

## Supporting Information

### A Facile Synthesis of Fluorescent Conjugated Polyelectrolytes using Polydentate Sulfonate as Highly Selective and Sensitive Copper (II) Sensors

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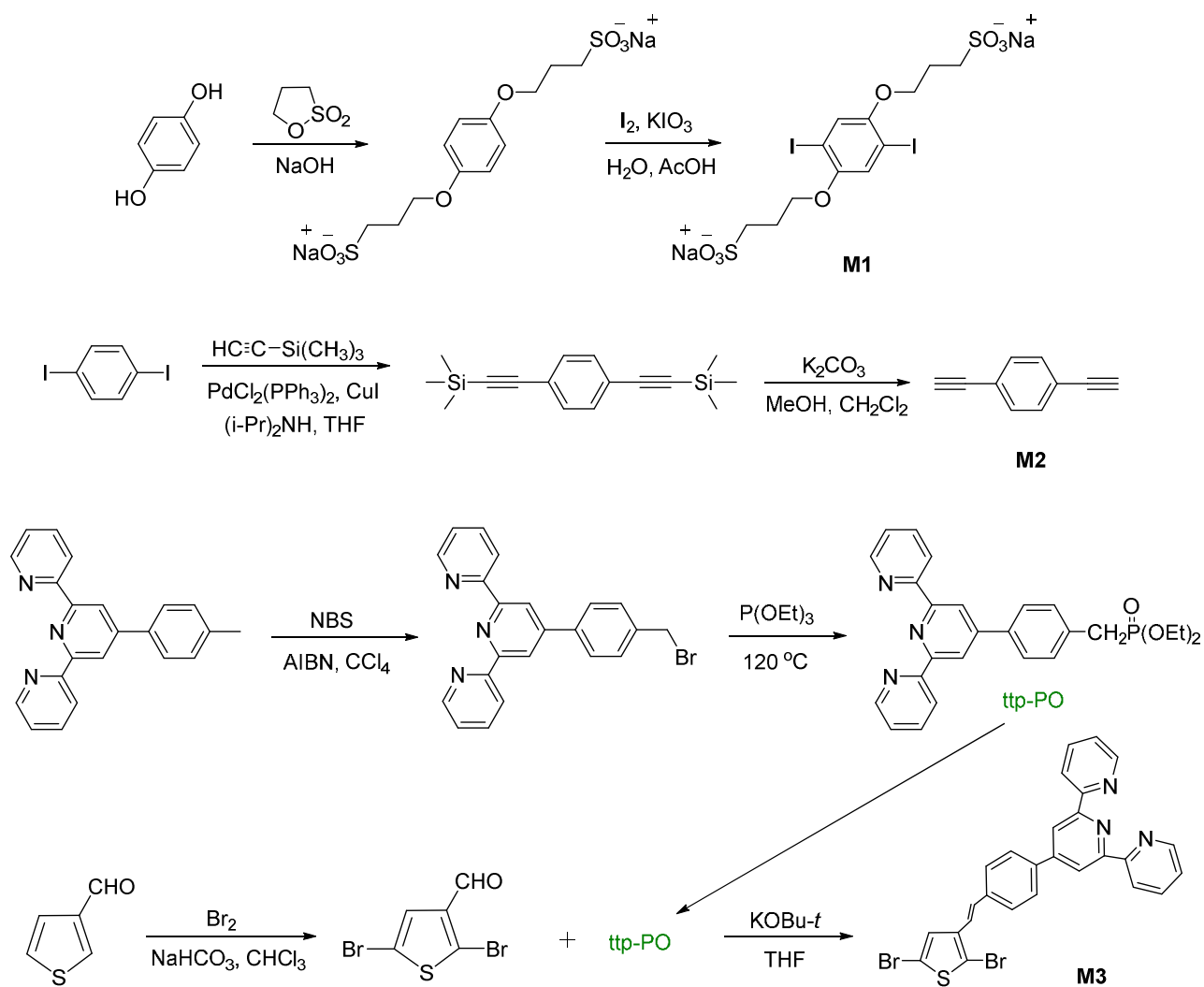
