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EFFECT OF CARBONIZATION ON BANANA PEELS FOR REMOVAL OF CADMIUM IONS FROM AQUEOUS SOLUTION

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Abstract

Adsorption studies of cadmium(II) were conducted on 623ºK or 723ºK carbonized banana peels named as BP623 and respectively BP723 as well as on the dried ones (BP). Carbonization enhances the quality of organic by-product used as adsorbent, reduces the equilibrium time and improves the quality of the final product (water). Evaluation of the effects of pH, contact time and solution temperature showed that the uptake of cadmium(II) ions was highly dependent on these factors, and increased with increasing pH and solution temperature.
Furthermore, the presence of carbo-acid groups on the surface of banana peels by-product enhanced the uptake of cadmium(II) cations on the adsorbents surface. The maximum adsorption capacity was obtained with 623ºK carbonized banana peels (119.84 mg/g). In addition, the desorption of cadmium(II) ions was carried out with various concentration of hydrochloric acid and the desorption rate increase with decreasing acid concentration. The maximum desorption rate of 89.65% was obtained for BP623.

Key words: activation energy, banana peels, cadmium, carbonization, wastewater

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