

# 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.

#### WARNING

{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> ( <a href="#">C02F 3/00</a> - <a href="#">C02F 9/00</a> take precedence)	1/047	. . . {using eolic energy}
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> )}	1/048	. . . {Purification of waste water by evaporation}
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)}	1/06	. . . Flash evaporation
1/003	. . {using household-type filters for producing potable water, e.g. pitchers, bottles, faucet mounted devices ( <a href="#">C02F 9/20</a> takes precedence)}	1/08	. . . Thin film evaporation
1/004	. . {using large scale industrial sized filters}	1/10	. . . by direct contact with a particulate solid or with a fluid, as a heat transfer medium
1/005	. {Systems or processes based on supernatural or anthroposophic principles, cosmic or terrestrial radiation, geomancy or rhabdomancy}	1/12	. . . . Spray 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> )}	1/14	. . . using solar energy
2001/007	. {Processes including a sedimentation step}	1/16	. . . using waste heat from other processes
1/008	. {Control or steering systems not provided for elsewhere in subclass <a href="#">C02F</a> }	1/18	. . . Transportable devices to obtain potable water
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> )	1/20	. by degassing, i.e. liberation of dissolved gases (degasification of liquids in general <a href="#">B01D 19/00</a> ; arrangement of degassing apparatus in boiler feed supply <a href="#">F22D</a> )
1/025	. . {Thermal hydrolysis}	1/22	. by freezing
1/04	. . by distillation or evaporation	1/24	. by flotation ( <a href="#">C02F 1/465</a> takes precedence)
1/041	. . . {by means of vapour compression}	1/26	. by extraction
1/042	. . . {Prevention of deposits}	1/265	. . {Desalination}
1/043	. . . {Details}	1/28	. by sorption (using ion-exchange <a href="#">C02F 1/42</a> ; sorbent compositions <a href="#">B01J</a> )
1/045	. . . {for obtaining ultra-pure water}	1/281	. . {using inorganic sorbents}
1/046	. . . {under vacuum produced by a barometric column}	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 ultraviolet 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}
  - 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}	3/005	. {Combined electrochemical biological processes (aeration by electrolytically produced oxygen bubbles <a href="#">C02F 3/202</a> )}
1/5254	. . . {using magnesium compounds and phosphoric acid for removing ammonia}	3/006	. {Regulation methods for biological treatment}
1/5263	. . {using natural chemical compounds}	2003/008	. {using anaerobic baffled reactors}
1/5272	. . {using specific organic precipitants}	3/02	. Aerobic processes
1/5281	. . {Installations for water purification using chemical agents}	3/025	. . {Biological purification using sources of oxygen other than air, oxygen or ozone}
1/529	. . {Processes or devices for preparing lime water}	3/04	. . using trickle filters
1/54	. . using organic material	3/043	. . . {Devices for distributing water over trickle filters}
1/542	. . . {Phosphorus compounds}	3/046	. . . {Soil filtration}
1/545	. . . {Silicon compounds}	3/06	. . using submerged filters
1/547	. . . {Tensides}	3/08	. . using moving contact bodies
1/56	. . . Macromolecular compounds	3/082	. . . {Rotating biological contactors}
1/58	. by removing specified dissolved compounds (using ion-exchange <a href="#">C02F 1/42</a> ; softening water <a href="#">C02F 5/00</a> )	3/085	. . . {Fluidized beds}
1/583	. . {by removing fluoride or fluorine compounds}	3/087	. . . . {Floating beds with contact bodies having a lower density than water}
1/586	. . {by removing ammoniacal nitrogen (for biological methods <a href="#">C02F 3/00</a> )}	3/10	. . Packings; Fillings; Grids (packing elements in general <a href="#">B01J 19/30</a> , <a href="#">B01J 19/32</a> )
