

# 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 specific 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 (inhibiting corrosion or incrustation in general [C23F](#))

##### 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.

##### WARNING

The following IPC groups are not used in the CPC system. Subject matter covered by these groups is classified in the following CPC groups:

[C10G 73/23](#)

covered by

[C10G 73/06](#)

<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 <a href="#">B03B</a>)</b>	<b>1/086</b>	. . {Characterised by the catalyst used}
		<b>1/10</b>	. from rubber or rubber waste
		<b>2/00</b>	<b>Production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon</b>
<b>1/002</b>	. {in combination with oil conversion- or refining processes}	<b>2/30</b>	. {from carbon monoxide with hydrogen}
<b>1/004</b>	. {Inhibiting of corrosion}	<b>2/31</b>	. . {thermal, non catalytic conversion}
<b>1/006</b>	. {Combinations of processes provided in groups <a href="#">C10G 1/02</a> - <a href="#">C10G 1/08</a> }	<b>2/32</b>	. . {with the use of catalysts}
<b>1/008</b>	. {Controlling or regulating of liquefaction processes (controlling or regulation in general <a href="#">G05</a> )}	<b>2/33</b>	. . . {characterised by the catalyst used}
<b>1/02</b>	. by distillation (destructive distillation of oil-shale <a href="#">C10B 53/06</a> )	<b>2/331</b>	. . . . {containing group VIII-metals}
<b>1/04</b>	. by extraction	<b>2/332</b>	. . . . . {of the iron-group}
<b>1/042</b>	. . {by the use of hydrogen-donor solvents}	<b>2/333</b>	. . . . . {of the platinum-group}
<b>1/045</b>	. . {Separation of insoluble materials}	<b>2/334</b>	. . . . . {containing molecular sieve catalysts}
<b>1/047</b>	. . {Hot water or cold water extraction processes}	<b>2/34</b>	. . . {Apparatus, reactors}
<b>1/06</b>	. by destructive hydrogenation	<b>2/341</b>	. . . . {with stationary catalyst bed}
<b>1/065</b>	. . {in the presence of a solvent}	<b>2/342</b>	. . . . {with moving solid catalysts}
<b>1/08</b>	. with moving catalysts	<b>2/343</b>	. . . . . {according to the "moving-bed" method}
<b>1/083</b>	. . {in the presence of a solvent}	<b>2/344</b>	. . . . . {according to the "fluidised-bed" technique}
		<b>2/35</b>	. . {with the use of another activation, e.g. radiation, vibration, electrical or electromagnetic means}
		<b>2/40</b>	. {from carbon monoxide with water vapor}

- 2/50 . {from carbon dioxide with hydrogen}
- 3/00 Production of liquid hydrocarbon mixtures from oxygen-containing or organic materials, e.g. fatty oils, fatty acids (production from non-melting solid oxygen-containing carbonaceous materials C10G 1/00; preparation of individual hydrocarbons or mixtures thereof of definite or specified contribution C07C)**

**WARNING**

Groups C10G 3/40-C10G 3/62 are incomplete pending reclassification of documents from group C10G 3/00.

Groups C10G 3/40-C10G 3/62 and C10G 3/00 should be considered in order to perform a complete search.

- 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 process (controlling or regulating in general G05)}
- 3/62 . {Catalyst regeneration (regeneration or reactivation of catalysts in general B01J 38/00)}

**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 (distillation in general B01D)**

- 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 (controlling or regulating in general G05)

