

C 12 BIOCHEMISTRY; BEER; SPIRITS; WINE; VINEGAR; MICROBIOLOGY; ENZYMOLOGY; MUTATION OR GENETIC ENGINEERING

Notes

- (1) In subclasses C 12 M to Q or S, and within each of these subclasses, in the absence of an indication to the contrary, classification is made in the last appropriate place. [3]
- (2) In this class, viruses, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are considered as micro-organisms. [3,5]
- (3) In this subclass, 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. [5]
- (4) The codes of subclass C 12 R are only for use as indexing codes associated with subclasses C to Q or S, so as to provide information concerning the micro-organisms used in the processes classified in these subclasses. [3]

C 12 C BREWING OF BEER (cleaning of raw materials A 23 N; pitching or depitching machines, cellar tools C 12 L; propagating yeasts C 12 N 1/14; non-beverage ethanolic fermentation C 12 P 7/06)

Note

In this subclass, it is desirable to add the indexing codes of subclass C 12 R. The indexing codes should be linked. [6]

Subclass Index

RAW MATERIALS FOR PREPARING BEER	1/00, 3/00, 5/00	SPECIAL BEER	12/00
PREPARATION AND TREATMENT OF WORT; FERMENTATION PROCESSES FOR BEER.....	7/00, 11/00	BREWING DEVICES	13/00

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 A 23 L)

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 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 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 (C 12 H takes precedence; containers with means specially adapted for effervescing potable liquids B 65 D 85/73) [6]

12/00 Processes specially adapted for making special kinds of beer [6]

- 12/02 . Beer with low calorie content (12/04 takes precedence) [6]
- 12/04 . Beer with low alcohol content (removal of alcohol C 12 H 3/00) [6]

13/00 Brewing devices, not covered by a single group of 1/00 to 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]

C 12 F RECOVERY OF BY-PRODUCTS OF FERMENTED SOLUTIONS; DENATURING OF, OR DENATURED, ALCOHOL [6]**Note**

In this subclass, it is desirable to add the indexing codes of subclass C 12 R. The indexing codes should be linked. [6]

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 (3/02 takes precedence; removal of yeast C 12 G 1/08)

- 3/08 . . Recovery of alcohol from press residues or other waste material (from carbon dioxide 3/04)
- 3/10 . from distillery slops

5/00 Preparation of denatured alcohol**C 12 G WINE; OTHER ALCOHOLIC BEVERAGES; PREPARATION THEREOF (beer C 12 C)****Note**

In this subclass, it is desirable to add the indexing codes of subclass C 12 R. The indexing codes should be linked. [6]

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 (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]

C 12 G, H, J

- 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 [C 12 H 3/00](#))
 - 3/10 . . . Increasing the alcohol content
 - 3/12 . . . by distillation (distillation processes or apparatus, in general [B 01 D 3/00](#))
 - 3/14 . . . by freezing **[6]**
-

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

Note

In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be linked. **[6]**

- 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** (distillation or rectification of fermented solutions to obtain pure alcohol [B 01 D 3/00](#); recovery of by-products of wine or beer other than low-alcohol beverages [C 12 F 3/06](#); preparation of alcoholic beverages other than wine or beer by varying the composition of fermented solutions [C 12 G 3/08](#)) **[6]**
 - 3/02 . . by evaporating **[6]**
 - 3/04 . . using semi-permeable membranes **[6]**
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C 12 J VINEGAR; ITS PREPARATION

Note

In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be linked. **[6]**

- 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

C 12 L PITCHING OR DEPITCHING MACHINES; CELLAR TOOLS (cleaning of casks [B 08 B 9/00](#))**Note**

In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be [linked](#). [6]

3/00	Pitching or depitching machines	11/00	Cellar tools
9/00	Venting devices for casks, barrels, or the like		

