

Supporting Information for

An Acid/Base Switchable and Reversibly Cross-Linkable Polyrotaxane

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1. ¹ H NMR, ¹³ C NMR and Mass Spectra of Compound 1	S2
2. ¹ H NMR Spectrum of Pseudorotaxane 2•3	S3
3. ¹ H NMR Spectrum of Polyrotaxane 4	S4
4. GPC of Polyrotaxane 4	S5
5. DSC of Polyrotaxane 4	S6
6. TGA of Polyrotaxane 4	S7

1. ^1H NMR, ^{13}C NMR and Mass Spectra of Compound **1**

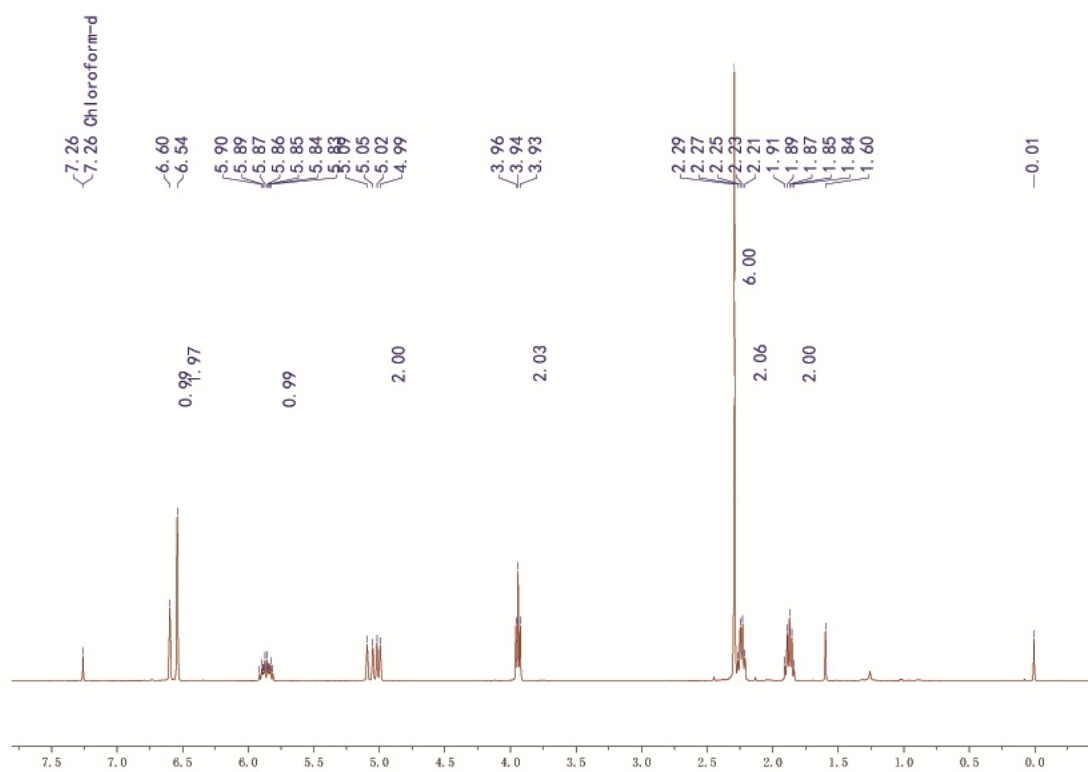


Figure S1. ^1H NMR spectrum (400 MHz, CDCl_3 , room temperature) of **1**.

