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Comparative performance of CdS/CdTe thin film solar cells fabricated with electrochemically deposited CdTe from 2-electrode and 3-electrode set-ups.

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A comparative study of the performance of thin film glass/FTO/CdS/CdTe/Au solar cells has been carried out for solar cells fabricated with CdTe electrochemically grown using 2-electrode and 3-electrode set-ups. Structural and optical characterization of the CdTe films prior to solar cell fabrication shows that both electrode set-ups produce CdTe with similar x-ray diffraction patterns and optical absorption properties. Current density-voltage characterization of the resulting un-optimized solar cells also show that CdTe from both electrode systems produced solar cells of comparable conversion efficiencies in the range (3.0 – 6.5)%. The open-circuit voltage, short-circuit current density and fill factor for cells from both systems were in the range (410 – 630) mV, (15.2 – 31.8) mAcm⁻² and (0.32 – 0.49) respectively. These results demonstrate that the 2-electrode electrodeposition is as good as the conventional 3-electrode counterpart in producing semiconductors without compromising their essential device qualities. This becomes important more so as the elimination of the relatively expensive reference electrode commonly used in 3-electrode set-up will go a long way to reducing the cost of producing thin film solar cells and other devices based on electrodeposition technique.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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