



*2009 CSREES National Water Conference; St. Louis, MO*

**Aqueous lead adsorption by activated carbon modified with ethylenedimine**

John Yang\*, Jianzhong Zhu, Baolin Deng  
Lincoln University of Missouri  
\*yangj@lincolnu.edu

Abstract:

This study is to develop a carbon-based adsorbent containing multi-functional ligands for effective removal of lead (Pb) ions from aqueous media. Activated carbon (AC) was oxidized by nitric acid, followed by chlorination with thionyl chloride and reaction with ethylenediamine. Modified activated carbon (MAC) was characterized using scanning electronic microscopy in conjunction of energy dispersive spectroscopy (SEM-EDS), Fourier transform infrared spectroscopy (FT-IR), and potentiometry. The effectiveness of Pb removal was evaluated by batch experiments of adsorptive kinetics and equilibrium isotherm. Surface characterizations confirmed that carboxyl, amine, and chlorine functional groups were effectively introduced on the carbon surface by the treatments, which increased surface negative charges and reduced  $pH_{zpc}$  of the carbon. Adsorptive experiments showed that aqueous Pb removal by MAC was faster, with higher capacity than AC (66.53 vs. 39.14 mg/g). Evidently, the modification has generated new surface sites accountable for enhanced Pb adsorption.

Impact Statement:

This research is to develop a carbon-based adsorbent for enhancing Pb removal from contaminated water.

Category: Other Water Resource Topics

Type of Presentation: Oral Presentation