Spatial Relationships between Metals and Microorganisms in a Contaminated Soil Materials. (S09-schulze161819-Poster)

Authors:

- H.D.Ruan* - *Purdue University*
- D.G.Schulze - *Purdue University*
- R.F.Turco - *Purdue University*

Abstract:

Many contaminated soils contain both heavy metal and organic pollutants. Our objective is to determine the impact of metal-rich, inorganic contaminants on the spatial distribution of microorganisms in a soil containing both inorganic (total Pb, 5054-12357; Cr, 365-1494 mg kg-1) and hydrocarbon contaminants, by determining the distribution of microbial colonies relative to the finely distributed inorganic phases. We stained the microbes in the whole soil with acridine orange, imbedded the soil in epoxy resin, prepared thin sections, and used fluorescent microscopy to locate the microbial colonies. We used a combination of light microscopy and synchrotron-based micro-x-ray diffraction and x-ray fluorescence to locate and identify the inorganic pollutants. Pb and Cr were present in the same phase, PbCrO4, known as 'chrome yellow pigment' or crocoite. Sub-millimeter Pb-Cr-rich grains had the same composition as larger areas of bulk material, indicating physical rather than chemical dispersion. Although our microscopy technique is still being refined, chromophore fluorescence is maintained throughout resin impregnation and thin section preparation. (Supported by USDA NRI and DOE NABIR.)

Corresponding Author Information:

Darrell Schulze
Purdue University
1150 Lilly Hall
West Lafayette, IN 47907-1150

phone: 765-494-8786
fax: 765-496-2926
e-mail: dschulze@purdue.edu

Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 1416

Keywords:
metals, bioremediation, fluorescent microscopy, x-ray microprobe