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BIOTREATMENT OF Cr(VI)-CONTAINING WASTEWATER MEDIATED BY INDIGENOUS BACTERIA

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Abstract

Indigenous *Pseudomonas veronii* 2E, *Klebsiella oxytoca* P2 and *Klebsiella ornithinolytica* 1P were tested as catalysts for the transformation of Cr(VI) to Cr(III) for Cr(VI)-containing wastewater biotreatments. The Cr(VI) biotransformation was assayed during bacterial growth and by using pre-grown quiescent cells. Proof of the unsuitability of a biotreatment based on Cr(VI)-reduction during bacterial growth was found: the reduction rate and the maximum Cr(VI) concentration able to be reduced were too low. On the other hand, high density suspensions of pre-grown quiescent cells presented the highest reduction rates, especially in the presence of an electron donor. The most efficient strain for Cr(VI) removal was *Pseudomonas veronii* 2E. Optimal pH and temperature for the biotransformation process resulted 7 and 32°C respectively. The maximum initial reduction rate obtained in these conditions was 0.49 mg Cr(VI) h⁻¹ g cell dry weight⁻¹ (9.4 μmol Cr(VI) h⁻¹ g cell dry weight⁻¹). Proof of the feasibility and efficiency of this technology is provided by using in calcium alginate immobilized *P. veronii* 2E cells for the treatment of a real Cr(VI)-containing industrial wastewater.

Key words: bioremediation, Cr(VI)-biotransformation, industrial wastewater biotreatment, *Pseudomonas veronii*

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