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Fluid-permeable holders contain small particle size catalyst - used in synthesis of organic cpds. from gases in one or more reaction zones reduce pressure drop across reaction zone(s)

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Prepn. of organic cpds. from synthesis gas comprises passing the gas through a reaction zone contg. catalyst (pref. particle dia. 0.1-1.5 mm) supported in fluid-permeable holders.

USE

The process can be used for preparing oxygen-contg. hydrocarbon derivs. such as methanol (e.g. using Zn/Cr catalyst) or for preparing hydrocarbons such as middle distillates (using Fischer-Tropsch catalysts contg. Fe, Co, Ru and/or Ni).

ADVANTAGE

The use of the holders reduces the pressure drop across the reaction zone, eliminates mass transport limitations and improves heat transfer even when using a small particle size catalyst.

E(10-E4E1, 10-J2D) N(2, 3-D, 3-F)

PREFERRED CATALYST HOLDER

The holders are cylindrical or spherical with a dia. 2-10 mm, have a width and height within 50% of their length, consist of a continuous network of Al or stainless steel (which are inert to the reaction) with a 0.1-0.5 mm mesh, 20-95% of the surface area of which is permeable. The volume of the interstices between the stacked holders is 20-50% of the reaction zone.

EXAMPLE

A H_2/CO mixt. in the molar ratio 2:1 was contacted at 230°C, 20 bar and 900 l/1 catalyst/hour with 5.2 kg catalyst comprising Co, Zr and SiO_2 in the wt. ratio 9:6:100 as 0.38 mm dia. particles contained in spherical 6 mm dia. holders contg. a stainless steel 0.3 mm mesh with a 75% permeable area.

The reaction yielded 120 C_{1+} /kg catalyst/hour with 83% selectivity (proportion of C_{1+} as C_{3+}) and a 0.04 bar pressure drop. (8pp1746DAHdwgNo0/0).

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