Supplementary information

Effects of Alkyl Chain Length on the Cold Crystallization of Schiff-Base Nickel(II) Complexes

Toru Ishikawa,* Akinori Honda and Kazuo Miyamura*

Department of Chemistry, Faculty of Science, Tokyo University of Science, 1-3 Kagurazaka, Shinjuku-ku, Tokyo 162-8601, Japan.

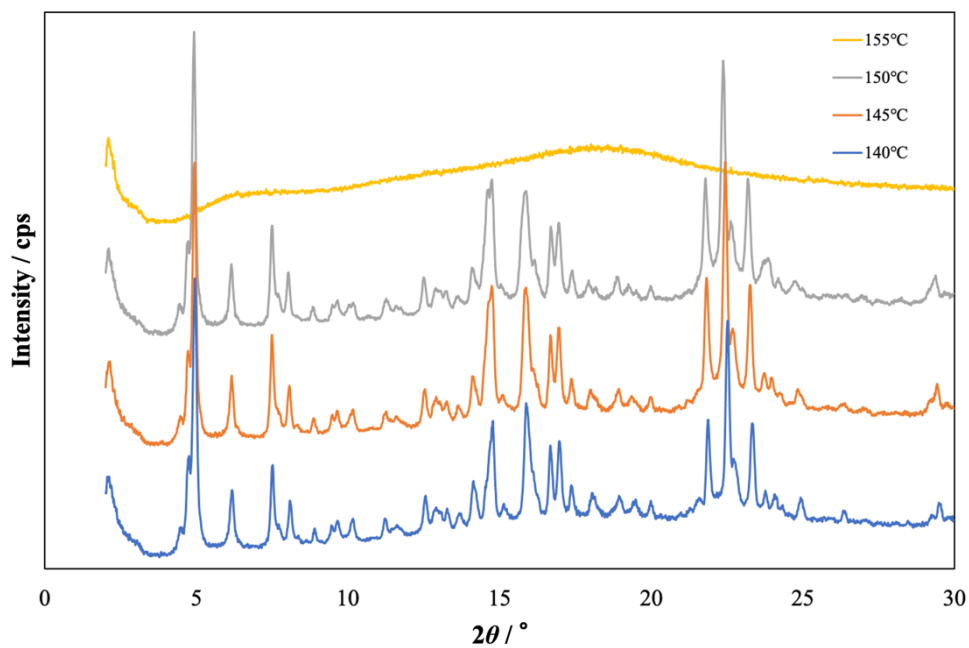E-mail: 1319701@ed.tus.ac.jp (T. Ishikawa), miyamura@rs.kagu.tus.ac.jp (K. Miyamura)

