

ASPHERIC MULTILAYER OPTICS FOR MICRO XRF APPLICATIONS

S. Rodrigues, P. Panine, P. Høghøj, B. Lantz

Xenocs SA, 19 rue François Blumet, F-38360 Sassenage, France

Multilayer X-ray optics are now widely used in diffraction applications such as single crystal diffraction and small angle x-rayscattering. In XRF, multilayers have been used for many years as analyzers for low Z elements. More recently, multilayer optics have been developed for microbeam excitation in (ED)XRF applications. Multilayer optics when coupled to microfocus sources can provide an intense monochromatic beam focused on a very small spot (typical smaller than 100 microns). Such monochromatic beam can benefit XRF detection of very low concentration of elements in a matrix or for thickness measurement of a very thin layer over a substrate on a very small sampling area (micro-XRF capability for detection of low concentration elements).

For this purpose, we have developed a unique aspheric multilayer optic (shaped as an ellipsoid of half or full revolution) which collects a very high solid angle and focuses X-rays on less than 100 microns spot when coupled to microfocus sources. We have tested the performances of this optic in XRF applications for low Z element detection and compared the data to a polychromatic radiation set-up. We will present the results and discuss the limits and advantages of multilayer optics for monochromatic excitation in XRF compared to other types of X-ray optics.