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**Abstract book**

**XVII INTERNATIONAL FREIK CONFERENCE ON PHYSICS AND  
TECHNOLOGY OF THIN FILMS AND NANOSYSTEMS**

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## Electrical and Optical Properties of CdTe Films

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CdTe films are successfully used to create solar cells based on the heterostructures. Increasing the efficiency of such solar cells is directly related to improving the quality of the source materials as well as understanding their physical properties.

CdTe films have been obtained from a pre-synthesized material by vacuum-evaporation technique and physical vapour deposition on freshly prepared mica chips and polished glass.

The electrical parameters of CdTe films have been determined both in a constant electric field and by impedance spectroscopy method (Autolab PGSTAT 12/FRA-2 analyzer) in the frequency range of 0.01-100 kHz.

It has been found that up to 600 V the current-voltage characteristics of the films are linear, and the resistivity is  $10^8$ - $10^9$   $\Omega$ ·cm.

The frequency dependence of the conductivity of polycrystalline CdTe films indicates a variable-range hopping conductivity. An increase in conductivity with frequency also indicates the existence of localized states in CdTe thin films.

The photoelectric properties of CdTe films obtained on various substrates have been studied. The dependence of the photosensitivity on the structure of the films and the technological conditions of growing has been found. It has been determined that the photosensitivity of the films obtained on the polished glass substrates is significantly higher than those of the films on freshly prepared mica chips (111) and increases with decreasing film thickness. This is due to the fact that the specific contribution of the grain boundaries increases with decreasing crystallite size.

Since annealing is used to increase the efficiency of surface-barrier solar cells, the effect of thermal processing (at 700-1000 K) on the optical properties of cadmium telluride thin films has been studied. A comparison of the optical transmission and reflection spectra of the films before and after annealing has revealed the formation of a modified surface. The possibility of obtaining intense photoluminescence, which is formed by interband recombination and transitions due to size quantization of the energy of charge carriers, has been established.