A Study on Phase Transformation Between Hyrate Forms of an Active Pharmaceutical Ingredient

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The transformation of hydrates (hemipenta to mono) of an API during crystallization from the suspension of hemipenta hydrate solid in the saturated solution was monitored by simultaneously using the in-situ measurement of ultrasonic velocity and the offline analysis technique: optical microscopic, crystallography (XRPD). The function of ultrasonic velocity depended on concentration solid fraction in suspension was found. From calibration, the solid composition, concentration of solution and supersaturation during the phase transformation and crystallization were estimated with elapsed time. As the result, kinetic of phase transformation and crystallization was found. The effect of mono hydrate seed, agitation rate and temperature on the phase transition as well as crystallization was also considered.