Supporting information for

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

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

a School of Materials Science & Engineering, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China.
b School of Life Science, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China
c School of Chemistry, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing, 100081, China

E-mail: tongbin@bit.edu.cn; 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. $^1$H-NMR spectrum of TPP-TDMAE.
Figure S2. $^{13}$C-NMR spectrum of TPP-TDMAE.

Figure S3. IR spectra of Py(PhCOOCH$_3$)$_3$, TTP-DMAE, TPP-BDMAE and TPP-TDMAE.
Figure S4. MS spectrum of TPP-TDMAE

calcd. for C_{37}H_{44}N_{4}O_{6}
640.3
Figure S5. $^1$H-NMR spectrum and MS spectrum of TPP-BDMAE
Figure S6. $^1$H-NMR spectrum and MS spectrum of TPP-DMAE

Section B. Supplementary spectra

Figure S7. Emission spectra of TPP-TDMAE (10 μM) in THF-water mixtures.
Figure S8. UV spectra of TPP-TDMAE in THF/H$_2$O mixture with different water content.

Figure S9. Emission intensities of TPP-DMAE, TPP-BDMAE and TPP-TDMAE (100 μM) in the absence and presence of 0.33 mM NaOH via H$_2$O contents in THF-H$_2$O mixture. Excitation wavelength: 320 nm, 300 nm and 300 nm.
Figure S10. Emission intensities of TPP-TDMAE (100 μM) via water fraction in organic solvent-water mixture. Excitation wavelength: 300 nm.

Figure S11. Transmittance changes of TPP-TDMAE (100 μM) in THF/H₂O(1/9,v/v, 3 mL) mixture. Solid: blank; Red dash: bubbling 0.5 mL CO₂; Green dot: adding 0.33 mM NaOH to the mixture after bubbling with 0.5 mL CO₂.
Figure S12. Size distribution of nanoparticles of TPP-TDMAE (100 μM) in THF/H$_2$O (1/9, v/v, 3 mL) mixture. Solid: blank; Red dash: bubbling 0.5 mL CO$_2$; Green dot: adding 0.33 mM NaOH to the mixture after bubbling with 0.5 mL CO$_2$.

Figure S13. Fluorescence changes of TPP-DMAE, TPP-BDMAE and TPP-TDMAE (100 μM) in THF/H$_2$O (1/9, v/v, 3 mL) as a function of the volume of CO$_2$. 

\[ \frac{I - I_0}{I_0} = \text{volume of CO}_2 \text{ (μL)} \]