

during heating with respect to the incident X-ray beam. Studies of crystal structures require mobility of the laser-heating system. We have developed a portable laser heating system for DACs suitable for the single crystal diffraction experiments. In order to test application of the portable laser heating system for single crystal diffraction studies at ID09a we investigated high-P,T behavior of tungsten single crystals up to 40 GPa and 2500 K and silicate perovskite (Mg,Fe)(Si,Al)O₃ at pressures over 75 GPa and 2700 K. The body text font is Times New Roman (size 9) with single spacing and full justification. The total allowed area is 8 x 24 cm.

Keywords: single crystals, high-pressure crystallography, high-temperature X-ray diffraction

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Progress in Using Short Wavelength Radiation for Chemical Crystallography. Jürgen Graf^a, Bernd Hasse^a, Francesca Fabbiani^b, Thomas Schulz^c, Dietmar Stalke^c, Holger Ott^d, Carsten Michaelsen^a. ^a*Incoatec GmbH, Geesthacht, Germany.* ^b*GWZ, University of Göttingen, Germany.* ^c*IAC, University of Göttingen, Germany.* ^d*Bruker AXS GmbH, Germany.*
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Combining synthetic multilayer mirrors with microfocus X-ray sources has become a standard with in-house X-ray sources for single crystal diffraction as well as a number of applications in powder diffraction. The maximum angle of incidence at which a multilayer mirror reflects is significantly smaller for higher energy radiation, such as Mo-K_α or Ag-K_α radiation than it is for Cu-K_α radiation. This is why synthetic multilayer mirrors traditionally have been used for Cu-K_α radiation or softer wavelengths. Modern deposition technology, however, allows for the reproducible production of high quality multilayer mirrors with smaller *d*-spacing. In consequence, these mirrors reflect higher energy radiation at larger angles of incidence. Combined with the latest generation of microfocus sealed tubes this provides new high-performance low-power X-ray sources for shorter wavelengths.

We will present selected results on the use of these low-power consumption, high-performance sources for Mo-K_α and Ag-K_α radiation in structural chemistry and high-pressure crystallography.

Keywords: instrumentation, high-pressure X-ray diffraction, chemical crystallography

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X-ray Diffraction from Crystals in Crystallization Drops. Tadeusz Skarzynski. *Oxford Diffraction, Yarnton, Oxfordshire, United Kingdom.*
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Characterization of protein crystals with X-rays, in-situ, without needing to extract them from the crystallization plate allows establishing a “base line” for crystal quality, and evaluating resolution limits before crystals are subjected to any manipulation. The in-situ testing also allows quickly distinguishing between salt and protein crystals, test

harvesting, soaking and cryoprotectant conditions and selecting the best crystals for data collection.

We will show how the in-situ testing, both at synchrotron beam lines and using the Oxford Diffraction PX Scanner system for home labs can be used as a powerful tool providing valuable feedback at all stages of macromolecule crystallization. Several examples of significant variation of diffraction properties of crystals grown from the same conditions will be illustrated and discussed highlighting the importance of critical assessment of crystal quality at room temperature. We will show results from crystals grown under oil and in capillary-based devices. Initial trials of using the in-situ diffraction to detect ligand and heavy-atom binding will be presented as well.

Keywords: crystallization process, X-ray methods, in-situ diffraction