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Effect of Sulfuric Acid Treatment for ZnO Photoelectrode on Photovoltaic Properties of Dye-sensitized Solar Cell

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This work mentions a surface treatment of ZnO film by sulfuric acid solution. The ZnO film was prepared from commercial ZnO nanoparticles using screen printing method. The ZnO film was vertically dipped into diluted sulfuric acid solution for different treatment times. Morphology of the treated ZnO film shows small different change. The treated ZnO film was used as photoelectrode of dye-sensitized solar cell and photovoltaic characteristic was measured. Maximum power conversion efficiency is observed for the dye-sensitized solar cell fabricated with treated ZnO film. It reveals a quite higher than PCE of dye-sensitized solar cell fabricated with the non-treated ZnO film. The efficiency enhancement of dye-sensitized solar cell is due to the increased open-circuit voltage and the fill factor even through the decrease of current density is appeared. The effect is a result of the improved internal resistance.

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