

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

## C07 ORGANIC CHEMISTRY

(NOTES omitted)

## C07C ACYCLIC OR CARBOCYCLIC COMPOUNDS

### NOTES

- In this subclass, the following terms or expressions are used with meanings indicated:
  - "bridged" means the presence of at least one fusion other than ortho, peri or spiro;
  - two rings are "condensed" if they share at least one ring member, i.e. "spiro" and "bridged" are considered as condensed;
  - "condensed ring system" is a ring system in which all rings are condensed among themselves;
  - "number of rings" in a condensed ring system equals the number of scissions necessary to convert the ring system into one acyclic chain;
  - "quinones" are compounds derived from compounds containing a six-membered aromatic ring or a system comprising six-membered aromatic rings (which system may be condensed or not condensed) by replacing two or four CH groups of the six-membered aromatic rings by C=O groups, and by removing one or two carbon-to-carbon double bonds, respectively, and rearranging the remaining carbon-to-carbon double bonds to give a ring or ring system with alternating double bonds, including the carbon-to-oxygen bonds; this means that acenaphthenequinone or camphorquinone are not considered as quinones.
- In this subclass, in the absence of an indication to the contrary, a process is classified in the last appropriate place.
- In this subclass, in the absence of an indication to the contrary, "quaternary ammonium compounds" are classified with the corresponding "non-quaternised nitrogen compounds".
- For the classification of compounds in groups [C07C 1/00](#) - [C07C 71/00](#) and [C07C 401/00](#) - [C07C 409/00](#) :
  - a compound is classified considering the molecule as a whole (rule of the "whole molecule approach");
  - a compound is considered to be saturated if it does not contain carbon atoms bound to each other by multiple bonds;
  - a compound is considered to be unsaturated if it contains carbon atoms bound to each other by multiple bonds, which includes six-membered aromatic ring, unless otherwise specified or implicitly derivable from the subdivision.
- For the classification of compounds in groups [C07C 201/00](#) - [C07C 395/00](#), i.e. after the functional group has been determined according to the "last place rule", a compound is classified according to the following principles:
  - compounds are classified in accordance with the nature of the carbon atom to which the functional group is attached;
  - a carbon skeleton is a carbon atom, other than a carbon atom of a carboxyl group, or a chain of carbon atoms bound to each other, a carbon skeleton is considered to be terminated by every bond to an element other than carbon or to a carbon atom of a carboxyl group;
  - when the molecule contains several functional groups, only functional groups linked to the same carbon skeleton as the one first determined are considered;
  - a carbon skeleton is considered to be saturated if it does not contain carbon atoms bound to each other by multiple bonds;
  - a carbon skeleton is considered to be unsaturated if it contains carbon atoms bound to each other by multiple bonds, which includes a six-membered aromatic ring.
- When classifying in this subclass, classification is also made in group [B01D 15/08](#) insofar as subject matter of general interest relating to chromatography is concerned.
- When a process is classified in a process group, combination sets are used to indicate the product of the process. A combination set consists of a process group, followed by and linked to the group of the product. The products are selected from the corresponding product groups.

### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
 

|  |            |  |
|--|------------|--|
| <a href="#">C07C 27/02</a>   | covered by | <a href="#">C07C 29/00</a> , <a href="#">C07C 51/00</a>                                  |
| <a href="#">C07C 47/042</a> , <a href="#">C07C 47/045</a> , <a href="#">C07C 47/048</a> ,<br><a href="#">C07C 47/052</a> , <a href="#">C07C 47/055</a> , <a href="#">C07C 47/058</a>   | covered by | <a href="#">C07C 47/04</a>   |
| <a href="#">C07C 47/07</a> , <a href="#">C07C 47/09</a>  | covered by | <a href="#">C07C 47/06</a>   |
| <a href="#">C07C 53/04</a>   | covered by | <a href="#">C07C 53/02</a>   |
| <a href="#">C07C 57/045</a> , <a href="#">C07C 57/05</a> , <a href="#">C07C 57/055</a> ,<br><a href="#">C07C 57/065</a> , <a href="#">C07C 57/07</a> , <a href="#">C07C 57/075</a><br><a href="#">C07C 69/025</a> , <a href="#">C07C 69/03</a> , <a href="#">C07C 69/035</a> | covered by | <a href="#">C07C 69/003</a> - <a href="#">C07C 69/017</a> and <a href="#">C07C 69/02</a> |
| <a href="#">C07C 69/347</a> , <a href="#">C07C 69/353</a>  | covered by | <a href="#">C07C 69/003</a> - <a href="#">C07C 69/017</a> and <a href="#">C07C 69/34</a> |
| <a href="#">C07C 69/527</a>  | covered by | <a href="#">C07C 69/003</a> - <a href="#">C07C 69/017</a> and <a href="#">C07C 69/52</a> |

C07C

(continued)

C07C 69/767, C07C 69/773

C07C 69/83

covered by

covered by

C07C 69/003 - C07C 69/017 and C07C 69/76

C07C 69/003 - C07C 69/017 and C07C 69/82

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

**Hydrocarbons** (derivatives of cyclohexane or of a cyclohexene {or of cyclohexadiene}, having a side-chain containing an acyclic unsaturated part of at least four carbon atoms, this part being directly attached to the cyclohexane or cyclohexene {or cyclohexadiene} rings C07C 403/00; preparation of macromolecular compounds C08; production or separation from undefined hydrocarbon mixtures such as petroleum oil C10G; natural gas, synthetic natural gas, liquefied petroleum gas C10L 3/00; electrolytic or electrophoretic processes C25B)

**1/00 Preparation of hydrocarbons from one or more compounds, none of them being a hydrocarbon**

- 1/02 . from oxides of a carbon (preparation of liquid hydrocarbon mixtures of undefined composition C10G 2/00; of synthetic natural gas C10L 3/06)
- 1/04 . . from carbon monoxide with hydrogen
- 1/0405 . . . {Apparatus}
- 1/041 . . . . {Reactors}
- 1/0415 . . . . . {with moving catalysts}
- 1/042 . . . . {Temperature controlling devices; Heat exchangers}
- 1/0425 . . . {Catalysts; their physical properties}
- 1/043 . . . . {characterised by the composition}
- 1/0435 . . . . . {containing a metal of group 8 or a compound thereof}
- 1/044 . . . . . {containing iron}
- 1/0445 . . . . {Preparation; Activation}
- 1/045 . . . . {Regeneration}
- 1/0455 . . . {Reaction conditions}
- 1/046 . . . . {Numerical values of parameters (only to be used if no other subgroup of C07C 1/04 is used)}
- 1/0465 . . . . {concerning fluidisation}
- 1/047 . . . . {Processes in which one or more parameters are changed during the process; Starting-up of the process}
- 1/0475 . . . . {Regulating}
- 1/048 . . . . {Temperature controlling measures}
- 1/0485 . . . {Set-up of reactors or accessories; Multi-step processes}
- 1/049 . . . . {Coupling of the reaction and regeneration of the catalyst}
- 1/0495 . . . {Non-catalytic processes; Catalytic processes in which there is also another way of activation, e.g. radiation}
- 1/06 . . . in the presence of organic compounds, e.g. hydrocarbons {(multi-step processes in which the feed to a subsequent reaction zone comprises at least a part of the reaction-product of a previous reaction zone C07C 1/0485)}
- 1/063 . . . . {the organic compound being the catalyst or a part of the catalyst system}
- 1/066 . . . . . {used for dissolving, suspending or transporting the catalyst}
- 1/08 . . . Isosyntheses
- 1/10 . . from carbon monoxide with water vapour
- 1/12 . . from carbon dioxide with hydrogen

- 1/20 . starting from organic compounds containing only oxygen atoms as heteroatoms
- 1/207 . . from carbonyl compounds
- 1/2072 . . . {by condensation (C07C 2/86 takes precedence)}
- 1/2074 . . . . {of only one compound}
- 1/2076 . . . {by a transformation in which at least one - C(=O)- moiety is eliminated}
- 1/2078 . . . {by a transformation in which at least one - C(=O)-O- moiety is eliminated}
- 1/213 . . . by splitting of esters
- 1/22 . . by reduction
- 1/24 . . by elimination of water
- 1/247 . . by splitting of cyclic ethers
- 1/26 . starting from organic compounds containing only halogen atoms as hetero-atoms
- 1/28 . . by ring closure
- 1/30 . . by splitting-off the elements of hydrogen halide from a single molecule
- 1/32 . starting from compounds containing hetero-atoms other than or in addition to oxygen or halogen
- 1/321 . . {the hetero-atom being a non-metal atom}
- 1/322 . . . {the hetero-atom being a sulfur atom}
- 1/323 . . . {the hetero-atom being a nitrogen atom}
- 1/324 . . . {the hetero-atom being a phosphorus atom (C07C 1/34 takes precedence)}
- 1/325 . . {the hetero-atom being a metal atom}
- 1/326 . . . {the hetero-atom being a magnesium atom}
- 1/327 . . . {the hetero-atom being an aluminium atom (C07C 2/88 takes precedence)}
- 1/328 . . . {the hetero-atom being an alkali metal atom}
- 1/34 . . reacting phosphines with aldehydes or ketones, e.g. Wittig reaction
- 1/36 . by splitting of esters (C07C 1/213, C07C 1/30 take precedence)

**2/00 Preparation of hydrocarbons from hydrocarbons containing a smaller number of carbon atoms (redistribution reactions involving splitting C07C 6/00)**

- 2/02 . by addition between unsaturated hydrocarbons
- 2/04 . . by oligomerisation of well-defined unsaturated hydrocarbons without ring formation
- 2/06 . . . of alkenes, i.e. acyclic hydrocarbons having only one carbon-to-carbon double bond
- 2/08 . . . . Catalytic processes
- 2/10 . . . . . with metal oxides
- 2/12 . . . . . with crystalline aluminosilicates {or with catalysts comprising} molecular sieves
- 2/14 . . . . . with inorganic acids; with salts or anhydrides of acids
- 2/16 . . . . . Acids of sulfur; Salts thereof; Sulfur oxides
- 2/18 . . . . . Acids of phosphorus; Salts thereof; Phosphorus oxides
- 2/20 . . . . . Acids of halogen; Salts thereof {; Complexes thereof with organic compounds}

- 2/22 . . . . . Metal halides; Complexes thereof with organic compounds
- 2/24 . . . . . with metals
- 2/26 . . . . . with hydrides or organic compounds ([C07C 2/20](#) takes precedence)
- 2/28 . . . . . with ion-exchange resins
- 2/30 . . . . . containing metal-to-carbon bond; Metal hydrides
- 2/32 . . . . . as complexes, e.g. acetyl-acetonates {([complexes of salts of acids of halogen C07C 2/20](#))}
- 2/34 . . . . . Metal-hydrocarbon complexes
- 2/36 . . . . . as phosphines, arsines, stilbines or bismuthines
- 2/38 . . . of dienes or alkynes
- 2/40 . . . of conjugated dienes
- 2/403 . . . . . {[Catalytic processes](#)}
- 2/406 . . . . . {[with hydrides or organic compounds](#)}
- 2/42 . . homo- or co-oligomerisation with ring formation, not being a Diels-Alder conversion
- 2/44 . . . of conjugated dienes only
- 2/46 . . . Catalytic processes
- 2/465 . . . . . {[with hydrides or organic compounds](#)}
- 2/48 . . . of only hydrocarbons containing a carbon-to-carbon triple bond
- 2/50 . . Diels-Alder conversion
- 2/52 . . . Catalytic processes
- 2/54 . . by addition of unsaturated hydrocarbons to saturated hydrocarbons or to hydrocarbons containing a six-membered aromatic ring with no unsaturation outside the aromatic ring
- 2/56 . . Addition to acyclic hydrocarbons
- 2/58 . . . Catalytic processes
- 2/60 . . . with halides
- 2/62 . . . with acids
- 2/64 . . Addition to a carbon atom of a six-membered aromatic ring
- 2/66 . . . Catalytic processes
- 2/68 . . . with halides
- 2/70 . . . with acids
- 2/72 . . Addition to a non-aromatic carbon atom of hydrocarbons containing a six-membered aromatic ring
- 2/74 . . by addition with simultaneous hydrogenation
- 2/76 . . by condensation of hydrocarbons with partial elimination of hydrogen
- 2/78 . . Processes with partial combustion
- 2/80 . . Processes with the aid of electrical means
- 2/82 . . oxidative coupling
- 2/84 . . . catalytic
- 2/86 . . by condensation between a hydrocarbon and a non-hydrocarbon
- 2/861 . . {[the non-hydrocarbon contains only halogen as hetero-atoms](#)}
- 2/862 . . {[the non-hydrocarbon contains only oxygen as hetero-atoms](#)}
- 2/864 . . . {[the non-hydrocarbon is an alcohol](#)}
- 2/865 . . . {[the non-hydrocarbon is an ether](#)}
- 2/867 . . . {[the non-hydrocarbon is an aldehyde or a ketone](#)}
- 2/868 . . {[the non-hydrocarbon contains sulfur as hetero-atom](#)}
- 2/88 . . Growth and elimination reactions {([preparation of metallo-organic compounds C07E](#))}
- 4/00 Preparation of hydrocarbons from hydrocarbons containing a larger number of carbon atoms** ([redistribution reactions involving splitting C07C 6/00](#); [cracking hydrocarbon oils C10G](#))
- 4/02 . . by cracking a single hydrocarbon or a mixture of individually defined hydrocarbons or a normally gaseous hydrocarbon fraction
- 4/025 . . {[Oxidative cracking, autothermal cracking or cracking by partial combustion](#)}
- 4/04 . . Thermal processes {([C07C 4/025](#) takes precedence)}
- 4/06 . . Catalytic processes {([C07C 4/025](#) takes precedence)}
- 4/08 . . by splitting-off an aliphatic or cycloaliphatic part from the molecule
- 4/10 . . from acyclic hydrocarbons
- 4/12 . . from hydrocarbons containing a six-membered aromatic ring, e.g. propyltoluene to vinyltoluene
- 4/14 . . . splitting taking place at an aromatic-aliphatic bond
- 4/16 . . . Thermal processes
- 4/18 . . . Catalytic processes
- 4/20 . . . Hydrogen being formed *in situ*, e.g. from steam
- 4/22 . . by depolymerisation to the original monomer, e.g. dicyclopentadiene to cyclopentadiene
- 4/24 . . by splitting polyarylsubstituted aliphatic compounds at an aliphatic-aliphatic bond, e.g. 1,4-diphenylbutane to styrene
- 4/26 . . by splitting polyaryl compounds at a bond between uncondensed six-membered aromatic rings, e.g. biphenyl to benzene
- 5/00 Preparation of hydrocarbons from hydrocarbons containing the same number of carbon atoms**
- 5/02 . . by hydrogenation ([simultaneous hydrogenation and dehydrogenation C07C 5/52](#))
- 5/03 . . of non-aromatic carbon-to-carbon double bonds
- 5/05 . . . Partial hydrogenation
- 5/08 . . of carbon-to-carbon triple bonds
- 5/09 . . . to carbon-to-carbon double bonds
- 5/10 . . of aromatic six-membered rings
- 5/11 . . . Partial hydrogenation
- 5/13 . . with simultaneous isomerisation
- 5/22 . . by isomerisation ([with simultaneous hydrogenation C07C 5/13](#); [with simultaneous dehydrogenation C07C 5/373](#))
- 5/2206 . . {[Catalytic processes not covered by C07C 5/23 - C07C 5/31](#)}
- 5/2213 . . . {[with metal oxides](#)}
- 5/222 . . . {[with crystalline alumino-silicates, e.g. molecular sieves](#)}
- 5/2226 . . . {[with inorganic acids; with salt or anhydrides of acids](#)}
- 5/2233 . . . . {[Acids of sulfur; Salts thereof; Sulfur oxides](#)}
- 5/224 . . . . {[Acids of phosphorus; Salts thereof; Phosphorus oxides](#)}
- 5/2246 . . . . {[Acids of halogen; Salts thereof](#)}
- 5/2253 . . . . . {[Metal halides; Complexes thereof with organic compounds](#)}
- 5/226 . . . {[with metals](#)}

- 5/2266 . . . {with hydrides or organic compounds  
(C07C 5/2246 takes precedence)}
- 5/2273 . . . . {with ion-exchange resins}
- 5/228 . . . . {containing metal-to-carbon bond; Metal hydrides}
- 5/2286 . . . . {containing complexes, e.g. acetyl-acetonates (complexes of salts of acids of halogen C07C 5/2246)}
- 5/2293 . . . . {containing phosphines, arsines, stibines, or bismuthines}
- 5/23 . . Rearrangement of carbon-to-carbon unsaturated bonds
- 5/25 . . . Migration of carbon-to-carbon double bonds
- 5/2506 . . . . {Catalytic processes}
- 5/2512 . . . . . {with metal oxides}
- 5/2518 . . . . . {with crystalline alumino-silicates, e.g. molecular sieves}
- 5/2525 . . . . . {with inorganic acids; with salts or anhydrides of acids}
- 5/2531 . . . . . {Acids of sulfur; Salts thereof; Sulfur oxides}
- 5/2537 . . . . . {Acids of phosphorus; Salts thereof; Phosphorus oxides}
- 5/2543 . . . . . {Acids of halogen; Salts thereof}
- 5/255 . . . . . {Metal halides; Complexes thereof with organic compounds}
- 5/2556 . . . . . {with metals}
- 5/2562 . . . . . {with hydrides or organic compounds  
(C07C 5/2543 takes precedence)}
- 5/2568 . . . . . {with ion-exchange resins}
- 5/2575 . . . . . {containing metal-to-carbon bond; Metal hydrides}
- 5/2581 . . . . . {containing complexes, e.g. acetyl-acetonates (complexes of salts of acids of halogen C07C 5/2543)}
- 5/2587 . . . . . {Metal-hydrocarbon complexes}
- 5/2593 . . . . . {containing phosphines, arsines, stibines or bismuthines}
- 5/27 . . Rearrangement of carbon atoms in the hydrocarbon skeleton
- 5/2702 . . . {Catalytic processes not covered by C07C 5/2732 - C07C 5/31; Catalytic processes covered by both C07C 5/2732 and C07C 5/277 simultaneously}
- 5/2705 . . . . {with metal oxides}
- 5/2708 . . . . {with crystalline alumino-silicates, e.g. molecular sieves}
- 5/271 . . . . {with inorganic acids; with salts or anhydrides of acids}
- 5/2713 . . . . . {Acids of sulfur; Salts thereof; Sulfur oxides}
- 5/2716 . . . . . {Acids of phosphorus; Salts thereof; Phosphorus oxides}
- 5/2718 . . . . . {Acids of halogen; Salts thereof; complexes thereof with organic compounds}
- 5/2721 . . . . . {Metal halides; Complexes thereof with organic compounds}
- 5/2724 . . . . {with metals}
- 5/2727 . . . . {with hydrides or organic compounds  
(C07C 5/2718 takes precedence)}
- 5/2729 . . . {Changing the branching point of an open chain or the point of substitution on a ring}
- 5/2732 . . . . {Catalytic processes}
- 5/2735 . . . . . {with metal oxides}
- 5/2737 . . . . . {with crystalline alumino-silicates, e.g. molecular sieves}
- 5/274 . . . . . {with inorganic acids; with salts or anhydrides of acids}
- 5/2743 . . . . . {Acids of sulfur; Salts thereof; Sulfur oxides}
- 5/2745 . . . . . {Acids of phosphorus; Salts thereof; Phosphorus acids}
- 5/2748 . . . . . {Acids of halogen; Salts thereof}
- 5/2751 . . . . . {Metal halides; Complexes thereof with organic compounds}
- 5/2754 . . . . . {with metals}
- 5/2756 . . . . . {with hydrides or organic compounds  
(C07C 5/2748 takes precedence)}
- 5/2759 . . . . . {containing metal-to-carbon bond; Metal hydrides}
- 5/2762 . . . . . {containing complexes, e.g. acetyl-acetonates (complexes of salts of acids of halogen C07C 5/2748)}
- 5/2764 . . . . . {Metal-hydrocarbon complexes}
- 5/2767 . . . {Changing the number of side-chains}
- 5/277 . . . . {Catalytic processes}
- 5/2772 . . . . . {with metal oxides}
- 5/2775 . . . . . {with crystalline alumino-silicates, e.g. molecular sieves}
- 5/2778 . . . . . {with inorganic acids; with salts or anhydrides of acids}
- 5/2781 . . . . . {Acids of sulfur; Salts thereof; Sulfur oxides}
- 5/2783 . . . . . {Acids of phosphorus; Salts thereof; Phosphorus oxides}
- 5/2786 . . . . . {Acids of halogen; Salts thereof}
- 5/2789 . . . . . {Metal halides; Complexes thereof with organic compounds}
- 5/2791 . . . . . {with metals}
- 5/2794 . . . . . {with hydrides or organic compounds  
(C07C 5/2786 takes precedence)}
- 5/2797 . . . . . {with ion-exchange resins}
- 5/29 . . . changing the number of carbon atoms in a ring while maintaining the number of rings
- 5/31 . . . changing the number of rings
- 5/32 . . by dehydrogenation with formation of free hydrogen
- 5/321 . . {Catalytic processes}
- 5/322 . . . {with metal oxides or metal sulfides}
- 5/324 . . . {with metals}
- 5/325 . . . . {of the platinum group}
- 5/327 . . Formation of non-aromatic carbon-to-carbon double bonds only
- 5/333 . . . Catalytic processes
- 5/3332 . . . . {with metal oxides or metal sulfides}
- 5/3335 . . . . {with metals}
- 5/3337 . . . . . {of the platinum group}
- 5/35 . . Formation of carbon-to-carbon triple bonds only
- 5/367 . . Formation of an aromatic six-membered ring from an existing six-membered ring, e.g. dehydrogenation of ethylcyclohexane to ethylbenzene
- 5/373 . . with simultaneous isomerisation
- 5/387 . . . of cyclic compounds containing non six-membered ring to compounds containing a six-membered aromatic ring

- 5/393 . . . with cyclisation to an aromatic six-membered ring, e.g. dehydrogenation of n-hexane to benzene
- 5/41 . . . . Catalytic processes
- 5/412 . . . . {with metal oxides or metal sulfides}
- 5/415 . . . . {with metals}
- 5/417 . . . . {of the platinum group}
- 5/42 . by dehydrogenation with a hydrogen acceptor

**NOTES**

1. The catalyst is considered as forming part of the acceptor system in case of simultaneous catalyst reduction.
2. The acceptor system is classified according to the supplying substances in case of in situ formation of the acceptor system or of in situ regeneration of the reduced acceptor system.
3. Compounds added for binding the reduced acceptor system are not considered as belonging to the acceptor system.

- 5/44 . . with halogen or a halogen-containing compound as an acceptor
- 5/46 . . with sulfur or a sulfur-containing compound as an acceptor
- 5/48 . . with oxygen as an acceptor
- 5/50 . . with an organic compound as an acceptor
- 5/52 . . . with a hydrocarbon as an acceptor, e.g. hydrocarbon disproportionation, i.e.  $2C_nH_p \rightarrow C_nH_{p+q} + C_nH_{p-q}$
- 5/54 . . with an acceptor system containing at least two compounds provided for in more than one of the sub-groups [C07C 5/44](#) - [C07C 5/50](#)
- 5/56 . . . containing only oxygen and either halogens or halogen-containing compounds

**6/00 Preparation of hydrocarbons from hydrocarbons containing a different number of carbon atoms by redistribution reactions**

- 6/02 . Metathesis reactions at an unsaturated carbon-to-carbon bond
- 6/04 . . at a carbon-to-carbon double bond
- 6/06 . . . at a cyclic carbon-to-carbon double bond
- 6/08 . by conversion at a saturated carbon-to-carbon bond
- 6/10 . . in hydrocarbons containing no six-membered aromatic rings
- 6/12 . . of exclusively hydrocarbons containing a six-membered aromatic ring
- 6/123 . . . {of only one hydrocarbon}
- 6/126 . . . {of more than one hydrocarbon}

**7/00 Purification; Separation; Use of additives (working-up undefined gaseous mixtures obtained by cracking hydrocarbon oils [C10G 70/00](#))**

- 7/005 . {Processes comprising at least two steps in series}
- 7/04 . by distillation
- 7/05 . . with the aid of auxiliary compounds
- 7/06 . . . by azeotropic distillation
- 7/08 . . . by extractive distillation
- 7/09 . by fractional condensation
- 7/10 . by extraction, i.e. purification or separation of liquid hydrocarbons with the aid of liquids
- 7/11 . by absorption, i.e. purification or separation of gaseous hydrocarbons with the aid of liquids

- 7/12 . by adsorption, i.e. purification or separation of hydrocarbons with the aid of solids, e.g. with ion-exchangers
- 7/13 . . by molecular-sieve technique
- 7/135 . by gas-chromatography
- 7/14 . by crystallisation; Purification or separation of the crystals
- 7/144 . using membranes, e.g. selective permeation
- 7/148 . by treatment giving rise to a chemical modification of at least one compound

**NOTE**

In the following sub-groups contact masses and catalysts are disregarded for classification purposes

- 7/14808 . . {with non-metals as element ([hydrogenation C07C 7/163](#))}
- 7/14816 . . . {oxygen; ozone}
- 7/14825 . . . {halogens}
- 7/14833 . . {with metals or their inorganic compounds}
- 7/14841 . . . {metals}
- 7/1485 . . . {oxides; hydroxides; salts ([C07C 7/156](#) takes precedence)}
- 7/14858 . . {with inorganic compounds not provided for before ([acids, sulfur oxides C07C 7/17](#))}
- 7/14866 . . . {water ([hydrate formation C07C 7/152](#))}
- 7/14875 . . {with organic compounds ([organo-metallic compounds C07C 7/173](#))}
- 7/14883 . . . {hydrocarbons}
- 7/14891 . . . {alcohols}
- 7/152 . . by forming adducts or complexes
- 7/156 . . . with solutions of copper salts
- 7/163 . . by hydrogenation
- 7/167 . . . for removal of compounds containing a triple carbon-to-carbon bond
- 7/17 . . with acids or sulfur oxides
- 7/171 . . . Sulfuric acid or oleum
- 7/173 . . with the aid of organo-metallic compounds
- 7/177 . . by selective oligomerisation or polymerisation of at least one compound of the mixture
- 7/20 . Use of additives, e.g. for stabilisation

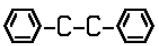
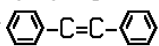
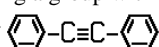
**9/00 Aliphatic saturated hydrocarbons**

- 9/02 . with one to four carbon atoms ([liquefied petroleum gas C10L 3/12](#))
- 9/04 . . Methane ([production by treatment of sewage C02F 11/04](#); natural gas, synthetic natural gas [C10L 3/06](#))
- 9/06 . . Ethane
- 9/08 . . Propane
- 9/10 . . with four carbon atoms
- 9/12 . . . Iso-butane
- 9/14 . with five to fifteen carbon atoms
- 9/15 . . Straight-chain hydrocarbons
- 9/16 . . Branched-chain hydrocarbons
- 9/18 . . . with five carbon atoms
- 9/21 . . . 2, 2, 4-Trimethylpentane
- 9/22 . with more than fifteen carbon atoms

**11/00 Aliphatic unsaturated hydrocarbons**

- 11/02 . Alkenes
- 11/04 . . Ethylene
- 11/06 . . Propene

|   |  |              |  |
|---|--|--------------|--|
| 11/08   | . . with four carbon atoms   | 13/39        | . . . with a bicyclo ring system containing seven carbon atoms   |
| 11/09   | . . . Isobutene  | 13/40        | . . . . with a bicycloheptane ring structure   |
| 11/10   | . . with five carbon atoms   | 13/42        | . . . . with a bicycloheptene ring structure   |
| 11/107  | . . with six carbon atoms  | 13/43        | . . . . substituted by unsaturated acyclic hydrocarbon   |
| 11/113  | . . . Methylpentenes   | 13/44        | . . . with a bicyclo ring system containing eight carbon atoms   |
| 11/12   | . Alkadienes   | 13/45        | . . . with a bicyclo ring system containing nine carbon atoms  |
| 11/14   | . . Allene   | 13/465       | . . . . Indenes; Completely or partially hydrogenated indenes  |
| 11/16   | . . with four carbon atoms   | 13/47        | . . . with a bicyclo ring system containing ten carbon atoms   |
| 11/167  | . . . 1, 3-Butadiene   | 13/48        | . . . . Completely or partially hydrogenated naphthalenes  |
| 11/173  | . . with five carbon atoms   | 13/50        | . . . . . Decahydronaphthalenes  |
| 11/18   | . . . Isoprene   | 13/52        | . . . . . Azulenes; Completely or partially hydrogenated azulenes  |
| 11/20   | . . . 1, 3-Pentadiene  | 13/54        | . . . with three condensed rings   |
| 11/21   | . Alkatrienes; Alkatetraenes; Other alkapolynes  | 13/547       | . . . . at least one ring not being six-membered, the other rings being at the most six-membered   |
| 11/22   | . containing carbon-to-carbon triple bonds   | 13/553       | . . . . . with an indacene or hydrogenated indacene ring system  |
| 11/24   | . . Acetylene ( <a href="#">production of acetylene gas by wet methods C10H</a> )                      | 13/567       | . . . . . with a fluorene or hydrogenated fluorene ring system   |
| 11/28   | . containing carbon-to-carbon double bonds and carbon-to-carbon triple bonds                           | 13/573       | . . . . . with three six-membered rings  |
| 11/30   | . . Butenyne   | 13/58        | . . . . . Completely or partially hydrogenated anthracenes   |
| <b>13/00</b>  | <b>Cyclic hydrocarbons containing rings other than, or in addition to, six-membered aromatic rings</b> | 13/60        | . . . . . Completely or partially hydrogenated phenanthrenes   |
| 13/02   | . Monocyclic hydrocarbons or acyclic hydrocarbon derivatives thereof                                   | 13/605       | . . . . . with a bridged ring system   |
| 13/04   | . . with a three-membered ring   | 13/61        | . . . . . with a bridged indene ring, e.g. dicyclopentadiene   |
| 13/06   | . . with a four-membered ring  | 13/615       | . . . . . with an adamantane ring  |
| 13/08   | . . with a five-membered ring  | 13/62        | . . . with more than three condensed rings   |
| 13/10   | . . . with a cyclopentane ring   | 13/64        | . . . . with a bridged ring system   |
| 13/11   | . . . . substituted by unsaturated hydrocarbon groups  | 13/66        | . . . . the condensed ring system contains only four rings   |
| 13/12   | . . . with a cyclopentene ring   | 13/68        | . . . . . with a bridged ring system   |
| 13/15   | . . . with a cyclopentadiene ring  | 13/70        | . . . with a condensed ring system consisting of at least two, mutually uncondensed aromatic ring systems, linked by an annular structure formed by carbon chains on non-adjacent positions of the aromatic ring, e.g. cyclophanes |
| 13/16   | . . with a six-membered ring   | 13/72        | . . . Spiro hydrocarbons   |
| 13/18   | . . . with a cyclohexane ring  | <b>15/00</b> | <b>Cyclic hydrocarbons containing only six-membered aromatic rings as cyclic parts</b>   |
| 13/19   | . . . . substituted by unsaturated hydrocarbon groups  | 15/02        | . Monocyclic hydrocarbons  |
| 13/20   | . . . with a cyclohexene ring  | 15/04        | . . Benzene  |
| 13/21   | . . . . Menthadienes   | 15/06        | . . Toluene  |
| 13/23   | . . . with a cyclohexadiene ring   | 15/067       | . . C <sub>8</sub> H <sub>10</sub> hydrocarbons  |
| 13/24   | . . with a seven-membered ring   | 15/073       | . . . Ethylbenzene   |
| 13/26   | . . with an eight-membered ring  | 15/08        | . . . Xylenes  |
| 13/263  | . . . with a cyclo-octene or cyclo-octadiene ring  | 15/085       | . . Isopropylbenzene   |
| 13/267  | . . . with a cyclo-octatriene or cyclo-octatetraene ring   | 15/107       | . . having saturated side-chain containing at least six carbon atoms, e.g. detergent alkylates   |
| 13/271  | . . with a nine- to ten- membered ring   | 15/113       | . . . having at least two saturated side-chains, each containing at least six carbon atoms   |
| 13/273  | . . with a twelve-membered ring  | 15/12        | . Polycyclic non-condensed hydrocarbons  |
| 13/275  | . . . the twelve-membered ring being unsaturated   | 15/14        | . . all phenyl groups being directly linked  |
| 13/277  | . . . . with a cyclododecatriene ring  | 15/16        | . . containing at least two phenyl groups linked by one single acyclic carbon atom   |
| 13/28   | . Polycyclic hydrocarbons or acyclic hydrocarbon derivatives thereof                                   |              |  |
| <b>NOTE</b>   |  |              |  |
| Ring systems consisting only of condensed six-membered ring with maximum number of non-cumulative double bonds are classified in group <a href="#">C07C 15/00</a> . |  |              |  |
| 13/32   | . . with condensed rings   |              |  |
| 13/34   | . . . with a bicyclo ring system containing four carbon atoms  |              |  |
| 13/36   | . . . with a bicyclo ring system containing five carbon atoms  |              |  |
| 13/38   | . . . with a bicyclo ring system containing six carbon atoms   |              |  |

- 15/18 . . containing at least one group with formula 
- 15/20 . Polycyclic condensed hydrocarbons
- 15/24 . . containing two rings
- 15/27 . . containing three rings
- 15/28 . . . Anthracenes
- 15/30 . . . Phenanthrenes
- 15/38 . . containing four rings
- 15/40 . substituted by unsaturated carbon radicals
- 15/42 . . monocyclic
- 15/44 . . . the hydrocarbon substituent containing a carbon-to-carbon double bond
- 15/46 . . . . Styrene; Ring-alkylated styrenes
- 15/48 . . . the hydrocarbon substituent containing a carbon-to-carbon triple bond
- 15/50 . . polycyclic non-condensed
- 15/52 . . . containing a group with formula 
- 15/54 . . . containing a group with formula 
- 15/56 . . polycyclic condensed
- 15/58 . . . containing two rings
- 15/60 . . . containing three rings
- 15/62 . . . containing four rings
- 17/23 . by dehalogenation
- 17/25 . by splitting-off hydrogen halides from halogenated hydrocarbons
- 17/26 . by reactions involving an increase in the number of carbon atoms in the skeleton
- 17/263 . . by condensation reactions
- 17/2632 . . . {involving an organo-magnesium compound, e.g. Grignard synthesis}
- 17/2635 . . . {involving a phosphorus compound, e.g. Wittig synthesis}
- 17/2637 . . . {between a compound containing only oxygen and possibly halogen as hetero-atoms and a halogenated hydrocarbon}
- 17/266 . . . of hydrocarbons and halogenated hydrocarbons
- 17/269 . . . of only halogenated hydrocarbons
- 17/272 . . by addition reactions
- 17/275 . . . of hydrocarbons and halogenated hydrocarbons
- 17/278 . . . of only halogenated hydrocarbons
- 17/281 . . . . of only one compound
- 17/30 . . by a Diels-Alder synthesis
- 17/32 . . by introduction of halogenated alkyl groups into ring compounds
- 17/35 . by reactions not affecting the number of carbon or of halogen atoms in the reaction
- 17/354 . . by hydrogenation
- 17/357 . . by dehydrogenation
- 17/358 . . by isomerisation
- 17/361 . by reactions involving a decrease in the number of carbon atoms
- 17/363 . . by elimination of carboxyl groups
- 17/367 . . by depolymerisation
- 17/37 . by disproportionation of halogenated hydrocarbons
- 17/38 . Separation; Purification; Stabilisation; Use of additives
- 17/383 . . by distillation
- 17/386 . . . with auxiliary compounds
- 17/389 . . by adsorption on solids
- 17/392 . . by crystallisation; Purification or separation of the crystals
- 17/395 . . by treatment giving rise to a chemical modification of at least one compound
- 17/42 . . Use of additives, e.g. for stabilisation

**Compounds containing carbon and halogens with or without hydrogen** (derivatives of cyclohexane or of a cyclohexene having an unsaturated side chain with at least four carbon atoms [C07C 403/00](#))

**17/00 Preparation of halogenated hydrocarbons**

- 17/007 . from carbon or from carbides and halogens
- 17/013 . by addition of halogens
- 17/02 . . to unsaturated hydrocarbons
- 17/04 . . to unsaturated halogenated hydrocarbons
- 17/06 . . combined with replacement of hydrogen atoms by halogens
- 17/07 . by addition of hydrogen halides
- 17/08 . . to unsaturated hydrocarbons
- 17/087 . . to unsaturated halogenated hydrocarbons
- 17/093 . by replacement by halogens
- 17/10 . . of hydrogen atoms (combined with addition of halogens to unsaturated hydrocarbons [C07C 17/06](#))
- 17/12 . . . in the ring of aromatic compounds
- 17/14 . . . in the side-chain of aromatic compounds
- 17/15 . . with oxygen as auxiliary reagent, e.g. oxychlorination
- 17/152 . . . of hydrocarbons
- 17/154 . . . . of saturated hydrocarbons
- 17/156 . . . . of unsaturated hydrocarbons
- 17/158 . . . of halogenated hydrocarbons
- 17/16 . . of hydroxyl groups
- 17/18 . . of oxygen atoms of carbonyl groups
- 17/20 . . of halogen atoms by other halogen atoms
- 17/202 . . . {two or more compounds being involved in the reaction}
- 17/204 . . . . {the other compound being a halogen}
- 17/206 . . . . {the other compound being HX}
- 17/208 . . . . {the other compound being MX}
- 17/21 . . . with simultaneous increase of the number of halogen atoms

