

ECLA**EUROPEAN CLASSIFICATION****C****CHEMISTRY; METALLURGY****Notes**

1. In section C, the definitions of groups of chemical elements are as follows:

- ALKALI METALS: Li, Na, K, Rb, Cs, Fr
- ALKALINE EARTH METALS: Ca, Sr, Ba, Ra
- LANTHANIDES: elements with atomic numbers 57 to 71 inclusive
- RARE EARTHS: Sc, Y, Lanthanides
- ACTINIDES: elements with atomic numbers 89 to 103 inclusive
- REFRACTORY METALS: Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W
- HALOGENS: F, Cl, Br, I, At
- NOBLE GASES: He, Ne, Ar, Kr, Xe, Rn
- PLATINUM GROUP: Os, Ir, Pt, Ru, Rh, Pd
- NOBLE METALS: Ag, Au, Platinum group
- LIGHT METALS: alkali metals, alkaline earth metals, Be, Al, Mg
- HEAVY METALS: metals other than light metals
- IRON GROUP: Fe, Co, Ni
- NON-METALS: H, B, C, Si, N, P, O, S, Se, Te, noble gases, halogens
- METALS: elements other than non-metals
- TRANSITION ELEMENTS: elements with atomic numbers 21 to 30 inclusive, 39 to 48 inclusive, 57 to 80 inclusive, 89 upwards

2. The following notes are meant to assist in the use of this part of the classification scheme; they must not be read as modifying in any way the elaborations.

a. Section C covers:

- i. pure chemistry, which covers inorganic compounds, organic compounds, macromolecular compounds, and their methods of preparation;
- ii. applied chemistry, which covers compositions containing the above compounds, such as: glass, ceramics, fertilisers, plastics compositions, paints, products of the petroleum industry. It also covers certain compositions on account of their having particular properties rendering them suitable for certain purposes, as in the case of explosives, dyestuffs, adhesives, lubricants, and detergents;
- iii. certain marginal industries, such as the manufacture of coke and of solid or gaseous fuels, the production and refining of oils, fats, and waxes, the fermentation industry, (e.g. brewing and wine-making) the sugar industry;
- iv. certain operations or treatments, which are either purely mechanical, e.g. the mechanical treatment of leather and skins, or partly mechanical, e.g. the treatment of water, or the prevention of corrosion in general;
- v. metallurgy, ferrous or non-ferrous alloys.

b.

- i. In the case of operations, treatments, products, or articles which have both a chemical and non-chemical part or aspect, the general rule is that the

chemical part or aspect is covered by section C.

- ii. In some of these cases, the chemical part or aspect brings with it a non-chemical one, even though purely mechanical, because this latter aspect either is essential to the operation or treatment or constitutes an important element of it; it has seemed, in fact, more logical not to dissociate the different parts or aspects of a coherent whole. This is the case for applied chemistry and for the industries, operations, and treatments mentioned in Notes 1), c), d) and e). For example, furnaces peculiar to the manufacture of glass are covered by class [C03](#) and not by class [F27](#).
- iii. There are, however, some exceptions in which the mechanical (or non-chemical) aspect carries with it the chemical aspect, for example:
 - certain extractive processes in subclass [A61K](#);
 - the chemical purification of air in subclass [A61L](#);
 - chemical methods of fire-fighting in subclass [A62D](#);
 - chemical processes and apparatus in class [B01](#);
 - impregnation of wood in subclass [B27K](#);
 - chemical methods of analysis or testing in subclass [G01N](#);
 - photographic materials and processes in class [G03](#), and generally, the chemical treatment of textiles and the production of cellulose or paper in section D.
- iv. In still other cases, the pure chemical aspect is covered by section C and the applied chemical aspect by another section such as A, B, F, e.g. the use of a substance or composition for
 - treatment of plants or animals covered by subclass [A01N](#);
 - foodstuffs covered by class [A23](#);
 - munitions or explosives covered by class [F42](#).
- v. When the chemical and mechanical aspects are so closely interlocked that a neat and simple division is not possible, or when certain mechanical processes follow as a natural or logical continuation of a chemical treatment, section C may cover, in addition to the chemical aspect, a part only of the mechanical aspect, e.g. after-treatments of artificial stone covered by class [C04](#). In this latter case a note or a reference is usually given to make the position clear, even if sometimes the division is rather arbitrary.

SUBSECTION: Chemistry

C01

INORGANIC CHEMISTRY (processing powders of inorganic compounds preparatory to the manufacturing of ceramic products [C04B35/00](#); fermentation or enzyme-using processes for the preparation of elements or inorganic compounds except carbon dioxide [C12P3/00](#); obtaining metal compounds from mixtures, e.g. ores, which are

intermediate compounds in a metallurgical process for obtaining a free metal C21B, C22B; production of non-metallic elements or inorganic compounds by electrolysis or electrophoresis C25B)

Note

In this class, in the absence of an indication to the contrary, a compound is classified in the last appropriate place; [N: except compounds of group [C01B6/00](#) which takes precedence over the other groups of class C01].

[N: **Notes** [C0711]

1. The name of compounds is to be taken in a strictly limitative sense. With the exception of hydrogen and oxygen, in order to include water of hydration and acid salts, compounds may not contain other parts than its name suggests. In some cases however subgroups are provided for compounds containing more parts than their name suggests, e.g. group [C01F7/76](#), providing for alum, is a subgroup of group [C01F7/74](#) covering aluminium sulfates. In such a case, this note is applicable to the particular subgroup

2. In class C01 it is desirable to add the indexing codes relating to structural and physical aspects of solid inorganic compounds. The indexing codes are chosen from the groups of M01P

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C01B **NON-METALLIC ELEMENTS; COMPOUNDS THEREOF;** [N: METALLOIDS OR COMPOUNDS THEREOF NOT COVERED BY SUBCLASS C01C] [C9510]

