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-C₃N₄ NFPs) was measured by following equation:

\[ Q = \frac{Q_R \cdot \frac{I}{I_R} \cdot \frac{OD}{OD_R} \cdot \frac{n^2}{n_R^2}} \]

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 \( \Phi=0.54 \)) was dissolved in 0.1 M H₂SO₄ (\( n=1.33 \)) and the g-C₃N₄ NFPs was dissolved in distilled water (\( n=1.33 \)). By the above equation, the FLQY of the g-C₃N₄ NFPs was measured to be 3.0 %.
2. FL responses of g-C₃N₄ NFFs in the presence of various metal ions

![FL intensity graph]

Fig.S1. FL responses of g-C₃N₄ NFFs in the presence of various metal ions with concentration of 100 µM
3. Effect of ion strength on the FL of g-C₃N₄ NFFs

Fig.S2. FL responses of g-C₃N₄ NFFs in various solutions containing different concentrations of KNO₃.
4. Effect of pH on the FL of g-C$_3$N$_4$ NFFs

![FL intensity vs pH graph](image)

Fig.S3. FL responses of g-C$_3$N$_4$ NFFs in various pH solution (0.1 M phosphate).
5. Comparison of ECL activity of g-C\textsubscript{3}N\textsubscript{4} NFFs with that of carbon quantum dots (CQDs) in the presence of S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-}

For further demonstrating how strong the ECL of g-C\textsubscript{3}N\textsubscript{4} NFFs was, the ECL response of g-C\textsubscript{3}N\textsubscript{4} NFFs was compared with that of previously reported carbon quantum dots (CQDs) in the presence of same concentration (1 mM) of S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-}. As shown in Fig. S4, the ECL intensity of g-C\textsubscript{3}N\textsubscript{4} NFFs–S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-} system can be 65 times as large as that of CQDs–S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-} system, indicating that the ECL activity of g-C\textsubscript{3}N\textsubscript{4} NFFs is much higher than that of CQDs.

![Fig. S4. Comparison of ECL responses of g-C\textsubscript{3}N\textsubscript{4} NFFs–S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-} with that of carbon quantum dots (CQDs)–S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-} at GC electrode in 0.1 M PBS (pH 7.0) The concentrations of S\textsubscript{2}O\textsubscript{8}\textsuperscript{2-} were all 1 mM. The potential scan rates were all 100 mV s\textsuperscript{-1}.](image-url)