



Organoclays for Soil Remediation: Batch and Column studies in Dichlorophenol/Organoclay/Aquifer system

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The aim of this study was to investigate the suitability of clay minerals partially modified by cationic surfactant in remediation techniques. Recent investigations have shown that partially modified organoclays (the exchanged surfactant amount is significantly below the cation exchange capacity, CEC) are effective adsorbents to remove halogenated aromatic compounds from aqueous solutions in batch system. Nevertheless, due to the low hydraulic conductivity of organoclay its application for contaminant elimination has not been investigated under flow condition till now. In this paper, the sorption of 2,4-dichlorophenol (DCP) was thus studied in the presence of organoclay and organoclay/aquifer mixtures using batch and column experiments as well.

The modified montmorillonite by dioktadecyldimethylammoniumbromide with different coverage showed high sorption affinity to DCP, resulting in the intercalation of the chloroaromatic compound into the organophilic interlayers of the clay. The sorption processes were reversible and completed within minutes in batch system.

Performing column experiments with the mixture of organoclay and aquifer materials seems to be a promising way to increase the low hydraulic conductivity of organoclay. The breakthrough behaviour of DCP was predicted by Hydrus-1D software package using the Freundlich parameters from adsorption isotherm.

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