

CFD simulation of Fischer-Tropsch synthesis reaction using Fe catalyst

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In modern industries, Energy of the highest demand is petroleum. Recently, It is actively proceeding shale gas development for substituting petroleum. However, All of them have the problem like corrupting the environment. Replacement method for this is the F-T synthesis. At first, It produce the syngas using various hydrocarbon. Then, It converts liquid fuel to syngas using the F-T synthesis reaction. The liquid fuel from F-T synthesis doesn't have the environmental pollution material like the sulfur in the petroleum. Therefore, The F-T synthesis fuel is the eco-friendly fuels than petroleum and shale gas. Tn F-T synthesis process, Many kinds of reactors and catalysts are used. In this study, We used packed bed reactor with Fe catalyst. CFD was used for simulation about F-T synthesis reaction. We used surface reaction model, Because the reation is caused on surface of catalyst. And, The FTS reaction rate is defined by UDF. It evaluated the simulation by comparing experimental data and simulation data.