Electronic Supplementary Material (ESI) for Soft Matter.

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.

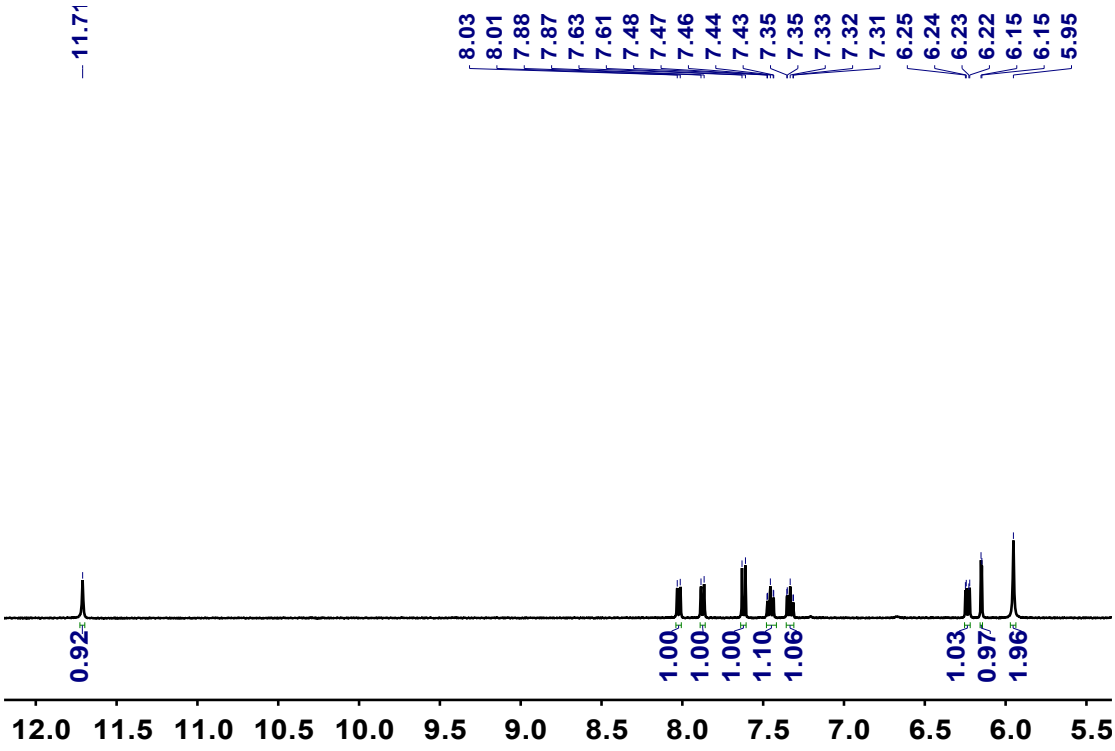

Fig. S1 Partial ^{1}H NMR spectrum (400 MHz, DMSO-d_6, 298 K) of compound **A**.

