

EVALUATION OF ION ADSORPTION CAPACITIES OF MURUNKAN CLAY AND COIR AS COST EFFECTIVE MATERIALS FOR DESALINATION OF WATER

Abstract

The main objective of this study is to evaluate the suitability of Murunkan clay, a natural clay found in Murunkan, Mannar and coconut coir as low cost filter materials for desalination of water. Percentage removal of Na^+ , K^+ , Mg^{2+} and Ca^{2+} cations by these filter materials was studied. Water taken from Negombo lagoon was stirred in clay for 30 minutes followed by keeping in contact for different time periods of 0.5, 1, 2, 3, 4 and 24 hours using raw Murunkan clay. The same procedure was followed using acid treated clay up to 4 hours. To evaluate ion adsorption capacity of individual coconut coir types; red coir, pith-free coir and activated coir, lagoon water samples were passed through columns containing packed coir. Furthermore, the water samples were passed through a column combination of three types of coir after stirring in the clay for an optimum time period. The efficiency of raw Murunkan clay, acid treated Murunkan clay and three types of coir was evaluated for lagoon water containing Na^+ , K^+ , Mg^{2+} and Ca^{2+} 31,705, 639, 3,139 and 1,029 ppm respectively. The highest percentage removal of ions was observed when lagoon water treated with raw Murunkan clay was used in column combination with coir, leading to the percentage removal of 50%, 52%, 63% and 85% for Na^+ , K^+ , Mg^{2+} and Ca^{2+} respectively with a flow rate of 0.05 ml s^{-1} .

Keywords— *Desalination, Murunkan clay, Red coir, Pith free coir, Activated coir*