Fischer–Tropsch synthesis process development: from laboratory to commercial scale

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Milestone advances using Synfuels China’s Fischer–Tropsch (F–T) synthesis technology have been made towards commercialization of Fischer-Tropsch synthesis technology in China. A four million ton/a coal-to-liquids (CTL) plant is under construction in Ningxia province following the successful technology demonstration at 4000 bbl/d scale in Inner Mongolia. The CTL process development by Synfuels China started from solid fundamental studies with more than twenty years experience accumulation in catalysis and kinetic studies, which led to the demonstration of Synfuels China’s medium temperature FT (MTFT) synthesis process. Density Functional Theory (DFT) together with the sophisticated catalyst property characterization tools has been routinely applied during catalyst development. Fundamental R&D efforts integrating all aspects of chemical engineering have greatly been enhanced by combining the fundamental tools covering the F–T synthesis mechanism, reaction engineering, and process optimization.

Figure 1: DFT study results

References