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 inflammable]
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, carbides}
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, oxygenated 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
C10L

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, naphtha, bitumen, tars, terpenite]

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]

1/1666 . . . [from compounds containing 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; alkylated 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

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

1/1832 . . . [mono-hydroxy]

1/1835 . . . [having at least two hydroxy substituted non condensed benzene rings]

1/1837 . . . [hydroxy attached to a condensed aromatic ring system]

1/185 . . . [Ethers; Acetals; Ketals; Aldehydes; Ketones]

1/1852 . . . [Ethers; Acetals; Ketals; Orthoesters]

1/1855 . . . [Cyclic ethers, e.g. epoxides, lactides, lactones]

1/1857 . . . [Aldehydes; Ketones]

1/188 . . . Carboxylic acids; [metal] salts thereof

1/1883 . . . [polycarboxylic acid]

1/1885 . . . [resin acid]

1/1886 . . . [naphthenic acid]

1/1888 . . . [tall oil]

1/189 . . . having at least one carbonyl group bound to an aromatic carbon atom

1/19 . . . [ester radical containing compounds; ester ethers; carbonic acid esters]

1/1905 . . . [of di- or polycarboxylic acids]

1/191 . . . [of di- or polyhydroxycarboxyls]

1/1915 . . . [of complex esters (at least 3 ester bonds)]

1/192 . . . Macromolecular compounds

1/195 . . . obtained by reactions involving only carbon-to-carbon unsaturated bonds

1/1955 . . . [homo- or 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 carboxy-group or salts, anhydrides or esters thereof (homo- or 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 a carboxy radical or of salts, anhydrides or esters thereof)

1/197 . . . . . . . derived from monomers containing a carboxy-group or salts, anhydrides or esters thereof (homo- or 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 a carboxy radical or of salts, anhydrides or esters thereof)

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 acyloxy radical of a saturated carboxylic acid, of carbonic acid)

1/199 . . . . . . . {condensation polymers of aldehydes or ketones}

1/200 . . . . . . . {polyesters}

1/201 . . . . . . . {aliphatic bond}

1/202 . . . . . . . {aromatic bond}

1/203 . . . . . . . {hydroxyl compounds; ethers, acetics, ketals}

1/204 . . . . . . . {aldehydes and ketones}

1/205 . . . . . . . {carboxylic 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}

1/21 . . . . . . . containing nitrogen

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 (C10L 1/221 takes precedence)

1/2222 . . . . . . . {cycle}aliphatic amines; polyamines (no macromolecular substituent 30C); quaternary ammonium compounds; carbamates (C10L 1/221 takes precedence)

1/2225 . . . . . . . {hydroxy containing (C10L 1/221 takes precedence)}

1/2227 . . . . . . . {urea; derivatives thereof; urethane (C10L 1/221 takes precedence)}

1/223 . . . . . . . having at least one amino group bound to an aromatic carbon atom (C10L 1/221, C10L 1/2227 takes precedence)

1/2235 . . . . . . . {hydroxy containing (C10L 1/221, C10L 1/2227 takes precedence)}

1/224 . . . . . . . Amides; Imides {carboxylic acid amides, imides (C10L 1/221, C10L 1/2227 takes precedence)}

1/226 . . . . . . . containing at least one nitrogen-to-nitrogen bond, e.g. azo compounds, azides, hydrazines (C10L 1/221, C10L 1/2227 takes precedence)

1/228 . . . . . . . containing at least one carbon-to-nitrogen double bond, e.g. guanidines, hydrazines, semicarbazones, imines; containing at least one carbon-to-nitrogen triple bond, e.g. nitriles (C10L 1/221, C10L 1/2227 takes precedence)

1/2283 . . . . . . . containing one or more carbon to nitrogen double bonds, e.g. guanidine, hydrazine, semi-carbazone, azomethine (C10L 1/221, C10L 1/2227 takes precedence)

1/2286 . . . . . . . containing one or more carbon to nitrogen triple bonds, e.g. nitriles (C10L 1/221, C10L 1/2227 takes precedence)

1/23 . . . . . . . containing at least one nitrogen-to-oxygen bond, e.g. nitro-compounds, nitrates, nitrites (C10L 1/221 takes precedence)

