

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

CHEMISTRY

C10 PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS; PEAT

C10G CRACKING HYDROCARBON OILS; PRODUCTION OF LIQUID HYDROCARBON MIXTURES, e.g. BY DESTRUCTIVE HYDROGENATION, OLIGOMERISATION, POLYMERISATION (cracking to hydrogen or synthesis gas [C01B](#); cracking or pyrolysis of hydrocarbon gases to individual hydrocarbons or mixtures thereof of definite or specified constitution [C07C](#); cracking to cokes [C10B](#)); RECOVERY OF HYDROCARBON OILS FROM OIL-SHALE, OIL-SAND, OR GASES; REFINING MIXTURES MAINLY CONSISTING OF HYDROCARBONS; REFORMING OF NAPHTHA; MINERAL WAXES

NOTES

- In this subclass,
 - groups [C10G 9/00](#) - [C10G 49/00](#) are limited to one-step processes;
 - combined or multi-step processes are covered by groups [C10G 51/00](#) - [C10G 69/00](#);
 - refining or recovery of mineral waxes is covered by group [C10G 73/00](#)
- In this subclass, the following terms or expressions are used with the meanings indicated:
 - "in the presence of hydrogen" or "in the absence of hydrogen" mean treatments in which hydrogen, in free form or as hydrogen generating compounds, is added, or not added, respectively;
 - "hydrotreatment" is used for conversion processes as defined in group [C10G 45/00](#) or group [C10G 47/00](#);
 - "hydrocarbon oils" covers mixtures of hydrocarbons such as tar oils or mineral oils.
- In this subclass, in the absence of an indication to the contrary, classification is made in the last appropriate place.

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:

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| C10G 73/23 | covered by | C10G 73/06 |
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- 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.

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| 1/00 | Production of liquid hydrocarbon mixtures from oil-shale, oil-sand, or non-melting solid carbonaceous or similar materials, e.g. wood, coal (mechanical winning of oil from oil-shales, oil-sand, or the like B03B) | | |
| | | 1/083 | . . {in the presence of a solvent} |
| | | 1/086 | . . {Characterised by the catalyst used} |
| | | 1/10 | . from rubber or rubber waste |
| | | 2/00 | Production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon |
| 1/002 | . {in combination with oil conversion- or refining processes} | 2/30 | . {from carbon monoxide with hydrogen} |
| 1/004 | . {Inhibiting of corrosion} | 2/31 | . . {thermal, non catalytic conversion} |
| 1/006 | . {Combinations of processes provided in groups C10G 1/02 - C10G 1/08 } | 2/32 | . . {with the use of catalysts} |
| | | 2/33 | . . . {characterised by the catalyst used} |
| 1/008 | . {Controlling or regulating of liquefaction processes} | 2/331 | {containing group VIII-metals} |
| | | 2/332 | {of the iron-group} |
| 1/02 | . by distillation | 2/333 | {of the platinum-group} |
| 1/04 | . by extraction | 2/334 | {containing molecular sieve catalysts} |
| 1/042 | . . {by the use of hydrogen-donor solvents} | 2/34 | . . . {Apparatus, reactors} |
| 1/045 | . . {Separation of insoluble materials} | 2/341 | {with stationary catalyst bed} |
| 1/047 | . . {Hot water or cold water extraction processes} | 2/342 | {with moving solid catalysts} |
| 1/06 | . by destructive hydrogenation | 2/343 | {according to the "moving-bed" method} |
| 1/065 | . . {in the presence of a solvent} | 2/344 | {according to the "fluidised-bed" technique} |
| 1/08 | . with moving catalysts | | |

- 2/35 . . {with the use of another activation, e.g. radiation, vibration, electrical or electromagnetic means}
- 2/40 . {from carbon monoxide with water vapor}
- 2/50 . {from carbon dioxide with hydrogen}

3/00 Production of liquid hydrocarbon mixtures from oxygen-containing organic materials, e.g. fatty oils, fatty acids (production from non-melting solid oxygen-containing carbonaceous materials C10G 1/00)

