

# 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:  
[C10G 73/23](#) covered by [C10G 73/06](#)
- 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>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)</b>	1/083	. . {in the presence of a solvent}
		1/086	. . {Characterised by the catalyst used}
		1/10	. from rubber or rubber waste
		<b>2/00</b>	<b>Production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon</b>
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 <a href="#">C10G 1/02</a> - <a href="#">C10G 1/08</a> }	2/32	. . {with the use of catalysts}
1/008	. {Controlling or regulating of liquefaction processes}	2/33	. . . {characterised by the catalyst used}
		2/331	. . . . {containing group VIII-metals}
1/02	. by distillation	2/332	. . . . . {of the iron-group}
1/04	. by extraction	2/333	. . . . . {of the platinum-group}
1/042	. . {by the use of hydrogen-donor solvents}	2/334	. . . . {containing molecular sieve catalysts}
1/045	. . {Separation of insoluble materials}	2/34	. . . {Apparatus, reactors}
1/047	. . {Hot water or cold water extraction processes}	2/341	. . . . {with stationary catalyst bed}
1/06	. by destructive hydrogenation	2/342	. . . . {with moving solid catalysts}
1/065	. . {in the presence of a solvent}	2/343	. . . . . {according to the "moving-bed" method}
1/08	. with moving catalysts	2/344	. . . . . {according to the "fluidised-bed" technique}

- 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**

17/02	• with acids or acid-containing liquids, e.g. acid sludge	25/03	• • with crystalline alumino-silicates, 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 <sub>2</sub> or SO <sub>2</sub> 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		
17/10	• Recovery of used refining agents		
<b>19/00</b>	<b>Refining hydrocarbon oils in the absence of hydrogen, by alkaline treatment</b>	<b>27/00</b>	<b>Refining of hydrocarbon oils in the absence of hydrogen, by oxidation</b>
19/02	• with aqueous alkaline solutions	27/02	• with halogen or compounds generating halogen; Hypochlorous acid or salts thereof
19/04	• • containing solubilisers, e.g. solutisers	27/04	• with oxygen or compounds generating oxygen
19/06	• • with plumbites or plumbates	27/06	• • in the presence of alkaline solutions
19/067	• with molten alkaline material	27/08	• • in the presence of copper chloride
19/073	• with solid alkaline material	27/10	• • in the presence of metal-containing organic complexes, e.g. chelates, or cationic ion-exchange resins
19/08	• Recovery of used refining agents	27/12	• • with oxygen-generating compounds, e.g. per-compounds, chromic acid, chromates (plumbites or plumbates C10G 19/06)
<b>21/00</b>	<b>Refining of hydrocarbon oils, in the absence of hydrogen, by extraction with selective solvents (C10G 17/00, C10G 19/00 take precedence)</b>	27/14	• • with ozone-containing gases
21/003	• {Solvent de-asphalting}	<b>29/00</b>	<b>Refining of hydrocarbon oils, in the absence of hydrogen, with other chemicals</b>
21/006	• {of waste oils, e.g. PCB's containing oils}	29/02	• Non-metals
21/02	• with two or more solvents, which are introduced or withdrawn separately	29/04	• Metals, or metals deposited on a carrier
21/04	• • by introducing simultaneously at least two immiscible solvents counter-current to each other	29/06	• Metal salts, or metal salts deposited on a carrier
21/06	• characterised by the solvent used	29/08	• • containing the metal in the lower valency
21/08	• • Inorganic compounds only	29/10	• • Sulfides
21/10	• • • Sulfur dioxide	29/12	• • Halides
21/12	• • Organic compounds only	29/16	• Metal oxides
21/14	• • • Hydrocarbons	29/20	• Organic compounds not containing metal atoms
21/16	• • • Oxygen-containing compounds	29/205	• • {by reaction with hydrocarbons added to the hydrocarbon oil}
21/18	• • • Halogen-containing compounds	29/22	• • containing oxygen as the only hetero atom
21/20	• • • Nitrogen-containing compounds	29/24	• • • Aldehydes or ketones
21/22	• • • Compounds containing sulfur, selenium, or tellurium	29/26	• • Halogenated hydrocarbons
21/24	• • • Phosphorus-containing compounds	29/28	• • containing sulfur as the only hetero atom, e.g. mercaptans, or sulfur and oxygen as the only hetero atoms
21/26	• • • Silicon-containing compounds		
21/27	• • • Organic compounds not provided for in a single one of groups C10G 21/14 - C10G 21/26	<b>31/00</b>	<b>Refining of hydrocarbon oils, in the absence of hydrogen, by methods not otherwise provided for (by distillation C10G 7/00)</b>
21/28	• Recovery of used solvent	31/06	• by heating, cooling, or pressure treatment
21/30	• Controlling or regulating	31/08	• by treating with water
<b>25/00</b>	<b>Refining of hydrocarbon oils in the absence of hydrogen, with solid sorbents</b>	31/09	• by filtration
<b>NOTE</b>		31/10	• with the aid of centrifugal force
	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.	31/11	• by dialysis
25/003	• {Specific sorbent material, not covered by C10G 25/02 or C10G 25/03}	<b>32/00</b>	<b>Refining of hydrocarbon oils by electric or magnetic means, by irradiation, or by using microorganisms</b>
25/006	• {of waste oils, e.g. PCB's containing oils}	32/02	• by electric or magnetic means
25/02	• with ion-exchange material	32/04	• by particle radiation
		<b>33/00</b>	<b>Dewatering or demulsification of hydrocarbon oils (by distillation C10G 7/04)</b>
		33/02	• with electrical or magnetic means
		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

