

# **Isothermal modelling of the adsorption of cadmium onto activated carbon from *Tridax procumbens***

## **ABSTRACT**

There is currently no feasible method of recycling Cd compounds, despite the fact that Cd production, consumption, and environmental release have all skyrocketed in recent decades. This raises serious concerns about the potential dangers of Cd compounds to human health. This highlights the pressing need for cadmium pollution cleanup. Biosorption is one of several viable technologies with several advantages, including low operating costs, very efficient detoxification of toxicants at low concentrations, and a low amount of disposal materials. The biosorption of cadmium onto activated carbon from *Tridax procumbens* is remodeled using nonlinear regression and the optimal mode was determined by a series of error function assessments. The Freundlich model performed best in statistical tests including root-mean-square error (RMSE), adjusted coefficient of determination ( $\text{adj}R^2$ ), bias factor (BF), accuracy factor (AF), and corrected Akaike Information Criterion (AICc). This is in contrast to the published work using a linearized form where the Langmuir model best represents the biosorption. The calculated Freundlich parameters  $k_F$  value using nonlinear regression was 1.501 (1/g) (95% confidence interval from 1.223 to 1.778) and  $n_F$  value of 4.943 (95% C.I. from 3.492 to 6.393). Confidence intervals for the uncertainty range can be calculated using nonlinear modeling and then used for model comparison and discriminant analysis.