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On the application of methods of positron annihilation spectroscopy for studying radiation-stimulated processes in chalcogenide glassy semiconductors

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Abstract

Unirradiated and γ-irradiated (average energy E = 1.25 MeV and dose Φ = 2.41 MGy) chalcogenide glassy semiconductors (CGSs) As2S3 and Ge15.8As21S63.2 are studied by positron annihilation lifetime spectroscopy (PALS) and Doppler broadening of the 0.511-MeV annihilation line (DBAL). Two 22Na positron sources with activities of 0.6 and 2.0 MBq and Kapton film thicknesses of 8.0 and 25.0 μm, respectively, are used. It is shown that radiation-induced changes in the PALS parameters of the CGS types under study are within measurement errors. The DBAL method appeared more efficient and accurate for studying radiation-stimulated processes in CGSs. © 2014 Pleiades Publishing, Ltd.

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