

# **INNOVATION OF METHOD TO REMOVE HARDNESS FROM DRINKING WATER**

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 Technology

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**2012**

## Abstract

Hard water contains mainly calcium ions. It consumes soap before lather will form, deposits soap curd on bath tubs, and forms scale in boilers, water heaters, and pipes. This study deals with the use of Montmorillonite clay in water softening application. The natural hard water was used as a source of hard water. Montmorillonite is smectite clay based on bi-dimensional lamellar alumino-silicate structure leading to a naturally high surface area/volume ratio. It is additionally expansive in liquid and cation exchangeable. Montmorillonite is relatively abundant in certain parts of the world, including Sri Lanka, and thus it is inexpensive. The batch experimental results informed that the hardness removal by Montmorillonite is possible. Calcium was removed from hard water by intercalation mechanism with the natural exchangeable cations, such as sodium and potassium ions, located between the Montmorillonite layers. In here the characterization of montmorillonite was done by using XRD and FTIR spectrum analysis. According to the XRD analysis the inter layer spacing of the MMT was obtained. The interlayer space of MMT was large than the ionic radius of MMT. Due to that the calcium ion in hard water can be intercalated in to the crystal structure of MMT. The FTIR studies shows that the present functional group in raw MMT and treated MMT. There is not any significant difference in sprectum. But the peak values are shifted. According to that the hard water can be modified the surface of MMT.