

Effect of Dealumination of Mordenite and Beta Zeolite Catalysts on Transmethylation of 2-Methylnaphthalene by Methanol and 1,2,4-Trimethylbenzene in the High-pressure Fixed-bed Flow Reactor

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Catalytic performances of various dealuminated H-mordenite, H-Beta for the methylation of 2-methylnaphthalene (2-MN) by methanol and 1,2,4-trimethylbenzene (TMB) as a solvent and methylating agent were investigated in a high-pressure fixed-bed flow reactor. It was found that dealumination of H-mordenite could substantially improve the catalytic selectivity and stability. The H-mordenite with the steam treatment at 550°C followed by acid leaching was revealed to exhibit comparatively high and stable conversion of 40% with the high 2,6-/2,7-DMN ratio of 2.4 at TOS 5h compared with H-mordenite showing conversion of 8.4% with 2,6-/2,7-DMN ratio of 1.4. On the other hand, H-Beta with the steam treatment at 800°C followed by acid leaching shows lower 2-MN conversion of 61% compared with unmodified H-Beta with 2-MN conversion of 89% at TOS 5h. The catalytic behavior has been discussed in relation with the catalyst porosity and acidity.