

Supporting Information

Dual-Fluorescent D-A Dyad with Tercarbazole Donor and Switchable Imide Acceptor: Promising Structure for an Integrated Logic Gate

Zujin Zhao, Yajun Xing, Zixing Wang and Ping Lu*

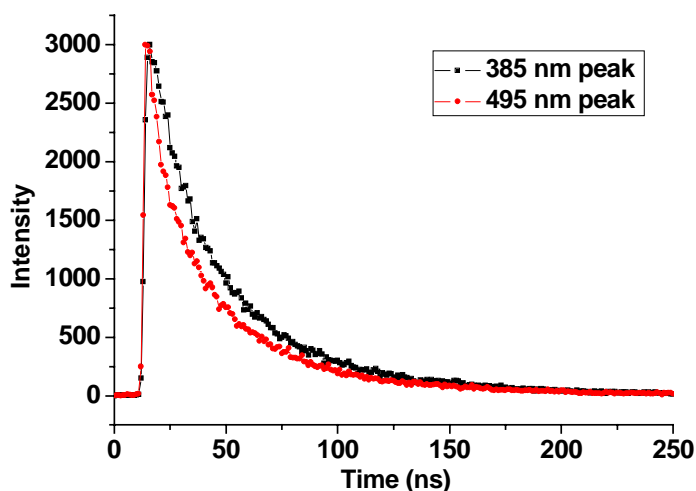
Department of Chemistry, Zhejiang University, Hangzhou, 310027, P. R. China

1. Time-resolved fluorescence results for TCz-MS.

Table 1. Fluorescence lifetimes of TCz-MS^a

	λ_{em1} (nm)	τ_1 (ns) ^b	χ^2	k_{et1} (s ⁻¹) ^d	λ_{em2} (nm)	τ_2 (ns) ^c	χ^2	k_{et2} (s ⁻¹) ^d
TCz-MS	385	14.4±0.701	1.46	0.0482×10 ⁸	495	10.7±0.465	1.65	0.0712×10 ⁸
		(25.9%)				(25.6%)		
		47.2±0.626				45.0±0.482		
		(74.1%)				(74.4%)		

^aMeasured in cyclohexane (1×10⁻⁶ M, 25 °C), excited at 300 nm; ^bDetecting wavelength; ^c k_{et} : Intramolecular electron-transfer rate constant calculated by the follow equation: $k_{\text{et}}=1/\tau_{\text{S}}-1/\tau_{\text{L}}$.



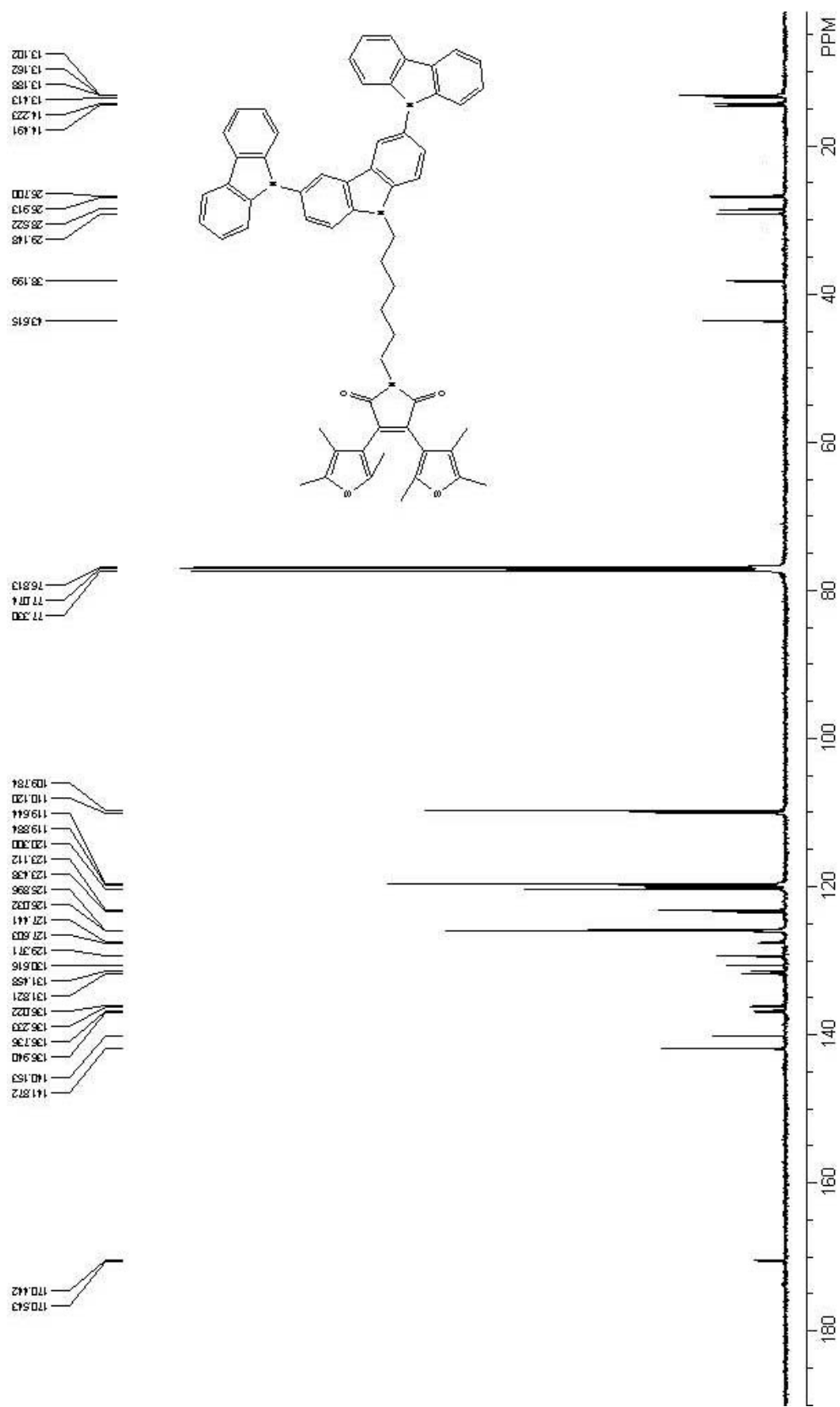
2. Experimental procedure for preparation of TCz-MS.