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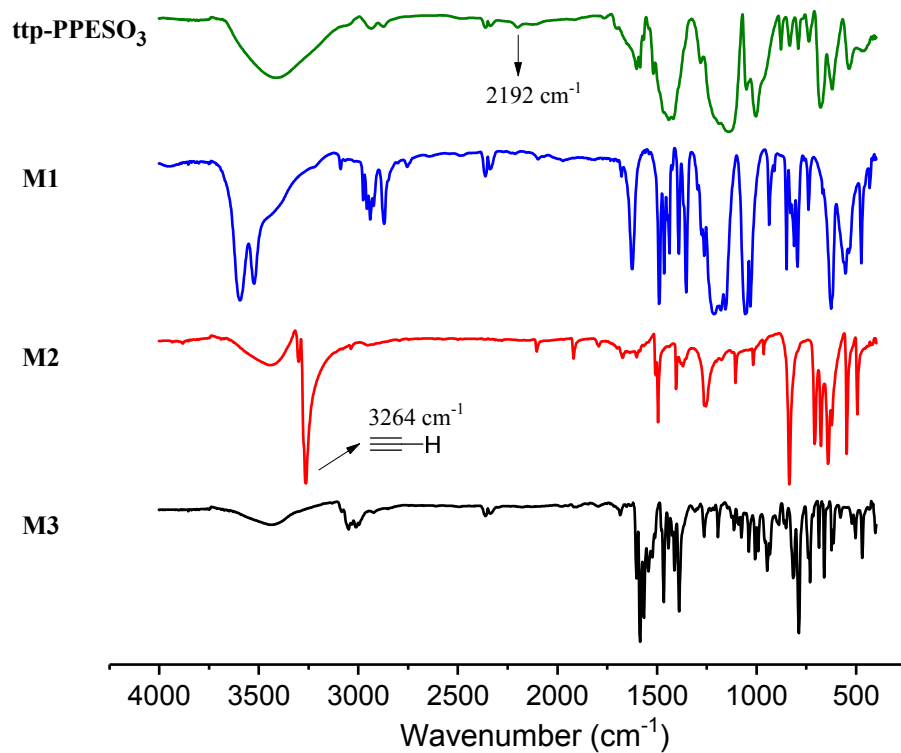
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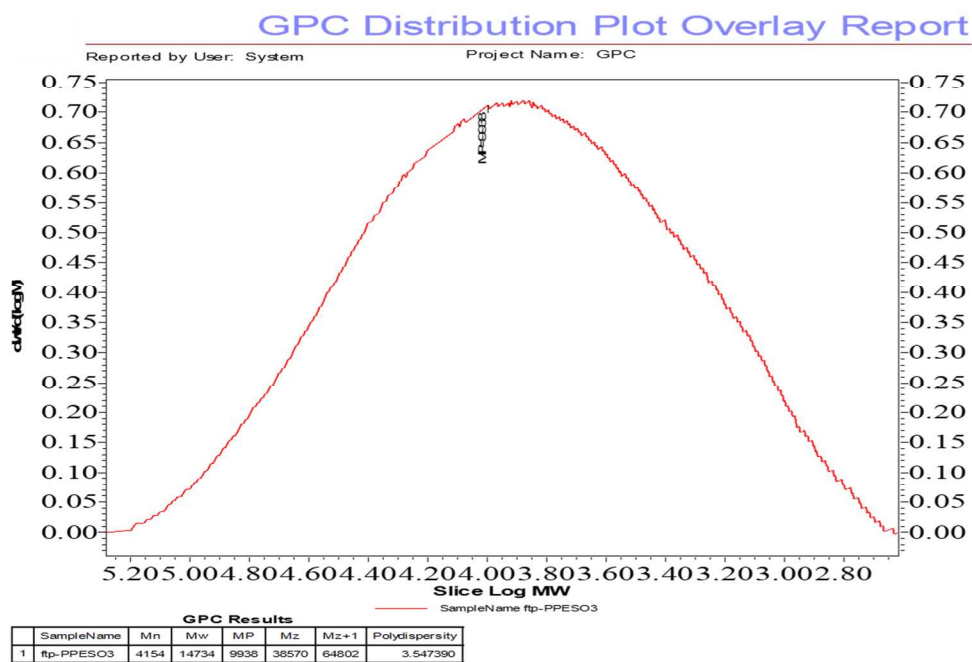
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**Scheme S1.** The synthetic routes for the three Monomers.

