Modification of carica papaya seeds with naoh for copper removal from water

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ABSTRACT

As people work to create a sustainable future, initiatives to improve the state of the environment have recently taken precedence. Due to the persistence of heavy metals in the environment and their nonbiodegradable nature, heavy metal contamination has become a global issue. In conjunction with the Sustainable Development Goals, this study proposes a green method of heavy metal removal by applying Carica papaya seeds (CPS) as an environmentally friendly and highly efficient adsorbent to remove copper (Cu) from the environment. To increase its potential in adsorbing copper(II) ions, CPS were treated with sodium hydroxide (NaOH). The effects of the adsorbent mass, pH, initial metal solution concentrations, and contact time were investigated in batch experiments. The optimum pH and contact time for CPS are pH 3-5 and 120 min, respectively, and the highest percentage of removal achieved is 82%. The adsorbent was characterized with scanning electron microscopy (SEM) and Fourier transform-infrared (FT-IR) spectroscopy to analyze the Cu adsorption process. In conclusion, the chemically treated CPS can be utilized as a potential bio-adsorbent for Cu removal from aqueous solutions.

KEYWORDS

Carica papaya seeds (CPS); Copper (Cu); Green adsorbent; Heavy metals; Water treatment

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