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无机原料体系合成TS-1影响因素的研究

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摘要 以廉价的硅溶胶和三氯化钛分别作为硅源和钛源，四丙基溴化铵(TPABr)为模板剂，二乙胺、正丁胺、氨水等作为碱源，在无机体系中合成了TS-1分子筛。采用XRD,IR,UV-vis,SEM，元素分析和N2吸附/脱附等对合成的分子筛进行了表征。详细考察了碱源、硅钛比N2保护、晶种、模板剂用量、硅源及晶化时间等因素对分子筛合成的影响。结果表明，以无机原料合成的TS-1与用传统有机原料合成的TS-1具有同样的特征。碱度的控制是合成的关键，配胶时需N2保护，加入晶种对合成有明显的导向作用，模板剂最低用量有一临界值，硅溶胶作硅源合成的TS-1晶粒比较大。

关键词 沸石 硅溶胶 氯化钛 四丙基溴化铵 X射线衍射分析 红外分光光度法 紫外分光光度法 影响因素 丙烯P 环氧化反应

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The influence parameters on the synthesis of TS-1 from inorganic reactant system

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Abstract Titanium silicalite-1(TS-1) was synthesized from inorganic reactant system using cheap colloidal silicon and TiCl3 aqueous solution as the silicon and titanium sources, respectively, TPABr as the templating agent, and diethylamine, n-butylamine, ammonia as base to provied the alkalinity necessary for crystallization. The ST-1 synthesized from the inorganic reactant system has been demonstrated to have the same characteristics with the standard TS-1 from organic synthesis system by XRD, IR, UV-vis, SEM, elemental analysis and N2 adsorption/desorption. The influence of various synthesis parameters such as base source, SiO2/TiO2 ratio, N2 protection, seed crystals, amounts of template, silicon source and crystallization time has been investigated in detail. It has been shown that the control of basicity of the reaction mixture is critical for the synthesis; N2 protection is essential when reactants were mixed; adding seeds can greatly facilitate the formation of the TS-1 crystal; there is a critical value for the minimum amount of TBABr required to crystallize TS-1; TS-1 crystals obtained with colloidal silicon are usually large.

Key words ZEOLITE SILICA SOLUTION TITANIUM CHLORIDE X-RAY DIFFRACTION ANALYSIS INFRARED SPECTROPHOTOMETRY ULTRAVIOLET SPECTROPHOTOMETRY INFLUENCING FACTORS PROPENE P EPOXIDATION REACTION

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