**19/00 Acyclic saturated compounds containing halogen atoms**

- 19/01 . containing chlorine
- 19/03 . . Chloromethanes
- 19/04 . . . Chloroform
- 19/041 . . . Carbon tetrachloride
- 19/043 . . Chloroethanes
- 19/045 . . . Dichloroethanes
- 19/05 . . . Trichloroethanes
- 19/055 . . . Tetrachloroethanes
- 19/07 . containing iodine
- 19/075 . containing bromine
- 19/08 . containing fluorine
- 19/10 . . and chlorine
- 19/12 . . . having two carbon atoms
- 19/14 . . and bromine
- 19/16 . . and iodine

**21/00 Acyclic unsaturated compounds containing halogen atoms**

- 21/02 . containing carbon-to-carbon double bonds
- 21/04 . . Chloro-alkenes
- 21/06 . . . Vinyl chloride
- 21/067 . . . Allyl chloride; Methallyl chloride
- 21/073 . . . Dichloro-alkenes
- 21/08 . . . . Vinylidene chloride
- 21/09 . . . . Dichloro-butenes
- 21/10 . . . Trichloro-ethylene
- 21/12 . . . Tetrachloro-ethylene
- 21/14 . . containing bromine
- 21/16 . . . Crotyl bromide
- 21/17 . . containing iodine
- 21/18 . . containing fluorine
- 21/185 . . . tetrafluorethene
- 21/19 . . Halogenated dienes
- 21/20 . . . Halogenated butadienes
- 21/21 . . . . Chloroprene
- 21/215 . . Halogenated polyenes with more than two carbon-to-carbon double bonds
- 21/22 . containing carbon-to-carbon triple bonds
- 22/00 Cyclic compounds containing halogen atoms bound to an acyclic carbon atom**
- 22/02 . having unsaturation in the rings
- 22/04 . . containing six-membered aromatic rings
- 22/06 . . . Trichloromethylbenzene
- 22/08 . . . containing fluorine
- 23/00 Compounds containing at least one halogen atom bound to a ring other than a six-membered aromatic ring**
- 23/02 . Monocyclic halogenated hydrocarbons
- 23/04 . . with a three-membered ring
- 23/06 . . with a four-membered ring
- 23/08 . . with a five-membered ring
- 23/10 . . with a six-membered ring
- 23/12 . . . Hexachlorocyclohexanes
- 23/14 . . with a seven-membered ring
- 23/16 . . with an eight-membered ring
- 23/18 . Polycyclic halogenated hydrocarbons
- 23/20 . . with condensed rings none of which is aromatic
- 23/22 . . . with a bicyclo ring system containing four carbon atoms
- 23/24 . . . with a bicyclo ring system containing five carbon atoms
- 23/26 . . . with a bicyclo ring system containing six carbon atoms
- 23/27 . . . with a bicyclo ring system containing seven carbon atoms
- 23/28 . . . . Saturated bicyclo ring system
- 23/30 . . . . Mono-unsaturated bicyclo ring system
- 23/32 . . . with a bicyclo ring system containing eight carbon atoms
- 23/34 . . . Halogenated completely or partially hydrogenated indenenes
- 23/36 . . . Halogenated completely or partially hydrogenated naphthalenes
- 23/38 . . . with three condensed rings
- 23/40 . . . . Halogenated completely or partially hydrogenated fluorenes
- 23/42 . . . . Halogenated completely or partially hydrogenated anthracenes

- 23/44 . . . . Halogenated completely or partially hydrogenated phenanthrenes
- 23/46 . . . with more than three condensed rings
- 25/00 Compounds containing at least one halogen atom bound to a six-membered aromatic ring**
- 25/02 . Monocyclic aromatic halogenated hydrocarbons
- 25/06 . . Monochloro-benzene
- 25/08 . . Dichloro-benzenes
- 25/10 . . Trichloro-benzenes
- 25/12 . . Hexachloro-benzene
- 25/125 . . Halogenated xylenes
- 25/13 . . containing fluorine
- 25/18 . Polycyclic aromatic halogenated hydrocarbons
- 25/20 . . Dichloro-diphenyl-trichloro-ethane
- 25/22 . . with condensed rings
- 25/24 . Halogenated aromatic hydrocarbons with unsaturated side chains
- 25/28 . . Halogenated styrenes

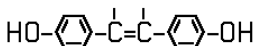
**Compounds containing carbon and oxygen, with or without hydrogen or halogens** (irradiation products of cholesterol or its derivatives [C07C 401/00](#); vitamin D derivatives, 9,10-seco cyclopenta[a]phenanthrene or analogues obtained by chemical preparation without irradiation [C07C 401/00](#); derivatives of cyclohexane or of a cyclohexene {or of cyclohexadiene}, having a side-chain containing an acyclic unsaturated part of at least four carbon atoms, this part being directly attached to the cyclohexane or cyclohexene {or cyclohexadiene} rings [C07C 403/00](#); prostaglandins or derivatives thereof [C07C 405/00](#); peroxy compounds [C07C 407/00](#), [C07C 409/00](#))

- 27/00 Processes involving the simultaneous production of more than one class of oxygen-containing compounds**
- 27/04 . by reduction of oxygen-containing compounds ([C07C 29/14 takes precedence](#))
- 27/06 . . by hydrogenation of oxides of carbon
- 27/08 . . . with moving catalysts
- 27/10 . by oxidation of hydrocarbons
- 27/12 . . with oxygen
- 27/14 . . . wholly gaseous reactions
- 27/16 . . with other oxidising agents
- 27/18 . by addition of alkynes to aldehydes, ketones, or alkylene oxides
- 27/20 . by oxo-reaction
- 27/22 . . with the use of catalysts which are specific for this process
- 27/24 . . with moving catalysts
- 27/26 . Purification; Separation; Stabilisation
- 27/28 . . by distillation
- 27/30 . . . by azeotropic distillation
- 27/32 . . . by extractive distillation
- 27/34 . . by extraction
- 29/00 Preparation of compounds having hydroxy or O-metal groups bound to a carbon atom not belonging to a six-membered aromatic ring**
- 29/03 . by addition of hydroxy groups to unsaturated carbon-to-carbon bonds, e.g. with the aid of H<sub>2</sub>O<sub>2</sub> (by simultaneous introduction of -OH groups and halogens [C07C 29/64](#))
- 29/04 . . by hydration of carbon-to-carbon double bonds

- 29/05 . . . with formation of absorption products in mineral acids and their hydrolysis (characterised by the method of hydrolysis [C07C 29/12](#))
- 29/06 . . . . the acid being sulfuric acid
- 29/08 . . . . the acid being phosphoric acid
- 29/09 . by hydrolysis
- 29/095 . . {of esters of organic acids}
- 29/10 . . of ethers, including cyclic ethers, e.g. oxiranes
- 29/103 . . . {of cyclic ethers}
- 29/106 . . . . {of oxiranes}
- 29/12 . . of esters of mineral acids
- 29/124 . . . of halides
- 29/128 . by alcoholysis
- 29/1285 . . {of esters of organic acids}
- 29/132 . by reduction of an oxygen containing functional group
- 29/136 . . of  $>C=O$  containing groups, e.g.  $—COOH$
- 29/14 . . . of a  $—CHO$  group
- 29/141 . . . . with hydrogen or hydrogen-containing gases
- 29/143 . . . of ketones
- 29/145 . . . . with hydrogen or hydrogen-containing gases
- 29/147 . . . of carboxylic acids or derivatives thereof
- 29/149 . . . . with hydrogen or hydrogen-containing gases
- 29/15 . by reduction of oxides of carbon exclusively
- 29/151 . . with hydrogen or hydrogen-containing gases
- 29/1512 . . . {characterised by reaction conditions}
- 29/1514 . . . . {the solvents being characteristic}
- 29/1516 . . . {Multisteps}
- 29/1518 . . . . {one step being the formation of initial mixture of carbon oxides and hydrogen for synthesis}
- 29/152 . . . characterised by the reactor used
- 29/153 . . . characterised by the catalyst used
- 29/154 . . . . containing copper, silver, gold, or compounds thereof
- 29/156 . . . . containing iron group metals, platinum group metals or compounds thereof
- 29/157 . . . . . containing platinum group metals or compounds thereof
- 29/158 . . . . . containing rhodium or compounds thereof
- 29/159 . . with reducing agents other than hydrogen or hydrogen-containing gases
- 29/16 . by oxo-reaction combined with reduction
- 29/17 . by hydrogenation of carbon-to-carbon double or triple bonds
- 29/172 . . {with the obtention of a fully saturated alcohol}
- 29/175 . . {with simultaneous reduction of an oxo group}
- 29/177 . . {with simultaneous reduction of a carboxy group}
- 29/19 . . in six-membered aromatic rings
- 29/20 . . . in a non-condensed rings substituted with hydroxy groups
- 29/32 . increasing the number of carbon atoms by reactions without formation of  $-OH$  groups
- 29/34 . . by condensation involving hydroxy groups or the mineral ester groups derived therefrom, e.g. Guerbet reaction
- 29/36 . increasing the number of carbon atoms by reactions with formation of hydroxy groups, which may occur via intermediates being derivatives of hydroxy, e.g. O-metal
- 29/38 . . by reaction with aldehydes or ketones
- 29/40 . . . with compounds containing carbon-to-metal bonds
- 29/42 . . . with compounds containing triple carbon-to-carbon bonds, e.g. with metal-alkynes
- 29/44 . increasing the number of carbon atoms by addition reactions, i.e. reactions involving at least one carbon-to-carbon double or triple bond ([C07C 29/16 takes precedence](#))
- 29/46 . . by diene-synthesis
- 29/48 . by oxidation reactions with formation of hydroxy groups
- 29/50 . . with molecular oxygen only
- 29/52 . . . in the presence of mineral boron compounds with, when necessary, hydrolysis of the intermediate formed
- 29/54 . . . starting from compounds containing carbon-to-metal bonds and followed by conversion of the  $-O-$  metal to  $-OH$  groups
- 29/56 . by isomerisation
- 29/58 . by elimination of halogen, e.g. by hydrogenolysis, splitting-off ([C07C 29/124 takes precedence](#))
- 29/60 . by elimination of  $-OH$  groups, e.g. by dehydration ([C07C 29/34 takes precedence](#))
- 29/62 . by introduction of halogen; by substitution of halogen atoms by other halogen atoms
- 29/64 . by simultaneous introduction of  $-OH$  groups and halogens
- 29/66 . . by addition of hypohalogenous acids, which may be formed *in situ*, to carbon-to-carbon unsaturated bonds
- 29/68 . Preparation of metal alcoholates ([C07C 29/42](#), [C07C 29/54 take precedence](#))
- 29/685 . . {by converting O-metal groups to other O-metal groups}
- 29/70 . . by converting hydroxy groups to O-metal groups {([C07C 29/09 takes precedence](#))}
- 29/705 . . . {by transalcoholysis (for the same reaction with the emphasis on alcohol preparation see [C07C 29/128](#))}
- 29/72 . . by oxidation of carbon-to-metal bonds
- 29/74 . Separation; Purification; Use of additives, e.g. for stabilisation
- 29/76 . . by physical treatment
- 29/78 . . . by condensation or crystallisation
- 29/80 . . . by distillation
- 29/82 . . . . by azeotropic distillation
- 29/84 . . . . by extractive distillation
- 29/86 . . . by liquid-liquid treatment
- 29/88 . . by treatment giving rise to a chemical modification of at least one compound ([chemisorption C07C 29/76](#))
- 29/90 . . . using hydrogen only
- 29/92 . . . by a consecutive conversion and reconstruction
- 29/94 . . Use of additives, e.g. for stabilisation
- 31/00 Saturated compounds having hydroxy or O-metal groups bound to acyclic carbon atoms**
- 31/02 . Monohydroxylic acyclic alcohols
- 31/04 . . Methanol
- 31/08 . . Ethanol
- 31/10 . . containing three carbon atoms
- 31/12 . . containing four carbon atoms
- 31/125 . . containing five to twenty-two carbon atoms
- 31/13 . Monohydroxylic alcohols containing saturated rings



|             |  |        |  |
|-------------|--|--------|--|
| 31/133      | . . monocyclic   | 33/22  | . . . Benzylalcohol; phenethyl alcohol   |
| 31/1333     | . . . {with a three-membered ring}   | 33/24  | . . polycyclic without condensed ring systems  |
| 31/1336     | . . . {with a four-membered ring}  | 33/26  | . Polyhydroxylic alcohols containing only six-membered aromatic rings as cyclic part   |
| 31/135      | . . . with a five or six-membered rings; Naphthenic alcohols   | 33/28  | . Alcohols containing only six-membered aromatic rings as cyclic part with unsaturation outside the aromatic rings                     |
| 31/1355     | . . . . {with a six-membered ring}   | 33/30  | . . monocyclic   |
| 31/137      | . . polycyclic with condensed ring systems   | 33/32  | . . . Cinnamyl alcohol   |
| 31/18       | . Polyhydroxylic acyclic alcohols  | 33/34  | . Monohydroxylic alcohols containing six-membered aromatic rings and other rings   |
| 31/20       | . . Dihydroxylic alcohols  | 33/36  | . Polyhydroxylic alcohols containing six-membered aromatic rings and other rings   |
| 31/202      | . . . {Ethylene glycol}  | 33/38  | . Alcohols containing six-membered aromatic rings and other rings and having unsaturation outside the aromatic rings                   |
| 31/205      | . . . {1,3-Propanediol; 1,2-Propanediol}   | 33/40  | . Halogenated unsaturated alcohols   |
| 31/207      | . . . {1,4-Butanediol; 1,3-Butanediol; 1,2-Butanediol; 2,3-Butanediol}   | 33/42  | . . acyclic  |
| 31/22       | . . Trihydroxylic alcohols, e.g. glycerol  | 33/423 | . . . {containing only double bonds as unsaturation}   |
| 31/225      | . . . {Glycerol}   | 33/426 | . . . {containing only triple bonds as unsaturation}   |
| 31/24       | . . Tetrahydroxylic alcohols, e.g. pentaerythritol   | 33/44  | . . containing rings other than six-membered aromatic rings  |
| 31/245      | . . . {Pentaerythritol}  | 33/46  | . . containing only six-membered aromatic rings as cyclic parts  |
| 31/26       | . . Hexahydroxylic alcohols  | 33/48  | . . . with unsaturation outside the aromatic rings   |
| 31/27       | . Polyhydroxylic alcohols containing saturated rings   | 33/483 | . . . . {Monocyclic}   |
| 31/272      | . . {Monocyclic}   | 33/486 | . . . . {Polycyclic}   |
| 31/274      | . . . {with a three to five-membered ring}   | 33/50  | . . containing six-membered aromatic rings and other rings   |
| 31/276      | . . . {with a six-membered ring}   | 35/00  | <b>Compounds having at least one hydroxy or O-metal group bound to a carbon atom of a ring other than a six-membered aromatic ring</b> |
| 31/278      | . . {Polycyclic with condensed rings}  | 35/02  | . monocyclic   |
| 31/28       | . Metal alcoholates (titanates, zirconates C07F 7/00)  | 35/04  | . . containing a three or four-membered rings  |
| 31/30       | . . Alkali metal or alkaline earth metal alcoholates   | 35/045 | . . . {containing a four-membered ring}  |
| 31/32       | . . Aluminium alcoholates  | 35/06  | . . containing a five-membered rings   |
| 31/34       | . Halogenated alcohols   | 35/08  | . . containing a six-membered rings  |
| 31/36       | . . the halogen not being fluorine   | 35/12  | . . . Menthol  |
| 31/38       | . . containing only fluorine as halogen  | 35/14  | . . . with more than one hydroxy group bound to the ring   |
| 31/40       | . . perhalogenated   | 35/16  | . . . . Inositols  |
| 31/42       | . . Polyhydroxylic acyclic alcohols  | 35/17  | . . . with unsaturation only outside the ring  |
| 31/44       | . . Halogenated alcohols containing saturated rings  | 35/18  | . . . with unsaturation at least in the ring   |
| 33/00       | <b>Unsaturated compounds having hydroxy or O-metal groups bound to acyclic carbon atoms</b>  | 35/20  | . . containing a seven or eight-membered rings   |
| <b>NOTE</b> | In condensed ring systems of six-membered aromatic rings and other rings, the double bond belonging to a benzene ring is not considered as unsaturated for the non-aromatic ring condensed thereon, e.g. the 1, 2, 3, 4-tetrahydronaphthalene ring is considered to be saturated outside the aromatic ring | 35/205 | . . containing a nine to twelve-membered rings, e.g. cyclododecanols   |
| 33/02       | . Acyclic alcohols with carbon-to-carbon double bonds  | 35/21  | . polycyclic, at least one hydroxy group bound to a non-condensed ring   |
| 33/025      | . . with only one double bond  | 35/22  | . polycyclic, at least one hydroxy group bound to a condensed ring system  |
| 33/03       | . . . in beta-position, e.g. allyl alcohol, methallyl alcohol  | 35/23  | . . with hydroxy on a condensed ring system having two rings   |
| 33/035      | . . . Alkenediols  | 35/24  | . . . the condensed ring system containing five carbon atoms   |
| 33/04       | . Acyclic alcohols with carbon-to-carbon triple bonds  | 35/26  | . . . . Bicyclopentadienols  |
| 33/042      | . . with only one triple bond  | 35/27  | . . . the condensed ring system containing six carbon atoms  |
| 33/044      | . . . Alkynediols  | 35/28  | . . . the condensed ring system containing seven carbon atoms  |
| 33/046      | . . . . Butynediols  | 35/29  | . . . . being a (2.2.1) system   |
| 33/048      | . . with double and triple bonds   | 35/30  | . . . . Borneol; Isoborneol  |
| 33/05       | . Alcohols containing rings other than six-membered aromatic rings   | 35/31  | . . . the condensed ring system containing eight carbon atoms  |
| 33/12       | . . containing five-membered rings   |        |  |
| 33/14       | . . containing six-membered rings  |        |  |
| 33/16       | . . containing rings with more than six ring members   |        |  |
| 33/18       | . Monohydroxylic alcohols containing only six-membered aromatic rings as cyclic part   |        |  |
| 33/20       | . . monocyclic   |        |  |

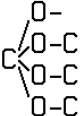
|              |  |   |  |
|--------------|--|---|--|
| 35/32        | . . . the condensed ring system being a (4.3.0) system, e.g. indenols  | 37/18   | . . by condensation involving halogen atoms of halogenated compounds   |
| 35/34        | . . . the condensed ring system being a (5.3.0.) system, e.g. azulenols  | 37/20   | . . using aldehydes or ketones   |
| 35/36        | . . . the condensed ring system being a (4.4.0) system, e.g. naphols   | 37/48   | . by exchange of hydrocarbon groups, which may be substituted, from the same of other compounds, e.g. transalkylation  |
| 35/37        | . . with a hydroxy group on a condensed system having three rings  | 37/50   | . by reactions decreasing the number of carbon atoms ( <a href="#">C07C 37/04</a> , <a href="#">C07C 37/045</a> , <a href="#">C07C 37/055</a> , <a href="#">C07C 37/08</a> take precedence)                        |
| 35/38        | . . . derived from the fluorene skeleton   | 37/52   | . . by splitting polyaromatic compounds, e.g. polyphenolalkanes  |
| 35/40        | . . . derived from the anthracene skeleton   | 37/54   | . . . by hydrolysis of lignin or sulfite waste liquor  |
| 35/42        | . . . derived from the phenanthrene skeleton   | 37/56   | . . by replacing a carboxyl or aldehyde group by a hydroxy group   |
| 35/44        | . . with a hydroxy group on a condensed ring system having more than three rings   | 37/58   | . by oxidation reactions introducing directly hydroxy groups on a =CH-group belonging to a six-membered aromatic ring with the aid of molecular oxygen   |
| 35/46        | . O-metal derivatives of the cyclically bound hydroxy groups   | 37/60   | . by oxidation reactions introducing directly hydroxy groups on a =CH-group belonging to a six-membered aromatic ring with the aid of other oxidants than molecular oxygen or their mixtures with molecular oxygen |
| 35/48        | . Halogenated derivatives  | 37/62   | . by introduction of halogen; by substitution of halogen atoms by other halogen atoms  |
| 35/50        | . . Alcohols with at least two rings   | 37/64   | . Preparation of O-metal compounds with O-metal group bound to a carbon atom belonging to a six-membered aromatic ring   |
| 35/52        | . . Alcohols with a condensed ring system  | 37/66   | . . by conversion of hydroxy groups to O-metal groups  |
| <b>37/00</b> | <b>Preparation of compounds having hydroxy or O-metal groups bound to a carbon atom of a six-membered aromatic ring</b>                                      | 37/68   | . Purification; separation; Use of additives, e.g. for stabilisation ( <a href="#">C07C 37/004</a> and <a href="#">C07C 37/005</a> take precedence)  |
| 37/001       | . {by modification in a side chain}  | 37/685  | . . {Processes comprising at least two steps in series}  |
| 37/002       | . . {by transformation of a functional group, e.g. oxo, carboxyl}  | 37/70   | . . by physical treatment  |
| 37/003       | . . {by hydrogenation of an unsaturated part}  | 37/72   | . . . by liquid-liquid treatment   |
| 37/004       | . {by obtaining phenols from plant material or from animal material}   | 37/74   | . . . by distillation  |
| 37/005       | . {by obtaining phenols from products, waste products or side-products of processes, not directed to the production of phenols, by conversion or working-up} | 37/76   | . . . . by steam distillation  |
| 37/006       | . . {from the petroleum industry}  | 37/78   | . . . . by azeotropic distillation   |
| 37/007       | . . {from the tar industry}  | 37/80   | . . . . by extractive distillation   |
| 37/008       | . . {from coke ovens}  | 37/82   | . . . by solid-liquid treatment; by chemisorption  |
| 37/009       | . . {from waste water (treatment of waste water <a href="#">C02F</a> )}  | 37/84   | . . . by crystallisation   |
| 37/01        | . by replacing functional groups bound to a six-membered aromatic ring by hydroxy groups, e.g. by hydrolysis   | 37/86   | . . by treatment giving rise to a chemical modification ( <a href="#">chemisorption C07C 37/82</a> )   |
| 37/02        | . . by substitution of halogen   | 37/88   | . . Use of additives, e.g. for stabilisation   |
| 37/04        | . . by substitution of SO <sub>3</sub> H groups or a derivative thereof  | <b>39/00</b>  | <b>Compounds having at least one hydroxy or O-metal group bound to a carbon atom of a six-membered aromatic ring</b>   |
| 37/045       | . . by substitution of a group bound to the ring by nitrogen   | <b>NOTE</b>   |  |
| 37/05        | . . . by substitution of a NH <sub>2</sub> group   | In condensed ring systems of six-membered aromatic rings and other rings, the double bond belonging to the benzene ring is not considered as unsaturated for the non-aromatic ring condensed thereon. |  |
| 37/055       | . . the substituted group being bound to oxygen, e.g. ether group  |   |  |
| 37/0555      | . . . {being esterified hydroxy groups}  |   |  |
| 37/06        | . by conversion of non-aromatic six-membered rings or of such rings formed <i>in situ</i> into aromatic six-membered rings, e.g. by dehydrogenation          |   |  |
| 37/07        | . . with simultaneous reduction of C=O group in that ring  |   |  |
| 37/08        | . by decomposition of hydroperoxides, e.g. cumene hydroperoxide  |   |  |
| 37/11        | . by reactions increasing the number of carbon atoms   |   |  |
| 37/115       | . . {using acetals}  | 39/02   | . monocyclic with no unsaturation outside the aromatic ring  |
| 37/14        | . . by addition reactions, i.e. reactions involving at least one carbon-to-carbon unsaturated bond   | 39/04   | . . Phenol   |
| 37/16        | . . by condensation involving hydroxy groups of phenols or alcohols or the ether or mineral ester group derived therefrom                                    | 39/06   | . . Alkylated phenols  |
|              |  | 39/07   | . . . containing only methyl groups, e.g. cresols, xylenols  |



- 39/08 . . Dihydroxy benzenes; Alkylated derivatives thereof
- 39/10 . . Polyhydroxy benzenes; Alkylated derivatives thereof ([C07C 39/08](#) takes precedence)
- 39/11 . . Alkylated hydroxy benzenes containing also acyclically bound hydroxy groups, e.g. saligenol
- 39/12 . polycyclic with no unsaturation outside the aromatic rings
- 39/14 . . with at least one hydroxy group on a condensed ring system containing two rings
- 39/15 . . with all hydroxy groups on non-condensed rings {, e.g. [phenylphenol](#)}
- 39/16 . . . Bis-(hydroxyphenyl) alkanes; Tris-(hydroxyphenyl)alkanes
- 39/17 . . containing other rings in addition to the six-membered aromatic rings {, e.g. [cyclohexylphenol](#)}
- 39/18 . monocyclic with unsaturation outside the aromatic ring
- 39/19 . . containing carbon-to-carbon double bonds but no carbon-to-carbon triple bonds
- 39/20 . . . Hydroxy-styrenes
- 39/205 . polycyclic, containing only six-membered aromatic rings as cyclic parts with unsaturation outside the rings
- 39/21 . . with at least one hydroxy group on a non-condensed ring
- 39/215 . . . containing , e.g. diethylstilbestrol
- 39/225 . . with at least one hydroxy group on a condensed ring system
- 39/23 . polycyclic, containing six-membered aromatic rings and other rings, with unsaturation outside the aromatic rings
- 39/235 . Metal derivatives of a hydroxy group bound to a six-membered aromatic ring
- 39/24 . Halogenated derivatives
- 39/245 . . {monocyclic polyhydroxylic containing halogens bound to ring carbon atoms}
- 39/26 . . monocyclic monohydroxylic containing halogen bound to ring carbon atoms
- 39/27 . . . all halogen atoms being bound to ring carbon atoms
- 39/28 . . . . the halogen being one chlorine atom
- 39/30 . . . . the halogen being two chlorine atoms
- 39/32 . . . . the halogen being three chlorine atoms
- 39/34 . . . . the halogen being four chlorine atoms
- 39/36 . . . . Pentachlorophenol
- 39/367 . . polycyclic non-condensed, containing only six-membered aromatic rings as cyclic parts, e.g. halogenated poly-hydroxyphenylalkanes
- 39/373 . . with all hydroxy groups on non-condensed rings and with unsaturation outside the aromatic rings
- 39/38 . . with at least one hydroxy group on a condensed ring system containing two rings
- 39/40 . . with at least one hydroxy group on a condensed ring system containing more than two rings
- 39/42 . . containing six-membered aromatic rings and other rings
- 39/44 . . Metal derivatives of an hydroxy group bound to a carbon atom of a six-membered aromatic ring


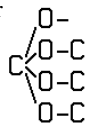


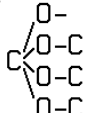
## 41/00

## Preparation of ethers; Preparation of compounds

having  groups,  groups

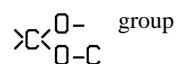
or  groups

- 41/01 . Preparation of ethers
- 41/02 . . from oxiranes
- 41/03 . . . by reaction of oxirane rings with hydroxy groups
- 41/05 . . by addition of compounds to unsaturated compounds
- 41/06 . . . by addition of organic compounds only
- 41/08 . . . . to carbon-to-carbon triple bonds
- 41/09 . . by dehydration of compounds containing hydroxy groups
- 41/14 . . by exchange of organic parts on the ether-oxygen for other organic parts, e.g. by trans-etherification
- 41/16 . . by reaction of esters of mineral or organic acids with hydroxy or O-metal groups
- 41/18 . . by reactions not forming ether-oxygen bonds
- 41/20 . . . by hydrogenation of carbon-to-carbon double or triple bonds
- 41/22 . . . by introduction of halogens; by substitution of halogen atoms by other halogen atoms
- 41/24 . . . by elimination of halogens, e.g. elimination of HCl
- 41/26 . . . by introduction of hydroxy or O-metal groups
- 41/28 . . . from acetals, e.g. by dealcoholysis
- 41/30 . . . by increasing the number of carbon atoms, e.g. by oligomerisation
- 41/32 . . by isomerisation
- 41/34 . . Separation; Purification; Stabilisation; Use of additives
- 41/36 . . . by solid-liquid treatment; by chemisorption
- 41/38 . . . by liquid-liquid treatment
- 41/40 . . . by change of physical state, e.g. by crystallisation
- 41/42 . . . . by distillation
- 41/44 . . . by treatments giving rise to a chemical modification ([by chemisorption C07C 41/36](#))
- 41/46 . . . Use of additives, e.g. for stabilisation
- 41/48 . Preparation of compounds having  groups
- 41/50 . . by reactions producing  groups
- 41/52 . . . by substitution of halogen only
- 41/54 . . . by addition of compounds to unsaturated carbon-to-carbon bonds
- 41/56 . . . by condensation of aldehydes, paraformaldehyde, or ketones
- 41/58 . . Separation; Purification; Stabilisation; Use of additives

|              |   |   |         |   |
|--------------|---|---|---------|---|
| 41/60        | . Preparation of compounds having   |  | 43/1783 | . . . . . {with hydroxy or -O-metal groups bound to the aromatic rings}   |
|              | groups or   |  | 43/1785 | . . . . . {having more than one ether bound}  |
|              | groups  |   | 43/1786 | . . . . . {containing halogen}  |
|              |   |   | 43/1787 | . . . . . {containing six-membered aromatic rings and having unsaturation outside the aromatic rings}   |
| <b>43/00</b> | <b>Ethers; Compounds having</b>   |  | 43/1788 | . . . . . {containing six-membered aromatic rings and other rings}  |
|              | groups,   |  | 43/18   | . . having an ether-oxygen atom bound to a carbon atom of a ring other than a six-membered aromatic ring  |
|              | groups or   |  | 43/184  | . . . to a carbon atom of a non-condensed ring  |
|              | groups  |   | 43/188  | . . . Unsaturated ethers  |
| 43/02        | . Ethers  |   | 43/192  | . . . containing halogen  |
| 43/03        | . . having all ether-oxygen atoms bound to acyclic carbon atoms                           |   | 43/196  | . . . containing hydroxy or O-metal groups  |
| 43/04        | . . . Saturated ethers  |   | 43/20   | . . having an ether-oxygen atom bound to a carbon atom of a six-membered aromatic ring  |
| 43/043       | . . . . {Dimethyl ether}  |   | 43/202  | . . . {the aromatic ring being a naphthalene}   |
| 43/046       | . . . . {Alkyl tert-alkyl ether, e.g. CH <sub>3</sub> OC(CH <sub>3</sub> ) <sub>3</sub> } |   | 43/205  | . . . the aromatic ring being a non-condensed ring  |
| 43/06        | . . . . Diethyl ether   |   | 43/2055 | . . . . {containing more than one ether bond}   |
| 43/10        | . . . . of polyhydroxy compounds  |   | 43/21   | . . . containing rings other than six-membered aromatic rings   |
| 43/11        | . . . . Polyethers containing —O—(C—C—O—) <sub>n</sub> units with ≤ 2 n ≤ 10              |   | 43/215  | . . . having unsaturation outside the six-membered aromatic rings   |
| 43/115       | . . . . containing carbocyclic rings  |   | 43/225  | . . . containing halogen  |
| 43/12        | . . . . containing halogen  |   | 43/23   | . . . containing hydroxy or O-metal groups  |
| 43/123       | . . . . . {both carbon chains are substituted by halogen atoms}                           |   | 43/235  | . . having an ether-oxygen atom bound to a carbon atom of a six-membered aromatic ring and to a carbon atom of a ring other than a six-membered aromatic ring |
| 43/126       | . . . . . {having more than one ether bond}   |   | 43/243  | . . . having unsaturation outside the six-membered aromatic rings   |
| 43/13        | . . . . containing hydroxy or O-metal groups (C07C 43/11 takes precedence)                |   | 43/247  | . . . containing halogen  |
| 43/132       | . . . . . {both carbon chains being substituted by hydroxy or O-metal groups}             |   | 43/253  | . . . containing hydroxy or O-metal groups  |
| 43/135       | . . . . . {having more than one ether bond}   |   | 43/257  | . . having an ether-oxygen atom bound to carbon atoms both belonging to six-membered aromatic rings   |
| 43/137       | . . . . . {containing halogen}  |   | 43/263  | . . . the aromatic rings being non-condensed  |
| 43/14        | . . . Unsaturated ethers  |   | 43/267  | . . . containing other rings  |
| 43/15        | . . . . containing only non-aromatic carbon-to-carbon double bonds                        |   | 43/275  | . . . having all ether-oxygen atoms bound to carbon atoms of six-membered aromatic rings  |
| 43/16        | . . . . . Vinyl ethers  |   | 43/285  | . . . having unsaturation outside the six-membered aromatic rings   |
| 43/162       | . . . . containing rings other than six-membered aromatic rings                           |   | 43/29   | . . . containing halogen  |
| 43/164       | . . . . containing six-membered aromatic rings  |   | 43/295  | . . . containing hydroxy or O-metal groups  |
| 43/166       | . . . . . having unsaturation outside the aromatic rings                                  |   | 43/30   | . Compounds having  groups   |
| 43/168       | . . . . . containing six-membered aromatic rings and other rings                          |   |         |   |
| 43/17        | . . . . containing halogen  |   |         |   |
| 43/172       | . . . . . containing rings other than six-membered aromatic rings                         |   |         |   |
| 43/174       | . . . . . containing six-membered aromatic rings  |   |         |   |
| 43/1742      | . . . . . {with halogen atoms bound to the aromatic rings}                                |   |         |   |
| 43/1745      | . . . . . {having more than one ether bond}   |   |         |   |
| 43/1747      | . . . . . {containing six membered aromatic rings and other rings}                        |   |         |   |
| 43/176       | . . . . . having unsaturation outside the aromatic rings                                  |   |         |   |
| 43/178       | . . . . containing hydroxy or O-metal groups  |   |         |   |
| 43/1781      | . . . . . {containing rings other than six-membered aromatic rings}                       |   |         |   |
| 43/1782      | . . . . . {containing six-membered aromatic rings}  |   |         |   |

**NOTE**

The acetal carbon atom is the carbon atom of the



|        |  |
|--------|--|
| 43/303 | . . having acetal carbon atoms bound to acyclic carbon atoms   |
| 43/305 | . . having acetal carbon atoms as rings members or bound to carbon atoms of rings other than six-membered aromatic rings |
| 43/307 | . . having acetal carbon atoms bound to carbon atoms of six-membered aromatic rings                                      |
| 43/313 | . . containing halogen   |
| 43/315 | . . containing oxygen atoms singly bound to carbon atoms not being acetal carbon atoms                                   |