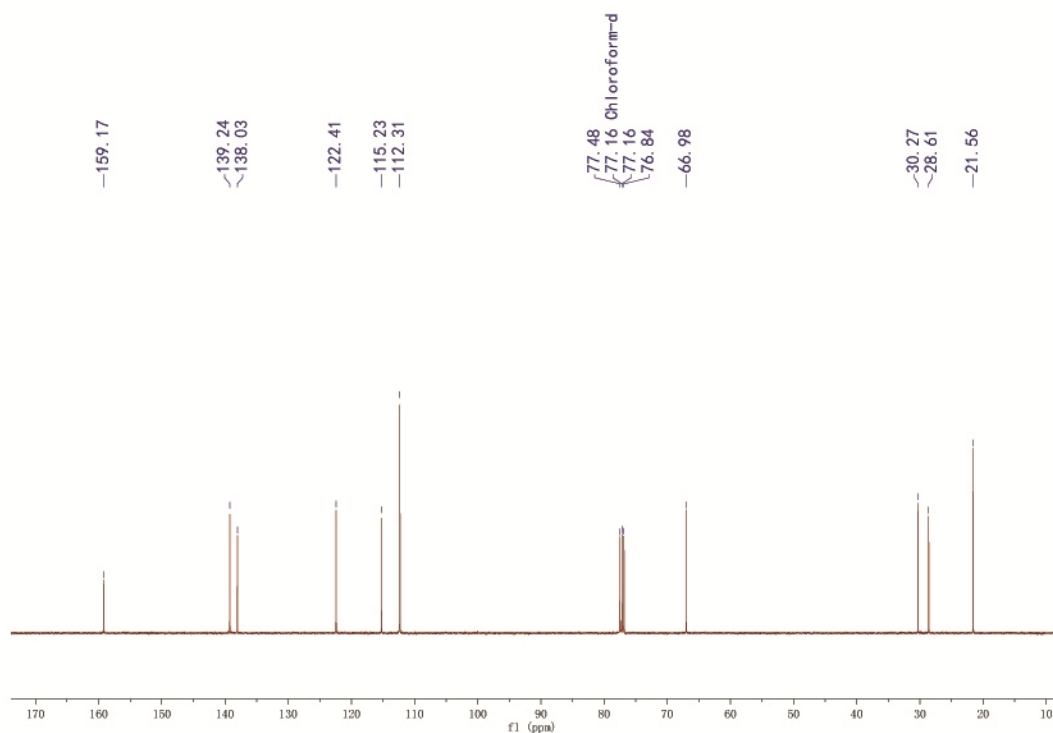


Figure S2. ^{13}C NMR spectrum (400 MHz, CDCl_3 , room temperature) of **1**.

Tolerance = 0.7 mDa / DBE: min = -1.5, max = 50.0
 Element prediction: Off

Monoisotopic Mass, Odd and Even Electron Ions
 9 formula(e) evaluated with 1 results within limits (up to 50 best isotopic matches for each mass)
 Elements Used:
 C: 0-100 H: 0-300 O: 0-2
 21-Jun-2012GCTPremier Zhejiang University
 zb-114 (1.938)

TOF MS EI+
 6.99e+003

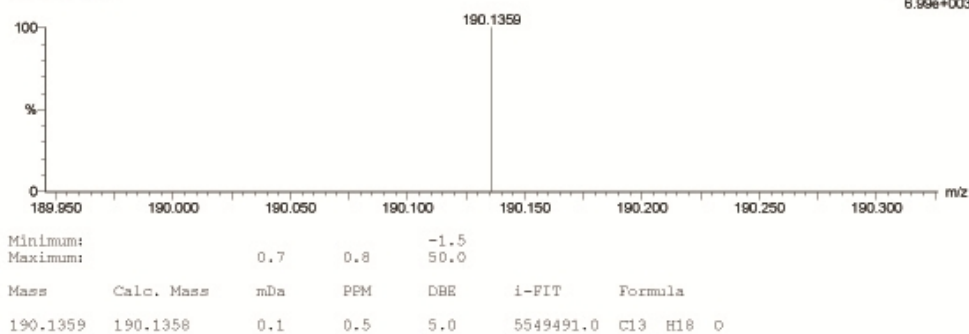


Figure S3. High resolution electrospray ionization mass spectrum of **1**. m/z calcd. for $C_{13}H_{18}O$ $[M + H]^+$, 190.1358; found, 190.1359.

