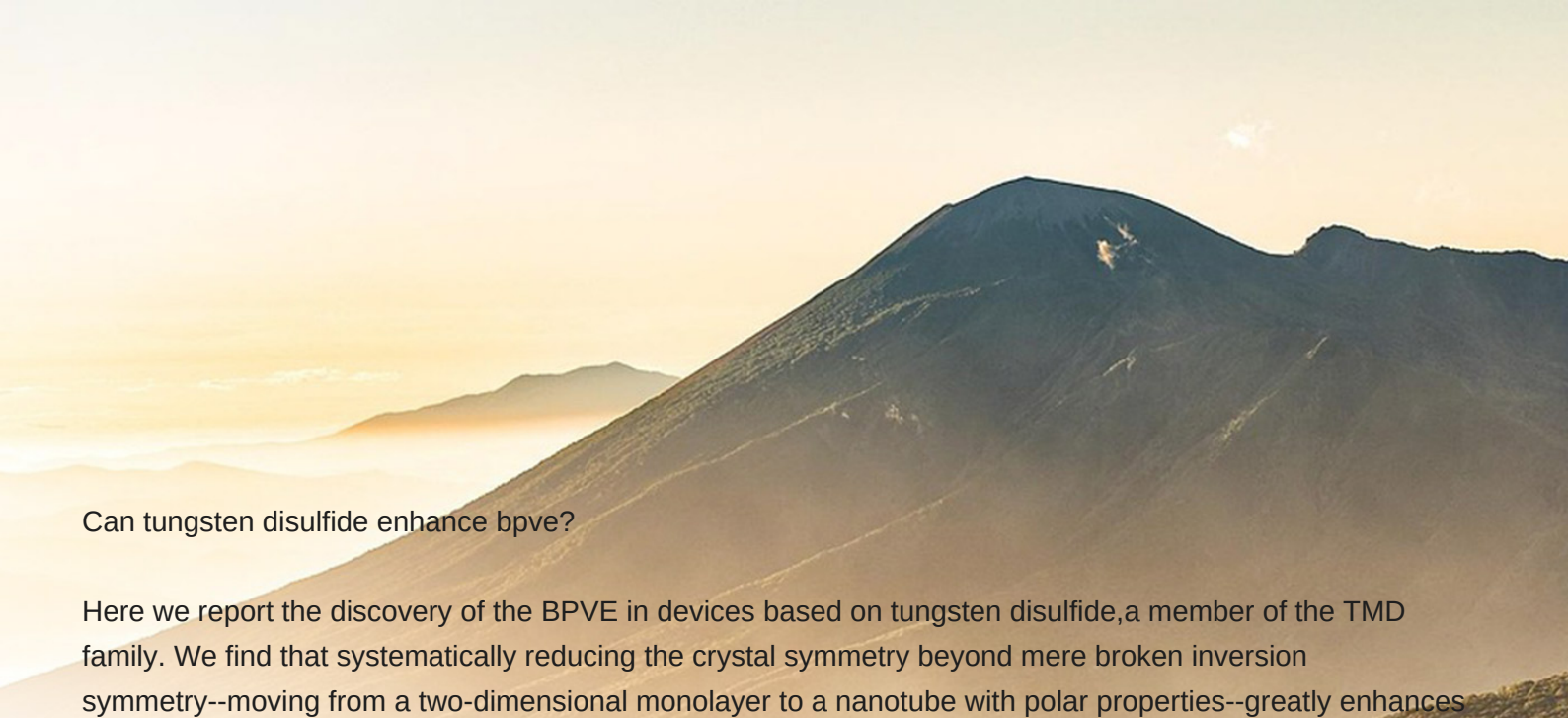

Can tungsten disulfide enhance bpve?

Here we report the discovery of the BPVE in devices based on tungsten disulfide,a member of the TMD family. We find that systematically reducing the crystal symmetry beyond mere broken inversion symmetry--moving from a two-dimensional monolayer to a nanotube with polar properties--greatly enhances the BPVE.

Do polar nanotubes increase photovoltaic efficiency?

A bulk photovoltaic effect is observed in devices based on tungsten disulfide, and is enhanced if the devices take the form of polar nanotubes, showing the importance of reducing crystal symmetry to a polar structure in achieving higher efficiencies.