- 43/317 . . having  $\begin{array}{c} \diagup \text{C} \diagdown \\ | \quad | \\ \text{O}-\text{X} \\ | \\ \text{O}-\text{C} \end{array}$  groups, X being hydrogen or metal
- 43/32 . Compounds having  $\begin{array}{c} \text{O}- \\ | \\ -\text{C}-\text{O}-\text{C} \\ | \quad | \\ \text{O}-\text{C} \end{array}$  groups or  $\begin{array}{c} \text{O}- \\ | \\ \text{C}-\text{O}-\text{C} \\ | \quad | \\ \text{O}-\text{C} \end{array}$  groups
- 45/00 Preparation of compounds having  $>\text{C}=\text{O}$  groups bound only to carbon or hydrogen atoms; Preparation of chelates of such compounds**
- 45/002 . {by dehydrogenation}
- 45/004 . {by reaction with organometalhalides}
- 45/006 . {by hydrogenation of aromatic hydroxy compounds}
- 45/008 . {by reaction with tri- or tetrahalomethyl compounds}
- 45/26 . by hydration of carbon-to-carbon triple bonds
- 45/27 . by oxidation (with ozone [C07C 45/40](#))
- 45/28 . . of  $\text{CH}_x$ -moieties
- 45/29 . . of hydroxy groups
- 45/292 . . . {with chromium derivatives}
- 45/294 . . . {with hydrogen peroxide}
- 45/296 . . . {with lead derivatives}
- 45/298 . . . {with manganese derivatives}
- 45/30 . . with halogen containing compounds, e.g. hypohalogenation
- 45/305 . . . {with halogenochromate reagents, e.g. pyridinium chlorochromate}
- 45/31 . . with compounds containing mercury atoms, which may be regenerated in situ, e.g. by oxygen
- 45/32 . . with molecular oxygen
- 45/33 . . . of  $\text{CH}_x$ -moieties
- 45/34 . . . . in unsaturated compounds
- 45/35 . . . . . in propene or isobutene
- 45/36 . . . . . in compounds containing six-membered aromatic rings
- 45/37 . . . of  $>\text{C}-\text{O}$ -functional groups to  $>\text{C}=\text{O}$  groups
- 45/38 . . . . being a primary hydroxyl group
- 45/39 . . . . being a secondary hydroxyl group
- 45/40 . by oxidation with ozone; by ozonolysis
- 45/41 . by hydrogenolysis or reduction of carboxylic groups or functional derivatives thereof
- 45/42 . by hydrolysis
- 45/43 . . of  $>\text{CX}_2$  groups, X being halogen
- 45/44 . by reduction and hydrolysis of nitriles
- 45/45 . by condensation
- 45/455 . . {with carboxylic acids or their derivatives}
- 45/46 . . Friedel-Crafts reactions
- 45/47 . . using phosgene
- 45/48 . . involving decarboxylation
- 45/49 . by reaction with carbon monoxide
- 45/50 . . by oxo-reactions
- 45/505 . . . {Asymmetric hydroformylation}
- 45/51 . by pyrolysis, rearrangement or decomposition
- 45/511 . . {involving transformation of singly bound oxygen functional groups to  $>\text{C}=\text{O}$  groups (involving two hydroxy groups [C07C 45/52](#); hydroperoxides [C07C 45/53](#))}
- 45/512 . . . {the singly bound functional group being a free hydroxyl group}
- 45/513 . . . {the singly bound functional group being an etherified hydroxyl group}
- 45/515 . . . {the singly bound functional group being an acetalised, ketalised hemi-acetalised, or hemi-ketalised hydroxyl group (cyclic acetals or ketals [C07C 45/59](#), [C07C 45/60](#))}
- 45/516 . . {involving transformation of nitrogen-containing compounds to  $>\text{C}=\text{O}$  groups}
- 45/517 . . {involving transformation of peroxy-compounds to  $>\text{C}=\text{O}$  groups}
- 45/518 . . {involving transformation of sulfur-containing compounds to  $>\text{C}=\text{O}$  groups}
- 45/52 . . by dehydration and rearrangement involving two hydroxy groups in the same molecule
- 45/53 . . of hydroperoxides
- 45/54 . . of compounds containing doubly bound oxygen atoms, e.g. esters
- 45/55 . . of oligo- or polymeric oxo-compounds
- 45/56 . from heterocyclic compounds ([C07C 45/55](#) takes precedence)
- 45/562 . . {with nitrogen as the only hetero atom}
- 45/565 . . . {by reaction with hexamethylene-tetramine}
- 45/567 . . {with sulfur as the only hetero atom}
- 45/57 . . with oxygen as the only heteroatom
- 45/58 . . . in three-membered rings
- 45/59 . . . in five-membered rings (from ozonides [C07C 45/40](#))
- 45/60 . . . in six-membered rings
- 45/61 . by reactions not involving the formation of  $>\text{C}=\text{O}$  groups
- 45/62 . . by hydrogenation of carbon-to-carbon double or triple bonds
- 45/63 . . by introduction of halogen; by substitution of halogen atoms by other halogen atoms
- 45/64 . . by introduction of functional groups containing oxygen only in singly bound form
- 45/65 . . by splitting-off hydrogen atoms or functional groups; by hydrogenolysis of functional groups
- 45/66 . . . by dehydration
- 45/67 . . by isomerisation; by change of size of the carbon skeleton
- 45/673 . . . {by change of size of the carbon skeleton}
- 45/676 . . . . {by elimination of carboxyl groups}
- 45/68 . . . by increase in the number of carbon atoms
- 45/69 . . . . by addition to carbon-to-carbon double or triple bonds
- 45/70 . . . . by reaction with functional groups containing oxygen only in singly bound form
- 45/71 . . . . . being hydroxy groups
- 45/72 . . . . by reaction of compounds containing  $>\text{C}=\text{O}$  groups with the same or other compounds containing  $>\text{C}=\text{O}$  groups
- 45/73 . . . . . combined with hydrogenation
- 45/74 . . . . . combined with dehydration
- 45/75 . . . . . Reactions with formaldehyde
- 45/76 . . . with the aid of ketenes
- 45/77 . Preparation of chelates of aldehydes or ketones
- 45/78 . Separation; Purification; Stabilisation; Use of additives
- 45/783 . . {by gas-liquid treatment, e.g. by gas-liquid absorption}
- 45/786 . . {by membrane separation process, e.g. pervaporation, perstraction, reverse osmosis}

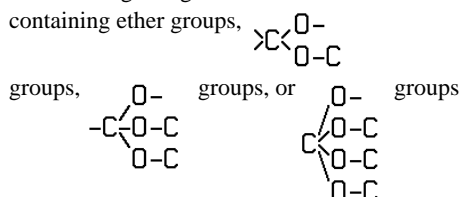
- 45/79 . . by solid-liquid treatment; by chemisorption  
 45/80 . . by liquid-liquid treatment  
 45/81 . . by change in the physical state, e.g. crystallisation  
 45/82 . . . by distillation  
 45/83 . . . . by extractive distillation  
 45/84 . . . . by azeotropic distillation  
 45/85 . . by treatment giving rise to a chemical modification (by chemisorption C07C 45/79)  
 45/86 . . Use of additives, e.g. for stabilisation  
 45/87 . Preparation of ketenes or dimeric ketenes (heterocyclic compounds C07D)  
 45/88 . . from ketones  
 45/89 . . from carboxylic acids, their anhydrides, esters or halides  
 45/90 . . Separation; Purification; Stabilisation; Use of additives

**46/00 Preparation of quinones**

- 46/02 . by oxidation giving rise to quinoid structures  
 46/04 . . of unsubstituted ring carbon atoms in six-membered aromatic rings  
 46/06 . . of at least one hydroxy group on a six-membered aromatic ring  
 46/08 . . . with molecular oxygen  
 46/10 . Separation; Purification; Stabilisation; Use of additives

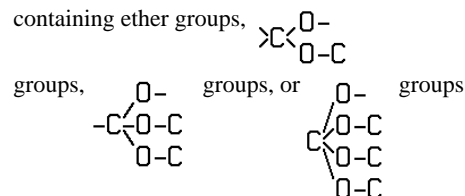
**47/00 Compounds having —CHO groups**

- 47/02 . Saturated compounds having —CHO groups bound to acyclic carbon atoms or to hydrogen  
 47/04 . . Formaldehyde  
 47/06 . . Acetaldehyde  
 47/105 . . containing rings  
 47/11 . . . monocyclic  
 47/115 . . . containing condensed ring systems  
 47/12 . . containing more than one —CHO group  
 47/127 . . . Glyoxal  
 47/133 . . . containing rings  
 47/14 . . containing halogen  
 47/16 . . . Trichloroacetaldehyde  
 47/17 . . . containing rings  
 47/19 . . containing hydroxy groups (sugars C07H)  
 47/192 . . . containing rings  
 47/195 . . . containing halogen  
 47/198 . . containing ether groups,

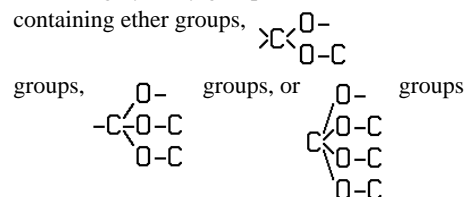


- 47/20 . Unsaturated compounds having —CHO groups bound to acyclic carbon atoms  
 47/21 . . with only carbon-to-carbon double bonds as unsaturation  
 47/22 . . . Acrylaldehyde; Methacrylaldehyde  
 47/222 . . with only carbon-to-carbon triple bonds as unsaturation  
 47/225 . . containing rings other than six-membered aromatic rings  
 47/228 . . containing six-membered aromatic rings, e.g. phenylacetaldehyde  
 47/23 . . . polycyclic  
 47/232 . . . having unsaturation outside the aromatic rings

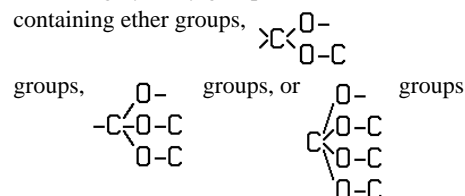
- 47/235 . . containing six-membered aromatic rings and other rings  
 47/238 . . . having unsaturation outside the aromatic rings  
 47/24 . . containing halogen  
 47/26 . . containing hydroxy groups  
 47/263 . . . acyclic  
 47/267 . . . containing rings other than six-membered aromatic rings  
 47/27 . . . containing six-membered aromatic rings  
 47/273 . . . containing halogen  
 47/277 . . containing ether groups,





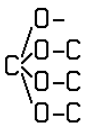


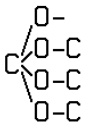


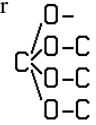


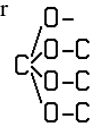
- 47/28 . Saturated compounds having —CHO groups bound to carbon atoms of rings other than six—membered aromatic rings  
 47/293 . . with three- or four-membered ring  
 47/30 . . with a five-membered ring  
 47/32 . . with a six-membered ring  
 47/33 . . with a seven- to twelve-membered ring  
 47/34 . . polycyclic  
 47/347 . . . having a —CHO group on a condensed ring system  
 47/353 . . containing halogen  
 47/36 . . containing hydroxy groups  
 47/37 . . containing ether groups,















- 47/38 . Unsaturated compounds having —CHO groups bound to carbon atoms of rings other than six—membered aromatic rings  
 47/395 . . with a three- or four-membered ring  
 47/40 . . with a five-membered ring  
 47/42 . . with a six-membered ring  
 47/43 . . with a seven- to twelve-membered ring  
 47/44 . . polycyclic  
 47/445 . . . containing a condensed ring system  
 47/45 . . having unsaturation outside the rings  
 47/453 . . containing six-membered aromatic rings  
 47/457 . . containing halogen  
 47/46 . . containing hydroxy groups  
 47/47 . . containing ether groups,



- 47/52 . Compounds having —CHO groups bound to carbon atoms of six—membered aromatic rings  
 47/54 . . Benzaldehyde  
 47/542 . . Alkylated benzaldehydes  
 47/544 . . Diformyl benzenes; Alkylated derivatives thereof  
 47/546 . . polycyclic  
 47/548 . . having unsaturation outside the six-membered aromatic rings

- 47/55 . . containing halogen
- 47/56 . . containing hydroxy groups
- 47/565 . . . all hydroxy groups bound to the ring
- 47/57 . . . polycyclic
- 47/575 . . containing ether groups,  groups,  groups, or  groups
- 47/58 . . . Vanillin
- 49/00 Ketones; Ketenes; Dimeric ketenes (heterocyclic compounds C07D, e.g. beta-lactones C07D 305/12); Ketonic chelates**
- 49/04 . Saturated compounds containing keto groups bound to acyclic carbon atoms
- 49/08 . . Acetone
- 49/10 . . Methyl-ethyl ketone
- 49/105 . . containing rings
- 49/11 . . . monocyclic
- 49/115 . . . containing condensed ring systems
- 49/12 . . Ketones containing more than one keto group
- 49/14 . . . Acetylacetone, i.e. 2,4-pentanedione
- 49/15 . . . containing rings
- 49/16 . . containing halogen
- 49/163 . . . containing rings
- 49/167 . . . containing only fluorine as halogen
- 49/17 . . containing hydroxy groups (sugars C07H)
- 49/172 . . . containing rings
- 49/173 . . . containing halogen
- 49/175 . . containing ether groups,  groups,  groups, or  groups
- 49/185 . . containing —CHO groups
- 49/20 . Unsaturated compounds containing keto groups bound to acyclic carbon atoms
- 49/203 . . with only carbon-to-carbon double bonds as unsaturation
- 49/205 . . . Methyl-vinyl ketone
- 49/207 . . with only carbon-to-carbon triple bonds as unsaturation
- 49/21 . . containing rings other than six-membered aromatic rings
- 49/213 . . containing six-membered aromatic rings
- 49/215 . . . polycyclic
- 49/217 . . . having unsaturation outside the aromatic rings
- 49/223 . . . polycyclic
- 49/225 . . containing six-membered aromatic rings and other rings
- 49/227 . . containing halogen
- 49/23 . . . containing rings other than six-membered aromatic rings
- 49/233 . . . containing six-membered aromatic rings
- 49/235 . . . . having unsaturation outside the aromatic rings
- 49/237 . . . containing six-membered aromatic rings and other rings
- 49/24 . . containing hydroxy groups
- 49/242 . . . containing rings other than six-membered aromatic rings
- 49/245 . . . containing six-membered aromatic rings
- 49/248 . . . . having unsaturation outside the aromatic rings
- 49/252 . . . containing six-membered aromatic rings and other rings
- 49/255 . . containing ether groups,  groups,  groups, or  groups
- 49/258 . . containing —CHO groups
- 49/29 . Saturated compounds containing keto groups bound to rings
- 49/293 . . to a three- or four-membered ring
- 49/297 . . to a five-membered ring
- 49/303 . . to a six-membered ring
- 49/307 . . to a seven- to twelve-membered ring
- 49/313 . . polycyclic
- 49/317 . . . both carbon atoms bound to the keto group belonging to rings
- 49/323 . . . having keto groups bound to condensed ring systems
- 49/327 . . containing halogen
- 49/333 . . . polycyclic
- 49/337 . . containing hydroxy groups
- 49/345 . . . polycyclic
- 49/35 . . containing ether groups,  groups,  groups, or  groups
- 49/355 . . containing —CHO groups
- 49/385 . Saturated compounds containing a keto group being part of a ring
- 49/39 . . of a three- or four-membered ring
- 49/395 . . of a five-membered ring
- 49/403 . . of a six-membered ring
- 49/407 . . . Menthones
- 49/413 . . of a seven- to twelve-membered ring
- 49/417 . . polycyclic
- 49/423 . . . a keto group being part of a condensed ring system
- 49/427 . . . . having two rings
- 49/433 . . . . the condensed ring system containing seven carbon atoms
- 49/437 . . . . . Camphor; Fenchone
- 49/443 . . . . the condensed ring system containing eight or nine carbon atoms
- 49/447 . . . . the condensed ring system containing ten carbon atoms
- 49/453 . . . . having three rings
- 49/457 . . containing halogen
- 49/463 . . . a keto group being part of a six-membered ring
- 49/467 . . . polycyclic
- 49/473 . . . . a keto group being part of a condensed ring system
- 49/477 . . . . . having two rings

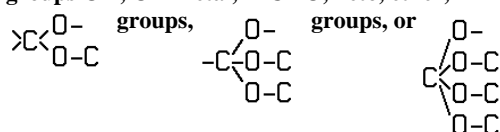
- 49/483 . . . . . having three rings
- 49/487 . . containing hydroxy groups
- 49/493 . . . a keto group being part of a three- to five-membered ring
- 49/497 . . . a keto group being part of a six-membered ring
- 49/503 . . . a keto group being part of a seven- to twelve-membered ring
- 49/507 . . . polycyclic
- 49/513 . . . . a keto group being part of a condensed ring system
- 49/517 . . containing ether groups,  groups,  groups, or  groups
- 49/523 . . containing —CHO groups
- 49/527 . Unsaturated compounds containing keto groups bound to rings other than six-membered aromatic rings
- 49/533 . . to a three- or four-membered ring
- 49/537 . . to a five-membered ring
- 49/543 . . to a six-membered ring
- 49/547 . . to a seven- to twelve-membered ring
- 49/553 . . polycyclic
- 49/557 . . having unsaturation outside the rings
- 49/563 . . containing six-membered aromatic rings
- 49/567 . . containing halogen
- 49/573 . . containing hydroxy groups
- 49/577 . . containing ether groups,  groups,  groups, or  groups
- 49/583 . . containing —CHO groups
- 49/587 . Unsaturated compounds containing a keto groups being part of a ring
- 49/593 . . of a three- or four-membered ring
- 49/597 . . of a five-membered ring
- 49/603 . . of a six-membered ring, e.g. quinone methides
- 49/607 . . of a seven- to twelve-membered ring
- 49/613 . . polycyclic
- 49/617 . . . a keto group being part of a condensed ring system
- 49/623 . . . . having two rings
- 49/627 . . . . the condensed ring system containing seven carbon atoms
- 49/633 . . . . the condensed ring system containing eight or nine carbon atoms
- 49/637 . . . . the condensed ring system containing ten carbon atoms
- 49/643 . . . . having three rings
- 49/647 . . having unsaturation outside the ring
- 49/653 . . . polycyclic
- 49/657 . . containing six-membered aromatic rings
- 49/665 . . . a keto group being part of a condensed ring system
- 49/67 . . . . having two rings, e.g. tetralones
- 49/675 . . . . having three rings
- 49/683 . . . having unsaturation outside the aromatic rings
- 49/687 . . containing halogen
- 49/693 . . . polycyclic
- 49/697 . . . containing six-membered aromatic rings
- 49/703 . . containing hydroxy groups
- 49/707 . . . a keto group being part of a three- to five-membered ring
- 49/713 . . . a keto group being part of a six-membered ring
- 49/717 . . . a keto group being part of a seven- to twelve-membered ring
- 49/723 . . . polycyclic
- 49/727 . . . . a keto group being part of a condensed ring system
- 49/733 . . . . . having two rings
- 49/737 . . . . . having three rings
- 49/743 . . . having unsaturation outside the rings, e.g. humulones, lupulones
- 49/747 . . . containing six-membered aromatic rings
- 49/753 . . containing ether groups,  groups,  groups, or  groups
- 49/755 . . . a keto group being part of a condensed ring system with two or three rings, at least one ring being a six-membered aromatic ring
- 49/757 . . containing —CHO groups
- 49/76 . Ketones containing a keto group bound to a six-membered aromatic ring ([compounds having a keto group being part of a condensed ring system and being bound to a six-membered aromatic ring C07C 49/657 - C07C 49/757](#))
- 49/78 . . Acetophenone
- 49/782 . . polycyclic
- 49/784 . . . with all keto groups bound to a non-condensed ring
- 49/786 . . . . Benzophenone
- 49/788 . . . with keto groups bound to a condensed ring system
- 49/792 . . . containing rings other than six-membered aromatic rings
- 49/794 . . having unsaturation outside an aromatic ring
- 49/796 . . . polycyclic
- 49/798 . . . containing rings other than six-membered aromatic rings
- 49/80 . . containing halogen
- 49/807 . . . all halogen atoms bound to the ring
- 49/813 . . . polycyclic
- 49/82 . . containing hydroxy groups
- 49/825 . . . all hydroxy groups bound to the ring
- 49/83 . . . polycyclic
- 49/835 . . . having unsaturation outside an aromatic ring
- 49/84 . . containing ether groups,  groups,  groups, or  groups
- 49/86 . . containing —CHO groups
- 49/88 . Ketenes; Dimeric ketenes
- 49/90 . Ketene, i.e. C<sub>2</sub>H<sub>2</sub>O

|              |   |        |   |
|--------------|---|--------|---|
| 49/92        | . Ketonic chelates  | 51/25  | . . . of unsaturated compounds containing no six-membered aromatic ring   |
| <b>50/00</b> | <b>Quinones</b>   | 51/252 | . . . . {of propene, butenes, acrolein or methacrolein}   |
|              | <b>NOTE</b>   | 51/255 | . . . of compounds containing six-membered aromatic rings without ring-splitting  |
|              | In this group, quinhydrones are classified according to their quinoid part.   | 51/265 | . . . . having alkyl side chains which are oxidised to carboxyl groups  |
| 50/02        | . with monocyclic quinoid structure   |        | <b>NOTE</b>   |
| 50/04        | . . Benzoquinones, i.e. $C_6H_4O_2$   |        | Reactions of the Katzschnmann type, i.e. oxidation of a dialkyl-aromatic compound with intermediate esterification of the mono-acid, see relevant ester groups, even when the end product is a carboxylic acid  |
| 50/06        | . . with unsaturation outside the quinoid structure   |        |   |
| 50/08        | . with polycyclic non-condensed quinoid structure   |        |   |
| 50/10        | . the quinoid structure being part of a condensed ring system containing two rings  |        |   |
| 50/12        | . . Naphthoquinones, i.e. $C_{10}H_6O_2$  |        |   |
| 50/14        | . . with unsaturation outside the ring system, e.g. vitamin K <sub>1</sub>  |        |   |
| 50/16        | . the quinoid structure being part of a condensed ring system containing three rings  | 51/27  | . . with oxides of nitrogen or nitrogen-containing mineral acids  |
| 50/18        | . . Anthraquinones, i.e. $C_{14}H_8O_2$   | 51/275 | . . . of hydrocarbyl groups   |
| 50/20        | . . with unsaturation outside the ring system   | 51/285 | . . with peroxy-compounds   |
| 50/22        | . the quinoid structure being part of a condensed ring system containing four or more rings                                       | 51/29  | . . with halogen-containing compounds which may be formed <i>in situ</i>  |
| 50/24        | . containing halogen  | 51/295 | . . with inorganic bases, e.g. by alkali fusion   |
| 50/26        | . containing groups having oxygen atoms singly bound to carbon atoms  | 51/305 | . . with sulfur or sulfur-containing compounds  |
| 50/28        | . . with monocyclic quinoid structure   | 51/31  | . . of cyclic compounds with ring-splitting   |
| 50/30        | . . with polycyclic non-condensed quinoid structure   | 51/313 | . . . {with molecular oxygen}   |
| 50/32        | . . the quinoid structure being part of a condensed ring system having two rings  | 51/316 | . . . {with oxides of nitrogen or nitrogen-containing mineral acids}  |
| 50/34        | . . the quinoid structure being part of a condensed ring system having three rings  | 51/34  | . by oxidation with ozone; by hydrolysis of ozonides  |
| 50/36        | . . the quinoid structure being part of a condensed ring system having four or more rings   | 51/347 | . by reactions not involving formation of carboxyl groups   |
| 50/38        | . containing —CHO or non—quinoid keto groups  | 51/353 | . . by isomerisation; by change of size of the carbon skeleton  |
| <b>51/00</b> | <b>Preparation of carboxylic acids or their salts, halides or anhydrides (of acids by hydrolysis of oils, fats or waxes C11C)</b> | 51/36  | . . by hydrogenation of carbon-to-carbon unsaturated bonds  |
| 51/02        | . from salts of carboxylic acids  | 51/363 | . . by introduction of halogen; by substitution of halogen atoms by other halogen atoms   |
| 51/04        | . from carboxylic acid halides  | 51/367 | . . by introduction of functional groups containing oxygen only in singly bound form  |
| 51/06        | . from carboxylic acid amides   | 51/373 | . . by introduction of functional groups containing oxygen only in doubly bound form  |
| 51/08        | . from nitriles   | 51/377 | . . by splitting-off hydrogen or functional groups; by hydrogenolysis of functional groups<br>{(C07C 51/36 - C07C 51/373 take precedence)}  |
| 51/083       | . from carboxylic acid anhydrides   |        |   |
| 51/087       | . . by hydrolysis   | 51/38  | . . . by decarboxylation  |
| 51/09        | . from carboxylic acid esters or lactones   | 51/41  | . Preparation of salts of carboxylic acids<br>{(C07C 51/093 - C07C 51/34 take precedence)<br>preparation of soap C11D}  |
| 51/093       | . by hydrolysis of —CX <sub>3</sub> groups, X being halogen   |        |   |
| 51/097       | . from or via nitro-substituted organic compounds   | 51/412 | . . {by conversion of the acids, their salts, esters or anhydrides with the same carboxylic acid part}  |
| 51/10        | . by reaction with carbon monoxide  | 51/414 | . . {Preparation of superbasic salts}   |
| 51/12        | . . on an oxygen-containing group in organic compounds, e.g. alcohols   | 51/416 | . . {Henkel reaction and related reactions, i.e. rearrangement of carboxylate salt groups linked to six-membered aromatic rings, in the absence or in the presence of CO or CO <sub>2</sub> , (e.g. preparation of terepholates from benzoates); no additional classification for the subsequent hydrolysis of the salt groups has to be given} |
| 51/14        | . . on a carbon-to-carbon unsaturated bond in organic compounds   |        |   |
| 51/145       | . . with simultaneous oxidation   |        |   |
| 51/15        | . by reaction of organic compounds with carbon dioxide, e.g. Kolbe-Schmitt synthesis  |        |   |
| 51/16        | . by oxidation (C07C 51/145 takes precedence)   |        |   |
| 51/21        | . . with molecular oxygen   |        |   |
| 51/215       | . . . of saturated hydrocarbyl groups   | 51/418 | . . {Preparation of metal complexes containing carboxylic acid moieties}  |
| 51/225       | . . . . of paraffin waxes   |        |   |
| 51/23        | . . . of oxygen-containing groups to carboxyl groups  | 51/42  | . Separation; Purification; Stabilisation; Use of additives   |
| 51/235       | . . . . of —CHO groups or primary alcohol groups  | 51/43  | . . by change of the physical state, e.g. crystallisation   |
| 51/245       | . . . . of keto groups or secondary alcohol groups  | 51/44  | . . . by distillation   |

|              |  |              |   |
|--------------|--|--------------|---|
| 51/445       | . . . . {by steam distillation}  | 55/08        | . . Malonic acid  |
| 51/46        | . . . . by azeotropic distillation   | 55/10        | . . Succinic acid   |
| 51/47        | . . by solid-liquid treatment; by chemisorption  | 55/12        | . . Glutaric acid   |
| 51/48        | . . by liquid-liquid treatment   | 55/14        | . . Adipic acid   |
| 51/487       | . . by treatment giving rise to chemical modification<br>(by chemisorption C07C 51/47)   | 55/16        | . . Pimelic acid  |
| 51/493       | . . . whereby carboxylic acid esters are formed  | 55/18        | . . Azelaic acid  |
| 51/50        | . . Use of additives, e.g. for stabilisation   | 55/20        | . . Sebacic acid  |
| 51/54        | . . Preparation of carboxylic acid anhydrides (by<br>oxidation C07C 51/16)   | 55/21        | . . Dicarboxylic acids containing twelve carbon<br>atoms  |
| 51/56        | . . from organic acids, their salts, their esters {or<br>their halides, e.g. by carboxylation}   | 55/22        | . . Tricarboxylic acids   |
| 51/567       | . . by reactions not involving carboxylic acid<br>anhydride groups   | 55/24        | . . containing more than three carboxyl groups  |
| 51/573       | . . Separation; Purification; Stabilisation; Use of<br>additives   | 55/26        | . . containing rings {other than aromatic rings}  |
| 51/58        | . . Preparation of carboxylic acid halides   | 55/28        | . . monocyclic  |
| 51/60        | . . by conversion of carboxylic acids or their<br>anhydrides {or esters, lactones, salts} into halides<br>with the same carboxylic acid part | 55/30        | . . containing condensed ring systems   |
| 51/62        | . . by reactions not involving the carboxylic acid<br>halide group   | 55/32        | . . containing halogen  |
| 51/64        | . . Separation; Purification; Stabilisation; Use of<br>additives   | 55/34        | . . containing rings  |
| <b>53/00</b> | <b>Saturated compounds having only one carboxyl<br/>group bound to an acyclic carbon atom or<br/>hydrogen</b>                                | 55/36        | . . Acyl halides  |
| 53/02        | . . Formic acid  | 55/38        | . . containing rings  |
| 53/06        | . . Salts thereof  | 55/40        | . . containing halogen outside the carboxyl halide<br>group                                     |
| 53/08        | . . Acetic acid (pyroligneous acid C10C; preparation of<br>vinegar C12J)   | <b>57/00</b> | <b>Unsaturated compounds having carboxyl groups<br/>bound to acyclic carbon atoms</b>           |
| 53/10        | . . Salts thereof  | 57/02        | . . with only carbon-to-carbon double bonds as<br>unsaturation                                  |
| 53/12        | . . Acetic anhydride (ketene C07C 49/90)   | 57/03        | . . Monocarboxylic acids  |
| 53/122       | . . Propionic acid   | 57/04        | . . . . Acrylic acid; Methacrylic acid  |
| 53/124       | . . Acids containing four carbon atoms   | 57/08        | . . . . Crotonic acid   |
| 53/126       | . . Acids containing more than four carbon atoms   | 57/10        | . . . . Sorbic acid   |
| 53/128       | . . the carboxylic group being bound to a carbon<br>atom bound to at least two other carbon atoms,<br>e.g. neo-acids                         | 57/12        | . . . . Straight chain carboxylic acids containing<br>eighteen carbon atoms                     |
| 53/132       | . . containing rings   | 57/13        | . . Dicarboxylic acids  |
| 53/134       | . . monocyclic   | 57/145       | . . . . Maleic acid   |
| 53/136       | . . containing condensed ring systems  | 57/15        | . . . . Fumaric acid  |
| 53/138       | . . . containing an adamantane ring system   | 57/155       | . . . . Citraconic acid   |
| 53/15        | . . containing halogen   | 57/16        | . . . . Muconic acid  |
| 53/16        | . . Halogenated acetic acids   | 57/18        | . . with only carbon-to-carbon triple bonds as<br>unsaturation                                  |
| 53/18        | . . . containing fluorine  | 57/20        | . . Propiolic acid  |
| 53/19        | . . Acids containing three or more carbon atoms  | 57/22        | . . Acetylene dicarboxylic acid   |
| 53/21        | . . . containing fluorine  | 57/24        | . . Diacetylene or polyacetylene dicarboxylic acids   |
| 53/23        | . . containing rings   | 57/26        | . . containing rings other than six-membered aromatic<br>rings                                  |
| 53/38        | . . Acyl halides   | 57/28        | . . containing an adamantane ring system  |
| 53/40        | . . Acetyl halides   | 57/30        | . . containing six-membered aromatic rings  |
| 53/42        | . . of acids containing three or more carbon atoms   | 57/32        | . . Phenylacetic acid   |
| 53/44        | . . containing rings   | 57/34        | . . containing more than one carboxyl group   |
| 53/46        | . . containing halogen outside the carbonyl halide<br>group  | 57/36        | . . . Phenylmalonic acid  |
| 53/48        | . . . Halogenated acetyl halides   | 57/38        | . . polycyclic  |
| 53/50        | . . . of acids containing three or more carbon atoms   | 57/40        | . . . containing condensed ring systems   |
| <b>55/00</b> | <b>Saturated compounds having more than one<br/>carboxyl group bound to acyclic carbon atoms</b>   | 57/42        | . . having unsaturation outside the rings   |
| 55/02        | . . Dicarboxylic acids   | 57/44        | . . . Cinnamic acid   |
| 55/06        | . . Oxalic acid  | 57/46        | . . containing six-membered aromatic rings and other<br>rings, e.g. cyclohexylphenylacetic acid |
| 55/07        | . . . Salts thereof  | 57/48        | . . having unsaturation outside the aromatic rings  |
|              |  | 57/50        | . . containing condensed ring systems   |
|              |  | 57/52        | . . containing halogen  |
|              |  | 57/54        | . . Halogenated acrylic or methacrylic acids  |
|              |  | 57/56        | . . containing rings other than six-membered<br>aromatic rings                                  |
|              |  | 57/58        | . . containing six-membered aromatic rings  |
|              |  | 57/60        | . . . having unsaturation outside the rings   |

- 57/62 . . containing six-membered aromatic rings and other rings
- 57/64 . Acyl halides
- 57/66 . . with only carbon-to-carbon double bonds as unsaturation
- 57/68 . . with only carbon-to-carbon triple bonds as unsaturation
- 57/70 . . containing rings other than six-membered aromatic rings
- 57/72 . . containing six-membered aromatic rings
- 57/74 . . containing six-membered aromatic rings and other rings
- 57/76 . . containing halogen outside the carbonyl halide groups

**59/00 Compounds having carboxyl groups bound to acyclic carbon atoms and containing any of the groups OH, O—metal, —CHO, keto, ether,**



**groups**

- 59/01 . Saturated compounds having only one carboxyl group and containing hydroxy or O-metal groups
- 59/06 . . Glycolic acid
- 59/08 . . Lactic acid
- 59/10 . . Polyhydroxy carboxylic acids
- 59/105 . . . having five or more carbon atoms, e.g. aldonic acids
- 59/11 . . containing rings
- 59/115 . . containing halogen
- 59/125 . Saturated compounds having only one carboxyl group and containing ether groups,  $\begin{array}{c} \text{O} \\ | \\ \text{>C} \\ | \\ \text{O}-\text{C} \end{array}$
- groups,  $\begin{array}{c} \text{O} \\ | \\ -\text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ | \\ \text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups
- 59/13 . . containing rings
- 59/135 . . containing halogen
- 59/147 . Saturated compounds having only one carboxyl group and containing —CHO groups
- 59/153 . . Glyoxylic acid
- 59/185 . Saturated compounds having only one carboxyl group and containing keto groups
- 59/19 . . Pyruvic acid
- 59/195 . . Acetoacetic acid
- 59/205 . . containing rings
- 59/21 . . containing halogen
- 59/215 . . containing singly bound oxygen containing groups
- 59/225 . . containing —CHO groups
- 59/235 . Saturated compounds containing more than one carboxyl group
- 59/245 . . containing hydroxy or O-metal groups
- 59/255 . . . Tartaric acid
- 59/265 . . . Citric acid
- 59/285 . . . Polyhydroxy dicarboxylic acids having five or more carbon atoms, e.g. saccharic acids
- 59/29 . . . containing rings
- 59/295 . . . containing halogen

- 59/305 . . containing ether groups,  $\begin{array}{c} \text{O} \\ | \\ \text{>C} \\ | \\ \text{O}-\text{C} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ | \\ -\text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ | \\ \text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups
- 59/31 . . . containing rings
- 59/315 . . . containing halogen
- 59/325 . . containing —CHO groups
- 59/347 . . containing keto groups
- 59/353 . . . containing rings
- 59/40 . Unsaturated compounds
- 59/42 . . containing hydroxy or O-metal groups
- 59/44 . . . Ricinoleic acid
- 59/46 . . . containing rings other than six-membered aromatic rings
- 59/48 . . . containing six-membered aromatic rings
- 59/50 . . . . Mandelic acid
- 59/52 . . . a hydroxy or O-metal group being bound to a carbon atom of a six-membered aromatic ring
- 59/54 . . . containing six-membered aromatic rings and other rings
- 59/56 . . . containing halogen
- 59/58 . . containing ether groups,  $\begin{array}{c} \text{O} \\ | \\ \text{>C} \\ | \\ \text{O}-\text{C} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ | \\ -\text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ | \\ \text{C} \\ | \\ \text{O}-\text{C} \end{array}$  groups
- 59/60 . . . the non-carboxylic part of the ether being unsaturated
- 59/62 . . . containing rings other than six-membered aromatic rings
- 59/64 . . . containing six-membered aromatic rings
- 59/66 . . . . the non-carboxylic part of the ether containing six-membered aromatic rings
- 59/68 . . . . . the oxygen atom of the ether group being bound to a non-condensed six-membered aromatic ring
- 59/70 . . . . . Ethers of hydroxy-acetic acid {, e.g. **substitutes on the ring**}
- 59/72 . . . containing six-membered aromatic rings and other rings
- 59/74 . . containing —CHO groups
- 59/76 . . containing keto groups
- 59/80 . . . containing rings other than six-membered aromatic rings
- 59/82 . . . . the keto group being part of a ring
- 59/84 . . . containing six membered aromatic rings
- 59/86 . . . containing six-membered aromatic rings and other rings
- 59/88 . . . containing halogen
- 59/90 . . . containing singly bound oxygen-containing groups
- 59/92 . . . containing —CHO groups

**61/00 Compounds having carboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings****NOTE**

The oxidation mixture of naphthenes containing naphthenic acids, is classified in [C07C 61/005](#)

- 61/005 . {Naphthenic acids}
- 61/04 . Saturated compounds having a carboxyl group bound to a three or four-membered ring
- 61/06 . Saturated compounds having a carboxyl group bound to a five-membered ring
- 61/08 . Saturated compounds having a carboxyl group bound to a six-membered ring
- 61/09 . . Completely hydrogenated benzenedicarboxylic acids
- 61/10 . Saturated compounds having a carboxyl group bound to a seven-to-twelve-membered ring
- 61/12 . Saturated polycyclic compounds
- 61/125 . . having a carboxyl group bound to a condensed ring system
- 61/13 . . . having two rings
- 61/135 . . . having three rings
- 61/15 . Saturated compounds containing halogen
- 61/16 . Unsaturated compounds
- 61/20 . . having a carboxyl group bound to a five-membered ring
- 61/22 . . having a carboxyl group bound to a six-membered ring
- 61/24 . . . Partially hydrogenated benzenedicarboxylic acids
- 61/26 . . having a carboxyl group bound to a seven-to-twelve-membered ring
- 61/28 . . polycyclic
- 61/29 . . . having a carboxyl group bound to a condensed ring system
- 61/35 . . having unsaturation outside the rings
- 61/37 . . . Chrysanthemumic acid
- 61/39 . . containing six-membered aromatic rings
- 61/40 . . containing halogen

**62/00 Compounds having carboxyl groups bound to carbon atoms of rings other than six—membered aromatic rings and containing any of the groups OH, O—metal, —CHO, keto, ether,**

groups,  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups

- 62/02 . Saturated compounds containing hydroxy or O-metal groups
- 62/04 . . with a six-membered ring
- 62/06 . . polycyclic
- 62/08 . Saturated compounds containing ether groups,  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups
- 62/10 . . with a six-membered ring
- 62/12 . . polycyclic

