# Supporting Information

# Hydrogen and nitrogen codoping of anatase $TiO_2$ for efficiency enhancement in organic solar cells

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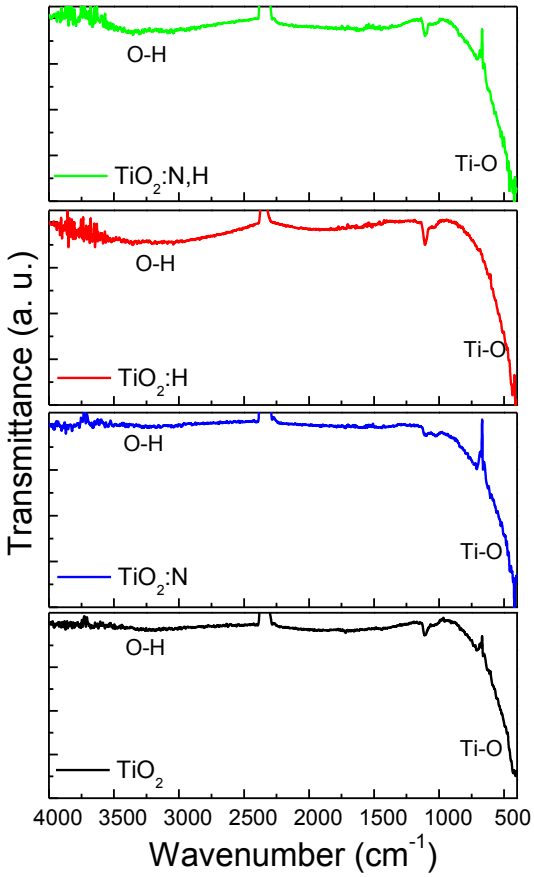


**Figure S1.** FTIR transmittance spectra of $TiO_2$ samples either as-deposited (on silicon substrates) or annealed in nitrogen, hydrogen and forming gas (containing 90% nitrogen and 10% hydrogen) at 550 $^{o}$C for 1 h. The thickness of the samples was ~40 nm.

