X-RAY DIFFRACTOMETRY WITH A MICROFOCUS SOURCE

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The increasing importance of X-ray diffractometry with 2-dimensional detectors has lead to a rising demand for highly intense X-ray sources enabling the analysis of very small and weakly scattering samples in the home-lab within a reasonable time frame. Therefore, various microfocusing sealed tube X-ray sources with focal spot sizes below 100µm are now available.

Results of the new low-maintenance high-brilliance Incoatec Microfocus Source IµS are presented. The source incorporates an optimized combination of an extremely bright and very durable stationary air-cooled 30 W microfocus source and the newest type of 2-dimensional beam shaping multilayer optics, the so called Quazar optics.

We show measurements with the IµS equipped with different 2-dimensional beam shaping multilayer optics. The comparison of IµS with typical sealed tube fine focus systems shows data of outstanding quality in diffractometry applications using a 2-dimensional detector. A huge improvement in intensity and resolution by factors of about 15 was observed. Especially for the measurements of powders in transmission geometry the IµS delivers very promising results. A focusing on the detector enables better crystallite statistics and better resolution. For some applications there are even intensity gain factors in the range of 100 achievable. For small angle scattering a factor of 5 in comparison to a typical sealed tube instrument was observed when using an IµS with optics for a parallel beam.

INFORMATION PAGE for the abstract
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I would like to present a talk in the session "New Developments in XRD & XRF Instrumentation" by V. E. Buhrke.

Publication in the DXC proceedings is planned.