

Washing remediation of strontium contaminated soil: Optimization of operating parameters at laboratory conditions

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The chelator-assisted dissolution of strontium (Sr^{II}) in soil was studied at laboratory conditions to comprehend the knowledge in chemical-induced washing remediation of radiogenic waste solids. Stable Sr^{II} -isotopes, which possesses similar biogeochemical behavior to that of strontium radioisotopes ($r\text{-Sr}$), was used as a natural analog to $r\text{-Sr}$. A certified reference material, JSO-1, from Geological Survey of Japan was used as a source of Sr^{II} -containing soil. The impacts of solution pH, complexation of Sr^{II} with chelators, ultrasound, admixtures of chelators, and a large excess of chelators in solution on the extraction of Sr^{II} from soil was evaluated. The Sr^{II} extraction rate with bio-relevant chelators was about 70% than with the environmentally-persistent variants at lower solution pHs and a higher soil to chelator ratio, while the dissolution of the competing geochemically correlated element was much lower.