

# THE REMOVAL OF CHROMIUM (VI) FROM AQUEOUS SOLUTION USING *Codiaeum variegatum* LEAVES AS NOVEL BIOSORBENTS

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## ABSTRACT

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Chromium pollution is one major issue that cannot be preventable due to the development of industrialization. Biosorption is method that has turned out to be the major revolution in bioremediation and green biotechnology. Biosorption is an environmentally friendly processes that involving removal of metal using the natural biosorbent from polluted or aqueous solution. In this project, *Codiaeum variegatum* also called as garden croton plant leaves were used as biosorbent for the removal of Cr(VI) from aqueous solution. The leaves were washed, dried, blended and sieved into three different meshes with different particle sizes (500, 300 and 149 microns). The batch experiment was carried out and the effect of initial pH (unadjusted and pH 2), effect of particle size as well as initial concentration of Cr(VI) (10, 20, 40, 60, 80 and 100 mg/L) with leaves for the removal of the Cr(VI) were studied. The removal of the Cr(VI) ions were tested using the DPC reagent which turned the solutions to pinkish purple in the presence of Cr(VI) ions and the absorbance readings of the test solutions were taken using the spectrophotometer. The percentage removal of Cr(VI) ions were calculated and the adsorption of the Cr(VI) was evaluated using two isotherms known as Langmuir isotherm and Freundlich isotherm. The particle size of 500 gave the highest percentage of Cr(VI) removal and it also used to investigate the effects of different concentrations on Cr(VI) removal. The pH 2 favours the adsorption of Cr(VI) by the biosorbent. The metal uptake capacity,  $q$  for Cr(VI) increases as the concentrations increases. Besides that, the values of the  $Q_{max}$ ,  $b$ ,  $K_f$  and  $n$  were calculated.