



Hydrothermal Synthesis of Mesoporous Sulphated Zirconia

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Abstract: The present study focuses on the synthesis to obtain mesoporous zirconia and sulphated zirconia. Sulphated zirconia has been prepared by a two-step synthesis via a hydrothermal route and calcined at 600°C, wherein the sulphate moiety has been introduced on the surface. Sulphated zirconia has many important industrial applications, especially in the field of oil industry as a catalyst. The obtained zirconia and sulphated zirconia have been characterized for BET surface area, pore volume, and pore size distribution by nitrogen adsorption/desorption method, NH₃-TPD, H₂-TPR, X-ray diffraction (XRD), Fourier transform spectroscopy (FTIR), Thermogravimetric analysis (TGA), and Scanning electron microscope (SEM). The prepared zirconia materials are crystalline in nature and have a high surface area (225 m²/g) and higher acidity (7.15 ml/g).

Keywords: Zirconia; sulphated zirconia; hydrothermal; BET; TPD/TPR.