Control of Supersaturation by Addition rate in Reverse Anti-solvent Crystallization

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HNIW is one of the HEMs and it has higher density and more stable than others. It has four polymorphs, alpha, beta, epsilon and gamma. Epsilon form is the highest density. It means it is the useful for use as an explosive. This research aims to study the crystal form obtained by controlling addition rate of anti-solvent to the degree of supersaturation.
Experimental conditions are the use of a 3-blade impeller at a constant rotational speed of rpm. The temperature is maintained at 293K. At this time, the ratio of the anti-solvent to the solvent and the concentration of the solution are kept constant and only the addition rate of solution is adjusted. Polymorphs are analyzed by raman spectroscopy according to the injection rate and morphology is checked in real time using FBRM.
The faster the addition rate, the higher the degree of supersaturation (S=C0-C*) and the nucleation and crystallization took place in the form of Beta. At low supersaturation it was obtained in the form of epsilon. The form of the first crystal is based on the degree of supersaturation.