

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

#### C02 TREATMENT OF WATER, WASTE WATER, SEWAGE, OR SLUDGE

**C02F TREATMENT OF WATER, WASTE WATER, SEWAGE, OR SLUDGE** (separation in general [B01D](#); special arrangements on waterborne vessels of installations for treating water, waste water or sewage, e.g. for producing fresh water, [B63J](#); adding materials to water to prevent corrosion [C23F](#); treating radioactively-contaminated liquids [G21F 9/04](#); regeneration of reactants for recirculation into processes, see the relevant places for the processes)

#### NOTE

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.

#### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:  
[C02F 9/02](#)-[C02F 9/14](#) covered by [C02F 9/00](#) and subgroup
- In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

|             |   |       |   |
|-------------|---|-------|---|
| <b>1/00</b> | <b>Treatment of water, waste water, or sewage</b><br>( <a href="#">C02F 3/00</a> - <a href="#">C02F 9/00</a> take precedence)   | 1/045 | . . . {for obtaining ultra-pure water}  |
| 1/001       | . {Processes for the treatment of water whereby the filtration technique is of importance ( <a href="#">C02F 1/44</a> takes precedence; construction of filters in general <a href="#">B01D 24/00</a> - <a href="#">B01D 41/00</a> )}                           | 1/046 | . . . {under vacuum produced by a barometric column}  |
| 1/002       | . . {using small portable filters for producing potable water, e.g. personal travel or emergency equipment, survival kits, combat gear ( <a href="#">C02F 1/003</a> takes precedence)}  | 1/047 | . . . {using eolic energy}  |
| 1/003       | . . {using household-type filters for producing potable water, e.g. pitchers, bottles, faucet mounted devices ( <a href="#">C02F 9/005</a> takes precedence)}   | 1/048 | . . . {Purification of waste water by evaporation}  |
| 1/004       | . . {using large scale industrial sized filters}  | 1/06  | . . . Flash evaporation   |
| 1/005       | . {Systems or processes based on supernatural or anthroposophic principles, cosmic or terrestrial radiation, geomancy or rhabdomancy}   | 1/08  | . . . Thin film evaporation   |
| 1/006       | . {Water distributors either inside a treatment tank or directing the water to several treatment tanks; Water treatment plants incorporating these distributors, with or without chemical or biological tanks (for settling tanks <a href="#">B01D 21/24</a> )} | 1/10  | . . . by direct contact with a particulate solid or with a fluid, as a heat transfer medium   |
| 2001/007    | . {Processes including a sedimentation step}  | 1/12  | . . . . Spray evaporation   |
| 1/008       | . {Control or steering systems not provided for elsewhere in subclass <a href="#">C02F</a> }  | 1/14  | . . . using solar energy  |
| 1/02        | . by heating (methods of steam generation <a href="#">F22B</a> ; preheating boiler feed-water or accumulating preheated boiler feed-water <a href="#">F22D</a> )  | 1/16  | . . . using waste heat from other processes   |
| 1/025       | . . {Thermal hydrolysis}  | 1/18  | . . . Transportable devices to obtain potable water   |
| 1/04        | . . by distillation or evaporation  | 1/20  | . by degassing, i.e. liberation of dissolved gases ( <a href="#">degassing of liquids in general B01D 19/00</a> ; arrangement of degassing apparatus in boiler feed supply <a href="#">F22D</a> ) |
| 1/041       | . . . {by means of vapour compression}  | 1/22  | . by freezing   |
| 1/042       | . . . {Prevention of deposits}  | 1/24  | . by flotation ( <a href="#">C02F 1/465</a> takes precedence)   |
| 1/043       | . . . {Details}   | 1/26  | . by extraction   |
|             |   | 1/265 | . . {Desalination}  |
|             |   | 1/28  | . by sorption (using ion-exchange <a href="#">C02F 1/42</a> ; sorbent compositions <a href="#">B01J</a> )   |
|             |   | 1/281 | . . {using inorganic sorbents}  |
|             |   | 1/283 | . . {using coal, charred products, or inorganic mixtures containing them}   |
|             |   | 1/285 | . . {using synthetic organic sorbents}  |
|             |   | 1/286 | . . {using natural organic sorbents or derivatives thereof}   |
|             |   | 1/288 | . . {using composite sorbents, e.g. coated, impregnated, multi-layered}   |
|             |   | 1/30  | . by irradiation  |
|             |   | 1/302 | . . {with microwaves}   |

- 1/305 . . {with electrons}
- 1/307 . . {with X-rays or gamma radiation}
- 1/32 . . with ultra-violet light
- 1/325 . . . {Irradiation devices or lamp constructions}
- 1/34 . with mechanical oscillations
- 1/36 . . ultrasonic vibrations
- 1/38 . by centrifugal separation
- 1/385 . . {by centrifuging suspensions (centrifuges [B04B](#))}
- 1/40 . Devices for separating or removing fatty or oily substances or similar floating material (cleaning or keeping clear the surface of open water from oil or like materials [E02B 15/04](#); devices in sewers for separating liquid or solid substances from sewage [E03F 5/14](#), e.g. for use in drains leading to the sewer [E03F 5/16](#))
- 1/42 . by ion-exchange (ion-exchange in general [B01J](#))

**NOTE**

When classifying in group [C02F 1/42](#), details of ion-exchangers can be further indexed by using indexing codes chosen from [C02F 2001/422](#) - [C02F 2001/427](#)

