

Biosorption of Chromium (Iii) Ions Onto Banana Petiole

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Water pollution is a major issue in Kenya. It has continuously led to issues of clean water shortage which had led to citizens to use water that doesn't meet safety standards. Heavy metals (metals which have densities of more than 5g/cm³ and adversely affect the environment and living organisms) are usually the major culprits for most of the water contamination. Industrialization which is the major cause of water pollution contaminates water with heavy metals from factory processes. These heavy metals are a threat to the health of the general public due to their biocumulative nature. Chromium is a heavy metal pollutant produced from industrial processes like chrome-plating processes, leather tanning, textile industries, chromium salt manufacturing and chromium mining processes. The conventional wastewater treatment methods include chemical precipitation, reverse osmosis, ion exchange, membrane filtration and biosorption. However, these methods have numerous disadvantages like they are expensive to run on largescale operations, they only partially remove the metal ions, have high energy and reagent requirements, generate sludge and aggregation of metal precipitates damage the expensive membranes. Biosorption is an area of interest especially in its application in removal of heavy metal contaminants in wastewaters by use of biological and agricultural waste biomasses. Biosorption provides a greater advantage over conventional methods since it has a potentially infinite agricultural biomass source ranging from banana peels, carrot peels, maize stalk charcoal, banana petiole, wheat husks, peanut hull, green coconut shell powder, mushrooms and many more. This study will aim to study of banana petiole as potential biomass and biosorbent for removal of toxic Chromium (III) ions. Batch experiments will be carried out to determine the most optimal contact time for exposure of the biomass to the ions and furthermore study how the biosorption is affected by temperature. Atomic Absorption Spectroscopy will then be used to determine the degree of biosorption of the banana petiole biomass samples. The results of this project will be used to determine the viability of using banana petiole biomass as an adsorbent. Furthermore they will be used to provide alternative to the available adsorbents.