**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 (using steam turbines, see F01K 23/064; using gas turbines, see F01K 25/14; the combined use of gas and steam turbines, see F01K 3/185)}
- 11/187 . . . {Controlling or regulating (controlling or regulating in general G05)}
- 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
- 17/04 . . Liquid-liquid treatment forming two immiscible phases
- 17/06 . . . using acids derived from sulfur or acid sludge thereof
- 17/07 . . . using halogen acids or oxyacids of halogen (acids generating halogen [C10G 27/02](#))
- 17/08 . with acid-forming oxides (refining with CO<sub>2</sub> or SO<sub>2</sub> as a selective solvent [C10G 21/06](#))
- 17/085 . . with oleum
- 17/09 . with acid salts
- 17/095 . with "solid acids", e.g. phosphoric acid deposited on a carrier
- 17/10 . Recovery of used refining agents
- 19/00 Refining hydrocarbon oils in the absence of hydrogen, by alkaline treatment**
- 19/02 . with aqueous alkaline solutions
- 19/04 . . containing solubilisers, e.g. solutisers
- 19/06 . . with plumbites or plumbates
- 19/067 . with molten alkaline material
- 19/073 . with solid alkaline material
- 19/08 . Recovery of used refining agents
- 21/00 Refining of hydrocarbon oils in the absence of hydrogen, by extraction with selective solvents ([C10G 17/00](#), [C10G 19/00](#) take precedence; dewaxing oils [C10G 73/02](#))**
- 21/003 . {Solvent de-asphalting}
- 21/006 . {of waste oils, e.g. PCB's containing oils}
- 21/02 . with two or more solvents, which are introduced or withdrawn separately
- 21/04 . . by introducing simultaneously at least two immiscible solvents counter-current to each other
- 21/06 . characterised by the solvent used
- 21/08 . . Inorganic compounds only
- 21/10 . . . Sulfur dioxide
- 21/12 . . Organic compounds only
- 21/14 . . . Hydrocarbons
- 21/16 . . . Oxygen-containing compounds
- 21/18 . . . Halogen-containing compounds
- 21/20 . . . Nitrogen-containing compounds
- 21/22 . . . Compounds containing sulfur, selenium, or tellurium
- 21/24 . . . Phosphorus-containing compounds
- 21/26 . . . Silicon-containing compounds

- 21/27 . . . Organic compounds not provided for in a single one of groups [C10G 21/14](#) - [C10G 21/26](#)
- 21/28 . Recovery of used solvent
- 21/30 . Controlling or regulating (controlling or regulating in general [G05](#))

**25/00 Refining of hydrocarbon oils in the absence of hydrogen, with solid sorbents****NOTE**

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.

- 25/003 . {Specific sorbent material, not covered by [C10G 25/02](#) or [C10G 25/03](#)}
- 25/006 . {of waste oils, e.g. PCB's containing oils}
- 25/02 . with ion-exchange material
- 25/03 . . with crystalline alumino-silicates, e.g. molecular sieves
- 25/05 . . . Removal of non-hydrocarbon compounds, e.g. sulfur compounds
- 25/06 . with moving sorbents or sorbents dispersed in the oil
- 25/08 . . according to the "moving bed" method
- 25/09 . . according to the "fluidised bed" technique
- 25/11 . . Distillation in the presence of moving sorbents
- 25/12 . Recovery of used adsorbent
- 27/00 Refining of hydrocarbon oils in the absence of hydrogen, by oxidation**
- 27/02 . with halogen or compounds generating halogen; Hypochlorous acid or salts thereof
- 27/04 . with oxygen or compounds generating oxygen
- 27/06 . . in the presence of alkaline solutions
- 27/08 . . in the presence of copper chloride
- 27/10 . . in the presence of metal-containing organic complexes, e.g. chelates, or cationic ion-exchange resins
- 27/12 . . with oxygen-generating compounds, e.g. per-compounds, chromic acid, chromates (plumbites or plumbates [C10G 19/06](#))
- 27/14 . . with ozone-containing gases
- 29/00 Refining of hydrocarbon oils in the absence of hydrogen, with other chemicals**
- 29/02 . Non-metals
- 29/04 . Metals, or metals deposited on a carrier
- 29/06 . Metal salts, or metal salts deposited on a carrier
- 29/08 . . containing the metal in the lower valency
- 29/10 . . Sulfides
- 29/12 . . Halides
- 29/16 . Metal oxides
- 29/20 . Organic compounds not containing metal atoms
- 29/205 . . {by reaction with hydrocarbons added to the hydrocarbon oil}
- 29/22 . . containing oxygen as the only hetero atom
- 29/24 . . . Aldehydes or ketones
- 29/26 . . Halogenated hydrocarbons
- 29/28 . . containing sulfur as the only hetero atom, e.g. mercaptans, or sulfur and oxygen as the only hetero atoms

