



## Decontamination and adsorption modelling of aqueous $Pb^{2+}$ and $Co^{2+}$ ions using natural inorganic materials: tripoli (NT) and bentonite (NB)

Nawash AL-Ghezawi<sup>a</sup>, Mohammed Ahmed Al-Anber<sup>a\*</sup>, Zaid Ahmed Al-Anber<sup>b</sup>, Tayel El-Hasan<sup>a</sup>, Idrees Al-Momani<sup>c</sup>

<sup>a</sup>Department of Chemical Science, Mu'tah University, P.O. Box 7, 61710 Al-Karak, Jordan  
Tel. +962(0)777272677; fax +962(0)32375540; eMail address: masachem@yahoo.com

<sup>b</sup>Department of Chemical Engineering, Faculty of Engineering Technology, Al-Balqa University, Amman, P.O. Box 15008, Amman 11131, Jordan

<sup>c</sup>Department of Chemistry, Faculty of Science, Yarmouk University, Irbid, Jordan

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### ABSTRACT

Decontamination and adsorption modelling of  $Co^{2+}$  and  $Pb^{2+}$  ions from a model aqueous solution have been studied in batch system using natural tripoli (NT) and bentonite (NB). The adsorption study is controlled by a number of factors such as adsorbent dosage, contact time, initial metal ion concentration, and temperature effect. The adsorption equilibrium is achieved during the first 60 min. The maximum removal 97% (approx.) is obtained at 10 g/L and 20°C. The dynamic isotherm has been successfully modelled by the Langmuir ( $R^2 = 0.98$ ). The negative thermodynamic parameter  $\Delta G$  indicates for the spontaneous adsorption. The pseudo-second-order kinetic model has much more reasonable for metal ions adsorption process ( $R^2 = 1.0$  approx.).

**Keywords:** Lead; Cobalt; Tripoli; Bentonite; Langmuir isotherm; Adsorption modeling; Pseudo-second order

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\*Corresponding author