ROLE OF MECHANICAL STRESSES AT ION IMPLANTATION OF CdHgTe SOLID SOLUTIONS

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S u m m a r y

The properties of n-$Cd_xHg_{1-x}Te$/CdZnTe ($x \approx 0.223$) structures implanted with B^+ and Ag^+ ions with an energy of 100 keV to a dose of 3×10^{13} cm^{-2} are studied. The software package TRIM_2008 was applied to simulate the ion implantation process. The surface morphology of heterostructures and their optical, mechanical and electrical properties are studied. It is found that the ion irradiation of specimens gives rise to the formation of a characteristic relief on their surface, as well as a layer in the near-surface region, where the optical parameters differ from those in the matrix. The implantation of $Cd_xHg_{1-x}Te$ epitaxial layers with boron and silver ions with the same energy and to the same dose brings about the formation of a damaged layer, substantially non-uniform by the thickness and the damage character, with maximum mechanical stresses that differ by two orders of magnitude. The values of the crystal lattice contraction coefficient β and the mechanical stresses $\sigma_{\max}$ in the region of radiation-induced disordering in the solid solution are determined. The influence of mechanical stresses in the doped layer on the defect redistribution and the formation of properties of $Cd_{0.223}Hg_{0.777}Te$ after the implantation is discussed.