- 62/14 . . . having a carboxyl group on a condensed ring system
- 62/16 . Saturated compounds containing —CHO groups
- 62/18 . Saturated compounds containing keto groups
- 62/20 . . with a {saturated} six-membered ring
- 62/22 . . polycyclic
- 62/24 . . the keto group being part of a ring
- 62/26 . . containing singly bound oxygen-containing groups
- 62/28 . . containing —CHO groups
- 62/30 . Unsaturated compounds
- 62/32 . . containing hydroxy or O-metal groups
- 62/34 . . containing ether groups,  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{C} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$  groups
- 62/36 . . containing —CHO groups
- 62/38 . . containing keto groups
- 63/00 Compounds having carboxyl groups bound to a carbon atoms of six-membered aromatic rings**
- 63/04 . Monocyclic monocarboxylic acids
- 63/06 . . Benzoic acid
- 63/08 . . . Salts thereof
- 63/10 . . . Halides thereof
- 63/14 . Monocyclic dicarboxylic acids
- 63/15 . . all carboxyl groups bound to carbon atoms of the six-membered aromatic ring
- 63/16 . . . 1,2 - Benzenedicarboxylic acid
- 63/20 . . . . Salts thereof
- 63/22 . . . . Halides thereof
- 63/24 . . . 1,3 - Benzenedicarboxylic acid
- 63/26 . . . 1,4 - Benzenedicarboxylic acid
- 63/28 . . . . Salts thereof
- 63/30 . . . . Halides thereof
- 63/307 . Monocyclic tricarboxylic acids
- 63/313 . Monocyclic acids containing more than three carboxyl groups
- 63/33 . Polycyclic acids
- 63/331 . . with all carboxyl groups bound to non-condensed rings
- 63/333 . . . 4,4' - Diphenyldicarboxylic acids
- 63/337 . . with carboxyl groups bound to condensed ring systems
- 63/34 . . . containing two {condensed} rings
- 63/36 . . . . containing one carboxyl group
- 63/38 . . . . containing two carboxyl groups both bound to carbon atoms of the condensed ring system
- 63/40 . . . . containing three or more carboxyl groups all bound to carbon atoms of the condensed ring system
- 63/42 . . . containing three or more {condensed} rings
- 63/44 . . . . containing one carboxyl group
- 63/46 . . . . containing two carboxyl groups both bound to carbon atoms of the condensed ring system
- 63/48 . . . . containing three or more carboxyl groups all bound to carbon atoms of the condensed ring system

- 63/49 . . containing rings other than six-membered aromatic rings
- 63/64 . Monocyclic acids with unsaturation outside the aromatic ring
- 63/66 . Polycyclic acids with unsaturation outside the aromatic rings
- 63/68 . containing halogen
- 63/70 . . Monocarboxylic acids
- 63/72 . . Polycyclic acids
- 63/74 . . having unsaturation outside the aromatic rings
- 65/00 Compounds having carboxyl groups bound to carbon atoms of six—membered aromatic rings and containing any of the groups OH, O—metal, —CHO, keto, ether,  $\begin{array}{c} \text{O} \\ | \\ \text{C} < \text{O} - \\ | \\ \text{O} - \text{C} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ | \\ \text{C} - \text{O} - \text{C} \\ | \\ \text{O} - \text{C} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ | \\ \text{C} < \text{O} - \\ | \\ \text{O} - \text{C} \end{array}$  groups (cyclic anhydrides)**
- [C07D](#))
- 65/01 . containing hydroxy or O-metal groups
- 65/03 . . monocyclic and having all hydroxy or O-metal groups bound to the ring
- 65/05 . . . o-Hydroxy carboxylic acids
- 65/10 . . . . Salicylic acid
- 65/105 . . polycyclic
- 65/11 . . . with carboxyl groups on a condensed ring system containing two rings
- 65/15 . . . with carboxyl groups on a condensed ring system containing more than two rings
- 65/17 . . containing rings other than six-membered aromatic rings
- 65/19 . . having unsaturation outside the aromatic ring
- 65/21 . containing ether groups,  $\begin{array}{c} \text{O} \\ | \\ \text{C} < \text{O} - \\ | \\ \text{O} - \text{C} \end{array}$  groups,  $\begin{array}{c} \text{O} \\ | \\ \text{C} - \text{O} - \text{C} \\ | \\ \text{O} - \text{C} \end{array}$  groups, or  $\begin{array}{c} \text{O} \\ | \\ \text{C} < \text{O} - \\ | \\ \text{O} - \text{C} \end{array}$  groups
- 65/24 . . polycyclic
- 65/26 . . . containing rings other than six-membered aromatic rings
- 65/28 . . having unsaturation outside the aromatic rings
- 65/30 . containing —CHO groups
- 65/32 . containing keto groups
- 65/34 . . polycyclic
- 65/36 . . . containing rings other than six-membered aromatic rings
- 65/38 . . having unsaturation outside the aromatic rings
- 65/40 . . containing singly bound oxygen-containing groups
- 65/42 . . containing —CHO groups
- 66/00 Quinone carboxylic acids**
- 66/02 . Anthraquinone carboxylic acids
- 67/00 Preparation of carboxylic acid esters**
- 67/02 . by interreacting ester groups, i.e. transesterification
- 67/03 . by reacting an ester group with a hydroxy group
- 67/035 . by reacting carboxylic acids or symmetrical anhydrides with saturated hydrocarbons
- 67/04 . by reacting carboxylic acids or symmetrical anhydrides onto unsaturated carbon-to-carbon bonds
- 67/05 . . with oxidation
- 67/055 . . . in the presence of platinum group metals or their compounds
- 67/08 . by reacting carboxylic acids or symmetrical anhydrides with the hydroxy or O-metal group of organic compounds
- 67/10 . by reacting carboxylic acids or symmetrical anhydrides with ester groups or with a carbon-halogen bond ([preparation from carboxylic acid halides C07C 67/14](#))
- 67/11 . . being mineral ester groups
- 67/12 . from asymmetrical anhydrides
- 67/14 . from carboxylic acid halides
- 67/16 . from carboxylic acids, esters or anhydrides wherein one oxygen atom has been replaced by a sulfur, selenium or tellurium atom
- 67/18 . by conversion of a group containing nitrogen into an ester group
- 67/20 . . from amides or lactams
- 67/22 . . from nitriles
- 67/24 . by reacting carboxylic acids or derivatives thereof with a carbon-to-oxygen ether bond, e.g. acetal, tetrahydrofuran
- 67/26 . . with an oxirane ring
- 67/27 . from ortho-esters
- 67/28 . by modifying the hydroxylic moiety of the ester, such modification not being an introduction of an ester group
- 67/283 . . by hydrogenation of unsaturated carbon-to-carbon bonds
- 67/287 . . by introduction of halogen; by substitution of halogen atoms by other halogen atoms
- 67/29 . . by introduction of oxygen-containing functional groups
- 67/293 . . by isomerisation; by change of size of the carbon skeleton
- 67/297 . . by splitting-off hydrogen or functional groups; by hydrogenolysis of functional groups
- 67/30 . by modifying the acid moiety of the ester, such modification not being an introduction of an ester group
- 67/303 . . by hydrogenation of unsaturated carbon-to-carbon bonds
- 67/307 . . by introduction of halogen; by substitution of halogen atoms by other halogen atoms
- 67/31 . . by introduction of functional groups containing oxygen only in singly bound form
- 67/313 . . by introduction of doubly bound oxygen containing functional groups, e.g. carboxyl groups
- 67/317 . . by splitting-off hydrogen or functional groups; by hydrogenolysis of functional groups
- 67/32 . . . Decarboxylation
- 67/327 . . . by elimination of functional groups containing oxygen only in singly bound form
- 67/333 . . by isomerisation; by change of size of the carbon skeleton ([introduction or elimination of carboxyl groups C07C 67/313](#), [C07C 67/32](#))
- 67/34 . . . Migration of  $\begin{array}{c} \text{O} \\ || \\ \text{C} - \text{O} - \text{C} - \\ | \end{array}$  groups in the molecule

- 67/343 . . . by increase in the number of carbon atoms
- 67/347 . . . . by addition to unsaturated carbon-to-carbon bonds
- 67/36 . by reaction with carbon monoxide or formates ([C07C 67/02](#), [C07C 67/03](#), [C07C 67/10](#) take precedence)
- 67/37 . . by reaction of ethers with carbon monoxide
- 67/38 . . by addition to an unsaturated carbon-to-carbon bond
- 67/39 . by oxidation of groups which are precursors for the acid moiety of the ester
- 67/40 . . by oxidation of primary alcohols
- 67/42 . . by oxidation of secondary alcohols or ketones
- 67/44 . by oxidation-reduction of aldehydes, e.g. Tishchenko reaction
- 67/46 . from ketenes or polyketenes
- 67/465 . by oligomerisation
- 67/47 . by telomerisation ([macromolecular compounds C08](#))
- 67/475 . by splitting of carbon-to-carbon bonds and redistribution, e.g. disproportionation or migration of  $\text{-COOC-}$  groups between different molecules
- 67/48 . Separation; Purification; Stabilisation; Use of additives
- 67/52 . . by change in the physical state, e.g. crystallisation
- 67/54 . . . by distillation
- 67/56 . . by solid-liquid treatment; by chemisorption
- 67/58 . . by liquid-liquid treatment
- 67/60 . . by treatment giving rise to chemical modification ([by chemisorption C07C 67/56](#))
- 67/62 . . Use of additives, e.g. for stabilisation
- 68/00 Preparation of esters of carbonic or haloformic acids**
- 68/01 . from carbon monoxide and oxygen
- 68/02 . from phosgene or haloformates
- 68/04 . from carbon dioxide or inorganic carbonates
- 68/06 . from organic carbonates
- 68/065 . . from alkylene carbonates
- 68/08 . Purification; Separation; Stabilisation
- 69/00 Esters of carboxylic acids; Esters of carbonic or haloformic acids (ortho esters, [see the relevant groups](#), e.g. [C07C 43/32](#))**
- NOTE**
- In this group esters having a variably-specified acid moiety, i.e. covered by more than one of groups [C07C 69/02](#), [C07C 69/34](#), [C07C 69/52](#), [C07C 69/608](#), [C07C 69/612](#), [C07C 69/62](#), [C07C 69/66](#), [C07C 69/74](#), [C07C 69/76](#), [C07C 69/95](#), [C07C 69/96](#), are covered by groups [C07C 69/003](#) - [C07C 69/017](#) according to their hydroxylic moiety
- 69/003 . Esters of saturated alcohols having the esterified hydroxy group bound to an acyclic carbon atom
- 69/007 . Esters of unsaturated alcohols having the esterified hydroxy group bound to an acyclic carbon atom
- 69/01 . . Vinyl esters
- 69/013 . Esters of alcohols having the esterified hydroxy group bound to a carbon atom of a ring other than a six-membered aromatic ring
- 69/017 . Esters of hydroxy compounds having the esterified hydroxy group bound to a carbon atom of a six-membered aromatic ring
- 69/02 . Esters of acyclic saturated monocarboxylic acids having the carboxyl group bound to an acyclic carbon atom or to hydrogen
- 69/04 . . Formic acid esters
- 69/06 . . . of monohydroxylic compounds
- 69/07 . . . . of unsaturated alcohols
- 69/08 . . . of dihydroxylic compounds
- 69/10 . . . of trihydroxylic compounds
- 69/12 . . Acetic acid esters
- 69/14 . . . of monohydroxylic compounds
- 69/145 . . . . of unsaturated alcohols
- 69/15 . . . . . Vinyl acetate
- 69/155 . . . . . Allyl acetate
- 69/157 . . . . . containing six-membered aromatic rings
- 69/16 . . . of dihydroxylic compounds
- 69/18 . . . of trihydroxylic compounds
- 69/21 . . . of hydroxy compounds with more than three hydroxy groups ([esters of sugars C07H](#))
- 69/22 . . having three or more carbon atoms in the acid moiety
- 69/24 . . . esterified with monohydroxylic compounds
- 69/26 . . . . Synthetic waxes
- 69/28 . . . esterified with dihydroxylic compounds
- 69/30 . . . esterified with trihydroxylic compounds ([fats, oils C11B](#), [C11C](#))
- 69/33 . . . esterified with hydroxy compounds having more than three hydroxy groups ([esters of sugars C07H](#))
- 69/34 . Esters of acyclic saturated polycarboxylic acids having an esterified carboxyl group bound to an acyclic carbon atom
- 69/36 . . Oxalic acid esters
- 69/38 . . Malonic acid esters
- 69/40 . . Succinic acid esters
- 69/42 . . Glutaric acid esters
- 69/44 . . Adipic acid esters
- 69/46 . . Pimelic acid esters
- 69/48 . . Azelaic acid esters
- 69/50 . . Sebacic acid esters
- 69/52 . Esters of acyclic unsaturated carboxylic acids having the esterified carboxyl group bound to an acyclic carbon atom
- 69/533 . . Monocarboxylic acid esters having only one carbon-to-carbon double bond
- 69/54 . . . Acrylic acid esters; Methacrylic acid esters
- 69/56 . . . Crotonic acid esters; Vinyl acetic acid esters
- 69/58 . . . Esters of straight chain acids with eighteen carbon atoms in the acid moiety
- 69/587 . . Monocarboxylic acid esters having at least two carbon-to-carbon double bonds
- 69/593 . . Dicarboxylic acid esters having only one carbon-to-carbon double bond
- 69/60 . . . Maleic acid esters; Fumaric acid esters
- 69/602 . . Dicarboxylic acid esters having at least two carbon-to-carbon double bonds
- 69/604 . . Polycarboxylic acid esters, the acid moiety containing more than two carboxyl groups
- 69/606 . . having only {or additionally} carbon-to-carbon triple bonds as unsaturation in the carboxylic acid moiety

- 69/608 . Esters of carboxylic acids having a carboxyl group bound to an acyclic carbon atom and having a ring other than a six-membered aromatic ring in the acid moiety
- 69/612 . Esters of carboxylic acids having a carboxyl group bound to an acyclic carbon atom and having a six-membered aromatic ring in the acid moiety
- 69/614 . . of phenylacetic acid
- 69/616 . . polycyclic
- 69/618 . . having unsaturation outside the six-membered aromatic ring
- 69/62 . Halogen-containing esters ([haloformic acid esters C07C 69/96](#))
- 69/63 . . of saturated acids
- 69/635 . . . containing rings in the acid moiety
- 69/65 . . of unsaturated acids
- 69/653 . . . Acrylic acid esters; Methacrylic acid esters; Haloacrylic acid esters; Halomethacrylic acid esters
- 69/657 . . . Maleic acid esters; Fumaric acid esters; Halomaleic acid esters; Halofumaric acid esters
- 69/66 . Esters of carboxylic acids having esterified carboxylic groups bound to acyclic carbon atoms and having any of the groups OH, O—metal, —CHO, keto, ether, acyloxy,  $\text{>C} \begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \end{smallmatrix}$  groups,  $\begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \\ \text{O}-\text{C} \end{smallmatrix}$  groups, or  $\begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \\ \text{O}-\text{C} \\ \text{O}-\text{C} \end{smallmatrix}$  in the acid moiety
- 69/67 . . of saturated acids
- 69/675 . . . of saturated hydroxy-carboxylic acids
- 69/68 . . . . Lactic acid esters
- 69/70 . . . . Tartaric acid esters
- 69/704 . . . . Citric acid esters
- 69/708 . . . Ethers
- 69/712 . . . . the hydroxy group of the ester being etherified with a hydroxy compound having the hydroxy group bound to a carbon atom of a six-membered aromatic ring
- 69/716 . . . Esters of keto-carboxylic acids {or [aldehyde-carboxylic acids](#)}
- 69/72 . . . . Acetoacetic acid esters
- 69/73 . . of unsaturated acids
- 69/732 . . . of unsaturated hydroxy carboxylic acids
- 69/734 . . . Ethers
- 69/736 . . . . the hydroxy group of the ester being etherified with a hydroxy compound having the hydroxy group bound to a carbon atom of a six-membered aromatic ring
- 69/738 . . . Esters of keto-carboxylic acids {or [aldehyde-carboxylic acids](#)}
- 69/74 . Esters of carboxylic acids having an esterified carboxyl group bound to a carbon atom of a ring other than a six-membered aromatic ring
- 69/743 . . of acids with a three-membered ring and with unsaturation outside the ring
- 69/747 . . . Chrysanthemumic acid esters
- 69/75 . . of acids with a six-membered ring
- 69/753 . . of polycyclic acids

- 69/757 . . having any of the groups OH, O—metal, —CHO, keto, ether, acyloxy,  $\text{>C} \begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \end{smallmatrix}$  groups,  $\begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \\ \text{O}-\text{C} \end{smallmatrix}$  groups, or  $\begin{smallmatrix} \text{O}- \\ \text{O}-\text{C} \\ \text{O}-\text{C} \\ \text{O}-\text{C} \end{smallmatrix}$  in the acid moiety
- 69/76 . Esters of carboxylic acids having a carboxyl group bound to a carbon atom of a six-membered aromatic ring
- 69/78 . . Benzoic acid esters
- 69/80 . . Phthalic acid esters
- 69/82 . . . Terephthalic acid esters
- 69/84 . . of monocyclic hydroxy carboxylic acids, the hydroxy groups and the carboxyl groups of which are bound to carbon atoms of a six-membered aromatic ring
- 69/86 . . . with esterified hydroxyl groups
- 69/88 . . . with esterified carboxyl groups
- 69/90 . . . with esterified hydroxyl and carboxyl groups
- 69/92 . . . with etherified hydroxyl groups
- 69/94 . . of polycyclic hydroxy carboxylic acids, the hydroxy groups and the carboxyl groups of which are bound to carbon atoms of six-membered aromatic rings
- 69/95 . Esters of quinone carboxylic acids
- 69/96 . Esters of carbonic or haloformic acids

## 71/00 Esters of oxyacids of halogens

**Compounds containing carbon and nitrogen with or without hydrogen, halogens or oxygen** ([irradiation products of cholesterol or its derivatives C07C 401/00](#); [vitamin D derivatives, 9,10-seco cyclopenta\[a\]phenanthrene or analogues obtained by chemical preparation without irradiation C07C 401/00](#); [derivatives of cyclohexane or of a cyclohexene {or of cyclohexadiene}, having a side-chain containing an acyclic unsaturated part of at least four carbon atoms, this part being directly attached to the cyclohexane or cyclohexene {or cyclohexadiene} rings C07C 403/00](#); [prostaglandins or derivatives thereof C07C 405/00](#); [peroxy compounds C07C 407/00, C07C 409/00](#))

## 201/00 Preparation of esters of nitric or nitrous acid or of compounds containing nitro or nitroso groups bound to a carbon skeleton

- 201/02 . Preparation of esters of nitric acid
- 201/04 . Preparation of esters of nitrous acid
- 201/06 . Preparation of nitro compounds
- 201/08 . . by substitution of hydrogen atoms by nitro groups
- 201/10 . . by substitution of functional groups by nitro groups
- 201/12 . . by reactions not involving the formation of nitro groups
- 201/14 . . by formation of nitro groups together with reactions not involving the formation of nitro groups
- 201/16 . . Separation; Purification; Stabilisation; Use of additives

## 203/00 Esters of nitric or nitrous acid

- 203/02 . Esters of nitric acid
- 203/04 . . having nitrate groups bound to acyclic carbon atoms
- 203/06 . . . Glycerol trinitrate

|               |   |        |   |
|---------------|---|--------|---|
| 203/08        | . . having nitrate groups bound to carbon atoms of rings other than six-membered aromatic rings                               | 205/30 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to a carbon atom of a six-membered aromatic ring                             |
| 203/10        | . . having nitrate groups bound to carbon atoms of six-membered aromatic rings  | 205/31 | . . . the carbon skeleton containing six-membered aromatic rings  |
| <b>205/00</b> | <b>Compounds containing nitro groups bound to a carbon skeleton</b>   | 205/32 | . . having nitro groups bound to acyclic carbon atoms and etherified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton           |
| 205/01        | . having nitro groups bound to acyclic carbon atoms   | 205/33 | . . having nitro groups or etherified hydroxy groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton                         |
| 205/02        | . . of a saturated carbon skeleton  | 205/34 | . . having nitro groups bound to carbon atoms of six-membered aromatic rings and etherified hydroxy groups bound to acyclic carbon atoms of the carbon skeleton           |
| 205/03        | . . of an unsaturated carbon skeleton   | 205/35 | . . having nitro groups and etherified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton   |
| 205/04        | . . . containing six-membered aromatic rings  | 205/36 | . . . to carbon atoms of the same non-condensed six-membered aromatic ring or to carbon atoms of six-membered aromatic rings being part of the same condensed ring system |
| 205/05        | . having nitro groups bound to carbon atoms of rings other than six-membered aromatic rings                                   | 205/37 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to an acyclic carbon atom  |
| 205/06        | . having nitro groups bound to carbon atoms of six-membered aromatic rings  | 205/38 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to a carbon atom of a six-membered aromatic ring, e.g. nitrodiphenyl ethers  |
| 205/07        | . the carbon skeleton being further substituted by halogen atoms  | 205/39 | . the carbon skeleton being further substituted by esterified hydroxy groups  |
| 205/08        | . . having nitro groups bound to acyclic carbon atoms   | 205/40 | . . having nitro groups and esterified hydroxy groups bound to acyclic carbon atoms of the carbon skeleton  |
| 205/09        | . . . of an unsaturated carbon skeleton   | 205/41 | . . having nitro groups or esterified hydroxy groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton                         |
| 205/10        | . . having nitro groups bound to carbon atoms of rings other than six-membered aromatic rings                                 | 205/42 | . . having nitro groups or esterified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton  |
| 205/11        | . . having nitro groups bound to carbon atoms of six-membered aromatic rings  | 205/43 | . . . to carbon atoms of the same non-condensed six-membered aromatic ring or to carbon atoms of six-membered aromatic rings being part of the same condensed ring system |
| 205/12        | . . . the six-membered aromatic ring or a condensed ring system containing that ring being substituted by halogen atoms       | 205/44 | . the carbon skeleton being further substituted by —CHO groups  |
| 205/13        | . the carbon skeleton being further substituted by hydroxy groups   | 205/45 | . the carbon skeleton being further substituted by at least one doubly—bound oxygen atom, not being part of a —CHO group  |
| 205/14        | . . having nitro groups and hydroxy groups bound to acyclic carbon atoms  | 205/46 | . . the carbon skeleton containing carbon atoms of quinone rings  |
| 205/15        | . . . of a saturated carbon skeleton  | 205/47 | . . . Anthraquinones containing nitro groups  |
| 205/16        | . . . of a carbon skeleton containing six-membered aromatic rings   | 205/48 | . . . . the carbon skeleton being further substituted by singly-bound oxygen atoms  |
| 205/17        | . . having nitro groups bound to acyclic carbon atoms and hydroxy groups bound to carbon atoms of six-membered aromatic rings | 205/49 | . the carbon skeleton being further substituted by carboxyl groups  |
| 205/18        | . . having nitro groups or hydroxy groups bound to carbon atoms of rings other than six-membered aromatic rings               | 205/50 | . . having nitro groups and carboxyl groups bound to acyclic carbon atoms of the carbon skeleton  |
| 205/19        | . . having nitro groups bound to carbon atoms of six-membered aromatic rings and hydroxy groups bound to acyclic carbon atoms | 205/51 | . . . the carbon skeleton being saturated   |
| 205/20        | . . having nitro groups and hydroxy groups bound to carbon atoms of six-membered aromatic rings                               | 205/52 | . . . . Nitro-acetic acids  |
| 205/21        | . . . having nitro groups and hydroxy groups bound to carbon atoms of the same non-condensed six-membered aromatic ring       | 205/53 | . . . the carbon skeleton containing six-membered aromatic rings  |
| 205/22        | . . . . having one nitro groups bound to the ring   |        |   |
| 205/23        | . . . . having two nitro groups bound to the ring   |        |   |
| 205/24        | . . . . having three, and only three, nitro groups bound to the ring  |        |   |
| 205/25        | . . . having nitro groups bound to carbon atoms of six-membered aromatic rings being part of a condensed ring system          |        |   |
| 205/26        | . . and being further substituted by halogen atoms  |        |   |
| 205/27        | . the carbon skeleton being further substituted by etherified hydroxy groups  |        |   |
| 205/28        | . . having nitro groups and etherified hydroxy groups bound to acyclic carbon atoms of the carbon skeleton                    |        |   |
| 205/29        | . . . the carbon skeleton being saturated   |        |   |

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| 205/54        | . . having nitro groups bound to acyclic carbon atoms and carboxyl groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton                               | 209/325 | . . . { <a href="#">reduction by other means than indicated in C07C 209/34 or C07C 209/36</a> }   |
| 205/55        | . . having nitro groups or carboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton   | 209/34  | . . . by reduction of nitro groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings { <a href="#">in presence of hydrogen-containing gases and a catalyst</a> }                   |
| 205/56        | . . having nitro groups bound to carbon atoms of six-membered aromatic rings and carboxyl groups bound to acyclic carbon atoms of the carbon skeleton                               | 209/36  | . . . by reduction of nitro groups bound to carbon atoms of six-membered aromatic rings { <a href="#">in presence of hydrogen-containing gases and a catalyst</a> }   |
| 205/57        | . . having nitro groups and carboxyl groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton   | 209/365 | . . . . { <a href="#">by reduction with preservation of halogen-atoms in compounds containing nitro groups and halogen atoms bound to the same carbon skeleton</a> }  |
| 205/58        | . . . the carbon skeleton being further substituted by halogen atoms  | 209/38  | . . by reduction of nitroso groups  |
| 205/59        | . . . the carbon skeleton being further substituted by singly-bound oxygen atoms  | 209/40  | . . by reduction of hydroxylamino or oxyimino groups  |
| 205/60        | . . . . in ortho-position to the carboxyl group, e.g. nitro-salicylic acids   | 209/42  | . . by reduction of nitrogen-to-nitrogen bonds  |
| 205/61        | . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms  | 209/44  | . by reduction of carboxylic acids or esters thereof in presence of ammonia or amines, or by reduction of nitriles, carboxylic acid amides, imines or imino-ethers  |
| <b>207/00</b> | <b>Compounds containing nitroso groups bound to a carbon skeleton</b>   | 209/46  | . . by reduction of carboxylic acids or esters thereof in presence of ammonia or amines   |
| 207/02        | . the carbon skeleton not being further substituted   | 209/48  | . . by reduction of nitriles  |
| 207/04        | . the carbon skeleton being further substituted by singly-bound oxygen atoms  | 209/50  | . . by reduction of carboxylic acid amides  |
|               |   | 209/52  | . . by reduction of imines or imino-ethers ( <a href="#">C07C 209/24 takes precedence</a> )   |
| <b>209/00</b> | <b>Preparation of compounds containing amino groups bound to a carbon skeleton</b>  | 209/54  | . by rearrangement reactions  |
| 209/02        | . by substitution of hydrogen atoms by amino groups   | 209/56  | . . from carboxylic acids involving a Hofmann, Curtius, Schmidt, or Lossen-type rearrangement   |
| 209/04        | . by substitution of functional groups by amino groups  | 209/58  | . . from or <a href="#">via</a> amides  |
| 209/06        | . . by substitution of halogen atoms  | 209/60  | . by condensation or addition reactions, e.g. Mannich reaction, addition of ammonia or amines to alkenes or to alkynes or addition of compounds containing an active hydrogen atom to Schiff's bases, quinone imines, or aziranes |
| 209/08        | . . . with formation of amino groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings   | 209/62  | . by cleaving carbon-to-nitrogen, sulfur-to-nitrogen, or phosphorus-to-nitrogen bonds, e.g. hydrolysis of amides, N-dealkylation of amines or quaternary ammonium compounds ( <a href="#">C07C 209/24 takes precedence</a> )      |
| 209/10        | . . . with formation of amino groups bound to carbon atoms of six-membered aromatic rings or from amines having nitrogen atoms bound to carbon atoms of six-membered aromatic rings | 209/64  | . by disproportionation   |
| 209/12        | . . . with formation of quaternary ammonium compounds   | 209/66  | . from or <a href="#">via</a> metallo-organic compounds   |
| 209/14        | . . by substitution of hydroxy groups or of etherified or esterified hydroxy groups   | 209/68  | . from amines, by reactions not involving amino groups, e.g. reduction of unsaturated amines, aromatisation, or substitution of the carbon skeleton   |
| 209/16        | . . . with formation of amino groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings   | 209/70  | . . by reduction of unsaturated amines  |
| 209/18        | . . . with formation of amino groups bound to carbon atoms of six-membered aromatic rings or from amines having nitrogen atoms bound to carbon atoms of six-membered aromatic rings | 209/72  | . . . by reduction of six-membered aromatic rings   |
| 209/20        | . . . with formation of quaternary ammonium compounds   | 209/74  | . . by halogenation, hydrohalogenation, dehalogenation, or dehydrohalogenation  |
| 209/22        | . . by substitution of other functional groups  | 209/76  | . . by nitration  |
| 209/24        | . by reductive alkylation of ammonia, amines or compounds having groups reducible to amino groups, with carbonyl compounds  | 209/78  | . . from carbonyl compounds, e.g. from formaldehyde, and amines having amino groups bound to carbon atoms of six-membered aromatic rings, with formation of methylene-diarylamines  |
| 209/26        | . . by reduction with hydrogen  | 209/80  | . by photochemical reactions; by using free radicals  |
| 209/28        | . . by reduction with other reducing agents   | 209/82  | . Purification; Separation; Stabilisation; Use of additives   |
| 209/30        | . by reduction of nitrogen-to-oxygen or nitrogen-to-nitrogen bonds  | 209/84  | . . Purification  |
| 209/32        | . . by reduction of nitro groups  | 209/86  | . . Separation  |
|               |   | 209/88  | . . . Separation of optical isomers   |
|               |   | 209/90  | . . Stabilisation; Use of additives   |

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| <b>211/00</b> | <b>Compounds containing amino groups bound to a carbon skeleton</b>   | 211/37        | . . . being further substituted by halogen atoms or by nitro or nitroso groups  |
| 211/01        | . having amino groups bound to acyclic carbon atoms   | 211/38        | . . . containing condensed ring systems   |
| 211/02        | . . of an acyclic saturated carbon skeleton   | 211/39        | . . of an unsaturated carbon skeleton   |
| 211/03        | . . . Monoamines  | 211/40        | . . . containing only non-condensed rings   |
| 211/04        | . . . . Mono-, di- or tri-methylamine   | 211/41        | . . . containing condensed ring systems   |
| 211/05        | . . . . Mono-, di- or tri-ethylamine  | 211/42        | . . . . with six-membered aromatic rings being part of the condensed ring systems   |
| 211/06        | . . . . containing only n- or iso-propyl groups   | 211/43        | . having amino groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton   |
| 211/07        | . . . . containing one, two or three alkyl groups, each having the same number of carbon atoms in excess of three | 211/44        | . . having amino groups bound to only one six-membered aromatic ring  |
| 211/08        | . . . . containing alkyl groups having a different number of carbon atoms   | 211/45        | . . . Monoamines  |
| 211/09        | . . . Diamines  | 211/46        | . . . . Aniline   |
| 211/10        | . . . . Diaminoethanes  | 211/47        | . . . . Toluidines; Homologues thereof  |
| 211/11        | . . . . Diaminopropanes   | 211/48        | . . . . N-alkylated amines  |
| 211/12        | . . . . 1,6-Diaminohexanes  | 211/49        | . . . having at least two amino groups bound to the carbon skeleton   |
| 211/13        | . . . Amines containing three or more amino groups bound to the carbon skeleton                                   | 211/50        | . . . . with at least two amino groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton  |
| 211/14        | . . . Amines containing amino groups bound to at least two aminoalkyl groups, e.g. diethylenetriamines            | 211/51        | . . . . . Phenylenediamines   |
| 211/15        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups                | 211/52        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups  |
| 211/16        | . . of a saturated carbon skeleton containing rings other than six-membered aromatic rings                        | 211/53        | . . . having the nitrogen atom of at least one of the amino groups further bound to a hydrocarbon radical substituted by amino groups                               |
| 211/17        | . . . containing only non-condensed rings   | 211/54        | . . having amino groups bound to two or three six-membered aromatic rings   |
| 211/18        | . . . containing at least two amino groups bound to the carbon skeleton   | 211/55        | . . . Diphenylamines  |
| 211/19        | . . . containing condensed ring systems   | 211/56        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups  |
| 211/20        | . . of an acyclic unsaturated carbon skeleton   | 211/57        | . . having amino groups bound to carbon atoms of six-membered aromatic rings being part of condensed ring systems of the carbon skeleton                            |
| 211/21        | . . . Monoamines  | 211/58        | . . . Naphthylamines; N-substituted derivatives thereof   |
| 211/22        | . . . containing at least two amino groups bound to the carbon skeleton   | 211/59        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups  |
| 211/23        | . . . the carbon skeleton containing carbon-to-carbon triple bonds  | 211/60        | . . . containing a ring other than a six-membered aromatic ring forming part of at least one of the condensed ring systems  |
| 211/24        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups                | 211/61        | . . . with at least one of the condensed ring systems formed by three or more rings   |
| 211/25        | . . of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings                     | 211/62        | . Quaternary ammonium compounds   |
| 211/26        | . . of an unsaturated carbon skeleton containing at least one six-membered aromatic ring                          | 211/63        | . . having quaternised nitrogen atoms bound to acyclic carbon atoms   |
| 211/27        | . . . having amino groups linked to the six-membered aromatic ring by saturated carbon chains                     | 211/64        | . . having quaternised nitrogen atoms bound to carbon atoms of six-membered aromatic rings  |
| 211/28        | . . . having amino groups linked to the six-membered aromatic ring by unsaturated carbon chains                   | 211/65        | . Metal complexes of amines   |
| 211/29        | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups                | <b>213/00</b> | <b>Preparation of compounds containing amino and hydroxy, amino and etherified hydroxy or amino and esterified hydroxy groups bound to the same carbon skeleton</b> |
| 211/30        | . . . the six-membered aromatic ring being part of a condensed ring system formed by two rings                    | 213/02        | . by reactions involving the formation of amino groups from compounds containing hydroxy groups or etherified or esterified hydroxy groups                          |
| 211/31        | . . . the six-membered aromatic ring being part of a condensed ring system formed by at least three rings         | 213/04        | . by reaction of ammonia or amines with olefin oxides or halohydrins  |
| 211/32        | . . . . containing dibenzocycloheptane or dibenzocycloheptene ring systems or condensed derivatives thereof       | 213/06        | . from hydroxy amines by reactions involving the etherification or esterification of hydroxy groups   |
| 211/33        | . having amino groups bound to carbon atoms of rings other than six-membered aromatic rings                       |               |   |
| 211/34        | . . of a saturated carbon skeleton  |               |   |
| 211/35        | . . . containing only non-condensed rings   |               |   |
| 211/36        | . . . containing at least two amino groups bound to the carbon skeleton   |               |   |