Fig. S1 X-ray diffraction patterns of OC6-salmpn at around 140-155°C after cold crystallization.
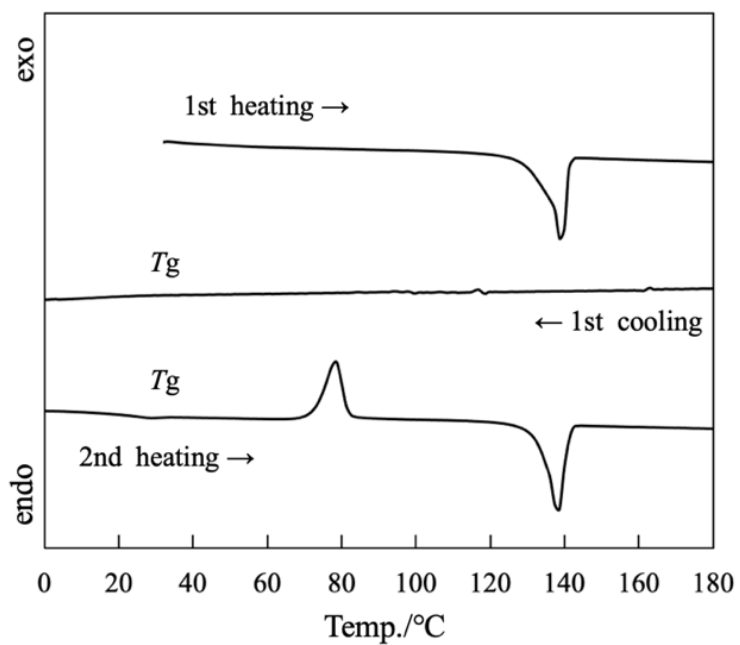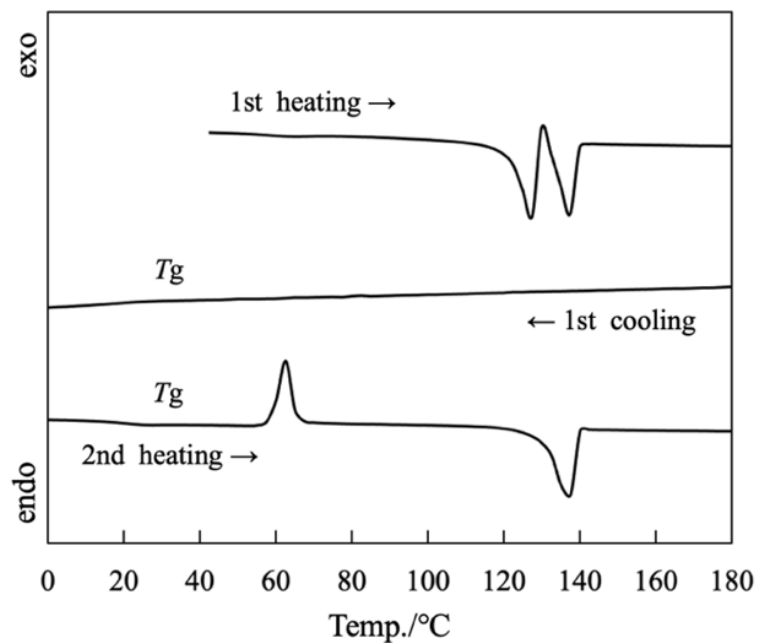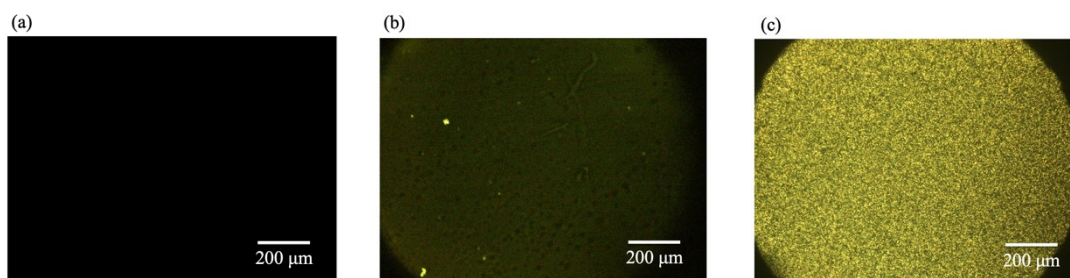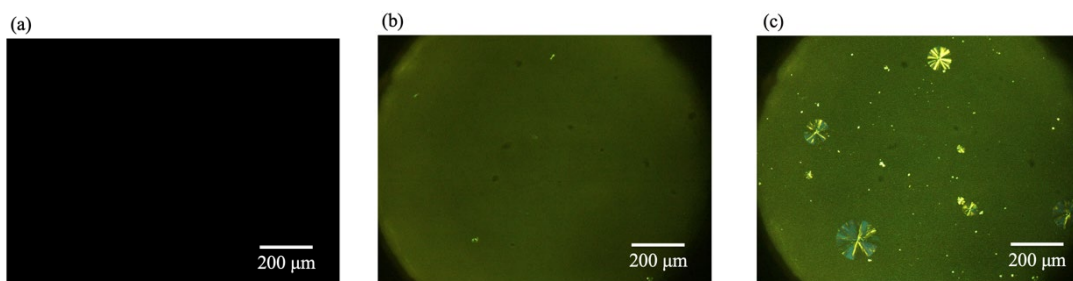

**Fig. S2** DSC diagrams of OC8-salmpn. Heating and cooling rate: 5℃/min.

Fig. S3 DSC diagrams of OC10-salmpn. Heating and cooling rate: 5℃/min.

