Supporting information

Three-dimensional Gd- TiO_2 fibrous photoelectrodes for efficient visible light driven photocatalytic performance

Junghyun Choi,‡[a] P. Sudhagar,‡[a,b,d] P. Lakshmipathiraj,[d] Jung Woo Lee,[a] Anitha Devadoss, [a] Sangkyu Lee,[c] Taeseup Song,[c] Seungki Hong, [a] S. Eito,[e] C. Terashima,[d] Tae Hee Han,[f] Jeung Ku Kang,[g] A. Fujishima,[d] Yong Soo Kang*[a,b] and Ungyu Paik*[a]

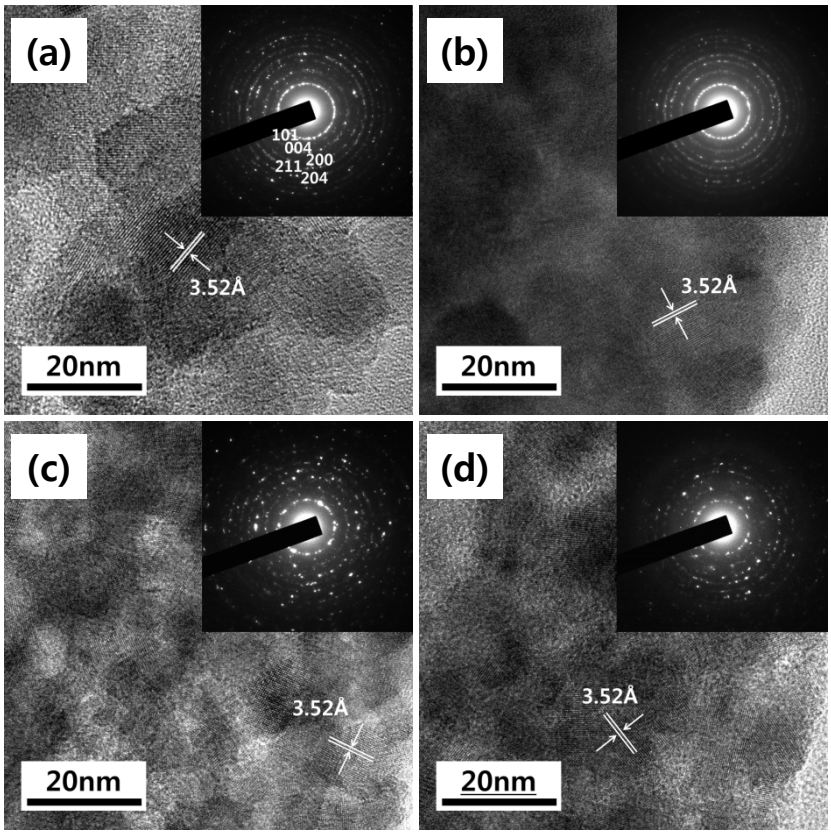

Figure S1. High resolution transmission electron microscope (HRTEM) images of (a) pristine TiO_2 nanoparticles, (b) Gd-doped TiO_2 nanoparticles, (c) pristine TiO_2 nanofibers, and (d) Gd-doped TiO_2 nanofibers. (Note that SAED patterns were presented in the insets).

Figure S1. Choi et al.

