Extreme ultraviolet broadband Mo/B_4C multilayer analyzer

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Abstract: A broadband extreme ultraviolet Mo/B_4C aperiodic multilayer analyzer was designed by a numerical method for polarization experiments in the 6.65–7.25 nm wavelength range. The multilayer was prepared using direct current magnetron sputtering and characterized using the soft X-ray polarimeter at BESSY-II. The measured s-reflectivity at a grazing angle of 45.6° is (6.23 ±0.61)% over the 6.75–7.35 nm wavelength range, and the spectral width is 6 times that of a corrersponding periodic multilayer. The aperiodic multilayer also exhibits high polarizing capability, up to 99.93% over the measured wavelength range. In addition, the aperiodic multilayer analyzer was measured in the angular range 42.6– 48.2° at a wavelength of 7.02 nm, and the s-reflectivity was (6.15 ±1.13)%.

Keywords: Polarization; aperiodic multilayer; analyzer; magnetic sputtering; synchrotron radiation

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