The effect of molecular weight on Poly (L-lactic acid) in the supercritical antisolvent precipitation and fractionation using Rapid Expansion Solvent System

정헌섭, 이창하[1], 임종성[2], 이윤우[3,*]
한국과학기술연구원; [1]연세대학교 화학공학교; [2]서강대학교;
[3]서울대학교 응용화학부
(ywlee@snu.ac.kr*)

The main purpose of this research was to find the effect of molecular weight on particle size in the Aerosol Solvent Extraction System (ASES) using supercritical CO_2 as an anti-solvent. In addition, Rapid Expansion of Supercritical Solution (RESS) technique was also used. The particle formation model was tested with poly(L-lactic acid) (L-PLA) which are different in molecular weight from 50,000 to 220,000. In ASES process, the experiments were performed under conditions such as pressure (100bar), temperature (36ºC), initial concentration (0.5wt%) and solution flow rate (0.3㎖/min). It was found that ASES gave fine particle size (70-1600nm) with a narrow size distribution by spraying methylene chloride solution including L-PLA varied from molecular weight. RESS conducted the fractionation experiment on the products made by ASES. Supercritical HCFC-22 was used as a solvent in RESS process. The particle size and morphology were measured using Scanning Election Microscopy (SEM), Particle Size Analyzer (PSA) and Gel Permeation Chromatography (GPC).