Transferred Metal Contacts for Ultrathin Solar Cells


Scientific Achievement
- We developed a simple method for transferring metal contacts onto 2D materials and used this technique to make ultrathin solar cells.

Significance and Impact
- We performed one of the first characterizations of 2D solar cells under one-sun illumination and created a useful technique for 2D researchers.

Technical Details
- Transferring metal contacts creates metal-2D semiconductor interfaces free of Fermi level pinning.
- We measured active-layer internal quantum efficiency >90%, demonstrating efficient carrier collection.
- We measured a power conversion efficiency of 0.5%, comparable to other ultrathin 2D photovoltaics.

Transferred-contact devices show diode-like IV curves and open-circuit voltage > 500 mV. Evaporated-contact devices show resistive IV curves and open-circuit voltage below 15 mV.

Ultrathin (<150 nm) solar cells made from 2D semiconductors with transferred contacts. Left, schematic. Right, photogenerated current mapping.

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