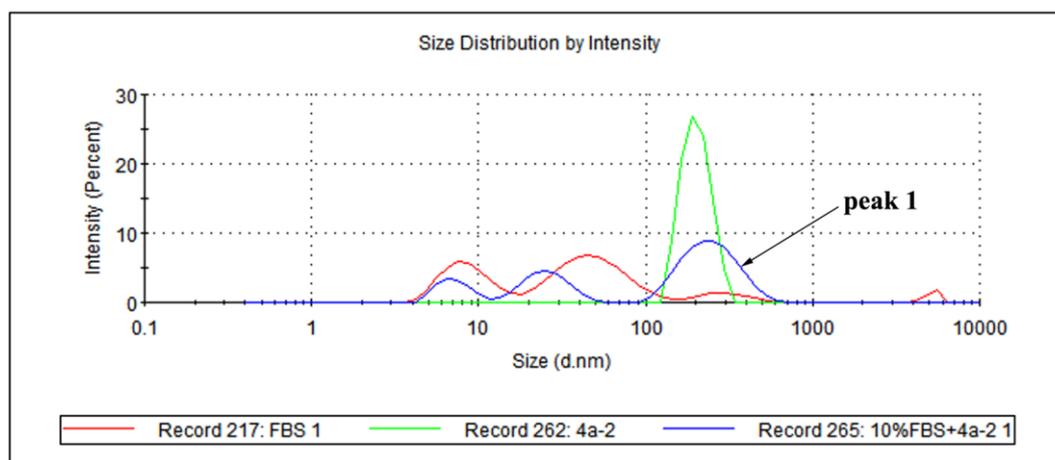


## Supplementary Information

# Aromatic thioacetal -Bridged ROS-Responsive Nanoparticles as Novel Gene Delivery Vehicles

Guo-Qing Lin, Wen-Jing Yi \*, Qiang Liu, Xue-Jun Yang and Zhi-Gang Zhao \*  
College of Chemistry and Environmental Protection Engineering, Southwest Minzu University,  
Chengdu 610041, P.R. China

\*Corresponding authors: Wen-Jing Yi, ywjchem@163.com;  
Zhi-Gang Zhao, zzg63129@163.com

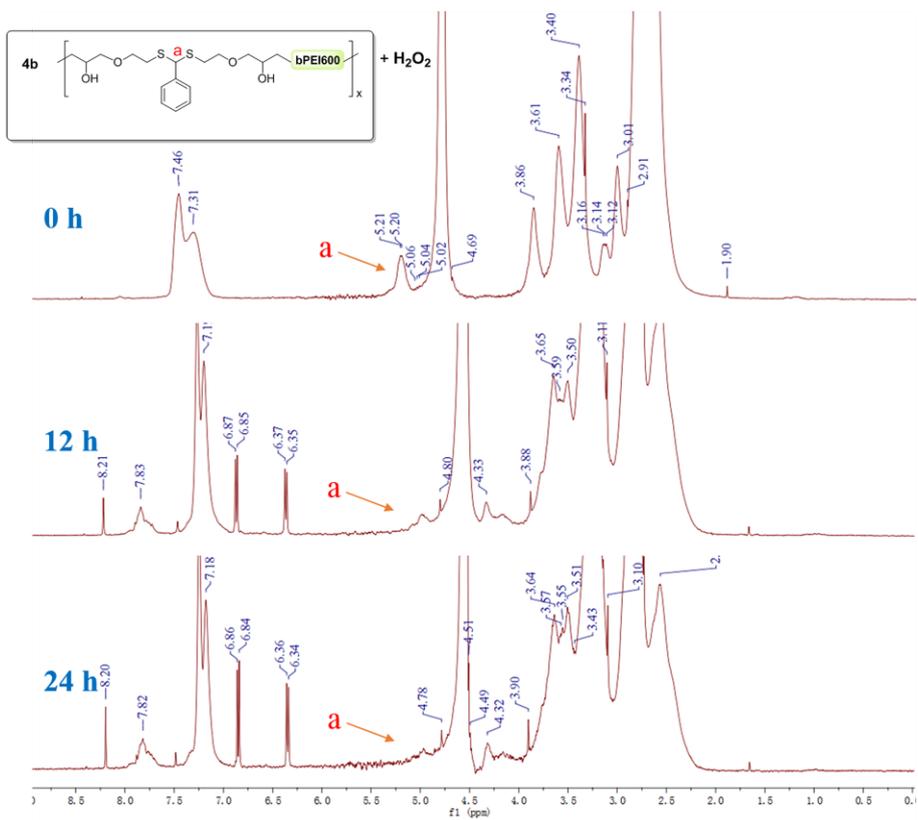
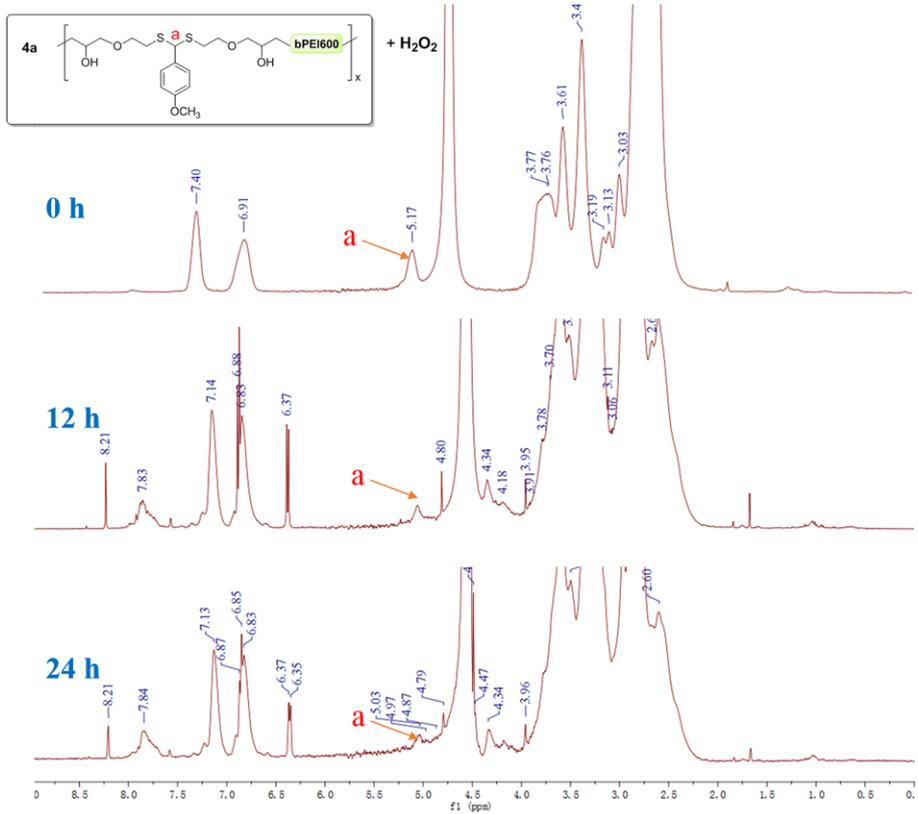


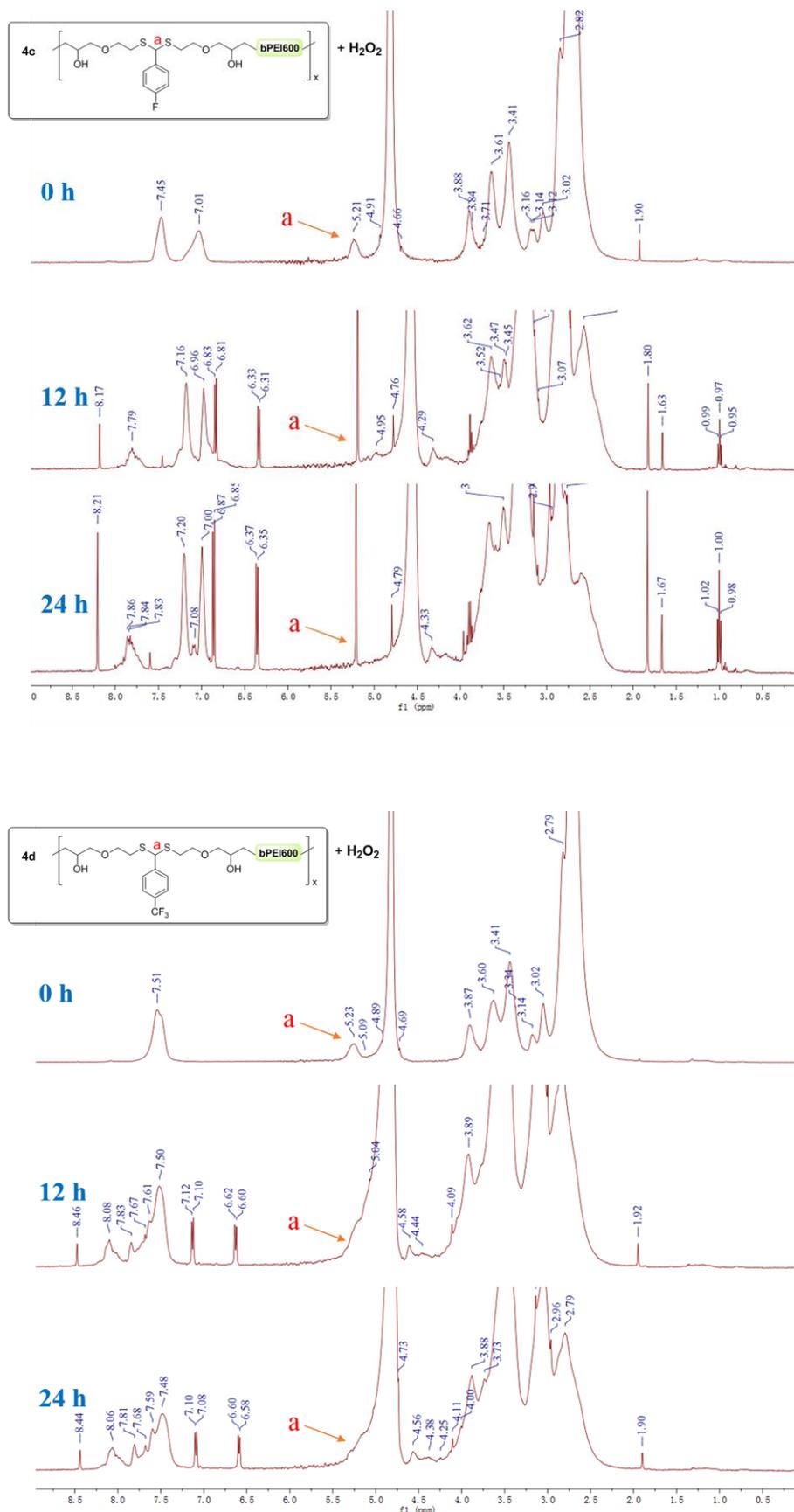
**Fig. S1** The particle diameter obtained by DLS.