Fig. S4 Optical microscopic images of OC8-salmpn (a) melted isotropic liquid state at 170℃ on 1st heating, and (b) isotropic supercooled liquid state under Tg , and (c) cold crystallized state at 100 °C on 2nd heating.


Fig. S5 Optical microscopic images of OC10-salmpn (a) melted isotropic liquid state at 170℃ on 1st heating, and (b) isotropic supercooled liquid state under Tg , and (c) cold crystallized state at 100 °C on 2nd heating.
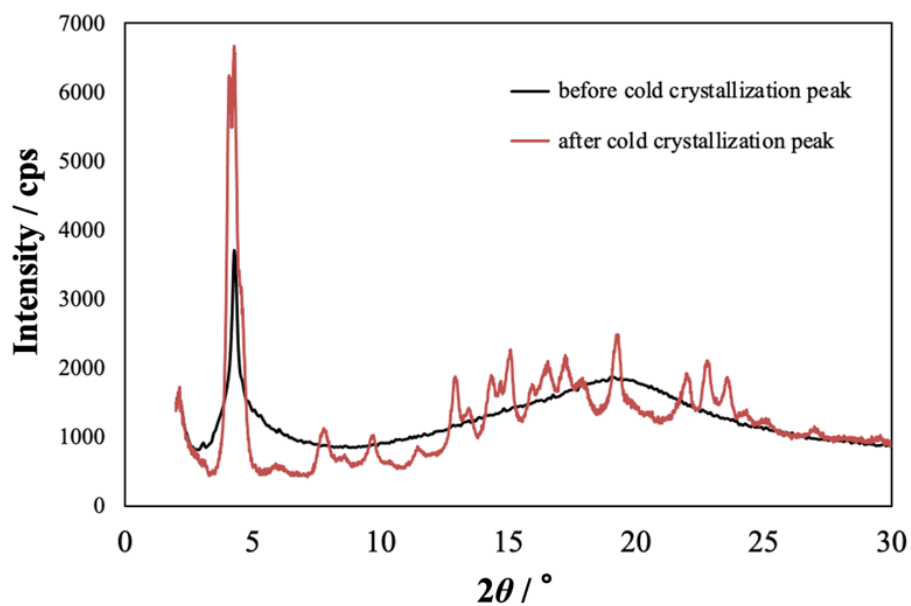
Fig. S6 X-ray diffraction patterns of OC8-salmpn. Black line: at 25 °C on heating (before cold crystallization peak). Red line: once heated to 100°C (after cold crystallization peak).
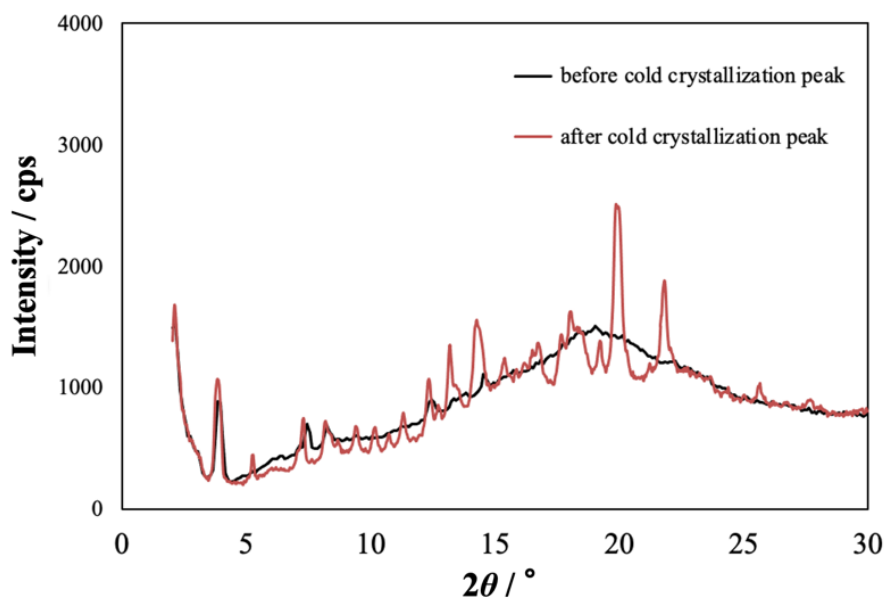
**Fig. S7** X-ray diffraction patterns of OC10-salmpn. Black line: at 25 °C on heating (before cold crystallization peak). Red line: once heated to 80°C (after cold crystallization peak).