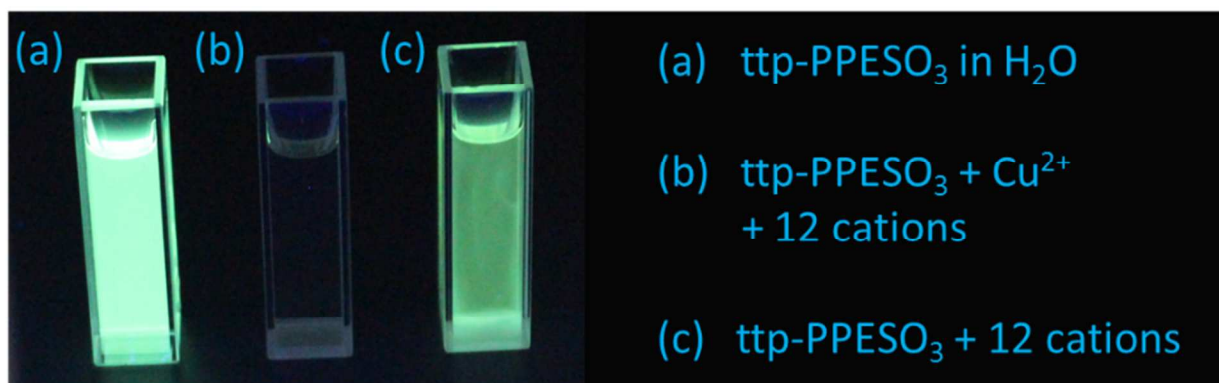




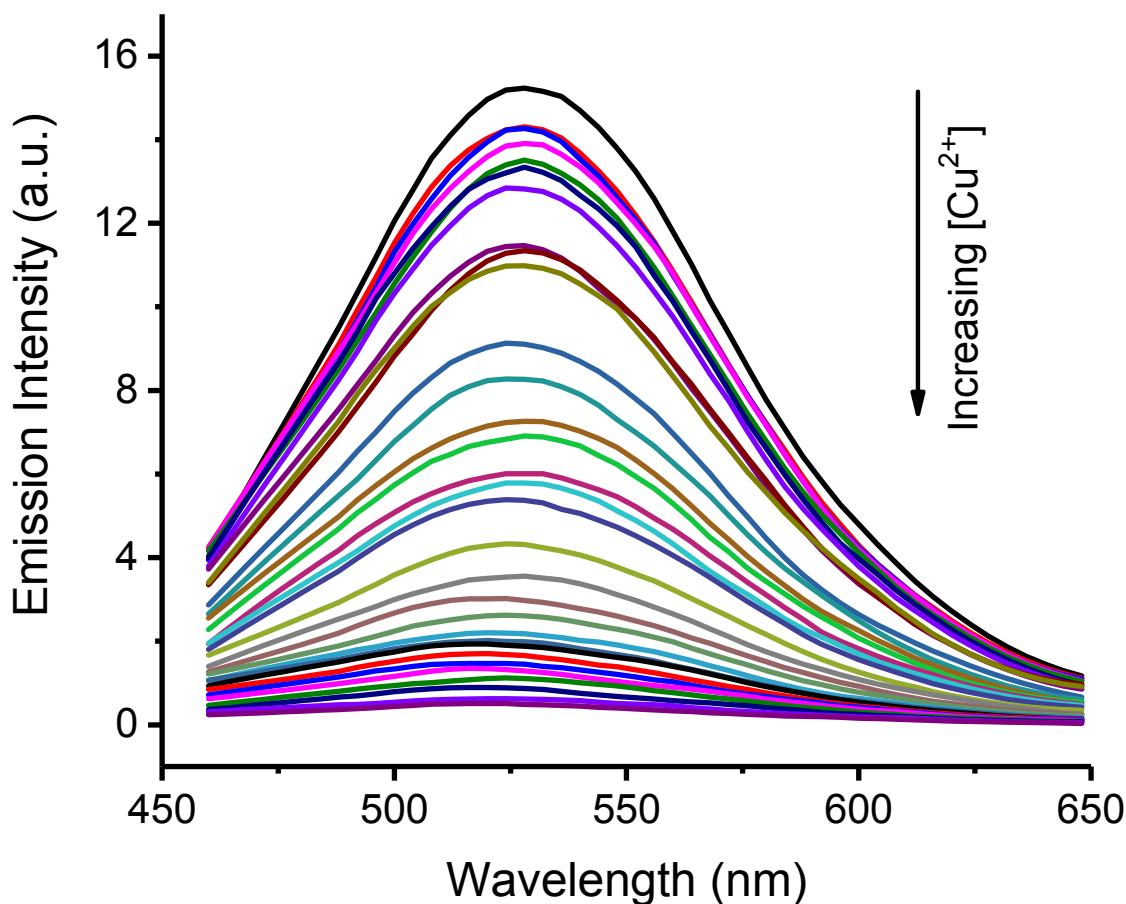
**Figure S1.** FTIR of the monomers and the ttp-PPESO<sub>3</sub>.



