

First Operational Experience of Slurry Phase Reactor for Fischer-Tropsch Synthesis in 1BPD Scale GTL process

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Due to the depletion of petroleum and the newly discovered natural gas resources such as shale gas and coalbed methane, Fischer-Tropsch synthesis (FTS), one of the key technologies in gas-to-liquids (GTL) process, is widely gaining attention as an alternative method to produce environmentally benign oils. To efficiently utilize these resources and independently develop domestic technology, 1 BPD scale GTL pilot was designed, manufactured and has been being operated by Korea GTL consortium. To design a reactor for FTS, a rigorous mathematical model was developed with gProms model and hydrodynamic mock-up test. In addition, a newly-developed high performance KRICT catalyst having high mechanical resistance and hydrothermal stability was used. We have operated the pilot 3 times including trial run, and the cumulative operation time totals 650 h. CO conversion ranged from 65 to 85% and C5+ selectivity ranged from 80 to 85% depending on the operation condition. First operational experience including 6 years development history for GTL process will be discussed.