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| 213/08        | • by reactions not involving the formation of amino groups, hydroxy groups or etherified or esterified hydroxy groups  | 215/50        | • • • with amino groups and the six-membered aromatic ring, or the condensed ring system containing that ring, bound to the same carbon atom of the carbon chain   |
| 213/10        | • Separation; Purification; Stabilisation; Use of additives  | 215/52        | • • • linked by carbon chains having two carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring  |
| <b>215/00</b> | <b>Compounds containing amino and hydroxy groups bound to the same carbon skeleton</b>   | 215/54        | • • • linked by carbon chains having at least three carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring   |
| 215/02        | • having hydroxy groups and amino groups bound to acyclic carbon atoms of the same carbon skeleton   | 215/56        | • • with amino groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by carbon chains further substituted by hydroxy groups   |
| 215/04        | • • the carbon skeleton being saturated  | 215/58        | • • • with hydroxy groups and the six-membered aromatic ring, or the condensed ring system containing that ring, bound to the same carbon atom of the carbon chain   |
| 215/06        | • • • and acyclic  | 215/60        | • • • • the chain having two carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring  |
| 215/08        | • • • • with only one hydroxy group and one amino group bound to the carbon skeleton   | 215/62        | • • • • the chain having at least three carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring   |
| 215/10        | • • • • with one amino group and at least two hydroxy groups bound to the carbon skeleton  | 215/64        | • • with rings other than six-membered aromatic rings being part of the carbon skeleton  |
| 215/12        | • • • • the nitrogen atom of the amino group being further bound to hydrocarbon groups substituted by hydroxy groups   | 215/66        | • • with quaternised amino groups bound to the carbon skeleton   |
| 215/14        | • • • • the nitrogen atom of the amino group being further bound to hydrocarbon groups substituted by amino groups   | 215/68        | • having amino groups bound to carbon atoms of six-membered aromatic rings and hydroxy groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton |
| 215/16        | • • • • the nitrogen atom of the amino group being further bound to carbon atoms of six-membered aromatic rings  | 215/70        | • • with rings other than six-membered aromatic rings being part of the carbon skeleton  |
| 215/18        | • • • • with hydroxy groups and at least two amino groups bound to the carbon skeleton   | 215/72        | • • with quaternised amino groups bound to the carbon skeleton   |
| 215/20        | • • • the carbon skeleton being saturated and containing rings   | 215/74        | • having hydroxy groups and amino groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton  |
| 215/22        | • • the carbon skeleton being unsaturated  | 215/76        | • • of the same non-condensed six-membered aromatic ring   |
| 215/24        | • • • and acyclic  | 215/78        | • • • containing at least two hydroxy groups bound to the carbon skeleton  |
| 215/26        | • • • and containing rings other than six-membered aromatic rings  | 215/80        | • • • containing at least two amino groups bound to the carbon skeleton  |
| 215/28        | • • • and containing six-membered aromatic rings   | 215/82        | • • • having the nitrogen atom of at least one of the amino groups further bound to a carbon atom of another six-membered aromatic ring  |
| 215/30        | • • • • containing hydroxy groups and carbon atoms of six-membered aromatic rings bound to the same carbon atom of the carbon skeleton   | 215/84        | • • having amino groups bound to carbon atoms of six-membered aromatic rings being part of condensed ring systems  |
| 215/32        | • • • • • containing hydroxy groups and carbon atoms of two six-membered aromatic rings bound to the same carbon atom of the carbon skeleton   | 215/86        | • • • being formed by two rings  |
| 215/34        | • • • • containing hydroxy groups and carbon atoms of six-membered aromatic rings bound to the same carbon atom of the carbon skeleton and at least one hydroxy group bound to another carbon atom of the carbon skeleton              | 215/88        | • • • being formed by at least three rings   |
| 215/36        | • • • • • 1-Aryl-2-amino-1,3-propane diols   | 215/90        | • • with quaternised amino groups bound to the carbon skeleton   |
| 215/38        | • • • • with rings other than six-membered aromatic rings being part of the carbon skeleton  | <b>217/00</b> | <b>Compounds containing amino and etherified hydroxy groups bound to the same carbon skeleton</b>  |
| 215/40        | • • with quaternised nitrogen atoms bound to carbon atoms of the carbon skeleton   |               |  |
| 215/42        | • having amino groups or hydroxy groups bound to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton  |               |  |
| 215/44        | • • bound to carbon atoms of the same ring or condensed ring system  |               |  |
| 215/46        | • having hydroxy groups bound to carbon atoms of at least one six-membered aromatic ring and amino groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton |               |  |
| 215/48        | • • with amino groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by carbon chains not further substituted by hydroxy groups   |               |  |

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| 217/02 | <ul style="list-style-type: none"> <li>• having etherified hydroxy groups and amino groups bound to acyclic carbon atoms of the same carbon skeleton</li> </ul>   | 217/42 | <ul style="list-style-type: none"> <li>• . . . having etherified hydroxy groups and at least two amino groups bound to the carbon skeleton</li> </ul>   |
| 217/04 | <ul style="list-style-type: none"> <li>• . the carbon skeleton being acyclic and saturated</li> </ul>   | 217/44 | <ul style="list-style-type: none"> <li>• . the carbon skeleton being saturated and containing rings</li> </ul>  |
| 217/06 | <ul style="list-style-type: none"> <li>• . . . having only one etherified hydroxy group and one amino group bound to the carbon skeleton, which is not further substituted</li> </ul>   | 217/46 | <ul style="list-style-type: none"> <li>• . the carbon skeleton being acyclic and unsaturated</li> </ul>   |
| 217/08 | <ul style="list-style-type: none"> <li>• . . . . the oxygen atom of the etherified hydroxy group being further bound to an acyclic carbon atom</li> </ul>   | 217/48 | <ul style="list-style-type: none"> <li>• . the carbon skeleton being unsaturated and containing rings</li> </ul>  |
| 217/10 | <ul style="list-style-type: none"> <li>• . . . . to an acyclic carbon atom of a hydrocarbon radical containing six-membered aromatic rings</li> </ul>   | 217/50 | <ul style="list-style-type: none"> <li>• . Ethers of hydroxy amines of undetermined structure, e.g. obtained by reactions of epoxides with hydroxy amines</li> </ul>  |
| 217/12 | <ul style="list-style-type: none"> <li>• . . . . the oxygen atom of the etherified hydroxy group being further bound to a carbon atom of a ring other than a six-membered aromatic ring</li> </ul>  | 217/52 | <ul style="list-style-type: none"> <li>• having etherified hydroxy groups or amino groups bound to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton</li> </ul>  |
| 217/14 | <ul style="list-style-type: none"> <li>• . . . . the oxygen atom of the etherified hydroxy group being further bound to a carbon atom of a six-membered aromatic ring</li> </ul>  | 217/54 | <ul style="list-style-type: none"> <li>• having etherified hydroxy groups bound to carbon atoms of at least one six-membered aromatic ring and amino groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton</li> </ul> |
| 217/16 | <ul style="list-style-type: none"> <li>• . . . . . the six-membered aromatic ring or condensed ring system containing that ring not being further substituted</li> </ul>  | 217/56 | <ul style="list-style-type: none"> <li>• . with amino groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by carbon chains not further substituted by singly-bound oxygen atoms</li> </ul>   |
| 217/18 | <ul style="list-style-type: none"> <li>• . . . . . the six-membered aromatic ring or condensed ring system containing that ring being further substituted</li> </ul>  | 217/58 | <ul style="list-style-type: none"> <li>• . . with amino groups and the six-membered aromatic ring, or the condensed ring system containing that ring, bound to the same carbon atom of the carbon chain</li> </ul>  |
| 217/20 | <ul style="list-style-type: none"> <li>• . . . . . by halogen atoms, by trihalomethyl, nitro or nitroso groups, or by singly-bound oxygen atoms</li> </ul>  | 217/60 | <ul style="list-style-type: none"> <li>• . . linked by carbon chains having two carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring</li> </ul>   |
| 217/22 | <ul style="list-style-type: none"> <li>• . . . . . by carbon atoms having at least two bonds to oxygen atoms</li> </ul>   | 217/62 | <ul style="list-style-type: none"> <li>• . . linked by carbon chains having at least three carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring</li> </ul>  |
| 217/24 | <ul style="list-style-type: none"> <li>• . . . . . the six-membered aromatic ring being part of a condensed ring system containing rings other than six-membered aromatic rings</li> </ul>  | 217/64 | <ul style="list-style-type: none"> <li>• . with amino groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by carbon chains further substituted by singly-bound oxygen atoms</li> </ul>   |
| 217/26 | <ul style="list-style-type: none"> <li>• . . . having only one etherified hydroxy group and one amino group bound to the carbon skeleton, which is further substituted by halogen atoms or by nitro or nitroso groups</li> </ul>                              | 217/66 | <ul style="list-style-type: none"> <li>• . . with singly-bound oxygen atoms and six-membered aromatic rings bound to the same carbon atom of the carbon chain</li> </ul>  |
| 217/28 | <ul style="list-style-type: none"> <li>• . . . having one amino group and at least two singly-bound oxygen atoms, with at least one being part of an etherified hydroxy group, bound to the carbon skeleton, e.g. ethers of polyhydroxy amines</li> </ul>     | 217/68 | <ul style="list-style-type: none"> <li>• . . . with singly-bound oxygen atoms, six-membered aromatic rings and amino groups bound to the same carbon atom of the carbon chain</li> </ul>  |
| 217/30 | <ul style="list-style-type: none"> <li>• . . . . having the oxygen atom of at least one of the etherified hydroxy groups further bound to a carbon atom of a six-membered aromatic ring</li> </ul>  | 217/70 | <ul style="list-style-type: none"> <li>• . . . . linked by carbon chains having two carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring</li> </ul>   |
| 217/32 | <ul style="list-style-type: none"> <li>• . . . . . the six-membered aromatic ring or condensed ring system containing that ring being further substituted</li> </ul>  | 217/72 | <ul style="list-style-type: none"> <li>• . . . . linked by carbon chains having at least three carbon atoms between the amino groups and the six-membered aromatic ring or the condensed ring system containing that ring</li> </ul>  |
| 217/34 | <ul style="list-style-type: none"> <li>• . . . . . by halogen atoms, by trihalomethyl, nitro or nitroso groups, or by singly-bound oxygen atoms</li> </ul>  | 217/74 | <ul style="list-style-type: none"> <li>• . with rings other than six-membered aromatic rings being part of the carbon skeleton</li> </ul>   |
| 217/36 | <ul style="list-style-type: none"> <li>• . . . . . by carbon atoms having at least two bonds to oxygen atoms</li> </ul>   | 217/76 | <ul style="list-style-type: none"> <li>• having amino groups bound to carbon atoms of six-membered aromatic rings and etherified hydroxy groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton</li> </ul>             |
| 217/38 | <ul style="list-style-type: none"> <li>• . . . . . the six-membered aromatic ring being part of a condensed ring system containing rings other than six-membered aromatic rings</li> </ul>  | 217/78 | <ul style="list-style-type: none"> <li>• having amino groups and etherified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton</li> </ul>  |
| 217/40 | <ul style="list-style-type: none"> <li>• . . . . having at least two singly-bound oxygen atoms, with at least one being part of an etherified hydroxy group, bound to the same carbon atom of the carbon skeleton, e.g. amino-ketals, ortho esters</li> </ul> |        |   |

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| 217/80 | . . having amino groups and etherified hydroxy groups bound to carbon atoms of non-condensed six-membered aromatic rings   | 219/24 | . having esterified hydroxy groups or amino groups bound to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton  |
| 217/82 | . . . of the same non-condensed six-membered aromatic ring   | 219/26 | . having esterified hydroxy groups bound to carbon atoms of at least one six-membered aromatic ring and amino groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton |
| 217/84 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to an acyclic carbon atom   | 219/28 | . . having amino groups bound to acyclic carbon atoms of the carbon skeleton  |
| 217/86 | . . . . . to an acyclic carbon atom of a hydrocarbon radical containing six-membered aromatic rings  | 219/30 | . . . with amino groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by carbon chains further substituted by singly-bound oxygen atoms   |
| 217/88 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to a carbon atom of a ring other than a six-membered aromatic ring  | 219/32 | . having amino groups bound to carbon atoms of six-membered aromatic rings and esterified hydroxy groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton             |
| 217/90 | . . . . the oxygen atom of at least one of the etherified hydroxy groups being further bound to a carbon atom of a six-membered aromatic ring, e.g. amino-diphenylethers   | 219/34 | . having amino groups and esterified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton  |
| 217/92 | . . . . the nitrogen atom of at least one of the amino groups being further bound to a carbon atom of a six-membered aromatic ring   | 221/00 | <b>Preparation of compounds containing amino groups and doubly-bound oxygen atoms bound to the same carbon skeleton</b>   |
| 217/94 | . . having amino groups bound to carbon atoms of six-membered aromatic rings being part of condensed ring systems and etherified hydroxy groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton | 223/00 | <b>Compounds containing amino and —CHO groups bound to the same carbon skeleton</b>   |
| 219/00 | <b>Compounds containing amino and esterified hydroxy groups bound to the same carbon skeleton</b>  | 223/02 | . having amino groups bound to acyclic carbon atoms of the carbon skeleton  |
| 219/02 | . having esterified hydroxy groups and amino groups bound to acyclic carbon atoms of the same carbon skeleton  | 223/04 | . having amino groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton  |
| 219/04 | . . the carbon skeleton being acyclic and saturated  | 223/06 | . having amino groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton   |
| 219/06 | . . . having the hydroxy groups esterified by carboxylic acids having the esterifying carboxyl groups bound to hydrogen atoms or to acyclic carbon atoms of an acyclic saturated carbon skeleton                                 | 225/00 | <b>Compounds containing amino groups and doubly—bound oxygen atoms bound to the same carbon skeleton, at least one of the doubly—bound oxygen atoms not being part of a —CHO group, e.g. amino ketones</b>  |
| 219/08 | . . . having at least one of the hydroxy groups esterified by a carboxylic acid having the esterifying carboxyl group bound to an acyclic carbon atom of an acyclic unsaturated carbon skeleton                                  | 225/02 | . having amino groups bound to acyclic carbon atoms of the carbon skeleton  |
| 219/10 | . . . having at least one of the hydroxy groups esterified by a carboxylic acid having the esterifying carboxyl group bound to an acyclic carbon atom of a carbon skeleton containing rings                                      | 225/04 | . . the carbon skeleton being saturated   |
| 219/12 | . . . having at least one of the hydroxy groups esterified by a carboxylic acid having the esterifying carboxyl group bound to a carbon atom of a ring other than a six-membered aromatic ring                                   | 225/06 | . . . and acyclic   |
| 219/14 | . . . having at least one of the hydroxy groups esterified by a carboxylic acid having the esterifying carboxyl group bound to a carbon atom of a six-membered aromatic ring   | 225/08 | . . . and containing rings  |
| 219/16 | . . . having at least one of the hydroxy groups esterified by an inorganic acid or a derivative thereof  | 225/10 | . . . . with doubly-bound oxygen atoms bound to carbon atoms not being part of rings  |
| 219/18 | . . the carbon skeleton being saturated and containing rings   | 225/12 | . . . . with doubly-bound oxygen atoms bound to carbon atoms being part of rings  |
| 219/20 | . . the carbon skeleton being unsaturated  | 225/14 | . . the carbon skeleton being unsaturated   |
| 219/22 | . . . and containing six-membered aromatic rings   | 225/16 | . . . and containing six-membered aromatic rings  |
|        |  | 225/18 | . . . . the carbon skeleton containing also rings other than six-membered aromatic rings  |
|        |  | 225/20 | . having amino groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton  |
|        |  | 225/22 | . having amino groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton   |
|        |  | 225/24 | . the carbon skeleton containing carbon atoms of quinone rings  |
|        |  | 225/26 | . . having amino groups bound to carbon atoms of quinone rings or of condensed ring systems containing quinone rings  |

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| 225/28        | . . . of non-condensed quinone rings   | 229/10 | . . . . the nitrogen atom of the amino group being further bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings          |
| 225/30        | . . . of condensed quinone ring systems formed by two rings  | 229/12 | . . . . . to carbon atoms of acyclic carbon skeletons  |
| 225/32        | . . . of condensed quinone ring systems formed by at least three rings   | 229/14 | . . . . . to carbon atoms of carbon skeletons containing rings   |
| 225/34        | . . . . Amino anthraquinones   | 229/16 | . . . . . to carbon atoms of hydrocarbon radicals substituted by amino or carboxyl groups, e.g. ethylenediamine-tetra-acetic acid, iminodiacetic acids               |
| 225/36        | . . . . . the carbon skeleton being further substituted by singly-bound oxygen atoms   | 229/18 | . . . . . the nitrogen atom of the amino group being further bound to carbon atoms of six-membered aromatic rings  |
| <b>227/00</b> | <b>Preparation of compounds containing amino and carboxyl groups bound to the same carbon skeleton</b>                             | 229/20 | . . . the carbon skeleton being further substituted by halogen atoms or by nitro or nitroso groups   |
| 227/02        | . Formation of carboxyl groups in compounds containing amino groups, e.g. by oxidation of amino alcohols                           | 229/22 | . . . the carbon skeleton being further substituted by oxygen atoms  |
| 227/04        | . Formation of amino groups in compounds containing carboxyl groups  | 229/24 | . . . having more than one carboxyl group bound to the carbon skeleton, e.g. aspartic acid   |
| 227/06        | . . by addition or substitution reactions, without increasing the number of carbon atoms in the carbon skeleton of the acid        | 229/26 | . . . having more than one amino group bound to the carbon skeleton, e.g. lysine   |
| 227/08        | . . . by reaction of ammonia or amines with acids containing functional groups   | 229/28 | . . the carbon skeleton being saturated and containing rings   |
| 227/10        | . . with simultaneously increasing the number of carbon atoms in the carbon skeleton   | 229/30 | . . the carbon skeleton being acyclic and unsaturated  |
| 227/12        | . Formation of amino and carboxyl groups   | 229/32 | . . the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings  |
| 227/14        | . from compounds containing already amino and carboxyl groups or derivatives thereof   | 229/34 | . . the carbon skeleton containing six-membered aromatic rings   |
| 227/16        | . . by reactions not involving the amino or carboxyl groups  | 229/36 | . . . with at least one amino group and one carboxyl group bound to the same carbon atom of the carbon skeleton  |
| 227/18        | . . by reactions involving amino or carboxyl groups, e.g. hydrolysis of esters or amides, by formation of halides, salts or esters | 229/38 | . having amino groups bound to acyclic carbon atoms and carboxyl groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton             |
| 227/20        | . . . by hydrolysis of N-acylated amino-acids or derivatives thereof, e.g. hydrolysis of carbamates                                | 229/40 | . having amino groups bound to carbon atoms of at least one six-membered aromatic ring and carboxyl groups bound to acyclic carbon atoms of the same carbon skeleton |
| 227/22        | . from lactams, cyclic ketones or cyclic oximes, e.g. by reactions involving Beckmann rearrangement                                | 229/42 | . . with carboxyl groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by saturated carbon chains                  |
| 227/24        | . from hydantoins  | 229/44 | . . with carboxyl groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by unsaturated carbon chains                |
| 227/26        | . from compounds containing carboxyl groups by reaction with HCN, or a salt thereof, and amines, or from aminonitriles             | 229/46 | . having amino or carboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings of the same carbon skeleton                                  |
| 227/28        | . from natural products  | 229/48 | . . with amino groups and carboxyl groups bound to carbon atoms of the same non-condensed ring   |
| 227/30        | . Preparation of optical isomers   | 229/50 | . . with amino groups and carboxyl groups bound to carbon atoms being part of the same condensed ring system   |
| 227/32        | . . by stereospecific synthesis  | 229/52 | . having amino and carboxyl groups bound to carbon atoms of six-membered aromatic rings of the same carbon skeleton  |
| 227/34        | . . by separation of optical isomers   | 229/54 | . . with amino and carboxyl groups bound to carbon atoms of the same non-condensed six-membered aromatic ring  |
| 227/36        | . Racemisation of optical isomers  | 229/56 | . . . with amino and carboxyl groups bound in ortho-position   |
| 227/38        | . Separation; Purification; Stabilisation; Use of additives ( <a href="#">separation of optical isomers C07C 227/34</a> )          |        |  |
| 227/40        | . . Separation; Purification   |        |  |
| 227/42        | . . . Crystallisation  |        |  |
| 227/44        | . . Stabilisation; Use of additives  |        |  |
| <b>229/00</b> | <b>Compounds containing amino and carboxyl groups bound to the same carbon skeleton</b>  |        |  |
| 229/02        | . having amino and carboxyl groups bound to acyclic carbon atoms of the same carbon skeleton                                       |        |  |
| 229/04        | . . the carbon skeleton being acyclic and saturated  |        |  |
| 229/06        | . . . having only one amino and one carboxyl group bound to the carbon skeleton  |        |  |
| 229/08        | . . . . the nitrogen atom of the amino group being further bound to hydrogen atoms   |        |  |

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| 229/58        | . . . . having the nitrogen atom of at least one of the amino groups further bound to a carbon atom of a six-membered aromatic ring, e.g. N-phenyl-anthranilic acids | 233/06 | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring                               |
| 229/60        | . . . with amino and carboxyl groups bound in meta- or para- positions   | 233/07 | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring   |
| 229/62        | . . . with amino groups and at least two carboxyl groups bound to carbon atoms of the same six-membered aromatic ring  | 233/08 | . . . with carbon atoms of carboxamide groups bound to acyclic carbon atoms of a saturated carbon skeleton containing rings   |
| 229/64        | . . . the carbon skeleton being further substituted by singly-bound oxygen atoms   | 233/09 | . . . with carbon atoms of carboxamide groups bound to carbon atoms of an acyclic unsaturated carbon skeleton   |
| 229/66        | . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms   | 233/10 | . . . with carbon atoms of carboxamide groups bound to carbon atoms of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings                     |
| 229/68        | . . with amino and carboxyl groups bound to carbon atoms of six-membered aromatic rings being part of the same condensed ring system                                 | 233/11 | . . . with carbon atoms of carboxamide groups bound to carbon atoms of an unsaturated carbon skeleton containing six-membered aromatic rings                                      |
| 229/70        | . . . the carbon skeleton being further substituted by singly-bound oxygen atoms   | 233/12 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by halogen atoms or by nitro or nitroso groups |
| 229/72        | . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms   | 233/13 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  |
| 229/74        | . . . . the condensed ring system being formed by at least three rings, e.g. amino anthraquinone carboxylic acids  | 233/14 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             |
| 229/76        | . Metal complexes of amino carboxylic acids  | 233/15 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               |
| <b>231/00</b> | <b>Preparation of carboxylic acid amides</b>   | 233/16 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms                   |
| 231/02        | . from carboxylic acids or from esters, anhydrides, or halides thereof by reaction with ammonia or amines  | 233/17 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  |
| 231/04        | . from ketenes by reaction with ammonia or amines  | 233/18 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of an acyclic saturated carbon skeleton                                      |
| 231/06        | . from nitriles by transformation of cyano groups into carboxamide groups  | 233/19 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a saturated carbon skeleton containing rings   |
| 231/065       | . . {By hydration using metals or metallic ions as catalyst}   | 233/20 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an acyclic unsaturated carbon skeleton  |
| 231/08        | . from amides by reaction at nitrogen atoms of carboxamide groups  | 233/21 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings |
| 231/10        | . from compounds not provided for in groups <a href="#">C07C 231/02</a> - <a href="#">C07C 231/08</a>  | 233/22 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a carbon skeleton containing six-membered aromatic rings                               |
| 231/12        | . by reactions not involving the formation of carboxamide groups   | 233/23 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             |
| 231/14        | . by formation of carboxamide groups together with reactions not involving the carboxamide groups  |        |   |
| 231/16        | . Preparation of optical isomers   |        |   |
| 231/18        | . . by stereospecific synthesis  |        |   |
| 231/20        | . . by separation of optical isomers   |        |   |
| 231/22        | . Separation; Purification; Stabilisation; Use of additives ( <a href="#">separation of optical isomers C07C 231/20</a> )  |        |   |
| 231/24        | . . Separation; Purification   |        |   |
| <b>233/00</b> | <b>Carboxylic acid amides</b>  |        |   |
| 233/01        | . having carbon atoms of carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms   |        |   |
| 233/02        | . . having nitrogen atoms of carboxamide groups bound to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals                                     |        |   |
| 233/03        | . . . with carbon atoms of carboxamide groups bound to hydrogen atoms  |        |   |
| 233/04        | . . . with carbon atoms of carboxamide groups bound to acyclic carbon atoms of an acyclic saturated carbon skeleton  |        |   |
| 233/05        | . . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms   |        |   |

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| 233/24 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               | 233/42 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               |
| 233/25 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of an acyclic saturated carbon skeleton                                      | 233/43 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of a saturated carbon skeleton   |
| 233/26 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a saturated carbon skeleton containing rings   | 233/44 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an unsaturated carbon skeleton  |
| 233/27 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an acyclic unsaturated carbon skeleton  | 233/45 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by carboxyl groups                             |
| 233/28 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings | 233/46 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  |
| 233/29 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a carbon skeleton containing six-membered aromatic rings                               | 233/47 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of an acyclic saturated carbon skeleton                                      |
| 233/30 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by doubly-bound oxygen atoms                   | 233/48 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a saturated carbon skeleton containing rings   |
| 233/31 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  | 233/49 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an acyclic unsaturated carbon skeleton  |
| 233/32 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             | 233/50 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings |
| 233/33 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               | 233/51 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a carbon skeleton containing six-membered aromatic rings                               |
| 233/34 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by amino groups                                | 233/52 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             |
| 233/35 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  | 233/53 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               |
| 233/36 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of an acyclic saturated carbon skeleton                                      | 233/54 | . . . . having the carbon atom of the carboxamide group bound to a hydrogen atom or to a carbon atom of a saturated carbon skeleton   |
| 233/37 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a saturated carbon skeleton containing rings   | 233/55 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an unsaturated carbon skeleton  |
| 233/38 | . . . . having the carbon atom of the carboxamide group bound to a carbon atom of an acyclic unsaturated carbon skeleton  | 233/56 | . . having carbon atoms of carboxamide groups bound to carbon atoms of carboxyl groups, e.g. oxamides   |
| 233/39 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings | 233/57 | . having carbon atoms of carboxamide groups bound to carbon atoms of rings other than six-membered aromatic rings   |
| 233/40 | . . . . having the carbon atom of the carboxamide group bound to an acyclic carbon atom of a carbon skeleton containing six-membered aromatic rings                               | 233/58 | . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals  |
| 233/41 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             | 233/59 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by halogen atoms or by nitro or nitroso groups |

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| 233/60 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms                   | 233/81        | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by carboxyl groups   |
| 233/61 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by doubly-bound oxygen atoms                   | 233/82        | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  |
| 233/62 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by amino groups                                | 233/83        | . . . . of an acyclic saturated carbon skeleton   |
| 233/63 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by carboxyl groups                             | 233/84        | . . . . of a saturated carbon skeleton containing rings   |
| 233/64 | . having carbon atoms of carboxamide groups bound to carbon atoms of six-membered aromatic rings  | 233/85        | . . . . of an acyclic unsaturated carbon skeleton   |
| 233/65 | . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals  | 233/86        | . . . . of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings   |
| 233/66 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by halogen atoms or by nitro or nitroso groups | 233/87        | . . . . of a carbon skeleton containing six-membered aromatic rings   |
| 233/67 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms                   | 233/88        | . having nitrogen atoms of carboxamide groups bound to an acyclic carbon atom and to a carbon atom of a six-membered aromatic ring wherein at least one ortho-hydrogen atom has been replaced             |
| 233/68 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  | 233/89        | . having nitrogen atoms of carboxamide groups quaternised   |
| 233/69 | . . . . of an acyclic saturated carbon skeleton   | 233/90        | . having nitrogen atoms of carboxamide groups further acylated  |
| 233/70 | . . . . of a saturated carbon skeleton containing rings   | 233/91        | . . with carbon atoms of the carboxamide groups bound to acyclic carbon atoms   |
| 233/71 | . . . . of an acyclic unsaturated carbon skeleton   | 233/92        | . . with at least one carbon atom of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring  |
| 233/72 | . . . . of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings   | <b>235/00</b> | <b>Carboxylic acid amides, the carbon skeleton of the acid part being further substituted by oxygen atoms</b>   |
| 233/73 | . . . . of a carbon skeleton containing six-membered aromatic rings   | 235/02        | . having carbon atoms of carboxamide groups bound to acyclic carbon atoms and singly-bound oxygen atoms bound to the same carbon skeleton   |
| 233/74 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             | 235/04        | . . the carbon skeleton being acyclic and saturated   |
| 233/75 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               | 235/06        | . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms  |
| 233/76 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by doubly-bound oxygen atoms                   | 235/08        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms                                |
| 233/77 | . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a hydrocarbon radical substituted by amino groups                                | 235/10        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms not being part of nitro or nitroso groups |
| 233/78 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by an acyclic carbon atom  | 235/12        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups  |
| 233/79 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a ring other than a six-membered aromatic ring             | 235/14        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring   |
| 233/80 | . . . with the substituted hydrocarbon radical bound to the nitrogen atom of the carboxamide group by a carbon atom of a six-membered aromatic ring                               | 235/16        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring   |
|        |   | 235/18        | . . . having at least one of the singly-bound oxygen atoms further bound to a carbon atom of a six-membered aromatic ring, e.g. phenoxyacetamides   |
|        |   | 235/20        | . . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms  |

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| 235/22 | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring   | 235/62        | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring  |
| 235/24 | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring   | 235/64        | . . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring  |
| 235/26 | . . the carbon skeleton being saturated and containing rings  | 235/66        | . . with carbon atoms of carboxamide groups bound to carbon atoms of six-membered aromatic rings being part of condensed ring systems and singly-bound oxygen atoms, bound to the same carbon skeleton               |
| 235/28 | . . the carbon skeleton being acyclic and unsaturated   | 235/68        | . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom and to a carbon atom of a six-membered aromatic ring wherein at least one ortho-hydrogen atom has been replaced |
| 235/30 | . . the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings   | 235/70        | . having carbon atoms of carboxamide groups and doubly-bound oxygen atoms bound to the same carbon skeleton  |
| 235/32 | . . the carbon skeleton containing six-membered aromatic rings  | 235/72        | . . with the carbon atoms of the carboxamide groups bound to acyclic carbon atoms  |
| 235/34 | . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms  | 235/74        | . . . of a saturated carbon skeleton   |
| 235/36 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring   | 235/76        | . . . of an unsaturated carbon skeleton  |
| 235/38 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring   | 235/78        | . . . . the carbon skeleton containing rings   |
| 235/40 | . having carbon atoms of carboxamide groups bound to carbon atoms of rings other than six-membered aromatic rings and singly-bound oxygen atoms bound to the same carbon skeleton                         | 235/80        | . . . having carbon atoms of carboxamide groups and keto groups bound to the same carbon atom, e.g. acetoacetamides  |
| 235/42 | . having carbon atoms of carboxamide groups bound to carbon atoms of six-membered aromatic rings and singly-bound oxygen atoms bound to the same carbon skeleton  | 235/82        | . . with the carbon atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring  |
| 235/44 | . . with carbon atoms of carboxamide groups and singly-bound oxygen atoms bound to carbon atoms of the same non-condensed six-membered aromatic ring  | 235/84        | . . with the carbon atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring  |
| 235/46 | . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms  | 235/86        | . having the nitrogen atom of at least one of the carboxamide groups quaternised   |
| 235/48 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms                                | 235/88        | . having the nitrogen atom of at least one of the carboxamide groups further acylated  |
| 235/50 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms not being part of nitro or nitroso groups | <b>237/00</b> | <b>Carboxylic acid amides, the carbon skeleton of the acid part being further substituted by amino groups</b>  |
| 235/52 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups  | 237/02        | . having the carbon atoms of the carboxamide groups bound to acyclic carbon atoms of the carbon skeleton   |
| 235/54 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring   | 237/04        | . . the carbon skeleton being acyclic and saturated  |
| 235/56 | . . . having the nitrogen atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring   | 237/06        | . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms   |
| 235/58 | . . . with carbon atoms of carboxamide groups and singly-bound oxygen atoms, bound in ortho-position to carbon atoms of the same non-condensed six-membered aromatic ring                                 | 237/08        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms   |
| 235/60 | . . . . having the nitrogen atoms of the carboxamide groups bound to hydrogen atoms or to acyclic carbon atoms  | 237/10        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms not being part of nitro or nitroso groups            |
|        |   | 237/12        | . . . having the nitrogen atom of at least one of the carboxamide groups bound to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups ( <a href="#">peptides C07K</a> )                   |
|        |   | 237/14        | . . the carbon skeleton being saturated and containing rings   |
|        |   | 237/16        | . . the carbon skeleton being acyclic and unsaturated  |

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| 237/18        | <ul style="list-style-type: none"> <li>the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings</li> </ul>   | 239/08        | <ul style="list-style-type: none"> <li>Hydroxylamino compounds or their ethers or esters</li> </ul>   |
| 237/20        | <ul style="list-style-type: none"> <li>the carbon skeleton containing six-membered aromatic rings</li> </ul>  | 239/10        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydroxylamino groups further bound to carbon atoms of unsubstituted hydrocarbon radicals or of hydrocarbon radicals substituted by halogen atoms or by nitro or nitroso groups</li> </ul> |
| 237/22        | <ul style="list-style-type: none"> <li>having nitrogen atoms of amino groups bound to the carbon skeleton of the acid part, further acylated (<a href="#">peptides C07K</a>)</li> </ul>   | 239/12        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydroxylamino groups further bound to carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms</li> </ul>  |
| 237/24        | <ul style="list-style-type: none"> <li>having the carbon atom of at least one of the carboxamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring of the carbon skeleton</li> </ul>                          | 239/14        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydroxylamino groups further bound to carbon atoms of hydrocarbon radicals substituted by doubly-bound oxygen atoms</li> </ul>  |
| 237/26        | <ul style="list-style-type: none"> <li>of a ring being part of a condensed ring system formed by at least four rings, e.g. tetracycline</li> </ul>  | 239/16        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydroxylamino groups further bound to carbon atoms of hydrocarbon radicals substituted by nitrogen atoms not being part of nitro or nitroso groups</li> </ul>                             |
| 237/28        | <ul style="list-style-type: none"> <li>having the carbon atom of at least one of the carboxamide groups bound to a carbon atom of a non-condensed six-membered aromatic ring of the carbon skeleton</li> </ul>                              | 239/18        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydroxylamino groups further bound to carbon atoms of hydrocarbon radicals substituted by carboxyl groups</li> </ul>  |
| 237/30        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to hydrogen atoms or to acyclic carbon atoms</li> </ul>  | 239/20        | <ul style="list-style-type: none"> <li>having oxygen atoms of hydroxylamino groups etherified</li> </ul>  |
| 237/32        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to an acyclic carbon atom of a hydrocarbon radical substituted by oxygen atoms</li> </ul>  | 239/22        | <ul style="list-style-type: none"> <li>having oxygen atoms of hydroxylamino groups esterified</li> </ul>  |
| 237/34        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms not being part of nitro or nitroso groups</li> </ul>        | <b>241/00</b> | <b>Preparation of compounds containing chains of nitrogen atoms singly-bound to each other, e.g. hydrazines, triazanes</b>  |
| 237/36        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups</li> </ul>   | 241/02        | <ul style="list-style-type: none"> <li>Preparation of hydrazines</li> </ul>   |
| 237/38        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to a carbon atom of a ring other than a six-membered aromatic ring</li> </ul>  | 241/04        | <ul style="list-style-type: none"> <li>Preparation of hydrazides</li> </ul>   |
| 237/40        | <ul style="list-style-type: none"> <li>having the nitrogen atom of the carboxamide group bound to a carbon atom of a six-membered aromatic ring</li> </ul>  | <b>243/00</b> | <b>Compounds containing chains of nitrogen atoms singly-bound to each other, e.g. hydrazines, triazanes</b>   |
| 237/42        | <ul style="list-style-type: none"> <li>having nitrogen atoms of amino groups bound to the carbon skeleton of the acid part, further acylated</li> </ul>   | 243/02        | <ul style="list-style-type: none"> <li>N-nitro compounds</li> </ul>   |
| 237/44        | <ul style="list-style-type: none"> <li>having carbon atoms of carboxamide groups, amino groups and singly-bound oxygen atoms bound to carbon atoms of the same non-condensed six-membered aromatic ring</li> </ul>                          | 243/04        | <ul style="list-style-type: none"> <li>N-nitroso compounds</li> </ul>   |
| 237/46        | <ul style="list-style-type: none"> <li>having carbon atoms of carboxamide groups, amino groups and at least three atoms of bromine or iodine, bound to carbon atoms of the same non-condensed six-membered aromatic ring</li> </ul>         | 243/06        | <ul style="list-style-type: none"> <li>N-nitroso-amines</li> </ul>  |
| 237/48        | <ul style="list-style-type: none"> <li>having the carbon atom of at least one of the carboxamide groups bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system of the same carbon skeleton</li> </ul> | 243/08        | <ul style="list-style-type: none"> <li>N-nitroso-carboxamides</li> </ul>  |
| 237/50        | <ul style="list-style-type: none"> <li>having the nitrogen atom of at least one of the carboxamide groups quaternised</li> </ul>  | 243/10        | <ul style="list-style-type: none"> <li>Hydrazines</li> </ul>  |
| 237/52        | <ul style="list-style-type: none"> <li>having the nitrogen atom of at least one of the carboxamide groups further acylated</li> </ul>   | 243/12        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydrazine groups bound to acyclic carbon atoms</li> </ul>   |
| <b>239/00</b> | <b>Compounds containing nitrogen-to-halogen bonds; Hydroxylamino compounds or ethers or esters thereof (<a href="#">oximes C07C 251/00</a>; <a href="#">hydroxamic acids or derivatives thereof C07C 259/00</a>)</b>                        | 243/14        | <ul style="list-style-type: none"> <li>of a saturated carbon skeleton</li> </ul>  |
| 239/02        | <ul style="list-style-type: none"> <li>Compounds containing nitrogen-to-halogen bonds</li> </ul>  | 243/16        | <ul style="list-style-type: none"> <li>of an unsaturated carbon skeleton</li> </ul>   |
| 239/04        | <ul style="list-style-type: none"> <li>N-halogenated amines</li> </ul>  | 243/18        | <ul style="list-style-type: none"> <li>containing rings</li> </ul>  |
| 239/06        | <ul style="list-style-type: none"> <li>N-halogenated carboxamides</li> </ul>  | 243/20        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydrazine groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>   |
|               |   | 243/22        | <ul style="list-style-type: none"> <li>having nitrogen atoms of hydrazine groups bound to carbon atoms of six-membered aromatic rings</li> </ul>  |
|               |   | 243/24        | <ul style="list-style-type: none"> <li>Hydrazines having nitrogen atoms of hydrazine groups acylated by carboxylic acids</li> </ul>   |
|               |   | 243/26        | <ul style="list-style-type: none"> <li>with acylating carboxyl groups bound to hydrogen atoms or to acyclic carbon atoms</li> </ul>   |
|               |   | 243/28        | <ul style="list-style-type: none"> <li>to hydrogen atoms or to carbon atoms of a saturated carbon skeleton</li> </ul>   |
|               |   | 243/30        | <ul style="list-style-type: none"> <li>to carbon atoms of an unsaturated carbon skeleton</li> </ul>   |
|               |   | 243/32        | <ul style="list-style-type: none"> <li>the carbon skeleton containing rings</li> </ul>  |
|               |   | 243/34        | <ul style="list-style-type: none"> <li>to carbon atoms of a carbon skeleton further substituted by nitrogen atoms</li> </ul>  |
|               |   | 243/36        | <ul style="list-style-type: none"> <li>with acylating carboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>  |