C01C **AMMONIA; CYANOGEN; COMPOUNDS THEREOF** ([N: metal hydrides, monoborane, diborane or addition complexes thereof [C01B6/00](#); salts of oxyacids of halogens [C01B11/00](#); peroxides, salts of peroxyacids [C01B15/00](#); thiosulfates, dithionites, polythionates [C01B17/64](#); compounds containing selenium or tellurium [C01B19/00](#); azides [C01B21/08](#); [N: compounds other than ammonia or cyanogen, containing nitrogen, non-metals and optionally metals [C01B21/082](#); metal imides or amides [C01B21/092](#); nitrites [C01B21/50](#); [N: compounds of noble gases [C01B23/00B](#)]; phosphides [C01B25/08](#); salts of oxyacids of phosphorus [C01B25/16](#); compounds containing silicon [C01B33/00](#); compounds containing boron [C01B35/00](#)] [C9602]

C01D **COMPOUNDS OF ALKALI METALS, i.e. LITHIUM, SODIUM, POTASSIUM, RUBIDIUM, CAESIUM, OR FRANCIUM** (metal hydrides [N: monoborane, diborane or addition complexes thereof] [C01B6/00](#); salts of oxyacids of halogens [C01B11/00](#); peroxides, salts of peroxyacids [C01B15/00](#); sulfides [C01B17/22](#); thiosulfates, dithionites, polythionates [C01B17/64](#); compounds containing selenium or tellurium [C01B19/00](#); binary compounds of nitrogen with metals [C01B21/06](#); azides [C01B21/08](#); [N: compounds other than ammonia and cyanogen, containing nitrogen and other non-metals [C01B21/082](#); metal amides [C01B21/092](#); nitrites [C01B21/50](#); phosphides [C01B21/50](#); [N: compounds of noble gases [C01B23/00B](#)]; phosphides [C01B25/08](#); salts of oxyacids of phosphorus [C01B25/16](#); carbides [C01B31/30](#); compounds containing silicon [C01B33/00](#); compounds containing boron [C01B35/00](#); cyanides [C01C3/08](#); salts of cyanic acid [C01C3/14](#); salts of cyanamide [C01C3/16](#); thiocyanates [C01C3/20](#)] [C9602]

C01F **COMPOUNDS OF THE METALS BERYLLIUM, MAGNESIUM,**

ALUMINIUM, CALCIUM, STRONTIUM, BARIUM, RADIUM, THORIUM, OR OF THE RARE-EARTH METALS (metal hydrides [N: monoborane, diborane or addition complexes thereof] [C01B6/00](#); salts of oxyacids of halogens [C01B11/00](#); peroxides, salts of peroxyacids [C01B15/00](#); sulfides or polysulfides of magnesium, calcium, strontium, or barium [C01B17/42](#); thiosulfates, dithionites, polythionates [C01B17/64](#); compounds containing selenium or tellurium [C01B19/00](#); binary compounds of nitrogen with metals [C01B21/06](#); azides [C01B21/08](#); [N: compounds other than ammonia or cyanogen containing nitrogen and non-metals and optionally metals [C01B21/082](#); amides or imides of silicon [C01B21/087](#)]; metal [N: imides or] amides [C01B21/092](#), [N: [C01B21/092B](#)]; nitrites [C01B21/50](#); [N: compounds of noble gases [C01B23/00B](#)]; phosphides [C01B25/08](#); salts of oxyacids of phosphorus [C01B25/16](#); carbides [C01B31/30](#); compounds containing silicon [C01B33/00](#); compounds containing boron [C01B35/00](#); compounds having molecular sieve properties but not having base-exchange properties [C01B37/00](#); compounds having molecular sieve and base-exchange properties, e.g. crystalline zeolites, [C01B39/00](#); cyanides [C01C3/08](#); salts of cyanic acid [C01C3/14](#); salts of cyanamide [C01C3/16](#); thiocyanates [C01C3/20](#); [N: double sulfates of magnesium with sodium or potassium [C01D5/12](#); with other alkali metals [C01D15/00](#), [C01D17/00](#)] [C9602]

C01G

COMPOUNDS CONTAINING METALS NOT COVERED BY SUBCLASSES C01D OR C01F

(metal hydrides [N: monoborane, diborane or addition complexes thereof] [C01B6/00](#); salts of oxyacids of halogens [C01B11/00](#); peroxides, salts or peroxyacids [C01B15/00](#); thiosulfates, dithionites, polythionates [C01B17/64](#); compounds containing selenium, or tellurium [C01B19/00](#); binary compounds of nitrogen with metals [C01B21/06](#); azides [C01B21/08](#); [N: compounds containing nitrogen, other non-metals and metal [C01B21/082](#)]; metal amides [C01B21/092](#); nitrites [C01B21/50](#); [N: compounds of noble gases [C01B23/00B](#)]; phosphides [C01B25/08](#); salts of oxyacids of phosphorus [C01B25/16](#); carbides [C01B31/30](#); compounds containing silicon [C01B33/00](#); compounds containing boron [C01B35/00](#); compounds having molecular sieve properties but not having base-exchange properties [C01B37/00](#); compounds having molecular sieve and base-exchange properties, e.g. crystalline zeolites, [C01B39/00](#); cyanides [C01C3/08](#); salts of cyanamide [C01C3/16](#); thiocyanates [C01C3/20](#)) [C9602]

C02

TREATMENT OF WATER, WASTE WATER, SEWAGE, OR SLUDGE

(settling tanks, filtering, e.g. sand filters or screening devices, [B01D](#))

C02F

TREATMENT OF WATER, WASTE WATER, SEWAGE, OR SLUDGE

(separation in general [B01D](#); special arrangements on waterborne vessels of installations for treating water, waste water or sewage, e.g. for producing fresh water, [B63J](#); adding materials to water to prevent corrosion [C23F](#); treating radioactively-contaminated liquids [G21F9/04](#); regeneration of reactants for recirculation into processes, see the relevant places for the processes)

C03

GLASS; MINERAL OR SLAG WOOL [N: (organic glasses [C08](#); metallic glasses, amorphous metals [B22F](#), [C22C](#))]

C03B MANUFACTURE, SHAPING, OR SUPPLEMENTARY PROCESSES

C03C CHEMICAL COMPOSITION OF GLASSES, GLAZES, OR VITREOUS ENAMELS; SURFACE TREATMENT OF GLASS; SURFACE TREATMENT OF FIBRES OR FILAMENTS FROM GLASS, MINERALS OR SLAGS; JOINING GLASS TO GLASS OR OTHER MATERIALS

C04 CEMENTS; CONCRETE; ARTIFICIAL STONE; CERAMICS; REFRACTORIES (alloys based on refractory metals [C22C](#))

Note

This class does not cover mechanical features provided for elsewhere, e.g. mechanical working [B28](#), kilns [F27](#).

