## Photophysical properties of electron-deficient free-base corrole bearing meso-fluorophenyl substituents.

Lei Zhang,<sup>†</sup> Zi-Yu Liu,<sup>†</sup> Xuan Zhan,<sup>‡</sup> Lili Wang<sup>†</sup>, Hui Wang,<sup>\*†</sup> and Hai-Yang Liu<sup>\*‡</sup>

<sup>†</sup> State Key Laboratory of Optoelectronics Materials and Technologies, Sun-Yat Sen University, Guangzhou 510275, China

‡ Department of Chemistry, South China University of Technology, Guangzhou 510641, China.

## **Supporting Information**



Figure S1. Fluorescence lifetime of  $S_1$  state of  $F_0C$ ,  $F_5C$ ,  $F_{10}C$  and  $F_{15}C$  in toluene measured by TSCPC.



Figure S2. Femtosecond transient absorbance of 3E-5 M of  $F_0C$  in toluene. Pump wavelength was 400 nm (2  $\mu$ J/pulse).



Figure S3. Femtosecond transient absorbance of 3E-5 M of  $F_5C$  in toluene. Pump wavelength was 400 nm (2  $\mu$ J/pulse). The initial TA is too tiny to be present clearly. The TA spectra have smoothed.



Figure S4. Femtosecond transient absorbance of 3E-5 M of  $F_{15}C$  in toluene. Pump wavelength was 400 nm (2  $\mu$ J/pulse).

The TA of  $S_2$  is too tiny to be recorded by 400 nm excitation. It is because the absorption cross secection of  $S_2$  is so small. To observe the  $S_2$ time profile, one can use the 415 nm pumping samples. However, the 415 nm lead to huge cross-phase modulation (XPM) signal,<sup>1</sup> which influences chirp-correction and the reconstruction of TA spectra. Therefore, we present TA spectra excited by 400 nm.



Figure S5. Time profiles of  $S_0$  bleaching at ca 432 nm. Red lines correspond to the single exponential fitting results. The fitting parameters are shown as follow.

	y0	A1	t1(lifetime)	k <sub>1</sub> (time
	(fixed)		ps	constant)
				$(10^8  \mathrm{s}^{-1})$
F <sub>5</sub> C	0	-0.06±2.06E-4	31597.7±1658.97	0.32 ±0.02
F <sub>10</sub> C	0	-0.079±2.19E-4	34143.193±1521.45	0.29±0.01
F <sub>15</sub> C	0	-0.080±3.704	15745.9±573.49	0.64±0.02



Figure S6. The results of the SVD and global-fitting analyses of TA spectra 30  $\mu$ M of

F<sub>5</sub>C in toluene.



Figure S7. The results of the SVD and global-fitting analyses of TA spectra 30  $\mu$ M of F<sub>15</sub>C in toluene.



Figure S8. Time profiles of 470 nm of 30  $\mu$ M of F<sub>0</sub>C in toluene after 415 nm pump. The pump energy is 0.5  $\mu$ J/pulse.



Figure S9. Comparison of UV-visable spectra of  $F_0C$  in toluene at different concentrations. Inset: the  $\varepsilon$  change when changing the

concentration from 1.65E-5 M to 8E-5 M. No apparent difference was recorded.



Figure S10. Time profiles of high concentration of tetraphenylporphyrin (TPP) in toluene at probed at 438 nm after excited at 415 nm. The lifetime of the S<sub>1</sub> state of TPP is 12.4 ns. <sup>2</sup> If the delay line is well adjusted, we should observe no decay until 4 ns. To do so, we guarantee the long time profile in Figure 7 is coming from real signal and not misadjustment of the delay line.

<sup>1.</sup> M. Lorenc, M. Ziolek, R. Naskrecki, J. Karolczak, J. Kubicki and A. Maciejewski, *Appl Phys B-Lasers O*, 2002, **74**, 19-27.

<sup>2.</sup> O. Ohno, Y. Kaizu and H. Kobayashi, J. Chem. Phys., 1985, 82, 1779-1787.