Supporting Information

Preparation of graphite-like carbon nitride nanoflake film with strong fluorescent and electrochemiluminescent activities

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1. Fluorescence Quantum Yield (FLQY) Measurements

The quantum yield of the graphite-like carbon nitride nanoflake particles (g-C_3N_4 NFPs) was measured by following equation:

$$Q = Q_R \bullet \frac{I}{I_R} \bullet \frac{OD_R}{OD} \bullet \frac{n^2}{n_R^2}$$

where Q is the quantum yield, *I* is the measured integrated emission intensity, n is the refractive index, and OD is the optical density, which is measured on a UV-Vis spectrophotometer. The subscript R refers to the reference fluorophore of known quantum yield, i.e. quinine sulfate (QS) used in present work. The quinine sulfate (literature Φ=0.54) was dissolved in 0.1 M H_2SO_4 (n=1.33) and the g-C_3N_4 NFPs was dissolved in distilled water (n=1.33). By the above equation, the FLQY of the g-C_3N_4 NFPs was measured to be 3.0 %.

2. FL responses of g-C_3N_4 NFFs in the presence of various metal ions

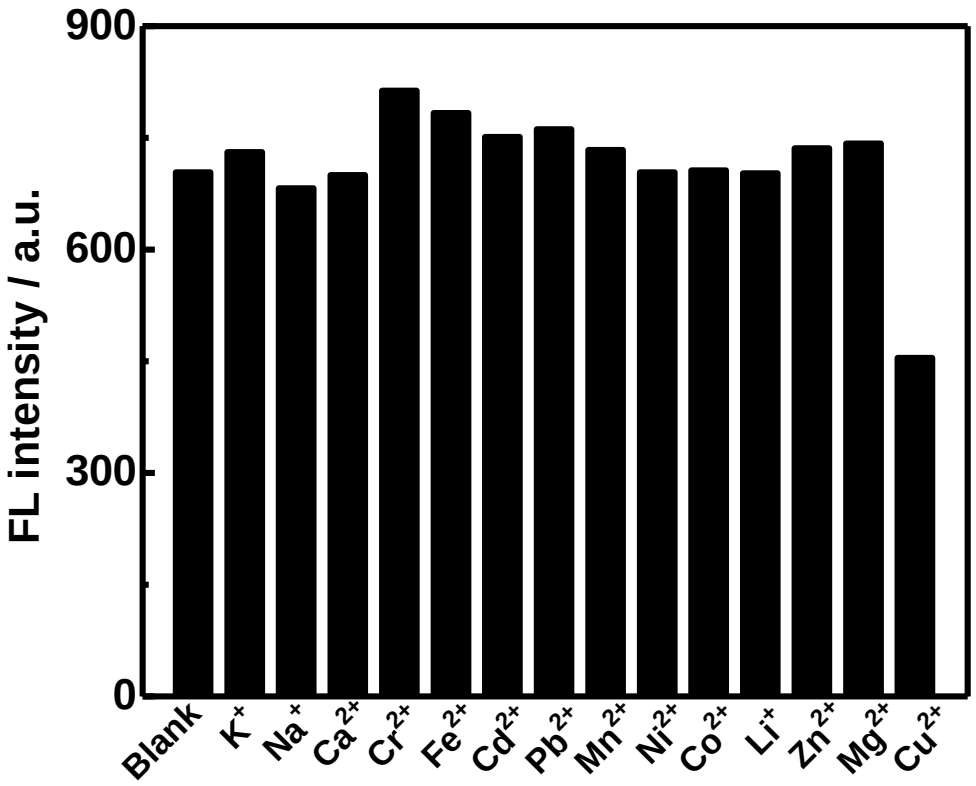

Fig.S1. FL responses of g-C_3N_4 NFFs in the presence of various metal ions with concentration of 100 μM

