CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

CHEMISTRY

C12 BIOCHEMISTRY; BEER; SPIRITS; WINE; VINEGAR; MICROBIOLOGY; ENZYMOLOGY; MUTATION OR GENETIC ENGINEERING

(NOTES omitted)

C12P FERMENTATION OR ENZYME-USING PROCESSES TO SYNTHESISE A DESIRED CHEMICAL COMPOUND OR COMPOSITION OR TO SEPARATE OPTICAL ISOMERS FROM A RACEMIC MIXTURE {(brewing of beer C12C; producing vinegar C12J; producing specific peptides or proteins C07K; producing enzymes C12N 9/00; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification C12N 15/00; measuring or testing processes involving enzymes or microorganisms C12Q; measuring or testing processes involving nucleic acid amplification reactions C12Q 1/6844; fermentation processes to form a food composition, A21 or A23; compounds in general, see the relevant compound class, e.g. C01, C07)}

NOTES

1. This subclass covers the production of compounds or compositions by biochemical transformation of matter performed by using enzymes or microorganisms, wherein microorganisms are defined as any single-celled organisms, including bacteria, fungi, yeast or microalgae, or plant or mammalian cells in the form of cell cultures.
2. In this subclass, documents are primarily classified according to the compounds produced. In addition, if appropriate, classification according to the method or biocatalyst used to produce the compound is made.
3. Classification in groups C12P 19/14 - C12P 19/24, C12P 39/00, C12P 41/00 - C12P 41/009 should only be made together with the corresponding product groups

WARNINGS

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

- C12P 21/04	covered by	C07K 7/50
- C12P 21/08	covered by	C07K 16/00

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.

1/00 Preparation of compounds or compositions, not provided for in groups C12P 3/00 - C12P 39/00, by using microorganisms or enzymes

NOTES

1. This group is used for the classification of documents relating to the production of compounds of unknown structure
2. When classifying in this group, classification should be made also in C12R

1/02 . by using fungi
1/04 . by using bacteria
1/06 . by using actinomycetales

3/00 Preparation of elements or inorganic compounds except carbon dioxide {(recovery of carbon dioxides as by-products C12F 3/02)}

5/00 Preparation of hydrocarbons {or halogenated hydrocarbons}

5/002 . {cyclic (compounds containing at least three condensed carbocyclic rings C12P 15/00)}
5/005 . . {aromatic (naphthacene C12P 29/00)}
5/007 . {containing one or more isoprene units, i.e. terpenes (carotenes C12P 23/00)}
5/02 . acyclic {(C12P 5/007 takes precedence)}
5/023 . . {Methane}
5/026 . . {Unsaturated compounds, i.e. alkenes, alkynes or allenes}

7/00 Preparation of oxygen-containing organic compounds

7/02 . containing a hydroxy group
7/04 . . acyclic
7/06 . . . Ethanol, i.e. non-beverage
7/065 . . . . {with microorganisms other than yeasts}
7/08 . . . . produced as by-product or from waste or cellulosic material substrate
7/10 . . . . . substrate containing cellulosic material

7/12 . . . . . substrate containing sulfite waste liquor or citrus waste

7/14 . . . . Multiple stages of fermentation; Multiple types of microorganisms or re-use of microorganisms

7/16 . . . Butanols

7/18 . . . polyhydric

7/20 . . . . Glycerol

7/22 . . aromatic

7/24 . containing a carbonyl group

7/26 . . Ketones

7/28 . . . Acetone-containing products

7/30 . . . . produced from substrate containing inorganic compounds other than water

7/32 . . . . produced from substrate containing inorganic nitrogen source

7/34 . . . . produced from substrate containing protein as nitrogen source

7/36 . . . . produced from substrate containing grain or cereal material

7/38 . . . Cyclopentanone- or cyclopentadione-containing products

7/40 . containing a carboxyl group {including Peroxycarboxylic acids}

7/42 . . Hydroxy-carboxylic acids

7/44 . . Polycarboxylic acids

7/46 . . . Dicarboxylic acids having four or less carbon atoms, e.g. fumaric acid, maleic acid

7/48 . . . Tricarboxylic acids, e.g. citric acid

7/50 . . . having keto groups, e.g. 2-ketoglutaric acid

7/52 . . Propionic acid; Butyric acids

7/54 . . Acetic acid (vinegar C12J)

7/56 . . Lactic acid

7/58 . . Aldonic, ketoaldonic or saccharic acids (uronic acids C12P 19/00)

7/60 . . . 2-Ketogulonic acid

7/62 . Carboxylic acid esters

WARNING

Groups C12P 7/62 and C12P 7/625 are incomplete pending reclassification of documents from group C12P 7/6436.