Green line: the diameter of **4a**/DNA complexes at w/w ratio of 2 without FBS;

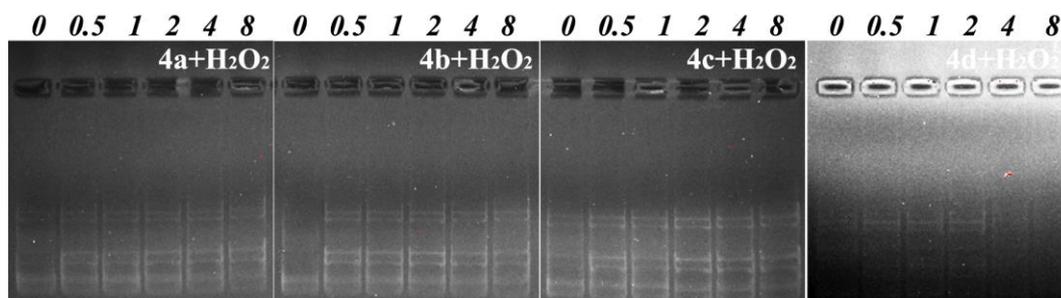
red line: the diameter of 10% FBS;

blue line: the diameter of **4a**/DNA complexes at w/w ratio of 2 in presence of 10% FBS.





**Fig. S2** Study of polymer **4** decomposition upon treatment with 100 mM H<sub>2</sub>O<sub>2</sub> (simulated ROS conditions) for 0, 12 and 24 h using <sup>1</sup>H-NMR analysis.



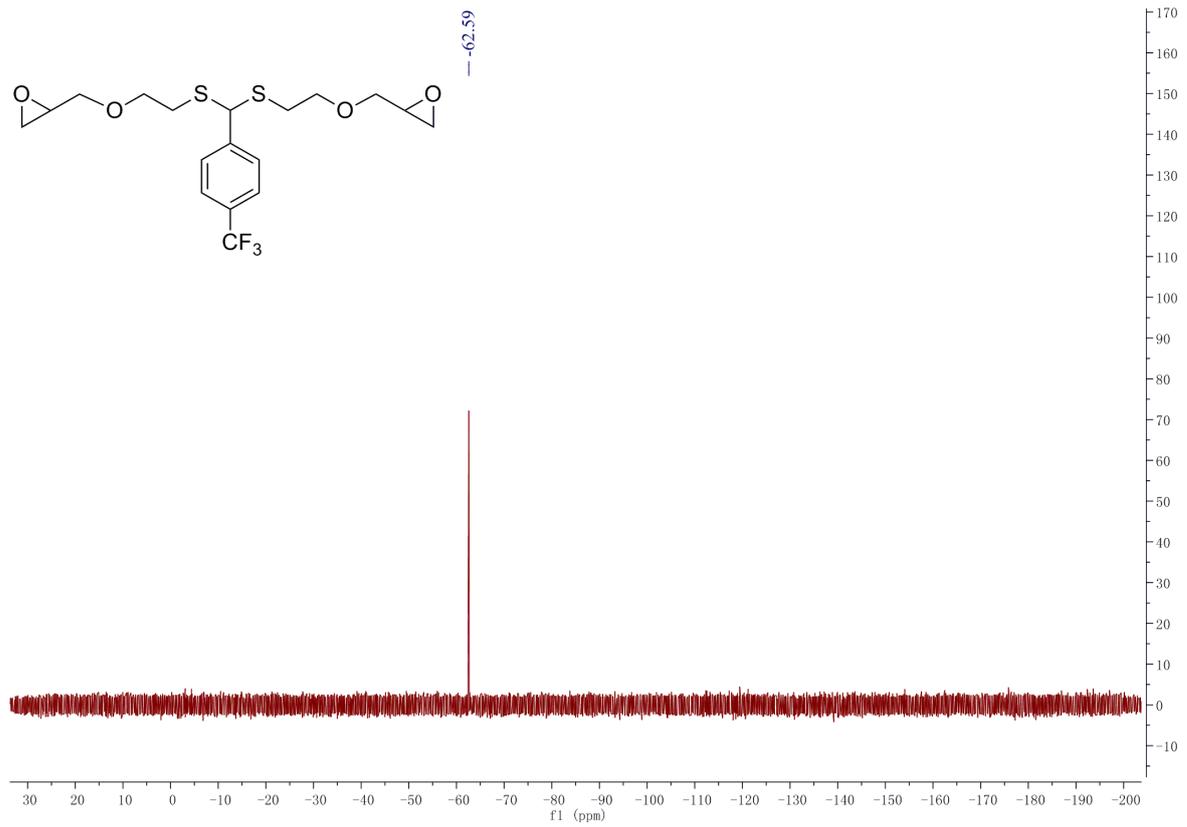
**Fig. S3** Agarose gel electrophoresis of polymer/DNA polyplexes prepared at different w/w ratios after incubation with 100 mM H<sub>2</sub>O<sub>2</sub> for 48 h at 37 °C. In each image, the first lane is the DNA control.

**Table S1** Polymer/DNA ratio in terms of both weight ratio (w/w) and N/P ratio (polymer nitrogen/DNA phosphate) were used.

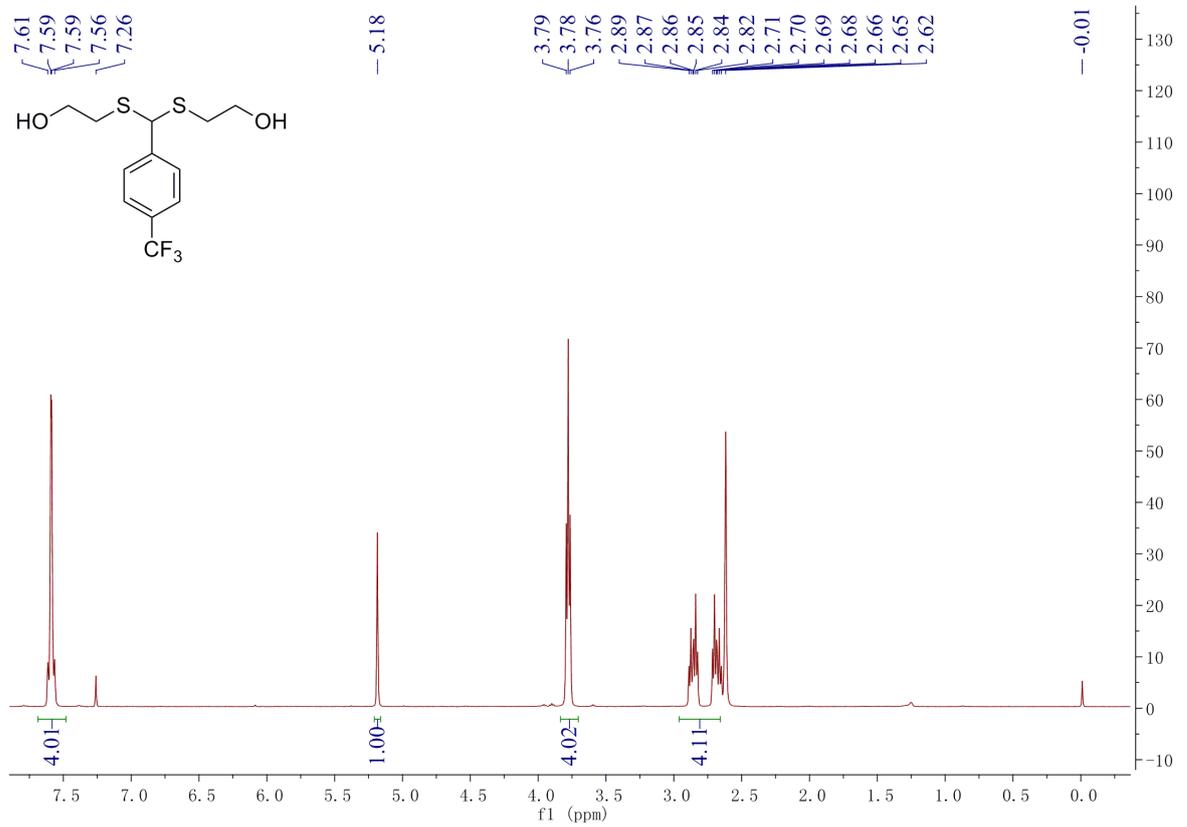
polymer	w/w ratio	1.4	2	4	6
	N/P ratio				
<b>4a</b>			8.74	17.49	26.22
<b>4b</b>			9.02	18.04	27.06
<b>4c</b>			8.85	17.71	26.55
<b>4d</b>			8.42	16.84	25.26
<b>PEI 25K</b>		10			
<b>PEI 600</b>				28.7	