1/231 . . . . . . . {nitro compounds; nitrates; nitrites (C10L 1/221 takes precedence)}

1/232 . . . . . . . containing nitrogen in a heterocyclic ring (C10L 1/221 takes precedence)

1/233 . . . . . . . containing nitrogen and oxygen in the ring, e.g. oxazoles (C10L 1/221 takes precedence)

1/235 . . . . . . . {morpholino, and derivatives thereof (C10L 1/221 takes precedence)}

1/234 . . . . . . . Macromolecular compounds (C10L 1/221 takes precedence)

1/236 . . . . . . . obtained by reactions involving only carbon-to-carbon unsaturated bonds (derivatives thereof (C10L 1/221 takes precedence)

1/2362 . . . . . . . {homo- or copolymers derived from unsaturated compounds containing nitrile groups (C10L 1/221 takes precedence)

1/2364 . . . . . . . {homo- or copolymers derived from unsaturated compounds containing amide and/or imide groups (C10L 1/221 takes precedence)

1/2366 . . . . . . . {homo- or copolymers derived from unsaturated compounds containing amine groups (C10L 1/221 takes precedence)

1/2368 . . . . . . . {homo- or copolymers derived from unsaturated compounds containing heterocyclic compounds containing nitrogen in the ring (C10L 1/221 takes precedence)
obtained otherwise than by reactions involving only carbon-to-carbon unsaturated bonds ([C10L 1/221 takes precedence])

Polyamides or polyimines, or derivatives thereof ([poly]amines and imines; derivatives thereof [substituted by a macromolecular group containing 30C] [C10L 1/221 takes precedence])

Polyoxalkyleneamines ([poly]oxalkylene amines and derivatives thereof [substituted by a macromolecular group containing 30C] [C10L 1/221 takes precedence])

containing sulfur, selenium and/or tellurium

[mercaptans; hydrocarbon sulfides]

(sulfur bond to an aromatic radical)

[containing a carboxylic substituted; derivatives thereof, e.g. esters]

(Thiocarboxylic acids and derivatives thereof, e.g. xanthates; Thioaromatic acids or derivatives thereof, e.g. dithio-carbamates; Thionurs)

(sulfur bond to oxygen, e.g. sulfones, sulfoxides)

([Sulfonic acids; Derivatives thereof, e.g. sulfonamides, sulfosuccinic acid esters]

(heterocyclic compounds)

(only sulfur as hetero atom)

(sulfur with oxygen and/or nitrogen in the ring, e.g. thiazoles)

[macromolecular compounds]

[obtained by reactions involving only carbon to carbon unsaturated bonds; derivatives thereof]

[obtained otherwise than by reactions involving unsaturated carbon to carbon bonds]

 Polyamines; polyamide-esters; polyurethane, polyureas [C10L 1/221 takes precedence]

Compounds of uncertain formula; reactions of organic compounds (hydrocarbons, acids, esters) with P, S or sulfur and phosphorus containing compounds

containing silicon

[macromolecular compounds]

[compounds not mentioned before (complexes)]

[derived from metals]

(boron compounds)

[organo-metallic compounds (containing a metal to carbon bond)]

[organo Pb compounds]

[organo tin compounds]

consisting of coal-oil suspensions or aqueous emulsions {or oil emulsions}

[Coal-oil suspensions]

(Dispersions containing coal, oil and water)

[Coal-water suspensions]

[Oil emulsions containing water or any other hydrophilic phase]

Gaseous fuels; Natural gas; Synthetic natural gas obtained by processes not covered by subclass C10G, C10K; Liquefied petroleum gas

[Additives for gaseous fuels]

[detectable by the senses]

Compositions containing acetylene

Absorbing compositions, e.g. solvents

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])

Production of synthetic natural gas

Working-up natural gas or synthetic natural gas

[Removal of contaminants]

[of acid contaminants]

[Sulfur containing contaminants]

[Carbon dioxide]

[of nitrogen]

[of water]

[Limiting or prohibiting hydrate formation]

[Production of gas hydrates]

Liquefied petroleum gas ([liquefying by pressure and cold treatment F25J])

