Title:	Annealing evolution to physical properties of CdCl2 activated CdTe:Cu films for absorber layer functioning
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Keywords:	physical properties polycrystalline CdTe CdCl2
Issue Date:	2020
Publisher:	American Institute of Physics
Citation:	AIP Conference Proceedings, 2265
Abstract:	The existence of grain boundaries and difficulties in formation of suitable ohmic contacts are problematic issues in polycrystalline CdTe thin film solar cells which behave as roadblocks in achieving higher efficiency. The two important steps viz. CdCl2 passivation and Cu doping into CdTe absorber layer are regarded as promising ways to tackle these problems. Therefore present investigation reports the annealing evolution to physical properties of CdCl2 treated CdTe:Cu films which are deposited by cost effective e-beam evaporation technique. Structural analysis describes that with annealing, average grain size corresponding to dominant (111) peak is enhanced. Optical absorbance is initially improved and later reduced with annealing, also a band gap of 1.62 eV is attained for 300 °C annealed films. The annealed films showed cylindrical shaped grain structure in AFM mapping. Electrical properties disclose a straight line relationship between current and voltage with varying conductivity. The improved grain growth, higher absorbance, near optimum band gap, ohmic nature and higher surface roughness of 300 °C processed films demand their recommendations as a pertinent contestant for absorber layer operations in CdTe based solar cells.
Description:	Only IISERM authors are available in the record.
URI:	https://aip.scitation.org/doi/10.1063/5.0016933 (https://aip.scitation.org/doi/10.1063/5.0016933) http://hdl.handle.net/123456789/3237 (http://hdl.handle.net/123456789/3237)
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