Optiaml Cooling Crystallization Process using Metastable Zone Limit Prediction

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The purity of crystal and the washing costs in crystallization process depend on the size distribution of crystal. To obtain the high purity crystal and to cut down the cost, size of crystal have to be large and size distribution have to be narrow. If the supersaturation of the solution is larger than the maximum allowable supersaturation, $\Delta Cmax$, many nuclei formed in the solution. If the nucleation occurs throughout the crystal growth operation, the product size distribution will be wide spread-over. The purity of the product is degraded and the fine particles increase the pressure drop for washing process. To avoid the nuclei formation, the crystallization processes have to be maintained in the metastable region in which particles only grow without nuclei generation. Thus, it is very important to identify the metastable limit. Optimal cooling curve can be obtained by using metastable limit prediction with optimization technique.