Temperature swing strategy for selective crystallization of α-L-glutamic acid

염승종, 윤희찬, 양대륙*
고려대학교
(dryang@korea.ac.kr*)

Selective crystallization of desired polymorph is often constrained by transformation into undesired polymorph. In the case of α-L-glutamic acid, transformation into β-form is accelerated at higher temperature so it limits the range of temperature swing for selective growth of α-form crystals. In order to avoid both polymorphic transformation and excess nucleation of α-crystals, crystallization of two polymorphs was simulated and optimized by mathematical model. This model includes crystallization kinetics with temperature dependency to illustrate suppression of β-form at low temperature and fast transformation at high temperature. Batch crystallization experiments support the model in representative cases. The optimal temperature swing strategy is first cooling until low temperature for nucleation of α-form, quick heating for going back into the metastable zone and then planned cooling right below the metastable limit.