Supporting Information

Ultra-selective Detection of Fe$^{2+}$ ion by Redox Mechanism Based on Fluorescent Polymerized Dopamine Derivatives

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Figure S1. (a) MALDI-TOF mass spectra of F-ODA (pH 7.4) and (b) the proposed chemical structures of the F-ODA.
**Figure S2.** The $^1$H NMR analysis (D$_2$O) of (a) pure dopamine and (b) F-ODA.
Figure S3. XPS spectra of polydopamine, (a) C1s, (b) N1s, and (c) O1s.
Figure S4. (a) Fluorescence spectra of F-ODA depending on the final concentration of NaOH and (b) maximum intensity of F-ODA upon the pH of reacting solution.
Figure S5. (a) A concise scheme for the experiment about effect of adding HCl. Normalized fluorescence spectra of (b) 5,6-dihydroxyindole-rich compound before and after centrifugation and (c) F-ODA supernatant and indole-5,6-quinone-rich compound.
Figure S6. Fluorescence spectra of F-ODA depending on the presence or absence of nitrogen purging to eliminate dissolved oxygen before adding HCl.
Figure S7. (a) The F-ODA decay curve measured at room temperature. (b) The plot of absorbance vs. area of fluorescence on anthracene (red dots) and F-ODA (black dots).
Figure S8. Redox potentials of half reactions triggered by adding Fe$^{2+}$ ion.
Figure S9. SEM-EDS results of (a) F-ODA (supernatant), (b) PDA (precipitate), and (c) F-ODA chelated with Fe$^{2+}$ ions.
\[ aA + bB + n[e^-] + h[H^+] = cC + dD \]

\[ E_h = E_0 + \frac{0.05916}{n} \log \left( \frac{(A)^a (B)^b}{(C)^c (D)^d} \right) - \frac{0.05916}{n} \rho H \]

Equation S1. Nernst Equation.