

Synthesis and characterization of gallosilicate MFI Zeolites : Effect of Si/Ga ratio on acidity and MTO reaction

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The tuning the acidity of zeolites as catalysts have been studied extensively. The framework substitution with other hetero atom instead of aluminum is well known to affect the acidity and in general the strength of the acidity is as follows : Al(OH)Si > Ga(OH)Si > Fe(OH)Si >> B(OH)Si. In particular, the deactivation of the methanol-to-olefin (MTO) reaction is due to the formation of coke in the pores and channels at the active acid sites. The corresponding critical coke deposition can be controllable through the framework substitution. In this work, gallosilicate MFI zeolites were synthesized with the controlled Si/Ga ratios to obtain a desired olefin yield. The physicochemical properties of the catalysts were investigated by XRD, N₂ adsorption, SEM, EDX and NH₃-TPD analysis. The catalytic activity of MTO reaction was also measured at 673 K with 1.2 h⁻¹ WHSV.