Table S1 Phase transition temperature and phase transition enthalpy of OCn-salmpn (n = 6,8,10).

n	1st heating				1st cooling	2nd heating				
	T_{m1}(°C)	ΔH_{m1}(kJ/mol)	T_{m2}(°C)	ΔH_{m2}(kJ/mol)	Tg(°C)	Tg(°C)	Tc_1(°C)	ΔHc_1(kJ/mol)	T_{m1}(°C)	ΔH_{m1}(kJ/mol)
6	150.9	24.4			43.1	37.2	102.1	17.0	151.4	22.7
8	135.3	22.4			29.9	30.5	72.5	14.4	134.0	21.2
10	122.2	19.3	134.3	14.0	19.1	15.4	58.8	12.8	132.1	20.3
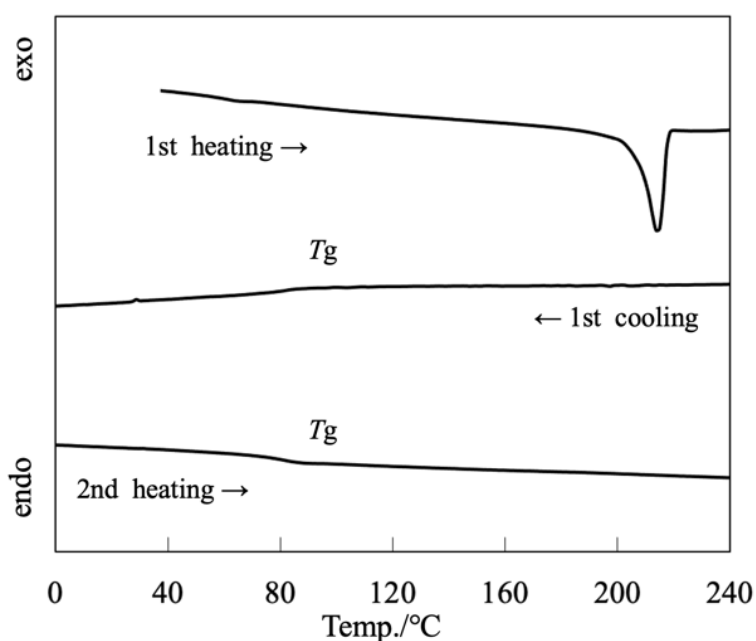
Fig. S8 DSC diagrams of OC2-salmpn. Heating and cooling rate: 5℃/min.

Table S2 Phase transition temperature and phase transition enthalpy of OCn-salmpn (n = 2,4).