- 3/40 . {Thermal non-catalytic treatment}
- 3/42 . {Catalytic treatment}
- 3/44 . . {characterised by the catalyst used}
- 3/45 . . . {containing iron group metals or compounds thereof}
- 3/46 {in combination with chromium, molybdenum, tungsten metals or compounds thereof}
- 3/47 . . . {containing platinum group metals or compounds thereof}
- 3/48 . . . {further characterised by the catalyst support}
- 3/49 {containing crystalline aluminosilicates, e.g. molecular sieves}
- 3/50 . {in the presence of hydrogen, hydrogen donors or hydrogen generating compounds}
- 3/52 . . {Hydrogen in a special composition or from a special source}
- 3/54 . {characterised by the catalytic bed}
- 3/55 . . {with moving solid particles, e.g. moving beds}
- 3/56 . . . {suspended in the oil, e.g. slurries, ebullated beds}
- 3/57 {according to the fluidised bed technique}
- 3/60 . {Controlling or regulating the processes}
- 3/62 . {Catalyst regeneration}

5/00 Recovery of liquid hydrocarbon mixtures from gases, e.g. natural gas

- 5/02 . with solid adsorbents
- 5/04 . with liquid absorbents
- 5/06 . by cooling or compressing

7/00 Distillation of hydrocarbon oils

- 7/003 . {distillation of lubricating oils}
- 7/006 . {of waste oils other than lubricating oils, e.g. PCB's containing oils}
- 7/02 . Stabilising gasoline by removing gases by fractioning
- 7/04 . Dewatering
- 7/06 . Vacuum distillation
- 7/08 . Azeotropic or extractive distillation (refining of hydrocarbon oils, in the absence of hydrogen, by extraction with selective solvents C10G 21/00)
- 7/10 . Inhibiting corrosion during distillation
- 7/12 . Controlling or regulating

Cracking in the absence of hydrogen

9/00 Thermal non-catalytic cracking, in the absence of hydrogen, of hydrocarbon oils

- 9/002 . {Cooling of cracked gases}
- 9/005 . {Coking (in order to produce liquid products mainly)}
- 9/007 . {Visbreaking}
- 9/02 . in retorts
- 9/04 . . Retorts

- 9/06 . by pressure distillation
- 9/08 . . Apparatus therefor
- 9/12 . . . Removing incrustation
- 9/14 . in pipes or coils with or without auxiliary means, e.g. digesters, soaking drums, expansion means
- 9/16 . . Preventing or removing incrustation
- 9/18 . . Apparatus
- 9/20 . . . Tube furnaces
- 9/203 {chemical composition of the tubes}
- 9/206 {controlling or regulating the tube furnaces}
- 9/24 . by heating with electrical means
- 9/26 . with discontinuously preheated non-moving solid material, e.g. blast and run
- 9/28 . with preheated moving solid material
- 9/30 . . according to the "moving bed" method
- 9/32 . . according to the "fluidised-bed" technique
- 9/34 . by direct contact with inert preheated fluids, e.g. with molten metals or salts
- 9/36 . . with heated gases or vapours
- 9/38 . . . produced by partial combustion of the material to be cracked or by combustion of another hydrocarbon
- 9/40 . by indirect contact with preheated fluid other than hot combustion gases
- 9/42 . by passing the material to be cracked in thin streams or as spray on or near continuously heated surfaces

11/00 Catalytic cracking, in the absence of hydrogen, of hydrocarbon oils (cracking in direct contact with molten metals or salts C10G 9/34)

- 11/02 . characterised by the catalyst used
- 11/04 . . Oxides
- 11/05 . . . Crystalline alumino-silicates, e.g. molecular sieves
- 11/06 . . Sulfides
- 11/08 . . Halides
- 11/10 . with stationary catalyst bed
- 11/12 . with discontinuously preheated non-moving solid catalysts, e.g. blast and run
- 11/14 . with preheated moving solid catalysts
- 11/16 . . according to the "moving bed" method
- 11/18 . . according to the "fluidised-bed" technique
- 11/182 . . . {Regeneration}
- 11/185 {Energy recovery from regenerator effluent gases}
- 11/187 {Controlling or regulating}
- 11/20 . by direct contact with inert heated gases or vapours
- 11/22 . . produced by partial combustion of the material to be cracked

15/00 Cracking of hydrocarbon oils by electric means, electromagnetic or mechanical vibrations, by particle radiation or with gases superheated in electric arcs

- 15/08 . by electric means or by electromagnetic or mechanical vibrations
- 15/10 . by particle radiation
- 15/12 . with gases superheated in an electric arc, e.g. plasma

