

The Effect of Inert Pellet Size in the Fixed-Bed Reactor for Fischer-Tropsch Synthesis (SiC ball)

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Currently the fluctuation of energy fuel cost has motivated researchers to study alternative technologies. The FTS process is considered one of the key technologies for the clean fuel production. In the FTS process a lot of heat are released from the exothermic reaction by synthesis of hydrocarbons. It was known that the selectivity of C₅+ can be controlled by the removal of reaction heat.

In this study, FTS reaction over Ru/Co/Al₂O₃ catalysts were carried out in the fixed-bed reactor to investigate the effect of inert pellets in catalytic bed. The experiment was carried out using different size of SiC pellet with a diameter of 1, 2 and 3 mm, respectively. The catalytic performance was studied by CO conversion, CH₄ and C₅+ selectivity under the same GHSV condition. In addition, the effect of different size of SiC pellet in FTS fixed bed reactor were discussed. It was found that various size of inert material has exhibited different contact area with catalyst and SiC pellet, which led to different heat transfer efficiency. It was also observed that this configurations were influenced on the heat removal that has been generated from the exothermic reaction over the catalyst.