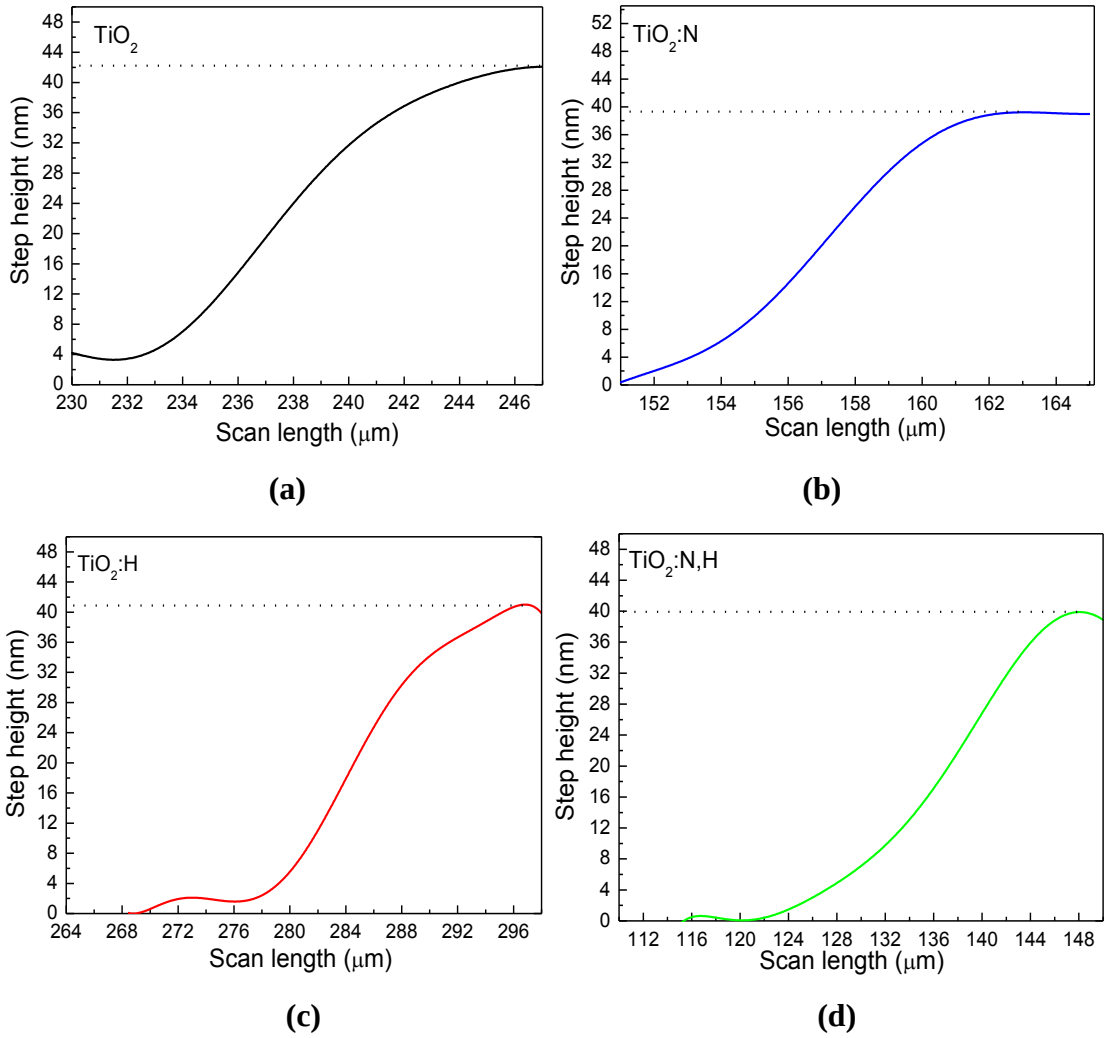


**Figure S2.** Profilometer thickness profile measurements of $TiO_2$ samples.

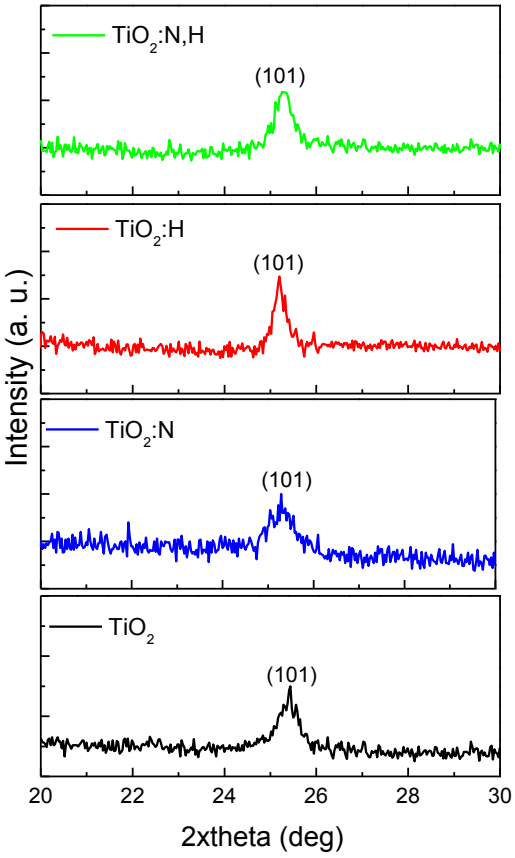


**Figure S3.** X-ray diffraction patterns of $TiO_2$ samples with a thickness of ~40 nm. The samples were either as-deposited or annealed in nitrogen, hydrogen and forming gas at 550 $^{o}$C for 1 h.

