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Electrokinetic Remediation of Uranium Contaminated Soil by Ion Exchange Membranes

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Abstract : The contamination of significant quantities of soils and sediments with uranium and other actinide elements as a result of nuclear activity poses many environmental risks. The electrokinetic process is one of the most promising remediation techniques for sludge, sediment, and saturated or unsaturated soils contaminated with heavy metals and radionuclides. However, secondary waste is a major concern for soil contaminated with nuclides. To minimize the generation of secondary wastes, this study used the anion and cation exchange membranes to improve the performance of the experimental apparatus. Remediation experiments of uranium-contaminated soil were performed with different agents. The results show that using acetic acid and EDTA as chelating agents clearly enhances the migration ability of the uranium. The ion exchange membranes (IEMs) used in the experiments not only reduce secondary wastes, but also, keep the soil pH stable.

Keywords : electrokinetic remediation, ion exchange membranes, soil, uranium
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