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
1. 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
2. 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.
3. In this subclass, in the absence of an indication to the contrary, classification is made in the last appropriate place.

WARNINGS
1. 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
2. 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.

<table>
<thead>
<tr>
<th>1/00</th>
<th>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)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/002</td>
<td>. (in combination with oil conversion- or refining processes)</td>
</tr>
<tr>
<td>1/004</td>
<td>. [Inhibiting of corrosion]</td>
</tr>
<tr>
<td>1/006</td>
<td>. (Combinations of processes provided in groups C10G 1/02 - C10G 1/08)</td>
</tr>
<tr>
<td>1/008</td>
<td>. (Controlling or regulating of liquefaction processes (controlling or regulation in general G05))</td>
</tr>
<tr>
<td>1/02</td>
<td>. by distillation (destructive distillation of oil-shale C10B 53/06)</td>
</tr>
<tr>
<td>1/04</td>
<td>. by extraction</td>
</tr>
<tr>
<td>1/042</td>
<td>. . [by the use of hydrogen-donor solvents]</td>
</tr>
<tr>
<td>1/045</td>
<td>. . [Separation of insoluble materials]</td>
</tr>
<tr>
<td>1/047</td>
<td>. . [Hot water or cold water extraction processes]</td>
</tr>
<tr>
<td>1/06</td>
<td>. by destructive hydrogenation</td>
</tr>
<tr>
<td>1/065</td>
<td>. . [in the presence of a solvent]</td>
</tr>
</tbody>
</table>

| 1/08 | . with moving catalysts |
| 1/083 | . . [in the presence of a solvent] |
| 1/086 | . . [Characterised by the catalyst used] |
| 1/10 | . from rubber or rubber waste |

<table>
<thead>
<tr>
<th>2/00</th>
<th>Production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/30</td>
<td>. [from carbon monoxide with hydrogen]</td>
</tr>
<tr>
<td>2/31</td>
<td>. . [thermal, non catalytic conversion]</td>
</tr>
<tr>
<td>2/32</td>
<td>. . . [with the use of catalysts]</td>
</tr>
<tr>
<td>2/33</td>
<td>. . . . [characterised by the catalyst used]</td>
</tr>
<tr>
<td>2/331</td>
<td>. . . . . [containing group VIII-metals]</td>
</tr>
<tr>
<td>2/332</td>
<td>. . . . . . [of the iron-group]</td>
</tr>
<tr>
<td>2/333</td>
<td>. . . . . . . [of the platinum-group]</td>
</tr>
<tr>
<td>2/334</td>
<td>. . . . . . . . [containing molecular sieve catalysts]</td>
</tr>
<tr>
<td>2/34</td>
<td>. . . . . . [Apparatus, reactors]</td>
</tr>
<tr>
<td>2/341</td>
<td>. . . . . . [with stationary catalyst bed]</td>
</tr>
<tr>
<td>2/342</td>
<td>. . . . . . . [with moving solid catalysts]</td>
</tr>
<tr>
<td>2/343</td>
<td>. . . . . . . . [according to the “moving-bed” method]</td>
</tr>
</tbody>
</table>
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 carbohydrateous materials C10G 1/00: preparation of individual hydrocarbons or mixtures thereof of definite or specified contribution C07C)

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 . . Dewaterting
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 . . [Catalytic cracking, in the absence of hydrogen, of hydrocarbon oils (cracking in direct contact with molten metals or salts C10G 9/24)]
9/004 . . Oxides
9/005 . . . . Crystalline alumino-silicates, e.g. molecular sieves
9/006 . . . . Sulfides
9/008 . . . . Halides
9/10 . . . . with stationary catalyst bed
9/12 . . . . with discontinuously preheated non-moving solid catalysts, e.g. blast and run
9/14 . . . . . . according to the “moving bed” method
9/16 . . . . . . according to the “fluidised-bed” technique
9/20 . . . . . . by heating with electrical means
9/24 . . . . . . with discontinuously preheated non-moving solid material, e.g. blast and run
9/26 . . . . . . with preheated moving solid material
9/28 . . . . . . according to the “moving bed” technique
9/30 . . . . . . according to the “fluidised-bed” technique
9/32 . . . . . . 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 9/24)

