

BaBiO₃: A Potential Absorber for All-Oxide Photovoltaics (PV-3)



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Scientific Achievement:

BaBiO₃ has been investigated as a potential photovoltaic absorber, with devices showing photo-response at 1 sun.

Significance and Impact:

- Potential inorganic photovoltaic absorber.
- Band diagram for BaBiO₃ (BBO) has been constructed.
- The BaBiO₃ device with an $J_{\text{light}}/J_{\text{dark}}$ ratio of 1.75, where J is current density, exhibited excellent photo-electrical response behavior.

Research Details:

- Thin-films of BBO have been deposited using pulsed laser deposition.
- X-ray diffraction confirms the polycrystalline nature of thin films.
- Complete band-diagram were constructed using X-ray photoelectron spectroscopy, ultraviolet photoelectron spectroscopy, and ultraviolet-visible spectrophotometry.
- Heterojunction of BBO/TiO₂ shows photoresponse, which confirms photon absorption in BBO.

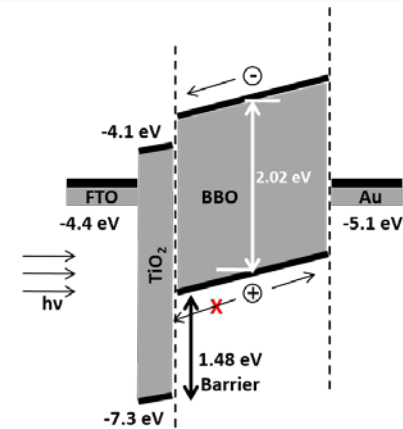


Fig. 1: Band diagram for the FTO/TiO₂/BBO/Au heterojunction diode.

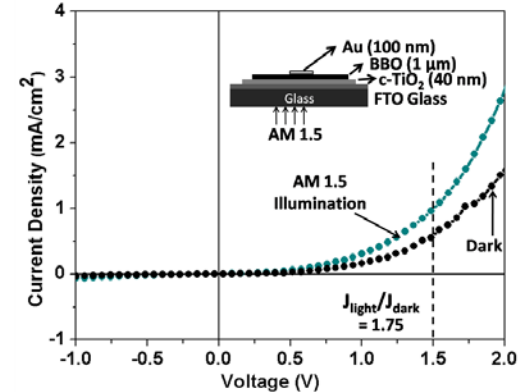


Fig. 2: J-V characteristics of the diodes in dark and under AM 1.5 illumination.

Publication(s):

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Contact: Sushobhan Avasthi (savasthi@iisc.ac.in)