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An Efficient Activated Carbon for Copper (II) Adsorption Synthesized from Indian Gooseberry Seed Shells

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Abstract : Removal of metal pollutants by efficient activated carbon is challenging research in the present-day scenario. In the present study, the characteristic features of an efficient activated carbon (AC) synthesized from Indian gooseberry seed shells for the copper (II) adsorption are reported. A three-step chemical activation method consisting of the impregnation, carbonization and subsequent activation is used to produce the activated carbon. The copper adsorption kinetics and isotherms onto the activated carbon were analyzed. As per present investigation, Indian gooseberry seed shells showed the BET surface area of 1359 m^2/g. The maximum adsorptivity of the activated carbon at a pH value of 9.52 was found to be 44.84 mg/g at 30°C. The adsorption process followed the pseudo-second-order kinetic model along with the Langmuir adsorption isotherm. This AC could be used as a favorable and cost-effective copper (II) adsorbent in wastewater treatment to remove the metal contaminants.

Keywords : activated carbon, adsorption isotherm, kinetic model, characterization
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