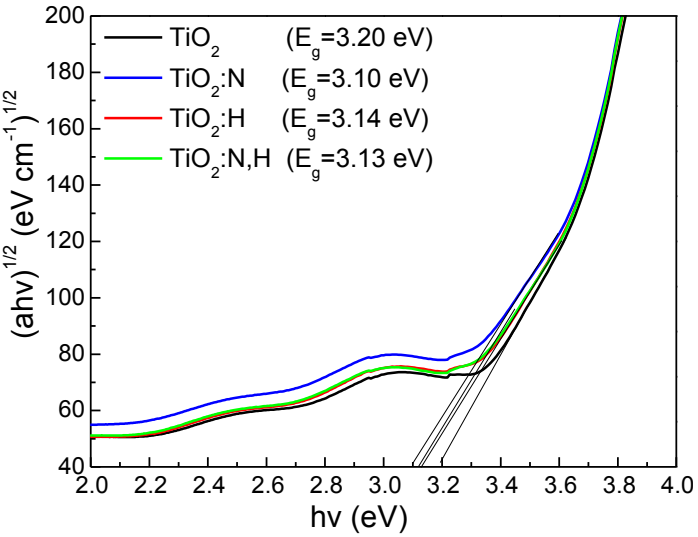


**Figure S4.** Tauc plots, as derived from absorption measurements, for the estimation of bandgap for the different $TiO_2$ samples.

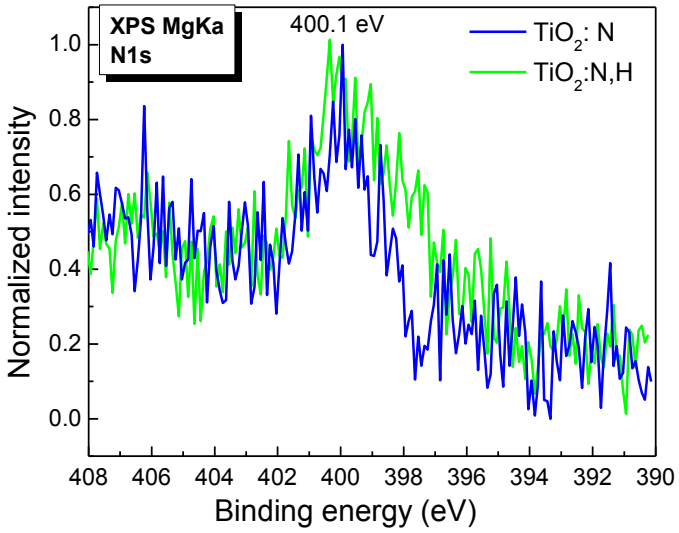


**Figure S5.** XPS N 1s peaks of $TiO_2$ samples annealed in nitrogen and forming gas environments at 550 $^{o}$C for 1 hour.

