

## Graphene quantum dots as a fluorescence-quenching probe for quantitative analysis of Ponceau 4R solution

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Fluorescence decay curve of GQDs, effects of pH, reaction time and temperature on the  $F_0/(F_0-F)$  of this sensor system, fluorescent emission spectra of diluted GQDs in the presence of different concentrations of Ponceau 4R, the synchronous and asynchronous 2D correlation fluorescence spectra of GQDs, effects of the potentially interfering substances on the  $F_0/(F_0-F)$  of this sensor system were shown in Fig. S1-S5.

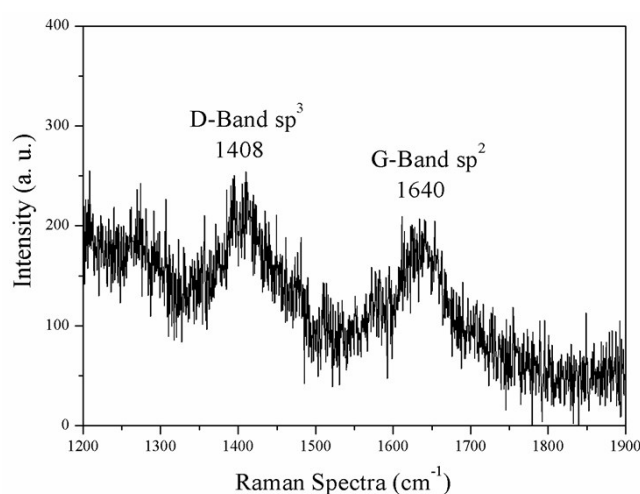


Fig. S1 Raman Spectrum of the as-synthesized GQDs.

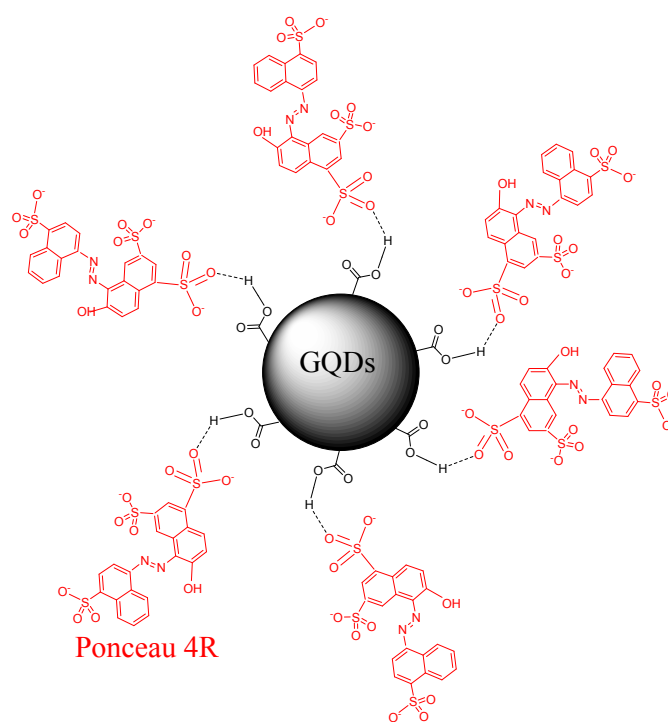


Fig. S2 Schematic illustration of the interaction of GQDs with Ponceau 4R.

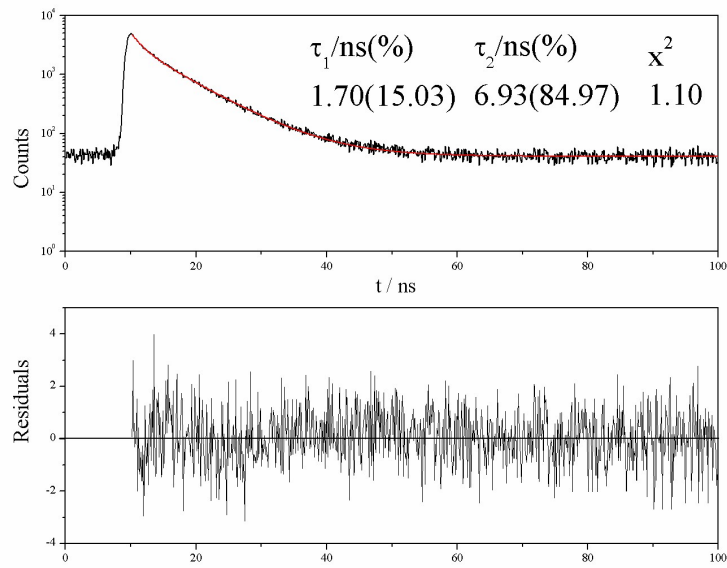


Fig. S3 Fluorescence decay curve of GQDs.