C 12 M APPARATUS FOR ENZYMOLOGY OR MICROBIOLOGY (installations for fermenting manure [A 01 C 3/02](#); preservation of living parts of humans or animals [A 01 N 1/02](#); physical or chemical apparatus in general [B 01](#); brewing apparatus [C 12 C](#); fermentation apparatus for wine [C 12 G](#); apparatus for preparing vinegar [C 12 J 1/10](#)) [3]**Notes**

- (1) Attention is drawn to Notes (1) to (3) following the title of class [C 12](#). [4]
 (2) In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be [linked](#). [6]

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

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. [3]
- | | | | |
|-------|---|-------------|---|
| 1/02 | . with agitation means; with heat exchange means [3] | 1/18 | . . Multiple fields or compartments [3] |
| 1/04 | . with gas introduction means [3] | 1/20 | . . . Horizontal planar fields [3] |
| 1/06 | . . with agitator, e.g. impeller [3] | 1/21 | . Froth suppressors [5] |
| 1/08 | . . with draft tube [3] | 1/22 | . Petri type dish [3] |
| 1/09 | . . Flotation apparatus [5] | 1/24 | . tube or bottle type [3] |
| 1/10 | . rotatably mounted [3] | 1/26 | . Inoculator or sampler [3] |
| 1/107 | . with means for collecting fermentation gases, e.g. methane (producing methane by anaerobic treatment of sludge C 02 F 11/04) [5] | 1/28 | . . being part of container [3] |
| 1/113 | . . with transport of the substrate during the fermentation [5] | 1/30 | . . . Sampler being a swab [3] |
| 1/12 | . with sterilisation, filtration, or dialysis means [3] | 1/32 | . . multiple field or continuous type [3] |
| 1/14 | . with means providing thin layers or with multi-level trays [3] | 1/33 | . Disintegrators [5] |
| 1/16 | . containing, or adapted to contain, solid media [3] | 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 G 05) [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] |

C 12 N 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 [A 01 N 63/00](#); food compositions [A 21](#), [A 23](#); medicinal preparations [A 61 K](#); chemical aspects of, or use of materials for, bandages, dressings, absorbent pads or surgical articles [A 61 L](#); fertilisers [C 05](#)); **PROPAGATING, PRESERVING, OR MAINTAINING MICRO-ORGANISMS** (preservation of living parts of humans or animals [A 01 N 1/02](#)); **MUTATION OR GENETIC ENGINEERING; CULTURE MEDIA** (microbiological testing media [C 12 Q](#)) [3]

Notes

- (1) Attention is drawn to Notes (1) to (3) following the title of class [C 12](#). [3,4]
 (2) *Therapeutic activity of single-cell proteins or enzymes is further classified in subclass [A 61 P](#).* [7]
 (3) In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be linked. [6]

Subclass Index

MICRO-ORGANISMS; SPORES; UNDIFFERENTIATED CELLS; VIRUSES.....	1/00; 3/00; 5/00; 7/00; 11/00	TREATMENT WITH ELECTRICAL OR WAVE ENERGY	13/00
ENZYMES	9/00, 11/00	MUTATION OR GENETIC ENGINEERING.....	15/00

