

### Influence of Sinusoidal Taylor Vortex Flow on Cooling Crystallization of L-Lysine

Nguyen Anh Tuan, 김우식\*  
경희대학교  
(wskim@khu.ac.kr\*)

A new design of elliptical Couette-Taylor (ECT) crystallizer exploiting the sinusoidal Taylor vortex flow was developed for the promotion of the cooling crystallization of L-lysine. Due to the sinusoidal gap geometry in ECT crystallizer, the higher Taylor vortex intensity and viscous energy dissipation was induced than those in the circular Couette-Taylor (CT) crystallizer. Thus, the crystal nucleation and growth of L-lysine were both significantly promoted, resulting in enhancement of the recovery of L-lysine. The 100% recovery of L-lysine was achieved at 15 min of the mean residence time in the ECT crystallizer, whereas it was required at least 60 min of mean residence time in the MSMPR crystallizer under the same crystallization conditions. Furthermore, the recovery of ECT crystallizer was slightly higher than that of circular CT crystallizer. The effective crystallization in the ECT crystallizer compared to that in the MSMPR crystallizer was explained in terms of the Taylor vortex to the energy dissipation and mass transfer. Meanwhile, the higher L-lysine recovery in ECT crystallizer than in the circular CT crystallizer was due to the sinusoidal intensity of the Taylor vortex.