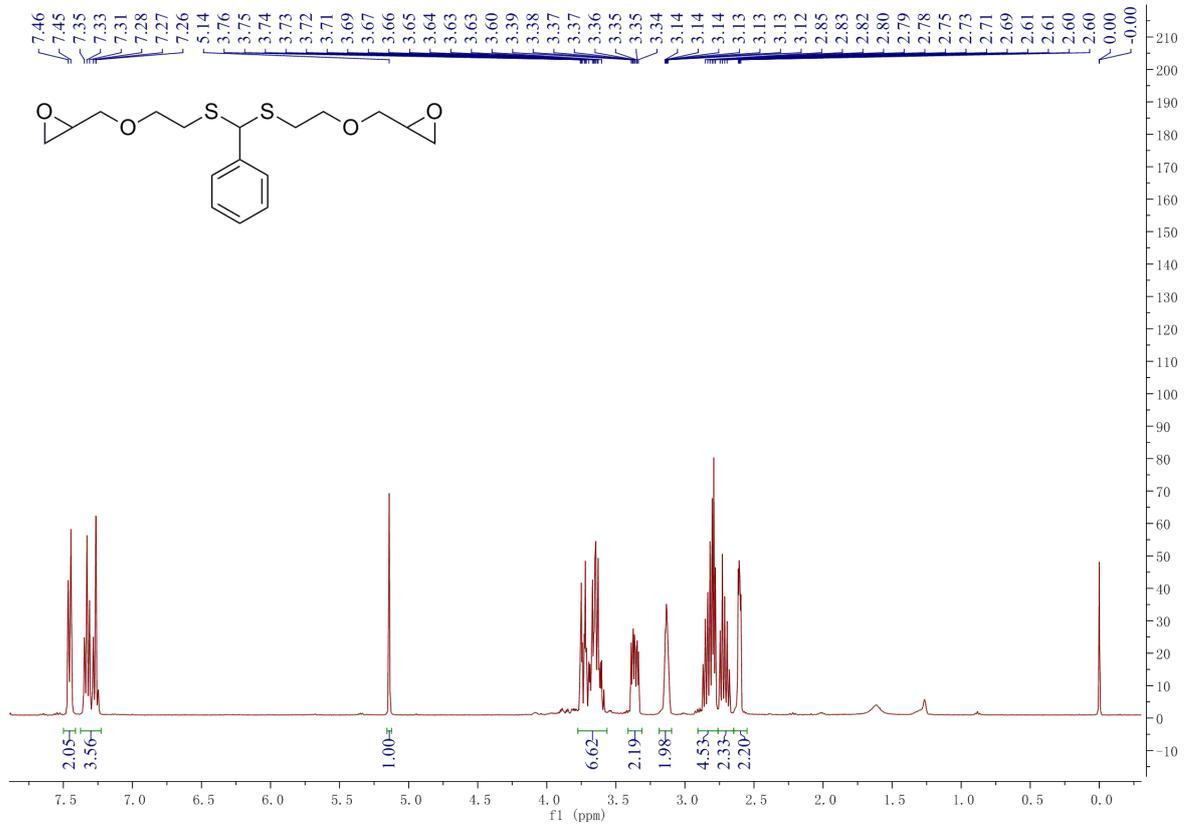
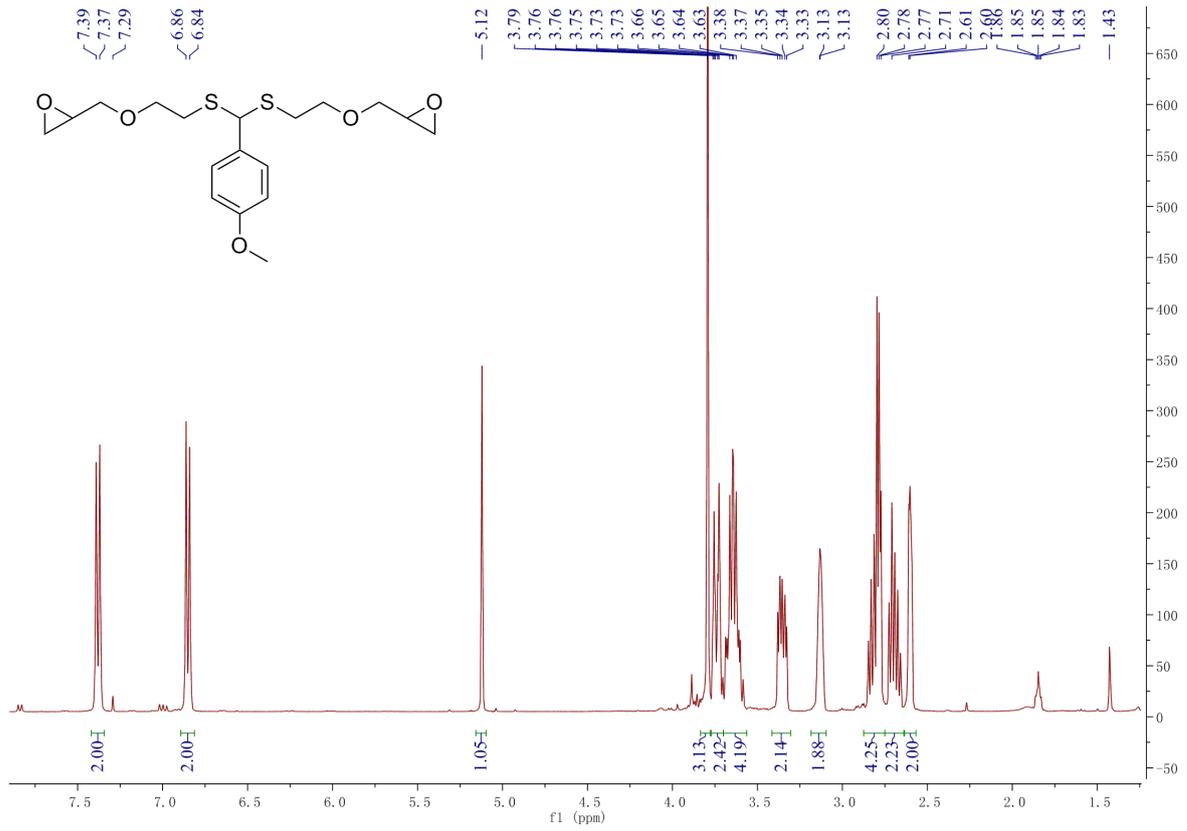
## Spectra

