

Composite crystallization of two active pharmaceutical ingredients in presence of polymers

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Particle engineering of pharmaceutical ingredients using crystallization has significantly been developed in decades. Polymer-directed crystallization, which adds a small amount of polymer to the crystallization process, can manipulate a variety of physical properties and gain many benefits. This study aims to prepare composite crystals of two drugs using the polymer-directed crystallization method for non-classical crystallization. The two drugs were celecoxib (Cel), and quercetin (Qu). A drowning out-crystallization method was used, in which an anti-solvent containing a polymer was injected into the solutions of two drugs. X-ray diffraction (XRD) observed no changes in the crystalline forms. Changes in crystal morphology of Cel and Qu were investigated by optical microscopy (OM) and scanning electron microscope (SEM). The melting point measurements by Differential Scanning Calorimetry (DSC) showed significant changes in the melting points of the two drugs, which indicates significant interactions among the drugs and the polymer. This novel preparation method of composite crystals could offer a new opportunity to produce complex formulations.