CPC  COOPERATIVE PATENT CLASSIFICATION

C     CHEMISTRY; METALLURGY
     (NOTES omitted)

CHEMISTRY

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

C10L  FUELS NOT OTHERWISE PROVIDED FOR (fuels for generating pressure gas, e.g. for rockets C06D 5/00; candles C11C; nuclear fuel G21C 3/00); NATURAL GAS; SYNTHETIC NATURAL GAS OBTAINED BY PROCESSES NOT COVERED BY SUBCLASSES C10G, C10K; LIQUEFIED PETROLEUM GAS; ADDING MATERIALS TO FUELS OR FIRES TO REDUCE SMOKE OR UNDESIRABLE DEPOSITS OR TO FACILITATE SOOT REMOVAL; FIRELIGHTERS

NOTE
In subclass C10L it is desirable to give indexing codes for information about components of solid, liquid and gaseous fuels or firelighters, their additives and constituents and their preparation and use. The indexing codes are taken from C10L 2200/00 - C10L 2290/60

WARNING
In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Liquid carbonaceous fuels
1/003 . . [Marking, e.g. coloration by addition of pigments]
1/006 . . [Making unflammable or hardly flammable]
1/02 . . essentially based on components consisting of carbon, hydrogen, and oxygen only
1/023 . . {for spark ignition}
1/026 . . {for compression ignition}
1/04 . . essentially based on blends of hydrocarbons
1/06 . . for spark ignition
1/08 . . for compression ignition
1/10 . . containing additives
1/103 . . {stabilisation of anti-knock agents}
1/106 . . {mixtures of inorganic compounds with organic macromolecular compounds}

NOTES
1. In groups C10L 1/12 - C10L 1/30|C10L 1/308| , in the absence of an indication to the contrary, a compound is always classified in the last appropriate place.
2. A metal salt or an ammonium salt of a compound is classified as that compound, e.g. a chromium sulfonate is classified as a sulfonate in group C10L 1/24 and not in group C10L 1/30.
3. When classifying in this group, it is desirable to classify the individual additional components using Combination Sets with symbols chosen from groups C10L 1/12 - C10L 1/308.
4. Mixtures of additives are classified in the corresponding main group. Individual additives can be classified using Combination Sets according to the Note above.
5. When several alternatives for the same individual additive are mentioned, e.g. as a Markush-formula, classification may be done in the corresponding main group only, the alternatives being classified using Combination Sets, according to the Note above.
6. Documents classified until April 2003, have been classified with Combination Sets as explained in the Notes above, however using symbols chosen from groups C10L 1/10 - C10L 1/308.

1/12 Inorganic compounds
1/1208 . . {elements}
1/1216 . . {metal compounds, e.g. hydrides, carbidies}
1/1225 . . {halogen containing compounds}
1/1233 . . {oxygen containing compounds, e.g. oxides, hydroxides, acids and salts thereof}
1/1241 . . . . [metal carbonyls]
1/125 . . . . [water]
1/1258 . . . . [hydrogen peroxide, oxygated water]
1/1266 . . . . [nitrogen containing compounds, (e.g. NH₃)]
1/1275 . . . . [sulfur, tellurium, selenium containing compounds]
1/1283 . . . . {phosphorus, arsenic, antimonium containing compounds}
1/1291 . . . . {Silicon and boron containing compounds}
1/14 . . Organic compounds

