

A Carbon and Nitrogen XANES Study of Copper and Nickel Binding to Fulvic Acid. (S02-howe401429-poster)

Authors:

- J.A. Howe* - *Univ. of Wisconsin*
- W.F. Bleam - *Univ. of Wisconsin*
- P.A. Helmke - *Univ. of Wisconsin*

Abstract:

The functional groups involved in metal binding to humic substances can be potentially identified by carbon and nitrogen x-ray absorption near edge spectroscopy (XANES). Copper and nickel binding to fulvic acid was investigated at pH 4, 6, and 8. Nitrogen XANES spectra reflected the dominance of amide and aromatic nitrogen groups in fulvic acid. There was no indication of metal binding by amide groups, but there was evidence of Cu binding in the peak attributable to aromatic nitrogen. This peak slightly increased and shifted to higher energies as the Cu concentration increased, but was not affected by pH. Carbon XANES spectra of fulvic acid were dominated by peaks attributable to carboxyl groups and carbon-carbon double bonds, but no evidence of Cu or Ni binding was observed. These results suggest that aromatic nitrogen groups play an important role in metal binding thus influencing the mobility and bioavailability of metal ions in the environment.

Speaker Information: Julie A. Howe, Univ. of Wisconsin, Dept. of Soil Science 1525 Observatory Dr., Madison, WI 53706; Phone: 608-262-0397; E-mail: jhowe@wisc.edu

Session Information: Wednesday, November 5, 2003, 4:00 PM-6:00 PM

Presentation Start: 4:00 PM (Poster Board Number: 1425)

Keywords: XANES; humic substances; copper; nickel