crystalls of zinc and cadmium sulfide (Cd,Zn)S
Cadmium cinnabar	(Cd,Hg)S (Cadmium mercury sulfide)

C09C 1/12

Cadmium suphoselenide

Definition statement

This subclass/group covers:

Treatment of cadmium suphoselenide to enhance its pigmenting or filling properties, e.g Cadmium Red Cd(S,Se)

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/14

Compounds of lead [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of lead	C01G 21/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/16

White lead

Definition statement

This subclass/group covers:

White lead is basic lead carbonate, (PbCO3)2Pb(OH)2) and has the warmest masstone of all the whites. It has a very subtle reddish-yellow undertone that is almost unnoticeable unless you are looking for it, or comparing lead white side by side with other kinds of white. This undertone is minimal in the best quality of lead whites.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/18

Red lead

Definition statement

This subclass/group covers:

Red lead is lead tetroxide, also called minium, red lead or triplumbic tetroxide, is a bright red or orange crystalline or amorphous pigment. Chemically, red lead is lead tetroxide, Pb3O4, or 2PbO·PbO2.

Lead tetroxide is used in the manufacture of rust-proof primer paints.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/20

Lead chromate

Definition statement

This subclass/group covers:

Treatment of lead chromate compounds to enhance their pigmenting or filling properties, e.g "chrome yellow" : Lead(II) chromate ($PbCrO_4$) is a chemical compound, a chromate of lead, but also a mixed phase compound of the type $(Pb(Cr,S)O_4$

Informative references

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

Compounds of chromium	C01G 37/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/22

Compounds of iron [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of iron	C01G 49/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/24

Oxides of iron

Definition statement

This subclass/group covers:

Iron oxide pigments consist in general of the well defined compounds like goethite (#-FeOOH) (yellow); lepidocrocite (#-FeOOH) (yellow to orange); hematite (#-Fe2O3, red) (light red to dark violet); maghemite (#-Fe2O3) (brown); magnetite (Fe3O4) (black).

Informative references

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

Compounds of iron	C01G 49/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/245

[N: of plate-like shape]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/26

Iron blues

Definition statement

This subclass/group covers:

The iron blues are based upon iron (II,III) hexacyanoferrate (II,III), ferric ferrocyanide, ferric hexacyanoferrate, iron (III) ferrocyanide, iron (III) hexacyanoferrate (II). Historical and more common names for said pigments are Prussian blue (Parisian blue, Berlin blue) and Turnbull's blue

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/28

Compounds of silicon [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of silicon	C01B 33/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/30

Silicic acid

Definition statement

This subclass/group covers:

Silicic acid is a general name for a family of chemical compounds of the element silicon, hydrogen, and oxygen, with the general formula

[SiOx(OH)4-2x]n.

Silicon dioxide (SiO2)is considered as anhydrous silicic acid and is classified

in C09C 1/30

Informative references

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

Compounds of silicon	C01B 33/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3009

[N: Physical treatment, e.g. grinding; treatment with ultrasonic vibrations]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3018

[N: Grinding]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3027

[N: Drying, calcination]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3036

[N: Agglomeration, granulation, pelleting]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3045

[N: Treatment with inorganic compounds]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3054

[N: Coating]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3063

[N: Treatment with low-molecular organic compounds]

Definition statement

This subclass/group covers:

Low-molecular organic compounds are compounds which consist of one type of molecule, which molecular weight can be exactly defined. The molecular weight of low-molecular compounds is less than 15000 g/mol. Typical low-molecular compounds are fatty acids, ethylene glycols.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3072

[N: Treatment with macro-molecular organic compounds]

Definition statement

This subclass/group covers:

Macromolecular organic compounds are compounds with a molecular weight of more than about 15000 g/mol. Typical macro-molecular organic compouds are polymers like polyethylene, polypropylene etc., waxes etc.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3081

[N: Treatment with organo-silicon compounds]

Special rules of classification within this group

Classification in C01P subgroup shall be applied.