Can tungsten disulfide be shaped into nanotubes?

Zhang and colleagues' work calls attention to a hitherto-unexplored approach: shaping the semiconductors that have high light absorption into nanotubes. In the case of tungsten disulfide,the crystal symmetry of the nanotube is reducedwith respect to that of the monolayer and bilayer,because of the tube's curved walls.

Can tungsten disulfide be used to make junction-free solar cells?

Zhang and colleagues fabricated junction-free solar cells using the semiconductor tungsten disulfide. Crystals of this material have a layered structure,and can be peeled off layer by layer in a similar way to graphite. The resulting atom-thick sheets can then be rolled by chemical methods into tubes that have diameters of about 100 nanometres.

What is the photovoltaic effect in a p-n junction?

7 RIKEN Center for Emergent Matter Science (CEMS),Wako,Japan. The photovoltaic effect in traditional p-n junctions-where a p-type material (with an excess of holes) abuts an n-type material (with an excess of electrons)-involves the light-induced creation of electron-hole pairs and their subsequent separation,generating a current.

Is tungsten disulfide a two dimensional semiconductor?

ENHANCED INTRINSIC PHOTOVOLTAIC EFFECT IN TUNGSTEN DISULFIDE NANOTUBES

You have full access to this article via your institution. Tungsten disulfide (WS 2) and other group-VI-B TMDs are two-dimensional semiconductorswith relatively small bandgaps of 1.2-2.1 eV (refs 11,12). In their most stable 2H phase,the unit cell of bulk TMDs is centrosymmetric and the material belongs to the D6h point group.

Xue et al. introduce a method for the epitaxial growth of tungsten disulfide nanoribbon arrays with predefined chirality and coherent polarity. The flexibility in fabricating deterministic-structured ribbon arrays enables the ???

The photovoltaic effect in traditional p???n junctions???where a p-type material (with an excess of holes) abuts an n-type material (with an excess of electrons)???involves the light-induced creation of electron???hole pairs and their subsequent separation, generating a current.This photovoltaic effect is particularly important for environmentally benign energy harvesting, and its efficiency

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Key takeaway: "Tungsten disulfide nanotubes with polar properties significantly enhance the bulk photovoltaic effect, resulting in higher efficiencies in solar energy conversion." Sign up DOI: 10.1038/s41586-019-1303-3

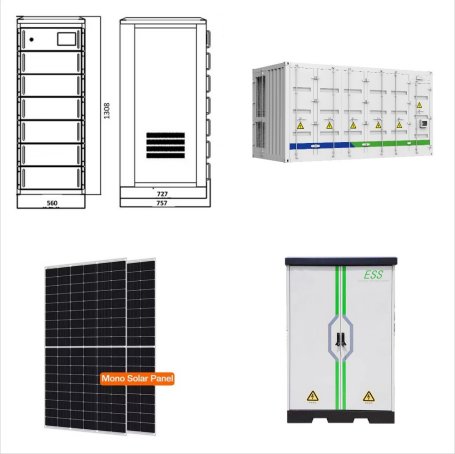
0619,"Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes"Nature??? ?????? 1 TMD. 2 . 3 . 4

Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes Nature (IF 50.5 Submission Guide >) Pub Date: 2019-06-01, DOI: 10.1038/s41586-019-1303-3 Y J Zhang 1,2, T Ideue 3, M Onga 3, F Qin 3, R Suzuki 3, A Zak 4, R Tenne 5, J H Smet 2, Y Iwasa 3,6

ENHANCED INTRINSIC PHOTOVOLTAIC EFFECT IN TUNGSTEN DISULFIDE NANOTUBES

Hydrogen Addition for Centimeter-Sized Monolayer Tungsten Disulfide Continuous Films by Ambient Pressure Chemical Vapor Deposition. Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Nature 2019, 570 (7761) Enhanced photovoltaic performances of graphene/Si solar cells by insertion of a MoS 2 thin film.

