Two-dimensional Powder X-ray Diffraction: fast and effective PXRD technique for material characterisation

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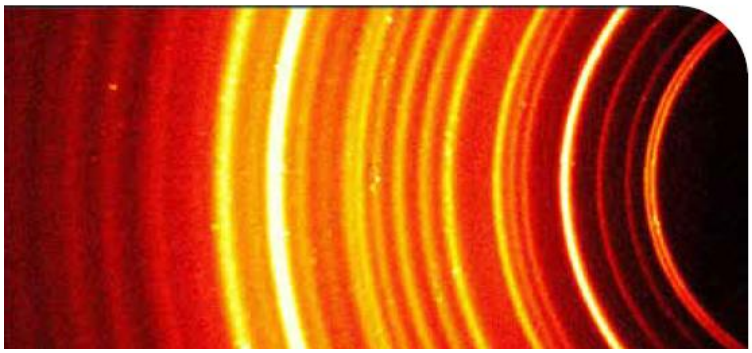
Physicochemical characterisation of the API is a regulatory requirement and a vital step in drug development. Powder X-ray diffraction (PXRD) is an accepted technique in the pharmaceutical industry as a non-destructive test method to analyse the structure of a crystalline material, determine the amorphous content, or detect residual crystallinity in amorphous samples. While conventional PXRD instruments collect diffraction patterns using 1D detectors, area (2D) detectors have been utilised recently in more modern diffractometers providing many advantages over the 1D technique. A two-dimensional diffraction frame contains far more information than a diffraction pattern measured with a conventional diffraction system with a point detector or a linear position-sensitive detector. The speed of two-dimensional diffraction is typically several orders of magnitude higher than conventional diffraction, making it suitable for high-throughput and fast PXRD measurements. In addition, very small quantity of material is needed to perform 2D-PXRD analysis using modern instruments.



The Solid State Research & Development (SSRD) team at Eurofins CDMO utilises a D8 Discover diffractometer equipped with a 2D detector and a microfocus X-ray source, specialised for high-throughput PXRD studies, which is capable of collecting PXRD data on samples as low as 1 mg. In addition to high-throughput screening, Eurofins CDMO's solid state experts take advantage of this instrument for fast PXRD method developments based on the additional knowledge gained about the nature of the sample, preferred orientation, and crystallite size from the 2D detector. This knowledge-based approach to method development adds value to Eurofins' GMP method validation and data collection when performed on a D2 Phaser PXRD diffractometer with optimised sample preparation for each specific compound. In summary, with the help of this new 2D X-ray diffraction technology, the Eurofins CDMO SSRD team collects PXRD data on small sample amounts with speed, accuracy, and optimised sample preparation based on the knowledge obtained from a 2D detector. For more information: *www.eurofins.com/cdmo*