



Evaluation of *Theobroma cacao* Waste Performance in Nickel Removal (II) in Continuous System*

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Abstract: The objective of this research was to evaluate the performance of cocoa shell residual biomass as an adsorbent of Ni (II) dissolved in aqueous solution, in a continuous fixed bed system determining the effect of bed height on the removal of this contaminant. The experimental work was based on: biomass preparation, design and assembly of the adsorption unit and mathematical modeling, considering as variables incidents in the process; the initial concentration of metal, pH, flow rate and particle size. In FTIR to shell analysis, the presence of functional groups favourable for metal adsorption was observed in the spectrum. The residual concentration of the solution was measured by atomic adsorption spectroscopy where the maximum adsorption capacity was 99.02% for the 10g (7.5 cm) bed. In addition, Thomas's model was the one that best adjusted the experimental data. The cocoa shell has the potential to be used as a solution bio-adsorbent of Ni (II) and the increased height of the bedding in the continuous system favours removal of the contaminant.

Keywords: Bio-adsorbent, cocoa shell, continuous system, molecular adsorption, mathematical modeling.

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