Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Shape-controlled Synthesis of Single-crystalline Anatase TiO_2 Micro/nanoarchitectures for Efficient Dye-sensitized Solar Cells

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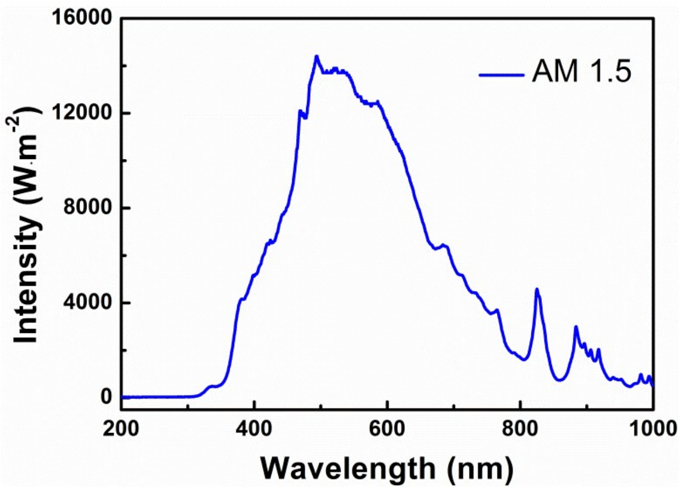

Fig. S1 The lamp spectra of one sun AM 1.5 G illumination (100 mW·cm^{-2}) as a function of wavelength.

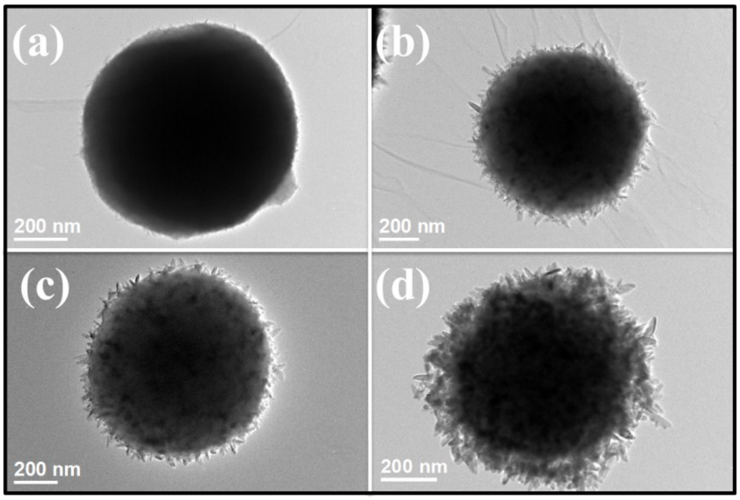

Fig. S2 Typical TEM images of the SM obtained in (a) 4 h, (b) 8 h, (c) 12 h, and 24 h.

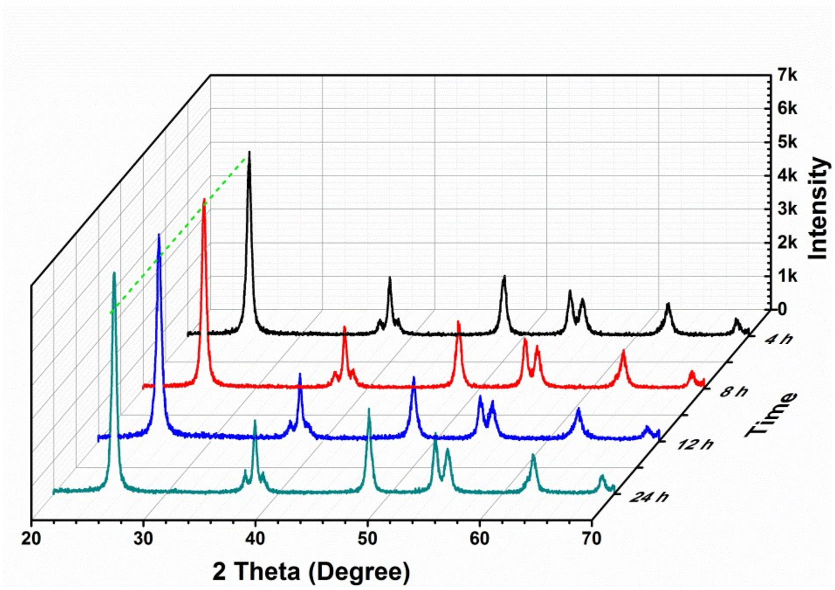

Fig. S3 XRD patterns of the SM synthesized with different reaction time.

