

## Effect of Zeolite Mesoporosity in the Hydrocracking Catalysts for FCC Light Cycle Oil Upgrading into Petrochemical Light Aromatic Hydrocarbons

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Diesel-boiling-range light cycle oil (LCO) from FCC unit are utilized as diesel pool additive and viscosity cutter for heavy fuel oil; however, its applications will be limited in the future due to increasingly strict emission regulations. In this study, we conducted a series of hydrotreating (HDT) and hydrocracking (HDC) tests at 6 MPa in a fixed-bed down-flow micro-reactor system using an actual LCO obtained from FCC unit. Since LCO contained aromatics with a wide distribution of molecular size of mono-, di- and tri+ring aromatic hydrocarbons, we focused mainly on enhancing conversion of heavy aromatic compounds in zeolite component of HDC catalysts to obtain high selectivity and high per-pass yield of BTX in mono-ring light aromatic products. For this purpose, a mesoporous H-Y zeolite was added to the zeolite mixture of H-Beta and H-ZSM-5 to prepare HDC catalysts. To assess the commercial feasibility of upgrading LCO into light aromatics, catalytic stability tests of HDC catalysts were also conducted using model feeds simulating hydrotreated LCOs with different nitrogen contents.