

Fabrication of $\text{WO}_3/\text{BiVO}_4/\text{TiO}_2$ heterostructure photoanode for photoelectrochemical hydrogen production지준혁, 김정현[†]

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With the increasing interests of environmental-friendly energy, solar energy conversion for hydrogen via photocatalytic water splitting becomes a promising method. Among various photocatalysts, metal oxide is commonly used because of its nontoxic and eco-friendly properties. BiVO_4 and TiO_2 nanoparticles are considered as a co-catalyst for better photocatalytic performance. In this work, $\text{WO}_3/\text{BiVO}_4/\text{TiO}_2$ heterostructure thin films have been manufactured. First, WO_3 structure is made by the spin-coating of prepared solution on FTO substrate. Afterwards, BiVO_4 and TiO_2 nanoclusters are deposited on WO_3 surfaces by same spin-coating method. The thickness of metal oxide film is controlled by changing the number of spin-coating cycles. The photoelectrochemical performance of photoelectrodes is analyzed using potentiostat (Iviumstat, Netherland) and IPCE. Structural and optical characterizations are measured by SEM to observe the morphology of $\text{WO}_3/\text{BiVO}_4/\text{TiO}_2$ substrate and by UV-vis to investigate the light absorption. In order to measure the hydrogen evolution, gas chromatography and solar simulator are used.