Advancing PDF Analysis: Fast and High-Quality Local Structure Insights with XRDynamic 500

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Pair distribution function (PDF) analysis is a powerful technique for investigating the local structure of materials, regardless of their state—crystalline, amorphous, or liquid. It provides critical insights into how atoms or molecules are arranged at the atomic scale.

PDF measurements are typically performed at synchrotron facilities, which offer rapid data collection. In contrast, conventional laboratory X-ray diffractometers (XRD) require significantly longer acquisition times to achieve comparable results. However, Anton Paar's XRDynamic 500 overcomes this limitation with cutting-edge hardware automation, enabling faster measurements without compromising data quality. A key factor in accelerating PDF data acquisition is the use of high-quantum-efficiency detectors optimized for hard X-ray radiation, such as Mo or Ag Kα sources. For instance, just one hour of measurement on the XRDynamic 500 can produce high-quality PDF data from a quartz sample.

In this presentation, we will showcase Anton Paar's state-of-the-art solutions for PDF analysis, introduce groundbreaking hardware advancements, and highlight real-world application examples that push the boundaries of what's possible in PDF data acquisition on laboratory XRD instruments.

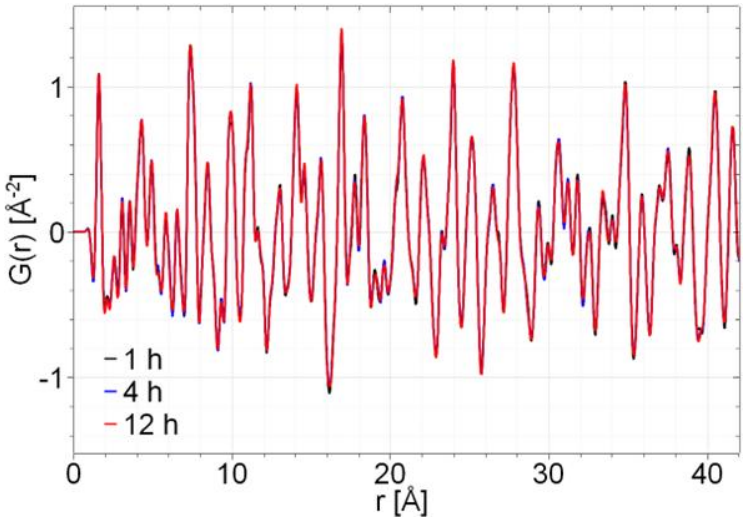


Figure 1. *Effect of scan time on PDF quality of quartz*