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Supplementary Materials

Evaluation of Efficient and Noble-Metal-Free $NiTiO_3$ Nanofibers Sensitized with Porous gC_3N_4 Sheets for Photocatalytic Applications

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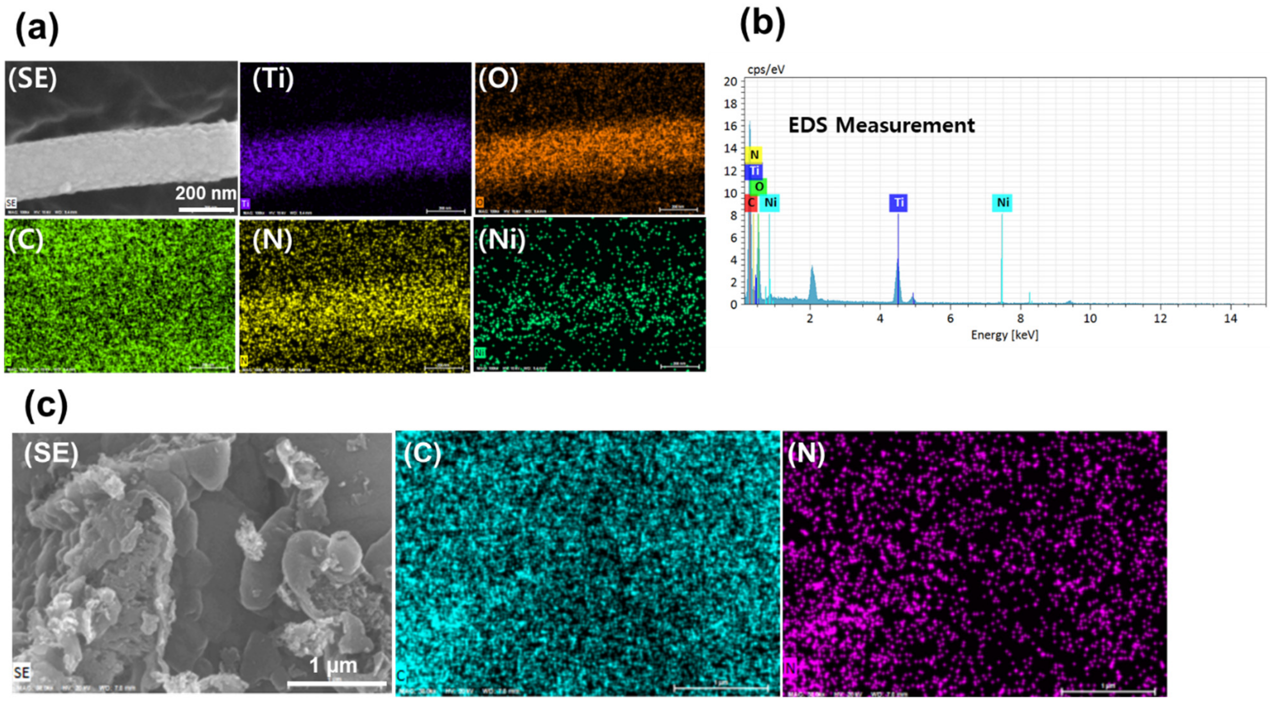

Figure S1. Elemental analysis of gnT6040 by scanning electron microscopy. (**a**) Mapping and (**b**) energy-dispersive X-ray spectroscopy (EDS) measurement. The nitrogen map confirms the coating of AAs-gC_3N_4 on the nanofibers. (**c**) SEM mapping of pristine AAs-gC_3N_4.

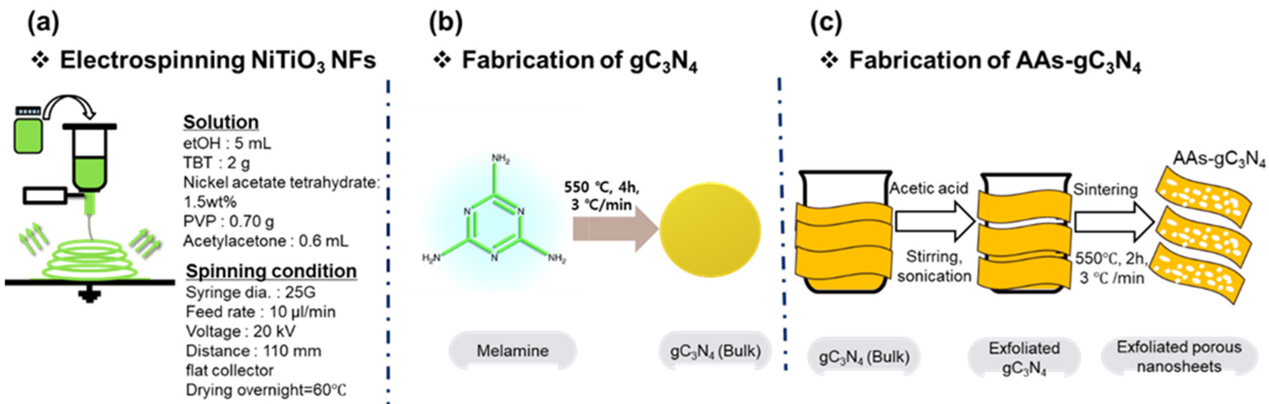

Figure S2. Detailed experimental setups for (**a**) electrospinning $NiTiO_3$ nanofibers, (**b**) synthesizing bulk gC_3N_4, and (**c**) fabrication of amorphous sheets of gC_3N_4 (AAs-gC_3N_4).

