

*Supporting information for*

**A Fluorescent Probe with an Aggregation-Enhanced  
Emission Feature for Real-Time Monitoring Low Carbon  
Dioxide**

Huan Wang,<sup>a</sup> Didi Chen,<sup>a</sup> Yahui Zhang,<sup>a</sup> Pai Liu,<sup>b</sup> Jianbing Shi,<sup>a</sup> Xiao Feng,<sup>c</sup> Bin Tong,<sup>\*a</sup> and Yuping Dong<sup>\*a</sup>

<sup>a</sup> School of Materials Science & Engineering, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China.

<sup>b</sup> School of Life Science, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China

<sup>c</sup> School of Chemistry, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China

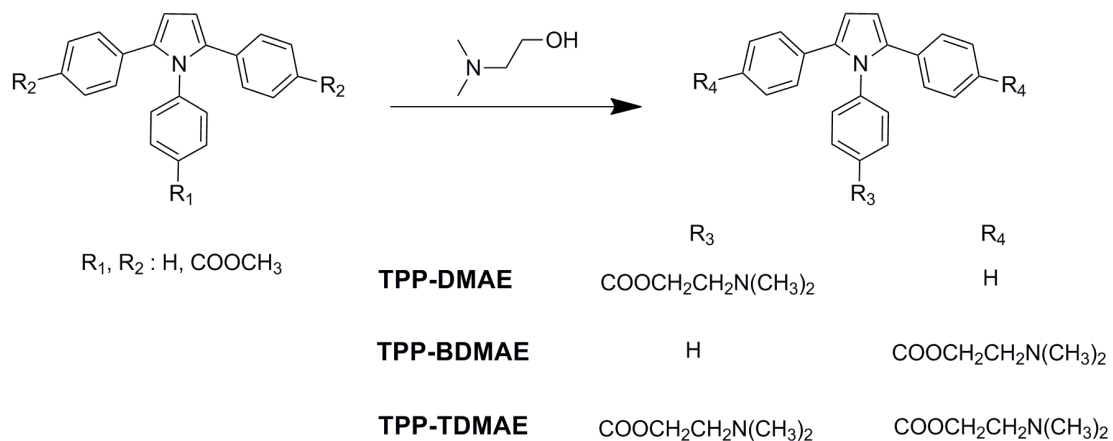
**E-mail:** [tongbin@bit.edu.cn](mailto:tongbin@bit.edu.cn); [chdongyp@bit.edu.cn](mailto:chdongyp@bit.edu.cn)

