**Supporting Information**

**Carbon quantum dots from pomelo peel as fluorescence probes for “turn-off–on” high-sensitivity detection of Fe3+ and L-cysteine**

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**Fig. S1** (A) Fluorescence intensity of CQDs from navel orange peel, (B) Fluorescence intensity of CQDs from orange peel, (C) Fluorescence intensity of CQDs from pomelo peel, (D) Fluorescence intensity of CQDs from different carbon sources.



**Fig. S2** (A) Effect of different solvents on fluorescence intensity of CQDs, (B) Effect of different concentration on fluorescence intensity of CQDs.



**Fig. S3** (A) UV absorption spectrum and fluorescence spectra of the optimal excitation and emission of the CQDs. Insert: Photograph of CQDs under the excitation of natural light and UV lamp with 365 nm. (B) Fluorescence emission spectra of the CQDs with a series of excitation wavelengths.

**Fig. S4** (A) The continuous fluorescence intensity measurements of CQDs aqueous solutions in 30 days. (B) Fluorescence stability of CQDs in aqueous solution with different irradiation time by UV light. (C) Fluorescence intensity of CQDs aqueous solutions at different pH values. (D) Fluorescence stability of CQDs after the addition of different concentrations of NaCl.

Table S1 Parameters of fluorescence quantum yield of CQDs.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Fluorescence integral area | Absorbance | QY |
| Quinine Sulfate | 118747547.5 | 0.1 | 56% |
| CQDs | 23127302.5 | 0.063 | 17.31% |

Table S2 Recoveries of Fe3+ and L-Cys from spiked water and amino acid beverage samples.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | Targets | Added (μM) | Detection(μM) | Recovery (%) | RSD (%) |
| Water | Fe3+  | 10 | 8.35 | 83.47 | 2.156 |
|  |  | 30 | 31.95 | 106.53 | 3.193 |
|  |  | 60 | 58.12 | 96.87 | 0.685 |
| Amino acid beverage | L-Cys | 10 | 12.27 | 122.74 | 3.981 |
|  |  | 30 | 27.07 | 90.22 | 0.358 |
|  |  | 60 | 52.25 | 87.08 | 1.106 |

Table S3 The repeatability of the CQDs-Fe3+ system for L-Cys detection.

|  |  |  |
| --- | --- | --- |
| n | Fluorescence intensity | RSD (%) |
| 1 | 2038 | 0.23 |
| 2 | 2041 |
| 3 | 2048 |
| 4 | 2035 |
| 5 | 2042 |
| 6 | 2045 |