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Ivana Lučića 5
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Issued to

Ali ALOUACHE
Ecole Normale Supérieure Kouba
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CERTIFICATE OF PRESENTATION

With this certificate we acknowledge the ON SITE poster
presentation by Ali ALOUACHE of the submission

**Analysis of Experimental Data and Breakthrough Curves for
Hexavalent Chromium Biosorption by Eucalyptus Chips in a Fixed-
Bed Column**

Siham Benaissa, Ali Alouache, Faiza Nessark, Mohamed Hachi, Radia
Maachou, Salima Kaizra, Housseem Eddine Sayah, Ghezlen Berrahou, Nail
Elmebrouk Ben Amara*

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Secretary of the Conference

Guzovic Zvonimir

Analysis of Experimental Data and Breakthrough Curves for Hexavalent Chromium Biosorption by Eucalyptus Chips in a Fixed-Bed Column

Sihem Benaissa¹, Ali Alouache*², Faiza Nessark^{3,4}, Mohamed Hachi⁵, Radia Maachou⁶, Salima Kaizra², Houssemeddine Sayah⁶, Ghezlen Berrahou¹, Nail Elmebrouk Ben Amara⁵

¹National School of Public Works, Gharidi 1, Alger, 16000 Algeria

²Laboratoire (LNCMS) Ecole Normale Supérieure Kouba, 16000 Algeria

³ Laboratoire d'Electrochimie et Matériaux (LEM), Université Ferhat Abbas Sétif 1, 19000, Algeria

⁴ Département de Chimie, Faculté des Sciences, Université Mohamed Boudiaf M'Sila, 28000, Algeria

⁵ Laboratory of applied research on plant sciences, University Ziane Achour of Djelfa 17000 Algeria

⁶USTHB UNIVERSITY, Algeria

Abstract

The study investigated the elimination of Cr(VI) from aqueous solutions using Eucalyptus chips biomass within a fixed-bed column. Various crucial design parameters such as bed depth (10–15 cm), flow rate (5–20 mL/min), and inlet concentration (30–50 mg/L) were explored through experimental trials. Optimal conditions were determined to be 15 cm bed depth, 10 mL/min flow rate, and 50 mg/L inlet concentration. Additionally, the BDST, Thomas, and Adams–Bohart models were employed to analyze the experimental data and forecast breakthrough curves under different operating conditions. The BDST model exhibited good conformity with the experimental results. Breakthrough curves were accurately represented by the Thomas model ($R^2 > 0.97$), while the Adams–Bohart model was suitable for the initial biosorption stage. The column was regenerated by rinsing Cr(VI) with 0.05 M HNO₃, and the biosorbent was reused for three biosorption regeneration cycles. The outcomes demonstrated efficient regeneration and significant Cr(VI) removal, albeit with a slight decline in biosorption capacity over cycles. Eucalyptus chips biomass emerged as a promising biosorbent for Cr(VI) removal in fixed-bed column applications.

Keywords: Eucalyptus chips, Hexavalent chromium, Biosorption; Modeling; Fixed-bed column

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- SDEWES2024-1183 **CHARACTERISATION OF RESIDENTIAL ELECTRICITY CONSUMPTION IN RURAL AREAS: INSIGHTS FOR THE PROMOTION OF RURAL RENEWABLE ENERGY COMMUNITIES IN THE VALENCIAN COMMUNITY.** *(poster)*
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