

HZSM-5沸石孔口改性及其择形分离性能

乐英红,唐颐,高滋

复旦大学化学系

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摘要 采用Si(OCH₃)₄化学气相沉积方法精细调变HZSM-5孔径, 焙烧后在沸石外表面上沉积一薄层氧化硅, 使沸石孔口有控制地被缩小。制备了一系列氧化硅沉积量不同的SiHZSM-5沸石, 并用红外光谱, NH₃-TPD和吸附方法对其进行表征, 结果表明沸石骨架结构, 内孔孔容和内表面性质基本不变。测定了SiHZSM-5沸石对于二甲苯和甲酚异构体的择形吸附性能, 发现在沉积量适当的SiHZSM-5沸石上能够成功地实现对二甲苯和对甲酚的择形选择吸附分离, 因为复合孔口缩小后将大的间位异构体排除在外, 而沸石总吸附容量仍保持较高水平。

关键词 [甲酚](#) [红外分光光度法](#) [二甲苯](#) [氧化硅](#) [结构与性能关系](#) [气相沉积](#) [HZSM-5](#) [孔口改性](#) [择形吸附分离](#) [甲氧基硅](#)

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Studies on the control of pore-opening size of HZSM-5 and its shape-selective adsorption

LE YINGHONG, TANG YI, GAO ZI

Abstract The pore-opening size of HZSM-5 was finely controlled by the chemical vapor deposition of Si(OCH₃)₄. After calcination a thin layer of silica was deposited on the external surface and narrowed the pore-opening of the zeolite effectively. A series of HZSM-5 zeolite samples with different amount of silica deposition (SiHZSM-5) were prepared and characterized by IR spectroscopy, NH₃-TPD and adsorption measurements. It was found that after deposition and calcination the zeolite framework structure, pore volume and internal surface properties were essentially unaltered. The shape-selective adsorption of xylene and cresol isomers on SiHZSM-5 was investigated. The separation of p-isomer from mixed isomers of xylene or cresol can be achieved successfully by using SiHZSM-5 with proper silica deposition extent, because the larger m-isomer molecules are refrained from adsorption due to the narrowed pore-opening while the total adsorption capacity of the zeolite keeps at a reasonably high level.

Key words [CRESOL](#) [INFRARED SPECTROPHOTOMETRY](#) [DIMETHYLBENZENE](#) [SILICON OXIDE](#) [STRUCTURE AND PROPERTY CORRELATION](#) [VAPOR PHASE DEPOSITION](#) [HZSM-5](#)

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