

Investigation of the Mechanism and Kinetics of Paclitaxel Extraction from *Taxus chinensis*

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Abstract

Solid-liquid extraction of paclitaxel from *Taxus chinensis* has been investigated to understand the effect of temperature and solvent concentration on mechanism and kinetics of extraction. The paclitaxel concentration-time data were analyzed using a second-order kinetic model to determine extraction constant. A diffusion model was utilized to determine diffusion coefficient taking into account of both washing and diffusion phases together. Extraction temperature was observed to show a significant effect on paclitaxel yield, extraction rate and effective diffusion coefficient. The thermodynamic analysis showed that the enthalpy change (ΔH^0) and entropy change (ΔS^0) were both positive, while the Gibbs free energy change (ΔG^0) was negative and decreased when increasing the temperature. Thus, the extraction was more feasible when using a higher temperature.

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