C10K

PURIFYING OR MODIFYING THE CHEMICAL COMPOSITION OF COMBUSTIBLE GASES CONTAINING CARBON MONOXIDE

Definition statement

This place covers:

Purifying combustible gases containing carbon monoxide, e.g. synthesis gas, e.g. by dust removal, condensing non-gaseous materials, washing, adsorption using solids such as active carbon; including regeneration of purifying material.

Modifying the chemical composition of combustible gases containing carbon monoxide to produce an improved fuel, e.g. by altering the calorific value, by reducing the carbon monoxide content (e.g. to zero), by catalytic treatment or by mixing with gases.

Relationships with other classification places

Production of synthesis gas (syngas) from liquid or gaseous hydrocarbons is covered by C01B 3/00.

Production of combustible gases containing carbon monoxide (including producer gas, wood gas, town gas, synthesis gas, manufactured gas and water gas) from solid carbonaceous fuels, is matter for C10J.

Destructive distillation processes, e.g. carbonisation or coking, and excluding gasification processes, are covered by subclass C10B. Combinations of gasification and destructive distillation are covered by group C10J 3/58.

Other gaseous fuels, including natural gas, substitute natural gas or synthetic natural gas (SNG) and liquefied petroleum gas (LPG), are covered by group C10L 3/00.

Modifying the properties of any distillation gases inside the oven is covered by subclass C10B

References

Limiting references

This place does not cover:

Isolation of hydrogen from mixtures containing hydrogen and carbon monoxide	C01B 3/50

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Multi-step process for production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen	C01B 3/02
Multi-step process for preparation of compounds having hydroxy or O-metal groups bound to a carbon atom not belonging to a six-membered aromatic ring by reduction of oxides of carbon exclusively with hydrogen or hydrogen-containing gases, one step being the formation of initial mixture of carbon oxides and hydrogen for synthesis	C07C 29/1518
Multi-step process for production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon	C10G 2/00
Plants with an integrated combined cycle, having more than one engine delivering power externally to the plant	F01K 23/06

Plant characterised by the engines using gaseous fuel generated in the plant from solid fuel	F02B 43/08
Gas turbine plant with separate fuel gasifiers	F02C 3/28
Carburettors for supplying combustible mixtures to internal combustion engines	F02M

References out of a residual place

Examples of places in relation to which this place is residual:

Plants with an integrated combined cycle, having more than one engine delivering power externally to the plant	**01K23/06**
Separation of gases or vapour by diffusion	B01D 53/22
Multi-step process for production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen	C01B 3/02
Multi-step process for preparation of ammonia	C01C 1/0405
Multi-step process for preparation of hydrocarbons from carbon monoxide with hydrogen	C07C 1/04
Multi-step process for preparation of compounds having hydroxy or O-metal groups bound to a carbon atom not belonging to a six-membered aromatic ring by reduction of oxides of carbon exclusively with hydrogen or hydrogen-containing gases, one step being the formation of initial	C07C 29/1518
Preparation of urea	C07C 273/02
Multi-step process for production of liquid hydrocarbon mixtures of undefined composition from oxides of carbon	C10G 2/00
Production of synthetic natural gas	C10L 3/08
Plant characterised by the engines using gaseous fuel generated in the plant from solid fuel	F02B 43/08
Gas turbine plant with separate fuel gasifiers	F02C 3/28
Combination of fuel cell with means for gasification of solid fuel	H01M 8/0643

Informative references

Attention is drawn to the following places, which may be of interest for search:

Gas washers	B01D 47/00
Chemical processes such as purification of gases or modification of the chemical composition thereof, applied to compositions other than combustible gases containing carbon monoxide	B01D 53/00, B01J 19/00
Isolation of inorganic compounds from gaseous mixtures which may include carbon monoxide	C07C, C01B
Processes of modifying the properties of distillation gases inside an oven	C10B 57/18
Natural gas; Synthetic natural gas obtained by processes not covered by C10G, C10K 3/02 or C10K 3/04	C10L 3/06

Special rules of classification

In the absence of an indication to the contrary, classification is made in the last appropriate place ("last place rule")

When necessary, multiple classification symbols have to be added to cover all the purification steps.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Combustible gas containing carbon monoxide	syngas, synthesis gas, coke oven gas, pyrolysis gas, carbonisation gas

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

COG	Coke Oven Gas

C10K 1/001

{working-up the condensates (recovering of NH_3 and NH_4 salts C01C 1/00; working-up or purifying tars and tar-oils C10C 1/00)}

References

Limiting references

This place does not cover:

Working-up or purifying tars and tar-oils	C10C 1/00

C10K 1/02

Dust removal

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Filters, i.e. particle separators, or filtering processes specially modified for separating dispersed particles from gases or vapours	B01D 46/00
Separating dispersed particles from gases, air or vapours by liquid as separating agent	B01D 47/00
Apparatus using free vortex flow, e.g. cyclones	B04C

C10K 1/022

{by baffle plates}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Separating dispersed particles from gases or vapours by inertia	B01D 45/04

C10K 1/024

{by filtration}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Filters, i.e. particle separators, or filtering processes specially modified for separating dispersed particles from gases or vapours	B01D 46/00
Separating dispersed particles from gases, air or vapours by liquid as separating agent	B01D 47/00
Apparatus using free vortex flow, e.g. cyclones	B04C

C10K 1/026

{by centrifugal forces (cyclones B04C)}

References

Limiting references

This place does not cover:

Apparatus using free vortex flow, e.g. cyclones, per se	B04C

Informative references

Attention is drawn to the following places, which may be of interest for search:

Separating dispersed particles from gases or vapours by centrifugal force	B01D 45/12

C10K 1/04

by cooling to condense non-gaseous materials {(C10K 1/001 takes precedence)}

Special rules of classification

C10K 1/001 takes precedence

C10K 1/06

combined with spraying with water {(C10K 1/001 takes precedence)}

Special rules of classification

C10K 1/001 takes precedence

C10K 1/08

by washing with liquids; Reviving the used wash liquors (gas washers B01D)

Definition statement

This place covers:

Acid gas removal, e.g. H2S, HCN, CO2, by absorption process, e.g. amine scrubbing

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Gas washers per se	B01D 47/00
Separation of gases or vapours by absorption, such as acid gas removal	B01D 53/14

C10K 1/18

hydrocarbon oils {(C10K 1/165 takes precedence)}

Special rules of classification

C10K 1/165 takes precedence

C10K 1/20

by treating with solids; Regenerating spent purifying masses {(separation by adsorption B01D 53/02; separation by chemical reaction B01D 53/34; refining of hydrocarbon oils with acids C10G 17/02, C10G 27/02, C10G 29/12)}

Definition statement

This place covers:

Adsorption of impurities

References

Limiting references

This place does not cover:

Separation of gases by adsorption, e.g. PSA	B01D 53/02
Separation of gases by chemical reaction	B01D 53/34

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adsorbents per se	B01J 20/00

C10K 1/32

with selectively adsorptive solids, e.g. active carbon

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adsorbents per se	B01J 20/00

C10K 1/34

by catalytic conversion of impurities to more readily removable materials

Definition statement

This place covers:

e.g. carbonyl sulfide (COS) hydrolysis

C10K 3/00

Modifying the chemical composition of combustible gases containing carbon monoxide to produce an improved fuel, e.g. one of different calorific value, which may be free from carbon monoxide

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Calorific value	Thermal energy content

C10K 3/04

reducing the carbon monoxide content {, e.g. water-gas shift [WGS]}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen by reaction of water vapour with carbon monoxide, water gas-shift reaction or WGS	C01B 3/12