C04B LIME, MAGNESIA; SLAG; CEMENTS; COMPOSITIONS THEREOF, e.g. MORTARS, CONCRETE OR LIKE BUILDING MATERIALS; ARTIFICIAL STONE [N: (roofing granules [E04D7/00B](#)); CERAMICS (devitrified glass-ceramics [C03C10/00](#)); REFRACTORIES; TREATMENT OF NATURAL STONE

C05 FERTILISERS; MANUFACTURE THEREOF (processes or devices for granulating materials, in general [B01J2/00](#); soil-conditioning or soil-stabilising materials [C09K17/00](#)) [[C9506](#)]

Note

An ingredient in a mixture of fertilisers, or a single fertiliser which contains more than one of the chemical elements on which the subdivision into subclasses is based, is classified only in the first of the appropriate subclasses. Thus, a nitrophosphate or an ammoniated superphosphate is classified in C05B but not in C05C, magnesium phosphate is classified in C05B but not in C05D, and calcium cyanamide in C05C but not in C05D.

[N: **Note**

[[C0409](#)]

In this class, mixtures of fertilizers are classified in the first appropriate place. After the notation of the appropriate classification symbol and separated therefrom by a + sign, notations concerning the ingredients of the mixture, not covered by the chosen classification symbol, may be added. These notations are selected from class C05 and are presented in the following way, e.g. [C05B1/02](#)+D1/02+D9/02
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C05B PHOSPHATIC FERTILISERS

C05C NITROGENOUS FERTILISERS

C05D INORGANIC FERTILISERS NOT COVERED BY SUBCLASSES [C05B](#), [C05C](#); FERTILISERS PRODUCING CARBON DIOXIDE

- C05F** **ORGANIC FERTILISERS NOT COVERED BY SUBCLASSES C05B, C05C, e.g. FERTILISERS FROM WASTE OR REFUSE** [N: (breeding of earthworms [A01K67/033B](#))]
- C05G** **MIXTURES OF FERTILISERS COVERED INDIVIDUALLY BY DIFFERENT SUBCLASSES OF CLASS C05; MIXTURES OF ONE OR MORE FERTILISERS WITH MATERIALS NOT HAVING A SPECIFIC FERTILISING ACTIVITY, e.g. PESTICIDES, SOIL-CONDITIONERS, WETTING AGENTS** (organic fertilisers containing added bacterial cultures, mycelia, or the like [C05F11/08](#); organic fertilisers containing plant vitamins or hormones [C05F11/10](#)); **FERTILISERS CHARACTERISED BY THEIR FORM** [[C9411](#)]
- C06** **EXPLOSIVES; MATCHES**
- C06B** **EXPLOSIVES OR THERMIC COMPOSITIONS** (blasting [F42D](#)); **MANUFACTURE THEREOF; USE OF SINGLE SUBSTANCES AS EXPLOSIVES** (compounds in general [C01](#), [C07](#) or [C08](#); [N: demolition agents based on cementitious or like materials [C04B41/00B](#)])
- C06C** **DETONATING OR PRIMING DEVICES; FUSES** (ammunition fuzes [F42C](#)); **CHEMICAL LIGHTERS; PYROPHORIC COMPOSITIONS**
- C06D** **MEANS FOR GENERATING SMOKE OR MIST; GAS-ATTACK COMPOSITIONS; GENERATION OF GAS FOR BLASTING OR PROPULSION (CHEMICAL PART)** (fuels [C10](#))
- C06F** **MATCHES; MANUFACTURE OF MATCHES**
- C07** **ORGANIC CHEMISTRY** (such compounds as the oxides, sulfides, or oxy-sulfides of carbon, cyanogen, phosgene, hydrocyanic acid or salts thereof [C01](#); products obtained from layered base-exchange silicates by ion-exchange with organic compounds such as ammonium, phosphonium or sulfonium compounds or by intercalation of organic compounds [C01B33/44](#); macromolecular compounds [C08](#); dyes [C09](#); fermentation products [C12](#); fermentation or enzyme-using processes to synthesise a desired chemical compound or composition or to separate optical isomers from a racemic mixture [C12P](#); production of organic compounds by electrolysis or electrophoresis [C25B3/00](#), [C25B7/00](#))

Notes

1. In this class, the following term is used with the meaning indicated:

- "preparation" covers purification, separation, stabilisation or use of additives, unless a separate place is provided therefor.