**Table of Contents**

**Section A. Synthesize and characterization**

**Section B. Supplementary spectra**

## Section A. Synthesis and characterization



Scheme S1. Synthetic routes of TPP-DMAE, TPP-BDMAE and TPP-TDMAE

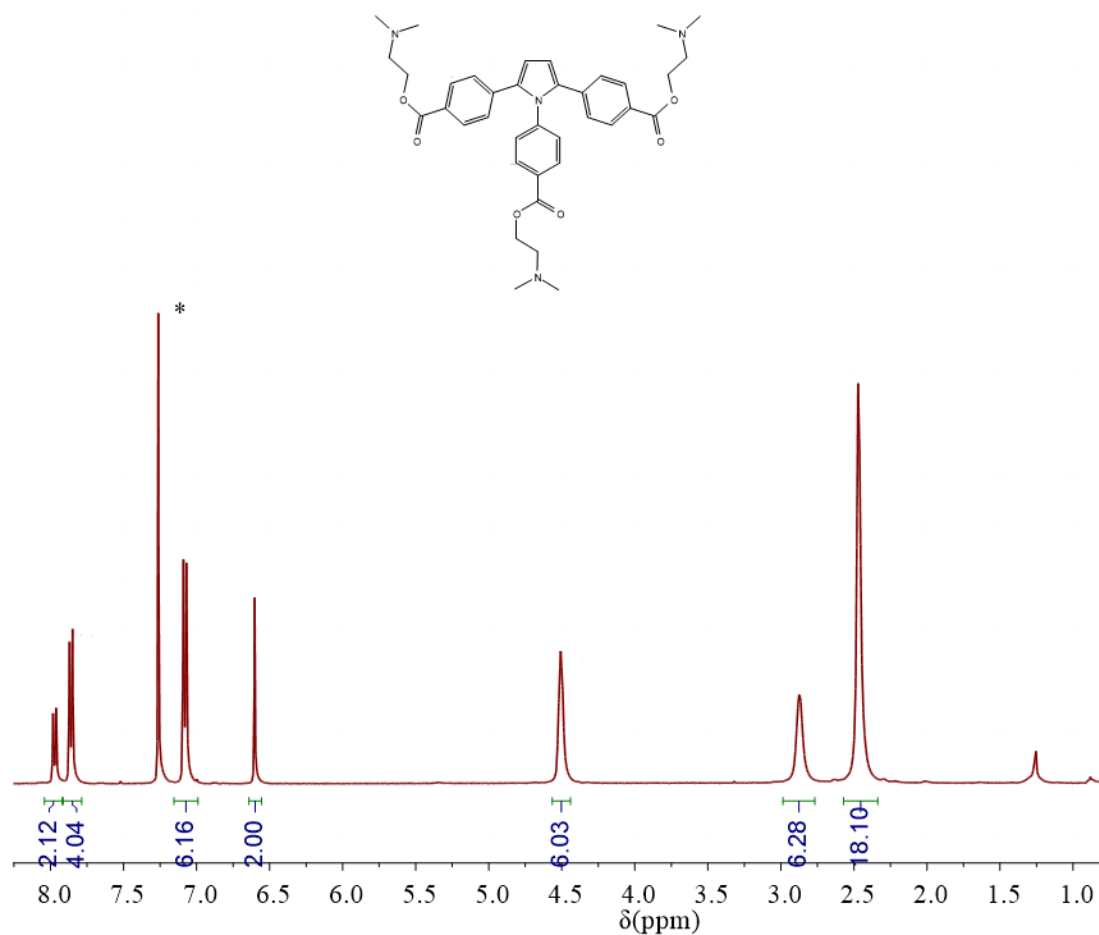


Figure S1.  $^1\text{H}$ -NMR spectrum of TPP-TDMAE.

