

New Instrumentation for X-Ray Micro Diffraction

Heiko R. Ress¹, Christoph Olligner², Geert Vanhoyland², Bob He¹, Brian Jones¹

¹ Bruker AXS – 5465 East Cheryl Pkwy – Madison, WI - US

² Bruker AXS – Oestliche Rheinbrueckenstrasse 49 - Karlsruhe - Germany

Micro X-Ray Diffraction (μ XRD) is used as an umbrella term for many different X-ray applications such as Powder Diffraction, High Resolution X-ray diffraction (HRXRD), Texture and Stress. Common to all of these applications is the use of an X-ray beam of 500 μ m and below. The need for ever this smaller spot sizes is driven by small sample amounts as well as structured and inhomogeneous samples.

Laboratory instruments for μ XRD employ - besides standard sealed tubes - microfocus and rotating anode X-ray sources in order to provide the highest available flux density. Despite these efforts the diffracted intensity can still be very weak and 1D or 2D dimensional detectors are therefore used whenever possible to increase the measurement signal or reduce the measurement time. Last but not least combined laser-systems ensure the correct measurement spot on the sample as well as automatic sample alignment using pattern recognition.

Bruker AXS has incorporated new X-ray sources into its D8 DISCOVER with DAVINCI diffractometer platform in order to provide higher flux density, better beam stability and smaller spot sizes. Component recognition is used in order support the user in the optimal diffractometer setup and document used configurations. State-of-the-art XRD² detectors are used for smallest spot sizes and shortest measurement times.