- 2001/422 . . {using anionic exchangers}
- 2001/425 . . {using cation exchangers}
- 2001/427 . . {using mixed beds}
- 1/44 . by dialysis, osmosis or reverse osmosis {(general membrane separation processes [B01D 61/00](#), membrane modules [B01D 63/00](#), electrodialysis [C02F 1/4693](#), combination of membrane modules and bioreactors [C02F 3/1268](#))}
- 1/441 . . {by reverse osmosis}
- 1/442 . . {by nanofiltration}
- 1/444 . . {by ultrafiltration or microfiltration}
- 1/445 . . {by forward osmosis}
- 1/447 . . {by membrane distillation (distillation and evaporation without the use of membranes [C02F 1/04](#))}
- 1/448 . . {by pervaporation}
- 1/46 . by electrochemical methods
- 1/4602 . . {for prevention or elimination of deposits}
- 1/4604 . . {for desalination of seawater or brackish water}
- 1/4606 . . {for producing oligodynamic substances to disinfect the water}
- 1/4608 . . {using electrical discharges}
- 1/461 . . by electrolysis
- 1/46104 . . . {Devices therefor; Their operating or servicing}
- 1/46109 . . . . {Electrodes}

**NOTE**

When classifying in group [C02F 1/46109](#), details of devices for electrolysis can be further indexed by using indexing codes chosen from [C02F 2001/46119](#) - [C02F 2001/46166](#)

- 1/46114 . . . . {Electrodes in particulate form or with conductive and/or non conductive particles between them}
- 2001/46119 . . . . {Cleaning the electrodes}
- 2001/46123 . . . . {Movable electrodes}
- 2001/46128 . . . . {Bipolar electrodes}
- 2001/46133 . . . . {characterised by the material}

- 2001/46138 . . . . . {Electrodes comprising a substrate and a coating}
- 2001/46142 . . . . . {Catalytic coating}
- 2001/46147 . . . . . {Diamond coating}
- 2001/46152 . . . . . {characterised by the shape or form (electrodes in particulate form or with conductive or non-conductive particles between them [C02F 1/46114](#))}
- 2001/46157 . . . . . {Perforated or foraminous electrodes}
- 2001/46161 . . . . . {Porous electrodes}
- 2001/46166 . . . . . {Gas diffusion electrodes}
- 2001/46171 . . . . . {Cylindrical or tubular shaped}
- 1/46176 . . . . {Galvanic cells}
- 1/4618 . . . . {for producing "ionised" acidic or basic water}

**NOTE**

When classifying in group [C02F 1/4618](#), details relating to the production of "ionised" acidic or basic water using electrolysis devices can be further indexed by using indexing codes chosen from [C02F 2001/46185](#) - [C02F 2001/46195](#)

- 2001/46185 . . . . . {only anodic or acidic water, e.g. for oxidizing or sterilizing}
- 2001/4619 . . . . . {only cathodic or alkaline water, e.g. for reducing}
- 2001/46195 . . . . . {characterised by the oxidation reduction potential [ORP]}
- 1/463 . . . by electrocoagulation
- 1/465 . . . by electroflotation
- 1/467 . . . by electrochemical disinfection; {by electrooxydation or by electroreduction}
- 1/4672 . . . . {by electrooxydation}
- 1/4674 . . . . . {with halogen or compound of halogens, e.g. chlorine, bromine}
- 1/4676 . . . . {by electroreduction}
- 1/4678 . . . . . {of metals}
- 1/469 . . by electrochemical separation, e.g. by electro-osmosis, electrodialysis, electrophoresis
- 1/4691 . . . {Capacitive deionisation}
- 1/4693 . . . {electrodialysis}
- 1/4695 . . . . {electrodeionisation}
- 1/4696 . . . {electrophoresis}
- 1/4698 . . . {electro-osmosis}
- 1/48 . with magnetic or electric fields ([C02F 1/46](#) takes precedence)
- 1/481 . . {using permanent magnets}
- 1/482 . . . {located on the outer wall of the treatment device, i.e. not in contact with the liquid to be treated, e.g. detachable}
- 1/484 . . {using electromagnets}
- 1/485 . . . {located on the outer wall of the treatment device, i.e. not in contact with the liquid to be treated, e.g. detachable}
- 1/487 . . {using high frequency electromagnetic fields, e.g. pulsed electromagnetic fields}
- 1/488 . . {for separation of magnetic materials, e.g. magnetic flocculation}
- 1/50 . by addition or application of a germicide or by oligodynamic treatment {([C02F 1/4606](#), [C02F 1/467](#), [C02F 1/76](#) take precedence)}