**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

- 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
- 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

47/36	. Controlling or regulating	55/00	<b>Treatment of hydrocarbon oils, in the absence of hydrogen, by at least one refining process and at least one cracking process</b>
49/00	<b>Treatment of hydrocarbon oils, in the presence of hydrogen or hydrogen-generating compounds, not provided for in a single one of groups <a href="#">C10G 45/02</a>, <a href="#">C10G 45/32</a>, <a href="#">C10G 45/44</a>, <a href="#">C10G 45/58</a> or <a href="#">C10G 47/00</a></b>	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	<b>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</b>
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	<b>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</b>
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	<b>Treatment of naphtha by at least one reforming process and at least one process of refining in the absence of hydrogen</b>
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	<b>Production of liquid hydrocarbon mixtures from lower carbon number hydrocarbons, e.g. by oligomerisation</b>	63/00	<b>Treatment of naphtha by at least one reforming process and at least one other conversion process (<a href="#">C10G 59/00</a>, <a href="#">C10G 61/00</a> take precedence)</b>
50/02	. of hydrocarbon oils for lubricating purposes	63/02	. plural serial stages only
<b>Multi-step processes</b>		63/04	. . including at least one cracking step
<b>NOTE</b>		63/06	. plural parallel stages only
Groups <a href="#">C10G 51/00</a> - <a href="#">C10G 69/00</a> 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	<b>Treatment of hydrocarbon oils, in the absence of hydrogen, by two or more cracking processes only</b>	65/00	<b>Treatment of hydrocarbon oils by two or more hydrotreatment processes only</b>
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	<b>Treatment of hydrocarbon oils, in the absence of hydrogen, by two or more refining processes</b>	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	<b>Treatment of hydrocarbon oils by at least one hydrotreatment process and at least one process for refining in the absence of hydrogen only</b>
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



