

Methanol conversion on the stability enhanced SAPO-34 catalyst

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The conversion of methanol to light olefins process(MTO) on small pore molecular sieve catalysts such as SAPO-34 is an attractive process as an alternative technology to the thermal cracking process of naphtha for the synthesis of olefins. In this study, we synthesized SAPO-34 and SAPO-5 catalysts using a mixture of morpholine and tetraethylammonium hydroxide (TEAOH) as template in the synthesis gel composition containing $1 \text{ Al}_2\text{O}_3 : 1 \text{ P}_2\text{O}_5 : 0.6 \text{ SiO}_2 : x \text{ morpholine} : (2-x)\text{TEAOH} : 52\text{H}_2\text{O}$. The catalysts were characterized by XRD, SEM, TG/DTA, ICP-AES, BET, and NH_3 -TPD. The catalytic activity tests using the SAPO catalysts were conducted to MTO reaction. In this work, we discuss the effects of preparation method on the catalyst lifetime of SAPO-34 for MTO reaction. In the case of SAPO-34, all the catalysts showed similar activity and product distribution in the MTO catalytic reaction. However, the catalyst obtained in mixture of 75 % morpholine and 25 % TEAOH gave the longest lifetime, where the lifetime was increased to 5 times more compared with that of the catalyst synthesized with 100 % morpholine.