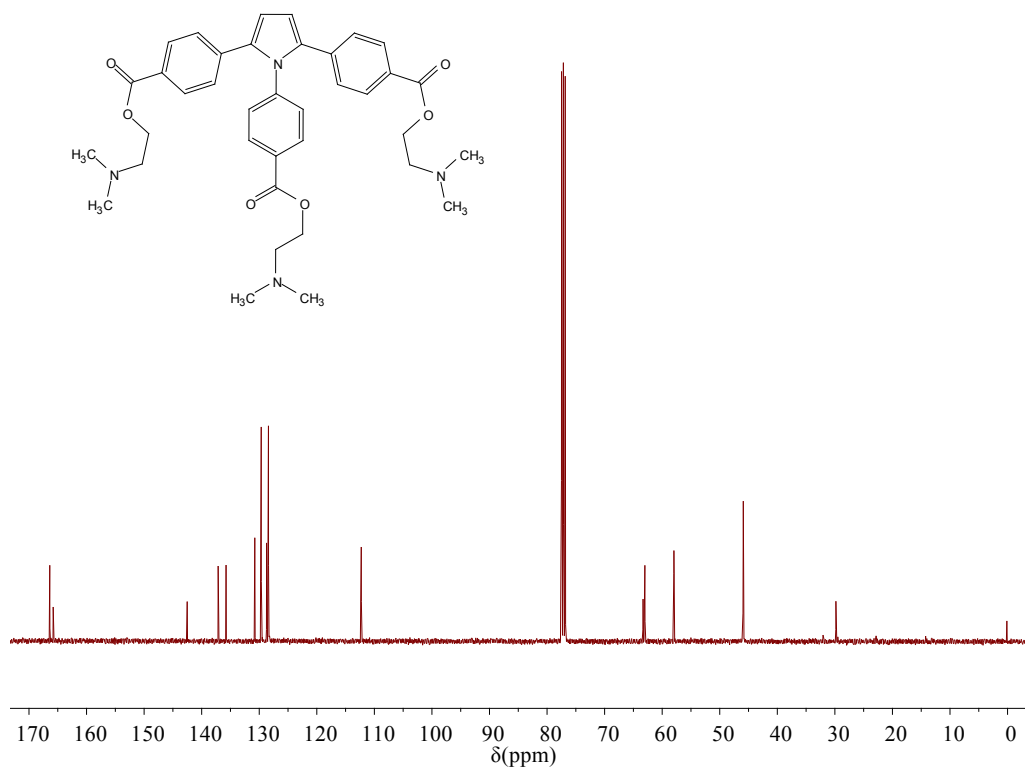


Figure S2.  $^{13}\text{C}$ -NMR spectrum of TPP-TDMAE.

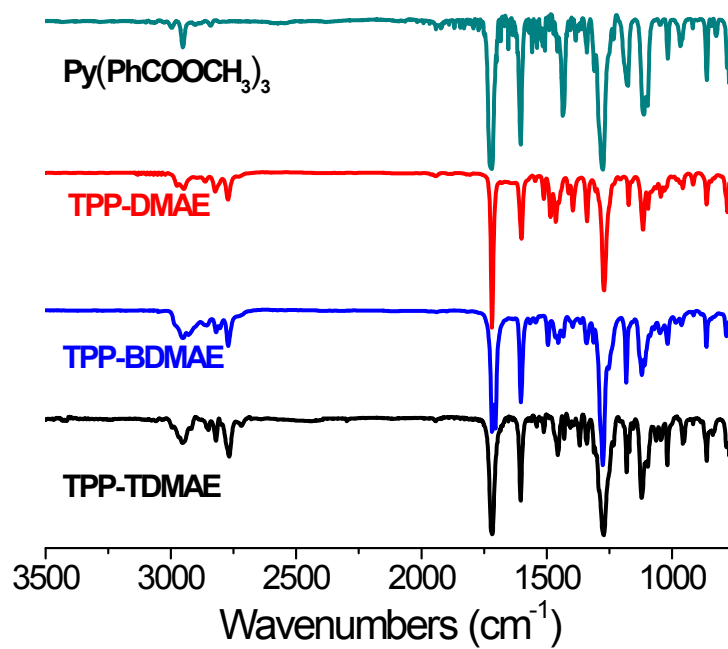


Figure S3. IR spectra of  $\text{Py}(\text{PhCOOCH}_3)_3$ , TPP-DMAE, TPP-BDMAE and TPP-TDMAE