<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>	45/04	. . characterised by the catalyst used
31/06	. by heating, cooling, or pressure treatment	45/06	. . . containing nickel or cobalt metal, or compounds thereof
31/08	. by treating with water	45/08	. . . . in combination with chromium, molybdenum, or tungsten metals, or compounds thereof
31/09	. by filtration	45/10	. . . containing platinum group metals or compounds thereof
31/10	. with the aid of centrifugal force	45/12	. . . containing crystalline alumino-silicates, e.g. molecular sieves
31/11	. by dialysis	45/14	. . with moving solid particles
<b>32/00</b>	<b>Refining of hydrocarbons oils by electric or magnetic means, by irradiation or by using microorganisms</b>	45/16	. . . suspended in the oil, e.g. slurries
32/02	. by electric or magnetic means	45/18	. . . according to the "moving-bed" technique
32/04	. by particle radiation	45/20	. . . according to the "fluidised-bed" technique
<b>33/00</b>	<b>Dewatering or demulsification of hydrocarbon oils (by distillation C10G 7/04)</b>	45/22	. . with hydrogen dissolved or suspended in the oil
33/02	. with electrical or magnetic means	45/24	. . with hydrogen-generating compounds
33/04	. with chemical means	45/26	. . . Steam or water
33/06	. with mechanical means, e.g. by filtration	45/28	. . . Organic compounds; Autofining
33/08	. Controlling or regulating (controlling or regulating in general G05)	45/30	. . . . characterised by the catalyst used
<b>35/00</b>	<b>Reforming naphtha</b>	45/32	. Selective hydrogenation of the diolefin or acetylene compounds
	<b>NOTE</b>	45/34	. . characterised by the catalyst used
	By reforming is meant the treatment of naphtha, in order to improve the octane number or its aromatic content.	45/36	. . . containing nickel or cobalt metal, or compounds thereof
35/02	. Thermal reforming	45/38	. . . . in combination with chromium, molybdenum or tungsten metals, or compounds thereof
35/04	. Catalytic reforming	45/40	. . . containing platinum group metals or compounds thereof
35/06	. . characterised by the catalyst used	45/42	. . with moving solid particles
35/065	. . . {containing crystalline zeolitic molecular sieves, other than aluminosilicates}	45/44	. Hydrogenation of the aromatic hydrocarbons
35/085	. . . containing platinum group metals or compounds thereof	45/46	. . characterised by the catalyst used
35/09	. . . . Bimetallic catalysts in which at least one of the metals is a platinum group metal	45/48	. . . containing nickel or cobalt metal, or compounds thereof
35/095	. . . containing crystalline alumino-silicates, e.g. molecular sieves {(C10G 35/065 takes precedence)}	45/50	. . . . in combination with chromium, molybdenum or tungsten metal, or compounds thereof
35/10	. . with moving catalysts	45/52	. . . containing platinum group metals or compounds thereof
35/12	. . . according to the "moving-bed" method	45/54	. . . containing crystalline alumino-silicates, e.g. molecular sieves
35/14	. . . according to the "fluidised-bed" technique	45/56	. . with moving solid particles
35/16	. with electric, electromagnetic, or mechanical vibrations; by particle radiation	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)
35/22	. Starting-up reforming operations	45/60	. . characterised by the catalyst used
35/24	. Controlling or regulating of reforming operations (controlling or regulating in general G05)	45/62	. . . containing platinum group metals or compounds thereof
<b>Hydrotreatment processes (reforming of naphtha C10G 35/00)</b>		45/64	. . . containing crystalline alumino-silicates, e.g. molecular sieves
<b>45/00</b>	<b>Refining of hydrocarbon oils using hydrogen or hydrogen-generating compounds</b>	45/66	. . with moving solid particles
	<b>NOTE</b>	45/68	. . Aromatisation of hydrocarbon oil fractions (of naphtha C10G 35/00)
	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.	45/70	. . . with catalysts containing platinum group metals or compounds thereof
45/02	. to eliminate hetero atoms without changing the skeleton of the hydrocarbon involved and without cracking into lower boiling hydrocarbons; Hydrofinishing	45/72	. Controlling or regulating (controlling or regulating in general G05)



