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CASTOR LEAF POWDER AS A BIOSORBENT FOR Cu(II) REMOVAL AND PRECONCENTRATION OF NATURAL WATER SAMPLES

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Abstract

This paper describes the preparation and use of a low cost biosorbent made of castor leaves for the extraction of Cu(II) from an aqueous medium. The biosorbent was characterized by Fourier transform infrared spectroscopy (FTIR), surface area and pore diameter measurements. The results showed absorption bands of carboxylic and amide groups at 1738 and 1540 cm^{-1} , respectively, and the measured surface area was $1.3728 \pm 0.0160 \text{ m}^2 \text{ g}^{-1}$, with predominance of microporous $< 10.51 \text{ \AA}$. Quantitative extraction was achieved at pH above 4 and kinetic equilibrium was reached within 10 minutes. Isotherm adsorption data were adjusted to a modified Langmuir equation, yielding a N_s value of $0.321 \text{ mmol g}^{-1}$. The continuous flow system showed, after the optimization parameters, a 47-fold enrichment factor (preconcentration factor) when applied to standard and real water samples (Paraná River and Tap water). The developed preconcentration method was validated against the certified reference material (CRM 1643e).

Keywords: castor plant leaves, copper extraction, natural river water, preconcentration

Received: February, 2013; Revised final: May, 2014; Accepted: May, 2014; Published in final edited form: January 2018

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