STUDY PROCESS OF CADMIUM ADSORPTION IN ALGAE *ARRIBADAS*

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INTRODUCTION

•The presence of metals in the environment has led to disastrous consequences for natural ecosystems causing degradation of natural resources, which have been of great concern in recent years. Among these metals, cadmium is widely used in galvanic industries and disposal of waste is classified as harmful to the environment indicating a need for its removal. This work was carried out to evaluate cadmium bioretenção capacity in aqueous solutions by algae arribadas.

MATERIALS AND METHODS

The arribadas algae used were collected on the beach of Jaguaribe, Itamaracá - Pernambuco, Brazil, washed, dried in a greenhouse at room temperature ($32 \pm 2.0°C$) for 4 days, pounded into knife mill and classified Tyler sieves. To optimize the process, we used a 23 factorial design with center point to evaluate the effect of buffer pH (3.0 to 5.0), stirring speed (100 to 300rpm) and mass algae (0.1 to 0, 2g) on the adsorptive process. Bioretenção The tests were performed by placing the algae are in contact with 25 ml of a solution containing 50 mg L-1 of Cd^{2+} in acetate buffer 0.1 mol L^{-1}, the conditions of the experimental design. The Cd^{2+} levels before and after the tests were quantified by Atomic Absorption Spectrometry. The kinetic experiments were performed under the conditions that gave the highest bioretenção in the factorial design studies, or algal mass 0.1g, stirring speed of 100 rpm and pH 5.0. Metal concentrations were used, ranging from 10-170 mgL^{-1}, where samples were withdrawn and filtered in a predetermined time interval in the range of 0.5 to 180 minutes.

RESULTS

The balance of algae Cádmio- arribadas retention were achieved in 30 minutes. To accomplish the linearization used the Langmuir model (Figure 2) and Freundlich. The quantity of cadmium adsorbed on the adsorbent $mg.g^{-1}$ ranged from 2.6 to 6.7 with pure estimated experimental error of 0.39% (Figure1). All major variables were significant at a level of 95% confidence. A rapid increase of the amount of cadmium biosorvido reaching the maximum sorption within 30 minutes was observed.
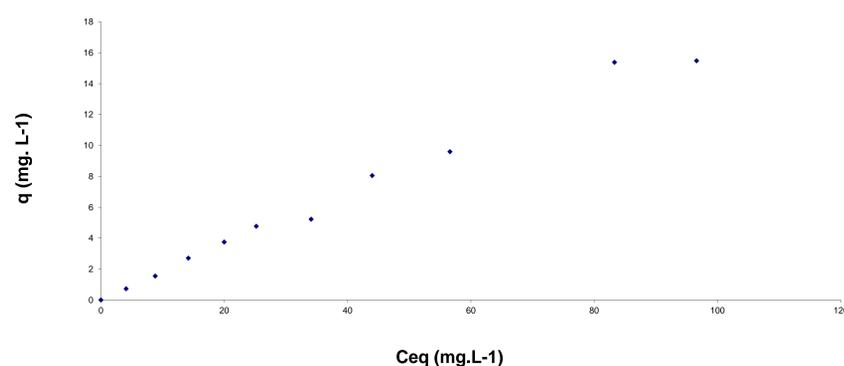

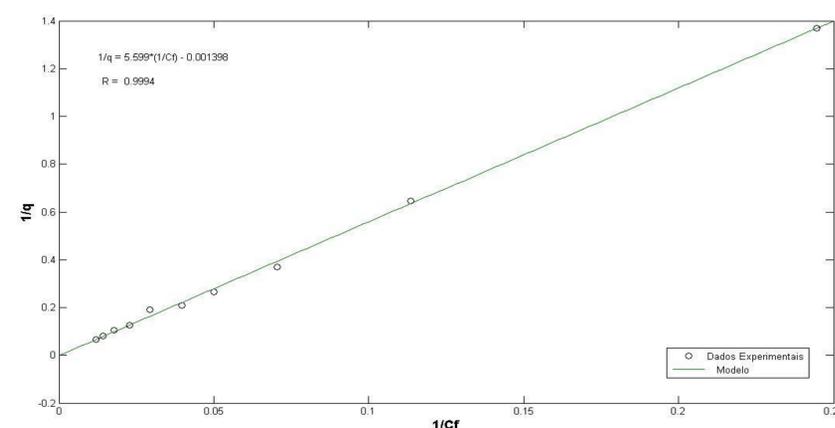**Figure 1. Isotherm of cadmium in bioretention arribadas algae**

Figure 2. Linear shape Langmuir adsorption model.

CONCLUSION

From the Langmuir equation n value was obtained (adsorption intensity) of 1.02 and a correlation coefficient (R^2) of 0.9974. There was a better fit Langmuir model. The arribadas algae shown to have a potential to remove cadmium from aqueous solutions and can be used in the removal of the metal in industrial effluents.