

Promising effect of higher alcohol addition in a slurry-phase Fischer-Tropsch reaction

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The slurry-phase Fischer-Tropsch (F-T) synthesis is intensively investigated in a recent decades due to its good selectivity to higher hydrocarbons with an excellent mass and heat transfer character resulted in an enhancement of catalyst stability. However, there are some critical challenges to be overcome for the development of robust next-generation F-T technology such as easy separation method of cobalt-based catalyst in F-T reaction medium and inhibition of catalyst aggregation during F-T synthesis reaction. In the present investigation, the effects of linear C₇~C₁₀ alcohol addition in F-T slurry medium were examined by using the 20 wt% Co/γ-Al₂O₃ catalyst at a fixed reaction conditions (T = 220 and 240 °C, P = 2.0 MPa and space velocity of 2000 L/Kg-cat/h). The additional of small amount of linear alcohols in the range of 5000~40000 ppm in F-T reaction medium reveals the enhanced selectivity to higher hydrocarbons and the reduced catalyst aggregation.