**Figure S2.** GPC results of the polyelectrolyte ttp-PPESO<sub>3</sub>.

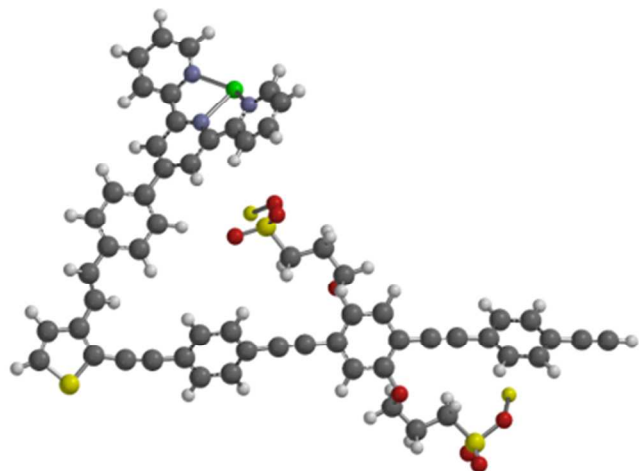


**Figure S3.** Interference studies on the ttp-PPESO<sub>3</sub> sensor: (a) polyelectrolyte aqueous solution (5  $\mu$ M). (b) Cu<sup>2+</sup> (5  $\mu$ M), together with other 12 cations, including Ca<sup>2+</sup>, Cd<sup>2+</sup>, Fe<sup>2+</sup>, H<sup>+</sup>, Hg<sup>2+</sup>, K<sup>+</sup>, Li<sup>+</sup>, Mg<sup>2+</sup>, Mn<sup>2+</sup>, Na<sup>+</sup>, Ni<sup>2+</sup>, Zn<sup>2+</sup> (each cation: 20  $\mu$ M) were added. (c) Same without Cu ions. The fluorescence images were taken under a commercial UV lamp with an excitation of 365 nm.

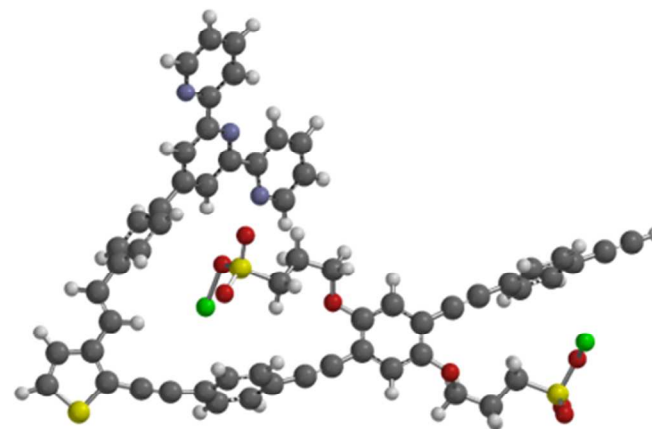


**Figure S4.** Fluorescence titration curves of the ttp-PPESO<sub>3</sub> aqueous solutions upon adding different concentrations of Cu ions.

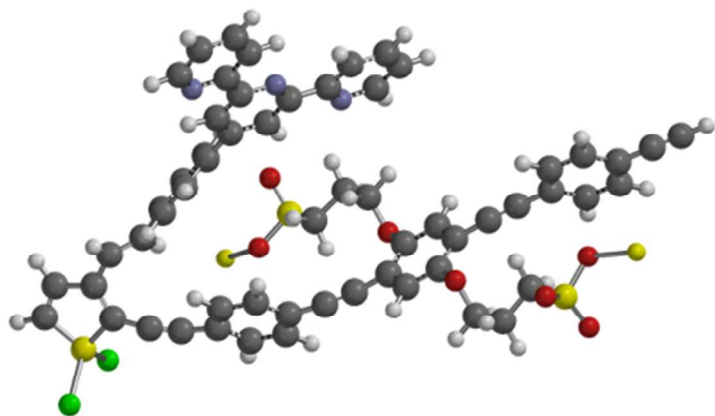
(a) ttp binding  $E_{(\min)} = 658.28 \text{ kJ/mol}$



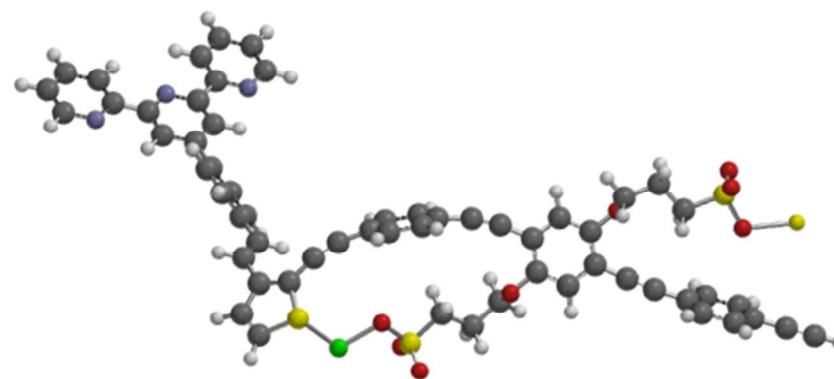
(b)  $\text{SO}_3^{2-}$  binding  $E_{(\min)} = 833.82 \text{ kJ/mol}$



(c) S atom binding  $E_{(\min)} = 747.23 \text{ kJ/mol}$



(d) S atom and  $\text{SO}_3^{2-}$  binding  $E_{(\min)} = 838.48 \text{ kJ/mol}$



**Figure S5.** Calculated energy-minimized structures of other possible complexes between the ttp-PPESO<sub>3</sub> and Cu ions.