

EFFECT OF ACTIVE TREATMENTS
ON PHOTOVOLTAIC CHARACTERISTICS
OF STRUCTURES BASED ON CdTe FILMS

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S u m m a r y

Photoelectric characteristics of ITO/CdTe structures fabricated by the thermal evaporation in vacuum followed by their deposition in a quasiclosed volume have been studied before and after treatments of various kinds. Some specimens were subjected to a “chloride” treatment, the others were annealed in air. Afterward, the specimens were treated in hydrogen plasma, and they were covered with a thin diamond-like carbon film. The “chloride” treatment of ITO/CdTe structures is shown to result in an increase of the diffusion length of charge carriers in the CdTe layer. The thermal annealing did not affect this parameter, but significantly enhanced the photosensitivity, which means a reduction of the surface recombination rate in the surface CdTe layer. For all considered ITO/CdTe structures obtained by the thermal evaporation in vacuum, the following treatment in hydrogen plasma and the deposition of thin diamond-like films brought about a substantial increase in the diffusion length of charge carriers in the CdTe layer. The ITO/CdTe structures obtained by the thermal vacuum evaporation and treated with hydrogen plasma demonstrated a significant enhancement of their spectral sensitivity in a wavelength range of 400–800 nm, whereas the same effect for structures subjected to the “chloride” treatment was obtained after the sequential hydrogen plasma treatment and the diamond-like carbon film deposition.