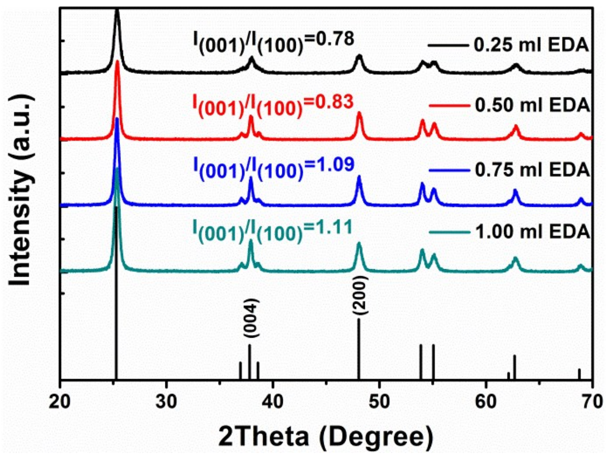

Fig. S4 XRD patterns of the SM using different amounts of EDA.

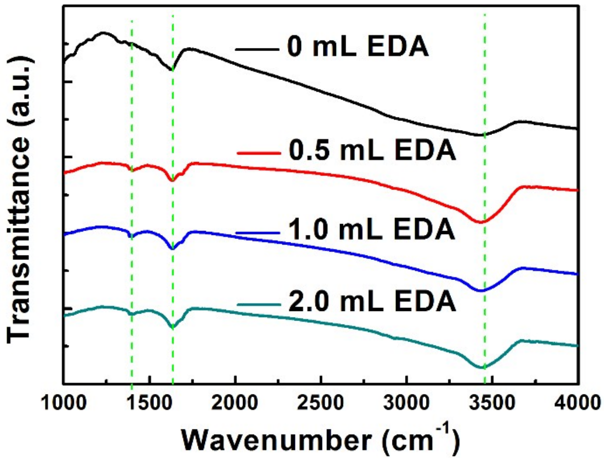

Fig. S5 FTIR spectra of TiO_2 micro/nanoarchitectures synthesized with different amounts of EDA.

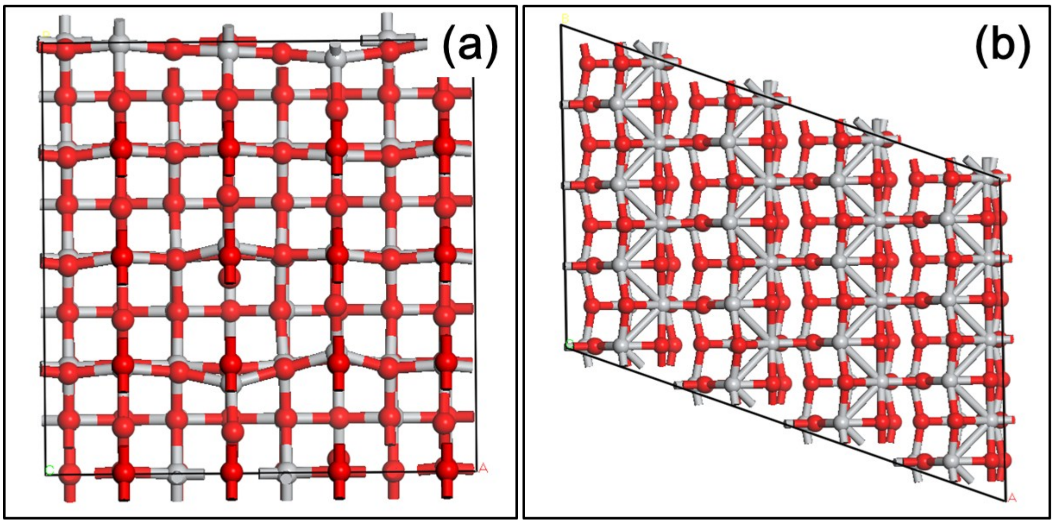

Fig. S6 Slice representation of the two surfaces of anatase: a (001) and b (101). Gray and red spheres represent titanium and oxygen ions, respectively.

