

Removal of chloride ion from water treatment effluents of Zahedan using clay minerals of two areas of Malek-Siah-Kouh and Hormak: thermodynamic and kinetics models

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Abstract

The removal of chloride ion from wastewater treatment effluents was studied using clay minerals as a biological absorbent through the UV / Vis technique. The influential variables were studied on absorption including; rotation speed (rpm 100, 120, 150, 180 and 210), temperature (25, 30, 35 and 40 degrees Celsius), grain sizes (meshes > 200, 350-200, 500- 350, <500), pH of the solution (2, 4, 6, 8 and 10), adsorbent amount (100, 150, 300, 200, 400 and 600 mg) and contact time of the absorber and absorbent (15, 20, 30, 45, 60, 120 and 180 minutes). The optimum values of the rotation(al) speed, temperature, grain size, adsorbent amount and the contact time of Malek-Siah-Kouh were estimated at 100rpm, 40 ° C, 200- 325, 400 and 15 min, respectively. Furthermore, the optimum values of the rotation(al) speed, temperature, grain size, adsorbent amount and the contact time of Hormak were estimated at 100rpm, 30 ° C, <500, =2pH, 100 mg and 15 min, respectively.

Introduction

A large amount of wastewater treatment effluent is daily due to high levels of salinity and heavy metals. According to the recent droughts and untapped use of water resources, special importance is; therefore, given to water quality improvement. The use of water treatment effluent is one of the most important solutions considered in addressing inadequacy of water. In recent years, there are different adsorbents for the absorption process using cheap raw materials. Agricultural wastes, natural soils, organic matter and biomass are among these adsorbents (1). Different physical and chemical methods have been used to purify sewages as well as removing contaminating elements, some of which have high costs while the adsorption method is relatively inexpensive due to the use of suitable absorbent material. The clay is used as a mineral absorber in order to remove cations and heavy metals. Clay minerals are suitable for the removal of pollutants and cations due to the high absorption, relatively inexpensive price and creation of the negative charge on the mineral network. Since natural mineral absorbent is used to absorb and remove contaminants, it will be a step towards