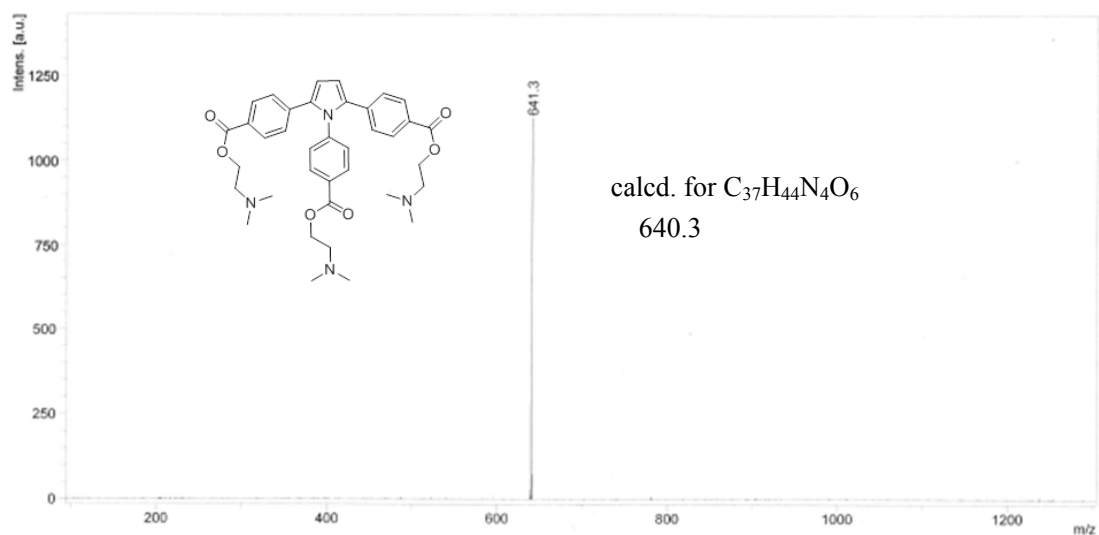
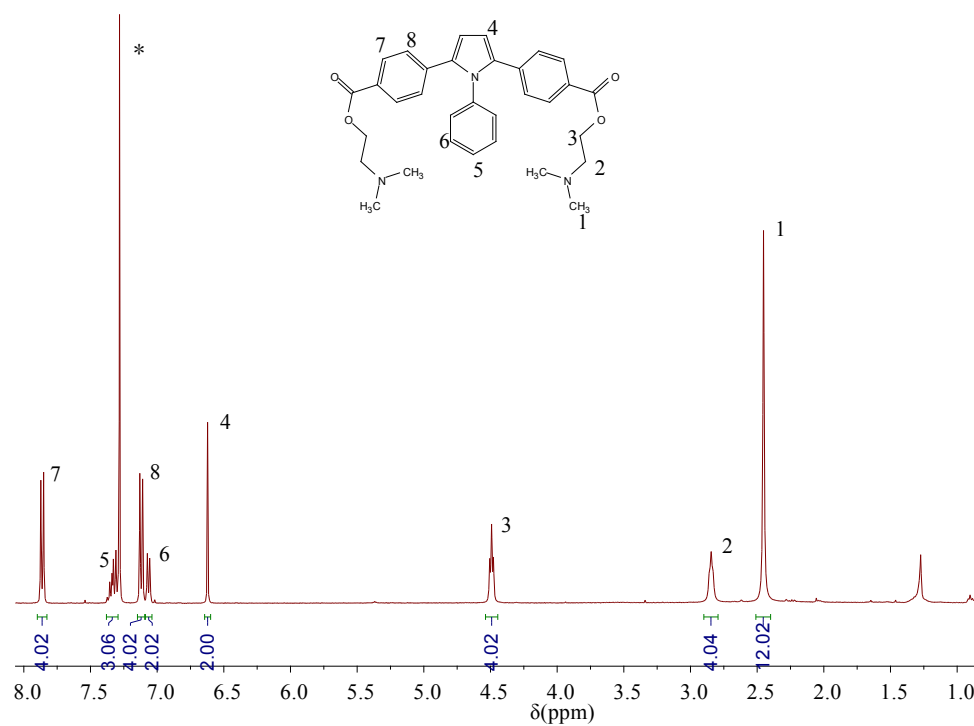


