



Chloride removal from Eshidiya phosphate mining wastewater

Mousa K. Abu-Arabi^{a,*}, Sadeq Emeish^b, Banan I. Hudaib^a

^aChemical Engineering Department, Jordan University of Science & Technology, Irbid 22110, Jordan

Tel. +962 795644112; Fax: +962 2 7201074; email: akras@just.edu.jo

^bChemical Engineering Department, Al-Balqa Applied University, Assalt, Jordan

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ABSTRACT

Treatment of industrial wastewater from Eshidiya phosphate mining was studied in this work for reuse possibilities. The wastewater contains sediments and chloride ions. The removal of chloride from the industrial wastewater by adsorption using Amberlite IRA-402 was investigated via batch and continuous adsorptions. In the batch adsorption, the amount of chloride removal reached about 82.5%. The equilibrium data for chloride removal onto Amberlite IRA-402 were fitted to Langmuir and Freundlich isotherms. The data followed the Langmuir isotherm, but not the Freundlich isotherm. The continuous adsorption of chloride ions on Amberlite IRA-402 using packed column was studied using a glass column (22 cm length and 2 cm diameter). The effect of initial concentration, feed flow rate, bed height, and initial pH on the breakthrough curves was evaluated. A decrease in the influent concentration resulted in a delay in the occurrence of the breakthrough curves. Higher flow rates and higher initial pH resulted in a shorter breakthrough time.

Keywords: Industrial wastewater; Phosphate mining; Chloride adsorption; Amberlite IRA-402; Batch; Continuous; Langmuir; Freundlich; Isotherms; Packed column; Bohart and Adams

*Corresponding author.