Mathematical Modelling of the Phase Transformation of Guanosine 5-Monophosphate (GMP) in Continuous Couette-Taylor Crystallizer

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The mathematical modeling of GMP crystallization in Couette-Taylor crystallizer is conducted. Generally, the phase transformation of GMP includes two processes: the dissolution of GMP amorphous and the nucleation-crystal growth of GMP crystal. Couette-Taylor crystallizer is modeled by plug flow crystallizer. In this work, we study the phase transformation of GMP via the amount of GMP amorphous, GMP crystal, GMP solution and the mass transfer coefficient along with axial flow position of Couette-Taylor crystallizer. In order to do this, the crystallization process was observed under various operation conditions of the GMP feed concentration and the rotating speed of the inner cylinder. Simulation results show that the plug flow crystallizer model could be used to estimate the phase transformation of GMP in Couette-Taylor crystallizer.