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1/143 . . . [mixtures of organic macromolecular compounds with organic non-macromolecular compounds]
1/146 . . . [Macromolecular compounds according to different macromolecular groups, mixtures thereof]
1/16 . . . Hydrocarbons
1/1608 . . . [Well defined compounds, e.g. hexane, benzene]
1/1616 . . . [fractions, e.g. lubricants, solvents, naptha, bitumen, tars, terpentine]
1/1625 . . . [macromolecular compounds]
1/1633 . . . [homo- or copolymers obtained by reactions only involving carbon-to-carbon unsaturated bonds]
1/1641 . . . [from compounds containing aliphatic carbon atoms]
1/165 . . . [from compounds containing aromatic monomers]
1/1658 . . . [from compounds containing conjugated dienes]
1/1666 . . . [from compounds containing non-conjugated dienes]
1/1675 . . . [natural rubbers]
1/1683 . . . [obtained otherwise than by reactions only involving carbon to carbon unsaturated bonds]
1/1691 . . . [petroleum waxes, mineral waxes; paraffines; alkylation products; Friedel-Crafts condensation products; petroleum resins; modified waxes (oxidised)]
1/18 . . . containing oxygen
1/1802 . . . [natural products, e.g. waxes, extracts, fatty oils]
1/1805 . . . [oxidised hydrocarbon fractions]
1/1808 . . . [oxidised mineral waxes]
1/1811 . . . [peroxides; ozonides]
1/1814 . . . [Chelates]
1/1817 . . . [Compounds of uncertain formula; reaction products where mixtures of compounds are obtained]
1/182 . . . containing hydroxy groups; Salts thereof (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817 take precedence)
1/1822 . . . [hydroxy group directly attached to (cyclo)aliphatic carbon atoms]
1/1824 . . . [mono-hydroxy]
1/1826 . . . [poly-hydroxy]
1/1828 . . . [Salts thereof]
1/183 . . . at least one hydroxy group bound to an aromatic carbon atom (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817, C10L 1/1828 take precedence)
1/1832 . . . [mono-hydroxy (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817, C10L 1/1828 take precedence)]
1/1835 . . . [having at least two hydroxy substituted non condensed benzene rings (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817, C10L 1/1828 take precedence)]
1/1837 . . . [hydroxy attached to a condensed aromatic ring system (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817 take precedence)]
1/185 . . . Ethers; Acetals; Ketals; Aldehydes; Ketones (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817 take precedence)
1/1852 . . . [Ethers; Acetals; Ketals; Orthoesters]
1/1855 . . . [Cyclic ethers, e.g. epoxides, lactides, lactones]
1/1857 . . . [Aldehydes; Ketones]
1/1881 . . . [carboxylic group attached to an aliphatic carbon atom]
1/1883 . . . [polycarboxylic acid]
1/1885 . . . [resin acid]
1/1886 . . . [naphthenic acid]
1/1888 . . . [tall oil]
1/189 . . . having at least one carboxyl group bound to an aromatic carbon atom (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817, C10L 1/1888 take precedence)
1/19 . . . Esters [ester radical containing compounds; ester ethers; carboxylic acid esters (C10L 1/1802, C10L 1/1805, C10L 1/1808, C10L 1/1811, C10L 1/1814, C10L 1/1817, C10L 1/1888 take precedence)]
1/1905 . . . [of di- or polycarboxylic acids]
1/191 . . . [of di- or polyhydroxyalcohols]
1/1915 . . . [complex esters (at least 3 ester bonds)]
1/192 . . . Macromolecular compounds (C10L 1/1814, C10L 1/1817 take precedence)
1/195 . . . obtained by reactions involving only carbon-to-carbon unsaturated bonds
1/1955 . . . [homo- copolymers of compounds having one or more unsaturated aliphatic radicals each having one carbon bond to carbon double bond, and at least one being terminated by an alcohol, ether, aldehyde, ketonic, ketal, acetal radical]
1/196 derived from monomers containing a carboxylic acid, anhydrides or esters thereof; homo- or copolymers of compounds having one or more unsaturated aliphatic radicals each having one carbon to carbon double bond, and at least one being terminated by a carboxylic radical or of salts, anhydrides or esters thereof.

1/1963 (mono-carboxylic)

1/1966 (poly-carboxylic)

1/197 derived from monomers containing a carboxylic acid, anhydrides or esters thereof; homo- or copolymers of compounds having one or more unsaturated aliphatic radicals each having one carbon to carbon double bond, and at least one being terminated by a carboxylic radical or of salts, anhydrides or esters thereof.

1/1973 (mono-carboxylic)

1/1976 (poly-carboxylic)

1/198 obtained otherwise than by reactions involving only carbon-to-carbon unsaturated bonds; homo- or copolymers of compounds having one or more unsaturated aliphatic radicals, each having only one carbon to carbon double bond, and at least one being terminated by an acyloxyl radical of a saturated carboxylic acid, of carbonic acid.

1/1981 (Condensation polymers of aldehydes or ketones)

1/1983 (polymers)

1/1985 (derivatives thereof)

1/1986 (complex polymers)

1/1988 (epoxy resins and derivatives; natural resins, e.g. colophony)

1/20 containing halogen

1/201 (aliphatic bond)

1/202 (aromatic bond)

1/203 (hydroxylic compounds; ethers, acetics, ketals)

1/204 (aldehydes and ketones)

1/205 (carboxyl radical containing compounds or derivatives, e.g. salts, esters)

1/206 (macromolecular compounds)

1/207 (containing halogen with or without hydrogen)

1/208 (containing halogen, oxygen, with or without hydrogen)

1/209 (halogenated waxes or paraffines)

1/22 containing nitrogen

1/221 (compounds of uncertain formula; reaction products where mixtures of compounds are obtained)

1/222 containing at least one carbon-to-nitrogen single bond

1/2222 (cyclo)aliphatic amines; polyamines (no macromolecular substituent 30C); quaternary ammonium compounds; carbamates

1/2225 (hydroxy containing)
1/238 . . . . obtained otherwise than by reactions involving only carbon-to-carbon unsaturated bonds ([C10L 1/221 takes precedence])
1/2381 . . . . {polymides; polyamide-esters; polyurethane, polyureas ([C10L 1/221 takes precedence])}
1/2383 . . . . {Polyamides or polyimines, or derivatives thereof ([poly]amines and imines; derivatives thereof (substituted by a macromolecular group containing 30C) ([C10L 1/221 takes precedence])}
1/2387 . . . . {Polyoxyalkyleneamines ((poly)oxyalkylene amines and derivatives thereof (substituted by a macromolecular group containing 30C) ([C10L 1/221 takes precedence])}
1/24 . . . containing sulfur, selenium and/or tellurium
1/2406 . . . {mercaptans; hydrocarbon sulfides}
1/2412 . . . . [sulfur bond to an aromatic radical]
1/2418 . . . . {containing a carboxylic substituted; derivatives thereof, e.g. esters}
1/2425 . . . . {Thiocarboxylic acids and derivatives thereof, e.g. xanthenes; Thiocarboxylic acids or thiurams}
1/2431 . . . . [sulfur bond to oxygen, e.g. sulfones, sulfoxides]
1/2437 . . . . {Sulfonic acids; Derivatives thereof, e.g. sulfonamides, sulfosuccinic acid esters}
1/2443 . . . . [heterocyclic compounds]
1/245 . . . . . . only sulfur as hetero atom
1/2456 . . . . [sulfur with oxygen and/or nitrogen in the ring, e.g. thiazoles]
1/2462 . . . . [macromolecular compounds]
1/2468 . . . . {obtained by reactions involving only carbon to carbon unsaturated bonds; derivatives thereof}
1/2475 . . . . {obtained otherwise than by reactions only involving unsaturated carbon to carbon bonds]
1/2481 . . . . {polysulfides (3 carbon to sulfur bonds)}
1/2487 . . . . {polyoxyalkylene thiocarbamates (O + S)}
1/2493 . . . . {compounds of uncertain formula; reactions of organic compounds (hydrocarbons, acids, esters) with sulfur or sulfur containing compounds]
1/26 . . . containing phosphorus
1/2608 . . . . {containing a phosphorus-carbon bond}
1/2616 . . . . [sulfur containing]
1/2625 . . . . [amine salts]
1/2633 . . . . [phosphorus bond to oxygen (no P. C. bond)]
1/2641 . . . . . . oxygen bonds only]
1/265 . . . . . . [oxygen and/or sulfur bonds]
1/2658 . . . . [amine salts]
1/2666 . . . . [macromolecular compounds]
1/2675 . . . . {obtained by reactions involving only carbon to carbon unsaturated bonds; derivatives thereof]
1/2683 . . . . {obtained otherwise than by reactions only involving unsaturated carbon to carbon bonds]
1/2691 . . . . {Compounds of uncertain formula; reaction of organic compounds (hydrocarbons acids, esters) with Px Sy, Px Sy Halz or sulfur and phosphorus containing compounds]
1/28 . . . containing silicon
1/285 . . . . . . [macromolecular compounds]
1/30 . . . . . . compounds not mentioned before (complexes)
1/301 . . . . . . [derived from metals]
1/303 . . . . . . [boron compounds]
1/305 . . . . . . [organo-metallic compounds (containing a metal to carbon bond)]
1/306 . . . . . . [organo Pb compounds]
1/308 . . . . . . [organo tin compounds]
1/32 . . . consisting of coal-oil suspensions or aqueous emulsions [or oil emulsions]
1/322 . . . . . . [Coal-oil suspensions]
1/324 . . . . . . {Dispersions containing coal, oil and water}
1/326 . . . . . . [Coal-water suspensions]
1/328 . . . . . . [Oil emulsions containing water or any other hydrophobic phase]
3/00 Gaseous fuels; Natural gas; Synthetic natural gas obtained by processes not covered by subclass C10G, C10K: Liquefied petroleum gas
3/003 . . . . . . [Additives for gaseous fuels]
3/006 . . . . . . [detectable by the senses]
3/02 . . . . . . Compositions containing acetylene
3/04 . . . . . . Absorbing compositions, e.g. solvents
3/06 . . . . . . Natural gas; Synthetic natural gas obtained by processes not covered by C10G, C10K 3/02 or C10K 3/04 ([liquefying by pressure and cold treatment F25J])
3/08 . . . Production of synthetic natural gas
3/10 . . . Working-up natural gas or synthetic natural gas
3/101 . . . . . . [Removal of contaminants]
3/102 . . . . . . [of acid contaminants]
3/103 . . . . . . [Sulfur containing contaminants]
3/104 . . . . . . [Carbon dioxide]
3/105 . . . . . . [of nitrogen]
3/106 . . . . . . [of water]
3/107 . . . . . . [Limiting or prohibiting hydrate formation]
3/108 . . . . . . [Production of gas hydrates]
3/12 . . . Liquefied petroleum gas ([liquefying by pressure and cold treatment F25J])
5/00 Solid fuels (produced by solidifying fluid fuels C10L 7/00)
5/02 . . . . . . [Solid fuels such as] briquettes consisting mainly of carbonaceous materials of mineral [or non-mineral] origin (peat briquettes C10F)
5/04 . . . . . . Raw material [of mineral origin] to be used; Pretreatment thereof ([pretreatment of fuels of non-mineral origin C10L 5/40])
5/06 . . . . . . Methods of (shaping, e.g. pelleting or) briquetting (mechanical part of pressing briquettes B30B 11/00)
5/08 . . . . . . without the aid of extraneous binders (briquetting peat C10F)
5/10 . . . . . . with the aid of binders, e.g. pretreated binders
5/105 . . . . . . [with a mixture of organic and inorganic binders]
Treating solid fuels to improve their combustion