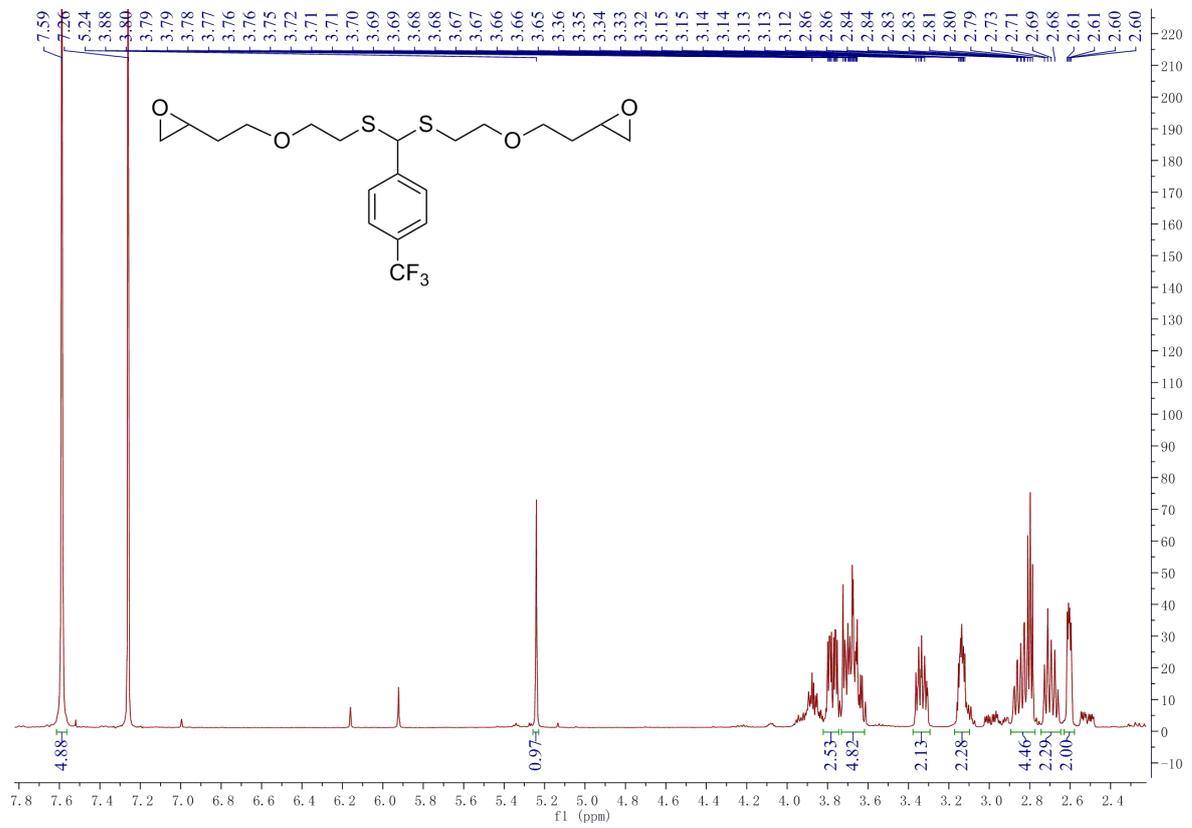
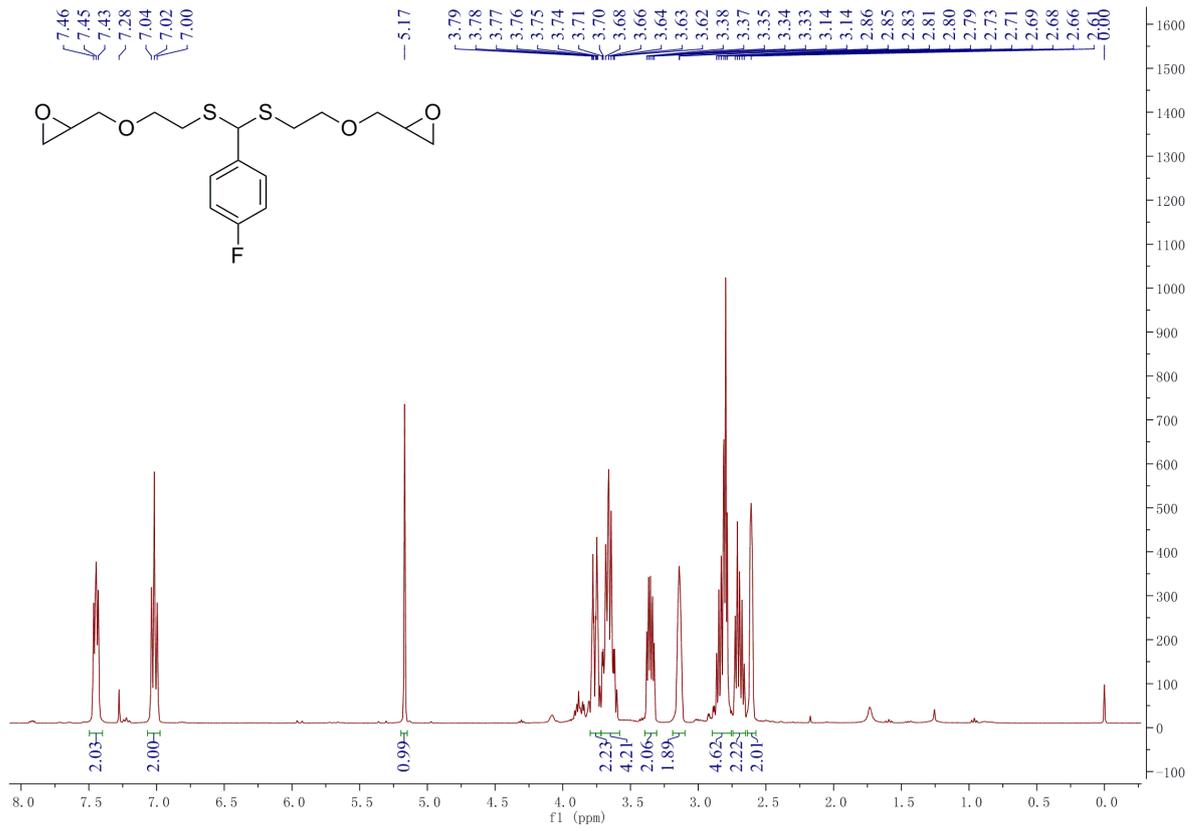
### <sup>19</sup>F-NMR Spectra

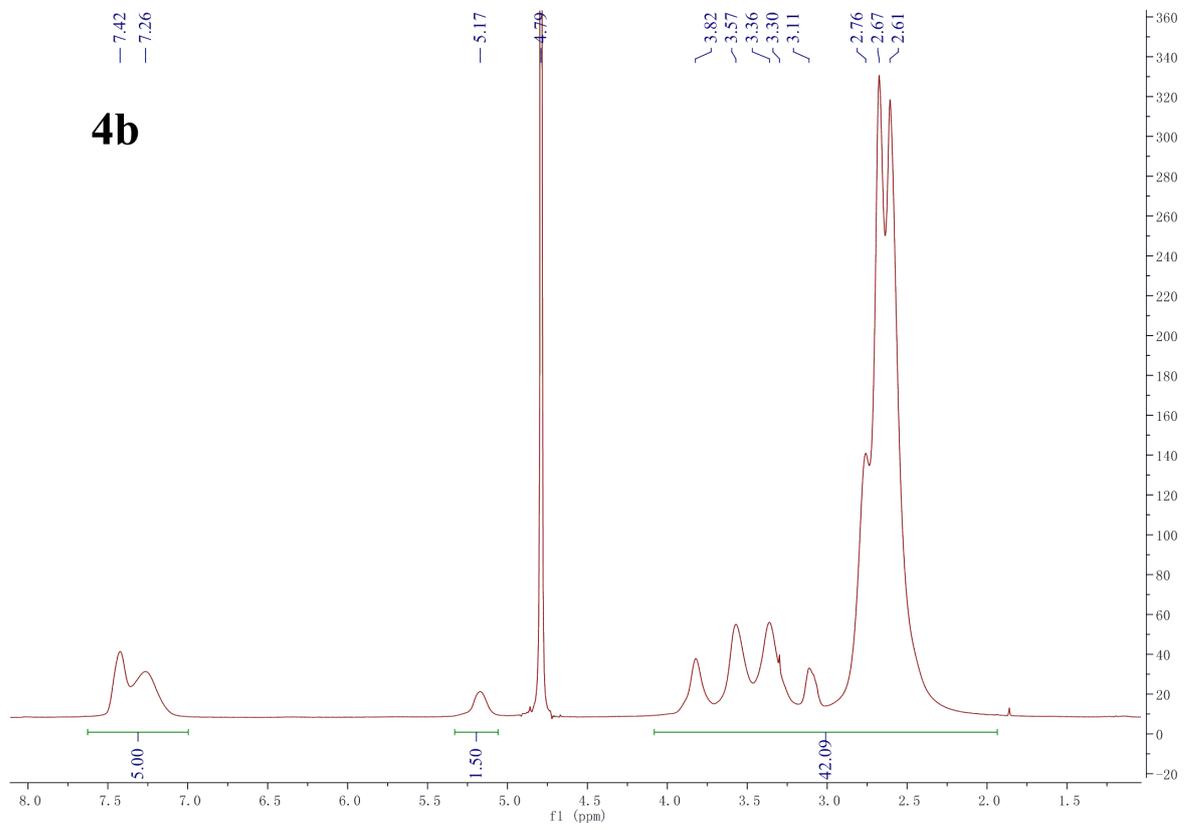
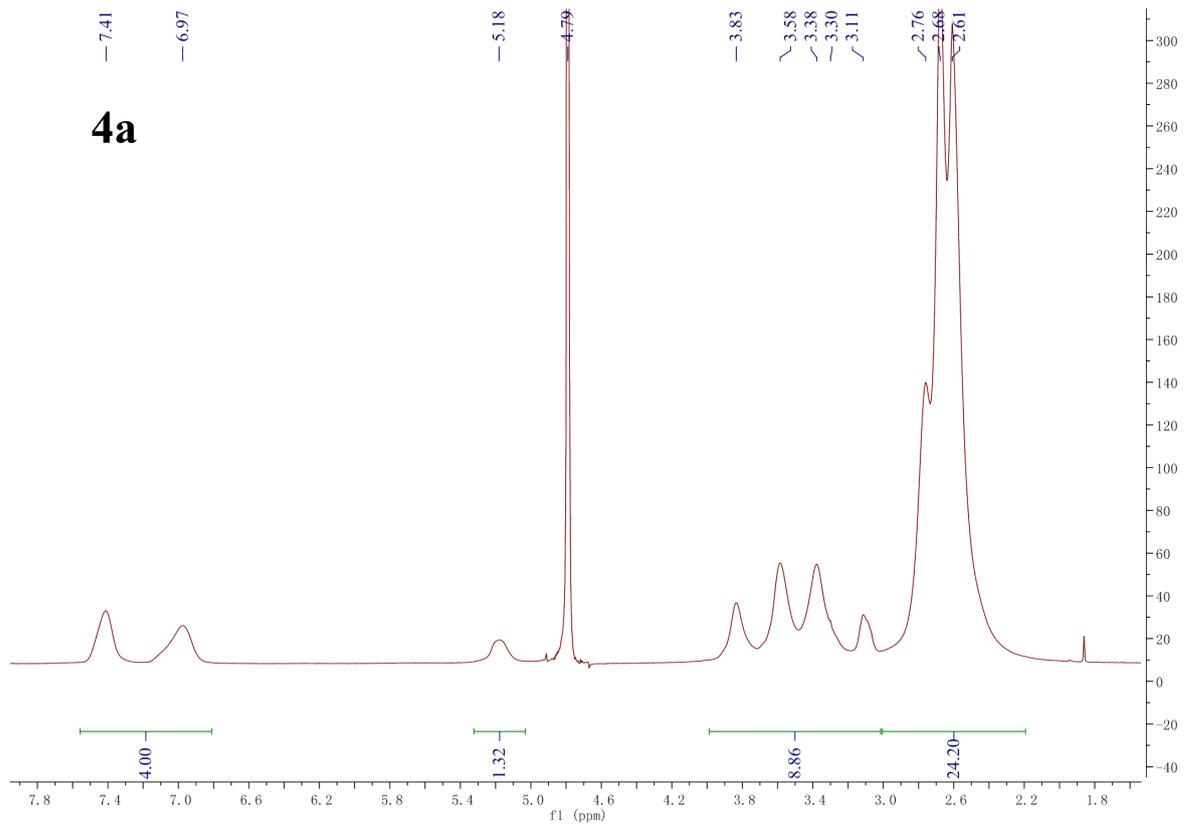


