

## The Non-isothermal Taylor Vortex for Crystal Size Distribution in Cooling Crystallization

Wu Zhaochui, \*

(wskim@khu.ac.kr\*)

Crystals size distribution (CSD) is an important indicator of crystal quality in crystallization process. And fine destruction technique is a prevalent route to achieve desired CSD based on that the fine crystals dissolves and survived crystals growth. The fine destruction technique also was introduced into Couette-Taylor (CT) crystallizer through non-isothermal Taylor vortex, which generated by individual temperature of inner ( $T_i$ ) and outer ( $T_o$ ) cylinders in batch and continuous cooling crystallization. The non-isothermal value, rotation speed and batch time/mean residence time are the crucial factors for CSD on basis of non-isothermal mode ( $T_i > T_o$ ) due to the adjustable heat transfer coefficients. For instance, in the batch system, the CSD is relative broad as the ratio of inner/outer heat transfer coefficients is low when the non-isothermal value is around 0.9 °C, but narrower CSD is obtained when the ratio of inner/outer heat transfer coefficients show high value 0.7 at higher non-isothermal values. The similar trend also displayed in continuous system. It is demonstrated that the non-isothermal Taylor vortex is highly efficient and productive technique for CSD in batch and continuous cooling crystallization.