

IN-SITU VARIABLE TEMPERATURE POWDER X-RAY DIFFRACTION AND THERMAL ANALYSIS

- Applications in the Pharmaceutical Industry

Shawn X. Yin, Raymond P. Scaringe, Jack Z. Gougoutas
Solid State Sciences
Bristol-Myers Squibb Company

Detailed knowledge of the thermal behavior and thermodynamics of active pharmaceutical ingredients (API) is critical in all stages of pharmaceutical product development. In-situ variable temperature powder X-ray diffraction (VT-PXRD) technique has been widely used in other fields as well as in the field of pharmaceutical science. Combined with other thermal analysis techniques, VT-PXRD can provide valuable information with regard to crystal structure, phase transitions, desolvation/dehydration, rehydration, melting, decomposition, and crystallization of pharmaceutical substances. This presentation will focus on how to use VT-PXRD in combination with other thermal techniques to address important problems in the pharmaceutical industry. An overview of experimental techniques and issues to be presented. Example cases will include the study of solvates/hydrates, solvated salts, and solvent-free substances.