



SYNTHESIS OF HIGHLY ORDERED TITANIUM-CONTAINING SBA-15 MESOPOROUS SILICAS FOR CATALYTIC ECO-FRIENDLY OXIDATIONS

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Abstract

Mesoporous Ti-SBA-15 materials have been synthesized up to a Si/Ti ratio of 20 using a two-step pH adjusting method. Low angle X-ray diffraction and diffuse reflectance UV-Vis spectroscopy revealed that the optimal pH value to synthesize highly ordered mesoporous solids having Ti atoms primarily in tetrahedral coordination environments is around 7.5. The nitrogen physisorption and TEM indicated also ordered mesostructures having relatively large surface areas and uniform mesopore size distribution. It was found that the amount of Ti (IV) increases with the decrease in the Si/Ti ratio. High titanium to silicon ratios (>20) lead to the formation of nanosized anatase phases. DR UV-vis results demonstrated the formation of Ti-OOH active functionalities at the Ti (IV) sites of Ti-SBA-15 upon exposure to H₂O₂ aqueous solution.

Key words: titanosilicates, mesoporous materials, SBA-15, pH-adjusting, DR UV-vis

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