

## عنوان مقاله:

Selective production of light olefins from methanol over desilicated highly siliceous ZSM-5 nanocatalysts

## محل انتشار:

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## خلاصه مقاله:

Highly siliceous ZSM-5 nanocatalysts can dehydrate methanol to a wide range of hydrocarbons. In this study, the development of hierarchical H-ZSM-5 nanocatalysts (Si/Al=200) were reported for the methanol-to-olefins (MTO) reaction. The nanocatalysts were prepared through a hydrothermal technique and treated by NaOH desilication. The parent and desilicated nanocatalysts were characterized using FE-SEM, XRD, FTIR, NH<sub>3</sub>-TPD and N<sub>2</sub> adsorption-desorption techniques. The mesoporosity increased five times without significant collapse of the crystalline framework as a result of the appropriate desilication of H-ZSM-5 nanocatalyst. For the nanocatalyst, a high surface area of 189.5 m<sup>2</sup> g<sup>-1</sup>, mesopore volume of 0.35 cm<sup>3</sup> g<sup>-1</sup> and well-adjusted strong acidity of 0.16 mmol NH<sub>3</sub> g<sup>-1</sup> resulted in a high methanol conversion of 100%, high propylene selectivity of 43% and low light paraffins selectivity of <8% in the MTO reaction. A broad mesopore size of 2-10 nm suppressed coke deposition and provided a long catalytic life time of 75 h. The developed high silica nanocatalyst showed a high potential for industrial applications due to its stable performance. Polyolefins J (2017) 5: 59-70

## کلمات کلیدی:

Hierarchical zeolites; ZSM-5; desilication; nanocatalyst, MTO

## لینک ثابت مقاله در پایگاه سیویلیکا:

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