

Adsorption and Desorption of Natural Gardenia Yellow Dye on Nonionic Polymeric Sorbent XAD-1600 for Dye-Sensitized Solar Cells

이재현, 류은미¹, 최문희¹, 김의진¹, 남보미¹, 김미진¹,
이재욱^{1,*}
조선대학교; ¹조선대학교 생명화학공학과
(jwlee@chosun.ac.kr*)

Adsorption characteristics, electrochemical properties and photovoltaic efficiency of dye-sensitized solar cells (DSSCs) employing gardenia yellow as a natural photosensitizer were systematically investigated. Both adsorption of gardenia yellow dissolved in aqueous solution on nonionic polymeric sorbent XAD-1600 and desorption by using different desorbates including water, ethanol and 10% ethanol were investigated. Adsorption kinetic data were measured and fitted using adsorption isotherms and kinetic models. Electrochemical properties for electron harvesting and electron transport were evaluated based on incident photon to current conversion efficiency (IPCE), intensity-modulated photocurrent spectroscopy (IMPS) and intensity-modulated photovoltage spectroscopy (IMVS). The results showed that the conversion efficiency of the natural DSSC was highly dependent on the adsorption characteristics of the natural dye on mesoporous TiO₂ thin films.