Modeling of two up-flow fixed-bed columns in series for the biosorption of Cr$^{6+}$ and Ni$^{2+}$ by sugarcane bagasse

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ABSTRACT

In this work, results of the biosorption of Cr$^{6+}$ and Ni$^{2+}$ by sugarcane bagasse in two up-flow fixed-bed columns in series have been presented. The experimental data were adjusted for several kinetic models that describe the breakthrough curve obtained for a single column and for two columns in series. The Dose–Response model is the one that better adjusts the experimental data for the studied metals with a high correlation coefficient. Although with a single column, it is possible to reduce the metal concentrations under the requirements of Cuban normative, the use of two columns in series guarantees concentration nearly to 0 for two metals. So, the percentage removal with two columns in series were 98.2 and 92.8% for Cr$^{6+}$ and Ni$^{2+}$, respectively.

Keywords: Biosorption; Fixed-bed columns; Sugarcane bagasse; Heavy metals; Modeling

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