



GEOC: Division of Geochemistry

290 - Arsenic oxidation by the mighty manganese soils of graskop

[View Session Detail](#)

Matthew Fischer², fischer@udel.edu, **Cathy Dowding**³, **Donald Sparks**¹

¹ Interdisciplinary Sci Engr Lab, Univ of Delaware, Newark, Delaware, United States; ² Plants and Soil Sciences, University of Delaware, Newark, Delaware, United States; ³ Plants and Soil Sciences, University of Stellenbosch, Stellenbosch, South Africa

Abstract: Manganese-oxides govern many geochemical reactions due to their abundance and high reactivity. Despite their importance in cycling redox sensitive compounds in natural systems, much remains unknown about the reactivity of manganese-oxides formed under environmental conditions. In order to study how naturally formed manganese-oxides react, soils from Graskop in the Mpumalanga region of South Africa were collected. Three soil profiles were excavated with a range of manganese concentrations. Each profile was separated into horizons, some containing up to 12% manganese by weight in the fine fraction and over 20% manganese by weight in the nodules. The soils in each horizon were analyzed to determine the CEC, EC, PZC, and pH. XRD characterized the minerals found in the clay fraction. Then, a series of batch reactions were used to determine the capacity of these soils to oxidize arsenite into arsenate. The conditions of the reaction were varied in order to elucidate how differing pH, arsenic concentration, and temperature influenced the oxidation. Understanding how these naturally occurring manganese-oxides react will allow researchers to more fully determine the role of manganese-oxides in controlling redox sensitive reactions in the environment.



Home



Schedule



Floor Plans



Play To Win



More ..

