THE INFLUENCE OF IRON IMPURITY ON THE $Hg_3In_2Te_6$ PROPERTIES

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S u m m a r y

The behaviour of Fe impurity in $Hg_3In_2Te_6$ semiconductor compound is investigated. On the direct crystallization from the melt, Fe impurity is distributed along the ingot with the effective segregation coefficient $k_{\text{eff}} = 0.3$. The effect of Fe impurity on the structure of short-range order in the crystal is found. At $N_{\text{Fe}} > 1 \cdot 10^{20}\ \text{cm}^{-3}$, interatomic bonds loosen and the lattice constant increases. Fe impurity behaves like an electrically unactive admixture. Conductivity remains intrinsic in the temperature range 150-410 K that can be explained by stabilization of the Fermi level position, which is disposed near the medial line of the energy gap. The temperature dependence of the impurity paramagnetic susceptibility satisfies the Curie law. It is shown that Fe impurity is present in the $Hg_3In_2Te_6$ matrix in the $Fe^{2+}(3d^6)$ charge state. The observed additional impurity absorption band in the range of 0.2 – 0.6 eV can be attributed to the intracenter transition of d-electrons from the lowest to excited energy states of Fe^{2+} ions.