Desalination and Water Treatment
www.deswater.com
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doi: 10/5004/dwt.2012.2943

Taylor & Francis
Taylor & Francis Group

45 (2012) 315–323
July

Contribution to the removal study of Co^{2+} ions by acid-activated clay from Maghnia (Algeria): equilibrium and kinetic studies

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Received 29 April 2011; Accepted 23 February 2012

ABSTRACT

A sample of clay, bentonite from Maghnia (N.W. Algeria) was treated (acid-activated) and used as adsorbent for the removal of Co^{2+} ions from aqueous solutions. The effect of acid treatment, shaking time, pH of aqueous solution, metal concentration and adsorbent amount was studied. The sorption kinetics of Co^{2+} have been analysed by Lagergren pseudo-first order and pseudo-second order kinetic models. The experimental results indicated that the best fit is obtained with the pseudo-second order kinetic model. The experimental equilibrium adsorption data were tested for the Freundlich and Langmuir equations. Results indicate that the order fit is Freundlich > Langmuir.

Keywords: Clay; Removal; Acid-treatment; FT-IR; Adsorption; Kinetics; Pseudo-second order; Langmuir; Freundlich; Co^{2+}; Ni^{2+}

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