Supporting Information

**BODIPY-derived multi-channel polymeric chemosensor with pH-tunable sensitivity: selective colorimetric and fluorimetric detection of Hg$^{2+}$ and HSO$_4^-$ in aqueous media**

Ujjal Haldar and Hyung-il Lee

---

**Fig. S1** $^1$H NMR spectrum of 1.
Fig. S2 $^1$H NMR spectrum of 2.
Fig. S3 $^1$H NMR spectrum of 3.

Fig. S4 GPC-RI traces of P1 and P2.
**Fig. S5** Determination of LOD for Hg$^{2+}$ by fluorometric titration plot.

**Fig. S6** (a) UV-vis and (b) emission spectra of P2 in the presence of various cations in DI-water at ambient temperature.
Fig. S7 (a) UV absorption and (b) fluorescence intensity of P2 (2.0 x10^{-4} M) in the presence of Hg^{2+} ions along with other cations. In each case, 100 equivalent excess of competitive metal ions over P2 was added to the probe solution.

Fig. S8 Determination of LOD for HSO_4^- by fluorometric titration plot.
**Fig. S9** (a) UV-vis and (b) emission spectra of P2 in the presence of various anions in DI-water at ambient temperature.

**Fig. S10** (a) UV absorption and (b) fluorescence intensity of P2 (2.0 x 10^-4 M) in the presence of HSO_4^- along with other anions. In each case, 100 equivalent excess of competitive anions was added to the probe solution.
**Fig. S11** FL emission spectra of P2 (2.0 x10⁻⁴ M) before and after treatment of eqimolar concentration of Hg²⁺ and HSO₄⁻ (20 µM each analytes). Both the analytes were added in the same time.
Fig. S12 Changes in emission intensity of P2 at various pH with [Hg$^{2+}$] fixed at 30 µM.

Fig. S13 Changes in emission intensity of P2 at various pH with [HSO$_4^-$] fixed at 30 µM.
**Fig. S14** Fluorescence decay profile of P2 in the presence of chemical stimuli and analytes at 298K.
Table S1. Comparative table for various BODIPY-based chemsensors for the detection of Hg$^{2+}$ ion.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Receptor</th>
<th>Metal ions</th>
<th>Switching type</th>
<th>Working media</th>
<th>Detection limit</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BODIPY</td>
<td>Hg$^{2+}$</td>
<td>Turn-on</td>
<td>(1:1 v/v; acetonitrile/water)</td>
<td>5 × 10$^{-7}$ M</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>BODIPY</td>
<td>Hg$^{2+}$</td>
<td>Turn-on</td>
<td>MeOH</td>
<td>2.8 µM</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>BODIPY</td>
<td>Hg$^{2+}$</td>
<td>Turn-on</td>
<td>7:3 v/v; acetonitrile/PBS</td>
<td>0.77 µM</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>BODIPY</td>
<td>Hg$^{2+}$, Au$^{3+}$</td>
<td>Turn-on</td>
<td>4:1 v/v; EtOH/phosphate buffer</td>
<td>160 nM (Hg$^{2+}$); 120 nM (Au$^{3+}$)</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>BODIPY</td>
<td>Hg$^{2+}$, Cd$^{2+}$</td>
<td>Turn-on</td>
<td>2:8 v/v DMSO-HEPES buffer)</td>
<td>1.88 x 105 M$^{-1}$ (Hg$^{2+}$); 3.77 x 104 M$^{-1}$ (Cd$^{2+}$)</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>BODIPY</td>
<td>Hg$^{2+}$, Cu$^{2+}$</td>
<td>Turn-on</td>
<td>acetonitrile</td>
<td>0.53 M (Hg$^{2+}$); 0.08 M (Cu$^{2+}$)</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>BODIPY</td>
<td>Hg$^{2+}$, Ag$^{+}$</td>
<td>Turn-on</td>
<td>85:15 v/v; THF-water</td>
<td>0.14 Mm (Hg$^{2+}$); 0.65 mM (Ag$^{+}$)</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>BODIPY</td>
<td>HSO$_4^-$</td>
<td>Turn-on</td>
<td>8:1 v/v; THF-water</td>
<td>6.45 × 10$^{-8}$ M</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>BODIPY</td>
<td>Hg$^{2+}$, HSO$_4^-$</td>
<td>Turn-on</td>
<td>water</td>
<td>1.10 µM (Hg$^{2+}$); 1.12 µM (HSO$_4^-$)</td>
<td>Present</td>
</tr>
</tbody>
</table>
References