2. 1H NMR Spectrum of Pseudorotaxane **2•3**

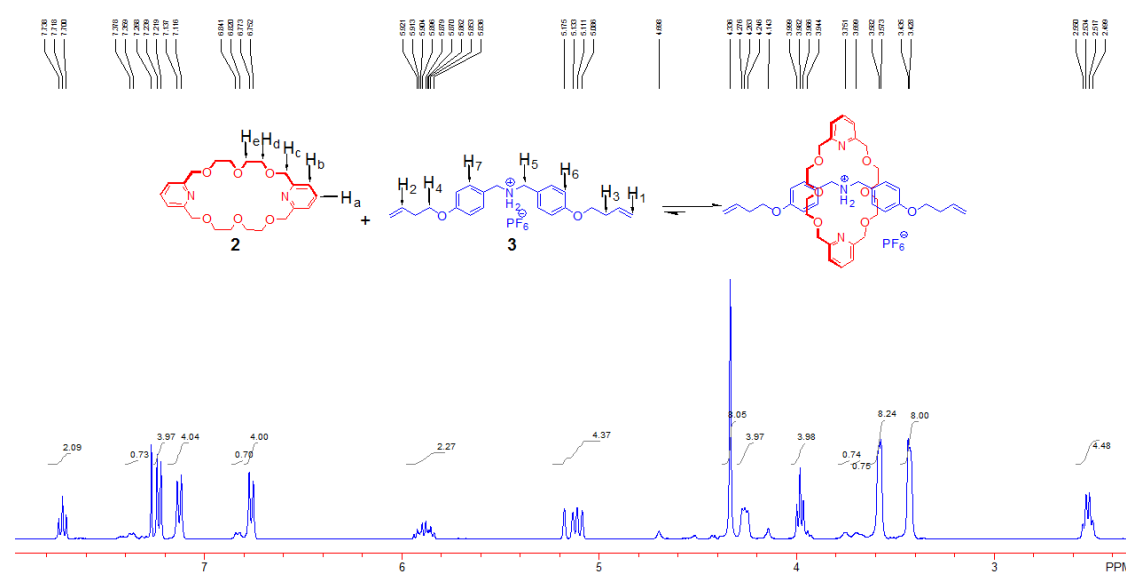


Figure S4. 1H NMR spectrum (400 MHz, $CDCl_3$, room temperature) of pseudorotaxane **2•3**.

3. ^1H NMR Spectrum of Polyrotaxane **4**

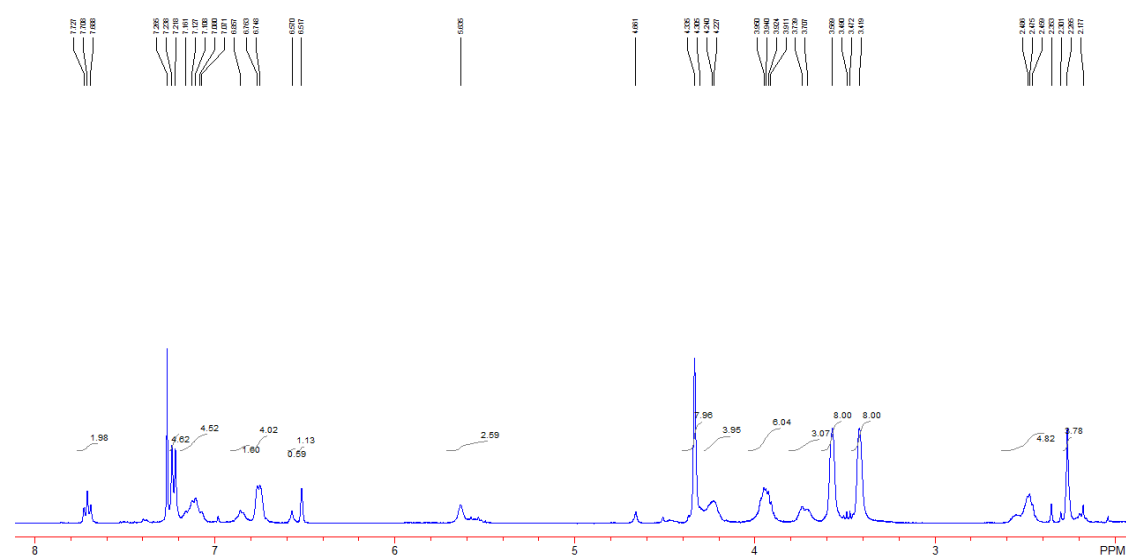


Figure S5. ^1H NMR spectrum (400 MHz, CDCl_3 , room temperature) of **4**.