1/60	. . Silicon compounds {( <a href="#">C02F 1/583</a> takes precedence)}	3/101	. . . {Arranged-type packing, e.g. stacks, arrays}
1/62	. . Heavy metal compounds	3/102	. . . {Permeable membranes}
1/64	. . . of iron or manganese	3/103	. . . {Textile-type packing}
1/645	. . . . {Devices for iron precipitation and treatment by air}	3/104	. . . {Granular carriers}
1/66	. by neutralisation; pH adjustment (for degassing <a href="#">C02F 1/20</a> ; using ion-exchange <a href="#">C02F 1/42</a> ; for flocculation or precipitation of suspended impurities <a href="#">C02F 1/52</a> ; for removing dissolved compounds <a href="#">C02F 1/58</a> )	3/105	. . . {Characterized by the chemical composition}
1/68	. by addition of specified substances, e.g. trace elements, for ameliorating potable water (medicinal water <a href="#">A61K</a> )	3/106	. . . . {Carbonaceous materials}
1/681	. . {by addition of solid materials for removing an oily layer on water}	3/107	. . . . {Inorganic materials, e.g. sand, silicates}
1/682	. . {by addition of chemical compounds for dispersing an oily layer on water}	3/108	. . . . {Immobilising gels, polymers or the like}
1/683	. . {by addition of complex-forming compounds}	3/109	. . . {Characterized by the shape ( <a href="#">C02F 3/104</a> takes precedence)}
1/685	. . {Devices for dosing the additives}	3/12	. . Activated sludge processes
1/686	. . . {Devices for dosing liquid additives}	3/1205	. . . {Particular type of activated sludge processes}
1/687	. . . {Devices for dosing solid compounds}	3/121	. . . . {Multistep treatment}
1/688	. . . {Devices in which the water progressively dissolves a solid compound}	3/1215	. . . . {Combinations of activated sludge treatment with precipitation, flocculation, coagulation and separation of phosphates}
1/70	. by reduction {( <a href="#">C02F 1/4676</a> takes precedence)}	3/1221	. . . . {comprising treatment of the recirculated sludge}
1/705	. . {Reduction by metals}	3/1226	. . . . {comprising an absorbent material suspended in the mixed liquor}
1/72	. by oxidation {( <a href="#">C02F 1/4672</a> takes precedence)}	3/1231	. . . . {Treatments of toxic sewage}
1/722	. . {Oxidation by peroxides}	3/1236	. . . {Particular type of activated sludge installations}
1/725	. . {by catalytic oxidation}	3/1242	. . . . {Small compact installations for use in homes, apartment blocks, hotels or the like}
1/727	. . {using pure oxygen or oxygen rich gas}	3/1247	. . . . . {comprising circular tanks with elements, e.g. decanters, aeration basins, in the form of segments, crowns or sectors}
1/74	. . with air (aeration of stretches of water <a href="#">C02F 7/00</a> )	3/1252	. . . . {Cylindrical tanks with horizontal axis}
1/76	. . with halogens or compounds of halogens {( <a href="#">C02F 1/4674</a> takes precedence)}	3/1257	. . . . {Oxidation ditches}
1/763	. . . {Devices for the addition of such compounds in gaseous form}	3/1263	. . . . {Sequencing batch reactors [SBR]}
1/766	. . . {by means of halogens other than chlorine or of halogenated compounds containing halogen other than chlorine}	3/1268	. . . . {Membrane bioreactor systems}
1/78	. . with ozone {( <a href="#">C02F 1/4672</a> takes precedence)}	3/1273	. . . . . {Submerged membrane bioreactors}
3/00	<b>Biological treatment of water, waste water, or sewage {(<a href="#">C02F 1/006</a> takes precedence)}</b>	3/1278	. . . {Provisions for mixing or aeration of the mixed liquor}
2003/001	. {using granular carriers or supports for the microorganisms}	3/1284	. . . . {Mixing devices}
2003/003	. . {using activated carbon or the like}	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 combined treatment operations, carried out in a defined order in three or more different treatment stages, each stage occurring in a separate location, e.g. apparatus, reactor or compartment.
- 2. This group does not cover treatments where the essential characteristic resides in an individual step of the treatment, which treatments are covered by groups C02F 1/00 - C02F 7/00.