C09C 1/309

[N: Combinations of treatments provided for in groups C09C 1/3009 to C09C 1/3081]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

The groups for the single treatments have to be indicated as well, e.g. a silicon dioxide treated with an inorganic compound, further coated with a macromolecular compound and a silane, followed by a grinding process will get the group symbols C09C 1/309, C09C 1/3045, C09C 1/3072, C09C 1/12 and C09C 1/3018

C09C 1/32

Ultramarine

Definition statement

This subclass/group covers:

Ultramarine is a blue pigment consisting primarily of a double silicate of aluminium (three dimensional aluminosilicate lattice) and sodium with some sulfides or sulfates, and occurring in nature as a proximate component of lapis lazuli. In the past, it has also been known as azzurrum ultramarine, azzurrum transmarinum, azzuro oltramarino, azur d'Acre, pierre d'azur, Lazurstein. Current terminology for ultramarine include natural ultramarine (English), outremer lapis (French), Ultramarin echt (German), oltremare genuino (Italian), and ultramarino verdadero (Spanish). Ultramarine is a complex sulfur-containing sodium-silicate (Na6-10Al6Si6O24S2-4) containing a blue cubic mineral called lazurite (the major component in lapis lazuli). The blue color of the pigment is due to the S3# radical anion, which contains an unpaired electron.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/34

Compounds of chromium [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078, C09C 1/08, C09C 1/20 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078
Treatment of zinc chromate	C09C 1/08
Treatment of lead chromate	C09C 1/20

Informative references

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

Compounds of chromium	C01G 37/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/343

[N: containing silicon or associated with silicon containing material, except when silicon only occurs in a thin coating of the particles]

Definition statement

This subclass/group covers:

Treatment of titanium compounds containing silicon or associated with silicon containing material, except when silicon only occurs in a thin coating of the particles.

Thin layer coating is a coating thickness being less than 0.1 time the particle

radius.

Informative references

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

Compounds of siliconCompounds of chromium	C01B 33/00 C01G 37/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/346

[N: Chromium oxides]

Informative references

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

Compounds of chromium	C01G 37/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/36

Compounds of titanium [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of titanium	C01G 23/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3607

[N: Titanium dioxide]

Definition statement

This subclass/group covers:

Treatment of titanium oxide compounds to enhance their pigmenting or filling properties, e.g rutile, anatase and brookite;

Anatase has the higher photocatalytic activity compared with the photocatalytic activity of rutile.

Informative references

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

Titanium dioxide	C01G 23/047

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3615

[N: Physical treatment, e.g. grinding, treatment with ultrasonic vibrations]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3623

[N: Grinding]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/363

[N: Drying, calcination]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3638

[N: Agglomeration, granulation, pelleting]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3646

[N: Densifying, degassing, packaging]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3653

[N: Treatment with inorganic compounds]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3661

[N: Coating]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3669

[N: Treatment with low-molecular organic compounds]

Definition statement

This subclass/group covers:

Low-molecular organic compounds are compounds which consist of one type of molecule, which molecular weight can be exactly defined. The molecular weight of low-molecular compounds is less than 15000 g/mol. Typical low-molecular compounds are fatty acids, ethylene glycols.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3676

[N: Treatment with macro-molecular organic compounds]

Definition statement

This subclass/group covers:

Macromolecular organic compounds are compounds with a molecular weight of more than about 15000 g/mol. Typical macro-molecular organic compounds are polymers like polyethylene, polypropylene etc., waxes etc.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3684

[N: Treatment with organo-silicon compounds]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/3692

[N: Combinations of treatments provided for in groups C09C 1/3615 to C09C 1/3684]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

The classes for the single treatments have to be indicated as well, e.g. a titanium dioxide treated with an inorganic compound, further coated with a macromolecular compound and a silane, followed by a grinding process will get the classes C09C 1/309, C09C 1/3045, C09C 1/3072, C09C 1/12 and C09C 1/3018.

