Photoelectrochemical Water Splitting Silicon Cells

오지훈†
KAIST
(jihun.oh@kaist.ac.kr†)

Photoelectrochemical (PEC) water splitting has drawn intense attention since it can produce H2 from water and sunlight. In this work, we propose design principles of PEC water splitting cells using Si solar absorber. Firstly, I'll demonstrate a new PEC photoelectrode architecture which can decouple light absorption and catalysis of metallic cocatalysts by forming a nanostructred metallic cocatalysts at a given surface coverage. Silicon and nanostructured Ni and NiFe is used as a model light absorber and cocatalysts, respectively, for water oxidation reaction. Then, a PEC cells comprising of transparent metal-oxide catalysts on Si will be given with a highlight of importance of band alignment of the heterostructure and catalysts property of metal-oxide layers.