

MFI型沸石晶体的择优定向生长

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摘要 首次采用“双模板剂”法在SiO₂-Na₂O-正丙胺-溴化N-乙基-六亚甲基四胺(EtHMTA⁺)-NaF-H₂O体系中合成得到了b轴择优取向的ZSM-5(MFI型)晶体,并用扫描电镜(SEM)

和XRD进行表征。择优取向程度与所用的两种模板剂的比例有关,当正丙胺:EtHMTA⁺比为0.7:0.3时,ZSM-5晶体择优取向最明显。

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Preferentially oriented growth of MFI-type zeolite crystals

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Abstract A novel "double-template" method has been developed to hydrothermally synthesize high silica MFI-type zeolite crystal with preferentially oriented growth along ac-plane. The reactant system for the synthesis is SiO₂-Na₂O-n-propylamine (n-PrNH₂)-N-ethyl-hexamethylene tetrammium bromide (EtHMTA⁺)-NaF-H₂O. SEM images show that almost all as-synthesized single crystals of the zeolite are in flat and thin form with (010) plane parallel to the test plate. The XRD patterns show that the intensity of (0k0)(k=2n) peaks is much stronger than that of any other peaks, indicating that the as-synthesized crystals are b-axis preferentially oriented on the test plate. The fraction of b-axis orientation of the crystals is strongly dependent on the ratio of the two templates used in the reactant, n-PrNH₂ and EtHMTA⁺. The optimal molar ratio of n-PrNH₂ to EtHMTA⁺ is 0.7:0.3 for the preferentially oriented growth of MFI-type zeolite crystals.

Key words [ORIENTED GROWTH](#) [ZEOLITE](#) [CRYSTALS](#) [SILICON DIOXIDE](#) [SODIUM OXIDE](#) [QUATERNARY AMMONIUM COMPOUNDS](#) [SODIUM FLUORIDE](#) [SCANNING ELECTRON MICROSCOPES](#) [X-RAY DIFFRACTION ANALYSIS](#) [ORIENTATION](#)

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