

SUPPORTING INFORMATION

Characterization of charge transport properties of 3D electrode for dye-sensitized solar cells

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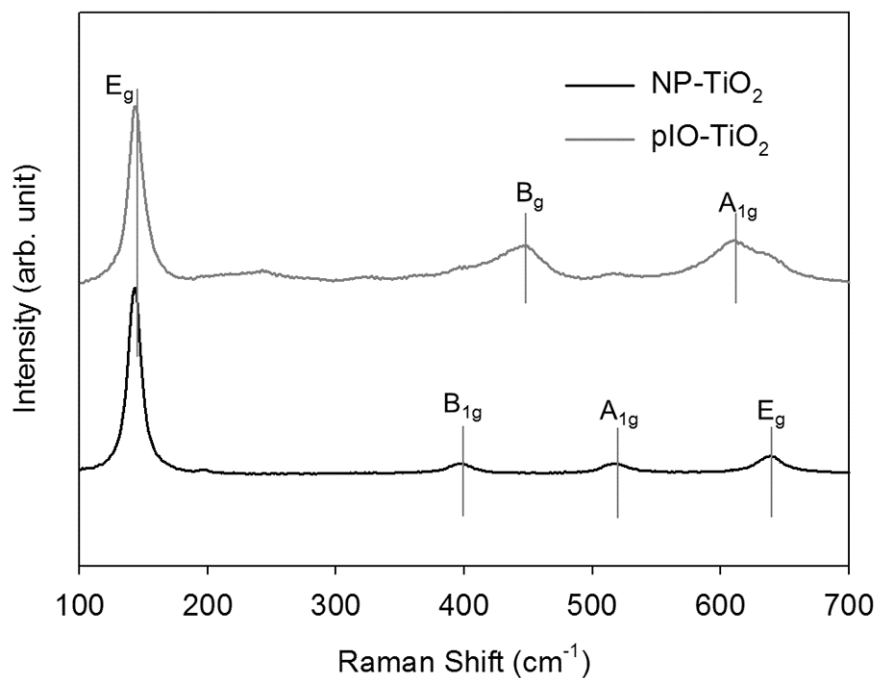


Figure S1. Raman spectra of NP-TiO₂ and pIO-TiO₂ film. The NP-TiO₂ showed four Raman active modes of E_g, B_{1g}, A_{1g}, and E_g which represent the anatase phase of TiO₂. The pIO-TiO₂ showed Raman modes of B_g and A_{1g} from the rutile phase and the E_g mode from the anatase phase. Raman spectra were taken using a Horiba Jobin Yvon LabRAM HR equipped with an air-cooled Ar-ion laser working at 541 nm.

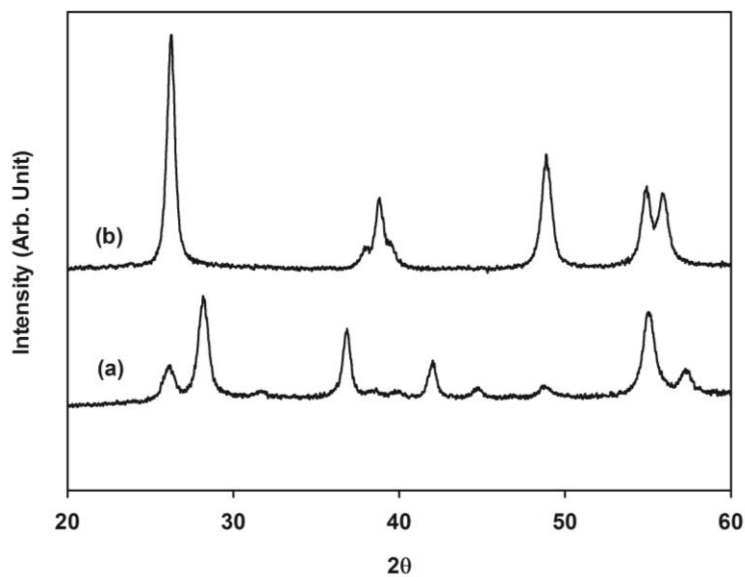


Figure S2. XRD patterns of (a) pIO-TiO₂ films and (b) NP-TiO₂ structure. NP-TiO₂ electrodes shows anatase TiO₂ phase. In the case of pIO-TiO₂ electrodes, the majority of pIO-TiO₂ was present as a TiO₂ rutile phase. A relatively small anatase peak from the IO skeleton was also observed.

