Supplementary Information

Polyaniline-Reduced Graphene Oxide Composite-Enhanced Visible-Light Driven Photocatalytic Activity for the Degradation of Organic dyes

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Figure S1: Dark adsorption and photodegradation of PANI, RGO, and PANI/RGO (PG2) composite
Figure S2: Plots of the concentration ratio of (a) MG, (b) RhB, and (c) CR dyes in an aqueous solution against specific time intervals under various conditions.
**Figure S3:** First-order kinetic plot of $\ln(C_0/C_t)$ versus time of (a) MG, (b) RhB, (c) CR dye discoloration in presence of PG1 and PG3 composite photocatalysts under visible-light irradiation.
Figure S4: UV–Vis absorption spectral changes of an aqueous solution of (a) PG1 and (b) PG3 for MG, (c) PG1 and (d) PG3 for RhB, (e) PG1 and (f) PG3 for CR dye under visible-light irradiation.
Figure S5: Time-resolved fluorescence decay spectra of the PANI, RGO and PG2 composite

Figure S6: EPR spectra of PANI/RGO composites
Figure S7: Transient photocurrent density vs time of PANI, RGO, and PANI/RGO (PG2) composite

Figure S8: HRTEM images of (A) PANI, (B) RGO and (C) PANI/RGO (PG2) composite

Table T1. The fluorescence lifetimes of photo excited charge carries in PANI, RGO and PANI/RGO (PG2) composite detected at 440 nm PL maxima upon excitation at 330 nm wavelengths.

| Samples            | $\tau_1$ (ns) | $\tau_2$ (ns) | $\tau_{\text{avg}}$ (ns) |
|--------------------|---------------|---------------|--------------------------|
| PANI               | 0.54          | 3.93          | 2.51                     |
| RGO                | 0.46          | 2.18          | 1.38                     |
| PANI/RGO (PG2)     | 0.28          | 2.13          | 1.22                     |