- 1/505 . . {by oligodynamic treatment}
- 1/52 . by flocculation or precipitation of suspended impurities {(C02F 1/463 takes precedence)}
- 1/5209 . . {Regulation methods for flocculation or precipitation}
- 2001/5218 . . {Crystallization}
- 1/5227 . . {Processes for facilitating the dissolution of solid flocculants in water}
- 1/5236 . . {using inorganic agents}
- 1/5245 . . . {using basic salts, e.g. of aluminium and iron}
- 1/5254 . . . {using magnesium compounds and phosphoric acid for removing ammonia}
- 1/5263 . . {using natural chemical compounds}
- 1/5272 . . {using specific organic precipitants}
- 1/5281 . . {Installations for water purification using chemical agents}
- 1/529 . . {Processes or devices for preparing lime water}
- 1/54 . . using organic material
- 1/542 . . . {Phosphorus compounds}
- 1/545 . . . {Silicon compounds}
- 1/547 . . . {Tensides}
- 1/56 . . . Macromolecular compounds
- 1/58 . by removing specified dissolved compounds (using ion-exchange C02F 1/42; softening water C02F 5/00)
- 1/583 . . {by removing fluoride or fluorine compounds}
- 1/586 . . {by removing ammoniacal nitrogen (for biological methods C02F 3/00)}
- 1/60 . . Silicon compounds {(C02F 1/583 takes precedence)}
- 1/62 . . Heavy metal compounds
- 1/64 . . . of iron or manganese
- 1/645 . . . . {Devices for iron precipitation and treatment by air}
- 1/66 . by neutralisation; pH adjustment (for degassing C02F 1/20; using ion-exchange C02F 1/42; for flocculation or precipitation of suspended impurities C02F 1/52; for removing dissolved compounds C02F 1/58)
- 1/68 . by addition of specified substances, e.g. trace elements, for ameliorating potable water (medicinal water A61K)
- 1/681 . . {by addition of solid materials for removing an oily layer on water}
- 1/682 . . {by addition of chemical compounds for dispersing an oily layer on water}
- 1/683 . . {by addition of complex-forming compounds}
- 1/685 . . {Devices for dosing the additives}
- 1/686 . . . {Devices for dosing liquid additives}
- 1/687 . . . {Devices for dosing solid compounds}
- 1/688 . . . {Devices in which the water progressively dissolves a solid compound}
- 1/70 . by reduction {(C02F 1/4676 takes precedence)}
- 1/705 . . {Reduction by metals}
- 1/72 . by oxidation {(C02F 1/4672 takes precedence)}
- 1/722 . . {Oxidation by peroxides}
- 1/725 . . {by catalytic oxidation}
- 1/727 . . {using pure oxygen or oxygen rich gas}
- 1/74 . . with air (aeration of stretches of water C02F 7/00)
- 1/76 . . with halogens or compounds of halogens {(C02F 1/4674 takes precedence)}
- 1/763 . . . {Devices for the addition of such compounds in gaseous form}
- 1/766 . . . {by means of halogens other than chlorine or of halogenated compounds containing halogen other than chlorine}
- 1/78 . . with ozone {(C02F 1/4672 takes precedence)}
- 3/00 Biological treatment of water, waste water, or sewage {(C02F 1/006 takes precedence)}**
- 2003/001 . {using granular carriers or supports for the microorganisms}
- 2003/003 . . {using activated carbon or the like}
- 3/005 . {Combined electrochemical biological processes (aeration by electrolytically produced oxygen bubbles C02F 3/202)}
- 3/006 . {Regulation methods for biological treatment}
- 2003/008 . {using anaerobic baffled reactors}
- 3/02 . Aerobic processes
- 3/025 . . {Biological purification using sources of oxygen other than air, oxygen or ozone}
- 3/04 . . using trickle filters
- 3/043 . . . {Devices for distributing water over trickle filters}
- 3/046 . . . {Soil filtration}
- 3/06 . . using submerged filters
- 3/08 . . using moving contact bodies
- 3/082 . . . {Rotating biological contactors}
- 3/085 . . . {Fluidized beds}
- 3/087 . . . . {Floating beds with contact bodies having a lower density than water}
- 3/10 . . Packings; Fillings; Grids (packing elements in general B01J 19/30, B01J 19/32)
- 3/101 . . . {Arranged-type packing, e.g. stacks, arrays}
- 3/102 . . . {Permeable membranes}
- 3/103 . . . {Textile-type packing}
- 3/104 . . . {Granular carriers}
- 3/105 . . . {Characterized by the chemical composition}
- 3/106 . . . . {Carbonaceous materials}
- 3/107 . . . . {Inorganic materials, e.g. sand, silicates}
- 3/108 . . . . {Immobilising gels, polymers or the like}
- 3/109 . . . {Characterized by the shape (C02F 3/104 takes precedence)}
- 3/12 . . Activated sludge processes
- 3/1205 . . . {Particular type of activated sludge processes}
- 3/121 . . . . {Multistep treatment}
- 3/1215 . . . . {Combinations of activated sludge treatment with precipitation, flocculation, coagulation and separation of phosphates}
- 3/1221 . . . . {comprising treatment of the recirculated sludge}
- 3/1226 . . . . {comprising an absorbent material suspended in the mixed liquor}
- 3/1231 . . . . {Treatments of toxic sewage}
- 3/1236 . . . {Particular type of activated sludge installations}
- 3/1242 . . . . {Small compact installations for use in homes, apartment blocks, hotels or the like}
- 3/1247 . . . . . {comprising circular tanks with elements, e.g. decanters, aeration basins, in the form of segments, crowns or sectors}
- 3/1252 . . . . {Cylindrical tanks with horizontal axis}
- 3/1257 . . . . {Oxidation ditches}
- 3/1263 . . . . {Sequencing batch reactors [SBR]}
- 3/1268 . . . . {Membrane bioreactor systems}
- 3/1273 . . . . . {Submerged membrane bioreactors}