2. In this class, in the absence of an indication to the contrary, and with the exception referred to below, a compound is classified in the last appropriate place, e.g. a compound containing an acyclic chain and a heterocyclic ring is classified only as a heterocyclic compound, and a steroid is classified only as a cyclopentanophenanthrene compound. In general, and in the absence of an indication to the contrary (such as groups [C07C59/58](#), [C07C59/70](#)), the terms "acyclic" and "aliphatic" are used to describe compounds in which there is no ring; and, if a ring were present, the compound would be taken by the "last place" rule to a later group for cycloaliphatic or aromatic compounds, if such a group exists. Where a compound or an entire group of compounds exists in tautomeric forms, it is classified as though existing in the form which is classified last in the system, unless the other form is specifically mentioned earlier in the system.
3. Chemical compounds and their preparation are classified in the groups for the type of compound prepared. The processes of preparation are also classified in the groups for the types of reaction employed, if of interest. General processes for the preparation of a class of compounds falling into more than one main group are classified in the groups for the processes employed, when such groups exist. The compounds prepared are also classified in the groups for the types of compound prepared, if of interest.
4. In this class, in the absence of an indication to the contrary, the compounds containing carboxyl or thiocarboxyl groups are classified as the relevant carboxylic or thiocarboxylic acids, unless the "last place rule" (see Note (2), above) dictates otherwise; a carboxyl group being a carbon atom having three bonds, and no more than three, to hetero atoms, other than nitrogen atoms of nitro or nitroso groups, with at least one multiple bond to the same hetero atom and a thiocarboxyl group being a carboxyl group having at least one bond to a sulfur atom, e.g. amides or nitriles of carboxylic acids, are classified with the corresponding acids.
5. Anhydrides and halides of carboxylic acids are classified as the relevant acids unless otherwise indicated. Salts of a compound, unless specifically provided for, are classified as that compound, e.g. aniline hydrochloride is classified as containing carbon, hydrogen and nitrogen only (in [C07C211/46](#)), sodium malonate is classified as malonic acid (in [C07C55/08](#)), and a mercaptide is classified as the mercaptan. Metal chelates are dealt with in the same way. Similarly, metal alcoholates and metal phenates are classified in subclass [C07C](#) and not in subclass [C07F](#), the alcoholates in [C07C31/28](#) to [C07C31/32](#) and the phenates as the corresponding phenols in group [C07C39/235](#) or [C07C39/44](#). Salts, adducts or complexes formed between two or more organic compounds are classified according to all compounds forming the salts, adducts or complexes.

C07B

GENERAL METHODS OF ORGANIC CHEMISTRY; APPARATUS THEREFOR (preparation of carboxylic acid esters by telomerisation [C07C67/47](#); telomerisation [C08F](#))

C07C

ACYCLIC OR CARBOCYCLIC COMPOUNDS

- C07D** **HETEROCYCLIC COMPOUNDS**
- C07F** **ACYCLIC, CARBOCYCLIC OR HETEROCYCLIC COMPOUNDS CONTAINING ELEMENTS OTHER THAN CARBON, HYDROGEN, HALOGEN, OXYGEN, NITROGEN, SULFUR, SELENIUM OR TELLURIUM** (metal-containing porphyrins [C07D487/22](#))
- C07G** **COMPOUNDS OF UNKNOWN CONSTITUTION**
- C07H** **SUGARS; DERIVATIVES THEREOF** (derivatives of aldonic or saccharic acids [C07C](#), [C07D](#); aldonic acids, saccharic acids [C07C59/105](#), [C07C59/285](#); cyanohydrins [C07C121/36](#); glycals [C07D](#); compounds of unknown constitution [C07G](#); polysaccharides, derivatives thereof [C08B](#); sugar and starch industry [C13](#))
- C07J** **STEROIDS (seco-steroids [C07C](#))**
- C07K** **PEPTIDES** (peptides in foodstuffs [A23](#); obtaining protein compositions for foodstuffs, working-up proteins for foodstuffs [A23J](#); preparations for medicinal purposes [A61K](#); peptides containing beta-lactam rings [C07D](#); cyclic dipeptides not having in their molecule any other peptide link than those which form their ring, e.g. piperazine-2,5-diones, [C07D](#); ergot alkaloids of the cyclic peptide type [C07D519/02](#); macromolecular compounds having statistically distributed amino acid units in their molecules, i.e. when the preparation does not provide for a specific; but for a random sequence of the amino acid units, homopolyamides and block copolyamides derived from amino acids [C08G69/00](#); macromolecular products derived from proteins [C08H1/00](#); preparation of glue or gelatine [C09H](#); single cell proteins, enzymes [C12N](#); genetic engineering processes for obtaining peptides [C12N15/00](#); compositions for measuring or testing processes involving enzymes [C12Q](#); investigation or analysis of biological material [G01N33/00](#))
- C08** **ORGANIC MACROMOLECULAR COMPOUNDS; THEIR PREPARATION OR CHEMICAL WORKING-UP; COMPOSITIONS BASED THEREON (manufacture or treatment of artificial threads, fibres, bristles or ribbons [D01](#))** [[C9410](#)]
- C08B** **POLYSACCHARIDES; DERIVATIVES THEREOF** (polysaccharides containing less than six saccharide radicals attached to each other by glycosidic linkages [C07H](#); fermentation or enzyme-using processes [C12P19/00](#); sugar industry [C13](#); production of cellulose [D21](#)) [[C9805](#)]
- C08C** **TREATMENT OR CHEMICAL MODIFICATION OF RUBBERS**

