Support information for

Two AIEE-active α-cyanostilbene derivatives containing BF$_2$ unit for detecting explosive picric acid in aqueous medium

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Fig. S1. UV-Vis spectra (A) and fluorescence spectra (B) of the compound TPA-B in different solvents.

Fig. S2. Lippert-Mataga diagram of compounds TPA-B and TPA-BN.
Fig. S3 UV-Vis spectra of TPA-B (a) and TPA-BN (b) in THF/water mixtures with different water volume fractions.

Fig. S4. PL emission (a) spectra changes of TPA-B ($5.0 \times 10^{-5} \text{ M}$) in THF/\text{H}_2\text{O} mixtures with different water volume fractions; Plots of fluorescence intensity determined in THF-H_2O solutions versus water fractions (b). Insets: photos of TPA-B in THF-H_2O mixtures ($f_w = 0\%$, 30\% and 99\%) taken under 365 nm UV lamp.

Fig. S5 The particle size analysis of TPA-B (A) in THF-\text{H}_2\text{O} mixtures ($f_w = 30\%$) and TPA-BN (B) in THF-\text{H}_2\text{O} mixtures ($f_w = 80\%$).
Fig. S6 (a) FL emission spectra obtained for different analytes (100 pm); (b) quenching percentages of compound TPA-B (10 mM) with different analytes (100 ppm) in THF/water (v/v=2:8) mixtures before (black) and after (red) the addition of 100 ppm. a: p-MP, b: o-NP, c: TNT, d: m-DOB, e: p-NP, f: p-DOB, g: PhOH, h: p-NA, i: NT, j: NB; (c) FL spectra of TPA-B in THF/water (v/v = 7 : 3) containing different amounts of PA; (d) corresponding Stern-Volmer plot for PA detection. Inset: Stern-Volmer plot obtained at a lower concentration of PA.

Fig. S7 The linear relationship of TPA-B (a) and TPA-BN (b) between the fluorescence intensity and the PA concentration.
<table>
<thead>
<tr>
<th>Compounds</th>
<th>Detecting system</th>
<th>$K_{sv}/\text{M}^{-1}$</th>
<th>Limit of detection (LOD)</th>
<th>Ref.</th>
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<tbody>
<tr>
<td>Pure DCM solution</td>
<td></td>
<td>$0.5 \times 10^4$</td>
<td>$21.5 \times 10^{-6}$</td>
<td>[58]</td>
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<td>test paper (toluene solution)</td>
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<td>$2.1 \times 10^6$</td>
<td>$49.8 \times 10^{-9}$</td>
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<tr>
<td>In CH$_3$CN/H$_2$O solution</td>
<td></td>
<td>$9.2 \times 10^6$</td>
<td>$35.8 \times 10^{-8}$</td>
<td>[59]</td>
</tr>
<tr>
<td>Pure THF solution</td>
<td></td>
<td>$0.7 \times 10^4$</td>
<td>/</td>
<td>[57]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1.0 \times 10^4$</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>TPA-BN/TPA-B</td>
<td>THF/H$_2$O mixtures</td>
<td>$1.28 \times 10^4$ /  $1.07 \times 10^4$</td>
<td>$1.26 \times 10^{-6}$ /  $1.51 \times 10^{-6}$</td>
<td>This work</td>
</tr>
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</table>
Fig. S8. UV-vis absorption spectra of PA; Normalized Fluorescence of TPA-B and TPA-BN.