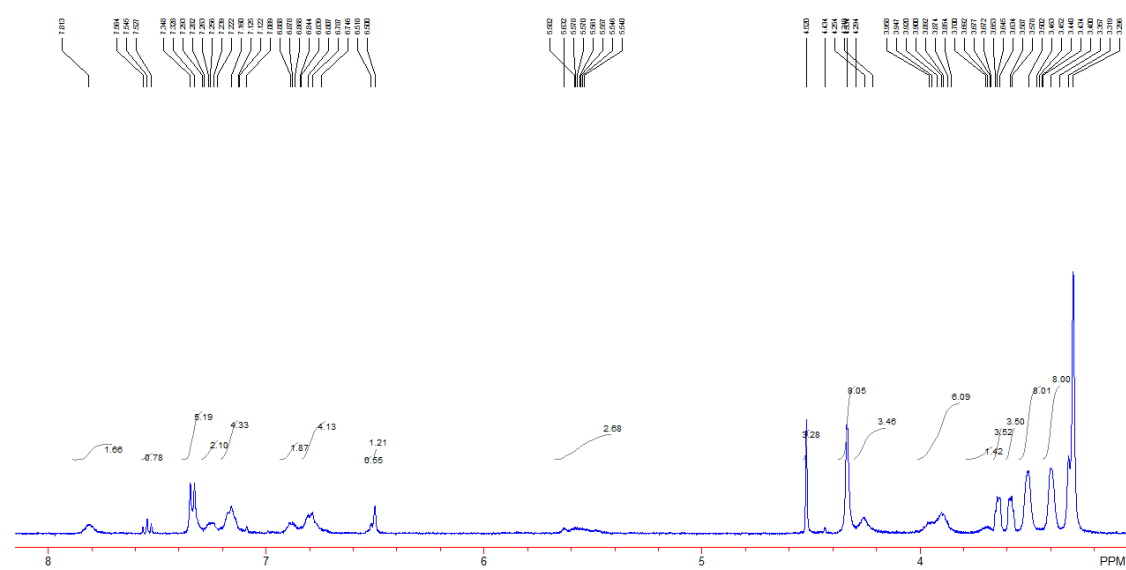
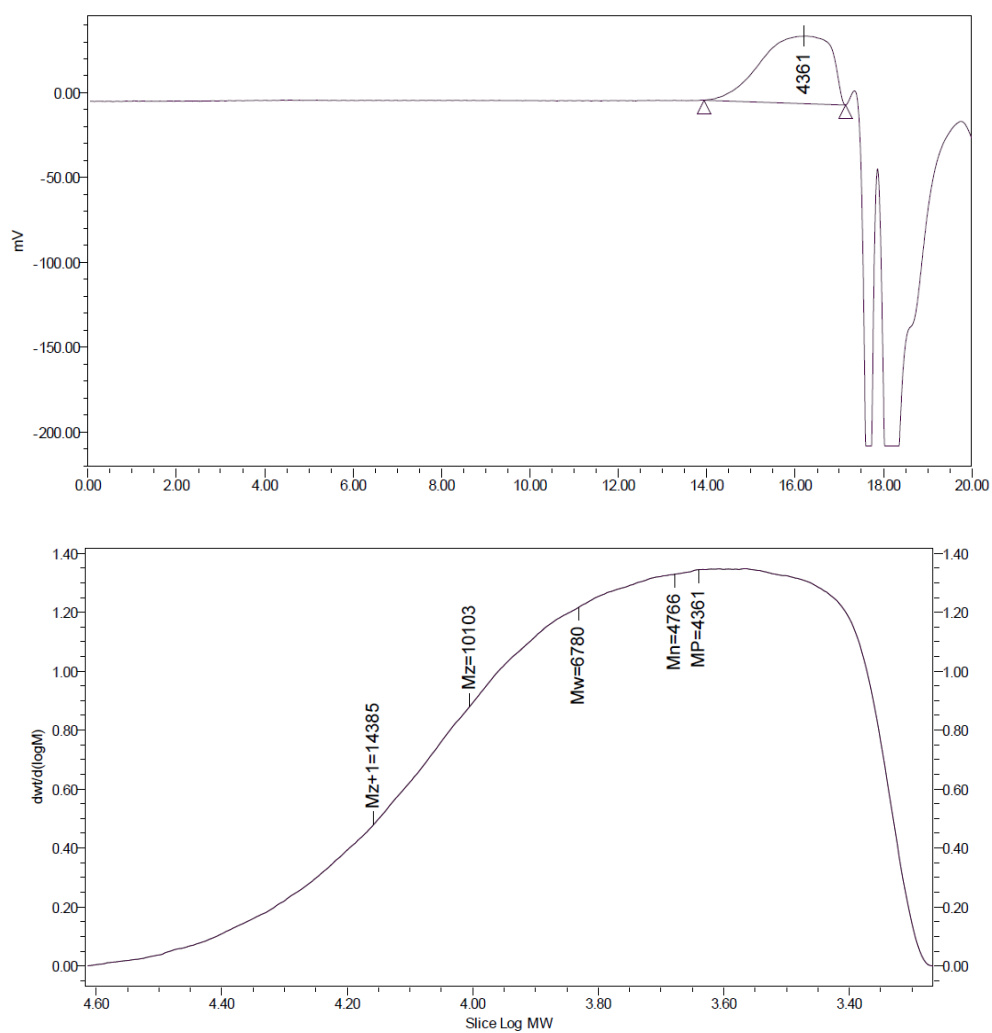


Figure S6. ^1H NMR spectrum (400 MHz, $d_6\text{-DMSO}$, room temperature) of **4**.

