

Synergistic Combination of High Aromatization Activity and Suppressed Hydrogenolysis in Hierarchical Pt/KL

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Pt/KL is a highly active aromatization catalyst due to its 1-dimensional micropores. However, the unique micropore structure of the KL can inhibit the diffusion of bulky aromatic products, which can cause side reactions that can decrease the aromatic yields. In this work, we investigated the effect of secondary mesoporosity in Pt/KL during C6 – C8 alkane aromatizations. Hierarchical Pt/KL exhibited enhanced aromatic yields. Also, the hierarchical Pt/KL showed less formation of dealkylated aromatic products than the Pt/KL due to suppressed secondary hydrogenolysis. It indicates that fast diffusion of alkylaromatics is important for suppressing the hydrogenolysis. Pt/ γ -Al₂O₃ showed lower aromatization activities than the KL-supported catalysts, which indicates Pt located inside the micropore is crucial for high aromatization activity. Therefore hierarchical Pt/KL provides the synergistically combined high aromatization activity and suppressed hydrogenolysis activity.