

研究论文

MCM-36分子筛的合成及其苯与丙烯烷基化性能研究

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摘要 分别从MCM-22和MCM-49前驱体出发合成了MCM-36分子筛, 在液-固固定床反应器上对MCM-36分子筛的苯与丙烯液相烷基化反应性能进行了评价. 由MCM-22前驱体出发合成的MCM-36(A) 结晶度良好, 比MCM-22具有更高比表面积和介孔孔容, 酸量明显下降. 由MCM-49前驱体出发合成的MCM-36(B)的比表面积和介孔孔容增加, 小角XRD特征衍射峰强度低于MCM-36(A), 与MCM-49相比酸量下降幅度较小. 在苯与丙烯液相烷基化反应中MCM-36(A)的活性与MCM-22相当, 丙烯的转化率大于99.5%, 异丙苯的选择性比MCM-22提高了7%. MCM-36(B)的反应活性高于MCM-36(A), 而异丙苯的选择性低于MCM-36(A). MCM-36分子筛上苯与丙烯液相烷基化反应活性的提高归因于有效酸性位点的增加, 异丙苯选择性的提高则主要归因于B酸量的降低.

关键词 [MCM-36分子筛](#) [MCM-22前驱体](#) [MCM-49前驱体](#) [烷基化](#)

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Synthesis of MCM-36 Molecular Sieve and Studies on Catalytic Performance of MCM-36 on Benzene Alkylation with Propylene

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Abstract Pillared layered MCM-36 zeolites were prepared from MCM-22 and MCM-49 precursors with polymeric silica as the pillaring agent, respectively. The structure and acid properties of samples were studied by means of N₂ adsorption, XRD, and FTIR. A higher BET specific surface area and a significant mesopore volume is obtained for MCM-36(A). The amount of Brønsted and Lewis acid sites in MCM-36(A) decreases obviously compared to MCM-22 resulting from the same precursor. For MCM-36(B) synthesized from MCM-49 precursor, the intensity of low angle XRD peak is lower than that of MCM-36(A), and the amount of acid sites decreases moderately compared to MCM-49. Under our operation conditions, the MCM-36(A) zeolite shows a higher activity and selectivity to cumene than MCM-22 zeolite. MCM-36(B) exhibits a higher activity but lower selectivity to cumene compared to MCM-36(A). Combined with the characterization results of acidic properties and textural parameters, we suppose that the increase of the selectivity to cumene in MCM-36 should be mainly due to the decrease of the density of Brønsted acidity, while the improvement of the catalytic activity of MCM-36 can be mainly assigned to the presence of a larger amount of structurally accessible acid sites in this material.

Key words [MCM-36 molecular sieve](#); [MCM-22 precursor](#); [MCM-49 precursor](#); [Alkylation](#)

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