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Synthesis, electrical properties and transport mechanisms of thermally vacuum evaporated CdTe nanocrystalline thin films

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Abstract

A stoichiometry CdTe nano-structured powder was synthesized by chemical process. Thin films of different thicknesses (40, 60, and 100 nm) of CdTe were prepared by thermal evaporation method onto silicon substrates. Current-voltage (I-V) and capacitance-voltage (C-V) characteristics of CdTe nanocrystalline thin films deposited on p-Si as heterojunction have been investigated. At low voltages, current in the forward direction was found to obey the diode equation and the conduction was controlled by thermionic emission mechanism. Also, various electrical parameters were determined from the I-V and C-V analysis. The thickness dependence of the obtained capacitance-voltage (C-V) characteristics was also considered. (C) 2012 Elsevier Ltd. All rights reserved.

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