Metal ion free watermelon (*Citrullus lanatus*) rind as adsorbent for the removal of lead and copper ions from aqueous solution

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**ABSTRACT**

Chemically protonated watermelon rind (PWR) was evaluated as a low-cost and efficient adsorbent for the removal of Pb\textsuperscript{2+} and Cu\textsuperscript{2+} ions from aqueous solution. Protonation of watermelon rind (WR) was carried out with 0.1 M HCl as protonating agent. The adsorption process was found to be spontaneous and exothermic in nature. Kinetic investigations suggest that the present system follows pseudo-second-order kinetic model and rate-limiting step is not chemical reaction. The maximum loading capacity of PWR was found to be 116.2 and 39.2 mg g\textsuperscript{-1} for Pb\textsuperscript{2+} and Cu\textsuperscript{2+} ions, respectively. FTIR and energy dispersive X-ray analyses supported the sorption of metal ions onto PWR. The results suggested that WR can be an effective adsorbent for the removal of heavy metal ions from aqueous solution.

*Keywords: Watermelon rind; Protonation; Adsorption; Desorption; Water treatment*

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