

### **130c Factors That Affect the Mesoporosity Development in Zsm-12 by Desilication**

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The development of mesopores around 15-20nm by alkaline treatment in a unidimensional high silica content zeolite, namely ZSM-12 was achieved. The factors that affect the generation of mesopores were thoroughly investigated. For the ZSM-12 with Si/Al ratio of 58, mesopores with volume from 0.25cm<sup>3</sup>/g to 0.55 cm<sup>3</sup>/g were generated without destroying the microporous structure of ZSM-12 by varying the NaOH solution concentration, operation temperature and time. Meanwhile, parent ZSM-12s with different Si/Al ratios in the range from 30 to 140 were also treated in order to investigate the influence of Si/Al ratios on the desilication of ZSM-12. For the ZSM-12 with relatively low Si/Al ratios ranging from 30 to 58, relatively high temperature or high NaOH concentration was favorable for the generation of mesopores while preserving the microporous structure and acidic property of ZSM-12. However, for the samples with higher Si/Al ratios, lower temperature or lower NaOH concentration were more appropriate for the creation of mesopores. This behavior indicated the content of tetrahedrally coordinated aluminum in the structure controls the mesopores formation by desilication in alkaline medium. For the as synthesized ZSM-12 prior to the removal of template, Si was more difficult to be extracted than the calcined samples with comparable Si/Al ratios, which also had an influence on the desilication process. The adjustable mesopores developed in ZSM-12 by alkaline treatment opened a new and economic path for the improvement of diffusion in the zeolite framework.