Supporting Information

Ultra-thin coating of g-C$_3$N$_4$ on an aligned ZnO nanorod film for rapid charge separation and improved photodegradation performance

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Figure captions:

**Figure S1.** Field-emission scanning electron microscope (FE-SEM) surface images of (a) 1D ZnO/gC$_3$N$_4$-1, (b) ZnO/gC$_3$N$_4$-2 and (c) ZnO/gC$_3$N$_4$-3.

**Figure S2.** XRD patterns of 1D ZnO nanorods, pure g-C$_3$N$_4$ and the 1D ZnO/gC$_3$N$_4$ films as a function of melamine amount.

**Figure S3.** (a) A linear potential sweep voltammetry plot and the (b) photocurrent density of the ZnO nanorod film and the 1D ZnO/gC$_3$N$_4$ films as a function of melamine amount under visible-light irradiation. EIS Nyquist plots of the ZnO nanorod film and the 1D ZnO/gC$_3$N$_4$ films as a function of melamine amount (c) in the dark and (d) under visible-light irradiation.

**Figure S4.** (a) Ultraviolet–visible (UV-Vis) absorbance spectra and (b) a plot of the Kubelka–Munk function of the ZnO nanorod film and the 1D ZnO/gC$_3$N$_4$ films as a function of melamine amount.
**Figure S5.** The temporal absorption spectral changes of MB dye during its photodegradation in the presence of (a) the ZnO nanorods films, (b) g-C3N4 films and (c) the 1D ZnO/gC$_3$N$_4$ films.

**Figure S6.** The weight of the 1D ZnO/gC$_3$N$_4$ films (a) before first photocatalytic reaction, (b) after first photocatalytic reaction and (c) after second photocatalytic reaction.
Figure S1. (a)-(c)
Figure S2.
Figure S3. (a)-(d)
Figure S4. (a),(b)
Figure S6. (a)-(c)