

Pulsed Electrokinetic Decontamination of Agricultural Lands around Abandoned Mines Contaminated with Heavy Metals

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The abandoned mines which contain heavy metals of high concentration including zinc, cadmium, arsenic and lead have damaged to people and the surrounding environment. In this study, the feasibility on electrokinetic remediation of Zn and Cd from the contaminated lands was investigated in the laboratory with field soils. The experiments were conducted by two different power supplies to compare normal electrokinetic remediation with enhanced electrokinetic remediation using pulsed power supply. Enhanced electrokinetic remediation using pulsed electric field will be expected to diminish the polarization process and to increase desorption of heavy metals from soil surface and to reduce the electrical power consumption. Zn and Cd are eliminated from soil by electromigration and electroosmosis mechanisms. In anode side, 0.1M MgSO₄ was used to supply sufficient amount of ion from the electric chamber to soil section, however, 0.1M HNO₃ was supplied to prevent the precipitation in the cathode. Power consumption in pulsed electrokinetics was lower to half compared to normal electrokinetics and accumulated electro-osmotic flow was 2/3 of normal one.