Supplementary Information

A highly selective off-on fluorescent chemodosimeter for Hg$^{2+}$ based on a anthracene-bis(phosphinesulfide) conjugate

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Figure S1. $^{31}$P NMR spectrum of L\textsuperscript{1} (δ in ppm, CDCl\textsubscript{3}, 25 °C).

Figure S2. UV-Vis spectra of L\textsuperscript{1} (black line) (2.79×10\textsuperscript{-5} M) and of a solution of L\textsuperscript{1} (red line) in MeCN/H\textsubscript{2}O 4:1 (v/v), 25°C, upon addition of Hg\textsuperscript{2+} ion, recorded after 1 h ([Hg\textsuperscript{2+}]/[L\textsuperscript{1}] molar ratio of 0.5).
**Figure S3.** Time trace of the fluorescence intensity at 411 nm of the reaction of L₁ (2.79×10⁻⁵ M) and Hg²⁺ at the [Hg²⁺]/[L₁] molar ratio of a) 0.25; b) 0.5, c) 1. MeCN/H₂O 4:1 (v/v), 25 °C, λ<sub>ex</sub> = 376 nm.

**Figure S4.** Job’s plot data for the system Hg²⁺-L₁. The total concentration of L₁ and Hg²⁺ was 2.8×10⁻⁵ M. Spectra were measured at 25 °C after 1 h the preparation of solutions. λ<sub>ex</sub> = 376 nm.
Figure S5. $^{31}$P NMR spectra in CDCl$_3$ of (a) L$^1$ (1.35×10$^{-3}$ M), and (b) after the addition of Hg(ClO$_4$)$_2$ in CD$_3$CN ([Hg$^{2+}$]/[L$^1$] molar ratio of 0.5) recorded after 20 min from the mixing, (c) the solution from (b) recorded after 1 h from the mixing; $\delta$ in ppm, 25 °C).

Figure S6. $^1$H NMR spectrum of the solution obtained from the reaction of L$^1$ in CDCl$_3$ (1.35×10$^{-3}$ M) with Hg(ClO$_4$)$_2$ in CD$_3$CN ([Hg$^{2+}$]/[L$^1$] molar ratio of 0.5) after the separation of the solid complex [HgL$_2$]; $\delta$ in ppm, 25 °C).

Figure S7. Atmospheric Pressure Chemical Ionisation Mass (APCI) spectrum of L$^1$ (4.35×10$^{-7}$ M) in MeCN upon addition of Hg$^{2+}$ ion. [Hg$^{2+}$]/[L$^1$] molar ratio of 0.5. Spectrum recorded after 1h from the mixing.