

Study on controlling supersaturation and obtaining the e-form of HNIW crystallization in solution

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Polymorphs of HNIW has the same chemical composition, but they have different structures, so each polymorph induces different character in explosive performance. The polymorphs consisted of alpha, beta, epsilon and gamma. We investigated how the desired form is obtained by the supersaturation. In experiment set up, the solution is added fast into anti-solvent (IPA) which is rotated by impeller with a constant agitation rate. The temperature is maintained as 293K by PID. The mass ratio of IPA and ACT ranges from 1:9 to 5:5. We changed the solute concentration and monitored the supersaturation by using the in-line Raman spectroscopy. Beta form was observed when the supersaturation is high. If the supersaturation is low, epsilon form was firstly precipitated. The range of the supersaturation that transformation of polymorphs occur is established.