

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 $\Phi = 2.41$ MGy) chalcogenide glassy semiconductors (CGSs) As_2S_3 and $\text{Ge}_{15.8}\text{As}_{21}\text{S}_{63.2}$ are studied by positron annihilation lifetime spectroscopy (PALS) and Doppler broadening of the 0.511-MeV annihilation line (DBAL). Two ^{22}Na 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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