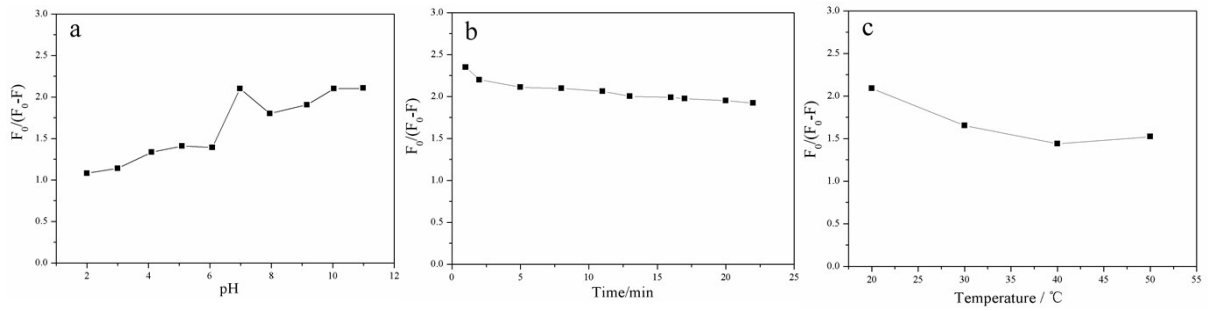


Fig. S4 Effects of pH, reaction time and temperature on the  $F_0/(F_0-F)$  of this sensor system.

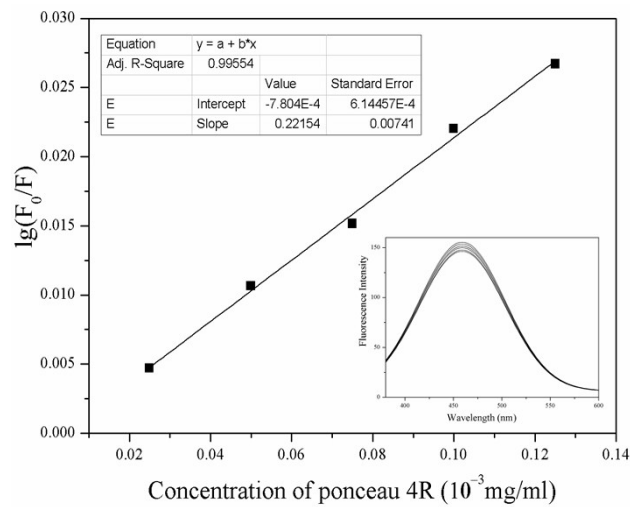


Fig. S5 Ponceau 4R concentration-dependent fluorescence emission of GQDs and the variation of  $\lg(F_0/F)$  as a function of Ponceau 4R (The concentration of GQDs is 0.08 mg/mL, and  $\lambda_{\text{ex}}=367$  nm)

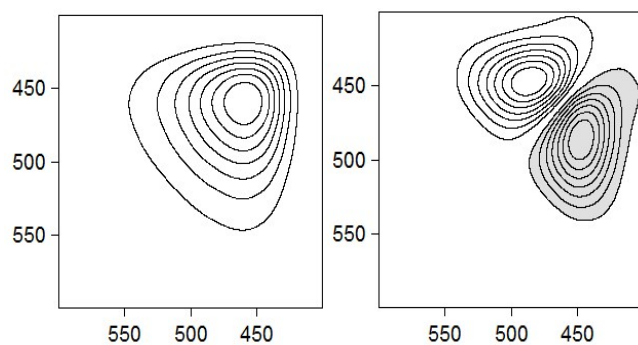


Fig. S6 The synchronous (left) and asynchronous (right) 2D correlation fluorescence spectra of GQDs in presence of different concentration of Ponceau 4R, which constructed from fluorescence spectra in Fig. 2.

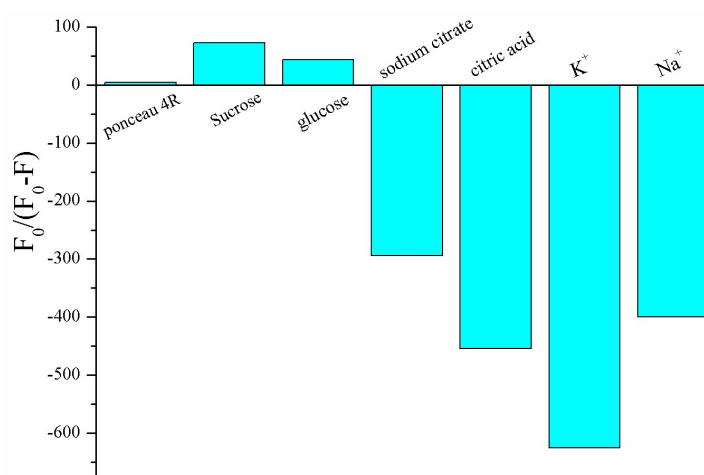


Fig. S7 Effects of the potentially interfering substances on the  $F_0/(F_0-F)$  of this sensor system under the optimum conditions. (The concentration of GQDs was 1.67 mg/mL, and  $\lambda_{ex}=367$  nm).