



## **Adsorptive Removal of Cr(VI) from Aqueous Solutions on Sawdust<sup>#</sup>**

Gamal Owes El-Sayed<sup>1,\*</sup>, Hassan Ali Dessouki<sup>1</sup>, Sabah Saad Ibrahim<sup>2</sup>

<sup>1</sup>*Chemistry Department, Faculty of Science, Benha University, Benha, Egypt;* <sup>2</sup>*National Water Research Center, Central Lab. for Environ. Qual. Monit., Elqanater Elkhayria, Egypt*

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**Abstract:** This study consider the possibility of using sawdust powder as an inexpensive adsorbent for the removal of Cr(VI) from contaminated chemical and mining industry wastewaters. The biosorption capacity of the sawdust for hexavalent chromium was studied at different solution pH values (1-8), initial metal concentration (40-1000 mg/L), salinity (1-10 g/L) and temperatures (25-40 °C). An optimum pH value of 5 was found suitable for metal ions removal. The adsorption of chromium attained equilibrium at about 1 h, with maximum removal percent of 25% at initial metal concentration of 1000 mg/L at optimum pH. The Langmuir, Freundlich and Temkin isotherm models were used to describe the uptake of Cr(VI) from aqueous solutions. The equilibrium adsorption data were better fitted to Langmuir isotherm ( $R^2=0.9938$ ). The maximum capacity ( $q_{max}$ ) of biomass was found to be 27.47 mg/g. The adsorption process was found to be exothermic and the thermodynamic parameters ( $\Delta G^0$ ,  $\Delta H^0$  and  $\Delta S^0$ ) were evaluated. The negative  $\Delta G^0$  value at various temperatures confirms the biosorption processes is spontaneous.

**Keywords:** *Hexavalent chromium, adsorption isotherm, sawdust.*

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\*Corresponding: E-Mail: [gamaloelsayed@yahoo.com](mailto:gamaloelsayed@yahoo.com); Tel:+2105618278; Fax: +2133222578

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