Figure S4. MS spectrum of TPP-TDMAE



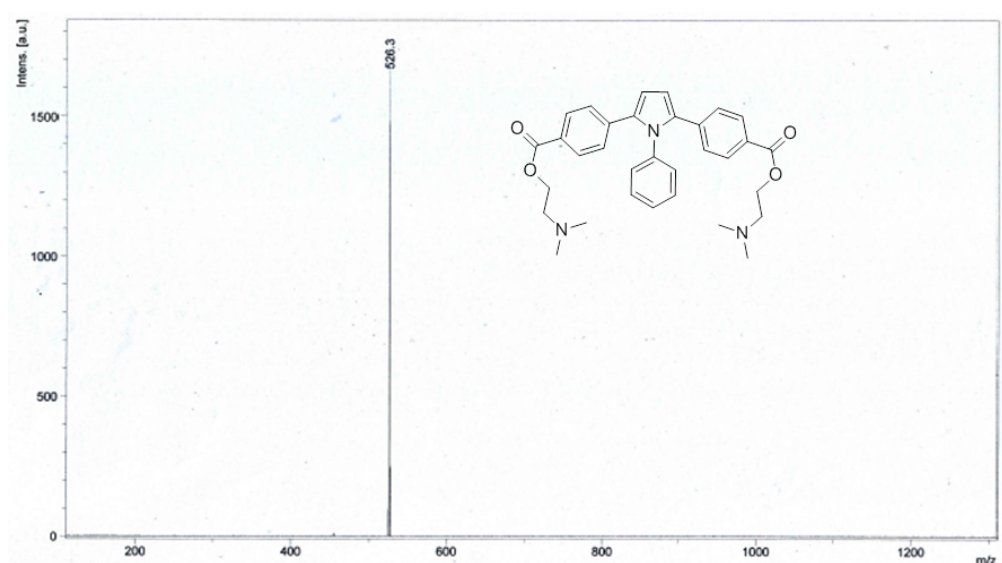
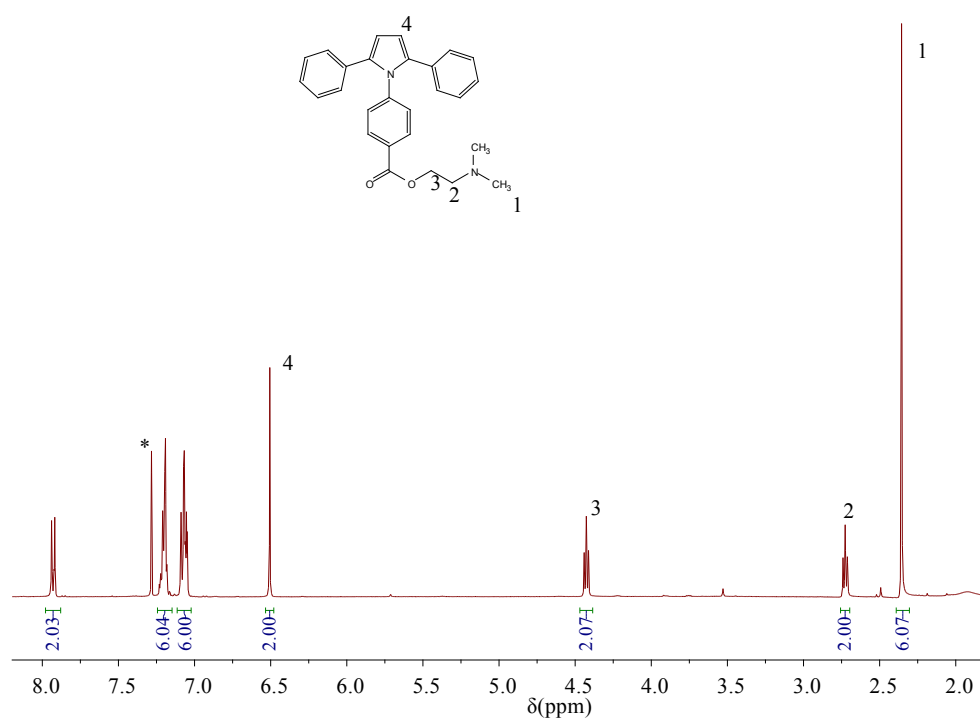


