THE FEATURES OF ELECTROCONDUCTIVITY OF Γ-IRRADIATED TLGATE2 MONOCRYSTALS

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In the paper the results of researches of a γ-irradiation influence on electroconductivity TlGaTe2 monocrystals are presented.

The received experimental results show, that the induced radiating defects result in occurrence of impurity energetic levels in the forbidden zone of a crystal. These levels have been heat-filled at temperature of lower, in comparison with not irradiated compound. This temperature range is characterized also by that, that at her there is a temperature filling the trap centers, and the located charged impurities are neutral. The ionization type defects (the charged defects) as result of γ-irradiation are dominating in these processes. In our opinion, the most probable mechanism of formation of radiating defects in $TlGaTe_2$ compounds is repeated ionization of the anionic sublattice.

Apparently from figure in both geometries of the experiment (σ is parallel and perpendicularly to crystallographic axes of a crystal) the reduction of electroconductivity is observed up to dozes of 100 Mrad. In the range of 100-200 Mrad the electroconductivity is constant. The further irradiation results in sharp growth of values of electroconductivity. The observable dependence is connected, most likely, to "healing" of own defects, and the further formation of radiating defects. The analysis of temperature dependence of electroconductivity, within the framework of Mott approach, has shown, that conductivity carries is hopping both before to, and after an irradiation. The parameters describing Mott conductivity in irradiated TlGaTe2 crystals are shown in the table.

Table.

Доза (Мрад)	Нап-равл.	R (Å)	N $\left(эV^{-1}sm^{-3}\right)$	E_0 (эV)	ΔE (эV)
0	Пар.	87,32	$8{,}03 \times 10^{18}$	0,096	0,0446
	Пер.	86,46	$8{,}35 \times 10^{18}$	0,095	0,0442
100	Пар.	91,24	$6{,}73 \times 10^{18}$	0,100	0,0936
	Пер.	108,6	$3{,}35 \times 10^{18}$	0,119	0,0555
150	Пар.	88,07	$6{,}17 \times 10^{18}$	0,102	0,0477
	Пер.	112	$2{,}97 \times 10^{18}$	0,123	0,0572
200	Пар.	92,15	$6{,}47 \times 10^{18}$	0,101	0,0471
	Пер.	99,79	$4{,}70 \times 10^{18}$	0,110	0,0510
250	Пар.	81,79	$1{,}04 \times 10^{19}$	0,090	0,0418
	Пер.	88,46	$7{,}62 \times 10^{18}$	0,097	0,0452

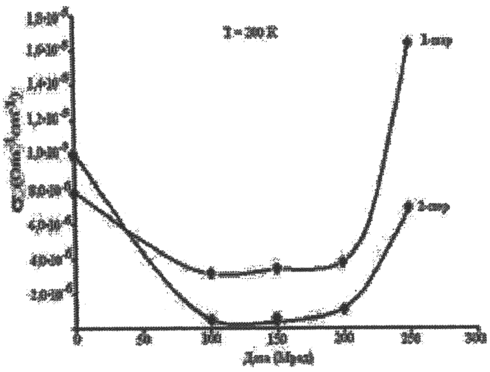

Fig.