

Photoelectrochemical characterization of surface-modified CuInS₂ nanorod arrays prepared via template-assisted growth and transfer

Wooseok Yang, Jimin Kim, Yunjung Oh and Jooho Moon*

Yonsei University

Although vertically aligned one-dimensional (1D) structure has been considered as efficient forms for photoelectrode, development of efficient 1D nanostructured photocathode are still required. In this sense, we recently demonstrated a simple fabrication route for CuInS₂ (CIS) nanorod arrays from aqueous solution by template-assisted growth-and-transfer method and their feasibility as a photoelectrode for water splitting. In this study, we further evaluated the photoelectrochemical properties surface-modified CIS nanorod arrays. Surface modification with CdS and ZnS was performed by successive ion layer adsorption and reaction (SILAR) method, which is well known as suitable technique for conformal coating throughout nanoporous structure. With surface modification of CdS and ZnS, both photoelectrochemical performance and stability of CuInS₂ nanorod arrays were improved by shifting of the flat-band potential, which was analyzed both onset potential and Mott-schottky plot.

Keywords: Photoelectrochemical water splitting, AAO template, CuInS₂, nanorod array