3. Effect of ion strength on the FL of g-C_3N_4 NFFs

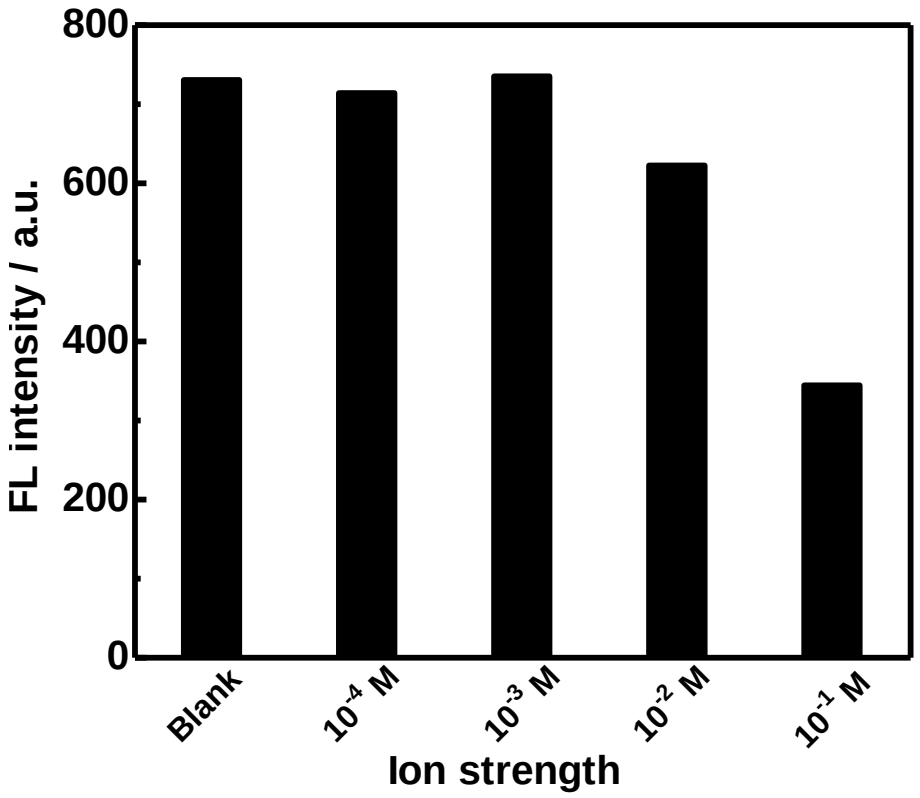

Fig.S2. FL responses of g-C_3N_4 NFFs in various solutions containing different concentrations of KNO_3.

4. Effect of pH on the FL of g-C_3N_4 NFFs

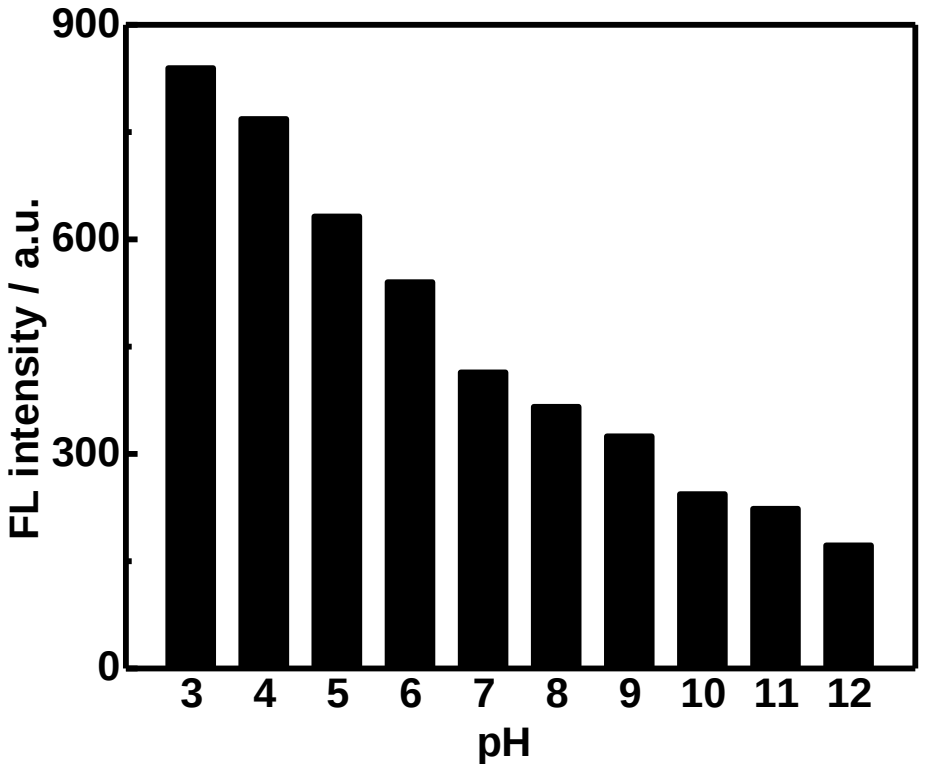

Fig.S3. FL responses of g-C_3N_4 NFFs in various pH solution (0.1 M phosphate).