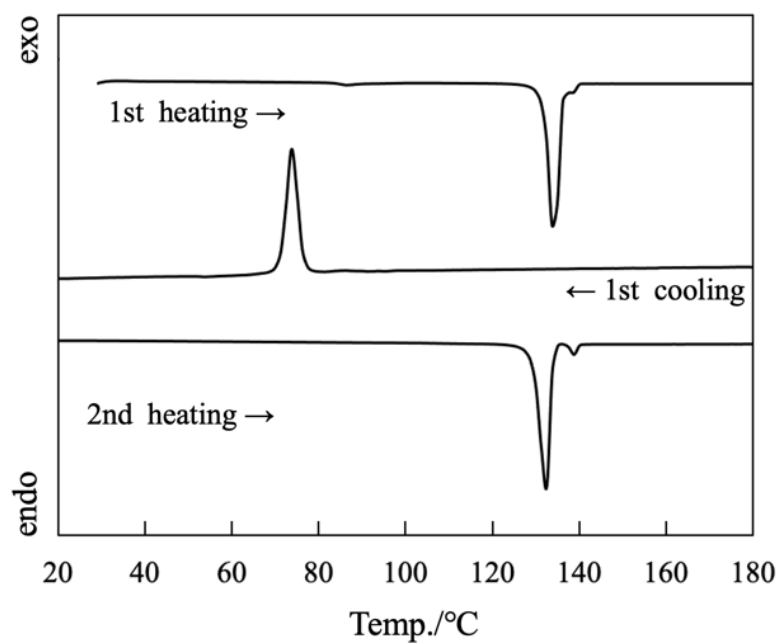| n	1st heating		1st cooling	2nd cooling
	T_m(°C)	ΔH_m(kJ/mol)	Tg(°C)	Tg(°C)
2	207.9	18.6	85.9	73.3
4	94.9	42.2	49.6	44.9

Fig. S9 DSC diagrams of OC12-salmpn. Heating and cooling rate: 5℃/min.

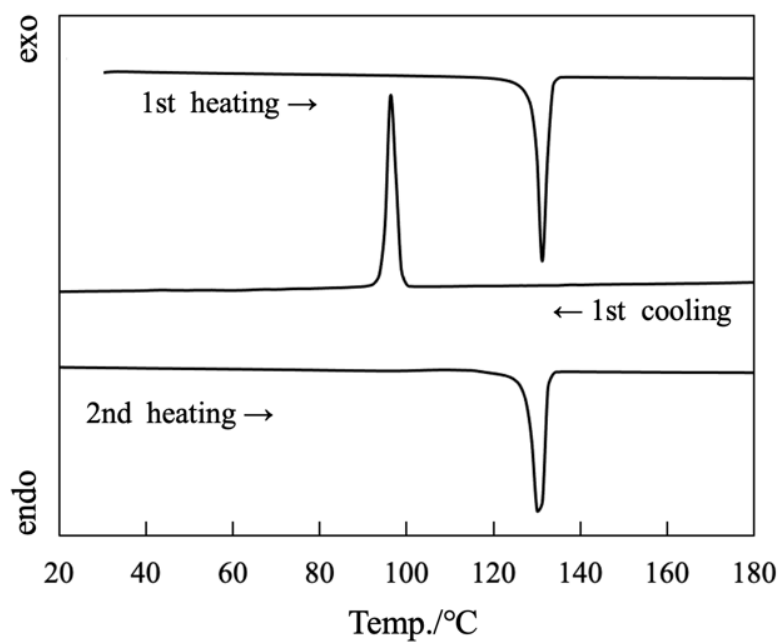**Fig. S10** DSC diagrams of OC16-salmpn. Heating and cooling rate: 5℃/min.
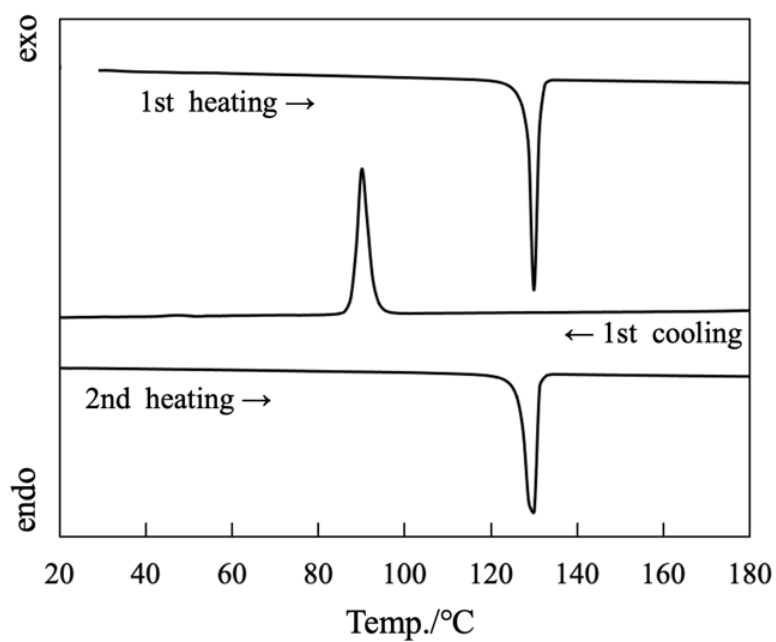
Fig. S11 DSC diagrams of OC18-salmpn. Heating and cooling rate: 5℃/min.