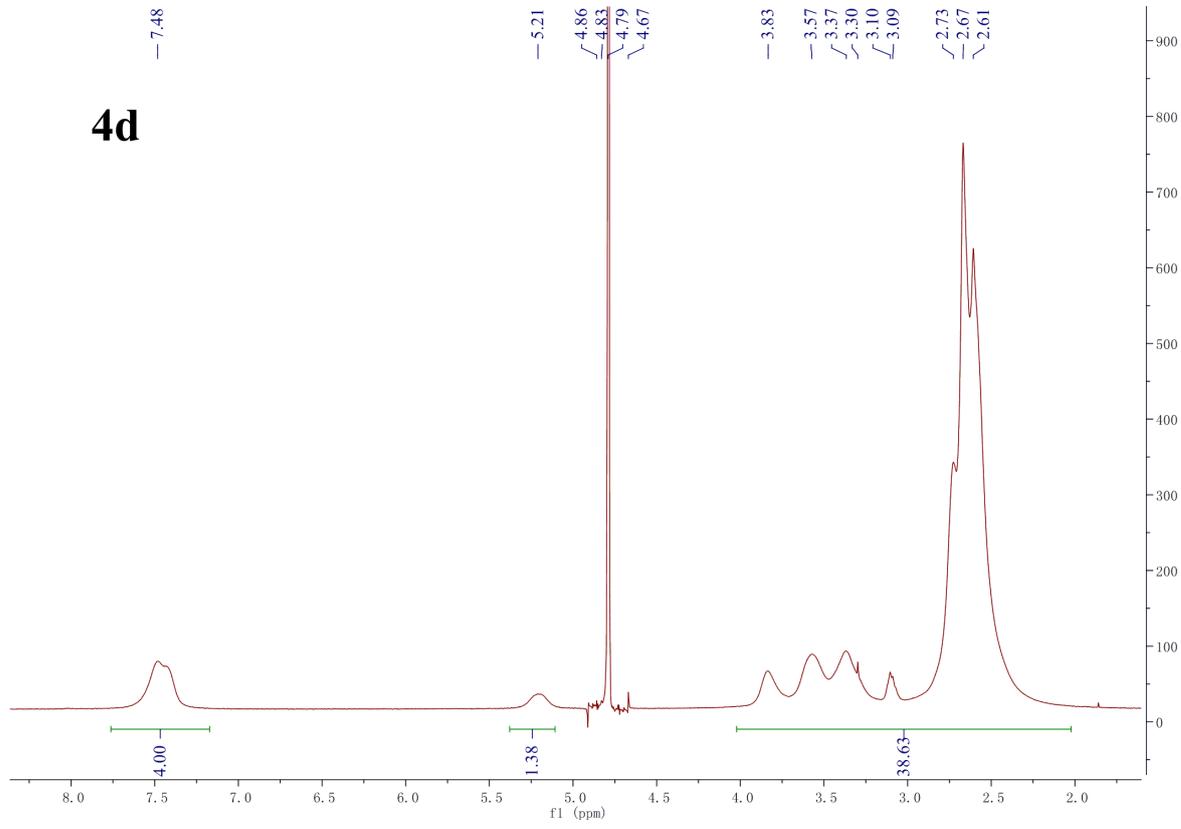
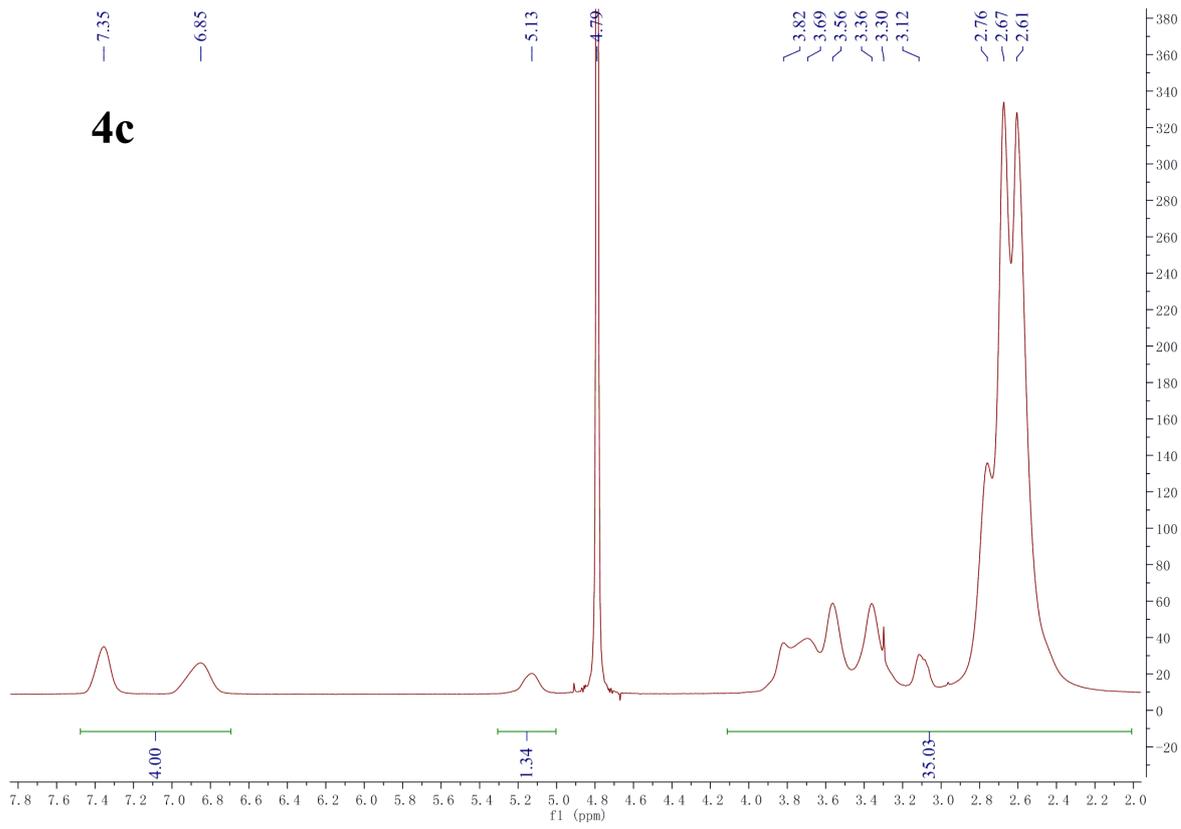
### $^1\text{H-NMR}$ Spectra



