

## REMOVAL OF Ca<sup>2+</sup> IN HARD WATER USING MODIFIED CELLULOSE EXTRACTED FROM CORNCOB

**Y.G.R.M.A.G Rathnayake<sup>1\*</sup>, I.D.D. Perera<sup>1</sup>, K.K.D.C.S. Weerathne<sup>1</sup>, M.A.S.R. Senevirathna<sup>1</sup> and J.T. Cooray<sup>2</sup>**

<sup>1</sup>Department of Science and Technology, Uva Wellassa University of Sri Lanka, Badulla, Sri Lanka

<sup>2</sup>Department of Applied Earth Sciences, Uva Wellassa University of Sri Lanka, Badulla, Sri Lanka

\*ayesha.gayathri@gmail.com

Hardness in water is a severe problem in many parts of the world, including Sri Lanka. Hard water causes many difficulties at domestic and industrial levels and makes it unpalatable for drinking. Since the existing methods for water hardness removal have several drawbacks, there is a growing interest in developing more environmentally- friendly softeners for reducing the water hardness. This study is conducted to develop a highly efficient metal ion adsorbent using modified cellulose extracted from agricultural waste since large quantities of corncob waste are typically dumped after harvest in agricultural areas. This study investigates whether the ethylenediaminetetraacetic acid (EDTA) modified cellulose isolated from corncobs can adsorb calcium (Ca) in hard water. The cellulose isolation from the corncob consists of de-hemicellulose, delignification, and bleaching. Cellulose fibres, thus extracted from corncob, were modified using the esterification method with EDTA. Modified cellulose was used as a calcium ion adsorbent, and it was tested using EDTA titrations. A solution of 100 mg/l calcium ion (Ca<sup>2+</sup>) was used as raw water for the purpose of studying adsorption efficiencies, and the effect of dosage of modified cellulose (Cell-EDTA) on sorption capacity was studied. Cellulose, modified cellulose (Cell-EDTA), and calcium-adsorbed modified cellulose were characterized using Fourier Transform Infrared (FTIR) spectrometer. It was found that cellulose extracted from corncob waste can be successfully modified with EDTA and can be used as an adsorbent for calcium. The ability of Ca<sup>2+</sup> adsorption of modified cellulose from corncob is calculated as 0.223 mg/g at a concentration of 100 mg/l of the adsorbate.

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