

Effect of crystallite sizes of iron-carbides derived from MIL-100(Fe) for CO hydrogenation to hydrocarbons

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Fischer-Tropsch Synthesis (FTS) reaction is key unit of Gas-to-Liquid (GTL) process to produce sulfur-free liquid fuels with lower aromatic content as a promising alternative petroleum-replaced technique. Iron-based FTS catalysts have been preferentially utilized, and the maximized conversion can be obtained at an optimal crystal size of iron carbides. The iron carbides with various crystallite sizes were synthesized by using metal-organic frameworks (MOF, MIL-100(Fe)) by changing molar ratios of organic linker, iron precursor, and DIW. At fixed pyrolysis conditions, iron carbides with various porosity and crystallite sizes were successfully synthesized, and the effects of their crystallite sizes were investigated for CO hydrogenation to hydrocarbons.

Keywords : Fischer-Tropsch Synthesis (FTS); MOF; MIL-100(Fe); composition; iron carbide; pyrolysis; catalytic activity.