

DEEP MULTILAYER GRATINGS WITH ADJUSTABLE BANDPASS FOR XRF SPECTROSCOPY

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Regular x-ray multilayer mirrors are widely used in wavelength dispersive x-ray fluorescence (WDXRF) spectrometers. More than 10 years ago the multilayers replaced artificial crystals, such as lead stearate, in analysis of light elements from Be to Mg. Employing the multilayers for heavier elements is limited by their relatively low spectral resolution in comparison with crystals, such as PET which are currently used for analysis of elements from Al to Ar. PET crystals, however, are very sensitive to the environment, and degrade fast under the influence of radiation, moisture, etc. Therefore, they don't last long and usually require temperature stabilization. Multilayer mirrors, on the other hand, are very stable, durable, and easy in use.

In this paper we propose deep multilayer gratings with adjustable bandpass as alternative dispersing elements to PET crystals for WDXRF spectroscopy. The deep multilayer gratings allow enhancing spectral resolution, keeping all other advantages of the multilayer mirrors [1-3]. Another advantage of the deep multilayer gratings is that the resolution is adjustable to the requirements and can vary in a wide range. Control of the bandpass is very important in many x-ray instruments when an optimum between photon flux and spectral resolution is needed.

References:

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