Water Vapor Isotherms and Heat of Immersion of Na/Ca-Montmorillonite Systems—I: Homoionic Clay

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Abstract: Adsorption isotherms for water vapor, *c*-spacing and heat of immersion in water of Na- and Ca-montmorillonite were measured at 25° C at various r.h. The amount of water adsorbed as a function of the r.h. increased gradually, whereas the *c*-spacing increased, and the heat of immersion (per mole of adsorbed water) decreased in steps. There was good agreement between the calorimetric data, the heat calculated from the isotherms by use of BET equation, and the calculations from the ion-dipole model. A model is presented to describe the hydration of sodium and calcium montmorillonite.