- 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 (controlling or regulating in general G05)
- 49/00** **Treatment of hydrocarbon oils in the presence of hydrogen or hydrogen-generating compounds, not provided for in a single one of the groups C10G 45/02, C10G 45/32, C10G 45/44, C10G 45/58 or C10G 47/00**
- 49/002 . {Apparatus for fixed bed hydrotreatment processes}
  - 49/005 . {Inhibiting corrosion in hydrotreatment processes}
  - 49/007 . {in the presence of hydrogen from a special source or of a special composition or having been purified by a special treatment}
  - 49/02 . characterised by the catalyst used
  - 49/04 . . containing nickel, cobalt, chromium, molybdenum, or tungsten metals, or compounds thereof
  - 49/06 . . containing platinum group metals or compounds thereof
  - 49/08 . . containing crystalline alumino-silicates, e.g. molecular sieves
  - 49/10 . with moving solid particles
  - 49/12 . . suspended in the oil, e.g. slurries
  - 49/14 . . according to the "moving-bed" technique
  - 49/16 . . according to the "fluidised-bed" technique
  - 49/18 . in the presence of hydrogen-generating compounds, e.g. ammonia, water, hydrogen sulfide
  - 49/20 . . Organic compounds
  - 49/22 . Separation of effluents
  - 49/24 . Starting-up hydrotreatment operations
  - 49/26 . Controlling or regulating (controlling or regulating in general G05)
- 50/00** **Production of liquid hydrocarbon mixtures from lower carbon number hydrocarbons, e.g. by oligomerisation (preparation of individual hydrocarbons or mixtures thereof of definite or specified constitution C07C)**

- 50/02 . of hydrocarbon oils for lubricating purposes

### Multi-step processes

#### NOTE

Groups [C10G 51/00](#) - [C10G 69/00](#) cover only those combined treating operations where the interest is directed to the relationship between the steps.

- 51/00** **Treatment of hydrocarbon oils in the absence of hydrogen, by two or more cracking processes only**
- 51/02 . plural serial stages only
  - 51/023 . . {only thermal cracking steps}
  - 51/026 . . {only catalytic cracking steps}
  - 51/04 . . including only thermal and catalytic cracking steps
  - 51/06 . plural parallel stages only
- 53/00** **Treatment of hydrocarbon oils in the absence of hydrogen, by two or more refining processes**
- 53/02 . plural serial stages only
  - 53/04 . . including at least one extraction step
  - 53/06 . . . including only extraction steps, e.g. deasphalting by solvent treatment followed by extraction of aromatics (refining in one step with two or more solvents which are introduced or withdrawn separately [C10G 21/02](#))
  - 53/08 . . including at least one sorption step
  - 53/10 . . including at least one acid-treatment step
  - 53/12 . . including at least one alkaline treatment step
  - 53/14 . . including at least one oxidation step
  - 53/16 . plural parallel stages only
- 55/00** **Treatment of hydrocarbon oils in the absence of hydrogen, by at least one refining process and at least one cracking process**
- 55/02 . plural serial stages only
  - 55/04 . . including at least one thermal cracking step
  - 55/06 . . including at least one catalytic cracking step
  - 55/08 . plural parallel stages only
- 57/00** **Treatment of hydrocarbon oils in the absence of the hydrogen, by at least one cracking process or refining process and at least one other conversion process**
- 57/005 . {with alkylation}
  - 57/02 . with polymerisation
- 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**
- 59/02 . plural serial stages only
  - 59/04 . . including at least one catalytic and at least one non-catalytic reforming step
  - 59/06 . plural parallel stages only
- 61/00** **Treatment of naphtha by at least one reforming process and at least one process of refining in the absence of hydrogen**
- 61/02 . plural serial stages only
  - 61/04 . . the refining step being an extraction
  - 61/06 . . the refining step being a sorption process
  - 61/08 . plural parallel stages only
  - 61/10 . processes also including other conversion steps

