

## Modeling and Simulation of Polymorphic Transformation of L-Glutamic Acid and Optimization Strategy for Cooling Crystallization of $\alpha$ -Form Crystals

염승중, 양대륙\*  
고려대학교  
(dryang@korea.ac.kr\*)

L-glutamic acid can be crystallized as metastable  $\alpha$ -form and stable  $\beta$ -form crystal. The  $\alpha$ -form is desired because of its prismatic shape. Production of  $\alpha$ -form of L-glutamic acid by cooling crystallization is not well-defined and  $\alpha$ -form solid is commercially not available. In this study, an optimal cooling strategy to selectively produce large and narrowly distributed  $\alpha$ -crystals is found by modeling and optimizing the crystallization and polymorphic transformation of L-glutamic acid. The optimal temperature profile is found to be cooling-heating-cooling concept where short nucleation period is followed by growth period in metastable zone. The obtained  $\alpha$ -form of L-glutamic acid by optimal strategy had improved mean size, distribution, and purity compared to constant cooling.