# Ultrasonic Cavitation Bubble-Induced Adsorption of Paclitaxel from *Taxus chinensis* onto Sylopute

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## Abstract

In this study, a technique for adsorption of paclitaxel using ultrasonic cavitation bubbles and gas bubbles was developed. Compared to the control (conventional adsorption), the adsorbed amount and adsorption rate constant increased 1.27-1.44 times and 7.44-9.71 times (ultrasonic adsorption with mixing at 80-250 W), 1.14-1.27 times and 4.63-9.31 times (ultrasonic adsorption without mixing at 80-250 W), and 1.06-1.19 times and 1.18-1.34 times (gas bubble-adsorption without mixing at 1.15-9.41 L/min), respectively. As a result of investigating the adsorption mechanism in which cavitation bubbles were introduced, the microjets and shocks waves produced by bubble collapse, rather than the bubble itself, drastically improves mass transport in the pores of the adsorbent, thereby completely eliminating the intraparticle diffusion resistance. In the case of gas bubbles, the intraparticle diffusion coefficient increased by 1.34-1.75 times compared to the control, but there was a limitation in promoting intraparticle diffusion.
Key words: Paclitaxel, Adsorption, Ultrasonic cavitation bubble, Gas bubble, Mechanism