

ENHANCED EFFICIENCY OF THE DYE-SENSITIZED SOLAR CELLS WITH NOVEL SYNTHESIZED TiO₂

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The influence of different polyethylene glycol(PEG) contents and HNO₃ treated in novel synthesized TiO₂ pastes were investigated. Dye-sensitized solar cells(DSSCs) were prepared with three kinds of TiO₂ and characterized their photoelectric properties. The titanias were prepared using a hydrothermal method by mixing NaOH, KOH and LiOH solution with Anatase TiO₂ powder(Aldrich), respectively. The concentration of PEG (M.W.=20,000), the dispersion of media, was controlled in the range of 4.8~23 wt.%. The effects on the performance of the DSSCs were also investigated with acid treatment of TiO₂ pastes. The TiO₂ electrodes fabricated in this study were characterized by x-ray diffraction(XRD), field emission scanning electron microscope (FE-SEM), and atomic force microscope(AFM). The I-V curves of cells show that the HNO₃(0.002mol/l)-treated film with 16.7 wt.% PEG has best efficiency, which is mainly depended on the degrees of dispersion and uniformity of TiO₂ films.

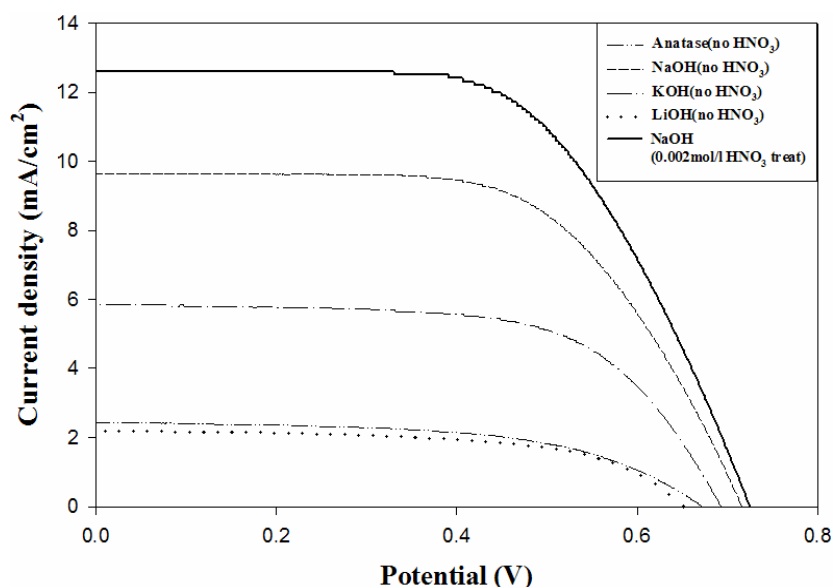


Figure 1. I-V curves of the DSSCs with TiO₂ electrode containing 16.7 wt.% PEG

References

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