C09C 1/38

Compounds of mercury [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009
Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078

Informative references

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

Compounds of mercury	C01G 13/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/40

Compounds of aluminium [N: (C09C 1/0009, C09C 1/0015, C09C 1/0078, C09C 1/32 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments for ceramics	C09C 1/0009

Pigment exhibiting interference colours	C09C 1/0015
Pigment consisting of flaky, non-metallic substrates, characterised by a surface-region containing free metal	C09C 1/0078
Treatment of ultramarine	C09C 1/32

Informative references

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

Compounds of aluminium	C01F 7/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/402

[N: Satin white, modifications thereof, e.g. carbonated or silicated; Calcium sulfoaluminates; Mixtures thereof, e.g. with calcium carbonate or kaolin]

Definition statement

This subclass/group covers:

Treatment of satin white compounds, calcium sulfoaluminates compounds, mixtures thereof to enhance their pigmenting or filling properties.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Satin white is a white pigment consisting essentially of calcium sulfate and aluminum hydroxide

C09C 1/405

[N: containing combined silica, e.g. mica]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/407

[N: Aluminium oxides or hydroxides]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/42

Clays (preparatory treatment for clay wares C04B 33/04)

References relevant to classification in this group

This subclass/group does not cover:

Preparatory treatment for clay wares	C04B 33/04

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/44

Carbon

Informative references

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

Compounds of carbon	C01B 31/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/46

Graphite ([N: C09C 1/0015 takes precedence]; preparation of graphite C01B 31/04)

Definition statement

This subclass/group covers:

Graphite is an allotrope of carbon and has a layered, planar structure. In each layer, the carbon atoms are arranged in a honeycomb lattice.

References relevant to classification in this subclass

This subclass/group does not cover:

Preparation of graphite	C01B 31/04

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/48

Carbon black

Definition statement

This subclass/group covers:

Carbon black is a form of amorphous carbon and produced with the thermal decomposition method or the partial combustion method using hydrocarbons such as oil or natural gas as raw material.

The characteristics of carbon black vary depending on manufacturing process, and therefore carbon black is classified by manufacturing process.

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/482

[N: Preparation from used rubber products, e.g. tyres (processing of used rubber in general B29H19/00)]

References relevant to classification in this group

This subclass/group does not cover:

Processing of used rubber in general	**B29H19/00**

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/485

[N: Preparation involving the use of a plasma or of an electric arc]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/487

[N: Separation; Recovery (quenching C09C 1/50 to C09C 1/54)]

References relevant to classification in this group

This subclass/group does not cover:

Quenching	C09C 1/50 to C09C 1/54

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/50

Furnace black; [N: Preparation thereof (separation or recovery C09C 1/487)]

Definition statement

This subclass/group covers:

Furnace black is a carbon black formed by partial combustion of petroleum or coal oil and gaseous hydrocarbons in a closed furnace with a deficiency of oxygen

References relevant to classification in this group

This subclass/group does not cover:

Separation or recovery	C09C 1/487

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/52

Channel black; [N: Preparation thereof (separation or recovery C09C 1/487)]

Definition statement

This subclass/group covers:

Channel black is a carbon black formed by bringing partially combusted fuel, which is generated with natural gas as raw material, into contact with channel steel and then collecting the carbon black which results.

References relevant to classification in this group

This subclass/group does not cover:

Separation or recovery	C09C 1/487

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/54

Acetylene black; Thermal black; [N: Preparation thereof (separation or recovery C09C 1/487)]

Definition statement

This subclass/group covers:

Acetylene black is a carbon black formed by thermally decomposing acetylene gas. It provides carbon black with higher structures and higher crystallinity.

References relevant to classification in this group

This subclass/group does not cover:

Separation or recovery	C09C 1/487

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/56

Treatment of carbon black; [N: Purification]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/565

[N: comprising an oxidative treatment with oxygen, ozone or oxygenated compounds, e.g. when such treatment occurs in a region of the furnace next to the carbon black generating reaction zone]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/58

Agglomerating, pelleting, or the like by wet methods

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/60

Agglomerating, pelleting, or the like by dry methods

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/62

Metallic pigments or fillers ([N: C09C 1/0015 takes precedence]; obtaining metal powder, see the relevant class for the method used, e.g. B22F 9/00, C21B 15/02, C22B 5/20,

C25C 5/00)

Definition statement

This subclass/group covers:

Metallic pigments or fillers, metallic effect pigments provided in their pure metallic form. However, for corrosion prevention the metallic pigments or fillers can be coated with optically non-active, protective coatings.

