ADSORPTION BEHAVIOR OF METAL IONS ONTO VINES OF CASCUTA REFLEXA (GIANT DODDER)

ABSTRACT: Metals have important applications at industrial level they have further used in many fields of medicine, catalysis, and biomimetic receptors although they have numerous applications at the meanwhile, they have potential to produce toxicity in the environment. There are many di chromates that were used from very long time and release openly into water bodies without any proper handling and hey persist there for decades and encountered humans, plants, and harm the environment and have adverse effects on human health. Chromium is a metallic compound originates naturally and found in plants, animals, and rocks. The acceptable concentration of chromium in drinking water is set by USEPA is 0.1mg per liter but it little varies with the standard value set by WHO (World Health Organization) and it is 0.05mg per liter. Chromium is referred to as two oxidation states one is hexavalent (having +6 oxidation states) and the other type is trivalent (with +3 states). They both produce from different sources, trivalent chromium has an essential role in the body and produce naturally in several fruits, vegetables, grains etc. on the other hand the hexavalent chromium originate from various metallurgic reactions occur at industrial level. It has adversarial effects on human health, when inhaled and enter inside the body through drinking contaminated water but research illustrates that the Chromium 6 is riskier for the human body when inhaled through breathing than the exposure through drinking. Its exposure to the body cause lungs cancer, malignant tumors in small intestine damage the oral cavity and the stomach cancers. There chromates with higher solubilizing power and versatile oxidation prospect have detrimental impacts on humans, environment. So, there is a requirement for the treatment of all these anions from the drinking water to eradicate all these risks. In this emerging world and the field of separation science the adsorption phenomenon is an important doorway to recognize these ions and finding the best solution towards the problem of health. This study focused on the development and designing of the material *Cuscuta Reflexa*, it is a parasitic plant and treated as a waste material because it effects the growth of other plants and take food and protection from them. It was efficient for the removal of chromates especially hexavalent chromium from wastewater. For this purpose, the

material was prepared and modified using different chemicals and then the efficiency was compared and concluded at which state the material shows the maximum efficiency. In the first part of the experimental scheme the surface charge has analyzed using salt addition method. After the experiment the graph has planned between initial pH values and final pH values and the point of intersect give the value of PZC. The value of PZC obtained was 4.7 and elucidated that this is the point at which the surface of the material turned as neutral specie. The material was modified using acids and bases and examined by FTIR characterization technique. In the second part of the study the Batch adsorption experiment was conducted consuming different parameters like time, dosage, concentration of metal and ph. The maximum value of adsorption (0.89mg/g) has obtained at pH 4 using 0.5g adsorbent dose and 40 min of contact time. The experimental data was analyzed using Langmuir, Freundlich and Temkin. After all the results it has been concluded that the Langmuir adsorption best fit into the data when compared with the remaining isotherms with the correlation coefficient value R^2 = 0.9651. In the third part the behavior of adsorption was surveyed in the presence of interfering ions like Ca, Mg, Na and K. the results revealed that these ions disturbed the chromium uptake capacity of CR. In the presence of Calcium ions, the chromium showed the maximum value it means that the potassium interferes less as compared to others. All the data accumulated after the study illustrated that the *Cuscuta Reflexa* have all the preferred characteristics that are required for the removal of Chromium from the solution in comparison with other materials. All the analytical working performed will be favorable and helpful not only for public concern but also for the industries and laboratories.

KEYWORDS: Cuscuta Reflexa; interfering ions; PZC; isotherms; hexavalent chromium