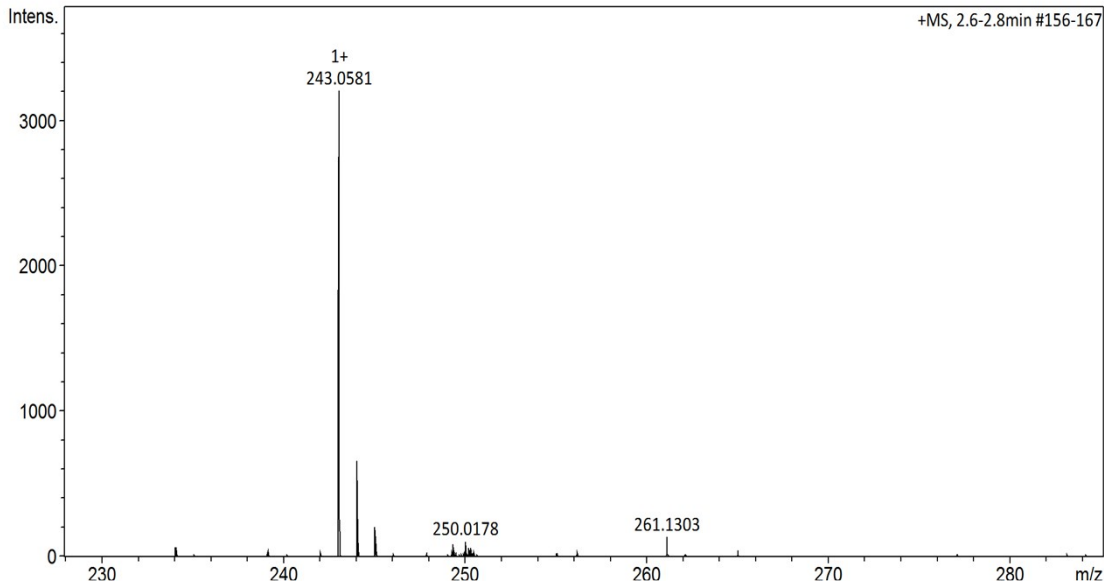

Fig. S2 Electrospray ionization mass spectrum of compound **A**. Assignment of the main peak: m/z 243.05 [**A** + H]$^{+}$.

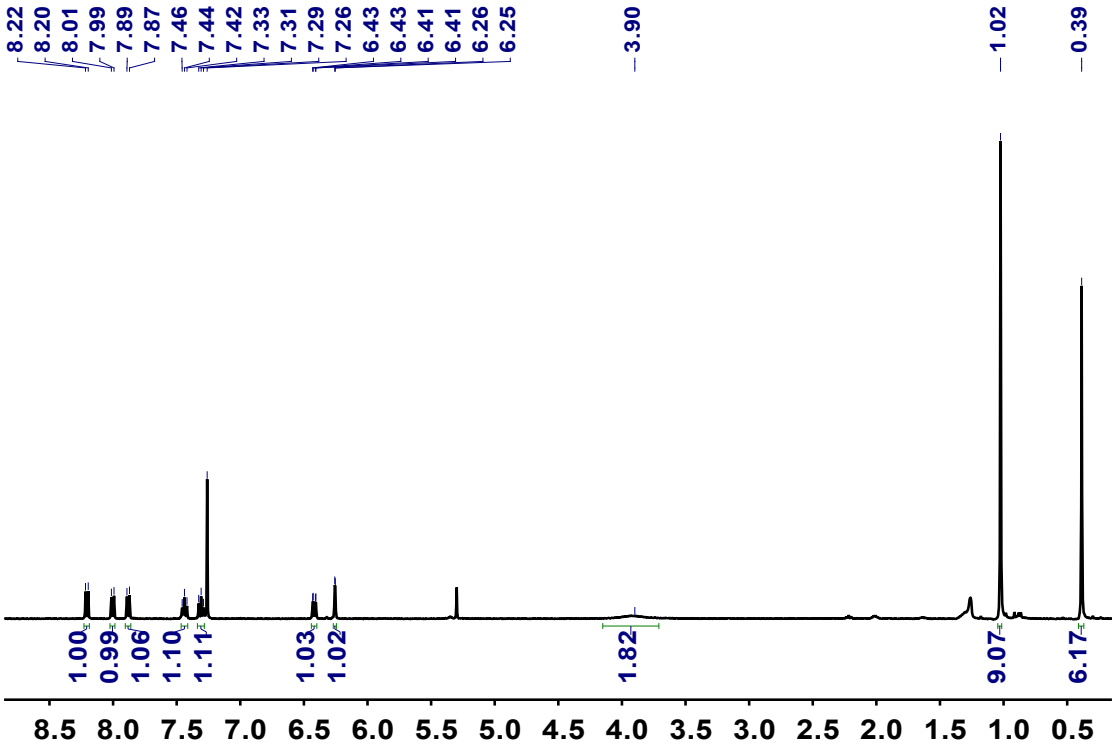

Fig. S3 Partial ^{1}H NMR spectrum (400 MHz, $CDCl_3$, 298 K) of compound **B**.