Refining in the absence of hydrogen

- 17/00 Refining of hydrocarbon oils in the absence of hydrogen, with acids, acid-forming compounds or acid-containing liquids, e.g. acid sludge**

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| 17/02 | . with acids or acid-containing liquids, e.g. acid sludge | 25/03 | . . with crystalline aluminosilicates, e.g. molecular sieves |
| 17/04 | . . Liquid-liquid treatment forming two immiscible phases | 25/05 | . . . Removal of non-hydrocarbon compounds, e.g. sulfur compounds |
| 17/06 | . . . using acids derived from sulfur or acid sludge thereof | 25/06 | . with moving sorbents or sorbents dispersed in the oil |
| 17/07 | . . . using halogen acids or oxyacids of halogen (acids generating halogen C10G 27/02) | 25/08 | . . according to the "moving bed" method |
| 17/08 | . with acid-forming oxides (refining with CO ₂ or SO ₂ as a selective solvent C10G 21/06) | 25/09 | . . according to the "fluidised bed" technique |
| 17/085 | . . with oleum | 25/11 | . . Distillation in the presence of moving sorbents |
| 17/09 | . with acid salts | 25/12 | . Recovery of used adsorbent |
| 17/095 | . with "solid acids", e.g. phosphoric acid deposited on a carrier | 27/00 | Refining of hydrocarbon oils in the absence of hydrogen, by oxidation |
| 17/10 | . Recovery of used refining agents | 27/02 | . with halogen or compounds generating halogen; Hypochlorous acid or salts thereof |
| 19/00 | Refining hydrocarbon oils in the absence of hydrogen, by alkaline treatment | 27/04 | . with oxygen or compounds generating oxygen |
| 19/02 | . with aqueous alkaline solutions | 27/06 | . . in the presence of alkaline solutions |
| 19/04 | . . containing solubilisers, e.g. solutisers | 27/08 | . . in the presence of copper chloride |
| 19/06 | . . with plumbites or plumbates | 27/10 | . . in the presence of metal-containing organic complexes, e.g. chelates, or cationic ion-exchange resins |
| 19/067 | . with molten alkaline material | 27/12 | . . with oxygen-generating compounds, e.g. per-compounds, chromic acid, chromates (plumbites or plumbates C10G 19/06) |
| 19/073 | . with solid alkaline material | 27/14 | . . with ozone-containing gases |
| 19/08 | . Recovery of used refining agents | 29/00 | Refining of hydrocarbon oils, in the absence of hydrogen, with other chemicals |
| 21/00 | Refining of hydrocarbon oils, in the absence of hydrogen, by extraction with selective solvents (C10G 17/00, C10G 19/00 take precedence) | 29/02 | . Non-metals |
| 21/003 | . {Solvent de-asphalting} | 29/04 | . Metals, or metals deposited on a carrier |
| 21/006 | . {of waste oils, e.g. PCB's containing oils} | 29/06 | . Metal salts, or metal salts deposited on a carrier |
| 21/02 | . with two or more solvents, which are introduced or withdrawn separately | 29/08 | . . containing the metal in the lower valency |
| 21/04 | . . by introducing simultaneously at least two immiscible solvents counter-current to each other | 29/10 | . . Sulfides |
| 21/06 | . characterised by the solvent used | 29/12 | . . Halides |
| 21/08 | . . Inorganic compounds only | 29/16 | . Metal oxides |
| 21/10 | . . . Sulfur dioxide | 29/20 | . Organic compounds not containing metal atoms |
| 21/12 | . . Organic compounds only | 29/205 | . . {by reaction with hydrocarbons added to the hydrocarbon oil} |
| 21/14 | . . . Hydrocarbons | 29/22 | . . containing oxygen as the only hetero atom |
| 21/16 | . . . Oxygen-containing compounds | 29/24 | . . . Aldehydes or ketones |
| 21/18 | . . . Halogen-containing compounds | 29/26 | . . Halogenated hydrocarbons |
| 21/20 | . . . Nitrogen-containing compounds | 29/28 | . . containing sulfur as the only hetero atom, e.g. mercaptans, or sulfur and oxygen as the only hetero atoms |
| 21/22 | . . . Compounds containing sulfur, selenium, or tellurium | 31/00 | Refining of hydrocarbon oils, in the absence of hydrogen, by methods not otherwise provided for (by distillation C10G 7/00) |
| 21/24 | . . . Phosphorus-containing compounds | 31/06 | . by heating, cooling, or pressure treatment |
| 21/26 | . . . Silicon-containing compounds | 31/08 | . by treating with water |
| 21/27 | . . . Organic compounds not provided for in a single one of groups C10G 21/14 - C10G 21/26 | 31/09 | . by filtration |
| 21/28 | . Recovery of used solvent | 31/10 | . with the aid of centrifugal force |
| 21/30 | . Controlling or regulating | 31/11 | . by dialysis |
| 25/00 | Refining of hydrocarbon oils in the absence of hydrogen, with solid sorbents | 32/00 | Refining of hydrocarbon oils by electric or magnetic means, by irradiation, or by using microorganisms |
| NOTE | | 32/02 | . by electric or magnetic means |
| | When classifying in this group, classification is also made in group B01D 15/08 insofar as subject matter of general interest relating to chromatography is concerned. | 32/04 | . by particle radiation |
| 25/003 | . {Specific sorbent material, not covered by C10G 25/02 or C10G 25/03 } | 33/00 | Dewatering or demulsification of hydrocarbon oils (by distillation C10G 7/04) |
| 25/006 | . {of waste oils, e.g. PCB's containing oils} | 33/02 | . with electrical or magnetic means |
| 25/02 | . with ion-exchange material | 33/04 | . with chemical means |
| | | 33/06 | . with mechanical means, e.g. by filtration |

- 33/08 . Controlling or regulating
- 35/00 Reforming naphtha**
- NOTE**
- By reforming is meant the treatment of naphtha, in order to improve the octane number or its aromatic content.
- 35/02 . Thermal reforming
- 35/04 . Catalytic reforming
- 35/06 . . characterised by the catalyst used
- 35/065 . . . {containing crystalline zeolitic molecular sieves, other than aluminosilicates}
- 35/085 . . . containing platinum group metals or compounds thereof
- 35/09 Bimetallic catalysts in which at least one of the metals is a platinum group metal
- 35/095 . . . containing crystalline alumino-silicates, e.g. molecular sieves {[C10G 35/065](#) takes precedence}
- 35/10 . . with moving catalysts
- 35/12 . . . according to the "moving-bed" method
- 35/14 . . . according to the "fluidised-bed" technique
- 35/16 . with electric, electromagnetic, or mechanical vibrations; by particle radiation
- 35/22 . Starting-up reforming operations
- 35/24 . Controlling or regulating of reforming operations
- 45/34 . . characterised by the catalyst used
- 45/36 . . . containing nickel or cobalt metal, or compounds thereof
- 45/38 in combination with chromium, molybdenum or tungsten metals, or compounds thereof
- 45/40 . . . containing platinum group metals or compounds thereof
- 45/42 . . with moving solid particles
- 45/44 . Hydrogenation of the aromatic hydrocarbons
- 45/46 . . characterised by the catalyst used
- 45/48 . . . containing nickel or cobalt metal, or compounds thereof
- 45/50 in combination with chromium, molybdenum or tungsten metal, or compounds thereof
- 45/52 . . . containing platinum group metals or compounds thereof
- 45/54 . . . containing crystalline alumino-silicates, e.g. molecular sieves
- 45/56 . . with moving solid particles
- 45/58 . to change the structural skeleton of some of the hydrocarbon content without cracking the other hydrocarbons present, e.g. lowering pour point; Selective hydrocracking of normal paraffins [\(C10G 32/00](#) takes precedence; improving or increasing the octane number or aromatic content of naphtha [C10G 35/00](#))
- 45/60 . . characterised by the catalyst used
- 45/62 . . . containing platinum group metals or compounds thereof
- 45/64 . . . containing crystalline alumino-silicates, e.g. molecular sieves
- 45/66 . . with moving solid particles
- 45/68 . . Aromatisation of hydrocarbon oil fractions
- 45/70 . . . with catalysts containing platinum group metals or compounds thereof
- 45/72 . Controlling or regulating

Hydrotreatment processes**45/00 Refining of hydrocarbon oils using hydrogen or hydrogen-generating compounds****NOTE**

Treatment of hydrocarbon oils in the presence of hydrogen-generating compounds not provided for in a single one of groups [C10G 45/02](#), [C10G 45/32](#), [C10G 45/44](#) or [C10G 45/58](#) is provided for in group [C10G 49/00](#).