5. Comparison of ECL activity of g-C_3N_4 NFFs with that of carbon quantum dots (CQDs) in the presence of $S_2O_8^{2-}$

For further demonstrating how strong the ECL of g-C_3N_4 NFFs was, the ECL response of g-C_3N_4 NFFs was compared with that of previously reported carbon quantum dots (CQDs) in the presence of same concentration (1 mM) of $S_2O_8^{2-}$. As shown in Fig. S4, the ECL intensity of g-C_3N_4 NFFs–$S_2O_8^{2-}$ system can be 65 times as large as that of CQDs–$S_2O_8^{2-}$ system, indicating that the ECL activity of g-C_3N_4 NFFs is much higher than that of CQDs.

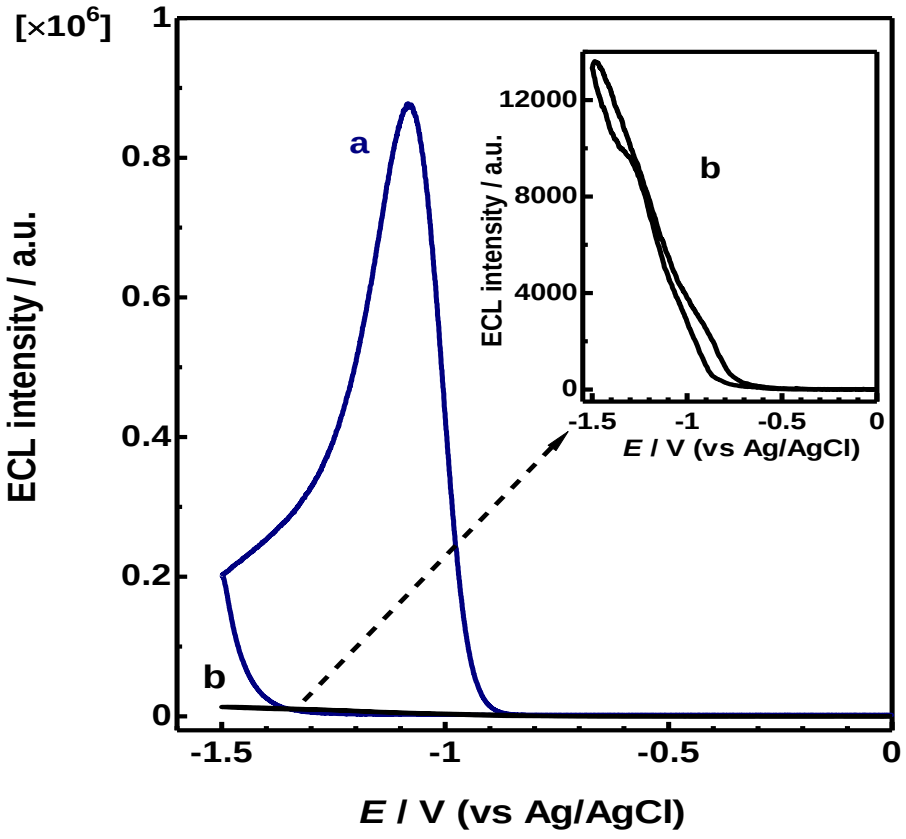

Fig. S4. Comparison of ECL responses of g-C_3N_4 NFFs–$S_2O_8^{2-}$ with that of carbon quantum dots (CQDs) –$S_2O_8^{2-}$ at GC electrod in 0.1 M PBS (pH 7.0) The concentrations of $S_2O_8^{2-}$ were all 1 mM. The potential scan rates were all 100 mV s^{-1}.