SECTION C — CHEMISTRY; METALLURGY

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

Note(s)

1. Between subclasses C12M-C12Q, and within each of these subclasses, in the absence of an indication to the contrary, classification is made in the last appropriate place. For example, a fermentation or enzyme-using process involving condition-responsive control is classified in subclass C12Q.
2. In this class, viruses, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are considered as micro-organisms.
3. In this class, unless specifically provided for, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are classified together with micro-organisms. Sub-cellular parts, unless specifically provided for, are classified with the whole cell.
4. The codes of subclass C12R are only for use as indexing codes associated with subclasses C12C-C12Q or C12S, so as to provide information concerning the micro-organisms used in the processes classified in these subclasses.

C12C **BREWING OF BEER** (cleaning of raw materials A23N; pitching or depitching machines, cellar tools C12L; propagating yeasts C12N 1/14; non-beverage ethanolic fermentation C12P 7/06)

Note(s)

In this subclass, it is desirable to add the indexing codes of subclass C12R.

Subclass index

1/00 Preparation of malt

1/02 • Pretreatment of grains, e.g. washing, steeping
1/027 • Germinating **[6]**
1/033 • • in boxes or drums **[6]**
1/047 • • Influencing the germination by chemical or physical means **[6]**
1/053 • • • by irradiation or electric treatment **[6]**
1/067 • Drying **[6]**
1/073 • • Processes or apparatus specially adapted to save or recover energy **[6]**
1/10 • • Drying on fixed supports
1/12 • • Drying on moving supports
1/125 • Continuous or semi-continuous processes for steeping, germinating or drying **[6]**
1/13 • • with vertical transport of the grains **[6]**
1/135 • • with horizontal transport of the grains **[6]**
1/15 • Grain or malt turning, charging or discharging apparatus **[6]**
1/16 • After-treatment of malt, e.g. malt cleaning, detachment of the germ
1/18 • Preparation of malt extract or of special kinds of malt, e.g. caramel, black malt (malt products for use as foodstuffs A23L)

3/00 Treatment of hops

3/02 • Drying
3/04 • Conserving; Storing; Packing
3/06 • • Powder or pellets from hops **[6]**
3/08 • • Solvent extracts from hops **[6]**
3/10 • • • using carbon dioxide **[6]**
3/12 • • Isomerised products from hops **[6]**

5/00 Other raw materials for the preparation of beer

5/02 • Additives for beer
5/04 • • Colouring additives

7/00 Preparation of wort (malt extract C12C 1/18)

7/01 • Pretreatment of malt, e.g. malt grinding **[6]**
7/04 • Preparation or treatment of the mash
7/047 • • part of the mash being unmalted cereal mash **[6]**
7/053 • • part of the mash being non-cereal material **[6]**
7/06 • • Mashing apparatus
7/14 • Clarifying wort (Läuterung)
7/16 • • by straining
7/165 • • • in mash filters **[6]**
7/17 • • • in lautertuns **[6]**
7/175 • • by centrifuging **[6]**
7/20 • • Boiling the beerwort (brew kettles C12C 13/02) **[6]**
7/22 • • • Processes or apparatus specially adapted to save or recover energy **[6]**

7/24 • Clarifying beerwort between hop boiling and cooling **[6]**
7/26 • Cooling beerwort; Clarifying beerwort during or after the cooling **[6]**
7/28 • After-treatment **[6]**

11/00 Fermentation processes for beer
11/02 • Pitching yeast
11/06 • Acidifying the wort
11/07 • Continuous fermentation **[6]**
11/09 • Fermentation with immobilised yeast **[6]**
11/11 • Post fermentation treatments, e.g. carbonation, concentration (C12H takes precedence; containers with means specially adapted for effervescing potable liquids B65D 85/73) **[6]**

12/00 Processes specially adapted for making special kinds of beer [6]
12/02 • Beer with low calorie content (C12C 12/04 takes precedence) **[6]**
12/04 • Beer with low alcohol content (removal of alcohol C12H 3/00) **[6]**

13/00 Brewing devices, not covered by a single group of C12C 1/00-C12C 12/04 [3, 6]
13/02 • Brew kettles **[3]**
13/06 • • heated with fire **[3]**
13/08 • • with internal heating elements **[6]**
13/10 • Home brew equipment **[6]**

C12F RECOVERY OF BY-PRODUCTS OF FERMENTED SOLUTIONS; DENATURING OF, OR DENATURED, ALCOHOL [6]

Note(s)

In this subclass, it is desirable to add the indexing codes of subclass C12R.

3/00 Recovery of by-products
3/02 • of carbon dioxide
3/04 • • Recovery of volatile fermentation products from carbon dioxide
3/06 • from beer or wine (C12F 3/02 takes precedence; removal of yeast C12G 1/08)
3/08 • • Recovery of alcohol from press residues or other waste material (from carbon dioxide C12F 3/04)
3/10 • from distillery slops

5/00 Preparation of denatured alcohol

C12G WINE; OTHER ALCOHOLIC BEVERAGES; PREPARATION THEREOF (beer C12C)

Note(s)

In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 Preparation of wine or sparkling wine
1/02 • Preparation of must from grapes; Must treatment or fermentation
1/022 • • Fermentation; Microbiological or enzymatic treatment **[6]**
1/024 • • • in a horizontally mounted cylindrical vessel (C12G 1/026 takes precedence) **[6]**
1/026 • • • in vessels with movable equipment for mixing the content **[6]**
1/028 • • • with thermal treatment of the grapes or the must **[6]**
1/032 • • • with recirculation of the must for pompage extraction **[6]**
1/036 • • • by use of a home wine making vessel **[6]**
1/04 • • Sulfiting the must; Desulfiting
1/06 • Preparation of sparkling wine, e.g. champagne; Impregnating wine with carbon dioxide
1/067 • • Continuous processes **[6]**
1/073 • • Fermentation with immobilised yeast **[6]**
1/08 • Removal of yeast ("degorgeage")
1/09 • • Agitation, centrifugation or vibration of bottles **[6]**
1/10 • Deacidifying of wine **[6]**
1/12 • Processes for preventing winestone precipitation **[6]**

3/00 Preparation of other alcoholic beverages
3/02 • by straight fermentation
3/04 • by mixing, e.g. liqueurs
3/06 • • with flavouring ingredients
3/07 • • • Flavouring with wood or wood extract; Pretreatment of the wood used therefor **[6]**
3/08 • by other methods for varying the composition of fermented solutions (removal of alcohol from alcoholic beverages to obtain alcohol-free or low-alcohol beverages C12H 3/00)
3/10 • • Increasing the alcohol content
3/12 • • • by distillation (distillation processes or apparatus, in general B01D 3/00)
3/14 • • • by freezing **[6]**

C12H PASTEURISATION, STERILISATION, PRESERVATION, PURIFICATION, CLARIFICATION, AGEING OF ALCOHOLIC BEVERAGES OR REMOVAL OF ALCOHOL THEREFROM (deacidifying wine C12G 1/10; preventing winestone precipitation C12G 1/12; simulation ageing by flavouring C12G 3/06) **[6]**

Note(s) [1, 2006.01]

1. 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.
2. In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 Pasteurisation, sterilisation, preservation, purification, clarification, or ageing of alcoholic beverages
1/02 • combined with removal of precipitate or added materials, e.g. adsorption material
1/04 • • with the aid of ion-exchange material or inert clarification material, e.g. adsorption material
1/044 • • • with the aid of inorganic material **[6]**
1/048 • • • • with silicon containing material **[6]**
1/052 • • • with the aid of organic material **[6]**
1/056 • • • • with the aid of polymers **[6]**
1/06 • • Precipitation by physical means, e.g. by irradiation, vibrations
1/065 • • • Separation by centrifugation **[6]**
1/07 • • • Separation by filtration **[6]**
1/075 • • • • by cross-flow filtration **[6]**
1/08 • • • by heating
1/10 • • Precipitation by chemical means
1/12 • without precipitation
1/14 • • with non-precipitating compounds, e.g. sulfiting; Sequestration, e.g. with chelate-producing compounds
1/15 • • • with enzymes **[6]**
1/16 • • by physical means, e.g. irradiation
1/18 • • • by heating
1/20 • • • • in containers allowing for expansion of the contents
1/22 • Ageing or ripening by storing, e.g. lagering of beer

3/00 Removal of alcohol from alcoholic beverages to obtain alcohol-free or low-alcohol beverages (recovery of by-products of wine or beer other than low-alcohol beverages C12F 3/06; preparation of alcoholic beverages other than wine or beer by varying the composition of fermented solutions C12G 3/08) **[6]**
3/02 • by evaporating **[6]**
3/04 • using semi-permeable membranes **[6]**

C12J VINEGAR; ITS PREPARATION

Note(s)

In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 Vinegar; Preparation; Purification
1/02 • from wine
1/04 • from alcohol
1/06 • from milk
1/08 • Addition of flavouring ingredients
1/10 • Apparatus

C12L PITCHING OR DEPITCHING MACHINES; CELLAR TOOLS (cleaning of casks B08B 9/00)

Note(s)

In this subclass, it is desirable to add the indexing codes of subclass C12R.

3/00 Pitching or depitching machines

9/00 Venting devices for casks, barrels, or the like

11/00 Cellar tools

C12M APPARATUS FOR ENZYMOLOGY OR MICROBIOLOGY (installations for fermenting manure A01C 3/02; preservation of living parts of humans or animals A01N 1/02; physical or chemical apparatus in general B01; brewing apparatus C12C; fermentation apparatus for wine C12G; apparatus for preparing vinegar C12J 1/10) **[3]**

Note(s)

1. Attention is drawn to Notes (1) to (3) following the title of class C12.
2. In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 Apparatus for enzymology or microbiology [3] **Note(s)**

This group covers:
- apparatus where micro-organisms or enzymes are produced or isolated;
- apparatus where the characteristics of micro-organisms or enzymes are investigated, e.g. which growth factors are necessary;
- apparatus specially adapted to employ micro-organisms or enzymes as "reactants" or biocatalysts;
- apparatus of both the laboratory and industrial scale.

1/02 • with agitation means; with heat exchange means **[3]**
1/04 • with gas introduction means **[3]**
1/06 • • with agitator, e.g. impeller **[3]**
1/08 • • with draft tube **[3]**
1/09 • • Flotation apparatus **[5]**
1/10 • rotatably mounted **[3]**
1/107 • with means for collecting fermentation gases, e.g. methane (producing methane by anaerobic treatment of sludge C02F 11/04) **[5]**
1/113 • • with transport of the substrate during the fermentation **[5]**
1/12 • with sterilisation, filtration, or dialysis means **[3]**
1/14 • with means providing thin layers or with multi-level trays **[3]**
1/16 • containing, or adapted to contain, solid media **[3]**
1/18 • • Multiple fields or compartments **[3]**
1/20 • • • Horizontal planar fields **[3]**
1/21 • Froth suppressors **[5]**
1/22 • Petri type dish **[3]**
1/24 • tube or bottle type **[3]**
1/26 • Inoculator or sampler **[3]**
1/28 • • being part of container **[3]**
1/30 • • • Sampler being a swab **[3]**
1/32 • • multiple field or continuous type **[3]**
1/33 • Disintegrators **[5]**
1/34 • Measuring or testing with condition measuring or sensing means, e.g. colony counters **[3]**
1/36 • including condition or time responsive control, e.g. automatically controlled fermentors (controlling or regulating in general G05) **[3]**
1/38 • • Temperature-responsive control **[3]**
1/40 • Apparatus specially designed for the use of free, immobilised, or carrier-bound enzymes, e.g. apparatus containing a fluidised bed of immobilised enzymes **[3]**
1/42 • Apparatus for the treatment of micro-organisms or enzymes with electrical or wave energy, e.g. magnetism, sonic wave **[5]**

3/00 Tissue, human, animal or plant cell, or virus culture apparatus [3]

3/02 • with means providing suspensions **[3]**
3/04 • with means providing thin layers **[3]**
3/06 • with filtration, ultrafiltration, inverse osmosis or dialysis means **[5]**
3/08 • Apparatus for tissue disaggregation **[5]**
3/10 • for culture in eggs **[5]**

C12N MICRO-ORGANISMS OR ENZYMES; COMPOSITIONS THEREOF (biocides, pest repellants or attractants, or plant growth regulators containing micro-organisms, viruses, microbial fungi, enzymes, fermentates, or substances produced by, or extracted from, micro-organisms or animal material A01N 63/00; medicinal preparations A61K; fertilisers C05F)**; PROPAGATING, PRESERVING, OR MAINTAINING MICRO-ORGANISMS; MUTATION OR GENETIC ENGINEERING; CULTURE MEDIA** (microbiological testing media C12Q 1/00) **[3]**

Note(s)

1. Attention is drawn to Notes (1) to (3) following the title of class C12.
2. Biocidal, pest repellant, pest attractant or plant growth regulatory activity of compounds or preparations is further classified in subclass A01P.
3. Therapeutic activity of single-cell proteins or enzymes is further classified in subclass A61P.
4. 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.
5. In this subclass, it is desirable to add the indexing codes of subclass C12R.

Subclass index

1/00 Micro-organisms, e.g. protozoa; Compositions thereof (medicinal preparations containing material from protozoa, bacteria or viruses A61K 35/66, from algae A61K 36/02, from fungi A61K 36/06; preparing medicinal bacterial antigen or antibody compositions, e.g. bacterial vaccines, A61K 39/00)**; Processes of propagating, maintaining or preserving micro-organisms or compositions thereof; Processes of preparing or isolating a composition containing a micro-organism; Culture media therefor [3]**

1/02 • Separating micro-organisms from their culture media **[3]**
1/04 • Preserving or maintaining viable micro-organisms (immobilised micro-organisms C12N 11/00) **[3]**
1/06 • Lysis of micro-organisms **[3]**
1/08 • Reducing the nucleic acid content **[3]**
1/10 • Protozoa; Culture media therefor **[3]**
1/11 • • modified by introduction of foreign genetic material **[5]**

1/12 • Unicellular algae; Culture media therefor (as new plants A01H 13/00) **[3]**
1/13 • • modified by introduction of foreign genetic material **[5]**
1/14 • Fungi (culture of mushrooms A01G 1/04; as new plants A01H 15/00); Culture media therefor **[3]**
1/15 • • modified by introduction of foreign genetic material **[5]**
1/16 • • Yeasts; Culture media therefor **[3]**
1/18 • • • Baker's yeast; Brewer's yeast **[3]**
1/19 • • • modified by introduction of foreign genetic material **[5]**
1/20 • Bacteria; Culture media therefor **[3]**
1/21 • • modified by introduction of foreign genetic material **[5]**
1/22 • Processes using, or culture media containing, cellulose or hydrolysates thereof **[3]**
1/24 • Processes using, or culture media containing, waste sulfite liquor **[3]**
1/26 • Processes using, or culture media containing, hydrocarbons (refining of hydrocarbon oils by using micro-organisms C10G 32/00) **[3]**
1/28 • • aliphatic **[3]**
1/30 • • • having five or less carbon atoms **[3]**
1/32 • Processes using, or culture media containing, lower alkanols, i.e. C_1 to C_6 **[3]**
1/34 • Processes using foam culture **[3]**
1/36 • Adaptation or attenuation of cells **[3]**
1/38 • Chemical stimulation of growth or activity by addition of chemical compounds which are not essential growth factors; Stimulation of growth by removal of a chemical compound (C12N 1/34 takes precedence) **[3]**

3/00 Spore-forming or isolating processes [3]

5/00 Undifferentiated human, animal or plant cells, e.g. cell lines; Tissues; Cultivation or maintenance thereof; Culture media therefor (plant reproduction by tissue culture techniques A01H 4/00) **[3, 5]**
5/02 • Propagation of single cells or cells in suspension; Maintenance thereof; Culture media therefor **[3]**
5/04 • Plant cells or tissues **[5]**
5/07 • Animal cells or tissues **[2010.01]**

Note(s) [2010.01]

The last place priority rule does not apply between the subgroups of this group.

5/071 • • Vertebrate cells or tissues, e.g. human cells or tissues **[2010.01]**
5/073 • • • Embryonic cells or tissues; Foetal cells or tissues **[2010.01]**
5/0735 • • • • Embryonic stem cells; Embryonic germ cells **[2010.01]**
5/074 • • • Adult stem cells **[2010.01]**
5/075 • • • Oocytes; Oogonia **[2010.01]**
5/076 • • • Sperm cells; Spermatogonia **[2010.01]**
5/077 • • • Mesenchymal cells, e.g. bone cells, cartilage cells, marrow stromal cells, fat cells or muscle cells **[2010.01]**
5/0775 • • • • Mesenchymal stem cells; Adipose-tissue derived stem cells **[2010.01]**
5/078 • • • Cells from blood or from the immune system **[2010.01]**
5/0781 • • • • B cells; Progenitors thereof **[2010.01]**
5/0783 • • • • T cells; NK cells; Progenitors of T or NK cells **[2010.01]**
5/0784 • • • • Dendritic cells; Progenitors thereof **[2010.01]**
5/0786 • • • • Monocytes; Macrophages **[2010.01]**
5/0787 • • • • Granulocytes, e.g. basophils, eosinophils, neutrophils or mast cells **[2010.01]**
5/0789 • • • • Stem cells; Multipotent progenitor cells **[2010.01]**
5/079 • • • Neural cells **[2010.01]**
5/0793 • • • • Neurons **[2010.01]**
5/0797 • • • • Stem cells; Progenitor cells **[2010.01]**
5/09 • Tumour cells **[2010.01]**
5/095 • • Stem cells; Progenitor cells **[2010.01]**
5/10 • Cells modified by introduction of foreign genetic material, e.g. virus-transformed cells **[5]**
5/12 • • Fused cells, e.g. hybridomas **[5]**
5/14 • • • Plant cells **[5]**
5/16 • • • Animal cells **[5]**
5/18 • • • • Murine cells, e.g. mouse cells **[5]**
5/20 • • • • • one of the fusion partners being a B lymphocyte **[5]**
5/22 • • • Human cells **[5]**
5/24 • • • • one of the fusion partners being a B lymphocyte **[5]**
5/26 • • • Cells resulting from interspecies fusion **[5]**
5/28 • • • • one of the fusion partners being a human cell **[5]**

7/00 Viruses, e.g. bacteriophages; Compositions thereof; Preparation or purification thereof (medicinal preparations containing viruses A61K 35/76; preparing medicinal viral antigen or antibody compositions, e.g. virus vaccines, A61K 39/00) **[3]**
7/01 • Viruses, e.g. bacteriophages, modified by introduction of foreign genetic material (vectors C12N 15/00) **[5]**
7/02 • Recovery or purification **[3]**
7/04 • Inactivation or attenuation; Producing viral sub-units **[3]**
7/06 • • by chemical treatment **[3]**
7/08 • • by serial passage of virus **[3]**

9/00 Enzymes, e.g. ligases (6.); Proenzymes; Compositions thereof (preparations containing enzymes for cleaning teeth A61K 8/66, A61Q 11/00; medicinal preparations containing enzymes or proenzymes A61K 38/43; enzyme containing detergent compositions C11D)**; Processes for preparing, activating, inhibiting, separating, or purifying enzymes [3]**

Note(s)

In this group:
- proenzymes are classified with the corresponding enzymes;
- enzymes are generally categorised according to the "Nomenclature and Classification of Enzymes" of the International Commission on Enzymes. Where appropriate, this designation appears in the subgroups below in parenthesis.

9/02 • Oxidoreductases (1.), e.g. luciferase **[3]**
9/04 • • acting on CHOH groups as donors, e.g. glucose oxidase, lactate dehydrogenase (1.1) **[3]**
9/06 • • acting on nitrogen containing compounds as donors (1.4, 1.5, 1.7) **[3]**
9/08 • • acting on hydrogen peroxide as acceptor (1.11) **[3]**
9/10 • Transferases (2.) (ribonucleases C12N 9/22) **[3]**

9/12 • • transferring phosphorus containing groups, e.g. kinases (2.7) **[3]**
9/14 • Hydrolases (3.) **[3]**
9/16 • • acting on ester bonds (3.1) **[3]**
9/18 • • • Carboxylic ester hydrolases **[3]**
9/20 • • • • Triglyceride splitting, e.g. by means of lipase **[3]**
9/22 • • • Ribonucleases **[3]**
9/24 • • acting on glycosyl compounds (3.2) **[3]**
9/26 • • • acting on alpha-1, 4-glucosidic bonds, e.g. hyaluronidase, invertase, amylase **[3]**
9/28 • • • • Alpha-amylase from microbial source, e.g. bacterial amylase **[3]**
9/30 • • • • • Fungal source **[3]**
9/32 • • • • Alpha-amylase from plant source **[3]**
9/34 • • • • Glucoamylase **[3]**
9/36 • • • acting on beta-1, 4 bonds between N-acetylmuramic acid and 2-acetylamino 2-deoxy-D-glucose, e.g. lysozyme **[3]**
9/38 • • • acting on beta-galactose-glycoside bonds, e.g. beta-galactosidase **[3]**
9/40 • • • acting on alpha-galactose-glycoside bonds, e.g. alpha-galactosidase **[3]**
9/42 • • • acting on beta-1, 4-glucosidic bonds, e.g. cellulase **[3]**
9/44 • • • acting on alpha-1, 6-glucosidic bonds, e.g. isoamylase, pullulanase **[3]**
9/46 • • • • Dextranase **[3]**
9/48 • • acting on peptide bonds, e.g. thromboplastin, leucine aminopeptidase (3.4) **[3]**
9/50 • • • Proteinases **[3]**
9/52 • • • • derived from bacteria **[3]**
9/54 • • • • • bacteria being Bacillus **[3]**
9/56 • • • • • • Bacillus subtilis or Bacillus licheniformis **[3]**
9/58 • • • • derived from fungi **[3]**
9/60 • • • • • from yeast **[3]**
9/62 • • • • • from Aspergillus **[3]**
9/64 • • • • derived from animal tissue, e.g. rennin **[3]**
9/66 • • • Elastase **[3]**
9/68 • • • Plasmin, i.e. fibrinolysin **[3]**
9/70 • • • Streptokinase **[3]**
9/72 • • • Urokinase **[3]**
9/74 • • • Thrombin **[3]**
9/76 • • • Trypsin; Chymotrypsin **[3]**
9/78 • • acting on carbon to nitrogen bonds other than peptide bonds (3.5) **[3]**
9/80 • • • acting on amide bonds in linear amides **[3]**
9/82 • • • • Asparaginase **[3]**
9/84 • • • • Penicillin amidase **[3]**
9/86 • • • acting on amide bonds in cyclic amides, e.g. penicillinase **[3]**
9/88 • Lyases (4.) **[3]**
9/90 • Isomerases (5.) **[3]**
9/92 • • Glucose isomerase **[3]**
9/94 • Pancreatin **[3]**
9/96 • Stabilising an enzyme by forming an adduct or a composition; Forming enzyme conjugates **[3]**
9/98 • Preparation of granular or free-flowing enzyme compositions (C12N 9/96 takes precedence) **[3]**
9/99 • Enzyme inactivation by chemical treatment **[3]**

