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A general environmentally friendly (sustainable) access to long chain fatty acid ionic liquids (LCFA-ILs)

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Supporting Information

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Supporting information for this article is given via a link at the end of the document.

Fig S1: ^{1}H NMR of **1** at 25 °C

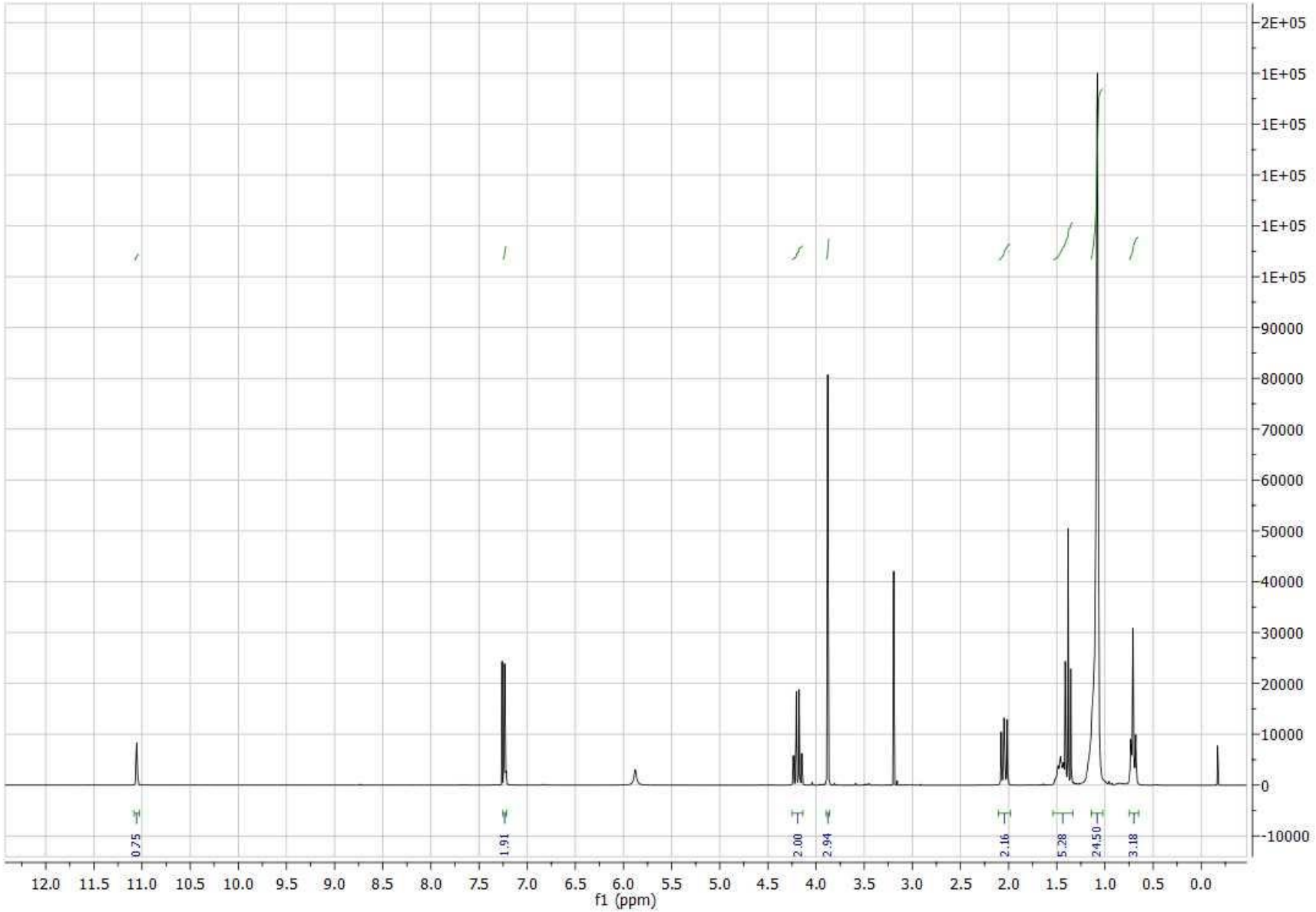


Fig S2: ^{13}C NMR of **1** at 25 °C

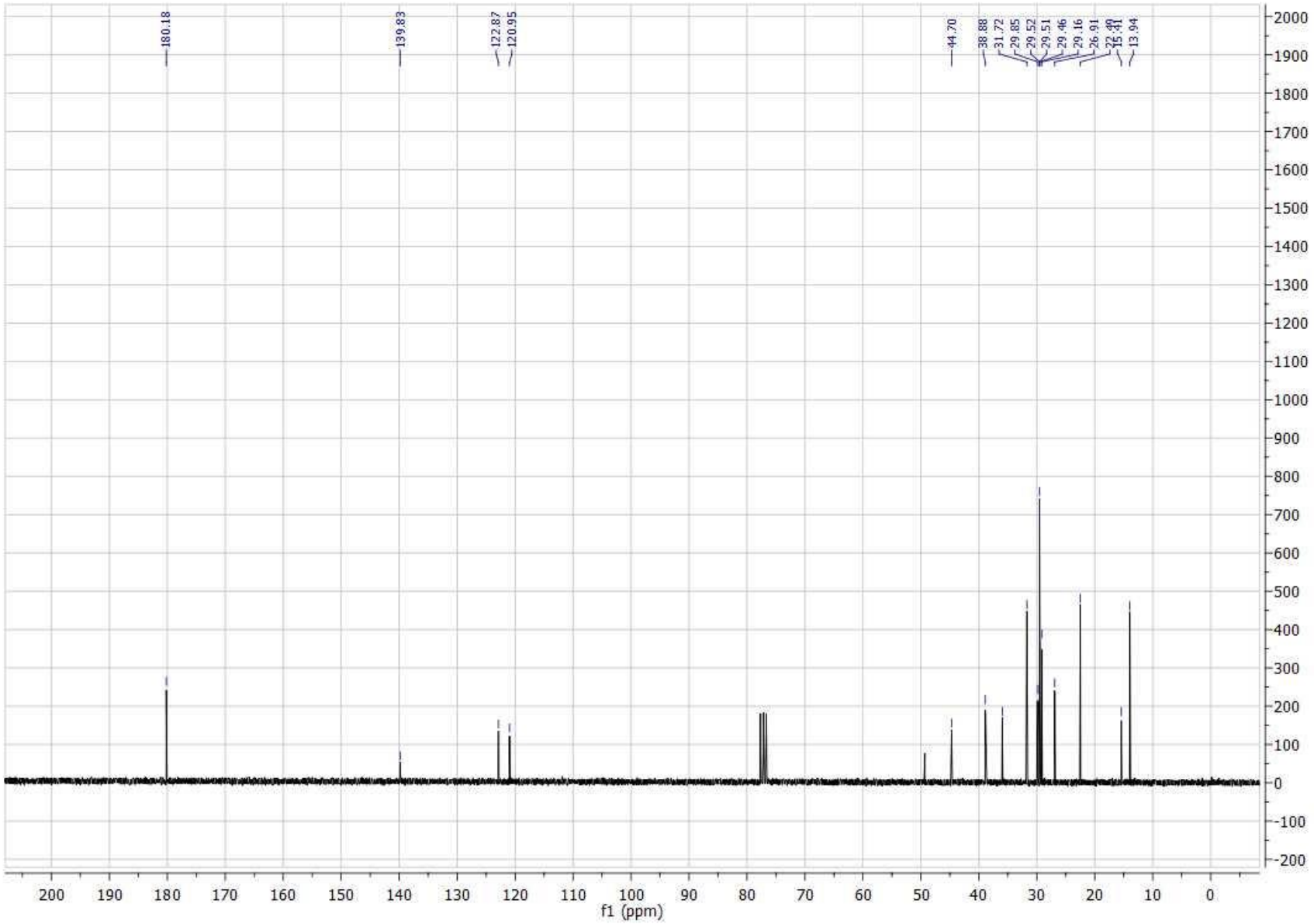


Table S1. Peak assignments and integrals of the ^{1}H-NMR spectrum of **1** at 25°C.

[EMIM]	**[C_{16}]**	**δ (ppm)**	**Shape**	**Integral**
$C(2)H_{\text{imidazolium}}$	-	11,06	s	0,75
$CHCl_3$	-	7.26	s	-
$C(4\text{-}5)H_{\text{imidaziolium}}$	-	7,24	t	1,91
$C(1)\ H_{2\ \text{chain}}$	-	4,19	m	2,00
$C\ (1')H_{3\ \text{chain}}$	-	3,88	s	2,94
MeOH		3,19	s	-
-	$C(2)H_2$	2,05	t	2,16
-	$C(3)H_2$	1,46	p	2,04
$C(2)\ _{\text{chain}}H_3$	-	1,38	t	3,14
-	$C(4\text{ to }15)H_2$	1,22-0,99	m	24,5
-	$C(18)H_3$	0,71	t	3,18

Table S2. Peak assignments of the ^{13}C-NMR spectrum of **1** at 25°C.

