

Name of Presenter

Steven Novianto Tanjaya

Affiliation

Tokyo University of Science, NIMS

Poster No. : 1-P-6

Stabilization of Semiconductor Photoelectrode by Metal Oxide Nanosheet Coating

Steven Novianto Tanjaya¹, Ken-ichi Katsumata², Takaaki Taniguchi³¹ National Institute for Materials Science, ² Tokyo University of Science, ³ Institute of Science TokyoTANIGUCHI.Takaaki@nims.go.jp

Keywords : PEC water splitting, photocorrosion, solution-phase deposition, titania nanosheet coating



Highlights of This Poster Presentation

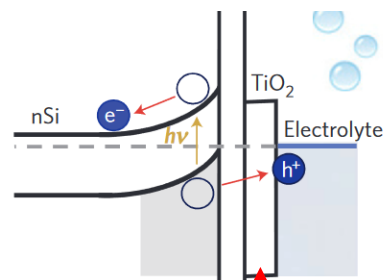
➤ Target

- Metal oxide coating protects water-splitting semiconductor photoelectrode from photocorrosion and performance deterioration.
- Titania ($\text{Ti}_{0.87}\text{O}_2$) nanosheet protective coating deposited via spin coating is inexpensive and energy-efficient, compared to conventional gas-phase deposition method.

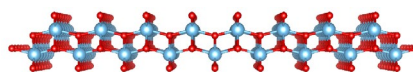
➤ Conclusion

Monolayer $\text{Ti}_{0.87}\text{O}_2$ nanosheet coating stabilized silicon photoanode and maintained a stable current, while AFM image shows minimal damage on the surface.

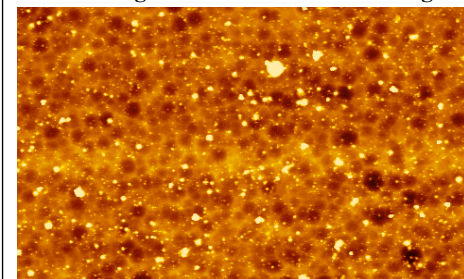
Photoelectrochemical water splitting



Hole-tunneling and surface passivation

This study : $\text{Ti}_{0.87}\text{O}_2$ nanosheet0.75 nm-thick $\text{Ti}_{0.87}\text{O}_2$

No coating : surface dissolution damage

With $\text{Ti}_{0.87}\text{O}_2$ nanosheet coating