11/00 Carrier-bound or immobilised enzymes; Carrier-bound or immobilised microbial cells; Preparation thereof [3]

11/02 • Enzymes or microbial cells being immobilised on or in an organic carrier **[3]**
11/04 • • entrapped within the carrier, e.g. gel, hollow fibre **[3]**
11/06 • • attached to the carrier <u>via</u> a bridging agent **[3]**
11/08 • • the carrier being a synthetic polymer **[3]**
11/10 • • the carrier being a carbohydrate **[3]**
11/12 • • • Cellulose or derivatives thereof **[3]**
11/14 • Enzymes or microbial cells being immobilised on or in an inorganic carrier **[3]**
11/16 • Enzymes or microbial cells being immobilised on or in a biological cell **[3]**
11/18 • Multi-enzyme systems **[3]**

13/00 Treatment of micro-organisms or enzymes with electrical or wave energy, e.g. magnetism, sonic waves [3]

15/00 Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification; Use of hosts therefor (mutants or genetically engineered micro-organisms C12N 1/00, C12N 5/00, C12N 7/00; new plants A01H; plant reproduction by tissue culture techniques A01H 4/00; new animals A01K 67/00; use of medicinal preparations containing genetic material which is inserted into cells of the living body to treat genetic diseases, gene therapy A61K 48/00; peptides in general C07K) **[3, 5, 6]**

<u>Note(s)</u>

This group <u>covers</u> processes wherein there is a modification of the genetic material which would not normally occur in nature without intervention of man which produce a change in the gene structure which is passed on to succeeding generations.

15/01 • Preparation of mutants without inserting foreign genetic material therein; Screening processes therefor **[5]**
15/02 • Preparation of hybrid cells by fusion of two or more cells, e.g. protoplast fusion **[5]**
15/03 • • Bacteria **[5]**
15/04 • • Fungi **[5]**
15/05 • • Plant cells **[5]**
15/06 • • Animal cells **[5]**
15/07 • • Human cells **[5]**
15/08 • • Cells resulting from interspecies fusion **[5]**
15/09 • Recombinant DNA-technology **[5]**
15/10 • • Processes for the isolation, preparation or purification of DNA or RNA (chemical preparation of DNA or RNA C07H 21/00; preparation of non-structural polynucleotides from micro-organisms or with enzymes C12P 19/34) **[5]**
15/11 • • DNA or RNA fragments; Modified forms thereof (DNA or RNA not used in recombinant technology C07H 21/00) **[5]**
15/113 • • • Non-coding nucleic acids modulating the expression of genes, e.g. antisense oligonucleotides **[2010.01]**
15/115 • • • Aptamers, i.e. nucleic acids binding a target molecule specifically and with high affinity without hybridising therewith **[2010.01]**
15/117 • • • Nucleic acids having immunomodulatory properties, e.g. containing CpG-motifs **[2010.01]**
15/12 • • • Genes encoding animal proteins **[5]**
15/13 • • • • Immunoglobulins **[5]**
15/14 • • • • Human serum albumins **[5]**

15/15 • • • • Protease inhibitors, e.g. antithrombin, antitrypsin, hirudin **[5]**
15/16 • • • • Hormones **[5]**
15/17 • • • • • Insulins **[5]**
15/18 • • • • • Growth hormones **[5]**
15/19 • • • • Interferons; Lymphokines; Cytokines **[5]**
15/20 • • • • • Interferons **[5]**
15/21 • • • • • • Alpha-interferons **[5]**
15/22 • • • • • • Beta-interferons **[5]**
15/23 • • • • • • Gamma-interferons **[5]**
15/24 • • • • • Interleukins **[5]**
15/25 • • • • • • Interleukin-1 **[5]**
15/26 • • • • • • Interleukin-2 **[5]**
15/27 • • • • • Colony stimulating factors **[5]**
15/28 • • • • • Tumor necrosis factors **[5]**
15/29 • • • Genes encoding plant proteins, e.g. thaumatin **[5]**
15/30 • • • Genes encoding protozoal proteins, e.g. from Plasmodium, Trypanosoma, Eimeria **[5]**
15/31 • • • Genes encoding microbial proteins, e.g. enterotoxins **[5]**
15/32 • • • • Bacillus crystal proteins **[5]**
15/33 • • • • Genes encoding viral proteins **[5]**
15/34 • • • • • Proteins from DNA viruses **[5]**
15/35 • • • • • • Parvoviridae, e.g. feline panleukopenia virus, human parvovirus **[5]**
15/36 • • • • • • Hepadnaviridae **[5]**
15/37 • • • • • • Papovaviridae, e.g. papillomaviruses, polyomavirus, SV40 **[5]**
15/38 • • • • • • Herpetoviridae, e.g. herpes simplex virus, varicella-zoster virus, Epstein-Barr virus, cytomegalovirus, pseudorabies virus **[5]**
15/39 • • • • • • Poxviridae, e.g. vaccinia virus, variola virus **[5]**
15/40 • • • • • Proteins from RNA viruses, e.g. flaviviruses **[5]**
15/41 • • • • • • Picornaviridae, e.g. rhinovirus, coxsackie viruses, echoviruses, enteroviruses **[5]**
15/42 • • • • • • • Foot-and-mouth disease virus **[5]**
15/43 • • • • • • • Poliovirus **[5]**
15/44 • • • • • • Orthomyxoviridae, e.g. infuenza virus **[5]**
15/45 • • • • • • Paramyxoviridae, e.g. measles virus, mumps virus, Newcastle disease virus, canine distemper virus, rinderpest virus, respiratory syncytial viruses **[5]**
15/46 • • • • • • Reoviridae, e.g. rotavirus, bluetongue virus, Colorado tick fever virus **[5]**
15/47 • • • • • • Rhabdoviridae, e.g. rabies viruses, vesicular stomatitis virus **[5]**
15/48 • • • • • • Retroviridae, e.g. bovine leukaemia virus, feline leukaemia virus **[5]**
15/49 • • • • • • • Lentiviridae, e.g. immunodeficiency viruses such as HIV, visna-maedi virus, equine infectious anaemia virus **[5]**
15/50 • • • • • • Coronaviridae, e.g. infectious bronchitis virus, transmissible gastroenteritis virus **[5]**
15/51 • • • • • Hepatitis viruses **[5]**
15/52 • • • Genes encoding for enzymes or proenzymes **[5]**

Note(s)

In this group:

- genes encoding for proenzymes are classified with the corresponding genes encoding enzymes;
- enzymes are generally categorised according to the "Nomenclature and Classification of Enzymes" of the International Commission on Enzymes. Where appropriate, this designation appears in the groups below in parenthesis.

