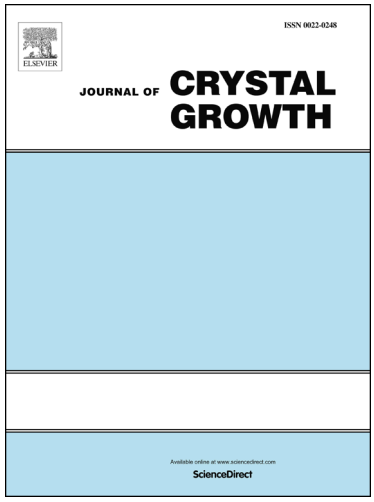


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# Design and optimization of production parameters for boric acid crystals with the crystallization process in an MSMPR crystallizer using FBRM® and PVM® technologies

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ABSTRACT

In crystallization studies, newly developed technologies, such as Focused Beam Reflectance Measurement (FBRM) and Particle Vision and Measurement (PVM) are appiled for determining on-line monitoring of a representation of the Chord Length Distribution (CLD) and observe the photographs of crystals respectively; moreover recently they are widely used. Properly installed, the FBRM ensures on-line determination of the CLD, which is statistically associated to the Crystal Size Distribution (CSD). In industrial crystallization, CSD and mean crystal size as well as external habit and internal structure are important characteristics for further use of the crystals. In this paper, the effect of residence time, stirring speed, feeding rate, supersaturation level and the polyelectrolytes such as anionic polyacrylamide (APAM) and non-ionic polyacrylamide (NPAM) on the CLD as well as the shape of boric acid crystals were investigated by using the FBRM G600 and the PVM V819 probes respectively in an MSMPR (Mixed Suspension Mixed Product Removal) crystallizer. The CSD and kinetic data were determined experimentally using continuous MSMPR crystallizer running at steady state. The population density of nuclei, the nucleation rate and the growth rate were determined from the experimental population balance distribution when the steady state was reached.