

Design of a plane grating with multilayer coating for the soft X-ray tomography beamline

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Abstract

The soft X-ray tomography (SXT) beamline using a bending-magnet source is designed for transmission full-field imaging of frozen-hydrated biological samples in the range between 260 eV and 2600 eV. In this beamline, the plane-grating monochromator (PGM) consists of two interchangeable plane gratings and a plane mirror to provide uniform energy-independent illumination. The 600 l/mm grating with Au coating has already been set up to serve the energy range from 260 eV to 1200 eV. Here the 2400 l/mm grating with B₄C/Mo multilayer coating is studied to enhance the diffraction efficiency in the energy range from 1200 eV to 2600 eV. The figure 1 shows diffraction efficiency of 2400 l/mm plane grating calculated by Gsolver in a multilayer period of 5 nm and 30 periods (60 layers).

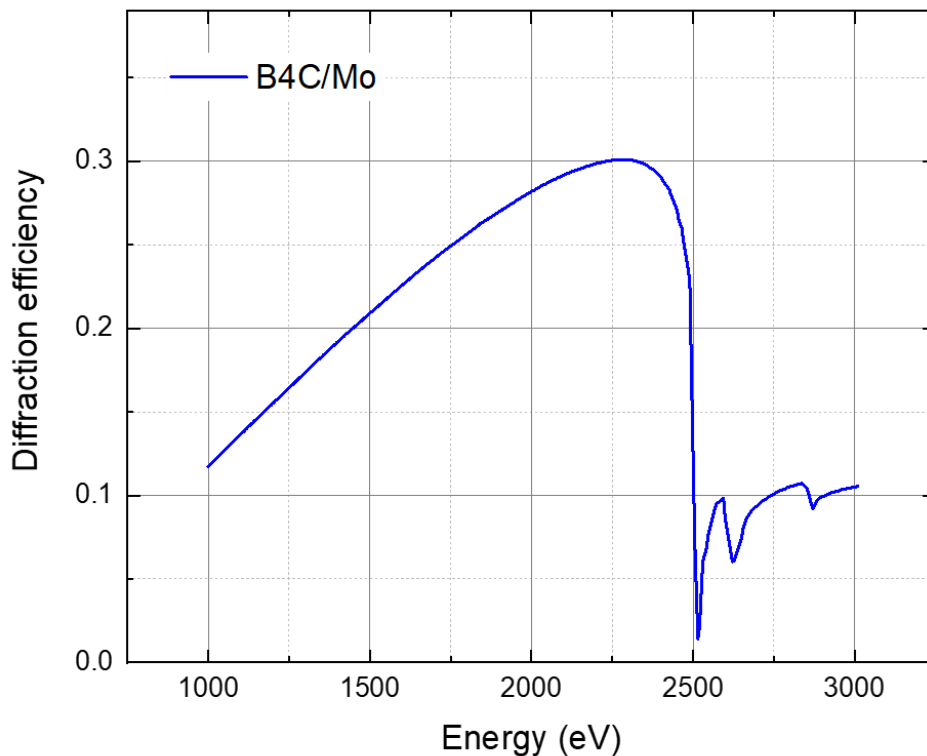


Figure 1 Diffraction efficiency of 2400 l/mm plane grating calculated by Gsolver