

CLASS 518, CHEMISTRY: FISCHER-TROPSCH PROCESSES; OR PURIFICATION OR RECOVERY OF PRODUCTS THEREOF

SECTION I - CLASS DEFINITION

This class provides for processes which include (a) the reaction of hydrogen with carbon monoxide, carbon dioxide or mixtures of these carbon oxides (Fischer-Tropsch synthesis) to yield one or more carbon compounds, e.g., hydrocarbons, alcohols, esters, acids, ketones, aldehydes, etc., or (b) the purification, separation, conversion or treatment of one or more of the products resulting from the Fischer-Tropsch synthesis, such as by saponification, oxidation, adsorption, solvent extraction, etc.

SECTION II - NOTES TO THE CLASS DEFINITION

- (1) Note. Class 518 provides for Fischer-Tropsch synthesis in combination with separation and also for mere separation of the results of Fischer-Tropsch synthesis, except as shown below in the "Relationship with Other Classes".
- (2) Note. This Class 518 provides for a process which includes Fischer-Tropsch synthesis as well as making one or more reactants preliminary thereto. The reactants (hydrogen, carbon monoxide or carbon dioxide) may be made separately or in admixture.
- (3) Note. Processes that include other reactants in addition to hydrogen, carbon monoxide, carbon dioxide or water will be classified with the compound produced.
- (4) Note. For the purpose of purification or recovery of a Fischer-Tropsch process product, Class 518 provides for any physical process required, but only two chemical processes are provided for, i.e., hydrogenation with gaseous hydrogen and formation of oximes of the oxygen containing products.

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions: Class 44 controls over Class 518 for Fischer-Tropsch synthesis if the product is set forth to be useful as a liquid or solid fuel and there is an additive present as required by Class 44.
- 48, Gas: Heating and Illuminating: Class 48 is superior to Class 518 for Fischer-Tropsch synthesis when the result is set forth as being for heating or illumination.
- 62, Refrigeration: Class 518 controls classification over Class 62 for a process which includes both Fischer-Tropsch synthesis and refrigeration. However, merely treating the product of such synthesis by a Class 62 process is in Class 62.
- 203, Distillation: Processes, Separatory: Class 518 controls classification over Class 203 for processes which include both Fischer-Tropsch synthesis and distillation. Separation of the results of such synthesis by distillation is in Class 203 when the Fischer-Tropsch synthesis is not claimed.
- 204, Chemistry: Electrical and Wave Energy: Class 204 controls classification for the combination of Fischer-Tropsch synthesis followed by a Class 204 step and also for treating the product of such synthesis when the Fischer-Tropsch synthesis is not claimed; however, Class 204 steps followed by Fischer-Tropsch synthesis is in Class 518.
- 252, Compositions: Class 252, subclass 373, provides for processes of making compositions of hydrogen and carbon monoxide or carbon dioxide. These are called synthesis gases and may be used for Fischer-Tropsch synthesis. The combination of making these synthesis gases and using for Fischer-Tropsch synthesis is classified in Class 518.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, per se, which may be used in a process of this class and especially subclasses 20+ for a process of regenerating or rehabilitating a catalyst.
- 520, through 528, 530, 532-570 and 585, Synthetic Resins and Natural Rubbers -- Part of the Class 520 Series; Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof; Organic Compounds -- Part of the Class 532-570 Series; and Chemistry, Hydrocarbons. Class 518 is superior to these classes when compounds normally classified in them are formed by a Fischer-

Tropsch reaction or are separated from the reaction mixture by any physical process or by one of the two chemical processes stated in (4) Note. However, claims which include other chemical processes to separate or form compounds from the Fischer-Tropsch reaction mixture are classified with the compound formed. Patents having both types of claims are classified as originals in Class 518 and cross-referenced to the appropriate compound class or classes.

SUBCLASSES

700 LIQUID PHASE FISCHER-TROPSCH REACTION:

This subclass is indented under the class definition. Processes wherein the Fischer-Tropsch reaction is carried out in the liquid state.

701 Rhodium containing catalyst utilized:

This subclass is indented under subclass 700. Processes wherein a catalyst containing rhodium is utilized for the Fischer-Tropsch reaction.

702 WITH PRELIMINARY REACTION TO FORM HYDROGEN OR A CARBON OXIDE:

This subclass is indented under the class definition. Processes which include a reaction to form hydrogen or a carbon oxide prior to the Fischer-Tropsch reaction.

703 Gaseous oxygen utilized in the preliminary reaction:

This subclass is indented under subclass 702. Processes wherein gaseous oxygen is utilized in the preliminary reaction.

704 This subclass is indented under subclass 702. Water utilized in the preliminary reaction: Processes wherein water is utilized in the preliminary reaction.

