

非离子型表面活性剂在SiO2凝胶中的造孔作用

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摘要 以非离子型表面活性剂C13EO9(或简写为AEO9)为模板剂，在强酸性的乙醇-水体系中通过溶胶-凝胶途径合成SiO2分子筛。结果表明，经焙烧去除模板剂以后的分子筛具有双孔分布的特征，孔径主要集中在2.56nm和13.95nm。经高分辨电镜(HRTEM)和X射线衍射(XRD)测试分析，前者呈有序排列，类似于MSU系列分子筛的孔道结构，而后者则呈无序的排列，它是由胶体粒子聚集而形成的颗粒间孔，并与在相同条件下不加AEO9制备的无定形SiO2凝胶以及用离子型表面活性剂十六烷基三甲基溴化铵(CTAB)代替AEO9为模板剂制备的分子筛进行了比较，二者的孔道结构分别呈无序排列和六方有序排列的单一孔分布特征。

关键词 [非离子表面活性剂](#) [二氧化硅](#) [分子筛](#) [溶胶-凝胶法](#) [X射线衍射分析](#) [模板剂](#)
[溴化十六烷基三甲铵](#)

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The creation of mesopore in silica gel by nonionic surfactant

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Abstract Double-mesopore silica molecu^lr sieves have been synthesized in strong acidic ethanol-water system using nonionic surfactant C13EO9 via sol-gel route. The pore diameter was mainly located at 2.56 and 13.95 nm respectively. The former relative small pore was proved to be packed ordering like that of MSU series molecular sieves, while the larger pore was packed disordering and it was formed by the aggregation of colloid partiles. The structure of the present double-pore molecular sieves was also characterized by XRD, TEM and nitrogen adsorption-desorption measuremnets. At the same time, preparations that without C13EO9 and replacing C13EO9 with CTAB were also carried out parallelly for comparison. The obtained amorphous silica gel prepared without surfactant and the molecular sieves prepared with CTAB were all proved to be single-pore distributed.

Key words [NON IONIC SURFACTANTS](#) [SILICON DIOXIDE](#) [MOLECULAR SIEVE](#) [SOL-GEL PROCESS](#) [X-RAY DIFFRACTION ANALYSIS](#) [TEMPLATE AGENT](#)

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