References relevant to classification in this group

This subclass/group does not cover:

Obtaining metal powder	B22F 0/00, C21B 15/02, C22B 5/20, C25C 5/00

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/622

[N: Comminution, shaping or abrasion of initially uncoated particles, possibly in presence of grinding aids, abrasives or chemical treating or coating agents; Particle solidification from melted or vaporised metal; Classification]

Definition statement

This subclass/group covers:

Comminution, shaping or abrasion of initially uncoated particles, with or without grinding aids, abrasives or chemical treating or coating agents.

Particle solidification from melted or vaporised metal

Classification

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/625

[N: the particles consisting of zinc or a zinc alloy]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/627

[N: Copper]

Special rules of classification within this group

Classification in C01P subgroupsshall be applied.

C09C 1/64

Aluminium

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/642

[N: treated with inorganic compounds]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/644

[N: treated with organic compounds, e.g. polymers]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/646

[N: concomitant with mechanical comminution, shaping or abrasion of the particles]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/648

[N: treated with inorganic and organic, e.g. polymeric, compounds]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 1/66

Copper alloys, e.g. bronze

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/00

Treatment in general of inorganic materials, other than fibrous fillers, to enhance their pigmenting or filling properties (dyeing other macromolecular particles C08J 3/20; dyeing macromolecular fibres D06P)

Definition statement

This subclass/group covers:

Treatment in general of inorganic materials not being fibrous fillers to increase their pigmenting or filling properties

References relevant to classification in this subclass

This subclass/group does not cover:

Dyeing other macromolecular particles	C08J 3/20
Dyeing macrolecular fibres	D06P

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

Specific examples shall always be classified in the appropriate C09C 1/00 group

C09C 3/003

[N: Flushing]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Flushing	to purge, washing

C09C 3/006

[N: Combinations of treatments provided for in groups C09C 3/04 to C09C 3/12]

Special rules of classification within this group

Classification in C01P subgroups shall be applied

The single treatment steps shall be classified in the appropriate C09C 3/00-class

C09C 3/04

Physical treatment, e.g. grinding, treatment with ultrasonic vibrations [N: (C09C 3/006 takes precedence)]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/041

[N: Grinding]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/043

[N: Drying, calcination]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/045

[N: Agglomeration, granulation, pelleting]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/046

[N: Densifying, degassing, packaging]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/048

[N: Treatment with a plasma]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/06

Treatment with inorganic compounds [N: (C09C 3/006, C09C 3/048 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Combination of treatments provided for in groups C09C 3/04 to C09C 3/12	C09C 3/006
Treatment with plasma	C09C 3/048

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/063

[N: Coating]

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/066

[N: Treatment or coating resulting in a free metal containing surface-region (C09C 1/0078 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Pigments consisting of flaky, non-metallics subtrates, characterised by a surface-region containing free metal	C09C 1/0078

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/08

Treatment with low-molecular-weight [N: non-polymer] organic compounds [N: (C09C 3/006, C09C 3/048 take precedence)]

Definition statement

This subclass/group covers:

Low-molecular organic compounds are compounds which consist of one type of molecule, which molecular weight can be exactly defined. The molecular weight of low-molecular compounds is less than 15000 g/mol. Typical low-molecular compounds are fatty acids, ethylene glycols.

References relevant to classification in this group

This subclass/group does not cover:

Combination of treatments provided for in groups C09C 3/04 to C09C 3/12	C09C 3/006
Treatment with plasma	C09C 3/048

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/10

Treatment with macromolecular organic compounds [N: (C09C 3/006 takes precedence)]

Definition statement

This subclass/group covers:

Macromolecular organic compounds are compounds with a molecular weight of more than about 15000 g/mol. Typical macro-molecular organic compouds are polymers like polyethylene, polypropylene etc., waxes etc.

References relevant to classification in this group

This subclass/group does not cover:

Combination of treatments provided for in groups C09C 3/04 to C09C 3/12	C09C 3/006

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 3/12

Treatment with organosilicon compounds [N: (C09C 3/006 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Combination of treatments provided for in groups C09C 3/04 to C09C 3/12	C09C 3/006

Special rules of classification within this group

Classification in C01P subgroups shall be applied.

