

Effect of TiO₂ nanofiber on electron transfer of photoelectrode

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The usual way to make good use of the sunlight which works as driving force in the DSSCs is to let the light stay longer in the cell through a diffraction layer on the photo-electrode. For the easiest and the most reduced process which fabricates photoelectrode including light scattering particle, electrospun TiO₂ nanofiber was directly mixed in rod-shape with existing TiO₂ paste without subsequent insertion of diffraction layer. Densely packed TiO₂ nanoparticle in electrospun nanorods provide pathway along which electrons move directly. The change of the crystal structure of the nanorod was obviously confirmed depending on sintering temperature (450°C, 650°C, 750°C, 850°C, 1000°C) by XRD and TEM. And the I-V curves showed that 850°C sintered nanorod mixed TiO₂ photo-electrode performed the highest efficiency. The efficiency increased from 5.27% to 6.22 and it was non-nanorod mixed and 850°C sintered nanorod mixed photo-electrode respectively.