

Abstract Submitted
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Photocatalytic Water-Splitting Characteristic of Electric Reduced Black TiO₂ Nanorods¹ JONG-WON YUN, Department of Physics and Energy, Univ. of Ulsan, KI YEON RYU, SUNHO KIM, SE-JUNG JANG, Department of Physics, Univ. of Ulsan, YONG SOO KIM, Department of Physics and Energy, Univ. of Ulsan — In various reduction methods of TiO₂, the electric reduction could apply to anodized TiO₂ nanotube. However, it is not suitable to reduce TiO₂ nanorods(NRs) grown on fluorine doped tin oxide (FTO) substrate using hydrothermal method, because those are easily peeled off due to lattice mismatching between FTO and TiO₂ NRs. In this talk, we will demonstrate electric reduced-black TiO₂ NRs with strong adhesion on FTO substrate for an effective visible photocatalyst. To fabricate the reduced-black TiO₂ NRs, we firstly deposited TiO₂ seed layer on FTO glass using RF-sputtering for mitigating the exfoliation, then grow TiO₂ NRs with hydrothermal method. Finally, TiO₂ NRs were reduced with electric bias. The final reduced-black TiO₂ NRs exhibit a higher photocurrent density, 0.9 mA/cm² in comparison with pure-TiO₂ NRs. This result indicates that our reduced-black TiO₂ NRs has lower bandgap with modified valance band position and enhance the surface reactivity with oxygen defect generation.

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