
The Influence of Pressure on the Electrical Resistivity of Clay-Water Systems*

W. J. Lang[†]

University of Illinois

* Presented at the 14th Conference, Berkeley.

[†] Presently with International Minerals and Chemicals Corp., Libertyville, Ill.

Abstract: The influence of pressure on the electrical resistivity of clay-water systems was investigated and found to reflect the abnormal nature of adsorbed water. The resistivity of montmorillonite-water systems varied with pressure in a manner similar to a dilute salt solution at pressures above 7000 psi. At pressures below this, abnormal pressure-resistivity relations resulted which were attributed to the presence of abnormal water associated with clay mineral surfaces. The pressure-induced breakdown of the abnormal water associated with montmorillonites was found to occur in abrupt stages as indicated by anomalies in the pressure-resistivity curves.

The anomalies indicated that layers of adsorbed water have differing degrees of structural bonding by which variations of the water-orientating ability of clay minerals may be compared. In general calcium montmorillonite was found to allow the most rigid bonding of the adsorbed water while sodium montmorillonite gave rise to the most extensive development of the abnormal water.

The abnormal water was found to re-form with some hysteresis effects when the pressure was released. An increase in temperature was found to decrease both the amount and the relative strength of the abnormal water.

Clays and Clay Minerals; 1967 v. 15; no. 1; p. 455-468; DOI: [10.1346/CCMN.1967.0150145](https://doi.org/10.1346/CCMN.1967.0150145)

© 1967, The Clay Minerals Society

Clay Minerals Society (www.clays.org)
