

Hydrocracking of Plant Heavy-Aromatics for Xylene-rich BTX

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BTX (Benzene/Toluene/Xylene) are important raw chemicals for plastics, resins, fibers, elastomers and lubricants etc. In oil refining and petrochemical processes, chemically-refractory heavy aromatic hydrocarbons such as LCO (light cycle oil) from FCC unit, PFO (pyrolysis fuel oil) from NCC and C10+ heavy-aromatics from p-xylene plants are produced in large quantities as by-products. Due to high aromatic contents, these fractions cannot be blended into DSL pool but are being disposed as blending stocks for viscosity adjustment of heavy fuel oil or plant fuels. One option for upgrading these fractions is to produce high-value chemicals such as BTX. In this study, we investigated a two-step catalytic process for converting the plant C10+ heavy-aromatics into BTX. For this purpose, the C10+ heavy-aromatics comprised mainly of 2- and 3-ring aromatics was first hydrogenated to 1-ring aromatics followed by selective hydrocracking of 1-ring aromatics into BTX. Compared to direct hydrocracking of the C10+ heavy-aromatics, the two-step catalytic process showed much enhanced BTX yield. Feed compositions for selective hydrocracking leading to Xylene-rich BTX will be discussed.