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# Dynamic Process for Biosorption of Cadmium in Aqueous Solution using Column Packed with Lignocellulosic Material

Candelaria Tejada-Tovar<sup>1</sup>, Angel Villabona-Ortíz<sup>2</sup>, Diofanor Acevedo\*<sup>3</sup>,  
Angelica Cabarcas<sup>4</sup>, Cristian Benitez<sup>5</sup>

<sup>1,2,4,5</sup>Faculty of Engineering, Chemical Engineering program, Research Group IDAB,  
University of Cartagena Av. El Consulado, St. 30 No. 48-152. Colombia.

<sup>3</sup>Faculty of Engineering, Research Group Innovation, Agricultural and Agro-industrial  
Development, University of Cartagena Av. El Consulado, St. 30 No. 48-152. Colombia.

**Abstract:**In the present investigation, the biosorption process for the removal of Cadmium in synthetic waters was adjusted on a pilot scale using cocoa shells as a biosorbent. This was obtained by calculating the experimental values using the response surface methodology (RSM) and an experimental design  $3^3$ , varying the feed rate, initial solution concentration and bed height, where the respective rupture curve was determined, using the Adams-Bohart, Thomas, Yoon-Nelson and Dose Response models to describe the behaviour of the column and obtain the kinetic parameters. The model that best fitted the experimental data and described the rupture curve was the Dose-response model, with an  $R^2$  value of 0.9979, followed by the Yoon-Nelson model with an  $R^2$  value of 0.9503, the Adams-Bohart model with an  $R^2$  value of 0.9246, and finally the Thomas model with an  $R^2$  value of 0.8728, which reached 0.9246. The cocoa shell is shown as a good precursor to generate adsorbent at low cost of heavy metals.

**Keywords:**Biosorption, Cadmium, Breakthrough curve, Thomas model.

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