15/53 • • • • Oxidoreductases (1) **[5]**
15/54 • • • • Transferases (2) **[5]**
15/55 • • • • Hydrolases (3) **[5]**
15/56 • • • • • acting on glycosyl compounds (3.2), e.g. amylase, galactosidase, lysozyme **[5]**
15/57 • • • • • acting on peptide bonds (3.4) **[5]**
15/58 • • • • • • • Plasminogen activators, e.g. urokinase, TPA **[5]**
15/59 • • • • • • • Chymosin **[5]**
15/60 • • • • Lyases (4) **[5]**
15/61 • • • • Isomerases (5) **[5]**
15/62 • • • DNA sequences coding for fusion proteins **[5]**

Note(s)

In this group, the following term is used with the meaning indicated:

- "fusion" means the fusion of two different proteins.

15/63 • • Introduction of foreign genetic material using vectors; Vectors; Use of hosts therefor; Regulation of expression **[5]**
15/64 • • • General methods for preparing the vector, for introducing it into the cell or for selecting the vector-containing host **[5]**
15/65 • • • using markers (enzymes used as markers C12N 15/52) **[5]**
15/66 • • • General methods for inserting a gene into a vector to form a recombinant vector using cleavage and ligation; Use of non-functional linkers or adaptors, e.g. linkers containing the sequence for a restriction endonuclease **[5]**

Note(s)

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

- "non-functional linkers" means DNA sequences which are used to link DNA sequences and which have no known function of structural gene or regulating function.

15/67 • • • General methods for enhancing the expression **[5]**
15/68 • • • • Stabilisation of the vector **[5]**
15/69 • • • • Increasing the copy number of the vector **[5]**
15/70 • • • Vectors or expression systems specially adapted for E. coli **[5]**

Note(s)

1. This group covers the use of E. coli as host.
2. Shuttle vectors also replicating in E. coli are classified according to the other host.

15/71 • • • • Expression systems using regulatory sequences derived from the trp-operon **[5]**
15/72 • • • • Expression systems using regulatory sequences derived from the lac-operon **[5]**
15/73 • • • • Expression systems using phage lambda regulatory sequences **[5]**

15/74 • • • Vectors or expression systems specially adapted for prokaryotic hosts other than E. coli, e.g. Lactobacillus, Micromonospora **[5]**

Note(s)

This group covers the use of prokaryotes as hosts.

15/75 • • • • for Bacillus **[5]**
15/76 • • • • for Actinomyces; for Streptomyces **[5]**
15/77 • • • • for Corynebacterium; for Brevibacterium **[5]**
15/78 • • • • for Pseudomonas **[5]**
15/79 • • • Vectors or expression systems specially adapted for eukaryotic hosts **[5]**

Note(s)

This group covers the use of eukaryotes as hosts.

15/80 • • • • for fungi **[5]**
15/81 • • • • • for yeasts **[5]**
15/82 • • • • for plant cells **[5]**
15/83 • • • • • Viral vectors, e.g. cauliflower mosaic virus **[5]**
15/84 • • • • • Ti-plasmids **[5]**
15/85 • • • • for animal cells **[5]**
15/86 • • • • • Viral vectors **[5]**
15/861 • • • • • • Adenoviral vectors **[7]**
15/863 • • • • • • Poxviral vectors, e.g. vaccinia virus **[7]**
15/864 • • • • • • Parvoviral vectors **[7]**
15/866 • • • • • • Baculoviral vectors **[7]**
15/867 • • • • • • Retroviral vectors **[7]**
15/869 • • • • • • Herpesviral vectors **[7]**
15/87 • • Introduction of foreign genetic material using processes not otherwise provided for, e.g. co-transformation **[5]**
15/873 • • • Techniques for producing new embryos, e.g. nuclear transfer, manipulation of totipotent cells or production of chimeric embryos **[2010.01]**
15/877 • • • • Techniques for producing new mammalian cloned embryos **[2010.01]**
15/88 • • • using micro-encapsulation, e.g. using liposome vesicle **[5]**
15/89 • • • using micro-injection **[5]**
15/90 • • • Stable introduction of foreign DNA into chromosome **[5]**

C12P FERMENTATION OR ENZYME-USING PROCESSES TO SYNTHESISE A DESIRED CHEMICAL COMPOUND OR COMPOSITION OR TO SEPARATE OPTICAL ISOMERS FROM A RACEMIC MIXTURE (fermentation processes to form a food composition A21, A23; compounds in general, see the relevant compound class, e.g. C01, C07; brewing of beer C12C; producing vinegar C12J; processes for producing enzymes C12N 9/00; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification C12N 15/00) **[3]**

Note(s)

1. This subclass covers both major and minor chemical modifications.
2. Group C12P 1/00 covers processes for producing organic compounds not sufficiently identified to be classified in groups C12P 3/00-C12P 37/00. Compounds identified only by their empirical formulae are not considered to be sufficiently identified.
3. Attention is drawn to Notes (1) to (3) following the title of class C12.
4. If a particular reaction is considered of interest, it is also classified in the relevant chemical compound class, e.g. C07, C08.
5. In this subclass:
   - metal or ammonium salts of a compound are classified as that compound.
   - compositions are classified in the relevant compound groups.
6. In this subclass, it is desirable to add the indexing codes of subclass C12R.

Subclass index

1/00 Preparation of compounds or compositions, not provided for in groups C12P 3/00-C12P 39/00, by using micro-organisms or enzymes; General processes for the preparation of compounds or compositions by using micro-organisms or enzymes [3]

1/02 • by using fungi **[3]**
1/04 • by using bacteria **[3]**
1/06 • by using actinomycetales **[3]**

3/00 Preparation of elements or inorganic compounds except carbon dioxide [3]

5/00 Preparation of hydrocarbons [3]

5/02 • acyclic (producing methane by anaerobic treatment of sludge C02F 11/04) **[3]**

7/00 Preparation of oxygen-containing organic compounds [3]

7/02 • containing a hydroxy group **[3]**
7/04 • • acyclic **[3]**
7/06 • • • Ethanol, i.e. non-beverage **[3]**
7/08 • • • • produced as by-product or from waste or cellulosic material substrate **[3]**
7/10 • • • • • substrate containing cellulosic material **[3]**
7/12 • • • • • substrate containing sulfite waste liquor or citrus waste **[3]**
7/14 • • • • Multiple stages of fermentation; Multiple types of micro-organisms or reuse for micro-organisms **[3]**
7/16 • • • Butanols **[3]**
7/18 • • • polyhydric **[3]**
7/20 • • • • Glycerol **[3]**
7/22 • • aromatic **[3]**
7/24 • containing a carbonyl group **[3]**
7/26 • • Ketones **[3]**
7/28 • • • Acetone-containing products **[3]**
7/30 • • • • produced from substrate containing inorganic compounds other than water **[3]**
7/32 • • • • produced from substrate containing inorganic nitrogen source **[3]**
7/34 • • • • produced from substrate containing protein as nitrogen source **[3]**
7/36 • • • • produced from substrate containing grain or cereal material **[3]**
7/38 • • • Cyclopentanone- or cyclopentadione-containing products **[3]**
7/40 • containing a carboxyl group **[3]**
7/42 • • Hydroxy carboxylic acids **[3]**
7/44 • • Polycarboxylic acids **[3]**
7/46 • • • Dicarboxylic acids having four or less carbon atoms, e.g. fumaric acid, maleic acid **[3]**
7/48 • • • Tricarboxylic acids, e.g. citric acid **[3]**
7/50 • • • having keto groups, e.g. 2-ketoglutaric acid **[3]**
7/52 • • Propionic acid; Butyric acids **[3]**
7/54 • • Acetic acid (vinegar C12J) **[3]**
7/56 • • Lactic acid **[3]**
7/58 • • Aldonic, ketoaldonic or saccharic acids (uronic acids C12P 19/00) **[3]**
7/60 • • • 2-Ketogulonic acid **[3]**
7/62 • Carboxylic acid esters **[3]**
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 **[3]**
7/66 • containing the quinoid structure **[3]**