<b>63/00</b>	<b>Treatment of naphtha by at least one reforming process and at least one other conversion process</b> ( <a href="#">C10G 59/00</a> , <a href="#">C10G 61/00</a> take precedence)	69/06	. . including at least one step of thermal cracking in the absence of hydrogen
63/02	. plural serial stages only	69/08	. . including at least one step of reforming naphtha
63/04	. . including at least one cracking step	69/10	. . . hydrocracking of higher boiling fractions into naphtha and reforming the naphtha obtained
63/06	. plural parallel stages only	69/12	. . including at least one polymerisation or alkylation step
63/08	. . including at least one cracking step	69/123	. . . {alkylation}
<b>65/00</b>	<b>Treatment of hydrocarbon oils by two or more hydrotreatment processes only</b>	69/126	. . . {polymerisation, e.g. oligomerisation}
65/02	. plural serial stages only	69/14	. plural parallel stages only
65/04	. . including only refining steps	<b>70/00</b>	<b>Working-up undefined normally gaseous mixtures obtained by processes covered by groups</b> <a href="#">C10G 9/00</a> , <a href="#">C10G 11/00</a> , <a href="#">C10G 15/00</a> , <a href="#">C10G 47/00</a> , <a href="#">C10G 51/00</a>
65/043	. . . {at least one step being a change in the structural skeleton}	70/002	. {by forming adducts or complexes}
65/046	. . . {at least one step being an aromatisation step}	70/004	. . {with solutions of copper salts}
65/06	. . . at least one step being a selective hydrogenation of the diolefins	70/006	. {with the use of acids or sulfur oxides}
65/08	. . . at least one step being a hydrogenation of the aromatic hydrocarbons	70/008	. {with the use of organometallic compounds}
65/10	. . including only cracking steps	70/02	. by hydrogenation
65/12	. . including cracking steps and other hydrotreatment steps	70/04	. by physical processes
65/14	. plural parallel stages only	70/041	. . {by distillation}
65/16	. . including only refining steps	70/042	. . . {with the use of auxiliary compounds}
65/18	. . including only cracking steps	70/043	. . {by fractional condensation}
<b>67/00</b>	<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>	70/044	. . {by crystallisation}
67/02	. plural serial stages only	70/045	. . {using membranes, e.g. selective permeation}
67/04	. . including solvent extraction as the refining step in the absence of hydrogen	70/046	. . {by adsorption, i.e. with the use of solids}
67/0409	. . . {Extraction of unsaturated hydrocarbons}	70/047	. . . {by molecular sieve technique}
67/0418	. . . . {The hydrotreatment being a hydrefining}	70/048	. . {by liquid-liquid extraction}
67/0427	. . . . {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes}	70/06	. . by gas-liquid contact
67/0436	. . . . {The hydrotreatment being an aromatic saturation}	<b>71/00</b>	<b>Treatment by methods not otherwise provided for of hydrocarbon oils or fatty oils for lubricating purposes</b> (by Fischer-Tropsch <a href="#">C07C 1/00</a> ; lubricating compositions <a href="#">C10M</a> )
67/0445	. . . . {The hydrotreatment being a hydrocracking}	71/02	. Thickening by voltolising (chemical modification of drying oils by voltolising <a href="#">C09F 7/04</a> )
67/0454	. . . {Solvent desasphalting}	<b>73/00</b>	<b>Recovery or refining of mineral waxes, e.g. montan wax</b> (compositions essentially based on waxes <a href="#">C08L 91/00</a> )
67/0463	. . . . {The hydrotreatment being a hydrefining}	73/02	. Recovery of petroleum waxes from hydrocarbon oils; Dewaxing of hydrocarbon oils
67/0472	. . . . {The hydrotreatment being a selective hydrogenation of diolefins or acetylenes}	73/025	. . {by filtration}
67/0481	. . . . {The hydrotreatment being an aromatics saturation}	73/04	. . with the use of filter aids
67/049	. . . . {The hydrotreatment being a hydrocracking}	73/06	. . with the use of solvents
67/06	. . including a sorption process as the refining step in the absence of hydrogen	73/08	. . . Organic compounds
67/08	. . including acid treatment as the refining step in the absence of hydrogen	73/10	. . . . Hydrocarbons
67/10	. . including alkaline treatment as the refining step in the absence of hydrogen	73/12	. . . . Oxygen-containing compounds
67/12	. . including oxidation as the refining step in the absence of hydrogen	73/14	. . . . Halogen-containing compounds
67/14	. . including at least two different refining steps in the absence of hydrogen	73/16	. . . . Nitrogen-containing compounds
67/16	. plural parallel stages only	73/18	. . . . containing sulfur, selenium or tellurium
<b>69/00</b>	<b>Treatment of hydrocarbon oils by at least one hydrotreatment process and at least one other conversion process</b> ( <a href="#">C10G 67/00</a> takes precedence)	73/20	. . . . containing phosphorus
69/02	. plural serial stages only	73/22	. . . . Mixtures or organic compounds
69/04	. . including at least one step of catalytic cracking in the absence of hydrogen	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 (controlling or regulating in general <a href="#">G05</a> )

