ELECTROCINETIC REMEDIATION ON CESSIUM (Cs) CONTAMINATED SOILS USING 2*D* ELECTRODE CONFIGURATION OF TETRAGONAL ANODE AND POT SHAPED CATHODE

ABSTRACT

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There has been study on the electrokinetic remediation in cesium contaminated soil with 2D electrode configuration of tetragonal anodes and pot-shaped cathodes using oxalic acid electrolytes and distilled water as electrolyte. In electrokinetic remediation three different soil layers were used, the first soil layer humic soil, the second layer sand and the third soil layer using soil originating from Kotagede, Yogyakarta, Indonesia 300 mg / Kg artificially contaminated in five saturation process cycles using deionized water and dried in the open air. Electrokinetic remediation was carried out using titanium anode electrodes and pot-shaped stainless steel cathode rods with a constant voltage of 20 V for 30 days. During the electrokinetic remediation process, it was observed that changes in situ pH, electrolyte conductivity, electrolyte pH and current measurements recorded every 30 seconds using a data logger. Characterization of mineral content contained in the soil was analyzed using X-Ray diffraction (XRD) and determination of cesium concentration was carried out by Atomic Absorption Spectroscopy (AAS) analysis. The results showed that 2D electrode configuration using oxalic acid as electrolyte can move cesium from the third soil layer (contaminant) towards the first soil layer near the cathode area amount 17,50 %. The success factor of electrokinetic remediation is supported by in-situ soil pH in acid condition which causes a high concentrations of dissolved Cs^+ ions. While the movement of cesium to the surface is affected by high electrolyte electroconductivity which results in high electric currents during the electrokinetic remediation process, thus helping cesium movement towards the ground surface.

Key Word: Cesium, Electrokinetic Remediation, Oxalic Acid, Konfiguration 2*D* Electrode