

RGO functionalized CdSe@ZnO hetero-nanorods with photoelectrochemical enhancement

Zhuo Zhang, 최민기, 백민기, 용기중<sup>†</sup>

포항공과대학교

(kyong@postech.ac.kr<sup>†</sup>)

Photoelectrochemical (PEC) hydrogen generation is a green and effective strategy for addressing energy crises. A two-story hetero-nanostructure and a novel nano-bridges by using RGO functionalized CdSe@ZnO hetero-nanorods as the building blocks were fabricated and demonstrated higher PEC efficiency respectively. For the first one, the upper story is a novel hetero-nanofilm consisting of a reduced graphene oxide (RGO) nanofilm covered by a large area of crystalline CdSe nanolayer with a (111) plane outside and a thickness less than 8 nm; the bottom story consists of CdSe-coated ZnO hetero-nanorods. For the second structure, the “pier” was built using ZnO NRs decorated with CdSe nanoparticles (NPs), and the “bridge” was constructed using CdSe nanowire covered by an RGO layer and cross-linked with ZnO NRs. Both of the two hetero-nanostructures can increase the PEC efficiency dramatically over that of bare ZnO, illustrating the potential of the two-story hetero-nanostructure in future photoelectrodes.