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
Cracking in the absence of hydrogen

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 CO₂ or SO₂ 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
31/00 Refining of hydrocarbon oils in the absence of hydrogen, by methods not otherwise provided for (by distillation C10G 72/00)
31/06 . by heating, cooling, or pressure treatment
31/08 . by treating with water
Refining in the absence of hydrogen

31/09 . by filtration
31/10 . with the aid of centrifugal force
31/11 . by dialysis

32/00 Refining of hydrocarbons oils by electric or magnetic means, by irradiation or by using microorganisms
32/02 . by electric or magnetic means
32/04 . by particle radiation

33/00 Dewatering or demulsification of hydrocarbon oils (by distillation C10G 7/04)
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 (controlling or regulating in general G05)

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 (controlling or regulating in general G05)

Hydrotreatment processes (refining of naphtha C10G 35/00)

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 hydrotreatment 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 (of naphtha C10G 35/00)
45/70 . . . with catalysts containing platinum group metals or compounds thereof
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
Hydrotreatment processes

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 aluminosilicate 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 aluminosilicates, 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]
57/006 . . 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
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)
63/02 . plural serial stages only
63/04 . including at least one cracking step
63/06 . plural parallel stages only
63/08 . including at least one cracking step
65/00 Treatment of hydrocarbon oils by two or more hydrotreatment processes only
65/02 . plural serial stages only
65/04 . including only refining steps
65/063 . [at least one step being a change in the structural skeleton]
65/066 . [at least one step being an aromatisation step]
65/068 . at least one step being a selective hydrogenation of the diolefins
65/08 . at least one step being a hydrogenation of the aromatic hydrocarbons
65/10 . including only cracking steps
65/12 . including cracking steps and other hydrotreatment steps
65/14 . plural parallel stages only
65/16 . including only refining steps
65/18 . including only cracking steps
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
67/02 . plural serial 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 hydoroforming]
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 hydoroforming]
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 . [polymetherisation, e.g. oligomeration]
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]
70/012 . by hydrogenation
70/014 . 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 (by Fischer-Tropsch C07C 1/00, lubricating compositions C10M)
71/02 . Thickening by voltollising (chemical modification of drying oils by voltollising 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 (controlling or regulating in general G05)
Multi-step processes

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; protection of pipes against corrosion or incrustation F16L 58/00)

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

2300/00 Aspects relating to hydrocarbon processing covered by groups C10G 1/00 - C10G 9/00

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

2300/1044 . . . Heavy gasoline or naphtha having a boiling range of about 100 - 180 °C

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 . . . C2-C4 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

2300/206 . . . . . . Asphaltenes

2300/207 . . . . . . Acid gases, e.g. H2S, COS, SO2, HCN

2300/208 . . . . . . Sediments, e.g. bottom sediment and water or BSW

2300/30 . . . Physical properties of feedstocks or products

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 CO2 emissions

2300/405 . . . . . . Limiting CO, NOx or SOx 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 Products obtained by processes covered by groups C10G 9/00 - C10G 69/14

2400/02 . . . . . . Gasoline

2400/04 . . . . . . Diesel oil

2400/06 . . . . . . Gasoil

2400/08 . . . . . . Jet fuel

2400/10 . . . . . . Lubricating oil

2400/12 . . . . . . Electrical isolation oil

2400/14 . . . . . . White oil, eating oil

2400/16 . . . . . . Residues

2400/18 . . . . . . Solvents

2400/20 . . . . . . C2-C4 olefins

2400/22 . . . . . . Higher olefins

2400/24 . . . . . . Acetylene and homologues

2400/26 . . . . . . Fuel gas

2400/28 . . . . . . Propane and butane
2400/30  . Aromatics