- C08F** **MACROMOLECULAR COMPOUNDS OBTAINED BY REACTIONS ONLY INVOLVING CARBON-TO-CARBON UNSATURATED BONDS**
- C08G** **MACROMOLECULAR COMPOUNDS OBTAINED OTHERWISE THAN BY REACTIONS ONLY INVOLVING UNSATURATED CARBON-TO-CARBON BONDS**
- C08H** **DERIVATIVES OF NATURAL MACROMOLECULAR COMPOUNDS (polysaccharides C08B; natural rubber C08C; natural resins or their derivatives C09F ; bituminous materials C10) [C1001]**
- C08J** **WORKING-UP; GENERAL PROCESSES OF COMPOUNDING; AFTER-TREATMENT NOT COVERED BY SUBCLASSES C08B, C08C, C08F, C08G (mechanical aspects B29; layered products, manufacture thereof B32B; treatment of macromolecular material specially adapted to enhance its filling properties in mortars, concrete or artificial stone C04B16/04, C04B18/20, C04B20/00; treatment of textiles D06) [C9410]**
- C08K** **USE OF INORGANIC OR NON-MACROMOLECULAR ORGANIC SUBSTANCES AS COMPOUNDING INGREDIENTS (pesticides, herbicides A01N; pharmaceuticals, cosmetics A61K; explosives C06B; paints, inks, varnishes, dyes, polishes, adhesives C09; lubricants C10M; detergents C11D; artificial filaments or fibres D01F; textile treating compositions D06) [C9410]**
- C08L** **COMPOSITIONS OF MACROMOLECULAR COMPOUNDS (pesticides, herbicides A01N; pharmaceuticals, cosmetics A61K; explosives C06B; compositions based on polymerisable monomers C08F, C08G; paints, inks, varnishes, dyes, polishes, adhesives C09; lubricants C10M; detergents C11D; artificial filaments or fibres D01F; textile treating compositions D06) [C9606]**
- C09** **DYES; PAINTS; POLISHES; NATURAL RESINS; ADHESIVES; MISCELLANEOUS COMPOSITIONS; MISCELLANEOUS APPLICATIONS OF MATERIALS**
- C09B** **ORGANIC DYES OR CLOSELY-RELATED COMPOUNDS FOR PRODUCING DYES; MORDANTS; LAKES (fermentation or enzyme-using processes to synthesise a desired chemical compound C12P)**
- C09C** **TREATMENT OF INORGANIC MATERIALS, OTHER THAN FIBROUS FILLERS, TO ENHANCE THEIR PIGMENTING OR FILLING**

IES (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 [C04B14/00](#), [C04B18/00](#), [C04B20/00](#)); **PREPARATION OF CARBON BLACK**; [N: Preparation of inorganic materials which are no single chemical compounds and which are mainly used as pigments or fillers] [[C9410](#)]

- C09D** COATING COMPOSITIONS, e.g. PAINTS, VARNISHES OR LACQUERS ; FILLING PASTES ; CHEMICAL PAINT OR INK REMOVERS ; INKS ; CORRECTING FLUIDS ; WOODSTAINS ; PASTES OR SOLIDS FOR COLOURING OR PRINTING ; USE OF MATERIALS THEREFOR (cosmetics [A61K](#) ; processes for applying liquids or other fluent materials to surfaces, in general, [B05D](#) ; staining wood [B27K 5/02](#) ; glazes or vitreous enamels [C03C](#) ; organic macromolecular compounds [C08](#) ; organic dyes or closely-related compounds for producing dyes, mordants or lakes, per se , [C09B](#) ; treatment of inorganic materials other than fibrous fillers used as pigments or fillers [C09C](#) ; natural resins, French polish, drying-oils, driers, turpentine, per se , [C09F](#) ; polishing compositions other than French polish, ski waxes [C09G](#) ; preparation of glue or gelatine [C09H](#), [[N: C08H 1/06](#)] ; adhesives or use of materials as adhesives [C09J](#) ; materials for sealing or packing joints or covers [C09K 3/10](#) ; materials for stopping leaks [C09K 3/12](#) ; processes for the electrolytic or electrophoretic production of coatings [C25D](#) ; textile-treating compositions [D06](#) ; paper-making [D21](#) ; conductors, insulators [H01B](#)) [[C1002](#)]
- C09F** NATURAL RESINS; FRENCH POLISH; DRYING-OILS; DRIERS (SICCATIVES); TURPENTINE
- C09G** POLISHING COMPOSITIONS OTHER THAN FRENCH POLISH; SKI WAXES
- C09H** PREPARATION OF GLUE OR GELATINE
- C09J** ADHESIVES; NON-MECHANICAL ASPECTS OF ADHESIVE PROCESSES IN GENERAL; ADHESIVE PROCESSES NOT PROVIDED FOR ELSEWHERE; USE OF MATERIALS AS ADHESIVES (surgical adhesives [A61L 24/00](#); processes for applying liquids or other fluent materials to surfaces in general [B05D](#); adhesives on the basis of non specified organic macromolecular compounds used as bonding agents in layered products [B32B](#); organic labelling fabrics or comparable materials or articles with deformable surface using adhesives and thermo-activatable adhesives respectively [B65C 5/02](#), [B65C 5/04](#); organic macromolecular compounds [C08](#); production of multi-layer textile fabrics [D06M 17/00](#); preparation of glue or gelatine [C09H](#) ; adhesive labels, tag tickets or similar identification of

cation means G09F 3/10) [\[C1105\]](#)

- C09K** MATERIALS FOR MISCELLANEOUS APPLICATIONS, NOT PROVIDED FOR ELSEWHERE
- C10** PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS; PEAT
- C10B** DESTRUCTIVE DISTILLATION OF CARBONAGEOUS MATERIALS FOR PRODUCTION OF GAS, COKE, TAR, OR SIMILAR MATERIALS
(cracking oils [C10G](#); underground gasification of minerals [E21B43/295](#))
- C10C** WORKING-UP PITCH, ASPHALT, BITUMEN, TAR; PYROLIGNEOUS ACID (compositions of bituminous materials [C08L95/00](#); carbon filaments by decomposition of organic filaments [D01F9/14](#))
- C10F** DRYING OR WORKING-UP OF PEAT
- C10G** CRACKING HYDROCARBON OILS; PRODUCTION OF LIQUID HYDROCARBON MIXTURES, e.g. BY DESTRUCTIVE HYDROGENATION, OLIGOMERISATION, POLYMERISATION
(cracking to hydrogen or synthesis gas C01B; cracking or pyrolysis of hydrocarbon gases to individual hydrocarbons or mixtures thereof of definite or specific constitution C07C; cracking to cokes C10B); RECOVERY OF HYDROCARBON OILS FROM OIL-SHALE, OIL-SAND, OR GASES; REFINING MIXTURES MAINLY CONSISTING OF HYDROCARBONS; REFORMING OF NAPHTHA; MINERAL WAXES
(inhibiting corrosion or incrustation in general C23F) [\[C9506\]](#)
- C10H** PRODUCTION OF ACETYLENE BY WET METHODS [\[N: \(purification of acetylene C07C7/00\)\]](#)
- C10J** PRODUCTION OF PRODUCER GAS, WATER-GAS, SYNTHESIS GAS FROM SOLID CARBONACEOUS MATERIAL, OR MIXTURES CONTAINING THESE GASES (synthesis gas from liquid or gaseous hydrocarbons [C01B](#); underground gasification of minerals [E21B43/295](#)); CARBURETTING AIR OR OTHER GASES
- C10K** PURIFYING OR MODIFYING THE CHEMICAL COMPOSITION OF COMBUSTIBLE GASES CONTAINING CARBON MONOXIDE

