ABSTRACT

Metal has important industrial uses and is employed in a variety of medical applica-tions, such as biological sensing and catalysis. Despite having many uses, they have the potential to be hazardous to the environment. Therefore, its dealing is necessary for both aquatic and wild animals, as well as for people. Cadmium is employed in a variety of sectors and harms living things. It is crucial to remove cadmium from the wastewater discharged by various industries. This study deal with the removal of cad-mium ions from waste water. As an absorbent, hyper cross linked polymer is used to remove cadmium from industrial waste water. Through the addition of salt, the point of zero charge was discovered, and its value is 2.7 PH. which implies that at this PH, the absorbent surface becomes neutral. The material had been modified by washing it with acid and base, and then FTIR analysis was done. Batch absorption tests were carried out employing a variety of variables, including time, dosage, metal concentra-tion, pH, and temperature. The greatest adsorption value was obtained at pH 10 with 0.5 g of adsorbent, 30-minute contact duration and favors exothermic reaction. To assess the experimental data, Langmuir, Freundlich and Temkin isotherms were used. Compared to Langmuir and temkin, Freundlich found the model to have the best fit with R_2 0.9917. Adsorption kinetics was also investigated, and for this investigation, pseudo first order has a high regression value of 0.9874. The presence of interfering ions including calcium, magnesium, sodium, and potassium will impact the adsorption capacity, according to a study on adsorption by interference ions. Cadmium exhibits greatest value in the presence of potassium while having the lowest value in the pres-ence of magnesium, resulting in good sorption. HCP is a proven effective adsorbent for removing cadmium from waste water. All analytical work will be beneficial to the general public, industry, laboratories.

KEYWORDS: Hyper crosslinked polymer; PZC; adsorption isotherm; adsorption kinet-ics; thermodynamics.