

The Investigation of the kinetics and mechanism of ultrasound-assisted extraction of paclitaxel from *Taxus chinensis*김학균, 김진현<sup>†</sup>

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Experimental studies were carried out for the ultrasonic cavitation bubble- and gas bubble-assisted extraction of paclitaxel from *Taxus chinensis* while varying parameters such as ultrasonic power, gas flow rate, and contact time. Extraction efficiency has been dramatically improved, and the time required for extraction has been reduced compared to conventional methods. As a result of investigating the mechanism of extraction in which cavitation and gas bubbles were introduced, it was found that the bubble itself contributes to the improvement of extraction efficiency. In addition, the extraction behavior was quantitatively investigated by calculating the effective diffusion coefficient and mass transfer coefficient of paclitaxel. As the ultrasonic power and gas flow rate increased, the extraction rate constant (3.5590–6.6028 mL/mg min at 80–380 W and 3.3568–4.1067 mL/mg min at 0.185–1.750 L/min), effective diffusion coefficient (12.4448–17.5691 $\times 10^{-13}$  m<sup>2</sup>/s at 80–380 W and 12.0788–16.1050 $\times 10^{-13}$  m<sup>2</sup>/s at 0.185–1.750 L/min), and mass transfer coefficients (2.5196–2.9750 $\times 10^{-7}$  m/s at 80–380 W and 2.3982–2.4286 $\times 10^{-7}$  m/s at 0.185–1.750 L/min) increased.