

Naphthalene Sorption on HPTMA-Modified Clays

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ABSTRACT

Clays coated with cationic surfactants (organoclays) have been investigated due to their effectiveness in sorbing organic compounds from water. The objectives of this study were to (1) study the sorption characteristics of a cationic surfactant (HDTMA) to clay minerals; (2) examine the partitioning of HOC (naphthalene) to the adsorbed surfactants within the context of the first objective; and (3) develop overall HOC distribution coefficients that consider sorbed surfactant amounts. The sorption of hydrophobic organic contaminant was due to partitioning of the organics into the organic pseudophase created by the surfactant tail groups. Sorption of naphthalene by HDTMA-clays at different surfactant surface coverages revealed that the naphthalene K_d values were affected by the surface concentration of surfactant.

In our study the kaolinite was modified with a cationic surfactant to achieve different fractional organic carbon contents and different surfactant molecule configurations on the surface. All of the sorption isotherms were nearly linear and could be described by a distribution coefficient (K_d). The sorption of naphthalene by the surfactant-modified kaolinite was found to be dependent on the bound surfactant molecule configuration as well as on the fractional organic carbon content, but halloysite was not affected by the increase of surfactant amounts. Results from this investigation provide additional insight into the role that sorbed surfactant structure plays in HOC partitioning.