

Sulfur Removal of Hydrocarbon Fuels Using Oxidative Desulfurization Enhanced by Fenton Process

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Abstract : A comprehensive development towards the production of ultra-clean fuels as a feed stock is getting to raise due to the increasing use of diesel fuels and global air pollution. Production of environmental-friendly fuels can be achievable by some limited single methods and most integrated ones. Oxidative desulfurization (ODS) presents vast ranges of technologies possessing suitable characteristics with regard to the Fenton process. Using toluene as a model fuel feed with dibenzothiophene (DBT) as a sulfur compound under various operating conditions is the attempt of this study. The results showed that this oxidative process followed a pseudo-first order kinetics. Removal efficiency of 77.43% is attained under reaction time of 40 minutes with $(\text{Fe}^{+2}/\text{H}_2\text{O}_2)$ molar ratio of 0.05 in acidic pH environment. In this research, temperature of 50 °C represented the most influential role in proceeding the reaction.

Keywords : design of experiment (DOE), dibenzothiophene (DBT), optimization, oxidative desulfurization (ODS)

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