73/36	Recovery of petroleum waxes from other compositions containing oil in minor proportions, from concentrates or from residues; De-oiling, sweating	2300/206	Asphaltenes
73/38	Chemical modification of petroleum	2300/207	Acid gases, e.g. H <sub>2</sub> S, COS, SO <sub>2</sub> , HCN
73/40	Physical treatment of waxes or modified waxes, e.g. granulation, dispersion, emulsion, irradiation	2300/208	Sediments, e.g. bottom sediment and water or BSW
73/42	Refining of petroleum waxes	2300/30	Physical properties of feedstocks or products
73/44	in the presence of hydrogen or hydrogen-generating compounds	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]
			Cetane number, cetane index
75/00	<b>Inhibiting corrosion or fouling in apparatus for treatment or conversion of hydrocarbon oils, in general (C10G 7/10, C10G 9/16 take precedence; protection of pipes against corrosion or incrustation F16L 58/00)</b>	2300/307	Gravity, density, e.g. API
75/02	by addition of corrosion inhibitors	2300/40	Characteristics of the process deviating from typical ways of processing
75/04	by addition of antifouling agents	2300/4006	Temperature
		2300/4012	Pressure
99/00	<b>Subject matter not provided for in other groups of this subclass</b>	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
		2300/701	Use of spent catalysts
		2300/703	Activation
		2300/705	Passivation
		2300/706	Catalytic metal recovery
		2300/708	Coking aspect, coke content and composition of deposits
		2300/80	Additives
		2300/802	Diluents
		2300/805	Water
		2300/807	Steam
		2400/00	<b>Products obtained by processes covered by groups C10G 9/00 - C10G 69/14</b>
2300/00	<b>Aspects relating to hydrocarbon processing covered by groups C10G 1/00 - C10G 99/00</b>	2400/02	Gasoline
2300/10	Feedstock materials	2400/04	Diesel oil
2300/1003	Waste materials	2400/06	Gasoil
2300/1007	Used oils	2400/08	Jet fuel
2300/1011	Biomass	2400/10	Lubricating oil
2300/1014	of vegetal origin	2400/12	Electrical isolation oil
2300/1018	of animal origin	2400/14	White oil, eating oil
2300/1022	Fischer-Tropsch products	2400/16	Residues
2300/1025	Natural gas	2400/18	Solvents
2300/1029	Gas hydrates	2400/20	C <sub>2</sub> -C <sub>4</sub> olefins
2300/1033	Oil well production fluids	2400/22	Higher olefins
2300/1037	Hydrocarbon fractions	2400/24	Acetylene and homologues
2300/104	Light gasoline having a boiling range of about 20 - 100 °C	2400/26	Fuel gas
2300/1044	Heavy gasoline or naphtha having a boiling range of about 100 - 180 °C	2400/28	Propane and butane
2300/1048	Middle distillates		
2300/1051	Kerosene having a boiling range of about 180 - 230 °C		
2300/1055	Diesel having a boiling range of about 230 - 330 °C		
2300/1059	Gasoil having a boiling range of about 330 - 427 °C		
2300/1062	Lubricating oils		
2300/1066	Special oils		
2300/107	Atmospheric residues having a boiling point of at least about 538 °C		
2300/1074	Vacuum distillates		
2300/1077	Vacuum residues		
2300/1081	Alkanes		
2300/1085	Solid paraffins		
2300/1088	Olefins		
2300/1092	C <sub>2</sub> -C <sub>4</sub> olefins		
2300/1096	Aromatics or polyaromatics		
2300/20	Characteristics of the feedstock or the products		
2300/201	Impurities		
2300/202	Heteroatoms content, i.e. S, N, O, P		
2300/203	Naphthenic acids, TAN		
2300/205	Metal content		