Groups C12P 7/6436, C12P 7/62 and C12P 7/625 should be considered in order to perform a complete search.

7/625 . . Polyesters of hydroxy carboxylic acids

7/64 . Fats; Fatty oils; Ester-type waxes; Higher fatty acids, i.e. having at least seven carbon atoms in an unbroken chain bound to a carboxyl group; Oxidised oils or fats

7/6409 . . Fatty acids

7/6418 . . . by hydrolysis of fatty acid esters

7/6427 . . . Polyunsaturated fatty acids [PUFA], i.e. having two or more double bonds in their backbone

WARNING

Group C12P 7/6427 is impacted by reclassification into groups C12P 7/6431, C12P 7/6432 and C12P 7/6434.

All groups listed in this Warning should be considered in order to perform a complete search.

7/6431 . . . . Linoleic acids [18:2[n-6]]

WARNING

Group C12P 7/6431 is incomplete pending reclassification of documents from group C12P 7/6427.

Groups C12P 7/6431 and C12P 7/6427 should be considered in order to perform a complete search.

7/6432 . . . . Eicosapentaenoic acids [EPA]

WARNING

Group C12P 7/6432 is incomplete pending reclassification of documents from group C12P 7/6427.

Groups C12P 7/6432 and C12P 7/6427 should be considered in order to perform a complete search.

7/6434 . . . . Docosahexenoic acids [DHA]

WARNING

Group C12P 7/6434 is incomplete pending reclassification of documents from group C12P 7/6427.

Groups C12P 7/6434 and C12P 7/6427 should be considered in order to perform a complete search.

7/6436 . . Fatty acid esters

WARNING

Group C12P 7/6436 is impacted by reclassification into groups C12P 7/62 and C12P 7/625.

All groups listed in this Warning should be considered in order to perform a complete search.

7/6445 . . . Glycerides

WARNING

Group C12P 7/6445 is impacted by reclassification into group C12P 7/6458.

Groups C12P 7/6445 and C12P 7/6458 should be considered in order to perform a complete search.

7/6454 . . . . by esterification

WARNING

Group C12P 7/6454 is impacted by reclassification into group C12P 7/6458.

Groups C12P 7/6454 and C12P 7/6458 should be considered in order to perform a complete search.

7/6458 . . . . by transesterification, e.g. interesterification, ester interchange, alcoholysis or acidolysis

WARNING

Group C12P 7/6458 is incomplete pending reclassification of documents from groups C12P 7/6445, C12P 7/6454, C12P 7/6472, C12P 7/6481 and C12P 7/649.

All groups listed in this Warning should be considered in order to perform a complete search.

7/6463 . . . . obtained from glyceride producing microorganisms, e.g. single cell oil

7/6472 . . . . containing polyunsaturated fatty acid [PUFA] residues, i.e. having two or more double bonds in their backbone

WARNING

Group C12P 7/6472 is impacted by reclassification into group C12P 7/6458.

Groups C12P 7/6472 and C12P 7/6458 should be considered in order to perform a complete search.

7/6481 . . . . Phosphoglycerides (phosphoglycerides having carboxylic acids with less than seven carbon atoms C12P 7/62)

WARNING

Group C12P 7/6481 is impacted by reclassification into group C12P 7/6458.

Groups C12P 7/6481 and C12P 7/6458 should be considered in order to perform a complete search.

7/649 . . . Biodiesel, i.e. fatty acid alkyl esters

WARNING

Group C12P 7/649 is impacted by reclassification into group C12P 7/6458.

Groups C12P 7/649 and C12P 7/6458 should be considered in order to perform a complete search.