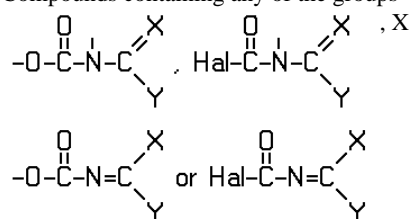
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| 243/38        | . . with acylating carboxyl groups bound to carbon atoms of six-membered aromatic rings  | 249/04        | . of oximes  |
| 243/40        | . Hydrazines having nitrogen atoms of hydrazine groups being quaternised   | 249/06        | . . by nitrosation of hydrocarbons or substituted hydrocarbons   |
| 243/42        | . Hydrazines having nitrogen atoms of hydrazine groups further singly-bound to hetero atoms  | 249/08        | . . by reaction of hydroxylamines with carbonyl compounds  |
| <b>245/00</b> | <b>Compounds containing chains of at least two nitrogen atoms with at least one nitrogen-to-nitrogen multiple bond (azoxy compounds C07C 291/08)</b>       | 249/10        | . . from nitro compounds or salts thereof  |
| 245/02        | . Azo compounds, i.e. compounds having the free valencies of —N=N— groups attached to different atoms, e.g. diazohydroxides                                | 249/12        | . . by reactions not involving the formation of oxyimino groups  |
| 245/04        | . . with nitrogen atoms of azo groups bound to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings                     | 249/14        | . . Separation; Purification; Stabilisation; Use of additives  |
| 245/06        | . . with nitrogen atoms of azo groups bound to carbon atoms of six-membered aromatic rings   | 249/16        | . of hydrazones  |
| 245/08        | . . . with the two nitrogen atoms of azo groups bound to carbon atoms of six-membered aromatic rings, e.g. azobenzene                                      | <b>251/00</b> | <b>Compounds containing nitrogen atoms doubly-bound to a carbon skeleton (diazo compounds C07C 245/12)</b>                                 |
| 245/10        | . . . with nitrogen atoms of azo groups bound to carbon atoms of six-membered aromatic rings being part of condensed ring systems                          | 251/02        | . containing imino groups  |
| 245/12        | . Diazo compounds, i.e. compounds having the free valencies of >N <sub>2</sub> groups attached to the same carbon atom                                     | 251/04        | . . having carbon atoms of imino groups bound to hydrogen atoms or to acyclic carbon atoms   |
| 245/14        | . . having diazo groups bound to acyclic carbon atoms of a carbon skeleton   | 251/06        | . . . to carbon atoms of a saturated carbon skeleton   |
| 245/16        | . . . Diazomethane   | 251/08        | . . . . being acyclic  |
| 245/18        | . . . the carbon skeleton being further substituted by carboxyl groups   | 251/10        | . . . to carbon atoms of an unsaturated carbon skeleton  |
| 245/20        | . Diazonium compounds  | 251/12        | . . . . being acyclic  |
| 245/22        | . containing chains of three or more nitrogen atoms with one or more nitrogen-to-nitrogen double bonds   | 251/14        | . . . . containing rings other than six-membered aromatic rings  |
| 245/24        | . . Chains of only three nitrogen atoms, e.g. diazoamines  | 251/16        | . . . . containing six-membered aromatic rings   |
| <b>247/00</b> | <b>Compounds containing azido groups</b>   | 251/18        | . . having carbon atoms of imino groups bound to carbon atoms of rings other than six-membered aromatic rings                              |
| 247/02        | . with azido groups bound to acyclic carbon atoms of a carbon skeleton   | 251/20        | . . having carbon atoms of imino groups being part of rings other than six-membered aromatic rings   |
| 247/04        | . . being saturated  | 251/22        | . . . Quinone imines   |
| 247/06        | . . . and containing rings   | 251/24        | . . having carbon atoms of imino groups bound to carbon atoms of six-membered aromatic rings   |
| 247/08        | . . being unsaturated  | 251/26        | . . having nitrogen atoms of imino groups further bound to halogen atoms   |
| 247/10        | . . . and containing rings   | 251/28        | . . having nitrogen atoms of imino groups acylated   |
| 247/12        | . . being further substituted by carboxyl groups   | 251/30        | . . having nitrogen atoms of imino groups quaternised  |
| 247/14        | . with azido groups bound to carbon atoms of rings other than six-membered aromatic rings  | 251/32        | . Oximes   |
| 247/16        | . with azido groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton  | 251/34        | . . with oxygen atoms of oxyimino groups bound to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals                  |
| 247/18        | . . being further substituted by carboxyl groups   | 251/36        | . . . with the carbon atoms of the oxyimino groups bound to hydrogen atoms or to acyclic carbon atoms                                      |
| 247/20        | . with azido groups acylated by carboxylic acids   | 251/38        | . . . . to carbon atoms of a saturated carbon skeleton   |
| 247/22        | . . with the acylating carboxyl groups bound to hydrogen atoms, to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings | 251/40        | . . . . to carbon atoms of an unsaturated carbon skeleton  |
| 247/24        | . . with at least one of the acylating carboxyl groups bound to a carbon atom of a six-membered aromatic ring  | 251/42        | . . . with the carbon atom of at least one of the oxyimino groups bound to a carbon atom of a ring other than a six-membered aromatic ring |
| <b>249/00</b> | <b>Preparation of compounds containing nitrogen atoms doubly-bound to a carbon skeleton (of diazo compounds C07C 245/12)</b>                               | 251/44        | . . . with the carbon atom of at least one of the oxyimino groups being part of a ring other than a six-membered aromatic ring             |
| 249/02        | . of compounds containing imino groups   | 251/46        | . . . . Quinone oximes   |
|               |  | 251/48        | . . . with the carbon atom of at least one of the oxyimino groups bound to a carbon atom of a six-membered aromatic ring                   |
|               |  | 251/50        | . . having oxygen atoms of oxyimino groups bound to carbon atoms of substituted hydrocarbon radicals                                       |

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| 251/52        | . . . of hydrocarbon radicals substituted by halogen atoms or by nitro or nitroso groups   | 253/22        | . by reaction of ammonia with carboxylic acids with replacement of carboxyl groups by cyano groups                              |
| 251/54        | . . . of hydrocarbon radicals substituted by singly-bound oxygen atoms   | 253/24        | . by ammoxidation of hydrocarbons or substituted hydrocarbons   |
| 251/56        | . . . of hydrocarbon radicals substituted by doubly-bound oxygen atoms   | 253/26        | . . containing carbon-to-carbon multiple bonds, e.g. unsaturated aldehydes  |
| 251/58        | . . . of hydrocarbon radicals substituted by nitrogen atoms not being part of nitro or nitroso groups  | 253/28        | . . containing six-membered aromatic rings, e.g. styrene  |
| 251/60        | . . . of hydrocarbon radicals substituted by carboxyl groups   | 253/30        | . by reactions not involving the formation of cyano groups  |
| 251/62        | . . having oxygen atoms of oxyimino groups esterified  | 253/32        | . Separation; Purification; Stabilisation; Use of additives   |
| 251/64        | . . . by carboxylic acids  | 253/34        | . . Separation; Purification  |
| 251/66        | . . . . with the esterifying carboxyl groups bound to hydrogen atoms, to acyclic carbon atoms or to carbon atoms of rings other than six-membered aromatic rings | <b>255/00</b> | <b>Carboxylic acid nitriles (cyanogen or compounds thereof C01C 3/00)</b>   |
| 251/68        | . . . . with at least one of the esterifying carboxyl groups bound to a carbon atom of a six-membered aromatic ring  | 255/01        | . having cyano groups bound to acyclic carbon atoms   |
| 251/70        | . . Metal complexes of oximes  | 255/02        | . . of an acyclic and saturated carbon skeleton   |
| 251/72        | . Hydrazones   | 255/03        | . . . Mononitriles  |
| 251/74        | . . having doubly-bound carbon atoms of hydrazone groups bound to hydrogen atoms or to acyclic carbon atoms  | 255/04        | . . . containing two cyano groups bound to the carbon skeleton  |
| 251/76        | . . . to carbon atoms of a saturated carbon skeleton   | 255/05        | . . . containing at least three cyano groups bound to the carbon skeleton   |
| 251/78        | . . . to carbon atoms of an unsaturated carbon skeleton  | 255/06        | . . of an acyclic and unsaturated carbon skeleton   |
| 251/80        | . . . . the carbon skeleton containing rings   | 255/07        | . . . Mononitriles  |
| 251/82        | . . having doubly-bound carbon atoms of hydrazone groups bound to carbon atoms of rings other than six-membered aromatic rings                                   | 255/08        | . . . . Acrylonitrile; Methacrylonitrile  |
| 251/84        | . . having doubly-bound carbon atoms of hydrazone groups being part of rings other than six-membered aromatic rings  | 255/09        | . . . containing at least two cyano groups bound to the carbon skeleton   |
| 251/86        | . . having doubly-bound carbon atoms of hydrazone groups bound to carbon atoms of six-membered aromatic rings  | 255/10        | . . containing cyano groups and halogen atoms, or nitro or nitroso groups, bound to the same acyclic carbon skeleton            |
| 251/88        | . . having also the other nitrogen atom doubly-bound to a carbon atom, e.g. azines   | 255/11        | . . containing cyano groups and singly-bound oxygen atoms bound to the same saturated acyclic carbon skeleton                   |
| <b>253/00</b> | <b>Preparation of carboxylic acid nitriles (of cyanogen or compounds thereof C01C 3/00)</b>  | 255/12        | . . . containing cyano groups and hydroxy groups bound to the carbon skeleton   |
| 253/02        | . by reaction of nitrogen oxide with organic compounds   | 255/13        | . . . containing cyano groups and etherified hydroxy groups bound to the carbon skeleton  |
| 253/04        | . by reaction of cyanogen halides, e.g. ClCN, with organic compounds   | 255/14        | . . . containing cyano groups and esterified hydroxy groups bound to the carbon skeleton  |
| 253/06        | . from N-formylated amino compounds  | 255/15        | . . containing cyano groups and singly-bound oxygen atoms bound to the same unsaturated acyclic carbon skeleton                 |
| 253/08        | . by addition of hydrogen cyanide or salts thereof to unsaturated compounds  | 255/16        | . . containing cyano groups and singly-bound oxygen atoms bound to the same carbon atom of an acyclic carbon skeleton           |
| 253/10        | . . to compounds containing carbon-to-carbon double bonds  | 255/17        | . . containing cyano groups and doubly-bound oxygen atoms bound to the same acyclic carbon skeleton                             |
| 253/12        | . . to compounds containing carbon-to-carbon triple bonds  | 255/18        | . . containing cyano groups bound to carbon atoms of carboxyl groups  |
| 253/14        | . by reaction of cyanides with halogen-containing compounds with replacement of halogen atoms by cyano groups  | 255/19        | . . containing cyano groups and carboxyl groups, other than cyano groups, bound to the same saturated acyclic carbon skeleton   |
| 253/16        | . by reaction of cyanides with lactones or compounds containing hydroxy groups or etherified or esterified hydroxy groups  | 255/20        | . . . the carbon skeleton being further substituted by singly-bound oxygen atoms  |
| 253/18        | . by reaction of ammonia or amines with compounds containing carbon-to-carbon multiple bonds other than in six-membered aromatic rings                           | 255/21        | . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms  |
| 253/20        | . by dehydration of carboxylic acid amides   | 255/22        | . . . containing cyano groups and at least two carboxyl groups bound to the carbon skeleton                                     |
|               |  | 255/23        | . . containing cyano groups and carboxyl groups, other than cyano groups, bound to the same unsaturated acyclic carbon skeleton |

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| <p>255/24 . . containing cyano groups and singly-bound nitrogen atoms, not being further bound to other hetero atoms, bound to the same saturated acyclic carbon skeleton</p> <p>255/25 . . . Aminoacetonitriles</p> <p>255/26 . . . containing cyano groups, amino groups and singly-bound oxygen atoms bound to the carbon skeleton</p> <p>255/27 . . . containing cyano groups, amino groups and doubly-bound oxygen atoms bound to the carbon skeleton</p> <p>255/28 . . . containing cyano groups, amino groups and carboxyl groups, other than cyano groups, bound to the carbon skeleton</p> <p>255/29 . . . containing cyano groups and acylated amino groups bound to the carbon skeleton</p> <p>255/30 . . containing cyano groups and singly-bound nitrogen atoms, not being further bound to other hetero atoms, bound to the same unsaturated acyclic carbon skeleton</p> <p>255/31 . . having cyano groups bound to acyclic carbon atoms of a carbon skeleton containing rings other than six-membered aromatic rings</p> <p>255/32 . . having cyano groups bound to acyclic carbon atoms of a carbon skeleton containing at least one six-membered aromatic ring</p> <p>255/33 . . . with cyano groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by saturated carbon chains</p> <p>255/34 . . . with cyano groups linked to the six-membered aromatic ring, or to the condensed ring system containing that ring, by unsaturated carbon chains</p> <p>255/35 . . . the carbon skeleton being further substituted by halogen atoms, or by nitro or nitroso groups</p> <p>255/36 . . . the carbon skeleton being further substituted by hydroxy groups</p> <p>255/37 . . . the carbon skeleton being further substituted by etherified hydroxy groups</p> <p>255/38 . . . the carbon skeleton being further substituted by esterified hydroxy groups</p> <p>255/39 . . . . with hydroxy groups esterified by derivatives of 2,2-dimethylcyclopropane carboxylic acids, e.g. of chrysanthemumic acids</p> <p>255/40 . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms</p> <p>255/41 . . . the carbon skeleton being further substituted by carboxyl groups, other than cyano groups</p> <p>255/42 . . . the carbon skeleton being further substituted by singly-bound nitrogen atoms, not being further bound to other hetero atoms</p> <p>255/43 . . . . the carbon skeleton being further substituted by singly-bound oxygen atoms</p> <p>255/44 . . . . at least one of the singly-bound nitrogen atoms being acylated</p> <p>255/45 . having cyano groups bound to carbon atoms of rings other than six-membered aromatic rings</p> <p>255/46 . . to carbon atoms of non-condensed rings</p> <p>255/47 . . to carbon atoms of rings being part of condensed ring systems</p> <p>255/48 . . to carbon atoms of 2,2-dimethylcyclopropane rings, e.g. nitrile of chrysanthemumic acids</p> <p>255/49 . having cyano groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton</p> | <p>255/50 . . to carbon atoms of non-condensed six-membered aromatic rings</p> <p>255/51 . . . containing at least two cyano groups bound to the carbon skeleton</p> <p>255/52 . . to carbon atoms of six-membered aromatic rings being part of condensed ring systems</p> <p>255/53 . . containing cyano groups and hydroxy groups bound to the carbon skeleton</p> <p>255/54 . . containing cyano groups and etherified hydroxy groups bound to the carbon skeleton</p> <p>255/55 . . containing cyano groups and esterified hydroxy groups bound to the carbon skeleton</p> <p>255/56 . . containing cyano groups and doubly-bound oxygen atoms bound to the carbon skeleton</p> <p>255/57 . . containing cyano groups and carboxyl groups, other than cyano groups, bound to the carbon skeleton</p> <p>255/58 . . containing cyano groups and singly-bound nitrogen atoms, not being further bound to other hetero atoms, bound to the carbon skeleton</p> <p>255/59 . . . the carbon skeleton being further substituted by singly-bound oxygen atoms</p> <p>255/60 . . . at least one of the singly-bound nitrogen atoms being acylated</p> <p>255/61 . containing cyano groups and nitrogen atoms being part of imino groups bound to the same carbon skeleton</p> <p>255/62 . containing cyano groups and oxygen atoms being part of oxyimino groups bound to the same carbon skeleton</p> <p>255/63 . containing cyano groups and nitrogen atoms further bound to other hetero atoms, other than oxygen atoms of nitro or nitroso groups, bound to the same carbon skeleton</p> <p>255/64 . . with the nitrogen atoms further bound to oxygen atoms</p> <p>255/65 . . with the nitrogen atoms further bound to nitrogen atoms</p> <p>255/66 . . . having cyano groups and nitrogen atoms being part of hydrazine or hydrazone groups bound to the same carbon skeleton</p> <p>255/67 . . . having cyano groups and azido groups bound to the same carbon skeleton</p> <p><b>257/00 Compounds containing carboxyl groups, the doubly-bound oxygen atom of a carboxyl group being replaced by a doubly-bound nitrogen atom, this nitrogen atom not being further bound to an oxygen atom, e.g. imino-ethers, amidines</b></p> <p>257/02 . with replacement of the other oxygen atom of the carboxyl group by halogen atoms, e.g. imino-halides</p> <p>257/04 . without replacement of the other oxygen atom of the carboxyl group, e.g. imino-ethers</p> <p>257/06 . . having carbon atoms of imino-carboxyl groups bound to hydrogen atoms, to acyclic carbon atoms, or to carbon atoms of rings other than six-membered aromatic rings</p> <p>257/08 . . having carbon atoms of imino-carboxyl groups bound to carbon atoms of six-membered aromatic rings</p> <p>257/10 . with replacement of the other oxygen atom of the carboxyl group by nitrogen atoms, e.g. amidines</p> <p>257/12 . . having carbon atoms of amidino groups bound to hydrogen atoms</p> |
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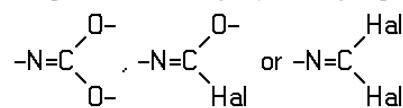
|               |   |               |   |
|---------------|---|---------------|---|
| 257/14        | • • having carbon atoms of amidino groups bound to acyclic carbon atoms   | 263/18        | • Separation; Purification; Stabilisation; Use of additives   |
| 257/16        | • • having carbon atoms of amidino groups bound to carbon atoms of rings other than six-membered aromatic rings   | 263/20        | • • Separation; Purification  |
| 257/18        | • • having carbon atoms of amidino groups bound to carbon atoms of six-membered aromatic rings  | <b>265/00</b> | <b>Derivatives of isocyanic acid</b>  |
| 257/20        | • • having nitrogen atoms of amidino groups acylated  | 265/02        | • having isocyanate groups bound to acyclic carbon atoms  |
| 257/22        | • • having nitrogen atoms of amidino groups further bound to nitrogen atoms, e.g. hydrazidines  | 265/04        | • • of a saturated carbon skeleton  |
| <b>259/00</b> | <b>Compounds containing carboxyl groups, an oxygen atom of a carboxyl group being replaced by a nitrogen atom, this nitrogen atom being further bound to an oxygen atom and not being part of nitro or nitroso groups</b> | 265/06        | • • of an unsaturated carbon skeleton   |
| 259/02        | • with replacement of the other oxygen atom of the carboxyl group by halogen atoms  | 265/08        | • • • the carbon skeleton containing rings  |
| 259/04        | • without replacement of the other oxygen atom of the carboxyl group, e.g. hydroxamic acids   | 265/10        | • having isocyanate groups bound to carbon atoms of rings other than six-membered aromatic rings  |
| 259/06        | • • having carbon atoms of hydroxamic groups bound to hydrogen atoms or to acyclic carbon atoms   | 265/12        | • having isocyanate groups bound to carbon atoms of six-membered aromatic rings   |
| 259/08        | • • having carbon atoms of hydroxamic groups bound to carbon atoms of rings other than six-membered aromatic rings  | 265/14        | • containing at least two isocyanate groups bound to the same carbon skeleton   |
| 259/10        | • • having carbon atoms of hydroxamic groups bound to carbon atoms of six-membered aromatic rings   | 265/16        | • having isocyanate groups acylated   |
| 259/12        | • with replacement of the other oxygen atom of the carboxyl group by nitrogen atoms, e.g. N-hydroxyamidines   | <b>267/00</b> | <b>Carbodiimides</b>  |
| 259/14        | • • having carbon atoms of hydroxamidine groups bound to hydrogen atoms or to acyclic carbon atoms  | <b>269/00</b> | <b>Preparation of derivatives of carbamic acid, i.e. compounds containing any of the groups</b>   |
| 259/16        | • • having carbon atoms of hydroxamidine groups bound to carbon atoms of rings other than six-membered aromatic rings   |               | $\begin{array}{c} \text{O} \\ \parallel \\ >\text{N}-\text{C}-\text{O}- \\ \text{O}- \end{array}, \begin{array}{c} \text{O} \\ \parallel \\ >\text{N}-\text{C}-\text{Hal} \\ \text{O}- \end{array}, \begin{array}{c} \text{O}- \\ \parallel \\ -\text{N}=\text{C}-\text{O}- \end{array},$ |
| 259/18        | • • having carbon atoms of hydroxamidine groups bound to carbon atoms of six-membered aromatic rings  |               | $\begin{array}{c} \text{O}- \\ \parallel \\ -\text{N}=\text{C}-\text{Hal} \end{array} \text{ or } \begin{array}{c} \text{Hal} \\ \parallel \\ -\text{N}=\text{C}-\text{Hal} \end{array}$  |
| 259/20        | • • with at least one nitrogen atom of hydroxamidine groups bound to another nitrogen atom  | 269/02        | <b>nitrogen atom not being part of nitro or nitroso groups</b>  |
| <b>261/00</b> | <b>Derivatives of cyanic acid</b>   | 269/04        | • from isocyanates with formation of carbamate groups   |
| 261/02        | • Cyanates  | 269/06        | • from amines with formation of carbamate groups  |
| 261/04        | • Cyanamides ( <a href="#">unsubstituted cyanamide C01C 3/16</a> )  | 269/08        | • by reactions not involving the formation of carbamate groups  |
| <b>263/00</b> | <b>Preparation of derivatives of isocyanic acid</b>   | 269/08        | • Separation; Purification; Stabilisation; Use of additives   |
| 263/02        | • by reaction of halides with isocyanic acid or its derivatives   | <b>271/00</b> | <b>Derivatives of carbamic acids, i.e. compounds containing any of the groups</b>   |
| 263/04        | • from or via carbamates or carbamoyl halides   |               | $\begin{array}{c} \text{O} \\ \parallel \\ >\text{N}-\text{C}-\text{O}- \\ \text{O}- \end{array}, \begin{array}{c} \text{O} \\ \parallel \\ >\text{N}-\text{C}-\text{Hal} \\ \text{O}- \end{array}, \begin{array}{c} \text{O}- \\ \parallel \\ -\text{N}=\text{C}-\text{O}- \end{array},$ |
| 263/06        | • from or via ureas   |               | $\begin{array}{c} \text{O}- \\ \parallel \\ -\text{N}=\text{C}-\text{Hal} \end{array} \text{ or } \begin{array}{c} \text{Hal} \\ \parallel \\ -\text{N}=\text{C}-\text{Hal} \end{array}$  |
| 263/08        | • from or via heterocyclic compounds, e.g. pyrolysis of furoxans  | 271/02        | <b>nitrogen atom not being part of nitro or nitroso groups</b>  |
| 263/10        | • by reaction of amines with carbonyl halides, e.g. with phosgene   | 271/04        | • Carbamic acids; Salts of carbamic acids   |
| 263/12        | • from or via nitrogen analogues of carboxylic acids, e.g. from hydroxamic acids, involving a Hofmann, Curtius or Lossen-type rearrangement ( <a href="#">C07C 209/56 takes precedence</a> )                              | 271/06        | ( <a href="#">unsubstituted carbamic acid or salts thereof C01B 21/12</a> )   |
| 263/14        | • by catalytic reaction of nitro compounds with carbon monoxide   | 271/08        | • Carbamic acid halides   |
| 263/16        | • by reactions not involving the formation of isocyanate groups   | 271/10        | • Esters of carbamic acids  |
|               |   | 271/12        | • • having oxygen atoms of carbamate groups bound to acyclic carbon atoms   |
|               |   | 271/14        | • • • with the nitrogen atoms of the carbamate groups bound to hydrogen atoms or to acyclic carbon atoms  |
|               |   | 271/16        | • • • • to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals  |
|               |   | 271/18        | • • • • to carbon atoms of hydrocarbon radicals substituted by halogen atoms or by nitro or nitroso groups  |
|               |   |               | • • • • to carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms  |
|               |   |               | • • • • to carbon atoms of hydrocarbon radicals substituted by doubly-bound oxygen atoms  |

- 271/20 . . . . to carbon atoms of hydrocarbon radicals substituted by nitrogen atoms not being part of nitro or nitroso groups
- 271/22 . . . . to carbon atoms of hydrocarbon radicals substituted by carboxyl groups
- 271/24 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 271/26 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a six-membered aromatic ring
- 271/28 . . . . to a carbon atom of a non-condensed six-membered aromatic ring
- 271/30 . . . . to a carbon atom of a six-membered aromatic ring being part of a condensed ring system
- 271/32 . . having oxygen atoms of carbamate groups bound to carbon atoms of rings other than six-membered aromatic rings
- 271/34 . . . with the nitrogen atoms of the carbamate groups bound to hydrogen atoms or to acyclic carbon atoms
- 271/36 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 271/38 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a six-membered aromatic ring
- 271/40 . . having oxygen atoms of carbamate groups bound to carbon atoms of six-membered aromatic rings
- 271/42 . . . with the nitrogen atoms of the carbamate groups bound to hydrogen atoms or to acyclic carbon atoms
- 271/44 . . . . to hydrogen atoms or to carbon atoms of unsubstituted hydrocarbon radicals
- 271/46 . . . . to carbon atoms of hydrocarbon radicals substituted by halogen atoms or by nitro or nitroso groups
- 271/48 . . . . to carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms
- 271/50 . . . . to carbon atoms of hydrocarbon radicals substituted by doubly-bound oxygen atoms
- 271/52 . . . . to carbon atoms of hydrocarbon radicals substituted by nitrogen atoms not being part of nitro or nitroso groups
- 271/54 . . . . to carbon atoms of hydrocarbon radicals substituted by carboxyl groups
- 271/56 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 271/58 . . . with the nitrogen atom of at least one of the carbamate groups bound to a carbon atom of a six-membered aromatic ring
- 271/60 . having oxygen atoms of carbamate groups bound to nitrogen atoms
- 271/62 . Compounds containing any of the groups

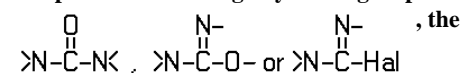


being a hetero atom, Y being any atom, e.g. N-acylcarbamates

- 271/64 . . Y being a hydrogen or a carbon atom, e.g. benzoylcarbamates
- 271/66 . . Y being a hetero atom
- 271/68 . Compounds containing any of the groups

**273/00**

**Preparation of urea or its derivatives, i.e. compounds containing any of the groups**

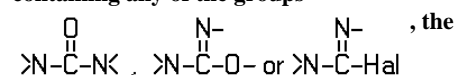


**nitrogen atoms not being part of nitro or nitroso groups**

- 273/02 . of urea, its salts, complexes or addition compounds
- 273/025 . . {of solutions of urea and formaldehyde}
- 273/04 . . from carbon dioxide and ammonia
- 273/06 . . from cyanamide or calcium cyanamide
- 273/08 . . from ammoniacal liquor
- 273/10 . . combined with the synthesis of ammonia
- 273/12 . . combined with the synthesis of melamine
- 273/14 . . Separation; Purification; Stabilisation; Use of additives
- 273/16 . . . Separation; Purification
- 273/18 . of substituted ureas
- 273/1809 . . {with formation of the N-C(O)-N moiety}
- 273/1818 . . . {from -N=C=O and XNR'R"}
- 273/1827 . . . . {X being H}
- 273/1836 . . . {from derivatives of carbamic acid}
- 273/1845 . . . . {comprising the -N-C(O)-Hal moiety}
- 273/1854 . . {by reactions not involving the formation of the N-C(O)-N- moiety}
- 273/1863 . . . {from urea}
- 273/1872 . . {Preparation of compounds comprising a -N-C(O)-N-C(O)-N- moiety}
- 273/1881 . . . {from urea}
- 273/189 . . {Purification, separation, stabilisation, use of additives}

**275/00**

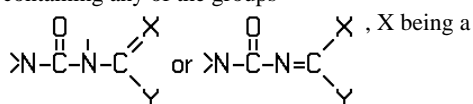
**Derivatives of urea, i.e. compounds containing any of the groups**



**nitrogen atoms not being part of nitro or nitroso groups**

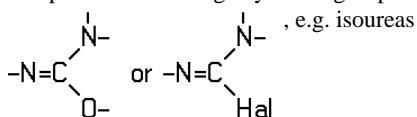
- 275/02 . Salts; Complexes; Addition compounds
- 275/04 . having nitrogen atoms of urea groups bound to acyclic carbon atoms
- 275/06 . . of an acyclic and saturated carbon skeleton
- 275/08 . . . being further substituted by halogen atoms, or by nitro or nitroso groups
- 275/10 . . . being further substituted by singly-bound oxygen atoms
- 275/12 . . . being further substituted by doubly-bound oxygen atoms
- 275/14 . . . being further substituted by nitrogen atoms not being part of nitro or nitroso groups
- 275/16 . . . being further substituted by carboxyl groups
- 275/18 . . of a saturated carbon skeleton containing rings
- 275/20 . . of an unsaturated carbon skeleton
- 275/22 . . . containing rings other than six-membered aromatic rings

- 275/24 . . . containing six-membered aromatic rings
- 275/26 . having nitrogen atoms of urea groups bound to carbon atoms of rings other than six-membered aromatic rings
- 275/28 . having nitrogen atoms of urea groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton
- 275/30 . . being further substituted by halogen atoms, or by nitro or nitroso groups
- 275/32 . . being further substituted by singly-bound oxygen atoms
- 275/34 . . . having nitrogen atoms of urea groups and singly-bound oxygen atoms bound to carbon atoms of the same non-condensed six-membered aromatic ring
- 275/36 . . . with at least one of the oxygen atoms further bound to a carbon atom of a six-membered aromatic ring, e.g. N-aryloxyphenylureas
- 275/38 . . being further substituted by doubly-bound oxygen atoms
- 275/40 . . being further substituted by nitrogen atoms not being part of nitro or nitroso groups
- 275/42 . . being further substituted by carboxyl groups
- 275/44 . having nitrogen atoms of urea groups doubly-bound to carbon atoms
- 275/46 . containing any of the groups



hetero atom, Y being any atom, e.g. acylureas

- 275/48 . . Y being a hydrogen or a carbon atom
- 275/50 . . . Y being a hydrogen or an acyclic carbon atom
- 275/52 . . . Y being a carbon atom of a ring other than a six-membered aromatic ring
- 275/54 . . . Y being a carbon atom of a six-membered aromatic ring, e.g. benzoylureas
- 275/56 . . . X being a nitrogen atom
- 275/58 . . Y being a hetero atom
- 275/60 . . . Y being an oxygen atom, e.g. allophanic acids
- 275/62 . . . Y being a nitrogen atom, e.g. biuret
- 275/64 . having nitrogen atoms of urea groups singly-bound to oxygen atoms
- 275/66 . having nitrogen atoms of urea groups bound to halogen atoms or to nitro or nitroso groups
- 275/68 . . N-nitroso ureas
- 275/70 . Compounds containing any of the groups



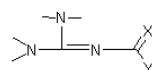
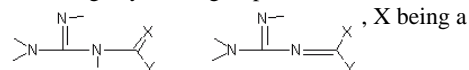
- 277/00 Preparation of guanidine or its derivatives, i.e. compounds containing the group**  $\begin{array}{c} \text{N-} \\ \parallel \\ \text{>N}-\text{C}-\text{N} \end{array}$ , the singly-bound nitrogen atoms not being part of nitro or nitroso groups

- 277/02 . of guanidine from cyanamide, calcium cyanamide or dicyandiamides
- 277/04 . of guanidine from ammonium thiocyanate
- 277/06 . Purification or separation of guanidine
- 277/08 . of substituted guanidines

- 279/00 Derivatives of guanidine, i.e. compounds containing the group**  $\begin{array}{c} \text{N-} \\ \parallel \\ \text{>N}-\text{C}-\text{N} \end{array}$ , the singly-bound

nitrogen atoms not being part of nitro or nitroso groups

- 279/02 . Guanidine; Salts, complexes or addition compounds thereof
- 279/04 . having nitrogen atoms of guanidine groups bound to acyclic carbon atoms of a carbon skeleton
- 279/06 . . being further substituted by halogen atoms, or by nitro or nitroso groups
- 279/08 . . being further substituted by singly-bound oxygen atoms
- 279/10 . . being further substituted by doubly-bound oxygen atoms
- 279/12 . . being further substituted by nitrogen atoms not being part of nitro or nitroso groups
- 279/14 . . being further substituted by carboxyl groups
- 279/16 . having nitrogen atoms of guanidine groups bound to carbon atoms of rings other than six-membered aromatic rings
- 279/18 . having nitrogen atoms of guanidine groups bound to carbon atoms of six-membered aromatic rings
- 279/20 . containing any of the groups



hetero atom, Y being any atom, e.g. acylguanidines

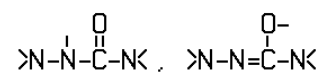
- 279/22 . . Y being a hydrogen or a carbon atom, e.g. benzoylguanidines
- 279/24 . . Y being a hetero atom
- 279/26 . . . X and Y being nitrogen atoms, i.e. biguanides
- 279/265 . . . {containing two or more biguanide groups}
- 279/28 . having nitrogen atoms of guanidine groups bound to cyano groups, e.g. cyanoguanidines, dicyandiamides
- 279/30 . having nitrogen atoms of guanidine groups bound to nitro or nitroso groups
- 279/32 . . N-nitroguanidines
- 279/34 . . . N-nitroguanidine
- 279/36 . . . Substituted N-nitroguanidines

- 281/00 Derivatives of carbonic acid containing functional groups covered by groups C07C 269/00 - C07C 279/00 in which at least one nitrogen atom of these functional groups is further bound to another nitrogen atom not being part of a nitro or nitroso group**

- 281/02 . Compounds containing any of the groups  $\begin{array}{c} \text{O} \\ \parallel \\ \text{>N}-\text{N}-\text{C}-\text{O-} \end{array}$  or  $\begin{array}{c} \text{O-} \\ \parallel \\ \text{>N}-\text{N}=\text{C}-\text{O-} \end{array}$ , e.g. carbazates

- 281/04 . . the other nitrogen atom being further doubly-bound to a carbon atom

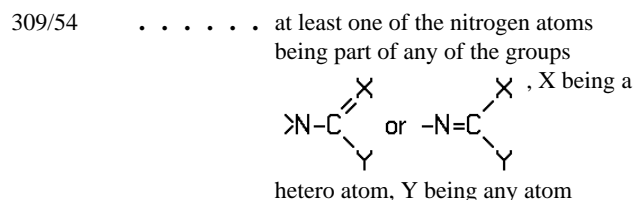
- 281/06 . Compounds containing any of the groups  $\begin{array}{c} \text{O} \\ \parallel \\ \text{>N}-\text{N}-\text{C}-\text{N} \end{array}$ , e.g.



