Industrial Crystallization: theoretical basis and industrial application

By

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Abstract

For solid state materials, the crystal structure, morphology and particle size will affect the performance of the final products. The control of the above mentioned properties of the crystalline materials has always been a challenge for many chemical products, such as pharmaceuticals, fine chemicals, food additives, etc. In the past decades, researchers in our center have worked on both theoretical basis and industrial application of crystallization technology. In this talk, I will give a brief introduction about some of the research projects.

To control the structure and particle size of the crystals, it is essential to better understand the thermodynamics and nucleation kinetics of crystallization process. Therefore, I will first talk about our investigations on thermodynamics and nucleation kinetics. For many crystalline products, their physiochemical properties may have some drawbacks, such as low solubility, poor stability and so on. Cocystal and nanocrystal technology have been used to improve the quality of the products, such as to improve the solubility of API by formation of cocrystals or by micronization. Also, I will also talk about the application of PAT tools to optimize and manipulate the crystallization process to produce crystals with better properties.

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