FISCHER-TROPSCH SYNTHESIS OF HYDROCARBONS USING IRON-MORDENITE CATALYSTS

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ABSTRACT:

Fischer-Tropsch catalysts with high activity and selectivity for olefins were produced using mordenite type SiO$_2$/Al$_2$O$_3$ = 12, 20, 28, 62 zeolite supported iron carbonyl compounds and were characterised by X-ray powder diffraction.

The adsorption of volatile Fe(CO)$_5$ on the support surface was carried out under vacuum at room temperature. Reduction pretreatment and the formation of active metallic iron particles were monitored by vibrating sample magnetometer (VSM). The magnetic saturation time was observed to increase with increasing the Al$_2$O$_3$ content of catalyst system indicating an increasing interaction between iron and alumina.

The activity and selectivity of different iron deposited mordenite samples were investigated during Fischer-Tropsch synthesis of hydrocarbons with H$_2$/CO=3 in the temperature range of 400-500°C using a microreactor system. The results correlated with the acidic properties of surface and/or with metallic state of active iron particles of the catalyst.

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