

## Ultrasonic Adsorption Kinetics, Isotherm, Mechanism, and Thermodynamic Analysis of Paclitaxel onto Sylopute

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### Abstract

The ultrasonic adsorption characteristics of paclitaxel from extracts of *Taxus chinensis* cell cultures by the commercial adsorbent Sylopute were investigated using different parameters such as ultrasonic power, initial paclitaxel concentration, adsorption temperature, and contact time. The experimental data were fitted to four adsorption isotherms including Langmuir, Freundlich, Temkin and Dubinin-Radushkevich in order to study the adsorption mechanisms and characteristics. Also, kinetic analysis was performed using the pseudo-first-order, pseudo-second-order, and intraparticle diffusion models. Furthermore, the thermodynamic parameters, activation parameters, isosteric heat of adsorption, and activation energy were quantitatively examined in order to evaluate the feasibility and nature of the adsorption process.

Key words: Paclitaxel; Sylopute; Ultrasonic adsorption; Adsorption isotherm; Kinetics; Thermodynamics