
Montmorillonite-Organic Complexes—Gas Chromatographic Determination of Energies of Interactions

K. K. Bissada and W. D. Johns

Department of Earth Sciences, Washington University, St. Louis, Mo. 63130* * Present address: Bellaire Research Laboratories, Texaco Inc., Bellaire, Texas.

Department of Earth Sciences, Washington University, St. Louis, Mo. 63130

Abstract: Gas-solid chromatographic measurements of interaction energies were made for the systems ethanol and acetone with K-, Na-, Ba-, and Ca-montmorillonites. The results revealed an increased interaction energy in the order: K-mont. < Na-mont. < Ba-mont. < Ca-mont. Interaction energies ranged from about 14 kcal/mole for K-montmorillonite to about 30 kcal/mole for Ca-montmorillonite. A very good agreement was observed between experimental heats of adsorption values and theoretical values for the electrostatic attractive energy between the respective cations and polar molecules.

These results confirm our earlier suggestions that complex formation takes place through cation-dipole interactions and that the polar molecules solvate the exchange cations in a manner similar to the hydration of cations in aqueous solutions.

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