



HP-01: Adsorption capacity of raw pomegranate peel biosorbent for copper removal: Thermodynamic studies

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Abstract

The removal of Cu(II) is an important issue for the treatment of industrial wastewater, due to its serious consequences on environment and human health. In this study describes the removal of Cu(II) ions from an aqueous solution using raw pomegranate peel (RPP), a cheap biosorbent. The biosorbent's three primary functional groups are hydroxyl (OH), carboxyl (COOH), and amine (NH₂). The pH at zero point charge (pH_{pzc}) demonstrate RPP's mildly acidic nature. Reduced RPP particle size results in an increase in adsorption capacity of 80 mg/g in 30 min, 86.13 mg/g in 60 min of contact, and an 86% removal rate for starting Cu(II) ions concentration of 200 mg/L and a 2 g/L biosorbent dose. Data from experimental isotherms for biosorption match the Temkin model well. The spontaneous, exothermic, and described pseudo-second order adsorption of Cu(II) ions onto RPP was found to match the kinetic data. With the multiple reuse promising application in environmental wastewater recycling with RPP, the adsorption mechanism of Cu(II) ions onto RPP was suggested.

Keywords: Environmental depollution, Heavy metals, Biosorption, Thermodynamic studies.

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