705 TREATMENT OF FEED OR RECYCLE STREAM:

This subclass is indented under the class definition. Processes wherein at least one reactant is treated prior to the Fischer-Tropsch reaction, such as removing sulfur therefrom, or pro-

cesses wherein the recycle stream is treated prior to returning to the reaction zone.

706 PLURAL ZONES EACH HAVING A FISCHER-TROPSCH REACTION:

This subclass is indented under the class definition. Processes wherein Fischer-Tropsch reactions take place in two or more reaction zones.

707 Diverse catalysts utilized in at least two zones:

This subclass is indented under subclass 706. Processes wherein different catalysts are utilized in at least two of the zones.

708 Water utilized:

This subclass is indented under subclass 706. Processes wherein water is utilized in at least one of the zones.

709 INCLUDING REGENERATION OF CATALYST:

This subclass is indented under the class definition. Processes wherein a catalyst, after utilization, is recycled for reuse.

SEE OR SEARCH CLASS:

502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, especially subclasses 20+ for a process, per se, of regenerating a catalyst.

710 Solvent utilized:

This subclass is indented under subclass 709. Processes wherein a solvent is utilized in the regeneration of a catalyst.

711 WATER UTILIZED DURING THE FISCHER-TROPSCH STEP OF THE PROCESS:

This subclass is indented under the class definition. Processes wherein water is utilized in the Fischer-Tropsch step of the process.

(1) Note. The water may or may not react.

712 TEMPERATURE CONTROL OR REGULATION OF THE FISCHER-TROPSCH REACTION:

This subclass is indented under the class definition. Processes wherein some means or method is employed to control or regulate the reaction temperature.

- 713 GROUP IB METAL CONTAINING CATALYST UTILIZED FOR THE FISCHER-TROPSCH REACTION (i.e., Cu, Ag, or Au):**
This subclass is indented under the class definition. Processes wherein a catalyst containing copper, silver, or gold is utilized for the Fischer-Tropsch reaction.
- 714 GROUP VIB METAL CONTAINING CATALYST UTILIZED FOR THE FISCHER-TROPSCH REACTION (i.e., Cr, Mo, or W):**
This subclass is indented under the class definition. Processes wherein a catalyst containing chromium, molybdenum, or tungsten is utilized for the Fischer-Tropsch reaction.
- 715 GROUP VIII METAL CONTAINING CATALYST UTILIZED FOR THE FISCHER-TROPSCH REACTION (i.e., Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, or Pt):**
This subclass is indented under the class definition. Processes wherein a catalyst containing iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, or platinum is utilized for the Fischer-Tropsch reaction.
- 716 Rhodium containing catalyst:**
This subclass is indented under subclass 715. Processes wherein the catalyst contains rhodium.
- 717 Group IA or IIA light metal containing material utilized during the Fischer-tropsch step of the process (i.e., Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, or Ba):**
This subclass is indented under subclass 715. Processes wherein a material containing lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium, or barium is utilized in any way during the Fischer-Tropsch reaction.
- 718 In the form of a salt:**
This subclass is indented under subclass 717. Processes wherein a salt of a Group IA or IIA light metal is utilized.
- 719 Iron containing catalyst:**
This subclass is indented under subclass 715. Processes wherein a catalyst containing iron is utilized.
- 720 Pretreatment of the catalyst:**
This subclass is indented under subclass 719. Processes wherein the iron-containing catalyst is treated in some manner prior to use.
- 721 The catalyst contains a metal in addition to the iron, or another material utilized contains a metal other than iron (e.g., as a promoter, retarder, etc.):**
This subclass is indented under subclass 719. Processes wherein a metal, in addition to the iron, is utilized in any form, e.g., as part of the catalyst, in a promoter or retarder, etc.
- 722 ADSORPTION WITH A SOLID MATERIAL:**
This subclass is indented under the class definition. Processes which include adsorption utilizing a solid material.
- 723 SALT CONTAINING EXTRACTANT UTILIZED:**
This subclass is indented under the class definition. Processes which include utilizing a salt-containing material as an extractant.
- 724 SOLVENT EXTRACTION UTILIZED:**
This subclass is indented under the class definition. Processes which include utilizing a solvent as an extractant.
- 725 Alcohol containing extractant utilized:**
This subclass is indented under subclass 724. Processes wherein the solvent utilized contains hydroxy groups.
- 726 Hydrogenation with gaseous hydrogen to purify or recover:**
This subclass is indented under the class definition. Processes which include hydrogenation utilizing gaseous hydrogen to purify or recover the product(s) of the Fischer-Tropsch reaction.
- 727 FORMING SALTS OR OXIMES OF OXYGEN CONTAINING COMPOUNDS TO PURIFY OR RECOVER:**
This subclass is indented under the class definition. Processes which include forming salts or oximes of the oxygen-containing compounds produced to purify or recover the products of the Fischer-Tropsch reaction.

728 MISCELLANEOUS:

This subclass is indented under the class definition. Processes not provided for in any other subclass to purify or recover.

END