

Production of linear alpha olefins via Fischer-Tropsch synthesis with Fe-based catalysts

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Fischer-Tropsch synthesis (FTS) has been considered as one of the most feasible methods to convert synthesis gas (CO+ H₂) derived from natural gas, coal and biomass for production of hydrocarbons and oxygenates. The FTS reaction can selectively produce linear alpha olefins (α -olefins), which are commonly used as chemical intermediates for a wide array of applications (i.e., surfactant, performance plastics and elastomers). Significant economic benefits could be achieved by increasing the yield of α -olefins in the FTS process. Optimizing the catalytic properties will lead to maximum the α -olefin selectivity during the FTS process.

In this study, we synthesized several Fe-based catalysts for the production of α -olefin through the FTS reaction. We have tried to adjust iron carbide properties that influence the CO conversion as well as the α -olefin selectivity. The reaction conditions were adjusted to increase the α -olefin selectivity.