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|--|--|
| <p>1/00 Micro-organisms, e.g. protozoa; Compositions thereof (medicinal preparations containing material from micro-organisms A 61 K 35/66; preparing medicinal bacterial antigen or antibody compositions, e.g. bacterial vaccines, A 61 K 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]</p> <p>1/02 . Separating micro-organisms from their culture media [3]</p> <p>1/04 . Preserving or maintaining viable micro-organisms (immobilised micro-organisms 11/00) [3]</p> <p>1/06 . Lysis of micro-organisms [3]</p> <p>1/08 . Reducing the nucleic acid content [3]</p> <p>1/10 . Protozoa; Culture media therefor [3]</p> <p>1/11 . . modified by introduction of foreign genetic material [5]</p> <p>1/12 . Unicellular algae; Culture media therefor (culture of multi-cellular plants A 01 G; as new plants A 01 H 13/00) [3]</p> <p>1/13 . . modified by introduction of foreign genetic material [5]</p> <p>1/14 . Fungi (culture of mushrooms A 01 G 1/04; as new plants A 01 H 15/00); Culture media therefor [3]</p> <p>1/15 . . modified by introduction of foreign genetic material [5]</p> <p>1/16 . . Yeasts; Culture media therefor [3]</p> <p>1/18 . . . Baker's yeast; Brewer's yeast [3]</p> <p>1/19 . . . modified by introduction of foreign genetic material [5]</p> <p>1/20 . Bacteria; Culture media therefor [3]</p> <p>1/21 . . modified by introduction of foreign genetic material [5]</p> <p>1/22 . Processes using, or culture media containing, cellulose or hydrolysates thereof [3]</p> <p>1/24 . Processes using, or culture media containing, waste sulfite liquor [3]</p> | <p>1/26 . Processes using, or culture media containing, hydrocarbons (refining of hydrocarbon oils by using micro-organisms C 10 G 32/00) [3]</p> <p>1/28 . . aliphatic [3]</p> <p>1/30 . . . having five or less carbon atoms [3]</p> <p>1/32 . Processes using, or culture media containing, lower alkanols, i.e. C₁ to C₆ [3]</p> <p>1/34 . Processes using foam culture [3]</p> <p>1/36 . Adaptation or attenuation of cells [3]</p> <p>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 (1/34 takes precedence) [3]</p> <p>3/00 Spore-forming or isolating processes [3]</p> <p>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 A 01 H 4/00) [3,5]</p> <p>5/02 . Propagation of single cells or cells in suspension; Maintenance thereof; Culture media therefor [3]</p> <p>5/04 . Plant cells or tissues [5]</p> <p>5/06 . Animal cells or tissues [5]</p> <p>5/08 . Human cells or tissues [5]</p> <p>5/10 . Cells modified by introduction of foreign genetic material, e.g. virus-transformed cells [5]</p> <p>5/12 . . Fused cells, e.g. hybridomas [5]</p> <p>5/14 . . . Plant cells [5]</p> <p>5/16 . . . Animal cells [5]</p> <p>5/18 Murine cells, e.g. mouse cells [5]</p> <p>5/20 one of the fusion partners being a B lymphocyte [5]</p> <p>5/22 . . . Human cells [5]</p> <p>5/24 one of the fusion partners being a B lymphocyte [5]</p> |
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- 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 A 61 K 35/76; preparing medicinal viral antigen or antibody compositions, e.g. virus vaccines, A 61 K 39/00) [3]
- 7/01 . Viruses, e.g. bacteriophages, modified by introduction of foreign genetic material (vectors 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 A 61 K 7/28; medicinal preparations containing enzymes or proenzymes A 61 K 38/43; enzyme containing detergent compositions C 11 D); **Processes for preparing, activating, inhibiting, separating, or purifying enzymes** (preparation of malt C 12 C 1/00) [3]
- Note**
- In this group:
 – proenzymes are classified with the corresponding enzymes; [5]
 – 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. [3]
- 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 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-acetyl amino 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 (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 via 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 thereof (mutants or genetically engineered micro-organisms 1/00, 5/00, 7/00; new plants A 01 H; plant reproduction by tissue culture techniques A 01 H 4/00; new animals A 01 K 67/00; use of medicinal preparations containing genetic material which is inserted into cells of the living body to treat genetic diseases, gene therapy A 61 K 48/00; peptides in general C 07 K) [3,5,6]**

Note

This group covers 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. [3]

- 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 C 07 H 21/00; preparation of non-structural polynucleotides from micro-organisms or with enzymes C 12 P 19/34) [5]
- 15/11 . . DNA or RNA fragments; Modified forms thereof (DNA or RNA not used in recombinant technology C 07 H 21/00) [5]
- 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. influenza 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, HIV [5]
- 15/49 Lentiviridae, e.g. immunodeficiency viruses, 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

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. [5]

- 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

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

- “fusion” means the fusion of two different proteins. [5]

- 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 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

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. [5]

- 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]