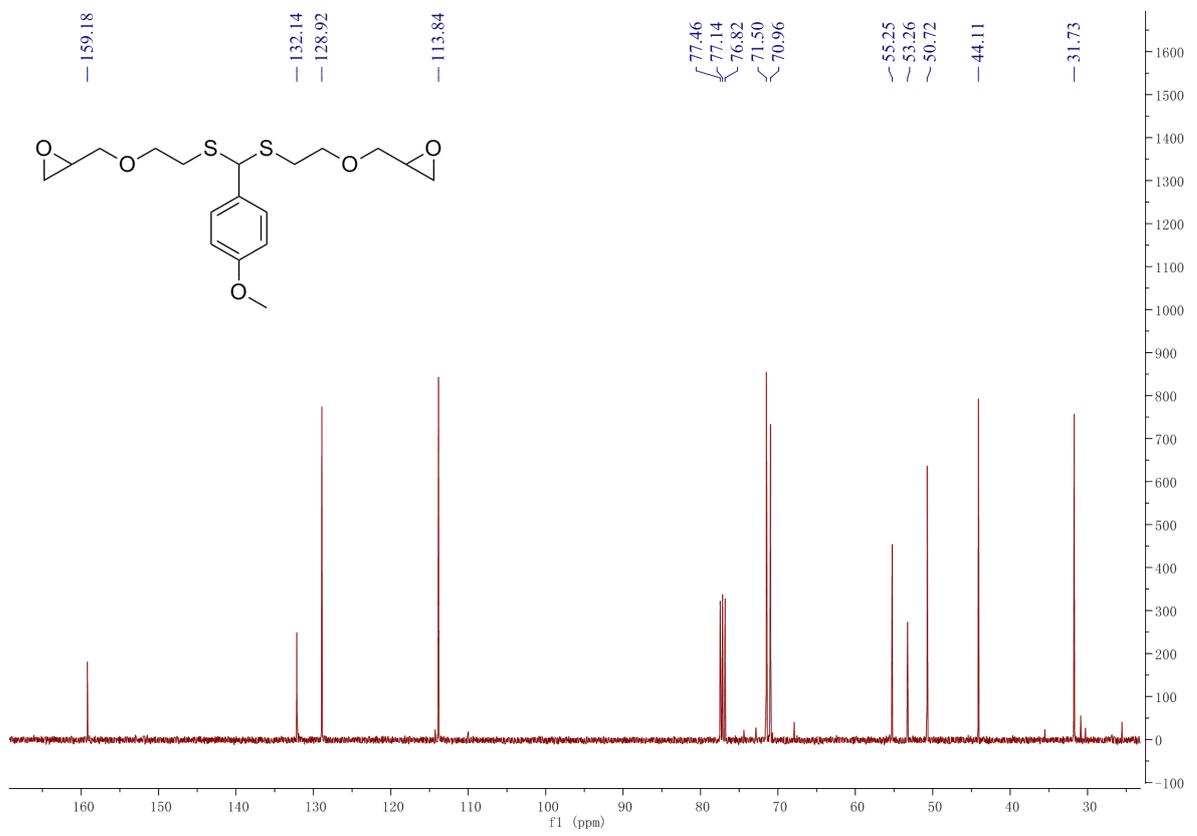
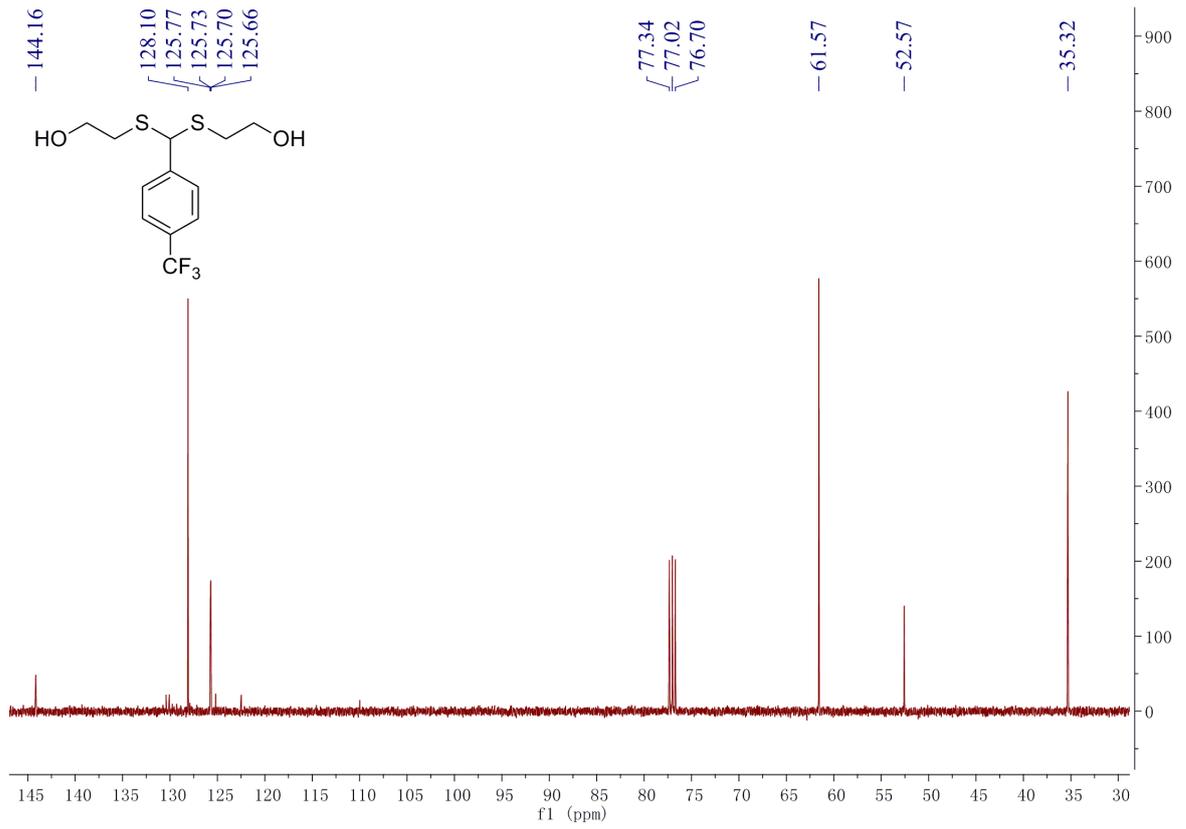


