PCIV-3

SURFACE-MODIFIED NANOCRYSTALLINE ZNO ELECTRODE FOR DYE-SENSITIZED SOLAR CELL

Yu-Ju Shin

Department of Chemistry, the Catholic University of Korea, Buchon 422-743 Kyeongki (Korea)

Nanocrystalline semiconducting electrode plays a key role in Dye-Sensitized Solar Cell (DSSC). It harvests the photo-induced electrons from activated dye moleculesand also ensures the diffusion pathway for electrons to the front contact with potential as high as possible. Up to now, TiO2 electrode has been proved to exhibit the best photovoltaic performances among various semiconducting oxides like Nb2O5, SnO2, WO3, ZnO, etc Considering that the electronic structure of ZnO is very similar to TiO2, and the recent striking achievement with ZnO in nanochemistry, the nanocrystalline ZnO electrode seemed us interesting for DSSC application. For this reason, we prepared nanocrystalline ZnO electrodes and also made some modification on the ZnO-electrode surface, where various nano-coatings of oxides such as TiO2 and SiO2 were applied. Preliminary results showed a striking enhancement of energy conversion efficiency () more than 10 times was achieved by the surface modification. In this presentation we will report the preliminary results on the photovoltaic properties of as-prepared ZnO-electrodes and discuss on the origins of such impressive increase of η.