A mechanism study of anti-solvent co-crystallization by ATR-FTIR, XRD and DSC

왕인천, 최광진[1,*]
인제대학교; [1]순천향대학교
(guangchoi@shc.ac.kr*)

The pharmaceutical performance including the solubility, dissolution rate, and ultimately bioavailability of insoluble drugs (BCS class Ⅱ) such as indomethacin (IMC) and carbamazepine (CBZ) can be substantially improved by co-crystal approach. Until now, pharmaceutical co-crystals have been prepared by evaporation, grinding (neat or solvent-assisted), cooling, and supercritical operation.
The preparation of IMC-SAC co-crystals by anti-solvent method was reported for the first time by our team. This approach has been well known for its primary advantages such as high production rate and process controllability.
In this study, the mechanism of the co-crystal formation between IMC and SAC in the mixture of methanol and water was investigated. A change in saturation by adding water as anti-solvent would have caused a change in hydrogen bonding status between IMC and SAC. During the co-crystallization reaction, solutions were sampled periodically for at-line characterization using ATR-FTIR, XRD, and DSC. We observed consistent spectral shifts as co-crystallization made a progress. We will discuss the results in detail with thermodynamic analysis.