4. GPC of Polyrotaxane 4



M_n	M_w	M_p	M_z	M_{z+1}	PDI
4766	6780	4361	10103	14385	1.422725

Figure S7. GPC of polyrotaxane 4.

5. DSC of Polyrotaxane 4

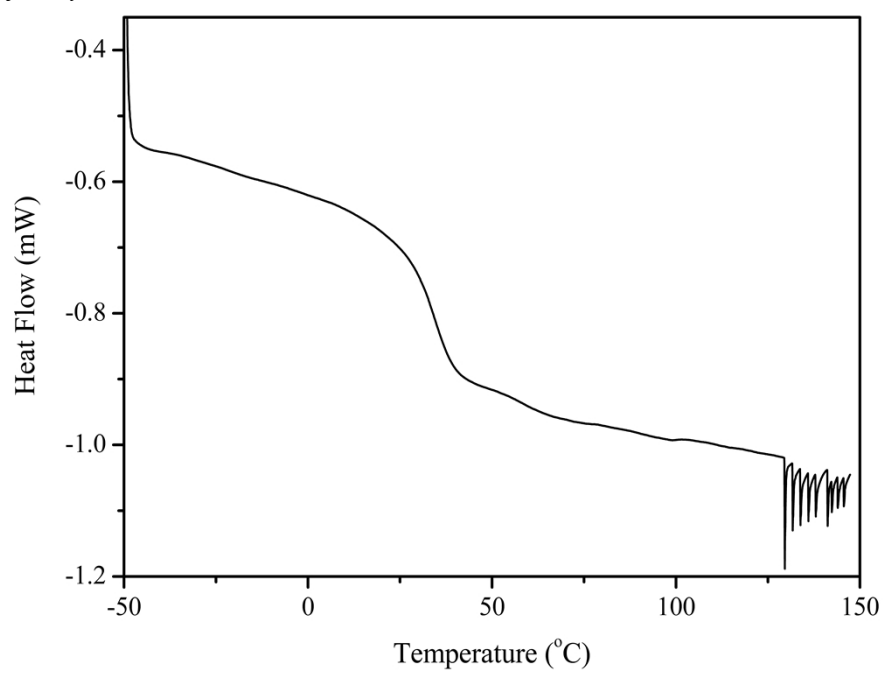


Figure S8. DSC of polyrotaxane 4.

6. TGA of Polyrotaxane **4**

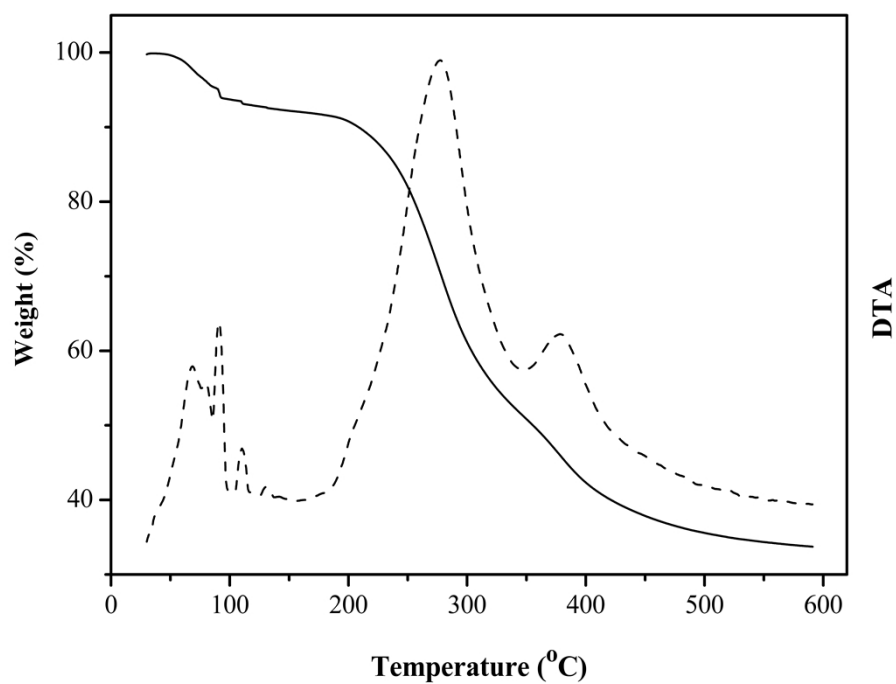


Figure S9. Thermogravimetric analysis scan (TGA) of polyrotaxane **4** at the heating rate of 20 °C/min from 35 °C to 600 °C.