Geometric effect of Taylor-vortex flow on crystal agglomeration in reaction crystallization

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A system that has attracted attention as efficient process equipment in rotating machines is the one that involves two concentric cylinders, with a stationary outer cylinder and a rotating inner cylinder, the flow in the annulus between the two cylindrical surfaces is called Taylor-Couette flow. Also when the equipment is operated in a continuous mode, an axial component is introduced. In order to apply Taylor flow in the crystallization reaction is necessary to known the hydrodynamic conditions and the behavior of the particles. The agglomerate particle size is frequently limited by the hydrodynamic conditions of the suspension such as the agitation and the dispersion medium. In this work Taylor vortex is applied to control the crystal agglomeration during continuous crystallization and evaluate how the different annulus between the two cylindrical surfaces (from narrow to wide) influence the shape, size and size distribution of the crystal, in order to achieve a good agglomerate particle with a high tap density, a spherical shape and narrow size distribution, with a short mean residence time and moderate rotation speed of the inner cylinder.