Repeatedly engineering uniform crystals through evaporative crystallization in confined flow system

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Evaporative crystallization often produces non-uniform crystallites unless a specific condition is employed. This phenomenon occurs because evaporation rates randomly fluctuate at each part of solution surface. If local evaporation rate is controlled by evaporation parameters such as temperature gradient and flow rate of evaporated gas, we might be able to engineer crystal size and habit. In this study, volatile solvents were used to control the evaporation crystallization of the active pharmaceutical ingredient (API) with polymer. The growth of crystal could be inhibited or enhanced depending on confined flow systems. Crystals that grow through evaporation will have different properties and will precipitate if there are highly interactive macromolecules around. By controlling the evaporation rate of the solvent or the growth of crystals in a polymeric environment, it could be useful for the future crystal engineering for the development of novel materials.