Table S1 Molecular adsorption energies of EDA on the (101) and (001) faces.

Facet	$E_{EDA\text{-}facet}$ (eV)	E_{EDA} (eV)	E_{facet} (eV)
(101)	-1998.83	-63.61	-2064.43
(001)	-1736.70	-63.61	-1668.71

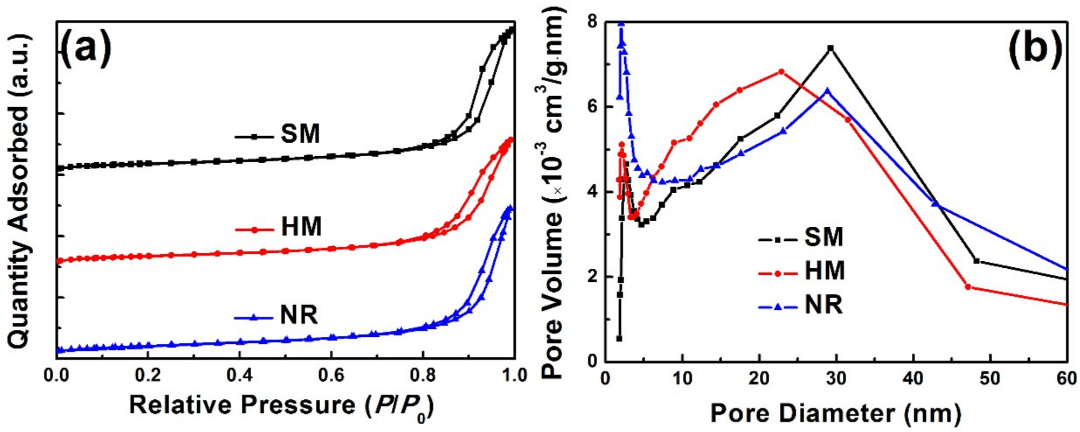

Fig. S7 (a) Nitrogen sorption isotherms and (b) the corresponding pore diameter distributions of the SM, HM, and NR.

Table S2 Physical properties of the SM, HM, and NR.

Samples	Pore size[α](nm)	Porosity[β](P)	S_{BET} ($m^2 \cdot g^{-1}$)	Crystallite[γ] (nm)
SM	21.3	0.566	74.8	29.3
HM	18.4	0.588	82.5	28.1
NR	16.6	0.541	70.5	31.8

[α]Pore sizes are based on the adsorption average pore width (4V/A by BET) calculated from the BJH model.

[β]Porosity is calculated from the BJH pore volume according to $P = \frac{\rho V_p}{1 + \rho V_p}$.

[γ]Crystallite is calculated by the Scherrer equation.

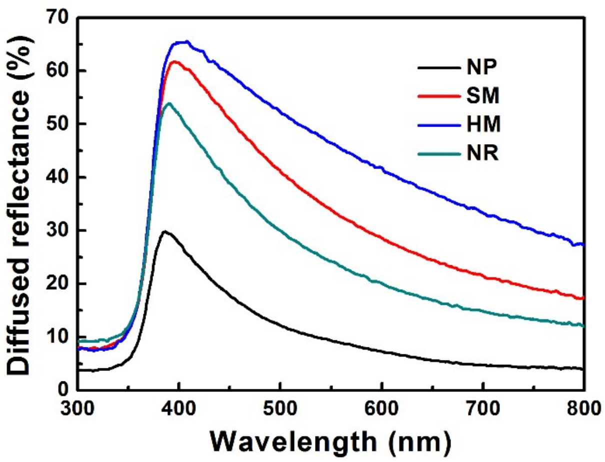

Fig. S8 Diffuse reflectance spectra of the NP, SM, HM, and NR photoanodes with the same film thickness (~9.5 μm).