Electronic Supplementary Material

A highly selective dual-channel chemosensor for mercury ions: utilization of the mechanism of intramolecular charge transfer blocking

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Fig. S1 Absorbance histogram data for a 1:20 mixture of ATS (2.0×10^{-5} M) and different metal ions as their perchlorate salts, in DMSO solution, acquired after 120 min.
**Fig. S2** Fluorescence emission data for a 1:20 mixture of **ATS** (2.0×10⁻⁵ M) and different metal ions as their perchlorate salts, in DMSO solution, acquired after 120 min. (excitation wavelength = 345 nm).
**Fig. S3** Time-dependent absorbance spectra of ATS ($2.0 \times 10^{-5}$ M) upon addition of Hg$^{2+}$ (20 equiv.) in DMSO. (a) Absorbance emission spectra: from top to bottom spectra were recorded after 120 min. (b) A plot of absorbance as estimated by the peak height at 403 nm and 345 nm.
**Fig. S4** IR spectra of compound **ATS** and after adding Hg$^{2+}$ in KBr disks.
**Fig. S5** Absorbance spectra of α-naphthylamine (2.0×10⁻⁵ M) and after addition Hg²⁺ in DMSO.
**Fig. S6** Fluorescence spectra upon excitation at 345 nm in DMSO of α-naphthylamine (2.0×10⁻⁵ M) and after addition of Hg²⁺.
Fig. S7 $^1$H-NMR spectrum of ATS in DMSO.
Fig. S8 $^{13}$C-NMR spectrum of ATS in DMSO.
Fig. S9 ESI-MS spectrum of ATS in DMSO.
Fig. S10 ESI-MS spectrum in the presence of Hg$^{2+}$ in DMSO.
Fig. S11 The $^1$H NMR spectrum of the 5-(4-Nitrophenyl)-2-furan formaldehyde.
Determination of the detection limit

We use the $3\delta$ way to figure out the detection limit. The process of the analysis as follows.

The photograph of the linear range

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\begin{align*}
\text{Linear Equation: } & Y=0.3429X-0.0292 \quad R=0.986 \\
S=3.429\times10^5 \quad \delta=\sqrt{\frac{\sum(F-\overline{F})^2}{(N-1)}}=0.060266 \ (N=16) \quad K=3 \\
\text{LOD}=K \times \delta/S=5.27\times10^{-7} \text{ M}
\end{align*}
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