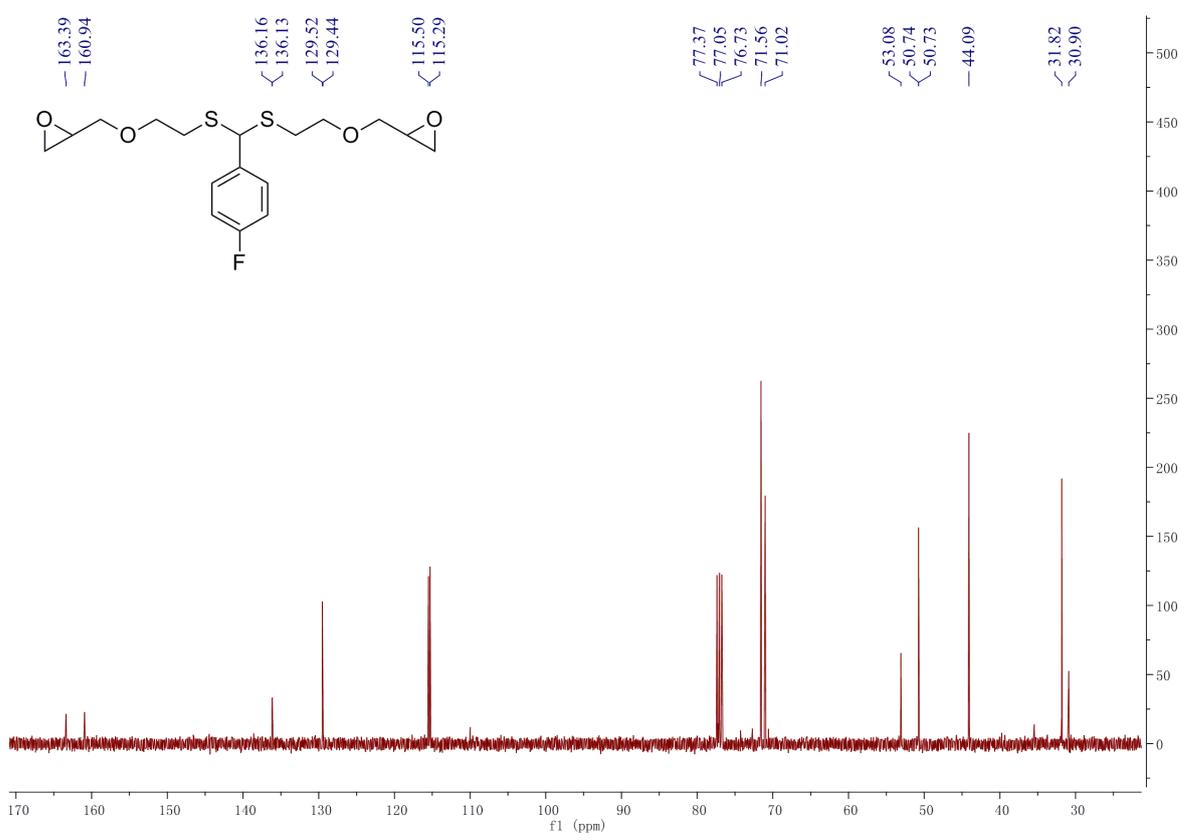
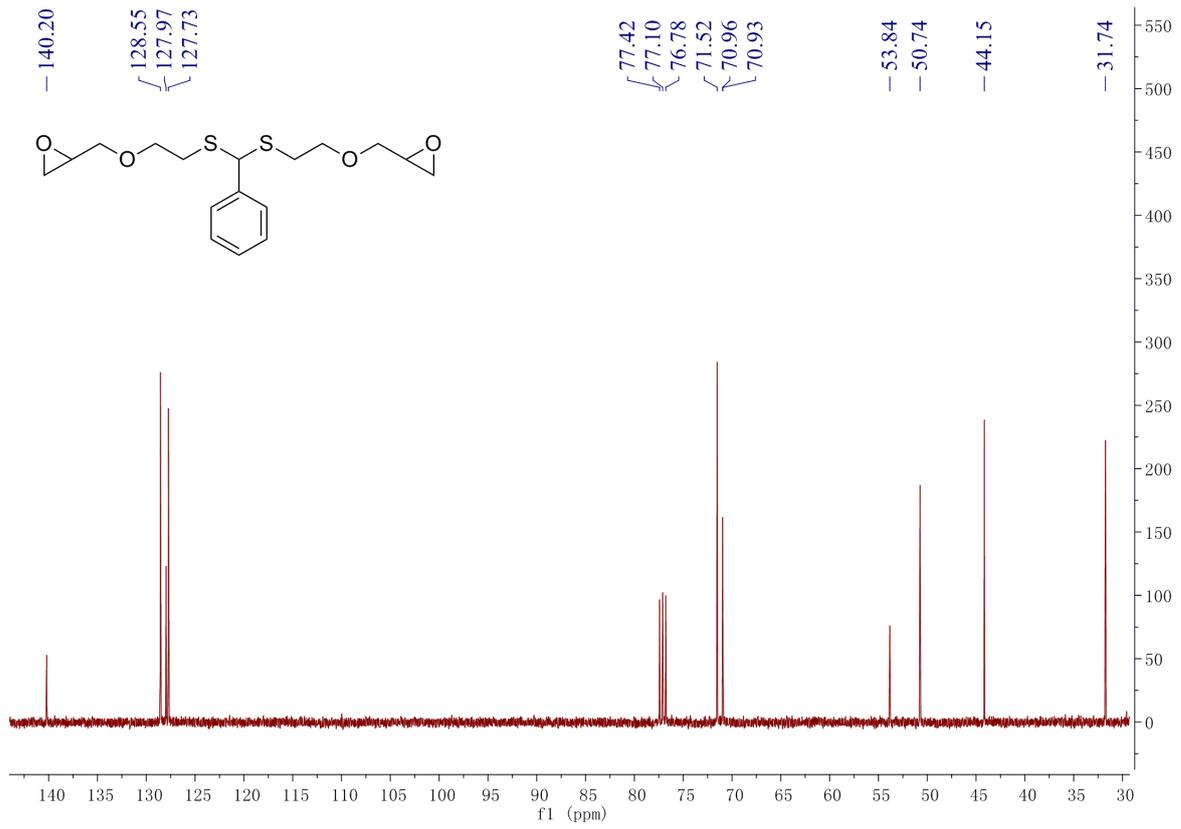