Sunlight harvested by nanotubes," Nature. 570 Intrinsic structural defects in monolayer molybdenum disulfide," Nano Lett. 13 (6), Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes," Nature. 570 (7761), 349



Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Zhang YJ 1 Here we report the discovery of the BPVE in devices based on tungsten disulfide, a member of the TMD family. We find that systematically reducing the crystal symmetry beyond mere

ENHANCED INTRINSIC PHOTOVOLTAIC EFFECT IN TUNGSTEN DISULFIDE NANOTUBES

(DOI: 10.1038/S41586-019-1303-3) The photovoltaic effect in traditional p???n junctions???where a p-type material (with an excess of holes) abuts an n-type material (with an excess of electrons)???involves the light-induced creation of electron???hole pairs and their subsequent separation, generating a current. This photovoltaic effect is particularly important for ???

Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Y. J. Zhang (), This photovoltaic effect is particularly important for environmentally benign energy harvesting, and its efficiency has been increased dramatically, almost reaching the theoretical limit1. Here we report the discovery of the BPVE in devices based on

The photovoltaic effect in traditional p???n junctions???where a p-type material (with an excess of holes) abuts an n-type material (with an excess of electrons)???involves the light ???

ENHANCED INTRINSIC PHOTOVOLTAIC EFFECT IN TUNGSTEN DISULFIDE NANOTUBES

The photovoltaic effect in traditional p???n junctions???where a p-type material (with an excess of holes) abuts an n-type material (with an excess of electrons)???involves the light-induced

The photovoltaic (PV) effect in non-centrosymmetric materials consisting of a single component under homogeneous illumination can exceed the fundamental Shockley-Queisser limit compared to the traditional p-n junctions. Two-dimensional (2D) materials with a reduced dimensionality and smaller bandgap were predicated to be better candidates for the ???

RESEARCH. I am studying the characteristic transport and optical properties in van der Waals nanostructures. By using the ionic liquid gating or exfoliation/transfer techniques, I will engineer the symmetry of van der Waals interfaces and search for the novel Physical properties and functionalities such as nonreciprocal transport and anomalous photovoltaic effect.

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The significantly enhanced photocurrent in 1D WS 2 nanotubes compared to 2D planar WS 2 monolayers Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Nature (2019) Enhanced photogalvanic effect in the two-dimensional MgCl 2 /ZnBr 2 vertical heterojunction by inhomogenous tensile stress.

Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes. Nature (2019) L. Yadgarov et al. Strong light???matter interaction in tungsten disulfide nanotubes. Phys. Chem. Chem. Phys. (2018) A.J. Mannix et al. Synthesis and chemistry of elemental 2D materials. Nat. Rev. Chem. (2017)

Monolayer transition metal dichalcogenides (TMDs) are being investigated as active materials in optoelectronic devices due to their strong excitonic effects. While mechanical exfoliation (ME) of monolayer TMDs is limited to small areas, these materials can also be exfoliated from their parent layered materials via high-volume liquid phase exfoliation (LPE). ???

ENHANCED INTRINSIC PHOTOVOLTAIC EFFECT IN TUNGSTEN DISULFIDE NANOTUBES

Special nanotubes could improve solar power special semiconductor material based on tungsten disulfide Enhanced intrinsic photovoltaic effect in tungsten disulfide nanotubes, Nature (2019

The photogalvanic effect (PGE) occurring in noncentrosymmetric materials enables the generation of a dc photocurrent at zero bias with a high polarization sensitivity, which makes it very attractive in photodetection. However, the magnitude of the PGE photocurrent is usually small, leading to a low photoresponsivity, and therefore hampers its practical application in ???

Tungsten disulfide nanotubes (WS2-NTs), with their cylindrical structure composed of rolled WS2 sheets, have attracted much interest because of their unique physical properties reflecting quasi-one-dimensional chiral structures. They exhibit a semiconducting electronic structure regardless of their chirality, and various semiconducting and optoelectronic device ???

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The growth of layered 2D compounds is a key ingredient in finding new phenomena in quantum materials, optoelectronics, and energy conversion. Here, we report SnP2Se6, a van der Waals chiral (R3 space group) semiconductor with an indirect bandgap of 1.36 to 1.41 electron volts. Exfoliated SnP2Se6 flakes are integrated into high-performance field-effect transistors ???