- 67/0409 . . . {Extraction of unsaturated hydrocarbons}
- 67/0418 . . . . {The hydrotreatment being a hydrotreating}
- 67/0427 . . . . {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes}
- 67/0436 . . . . {The hydrotreatment being an aromatic saturation}
- 67/0445 . . . . {The hydrotreatment being a hydrocracking}
- 67/0454 . . . {Solvent desasphalting}
- 67/0463 . . . . {The hydrotreatment being a hydrotreating}
- 67/0472 . . . . {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes}
- 67/0481 . . . . {The hydrotreatment being an aromatics saturation}
- 67/049 . . . . {The hydrotreatment being a hydrocracking}
- 67/06 . . including a sorption process as the refining step in the absence of hydrogen
- 67/08 . . including acid treatment as the refining step in the absence of hydrogen
- 67/10 . . including alkaline treatment as the refining step in the absence of hydrogen
- 67/12 . . including oxidation as the refining step in the absence of hydrogen
- 67/14 . . including at least two different refining steps in the absence of hydrogen
- 67/16 . plural parallel stages only
- 69/00 Treatment of hydrocarbon oils by at least one hydrotreatment process and at least one other conversion process (C10G 67/00 takes precedence)**
- 69/02 . plural serial stages only
- 69/04 . . including at least one step of catalytic cracking in the absence of hydrogen
- 69/06 . . including at least one step of thermal cracking in the absence of hydrogen
- 69/08 . . including at least one step of reforming naphtha
- 69/10 . . . hydrocracking of higher boiling fractions into naphtha and reforming the naphtha obtained
- 69/12 . . including at least one polymerisation or alkylation step
- 69/123 . . . {alkylation}
- 69/126 . . . {polymerisation, e.g. oligomerisation}
- 69/14 . plural parallel stages only
- 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**
- 70/002 . {by forming adducts or complexes}
- 70/004 . . {with solutions of copper salts}
- 70/006 . {with the use of acids or sulfur oxides}
- 70/008 . {with the use of organometallic compounds}
- 70/02 . by hydrogenation
- 70/04 . by physical processes
- 70/041 . . {by distillation}
- 70/042 . . . {with the use of auxiliary compounds}
- 70/043 . . {by fractional condensation}
- 70/044 . . {by crystallisation}
- 70/045 . . {using membranes, e.g. selective permeation}
- 70/046 . . {by adsorption, i.e. with the use of solids}
- 70/047 . . . {by molecular sieve technique}
- 70/048 . . {by liquid-liquid extraction}
- 70/06 . . by gas-liquid contact

- 71/00 Treatment by methods not otherwise provided for of hydrocarbon oils or fatty oils for lubricating purposes**
- 71/02 . Thickening by voltolising (chemical modification of drying oils by voltolising C09F 7/04)
- 73/00 Recovery or refining of mineral waxes, e.g. montan wax (compositions essentially based on waxes C08L 91/00)**
- 73/02 . Recovery of petroleum waxes from hydrocarbon oils; Dewaxing of hydrocarbon oils
- 73/025 . . {by filtration}
- 73/04 . . with the use of filter aids
- 73/06 . . with the use of solvents
- 73/08 . . . Organic compounds
- 73/10 . . . . Hydrocarbons
- 73/12 . . . . Oxygen-containing compounds
- 73/14 . . . . Halogen-containing compounds
- 73/16 . . . . Nitrogen-containing compounds
- 73/18 . . . . containing sulfur, selenium or tellurium
- 73/20 . . . . containing phosphorus
- 73/22 . . . . Mixtures or organic compounds
- 73/24 . . by formation of adducts
- 73/26 . . by flotation
- 73/28 . . by centrifugal force
- 73/30 . . with electric means
- 73/32 . . Methods of cooling during dewaxing
- 73/34 . . Controlling or regulating
- 73/36 . Recovery of petroleum waxes from other compositions containing oil in minor proportions, from concentrates or from residues; De-oiling, sweating
- 73/38 . Chemical modification of petroleum
- 73/40 . Physical treatment of waxes or modified waxes, e.g. granulation, dispersion, emulsion, irradiation
- 73/42 . Refining of petroleum waxes
- 73/44 . . in the presence of hydrogen or hydrogen-generating compounds
- 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)**
- 75/02 . by addition of corrosion inhibitors
- 75/04 . by addition of antifouling agents
- 99/00 Subject matter not provided for in other groups of this subclass**

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**2300/00 Aspects relating to hydrocarbon processing covered by groups C10G 1/00 - C10G 99/00**

- 2300/10 . Feedstock materials
- 2300/1003 . . Waste materials
- 2300/1007 . . . Used oils
- 2300/1011 . . Biomass
- 2300/1014 . . . of vegetal origin
- 2300/1018 . . . of animal origin
- 2300/1022 . . Fischer-Tropsch products
- 2300/1025 . . Natural gas
- 2300/1029 . . Gas hydrates
- 2300/1033 . . Oil well production fluids
- 2300/1037 . . Hydrocarbon fractions

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	<b>2400/00</b>		<b>Products obtained by processes covered by groups C10G 9/00 - C10G 69/14</b>
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 <sub>2</sub> S, COS, SO <sub>2</sub> , 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 <sub>2</sub> emissions			
2300/405	. .	Limiting CO, NO <sub>x</sub> or SO <sub>x</sub> 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			