7/66 . containing the quinoid structure

9/00 Preparation of organic compounds containing a metal or atom other than H, N, C, O, S or halogen {(phosphoglycerides, C12P 7/6481)}

11/00 Preparation of sulfur-containing organic compounds

13/00 Preparation of nitrogen-containing organic compounds

13/001 . {Amines; Imines}

13/002 . {Nitriles (-CN)}

13/004 . . {Cyanohydrins}

13/005 . {Amino acids other than alpha- or beta amino acids, e.g. gamma amino acids}

13/007 . {Carnitine; Butyrobetaine; Crotonobetaine}

13/008 . {containing a N-O bond, e.g. nitro (-NO_2), nitroso (-NO)}

13/02 . Amides, e.g. chloramphenicol {or polyamides; Imides or polyimides; Urethanes, i.e. compounds comprising N-C=O structural element or polyurethanes (peptides C12P 21/00 or C07K)}

13/04 . Alpha- or beta- amino acids {(other amino acids C12P 13/005)}

13/06 . . Alanine; Leucine; Isoleucine; Serine; Homoserine

13/08 . . Lysine; Diaminopimelic acid; Threonine; Valine

13/10 . . Citrulline; Arginine; Ornithine

13/12 . . Methionine; Cysteine; Cystine

13/14 . . Glutamic acid; Glutamine

13/16 . . . using surfactants, fatty acids or fatty acid esters, i.e. having at least seven carbon atoms in an unbroken chain bound to a carboxyl group or a carboxyl ester group

13/18 . . . using biotin or its derivatives

13/20 . . Aspartic acid; Asparagine

13/22 . . Tryptophan; Tyrosine; Phenylalanine; 3,4-Dihydroxyphenylalanine

NOTE

Processes for the preparation of different amino acids covered by more than one of the groups C12P 13/222 - C12P 13/227 are classified in group C12P 13/22

13/222 . . . {Phenylalanine}

13/225 . . . {Tyrosine; 3,4-Dihydroxyphenylalanine}

13/227 . . . {Tryptophan}

13/24 . . Proline; Hydroxyproline; Histidine

15/00 Preparation of compounds containing at least three condensed carbocyclic rings {(gibbanes C12P 27/00; naphthacenes C12P 29/00)}

17/00 Preparation of heterocyclic carbon compounds with only O, N, S, Se or Te as ring hetero atoms (C12P 13/04 - C12P 13/24 take precedence)

17/02 . Oxygen as only ring hetero atoms

17/04 . . containing a five-membered hetero ring, e.g. griseofulvin {, vitamin C}

17/06 . . containing a six-membered hetero ring, e.g. fluorescein

17/08 . . containing a hetero ring of at least seven ring members, e.g. zearalenone, macrolide aglycons

17/10 . Nitrogen as only ring hetero atom

17/12 . . containing a six-membered hetero ring

17/14 . Nitrogen or oxygen as hetero atom and at least one other diverse hetero ring atom in the same ring

17/16 . containing two or more hetero rings {(thiamine open chain analogs C12P 17/167, i.e. not condensed among themselves or through a common carbocyclic ring system)}

17/162 . . {Heterorings having oxygen atoms as the only ring heteroatoms, e.g. Lasalocid}

17/165 . . {Heterorings having nitrogen atoms as the only ring heteroatoms}

17/167 . . {Heterorings having sulfur atoms as ring heteroatoms, e.g. vitamin B1, thiamine nucleus and open chain analogs}

17/18 . containing at least two hetero rings condensed among themselves or condensed with a common carbocyclic ring system, e.g. rifamycin {(e.g. Rifamycin C12P 17/189)}

17/181 . . {Heterocyclic compounds containing oxygen atoms as the only ring heteroatoms in the condensed system, e.g. Salinomycin, Septamycin}

17/182 . . {Heterocyclic compounds containing nitrogen atoms as the only ring heteroatoms in the condensed system (alloxazine or isoalloxazine, e.g. riboflavine C12P 25/00)}

17/183 . . . {containing an indolo[4,3-F,G]quinoleine nucleus, e.g. compound containing the lysergic acid nucleus as well as the dimeric ergot nucleus}

17/184 . . . {containing a beta-lactam ring, e.g. thienamycin}

17/185 . . {Heterocyclic compounds containing sulfur atoms as ring hetero atoms in the condensed system (cepam nucleus C12P 35/00; penam nucleus C12P 37/00)}

17/186 . . . {containing a 2-oxo-thieno[3,4-d]imidazol nucleus, e.g. Biotin}

17/187 . . . {containing two or more directly linked sulfur atoms, e.g. epithiopiperazines}

17/188 . . {Heterocyclic compound containing in the condensed system at least one hetero ring having nitrogen atoms and oxygen atoms as the only ring heteroatoms (ergot-alcaloids C12P 17/183)}

17/189 . . . {containing the rifamycin nucleus}

19/00 Preparation of compounds containing saccharide radicals (ketoaldonic acids C12P 7/58)

NOTE

Attention is drawn to the term "saccharide radical" in the first Note following the title of subclass C07H.

