

Synthesis and characterization of a Nano-adsorbent derivative derived from grape seeds for Cadmium ion removal in an aqueous solution

ABSTRACT

Grape seeds were utilized as a source for nanoparticle adsorbents. The objective of this work was to prepare a nano adsorbent from grape seeds (GS) and FeCl₂. The physical and chemical properties of grape seed ferrous oxide nanoparticles (GS-IONPs) were investigated. Batch adsorption was used to investigate the adsorption of cadmium from industrial water with different initial concentrations, solution pH and contact time. The adsorption isotherm data for Cd(II) on GS-IONPs were fitted to the Langmuir, Freundlich, and Temkin isotherm models. The data fit the Langmuir model well, with a maximum cadmium uptake of 16.3 mg/g. It was found that %removal of cadmium decreased from 98.0% to 88.0% as the initial concentration increased. The results revealed that the prepared adsorbent was effective in Cd(II) removal.

Keyword: Grape seeds; Nanoparticles adsorbent; Cadmium; Adsorption; Isotherm models