



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.12 No.06, pp 116-124, 2019

Mitigation of Contamination Levels and Ecological Risk of Toxic Metal Contaminated Soil using CA-EKSR Process

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Abstract : Many studies have focussed on decontamination of the soil by incorporating electrokinetic technologies. However, these not considered to determine the contamination and decontamination levels before and after treatment. We addressed this problem and determined the decontamination levels of toxic metals(TMs) after treatment. In this study, TMs contaminated granite mining soil was treated with the chelating agents and electrokinetic soil remediation (CA-EKSR) process. After 20 days of treatment, we determined the decontamination levels and ecological risk indices of TMs through pollution index (PI), Geo-accumulation index (I_{geo}) and potential ecological risk index (RI). The removal performance of TMs was found in CA-EKSR (citric acid and EDTA as chelating agents) treatment about 5-6 times more than when conventional treatment. The overall ecological risk index (RI) was reduced from 224 to 35.6, after treatment with chelating agent, which indicated that the soil has low environmental risk. It is observed that the CA-EKSR treatment was an effective in the remediation and mitigation of TMs from contaminated mining waste. The study is useful for the researchers to investigate the soil quality, contamination levels and ecological risk indices particularly in the soil decontamination studies.

Keywords : Electrokinetic technology, Heavy metals, chelating agents, Pollution index, Geo-accumulation index.

Koteswara Reddy G /International Journal of ChemTech Research, 2019,12(6): 116-124.

DOI= <http://dx.doi.org/10.20902/IJCTR.2019.120615>