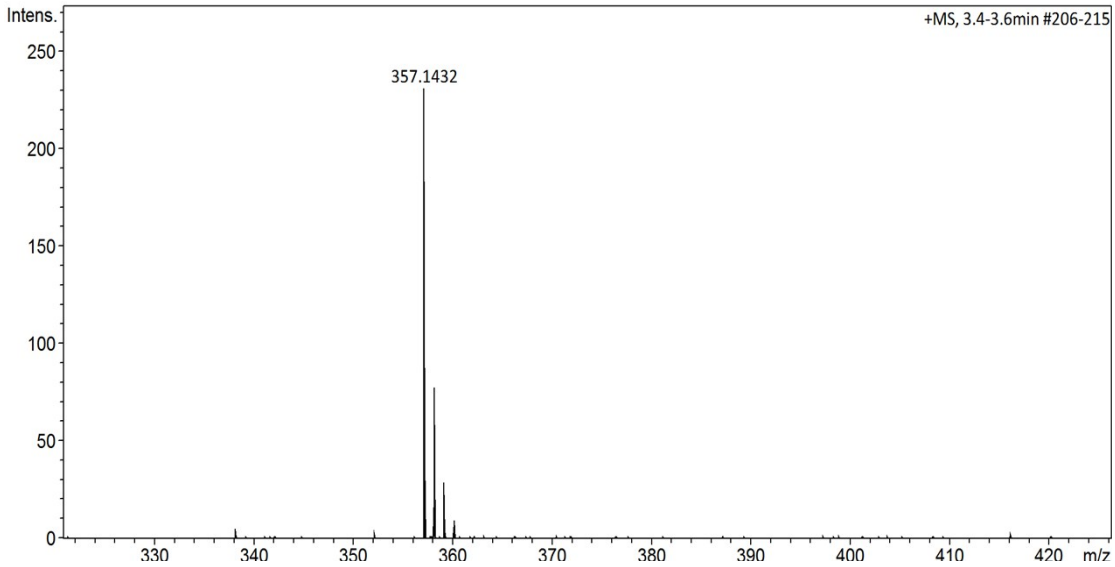

Fig. S4 Electrospray ionization mass spectrum of compound **B**. Assignment of the main peak: m/z 357.14 [**B** + H]$^{+}$.

