

## Hydrocarbon Production Of Gasoline Range From Syngas Using Cobalt-Based Hybrid Catalysts

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Fischer-Tropsch synthesis (FTS) reaction for the direct production of gasoline range hydrocarbons (C5-C9) from syngas was investigated on cobalt-based catalysts with promoter as Pt. The catalysts were synthesized by co-precipitation method in an aqueous solution containing Co and Al metal precursors (cobalt nitrate and aluminum nitrate with the weight ratio of Co/Al<sub>2</sub>O<sub>3</sub> = 20/100) and Na<sub>2</sub>CO<sub>3</sub> solution as a precipitating agent at 70°C in a slurry of ZSM-5 (Si/Al=25). The hybrid catalysts are noted as a Co-Al<sub>2</sub>O<sub>3</sub>-xPt/ZSM-5 (x is 0.05, 0.1, 0.3 and 0.5). The FTS reaction was carried out subsequently under the following reaction conditions; T = 240 and 260°C, P = 2.0 MPa and SV = 3,000 ml/gcat/h. The hybrid catalysts are characterized using BET, XRD, H<sub>2</sub>-TPR, NH<sub>3</sub>-TPD, SEM, TEM and XPS. As results, the impregnated Co/ZSM-5 hybrid catalyst is taken as a reference show higher values for conversion and C1 selectivity at 240 °C than that of promoted Co-Al<sub>2</sub>O<sub>3</sub>/ZSM-5 hybrid catalysts. All hybrid catalysts show the C5-C9 yield (%) higher than that of Co/ZSM-5 catalyst. The promoted hybrid catalysts are found to be more promising towards direct production of the hydrocarbons of gasoline range.