

Can lateral Schottky-junction photovoltaic devices be grown by chemical vapor deposition?

Here, we present the design, modeling, fabrication, and characterization of monolayer MoS₂-based lateral Schottky-junction photovoltaic (PV) devices grown by using chemical vapor deposition (CVD). The device design consists of asymmetric Ti and Pt metal contacts with a work function offset to enable charge separation.

Is Photothermoelectric-effect induced current in the MoS₂ sheet neglected?

With these laser powers, the photothermoelectric-effect-induced current in the MoS₂ sheet could be neglected in the present study.

What is the performance of a Schottky-junction monolayer solar cell?

Performance of a Schottky-junction monolayer MoS₂-based solar cell in the dark and under 1 sun equivalent AM1.5D illumination, measured at room temperature. The solar cell active area is 0.15 mm² with 1 mm channels between asymmetric Ti and Pt grid fingers.

What is a large Schottky barrier between MoS₂ and Pt?

The larger bend on the right side between MoS₂ and Pt indicates a large Schottky barrier. Once the model is established, the current density-voltage ($J - V$) relationship of the device is studied under forward bias. Figure 4 shows the simulated $J - V$ plots for the various work functions of the asymmetric contacts.

Can a vertical Schottky-junction PV device achieve 256 mV of VOC?

(10) Cora et al. demonstrated a vertical Schottky-junction PV device with exfoliated 16 nm WS₂ and asymmetric Au and Ag contacts to achieve 256 mV of VOC and a power conversion efficiency of 0.46% under AM1.5G solar spectrum.

Could bulk photovoltaic effect overcome the Shockley-Queisser limit of photon-electricity conversion?

Nature Nanotechnology 16,894-901 (2021) Cite this article The theoretical Shockley-Queisser limit of photon-electricity conversion in a conventional p-n junction could be potentially overcome by the bulk photovoltaic effect that uniquely occurs in non-centrosymmetric materials.

Solar panel installation cost: The installation price varies by location and solar provider. Cost also depends on your chosen solar panel brand, type, and system upgrades. In most cases, you must decide between ...

Here, we present the design, modeling, fabrication, and characterization of monolayer MoS₂-based lateral Schottky-junction photovoltaic (PV) devices grown by using chemical vapor ...

A typical residential solar panel with 60 cells combined might produce anywhere from 220 to over 400 watts of power. Depending on factors like temperature, hours of sunlight, and electricity use, property owners will ...

In addition, our gated MoS 2 Schottky diodes show a photovoltaic effect. We estimate that the maximum electrical power that can be extracted from the device is about 2.5% of the laser ...

It allows the current to flow from the panel to the battery but blocks the flow in opposite direction. It is always installed in series with the solar panel. Bypass diode configuration. Figure 3 shows ...

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Here we report an experimental demonstration of the flexo-photovoltaic effect in an archetypal two-dimensional material, MoS 2, by using a strain-gradient engineering approach based on ...

Here we report the characterization of the optoelectronic properties of vertical homojunctions made by stacking few-layer flakes of MoS 2:Fe (n-type) and MoS 2:Nb (p-type). The junctions ...

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