- 45/02 . to eliminate hetero atoms without changing the skeleton of the hydrocarbon involved and without cracking into lower boiling hydrocarbons; Hydrofinishing
- 45/04 . . characterised by the catalyst used
- 45/06 . . . containing nickel or cobalt metal, or compounds thereof
- 45/08 in combination with chromium, molybdenum, or tungsten metals, or compounds thereof
- 45/10 . . . containing platinum group metals or compounds thereof
- 45/12 . . . containing crystalline alumino-silicates, e.g. molecular sieves
- 45/14 . . with moving solid particles
- 45/16 . . . suspended in the oil, e.g. slurries
- 45/18 . . . according to the "moving-bed" technique
- 45/20 . . . according to the "fluidised-bed" technique
- 45/22 . . with hydrogen dissolved or suspended in the oil
- 45/24 . . with hydrogen-generating compounds
- 45/26 . . . Steam or water
- 45/28 . . . Organic compounds; Autofining
- 45/30 characterised by the catalyst used
- 45/32 . Selective hydrogenation of the diolefin or acetylene compounds
- 47/00 Cracking of hydrocarbon oils, in the presence of hydrogen or hydrogen-generating compounds, to obtain lower boiling fractions** ([C10G 15/00](#) takes precedence; destructive hydrogenation of non-melting solid carbonaceous or similar materials [C10G 1/06](#))
- 47/02 . characterised by the catalyst used
- 47/04 . . Oxides
- 47/06 . . Sulfides
- 47/08 . . Halides
- 47/10 . . with catalysts deposited on a carrier
- 47/12 . . . Inorganic carriers
- 47/14 the catalyst containing platinum group metals or compounds thereof
- 47/16 Crystalline alumino-silicate carriers
- 47/18 the catalyst containing platinum group metals or compounds thereof
- 47/20 the catalyst containing other metals or compounds thereof
- 47/22 . Non-catalytic cracking in the presence of hydrogen
- 47/24 . with moving solid particles
- 47/26 . . suspended in the oil, e.g. slurries
- 47/28 . . according to the "moving-bed" technique
- 47/30 . . according to the "fluidised-bed" technique
- 47/32 . in the presence of hydrogen-generating compounds
- 47/34 . . Organic compounds, e.g. hydrogenated hydrocarbons