19/02 . Monosaccharides (2-ketogulonic acid C12P 7/60)

19/04 . Polysaccharides, i.e. compounds containing more than five saccharide radicals attached to each other by glycosidic bonds

19/06 . . Xanthan, i.e. Xanthomonas-type heteropolysaccharides

19/08 . . Dextran

19/10 . . Pullulan

19/12 . Disaccharides

19/14 . produced by the action of a carbohydrase {(EC 3.2.x)}, e.g. by alpha-amylase {, e.g. by cellulase, hemicellulase}

19/16 . produced by the action of an alpha-1, 6-glucosidase, e.g. amylose, debranched amylopectin (non-biological hydrolysis of starch C08B 30/00)

19/18 . produced by the action of a glycosyl transferase, e.g. alpha-, beta- or gamma-cyclodextrins

19/20 . produced by the action of an exo-1,4 alpha-glucosidase, e.g. dextrose

19/22 . produced by the action of a beta-amylase, e.g. maltose

19/24 . produced by the action of an isomerase, e.g. fructose

19/26 . Preparation of nitrogen-containing carbohydrates

19/28 . . N-glycosides

19/30 . . . Nucleotides

19/305 . . . . {Pyrimidine nucleotides}

19/32 . . . . having a condensed ring system containing a six-membered ring having two N-atoms in the same ring, e.g. purine nucleotides, nicotineamide-adenine dinucleotide

19/34 . . . . Polynucleotides, e.g. nucleic acids, oligoribonucleotides

19/36 . . . . Dinucleotides, e.g. nicotineamide-adenine dinucleotide phosphate

19/38 . . . Nucleosides

19/385 . . . . {Pyrimidine nucleosides}

19/40 . . . . having a condensed ring system containing a six-membered ring having two nitrogen atoms in the same ring, e.g. purine nucleosides

19/42 . . . Cobalamins, i.e. vitamin B_{12}, LLD factor

19/44 . Preparation of O-glycosides, e.g. glucosides {(polysaccharides and not substituted disaccharides C12P 19/04, C12P 19/12)}

19/445 . . {The saccharide radical is condensed with a heterocyclic radical, e.g. everninomycin, papulacandin}

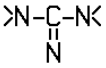
19/46 . . having an oxygen atom of the saccharide radical bound to a cyclohexyl radical, e.g. kasugamycin

19/48 . . . the cyclohexyl radical being substituted by two or more nitrogen atoms, e.g. destomycin, neamin

19/485 . . . . {Having two saccharide radicals bound through only oxygen to non-adjacent ring carbons of the cyclohexyl radical, e.g. gentamycin, kanamycin, sisomycin, verdamycin, mutamycin, tobramycin, nebramycin, antibiotics 66-40B, 66-40D, XK-62-2, 66-40, G-418, G-52 (see also C12P 19/54)}

19/50 . . . . having two saccharide radicals bound through only oxygen to adjacent ring carbon atoms of the cyclohexyl radical, e.g. ambutyrosin, ribostamycin

19/52 . . . . . containing three or more saccharide radicals, e.g. neomycin, lividomycin

19/54 . . . the cyclohexyl radical being bound directly to a nitrogen atom of two or more  radicals, e.g. streptomycin

19/56 . . having an oxygen atom of the saccharide radical directly bound to a condensed ring system having three or more carbocyclic rings, e.g. daunomycin, adriamycin

19/58 . . having an oxygen atom of the saccharide radical directly bound through only acyclic carbon atoms to a non-saccharide heterocyclic ring, e.g. bleomycin, phleomycin

19/60 . . having an oxygen of the saccharide radical directly bound to a non-saccharide heterocyclic ring or a condensed ring system containing a non-saccharide heterocyclic ring, e.g. coumermycin, novobiocin {(C12P 19/605)}

19/605 . . . {to a 1-benzopyran-2-on (or the chalcones and hydrogenated chalcones thereof, e.g. coumermycin, novobiocin, novenamin)}

19/62 . . . the hetero ring having eight or more ring members and only oxygen as ring hetero atoms, e.g. erythromycin, spiramycin, nystatin

