

The Removal of Chromium (VI) by a Novel Heat – Treated Biocarbon

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ABSTRACT

The capability of a novel heat-treated biocarbon had been investigated. Study for the effects of contact time, biocarbon dosage, pH and concentration on the removal of Cr(VI) by biocarbon were conducted under room temperature ($25^{\circ}\text{C} \pm 2^{\circ}\text{C}$) with volume of 25 mL Cr(VI) solution and agitation speed of 250 rpm. Standard curve of 1,5-diphenylcarbazide assay was prepared for the determination of residual concentration of Cr(VI). Equation of $y = 0.6695x$ was generated from the standard curve. All the experiments were repeated for three times in order to get an average value. The results obtained were analyzed by using SPSS (One Way ANOVA, Fisher's LSD Post Hoc Tests and Duncan's Test). Graphs of % removal and uptake of Cr(VI) against the effects (contact time, biocarbon dosage, pH and concentration) were prepared. Value of pH_{pzc} was determined in order to understand the effect of pH on the biosorption of Cr(VI) and the value was 6.55. Adsorption isotherms (Langmuir and Freundlich) were used to investigate the biosorption behavior of the biocarbon. The equilibrium data was fitted with Freundlich isotherm (R^2 of 0.9963).

Keywords: biocarbon; biosorption; Cr(VI); pH_{pzc} ; adsorption isotherms