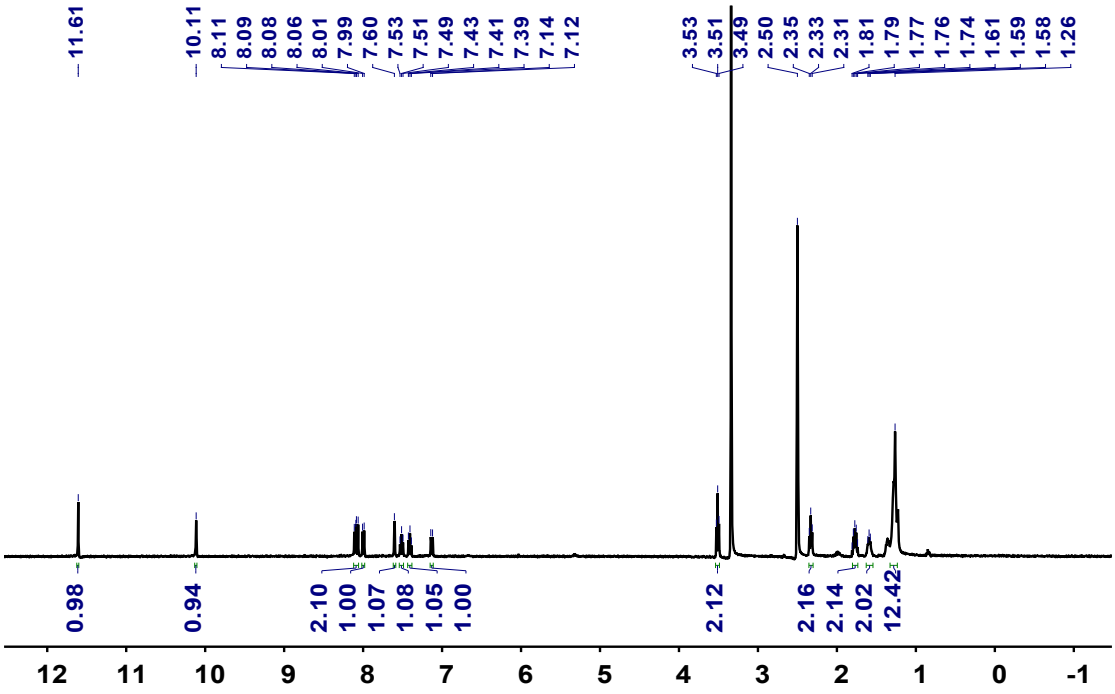

Fig. S5 ^{1}H NMR spectrum (400 MHz, DMSO-d_6, 298 K) of compound **C**.

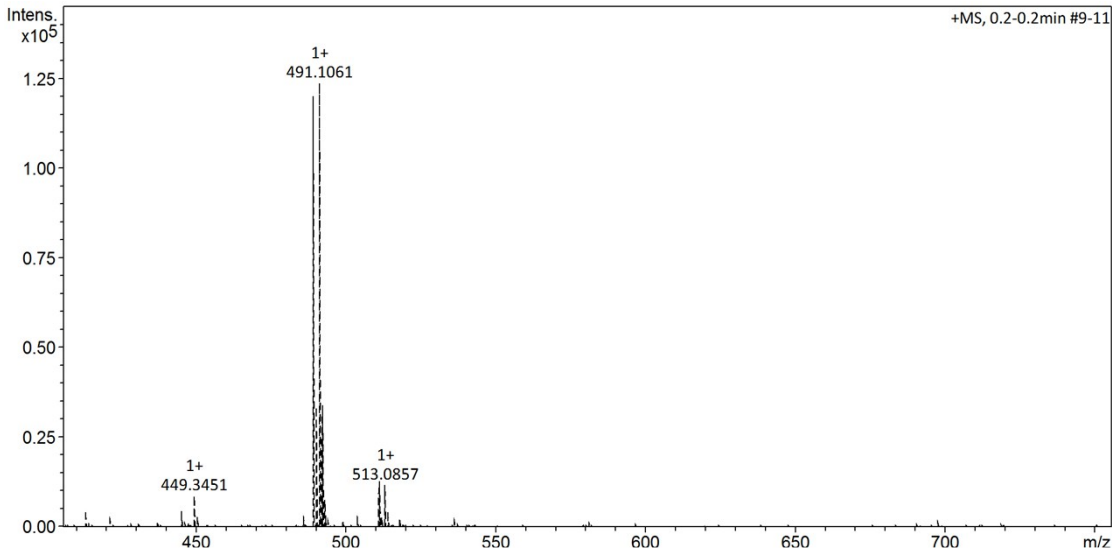

Fig. S6 Electrospray ionization mass spectrum of compound **C**. Assignment of the main peak: m/z 491.10 [**C** + H]$^{+}$.

