

Optimization of Seeded Batch Drowning-out Crystallization with Dynamic Meta-stable Limit Model

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Drowning-out crystallization process causes reduction of solubility as feeding anti-solvent into the solution. It is ternary system that is composed of Potash alum(solute) - Water (solvent) - Acetone(anti-solvent) in this research. The ultimate objective is to maximize crystal growth with suppressing the nucleation using dynamic metastable limit model. The metastable region and growth kinetics for potash alum were obtained from some experiments. Then, the parameters of the model were found about various initial concentration of the solution. We proposed the optimal feeding strategy of anti-solvent by genetic algorithm based on above results. To verify its superiority, we conducted experiments by the optimal feeding strategy and the constant feeding rate respectively. When crystal size distribution(CSD) was analyzed about each experiment, nucleation decreased remarkably and crystals were far more grow in the optimal feeding strategy.