Solid fuels (produced by solidifying fluid fuels C10L 7/00)

Solid fuels such as] briquettes consisting mainly of carbonaceous materials of mineral [or non-mineral] origin (peat briquettes C10F)

Raw material [of mineral origin] to be used; Pretreatment thereof [pretreatment of fuels of equipment C10F]

Methods of [shaping, e.g. pelletizing or briquetting] (mechanical part of pressing briquettes B30B 1/100)

without the aid of extraneous binders (briquetting peat C10F)

with the aid of binders, e.g. pretreated binders

with a mixture of organic and inorganic binders
Treating solid fuels to improve their combustion

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)

- for reducing smoke development
- for minimising corrosion or incrustation
- for facilitating soot removal
- for improving lubricity; for reducing wear
- for improving the octane number
- for improving the cetane number
- for improving low temperature properties
- . Pour-point depressants
- . use of detergents or dispersants for purposes not provided for in groups C10L 10/02 - C10L 10/16

11/00 Manufacture of firelighters

- . based on refractory porous bodies
- . consisting of combustible material (matches C06F)
- . of a special shape
- . Apparatus therefor

2200/00 Components of fuel compositions

NOTE Additives in liquid fuels present in concentrations lower than 5%: get a class taken from C10L 1/10 -C10L 1/308 and corresponding C10L 1/10 -C10L 1/308. In groups C10L 1/32 - C10L 11/08 is such distinction between the terms additive and component not made.

- . Inorganic or organic compounds containing atoms other than C, H or O, e.g. organic compounds containing heteroatoms or metal organic complexes
- . Metals or alloys
- . Group I metals: Li, Na, K, Rb, Cs, Fr, Cu, Ag, Au
- . Group II metals: Be, Mg, Ca, Sr, Ba, Ra, Zn, Cd, Hg
- . Group III metals: Sc, Y, Al, Ga, In, Tl
- . Group IV metals: Ti, Zr, Hf, Ge, Sn, Pb
- . Group V metals: V, Nb, Ta, As, Sb, Bi
- . Group VI metals: Cr, Mo, W, Po
- . Group VII metals: Mn, To, Re
- . Group VIII metals: Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt
- . Lanthanide group metals: La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu
- . Halogen containing compounds
- . Oxygen containing compounds
- . Nitrogen containing compounds
- . Sulphur containing compounds
- . Phosphor containing compounds
- . Silicon containing compounds
- . Hydrogen
- . Carbon monoxide
- . Carbon dioxide
- . Salts, such as carbonates, oxides, hydroxides, percompounds, e.g. peroxides, perborates, nitrates, nitrites, sulfates, and silicates
- . Water
- . Organic compounds
Specifically defined hydrocarbon fractions as obtained from, e.g. a distillation column

Light distillates, e.g. LPG, naphtha

Gasoline

Kerosene, jet fuel

Middle or heavy distillates, heating oil, gasoil, marine fuels, residua

Diesel

Petroleum or natural waxes, e.g. paraffin waxes, asphaltenes

Fractions defined by their origin

Renewables or materials of biological origin

Biodiesel, i.e. defined lower alky esters of fatty acids first generation biodiesel

Vegetable or animal oils

Fischer-Tropsch products

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

Absorbents, e.g. in the absence of an actual absorbent column 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

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
C10L

2290/546  . . Sieving for separating fractions, components or impurities during preparation or upgrading of a fuel
2290/547  . . Filtration for separating fractions, components or impurities during preparation or upgrading of a fuel
2290/548  . . Membrane- or permeation-treatment for separating fractions, components or impurities during preparation or upgrading of a fuel
2290/56  . . Specific details of the apparatus for preparation or upgrading of a fuel
2290/562  . . Modular or modular elements containing apparatus
2290/565  . . Apparatus size
2290/567  . . Mobile or displaceable apparatus
2290/58  . . Control or regulation of the fuel preparation of upgrading process
2290/60  . . Measuring or analysing fractions, components or impurities or process conditions during preparation or upgrading of a fuel

2300/00 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

2300/20  . . Mixture of two components
2300/30  . . Mixture of three components
2300/40  . . Mixture of four or more components