

COLLIMATING AND FOCUSING POLYCAPILLARY OPTICS FOR POWDER DIFFRACTION

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Abstract: In this paper, we describe a low power system using Polycapillary collimating and focusing optics that were designed to collect Cu Ka radiation from an Oxford Ultra-Bright micro-focus source for X-ray powder diffraction measurements. The characterizations of the source and polycapillary optics are presented. A collimator with two apertures was used to block high energy X-rays. An optic alignment system was designed to optimize coupling between the optics and the source, taking into account the maximum radiation direction from the source. Several powder sample data sets were collected with this system and their qualities are compared with data sets from the same samples taken with an Enraf-Nonius FR590 sealed-tube source system. Discussion is also presented for further improving the performance of this low power system.