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EFFECTS OF ADDING CALCIUM CHLORIDE IN ELECTROLYTES ON THE REMOVAL EFFICIENCY OF HEAVY METALS IN SOIL BY VERTICAL ELECTRO-KINETIC METHOD

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Abstract

Soil heavy metal pollution is an important environmental issue, and the electro kinetic method has been considered as an effective remediation technology for removing heavy metals from soil. In electro kinetic study, the properties of the electrolyte such as pH value, electrical conductivity and surface tension are the essential factors affecting the soil remediation efficiency. A previous study has shown that the Effective Microorganisms (EM) could be a potential electrolyte for soil electro kinetic experiment. This study tested the effect of adding additional calcium chloride in EM combined with vertical electric flushing method on soil heavy metal removal. The test soil sample was collected from farmland polluted by heavy metals in Changhua County in Taiwan, and the soil mainly contained copper and zinc. After 21 days of vertical electric flushing study, the total copper removal rate followed the following order: EM+0.01M calcium chloride (54.8%) > EM (31.25%) > EM+0.05 M (19.67%). The total zinc removal rate followed the following order: EM (69.36%)> EM+0.01M calcium chloride (65.71%) > EM+0.05M calcium chloride (55.55%). Overall as the concentration of calcium chloride added to the EM bacterial solution increase. Overall, adding

0.01 M calcium chloride in EM could significantly improve the copper removal efficiency. But for zinc, adding calcium chloride does not significantly help the removal rate of zinc.

Keywords

Vertical Electric Flushing, Soil Heavy Metals, Effective Microorganism, Calcium Chloride