

Preparation and Reaction Characteristics of Zeolite Catalysts for Reactive Distillation

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Ethyl-acetate is used as raw material of cosmetics and medical supplies, solvent of ink, etc. Preparation of ester like this is realized by esterification under acidic catalysts. Therefore, if reaction and separation is performed at the same time, it would not need additional process for separation of unreacted materials or can be minimized because the conversion can be improved greatly. In this work, we intended to application of zeolite catalyst as solid acid catalyst for reactive distillation instead of sulfuric acid. ZSM-5 and Y-zeolite were prepared by hydrothermal treatment, and their reaction characteristics were investigated according to various conditions. Al(OH)₃ was better alumina source than NaAlO₂ in this experiment. It was suitable that Na-ZSM-5's ion-exchanged time was four hours and a number of ion-exchange was three times. Also Na-montmorillonite and Ca-montmorillonite was better than other binders. In the result of reaction characteristics, when SiO₂/Al₂O₃ ratio is 50, reactivity is the most superior. From the comparison of reaction characteristics between ZSM-5 and Y-zeolite, we inferred that ZSM-5 is better material than Y-zeolite as solid acid catalysts for reactive distillation.