

## Supporting Information

For

### Highly Efficient and Stable Ionic Liquid-based Gel Electrolytes

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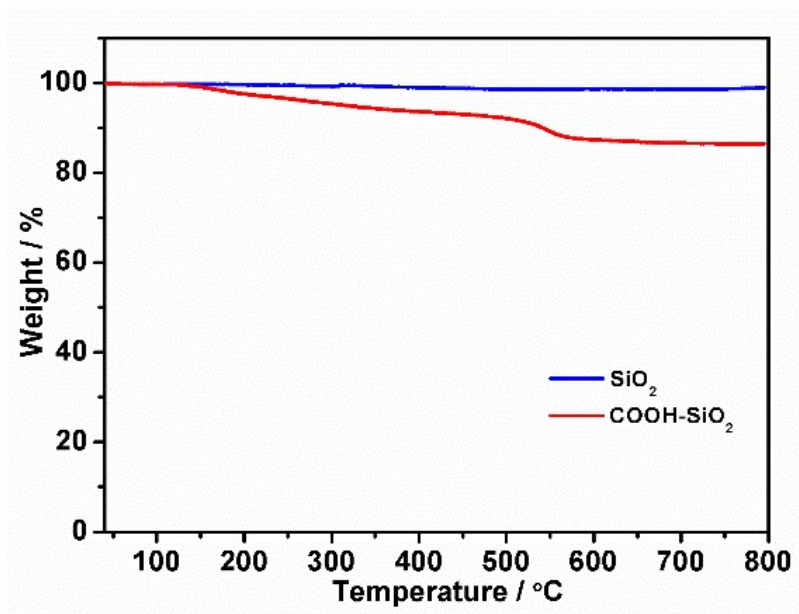
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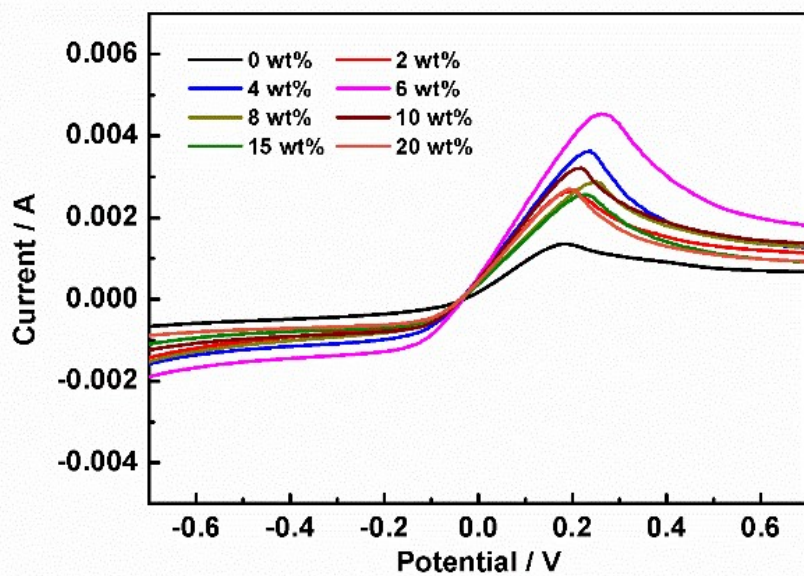
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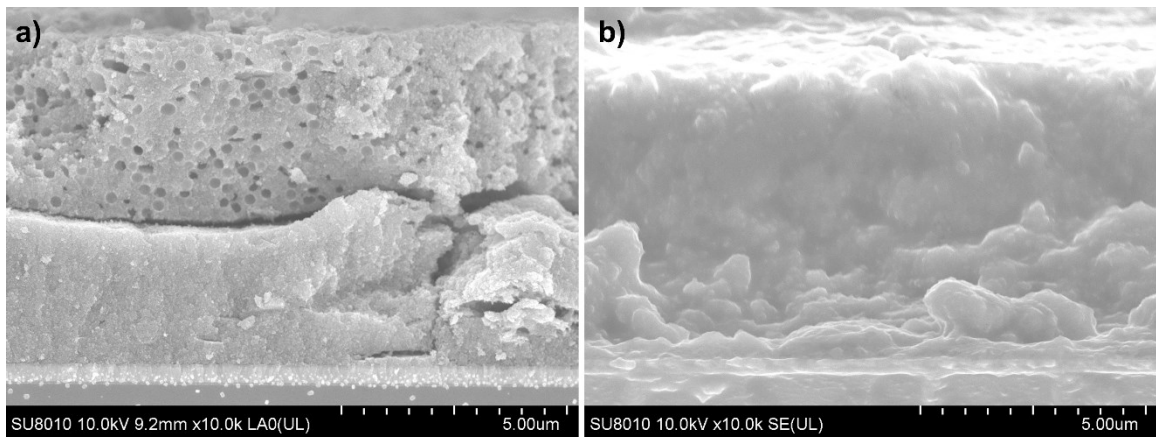
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**Figure S1** TGA curves of SiO<sub>2</sub> and COOH-SiO<sub>2</sub> nanoparticles.



**Figure S2** Linear sweep voltammograms (LSV) of DSSCs with different amount COOH-SiO<sub>2</sub> in ionic liquid electrolyte.



**Figure S3** Cross-sectional SEM images of the bare TiO<sub>2</sub> electrode and TiO<sub>2</sub> electrode deposited with gel electrolyte (6 wt% COOH-SiO<sub>2</sub>)

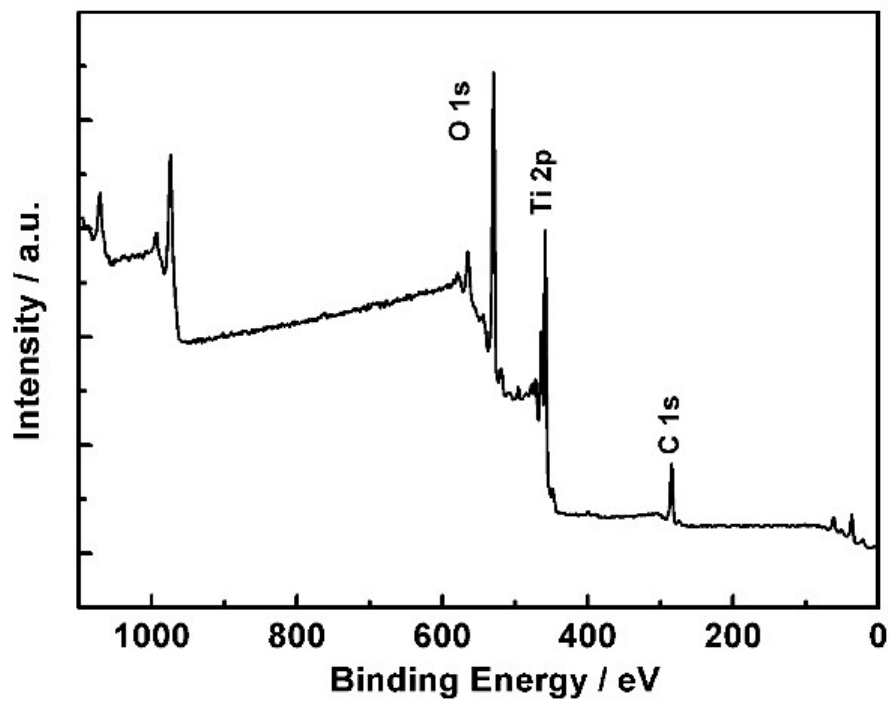
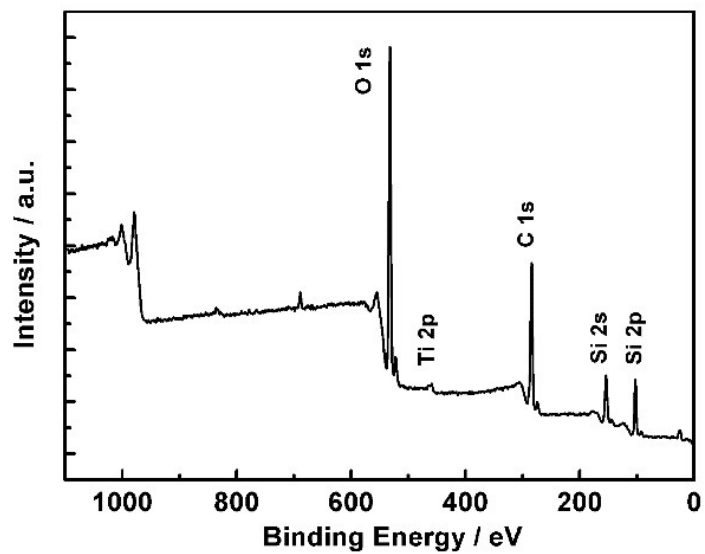
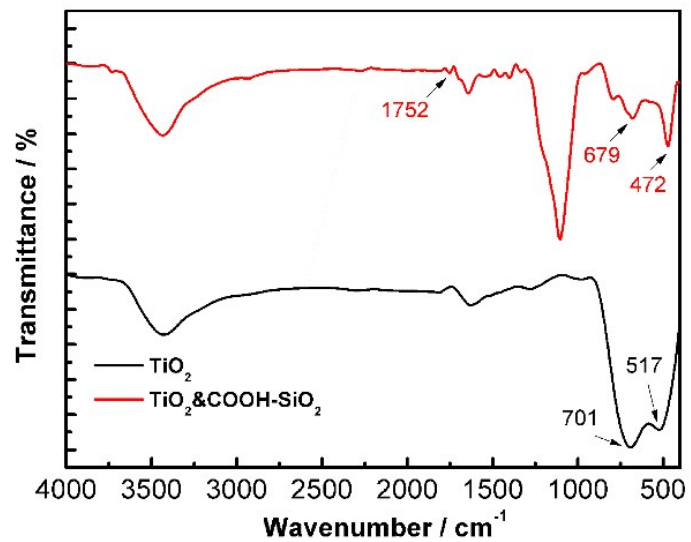


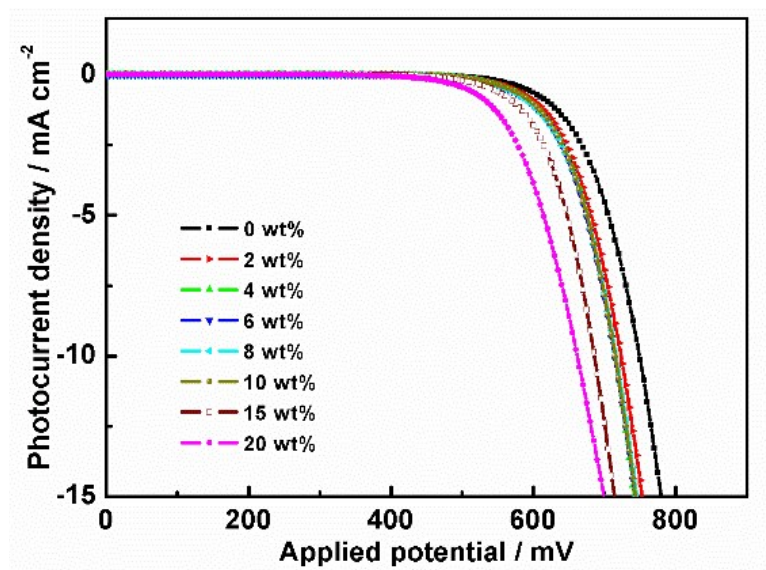
Figure S4 XPS survey spectra of TiO<sub>2</sub>.



**Figure S5** XPS survey spectra of  $\text{TiO}_2\&\text{COOH-SiO}_2$  (the weight ratio for  $\text{TiO}_2$  and  $\text{COOH-SiO}_2$  is 10:1).

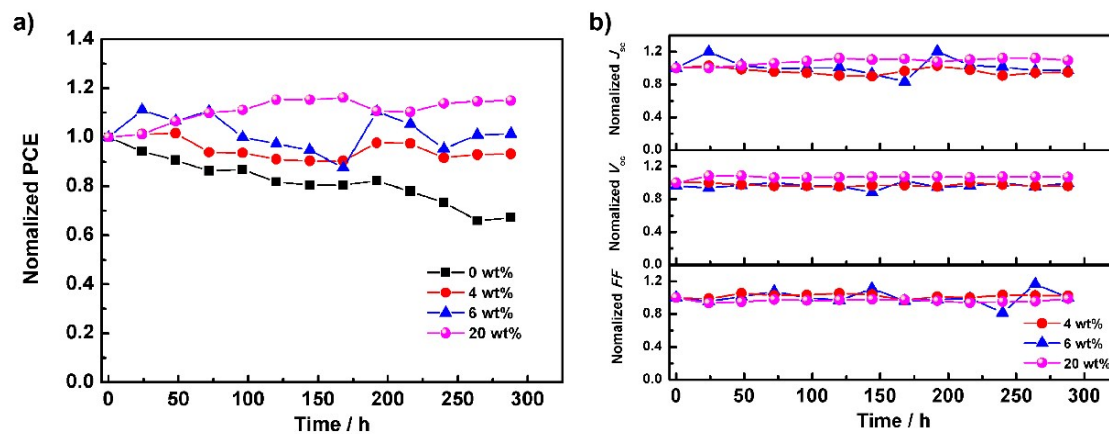


**Figure S6** IR spectra of TiO<sub>2</sub> and mixture of TiO<sub>2</sub>&COOH-SiO<sub>2</sub> (the weight ratio for TiO<sub>2</sub> and COOH-SiO<sub>2</sub> is 10:1).



**Figure S7** Characteristic  $J$ - $V$  curves for DSSCs with different amount of COOH-SiO<sub>2</sub> in ionic liquid electrolyte under dark conditions.





**Figure S8** (a) Long-term stability of DSSCs with different amount of COOH-SiO<sub>2</sub> under the continuous illumination, (b) Time-dependence changes of the photovoltaic parameters for the DSSCs based on gel electrolytes.