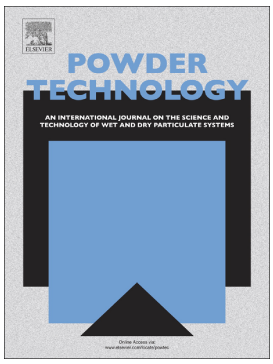

Combined cooling and antisolvent crystallization of L-asparagine monohydrate

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Combined cooling and antisolvent crystallization of L-asparagine monohydrate.

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Abstract

Combining cooling crystallization and antisolvent crystallization is advantageous as it not only enhances yield but also offers two manipulative variables to exercise greater control on the outcome of a crystallization process. This study investigates the combined cooling and antisolvent crystallization of L-asparagine monohydrate (LAM) from it's aqueous solution using isopropanol as antisolvent. Three well known cooling policies (cubic cooling, natural cooling, linear cooling) and three feeding policies that are inspired by these cooling policies are employed to investigate the effect of combined modes of operation on crystal yield and crystal size distribution (CSD). The resulting supersaturation profile for a combined mode is intuitive and can be construed by qualitative superposition of supersaturation profiles of individual modes. A significant enhancement in the yield has been observed in all combined modes compared to individual modes of crystallization. Similar to individual modes, the highest mean size was obtained by combining slow cooling and slow-antisolvent addition strategy. Further, a population balance model is developed for the combined

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