

Synergistic Effect of Mixing Cavitation and Gas Bubbles on Fractional Precipitation Efficiency of Paclitaxel

박영주, 김진현[†]

공주대학교

(jinhyun@kongju.ac.kr[†])

Abstract

In this study, a fractional precipitation technique of paclitaxel using ultrasonic cavitation bubbles and gas bubbles is presented. Precipitation efficiency has been dramatically improved, and the time required for precipitation has been reduced compared to conventional methods. In particular, the synergistic effect of mixing cavitation bubbles and gas bubbles during fractional precipitation was confirmed. As a result of investigating the mechanism of fractional precipitation in which cavitation and gas bubbles were introduced, it was found that the bubble itself acts as a nucleation site, resulting in faster nucleation and thereby improving precipitation efficiency. In addition, The precipitation characteristics were identified through the determination of kinetic and thermodynamic parameters, and the diffusion coefficient of paclitaxel and the size of particles were calculated to quantitatively investigate the precipitation behavior.

Key words: Paclitaxel; Fractional precipitation; Cavitation bubble; Gas bubble; Synergistic effect