High-specific-power flexible transition metal dichalcogenide solar cells

Are semiconducting transition metal dichalcogenides suitable for high-specific-power photovoltaics?
Provided by the Springer Nature SharedIt content-sharing initiative Semiconducting transition metal dichalcogenides (TMDs) are promisingfor flexible high-specific-power photovoltaics due to their ultrahigh optical absorption coefficients,desirable band gaps and self-passivated surfaces.

Are ultrathin transition metal dichalcogenides a future for lightweight photovoltaics?
Ultrathin transition metal dichalcogenides (TMDs) hold promisefor next-generation lightweight photovoltaics. Here,the authors demonstrate the first flexible high power-per-weight TMD solar cells with notably improved power conversion efficiency.

Do flexible TMD solar cells achieve high specific power?
Our flexible TMD (WSe 2) solar cell achieves a relatively high specific powerdespite its moderate PCE (filled green star). Arrow 1 shows the projected effect of reducing substrate thickness,arrow 2 shows the projected effect of improving PCE. With these improvements,TMD solar cells could reach unprecedented specific power in the future.

What is the PCE of flexible TMD solar cells?
The flexible TMD (WSe 2) solar cells made in this fashion achieve a PCE of 5.1%,surpassing previous flexible TMD solar cells by more than an order of magnitude 20.

Are TMD solar cells the future of photovoltaics?
We further project that TMD solar cells could achieve specific power up to 46 W g-1,creating unprecedented opportunities in a broad range of industries from aerospace to wearable and implantable electronics. Ultrathin transition metal dichalcogenides (TMDs) hold promise for next-generation lightweight photovoltaics.

Do flexible solar cells achieve a high PCE?
Under global air mass AM 1.5 G illumination,the flexible WSe 2 solar cells achieve VOC of 476 mV,a JSC of 17.3 mA cm -2,and a fill factor (FF) of 61.7% (Fig. 1f),leading to an unprecedented PCE of 5.1%in flexible TMD solar cells,over 10× higher than previous demonstrations (<0.7%) 20.

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Semiconducting transition metal dichalcogenides (TMDs) are promising for flexible high-specific-power photovoltaics due to their ultrahigh optical absorption coefficients, desirable band gaps ...

Two-dimensional (2D) materials have attracted tremendous attention in recent years, with transition metal dichalcogenides (TMDs) representing a particularly intriguing class.

High-specific-power flexible transition metal dichalcogenide solar cells

Transition metal dichalcogenide (TMD) solar cells offer a promising solution for powering Internet of Things (IoT) devices in indoor environments. This realistic modeling study ...

Its findings can be found in the paper High-specific-power flexible transition metal dichalcogenide solar cells, which was recently published in nature communications. This content is protected by ...

Emerging semiconducting transition metal dichalcogenides (TMDs) exhibit excellent properties for such flexible high-speci c-power photovoltaics.

High-specific-power flexible transition metal dichalcogenide solar cells ... We further project that TMD solar cells could achieve specific power up to 46 W g -1, creating ...

Layered semiconducting transition metal dichalcogenides (TMDs) are promising materials for high-specific-power photovoltaics due to their excellent optoelectronic properties. However, in practice, contacts to TMDs ...

The strong light-matter interaction in two-dimensional (2D) transition metal dichalcogenides (TMDCs) such as MoS 2 results in very high absorptance and photogeneration in these materials, making them suitable for ...

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Downloadable! Semiconducting transition metal dichalcogenides (TMDs) are promising for flexible high-specific-power photovoltaics due to their ultrahigh optical absorption coefficients, ...

High-speci c-power exible transition metal dichalcogenide solar cells Koosha Nassiri Nazif 1,8, Alwin Daus 1,8, Jiho Hong 2,3, Nayeun Lee 2,3, Sam Vaziri 1, Aravindh ...

Semiconducting transition metal dichalcogenides (TMDs) are promising for flexible highspecific-power photovoltaics due to their ultrahigh optical absorption coefficients, desirable band gaps ...

High-specific-power flexible WSe 2 solar cells. Semiconducting TMDs show promise for moderate to high efficiency, moderate specific power, and flexibility due to their maximum ...

Semiconducting transition metal dichalcogenides (TMDs) are promising for flexible high-specific-power photovoltaics due to their ultrahigh optical absorption coefficients,...

High-specific-power flexible transition metal dichalcogenide solar cells

(TMD) ??,-TMD ...

Such high carrier lifetimes correspond to power conversion efficiency of ~22% and specific power of ~64 -W g1 in a packaged solar cell, or ~3 W g-1 in a fully-packaged solar ...

Stanford scientists have fabricated a transition metal dichalcogenide (TMD) solar cell that is claimed to overcome the typical issue of this kind of PV device, the so-called Fermi-level...

Introduction. Conventional silicon (Si) solar cells dominate the photovoltaics market with a market share of about 95% due to their low-cost manufacturing and reasonable power conversion ...

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