

Geometric Effect of Couette-Taylor Crystallizer on Cooling Crystallization of L-Lysine

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A new continuous elliptical Couette-Taylor (ECT) crystallizer exploiting the unique Taylor vortex flow was developed to promote the recovery of L-Lysine crystal products. Due to the unique mixing of the Taylor vortex flow in ECT crystallizer, the nucleation and growth of L-Lysine crystals were both markedly promoted, allowing the significant enhancement of the recovery. Here, the recovery of ECT was higher than that in a MSMPR and conventional CT crystallizer under the same crystallization conditions. The efficiency of the Taylor vortex flow in ECT crystallizer for the recovery over the turbulent eddy flow in the MSMPR crystallizer was expected in terms of the effectiveness of the turbulence mixing for mass transfer at the solid-liquid interface. As the recovery of L-Lysine crystals was determined by the nucleation and growth processes, the rotation speed of elliptical inner cylinder, feed concentration, mean residence time, cooling temperature and feed solution temperature will be considered as the critical factors to impact the recovery and mean crystal size of L-Lysine crystals.