

Catalytic Cracking Of A Mixture Of Dodecane And 1,3,5 Triisopropyl-Benzene Over USV And ZSM-5 Zeolites Based Catalysts

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Summary

The reaction of dodecane (C₁₂) and 1,3,5-tri-isopropyl-Benzene (TIPB) was experimentally investigated over catalyst SB (based oil USY zeolite) and GKF-3 (based on ZSM5 zeolites). Series of experiments with pure and 50-50 weight percent mixtures of C₁₂ and TIPB were conducted. The reaction conditions were adjusted to Simulate a commercial FCC unit at 450 degrees C, cat/oil ratio of 5, pressure of 1-1.5 bar, and reaction times of 3-15 sec. GKF-3 was observed to give higher C₁₂ conversion compared to SB. On the contrary, the kinetic of TIPB showed a complicated behavior due to the Mutual effects of zeolite acidity and pore size. The conversion of pure C₁₂ on SB was observed to be lower than the conversion of TIPB while the opposite was true on GKF-3. This behaviour could be attributed to the higher activation energy of paraffin catalytic cracking compared to alkyl-aromatic dealkylation. While, the conversion of C₁₂ was not affected by the presence of TIPB in both catalysts a huge drop in the conversion of TIPB was observed in the presence of C₁₂ over both catalysts. This indicates that the diffusion of TIPB molecules is the rate determining step.

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