



## In situ XANES studies of copper in a contaminated soil under electric field

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Speciation of copper in a contaminated soil during electrokinetic treatments has been studied by in situ X-ray absorption near edge structural (XANES) spectroscopy. The least-square fitted XANES spectra show that CuCO<sub>3</sub>(68%) and CuCl<sub>2</sub> (32%) are the major copper species in the contaminated soil. In the presence of H<sub>3</sub>PO<sub>4</sub> (40%), 95% of CuCl<sub>2</sub> and 28% of CuCO<sub>3</sub> are dissolved into the aqueous phase. After 90 minutes of the electrokinetic treatments, at least 26% of Cu(II) are transported toward the cathode under the electric field (1-5 V/cm). Similar dissolution behavior of copper from the soil with 40% of H<sub>3</sub>PO<sub>4</sub> and 2% of H<sub>2</sub>O<sub>2</sub> is also observed. Migration of Cu(II) to the cathode is highly enhanced under the electric field (5 volts/cm) in the first 90 minutes of the electrokinetic process.