Metal/Carbon multilayers deposited by the magnetron and ion - beam sputtering techniques as normal incidence reflectors for wavelengths near the C-K radiation line.

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The C-based multilayers with the absorbing layers of Ni, Cr, V, Co, and NiCr have been deposited by both the magnetron and ion-beam sputtering techniques. The multilayer reflectivity has been measured at the Cu-K (Lambda=0.154nm) radiation by using the X-ray diffractometer (Osmic Inc.) and at wavelengths around the C-K radiation line (Lambda=4.47nm) by the synchrotron radiation (BNL) and by the soft X-ray reflectometer (IPM, Nizhniy Novgorod, Russia). The maximum reflectivity of 11.2% at normal incidence at Lambda=4.47nm with the angle resolution tan(theta) / delta(theta) = 111 has been observed with the Co/C structures prepared by the ion-beam technique. The maximum spectral resolution Lambda / delta(Lambda) 170 with the reflectivity of 6.6% has been measured with the V/C structures deposited by the magnetron sputtering technique. Comparison of both techniques for deposition of the C-based X-ray multilayers are presented.

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