Supporting Information

Tailored Synthesis of $SrTiO_3/TiO_2$ Heterostructures for Dye-Sensitized Solar Cells with Enhanced Photoelectric Conversion Performance

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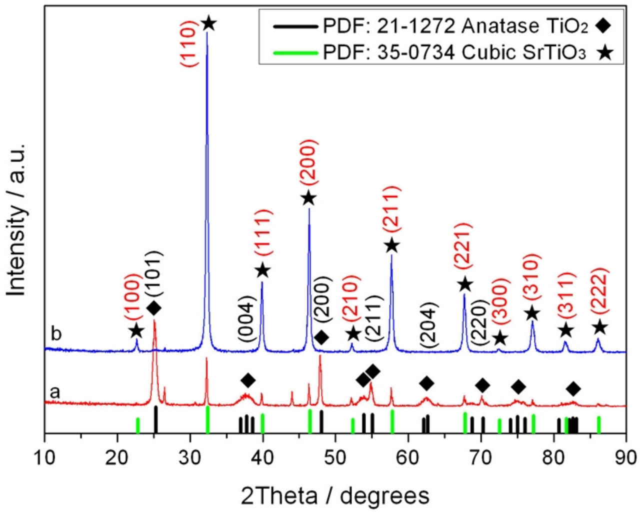

Figure S1 XRD patterns of the $SrTiO_3/TiO_2$ samples: (a) ST0 and (b) ST4.

Table S1 Actual percent data of Sr/Ti from EDS spectra

Atomic Percent / Elements / Samples	Sr (%)	Ti (%)	Actual Percent	Theoretical Percent
ST0	6.06	40.43	15	25
ST1	8.92	20.92	43	50
ST2	13.05	17.40	75	75
ST3	14.19	16.45	86	100
ST4	15.34	15.37	98	150

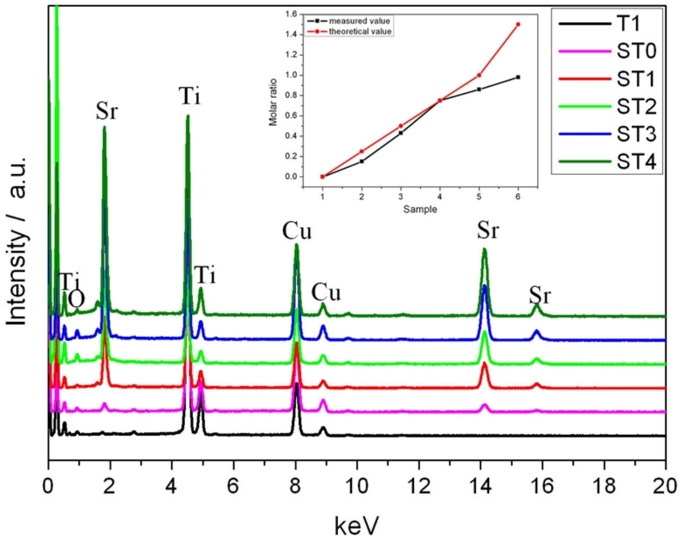

Figure S2 EDX spectra of TiO_2 and $SrTiO_3/TiO_2$ samples.

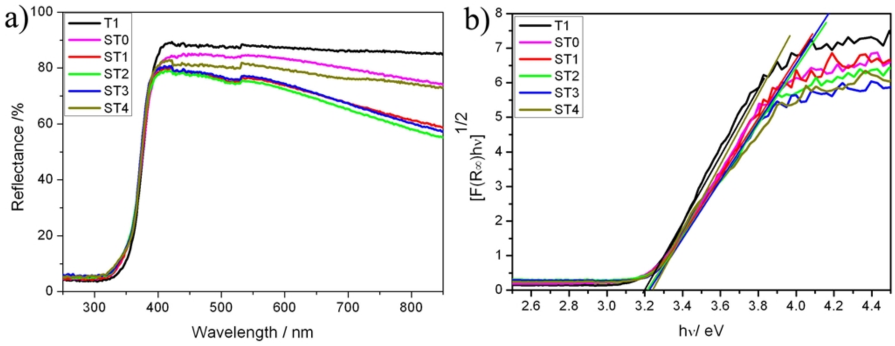

Figure S3 (a) UV-vis diffuse reflectance spectra (DRS) of TiO_2 and $SrTiO_3/TiO_2$ samples. (b) The plots of transformed Kubelka-Munk function versus the energy of light.

The reflectance ability of the TiO_2 nanosheets (T1) was much greater than that of the $SrTiO_3/TiO_2$ samples (ST-series) over the whole wavelength range (Fig. S3a). The reflectance first decreased and then increased with increasing the molar ratio of Sr/Ti, the samples ST1, ST2 and ST3 have the lowest reflectance, in other words, the ability of absorb the solar light is the highest. This ability makes it for promising application in photovoltaic devices. The band gap energy of the TiO_2 and $SrTiO_3/TiO_2$ samples can be roughly determined according to the plots in Fig. S3b, which are obtained via the transformation based on the Kubelka-Munk function ($F(R\infty)=(1-R)^2/(2R)$), where R is the reflection coefficient).[1] The TiO_2 sample (T1) exhibits a smooth absorption edge around 390 nm, corresponding to band gap energy of 3.2 eV. The estimated band gap value of the $SrTiO_3/TiO_2$ samples (ST-series) is approximately to 3.25 eV.

References

1. Uddin, M. T.; Nicolas, Y.; Olivier, C.; Toupance, T.; Servant, L.; Muller, M. M.; Kleebe, H. J.; Ziegler, J.; Jaegermann, W.. *Inorg. Chem.* **2012,** *51*, 7764–7773.