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SYNTHESIS OF FERRIERITE/ZSM-35 TYPE ZEOLITE WITH ETHYLENEDIAMINE AS TEMPLATE

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Abstract

The crystallization of ferrierite/ZSM-35 zeolite at 180 ± 5^0C in the presence of ethylenediamine as a structure-directing agent from reaction mixtures containing various active $NaOH/SiO_2$ ratios has been studied. X-ray diffraction, scanning electron microscopy, TG/DTG/DSC analysis, nitrogen sorption measurements and temperature-programmed ammonia desorption were used to characterize the ferrierite/ZSM-35 solids. The XRD data reveal that the samples synthesized in optimized conditions are fully crystalline and pure. The SEM results prove that the shape and size of crystals are influenced by the pH of the synthesis gel and the crystallization time. The TG/DTG/DSC curves confirm the presence of ethylenediamine in the crystalline voids of ferrierite/ZSM-35. The temperature-programmed ammonia desorption curve of H-ferrierite/ZSM-5 presents two peaks of desorbed ammonia, one characteristic to the weak acid sites (low-temperature) and the other one to the strong acid sites (high-temperature).

Key words: ethylenediamine, ferrierite/ZSM-35, morphology, synthesis

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