

Direct Synthesis of Titanium Incorporated SBA-16 Molecular Sieves

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Highly ordered three dimensional (3-D) cubic TiSBA-16 molecular sieves with different nSi/nTi ratio have been prepared through direct synthesis under highly acidic condition. The structure and the textural properties of the materials were characterized by X-ray diffraction, N₂ physisorption, SEM, and TEM analysis. XRD analyses confirmed well-ordered mesostructures in all of these materials. N₂ adsorption-desorption isotherms of TiSBA-16 prepared showed a type IV isotherm with H₂ hysteresis loops according to IUPAC classification. The nature and the coordination of the Ti atoms in SBA-16 prepared with various Ti content were investigated by UV-vis spectroscopy. It has been found that the Ti atoms are well-dispersed and mostly occupy the tetrahedral coordination. SEM analyses indicate the spherical particle morphology. TEM clearly showed the uniform pore structure present in the materials prepared.