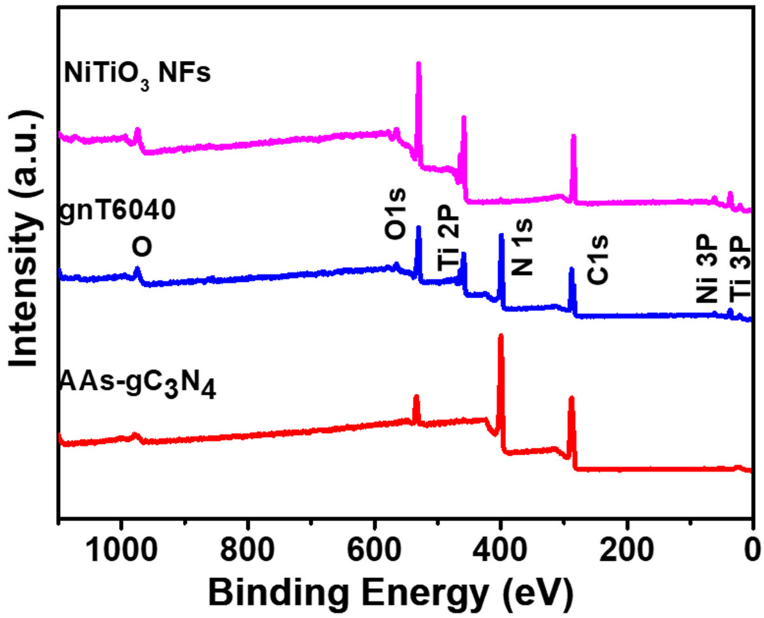

Figure S3. X-ray photoelectron survey spectra showing constituent elements on the surface of Ni-TiO_3, AAs-gC_3N_4, and gnT6040.

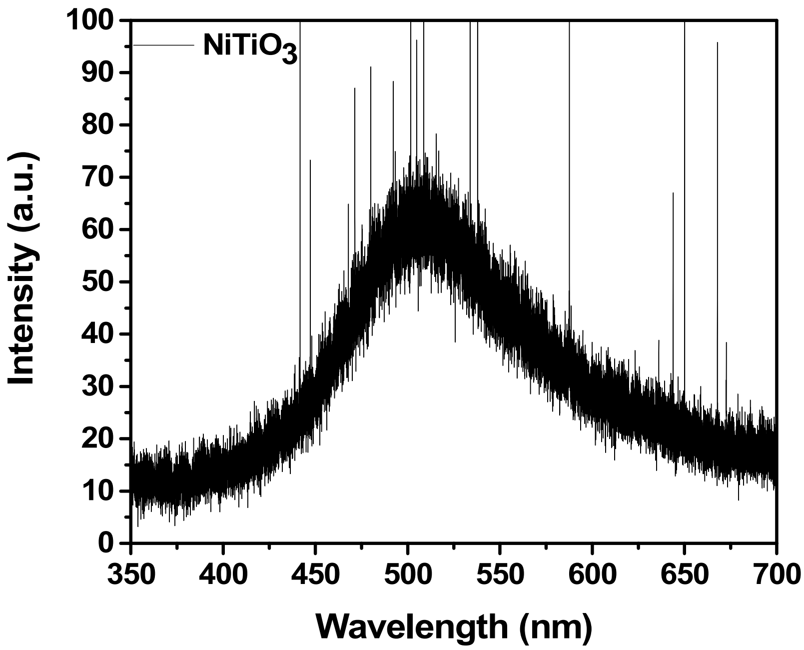

Figure S4. Photoluminescence spectrum of $NiTiO_3$ NFs showing a smaller number of photogenerated carriers.

