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Investigation of the Microporous and Mesoporous Structures of the Reşadiye (Tokat/Turkey) Bentonite and its Fractions

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Abstract: It was determined by X-ray diffraction that, besides containing clay minerals such as montmorillonite and illite, the original bentonite contained also clinoptilolite, opal-C, quartz, calcite and dolomite. The original bentonite was separated into four fractions by decantation and precipitation from its aqueous suspension. The adsorption and desorption of nitrogen on the original bentonite and its fractions at 77 K were investigated. The specific surface areas of the samples were determined according to the methods of Brunauer-Emmett-Teller, de Boer-Lippens, and Harkins-Jura by using the adsorption data. The mesopore size distribution curves were plotted by using the desorption data. The specific micropore and the specific micropore-mesopore volumes were determined by the extrapolation of these curves. The correlation between the specific surface areas and the specific micropore-mesopore volumes is discussed.

Key Words: Adsorption, Bentonite, Montmorillonite, Porosity, Surface Area.

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