

X-ray Diffraction

Category:

C. Particle Characterisation in and ex-situ

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Short technology description

X-ray diffraction (XRD) using the PHILIPS X'PERT PRO is a powerful analysis technique for identifying phases in crystalline materials, such as metals, inter-metallics, ceramics, minerals, polymers, or other inorganic or organic compounds. Not only the crystal structure itself is revealed by the diffraction of X-rays, but also a variety of related characteristics such as the internal stress state of materials, crystallite size, preferential orientation of the grains,...

Main Features (Equipment Capabilities):

- fully automated goniometer,
- 2 θ measurement range from -40° to 162° and $\pm 0.001^{\circ}$ reproducibility (with attachments)
- generator power 3.0 kW
- incident beam attachments:
 - graded multilayer X-ray mirror (line focus) for Cu radiation
 - X-ray lens (point focus) with max. 0.3° beam divergence
 - Mono-capillary with spot size 0.1 mm
 - programmable divergence slit
 - 0.04 rad Soller slits
- sample stages:
 - open Eulerian cradle (psi ranging from -5° to 95°) with manual z-translation
 - multi purpose sample stage with automated x, y and z translations, rotation and
 - sample spinner stage, with sample changer
- diffracted beam attachments
 - programmable anti-scatter slit and receiving slit
 - curved diffracted beam monochromator for Cu radiation (pyrolytic graphite)
 - parallel plate collimator, $0.27^{\circ} \times 2$ acceptance angle
 - flat monochromator crystal (pyrolytic graphite)
- Cu and Cr radiation
- software for qualitative and quantitative phase analysis, crystallographic and Rietveld analysis, and internal stress and texture measurements

Typical Samples & Images:

Any further Information:

