

Mesoporous SnO₂-Based Electrodes For Dye-Sensitized Solar Cells

이정화, 김명실, 김지만*
성균관대학교
(jimankim@skku.edu*)

In this study, we have successfully synthesized ordered mesoporous SnO₂/TiO₂ with three-dimensional bicontinuous cubic structure, high surface area and crystalline frameworks by using a facile solvent-free infiltration method from a mesoporous silica template of KIT-6 and employed as electrode in dye-sensitized solar cells. On the basis of the investigation of the XRD pattern, nitrogen adsorption (BET), dye adsorption, UV-vis diffuse reflectance spectroscopy, dark current, current-voltage(I-V) characteristics and electrochemical impedance spectra(EIS), it was found that when the Ti-content is 20wt%, the energy-conversion efficiency meso-SnO₂/TiO₂ is significantly best, by about 1.95%. And it is mainly the result of TiO₂ particles on mesoporous SnO₂ electrode inhibited electron recombination caused by passivation of reactive surface states and increased the light scattering, leading to greatly improvement in the open-circuit voltage, short-circuit current, and fill factor.