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| 47/36 | . Controlling or regulating | 55/00 | Treatment of hydrocarbon oils, in the absence of hydrogen, by at least one refining process and at least one cracking process |
| 49/00 | Treatment of hydrocarbon oils, in the presence of hydrogen or hydrogen-generating compounds, not provided for in a single one of groups C10G 45/02, C10G 45/32, C10G 45/44, C10G 45/58 or C10G 47/00 | 55/02 | . plural serial stages only |
| 49/002 | . {Apparatus for fixed bed hydrotreatment processes} | 55/04 | . . including at least one thermal cracking step |
| 49/005 | . {Inhibiting corrosion in hydrotreatment processes} | 55/06 | . . including at least one catalytic cracking step |
| 49/007 | . {in the presence of hydrogen from a special source or of a special composition or having been purified by a special treatment} | 55/08 | . plural parallel stages only |
| 49/02 | . characterised by the catalyst used | 57/00 | Treatment of hydrocarbon oils, in the absence of hydrogen, by at least one cracking process or refining process and at least one other conversion process |
| 49/04 | . . containing nickel, cobalt, chromium, molybdenum, or tungsten metals, or compounds thereof | 57/005 | . {with alkylation} |
| 49/06 | . . containing platinum group metals or compounds thereof | 57/02 | . with polymerisation |
| 49/08 | . . containing crystalline alumino-silicates, e.g. molecular sieves | 59/00 | Treatment of naphtha by two or more reforming processes only or by at least one reforming process and at least one process which does not substantially change the boiling range of the naphtha |
| 49/10 | . with moving solid particles | 59/02 | . plural serial stages only |
| 49/12 | . . suspended in the oil, e.g. slurries | 59/04 | . . including at least one catalytic and at least one non-catalytic reforming step |
| 49/14 | . . according to the "moving-bed" technique | 59/06 | . plural parallel stages only |
| 49/16 | . . according to the "fluidised-bed" technique | 61/00 | Treatment of naphtha by at least one reforming process and at least one process of refining in the absence of hydrogen |
| 49/18 | . in the presence of hydrogen-generating compounds, e.g. ammonia, water, hydrogen sulfide | 61/02 | . plural serial stages only |
| 49/20 | . . Organic compounds | 61/04 | . . the refining step being an extraction |
| 49/22 | . Separation of effluents | 61/06 | . . the refining step being a sorption process |
| 49/24 | . Starting-up hydrotreatment operations | 61/08 | . plural parallel stages only |
| 49/26 | . Controlling or regulating | 61/10 | . processes also including other conversion steps |
| 50/00 | Production of liquid hydrocarbon mixtures from lower carbon number hydrocarbons, e.g. by oligomerisation | 63/00 | Treatment of naphtha by at least one reforming process and at least one other conversion process (C10G 59/00, C10G 61/00 take precedence) |
| 50/02 | . of hydrocarbon oils for lubricating purposes | 63/02 | . plural serial stages only |
| Multi-step processes | | 63/04 | . . including at least one cracking step |
| NOTE | | 63/06 | . plural parallel stages only |
| Groups C10G 51/00 - C10G 69/00 cover only those combined treating operations where the interest is directed to the relationship between the steps. | | 63/08 | . . including at least one cracking step |
| 51/00 | Treatment of hydrocarbon oils, in the absence of hydrogen, by two or more cracking processes only | 65/00 | Treatment of hydrocarbon oils by two or more hydrotreatment processes only |
| 51/02 | . plural serial stages only | 65/02 | . plural serial stages only |
| 51/023 | . . {only thermal cracking steps} | 65/04 | . . including only refining steps |
| 51/026 | . . {only catalytic cracking steps} | 65/043 | . . . {at least one step being a change in the structural skeleton} |
| 51/04 | . . including only thermal and catalytic cracking steps | 65/046 | . . . {at least one step being an aromatisation step} |
| 51/06 | . plural parallel stages only | 65/06 | . . . at least one step being a selective hydrogenation of the diolefins |
| 53/00 | Treatment of hydrocarbon oils, in the absence of hydrogen, by two or more refining processes | 65/08 | . . . at least one step being a hydrogenation of the aromatic hydrocarbons |
| 53/02 | . plural serial stages only | 65/10 | . . including only cracking steps |
| 53/04 | . . including at least one extraction step | 65/12 | . . including cracking steps and other hydrotreatment steps |
| 53/06 | . . . including only extraction steps, e.g. deasphalting by solvent treatment followed by extraction of aromatics | 65/14 | . plural parallel stages only |
| 53/08 | . . including at least one sorption step | 65/16 | . . including only refining steps |
| 53/10 | . . including at least one acid-treatment step | 65/18 | . . including only cracking steps |
| 53/12 | . . including at least one alkaline treatment step | 67/00 | Treatment of hydrocarbon oils by at least one hydrotreatment process and at least one process for refining in the absence of hydrogen only |
| 53/14 | . . including at least one oxidation step | 67/02 | . plural serial stages only |
| 53/16 | . plural parallel stages only | 67/04 | . . including solvent extraction as the refining step in the absence of hydrogen |