- 9/20 . Portable or detachable small-scale multistage treatment devices, e.g. point of use or laboratory water purification systems
- 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



11/121	. . by mechanical de-watering	2101/366	. . . {Dioxine; Furan}
11/122	. . . using filter presses ( <a href="#">C02F 11/123 takes precedence</a> )	2101/38	. . containing nitrogen
11/123	. . . using belt or band filters	2101/40	. . {containing sulfur}
11/125	. . . using screw filters	<b>2103/00</b>	<b>Nature of the water, waste water, sewage or sludge to be treated</b>
11/126	. . . using drum filters	2103/001	. {Runoff or storm water}
11/127	. . . by centrifugation	2103/002	. {Grey water, e.g. from clothes washers, showers or dishwashers}
11/128	. . . using batch processes	2103/003	. {Wastewater from hospitals, laboratories and the like, heavily contaminated by pathogenic microorganisms}
11/13	. . by heating	2103/005	. {Black water originating from toilets}
11/131	. . . using electromagnetic or ultrasonic waves	2103/006	. {Dental effluents}
11/14	. . with addition of chemical agents	2103/007	. {Contaminated open waterways, rivers, lakes or ponds}
11/143	. . . using inorganic substances ( <a href="#">C02F 11/148 takes precedence</a> )	2103/008	. {Originating from marine vessels, ships and boats, e.g. bilge water or ballast water}
11/145	. . . . using calcium compounds	2103/02	. Non-contaminated water, e.g. for industrial water supply
11/147	. . . using organic substances ( <a href="#">C02F 11/148 takes precedence</a> )	2103/023	. . {Water in cooling circuits}
11/148	. . . Combined use of inorganic and organic substances, being added in the same treatment step	2103/026	. . {Treating water for medical or cosmetic purposes}
11/15	. . by treatment with electric, magnetic or electromagnetic fields; by treatment with ultrasonic waves ( <a href="#">for the purpose of heating C02F 11/131</a> )	2103/04	. . for obtaining ultra-pure water
11/16	. . using drying or composting beds	2103/06	. Contaminated groundwater or leachate
11/18	. by thermal conditioning ( <a href="#">by pyrolysis C02F 11/10</a> )	2103/08	. Seawater, e.g. for desalination
11/185	. . {by pasteurisation}	2103/10	. from quarries or from mining activities
11/20	. . by freezing	2103/12	. from the silicate or ceramic industries, e.g. waste waters from cement or glass factories
<b>2101/00</b>	<b>Nature of the contaminant</b>	2103/14	. Paint wastes
2101/003	. {Explosive compounds, e.g. TNT}	2103/16	. from metallurgical processes, i.e. from the production, refining or treatment of metals, e.g. galvanic wastes
2101/006	. {Radioactive compounds}	2103/18	. from the purification of gaseous effluents
2101/10	. Inorganic compounds	2103/20	. from animal husbandry
2101/101	. . {Sulfur compounds}	2103/22	. from the processing of animals, e.g. poultry, fish, or parts thereof
2101/103	. . {Arsenic compounds}	2103/24	. . from tanneries
2101/105	. . {Phosphorus compounds}	2103/26	. from the processing of plants or parts thereof
2101/106	. . {Selenium compounds}	2103/28	. . from the paper or cellulose industry
2101/108	. . {Boron compounds}	2103/30	. from the textile industry
2101/12	. . Halogens or halogen-containing compounds	2103/32	. from the food or foodstuff industry, e.g. brewery waste waters
2101/14	. . . Fluorine or fluorine-containing compounds	2103/322	. . {from vegetable oil production, e.g. olive oil production}
2101/16	. . Nitrogen compounds, e.g. ammonia	2103/325	. . {from processes relating to the production of wine products}
2101/163	. . . {Nitrates}	2103/327	. . {from processes relating to the production of dairy products}
2101/166	. . . {Nitrites}	2103/34	. from industrial activities not provided for in groups <a href="#">C02F 2103/12</a> - <a href="#">C02F 2103/32</a>
2101/18	. . . Cyanides	2103/343	. . {from the pharmaceutical industry, e.g. containing antibiotics}
2101/20	. . Heavy metals or heavy metal compounds	2103/346	. . {from semiconductor processing, e.g. waste water from polishing of wafers}
2101/203	. . . {Iron or iron compound}	2103/36	. . from the manufacture of organic compounds
2101/206	. . . {Manganese or manganese compounds}	2103/365	. . . {from petrochemical industry (e.g. refineries)}
2101/22	. . . Chromium or chromium compounds, e.g. chromates	2103/38	. . . Polymers
2101/30	. Organic compounds	2103/40	. . from the manufacture or use of photosensitive materials
2101/301	. . {Detergents, surfactants}	2103/42	. from bathing facilities, e.g. swimming pools
2101/303	. . {Complexing agents}	2103/44	. from vehicle washing facilities
2101/305	. . {Endocrine disruptive agents}		
2101/306	. . {Pesticides}		
2101/308	. . {Dyes; Colorants; Fluorescent agents}		
2101/32	. . Hydrocarbons, e.g. oil		
2101/322	. . . {Volatile compounds, e.g. benzene}		