Notes

- (1) This group covers the use of *E. coli* as host. [5]
 (2) Shuttle vectors also replicating in *E. coli* are classified according to the other host. [5]

- 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

This group covers the use of prokaryotes as hosts. [5]

- 15/75 for *Bacillus* [5]
 15/76 for Actinomycetes; 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

This group covers the use of eukaryotes as hosts. [5]

- 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]
 15/88 . . . 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]

C 12 P 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 A 21, A 23; compounds in general, see the relevant compound class, e.g. C 01, C 07; brewing of beer C 12 C; producing vinegar C 12 J; processes for producing enzymes C 12 N 9/00; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification C 12 N 15/00) [3]

Notes

- (1) This subclass covers both major and minor chemical modifications. [3]
- (2) Group 1/00 covers processes for producing organic compounds not sufficiently identified to be classified in groups 3/00 to 37/00. Compounds identified only by their empirical formulae are not considered to be sufficiently identified. [3]
- (3) Attention is drawn to Notes (1) to (3) following the title of class C 12. [4]
- (4) If a particular reaction is considered of interest, it is also classified in the relevant chemical compound class, e.g. C 07, C 08. [3]
- (5) In this subclass:
 - metal or ammonium salts of a compound are classified as that compound.
 - compositions are classified in the relevant compound groups. [3]
- (6) In this subclass, it is desirable to add the indexing codes of subclass C 12 R. The indexing codes should be linked. [6]

Subclass Index

BIOSYNTHESIS OF CHEMICAL SUBSTANCES

Inorganic compounds	3/00
Acyclic or carbocyclic organic compounds	5/00 to 15/00
peptides or proteins	21/00
Carotenes.....	23/00
Tetracyclines.....	29/00
Prostaglandins	31/00

Steroids	33/00
Heterocyclic organic compounds	17/00
containing saccharide radicals.....	19/00
Riboflavin	25/00
Giberellin	27/00
Cephalosporin; penicillin	35/00; 37/00
SEPARATION OF OPTICAL ISOMERS	41/00
OTHER PROCESSES FOR BIOSYNTHESIS PREPARATIONS.....	1/00, 39/00

1/00	Preparation of compounds or compositions, not provided for in groups 3/00 to 39/00, by using micro-organisms or enzymes; General processes for the preparation of compounds or compositions by using micro-organisms or enzymes [3]	7/12	. . . . .	substrate containing sulfite waste liquor or citrus waste [3]
1/02	. by using fungi [3]	7/14	. . . . .	Multiple stages of fermentation; Multiple types of micro-organisms or reuse for micro-organisms [3]
1/04	. by using bacteria [3]	7/16	. . . . .	Butanols [3]
1/06	. by using actinomycetales [3]	7/18	. . . . .	polyhydric [3]
3/00	Preparation of elements or inorganic compounds except carbon dioxide [3]	7/20	. . . . .	Glycerol [3]
5/00	Preparation of hydrocarbons [3]	7/22	. . . . .	aromatic [3]
5/02	. acyclic (producing methane by anaerobic treatment of sludge C 02 F 11/04) [3]	7/24	. . . . .	containing a carbonyl group [3]
7/00	Preparation of oxygen-containing organic compounds [3]	7/26	. . . . .	Ketones [3]
7/02	. containing a hydroxy group [3]	7/28	. . . . .	Acetone-containing products [3]
7/04	. . acyclic [3]	7/30	. . . . .	produced from substrate containing inorganic compounds other than water [3]
7/06	. . . Ethanol, i.e. non-beverage [3]	7/32	. . . . .	produced from substrate containing inorganic nitrogen source [3]
7/08	. . . . produced as by-product or from waste or cellulosic material substrate [3]	7/34	. . . . .	produced from substrate containing protein as nitrogen source [3]
7/10	. . . . . substrate containing cellulosic material [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 C 12 J) [3]
- 7/56 . . Lactic acid [3]
- 7/58 . . Aldonic, ketoaldonic or saccharic acids (uronic acids 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 (13/04 to 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 7/58) [3]**
- Note**
- Attention is drawn to Note (3) following the title of subclass C 07 H, which defines the expression "saccharide radical". [3]
- 19/02 . Monosaccharides (2-ketogulonic acid 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 C 08 B 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, nicotinamide-adenine dinucleotide [3]
- 19/34 Polynucleotides, e.g. nucleic acids, oligoribonucleotides [3]
- 19/36 Dinucleotides, e.g. nicotinamide-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 B₁₂, 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 $\begin{array}{c} >N-C-N< \\ || \\ N \end{array}$ 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 C 12 N 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 21/02) [3]
- 21/06 . produced by the hydrolysis of a peptide bond, e.g. hydrolysate products (preparing foodstuffs by protein hydrolysis A 23 J 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 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** (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]