9/00 Preparation of organic compounds containing a metal or atom other than H, N, C, O, S, or halogen [3]

11/00 Preparation of sulfur-containing organic compounds [3]

13/00 Preparation of nitrogen-containing organic compounds [3]

13/02 • Amides, e.g. chloramphenicol **[3]**
13/04 • Alpha- or beta-amino acids **[3]**
13/06 • • Alanine; Leucine; Isoleucine; Serine; Homoserine **[3]**
13/08 • • Lysine; Diaminopimelic acid; Threonine; Valine **[3]**
13/10 • • Citrulline; Arginine; Ornithine **[3]**
13/12 • • Methionine; Cysteine; Cystine **[3]**
13/14 • • Glutamic acid; Glutamine **[3]**
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 **[3]**
13/18 • • • using biotin or its derivatives **[3]**
13/20 • • Aspartic acid; Asparagine **[3]**
13/22 • • Tryptophan; Tyrosine; Phenylalanine; 3,4-Dihydroxyphenylalanine **[3]**
13/24 • • Proline; Hydroxyproline; Histidine **[3]**

15/00 Preparation of compounds containing at least three condensed carbocyclic rings [3]

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) **[3]**

17/02 • Oxygen as only ring hetero atoms **[3]**
17/04 • • containing a five-membered hetero ring, e.g. griseofulvin **[3]**
17/06 • • containing a six-membered hetero ring, e.g. fluorescein **[3]**
17/08 • • containing a hetero ring of at least seven ring members, e.g. zearalenone, macrolide aglycons **[3]**
17/10 • Nitrogen as only ring hetero atom **[3]**
17/12 • • containing a six-membered hetero ring **[3]**
17/14 • Nitrogen or oxygen as hetero atom and at least one other diverse hetero ring atom in the same ring **[3]**
17/16 • containing two or more hetero rings **[3]**
17/18 • containing at least two hetero rings condensed among themselves or condensed with a common carbocyclic ring system, e.g. rifamycin **[3]**

19/00 Preparation of compounds containing saccharide radicals (ketoaldonic acids C12P 7/58) **[3]**

Note(s)

Attention is drawn to Note (3) following the title of subclass C07H, which defines the expression "saccharide radical".

19/02 • Monosaccharides (2-ketogulonic acid C12P 7/60) **[3]**
19/04 • Polysaccharides, i.e. compounds containing more than five saccharide radicals attached to each other by glycosidic bonds **[3]**
19/06 • • Xanthan, i.e. Xanthomonas-type heteropolysaccharides **[3]**
19/08 • • Dextran **[3]**
19/10 • • Pullulan **[3]**
19/12 • Disaccharides **[3]**
19/14 • produced by the action of a carbohydrase, e.g. by alpha-amylase **[3]**
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) **[3]**
19/18 • produced by the action of a glycosyl transferase, e.g. alpha-, beta- or gamma-cyclodextrins **[3]**
19/20 • produced by the action of an exo-1, 4 alpha-glucosidase, e.g. dextrose **[3]**
19/22 • produced by the action of a beta-amylase, e.g. maltose **[3]**
19/24 • produced by the action of an isomerase, e.g. fructose **[3]**
19/26 • Preparation of nitrogen-containing carbohydrates **[3]**

19/28 • • N-glycosides **[3]**
19/30 • • • Nucleotides **[3]**
19/32 • • • • having a condensed ring system containing a six-membered ring having two nitrogen atoms in the same-ring, e.g. purine nucleotides, nicotineamide-adenine dinucleotide **[3]**
19/34 • • • • Polynucleotides, e.g. nucleic acids, oligoribonucleotides **[3]**
19/36 • • • • Dinucleotides, e.g. nicotineamide-adenine dinucleotide phosphate **[3]**
19/38 • • • Nucleosides **[3]**
19/40 • • • • having a condensed ring system containing a six-membered ring having two nitrogen atoms in the same ring, e.g. purine nucleosides **[3]**
19/42 • • • Cobalamins, i.e. vitamin B_{12}, LLD factor **[3]**
19/44 • Preparation of O-glycosides, e.g. glucosides **[3]**
19/46 • • having an oxygen atom of the saccharide radical bound to a cyclohexyl radical, e.g. kasugamycin **[3]**
19/48 • • • the cyclohexyl radical being substituted by two or more nitrogen atoms, e.g. destomycin, neamin **[3]**
19/50 • • • • having two saccharide radicals bound through only oxygen to adjacent ring carbon atoms of the cyclohexyl radical, e.g. ambutyrosin, ribostamycin **[3]**
19/52 • • • • • containing three or more saccharide radicals, e.g. neomycin, lividomycin **[3]**
19/54 • • • the cyclohexyl radical being bound directly to a nitrogen atom of two or more  radicals, e.g. streptomycin **[3]**
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 **[3]**
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 **[3]**
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 **[3]**
19/62 • • • the hetero ring having eight or more ring members and only oxygen as ring hetero atoms, e.g. erythromycin, spiramycin, nystatin **[3]**
19/64 • Preparation of S-glycosides, e.g. lincomycin **[3]**

21/00 **Preparation of peptides or proteins** (single-cell protein C12N 1/00) **[3]**
21/02 • having a known sequence of two or more amino acids, e.g. glutathione **[3]**
21/04 • • Cyclic or bridged peptides or polypeptides, e.g. bacitracin (cyclised by —S—S— bonds only C12P 21/02) **[3]**
21/06 • produced by the hydrolysis of a peptide bond, e.g. hydrolysate products (preparing foodstuffs by protein hydrolysis A23J 3/00) **[3]**
21/08 • Monoclonal antibodies **[5]**

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 hetero-rings C12P 17/00) **[3]**

25/00 **Preparation of compounds containing alloxazine or isoalloxazine nucleus, e.g. riboflavin [3]**

27/00 **Preparation of compounds containing a gibbane ring system, e.g. gibberellin [3]**

29/00 **Preparation of compounds containing a naphthacene ring system, e.g. tetracycline** (C12P 19/00 takes precedence) **[3]**

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 [3]**

33/00 **Preparation of steroids [3]**

Note(s)

Attention is drawn to Note (1) following the title of subclass C07J, which explains what is covered by the term "steroids".

Note(s)

In groups C12P 33/02-C12P 33/20, the following terms are used with the meaning indicated:

- "acting", "forming", "hydroxylating", "dehydroxylating" or "dehydrogenating" means the action of a micro-organism or enzyme rather than other chemical action.

