Electronic Supplementary Information

Ratiometric, Colorimetric and Fluorescent Chemosensor for “Turn-On” Detection of Cyanide (CN⁻)

Jing Wang and Chang-Sik Ha*

Department of Polymer Science and Engineering, Pusan National University, Busan 609-735, Korea
E-mail: csha@pusan.ac.kr

Scheme S1 Chemical structure of Compound 2.
1. Absorption and fluorescence spectrophotometry studies

![Fluorescence spectra](image)

**Figure S1.** Fluorescence spectra of 1 before and after the addition of different anions (100 equiv of 1) in a mixture of H$_2$O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0). The concentration of 1 was fixed at 2.0×10$^{-5}$ M.

![Absorption spectra](image)

**Figure S2.** (Left) UV-vis absorption of 1 after the addition of different amounts of CN$^-$ anions in a mixture of H$_2$O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0). The concentration of 1 was fixed at 2.0×10$^{-5}$ M; (right) the changes in the absorbance in UV-vis spectra of 1 at 325 nm and 480 nm after the addition of different amounts of CN$^-$. 
Figure S3. The plot with $I_0/(I - I_0)$ versus $[G]^{-1}$ based on 1:1 binding model. $I_0$ and $I$ are the fluorescence intensity of compound 1 at 590 nm in the absence and presence of CN$^-$ anions, respectively. $[G]$ is the concentration of CN$^-$ anions.

Figure S4. Fluorescence spectra of 1/Zn(II) ($3.0 \times 10^{-5}$ M/$3.0 \times 10^{-5}$ M) before and after the addition of different anions ($1.5 \times 10^{-4}$ M) in a mixture of H$_2$O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0).
**Fig. S5** Effect of pH on the changes in fluorescence intensity of 1/Zn(II) (3.0×10⁻⁵ M / 3.0×10⁻⁵ M) in a mixture of H₂O-MeOH (2/5, v/v, 10 mM HEPES buffer solution). I₀ and I are the fluorescence intensity of 1/Zn(II) at 600 nm in the absence and in the presence of 5.0 equiv of CN⁻ anions, respectively.

**Fig. S6** (Left) UV-vis spectra of 1/Zn(II) (1.5×10⁻⁵ M/4.5×10⁻⁵ M) in the presence of different amounts of H₂PO₄⁻ anions in a mixture of H₂O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0). (right) the changes in the UV-vis spectra of 1/Zn(II) (1.5×10⁻⁵ M / 4.5×10⁻⁵ M) at 325 nm, 384 nm and 499 nm after the addition of different amounts of H₂PO₄⁻ anions.
**Figure S7.** Fluorescence spectra of 1/Zn(II) (1.5×10⁻⁵ M/4.5×10⁻⁵ M) after the addition of different amounts of H₂PO₄⁻ anions in a mixture of H₂O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0).

**Figure S8.** The changes in the absorbance of 1/Zn(II)/CN⁻ (1.0×10⁻⁵ M/1.0×10⁻⁵ M/1.0×10⁻⁵ M) after the addition of different H₂PO₄⁻ anions in a mixture of H₂O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0).
Figure S9. The changes in fluorescence spectra of 1/Zn(II)/CN⁻ (1.0×10⁻⁵ M/1.0×10⁻⁵ M/1.0×10⁻⁵ M) after the addition of different amounts of H₂PO₄⁻ anions in a mixture of H₂O-MeOH (2/5, v/v, 10 mM HEPES buffer solution, pH 7.0).