Supporting Information

Separately enhanced dual emissions of amphiphilic derivative of 2-(2’-hydroxylphenyl) benzothiazole by supramolecular complexation

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1. The $^1$H NMR and mass spectra of compounds.

Fig. S1 Partial $^1$H NMR spectrum (400 MHz, DMSO-$d_6$, 298 K) of compound A.

Fig. S2 Electrospray ionization mass spectrum of compound A. Assignment of the main peak: m/z 243.05 [A + H]$^+$. 
**Fig. S3** Partial $^1$H NMR spectrum (400 MHz, CDCl$_3$, 298 K) of compound B.

**Fig. S4** Electrospray ionization mass spectrum of compound B. Assignment of the main peak: m/z 357.14 [B + H]$^+$. 

S3
Fig. S5 ¹H NMR spectrum (400 MHz, DMSO-d$_6$, 298 K) of compound C.

Fig. S6 Electrospray ionization mass spectrum of compound C. Assignment of the main peak: m/z 491.10 [C + H]$^+$. 
Fig. S7 $^1$H NMR spectrum (400 MHz, DMSO-$d_6$, 298 K) of HBT-11.

Fig. S8 Electrospray ionization mass spectrum of HBT-11. Assignment of the main peak: m/z 488.23 [HBT-11 – Br$^{-}$]$^+$. 
2. The four-level photo-cycle process

The ESIPT process requires an intramolecular hydrogen bond between the proton donor (-OH, -NH\textsubscript{2}) and neighboring proton acceptor (-C=O, -N=) groups of the molecule. In the ground state, the enol-form is stable. Upon excitation, the redistribution of electronic charge results in fast proton transfer from the donor to acceptor via the intramolecular hydrogen bond, and the enol-form converted to keto-form (still excited state). The keto-form at excited state decay to ground state via irradiative (or non-irradiative) emission. Finally, the keto-form at ground state goes back to the enol-form via reversible proton transfer. The whole process involves four energy levels, and so called four-level photo-cycle process.

3. The photograph of powder

![Fig. S9 Photograph showing the color of HBT-11 powder under illumination of 365 nm light.](image)

4. The fluorescence spectra of different concentration for determination of CMC

![Fig. S10 Concentration-dependent fluorescence spectra of HBT-11 in aqueous solution. Curves represent 0.08 × 10\textsuperscript{-4}, 0.1 × 10\textsuperscript{-4}, 0.2 × 10\textsuperscript{-4}, 0.4 × 10\textsuperscript{-4}, 0.6 × 10\textsuperscript{-4}, 0.8 × 10\textsuperscript{-4}, 1.0 × 10\textsuperscript{-4}, 1.5 × 10\textsuperscript{-4}, 2.0 × 10\textsuperscript{-4}, 2.5 × 10\textsuperscript{-4}, 3.0 × 10\textsuperscript{-4}, 3.5 × 10\textsuperscript{-4}, 4.0 × 10\textsuperscript{-4}(mol/L).](image)
5. The Tyndall effect of compound C in cyclohexane

![Photo of Tyndall effect for cyclohexane solution of compound C](image)

**Fig. S11** The photograph of Tyndall effect for the cyclohexane solution of compound C.

6. The morphological change of HBT-11 upon addition of the two CDs

![TEM images of HBT-11 and HBT-11/CD complexes](image)

**Fig. S12** The TEM images of (a) HBT-11 (4.0 × 10⁻⁴ mol/L), (b) HBT-11/α-CD (1 eq.), (c) HBT-11/β-CD (1 eq.).

7. The quantum yield of HBT-11 in different systems

**Table S1** Quantum yield of HBT-11 in different concentrations in the absence and presence of CDs.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>System</th>
<th>Φ_f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 × 10⁻⁵ mol/L</td>
<td>HBT-11</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>+ α-CD</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>+ β-CD</td>
<td>3.4</td>
</tr>
<tr>
<td>4.0 × 10⁻⁴ mol/L</td>
<td>HBT-11</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>+ α-CD</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>+ β-CD</td>
<td>3.4</td>
</tr>
</tbody>
</table>

8. The time-resolved fluorescence of HBT-11 in different systems
Fig. S13 Time-resolved fluorescence decays of HBT-11 in the absent and presence of α-CD and β-CD in aqueous solution.