Supporting Information

Green Synthesis of Biphasic TiO$_2$-Reduced Graphene Oxide Nanocomposites with Highly Enhanced Photocatalytic Activity

Md. Selim Arif Sher Shah,† A Reum Park,† Kan Zhang,‡ Jong Hyeok Park, †,‡ and Pil J. Yoo†,‡,*

†School of Chemical Engineering and ‡SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, Suwon 440-746, Republic of Korea

Email Address: pjyoo@skku.edu

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Crystallite size calculation: From Raman spectra crystallite size, $L_a$, of graphitic sp$^2$ lattice can be calculated applying the following equation$^1$

$$L_a = 2.4 \times 10^{-10} \times \lambda^4 \times \frac{I_G}{I_D}$$

where, $\lambda$ is the wavelength of the excitation laser in nm, here 514.5 nm. Following the above equation the values of $L_a$ for GO, RGO, TiO$_2$-2wt% RGO and TiO$_2$-2wt% RGO after use were determined to be 17.0, 15.6, 15.3 and 14.6, respectively.

Figure S1. Core-level C 1s XPS spectra of (A) GO, (B) RGO and (C) TiO$_2$-2wt% RGO after use.
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Figure S2. (A) Optical images of the reaction mixture at different time intervals during the dye degradation experiment. (B) Corresponding UV-visible absorbance spectra.

Figure S2A shows the optical images of the reaction mixtures and S2B is their UV-visible spectra at different time intervals during the dye degradation experiment with the catalyst TiO$_2$-2 wt% RGO. It shows that after 80 min reaction the spectrum virtually becomes flat. Further process shows that the spectra after 100 min reaction time to be flat and therefore not shown in the main text. It is notable in this figure that the peak position ($\lambda_{\text{max}}$, 553.5 nm) does not change during the dye degradation process.
Figure S3. Photodegradation of benzoic acid by the catalyst of TiO$_2$-5 wt% RGO under visible light with varying irradiation time.