

# **Applicability of Red earth in Manganese removal from groundwater**

A dissertation submitted to the  
Faculty of Science & Technology  
Uva Wellassa University  
in partial fulfillment of the requirements for the award of the  
Degree of Bachelor of Science in Mineral resources and Technology

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2012**

## Abstract

Manganese is commonly present in groundwater worldwide. The presence of manganese in the drinking water supply is not harmful to human health, however it is undesirable. Bad taste, discoloration, staining, deposition in the distribution system leading to after growth, and incidences of high turbidity are some of the aesthetic and operational problems associated with manganese in water supplies.

Different mechanisms (physical, chemical, and biological) may contribute to the removal of manganese in filters and the dominant mechanism depends on water quality and process conditions applied. Under the commonly applied treatment conditions in manganese removal plants, the oxidation-floc formation mechanism (floc filtration) is commonly believed to be dominant.

Adsorption characteristics of manganese onto Natural Red Earth (NRE), have been studied in batch technique to ascertain the effect of pH, ionic strength, initial sorbent and sorbate concentrations, temperature and effect of other cation and anion. Solid suspension (10 g/L NRE) was sufficient to remove Manganese up to 10ppm. Manganese adsorption achieved its maximum adsorption of nearly 100% at neutral to slightly acidic conditions. The rate of adsorption of manganese was very fast. Manganese adsorption onto NRE was better explained by Langmuir-Freundlich isotherm. These results suggested that the NRE could be effectively used as a low cost candidate for removal of Manganese from environmental water.

**Key words**

**Adsorption, Aesthetic, Ionic strength, Floc-filtration**