

Direct Conversion of Crude Oils into Petrochemicals under High Severity Conditions

Authors : Anaam H. Al-ShaikhAli, Mansour A. Al-Herz

Abstract : The research leverages the proven HS-FCC technology to directly crack crude oils into petrochemical building blocks. Crude oils were subjected to an optimized hydro-processing process where metal contaminants and sulfur were reduced to an acceptable level for feeding the crudes into the HS-FCC technology. The hydro-processing is achieved through a fixed-bed reactor which is composed of 3 layers of catalysts. The crude oil is passed through a demetalization catalyst followed by a desulfurization catalyst and finally a de-aromatization catalyst. The hydroprocessing was conducted at an optimized liquid hourly space velocity (LHSV), temperature, and pressure for an optimal reduction of metals and sulfur from the crudes. The hydro-processed crudes were then fed into a micro activity testing (MAT) unit to simulate the HS-FCC technology. The catalytic cracking of crude oils was conducted over tailored catalyst formulations under an optimized catalyst/oil ratio and cracking temperature for optimal production of total light olefins.

Keywords : petrochemical, catalytic cracking, catalyst synthesis, HS-FCC technology

Conference Title : ICHCRM 2023 : International Conference on Heterogeneous Catalysis and Reaction Mechanisms

Conference Location : Paris, France

Conference Dates : September 18-19, 2023