

Fractional precipitation of paclitaxel based on ultrasonic cavitation bubbles and gas bubbles

강희중, 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 by 20–30 times compared to conventional methods. As a result of investigating the mechanism of fractional precipitation in which cavitation and gas bubbles were introduced, it was found that the bubble surface itself acts as a nucleation site, resulting in faster nucleation and thereby improving precipitation efficiency. In addition, compared to the conventional fractional precipitation, the particle size was reduced by 7.8–8.9 times and 4.7–4.9 times for cavitation bubbles and gas bubbles, respectively, and the diffusion coefficient was increased by 10.3–11.9 times (cavitation bubble) and 4.7–4.9 times (gas bubble).

Keywords: Paclitaxel; fractional precipitation; ultrasonic cavitation bubble; gas bubble; mechanism