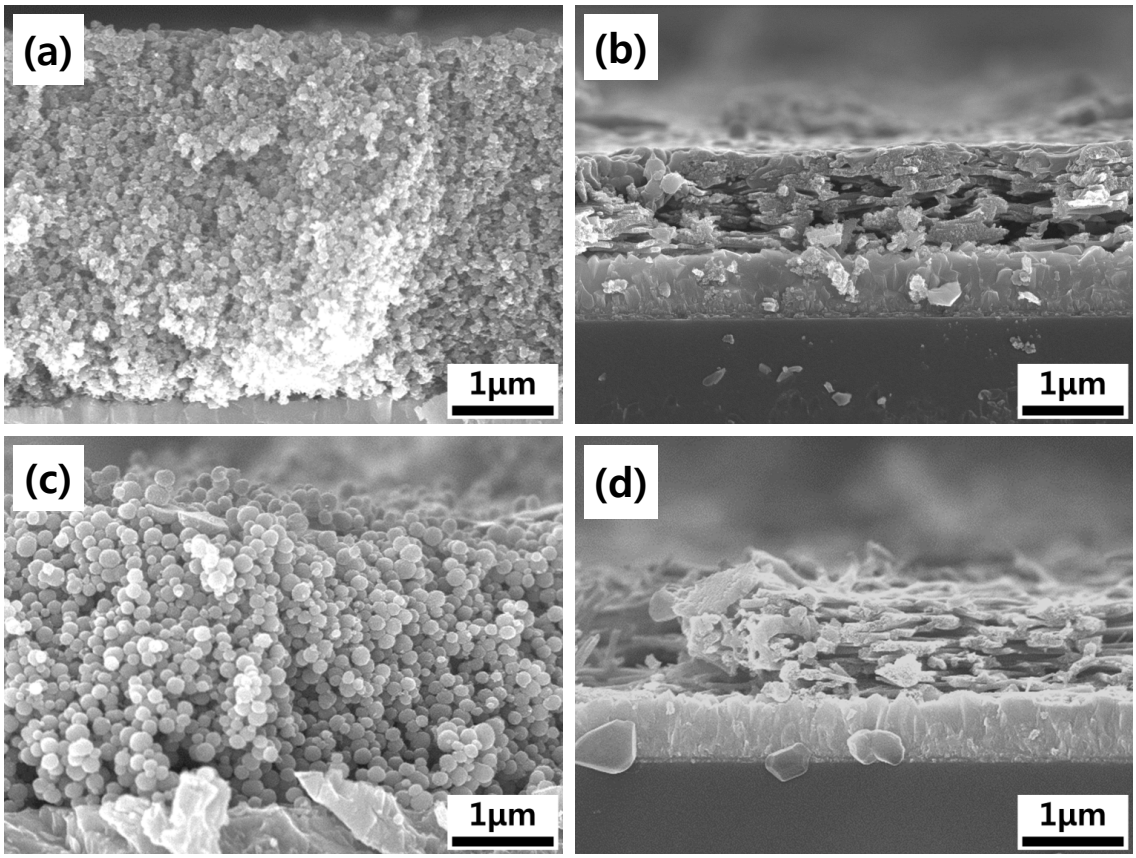

Figure S2. Cross section SEM images of (a) TiO_2 nanoparticles, (b) TiO_2 nanofibers, (c) Gd-doped TiO_2 nanoparticles and (d) Gd-doped TiO_2 nanofiber electrodes.

Figure S2. Choi et al.