Notes

- (1) In groups 33/02 to 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. [3]
- (2) Attention is drawn to the Note following the title of subclass C 07 J, which explains what is covered by the term "steroids". [3]

- 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]

C 12 Q MEASURING OR TESTING PROCESSES INVOLVING ENZYMES OR MICRO-ORGANISMS (immunoassay [G 01 N 33/53](#)); **COMPOSITIONS OR TEST PAPERS THEREFOR; PROCESSES OF PREPARING SUCH COMPOSITIONS; CONDITION-RESPONSIVE CONTROL IN MICROBIOLOGICAL OR ENZYMOLOGICAL PROCESSES** [3]

Notes

- (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 [G 01 N 3/00 to 29/00](#), which is covered by subclass [G 01 N](#). [3]
- (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]
- (3) Attention is drawn to Notes (1) to (3) following the title of class [C 12](#). [4]
- (4) In this subclass, test media are classified in the appropriate group for the relevant test process. [3]
- (5) In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be linked. [6]

<p>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, C 12 M 1/34); Compositions therefor; Processes of preparing such compositions [3]</p> <p>1/02 . involving viable micro-organisms [3]</p> <p>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]</p> <p>1/06 . . . Quantitative determination [3]</p> <p>1/08 using multifield media [3]</p> <p>1/10 Enterobacteria [3]</p> <p>1/12 Nitrate to nitrite reducing bacteria [3]</p> <p>1/14 Streptococcus; Staphylococcus [3]</p> <p>1/16 using radioactive material [3]</p> <p>1/18 . . Testing for antimicrobial activity of a material [3]</p> <p>1/20 . . . using multifield media [3]</p> <p>1/22 . . Testing for sterility conditions [3]</p> <p>1/24 . . Methods of sampling, or inoculating or spreading a sample; Methods of physically isolating an intact micro-organism [3]</p> <p>1/25 . involving enzymes not classifiable in groups 1/26 to 1/70 [5]</p> <p>1/26 . involving oxidoreductase [3]</p> <p>1/28 . . involving peroxidase [3]</p> <p>1/30 . . involving catalase [3]</p>	<p>1/32 . . involving dehydrogenase [3]</p> <p>1/34 . involving hydrolase [3]</p> <p>1/37 . . involving peptidase or proteinase [5]</p> <p>1/40 . . involving amylase [3]</p> <p>1/42 . . involving phosphatase [3]</p> <p>1/44 . . involving esterase [3]</p> <p>1/46 . . . involving cholinesterase [3]</p> <p>1/48 . involving transferase [3]</p> <p>1/50 . . involving creatine phosphokinase [3]</p> <p>1/52 . . involving transaminase [3]</p> <p>1/527 . involving lyase [5]</p> <p>1/533 . involving isomerase [5]</p> <p>1/54 . involving glucose or galactose [3]</p> <p>1/56 . involving blood clotting factors, e.g. involving thrombin, thromboplastin, fibrinogen [3]</p> <p>1/58 . involving urea or urease [3]</p> <p>1/60 . involving cholesterol [3]</p> <p>1/61 . involving triglycerides [5]</p> <p>1/62 . involving uric acid [3]</p> <p>1/64 . Geomicrobiological testing, e.g. for petroleum [3]</p> <p>1/66 . involving luciferase [3]</p> <p>1/68 . involving nucleic acids [3]</p> <p>1/70 . involving virus or bacteriophage [3]</p> <p>3/00 Condition-responsive control processes (apparatus therefor C 12 M 1/36; controlling or regulating in general G 05) [3]</p>
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C 12 R INDEXING SCHEME ASSOCIATED WITH SUBCLASSES [C 12 C TO Q](#) ORS, RELATING TO MICRO-ORGANISMS [3]