C09C 200/00

Compositional and structural details of pigments exhibiting interference colours

Special rules of classification within this group

When the subgroups of **C09C200/00** to **C09C220/20** are used for classification only for C09C 1/0015 to C09C 1/0075, no symbols are given for the classification of the particle morphology according to the symbols C01P 2004/10 to C01P 2004/42 or C01P 2004/80 to C01P 2004/88

C09C 210/00

Special effects or used of interference pigments

C09C 220/00

Methods of preparing the interference pigments

C01P

Classification scheme relating to structural and physical aspects of solid inorganic compounds

Definition statement

This subclass/group covers:

The classification scheme C01P is systematically applied for classification of crystal-structural features (C01P 2002/00-C01P 2002/90), particle morphologies (C01P 2004/00-C01P 2004/90) and properties (C01P 2006/00-C01P 2006/90) of solid inorganic materials. The scheme is used for all incoming documents classified in C01B-C01G and in C09C from 1994 onwards. Although gradually extended, the major part of the present scheme is operational from 2003.

The back-log of the following C01-groups is completely classified according to the C01P-scheme:

C01B 13/14-C01B 13/366 (oxides in general complete)

C01B 17/20-C01B 17/46

C01B 19/00-C01B 19/04 (all selenides, tellurides)

C01B 21/06-C01B 21/076 (all nitrides)

C01B 21/082-C01B 21/0828

C01B 31/30-C01B 31/36 (all carbides)

C01B 33/18-C01B 33/193

C01C 3/08-C01C 3/12 (all cyanides)

C01F 5/02-C01F 5/38

C01F 7/001-C01F 7/046

C01F 7/14-C01F 7/18

C01F 7/30-C01F 7/36

C01F 7/42-C01F 7/46

C01F 7/56-C01F 7/62

C01F 11/02-C01F 11/186

C01F 11/46-C01F 11/468

C01F 17/00

C01F 17/0012-C01F 17/0093

C01G 1/02

C01G 3/006-C01G 3/02

C01G 21/006-C01G 21/10

C01G 21/22

C01G 23/002-C01G 23/006

C01G 23/04-C01G 23/08

C01G 25/006-C01G 25/02

C01G 27/006-C01G 27/02

C01G 28/002-C01G 28/005

C01G 28/02-C01G 28/026

C01G 29/00

C01G 29/006

C01G 30/002

C01G 30/004-C01G 30/005

C01G 30/02-C01G 30/026

C01G 31/006-C01G 31/02

C01G 33/00

C01G 33/006

C01G 35/00

C01G 35/006

C01G 37/006-C01G 37/033

C01G 39/006-C01G 39/02

C01G 41/006-C01G 41/02

C01G 43/006-C01G 43/025

C01G 45/006-C01G 45/02

C01G 47/00

C01G 47/006

C01G 49/0018-C01G 49/08

C01G 51/006

C01G 51/04

C01G 53/006

C01G 53/04

C01G 55/002

C01G 55/004

C01G 56/003

C01G 56/005

C01G57/00

C01G57/00D

Special rules of classification within this group

This classification scheme is applicable to the whole class C01 and subclass C09C.

Classes are attributed as complete as possible which can easily result in a number of 3 to 10 C01P-classes attributed per document.

C01P 2002/00

Crystal-structural characteristics

Definition statement

This subclass/group covers:

Features relating to the crystal structure of inorganic compounds, which are independent from the size of the particles (C01P 2004/00) and which cannot be qualified as a macroscopic physical property (C01P 2006/00).

C01P 2002/01

depicted by a TEM-image

Definition statement

This subclass/group covers:

Any image obtained by TEM or HRTEM, of particles completely or partially.

References relevant to classification in this group

This subclass/group does not cover:

TEM-images showing X-Ray data:	C01P 2002/72
TEM- (or SEM-) images of particles:	C01P 2004/03 (respectively C01P 2004/04)

Special rules of classification within this group

Care should be taken not to use this class for SEM- (Scanning Electron Microscope) images which are not used for depicting crystal structures.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

TEM:	Transmission Electron Microscope
HRTEM:	High-resolution Transmission Electron Microscope
SEM:	Scanning Electron Microscope

C01P 2002/02

Amorphous compounds

Definition statement

This subclass/group covers:

Mostly only attributed to compounds which are described as being 100% amorphous.

