DEVELOPMENT OF EFFICIENT METHOD FOR HARDNESS 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

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2013

Abstract

One of the factors that establish the quality of a water supply is its degree of hardness. The hardness of water is defined in terms of its content of calcium and magnesium ions. Since an analysis does not distinguish between Ca^{2+} and Mg^{2}, and hardness is induced due to by carbonate deposits in the earth. They have tendency to make water unusable for industrial and domestic purposes .Therefore it is necessary to formulate a mechanism to remove total hardness in utilizing water.

Bentonite enormously abundant, because of huge industrial usage. It has been considered as a potential absorbent for removing pollutant from water and waste water. The effective application of bentonite for water treatment is limited due to small surface area leading to its low adsorption capacity. Therefore, this research is focused to change the surface area to obtain maximum adsorption capacity and hence remove the hardness in the water. To achieve this aim, bentonite was treated in varying concentrations of hydrochloric acid, potassium dihydrophosphate and sodium sulphate. Then the hard water was passed through the treated bentonite clay and measured hardness via EDTA titration method. In that case 0.5 M HCl treated Bentonite has removed 60.4 % of hardness and 150 mg/L KH_2PO_4 treated bentonite has removed 66.1% and as well as 150 mg/L Na_2SO_4 treated bentonite has removed 71.0% of hardness in 20 mL of hard water sample.

Changes within the surface area are the dominant factor for the final outcome. It was clear that treated bentonite can remove total hardness than the raw bentonite.