General. Solvents used in this study were spectrograde and purified by distillation before use. UV-vis absorption spectra were recorded on Shimadzu UV-2450 spectrophotometer. Fluorescence

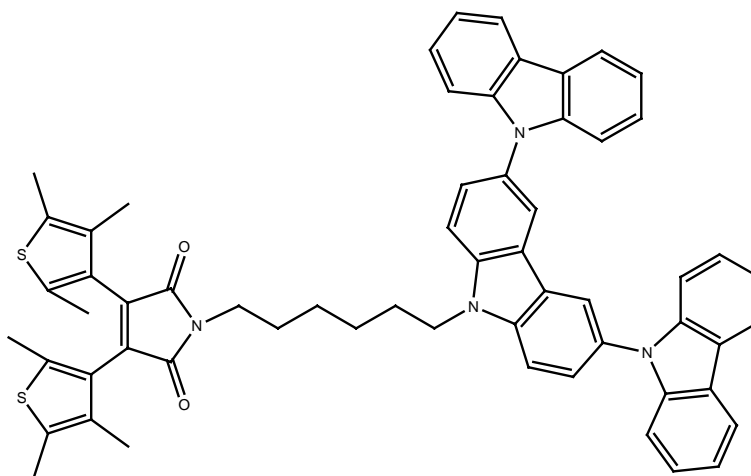
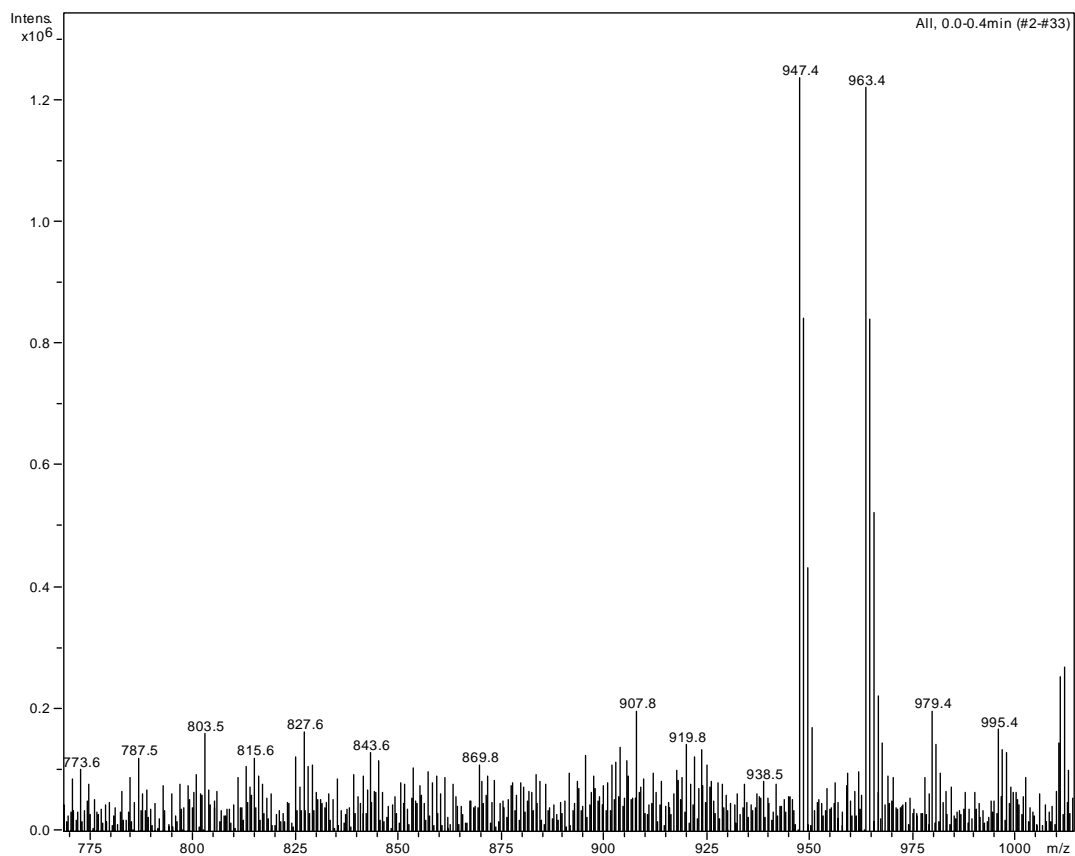
* Corresponding author. Tel.: + 86-571-879- 52543.
E-mail address: pinglu@zju.edu.cn (P. Lu).

