Adsolubilization of Nonionic Organic Compounds into Surfactant-modified Anionic Clays. (S11you104107-Oral)

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Abstract:

Protection and restoration of soils and aquifers contaminated by organic compounds requires development of natural and/or synthetic materials that can be used as adsorbents that effectively remove organic pollutants. In this study, anionic surfactants octylsulfate (OS), dodecylsulfate (DS), 4octylbenzenesulfonate (OBS) and dodecylbenzenesulfonate (DBS) were intercalated into a Mg-Al layered double hydroxide (Mg-Al LDH). Retention of surfactant by Mg-Al LDH decreased in the order: DS > OBS > DBS > OS. X-ray diffraction analysis revealed that surfactant molecules could adopt various configurations in Mg-Al LDH interlayer, with OS forming bilayers and the remaining surfactants exhibiting monolayer arrangements. BET analysis indicated there was a decrease in surface area resulting from intercalation of surfactants. The synthesized organo-LDHs were examined for their abilities to remove nonionic organic compounds 1,2,4-trichlorobenzene and 1,1,1-trichloroethane. Batch adsorption results indicated both organic compounds could be sorbed by all of the organo-LDHs studied, with adsorption affinities dependent upon the type of surfactant used. Adsorption characteristics indicate the retention of both organic compounds on organo-LDHs was due to partitioning mechanisms.

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