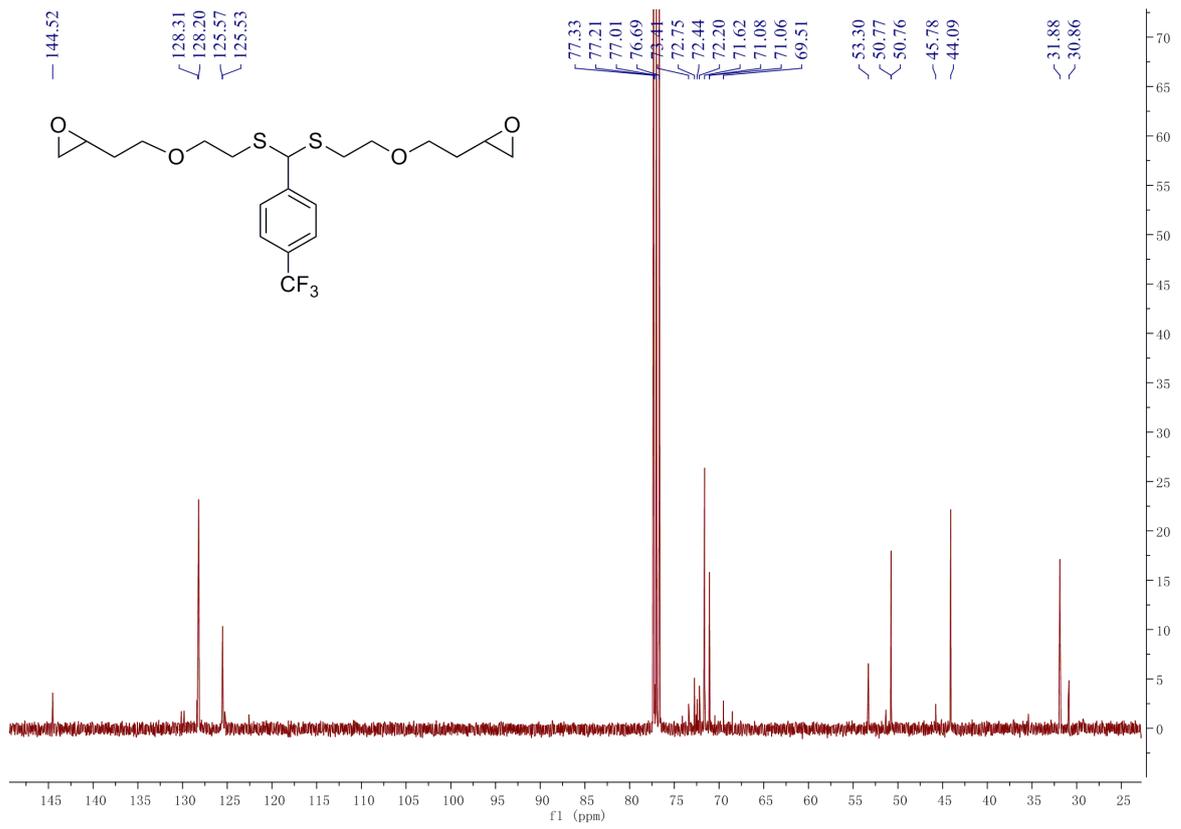




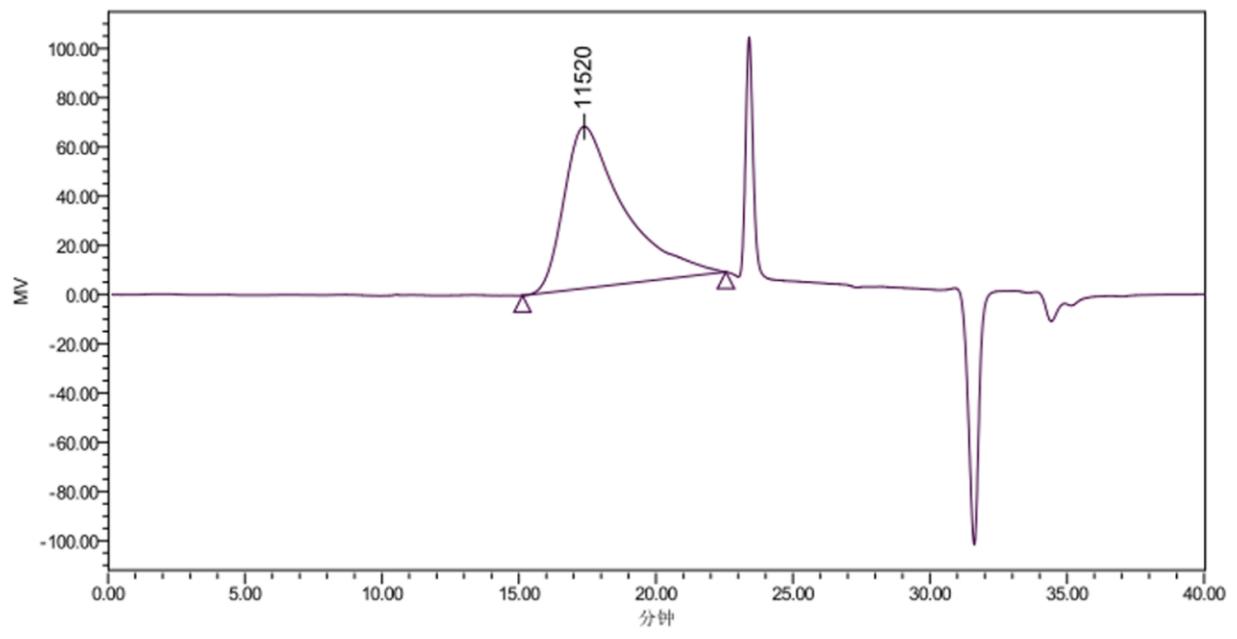
**<sup>13</sup>C-NMR Spectra**







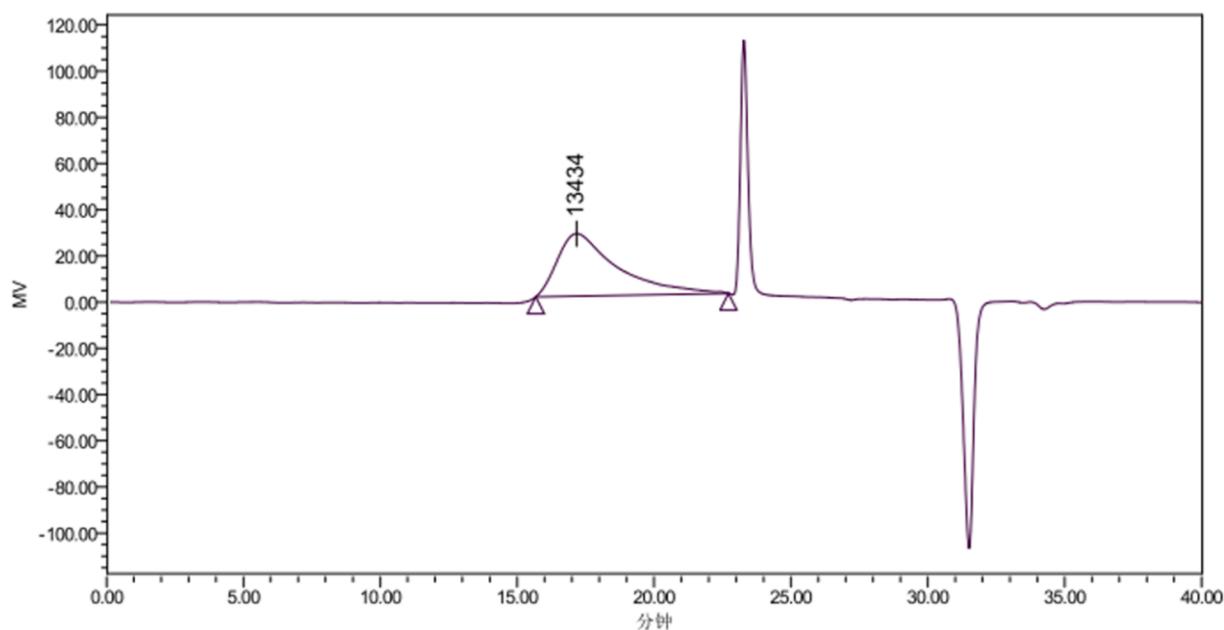
**GPC**



宽分布未知样相对峰表

分布名	Mn (道尔顿)	Mw (道尔顿)	MP	Mz (道尔顿)	Mz+1 (道尔顿)	多分散性	Mz/Mw	Mz+1/Mw
1	5349	9871	11520	14803	19572	1.845554	1.499636	1.982787

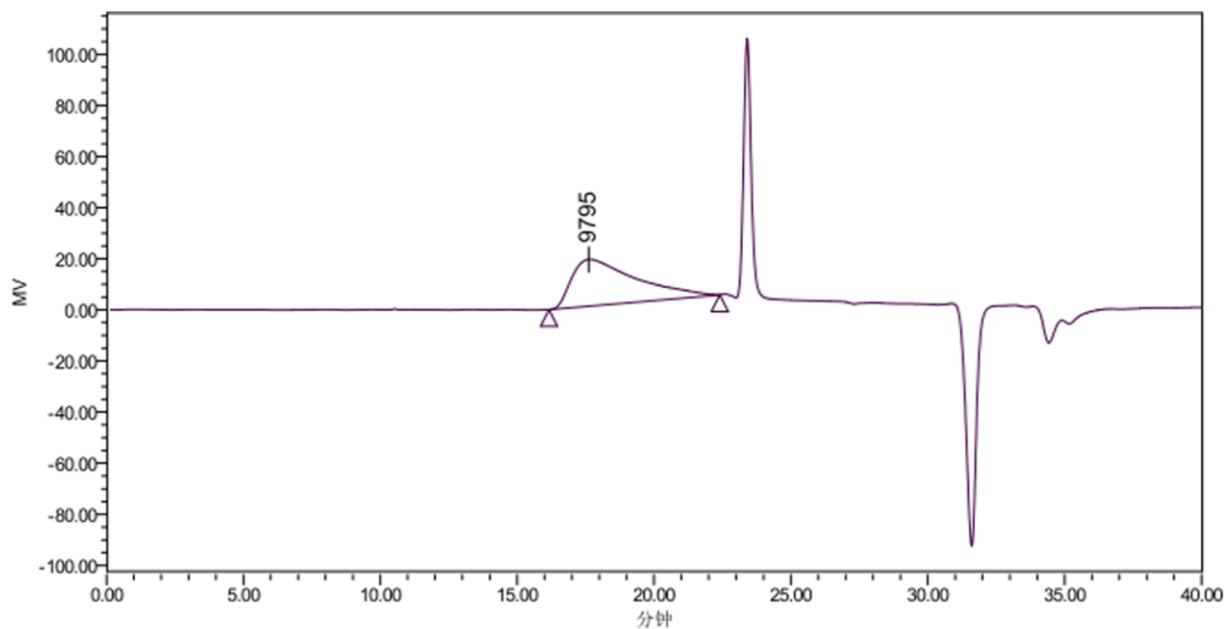
**4a**



宽分布未知样相对峰表

分布名	Mn (道尔顿)	Mw (道尔顿)	MP	Mz (道尔顿)	Mz+1 (道尔顿)	多分散性	Mz/Mw	Mz+1/Mw
1	5547	10916	13434	16168	20475	1.968078	1.481086	1.875709

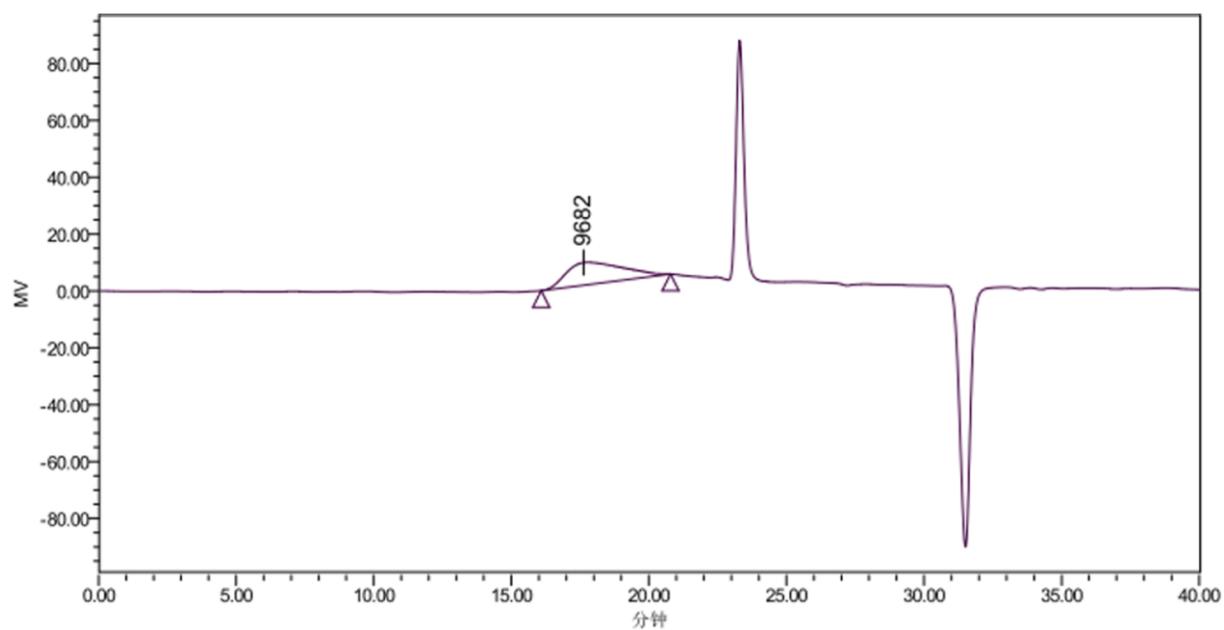
4b



宽分布未知样相对峰表

分布名	Mn (道尔顿)	Mw (道尔顿)	MP	Mz (道尔顿)	Mz+1 (道尔顿)	多分散性	Mz/Mw	Mz+1/Mw
1	4199	7123	9795	10114	12458	1.696495	1.419886	1.748911

4c



宽分布未知样相对峰表

分布名	Mn (道尔顿)	Mw (道尔顿)	MP	Mz (道尔顿)	Mz+1 (道尔顿)	多分散性	Mz/Mw	Mz+1/Mw
1	5879	8209	9682	10781	13143	1.396357	1.313374	1.601084

4d