- 3/1278 . . . {Provisions for mixing or aeration of the mixed liquor}
- 3/1284 . . . . {Mixing devices}
- 3/1289 . . . . {Aeration by saturation under super-atmospheric pressure}
- 3/1294 . . . . {"Venturi" aeration means}
- 3/14 . . . using surface aeration
- 3/145 . . . . {Protection against aerosols}
- 3/16 . . . . the aerator having a vertical axis
- 3/165 . . . . . {using vertical aeration channels}
- 3/18 . . . . the aerator having a horizontal axis
- 3/20 . . . using diffusers
- 3/201 . . . . {Perforated, resilient plastic diffusers, e.g. membranes, sheets, foils, tubes, hoses}
- 3/202 . . . . {Aeration by electrolytically produced oxygen bubbles}
- 3/203 . . . . {Swing diffusers}
- 3/205 . . . . {Moving, e.g. rotary, diffusers; Stationary diffusers with moving, e.g. rotary, distributors}
- 3/206 . . . . . {with helical screw impellers}
- 3/207 . . . . . {with axial thrust propellers}
- 3/208 . . . . {Membrane aeration ([C02F 3/201 takes precedence](#))}
- 3/22 . . . using circulation pipes
- 3/223 . . . . {using "air-lift"}
- 3/226 . . . . {"Deep shaft" processes}
- 3/24 . . . using free-fall aeration or spraying
- 3/26 . . . using pure oxygen or oxygen-rich gas
- 3/28 . Anaerobic digestion processes
- 3/2806 . . {Anaerobic processes using solid supports for microorganisms}
- 3/2813 . . {using anaerobic contact processes}
- 3/282 . . {using anaerobic sequencing batch reactors}
- 3/2826 . . {using anaerobic filters}
- 3/2833 . . {using fluidized bed reactors}
- 3/284 . . {using anaerobic baffled reactors}
- 3/2846 . . {using upflow anaerobic sludge blanket [UASB] reactors}
- 3/2853 . . {using anaerobic membrane bioreactors}
- 3/286 . . {including two or more steps}
- 3/2866 . . {Particular arrangements for anaerobic reactors}
- 3/2873 . . . {with internal draft tube circulation}
- 3/288 . . . {comprising septic tanks combined with a filter}
- 3/2886 . . . {Two story combinations of the Imhoff tank type}
- 3/2893 . . . {with biogas recycling}
- 3/30 . Aerobic and anaerobic processes
- 3/301 . . {Aerobic and anaerobic treatment in the same reactor}
- 3/302 . . {Nitrification and denitrification treatment ([C02F 3/308 takes precedence](#))}
- 3/303 . . . {characterised by the nitrification}
- 3/305 . . . {characterised by the denitrification}
- 3/306 . . . . {Denitrification of water in soil}
- 3/307 . . . {characterised by direct conversion of nitrite to molecular nitrogen, e.g. by using the Anammox process}
- 3/308 . . {Biological phosphorus removal}
- 3/32 . characterised by the animals or plants used, e.g. algae
- 3/322 . . {use of algae}
- 3/325 . . . {as symbiotic combination of algae and bacteria}
- 3/327 . . {characterised by animals and plants}
- 3/34 . characterised by the microorganisms used
- 3/341 . . {Consortia of bacteria}
- 3/342 . . {characterised by the enzymes used}
- 3/343 . . {for digestion of grease, fat, oil}
- 3/344 . . {for digestion of mineral oil}
- 3/345 . . {for biological oxidation or reduction of sulfur compounds}
- 3/346 . . {Iron bacteria}
- 3/347 . . {Use of yeasts or fungi ([C02F 3/322 takes precedence](#))}
- 3/348 . . {characterised by the way or the form in which the microorganisms are added or dosed}
- 5/00 Softening water; Preventing scale; Adding scale preventatives or scale removers to water, e.g. adding sequestering agents ([softening using ion-exchange C02F 1/42](#))**
- 5/02 . Softening water by precipitation of the hardness
- 5/025 . . {Hot-water softening devices}
- 5/04 . . using phosphates ([C02F 5/06 takes precedence](#))
- 5/06 . . using calcium compounds
- 5/08 . Treatment of water with complexing chemicals or other solubilising agents for softening, scale prevention or scale removal, e.g. adding sequestering agents
- 5/083 . . {Mineral agents}
- 5/086 . . {Condensed phosphates}
- 5/10 . . using organic substances
- 5/105 . . . {combined with inorganic substances}
- 5/12 . . . containing nitrogen ([C02F 5/14 takes precedence](#))
- 5/125 . . . . {combined with inorganic substances}
- 5/14 . . . containing phosphorus
- 5/145 . . . . {combined with inorganic substances}
- 7/00 Aeration of stretches of water**
- 9/00 Multistage treatment of water, waste water, or sewage**
- NOTES**
- 1. This group covers only those combined treating operations where the interest is directed to the relationship between the steps.
- 2. This group does not cover, for example, chemical treatment followed by settlement or biological treatment involving normal mechanical treatment.
- 3. In this group, the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- 9/005 . {Portable or detachable small-scale multistage treatment devices, e.g. point of use or laboratory water purification systems ([single-stage processes in combination with filtration techniques C02F 1/002 or C02F 1/003](#))}
- 11/00 Treatment of sludge; Devices therefor**
- 11/002 . {Sludge treatment using liquids immiscible with water}
- 11/004 . {Sludge detoxification}

- 11/006 . {Electrochemical treatment, e.g. electro-oxidation or electro-osmosis}
- 11/008 . {Sludge treatment by fixation or solidification}
- 11/02 . Biological treatment
- 11/04 . . Anaerobic treatment; Production of methane by such processes
- 11/06 . by oxidation (incinerators for burning waste liquors, e.g. sulfite liquor from paper-making plant [F23G 7/04](#))
- 11/08 . . Wet air oxidation
- 11/083 . . . {using deep well reactors}
- 11/086 . . . {in the supercritical state}
- 11/10 . by pyrolysis
- 11/12 . by de-watering, drying or thickening

**WARNING**

Groups [C02F 11/12](#) - [C02F 11/128](#) are impacted by reclassification into groups [C02F 11/13](#), [C02F 11/131](#), and [C02F 11/15](#).

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

- 11/121 . . by mechanical de-watering
- 11/122 . . . using filter presses ([C02F 11/123](#) takes precedence)
- 11/123 . . . using belt or band filters
- 11/125 . . . using screw filters
- 11/126 . . . using drum filters
- 11/127 . . . by centrifugation
- 11/128 . . . using batch processes
- 11/13 . . by heating

**WARNING**

Group [C02F 11/13](#) is incomplete pending reclassification of documents from groups [C02F 11/12](#), [C02F 11/121](#), [C02F 11/122](#), [C02F 11/123](#), [C02F 11/125](#), [C02F 11/126](#), [C02F 11/127](#), [C02F 11/128](#), [C02F 11/18](#), and [C02F 11/185](#).