C01P 2002/10

One-dimensional structures

References relevant to classification in this group

This subclass/group does not cover:

One-dimensional particles:	C01P 2004/10

C01P 2002/20

Two-dimensional structures

References relevant to classification in this group

This subclass/group does not cover:

Two-dimensional particles:	C01P 2004/20

C01P 2002/22

layered hydroxide-type, e.g. of the hydrotalcite-type

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Hydrotalcite:	Mg6Al2(OH)16CO3.4H2O

Synonyms and Keywords

In patent documents the following abbreviations are often used:

LDH:	Layered Double Hydroxide

C01P 2002/30

Three-dimensional structures

Definition statement

This subclass/group covers:
Structures not classified below, e.g. compounds with the garnet-structure

References relevant to classification in this group

This subclass/group does not cover:

Three-dimensional particles:	C01P 2004/30

C01P 2002/32

spinel-type (AB2O4)

Definition statement

This subclass/group covers:
All compounds with the spinel structure.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Spinel:	MgAl2O4

C01P 2002/34

perovskite-type (ABO3)

Definition statement

This subclass/group covers:
All compounds with the perovskite structure.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Perovskite:	CaTiO3

C01P 2002/50

Solid solutions

Definition statement

This subclass/group covers:

Structures wherein one or more cations or anions can be replaced by other ion without change of the crystal structure.

Special rules of classification within this group

Complete solid solutions are double classified according to both end members.

C01P 2002/52

containing elements as dopants

Definition statement

This subclass/group covers:

The definition of dopant differs depending on the technical field.

In class C01 regarding the amount of replacing cation or anion is a limit value of about 5 atom-% taken as a rule.

C01P 2002/60

Compounds characterised by their crystallite size

Definition statement

This subclass/group covers:

The crystallite size differs from the particle size (C01P 2004/60-C01P 2004/64) in that it concerns the crystalline domain size, i.e. the smallest single crystalline part of the material.

References relevant to classification in this group

This subclass/group does not cover:

Characterizations of (primary or secondary) particle sizes:	C01P 2004/60

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Crystallite size:	The expression 'crystallite size' refers to the volume of powder material having one single crystalline structure. Mostly powders are polycrystalline and consist of a large number of crystallites held together by a crystallite- (or grain-) boundary.

C01P 2002/72

by d-values or two theta-values, e.g. as X-ray diagram

Definition statement

This subclass/group covers:

Tables or X-ray diagrams specifying d- or two theta-values together with intensities.

References relevant to classification in this group

This subclass/group does not cover:

Amorphous compounds:	C01P 2002/04
Compounds indicated by their crystallinity index:	C01P 2002/02

C01P 2002/74

by peak-intensities or a ratio thereof only

Definition statement

This subclass/group covers:

Situations wherein only peak intensities or a ratio of two intensities are given.

References relevant to classification in this group

This subclass/group does not cover:

Intensities and two-theta (or d-values), e.g. by specification as X-ray diagram or in a table:	C01P 2002/72

C01P 2002/76

by a space-group or by other symmetry indications

Definition statement

This subclass/group covers:

Symmetry indications: e.g. orthorhombic or hexagonal. Example: hexagonal BN.

C01P 2002/77

by unit-cell parameters, atom positions or structure diagrams

Definition statement

This subclass/group covers:

'Structure diagrams' include all two and three dimensional ways of depicting the structure of a solid material.

C01P 2002/78

by stacking-plane distances or stacking sequences

Definition statement

This subclass/group covers:

E.g. layer distances as specified in layered double hydroxide compounds (as such classified in C01P 2002/22).

C01P 2002/82

by IR- or Raman-data

Definition statement

This subclass/group covers:

Infra-red and Raman spectroscopy data (0.7-300 micrometer = 700-300.000 nm)

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

IR:	Infra-Red radiation

C01P 2002/84

by UV- or VIS- data

Definition statement

This subclass/group covers:

UV and visible light data (380-750 nm wavelength).