- C10L** **FUELS NOT OTHERWISE PROVIDED FOR** (fuels for generating pressure gas, e.g. for rockets [C06D5/00](#); candles [C11C](#); nuclear fuel [G21C3/00](#)); **NATURAL GAS; SYNTHETIC NATURAL GAS OBTAINED BY PROCESSES NOT COVERED BY SUBCLASSES C10G, C10K; LIQUEFIED PETROLEUM GAS; ADDING MATERIALS TO FUELS OR FIRES TO REDUCE SMOKE OR UNDESIRABLE DEPOSITS OR TO FACILITATE SOOT REMOVAL; FIRELIGHTERS**
- C10M** **LUBRICATING COMPOSITIONS** (well drilling compositions [C09K8/02](#)); **USE OF CHEMICAL SUBSTANCES EITHER ALONE OR AS LUBRICATING INGREDIENTS IN A LUBRICATING COMPOSITION** ([N: lubricants for medical use [A61](#)]; mould release, i.e. separating, agents for metals [B22C3/00](#), for plastics or substances in a plastic state, in general [B29C33/56](#), for glass [C03B40/02](#); use of particular substances in particular apparatus or conditions, see [F16N](#) or the relevant groups for the application, e.g. [A21D8/08](#), [B21C9/00](#), [H01B3/18](#); immersion oils for microscopy [G02B21/33](#)) [[C0306](#)]
- C11** **ANIMAL AND VEGETABLE OILS, FATS, FATTY SUBSTANCES AND WAXES; FATTY ACIDS THEREFROM; DETERGENTS; CANDLES** (edible oil or fat compositions [A23](#))
- C11B** **PRODUCING** (pressing, extraction), **REFINING AND PRESERVING FATS, FATTY SUBSTANCES** (e.g. lanolin), **FATTY OILS AND WAXES, INCLUDING EXTRACTION FROM WASTE MATERIALS; ESSENTIAL OILS; PERFUMES** (drying-oils [C09F](#))
- C11C** **FATTY ACIDS FROM FATS, OILS OR WAXES; CANDLES; FATS, OILS OR FATTY ACIDS BY CHEMICAL MODIFICATION OF FATS, OILS, OR FATTY ACIDS OBTAINED THEREFROM**
- C11D** **DETERGENT COMPOSITIONS** (preparations specially adapted for washing the hair [A61K7/075](#); methods or apparatus for disinfection or sterilisation [A61L](#); special washing compositions for cleaning semi-permeable membranes [B01D65/06](#)); **USE OF SINGLE SUBSTANCES AS DETERGENTS; SOAP OR SOAP-MAKING; RESIN SOAPS; RECOVERY OF GLYCEROL** [[C9908](#)]
- C12** **BIOCHEMISTRY; BEER; SPIRITS; WINE; VINEGAR; MICROBIOLOGY; ENZYMOLOGY; MUTATION OR GENETIC ENGINEERING**

Notes

1. In subclasses [C12M](#) to [C12Q](#) and within each of these subclasses, in the absence of

an indication to the contrary, classification is made in the last appropriate place.

2. In this class, viruses, undifferentiated human, animal or plant cells, protozoa, tissues, and unicellular algae are considered as micro-organisms.
3. In this class, unless specifically provided for, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are classified together with micro-organisms. Sub-cellular parts, unless specifically provided for, are classified with the whole cell.

- C12C** **BREWING OF BEER** (cleaning of raw materials [A23N](#); pitching and depitching machines, cellar tools [C12L](#); propagating yeasts [C12N1/14](#); non-beverage ethanolic fermentation [C12P7/06](#))
- C12F** **DISTILLATION OR RECTIFICATION OF FERMENTED SOLUTIONS; RECOVERY OF BY-PRODUCTS; DENATURING OF, OR DENATURED, ALCOHOL**
- C12G** **WINE; OTHER ALCOHOLIC BEVERAGES; PREPARATION THEREOF (beer [C12C](#))**
- C12H** **PASTEURISATION; STERILISATION; PRESERVATION; PURIFICATION; CLARIFICATION; AGEING**
- C12J** **VINEGAR; ITS PREPARATION**
- C12L** **PITCHING OR DEPITCHING MACHINES; CELLAR TOOLS** (cleaning of casks [B08B9/00](#))
- C12M** **APPARATUS FOR ENZIMOLOGY OR MICROBIOLOGY; [N: APPARATUS FOR CULTURING MICROORGANISMS FOR PRODUCING BIOMASS, FOR GROWING CELLS OR FOR OBTAINING FERMENTATION OR METABOLIC PRODUCTS, i.e. BIOREACTORS OR FERMENTERS**
- C12N** **MICRO-ORGANISMS OR ENZYMES; COMPOSITIONS THEREOF** (biocides, pest repellants or attractants, or plant growth regulators, containing micro-organisms, viruses, microbial fungi, enzymes, fermentates or substances produced by or extracted from micro-organisms or animal material [A01N63/00](#); food compositions [A21](#), [A23](#); medicinal preparations [A61K](#); chemical aspects of, or use of materials for, bandages, dressings, absorbent pads or surgical articles [A61L](#); fertilisers [C05](#)); **PROPAGATING, PRESERVING OR MAINTAINING MICRO-ORGANISMS** (preservation of living parts of humans or animals [A01N1/02](#));

