**Interlayer Characterization of HDTMA-Modified Montmorillonite for Use in Contaminant Remediation**

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Use of organically-modified clays (organoclays) has been investigated as a promising and potentially cost-effective method for removing organic contaminants from water. However, important questions remain regarding the chemical environment of the organo-interlayer of the clay and how interlayer chemistry influences contaminant uptake. In this work, we characterize the chemical environment of the interlayer of two hexadecyltrimethyl ammonium (HDTMA)-modified montmorillonites (STx-1b and SWy-2) using total carbon analysis, X-ray diffraction, and infrared spectroscopy, and, for a small number of samples, high-resolution transmission electron microscopy. HDTMA loadings were varied to examine how the degree of organo-modification alters the interlayer chemical environment, and clays were studied under both dry and water-saturated conditions, the latter being relatively rare in the organoclay literature. Our results suggest that the level of organic modification and the process of hydration influence the relative crystallinity of the interlayer organic phase and the interlayer spacing of HDTMA-modified montmorillonite. Ongoing contaminant adsorption studies will elucidate the mechanism(s) of sorption and how the magnitude of contaminant uptake depends on interlayer chemistry. Better understanding of relationships between interlayer chemistry and contaminant uptake will allow for optimization of organoclay design for improved contaminant remediation.