References relevant to classification in this group

This subclass/group does not cover:

Inorganic luminescent materials:	C09K 11/08

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

UV:	Ultra-Violet radiation
VIS:	Visible radiation ('Light')

C01P 2002/85

by XPS, EDX or EDAX data

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

XPS:	X-ray Photoelectron Spectroscopy
EDX:	Energy Dispersive X-ray Spectroscopy
EDAX:	Energy Dispersive X-ray Analytical Spectroscopy
EDS:	Energy Dispersive Spectroscopy

C01P 2002/86

by NMR- or ESR-data

Definition statement

This subclass/group covers:

Nuclear Magnetic Resonance and Electron Spin Resonance data.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

NMR:	Nuclear Magnetic Resonance
ESR:	Electron Spin Resonance data

C01P 2002/87

by chromatography data, e.g. HPLC, gas chromatography

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

HPLC:	High-Performance Liquid Chromatography

C01P 2002/88

by thermal analysis data, e.g. TGA, DTA, DSC

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

TGA:	Thermal Gravimetric Analysis
DTA:	Differential Thermal Analysis
DSC:	Differential Scanning Calorimetry

C01P 2004/00

Particle morphology

Definition statement

This subclass/group covers:

Features relating to the size or shape of particles of inorganic compounds.

C01P 2004/03

obtained by SEM

Special rules of classification within this group

Care should be given not to confuse SEM (Scanning Electron Microscope) and TEM (Transmisson Electron Micrsocope) images.

Check the description carefully about this. Mostly is the magnification factor an indicator.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

SEM:	Scanning Electron Microscopy

C01P 2004/04

obtained by TEM, STEM, STM or AFM

Special rules of classification within this group

Care should be given not to confuse SEM (Scanning Electron Microscope) and TEM (Transmisson Electron Micrsocope) images.

Check the description carefully about this. Mostly is the magnification factor an indicator.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

TEM:	Transmission Electron Microscopy
STEM:	Scanning Transmission Electron Microscopy
STM:	Scanning Tunneling Microscopy
AFM:	Atomic Force Microscopy

C01P 2004/10

extending in one dimension, e.g. needle-like

Definition statement

This subclass/group covers:

All those particles whereby one dimension is significantly larger that the other two.

Synonyms and Keywords

In patent documents the following expressions/words "needle-like"and "acicular" are often used as synonyms.

C01P 2004/11

with a prismatic shape

Definition statement

This subclass/group covers:

The shape refers to the section considered perpendicular to the length.

C01P 2004/12

with a cylindrical shape

Definition statement

This subclass/group covers:

The shape refers to the section considered perpendicular to the length.

C01P 2004/13

Nanotubes

Definition statement

This subclass/group covers:

Nanotubes as defined by ISO/TS 27687 (available in BNS as XP008113666): being hollow nanofibres whereby a nanofibre is a nano-object with two external dimensions in the nanoscale (1-100 nm).

C01P 2004/16

Nanowires or nanorods, i.e. solid nano-fibres with two nearly equal dimensions between 1-100 nanometer

Definition statement

This subclass/group covers:

Nanofibres as defined by ISO/TS 27687 and further limited to those solid nanofibres with nearly equal dimensions in the nanoscale (1-100 nm).

C01P 2004/17

Nanostrips, nanoribbons or nanobelts, i.e. solid nano-fibres with two significantly differing dimensions between 1-100 nanometer

Definition statement

This subclass/group covers:

Nanofibres as defined by ISO/TS 27687 and further limited to those solid nanofibres with nearly equal dimensions in the nanoscale (1-100 nm).

C01P 2004/20

extending in two dimensions, e.g. plate-like

Definition statement

This subclass/group covers:

All those particles whereby two dimensions are significantly larger than the third one.

C01P 2004/24

Nanoplates, i.e. plate-like particles with a thickness from 1-100 nanometer

Definition statement

This subclass/group covers:

Nanoplates as defined by ISO/TS 27687 and further defined as particles with only one dimension in the nanoscale (1-100 nm).

C01P 2004/30

extending in three dimensions

Definition statement

This subclass/group covers:

All those particles of particular shape and not belonging to C01P 2004/10 or C01P 2004/20.

