

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



A joint India-U.S. research consortium funded under the *Joint Clean Energy Research & Development Center (JCERDC)*

## 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-cm<sup>2</sup> 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.

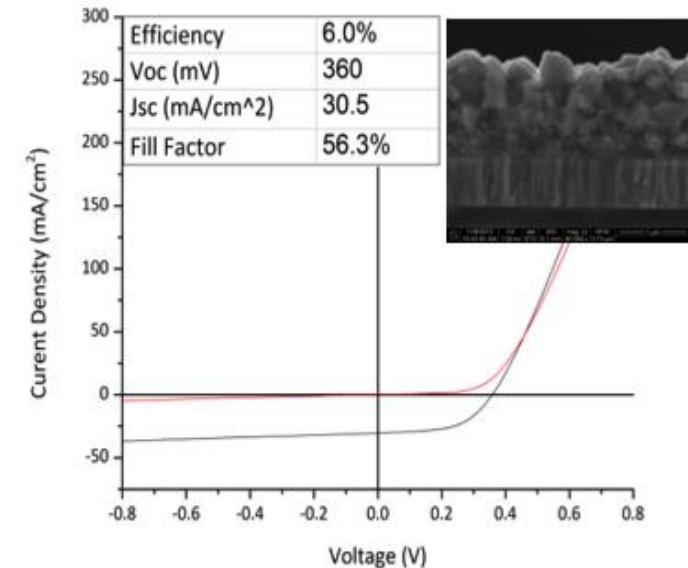


Figure 1. Coated CZTS device showing a record 6% conversion efficiency.

**Contact(s):** Kevin Brew ([kbrew@purdue.edu](mailto:kbrew@purdue.edu)), Rakesh Agrawal ([agrawalr@purdue.edu](mailto:agrawalr@purdue.edu)), & Sean Garner ([GarnerSM@Corning.com](mailto:GarnerSM@Corning.com))