Taylor Vortex effect on crystal agglomeration in continuous crystallizer

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The influence of Taylor vortices on the crystal agglomeration was experimentally investigated in a continuous Couette–Taylor (CT) crystallizer with different geometries. The Taylor vortex flow is induced in the annular gap between two concentric cylinders when the rotation speed of the inner cylinder exceeds a certain critical value, while the outer cylinder remains stationary. The agitation and the dispersion medium are important factors for the agglomeration of crystals because generally determine the collision and physical adhesion between crystals. Thus, the agglomeration depends on the hydrodynamics conditions of the fluid, which determine the size and morphology of the crystal. Due to the mixing fluid motion generated, the crystal size distribution changes significantly with the reactor geometry as well as with the mixing intensity and residence time distribution. So, in this work, the geometry of the CT crystallizer as well as the synthetic conditions (pH, mean residence time, chelating agent) were varied in order to investigate the effect of Taylor vortex flow and obtain an optimal condition to produce crystals with high tap density, spherical shape and narrow size distribution.