

Removal of calcium ions in aqueous solutions by modified *Moringaoleifera* fruit coat

Dahanayaka H.S. and Prabagar J.*

Department of Chemistry, University of Jaffna, Jaffna, Sri Lanka

In this study, removal of calcium ions in aqueous solutions by modified *Moringa oleifera* (MO) fruit coat was carried out. Different particle sizes (62 μm -2000 μm) of MO were taken and tested for their efficiency on adsorption with different dosages on removal of calcium ions of different concentrations. Before the modification of MO, experiment was conducted with the calcium ion solution and unmodified MO fruit coat and results showed that Ca ions were released from the fruit coat material. For the modification process dried MO fruit coat were treated with 1 mol dm^{-3} NaOH. The effect of experimental conditions such as the particle size of the MO fruit coat, initial pH of the solution, the dosage of MO, initial metal ion concentration were investigated. Results showed that the maximum adsorption capacity of 95.18% was observed at pH 7 with 2 g of dosage of MO in the particle size range of 149 μm -177 μm . The adsorption was tested by fitting the adsorption data with Langmuir isotherm and Freundlich model. It was found that the adsorption of Ca^{2+} on MO fruit coat obeys the Langmuir model. The maximum adsorption capacity of Ca metal ion by using modified MO fruit coat was 6.144 mg g^{-1} . These findings suggest that modified MO fruit coat has high biosorption activity for the removal of calcium ions in aqueous solutions.

Keywords: adsorption process, biosorbent, *Moringa oleifera*, Langmuir isotherm and Freundlich model

*Corresponding author: j_prabagar@yahoo.co.uk