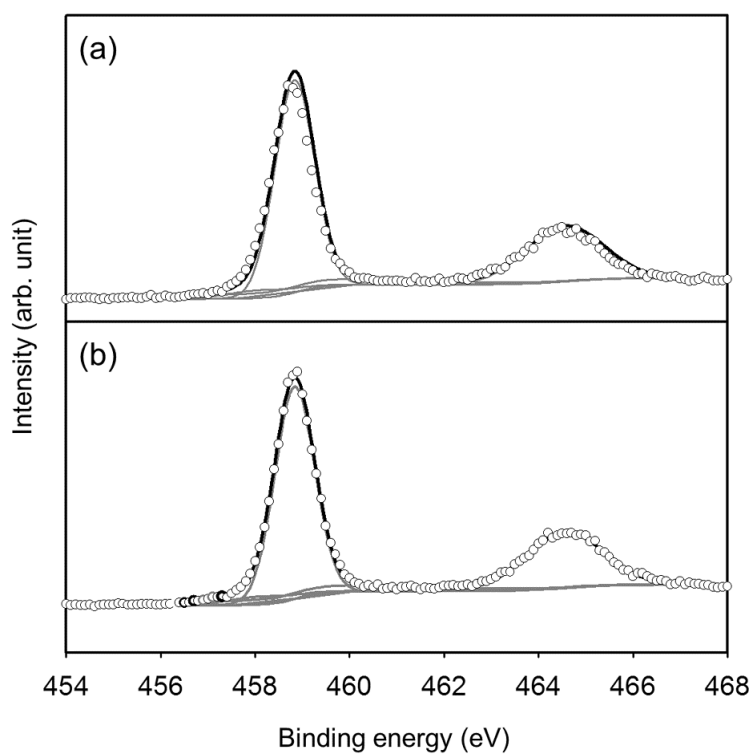


Figure S3. XPS Ti $2p$ spectrum of (a) the IO TiO₂ and (b) pIO TiO₂ structure; experimental data (circle), four deconvoluted spectra (red solid line), summation of the four spectra (black solid line). The IO TiO₂ film was post-treated in 0.3 M TiCl₄ aqueous solution at 70°C for 30 min.

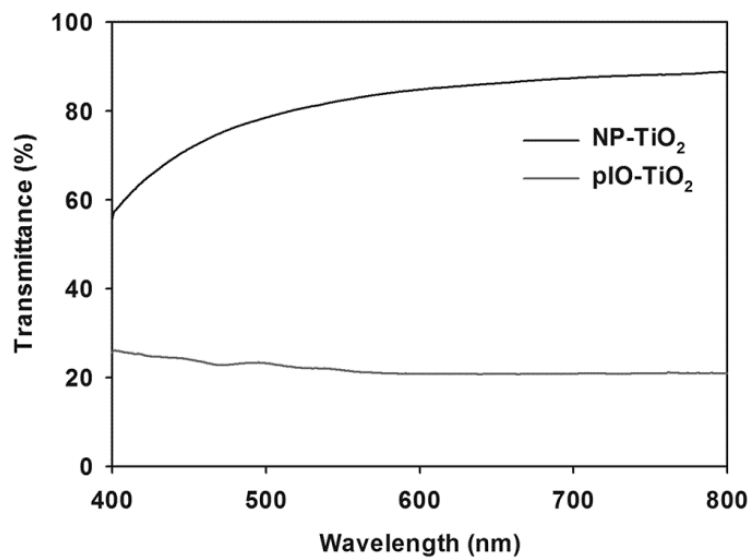


Figure S4. Normal transmittance spectra of pIO TiO₂ and NP TiO₂ film. The transmittance of pIO TiO₂ film was around 4 times lower than that of NP TiO₂ film over the measured range of wavelength, which implies the higher scattering property of pIO TiO₂ than NP TiO₂. The transmittance was measured using a UV-vis spectrophotometer (Shimadzu, UV-2550).