spectra were recorded on Shimadzu RF-5301pc instrument. ^1H and ^{13}C NMR spectra were obtained on a Bruker AMX-500 MHz spectrometer. ^{13}C NMR spectra were obtained with broad band proton decoupling. Spectra were run in CDCl_3 and internally referenced to tetramethylsilane. ESI mass spectra were obtained on Bruker Esquire3000plus.

Synthesis. TCz-MS: In a 50 mL round bottle flask, **2** (50 mg, 0.08 mmol), **3** (50 mg, 0.14 mmol), K_2CO_3 (5 g, 36 mmol), TBAB (0.01 g, 0.03mmol) and 30 mL anhydrous THF were mixed and refluxed for 24 hours. After the reaction mixture was cooled down, it was poured into 75 mL water and extracted with methylene chloride (75 mL \times 2). The combined organic phase was washed with 5 % HCl, brine and dried over anhydrous MgSO_4 . The filtrate was concentrated under reduced pressure. The residue was purified with column chromatography (CH_2Cl_2 / hexane as eluent). In this way, 30 mg (40.5 % yield) of **TCz-MS** was obtained. ^1H NMR δ (CDCl_3): 1.50 (m, 2H), 1.61 (m, 2H), 1.72 (s, 3H), 1.75 (m, 2H), 1.88 (s, 3H), 1.89 (s, 3H), 2.04 (s, 3H), 2.06 (m, 2H), 2.21 (s, 3H), 2.23 (s, 3H), 3.66 (t, 2H, $J = 7.0$ Hz), 4.48 (t, 2H, $J = 7.0$ Hz), 7.27 (m, 4H), 7.38 (s, 8H), 7.66 (s, 4H), 8.16 (d, 4H, $J = 8.5$ Hz), 8.22 (s, 2H) ppm. ^{13}C NMR δ (CDCl_3): 13.10, 13.16, 13.19, 13.41, 14.22, 14.49, 26.70, 26.91, 28.52, 29.15, 38.20, 43.62, 109.78, 110.12, 119.64, 119.88, 120.30, 123.11, 123.44, 125.90, 126.03, 127.44, 127.60, 129.37, 130.62, 131.46, 136.02, 136.23, 136.74, 136.94, 140.15, 141.88, 170.44, 170.54 ppm. MS (ESI, positive polarity): 947.4 ($\text{M} + \text{Na}^+$), 963.4 ($\text{M} + \text{K}^+$).



Compound TCz-MS's ^{13}C NMR spectrum.



Compound TCz-MS's mass spectrum.