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Synthesis and characterization of Ba/MCM-41

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Abstract: Mesoporous Ba/MCM-41 type materials (Ba/MCM-41) with high Ba/Si molar ratios between 0.025 and 0.1 were synthesized by direct hydrothermal synthesis. The samples were characterized by XRD, nitrogen adsorption, TGA-DTA, FTIR, SEM-EDS, and TEM techniques. BET surface areas of samples with various Ba loadings were found between 722 and 931 m^2/g with 28 Å average pore size, which is consistent with the pore size of 30 Å for pure MCM-41 samples synthesized by the same procedure. The crystal structures of synthesized MCM-41 and Ba/MCM-41 were confirmed by XRD analysis. Among the investigated Ba/MCM-41 samples, the formation of barium oxide and barium nitrate species besides silicates was also observed in the high angle region XRD patterns.

Key Words: MCM-41, Ba, hydrothermal synthesis

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