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| 67/0409 | . . . {Extraction of unsaturated hydrocarbons} | 71/00 | Treatment by methods not otherwise provided for of hydrocarbon oils or fatty oils for lubricating purposes |
| 67/0418 | {The hydrotreatment being a hydrotreatment} | | |
| 67/0427 | {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes} | 71/02 | . Thickening by voltolising (chemical modification of drying oils by voltolising C09F 7/04) |
| 67/0436 | {The hydrotreatment being an aromatic saturation} | 73/00 | Recovery or refining of mineral waxes, e.g. montan wax (compositions essentially based on waxes C08L 91/00) |
| 67/0445 | {The hydrotreatment being a hydrocracking} | | |
| 67/0454 | . . . {Solvent desasphalting} | 73/02 | . Recovery of petroleum waxes from hydrocarbon oils; Dewaxing of hydrocarbon oils |
| 67/0463 | {The hydrotreatment being a hydrotreatment} | 73/025 | . . {by filtration} |
| 67/0472 | {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes} | 73/04 | . . with the use of filter aids |
| 67/0481 | {The hydrotreatment being an aromatics saturation} | 73/06 | . . with the use of solvents |
| 67/049 | {The hydrotreatment being a hydrocracking} | 73/08 | . . . Organic compounds |
| 67/06 | . . including a sorption process as the refining step in the absence of hydrogen | 73/10 | Hydrocarbons |
| 67/08 | . . including acid treatment as the refining step in the absence of hydrogen | 73/12 | Oxygen-containing compounds |
| 67/10 | . . including alkaline treatment as the refining step in the absence of hydrogen | 73/14 | Halogen-containing compounds |
| 67/12 | . . including oxidation as the refining step in the absence of hydrogen | 73/16 | Nitrogen-containing compounds |
| 67/14 | . . including at least two different refining steps in the absence of hydrogen | 73/18 | containing sulfur, selenium or tellurium |
| 67/16 | . plural parallel stages only | 73/20 | containing phosphorus |
| 69/00 | Treatment of hydrocarbon oils by at least one hydrotreatment process and at least one other conversion process (C10G 67/00 takes precedence) | 73/22 | Mixtures or organic compounds |
| 69/02 | . plural serial stages only | 73/24 | . . by formation of adducts |
| 69/04 | . . including at least one step of catalytic cracking in the absence of hydrogen | 73/26 | . . by flotation |
| 69/06 | . . including at least one step of thermal cracking in the absence of hydrogen | 73/28 | . . by centrifugal force |
| 69/08 | . . including at least one step of reforming naphtha | 73/30 | . . with electric means |
| 69/10 | . . . hydrocracking of higher boiling fractions into naphtha and reforming the naphtha obtained | 73/32 | . . Methods of cooling during dewaxing |
| 69/12 | . . including at least one polymerisation or alkylation step | 73/34 | . . Controlling or regulating |
| 69/123 | . . . {alkylation} | 73/36 | . Recovery of petroleum waxes from other compositions containing oil in minor proportions, from concentrates or from residues; De-oiling, sweating |
| 69/126 | . . . {polymerisation, e.g. oligomerisation} | 73/38 | . Chemical modification of petroleum |
| 69/14 | . plural parallel stages only | 73/40 | . Physical treatment of waxes or modified waxes, e.g. granulation, dispersion, emulsion, irradiation |
| 70/00 | Working-up undefined normally gaseous mixtures obtained by processes covered by groups C10G 9/00, C10G 11/00, C10G 15/00, C10G 47/00, C10G 51/00 | 73/42 | . Refining of petroleum waxes |
| 70/002 | . {by forming adducts or complexes} | 73/44 | . . in the presence of hydrogen or hydrogen-generating compounds |
| 70/004 | . . {with solutions of copper salts} | 75/00 | Inhibiting corrosion or fouling in apparatus for treatment or conversion of hydrocarbon oils, in general (C10G 7/10, C10G 9/16 take precedence) |
| 70/006 | . {with the use of acids or sulfur oxides} | 75/02 | . by addition of corrosion inhibitors |
| 70/008 | . {with the use of organometallic compounds} | 75/04 | . by addition of antifouling agents |
| 70/02 | . by hydrogenation | 99/00 | Subject matter not provided for in other groups of this subclass |
| 70/04 | . by physical processes | | |
| 70/041 | . . {by distillation} | 2300/00 | Aspects relating to hydrocarbon processing covered by groups C10G 1/00 - C10G 99/00 |
| 70/042 | . . . {with the use of auxiliary compounds} | 2300/10 | . Feedstock materials |
| 70/043 | . . {by fractional condensation} | 2300/1003 | . . Waste materials |
| 70/044 | . . {by crystallisation} | 2300/1007 | . . . Used oils |
| 70/045 | . . {using membranes, e.g. selective permeation} | 2300/1011 | . . Biomass |
| 70/046 | . . {by adsorption, i.e. with the use of solids} | 2300/1014 | . . . of vegetal origin |
| 70/047 | . . . {by molecular sieve technique} | 2300/1018 | . . . of animal origin |
| 70/048 | . . {by liquid-liquid extraction} | 2300/1022 | . . Fischer-Tropsch products |
| 70/06 | . . by gas-liquid contact | 2300/1025 | . . Natural gas |
| | | 2300/1029 | . . Gas hydrates |
| | | 2300/1033 | . . Oil well production fluids |
| | | 2300/1037 | . . Hydrocarbon fractions |