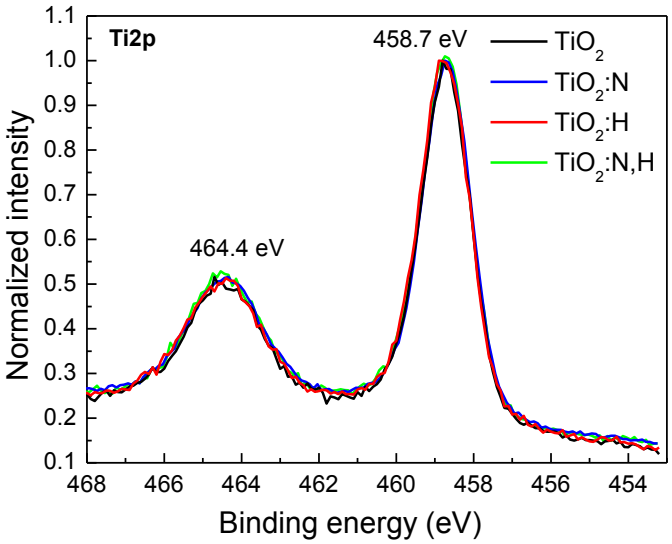


**Figure S6.** XPS Ti 2p peaks of $TiO_2$ samples annealed in different environments.

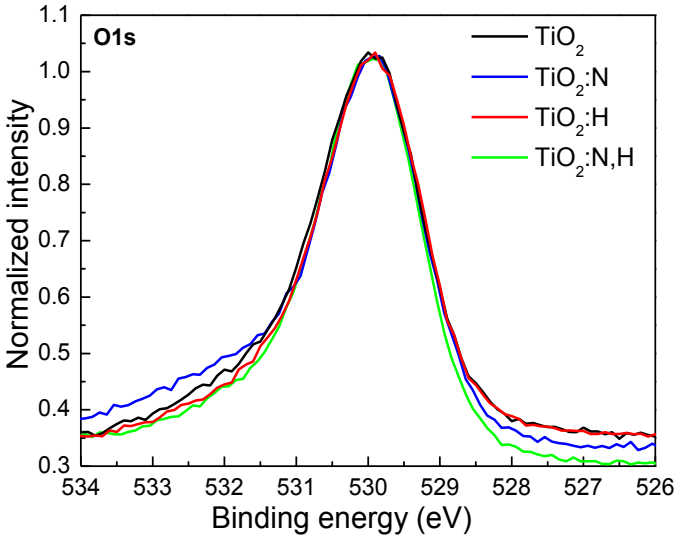


**Figure S7.** XPS O 1s peaks of $TiO_2$ samples annealed in different environments.

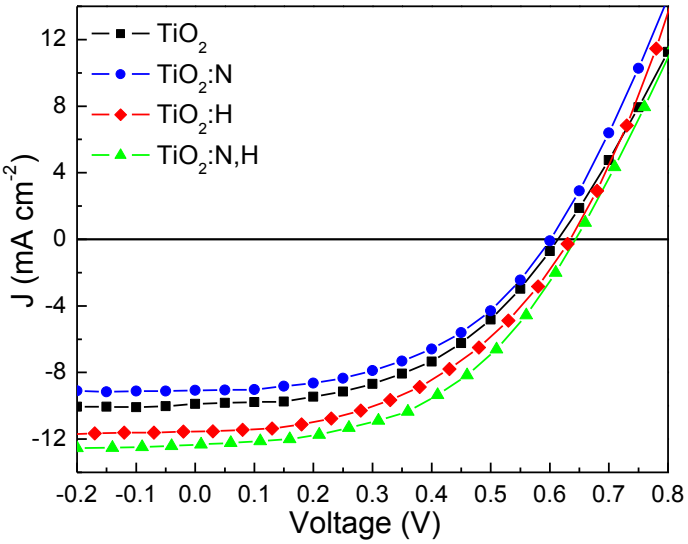


**Figure S8.** Current density versus applied voltage (J-V) curves taken under 1.5 AM illumination of P3HT:$PC_{70}BM$-based organic solar cells using N and H doped and codoped $TiO_2$ ETLs. The annealing in different environments was performed at 550 $^{o}C$ for 1 hour.

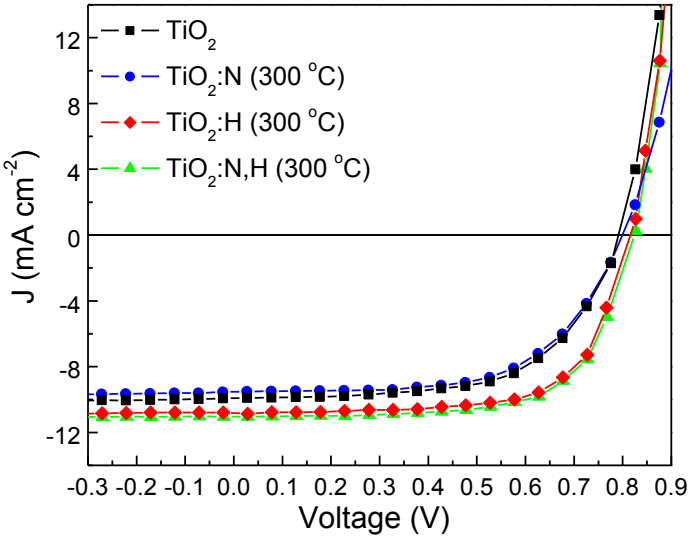


**Figure S9.** Current density versus applied voltage (J-V) curves taken under 1.5 AM illumination of P3HT:$IC_{60}BM$-based organic solar cells using $TiO_2$ ETLs. The $TiO_2$ layers were either as-deposited or annealed in nitrogen, hydrogen and forming gas at 300 $^{o}C$ for 30 min.