Supplementary Material (ESI) for New Journal of Chemistry

Supplementary Information

Preparation of Graphene-TiO_2 Composites with Enhanced Photocatalytic Activity

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Figure S1. (a) XRD pattern of graphite oxide (GO), (b) AFM image of graphene oxide. Graphene oxide was obtained by sonicating a sufficiently dilute colloidal suspension of GO for a desired time. The uniform thickness of about 1.1 nm, which is the typical thickness of a hydrated individual graphene oxide layer, can be observed from the AFM image.

Figure S2. Photocurrents of TiO_2 and G-TiO_2 composites under intermittent irradiation of a 150 W high-pressure Xenon lamp at a bias potential of 0.2 V.

Figure S3. XRD pattern of the reduced exfoliated GO obtained by solvothermal reduction (180 °C) for 4 h.

Figure S4. Photographic images of the dispersions of G-TiO_2 composites with reaction time of 4 h (left) and 8 h (right). The left sample exhibits the separation of TiO_2 (white layer) and graphene (black layer) while the right sample is a gray dispersion with homogeneous appearance.

Figure S5. C1s XPS spectra of G-TiO_2 composites with reaction time of (a) 4 h and (b) 8 h.

Figure S6. UV-vis absorption spectra showing the degradation of methylene blue (MB) by using different photocatalysts, (a) pure TiO_2, (b) P25, (c) G-TiO_2 composites with reaction time of 4 h and (d) G-TiO_2 composites with reaction time of 8 h.

Figure S7. (a) TEM image and (b) FTIR spectrum of used G-TiO_2 composites.

Figure S1.

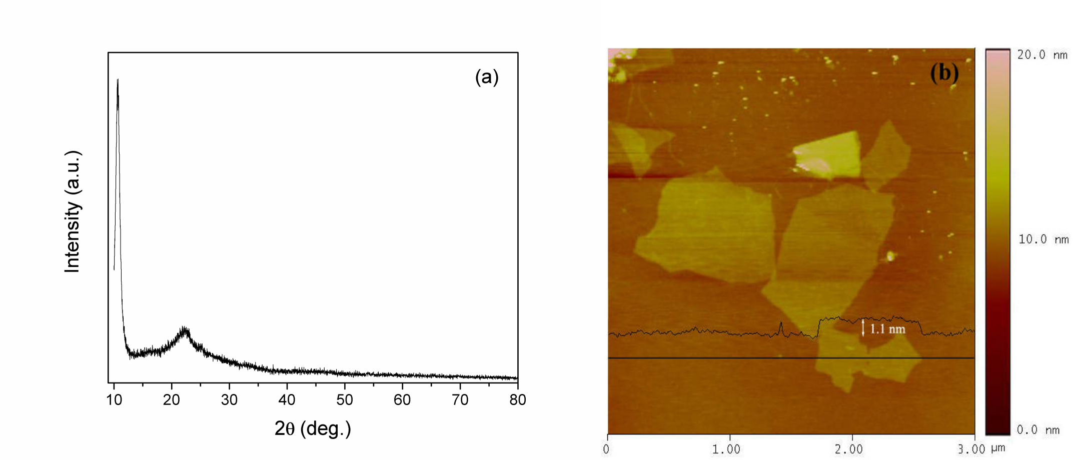

(a)
Intensity (a.u.)
10
20
30
40
50
60
70
80
2θ (deg.)
(b)
1.1 nm
20.0 nm
10.0 nm
0.0 nm
0
1.00
2.00
3.00 µm

Figure S2.

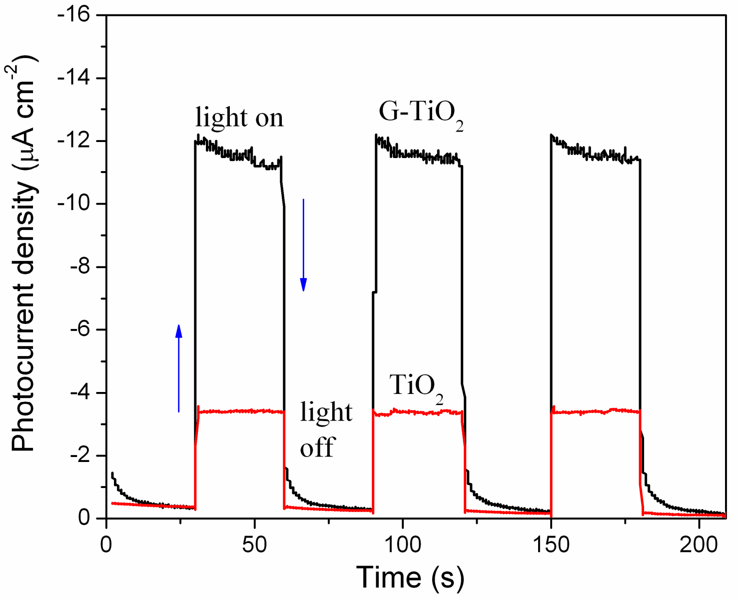

Photocurrent density (μA cm^{-2})
-16
-14
-12
-10
-8
-6
-4
-2
0
Time (s)
0
50
100
150
200
light on
light off
G-TiO$_2$
TiO$_2$

Figure S3.

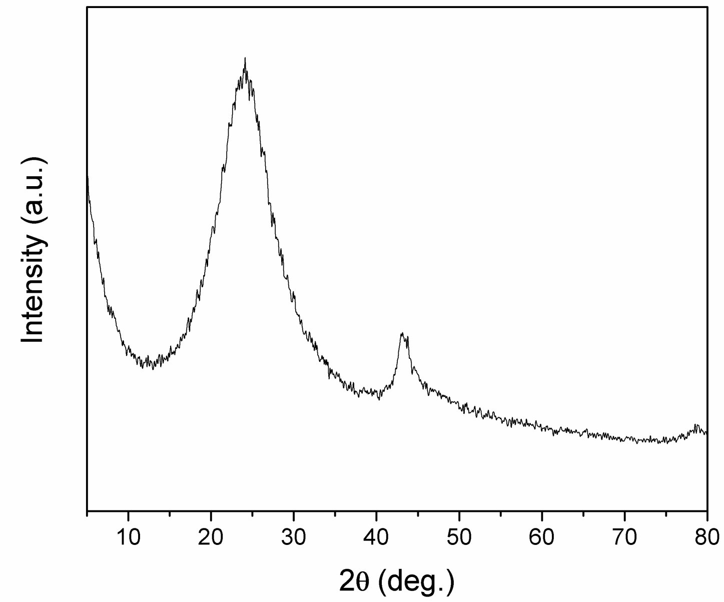


Figure S4.

Figure S5.

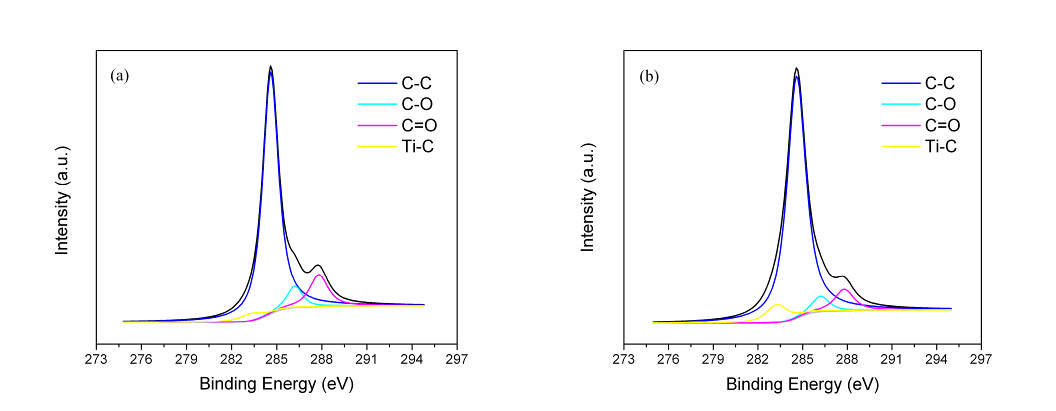

(a)
C-C
C-O
C=O
Ti-C
Intensity (a.u.)
273
276
279
282
285
288
291
294
297
Binding Energy (eV)
(b)
C-C
C-O
C=O
Ti-C
Intensity (a.u.)
273
276
279
282
285
288
291
294
297
Binding Energy (eV)

Figure S6.

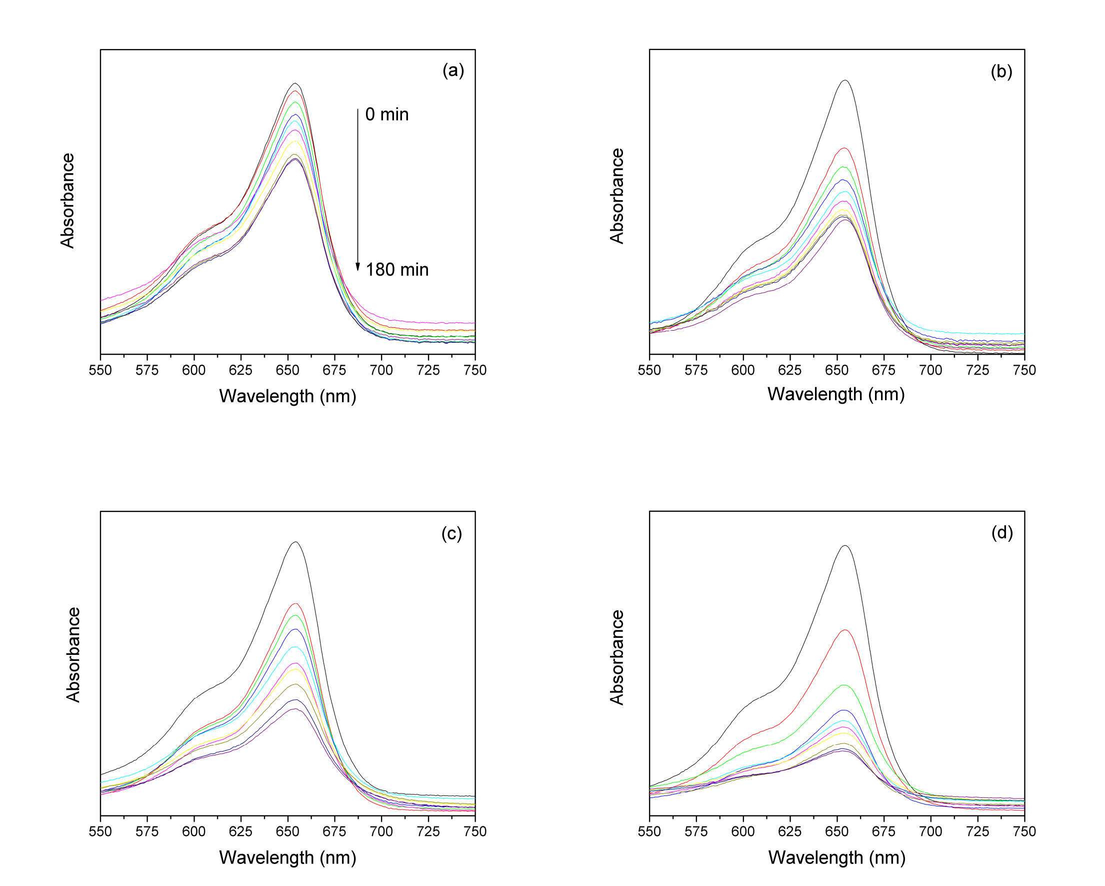
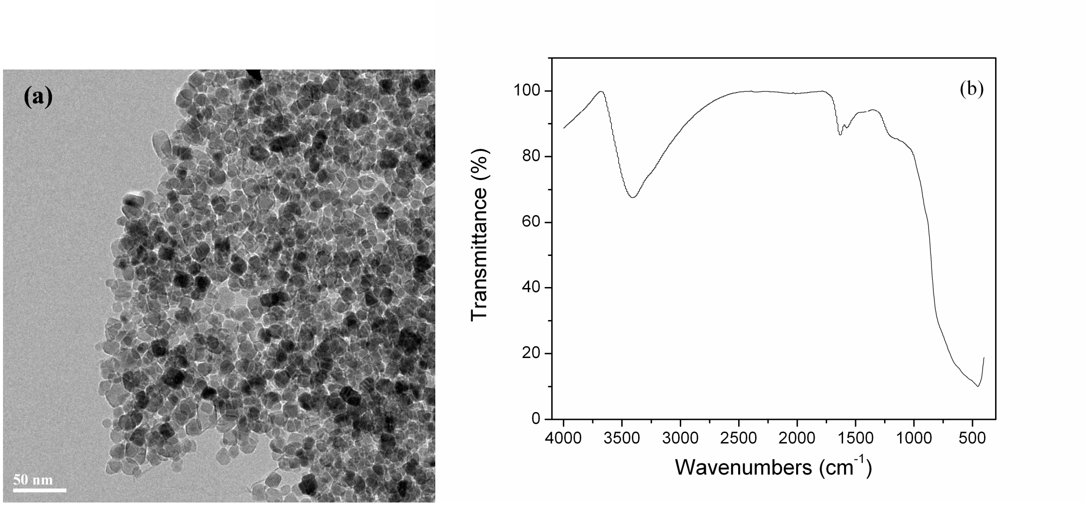

(a)
0 min
180 min
Absorbance
Wavelength (nm)
550
575
600
625
650
675
700
725
750
(b)
(c)
(d)

Figure S7.


(a)
50 nm
(b)
Transmittance (%)
0
20
40
60
80
100
4000
3500
3000
2500
2000
1500
1000
500
Wavenumbers (cm^{-1})