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Cobalt-rhenium titania catalysts - with high volumetric productivity for hydrocarbon synthesis (Eng)

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R(DE GB NL)

Addnl. Data: MAULDIN C H

F(10-J2D3, 35-T, 35-V) H(4-E5, 4-F2E) J(4-E4) N(2-B1, 3-B, 3-E) ¹

USE/ADVANTAGE

Catalysts have good selectivity, activity and volumetric productivity in hydrocarbon synthesis esp. the prodn. of $5C^+$ hydrocarbons from synthesis gas, CO and H_2 .

PREFERRED EMBODIMENTS

Pv is at least 500 at $200^\circ C$ and $H_2:CO$ ratio of 2:1.

The rutile:anatase ratio of titania is at least 2:3.

The cpds. are decomposed by treatment with a H-contg. or O-contg. gas or H-contg. followed by O-contg. gas. The wt.% Co applied in each step is no more than 8 wt.% giving less than 80% pore vol. filled.

EXAMPLE

A Co-Re on TiO_2 catalyst, prepd. by multiple impregnation cycles to give a Co loading of 13.3 wt.% had Pv of 862 and 77 wt.% CO conversion at $20^\circ C$ catalytic synthesis. This compared with Pv of 454 and 71 wt.% conversion for a Co-Zr- SiO_2 catalyst. (14pp2274SLDwgNo0/4)

SR:No-SR.Pub

A hydrocarbon synthesis catalyst (I) comprises:

- (a) 10-25 wt.% Co;
- (b) Re, in a Re:Co wt. ratio greater than 0.05:1; and
- (c) a TiO_2 support, pref. contg. more than 50 wt.%

TiO_2 .

The catalyst has a volumetric productivity (Pv) in cm^3 CO conversion/hour/ cm^3 catalyst, for hydrocarbon synthesis from H_2 and CO, satisfying the relationship $4C^- = 4 + (0.008) Pv$ where $4C^-$ is wt.% of 4C or less hydrocarbons.

Prepn. of (I) is also claimed and involves contacting the support with cpds. of Co and Re, decomposing the Co and Re cpds. and repeating these stages at least once.