

Multilayer coatings for Synchrotron Radiation

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Our group has experience in the fabrication and study of multilayer coatings, which are mainly used in X-ray optics as multilayer X-ray mirrors (MXMs). These are conventional MXMs based on Be, B, C, Mg, Si, Sc and Ti, as well as heat- and radiation-resistant MXMs, for example: Si/Mg₂Si, Mo₂B₅/B₄C, MoSi₂/Si, WC/Si, CrB₂/C, etc. We have fabricated mirrors, monochromators, collimators, polarizers, objectives, diffraction gratings, supermirrors etc. We have studied thermal and radiation stability of MXMs; the early stage of reaction between layers at sub-nanometer level; and evaluated the thickness, composition and density of reaction products. Some recent results on the application of fabricated multilayer materials in three areas will be presented.

These include: (1) multilayers (MLs) for radiation-resistant materials in nuclear and fusion power applications (using W/quasicrystal multilayers as an example); (2) reflective X-ray masks using WC/Si multilayers; and (3) high-resolution multilayer X-ray mirrors using W/B₄C and W/Si material pairs.

Type of presence

Presence online

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