**MUTATION OR GENETIC ENGINEERING; CULTURE MEDIA
(micro-biological testing media C12Q)**

- C12P** **FERMENTATION OR ENZYME-USING PROCESSES TO SYNTHESISE A DESIRED CHEMICAL COMPOUND OR COMPOSITION OR TO SEPARATE OPTICAL ISOMERS FROM A RACEMIC MIXTURE** (brewing of beer C12C; producing vinegar C12J; producing specific peptides or proteins C07K; producing enzymes [C12N9/00](#); DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification [C12N15/00](#); measuring or testing processes involving enzymes or micro-organisms C12Q; measuring or testing processes involving nucleic acid amplification reactions [C12Q1/68D](#); fermentation processes to form a food composition, A21 or A23; compounds in general, see the relevant compound class, e.g. C01, C07) [[C1207](#)]
- C12Q** **MEASURING OR TESTING PROCESSES INVOLVING ENZYMES OR MICRO-ORGANISMS** (immunoassay [G01N33/53](#)); **COMPOSITIONS OR TEST PAPERS THEREFOR; PROCESSES OF PREPARING SUCH COMPOSITIONS; CONDITION RESPONSIVE CONTROL IN MICROBIOLOGICAL OR ENZYMOLOGICAL PROCESSES**
- C12R** **PROCESSES USING MICRO-ORGANISMS**
- C12Y** **ENZYMES** [[N1201](#)]
- C13** **SUGAR INDUSTRY (polysaccharides, e.g. starch, derivatives thereof C08B; malt C12C)** [[C1102](#)]
- Notes** [[N1102](#)]
 1. In class C13, the following terms or expressions are used with the meanings indicated:
 • "sugars" are a class of edible, water-soluble crystalline carbohydrates, having a characteristic sweet taste, including mono-, di- and oligosaccharides, e.g. sucrose, lactose and fructose. A more specific meaning of the term "sugar" is defined in the note of subclass C13B. 2. Processes using enzymes or micro-organisms in order to : i. to liberate, separate or purify a pre-existing compound or composition, or to ii. to treat textiles or clean solid surfaces of materials are further classified in subclass C12S .
- C13B** **PRODUCTION OF SUCROSE; APPARATUS SPECIALLY ADAPTED THEREFOR (chemically synthesised sugars or sugar derivatives C07H ; fermentation or enzyme-using processes for preparing compounds containing saccharide radicals C12P 19/00)** [[N1101](#)]
- C13K** **SACCHARIDES, OTHER THAN SUCROSE, OBTAINED FROM NATURAL SOURCES OR BY HYDROLYSIS OF NATURALLY OCCURRING DI-, OLIGO- OR POLYSACCHARIDES (chemically synthesised sugars or sugar derivatives C07H ; polysaccharides, e.g.**

starch, derivatives thereof C08B ; malt C12C ; fermentation or enzyme-using processes for preparing compounds containing saccharide radicals C12P 19/00) [\[C1102\]](#)

C14 SKINS; HIDES; PELTS; LEATHER

C14B MECHANICAL TREATMENT OR PROCESSING OF SKINS, HIDES OR LEATHER IN GENERAL; PELT-SHEARING MACHINES; INTESINE-SPLITTING MACHINES (making leather substitutes B29, D06N; making articles from leather B68F; mechanical cleaning of hides or the like D06G; artificial leather D06N)

C14C CHEMICAL TREATMENT OF HIDES, SKINS OR LEATHER, e.g. TANNING, IMPREGNATING, FINISHING; APPARATUS THEREFOR; COMPOSITIONS FOR TANNING (bleaching of leather or furs D06L; dyeing of leather or furs D06P)

SUBSECTION: Metallurgy

C21 METALLURGY OF IRON

C21B MANUFACTURE OF IRON OR STEEL (preliminary treatment of ferrous ores or scrap [C22B1/00](#); electric heating [H05B](#))

C21C PROCESSING OF PIG-IRON, e.g. REFINING, MANUFACTURE OF WROUGHT-IRON OR STEEL; TREATMENT IN MOLTEN STATE OF FERROUS ALLOYS (refining metals in general [C22B9/00](#))

C21D MODIFYING THE PHYSICAL STRUCTURE OF FERROUS METALS; GENERAL DEVICES FOR HEAT TREATMENT OF FERROUS OR NON-FERROUS METALS OR ALLOYS; MAKING METAL MALLEABLE BY DECARBURISATION, TEMPERING OR OTHER TREATMENTS (cementation by diffusion processes C23C; surface treatment of metallic material involving at least one process provided for in class C23 and at least one process covered by this subclass, [C23F17/00](#); unidirectional solidification of eutectic materials or unidirectional demixing of eutectoid materials C30B)

C22 METALLURGY (of iron [C21](#)); FERROUS OR NON-FERROUS ALLOYS; TREATMENT OF ALLOYS OR NON-FERROUS METALS (production of metals by electrolysis or electrophoresis [C25](#))

C22B **PRODUCTION AND REFINING OF METALS (electrolytic C25);
PRETREATMENT OF RAW MATERIALS**

C22C **ALLOYS** (flints [C06C15/00](#); treatment of alloys C21D, C22F) [[C9506](#)]

C22F **CHANGING THE PHYSICAL STRUCTURE OF NON-FERROUS
METALS AND NON-FERROUS ALLOYS** (surface treatment of metallic material
involving at least one process provided for in class [C23](#) and at least one process covered
by this subclass, [C23F17/00](#))

C23 **COATING METALLIC MATERIAL; COATING MATERIAL
WITH METALLIC MATERIAL** (by metallising textiles [D06M11/83](#); decorating
textiles by locally metallising [D06Q1/04](#)); **CHEMICAL SURFACE
TREATMENT; DIFFUSION TREATMENT OF METALLIC
MATERIAL; COATING BY VACUUM EVAPORATION, BY
SPUTTERING, BY ION IMPLANTATION OR BY CHEMICAL
VAPOUR DEPOSITION, IN GENERAL** (for specific applications, see the
relevant places, e.g. for manufacturing resistors [H01C17/06](#)); **INHIBITING
CORROSION OF METALLIC MATERIAL OR INCRUSTATION
IN GENERAL** (treating metal surfaces or coating of metals
by electrolysis or electrophoresis C25D, C25F)

Note

In this class, the following expression is used with the meaning indicated:

- "metallic material" covers:

1. metals;
2. alloys (attention is drawn to the Note following the title of subclass C22C):
 - a. alloys containing at least 50 % by weight of one or more of borides, carbides, nitrides, oxides or silicides and binding metal;
 - b. non-ferrous alloys containing at least 5 % by weight but less than 50 % by weight of borides, carbides, nitrides, oxides or silicides of refractory metals, whether added as such or formed in situ.