Figure S5.  $^1\text{H}$ -NMR spectrum and MS spectrum of TPP-BDMAE



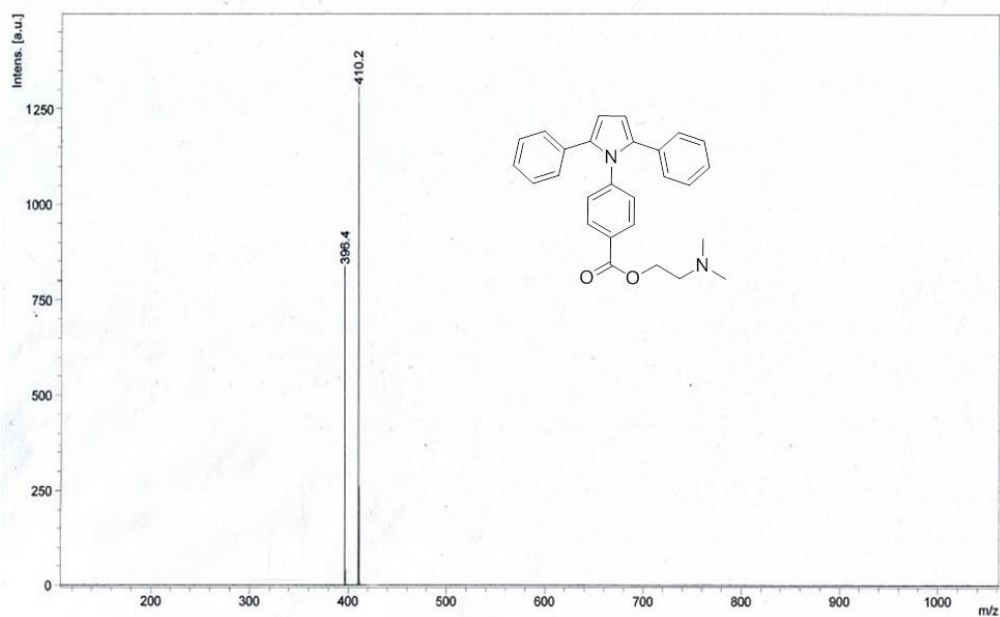


Figure S6.  $^1\text{H}$ -NMR spectrum and MS spectrum of TPP-DMAE

## Section B. Supplementary spectra

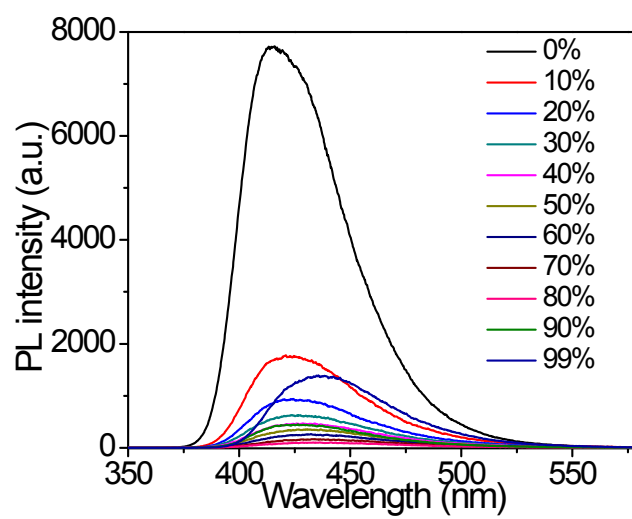


Figure S7. Emission spectra of TPP-TDMAE (10  $\mu\text{M}$ ) in THF-water mixtures.

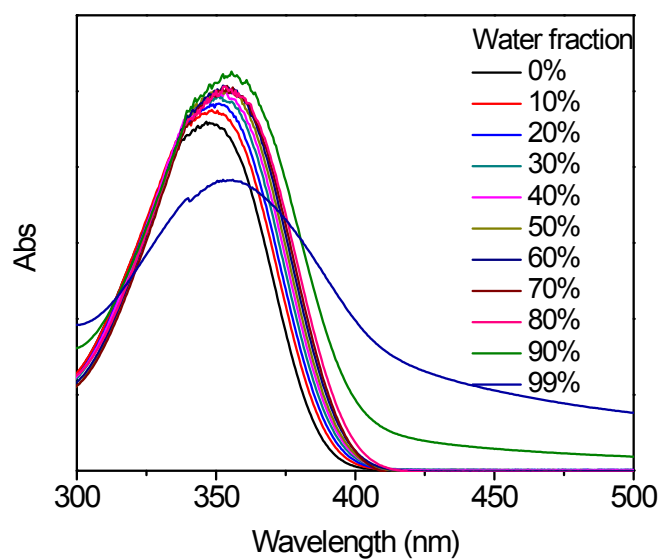


Figure S8. UV spectra of TPP-TDMAE in THF/H<sub>2</sub>O mixture with different water content.

