Investigation of The Effect Of Initial Metal Ion Concentration on Chromium (Iii) Adsorption onto Thebanana Leaf Petiole as the Biosorbent

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Abstract

There is a tremendous increasing demand for portable water due to the rising human population and urbanization and industrialization and climate change. There is no doubt that water in this county and largely the country is a scarce resource. This calls for better technologies to be developed to curb this. They include sea water desalination, scavenging distant waters through construction of dams and supplying it by piping systems, exploration of deeper ground waters and treatment the contaminated waters. Due to the huge usage of waters by the large human populace, recycling and reusing the water rather than losing, it to the sewer systems would be more economical. This would make more water available for domestic and agricultural use. This will be done by employing technologies, which could improve on the quality of water for such applications. Some of the conventional methods for wastewater treatment include chemical precipitation, reverse osmosis, ion exchange, membrane filtration and biosorption. Most of these methods of wastewater treatment are expensive and partially remove heavy metals' ions. The latest research has been on developing low-cost technologies for grey water treatment. This brings in handy the use of adsorbents in removing the heavy metal pollutants from wastewaters and in particular, bio-sorbents to replace the commercial adsorbents. This study investigates the potential of the banana leaf petiole as a low-cost adsorbent for chromium (III) contaminated wastewater. This study will investigate the effect of contact time on chromium (III) adsorption onto the banana leaf petiole and the effect of initial metal ion concentration on chromium (III) adsorption onto the adsorbent. The biological and physicochemical parameters of the chromium (III) contaminated water to be considered for decontamination are Bio-Chemical Oxygen Demand, pH, Total Dissolved Solids, Temperature and both the initial and final concentrations of chromium (III) ions. The results will be subjected to the standard methods for examining pure water and wastewater. The results will then be subjected to the analysis of variance and mean values. Q Test, T Test, and F Test will be done for further analysis. The obtained experimental data will be fitted to the Langmuir isotherm. Atomic Absorption Spectroscopy will then be used to determine the absorbance of the samples. The results of this project will be used to determine the viability of using the banana petiole biomass as an adsorbent. They also will be used to provide an alternative to the available adsorbent.