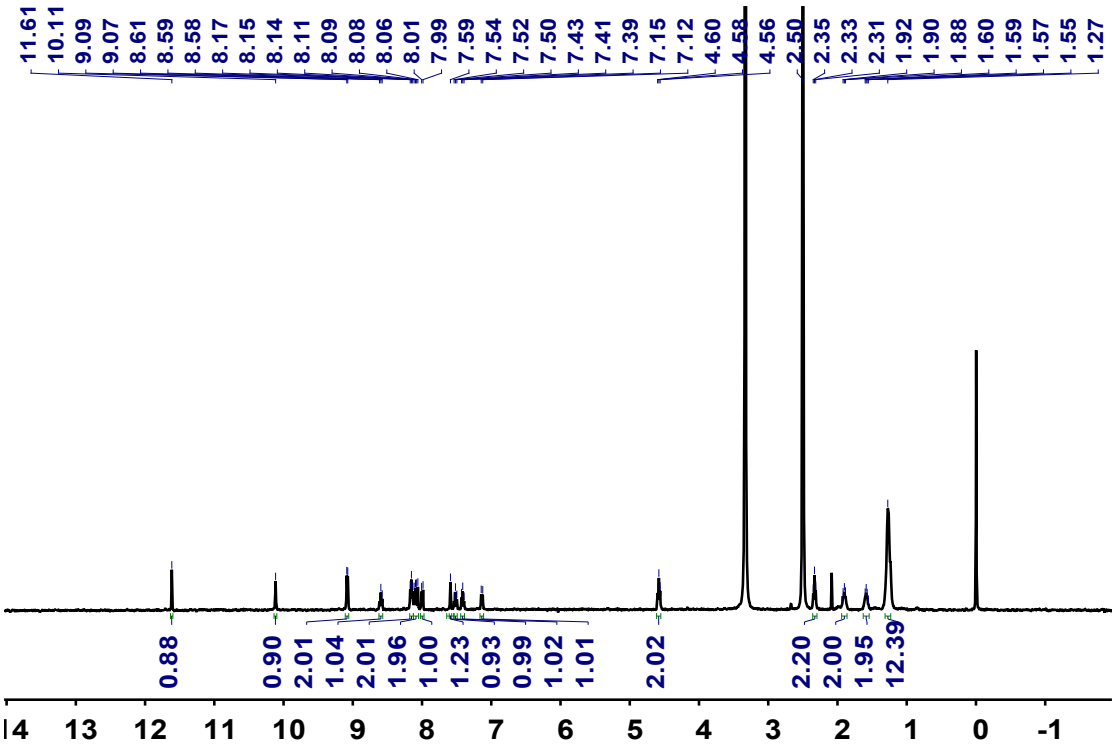

Fig. S7 ^{1}H NMR spectrum (400 MHz, DMSO-d_6, 298 K) of **HBT-11**.