or  $\begin{array}{c} \text{O-} \\ \parallel \\ \text{>N}-\text{N}-\text{C}=\text{N-} \end{array}$   
semicarbazides

|  |   |               |  |
|--|---|---------------|--|
| 281/08   | . . the other nitrogen atom being further doubly-bound to a carbon atom, e.g. semicarbazones  | 303/18        | . . by reaction of sulfides with compounds having functional groups with formation of sulfo or halosulfonyl groups   |
| 281/10   | . . . the carbon atom being further bound to an acyclic carbon atom or to a carbon atom of a ring other than a six-membered aromatic ring   | 303/20        | . . by addition of sulfurous acid or salts thereof to compounds having carbon-to-carbon multiple bonds   |
| 281/12   | . . . the carbon atom being part of a ring other than a six-membered aromatic ring  | 303/22        | . . from sulfonic acids, by reactions not involving the formation of sulfo or halosulfonyl groups; {from sulfonic halides by reactions not involving the formation of halosulfonyl groups} |
| 281/14   | . . . the carbon atom being further bound to a carbon atom of a six-membered aromatic ring  | 303/24        | . of esters of sulfuric acids  |
| 281/16   | . Compounds containing any of the groups<br>$\begin{array}{c} \text{N-} \\   \\ \text{>N-N-C-N<} \end{array} \text{ or } \begin{array}{c} \text{-N-} \\   \\ \text{>N-N=C-N<} \end{array}, \text{ e.g.}$ aminoguanidine | 303/26        | . of esters of sulfonic acids  |
| 281/18   | . . the other nitrogen atom being further doubly-bound to a carbon atom, e.g. guanyldiazones  | 303/28        | . . by reaction of hydroxy compounds with sulfonic acids or derivatives thereof  |
| 281/20   | . the two nitrogen atoms of the functional groups being doubly-bound to each other, e.g. azoformamide   | 303/30        | . . by reactions not involving the formation of esterified sulfo groups  |
| <b>291/00</b>  | <b>Compounds containing carbon and nitrogen and having functional groups not covered by groups C07C 201/00 - C07C 281/00</b>  | 303/32        | . of salts of sulfonic acids   |
| 291/02   | . containing nitrogen-oxide bonds   | 303/34        | . of amides of sulfuric acids  |
| 291/04   | . . containing amino-oxide bonds  | 303/36        | . of amides of sulfonic acids  |
| 291/06   | . . Nitrile oxides  | 303/38        | . . by reaction of ammonia or amines with sulfonic acids, or with esters, anhydrides, or halides thereof   |
| 291/08   | . . Azoxy compounds   | 303/40        | . . by reactions not involving the formation of sulfonamide groups   |
| 291/10   | . Isocyanides   | 303/42        | . Separation; Purification; Stabilisation; Use of additives  |
| 291/12   | . Fulminates  | 303/44        | . . Separation; Purification   |
| 291/14   | . containing at least one carbon atom bound to a nitro or nitroso group and doubly-bound to a hetero atom   | 303/46        | . . . from by-products of refining mineral oils with sulfuric acid   |
| <b>Compounds containing carbon together with sulfur, selenium, or tellurium, with or without hydrogen, halogens, oxygen, or nitrogen (irradiation products of cholesterol or its derivatives C07C 401/00; vitamin D derivatives, 9-10-seco cyclopenta[a]phenanthrene or analogues obtained by chemical preparation without irradiation C07C 401/00; derivatives of cyclohexane or of a cyclohexene {or of cyclohexadiene}, having a side-chain containing an acyclic unsaturated part of at least four carbon atoms, this part being directly attached to the cyclohexane or cyclohexene {or cyclohexadiene} rings C07C 403/00; protaglandins or derivatives thereof C07C 405/00; peroxy compounds C07C 407/00, C07C 409/00)</b> |   |               |  |
| <b>301/00</b>  | <b>Esters of sulfurous acid (cyclic esters C07D)</b>  | <b>305/00</b> | <b>Esters of sulfuric acids (cyclic esters C07D)</b>   |
| 301/02   | . having sulfite groups bound to carbon atoms of six-membered aromatic rings  | 305/02        | . having oxygen atoms of sulfate groups bound to acyclic carbon atoms of a carbon skeleton   |
| <b>303/00</b>  | <b>Preparation of esters or amides of sulfuric acids; Preparation of sulfonic acids or of their esters, halides, anhydrides or amides</b>   | 305/04        | . . being acyclic and saturated  |
| 303/02   | . of sulfonic acids or halides thereof  | 305/06        | . . . Hydrogenosulfates  |
| 303/04   | . . by substitution of hydrogen atoms by sulfo or halosulfonyl groups   | 305/08        | . . . Dialkylsulfates; Substituted dialkylsulfates   |
| 303/06   | . . . by reaction with sulfuric acid or sulfur trioxide   | 305/10        | . . . being further substituted by singly-bound oxygen atoms   |
| 303/08   | . . . by reaction with halogenosulfonic acids   | 305/12        | . . being saturated and containing rings   |
| 303/10   | . . . by reaction with sulfur dioxide and halogen or by reaction with sulfuryl halides  | 305/14        | . . being acyclic and unsaturated  |
| 303/12   | . . . by reaction with thionylhalides   | 305/16        | . . being unsaturated and containing rings   |
| 303/14   | . . by sulfoxidation, i.e. by reaction with sulfur dioxide and oxygen with formation of sulfo or halosulfonyl groups  | 305/18        | . . . containing six-membered aromatic rings   |
| 303/16   | . . by oxidation of thiols, sulfides, hydropolysulfides, or polysulfides with formation of sulfo or halosulfonyl groups   | 305/20        | . having oxygen atoms of sulfate groups bound to carbon atoms of rings other than six-membered aromatic rings  |
|  |   | 305/22        | . having oxygen atoms of sulfate groups bound to carbon atoms of six-membered aromatic rings   |
|  |   | 305/24        | . . of non-condensed six-membered aromatic rings   |
|  |   | 305/26        | . Halogenosulfates, i.e. monoesters of halogenosulfuric acids  |
|  |   | <b>307/00</b> | <b>Amides of sulfuric acids, i.e. compounds having singly-bound oxygen atoms of sulfate groups replaced by nitrogen atoms, not being part of nitro or nitroso groups</b>                   |
|  |   | 307/02        | . Monoamides of sulfuric acids or esters thereof, e.g. sulfamic acids  |
|  |   | 307/04        | . Diamides of sulfuric acids   |
|  |   | 307/06        | . . having nitrogen atoms of the sulfamide groups bound to acyclic carbon atoms  |
|  |   | 307/08        | . . having nitrogen atoms of the sulfamide groups bound to carbon atoms of rings other than six-membered aromatic rings  |

|               |   |        |   |
|---------------|---|--------|---|
| 307/10        | . . having nitrogen atoms of the sulfamide groups bound to carbon atoms of six-membered aromatic rings  | 309/27 | . . . containing carboxyl groups bound to the carbon skeleton   |
| <b>309/00</b> | <b>Sulfonic acids; Halides, esters, or anhydrides thereof</b>   | 309/28 | . . having sulfo groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton   |
| 309/01        | . Sulfonic acids  | 309/29 | . . . of non-condensed six-membered aromatic rings  |
| 309/02        | . . having sulfo groups bound to acyclic carbon atoms   | 309/30 | . . . . of six-membered aromatic rings substituted by alkyl groups  |
| 309/03        | . . . of an acyclic saturated carbon skeleton   | 309/31 | . . . . . by alkyl groups containing at least three carbon atoms  |
| 309/04        | . . . . containing only one sulfo group   | 309/32 | . . . . containing at least two non-condensed six-membered aromatic rings in the carbon skeleton  |
| 309/05        | . . . . containing at least two sulfo groups bound to the carbon skeleton   | 309/33 | . . . of six-membered aromatic rings being part of condensed ring systems   |
| 309/06        | . . . . containing halogen atoms, or nitro or nitroso groups bound to the carbon skeleton   | 309/34 | . . . . formed by two rings   |
| 309/07        | . . . . containing oxygen atoms bound to the carbon skeleton  | 309/35 | . . . . . Naphthalene sulfonic acids  |
| 309/08        | . . . . . containing hydroxy groups bound to the carbon skeleton  | 309/36 | . . . . . substituted by alkyl groups   |
| 309/09        | . . . . . containing etherified hydroxy groups bound to the carbon skeleton   | 309/37 | . . . . . by alkyl groups containing at least three carbon atoms  |
| 309/10        | . . . . . with the oxygen atom of at least one of the etherified hydroxy groups further bound to an acyclic carbon atom   | 309/38 | . . . . formed by at least three rings  |
| 309/11        | . . . . . with the oxygen atom of at least one of the etherified hydroxy groups further bound to a carbon atom of a six-membered aromatic ring  | 309/39 | . . . containing halogen atoms bound to the carbon skeleton   |
| 309/12        | . . . . . containing esterified hydroxy groups bound to the carbon skeleton   | 309/40 | . . . containing nitro or nitroso groups bound to the carbon skeleton   |
| 309/13        | . . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton  | 309/41 | . . . containing singly-bound oxygen atoms bound to the carbon skeleton   |
| 309/14        | . . . . . containing amino groups bound to the carbon skeleton  | 309/42 | . . . . having the sulfo groups bound to carbon atoms of non-condensed six-membered aromatic rings  |
| 309/15        | . . . . . the nitrogen atom of at least one of the amino groups being part of any of the groups<br>$\begin{array}{c} \text{X} \\ \parallel \\ \text{>N}-\text{C}-\text{Y} \quad \text{or} \quad -\text{N}=\text{C} \begin{array}{l} \text{X} \\ \diagup \\ \text{Y} \end{array} \end{array}, \text{X}$ <p>being a hetero atom, Y being any atom</p> | 309/43 | . . . . having at least one of the sulfo groups bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system  |
| 309/16        | . . . . . containing doubly-bound nitrogen atoms bound to the carbon skeleton   | 309/44 | . . . containing doubly-bound oxygen atoms bound to the carbon skeleton   |
| 309/17        | . . . . containing carboxyl groups bound to the carbon skeleton   | 309/45 | . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton  |
| 309/18        | . . . . . containing amino groups bound to the same carbon skeleton   | 309/46 | . . . . having the sulfo groups bound to carbon atoms of non-condensed six-membered aromatic rings  |
| 309/19        | . . . of a saturated carbon skeleton containing rings   | 309/47 | . . . . having at least one of the sulfo groups bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system  |
| 309/20        | . . . of an acyclic unsaturated carbon skeleton   | 309/48 | . . . . the carbon skeleton being further substituted by halogen atoms  |
| 309/21        | . . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton  | 309/49 | . . . . the carbon skeleton being further substituted by singly-bound oxygen atoms  |
| 309/22        | . . . . containing carboxyl groups bound to the carbon skeleton   | 309/50 | . . . . . having at least one of the sulfo groups bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system  |
| 309/23        | . . . of an unsaturated carbon skeleton containing rings other than six-membered aromatic rings   | 309/51 | . . . . . at least one of the nitrogen atoms being part of any of the groups<br>$\begin{array}{c} \text{X} \\ \parallel \\ \text{>N}-\text{C} \begin{array}{l} \text{Y} \\ \diagdown \end{array} \quad \text{or} \quad -\text{N}=\text{C} \begin{array}{l} \text{X} \\ \diagup \\ \text{Y} \end{array} \end{array}, \text{X being a hetero atom, Y being any atom}$ |
| 309/24        | . . . of a carbon skeleton containing six-membered aromatic rings   | 309/52 | . . . . the carbon skeleton being further substituted by doubly-bound oxygen atoms  |
| 309/25        | . . having sulfo groups bound to carbon atoms of rings other than six-membered aromatic rings of a carbon skeleton  | 309/53 | . . . . . the carbon skeleton containing carbon atoms of quinone rings  |
| 309/26        | . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton  |        |   |



- 309/55 . . . . . Y being a hydrogen or a carbon atom
- 309/56 . . . . . Y being a hetero atom
- 309/57 . . . containing carboxyl groups bound to the carbon skeleton
- 309/58 . . . Carboxylic acid groups or esters thereof
- 309/59 . . . Nitrogen analogues of carboxyl groups
- 309/60 . . . the carbon skeleton being further substituted by singly-bound oxygen atoms
- 309/61 . . . the carbon skeleton being further substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 309/62 . . Sulfonated fats, oils or waxes of undetermined constitution ([\(bituminosulfonic acid C07G 9/00; chemical modification of petroleum waxes C10G 73/38\)](#))
- 309/63 . Esters of sulfonic acids
- 309/64 . . having sulfur atoms of esterified sulfo groups bound to acyclic carbon atoms
- 309/65 . . . of a saturated carbon skeleton
- 309/66 . . . Methanesulfonates
- 309/67 . . . of an unsaturated carbon skeleton
- 309/68 . . . of a carbon skeleton substituted by singly-bound oxygen atoms
- 309/69 . . . of a carbon skeleton substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 309/70 . . . of a carbon skeleton substituted by carboxyl groups
- 309/71 . . having sulfur atoms of esterified sulfo groups bound to carbon atoms of rings other than six-membered aromatic rings
- 309/72 . . having sulfur atoms of esterified sulfo groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton
- 309/73 . . . to carbon atoms of non-condensed six-membered aromatic rings
- 309/74 . . . to carbon atoms of six-membered aromatic rings being part of condensed ring systems
- 309/75 . . . containing singly-bound oxygen atoms bound to the carbon skeleton
- 309/76 . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton
- 309/77 . . . containing carboxyl groups bound to the carbon skeleton
- 309/78 . Halides of sulfonic acids
- 309/79 . . having halosulfonyl groups bound to acyclic carbon atoms
- 309/80 . . . of a saturated carbon skeleton
- 309/81 . . . of an unsaturated carbon skeleton
- 309/82 . . . of a carbon skeleton substituted by singly-bound oxygen atoms
- 309/83 . . . of a carbon skeleton substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 309/84 . . . of a carbon skeleton substituted by carboxyl groups

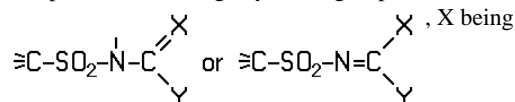
- 309/85 . . having halosulfonyl groups bound to carbon atoms of rings other than six-membered aromatic rings
- 309/86 . . having halosulfonyl groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton
- 309/87 . . . containing singly-bound oxygen atoms bound to the carbon skeleton
- 309/88 . . . containing nitrogen atoms, not being part of nitro or nitroso groups, bound to the carbon skeleton
- 309/89 . . . containing carboxyl groups bound to the carbon skeleton
- 311/00 Amides of sulfonic acids, i.e. compounds having singly-bound oxygen atoms of sulfo groups replaced by nitrogen atoms, not being part of nitro or nitroso groups**
- 311/01 . Sulfonamides having sulfur atoms of sulfonamide groups bound to acyclic carbon atoms
- 311/02 . . of an acyclic saturated carbon skeleton
- 311/03 . . . having the nitrogen atoms of the sulfonamide groups bound to hydrogen atoms or to acyclic carbon atoms
- 311/04 . . . . to acyclic carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms
- 311/05 . . . . to acyclic carbon atoms of hydrocarbon radicals substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 311/06 . . . . to acyclic carbon atoms of hydrocarbon radicals substituted by carboxyl groups
- 311/07 . . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 311/08 . . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a six-membered aromatic ring
- 311/09 . . . the carbon skeleton being further substituted by at least two halogen atoms
- 311/10 . . of a saturated carbon skeleton containing rings
- 311/11 . . of an acyclic unsaturated carbon skeleton
- 311/12 . . of an unsaturated carbon skeleton containing rings
- 311/13 . . . the carbon skeleton containing six-membered aromatic rings
- 311/14 . Sulfonamides having sulfur atoms of sulfonamide groups bound to carbon atoms of rings other than six-membered aromatic rings
- 311/15 . Sulfonamides having sulfur atoms of sulfonamide groups bound to carbon atoms of six-membered aromatic rings
- 311/16 . . having the nitrogen atom of at least one of the sulfonamide groups bound to hydrogen atoms or to an acyclic carbon atom
- 311/17 . . . to an acyclic carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms
- 311/18 . . . to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 311/19 . . . to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups

- 311/20 . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 311/21 . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a six-membered aromatic ring
- 311/22 . Sulfonamides, the carbon skeleton of the acid part being further substituted by singly-bound oxygen atoms
- 311/23 . . having the sulfur atoms of the sulfonamide groups bound to acyclic carbon atoms
- 311/24 . . . of an acyclic saturated carbon skeleton
- 311/25 . . . of a saturated carbon skeleton containing rings
- 311/26 . . . of an acyclic unsaturated carbon skeleton
- 311/27 . . . of an unsaturated carbon skeleton containing rings
- 311/28 . . having the sulfur atom of at least one of the sulfonamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 311/29 . . having the sulfur atom of at least one of the sulfonamide groups bound to a carbon atom of a six-membered aromatic ring
- 311/30 . Sulfonamides, the carbon skeleton of the acid part being further substituted by singly-bound nitrogen atoms, not being part of nitro or nitroso groups
- 311/31 . . having the sulfur atoms of the sulfonamide groups bound to acyclic carbon atoms
- 311/32 . . . of an acyclic saturated carbon skeleton
- 311/33 . . . of a saturated carbon skeleton containing rings
- 311/34 . . . of an acyclic unsaturated carbon skeleton
- 311/35 . . . of an unsaturated carbon skeleton containing rings
- 311/36 . . having the sulfur atom of at least one of the sulfonamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 311/37 . . having the sulfur atom of at least one of the sulfonamide groups bound to a carbon atom of a six-membered aromatic ring
- 311/38 . . . having sulfur atoms of sulfonamide groups and amino groups bound to carbon atoms of six-membered rings of the same carbon skeleton
- 311/39 . . . . having the nitrogen atom of at least one of the sulfonamide groups bound to hydrogen atoms or to an acyclic carbon atom
- 311/40 . . . . to an acyclic carbon atom of a hydrocarbon radical substituted by singly-bound oxygen atoms
- 311/41 . . . . to an acyclic carbon atom of a hydrocarbon radical substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 311/42 . . . . to an acyclic carbon atom of a hydrocarbon radical substituted by carboxyl groups
- 311/43 . . . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a ring other than a six-membered aromatic ring
- 311/44 . . . . having the nitrogen atom of at least one of the sulfonamide groups bound to a carbon atom of a six-membered aromatic ring

- 311/45 . . at least one of the singly-bound nitrogen atoms being part of any of the groups  

$$\begin{array}{c} \text{X} \\ \diagup \quad \diagdown \\ \text{N}-\text{C} \\ \diagdown \quad \diagup \\ \text{Y} \end{array} \quad \text{or} \quad \begin{array}{c} \text{X} \\ \diagup \quad \diagdown \\ -\text{N}=\text{C} \\ \diagdown \quad \diagup \\ \text{Y} \end{array}$$

Y being any atom, e.g. N-acylaminosulfonamides
- 311/46 . . . Y being a hydrogen or a carbon atom
- 311/47 . . . Y being a hetero atom
- 311/48 . having nitrogen atoms of sulfonamide groups further bound to another hetero atom
- 311/49 . . to nitrogen atoms
- 311/50 . Compounds containing any of the groups



- 311/51 . . Y being a hydrogen or a carbon atom
- 311/52 . . Y being a hetero atom
- 311/53 . . . X and Y not being nitrogen atoms, e.g. N-sulfonylcarbamic acid
- 311/54 . . . either X or Y, but not both, being nitrogen atoms, e.g. N-sulfonylurea
- 311/55 . . . . having sulfur atoms of the sulfonylurea groups bound to acyclic carbon atoms
- 311/56 . . . . having sulfur atoms of the sulfonylurea groups bound to carbon atoms of rings other than six-membered aromatic rings
- 311/57 . . . . having sulfur atoms of the sulfonylurea groups bound to carbon atoms of six-membered aromatic rings
- 311/58 . . . . . having nitrogen atoms of the sulfonylurea groups bound to hydrogen atoms or to acyclic carbon atoms
- 311/59 . . . . . having nitrogen atoms of the sulfonylurea groups bound to carbon atoms of rings other than six-membered aromatic rings
- 311/60 . . . . . having nitrogen atoms of the sulfonylurea groups bound to carbon atoms of six-membered aromatic rings
- 311/61 . . . . . having nitrogen atoms of the sulfonylurea groups further bound to another hetero atom
- 311/62 . . . . . having nitrogen atoms of the sulfonylurea groups further acylated
- 311/63 . . . . N-sulfonylisoureas
- 311/64 . . . X and Y being nitrogen atoms, e.g. N-sulfonylguanidine
- 311/65 . N-sulfonylisocyanates

**313/00 Sulfinic acids; Sulfenic acids; Halides, esters or anhydrides thereof; Amides of sulfinic or sulfenic acids, i.e. compounds having singly-bound oxygen atoms of sulfinic or sulfenic groups replaced by nitrogen atoms, not being part of nitro or nitroso groups**

- 313/02 . Sulfinic acids; Derivatives thereof
- 313/04 . . Sulfinic acids; Esters thereof
- 313/06 . . Sulfinamides
- 313/08 . Sulfenic acids; Derivatives thereof
- 313/10 . . Sulfenic acids; Esters thereof
- 313/12 . . . having sulfur atoms of sulfenic groups bound to acyclic carbon atoms

- 313/14 . . . having sulfur atoms of sulfenic groups bound to carbon atoms of rings other than six-membered aromatic rings
- 313/16 . . . having sulfur atoms of sulfenic groups bound to carbon atoms of six-membered aromatic rings
- 313/18 . . Sulfenamides
- 313/20 . . . having sulfur atoms of sulfenamide groups bound to acyclic carbon atoms
- 313/22 . . . having sulfur atoms of sulfenamide groups bound to carbon atoms of rings other than six-membered aromatic rings
- 313/24 . . . having sulfur atoms of sulfenamide groups bound to carbon atoms of six-membered aromatic rings
- 313/26 . . . Compounds containing any of the groups  

$$\begin{array}{c} \text{X} \\ \parallel \\ \equiv\text{C}-\text{S}-\text{N}-\text{C}-\text{Y} \text{ or } \equiv\text{C}-\text{S}-\text{N}=\text{C}-\text{Y} \end{array}$$
, X being a hetero atom, Y being any atom
- 313/28 . . . . Y being a hydrogen or a carbon atom
- 313/30 . . . . Y being a hetero atom
- 313/32 . . . . . X and Y not being nitrogen atoms, e.g. N-sulphenylcarbamic acid
- 313/34 . . . . . either X or Y, but not both, being nitrogen atoms, e.g. N-sulphenylureas
- 313/36 . . . having nitrogen atoms of sulfenamide groups further bound to other hetero atoms
- 313/38 . . . N-sulphenylisocyanates
- 315/00 Preparation of sulfones; Preparation of sulfoxides**
- 315/02 . by formation of sulfone or sulfoxide groups by oxidation of sulfides, or by formation of sulfone groups by oxidation of sulfoxides
- 315/04 . by reactions not involving the formation of sulfone or sulfoxide groups
- 315/06 . Separation; Purification; Stabilisation; Use of additives
- 317/00 Sulfones; Sulfoxides**
- 317/02 . having sulfone or sulfoxide groups bound to acyclic carbon atoms
- 317/04 . . of an acyclic saturated carbon skeleton
- 317/06 . . of a saturated carbon skeleton containing rings
- 317/08 . . of an acyclic unsaturated carbon skeleton
- 317/10 . . of an unsaturated carbon skeleton containing rings
- 317/12 . having sulfone or sulfoxide groups bound to carbon atoms of rings other than six-membered aromatic rings
- 317/14 . having sulfone or sulfoxide groups bound to carbon atoms of six-membered aromatic rings
- 317/16 . having sulfone or sulfoxide groups and singly-bound oxygen atoms bound to the same carbon skeleton
- 317/18 . . with sulfone or sulfoxide groups bound to acyclic carbon atoms of the carbon skeleton
- 317/20 . . with sulfone or sulfoxide groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton
- 317/22 . . with sulfone or sulfoxide groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton
- 317/24 . having sulfone or sulfoxide groups and doubly-bound oxygen atoms bound to the same carbon skeleton
- 317/26 . having sulfone or sulfoxide groups and nitrogen atoms, not being part of nitro or nitroso groups, bound to the same carbon skeleton
- 317/28 . . with sulfone or sulfoxide groups bound to acyclic carbon atoms of the carbon skeleton
- 317/30 . . with sulfone or sulfoxide groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton
- 317/32 . . with sulfone or sulfoxide groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton
- 317/34 . . . having sulfone or sulfoxide groups and amino groups bound to carbon atoms of six-membered aromatic rings being part of the same non-condensed ring or of a condensed ring system containing that ring
- 317/36 . . . . with the nitrogen atoms of the amino groups bound to hydrogen atoms or to carbon atoms
- 317/38 . . . . with the nitrogen atom of at least one amino group being part of any of the groups  

$$\begin{array}{c} \text{X} \\ \parallel \\ >\text{N}-\text{C}-\text{Y} \text{ or } -\text{N}=\text{C}-\text{Y} \end{array}$$
, X being a hetero atom, Y being any atom, e.g. N-acylaminosulfones
- 317/40 . . . . . Y being a hydrogen or a carbon atom
- 317/42 . . . . . Y being a hetero atom
- 317/44 . having sulfone or sulfoxide groups and carboxyl groups bound to the same carbon skeleton
- 317/46 . . the carbon skeleton being further substituted by singly-bound oxygen atoms
- 317/48 . . the carbon skeleton being further substituted by singly-bound nitrogen atoms, not being part of nitro or nitroso groups
- 317/50 . . . at least one of the nitrogen atoms being part of any of the groups  

$$\begin{array}{c} \text{X} \\ \parallel \\ >\text{N}-\text{C}=\text{Y} \text{ or } -\text{N}=\text{C}-\text{Y} \end{array}$$
, X being a hetero atom, Y being any atom
- 319/00 Preparation of thiols, sulfides, hydropolysulfides or polysulfides**
- 319/02 . of thiols
- 319/04 . . by addition of hydrogen sulfide or its salts to unsaturated compounds
- 319/06 . . from sulfides, hydropolysulfides or polysulfides
- 319/08 . . by replacement of hydroxy groups or etherified or esterified hydroxy groups
- 319/10 . . . by replacement of hydroxy groups or etherified or esterified hydroxy groups bound to carbon atoms of six-membered aromatic rings
- 319/12 . . by reactions not involving the formation of mercapto groups
- 319/14 . of sulfides
- 319/16 . . by addition of hydrogen sulfide or its salts to unsaturated compounds
- 319/18 . . by addition of thiols to unsaturated compounds
- 319/20 . . by reactions not involving the formation of sulfide groups
- 319/22 . of hydropolysulfides or polysulfides
- 319/24 . . by reactions involving the formation of sulfur-to-sulfur bonds

|               |   |        |   |
|---------------|---|--------|---|
| 319/26        | • Separation; Purification; Stabilisation; Use of additives   | 323/14 | • • • the carbon skeleton being acyclic and unsaturated   |
| 319/28        | • • Separation; Purification  | 323/15 | • • • the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings   |
| 319/30        | • • • from the by-products of refining mineral oils   |        |   |
| <b>321/00</b> | <b>Thiols, sulfides, hydropolysulfides or polysulfides</b>  | 323/16 | • • • the carbon skeleton containing six-membered aromatic rings  |
| 321/02        | • Thiols having mercapto groups bound to acyclic carbon atoms   | 323/17 | • • having the sulfur atom of at least one of the thio groups bound to a carbon atom of a ring other than a six-membered aromatic ring of the carbon skeleton |
| 321/04        | • • of an acyclic saturated carbon skeleton   |        |   |
| 321/06        | • • of a saturated carbon skeleton containing rings   | 323/18 | • • having the sulfur atom of at least one of the thio groups bound to a carbon atom of a six-membered aromatic ring of the carbon skeleton                   |
| 321/08        | • • of an acyclic unsaturated carbon skeleton   |        |   |
| 321/10        | • • of an unsaturated carbon skeleton containing rings  | 323/19 | • • • with singly-bound oxygen atoms bound to acyclic carbon atoms of the carbon skeleton   |
| 321/12        | • Sulfides, hydropolysulfides, or polysulfides having thio groups bound to acyclic carbon atoms   | 323/20 | • • • with singly-bound oxygen atoms bound to carbon atoms of the same non-condensed six-membered aromatic ring   |
| 321/14        | • • of an acyclic saturated carbon skeleton   | 323/21 | • • • with the sulfur atom of the thio group bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system                     |
| 321/16        | • • of a saturated carbon skeleton containing rings   | 323/22 | • containing thio groups and doubly-bound oxygen atoms bound to the same carbon skeleton  |
| 321/18        | • • of an acyclic unsaturated carbon skeleton   | 323/23 | • containing thio groups and nitrogen atoms, not being part of nitro or nitroso groups, bound to the same carbon skeleton                                     |
| 321/20        | • • of an unsaturated carbon skeleton containing rings  |        |   |
| 321/22        | • Thiols, sulfides, hydropolysulfides, or polysulfides having thio groups bound to carbon atoms of rings other than six-membered aromatic rings               | 323/24 | • • having the sulfur atoms of the thio groups bound to acyclic carbon atoms of the carbon skeleton   |
| 321/24        | • Thiols, sulfides, hydropolysulfides, or polysulfides having thio groups bound to carbon atoms of six-membered aromatic rings                                | 323/25 | • • • the carbon skeleton being acyclic and saturated   |
| 321/26        | • • Thiols  | 323/26 | • • • the carbon skeleton being saturated and containing rings  |
| 321/28        | • • Sulfides, hydropolysulfides, or polysulfides having thio groups bound to carbon atoms of six-membered aromatic rings                                      | 323/27 | • • • the carbon skeleton being acyclic and unsaturated   |
| 321/30        | • • • Sulfides having the sulfur atom of at least one thio group bound to two carbon atoms of six-membered aromatic rings                                     | 323/28 | • • • the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings   |
| <b>323/00</b> | <b>Thiols, sulfides, hydropolysulfides or polysulfides substituted by halogen, oxygen or nitrogen atoms, or by sulfur atoms not being part of thio groups</b> | 323/29 | • • • the carbon skeleton containing six-membered aromatic rings  |
| 323/01        | • containing thio groups and halogen atoms, or nitro or nitroso groups bound to the same carbon skeleton  | 323/30 | • • having the sulfur atom of at least one of the thio groups bound to a carbon atom of a ring other than a six-membered aromatic ring of the carbon skeleton |
| 323/02        | • • having sulfur atoms of thio groups bound to acyclic carbon atoms of the carbon skeleton   |        |   |
| 323/03        | • • • the carbon skeleton being acyclic and saturated   | 323/31 | • • having the sulfur atom of at least one of the thio groups bound to a carbon atom of a six-membered aromatic ring of the carbon skeleton                   |
| 323/04        | • • • the carbon skeleton being saturated and containing rings  | 323/32 | • • • having at least one of the nitrogen atoms bound to an acyclic carbon atom of the carbon skeleton  |
| 323/05        | • • • the carbon skeleton being acyclic and unsaturated   | 323/33 | • • • having at least one of the nitrogen atoms bound to a carbon atom of the same non-condensed six-membered aromatic ring                                   |
| 323/06        | • • • the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings   | 323/34 | • • • • the thio group being a mercapto group   |
| 323/07        | • • • the carbon skeleton containing six-membered aromatic rings  | 323/35 | • • • • the thio group being a sulfide group  |
| 323/08        | • • having sulfur atoms of thio groups bound to carbon atoms of rings other than six-membered aromatic rings of the carbon skeleton                           | 323/36 | • • • • the sulfur atom of the sulfide group being further bound to an acyclic carbon atom  |
| 323/09        | • • having sulfur atoms of thio groups bound to carbon atoms of six-membered aromatic rings of the carbon skeleton  | 323/37 | • • • • the sulfur atom of the sulfide group being further bound to a carbon atom of a six-membered aromatic ring   |
| 323/10        | • containing thio groups and singly-bound oxygen atoms bound to the same carbon skeleton  |        |   |
| 323/11        | • • having the sulfur atoms of the thio groups bound to acyclic carbon atoms of the carbon skeleton   | 323/38 | • • • with the sulfur atom of the thio group bound to a carbon atom of a six-membered aromatic ring being part of a condensed ring system                     |
| 323/12        | • • • the carbon skeleton being acyclic and saturated   |        |   |
| 323/13        | • • • the carbon skeleton being saturated and containing rings  |        |   |

- 323/39 . . at least one of the nitrogen atoms being part of any of the groups
- $$\begin{array}{c} \text{X} \\ \parallel \\ \text{N}-\text{C}-\text{Y} \end{array} \text{ or } \begin{array}{c} \text{X} \\ \diagup \\ -\text{N}=\text{C} \\ \diagdown \\ \text{Y} \end{array}, \text{X}$$
- being a hetero atom, Y being any atom
- 323/40 . . . Y being a hydrogen or a carbon atom
- 323/41 . . . . Y being a hydrogen or an acyclic carbon atom
- 323/42 . . . . Y being a carbon atom of a six-membered aromatic ring
- 323/43 . . . Y being a hetero atom
- 323/44 . . . . X or Y being nitrogen atoms
- 323/45 . . having at least one of the nitrogen atoms doubly-bound to the carbon skeleton
- 323/46 . . having at least one of the nitrogen atoms, not being part of nitro or nitroso groups, further bound to other hetero atoms
- 323/47 . . . to oxygen atoms
- 323/48 . . . to nitrogen atoms
- 323/49 . . . to sulfur atoms
- 323/50 . containing thio groups and carboxyl groups bound to the same carbon skeleton
- 323/51 . . having the sulfur atoms of the thio groups bound to acyclic carbon atoms of the carbon skeleton
- 323/52 . . . the carbon skeleton being acyclic and saturated
- 323/53 . . . the carbon skeleton being saturated and containing rings
- 323/54 . . . the carbon skeleton being acyclic and unsaturated
- 323/55 . . . the carbon skeleton being unsaturated and containing rings other than six-membered aromatic rings
- 323/56 . . . the carbon skeleton containing six-membered aromatic rings
- 323/57 . . . the carbon skeleton being further substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 323/58 . . . . with amino groups bound to the carbon skeleton
- 323/59 . . . . with acylated amino groups bound to the carbon skeleton
- 323/60 . . . with the carbon atom of at least one of the carboxyl groups bound to nitrogen atoms
- 323/61 . . having the sulfur atom of at least one of the thio groups bound to a carbon atom of a ring other than a six-membered aromatic ring of the carbon skeleton
- 323/62 . . having the sulfur atom of at least one of the thio groups bound to a carbon atom of a six-membered aromatic ring of the carbon skeleton
- 323/63 . . . the carbon skeleton being further substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 323/64 . containing thio groups and sulfur atoms, not being part of thio groups, bound to the same carbon skeleton
- 323/65 . . containing sulfur atoms of sulfone or sulfoxide groups bound to the carbon skeleton
- 323/66 . . containing sulfur atoms of sulfo, esterified sulfo or halosulfonyl groups, bound to the carbon skeleton
- 323/67 . . containing sulfur atoms of sulfonamide groups, bound to the carbon skeleton

