



## Fischer-Tropsch synthesis in Fixed-bed reactor over Ru-promoted Co/SiO<sub>2</sub> catalysts

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A series of catalysts containing 0, 0.25, 0.50, 0.75 and 1 wt% Ru on 10 wt% Co/SiO<sub>2</sub> were prepared by co-impregnation of silica commercial supports for the Fischer Tropsch reaction using fixed-bed reactor and the reaction was carried out in temperature at 473 K and 1 MPa and H<sub>2</sub>/CO = of 2. Metal component analysis of synthetic catalysts were identified by X-rays Fluorescence (XRF) technique. Morphologies of all samples were checked by Scanning electron microscopy (SEM). The structure of the studied catalysts were carried out by X-rays Diffraction (XRD), which revealed of catalyst calcined temperature at 673 K with a ramping rate of 2 K.min<sup>-1</sup> for 3 h. Finally, BET surface area, pore volume and pore size distribution were estimated from nitrogen desorption isotherm obtained at -196°C using a constant-volume adsorption apparatus.. The effect of promoter on the reducibility of cobalt oxide species, dispersion of the cobalt, activity and selectivity of FTS was investigated. Increasing the ruthenium loading from 0 to 1 wt% increased the CO conversion and the C<sub>12+</sub> selectivity. The percentage of CO conversion increased from 49.44% (0 wt% Ru) to 69.8% (1 wt% Ru) while the C<sub>12+</sub> liquid hydrocarbons selectivity of the 0 wt% Ru is about 35.73% lower than that of the 1 wt% Ru is about 46.64%.

**Keywords** Fischer Tropsch synthesis; Gas-to-liquids; Cobalt catalyst; Noble metal promoters