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

- 11/131 . . . using electromagnetic or ultrasonic waves

**WARNING**

Group [C02F 11/131](#) is incomplete pending reclassification of documents from groups [C02F 11/12](#), [C02F 11/121](#), [C02F 11/122](#), [C02F 11/123](#), [C02F 11/125](#), [C02F 11/126](#), [C02F 11/127](#), [C02F 11/128](#), [C02F 11/18](#), and [C02F 11/185](#).

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

- 11/14 . . with addition of chemical agents

**WARNING**

Group [C02F 11/14](#) is impacted by reclassification into groups [C02F 11/143](#), [C02F 11/145](#), [C02F 11/147](#), and [C02F 11/148](#).

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

- 11/143 . . . using inorganic substances ([C02F 11/148](#) takes precedence)

**WARNING**

Group [C02F 11/143](#) is incomplete pending reclassification of documents from group [C02F 11/14](#).

Groups [C02F 11/14](#) and [C02F 11/143](#) should be considered in order to perform a complete search.

- 11/145 . . . . using calcium compounds

**WARNING**

Group [C02F 11/145](#) is incomplete pending reclassification of documents from group [C02F 11/14](#).

Groups [C02F 11/14](#) and [C02F 11/145](#) should be considered in order to perform a complete search.

- 11/147 . . . using organic substances ([C02F 11/148](#) takes precedence)

**WARNING**

Group [C02F 11/147](#) is incomplete pending reclassification of documents from group [C02F 11/14](#).

Groups [C02F 11/14](#) and [C02F 11/147](#) should be considered in order to perform a complete search.

- 11/148 . . . Combined use of inorganic and organic substances, being added in the same treatment step

**WARNING**

Group [C02F 11/148](#) is incomplete pending reclassification of documents from group [C02F 11/14](#).

Groups [C02F 11/14](#) and [C02F 11/148](#) should be considered in order to perform a complete search.