Table S3 Phase transition temperature and phase transition enthalpy of OCn-salmpn (n = 12,14,16,18).

| n	1st heating		1st cooling		2nd heating			
	T_{m1}(℃)	ΔH_{m1}(kJ/mol)	T_c (℃)	ΔH_c (kJ/mol)	T_{m1}(℃)	ΔH_{m1}(kJ/mol)	T_{m2}(℃)	ΔH_{m2}(kJ/mol)
12	131.9	48.2	76.3	42.1	129.4	44.3	137.3	1.7
14	129.6	46.8	83.6	42.0	129.6	41.5	133.8	0.9
16	128.4	58.9	92.9	56.4	126.7	57.5		
18	129.4	65.4	98.4	63.1	127.8	67.1		
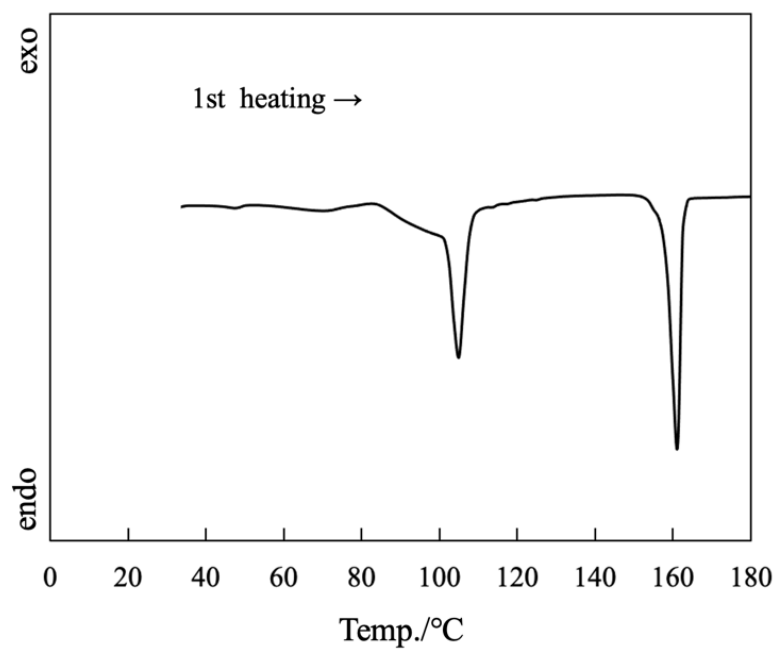
Fig. S12a DSC diagrams of OC6-salmpn・CHCl$_3$ on 1st heating. Heating rate: 5℃/min.
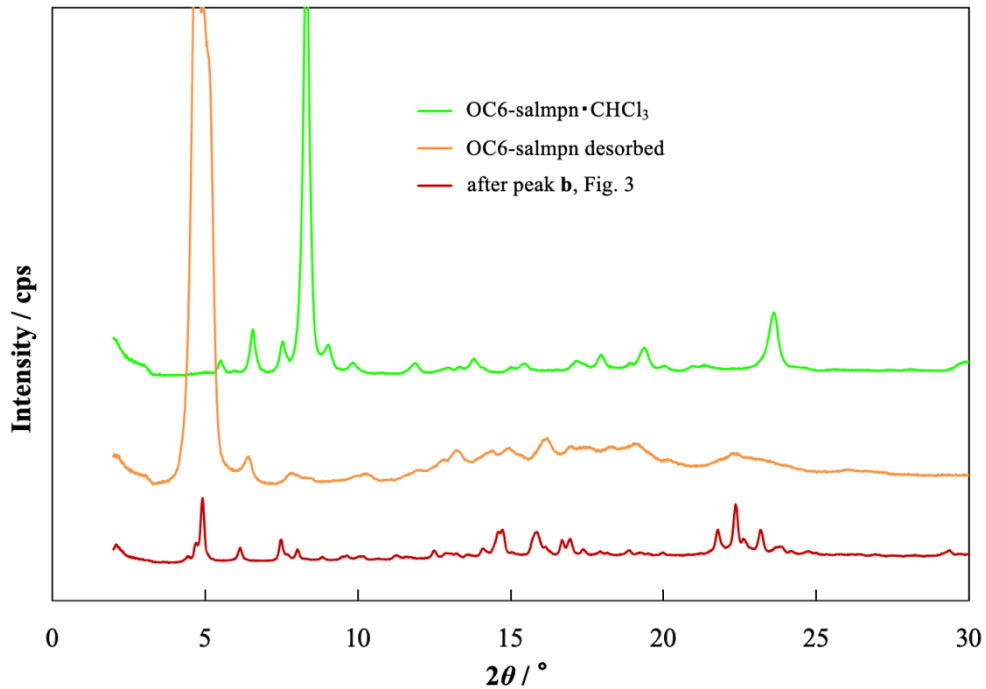
Fig. S12b X-ray diffraction patterns of simulated single crystal structure, OC6-salmpn・CHCl$_3$, and OC6-salmpn desorption and the pattern in Fig. 5 (red curve).
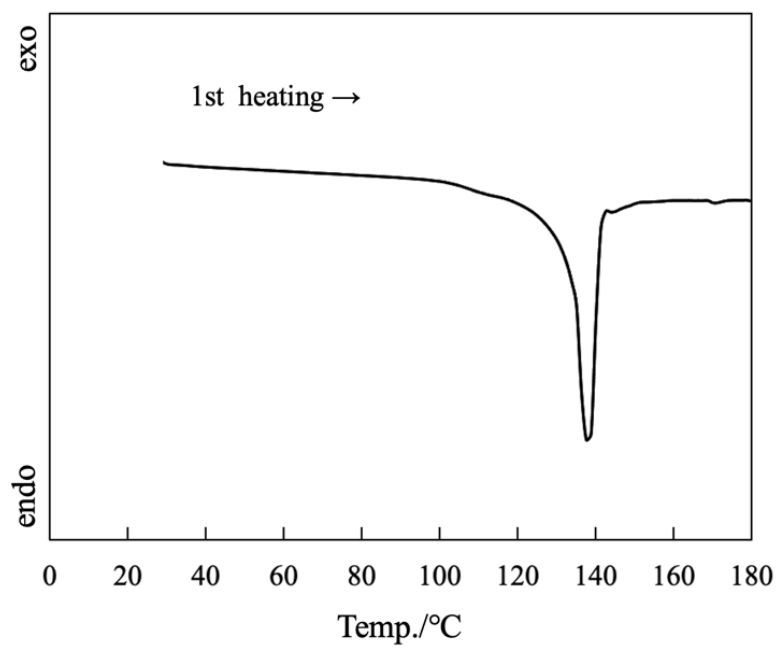
Figure S13 DSC diagrams of OC4-salmpn・CHCl$_3$ on 1st heating. Heating rate: 5℃/min.