19/623 . . . . {Avermectin; Milbemycin; Ivermectin; C-076}

19/626 . . . . {Natamycin; Pimaricin; Tennecetin}
19/64 . Preparation of S-glycosides, e.g. lincomycin

21/00 Preparation of peptides or proteins (single cell protein C12N 1/00)
21/005 . {Glycopeptides, glycoproteins}
21/02 . having a known sequence of two or more amino acids, e.g. glutathione
21/06 . produced by the hydrolysis of a peptide bond, e.g. hydrolysate products (preparing foodstuffs by protein hydrolysis A23J 3/00)

23/00 Preparation of compounds containing a cyclohexene ring having an unsaturated side chain containing at least ten carbon atoms bound by conjugated double bonds, e.g. carotenes (containing heterorings C12P 17/00)

25/00 Preparation of compounds containing alloxazine or isoalloxazine nucleus, e.g. riboflavin

27/00 Preparation of compounds containing a gibbane ring system, e.g. gibberellin

29/00 Preparation of compounds containing a naphthacene ring system, e.g. tetracycline (C12P 19/00 takes precedence)

31/00 Preparation of compounds containing a five-membered ring having two side-chains in ortho position to each other, and having at least one oxygen atom directly bound to the ring in ortho position to one of the side-chains, one side-chain containing, not directly bound 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 at least one oxygen atom bound in gamma-position to the ring, e.g. prostaglandins
31/005 . {by fermentation or enzyme-using processes from marine organisms, e.g. Plexaura Homomalla}

33/00 Preparation of steroids

NOTES

1. Attention is drawn to the definition of steroids in the note following the title of subclass C07J.
2. In groups C12P 33/02 - C12P 33/20, the terms "acting", "forming", "hydroxylating", "dehydroxylating" and "dehydrogenating" refer to the action of a microorganism or enzyme rather than other chemical action.

33/005 . {Degradation of the lateral chains at position 17}
33/02 . Dehydrogenating; Dehydroxylating
33/04 . . Forming an aryl ring from A ring
33/06 . Hydroxylating
33/08 . . at 11 position
33/10 . . . at 11 alpha-position
33/12 . Acting on D ring {(carbons 13 and 14 belong to the C ring; degradation of lateral chains C12P 33/005)}
33/14 . . Hydroxylating at 16 position
33/16 . . Acting at 17 position
33/18 . . . Hydroxylating at 17 position
33/20 . containing heterocyclic rings {(reactions are also classified in groups C12P 33/00 - C12P 33/18)}

35/00 Preparation of compounds having a 5-thia-1-azabicyclo [4.2.0] octane ring system, e.g. cephalosporin
35/02 . by desacylation of the substituent in the 7 position
35/04 . by acylation of the substituent in the 7 position
35/06 . Cephalosporin C; Derivatives thereof
35/08 . disubstituted in the 7 position

37/00 Preparation of compounds having a 4-thia-1-azabicyclo [3.2.0] heptane ring system, e.g. penicillin
37/02 . in presence of phenylacetic acid or phenylacetamide or their derivatives {not to be used}
37/04 . by acylation of the substituent in the 6 position
37/06 . by desacylation of the substituent in the 6 position

39/00 Processes involving microorganisms of different genera in the same process, simultaneously

41/00 Processes using enzymes or microorganisms to separate optical isomers from a racemic mixture
41/001 . {by metabolizing one of the enantiomers}
41/002 . {by oxidation/reduction reactions}
41/003 . {by ester formation, lactone formation or the inverse reactions}
41/004 . . {by esterification of alcohol- or thiol groups in the enantiomers or the inverse reaction}
41/005 . . {by esterification of carboxylic acid groups in the enantiomers or the inverse reaction}
41/006 . {by reactions involving C-N bonds, e.g. nitriles, amides, hydantoins, carbamates, lactames, transamination reactions, or keto group formation from racemic mixtures}
41/007 . . {by reactions involving acyl derivatives of racemic amines}
41/008 . . {by reactions involving carbamates}
41/009 . . {by reactions involving hydantoins or carbamoylamino compounds}

2201/00 Pretreatment of cellulosic or lignocellulosic material for subsequent enzymatic treatment or hydrolysis

2203/00 Fermentation products obtained from optionally pretreated or hydrolyzed cellulosic or lignocellulosic material as the carbon source (ethanol C12P 7/10)