
Electrical Conductivity of Na-Montmorillonite Suspensions*

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Abstract: The electrical conductivity of Na-montmorillonite suspensions in various salt and clay concentrations was measured. The weight conductance of the clay suspension was found to decrease with increase in clay concentration between 0 and approximately 0.5 g clay/100 ml, then rose to a plateau at 6–10 g clay/100 ml. The weight conductance of the clay suspensions also increased with an increase in the salt solution concentration. If the model of two resistors in parallel is used in interpreting the experimental data, these changes can be attributed to an increase in the mobility of the adsorbed Na ions. It is proposed that the two resistors in series model is more realistic in describing the conductivity of the suspensions. This model predicts the observed weight conductance changes of the suspensions, while the mobility of the adsorbed ions remains constant. A constant mobility of the adsorbed Na ions in clay-water systems of low to medium salt and clay concentrations also is predicted by the diffuse double layer.

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