|                |  |                |   |
|----------------|--|----------------|---|
| 11/15          | <ul style="list-style-type: none"> <li>by treatment with electric, magnetic or electromagnetic fields; by treatment with ultrasonic waves (for the purpose of heating <a href="#">C02F 11/131</a>)</li> </ul> <p><b>WARNING</b></p> <p>Group <a href="#">C02F 11/15</a> is incomplete pending reclassification of documents from groups <a href="#">C02F 11/12</a>, <a href="#">C02F 11/121</a>, <a href="#">C02F 11/122</a>, <a href="#">C02F 11/123</a>, <a href="#">C02F 11/125</a>, <a href="#">C02F 11/126</a>, <a href="#">C02F 11/127</a>, <a href="#">C02F 11/128</a>, <a href="#">C02F 11/18</a>, and <a href="#">C02F 11/185</a>.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p> | 2101/32        | <ul style="list-style-type: none"> <li>Hydrocarbons, e.g. oil</li> </ul>  |
|                |  | 2101/322       | <ul style="list-style-type: none"> <li>{ Volatile compounds, e.g. benzene }</li> </ul>  |
|                |  | 2101/325       | <ul style="list-style-type: none"> <li>{ Emulsions }</li> </ul>   |
|                |  | 2101/327       | <ul style="list-style-type: none"> <li>{ Polyaromatic Hydrocarbons [PAH's] }</li> </ul>   |
|                |  | 2101/34        | <ul style="list-style-type: none"> <li>containing oxygen</li> </ul>   |
|                |  | 2101/345       | <ul style="list-style-type: none"> <li>{ Phenols }</li> </ul>   |
|                |  | 2101/36        | <ul style="list-style-type: none"> <li>containing halogen</li> </ul>  |
|                |  | 2101/363       | <ul style="list-style-type: none"> <li>{ PCB's; PCP's }</li> </ul>  |
|                |  | 2101/366       | <ul style="list-style-type: none"> <li>{ Dioxine; Furan }</li> </ul>  |
|                |  | 2101/38        | <ul style="list-style-type: none"> <li>containing nitrogen</li> </ul>   |
|                |  | 2101/40        | <ul style="list-style-type: none"> <li>containing sulfur</li> </ul>   |
|                |  | <b>2103/00</b> | <b>Nature of the water, waste water, sewage or sludge to be treated</b>   |
|                |  | 2103/001       | <ul style="list-style-type: none"> <li>{ Runoff or storm water }</li> </ul>   |
|                |  | 2103/002       | <ul style="list-style-type: none"> <li>{ Grey water, e.g. from clothes washers, showers or dishwashers }</li> </ul>   |
|                |  | 2103/003       | <ul style="list-style-type: none"> <li>{ Wastewater from hospitals, laboratories and the like, heavily contaminated by pathogenic microorganisms }</li> </ul>       |
|                |  | 2103/005       | <ul style="list-style-type: none"> <li>{ Black water originating from toilets }</li> </ul>  |
|                |  | 2103/006       | <ul style="list-style-type: none"> <li>{ Dental effluents }</li> </ul>  |
|                |  | 2103/007       | <ul style="list-style-type: none"> <li>{ Contaminated open waterways, rivers, lakes or ponds }</li> </ul>   |
|                |  | 2103/008       | <ul style="list-style-type: none"> <li>{ Originating from marine vessels, ships and boats, e.g. bilge water or ballast water }</li> </ul>                           |
|                |  | 2103/02        | <ul style="list-style-type: none"> <li>Non-contaminated water, e.g. for industrial water supply</li> </ul>  |
|                |  | 2103/023       | <ul style="list-style-type: none"> <li>{ Water in cooling circuits }</li> </ul>   |
|                |  | 2103/026       | <ul style="list-style-type: none"> <li>{ Treating water for medical or cosmetic purposes }</li> </ul>   |
|                |  | 2103/04        | <ul style="list-style-type: none"> <li>for obtaining ultra-pure water</li> </ul>  |
|                |  | 2103/06        | <ul style="list-style-type: none"> <li>Contaminated groundwater or leachate</li> </ul>  |
|                |  | 2103/08        | <ul style="list-style-type: none"> <li>Seawater, e.g. for desalination</li> </ul>   |
|                |  | 2103/10        | <ul style="list-style-type: none"> <li>from quarries or from mining activities</li> </ul>   |
|                |  | 2103/12        | <ul style="list-style-type: none"> <li>from the silicate or ceramic industries, e.g. waste waters from cement or glass factories</li> </ul>                         |
|                |  | 2103/14        | <ul style="list-style-type: none"> <li>Paint wastes</li> </ul>  |
|                |  | 2103/16        | <ul style="list-style-type: none"> <li>from metallurgical processes, i.e. from the production, refining or treatment of metals, e.g. galvanic wastes</li> </ul>     |
|                |  | 2103/18        | <ul style="list-style-type: none"> <li>from the purification of gaseous effluents</li> </ul>  |
|                |  | 2103/20        | <ul style="list-style-type: none"> <li>from animal husbandry</li> </ul>   |
|                |  | 2103/22        | <ul style="list-style-type: none"> <li>from the processing of animals, e.g. poultry, fish, or parts thereof</li> </ul>  |
|                |  | 2103/24        | <ul style="list-style-type: none"> <li>from tanneries</li> </ul>  |
|                |  | 2103/26        | <ul style="list-style-type: none"> <li>from the processing of plants or parts thereof</li> </ul>  |
|                |  | 2103/28        | <ul style="list-style-type: none"> <li>from the paper or cellulose industry</li> </ul>  |
|                |  | 2103/30        | <ul style="list-style-type: none"> <li>from the textile industry</li> </ul>   |
|                |  | 2103/32        | <ul style="list-style-type: none"> <li>from the food or foodstuff industry, e.g. brewery waste waters</li> </ul>  |
|                |  | 2103/322       | <ul style="list-style-type: none"> <li>{ from vegetable oil production, e.g. olive oil production }</li> </ul>  |
|                |  | 2103/325       | <ul style="list-style-type: none"> <li>{ from processes relating to the production of wine products }</li> </ul>  |
|                |  | 2103/327       | <ul style="list-style-type: none"> <li>{ from processes relating to the production of dairy products }</li> </ul>   |
|                |  | 2103/34        | <ul style="list-style-type: none"> <li>from industrial activities not provided for in groups <a href="#">C02F 2103/12</a> - <a href="#">C02F 2103/32</a></li> </ul> |
|                |  | 2103/343       | <ul style="list-style-type: none"> <li>{ from the pharmaceutical industry, e.g. containing antibiotics }</li> </ul>   |
|                |  | 2103/346       | <ul style="list-style-type: none"> <li>{ from semiconductor processing, e.g. waste water from polishing of wafers }</li> </ul>                                      |
| 11/16          | <ul style="list-style-type: none"> <li>using drying or composting beds</li> </ul>  |                |   |
| 11/18          | <ul style="list-style-type: none"> <li>by thermal conditioning (by pyrolysis <a href="#">C02F 11/10</a>)</li> </ul> <p><b>WARNING</b></p> <p>Group <a href="#">C02F 11/18</a> is impacted by reclassification into groups <a href="#">C02F 11/13</a>, <a href="#">C02F 11/131</a>, and <a href="#">C02F 11/15</a>.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>  |                |   |
| 11/185         | <ul style="list-style-type: none"> <li>{ by pasteurisation }</li> </ul> <p><b>WARNING</b></p> <p>Group <a href="#">C02F 11/185</a> is impacted by reclassification into groups <a href="#">C02F 11/13</a>, <a href="#">C02F 11/131</a>, and <a href="#">C02F 11/15</a>.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>   |                |   |
| 11/20          | <ul style="list-style-type: none"> <li>by freezing</li> </ul>  |                |   |
| <b>2101/00</b> | <b>Nature of the contaminant</b>   |                |   |
| 2101/003       | <ul style="list-style-type: none"> <li>{ Explosive compounds, e.g. TNT }</li> </ul>  |                |   |
| 2101/006       | <ul style="list-style-type: none"> <li>{ Radioactive compounds }</li> </ul>  |                |   |
| 2101/10        | <ul style="list-style-type: none"> <li>Inorganic compounds</li> </ul>  |                |   |
| 2101/101       | <ul style="list-style-type: none"> <li>{ Sulfur compounds }</li> </ul>   |                |   |
| 2101/103       | <ul style="list-style-type: none"> <li>{ Arsenic compounds }</li> </ul>  |                |   |
| 2101/105       | <ul style="list-style-type: none"> <li>{ Phosphorus compounds }</li> </ul>   |                |   |
| 2101/106       | <ul style="list-style-type: none"> <li>{ Selenium compounds }</li> </ul>   |                |   |
| 2101/108       | <ul style="list-style-type: none"> <li>{ Boron compounds }</li> </ul>  |                |   |
| 2101/12        | <ul style="list-style-type: none"> <li>Halogens or halogen-containing compounds</li> </ul>   |                |   |
| 2101/14        | <ul style="list-style-type: none"> <li>Fluorine or fluorine-containing compounds</li> </ul>  |                |   |
| 2101/16        | <ul style="list-style-type: none"> <li>Nitrogen compounds, e.g. ammonia</li> </ul>   |                |   |
| 2101/163       | <ul style="list-style-type: none"> <li>{ Nitrates }</li> </ul>   |                |   |
| 2101/166       | <ul style="list-style-type: none"> <li>{ Nitrites }</li> </ul>   |                |   |
| 2101/18        | <ul style="list-style-type: none"> <li>Cyanides</li> </ul>   |                |   |
| 2101/20        | <ul style="list-style-type: none"> <li>Heavy metals or heavy metal compounds</li> </ul>  |                |   |
| 2101/203       | <ul style="list-style-type: none"> <li>{ Iron or iron compound }</li> </ul>  |                |   |
| 2101/206       | <ul style="list-style-type: none"> <li>{ Manganese or manganese compounds }</li> </ul>   |                |   |
| 2101/22        | <ul style="list-style-type: none"> <li>Chromium or chromium compounds, e.g. chromates</li> </ul>   |                |   |
| 2101/30        | <ul style="list-style-type: none"> <li>Organic compounds</li> </ul>  |                |   |
| 2101/301       | <ul style="list-style-type: none"> <li>{ Detergents, surfactants }</li> </ul>  |                |   |
| 2101/303       | <ul style="list-style-type: none"> <li>{ Complexing agents }</li> </ul>  |                |   |
| 2101/305       | <ul style="list-style-type: none"> <li>{ Endocrine disruptive agents }</li> </ul>  |                |   |
| 2101/306       | <ul style="list-style-type: none"> <li>{ Pesticides }</li> </ul>   |                |   |
| 2101/308       | <ul style="list-style-type: none"> <li>{ Dyes; Colorants; Fluorescent agents }</li> </ul>  |                |   |

