

Oxygen-deficient solar power generation is low

How does oxygen-deficient black zirconia (ZrO_{2-x}) affect solar light absorption?

In conclusions, oxygen-deficient black zirconia (ZrO_{2-x}) was prepared via the magnesiothermic reduction in H_2/Ar atmosphere, which resulted in a drastic increment in solar light absorption and band gap decrement (to 1.52 from 5.09 eV for white ZrO_2).

Is energy loss a problem in organic solar cells?

Provided by the Springer Nature SharedIt content-sharing initiative Energy loss within organic solar cells (OSCs) is undesirable as it reduces cell efficiency¹⁻⁴.

How are oxygen defects created?

Besides gaseous hydrogen reduction, oxygen defects were also created via solid-state reduction of $(\text{Sr}_{1-x}\text{Ba}_x)\text{FeO}_2$ perovskite using solid reagents that can thermally release hydrogen (CaH_2, NaH) and wet-chemical reduction with H_2O_2 aqueous solution on $\text{La}_{0.8}\text{Sr}_{0.2}\text{CoO}_{3-\delta}$ (LSC).

Does low formation energy cause oxygen vacancies in perovskite oxides?

Typically, low formation energy results in a higher degree of oxygen defects. Sr and Ca are the most favorable and commonly used alkaline-earth metals to create oxygen vacancies in ABO_3 -type perovskite oxides [3,70].

Does oxygen deficiency affect photo-generated charge carrier recombination?

For our oxygen-deficient $\text{WO}_{3-x}/\text{Zn}_{0.3}\text{Cd}_{0.7}\text{S}$ Z-scheme system, the photo-generated holes tend to be present in the VB of WO_{3-x} , while the electrons in the conduction band of WO_{3-x} combine with the holes of $\text{Zn}_{0.3}\text{Cd}_{0.7}\text{S}$ through the interface contact. As a result, the photo-generated charge carrier recombination can be significantly decreased.

Why does a reduced material always have surface oxygen vacancies?

A reduced material with oxygen vacancies tends to always have surface oxygen vacancies since reduction initially attacks surface lattice oxygen, and consequently through the deconvolution of the O 1s spectra of a reduced material, the determination of vacant sites can be inferred.

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The activation energies of oxygen permeation for a high-temperature region (973-1073 K) and a low-temperature region (773-923 K) were equal to ~ 24 and 7 kJ mol⁻¹, respectively, suggesting that the oxygen ...

Serious oxygen deficiency and doping compensation of the engineered a-GaO X film ensure the high response currents and low dark currents, respectively. Annealing item in nitrogen of DD ...

Pulsed laser irradiation is a simple process for producing oxygen-deficient TiO₂; however, this is more suitable for treating films because the radiation response mainly happens in the surface layer. Similarly, oxygen ...

For highly oxygen-deficient films, photoelectron spectroscopy shows an over 2 eV broad distribution of oxygen vacancy states within the bandgap which gives rise to extended visible light absorption. We examine the nature of this distribution ...

In this work, oxygen vacancies were created to activate tungsten trioxide (WO₃) as a highly efficient counter electrode (CE) in dye-sensitized solar cells (DSSCs). The levels of oxygen vacancies (OVs) in WO₃ were finely formed and tuned ...

With the unique pore structure, surface wettability, and low thermal conductivity, the tubular carbon should be a promising photothermal material for solar steam generation. To ...

It shows for the first time a dramatic increase in solar light absorbance and significant activity for solar light-induced H₂ production from methanol-water with excellent stability up to 30 days ...

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The reported enhancement in intrinsic OER activity of oxygen-deficient perovskites surfaces has inspired their fabrication via a myriad of schemes. Oxygen vacancies in perovskites are amongst the most favorable ...

Titanium dioxide (TiO₂) as a common photothermal material usually faces with low photothermal conversion efficiency, mainly owing to the little utilization of visible (Vis) and near-infrared (NIR) light in the solar ...



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Web: <https://foton-zonnepanelen.nl>