Fuels not provided for in other groups of this subclass

9/00

Treating solid fuels to improve their combustion

9/02

by chemical means

9/04

by hydrogenating

9/06

by oxidation

9/08

by heat treatments, e.g. calcining

9/083

[Torrefaction]

9/086

[Hydrothermal carbonization]

9/10

by using additives

9/12

Oxidation means, e.g. oxygen-generating compounds

10/00

Use of additives to fuels or fires for particular purposes (additives for liquid carbonaceous fuels characterised by their chemical nature C10L 1/10; using binders for briquetting solid fuels C10L 5/10; using additives to improve the combustion of solid fuels C10L 9/10)

10/02

for reducing smoke development

10/04

for minimising corrosion or incrustation

10/06

for facilitating soot removal

10/08

for improving lubricity; for reducing wear

10/10

for improving the octane number

10/12

for improving the cetane number

10/14

for improving low temperature properties

10/16

. Pour-point depressants

10/18

. use of detergents or dispersants for purposes not provided for in groups C10L 10/02 - C10L 10/16

11/00

Manufacture of firelighters

11/02

. based on refractory porous bodies

11/04

. consisting of combustible material (matches C06F)

11/06

. of a special shape

11/08

. Apparatus therefor

2200/00

Components of fuel compositions

2200/02

. Inorganic or organic compounds containing atoms other than C, H or O, e.g. organic compounds containing heteroatoms or metal organic complexes

2200/0204

. Metals or alloys

2200/0209

. Group I metals: Li, Na, K, Rb, Cs, Fr, Cu, Ag, Au

2200/0213

. Group II metals: Be, Mg, Ca, Sr, Ba, Ra, Zn, Cd, Hg

2200/0218

. Group III metals: Sc, Y, Al, Ga, In, Tl

2200/0222

. Group IV metals: Ti, Zr, Hf, Ge, Sn, Pb

2200/0227

. Group V metals: V, Nb, Ta, As, Sb, Bi

2200/0231

. Group VI metals: Cr, Mo, W, Po

2200/0236

. Group VII metals: Mn, To, Re

2200/024

. Group VIII metals: Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt

2200/0245

. Lanthanide group metals: La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu

2200/025

. Halogen containing compounds

2200/0254

. Oxygen containing compounds

2200/0259

. Nitrogen containing compounds

2200/0263

. Sulphur containing compounds

2200/0268

. Phosphor containing compounds

2200/0272

. Silicon containing compounds

2200/0277

. Hydrogen

2200/0281

. Carbon monoxide

2200/0286

. Carbon dioxide

2200/029

. Salts, such as carbonates, oxides, hydroxides, percompounds, e.g. peroxides, perborates, nitrates, nitrites, sulfates, and silicates