33/02 • Dehydrogenating; Dehydroxylating **[3]**
33/04 • • Forming an aryl ring from A ring **[3]**
33/06 • Hydroxylating **[3]**
33/08 • • at 11 position **[3]**
33/10 • • • at 11alpha-position **[3]**
33/12 • Acting on D ring **[3]**
33/14 • • Hydroxylating at 16 position **[3]**
33/16 • • Acting at 17 position **[3]**
33/18 • • • Hydroxylating at 17 position **[3]**
33/20 • containing heterocyclic rings **[3]**

35/00 **Preparation of compounds having a 5-thia-1-azabicyclo [4.2.0] octane ring system, e.g. cephalosporin [3]**
35/02 • by desacylation of the substituent in the 7 position **[3]**
35/04 • by acylation of the substituent in the 7 position **[3]**
35/06 • Cephalosporin C; Derivatives thereof **[3]**
35/08 • disubstituted in the 7 position **[3]**

37/00 **Preparation of compounds having a 4-thia-1-azabicyclo [3.2.0] heptane ring system, e.g. penicillin [3]**
37/02 • in presence of phenylacetic acid or phenylacetamide or their derivatives **[3]**
37/04 • by acylation of the substituent in the 6 position **[3]**
37/06 • by desacylation of the substituent in the 6 position **[3]**

39/00 **Processes involving micro-organisms of different genera in the same process, simultaneously [3]**

41/00 **Processes using enzymes or micro-organisms to separate optical isomers from a racemic mixture [4]**

C12Q MEASURING OR TESTING PROCESSES INVOLVING ENZYMES OR MICRO-ORGANISMS (immunoassay G01N 33/53); COMPOSITIONS OR TEST PAPERS THEREFOR; PROCESSES OF PREPARING SUCH COMPOSITIONS; CONDITION-RESPONSIVE CONTROL IN MICROBIOLOGICAL OR ENZYMOLOGICAL PROCESSES [3]

Note(s)

1. This subclass does not cover the observation of the progress or of the result of processes specified in this subclass by any of the methods specified in groups G01N 3/00-G01N 29/00, which is covered by subclass G01N.
2. In this subclass, the following expression is used with the meaning indicated:
   - "involving", when used in relation to a substance, includes the testing for the substance as well as employing the substance as a determinant or reactant in a test for a different substance.
3. Attention is drawn to Notes (1) to (3) following the title of class C12.
4. In this subclass, test media are classified in the appropriate group for the relevant test process.
5. In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 **Measuring or testing processes involving enzymes or micro-organisms** (measuring or testing apparatus with condition measuring or sensing means, e.g. colony counters, C12M 1/34)**; Compositions therefor; Processes of preparing such compositions [3]**

1/02 • involving viable micro-organisms **[3]**
1/04 • • Determining presence or kind of micro-organism; Use of selective media for testing antibiotics or bacteriocides; Compositions containing a chemical indicator therefor **[3]**
1/06 • • • Quantitative determination **[3]**
1/08 • • • • using multifield media **[3]**
1/10 • • • Enterobacteria **[3]**
1/12 • • • Nitrate to nitrite reducing bacteria **[3]**
1/14 • • • Streptococcus; Staphylococcus **[3]**
1/16 • • • using radioactive material **[3]**
1/18 • • Testing for antimicrobial activity of a material **[3]**
1/20 • • • using multifield media **[3]**
1/22 • • Testing for sterility conditions **[3]**
1/24 • • Methods of sampling, or inoculating or spreading a sample; Methods of physically isolating an intact micro-organism **[3]**
1/25 • involving enzymes not classifiable in groups C12Q 1/26-C12Q 1/70 **[5]**
1/26 • involving oxidoreductase **[3]**
1/28 • • involving peroxidase **[3]**
1/30 • • involving catalase **[3]**
1/32 • • involving dehydrogenase **[3]**
1/34 • involving hydrolase **[3]**
1/37 • • involving peptidase or proteinase **[5]**
1/40 • • involving amylase **[3]**
1/42 • • involving phosphatase **[3]**
1/44 • • involving esterase **[3]**
1/46 • • • involving cholinesterase **[3]**
1/48 • involving transferase **[3]**
1/50 • • involving creatine phosphokinase **[3]**
1/52 • • involving transaminase **[3]**
1/527 • involving lyase **[5]**
1/533 • involving isomerase **[5]**
1/54 • involving glucose or galactose **[3]**
1/56 • involving blood clotting factors, e.g. involving thrombin, thromboplastin, fibrinogen **[3]**
1/58 • involving urea or urease **[3]**
1/60 • involving cholesterol **[3]**
1/61 • involving triglycerides **[5]**
1/62 • involving uric acid **[3]**
1/64 • Geomicrobiological testing, e.g. for petroleum **[3]**
1/66 • involving luciferase **[3]**
1/68 • involving nucleic acids **[3]**
1/70 • involving virus or bacteriophage **[3]**

3/00 **Condition-responsive control processes** (apparatus therefor C12M 1/36; controlling or regulating in general G05) **[3]**

C12R INDEXING SCHEME ASSOCIATED WITH SUBCLASSES C12C-C12Q OR C12S, RELATING TO MICRO-ORGANISMS [3]

Note(s)

1. This subclass constitutes an indexing scheme associated with the other subclasses of class C12, relating to micro-organisms used in the processes classified in subclasses C12C-C12Q or C12S.
2. The bacteria terminology is based on "Bergey's Manual of Determinative Bacteriology", Eighth Edition, 1975.

1/00 **Micro-organisms [3]**

1/01 • Bacteria or actinomycetales **[3]**
1/02 • • Acetobacter **[3]**
1/025 • • Achromobacter **[3]**
1/03 • • Actinomadura **[3]**
1/04 • • Actinomyces **[3]**
1/045 • • Actinoplanes **[3]**
1/05 • • Alcaligenes **[3]**
1/06 • • Arthrobacter **[3]**
1/065 • • Azotobacter **[3]**
1/07 • • Bacillus **[3]**
1/08 • • • Bacillus brevis **[3]**