**325/00 Thioaldehydes; Thioketones; Thioquinones; Oxides thereof**

- 325/02 . Thioketones; Oxides thereof
- 325/04 . Thioquinones; Oxides thereof

**327/00 Thiocarboxylic acids**

- 327/02 . Monothiocarboxylic acids
- 327/04 . . having carbon atoms of thiocarboxyl groups bound to hydrogen atoms or to acyclic carbon atoms
- 327/06 . . . to hydrogen atoms or to carbon atoms of an acyclic saturated carbon skeleton
- 327/08 . . . to carbon atoms of a saturated carbon skeleton containing rings
- 327/10 . . . to carbon atoms of an acyclic unsaturated carbon skeleton
- 327/12 . . . to carbon atoms of an unsaturated carbon skeleton containing rings
- 327/14 . . having carbon atoms of thiocarboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings
- 327/16 . . having carbon atoms of thiocarboxyl groups bound to carbon atoms of six-membered aromatic rings
- 327/18 . Dithiocarboxylic acids
- 327/20 . Esters of monothiocarboxylic acids
- 327/22 . . having carbon atoms of esterified thiocarboxyl groups bound to hydrogen atoms or to acyclic carbon atoms
- 327/24 . . having carbon atoms of esterified thiocarboxyl groups bound to carbon atoms of rings other than six-membered aromatic rings
- 327/26 . . having carbon atoms of esterified thiocarboxyl groups bound to carbon atoms of six-membered aromatic rings
- 327/28 . . having sulfur atoms of esterified thiocarboxyl groups bound to carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms
- 327/30 . . having sulfur atoms of esterified thiocarboxyl groups bound to carbon atoms of hydrocarbon radicals substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 327/32 . . having sulfur atoms of esterified thiocarboxyl groups bound to carbon atoms of hydrocarbon radicals substituted by carboxyl groups
- 327/34 . . . with amino groups bound to the same hydrocarbon radicals
- 327/36 . Esters of dithiocarboxylic acids
- 327/38 . Amides of thiocarboxylic acids
- 327/40 . . having carbon atoms of thiocarboxamide groups bound to hydrogen atoms or to acyclic carbon atoms
- 327/42 . . . to hydrogen atoms or to carbon atoms of a saturated carbon skeleton
- 327/44 . . . to carbon atoms of an unsaturated carbon skeleton
- 327/46 . . having carbon atoms of thiocarboxamide groups bound to carbon atoms of rings other than six-membered aromatic rings
- 327/48 . . having carbon atoms of thiocarboxamide groups bound to carbon atoms of six-membered aromatic rings

|        |   |        |   |
|--------|---|--------|---|
| 327/50 | <ul style="list-style-type: none"> <li>Compounds containing any of the groups <math display="block">\begin{array}{c} \text{S} \quad \text{X} \\ \parallel \quad \parallel \\ -\text{C}-\text{N}-\text{C}-\text{Y} \quad \text{or} \quad -\text{C}-\text{N}=\text{C}-\text{Y} \end{array}</math>           , X being a hetero atom, Y being any atom         </li> </ul> | 331/24 | <ul style="list-style-type: none"> <li>the carbon skeleton containing six-membered aromatic rings</li> </ul>  |
| 327/52 | <ul style="list-style-type: none"> <li>Y being a hydrogen or a carbon atom</li> </ul>   | 331/26 | <ul style="list-style-type: none"> <li>having isothiocyanate groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>  |
| 327/54 | <ul style="list-style-type: none"> <li>Y being a hetero atom</li> </ul>   | 331/28 | <ul style="list-style-type: none"> <li>having isothiocyanate groups bound to carbon atoms of six-membered aromatic rings</li> </ul>   |
| 327/56 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarboxamide groups further bound to another hetero atom</li> </ul>  | 331/30 | <ul style="list-style-type: none"> <li>containing at least two isothiocyanate groups bound to the same carbon skeleton</li> </ul>   |
| 327/58 | <ul style="list-style-type: none"> <li>Derivatives of thiocarboxylic acids, the doubly-bound oxygen atoms being replaced by nitrogen atoms, e.g. imino-thio ethers</li> </ul>   | 331/32 | <ul style="list-style-type: none"> <li>having isothiocyanate groups acylated</li> </ul>   |
| 327/60 | <ul style="list-style-type: none"> <li>Thiocarboxylic acids having sulfur atoms of thiocarboxyl groups further doubly-bound to oxygen atoms</li> </ul>  | 333/00 | <b>Derivatives of thiocarbamic acids, i.e. compounds containing any of the groups</b> $\begin{array}{c} \text{S} \quad \text{O} \quad \text{S} \\ \parallel \quad \parallel \quad \parallel \\ >\text{N}-\text{C}-\text{S}- \quad >\text{N}-\text{C}-\text{S}- \quad >\text{N}-\text{C}-\text{O}- \end{array}$ $\begin{array}{c} \text{S} \quad \text{S}- \quad \text{O}- \\ \parallel \quad \parallel \quad \parallel \\ >\text{N}-\text{C}-\text{Hal} \quad >\text{N}=\text{C}-\text{S}- \quad >\text{N}=\text{C}-\text{S}- \end{array}$ $\begin{array}{c} \text{S}- \\   \\ >\text{N}=\text{C}-\text{Hal} \end{array}$ , the   |
| 329/00 | <b>Thiocarbonic acids; Halides, esters or anhydrides thereof</b>  |        | <b>nitrogen atom not being part of nitro or nitroso groups</b>  |
| 329/02 | <ul style="list-style-type: none"> <li>Monothiocarbonic acids; Derivatives thereof</li> </ul>   | 333/02 | <ul style="list-style-type: none"> <li>Monothiocarbamic acids; Derivatives thereof</li> </ul>   |
| 329/04 | <ul style="list-style-type: none"> <li>Esters of monothiocarbonic acids</li> </ul>  | 333/04 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarbamic groups bound to hydrogen atoms or to acyclic carbon atoms</li> </ul>   |
| 329/06 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocarbonic groups bound to acyclic carbon atoms</li> </ul>  | 333/06 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarbamic groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>  |
| 329/08 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocarbonic groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>  | 333/08 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarbamic groups bound to carbon atoms of six-membered aromatic rings</li> </ul>   |
| 329/10 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocarbonic groups bound to carbon atoms of six-membered aromatic rings</li> </ul>   | 333/10 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarbamic groups being part of any of the groups <math display="block">\begin{array}{c} \text{O} \quad \text{X} \quad \text{S} \quad \text{X} \\ \parallel \quad \parallel \quad \parallel \quad \parallel \\ -\text{S}-\text{C}-\text{N}-\text{C}-\text{Y} \quad -\text{O}-\text{C}-\text{N}-\text{C}-\text{Y} \end{array}</math> <math display="block">\begin{array}{c} \text{S} \quad \text{X} \quad \text{O} \quad \text{X} \\ \parallel \quad \parallel \quad \parallel \quad \parallel \\ \text{Hal}-\text{C}-\text{N}-\text{C}-\text{Y} \quad -\text{S}-\text{C}-\text{N}-\text{C}-\text{Y} \end{array}</math> <math display="block">\begin{array}{c} \text{S} \quad \text{X} \quad \text{S} \quad \text{X} \\ \parallel \quad \parallel \quad \parallel \quad \parallel \\ -\text{O}-\text{C}-\text{N}-\text{C}-\text{Y} \quad \text{Hal}-\text{C}-\text{N}-\text{C}-\text{Y} \end{array}</math>           , X being a hetero atom, Y being any atom, e.g., N-acyl-thiocarbamates         </li></ul> |
| 331/00 | <b>Derivatives of thiocyanic acid or of isothiocyanic acid</b>  |        |   |
| 331/02 | <ul style="list-style-type: none"> <li>Thiocyanates</li> </ul>  | 333/12 | <ul style="list-style-type: none"> <li>having nitrogen atoms of thiocarbamic groups bound to other hetero atoms</li> </ul>  |
| 331/04 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to acyclic carbon atoms</li> </ul>   | 333/14 | <ul style="list-style-type: none"> <li>Dithiocarbamic acids; Derivatives thereof</li> </ul>   |
| 331/06 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>   | 333/16 | <ul style="list-style-type: none"> <li>Salts of dithiocarbamic acids</li> </ul>   |
| 331/08 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to carbon atoms of six-membered aromatic rings</li> </ul>  | 333/18 | <ul style="list-style-type: none"> <li>Esters of dithiocarbamic acids</li> </ul>  |
| 331/10 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to carbon atoms of hydrocarbon radicals substituted by singly-bound oxygen atoms</li> </ul>  | 333/20 | <ul style="list-style-type: none"> <li>having nitrogen atoms of dithiocarbamate groups bound to hydrogen atoms or to acyclic carbon atoms</li> </ul>  |
| 331/12 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to carbon atoms of hydrocarbon radicals substituted by nitrogen atoms, not being part of nitro or nitroso groups</li> </ul>  | 333/22 | <ul style="list-style-type: none"> <li>having nitrogen atoms of dithiocarbamate groups bound to carbon atoms of rings other than six-membered aromatic rings</li> </ul>   |
| 331/14 | <ul style="list-style-type: none"> <li>having sulfur atoms of thiocyanate groups bound to carbon atoms of hydrocarbon radicals substituted by carboxyl groups</li> </ul>  | 333/24 | <ul style="list-style-type: none"> <li>having nitrogen atoms of dithiocarbamate groups bound to carbon atoms of six-membered aromatic rings</li> </ul>  |
| 331/16 | <ul style="list-style-type: none"> <li>Isothiocyanates</li> </ul>   |        |   |
| 331/18 | <ul style="list-style-type: none"> <li>having isothiocyanate groups bound to acyclic carbon atoms</li> </ul>  |        |   |
| 331/20 | <ul style="list-style-type: none"> <li>of a saturated carbon skeleton</li> </ul>  |        |   |
| 331/22 | <ul style="list-style-type: none"> <li>of an unsaturated carbon skeleton</li> </ul>   |        |   |

- 333/26 . . . containing any of the groups
- $$\begin{array}{c} \text{S} \\ \parallel \\ -\text{S}-\text{C}-\text{N}-\text{C}=\text{X} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array} \quad \text{or} \quad \begin{array}{c} \text{S} \\ \parallel \\ -\text{S}-\text{C}-\text{N}=\text{C} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{X being a hetero atom, Y being any atom, e.g. N-acyldithiocarbamates}$$
- 333/28 . . . having nitrogen atoms of dithiocarbamate groups bound to other hetero atoms
- 333/30 . . having sulfur atoms of dithiocarbamic groups bound to other sulfur atoms
- 333/32 . . . Thiuramsulfides; Thiurampolysulfides
- 335/00 Thioureas, i.e. compounds containing any of the groups**
- $$\begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{C}-\text{N}< \end{array} \quad \text{or} \quad \begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{C}-\text{N}< \end{array}, \text{the nitrogen atoms not being part of nitro or nitroso groups}$$
- 335/02 . Thiourea
- 335/04 . Derivatives of thiourea
- 335/06 . . having nitrogen atoms of thiourea groups bound to acyclic carbon atoms
- 335/08 . . . of a saturated carbon skeleton
- 335/10 . . . of an unsaturated carbon skeleton
- 335/12 . . . . the carbon skeleton containing six-membered aromatic rings
- 335/14 . . having nitrogen atoms of thiourea groups bound to carbon atoms of rings other than six-membered aromatic rings
- 335/16 . . having nitrogen atoms of thiourea groups bound to carbon atoms of six-membered aromatic rings of a carbon skeleton
- 335/18 . . . being further substituted by singly-bound oxygen atoms
- 335/20 . . . being further substituted by nitrogen atoms, not being part of nitro or nitroso groups
- 335/22 . . . being further substituted by carboxyl groups
- 335/24 . . containing any of the groups
- $$\begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{C}-\text{N}-\text{C}=\text{X} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array} \quad \text{or} \quad \begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{C}-\text{N}=\text{C} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{X being a hetero atom, Y being any atom}$$
- 335/26 . . . Y being a hydrogen or a carbon atom, e.g. benzoylthioureas
- 335/28 . . . Y being a hetero atom, e.g. thiobiuret
- 335/30 . Isothioureas
- 335/32 . . having sulfur atoms of isothiourea groups bound to acyclic carbon atoms
- 335/34 . . having sulfur atoms of isothiourea groups bound to carbon atoms of rings other than six-membered aromatic rings
- 335/36 . . having sulfur atoms of isothiourea groups bound to carbon atoms of six-membered aromatic rings
- 335/38 . . containing any of the groups
- $$\begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{C}=\text{N}-\text{C}=\text{X} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array} \quad \text{or} \quad \begin{array}{c} \text{S}- \\ | \\ >\text{N}=\text{C}-\text{N}=\text{C} \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{X being a hetero atom, Y being any atom}$$

- 335/40 . having nitrogen atoms of thiourea or isothiourea groups further bound to other hetero atoms
- 335/42 . . Sulfonylthioureas; Sulfonylisothioureas
- 335/44 . . Sulfenylthioureas; Sulfenylisothioureas
- 337/00 Derivatives of thiocarbonic acids containing functional groups covered by groups C07C 333/00 or C07C 335/00 in which at least one nitrogen atom of these functional groups is further bound to another nitrogen atom not being part of a nitro or nitroso group**
- 337/02 . Compounds containing any of the groups
- $$\begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{N}-\text{C}-\text{S}- \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{e.g.}$$
- $$\begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{N}=\text{C}-\text{S}- \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}$$
- $$\begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{N}-\text{C}-\text{O}- \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{e.g.}$$
- $$\begin{array}{c} \text{O} \\ \parallel \\ >\text{N}-\text{N}-\text{C}-\text{S}- \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}$$
- or
- $$\begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{N}=\text{C}-\text{O}- \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}$$
- thiocarbazates
- 337/04 . . the other nitrogen atom being further doubly-bound to a carbon atom
- 337/06 . Compounds containing any of the groups
- $$\begin{array}{c} \text{S} \\ \parallel \\ >\text{N}-\text{N}-\text{C}-\text{N}< \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}, \text{e.g.}$$
- $$\begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{N}=\text{C}-\text{N}< \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}$$
- or
- $$\begin{array}{c} \text{S}- \\ | \\ >\text{N}-\text{N}-\text{C}=\text{N}< \\ | \quad \quad | \\ \text{Y} \quad \quad \text{Y} \end{array}$$
- thiosemicarbazides
- 337/08 . . the other nitrogen atom being further doubly-bound to a carbon atom, e.g. thiosemicarbazones
- 337/10 . the two nitrogen atoms of the functional groups being doubly-bound to each other
- 381/00 Compounds containing carbon and sulfur and having functional groups not covered by groups C07C 301/00 - C07C 337/00**
- 381/02 . Thiosulfates
- 381/04 . Thiosulfonates
- 381/06 . Compounds containing sulfur atoms only bound to two nitrogen atoms
- 381/08 . . having at least one of the nitrogen atoms acylated
- 381/10 . Compounds containing sulfur atoms doubly-bound to nitrogen atoms
- 381/12 . Sulfonium compounds
- 381/14 . Compounds containing a carbon atom having four bonds to hetero atoms with a double bond to one hetero atom and at least one bond to a sulfur atom further doubly-bound to oxygen atoms
- 391/00 Compounds containing selenium**
- 391/02 . having selenium atoms bound to carbon atoms of six-membered aromatic rings
- 395/00 Compounds containing tellurium**
- 401/00 Irradiation products of cholesterol or its derivatives; Vitamin D derivatives, 9,10-seco cyclopenta[a]phenanthrene or analogues obtained by chemical preparation without irradiation**

**403/00 Derivatives of cyclohexane or of a cyclohexene {or of cyclohexadiene}, having a side-chain containing an acyclic unsaturated part of at least four carbon atoms, this part being directly attached to the cyclohexane or cyclohexene {or cyclohexadiene} rings, e.g. vitamin A, beta-carotene, beta-ionone**

- 403/02 . having side-chains containing only carbon and hydrogen atoms
- 403/04 . having side-chains substituted by halogen atoms
- 403/06 . having side-chains substituted by singly-bound oxygen atoms
- 403/08 . . by hydroxy groups
- 403/10 . . by etherified hydroxy groups
- 403/12 . . by esterified hydroxy groups
- 403/14 . having side-chains substituted by doubly-bound oxygen atoms
- 403/16 . . not being part of —CHO groups
- 403/18 . having side-chains substituted by nitrogen atoms
- 403/20 . having side-chains substituted by carboxyl groups {or halides, anhydrides, or (thio)esters thereof}
- 403/22 . having side-chains substituted by sulfur atoms
- 403/24 . having side-chains substituted by six-membered non-aromatic rings, e.g. beta-carotene

**405/00 Compounds containing a five-membered ring having two side-chains in ortho position to each other, and having oxygen atoms directly attached to the ring in ortho position to one of the side-chains, one side-chain containing, not directly attached to the ring, a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, and the other side-chain having oxygen atoms attached in gamma-position to the ring, e.g. prostaglandins {; Analogues or derivatives thereof}**

- 405/0008 . {Analogues having the carboxyl group in the side-chains replaced by other functional groups}
- 405/0016 . . {containing only hydroxy, etherified or esterified hydroxy groups}
- 405/0025 . . {containing keto groups}
- 405/0033 . . {containing sulfur}
- 405/0041 . . {containing nitrogen}
- 405/005 . {Analogues or derivatives having the five membered ring replaced by other rings}
- 405/0058 . . {having the side-chains or their analogues or derivatives attached to a not condensed ring different from a five-membered ring}
- 405/0066 . . . {to a six-membered ring}
- 405/0075 . . {having the side-chains or their analogues or derivatives attached to a condensed ring system}
- 405/0083 . . . {which is only ortho or peri condensed, e.g. carbacyclins}
- 405/0091 . . . {which is bridged condensed}

**407/00 Preparation of peroxy compounds**

- 407/003 . {Separation; Purification; Stabilisation; Use of additives}
- 407/006 . . {Stabilisation; Use of additives}

**409/00 Peroxy compounds**

- 409/02 . the —O—O— group being bound between a carbon atom, not further substituted by oxygen atoms, and hydrogen, i.e. hydroperoxides
- 409/04 . . the carbon atom being acyclic
- 409/06 . . . Compounds containing rings other than six-membered aromatic rings

- 409/08 . . . Compounds containing six-membered aromatic rings
- 409/10 . . . . Cumene hydroperoxide
- 409/12 . . . . with two alpha, alpha-dialkylmethyl hydroperoxy groups bound to carbon atoms of the same six-membered aromatic ring
- 409/14 . . the carbon atom belonging to a ring other than a six-membered aromatic ring
- 409/16 . the —O—O— group being bound between two carbon atoms not further substituted by oxygen atoms, i.e. peroxides
- 409/18 . . at least one of the carbon atoms belonging to a ring other than a six-membered aromatic ring
- 409/20 . the —O—O— group being bound to a carbon atom further substituted by singly—bound oxygen atoms
- 409/22 . . having two —O—O— groups bound to the carbon atom
- 409/24 . the —O—O— group being bound between a >C=O group and hydrogen, i.e. peroxy acids
- 409/26 . . Peracetic acid
- 409/28 . . a >C=O group being bound to a carbon atom of a ring other than a six-membered aromatic ring
- 409/30 . . a >C=O group being bound to a carbon atom of a six-membered aromatic ring
- 409/32 . the —O—O— group being bound between two >C=O groups
- 409/34 . . both belonging to carboxylic acids
- 409/36 . . . Diacetyl peroxide
- 409/38 . the —O—O— group being bound between a >C=O group and a carbon atom, not further substituted by oxygen atoms, i.e. esters of peroxy acids
- 409/40 . containing nitrogen atoms
- 409/42 . containing sulfur atoms
- 409/44 . . with sulfur atoms directly bound to the —O—O— groups, e.g. persulfonic acids

**Indexing scheme associated with groups C07C 1/00 - C07C 6/00, relating to catalysts used in the preparation of hydrocarbons**

- 2521/00 Catalysts comprising the elements, oxides or hydroxides of magnesium, boron, aluminium, carbon, silicon, titanium, zirconium or hafnium**
- 2521/02 . Boron or aluminium; Oxides or hydroxides thereof
- 2521/04 . . Alumina
- 2521/06 . Silicon, titanium, zirconium or hafnium; Oxides or hydroxides thereof
- 2521/08 . . Silica
- 2521/10 . Magnesium; Oxides or hydroxides thereof
- 2521/12 . Silica and alumina
- 2521/14 . Silica and magnesia
- 2521/16 . Clays or other mineral silicates
- 2521/18 . Carbon
- 2523/00 Catalysts comprising metals or metal oxides or hydroxides, not provided for in group C07C 2521/00 (C07C 2521/16 takes precedence)**
- 2523/02 . of the alkali- or alkaline earth metals or beryllium
- 2523/04 . . Alkali metals
- 2523/06 . of zinc, cadmium or mercury
- 2523/08 . of gallium, indium or thallium
- 2523/10 . of rare earths
- 2523/12 . of actinides
- 2523/14 . of germanium, tin or lead

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| 2523/16  | . of arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium         | 2523/84        | . . . with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium  |
| 2523/18  | . . Arsenic, antimony or bismuth   | 2523/843       | . . . . Arsenic, antimony or bismuth  |
| 2523/20  | . . Vanadium, niobium or tantalum  | 2523/847       | . . . . Vanadium, niobium or tantalum   |
| 2523/22  | . . . Vanadium   | 2523/85        | . . . . Chromium, molybdenum or tungsten  |
| 2523/24  | . . Chromium, molybdenum or tungsten   | 2523/86        | . . . . . Chromium  |
| 2523/26  | . . . Chromium   | 2523/88        | . . . . . Molybdenum  |
| 2523/28  | . . . Molybdenum   | 2523/881       | . . . . . and iron  |
| 2523/30  | . . . Tungsten   | 2523/882       | . . . . . and cobalt  |
| 2523/31  | . . . combined with bismuth  | 2523/883       | . . . . . and nickel  |
| 2523/32  | . . Manganese, technetium or rhenium   | 2523/885       | . . . . . and copper  |
| 2523/34  | . . . Manganese  | 2523/887       | . . . . . containing in addition other metals, oxides or hydroxides provided for in groups <a href="#">C07C 2523/02</a> - <a href="#">C07C 2523/36</a>  |
| 2523/36  | . . . Rhenium  | 2523/888       | . . . . . Tungsten  |
| 2523/38  | . of noble metals  | 2523/889       | . . . . Manganese, technetium or rhenium  |
| 2523/40  | . . of the platinum group metals   | 2523/89        | . . combined with noble metals  |
| 2523/42  | . . . Platinum   | <b>2525/00</b> | <b>Catalysts of the Raney type</b>  |
| 2523/44  | . . . Palladium  | 2525/02        | . Raney nickel  |
| 2523/46  | . . . Ruthenium, rhodium, osmium or iridium  | <b>2527/00</b> | <b>Catalysts comprising the elements or compounds of halogens, sulfur, selenium, tellurium, phosphorus or nitrogen; Catalysts comprising carbon compounds</b>                                       |
| 2523/48  | . . Silver or gold   |                | <b>NOTE</b>   |
| 2523/50  | . . . Silver   |                | Metal catalysts or metal oxide catalysts activated or conditioned by halogens, sulfur or phosphorus, or compounds thereof are indexed in the appropriate groups for metal or metal oxide catalysts. |
| 2523/52  | . . . Gold   | 2527/02        | . Sulfur, selenium or tellurium; Compounds thereof  |
| 2523/54  | . . combined with metals, oxides or hydroxides provided for in groups <a href="#">C07C 2523/02</a> - <a href="#">C07C 2523/36</a>                | 2527/03        | . . Acids of sulfur other than sulfhydrylic acid or sulfuric acid, e.g. halosulfonic acids  |
| 2523/56  | . . . Platinum group metals  | 2527/04        | . . Sulfides  |
| 2523/58  | . . . . with alkali- or alkaline earth metals or beryllium   | 2527/043       | . . . with iron group metals or platinum group metals   |
| 2523/60  | . . . . with zinc, cadmium or mercury  | 2527/045       | . . . . Platinum group metals   |
| 2523/62  | . . . . with gallium, indium, thallium, germanium, tin or lead   | 2527/047       | . . . with chromium, molybdenum, tungsten or polonium   |
| 2523/63  | . . . . with rare earths or actinides  | 2527/049       | . . . . with iron group metals or platinum group metals   |
| 2523/64  | . . . . with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium | 2527/051       | . . . . Molybdenum  |
| 2523/644 | . . . . . Arsenic, antimony or bismuth   | 2527/053       | . . Sulfates or other compounds comprising the anion (SnO <sub>3n+1</sub> ) <sup>2-</sup>   |
| 2523/648 | . . . . . Vanadium, niobium or tantalum  | 2527/054       | . . . Sulfuric acid or other acids with the formula H <sub>2</sub> SnO <sub>3n+1</sub>  |
| 2523/652 | . . . . . Chromium, molybdenum or tungsten   | 2527/055       | . . . with alkali metals, copper, gold or silver  |
| 2523/656 | . . . . . Manganese, technetium or rhenium   | 2527/057       | . . Selenium or tellurium; Compounds thereof  |
| 2523/66  | . . . Silver or gold   | 2527/06        | . Halogens; Compounds thereof   |
| 2523/68  | . . . . with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium | 2527/08        | . . Halides ( <a href="#">C07C 2527/122</a> - <a href="#">C07C 2527/138</a> take precedence)  |
| 2523/70  | . of the iron group metals or copper   | 2527/10        | . . . Chlorides   |
| 2523/72  | . . Copper   | 2527/11        | . . . . Hydrogen chloride   |
| 2523/74  | . . Iron group metals  | 2527/12        | . . . Fluorides   |
| 2523/745 | . . . Iron   | 2527/1206      | . . . . Hydrogen fluoride   |
| 2523/75  | . . . Cobalt   | 2527/1213      | . . . . Boron fluoride  |
| 2523/755 | . . . Nickel   | 2527/122       | . . Compounds comprising a halogen and copper   |
| 2523/76  | . . combined with metals, oxides or hydroxides provided for in groups <a href="#">C07C 2523/02</a> - <a href="#">C07C 2523/36</a>                | 2527/125       | . . Compounds comprising a halogen and scandium, yttrium, aluminium, gallium, indium or thallium  |
| 2523/78  | . . . with alkali- or alkaline earth metals or beryllium   | 2527/126       | . . . Aluminium chloride  |
| 2523/80  | . . . with zinc, cadmium or mercury  |                |   |
| 2523/825 | . . . with gallium, indium or thallium   |                |   |
| 2523/83  | . . . with rare earths or actinides  |                |   |
| 2523/835 | . . . with germanium, tin or lead  |                |   |

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| 2527/128       | . . Compounds comprising a halogen and an iron group metal or a platinum group metal   | 2529/12 | . . . . . Noble metals   |
| 2527/13        | . . . Platinum group metals  | 2529/14 | . . . . . Iron group metals or copper  |
| 2527/132       | . . Compounds comprising a halogen and chromium, molybdenum, tungsten or polonium  | 2529/16 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/133       | . . Compounds comprising a halogen and vanadium, niobium, tantalum, antimony or bismuth  | 2529/18 | . . . . . of the mordenite type  |
| 2527/135       | . . Compounds comprising a halogen and titanium, zirconium, hafnium, germanium, tin or lead  | 2529/20 | . . . . . containing iron group metals, noble metals or copper   |
| 2527/138       | . . Compounds comprising a halogen and an alkaline earth metal, magnesium, beryllium, zinc, cadmium or mercury                                       | 2529/22 | . . . . . Noble metals   |
| 2527/14        | . Phosphorus; Compounds thereof  | 2529/24 | . . . . . Iron group metals or copper  |
| 2527/16        | . . containing oxygen  | 2529/26 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/167       | . . . Phosphates or other compounds comprising the anion $(\text{PnO}_{3n+1})(n+2)-$   | 2529/40 | . . . . . of the pentasil type, e.g. types ZSM-5, ZSM-8 or ZSM-11  |
| 2527/173       | . . . . Phosphoric acid or other acids with the formula $\text{Hn}+2\text{PnO}_{3n+1}$   | 2529/42 | . . . . . containing iron group metals, noble metals or copper   |
| 2527/18        | . . . with metals  | 2529/44 | . . . . . Noble metals   |
| 2527/182       | . . with silicon   | 2529/46 | . . . . . Iron group metals or copper  |
| 2527/185       | . . with iron group metals or platinum group metals  | 2529/48 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/186       | . . with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium         | 2529/50 | . . . . . of the erioinite or offretite type, e.g. zeolite T   |
| 2527/187       | . . . with manganese, technetium or rhenium  | 2529/52 | . . . . . containing iron group metals, noble metals or copper   |
| 2527/188       | . . . with chromium, molybdenum, tungsten or polonium  | 2529/54 | . . . . . Noble metals   |
| 2527/19        | . . . . Molybdenum   | 2529/56 | . . . . . Iron group metals or copper  |
| 2527/192       | . . . . . with bismuth   | 2529/58 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/195       | . . . with vanadium, niobium or tantalum   | 2529/60 | . . . . . of the type L  |
| 2527/198       | . . . . Vanadium   | 2529/61 | . . . . . containing iron group metals, noble metals or copper   |
| 2527/199       | . . . . . with chromium, molybdenum, tungsten or polonium  | 2529/62 | . . . . . Noble metals   |
| 2527/20        | . Carbon compounds   | 2529/63 | . . . . . Iron group metals or copper  |
| 2527/22        | . . Carbides   | 2529/64 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/224       | . . . Silicon carbide  | 2529/65 | . . . . . of the ferrierite type, e.g. types ZSM-21, ZSM-35 or ZSM-38  |
| 2527/228       | . . . . with phosphorus, arsenic, antimony or bismuth  | 2529/66 | . . . . . containing iron group metals, noble metals or copper   |
| 2527/232       | . . Carbonates   | 2529/67 | . . . . . Noble metals   |
| 2527/236       | . . . Hydroxy carbonates   | 2529/68 | . . . . . Iron group metals or copper  |
| 2527/24        | . Nitrogen compounds   | 2529/69 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2527/25        | . . Nitrates   | 2529/70 | . . . . . of types characterised by their specific structure not provided for in groups <a href="#">C07C 2529/08</a> - <a href="#">C07C 2529/65</a>      |
| 2527/26        | . . Cyanides   | 2529/72 | . . . . . containing iron group metals, noble metals or copper   |
| <b>2529/00</b> | <b>Catalysts comprising molecular sieves</b>   | 2529/74 | . . . . . Noble metals   |
| 2529/03        | . not having base-exchange properties  | 2529/76 | . . . . . Iron group metals or copper  |
| 2529/035       | . . Crystalline silica polymorphs, e.g. silicalites  | 2529/78 | . . . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |
| 2529/04        | . having base-exchange properties, e.g. crystalline zeolites, pillared clays   |         |  |
| 2529/05        | . . Pillared clays   |         |  |
| 2529/06        | . . Crystalline aluminosilicate zeolites; Isomorphous compounds thereof  |         |  |
| 2529/064       | . . . containing iron group metals, noble metals or copper   |         |  |
| 2529/068       | . . . . Noble metals   |         |  |
| 2529/072       | . . . . Iron group metals or copper  |         |  |
| 2529/076       | . . . containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium |         |  |
| 2529/08        | . . . of the faujasite type, e.g. type X or Y  |         |  |
| 2529/10        | . . . containing iron group metals, noble metals or copper   |         |  |

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| 2529/80        | . . . Mixtures of different zeolites   | 2602/10        | . . . the other ring being six-membered, e.g. tetraline                  |
| 2529/82        | . Phosphates   | 2602/12        | . . . the other ring being at least seven-membered                       |
| 2529/83        | . . Aluminophosphates (APO compounds)  | 2602/14        | . . All rings being cycloaliphatic                                       |
| 2529/84        | . . Aluminophosphates containing other elements, e.g. metals, boron  | 2602/16        | . . . the ring system containing five carbon atoms                       |
| 2529/85        | . . . Silicoaluminophosphates (SAPO compounds)   | 2602/18        | . . . the ring system containing six carbon atoms                        |
| 2529/86        | . Borosilicates; Aluminoborosilicates  | 2602/20        | . . . the ring system containing seven carbon atoms                      |
| 2529/87        | . Gallosilicates; Aluminogallosilicates; Galloborosilicates  | 2602/22        | . . . the ring system containing eight carbon atoms, e.g. pentalene      |
| 2529/88        | . Ferrosilicates; Ferroaluminosilicates  | 2602/24        | . . . the ring system containing nine carbon atoms, e.g. perhydroindane  |
| 2529/89        | . Silicates, aluminosilicates or borosilicates of titanium, zirconium or hafnium   | 2602/26        | . . . the ring system containing ten carbon atoms                        |
| <b>2531/00</b> | <b>Catalysts comprising hydrides, coordination complexes or organic compounds</b>  | 2602/28        | . . . . Hydrogenated naphthalenes  |
| 2531/02        | . containing organic compounds or metal hydrides   | 2602/30        | . . . . Azulenes; Hydrogenated azulenes                                  |
| 2531/025       | . . Sulfonic acids   | 2602/32        | . . . the ring system containing at least eleven carbon atoms            |
| 2531/04        | . . containing carboxylic acids or their salts   | 2602/34        | . . . . Heptalenes; Hydrogenated heptalenes                              |
| 2531/06        | . . containing polymers  | 2602/36        | . the rings having more than two atoms in common                         |
| 2531/08        | . . . Ion-exchange resins  | 2602/38        | . . the bicyclo ring system containing five carbon atoms                 |
| 2531/10        | . . . . sulfonated   | 2602/40        | . . the bicyclo ring system containing six carbon atoms                  |
| 2531/12        | . . containing organo-metallic compounds or metal hydrides   | 2602/42        | . . the bicyclo ring system containing seven carbon atoms                |
| 2531/14        | . . . of aluminium or boron  | 2602/44        | . . the bicyclo ring system containing eight carbon atoms                |
| 2531/16        | . containing coordination complexes  | 2602/46        | . . the bicyclo ring system containing nine carbon atoms                 |
| 2531/18        | . . containing nitrogen, phosphorus, arsenic or antimony   | 2602/48        | . . the bicyclo ring system containing ten carbon atoms                  |
| 2531/20        | . . Carbonyls  | 2602/50        | . Spiro compounds  |
| 2531/22        | . . Organic complexes  | <b>2603/00</b> | <b>Systems containing at least three condensed rings</b>                 |
| 2531/24        | . . Phosphines   | 2603/02        | . Ortho- or ortho- and peri-condensed systems                            |
| 2531/26        | . containing in addition, inorganic metal compounds not provided for in groups <a href="#">C07C 2531/02</a> - <a href="#">C07C 2531/24</a> | 2603/04        | . . containing three rings   |
| 2531/28        | . . of the platinum group metals, iron group metals or copper  | 2603/06        | . . . containing at least one ring with less than six ring members       |
| 2531/30        | . . . Halides  | 2603/08        | . . . . containing three- or four-membered rings                         |
| 2531/32        | . . of manganese, technetium or rhenium  | 2603/10        | . . . . containing five-membered rings                                   |
| 2531/34        | . . of chromium, molybdenum or tungsten  | 2603/12        | . . . . . only one five-membered ring                                    |
| 2531/36        | . . of vanadium, niobium or tantalum   | 2603/14        | . . . . . Benz[f]indenes; Hydrogenated benz[f]indenes                    |
| 2531/38        | . . of titanium, zirconium or hafnium  | 2603/16        | . . . . . Benz[e]indenes; Hydrogenated benz[e]indenes                    |
|                |  | 2603/18        | . . . . . Fluorenes; Hydrogenated fluorenes                              |
|                |  | 2603/20        | . . . . . Acenaphthenes; Hydrogenated acenaphthenes                      |
|                |  | 2603/22        | . . . containing only six-membered rings                                 |
|                |  | 2603/24        | . . . . Anthracenes; Hydrogenated anthracenes                            |
|                |  | 2603/26        | . . . . Phenanthrenes; Hydrogenated phenanthrenes                        |
|                |  | 2603/28        | . . . . Phenalenes; Hydrogenated phenalenes                              |
|                |  | 2603/30        | . . . containing seven-membered rings                                    |
|                |  | 2603/32        | . . . . Dibenzocycloheptenes; Hydrogenated dibenzocycloheptenes          |
|                |  | 2603/34        | . . . . Benzoheptalenes; Hydrogenated benzoheptalenes                    |
|                |  | 2603/36        | . . . containing eight-membered rings                                    |
|                |  | 2603/38        | . . . containing rings with at least nine members                        |
|                |  | 2603/40        | . . containing four condensed rings                                      |
|                |  | 2603/42        | . . . containing only six-membered rings                                 |
|                |  | 2603/44        | . . . . Naphthacenes; Hydrogenated naphthacenes                          |
|                |  | 2603/46        | . . . . . 1,4,4a,5,5a,6,11,12a-Octahydronaphthacenes, e.g. tetracyclines |

#### Indexing scheme associated with groups

#### [C07C 1/00](#) - [C07C 409/00](#), relating to carbocyclic rings or ring systems

|                |   |
|----------------|---|
| <b>2601/00</b> | <b>Systems containing only non-condensed rings</b>                |
| 2601/02        | . with a three-membered ring                                      |
| 2601/04        | . with a four-membered ring                                       |
| 2601/06        | . with a five-membered ring                                       |
| 2601/08        | . . the ring being saturated                                      |
| 2601/10        | . . the ring being unsaturated                                    |
| 2601/12        | . with a six-membered ring  |
| 2601/14        | . . The ring being saturated                                      |
| 2601/16        | . . the ring being unsaturated                                    |
| 2601/18        | . with a ring being at least seven-membered                       |
| 2601/20        | . . the ring being twelve-membered                                |
| <b>2602/00</b> | <b>Systems containing two condensed rings</b>                     |
| 2602/02        | . the rings having only two atoms in common                       |
| 2602/04        | . . One of the condensed rings being a six-membered aromatic ring |
| 2602/06        | . . . the other ring being four-membered                          |
| 2602/08        | . . . the other ring being five-membered, e.g. indane             |

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| 2603/48 | . . . . Chrysenes; Hydrogenated chrysenes   |
| 2603/50 | . . . . Pyrenes; Hydrogenated pyrenes   |
| 2603/52 | . . containing five condensed rings   |
| 2603/54 | . . containing more than five condensed rings   |
| 2603/56 | . Ring systems containing bridged rings   |
| 2603/58 | . . containing three rings  |
| 2603/60 | . . . containing at least one ring with less than six members   |
| 2603/62 | . . . . containing three- or four-membered rings  |
| 2603/64 | . . . . . having a tricyclo[2.2.1.0(2,6)]heptstructure  |
| 2603/66 | . . . . containing five-membered rings  |
| 2603/68 | . . . . . Dicyclopentadienes; Hydrogenated dicyclopentadienes   |
| 2603/70 | . . . containing only six-membered rings  |
| 2603/72 | . . . . Ethanonaphthalenes; Hydrogenated ethanonaphthalenes   |
| 2603/74 | . . . . Adamantanes   |
| 2603/76 | . . . containing at least one ring with more than six ring members  |
| 2603/78 | . . . . containing seven-membered rings   |
| 2603/80 | . . . . containing eight-membered rings   |
| 2603/82 | . . . . . having three condensed rings with in total fourteen carbon atoms and having a having a [5.4.3.0(1,8)] ring structure, e.g. pleuromutiline   |
| 2603/84 | . . . . containing rings with more than eight members   |
| 2603/86 | . . containing four rings   |
| 2603/88 | . . . Ethanoanthracenes; Hydrogenated ethanoanthracenes   |
| 2603/90 | . . containing more than four rings   |
| 2603/91 | . . . Polycyclopentadienes; Hydrogenated polycyclopentadienes   |
| 2603/92 | . with a condensed ring system consisting of at least two mutually uncondensed aromatic ring systems, linked by an annular structure formed by carbon chains on non-adjacent positions of the aromatic system, e.g. cyclophanes |
| 2603/93 | . Spiro compounds   |
| 2603/94 | . . containing "free" spiro atoms   |
| 2603/95 | . . containing "not free" spiro atoms   |
| 2603/96 | . . . containing at least one ring with less than six members   |
| 2603/97 | . . . . containing five-membered rings  |
| 2603/98 | . . . containing at least one ring with more than six ring members  |
| 2603/99 | . . . . containing eight-membered rings   |
| 2604/00 | <b>Fullerenes, e.g. C<sub>60</sub> buckminsterfullerene or C<sub>70</sub></b>   |