Design and Testing of X-ray Fluorescence Detectors Using Synthetic Multilayers

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It is a concern that the 13-element Ge detector, commonly used for x-ray fluorescence detection on dilute systems, will not be compatible with the third-generation sources due to its count rate limitations and the high photon flux from the source. Thus, we are developing energy-resolving x-ray fluorescence detectors using synthetic multilayers. This type of detector can be built with good energy resolution and reasonable solid angle, and is tunable over a wide energy region We will present the development of multilayer array detectors using graded multilayers. Tests on a prototype multilayer array detector showed superb background rejection and reasonable efficiency. The design and testing of a 20-element multilayer array detector will also be presented.