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Study of effect of Ag promoter over Cobalt based catalysts in CO hydrogenation reaction

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Fischer–Tropsch synthesis can produce hydrocarbons using syngas derived from coal, natural gas or biomass. Supported cobalt catalysts are preferred due to their high activity, high selectivity to long-chain paraffins, low water–gas-shift activity and high resistance to deactivation[1-3]. For these catalysts, the support not only provides a large surface area for the cobalt dispersion, but also has significant effects on the FT performance due to metal–support interactions, porosity and mass transfer limitations . Conventionally, silica, alumina and titanium can be used as Co supports [4,5]. In this research, we studied the influence of Ag promoter into cobalt based catalyst. The catalyst was prepared incipient wetness impregnation method. The catalyst has been characterized with XRD,BET,H_2-TPR ICP techniques and then tested in a fixed-bed reactor under pressure of 27 atm, temperature of 210 ºC, H_2 to CO ratio of 2, and GHSV of 2 l/h/gcat. The result was shown 56.3 % CO conversion, 14.6 % CH_4, 9.3 % C_2-C_4, and 76.1 % C_5^+ selectivity.

Keywords: Fischer–Tropsch synthesis,Cobalt catalyst,Ag promoter,Product distribution.

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