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Convergent beam powder x-ray diffraction WEI ZHOU, CAROLYN MACDONALD, University at Albany — Polycapillary x-ray optics, arrays of hollow glass tubes, were used to collimate and focus x rays onto powder samples for diffraction measurements.[1] Comparisons were made of system resolution and diffracted beam intensity for with and without focusing and collimating optics using a standard small spot rotating anode system in point source geometry. The results for simple inorganic standards and a variety of macromolecules were compared to those obtained with a very low power, 20 W, microfocus source which allowed smaller source-to-optic distances and therefore collection over larger solid angles.[2] In order to compare with theoretical calculations, detailed source and optic characterization were performed. Resolution and intensity were in good agreement with those obtained from simple geometrical calculations, which allows for system design and optimization for the desired sample characteristics.

[1]C.A. MacDonald and W.M. Gibson, "Applications and Advances In Polycapillary Optics", X-ray Spectrometry, **32** (3), 2003, pp 258-268.
[2]N. Mail, W. M. Gibson, and, C.A. MacDonald, "Molybdenum Microfocus Source Coupling to Polycapillary Optics for Powder Diffraction," in Ali M. Khounsary , C.A. MacDonald, eds., **Advances in Laboratory-Based X-Ray Sources and Optics III**, SPIE vol. 4781, pp. 87-95, 2002.

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