Notes

- (1) This subclass constitutes an indexing scheme associated with the other subclasses of class [C 12](#), relating to micro-organisms used in the processes classified in subclasses [C 12 C to Q](#) or [S](#). The indexing codes should be linked. [3]
Attention is drawn to Chapter IV of the Guide which sets forth the rules concerning the application and presentation of the different types of indexing code.
- (2) The bacteria terminology is based on “Bergey’s Manual of Determinative Bacteriology”, Eighth Edition, 1975. [3]

1:00	Micro-organisms [3]		
1:01	. Bacteria or actinomycetales [3]	1:45	. . . Staphylococcus epidermidis [3]
1:02	. . Acetobacter [3]	1:46	. . Streptococcus [3]
1:025	. . Achromobacter [3]	1:465	. . Streptomyces [3]
1:03	. . Actinomadura [3]	1:47	. . . Streptomyces albus [3]
1:04	. . Actinomyces [3]	1:48	. . . Streptomyces antibioticus [3]
1:045	. . Actinoplanes [3]	1:485	. . . Streptomyces aureofaciens [3]
1:05	. . Alcaligenes [3]	1:49	. . . Streptomyces aureus [3]
1:06	. . Arthrobacter [3]	1:50	. . . Streptomyces bikiniensis [3]
1:065	. . Azotobacter [3]	1:51	. . . Streptomyces candidus [3]
1:07	. . Bacillus [3]	1:52	. . . Streptomyces chartreusis [3]
1:08	. . . Bacillus brevis [3]	1:525	. . . Streptomyces diastatochromogenes [3]
1:085	. . . Bacillus cereus [3]	1:53	. . . Streptomyces filipinensis [3]
1:09	. . . Bacillus circulans [3]	1:54	. . . Streptomyces fradiae [3]
1:10	. . . Bacillus licheniformis [3]	1:545	. . . Streptomyces griseus [3]
1:11	. . . Bacillus megaterium [3]	1:55	. . . Streptomyces hygroscopicus [3]
1:12	. . . Bacillus polymyxa [3]	1:56	. . . Streptomyces lavendulae [3]
1:125	. . . Bacillus subtilis [3]	1:565	. . . Streptomyces lincolnensis [3]
1:13	. . Brevibacterium [3]	1:57	. . . Streptomyces noursei [3]
1:14	. . Chainia [3]	1:58	. . . Streptomyces olivaceus [3]
1:145	. . Clostridium [3]	1:585	. . . Streptomyces platensis [3]
1:15	. . Corynebacterium [3]	1:59	. . . Streptomyces rimosus [3]
1:16	. . . Corynebacterium diphtheriae [3]	1:60	. . . Streptomyces sparsogenes [3]
1:165	. . . Corynebacterium poinsettiae [3]	1:61	. . . Streptomyces venezuelae [3]
1:17	. . . Corynebacterium pyogenes [3]	1:62	. . Streptosporangium [3]
1:18	. . Erwinia [3]	1:625	. . Streptoverticillium [3]
1:185	. . Escherichia [3]	1:63	. . Vibrio [3]
1:19	. . . Escherichia coli [3]	1:64	. . Xanthomonas [3]
1:20	. . Flavobacterium [3]	1:645	. Fungi [3]
1:21	. . Haemophilus [3]	1:65	. . Absidia [3]
1:22	. . Klebsiella [3]	1:66	. . Aspergillus [3]
1:225	. . Lactobacillus [3]	1:665	. . . Aspergillus awamori [3]
1:23	. . . Lactobacillus acidophilus [3]	1:67	. . . Aspergillus flavus [3]
1:24	. . . Lactobacillus brevis [3]	1:68	. . . Aspergillus fumigatus [3]
1:245	. . . Lactobacillus casei [3]	1:685	. . . Aspergillus niger [3]