- 2103/36 . . from the manufacture of organic compounds
- 2103/365 . . . {from petrochemical industry (e.g. refineries)}
- 2103/38 . . . Polymers
- 2103/40 . . from the manufacture or use of photosensitive materials
- 2103/42 . from bathing facilities, e.g. swimming pools
- 2103/44 . from vehicle washing facilities
- 2201/00 Apparatus for treatment of water, waste water or sewage**
- 2201/001 . Build in apparatus for autonomous on board water supply and wastewater treatment (e.g. for aircrafts, cruiseships, oil drilling platforms, railway trains, space stations)
- 2201/002 . Construction details of the apparatus
- 2201/003 . . Coaxial constructions, e.g. a cartridge located coaxially within another
- 2201/004 . . Seals, connections
- 2201/005 . . Valves
- 2201/006 . . Cartridges
- 2201/007 . . Modular design
- 2201/008 . Mobile apparatus and plants, e.g. mounted on a vehicle (for biological treatment C02F 2203/008)
- 2201/009 . Apparatus with independent power supply, e.g. solar cells, windpower, fuel cells (for electrolysis apparatus C02F 2201/46165)
- 2201/32 . Details relating to UV-irradiation devices
- 2201/322 . . Lamp arrangement
- 2201/3221 . . . Lamps suspended above a water surface or pipe
- 2201/3222 . . . Units using UV-light emitting diodes [LED]
- 2201/3223 . . . Single elongated lamp located on the central axis of a tubular reactor
- 2201/3224 . . . Units using UV-light guiding optical fibers
- 2201/3225 . . . Lamps immersed in an open channel, containing the liquid to be treated
- 2201/3226 . . . Units using UV-light emitting lasers
- 2201/3227 . . . Units with two or more lamps
- 2201/3228 . . . Units having reflectors, e.g. coatings, baffles, plates, mirrors
- 2201/324 . . Lamp cleaning installations, e.g. brushes
- 2201/326 . . Lamp control systems
- 2201/328 . . Having flow diverters (baffles)
- 2201/46 . Apparatus for electrochemical processes
- 2201/461 . . Electrolysis apparatus
- 2201/46105 . . . Details relating to the electrolytic devices
- 2201/4611 . . . . Fluid flow
- 2201/46115 . . . . Electrolytic cell with membranes or diaphragms
- 2201/4612 . . . . Controlling or monitoring
- 2201/46125 . . . . . Electrical variables
- 2201/4613 . . . . . Inverting polarity
- 2201/46135 . . . . . Voltage
- 2201/4614 . . . . . Current
- 2201/46145 . . . . . Fluid flow
- 2201/4615 . . . . . Time
- 2201/46155 . . . . . Heating or cooling
- 2201/4616 . . . . . Power supply
- 2201/46165 . . . . . Special power supply, e.g. solar energy or batteries
- 2201/4617 . . . . . DC only
- 2201/46175 . . . . . Electrical pulses
- 2201/4618 . . . . . Supplying or removing reactants or electrolyte
- 2201/46185 . . . . . Recycling the cathodic or anodic feed
- 2201/4619 . . . . . Supplying gas to the electrolyte (gas diffusion electrodes C02F 2001/46166)
- 2201/46195 . . . . . Cells containing solid electrolyte
- 2201/48 . Devices for applying magnetic or electric fields
- 2201/483 . . using coils
- 2201/486 . . using antenna
- 2201/78 . Details relating to ozone treatment devices
- 2201/782 . . Ozone generators
- 2201/784 . . Diffusers or nozzles for ozonation
- 2203/00 Apparatus and plants for the biological treatment of water, waste water or sewage**
- 2203/002 . comprising an initial buffer container
- 2203/004 . comprising a selector reactor for promoting floc-forming or other bacteria
- 2203/006 . details of construction, e.g. specially adapted seals, modules, connections
- 2203/008 . Mobile apparatus and plants, e.g. mounted on a vehicle
- 2209/00 Controlling or monitoring parameters in water treatment**
- 2209/001 . Upstream control, i.e. monitoring for predictive control
- 2209/003 . Downstream control, i.e. outlet monitoring, e.g. to check the treating agents, such as halogens or ozone, leaving the process
- 2209/005 . Processes using a programmable logic controller [PLC]
- 2209/006 . . comprising a software program or a logic diagram
- 2209/008 . . comprising telecommunication features, e.g. modems or antennas
- 2209/01 . Density
- 2209/02 . Temperature
- 2209/03 . Pressure
- 2209/04 . Oxidation reduction potential [ORP]
- 2209/05 . Conductivity or salinity
- 2209/055 . . Hardness
- 2209/06 . pH
- 2209/07 . Alkalinity
- 2209/08 . Chemical Oxygen Demand [COD]; Biological Oxygen Demand [BOD]
- 2209/09 . Viscosity
- 2209/10 . Solids, e.g. total solids [TS], total suspended solids [TSS] or volatile solids [VS]
- 2209/105 . . Particle number, particle size or particle characterisation
- 2209/11 . Turbidity
- 2209/12 . Volatile Fatty Acids (VFAs)
- 2209/14 . NH<sub>3</sub>-N
- 2209/15 . NO<sub>3</sub>-N
- 2209/16 . Total nitrogen (tkN-N)
- 2209/18 . PO<sub>4</sub>-P
- 2209/19 . SO<sub>4</sub>-S
- 2209/20 . Total organic carbon [TOC]
- 2209/21 . Dissolved organic carbon [DOC]
- 2209/22 . O<sub>2</sub>
- 2209/225 . . in the gas phase
- 2209/23 . O<sub>3</sub>
- 2209/235 . . in the gas phase
- 2209/24 . CO<sub>2</sub>
- 2209/245 . . in the gas phase