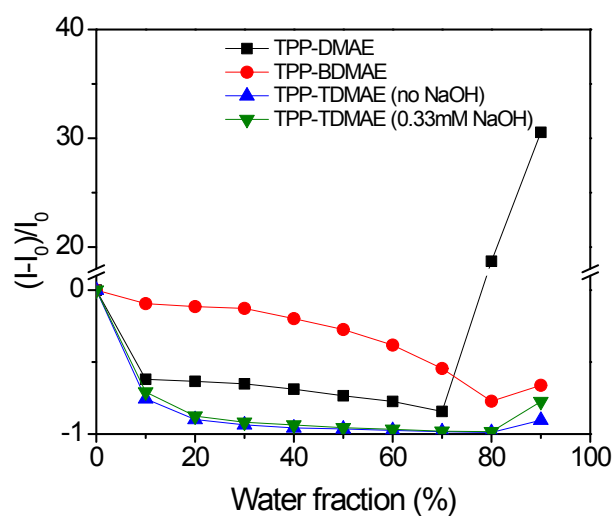


Figure S9. Emission intensities of TPP-DMAE, TPP-BDMAE and TPP-TDMAE (100  $\mu$ M) in the absence and presence of 0.33 mM NaOH via H<sub>2</sub>O contents in THF-H<sub>2</sub>O mixture. Excitation wavelength: 320 nm, 300 nm and 300 nm.

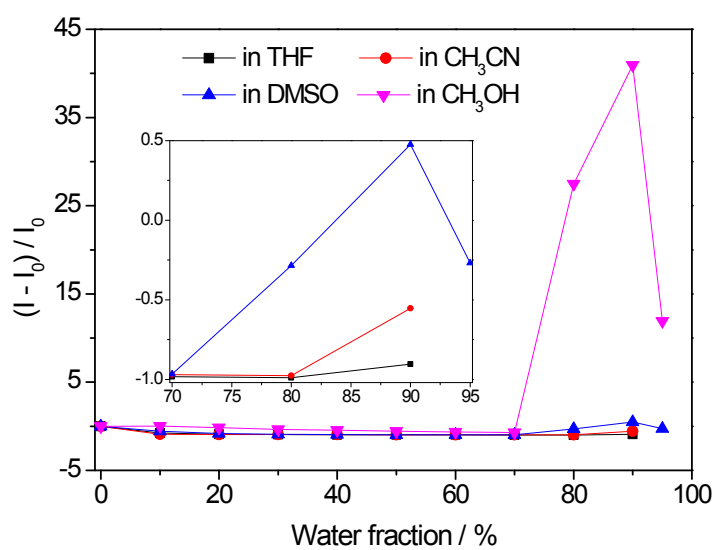


Figure S10. Emission intensities of TPP-TDMAE (100  $\mu$ M) via water fraction in organic solvent-water mixture. Excitation wavelength: 300 nm.

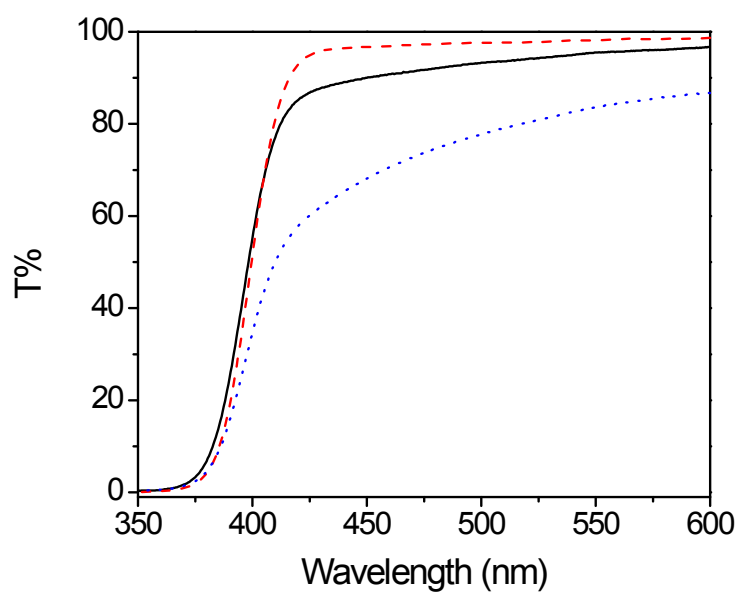


Figure S11. Transmittance changes of TPP-TDMAE (100  $\mu$ M) in THF/H<sub>2</sub>O(1/9,v/v, 3 mL) mixture. Solid: blank; Red dash: bubbling 0.5 mL CO<sub>2</sub>; Green dot: adding 0.33 mM NaOH to the mixture after bubbling with 0.5 mL CO<sub>2</sub>.

