

عنوان مقاله:

Spray Drying of Nanostructured Kaolin-Bound SAPO-34 Catalyst for Conversion of Methanol to Light Olefins in Fluidized Bed Reactor: Comparison of Silica and Alumina Sol as Binder

محل انتشار:

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خلاصه مقاله:

The aim of this research is to investigate the influence of various binder materials in the assembly of nanostructured kaolin-SAPO-34 catalyst by spray drying for conversion of methanol to light olefins in a fluidized bed reactor. The catalysts were prepared by contribution of kaolin matrix, silica/alumina sol binder and SAPO-34 catalyst under the same conditions. Inorganic binders have important role in microspherical catalysts preparation which was taken in to account in the presented paper by the application of silica and alumina sol. Physiochemical properties of the catalysts were identified by XRD, FESEM and BET-BJH techniques. The results of XRD analysis exhibit typical SAPO-34 and kaolinite phase for all spray dried catalysts. It represents the successful spray drying that the crystallite structures of the shaped samples contain both the expected phases (kaolinite and SAPO-34). Moreover, it was observed that the spray dried catalyst using silica sol have larger particle sizes than the one synthesized with alumina sol. The catalysts mechanical strength was evaluated by the ASTM D5757-95 fluidized bed attrition test. Spray dried catalyst with silica sol exhibits better attrition resistance which can be related to its produced smoother particle surface. Catalytic performance tests were carried out to study the MTO activity of the catalysts in fluidized bed reactor. The shaped catalyst with silica sol showed higher light olefins selectivity and longer life time during MTO reaction in a fluidized bed reactor compared to the sample prepared with alumina sol

کلمات کلیدی:

.Binder, Kaolin-bound SAPO-34, Spray Dryer, Fluidized Bed Reactor, Methanol to Light Olefins

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