

# BaBiO<sub>3</sub>: A Potential Absorber for All-Oxide Photovoltaics (PV-3)



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## Scientific Achievement:

BaBiO<sub>3</sub> 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 BaBiO<sub>3</sub> (BBO) has been constructed.
- The BaBiO<sub>3</sub> 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/TiO<sub>2</sub> shows photoresponse, which confirms photon absorption in BBO.

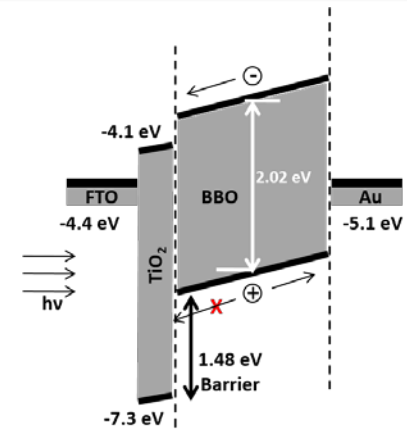


Fig. 1: Band diagram for the FTO/TiO<sub>2</sub>/BBO/Au heterojunction diode.

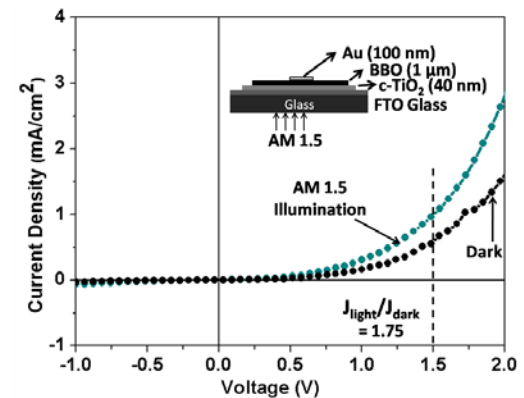


Fig. 2: J-V characteristics of the diodes in dark and under AM 1.5 illumination.

## Publication(s):

A.S. Chouhan, E. Athresh, R. Ranjan, S. Raghavan, and S. Avasthi. BaBiO<sub>3</sub>: A potential absorber for all-oxide photovoltaics. *Materials Letters* **210** (2018) 218–222. DOI: [10.1016/j.matlet.2017.09.038](https://doi.org/10.1016/j.matlet.2017.09.038)

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