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 Catalyst prepn. for converting synthesis gas to liq. hydrocarbon(s) - by  
 impregnation or pptn. of cobalt or nickel on metal oxide support, and  
 redn., oxidn. and redn.  
 C88-041090

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Prepn. of a catalyst for conversion of syngas to a prod. contg  
 liq. hydrocarbons comprises:

(A) depositing Co or Ni precursor on a refractory metal  
 oxide support by impregnation or pptn., to distribute Co or  
 Ni crystallites to form a supported catalyst; and

(B) activating the supported catalyst by subjecting it at  
 about 100-450°C to (i) redn. in H<sub>2</sub>, (ii) oxidn. in an O<sub>2</sub>-contg  
 gas, and (iii) redn. in H<sub>2</sub>, to form an activated supported  
 catalyst, more active for syngas conversion after step (iii)  
 than after step (i).

The catalyst is also claimed.

E(10-J2D) H(4-E5, 4-F2, 4-F2E) N(2-B, 2-C, 5-B)

#### ADVANTAGE

Steps B ('ROR activation') increase the catalyst's by up  
 to about 100%.

#### PREFERRED COMPONENTS

The support is pref. SiO<sub>2</sub> or esp. Al<sub>2</sub>O<sub>3</sub>. The catalyst  
 pref. contains about 5-15wt.% Co. It may also contain a La or  
 Mn promoter or about 0.05-0.50wt.% Ru.

#### IMPREGNATION

Co may be impregnated onto the support using a non-aq.  
 impregnating soln., esp. an acetone soln. The soln. may also  
 contain Ru. E.g. the incipient wetness technique may be  
 used.

#### ACTIVATION

Steps (i) and (iii) are pref. conducted at about 200-450°C,  
 and step (ii) at about 250-400°C. All 3 steps are pref. con-  
 ducted while heating at about 0.1-2°C per min. The H<sub>2</sub> in  
 steps (i) and (iii) may be mixed with N<sub>2</sub>.

#### EXAMPLE

A catalyst was prepd. by impregnating 22g  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> with  
 8.7g Co<sub>2</sub>(CO)<sub>8</sub> in THF. It was activated by redn. in H<sub>2</sub> sub-

ected to a synthesis run with CO and H<sub>2</sub> (1.85:1) at 195°C, and again activated by redn. with H<sub>2</sub>, finally at 350°C for 1 hr. Its activity with syngas under the same conditions as before was then 1506cc CO reacted/g metal x hr. After further activating by oxidn. and redn. according to the invention, the activity of the catalyst, measured as before, was 1726cc CO/g metal x hr. (9pp1492CGDwgNo0/0)