CPC  COOPERATIVE PATENT CLASSIFICATION

C  CHEMISTRY; METALLURGY
   (NOTES omitted)

CHEMISTRY

C12  BIOCHEMISTRY; BEER; SPIRITS; WINE; VINEGAR; MICROBIOLOGY; ENZYMEOLOGY; 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 dioxide as by-products C12F 3/02}

5/00 Preparation of hydrocarbons [or halogenated hydrocarbons]

5/02 . cyclic (compounds containing at least three condensed carbycyclic rings C12P 15/00)
5/05 . aromatic (naphthacene C12P 29/00)
5/07 . 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 cellulose material substrate
7/10 . . . . . substrate containing cellulose material
containing the quinoid structure

Oxidised oils or fats are produced from substrate containing sulfuric waste or inorganic sulfur containing products.

Processes for the preparation of different amino acids covered by more than one of the groups C12P 7/36 - 7/38 are classified in group C12P 7/32.

NOTE

Processes for the preparation of different amino acids covered by more than one of the groups C12P 7/36 - 7/38 are classified in group C12P 7/32.

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 atom
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. zeaxalene, macrolyle 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
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 carbohydrate [(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 amyllopectin (non-biological hydrolysis of starch C10B 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. dextrise
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, nicotinamide-adenine dinucleotide
19/34 . . . Polynucleotides, e.g. nucleic acids, oligoribonucleotides
19/36 . . . Dinucleotides, e.g. nicotinamide-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 . . . Cobalmins, i.e. vitamin B12, 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. evernixinominocin, 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. ambutrosin, ribostamycin
19/52 . . . containing three or more saccharide radicals, e.g. neomycin, liddovimycin
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. coumerycin, novobiocin (C12P 19/605)

19/605 . . . . [to a 1-benzopyran-2-on (or the chalcones and hydrogenated chalcone thereof, e.g. coumerycin, 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; Tenneceitin)

19/64 . . Preparation of S-glycosides, e.g. lincomycin

21/00 Preparation of peptides or proteins (single cell protein C12N 1/00)

21/005 . . (Glycopetides, 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. hydrolysat products (preparing foodsby protein hydrolysis A23J 3/000)

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. carotenoids (containing heterocycles C12P 17/000)

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 the at 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 33/00 - 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 (carbon 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 carbamoylamin compounds)

4201/00 Pretreatment of cellulosic or lignocellulosic material for subsequent enzymatic treatment or hydrolysis

4203/00 Fermentation products obtained from optionally pretreated or hydrolyzed cellulosic or lignocellulosic material as the carbon source (ethanol C12P 7/10)