

Photoelectric properties of Ge electron-hole junction with GeSn thin films.

The mechanisms of the photoelectric response of Ge electron-hole junction with GeSn thin films are investigated. The shape of current-voltage characteristics of the p-Ge/i-GeSn/n-Ge heterojunctions, measured in the temperature range 10–200 K, was analyzed using a two-diode model, which involves the influence of diffusion and recombination currents. The analysis of the temperature dependence of the diffusion current allowed us to determine the height of the potential barrier about 514 meV. It was shown that the conductivity of electron-hole transitions at low temperatures is determined by the dominance of the recombination current with the participation of the energy levels of the valence band of the GeSn film. At the same time, the photovoltage spectra of p-Ge/i-GeSn/n-Ge heterojunctions have been analyzed to determine a bandgap of the GeSn film. It is shown that direct band-band transitions in GeSn determine the photosensitivity of diodes in the spectral range of 0.5-0.7 eV.

Topics

Session A. Physics of condensed matter and spectroscopy

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