1:25	. . . Lactobacillus plantarum [3]	1:69	. . . Aspergillus oryzae [3]
1:26	. . Methylomonas [3]	1:70	. . . Aspergillus ustus [3]
1:265	. . Micrococcus [3]	1:71	. . . Aspergillus wentii [3]
1:27	. . . Micrococcus flavus [3]	1:72	. . Candida [3]
1:28	. . . Micrococcus glutamicus [3]	1:725	. . . Candida albicans [3]
1:285	. . . Micrococcus lysodeikticus [3]	1:73	. . . Candida lipolytica [3]
1:29	. . Micromonospora [3]	1:74	. . . Candida tropicalis [3]
1:30	. . . Micromonospora chalcea [3]	1:745	. . Cephalosporium [3]
1:31	. . . Micromonospora purpurea [3]	1:75	. . . Cephalosporium acremonium [3]
1:32	. . Mycobacterium [3]	1:76	. . . Cephalosporium coeruleum [3]
1:325	. . . Mycobacterium avium [3]	1:765	. . . Cephalosporium crocinigenum [3]
1:33	. . . Mycobacterium fortuitum [3]	1:77	. . Fusarium [3]
1:34	. . . Mycobacterium smegmatis [3]	1:78	. . Hansenula [3]
1:35	. . Mycoplasma [3]	1:785	. . Mucor [3]
1:36	. . Neisseria [3]	1:79	. . Paecilomyces [3]
1:365	. . Nocardia [3]	1:80	. . Penicillium [3]
1:37	. . Proteus [3]	1:81	. . . Penicillium brevi [3]
1:38	. . Pseudomonas [3]	1:82	. . . Penicillium chrysogenum [3]
1:385	. . . Pseudomonas aeruginosa [3]	1:825	. . . Penicillium notatum [3]
1:39	. . . Pseudomonas fluorescens [3]	1:83	. . . Penicillium patulum [3]
1:40	. . . Pseudomonas putida [3]	1:84	. . Pichia [3]
1:41	. . Rhizobium [3]	1:845	. . Rhizopus [3]
1:42	. . Salmonella [3]	1:85	. . Saccharomyces [3]
1:425	. . Serratia [3]	1:86	. . . Saccharomyces carlsbergensis [3]
1:43	. . . Serratia marcescens [3]	1:865	. . . Saccharomyces cerevisiae [3]
1:44	. . Staphylococcus [3]	1:87	. . . Saccharomyces lactis [3]
1:445	. . . Staphylococcus aureus [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]

C 12 S 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 [C 02 F 3/00](#), of sludge [11/02](#); processes using enzymes or micro-organisms to separate optical isomers from a racemic mixture [C 12 P 41/00](#)); **PROCESSES USING ENZYMES OR MICRO-ORGANISMS TO TREAT TEXTILES OR TO CLEAN SOLID SURFACES OF MATERIALS** [5]

Notes

(1) This subclass covers processes already provided for in:

A 21	C 01	D 01 C, F
A 23	C 05 F	D 06 L, M, P
A 61 L	C 08	D 21 C, H
A 62 D	C 09 B, H	
	C 10 G	F 24 F, J
B 01 D	C 13	F 26 B
B 08 B	C 14 C	
B 09 C	C 21 B	H 01 M
	C 22 B	
	C 23 F, G	

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. [5]

(2) Attention is drawn to Notes (1) to (3) following the title of class [C 12](#). [5]

(3) The classification symbols of this subclass are not listed first when printed on the patent documents. [5]

(4) In this subclass, it is desirable to add the indexing codes of subclass [C 12 R](#). The indexing codes should be linked. [6]

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]

13/00 Processes not provided for in groups 1/00 to 11/00 [5]