C23C **COATING METALLIC MATERIAL; COATING MATERIAL WITH
METALLIC MATERIAL; SURFACE TREATMENT OF METALLIC
MATERIAL BY DIFFUSION INTO THE SURFACE, BY CHEMICAL
CONVERSION OR SUBSTITUTION; COATING BY VACUUM
EVAPORATION, BY SPUTTERING, BY ION IMPLANTATION OR BY
CHEMICAL VAPOUR DEPOSITION, IN GENERAL** (applying liquids or other
fluent materials to surfaces in general B05; making metal-coated products by extrusion
[B21C23/22](#); covering with metal by connecting pre-existing layers to articles, see the
relevant places, e.g. [B21D39/00](#), B23K; working of metal by the action of a high

centration of electric current on a workpiece using an electrode B23H; metallising of glass C03C; metallising mortars, concrete, artificial stone, ceramics or natural stone C04B41/00; paints varnishes, laquers C09D; enamelling of, or applying a vitreous layer to, metals C23D; inhibiting corrosion of metallic material or incrustation in general C23F; single-crystal film growth C30B; manufacture of semiconductor devices H01L; manufacture of printed circuits H05K)

C23D ENAMELLING OF, OR APPLYING A VITREOUS LAYER TO, METALS (chemical composition of the enamels C03C)

C23F NON-MECHANICAL REMOVAL OF METALLIC MATERIAL FROM SURFACE (working metal by laser beams B23K26/00; desurfacing by applying flames B23K7/00; working of metal by electro-erosion B23H; producing decorative effects by removing surface material, e.g. by engraving, by etching, B44C1/22; electrolytic etching or polishing C25F); **INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL; MULTI-STEP PROCESSES FOR SURFACE TREATMENT OF METALLIC MATERIAL INVOLVING AT LEAST ONE PROCESS PROVIDED FOR IN CLASS C23 AND AT LEAST ONE PROCESS COVERED BY SUBCLASS C21D OR C22F OR CLASS C25.**

C23G CLEANING OR DEGREASING OF METALLIC MATERIAL BY CHEMICAL METHODS OTHER THAN ELECTROLYSIS (polishing compositions C09G; detergents in general C11D)

C25 ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR (electrodialysis, electro-osmosis, separation of liquids by electricity B01D; [N: separation of isotopes by electrochemical methods B01D59/38]; working of metal by the action of a high concentration of electric current B23H; treatment of water, waste water or sewage by electrochemical methods C02F1/46; surface treatment of metallic material or coating involving at least one process provided for in class C23 and at least one process covered by this class C23C28/00, C23F17/00; anodic or cathodic protection C23E; single-crystal growth C30B; metallising textiles D06M11/83; decorating textiles by locally metallising D06Q1/04; electrochemical methods of analysis G01N; electrochemical measuring, indicating or recording devices G01R; electrolytic circuit elements, e.g. capacitors, H01G; electrochemical current or voltage generators H01M)

Notes

1. Electrolytic or electrophoretic processes or apparatus or operational features are classified:

- a. in the groups for the compounds or articles produced, and
 - b. in the groups which cover the apparatus or operational features.
2. The electrolytic or electrophoretic purification of materials is classified according to the nature of the liquid in the relevant places, e.g. [A01K63/00](#), [C02F1/46](#), [C25B15/08](#), [C25D21/16](#), [C25F7/02](#).

- C25B** ELECTROLYTIC OR ELECTROPHORETIC PROCESSES FOR THE PRODUCTION OF COMPOUNDS OR NON-METALS; APPARATUS THEREFOR
- C25C** PROCESSES FOR THE ELECTROLYTIC PRODUCTION, RECOVERY OR REFINING OF METALS; APPARATUS THEREFOR
- C25D** PROCESSES FOR THE ELECTROLYTIC OR ELECTROPHORETIC PRODUCTION OF COATINGS; ELECTROFORMING (decorating textiles by metallising [D06Q1/04](#); manufacturing printed circuits by metal deposition [H05K3/18](#)); APPARATUS THEREFOR
- C25F** PROCESSES FOR THE ELECTROLYTIC REMOVAL OF MATERIALS FROM OBJECTS; APPARATUS THEREFOR
- C30** CRYSTAL GROWTH (separation by crystallisation in general [B01D9/00](#))
- C30B** SINGLE-CRYSTAL-GROWTH (by using ultra-high pressure, e.g. for the formation of diamonds [B01J3/06](#)); UNIDIRECTIONAL SOLIDIFICATION OF EUTECTIC MATERIAL OR UNIDIRECTIONAL DEMIXING OF EUTECTOID MATERIAL; REFINING BY ZONE-MELTING OF MATERIAL (zone-refining of metals or alloys C22B); PRODUCTION OF A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (casting of metals, casting of other substances by the same processes or devices B22D; working of plastics B29; modifying the physical structure of metals or alloys C21D, C22F); SINGLE CRYSTALS OR HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE; AFTER-TREATMENT OF SINGLE CRYSTALS OR A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (for producing semiconductor devices or parts thereof H01L); APPARATUS THEREFOR
- C40** COMBINATORIAL CHEMISTRY [\[N0405\]](#)

C40B

**COMBINATORIAL CHEMISTRY; LIBRARIES, e.g. CHEMICAL
LIBRARIES, IN SILICO LIBRARIES** [N0405]