C10G

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|-----------|---------|---|----------------|-------|--|
| 2300/104 | . . . | Light gasoline having a boiling range of about 20 - 100 °C | 2300/701 | . . | Use of spent catalysts |
| 2300/1044 | . . . | Heavy gasoline or naphtha having a boiling range of about 100 - 180 °C | 2300/703 | . . | Activation |
| 2300/1048 | . . . | Middle distillates | 2300/705 | . . | Passivation |
| 2300/1051 | | Kerosene having a boiling range of about 180 - 230 °C | 2300/706 | . . | Catalytic metal recovery |
| 2300/1055 | | Diesel having a boiling range of about 230 - 330 °C | 2300/708 | . . | Coking aspect, coke content and composition of deposits |
| 2300/1059 | | Gasoil having a boiling range of about 330 - 427 °C | 2300/80 | . . | Additives |
| 2300/1062 | . . . | Lubricating oils | 2300/802 | . . | Diluents |
| 2300/1066 | | Special oils | 2300/805 | . . | Water |
| 2300/107 | . . | Atmospheric residues having a boiling point of at least about 538 °C | 2300/807 | . . . | Steam |
| 2300/1074 | . . | Vacuum distillates | 2400/00 | | Products obtained by processes covered by groups C10G 9/00 - C10G 69/14 |
| 2300/1077 | . . | Vacuum residues | 2400/02 | . . | Gasoline |
| 2300/1081 | . . | Alkanes | 2400/04 | . . | Diesel oil |
| 2300/1085 | . . . | Solid paraffins | 2400/06 | . . | Gasoil |
| 2300/1088 | . . | Olefins | 2400/08 | . . | Jet fuel |
| 2300/1092 | . . . | C2-C4 olefins | 2400/10 | . . | Lubricating oil |
| 2300/1096 | . . | Aromatics or polyaromatics | 2400/12 | . . | Electrical isolation oil |
| 2300/20 | . . | Characteristics of the feedstock or the products | 2400/14 | . . | White oil, eating oil |
| 2300/201 | . . | Impurities | 2400/16 | . . | Residues |
| 2300/202 | . . . | Heteroatoms content, i.e. S, N, O, P | 2400/18 | . . | Solvents |
| 2300/203 | | Naphthenic acids, TAN | 2400/20 | . . | C2-C4 olefins |
| 2300/205 | . . . | Metal content | 2400/22 | . . | Higher olefins |
| 2300/206 | | Asphaltenes | 2400/24 | . . | Acetylene and homologues |
| 2300/207 | . . . | Acid gases, e.g. H ₂ S, COS, SO ₂ , HCN | 2400/26 | . . | Fuel gas |
| 2300/208 | . . . | Sediments, e.g. bottom sediment and water or BSW | 2400/28 | . . | Propane and butane |
| 2300/30 | . . | Physical properties of feedstocks or products | 2400/30 | . . | Aromatics |
| 2300/301 | . . . | Boiling range | | | |
| 2300/302 | . . . | Viscosity | | | |
| 2300/304 | . . . | Pour point, cloud point, cold flow properties | | | |
| 2300/305 | . . . | Octane number, e.g. motor octane number [MON], research octane number [RON] | | | |
| 2300/307 | . . . | Cetane number, cetane index | | | |
| 2300/308 | . . . | Gravity, density, e.g. API | | | |
| 2300/40 | . . | Characteristics of the process deviating from typical ways of processing | | | |
| 2300/4006 | . . | Temperature | | | |
| 2300/4012 | . . | Pressure | | | |
| 2300/4018 | . . | Spatial velocity, e.g. LHSV, WHSV | | | |
| 2300/4025 | . . | Yield | | | |
| 2300/4031 | . . | Start up or shut down operations | | | |
| 2300/4037 | . . | In-situ processes | | | |
| 2300/4043 | . . | Limiting CO ₂ emissions | | | |
| 2300/405 | . . | Limiting CO, NO _x or SO _x emissions | | | |
| 2300/4056 | . . | Retrofitting operations | | | |
| 2300/4062 | . . | Geographical aspects, e.g. different process units form a combination process at different geographical locations | | | |
| 2300/4068 | . . | Moveable devices or units, e.g. on trucks, barges | | | |
| 2300/4075 | . . | Limiting deterioration of equipment | | | |
| 2300/4081 | . . | Recycling aspects | | | |
| 2300/4087 | . . | Catalytic distillation | | | |
| 2300/4093 | . . | Catalyst stripping | | | |
| 2300/42 | . . | Hydrogen of special source or of special composition | | | |
| 2300/44 | . . | Solvents | | | |
| 2300/70 | . . | Catalyst aspects | | | |