

# Recycling and Reuse Technology Transfer Center

## Recycling and Reuse Technology Transfer Center



<http://www.rrttc.uni.edu>

### **Ultrasound Modified Ferric Hydroxide/Cupric Ion Adsorption and Sequestration at Varying pH Levels**

Publication: 1996 - 063

H. Campos, Environmental Science, University of Northern Iowa

May 1996

96-063

ULTRASOUND MODIFIED FERRIC HYDROXIDE/CUPRIC ION ADSORPTION  
AND SEQUESTRATION AT VARYING pH LEVELS

An Abstract of a Thesis  
Submitted  
In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science

Humberto Campos  
University of Northern Iowa  
May 1996

## ABSTRACT

This study was undertaken to determine if hydrous metal oxide adsorption, an important treatment method used to remove adsorbates from aqueous solution, could be enhanced through ultrasonic irradiation. A model system based on preformed hydrous ferric oxide as the adsorbent and copper as the adsorbate was investigated. Brief exposure of the preformed hydrous ferric oxide floc to intense ultrasonic radiation (ca. 13 Watts/cm<sup>2</sup>) in the presence of copper species effectively disrupted the flocculated particles permitting the copper adsorbate to access adsorption sites previously isolated within the floc. The experimental data indicate that ultrasonic disruption of pre-formed hydrous ferric oxide can improve the removal efficiency of copper species from aqueous solution. The methodology is effective over copper to iron molar concentration ratios ranging from 10 to 30% (in molar ratio) and pH values from 7.5 to 9.5. Based on the results of this study, ultrasonic treatment holds promise as a methodology to enhance the removal of a variety of cationic adsorbates from solution.