2200/0295

. Water

2200/04

. Organic compounds
Function and purpose of components of a fuel or the composition as a whole

Absorbs, e.g. in the absence of an actual absorbent or scavenger
Catalyst added to fuel stream to improve a reaction
Firelighters or wicks, as additive to a solid fuel
Inhibitors
Anti-oxidants
for anti-foaming
Disinfectants, biocides, anti-microbials
Metal deactivators
Demulsifiers
for inhibiting misting
for inhibiting or avoiding odor
for adding an odor to the fuel or combustion products
for producing sound, e.g. during burning an artificial fire log to mimic sound of real wood
for improving storage or transport of the fuel
Tracers which serve to track or identify the fuel component or fuel composition
for rendering the fuel or flame visible or for adding or altering its color
for improving conductivity
for improving fuel economy or fuel efficiency

Structural features of fuel components or fuel compositions, either in solid, liquid or gaseous state
Microbial additives
Additive or component is a polymer
Particle, bubble or droplet size
Emulsion details
Oil in water (o/w) emulsion
Water in oil (w/o) emulsion
Microemulsion or nanoemulsion
Complex emulsions, e.g. water in oil in water (w/o/w) or oil in water in oil (o/w/o), bicontinuous emulsion, e.g. wherein both phases are continuous or multiple emulsions

Specifically adapted fuels
for internal combustion engines
for gasoline engines
for diesel engines, e.g. automobiles, stationary, marine
for turbines, planes, power generation

Fuel preparation or upgrading, processes or apparatus therefore, comprising specific process steps or apparatus units
Combustion or pyrolysis
Gasification
Heat exchange, direct or indirect
Drying or removing water
Recycling of a stream within the process or apparatus to reuse elsewhere therein
Regeneration of a solvent, catalyst, adsorbent or any other component used to treat or prepare a fuel
Injection, e.g. in a reactor or a fuel stream during fuel production
of additive or catalyst
of fuel
of air
of water
of steam
Spraying or sprinkling
Coating of a fuel as a whole or of a fuel component
Impregnation or immersion of a fuel component or a fuel as a whole
Mixing, stirring of fuel components
Composting, fermenting or anaerobic digestion of fuel components or materials from which fuels are prepared
Cutting, disintegrating, shredding or grinding
Pressing, compressing or compacting
Molding or moulds
Applying ultrasonic energy
Applying radiation such as microwave, IR, UV
Applying an electric field or inclusion of electrodes in the apparatus
Applying a magnetic field or inclusion of magnets in the apparatus
Fischer-Tropsch steps
Deacidification step, e.g. in coal enhancing
Compressors or pumps
Expanders, e.g. throttles or flash tanks
Screws or pistons for moving along solids
Hoppers
Specific separation steps for separating fractions, components or impurities during preparation or upgrading of a fuel
Absorption of impurities during preparation or upgrading of a fuel
Adsorption of impurities during preparation or upgrading of a fuel
Distillation, fractionation or rectification for separating fractions, components or impurities during preparation or upgrading of a fuel
Extraction for separating fractions, components or impurities during preparation or upgrading of a fuel
Washing, scrubbing, stripping, scavenging for separating fractions, components or impurities during preparation or upgrading of a fuel
Sieving for separating fractions, components or impurities during preparation or upgrading of a fuel

Filtration for separating fractions, components or impurities during preparation or upgrading of a fuel

Membrane- or permeation-treatment for separating fractions, components or impurities during preparation or upgrading of a fuel

Specific details of the apparatus for preparation or upgrading of a fuel

Modular or modular elements containing apparatus

Apparatus size

Mobile or displaceable apparatus

Control or regulation of the fuel preparation of upgrading process

Measuring or analysing fractions, components or impurities or process conditions during preparation or upgrading of a fuel

Mixture of two or more additives covered by the same group of C10L 1/00 - C10L 1/308

NOTE

After the code and separated therefrom by a + sign, the codes C10L 2300/20 - C10L 2300/40 are added according to the number of components in the mixture. Example: C10L1/16A + C10L 2300/20 corresponds to a mixture of two well defined hydrocarbons, e.g. mixture of hexane and benzene

Mixture of two components

Mixture of three components

Mixture of four or more components