

## Influence of Acetic Acid on the Photovoltaic Performance of Ru(II)-Dye Sensitized Nanocrystalline TiO<sub>2</sub> Solar Cells

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Titanium oxide based dye-sensitized solar cells(DSSC) was fabricated by the use of acetic acid having the carboxyl acid functional groups. Influence of acetic acid treatment of TiO<sub>2</sub> electrode with different acids and concentrations on the photovoltaic performance of DSSC was investigated. The additional acetic acid formed assures both, necking between particles and film adhesion to the substrate. The photoelectrode obtained by acid treatment had been characterized by scanning electron microscopy, attenuated total reflection Fourier transform infrared spectroscopy and I-V measurement. It was found that DSSC had better photovoltaic performance when the TiO<sub>2</sub> electrode was treated by acetic acid than that by hydrochloric acid and phosphoric acid. When the concentration of acetic acid to treat TiO<sub>2</sub> electrode increases from 0 to 0.5M, the fill factor (FF) of DSSC increase, the short-circuit current (I<sub>sc</sub>) decreases, the open-circuit voltage (V<sub>oc</sub>) increase. The acid treatment of TiO<sub>2</sub> electrode provides useful information on the mechanism of energy conversion of DSSC.