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Iron Pyrite Oxygen Alloy for Improved Photovoltaic Efficiencies and Increased Photovoltages

Tech ID: 24614 / UC Case 2012-769-0

BRIEF DESCRIPTION

A new iron pyrite oxygen alloy that has ~10% of the sulfur in iron pyrite replaced with oxygen to increase the band gap of the material. This resulting material has potentially greater photovoltages and improved photovoltaic efficiencies than iron pyrite.

FULL DESCRIPTION

Iron pyrite (FeS_2) is a promising photovoltaic material because of its strong light absorption, sufficient minority carrier diffusion length, and relative abundance. However, the band gap of pyrite ($E_g = 0.85\text{-}0.95\text{ eV}$) is somewhat narrow for optimal photovoltaic applications and subsequently the open circuit voltage of pyrite based devices ($V_{oc} < 0.2\text{ V}$) is too low.

Researchers at the University of California, Irvine have developed a new iron pyrite oxygen alloy with a predicted band gap of 1.2-1.3 eV, compared to 0.85-0.95 eV for pure iron pyrite.

SUGGESTED USES

This alloy may be used in photovoltaic devices (solar panels).

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,450,120	09/20/2016	2012-769

CONTACT

Alvin Viray
aviray@uci.edu
tel: 949-824-3104.



OTHER INFORMATION

KEYWORDS

Photovoltaic, Band gap, Iron pyrite, Alloy

CATEGORIZED AS

» **Energy**
» Solar

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