

Promotion of Co-Crystallization of Caffeine and Benzoic Acid in Taylor Vortex Flow

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In the present study, a periodic fluid motion of Taylor vortex flow was applied to obtain CAF/BA co-crystal in the cooling co-crystallization. According to our previous studies, it was demonstrated that the Taylor vortex flow was highly effective for induction of nucleation, especially, of stable form in polymorphic crystallization. So it might be guessed in the present study that Taylor vortex flow would promote the formation of CAF/BA co-crystal without any heteronuclear seeds. Also, a turbulent eddy flow was applied for the co-crystallization of CAF and BA in order to investigate the influence of the fluid motion on the co-crystallization. Three different conditions of co-crystallization, including rotation/agitation speed, initial concentration, and cooling rate were studied. Meanwhile, a multivariate data analysis method, the principal component analysis (PCA), was used to evaluate their similarities and difference existing in the data.