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Advances in X-ray Optics: Improving the Performance of Sealed Tube Based Diffraction Systems. Anita Coetzee, Bram Schierbeek, Arjen Storm, Bruker Nonius BV, Oostsingel 209, 2612 HL Delft, The Netherlands.

New generation sensitive CCD detectors in combination with recent advances in X-ray optics, have brought problems that were traditionally intractable within scientific reach.

With the addition of optics the intensity obtained from a standard sealed tube generator can be significantly increased over the traditional graphite monochromator. Monocapillary glass optics can easily be added to a system. These optics focus the beam, based on total external reflection of x-rays on smooth surfaces.

Combining graded multilayer optics[1] with a sealed tube generator allows for the exclusion of a monochromator, since this optics will monochromate the beam. These optics can be configured for maximum parallelism of the beam (Göbel mirrors) or in a side-by-side Kirkpatrick-Baez scheme as conceived by Montel in the 1950's[2] to optimize flux density.

This study reviews the advances in optics for Cu radiation, giving representative examples of samples which have been studied, using a sealed tube X-ray generator in combination with a sensitive CCD detector, combined with different optics. Typical results obtained on small crystals of organic molecules, absolute structure configuration of natural products and pharmaceuticals and the screening of proteins are presented.

[1] H. Göbel, 38th Annual Denver Conference, 1-5 August 1994, Steamboat Springs, Colorado, USA. H. Göbel, ACA meeting, Pittsburgh, 1992, Paper I01.

[2] M. Montel, *Optica Acta*, 1, 1954, p. 117. M. Montel, *X-ray Microscopy and Microradiography*, Vol. 5, 1957, pp. 177-185.