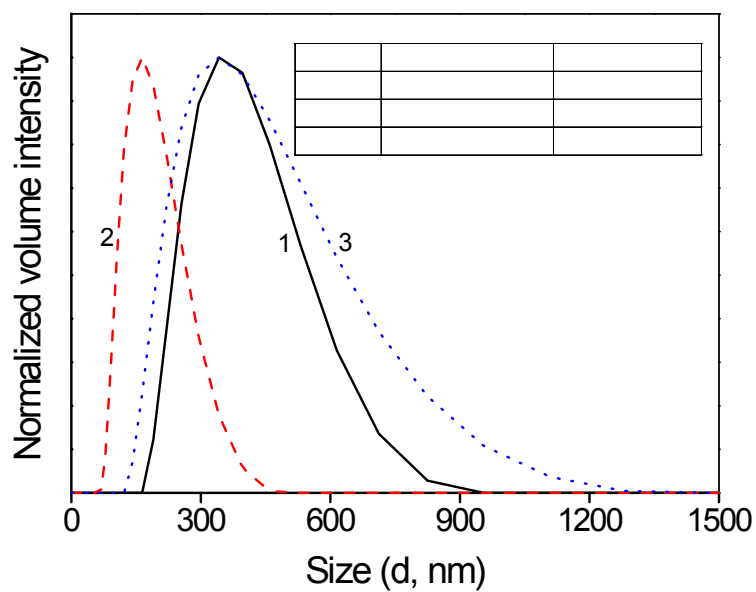


Figure S12. Size distribution of nanoparticles of TPP-TDMAE (100  $\mu$ M) in THF/H<sub>2</sub>O(1/9,v/v, 3 mL) mixture. Solid: blank; Red dash: bubbling 0.5 mL CO<sub>2</sub>; Green dot: adding 0.33 mM NaOH to the mixture after bubbling with 0.5 mL CO<sub>2</sub>.

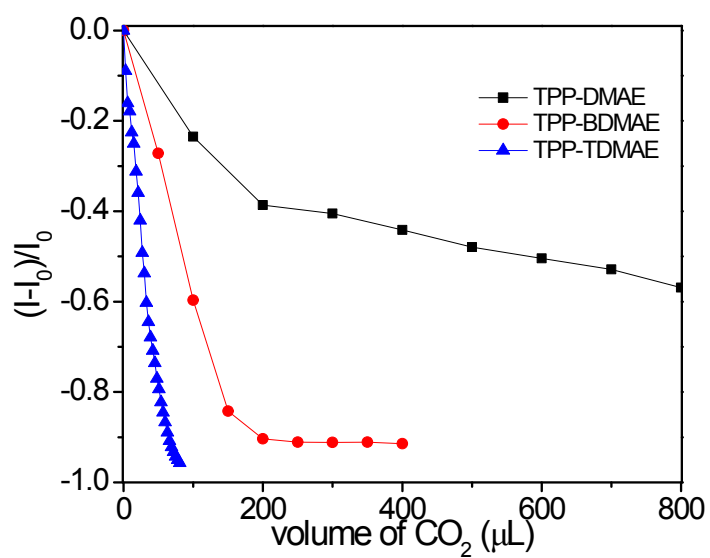


Figure S13. Fluorescence changes of TPP-DMAE, TPP-BDMAE and TPP-TDMAE (100  $\mu$ M) in THF/H<sub>2</sub>O (1/9, v/v, 3 mL) as a function of the volume of CO<sub>2</sub>.