1/085 • • • Bacillus cereus **[3]**
1/09 • • • Bacillus circulans **[3]**
1/10 • • • Bacillus licheniformis **[3]**
1/11 • • • Bacillus megaterium **[3]**
1/12 • • • Bacillus polymyxa **[3]**
1/125 • • • Bacillus subtilis **[3]**
1/13 • • Brevibacterium **[3]**
1/14 • • Chainia **[3]**
1/145 • • Clostridium **[3]**
1/15 • • Corynebacterium **[3]**
1/16 • • • Corynebacterium diphtheriae **[3]**
1/165 • • • Corynebacterium poinsettiae **[3]**
1/17 • • • Corynebacterium pyogenes **[3]**
1/18 • • Erwinia **[3]**
1/185 • • Escherichia **[3]**
1/19 • • • Escherichia coli **[3]**
1/20 • • Flavobacterium **[3]**
1/21 • • Haemophilus **[3]**
1/22 • • Klebsiella **[3]**
1/225 • • Lactobacillus **[3]**
1/23 • • • Lactobacillus acidophilus **[3]**
1/24 • • • Lactobacillus brevis **[3]**
1/245 • • • Lactobacillus casei **[3]**
1/25 • • • Lactobacillus plantarum **[3]**
1/26 • • Methylomonas **[3]**
1/265 • • Micrococcus **[3]**
1/27 • • • Micrococcus flavus **[3]**
1/28 • • • Micrococcus glutamicus **[3]**
1/285 • • • Micrococcus lysodeikticus **[3]**
1/29 • • Micromonospora **[3]**
1/30 • • • Micromonospora chalcea **[3]**
1/31 • • • Micromonospora purpurea **[3]**
1/32 • • Mycobacterium **[3]**
1/325 • • • Mycobacterium avium **[3]**
1/33 • • • Mycobacterium fortuitum **[3]**
1/34 • • • Mycobacterium smegmatis **[3]**
1/35 • • Mycoplasma **[3]**
1/36 • • Neisseria **[3]**
1/365 • • Nocardia **[3]**
1/37 • • Proteus **[3]**
1/38 • • Pseudomonas **[3]**
1/385 • • • Pseudomonas aeruginosa **[3]**
1/39 • • • Pseudomonas fluorescens **[3]**
1/40 • • • Pseudomonas putida **[3]**
1/41 • • Rhizobium **[3]**
1/42 • • Salmonella **[3]**
1/425 • • Serratia **[3]**
1/43 • • • Serratia marcescens **[3]**
1/44 • • Staphylococcus **[3]**
1/445 • • • Staphylococcus aureus **[3]**
1/45 • • • Staphylococcus epidermidis **[3]**
1/46 • • Streptococcus **[3]**
1/465 • • Streptomyces **[3]**
1/47 • • • Streptomyces albus **[3]**
1/48 • • • Streptomyces antibioticus **[3]**
1/485 • • • Streptomyces aureofaciens **[3]**
1/49 • • • Streptomyces aureus **[3]**
1/50 • • • Streptomyces bikiniensis **[3]**
1/51 • • • Streptomyces candidus **[3]**
1/52 • • • Streptomyces chartreusis **[3]**
1/525 • • • Streptomyces diastatochromogenes **[3]**
1/53 • • • Streptomyces filipinensis **[3]**
1/54 • • • Streptomyces fradiae **[3]**
1/545 • • • Streptomyces griseus **[3]**
1/55 • • • Streptomyces hygroscopicus **[3]**
1/56 • • • Streptomyces lavendulae **[3]**
1/565 • • • Streptomyces lincolnensis **[3]**
1/57 • • • Streptomyces noursei **[3]**
1/58 • • • Streptomyces olivaceus **[3]**
1/585 • • • Streptomyces platensis **[3]**
1/59 • • • Streptomyces rimosus **[3]**
1/60 • • • Streptomyces sparsogenes **[3]**
1/61 • • • Streptomyces venezuelae **[3]**
1/62 • • Streptosporangium **[3]**
1/625 • • Streptoverticillium **[3]**
1/63 • • Vibrio **[3]**
1/64 • • Xanthomonas **[3]**
1/645 • Fungi **[3]**
1/65 • • Absidia **[3]**
1/66 • • Aspergillus **[3]**
1/665 • • • Aspergillus awamori **[3]**
1/67 • • • Aspergillus flavus **[3]**
1/68 • • • Aspergillus fumigatus **[3]**
1/685 • • • Aspergillus niger **[3]**
1/69 • • • Aspergillus oryzae **[3]**
1/70 • • • Aspergillus ustus **[3]**
1/71 • • • Aspergillus wentii **[3]**
1/72 • • Candida **[3]**
1/725 • • • Candida albicans **[3]**
1/73 • • • Candida lipolytica **[3]**
1/74 • • • Candida tropicalis **[3]**
1/745 • • Cephalosporium **[3]**
1/75 • • • Cephalosporium acremonium **[3]**
1/76 • • • Cephalosporium coerulescens **[3]**
1/765 • • • Cephalosporium crotocinigenum **[3]**
1/77 • • Fusarium **[3]**
1/78 • • Hansenula **[3]**
1/785 • • Mucor **[3]**
1/79 • • Paecilomyces **[3]**
1/80 • • Penicillium **[3]**
1/81 • • • Penicillium brevi **[3]**
1/82 • • • Penicillium chrysogenum **[3]**
1/825 • • • Penicillium notatum **[3]**
1/83 • • • Penicillium patulum **[3]**
1/84 • • Pichia **[3]**
1/845 • • Rhizopus **[3]**
1/85 • • Saccharomyces **[3]**
1/86 • • • Saccharomyces carlsbergensis **[3]**
1/865 • • • Saccharomyces cerevisiae **[3]**
1/87 • • • Saccharomyces lactis **[3]**
1/88 • • Torulopsis **[3]**
1/885 • • Trichoderma **[3]**
1/89 • Algae **[3]**
1/90 • Protozoa **[3]**
1/91 • Cell lines **[3, 7]**
1/92 • Viruses **[5, 7]**
1/93 • • Animal viruses **[7]**
1/94 • • Plant viruses **[7]**

C12S PROCESSES USING ENZYMES OR MICRO-ORGANISMS TO LIBERATE, SEPARATE OR PURIFY A PRE-EXISTING COMPOUND OR COMPOSITION (biological treatment of water, waste water, or sewage C02F 3/00, of sludge C02F 11/02; processes using enzymes or micro-organisms to separate optical isomers from a racemic mixture C12P 41/00)**; PROCESSES USING ENZYMES OR MICRO-ORGANISMS TO TREAT TEXTILES OR TO CLEAN SOLID SURFACES OF MATERIALS [5]**

Note(s)

1. This subclass covers processes already provided for in:
   - Section A: A21, A23, A61L, A62D;
   - Section B: B01D, B08B, B09C;
   - Section C: C01, C05F, C08, C09B, C09H, C10G, C13, C14C, C21B, C22B, C23F, C23G;
   - Section D: D01C, D01F, D06L, D06M, D06P, D21C, D21H;
   - Section E: E21B;
   - Section F: F24F, F24J, F26B;
   - Section H: H01M.

This subclass is intended to provide a basis for a complete search to be made with respect to the subject matter defined by the subclass title and, therefore, all relevant information is classified in this subclass, even if classified elsewhere.

2. Attention is drawn to Notes (2) and (3) following the title of class C12.
3. In this subclass, in the absence of an indication to the contrary, classification is made in the last appropriate place.
4. The classification symbols of this subclass are not listed first when printed on patent documents.
5. In this subclass, it is desirable to add the indexing codes of subclass C12R.

1/00 Treatment of petroleum oils, shale oils or sand oils [5]

1/02 • Desulfurising **[5]**

3/00 Treatment of animal or plant materials or micro-organisms [5]

3/02 • Recovery or purification of carbohydrate material **[5]**
3/04 • • Cellulose, e.g. plant fibres **[5]**
3/06 • • • Treatment of hemp or flax **[5]**
3/08 • • • in the production of paper pulp **[5]**
3/10 • • Treatment of sugar or molasses **[5]**
3/12 • • Treatment of pectin or starch **[5]**
3/14 • Recovery or purification of proteinaceous material **[5]**
3/16 • • Collagen or gelatin **[5]**
3/18 • Recovery or purification of glyceridic oils, fats, ester-type waxes or fatty acids **[5]**
3/20 • Removal of nucleic acids from intact or disrupted cells **[5]**
3/22 • Treatment of blood fractions **[5]**
3/24 • Treatment of animal secretions or organs **[5]**

5/00 Treatment of emulsions, gases or foams [5]

7/00 Treatment of hides, e.g. depilating, bating [5]

9/00 Cleaning solid surfaces of materials [5]

11/00 Treatment of textiles, e.g. cleaning [5]

99/00 Subject matter not provided for in other groups of this subclass [2010.01]