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Adsorption, kinetic and thermodynamic studies for the biosorption of cadmium onto microalgae *Parachlorella sp.*

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Highlights

- Equilibrium and kinetics of Cd(II) adsorption by *Parachlorella sp*. studied.
- Maximum uptake of 96.20 mg/g was obtained at pH of 7 and 35 °C.
- Increasing mixing speed from 100 rpm to 150 rpm resulted in half the process time.
- The uptake reduced at mixing speed of 250 rpm, because of damage to the microalgae.
- Thermodynamic properties show the spontaneity of the process.

Abstract

In this study, the biosorption of cadmium ions from aqueous solutions by different microalgae i.e., *Parachlorella sp.*, *Spirulina sp.*, *Scenedesmus sp.*, and *Nannochloropsis sp.*was examined. The sorption capacity of *Parachlorella sp.* at 30°C and pH of 7 was determined to be 90.72 mg/g that was shown to be 1.5 to 3 times higher than the sorption capacity of the other sorbents studied. The two characterization techniques employed, namely, scanning electron microscopy and Fourier-