Role of mineral weathering processes on contaminant fate. (S09-dion113905-Poster)

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Abstract:

Mineral weathering processes have the ability to alter the long-term sequestration (sorption) of contaminants. This work focuses specifically on using tetraphenyl boron as a way to enhance mineral weathering through the extraction of potassium interlayers. Successive chemical weathering steps were conducted in order to produce a range of weathering products. Materials formed from the weathering procedure were examined using a variety of spectroscopic techniques such as: XRD, SEM, and TEM. Results from the spectroscopic investigations indicated that complete degradation of phyllosilicate structure was possible. Additional chemical characterization was conducted to measure the proportion of frayed edge sites and determine the change in selectivity of certain metals (Cs, K, Pb, Ni, U). Sorption/desorption experiments were conducted on weathered materials after 0, 1, 3, 6, and 9 times through the weathering procedure. As expected, an increase in weathering decreased the ability of the soil to specifically retain contaminants, resulting in potential contaminant transport. Utilizing a chemical weathering scheme may aid in the modeling of long-term contaminant fate.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 1315

Keywords:

mineral weathering, metals, sorption/desorption processes