ANISOTROPY OF ELECTRO-CONDUCTIVITY IN Γ-IRRADIATED TLINS2 WITH HEXAGONAL MODIFICATION

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$TlInS_2$ combination is a perspective material for designing receivers of different radiation, electron switches and so on.

In the given work anisotropy of specific electro-conductivity of γ-irradiated and non-irradiated $TlInS_2$ with hexagonal modification was investigated in temperature range of 169-297 K. the crystals had n-type conductivity. Band-gap energy was E_g=1 eV.

Temperature dependence of specific electro-conductivity in both perpendicular and parallel direction of C axis of the crystal was measured. It was determined that specific electro-conductivity in these crystals is strongly anisotropic and has temperature-activated character.

In non-irradiated crystals the value of $\frac{\Gamma_{nc}}{\Gamma_{\perp c}}$ relation in temperature range of 169-177 K decreases, practically doesn't change at 202-248 K, but at 248-297 K decreases again and increase having minimum at 265 K.

During γ-irradiation with 1.3 MeV energy and 50 krad dose behavior of temperature dependence of $\frac{\Gamma_{nc}}{\Gamma_{\perp c}}$ relation in the above-mentioned temperature ranges practically remains, but magnitude of $\frac{\Gamma_{nc}}{\Gamma_{\perp c}}$ increases for several times in comparison with non-irradiated samples.

After γ-irradiation with 100 krad dose, the value of $\frac{\Gamma_{nc}}{\Gamma_{\perp c}}$ relation in temperature range of 169-212 K practically doesn't change, at 212-248 K increases, but at 248-297 K decreases again and increases having minimum at 265 K.

The results of investigations are interpreted by the fact that radiation defects generated under the influence of γ-quanta mainly accumulate inter layers at the result of which specific electro-conductivity varies depending on irradiation dose.