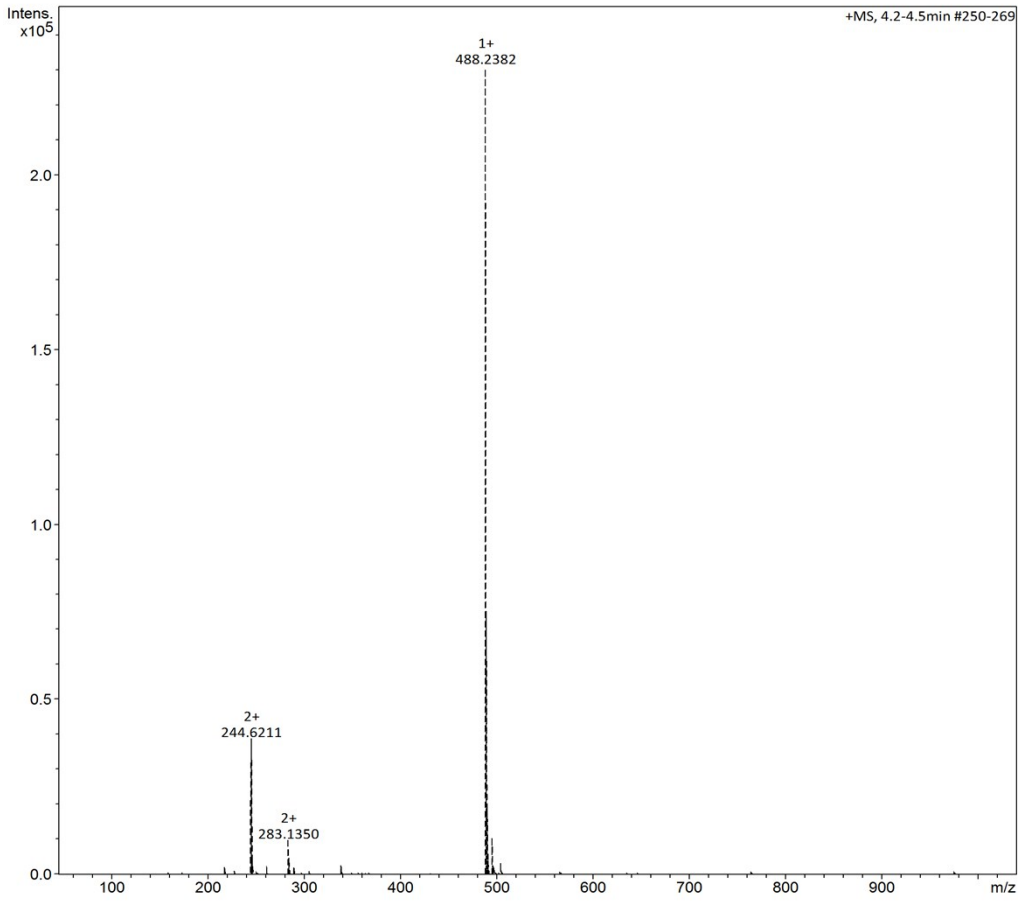

Fig. S8 Electrospray ionization mass spectrum of **HBT-11**. Assignment of the main peak: m/z 488.23 [**HBT-11** – Br^{-}]$^{+}$.

2. The four-level photo-cycle process

The ESIPT process requires an intramolecular hydrogen bond between the proton donor (-OH, -NH_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

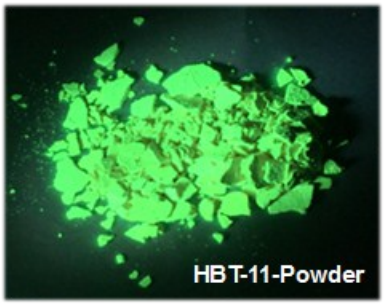

Fig. S9 Photograph showing the color of HBT-11 powder under illumination of 365 nm light.

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

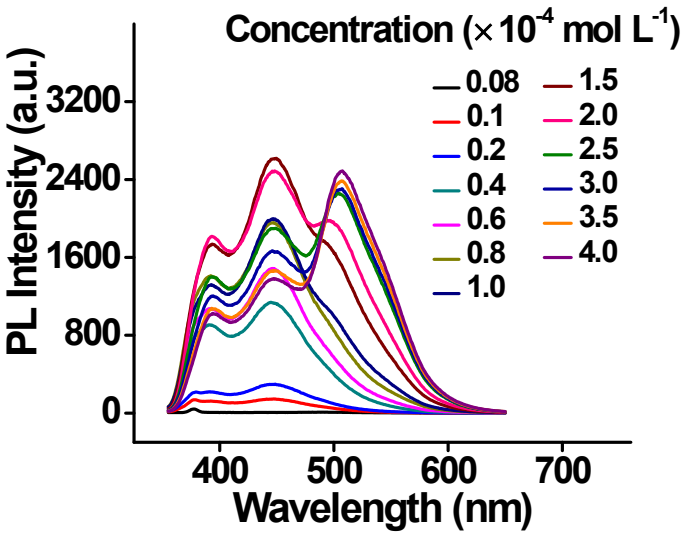

Fig. S10 Concentration-dependent fluorescence spectra of HBT-11 in aqueous solution. Curves represent 0.08×10^{-4}, 0.1×10^{-4}, 0.2×10^{-4}, 0.4×10^{-4}, 0.6×10^{-4}, 0.8×10^{-4}, 1.0×10^{-4}, 1.5×10^{-4}, 2.0×10^{-4}, 2.5×10^{-4}, 3.0×10^{-4}, 3.5×10^{-4}, 4.0×10^{-4} (mol/L).

