

Direct Synthesis of Mesoporous zeolite X from Bottom Ash With Microwave

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Coal ash, which has been constantly formed at thermoelectric power plants as an industrial solid waste contains silica and alumina as the major elements. The amount of produced coal ash shows an ever increasing trend. Mesoporous materials with channels or pores have attracted much attention for their potential applications as adsorbents and versatile catalysts. The aim of this research is to prepare mesoporous Zeolite X with microwave irradiation which can be used as CO₂ adsorbents by using carbon source in bottom ash as hard template. The obtained samples are characterized by low-angle X-ray diffraction (XRD), Scanning electron microscope (SEM), Transmission electron microscope (TEM) and Brunauer-Emmett-Teller (BET) to confirm introduction of mesoporosity. The adsorption capacity of mesoporous Zeolite X is also investigated by temperature swing adsorption (TSA) from 40°C to 140°C.