عنوان مقاله:

Conventional hydrothermal synthesis of H-ZSM-5 catalysts using various templates for light olefins production from methanol

محل انتشار:

پانزدهمین کنگره ملی مهندسی شیمی ایران (سال: 1393)

تعداد صفحات اصل مقاله: 4

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خلاصه مقاله:

High-silica H-ZSM-5 catalysts were successfully synthesized using the conventional hydrothermal method under a static condition in the presence of tetrapropyl ammonium hydroxide (TPAOH), tetrapropyl ammonium bromide (TPABr), n-butyl amine (NBA) and morpholine (MOR) as the structure-directing agents. The influences of the templates on the crystal size, surface area, pore volume, morphology and surface acidity of H-ZSM-5 catalysts were characterized by XRD, SEM, BET and NH3-TPD techniques. The catalytic performances of the H-ZSM-5 samples in themethanol to olefins (MTO) reaction were conducted in a fixed-bed reactor at 480 °C, atmospheric pressure and methanol WHSV of 0.9 h-1 using methanol to water weight ratio of unity in the feed. The SEM micrographs revealed that only ZSM-5 samples prepared with TPAOH and TPABrexhibited the MFI-typical hexagonal and spherical-shaped morphologies. The XRD patterns indicated higher crystallinity for the catalyst synthesized using TPABr. Also, this catalyst exhibited the highest acidity and an acceptable surface area. All the samples illustrated activity inthe MTO reaction but the products selectivities especially for the propylene and other light olefins were extremely different. The prepared sample with TPABr as the template displayed the highest methanol conversion (99.37%) and propylene selectivity (37.59%).results.

کلمات کلیدی:

H-ZSM-5; Methanol to light olefins (MTO); Template; Hydrothermal synthesis

لینک ثابت مقاله در پایگاه سیویلیکا: