

# Supplementary Information

## Facile infiltration of semiconducting polymer into mesoporous electrodes for hybrid solar cells

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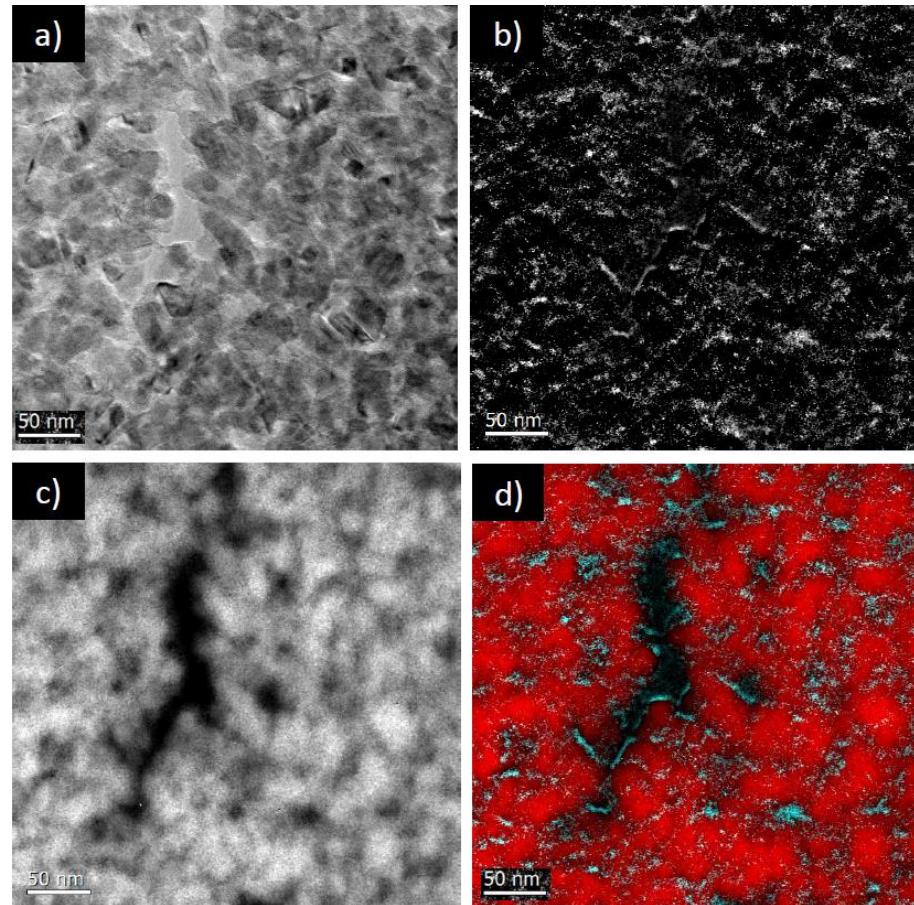
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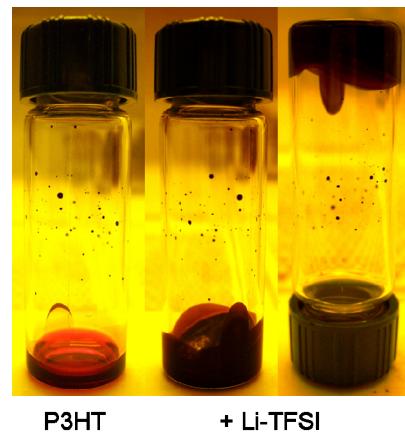
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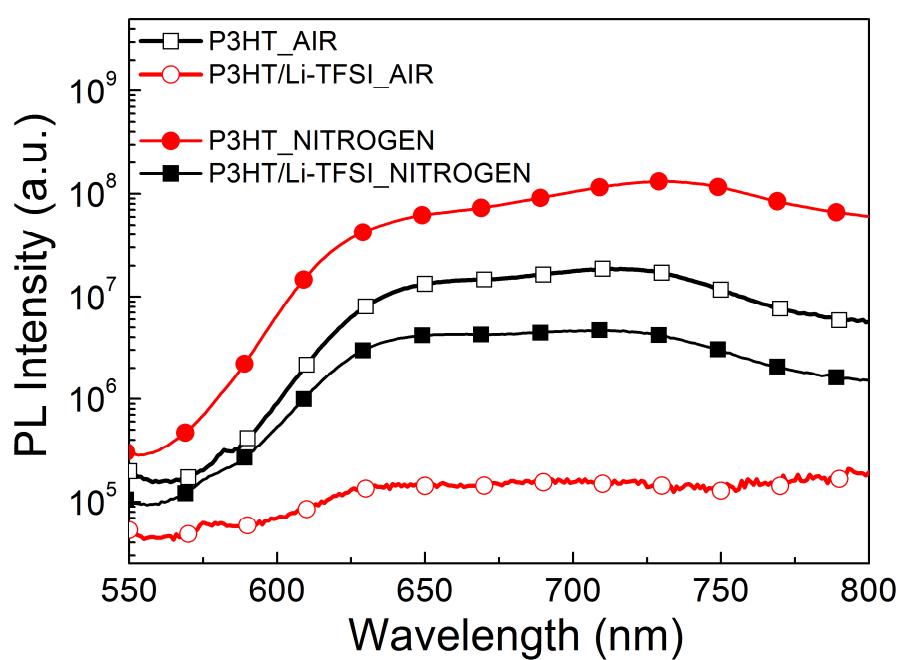


### TiO<sub>2</sub>/D131/LiTFSI+*t*BP/P3HT

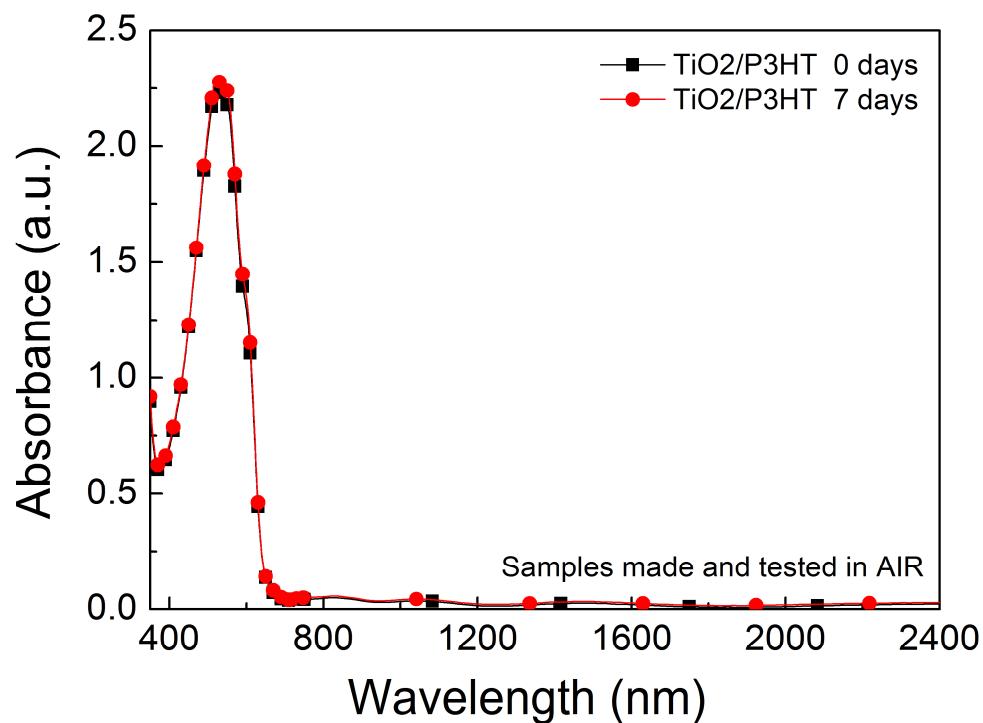
**Fig. S1** Transmission electron micrographs of the same cross section shown in **Fig. 2** (e-h), but focusing only on the central TiO<sub>2</sub>/D131/LiTFSI+*t*BP/P3HT section with higher resolution: (a) bright field TEM, and a corresponding energy-filtered TEM images of the same sample region shown in (a) using: (b) the sulfur L2,3 edge transition (165 eV), and (c) titanium L2,3 edge (460 eV). Bright intensity in (b) and (c) indicate the locations of sulfur-rich (b) or titanium-rich (c) regions in the cross section. For clarity, an overlay between (b) and (c) is presented in (d), while titanium-rich regions are red and sulfur-rich regions are blue. Voids are bright in the bright filed image (a) and dark in the overlay image (d).



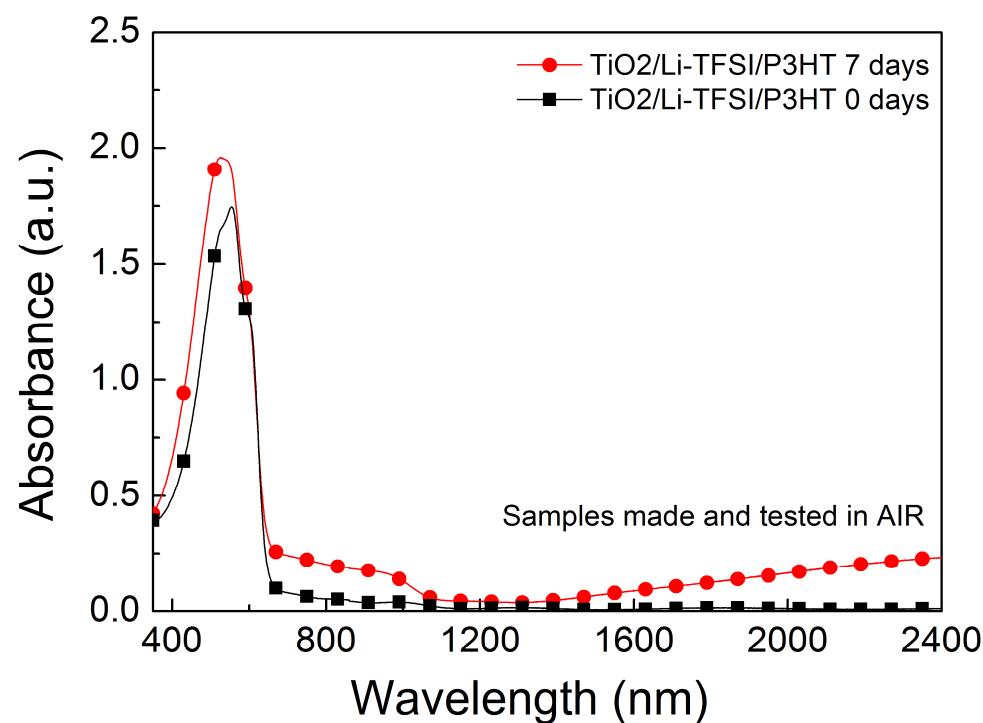
**Fig. S2** Photo of 3% P3HT solution in chlorobenzene prior and 2 sec after addition of Li-TFSI which causes gelling of the solution.



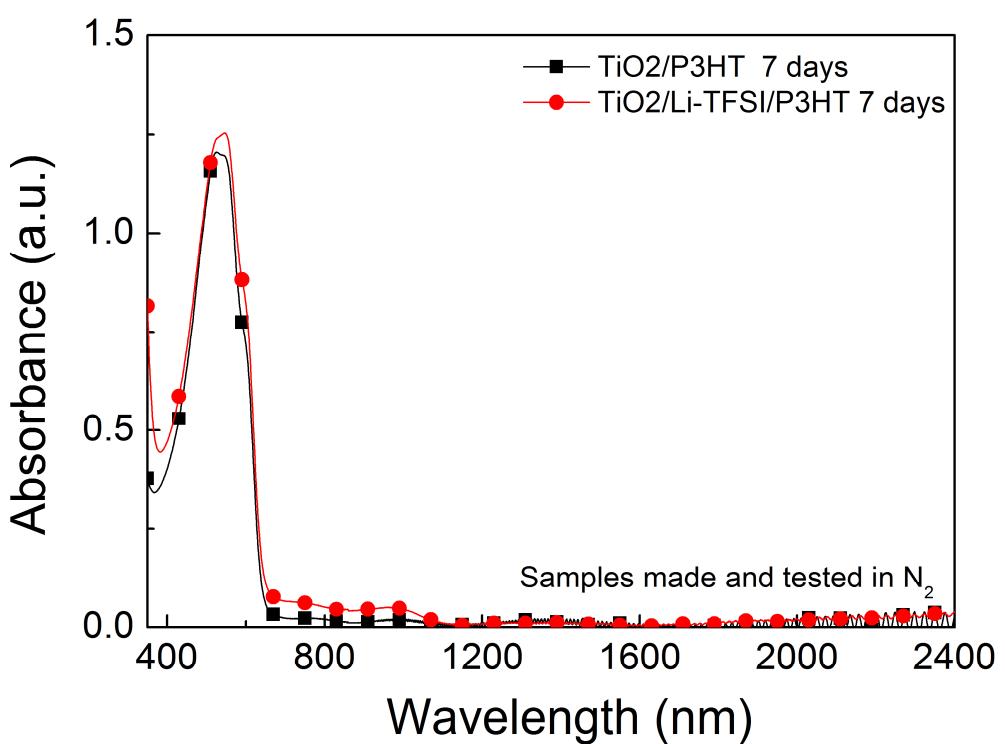
**Fig.S3** Photoluminescence spectra for a  $1\ \mu\text{m}$  thick  $\text{TiO}_2$  film coated with P3HT with and without Li-TFSI pre-coating, prepared in air as well as prepared and sealed under nitrogen.



**Fig. S4** Absorption spectra for 1  $\mu\text{m}$  thick  $\text{TiO}_2$  film coated with P3HT measured in air right after preparation and aged for 7 days in the dark.



**Fig. S5** Absorption spectra for 1  $\mu\text{m}$  thick  $\text{TiO}_2/\text{P3HT}$  when Li-TFSI are pre-spun. The samples were measured in air right after preparation and aged for 7 days in the dark.



**Fig. S6** Absorption spectra for 1  $\mu\text{m}$  thick  $\text{TiO}_2/\text{P}3\text{HT}$  with and without Li-TFSI pre-coating prepared and sealed under nitrogen. They were tested right after preparation and aged for 7 days in the dark.