

The Effect of Non-isothermal Taylor Vortex on Crystal Size Distribution in Continuous Cooling Crystallization of L-lysine

Wu Zhaohui, 김우식*

경희대학교

(wskim@khu.ac.kr*)

In the present study, to control crystal size distribution, the non-isothermal Taylor vortex by heating inner (T_i) and cooling outer (T_o) cylinders (mode II, $T_i > T_o$) of the Couette-Taylor (CT) crystallizer was developed in continuous cooling crystallization of L-lysine. The method involves simultaneous dissolution of crystals at hot surface and growth at cool surface in CT crystallizer. The temperature gradient between T_i and T_o showed significant effect on crystal size distribution, and higher temperature gradient produced narrower crystal size distribution. Furthermore, low rotation speed of inner cylinder and short mean residence time under the non-isothermal condition contributed to narrow size distribution in final product. In addition, as comparing with the isothermal condition (mode I, $T_i = T_o$), it was clearly shown that the mode II among various non-isothermal modes was the most effective method for crystal size distribution. From the experimental results, it was demonstrated that the non-isothermal Taylor vortex in continuous cooling crystallization was highly efficient and productive route for crystal size distribution.