

Full Paper

二氧化锡纳米粒子在高硅TON, MFI和FAU型沸石外表面的形成和聚集

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摘要 将高硅TON, MFI和FAU沸石分别浸渍于SnCl₂溶液, 再于873 K温度下焙烧,

在高硅TON, MFI和FAU沸石外表面制备出二氧化锡纳米粒子。用XRD和SAED表征生成物的物相,

TEM表征形成二氧化锡纳米粒子的形貌、尺寸和聚集状态。结果显示: 在TON,

MFI和FAU沸石外表面形成二氧化锡纳米粒子的尺寸分别在8 nm, 10-80 nm和6 nm。在室温下用40%的氢氟酸分解SnO₂-

TON和SnO₂-MFI分别得到二氧化锡微胶囊和网状的二氧化锡纳米结构。同在NaY沸石表面形成的纳米二氧化锡比较,

在具有一维孔道体系的TON沸石和二维孔道体系的MFI沸石外表面形成的纳米二氧化锡的形貌与聚集状态都不相同,

这表明沸石的骨架类型、表面结构与特性在沸石外表面形成二氧化锡纳米结构时起重要作用。

关键词 [纳米材料](#), [二氧化锡](#), [TON沸石](#), [MFI沸石](#), [FAU沸石](#)

分类号

Forming and Gathering of SnO₂ Nanoparticles on External Surface of High Silica TON, MFI and FAU Type Zeolites

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Abstract Tin dioxide (SnO₂) nano-particles were prepared on high silica TON, MFI and FAU type zeolites by impregnation of SnCl₂ solution and subsequent calcination at 873 K. XRD and SAED were used to characterize the crystalline phase, and TEM was used to characterize the morphology, the particle size and the agglomerative state of the formed nano-materials. The nano-particles, which possess 8 nm, 10—80 nm and 6 nm in size, were found to form on the outer surface of TON, MFI and FAU zeolites, respectively. SnO₂ microcapsules and SnO₂ netlike nanostructure were obtained by decomposition of SnO₂-TON and SnO₂-MFI in 40% hydrofluoric acid at room temperature. Compared with the nano-particles formed on NaY zeolite, the special morphology and the agglomerative state of SnO₂ nanostructures on TON and MFI type zeolites with one and two dimension channel system indicate that the heterogeneous framework, surface structure and property perform important function for forming and growing SnO₂ nanostructure on the outer surface of the zeolites.

Key words [nano-material](#) [tin dioxide](#) [TON zeolite](#) [MFI zeolite](#) [FAU zeolite](#)

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