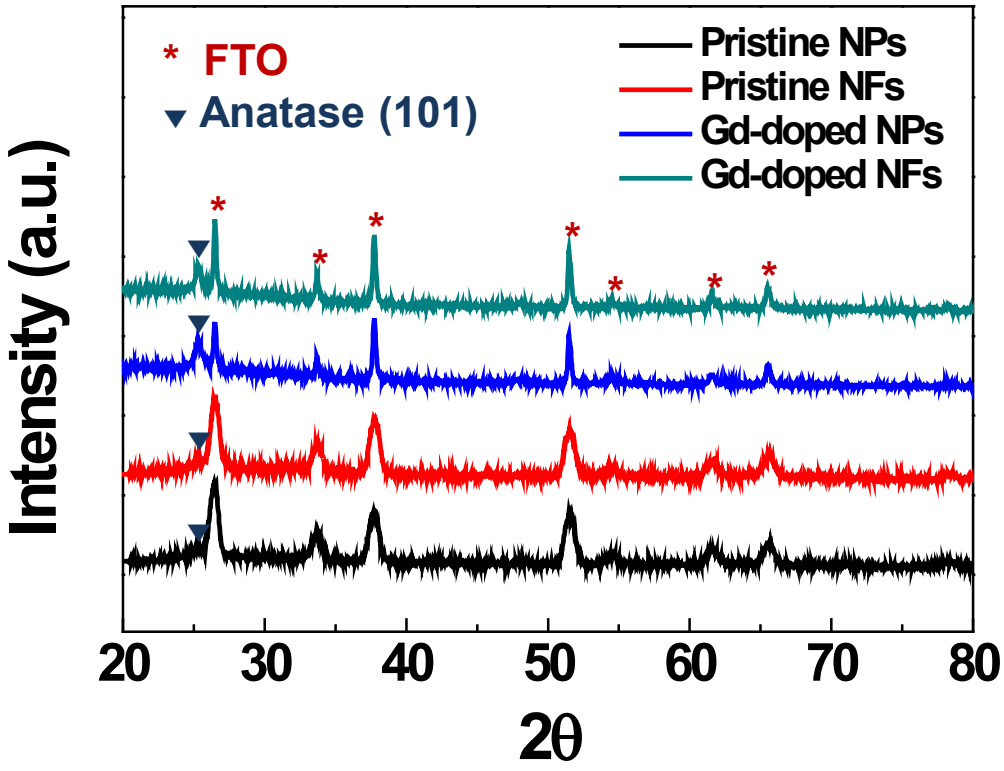

Figure S3. XRD spectra of pristine and Gd doped TiO_2 nanostructured electrodes

Figure S3. Choi et al.

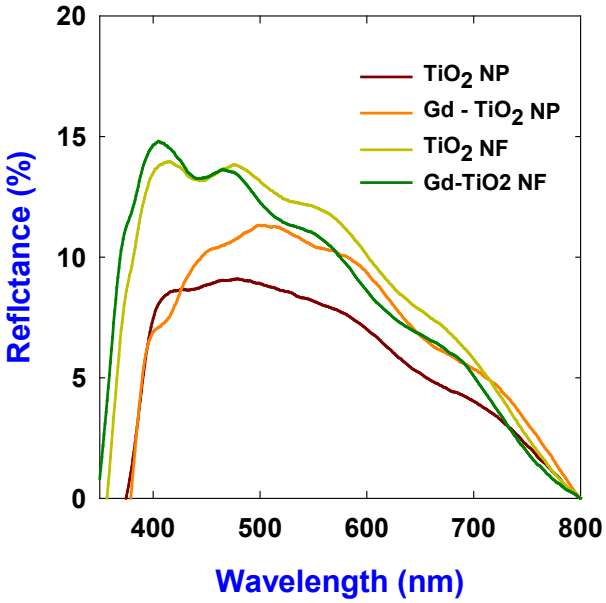

Figure S4. Diffusion reflectance spectra of pristine and Gd-doped TiO_2 nanofibers and nanoparticle electrodes.

Figure S4. Choi et al.

Table S1 Elemental composition (atomic %) of Ti and O in pristine and Gd-doped TiO_2 nanofiber electrodes.

Electrode	Ti 2p (%)	O1s (%)		
		Lattice oxide (530.7 eV)	Surface hydroxyl oxygen (532.5 eV)	Surface adsorbed oxygen (533.6 eV)
Pristine TiO_2 NF	22.3	54.1	6.0	N/A
Gd-doped TiO_2 NF	21.4	47.5	8.5	3.3
Pristine TiO_2 NP	21.5	51.7	6.1	N/A
Gd-doped TiO_2 NP	21.2	49.9	6.9	N/A

Table S2. Electronic parameters of pristine and Gd doped TiO2 nanostructures (values estimated from UPS spectra Figure 5b)

Sample	VBM (eV)	Ionization Energy (eV)	Work function (eV)
TiO_2 NP	3.36	7.71	4.32
Gd-TiO_2 NP	3.33	7.83	4.50
TiO_2 NF	3.43	7.03	3.60
Gd-TiO_2 NP	3.40	7.36	3.96

Table S3. Cartesian components of stress tensor of pure anatase TiO_2 lattice

Cartesian components (Gpa)			
	x	y	z
x	0.050976	0.000000	0.000000
y	0.000000	0.050976	0.000000
z	0.000000	0.000000	0.039055