2101/325	. . . {Emulsions}		
2101/327	. . . {Polyaromatic Hydrocarbons [PAH's]}		
2101/34	. . containing oxygen		
2101/345	. . . {Phenols}		
2101/36	. . containing halogen		
2101/363	. . . {PCB's; PCP's}		

<b>2201/00</b>	<b>Apparatus for treatment of water, waste water or sewage</b>	<b>2201/784</b>	. . Diffusers or nozzles for ozonation
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)	<b>2203/00</b>	<b>Apparatus and plants for the biological treatment of water, waste water or sewage</b>
2201/002	. Construction details of the apparatus	2203/002	. comprising an initial buffer container
2201/003	. . Coaxial constructions, e.g. a cartridge located coaxially within another	2203/004	. comprising a selector reactor for promoting floc-forming or other bacteria
2201/004	. . Seals, connections	2203/006	. details of construction, e.g. specially adapted seals, modules, connections
2201/005	. . Valves	2203/008	. Mobile apparatus and plants, e.g. mounted on a vehicle
2201/006	. . Cartridges	<b>2209/00</b>	<b>Controlling or monitoring parameters in water treatment</b>
2201/007	. . Modular design	2209/001	. Upstream control, i.e. monitoring for predictive control
2201/008	. Mobile apparatus and plants, e.g. mounted on a vehicle	2209/003	. Downstream control, i.e. outlet monitoring, e.g. to check the treating agents, such as halogens or ozone, leaving the process
2201/009	. Apparatus with independent power supply, e.g. solar cells, windpower or fuel cells	2209/005	. Processes using a programmable logic controller [PLC]
2201/32	. Details relating to UV-irradiation devices	2209/006	. . comprising a software program or a logic diagram
2201/322	. . Lamp arrangement	2209/008	. . comprising telecommunication features, e.g. modems or antennas
2201/3221	. . . Lamps suspended above a water surface or pipe	2209/01	. Density
2201/3222	. . . Units using UV-light emitting diodes [LED]	2209/02	. Temperature
2201/3223	. . . Single elongated lamp located on the central axis of a turbular reactor	2209/03	. Pressure
2201/3224	. . . Units using UV-light guiding optical fibers	2209/04	. Oxidation reduction potential [ORP]
2201/3225	. . . Lamps immersed in an open channel, containing the liquid to be treated	2209/05	. Conductivity or salinity
2201/3226	. . . Units using UV-light emitting lasers	2209/055	. . Hardness
2201/3227	. . . Units with two or more lamps	2209/06	. pH
2201/3228	. . . Units having reflectors, e.g. coatings, baffles, plates, mirrors	2209/07	. Alkalinity
2201/324	. . Lamp cleaning installations, e.g. brushes	2209/08	. Chemical Oxygen Demand [COD]; Biological Oxygen Demand [BOD]
2201/326	. . Lamp control systems	2209/09	. Viscosity
2201/328	. . Having flow diverters (baffles)	2209/10	. Solids, e.g. total solids [TS], total suspended solids [TSS] or volatile solids [VS]
2201/46	. Apparatus for electrochemical processes	2209/105	. . Particle number, particle size or particle characterisation
2201/461	. . Electrolysis apparatus	2209/11	. Turbidity
2201/46105	. . . Details relating to the electrolytic devices	2209/12	. Volatile Fatty Acids (VFAs)
2201/4611	. . . . Fluid flow	2209/14	. NH <sub>3</sub> -N
2201/46115	. . . . Electrolytic cell with membranes or diaphragms	2209/15	. NO <sub>3</sub> -N
2201/4612	. . . . Controlling or monitoring	2209/16	. Total nitrogen (tkN-N)
2201/46125	. . . . . Electrical variables	2209/18	. PO <sub>4</sub> -P
2201/4613	. . . . . Inverting polarity	2209/19	. SO <sub>4</sub> -S
2201/46135	. . . . . Voltage	2209/20	. Total organic carbon [TOC]
2201/4614	. . . . . Current	2209/21	. Dissolved organic carbon [DOC]
2201/46145	. . . . . Fluid flow	2209/22	. O <sub>2</sub>
2201/4615	. . . . . Time	2209/225	. . in the gas phase
2201/46155	. . . . . Heating or cooling	2209/23	. O <sub>3</sub>
2201/4616	. . . . . Power supply	2209/235	. . in the gas phase
2201/46165	. . . . . Special power supply, e.g. solar energy or batteries	2209/24	. CO <sub>2</sub>
2201/4617	. . . . . DC only	2209/245	. . in the gas phase
2201/46175	. . . . . Electrical pulses	2209/26	. H <sub>2</sub> S
2201/4618	. . . . . Supplying or removing reactants or electrolyte	2209/265	. . in the gas phase
2201/46185	. . . . . Recycling the cathodic or anodic feed	2209/28	. CH <sub>4</sub>
2201/4619	. . . . . Supplying gas to the electrolyte	2209/285	. . CH <sub>4</sub> in the gas phase
2201/46195	. . . . . Cells containing solid electrolyte	2209/29	. Chlorine compounds
2201/48	. Devices for applying magnetic or electric fields	2209/30	. H <sub>2</sub>
2201/483	. . using coils	2209/32	. CO
2201/486	. . using antenna	2209/34	. N <sub>2</sub> O
2201/78	. Details relating to ozone treatment devices	2209/36	. Biological material, e.g. enzymes or ATP
2201/782	. . Ozone generators		

- 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