

### Removal of As, Cu and Pb from Spiked Kaolin Using Natural Chelating Agents

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In this study, the effect of natural chelating agents (NCAs) including humic acid and fulvic acid on the removal of heavy metals from spiked kaolin was investigated. Natural chelating agents have various functional groups which could form chelating bonds with heavy metals and enhance their mobility in soil. White kaolin was artificially spiked with metals, where the initial concentrations were 296.6 mg As/kg, 866.2 mg Cu/kg, and 1413.9 mg Pb/kg, respectively. Effects of reaction time, initial concentration of NCAs, pH, and the concentration of solubilized Fe and Al were evaluated. As results, 5 g/L of humic acid enhanced the removal of As and Pb, and 1 g/L of fulvic acid showed increased the removal of As over 30 %. Because most of Cu was in the exchangeable form, it was easily removed without additives and even hindered to be mobilized with humic acid. The concentrations of solubilized Fe or Al were correlated with As with over 0.9 R<sup>2</sup> for both humic acid and fulvic acid. It seemed that solubilized Al or Fe were also enhanced the leaching potential of As and Pb due to their chelating capability. In conclusion, natural chelating agents could be applied to remove heavy metals from kaolin effectively. This research was supported by a grant from R&D program funded by Korea Ministry of Knowledge Economy.