C01P 2004/45

Aggregated particles or particles with an intergrown morphology

Definition statement

This subclass/group covers:

Aggregates in which particles are hold together by strong forces (chemical bonds also qualified as cementation) and wherein the resulting external surface area is significantly smaller than the sum of the surface area of the individual components.

C01P 2004/50

Agglomerated particles

Definition statement

This subclass/group covers:

Agglomerates in which particles are hold together by weak forces (Van der

Waals forces or simple physical entanglement) and wherein the resulting external surface area is about similar to the sum of the surface area of the individual components.

C01P 2004/51

Particles with a specific particle size distribution

Definition statement

This subclass/group covers:

Any particle size distribution (e.g. three size distribution peaks) not classified in C01P 2004/52 or C01P 2004/53

C01P 2004/52

highly monodisperse size distribution

Definition statement

This subclass/group covers:

Documents in which the particle size distribution is qualified as monodisperse or by a narrow size distribution curve.

C01P 2004/54

Particles characterised by their aspect ratio, i.e. the ratio of sizes in the longest to the shortest dimension

Special rules of classification within this group

This class is mostly given in case of needle-like or plate-like particles (high a.r.) However also to three dimensional particles in order to express the gact that they are equaxed in the three directions (low a.r.).

C01P 2004/60

Particles characterised by their size

Definition statement

This subclass/group covers:

The indication of the largest size of the particle.

Special rules of classification within this group

In case particles are characterised by a primary and secondary particles size

does the size refer to the secondary particle size.

In case a document discloses a range for the particle size is the whole range classified including the both end members of the range.

Examples:

disclosed: d= 50-250 nm, classes given: C01P 2004/64, C01P 2004/62

disclosed: d= 0,25-80 micrometer, classes given: C01P 2004/62, C01P 2004/61

C01P 2004/64

Nanometer sized, i.e. from 1-100 nanometer

Definition statement

This subclass/group covers:

Nanoparticles as defined by ISO/TS 27687: being nano-objects with all three dimensions in the nanoscale (1-100 nm).

C01P 2004/86

Thin layer coatings, i.e. the coating thickness being less than 0.1 time the particle radius

C01P 2006/00

Physical properties of inorganic compounds

Definition statement

This subclass/group covers:

Features relating to the macroscopic physical properties of inorganic compounds.

C01P 2006/10

Solid density

Definition statement

This subclass/group covers:

Values of densities for 100% full dense materials.

C01P 2006/11

Powder tap density

Definition statement

This subclass/group covers:

Density values of tapped powders without further consolidation e.g. by pressing.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Tap density	Bulk density

C01P 2006/12

Surface area

Definition statement

This subclass/group covers:

Values mostly obtained as BET-values and expressed in m2/g.

C01P 2006/13

thermal stability thereof at high temperatures

Definition statement

This subclass/group covers:

Value mostly expressed as m2/g after heating at a specified T and t.

C01P 2006/14

Pore volume

Definition statement

This subclass/group covers:

Mostly expressed as m3/g.

C01P 2006/19

Oil-absorption capacity, e.g. DBP values

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

DBP	DiButyl Phthalate

C01P 2006/21

Attrition-index or crushing strength of granulates

Definition statement

This subclass/group covers:

The resistance of particles against applied mechanical forces.

C01P 2006/22

Rheological behaviour as dispersion, e.g. viscosity, sedimentation stability

Definition statement

This subclass/group covers:

Mostly aqueous suspensions of particles, e.g. of calcium carbonate in water.

References relevant to classification in this group

This subclass/group does not cover:

Emulsifiers as such	B01F 17/00

C01P 2006/32

Thermal properties

Definition statement

This subclass/group covers:

E.g. thermal conductivity of AlN.

C01P 2006/60

Optical properties, e.g. expressed in CIELAB-values

Definition statement

This subclass/group covers:

Colour of inorganic materials.

C01P 2006/80

Compositional purity

Definition statement

This subclass/group covers:

In general only added in combination with EC's which explicitly does address the purity of a product compound. Documents classified in purification-groups (e.g. C01F 7/46) should exceptionally get this code.

C01P 2006/82

water content

Definition statement

This subclass/group covers:

E.g. water content after dehydration treatments.