



ELECTROPHYSICAL PROPERTIES OF THE ZnTe/CdTe THIN FILM HETEROSTRUCTURES

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ABSTRACT

Current–voltage characteristics at different temperatures and capacity-voltage characteristics of ZnTe/CdTe thin film heterostructures have been investigated. ZnTe/CdTe thin film heterostructures were obtained by close space sublimation method. The current-voltage and capacity-voltage analysis indicates to existence of a high resistive layer at the interface of ZnTe/CdTe. It has revealed that direct current–voltage characteristics of such structures are described by exponential dependence at small voltage (to 0.3V) and then, at greater voltage (to 0.8V) they have sublinear behavior. From the capacity-voltage analysis, width of the layer has been estimated. These experimental results have been explained on the basis of the theory of injection depletion. The dependence, probably, is related to the injection-depletion effect taking place when diffusion current of the injected carriers is directed contrary to the drift current. Such a result has been obtained in a wide range of temperature and it is the evidence of drift-diffusion model of the current transport.

Keywords: ZnTe/CdTe thin film heterostructures; Depletion layer, Drift-diffusion transport model