

Thin-Film Absorber Materials: Coated CZTS Solar Cell (PV-1)



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Scientific Achievement:

CZTS nano-size particles were coated onto Mo-coated glass to obtain a working photovoltaic device with 6% efficiency.

Significance and Impact:

This method of device integration opens up the future of paintable, roll-to-roll processable or printable photovoltaic devices.

Research Details:

- A photovoltaic conversion efficiency (PCE) of 6.0% was reached for a device on Corning Willow glass (CWG) with 0.47-cm² total area. The average PCE for the record device is 5.4%. The record current density-voltage curve (Figure 1) shows lower performance due to lower open-circuit voltage and a low fill factor. Both results are attributed to poor sintering.
- Cross-section image (Figure 1) of a finished device fabricated via the same method shows that limited grain-coarsening exists with CZTS on CWG.
- The efficiency has been raised from the previous record of 4.4% PCE by improved coating methods.

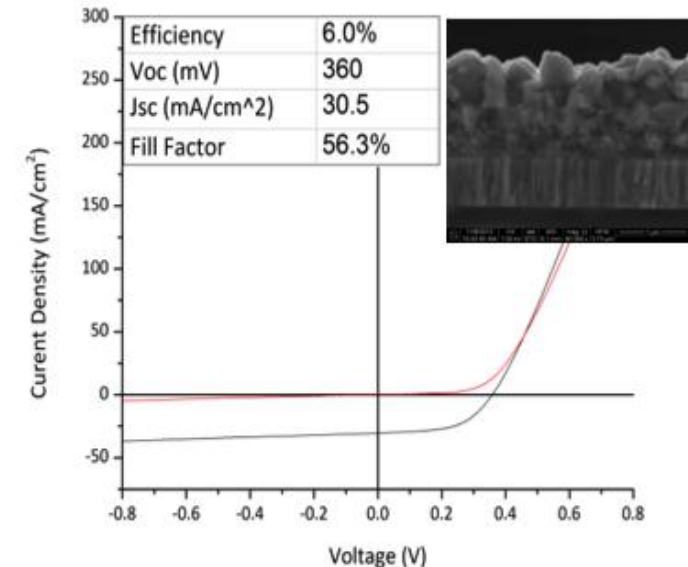


Figure 1. Coated CZTS device showing a record 6% conversion efficiency.

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