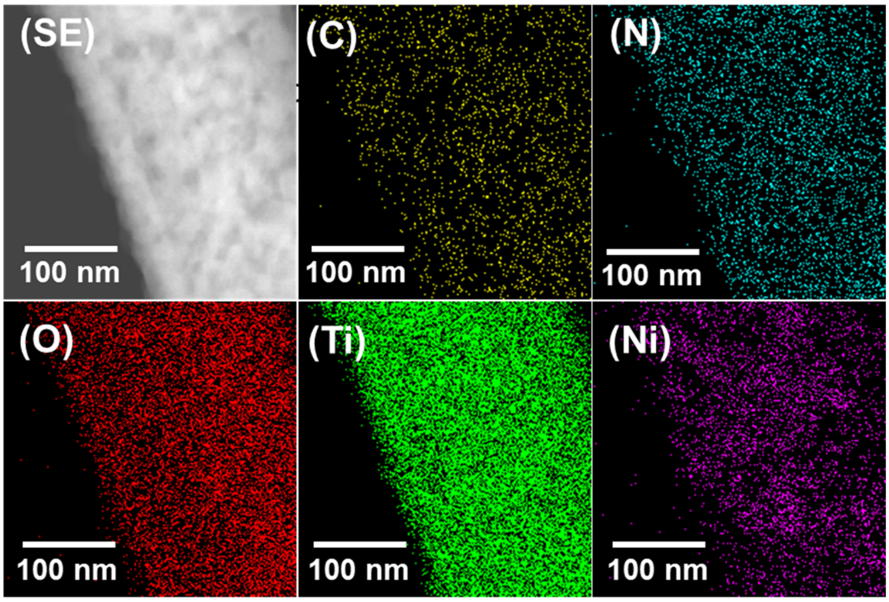

Figure S5. TEM mapping of gnT6040 hybrid structure showing deposition of AAs-gC_3N_4 over $NiTiO_3$ NFs.

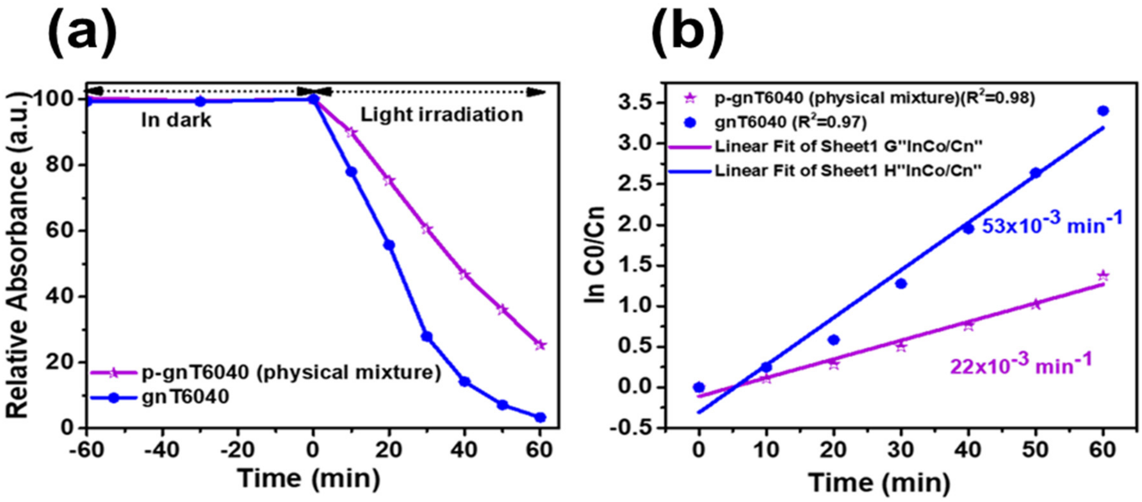

Figure S6. MB removal efficiency of the as-prepared gnT6040 and physically mixed p-gnT6040 sample under light irradiation (Halogen lamp 100 W, 380–800 nm). To prepare p-gnT6040 through physical mixing, 60 wt% $NiTiO_3$ NFs were homogeneously mixed with 40 wt% of AAs-gC_3N_4 to be used in MB removal test without any further treatment. This test verifies the role of heterostructure and superiority of gnT6040 over the physically mixed sample of p-gnT6040. Figure S6 shows (**a**) MB removal efficiency as a function of time and (**b**) reaction rate constants for the gnT6040 and p-gnT6040 photocatalysts

Table S1. Brunauer-Emmett-Teller (BET) specific surface area of the samples $NiTiO_3$ NFs, gC_3N_4, AAs-gC_3N_4, and gnT6040.

Samples	BET specific surface area (m^2 g^{-1})	Pore volume (cm^3 g^{-1})	Average pore size (nm)
$NiTiO_3$ NFs	11.0468	0.0357	11.3150
gC_3N_4	11.6816	0.0850	23.3068
AAs-gC_3N_4	126.8486	0.5977	20.3439
gnT6040	46.0890	0.2279	19.7086

Table S2. Comparison of the photodegradation performance of photocatalysts containing $NiTiO_3$ toward methylene blue (MB).

Ref.	Photocatalyst	Cophotocatalyst	Light source	Photodegradation
[1]	$NiTiO_3$	TiO_2	Hg lamp, 125 W	MB (73% in 6 h)
[2]	$NiTiO_3$	N-doped	Hg lamp, 240 W	MB (73% in 2.5 h)
[3]	$NiTiO_3$	Ag	Blue LED, 0.5 W	MB (95% in 10 h)
[4]	$NiTiO_3$	Pt	Xe lamp, 300 W	MB (95% in 2 h)
[5]	$NiTiO_3$	SiO_2	Xe lamp, 200 W	MB (90% in 2.5 h)
[6]	$NiTiO_3$	Co-gC_3N_4	GB22100(B) ED-D Eltime, 100 W	MB (k_{app} = 7.15 × 10^{-3} min^{-1} in 180 min)
[7]	$NiTiO_3$ NFs	AAs-gC_3N_4	Halogen, 100 W	MB (97%) and k_{app} = 58 × 10^{-3} min^{-1}

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7. This work