BONNER SPHERE MEASUREMENTS OF 241Am-B AND 241Am-F NEUTRON ENERGY SPECTRA UNFOLDED USING HIGH-RESOLUTION A PRIORI DATA

Abstract:
High-resolution neutron energy spectra, covering the entire energy range of interest, for two standard radionuclide neutron sources (241Am-B and 241Am-F) have been derived from Bonner sphere measurements by using high-resolution a priori data in the unfolding process. In each case, two a priori spectra were used, one from a two-stage calculation and also one from a combination of the calculated spectrum with a high-resolution measured spectrum. The unfolded spectra are compared with those published elsewhere and show significant differences from the ISO- and IAEA-recommended spectra for 241Am-B and 241Am-F, respectively. Values for the fluence-average energy and fluence-to-dose-equivalent conversion coefficients are presented for the new spectra, and the implications of the new spectra for the emission rates of the sources when measured by the manganese bath technique are also determined.

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