5. The Tyndall effect of compound C in cyclohexane

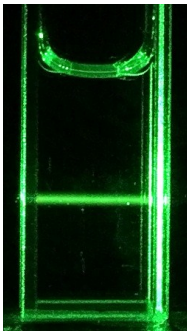

Fig. S11 The photograph of Tyndall effect for the cyclohexane solution of compound ***C***.

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

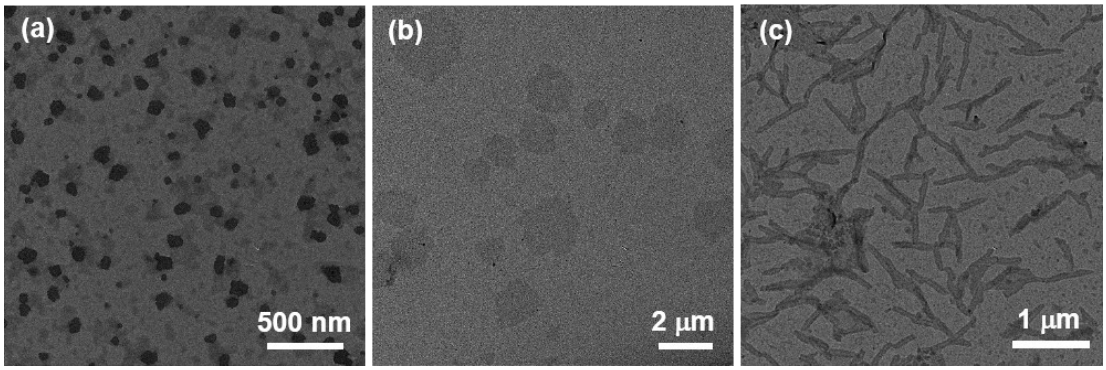

Fig. S12 The TEM images of (a) HBT-11 (4.0×10^{-4} mol/L), (b) HBT-11/α-CD (1eq.), (c) HBT-11/β-CD (1eq.).

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.

Concentration	System	Φ_F (%)
5.0×10^{-5} mol/L	HBT-11	1.0
	+ α-CD	3.7
	+ β-CD	3.4
4.0×10^{-4} mol/L	HBT-11	1.1
	+ α-CD	4.1
	+ β-CD	3.4

8. The time-resolved fluorescence of HBT-11 in different systems

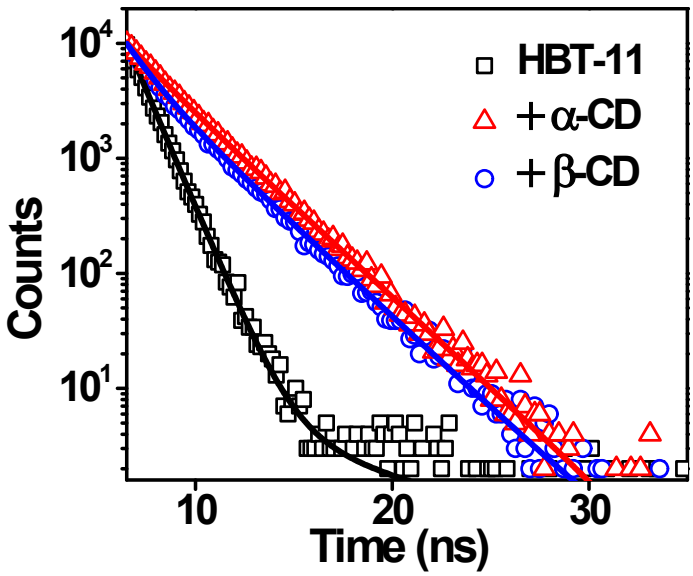

Fig. S13 Time-resolved fluorescence decays of HBT-11 in the absent and presence of α-CD and β-CD in aqueous solution.