- 2209/26 . H<sub>2</sub>S
- 2209/265 . . in the gas phase
- 2209/28 . CH<sub>4</sub>
- 2209/285 . . CH<sub>4</sub> in the gas phase
- 2209/29 . Chlorine compounds
- 2209/30 . H<sub>2</sub>
- 2209/32 . CO
- 2209/34 . N<sub>2</sub>O
- 2209/36 . Biological material, e.g. enzymes or ATP
- 2209/38 . Gas flow rate
- 2209/40 . Liquid flow rate
- 2209/42 . Liquid level
- 2209/44 . Time
- 2209/445 . . Filter life
- 2301/00 General aspects of water treatment**
- 2301/02 . Fluid flow conditions
- 2301/022 . . Laminar
- 2301/024 . . Turbulent
- 2301/026 . . Spiral, helicoidal, radial
- 2301/028 . . Tortuous
- 2301/04 . Flow arrangements
- 2301/043 . . Treatment of partial or bypass streams
- 2301/046 . . Recirculation with an external loop
- 2301/06 . Pressure conditions
- 2301/063 . . Underpressure, vacuum
- 2301/066 . . Overpressure, high pressure
- 2301/08 . Multistage treatments, e.g. repetition of the same process step under different conditions
- 2301/10 . Temperature conditions for biological treatment
- 2301/103 . . Psychrophilic treatment
- 2301/106 . . Thermophilic treatment
- 2303/00 Specific treatment goals**
- 2303/02 . Odour removal or prevention of malodour
- 2303/04 . Disinfection
- 2303/06 . Sludge reduction, e.g. by lysis
- 2303/08 . Corrosion inhibition
- 2303/10 . Energy recovery
- 2303/12 . Prevention of foaming
- 2303/14 . Maintenance of water treatment installations
- 2303/16 . Regeneration of sorbents, filters
- 2303/18 . Removal of treatment agents after treatment
- 2303/185 . . The treatment agent being halogen or a halogenated compound
- 2303/20 . Prevention of biofouling
- 2303/22 . Eliminating or preventing deposits, scale removal, scale prevention ([C02F 1/042](#), [C02F 1/4602](#), [C02F 5/00 take precedence](#))
- 2303/24 . Separation of coarse particles, e.g. by using sieves or screens
- 2303/26 . Reducing the size of particles, liquid droplets or bubbles, e.g. by crushing, grinding, spraying, creation of microbubbles or nanobubbles
- 2305/00 Use of specific compounds during water treatment**
- 2305/02 . Specific form of oxidant
- 2305/023 . . Reactive oxygen species, singlet oxygen, OH radical
- 2305/026 . . Fenton's reagent
- 2305/04 . Surfactants, used as part of a formulation or alone
- 2305/06 . Nutrients for stimulating the growth of microorganisms
- 2305/08 . Nanoparticles or nanotubes
- 2305/10 . Photocatalysts
- 2305/12 . Inert solids used as ballast for improving sedimentation ([C02F 3/1226 takes precedence](#))
- 2305/14 . Additives which dissolves or releases substances when predefined environmental conditions are reached, e.g. pH or temperature
- 2307/00 Location of water treatment or water treatment device**
- 2307/02 . as part of a bottle
- 2307/04 . as part of a pitcher or jug
- 2307/06 . Mounted on or being part of a faucet, shower handle or showerhead
- 2307/08 . Treatment of wastewater in the sewer, e.g. to reduce grease, odour
- 2307/10 . as part of a potable water dispenser, e.g. for use in homes or offices
- 2307/12 . as part of household appliances such as dishwashers, laundry washing machines or vacuum cleaners
- 2307/14 . Treatment of water in water supply networks, e.g. to prevent bacterial growth