

Presents

INFLUENCE OF AU NANOPARTICLES ON THE TiO₂ BASED DYE-SENSITIZED SOLAR CELL

by Ms. Hu Xiaoping

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Abstract

Au nanoparticle has been attractive to the development of optical and photo-catalytical materials. To investigate the influence of Au nanoparticle on the dye-sensitized solar cell, Au/TiO₂ nanocomposite films with different Au concentrations were synthesized by sol-gel method. The investigation of UV-visible spectroscopy and photocurrent measurement on these films showed that Au/TiO₂ composite films enhanced optical absorption in the visible region, due to the Surface Plasmon Resonance (SPR) of Au nanoparticles. However, this enhancement did not exhibit on the photocurrent spectra of dye-sensitized solar cell. On the other hand, due to the Au nanoparticle participation, the photocurrent of Au/TiO₂ composite film in UV region decreased compared to that of pure TiO₂ film. To understand this decrease on the photocurrent, the influences of Au nanoparticles on the morphology, crystal structure and surface state of Au/TiO₂ nanocomposite films were explored. In addition, the film structure was modified into multi-layer to improve the performance of Au nanoparticle in the dye-sensitized solar cell. The effects of this modification on the properties of the film and dye sensitization were also discussed.

Speaker Ms. Hu Xiaoping

Ms. Hu Xiaoping graduated from Department of Materials Science and Engineering, North-eastern University, China, in 1994. Three years later, she received her M. Eng in Corrosion and Protection from Central Iron & Steel Research Institute (CISRI) in Beijing. She worked at the same institute as Research Engineer for the next four years. In 2001, she became a Ph. D. candidate on Electrochemistry in the Department of Material Science, NUS. She is now working with Advanced Materials & Technology Company in China, on the research of thin film solar cell.

ALL ARE WELCOME!

Prof Li Yi Host