Iron sulfide solar cells

How does FeS2 absorb light in a solar cell?
The strategy adopted here is to develop a solar cell where the high light absorbing FeS2 (a = 6 105 cm-1) absorbs the visible light and injects the electrons into the conduction band of the large gap TiO2(or other oxides: e.g. ZnO,WO3) thus generating a photovoltage.

Is pyrite a solar energy material?
Pyrite (Eg =0.95 eV) is being developed as a solar energy materialdue to its environmental compatibility and its very high light absorption coefficient. A compilationof material,electronic and interfacial chemical properties is presented,which is considered relevant for quantum energy conversion.

Can zinc be incorporated in FeS2 (pyrite)?
The element zinc can be incorporated in FeS2 (pyrite) in concentrations of up to 4500 p,g/g. A. Ennaoui et al. /Iron disulfide for solar energy conc'ersion 319 We assume that Zn2+substitutes for Fe2+because ZnS2 crystallizes in the pyrite structure. Its influence on conductivity,even at this high concentration,is small (section 3.1.1).

Is pyrite a sensitization solar cell?
The most interesting aspect of this study is the use of pyrite as an ultrathin (10-20 nm) layer sandwiched between large gap p-type and n-type materials in a p-i-n like structure. Such a system,in which the pyrite layer only acts as photon absorber and mediates injection of excited electrons can be defined as sensitization solar cell.

What is the difference between a solar cell and a silicon solar cell?
The energy converting structures are 10,000 times thinnerthan the structure of a silicon solar cell and the plant can afford to throw them away every year. In contrast,solar cells not only have to be synthesized at very high tempera- tures,they need years to recover the energy needed for their synthesis.

What is the value of U for FeS2 (pyrite)?
For FeS2 (pyrite) the value of u equals 0.386. Other minerals are also summa- rized in table 2 . Iron disulfide FeS2 can also crystallize in the marcasite structure,an or- thorhombic modification (space group Pnmm) which is present in nature. Marcasite was synthesized as thin films (see section 2.1.4).

In this paper, the prospects of iron oxide films and their sulfidation for dye-sensitized solar cells (DSSC) are reviewed. Iron oxide thin films were prepared by hollow ...

The peculiar electron transfer properties of pyrite interfaces, facilitating interfacial coordination chemical pathways, may turn out to be very helpful. Significant research ...

Iron sulfide solar cells

Iron sulfide is explored as the counter electrode (CE) in quantum dots-sensitized solar cells (QDSCs), which is prepared by simply immersing carbon steel in Na 2 S solution. ...

In recent years, iron sulfide (FeS 2), otherwise known as pyrite, has ...

This review explores the synthesis of two-dimensional iron sulfides and their ...

Iron oxide can serve as a convenient precursor for iron sulfide (FeS 2), also ...

The abundant, naturally occurring natural compound pyrite (FeS2) can be ...

While solar cells are beginning to make a dent in the energy landscape, the link between solar energy harvesting and CO 2 conversion remains elusive. ... Mineral iron ...

Pyrite-phase iron sulfide nanocrystals were synthesized to form solvent-based dispersions, or ...

The abundant, naturally occurring natural compound pyrite (FeS2) can be used as a semiconducting material for photoelectrochemical and photovoltaic solar cells. Unlike most of ...

The peculiar electron transfer properties of pyrite interfaces, facilitating ...

The study shows the feasibility of using iron sulfide as a counter electrode in Dye-sensitized solar cells. It was found that the iron sulfide thin films with an amorphous ...

This document summarizes research done under the SunShot Next Generation PV II project entitled, "Pyrite Iron Sulfide Solar Cells Made from Solution," award number DE ...

Our preliminary results suggest that in the long term iron sulphide has realistic potential as a solar energy material for mass production. FeS2 has an energy gap AEG = 0.95 ...

The study shows the feasibility of using iron sulfide as a counter electrode in ...

Iron sulfide is explored as the counter electrode (CE) in quantum dots ...

Solar cells have drawn tremendous attention because of the inexhaustible and easily available utilization of solar energy. ... We systematically studied iron sulfide CEs using ...

This review explores the synthesis of two-dimensional iron sulfides and their promising applications in energy storage and conversion systems. The discussion highlights ...

Currently, leading materials used in relevant thin-film solar cells are cadmium telluride (CdTe) and copper

indium gallium diselenide (CIGS), with the best conversion ...

Pyrite-phase iron sulfide nanocrystals were synthesized to form solvent-based dispersions, or "solar paint," to fabricate photovoltaic devices (PVs), and none of the devices exhibited PV ...

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