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**Catalytic conversion of synthesis gas to hydrocarbon(s) - using a reaction vessel contg. helical cooling tubes**

C88-136911

E(10-J2D) H:4-E5 4-F2E) N(1-B, 2-E, 3-B)

Hydrocarbon catalysts at least 2 carbon atoms are prepd. from a gas mixt. comprising H<sub>2</sub> and CO<sub>2</sub> by passing the gas mixt. through a reaction zone contg. catalyst particles, while removing heat from the reaction zone by a cooling medium which flows via one or more helical patterns, each pattern contg. one or more helices.

#### USE ADVANTAGE

Use of a conventional multitube reactor presents a number of difficulties, e.g. non-uniform heat removal and expansion problems, when upscaled to very large capacity. These problems are avoided, and catalyst loading is easier. The method is useful for conversion of synthesis gas to C<sub>5</sub>+ hydrocarbons, esp. C<sub>20</sub>+ paraffins.

#### REACTION CONDITIONS

The catalyst pref. contains a Group VIII non-noble metal,

e.g. Co, and opt. a noble metal, e.g. Ru and/or a Group IVb or Vlb metal, e.g. Zr, Ti or Cr on a refractory support, e.g. Al<sub>2</sub>O<sub>3</sub> or SiO<sub>2</sub>.

Prof. temp. is 150-390° C, pressure 5-100 bar abs., GHSV 500-5000. The catalyst may be kept in contact with liquid hydrocarbon product in the reactor.

#### APPARATUS

The reaction vessel is cylindrical. It contains helically wound tube(s) or tube bundle(s), concentric with the vessel axis. When there is more than one tube or bundle, the screw directions of adjacent tubes or bundles are opposite to each other. Cooling medium is water. (10pp1644CGDwgNo0/0).

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