[EMIM]	**[C_{16}]**	**δ (ppm)**	**[EMIM]**	**[C_{16}]**	**δ (ppm)**
-	C(1)OO-	180,2	-	$C(\text{chain})H_2$	29,9
$C(2)H_{\text{imidazolium}}$	-	139,8	-	$C(\text{chain})H_2$	29,5-29,4
$C(4)H_{\text{imidazolium}}$	-	122,9			
$C(5)H_{\text{imidazolium}}$	-	121,0	-	$C(\text{chain})H_2$	29,2
$CDCl_3$, $CHCl_3$		77.7-76.7, 77.2	- $C(2)H_{3\ \text{chain}}$	$C(\text{chain})H_2$ -	22,5 15,4
MeOD		49,3	-	$C(16)H_3$	14,0
$C(1)H_{2\ \text{chain}}$	-	44,7			
-	$C(1)H_2$	38.8			
$C(1')H_3$	-	36,0			
-	$C(14)H_2$	31,7			

Fig S3: ^{1}H NMR of **2** at 25 °C

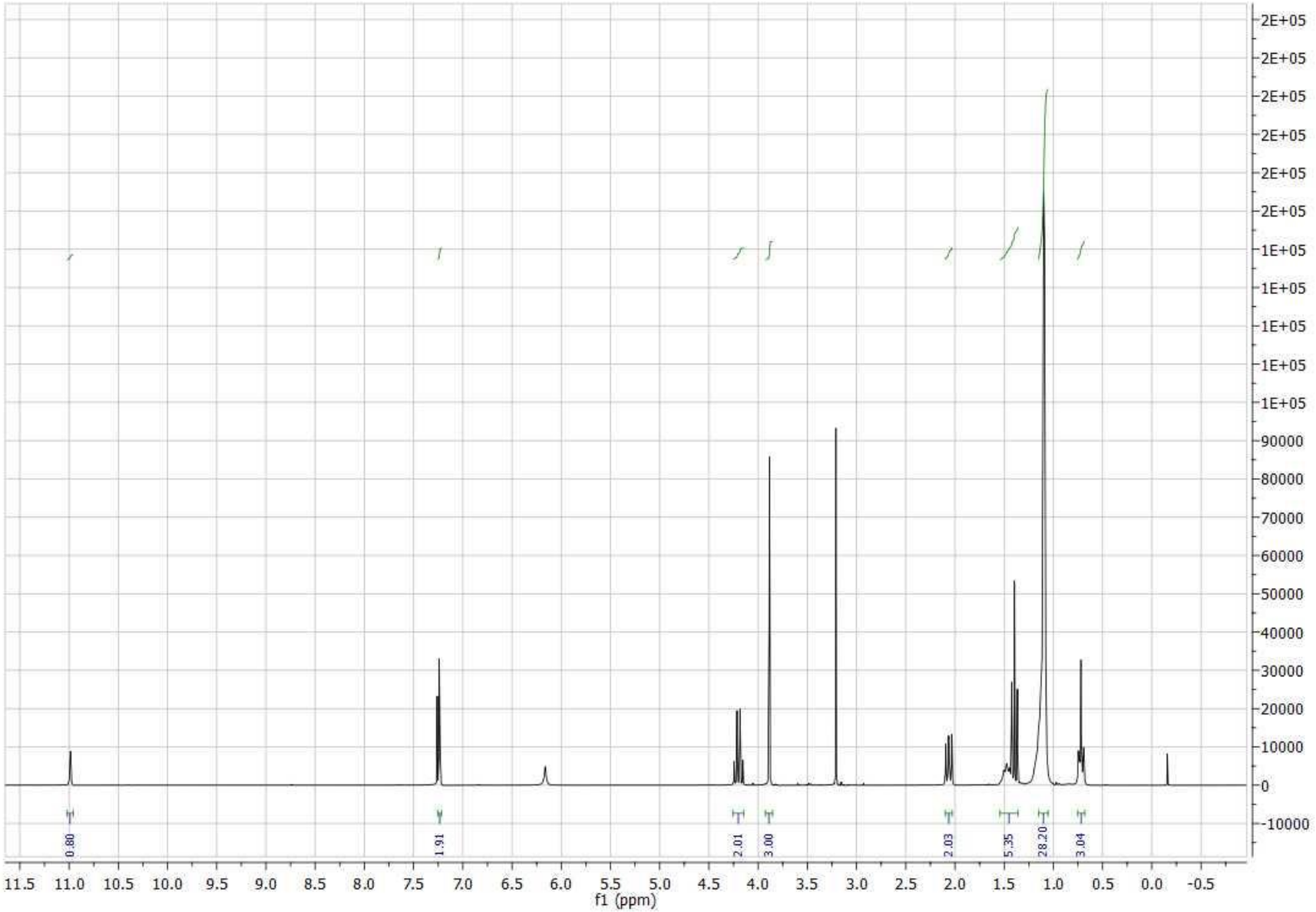


Fig S4: ^{13}C NMR of **2** at 25 °C

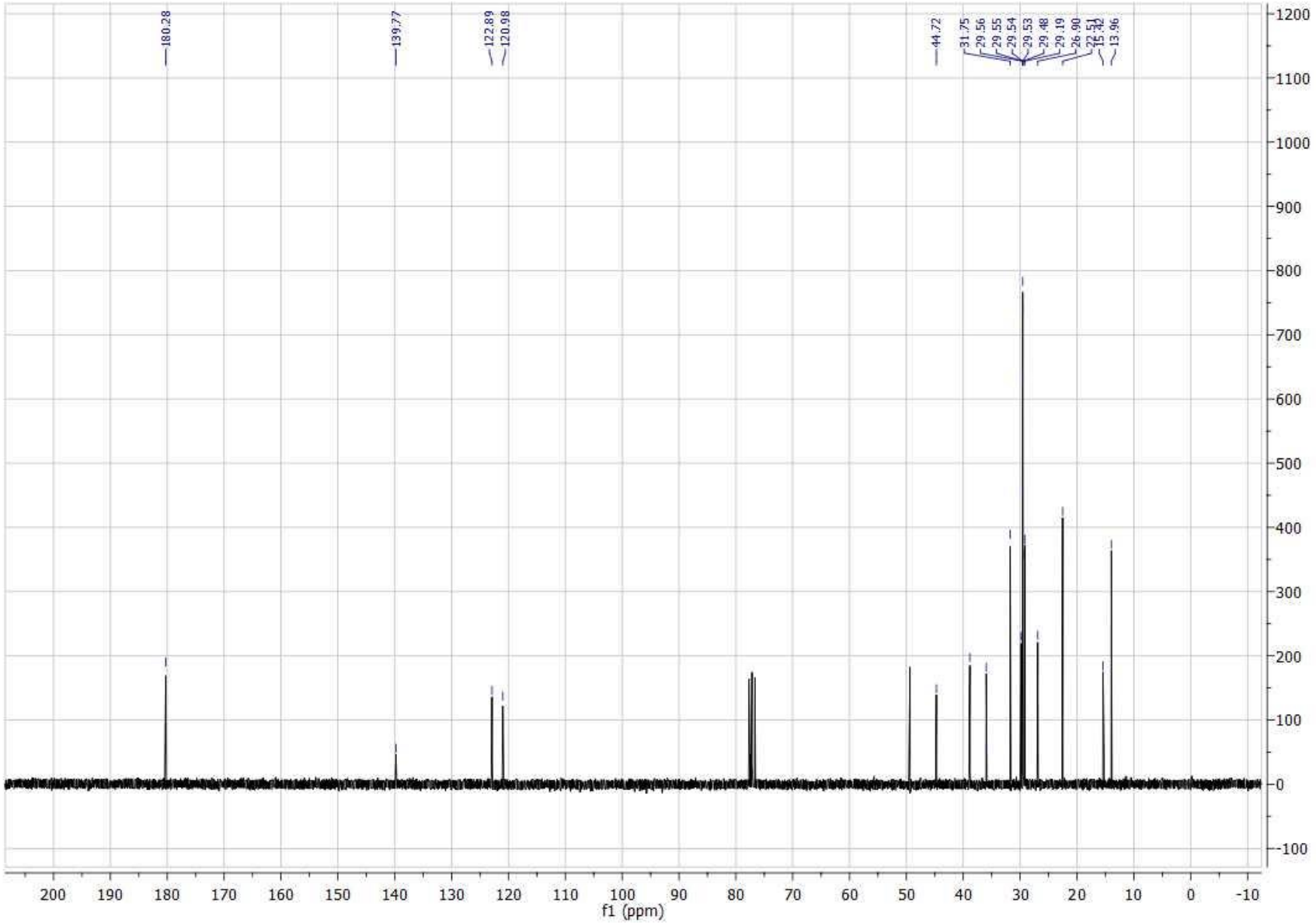


Table S3. Peak assignments and integrals of the ^{1}H-NMR spectrum of **2** at 25°C.

[EMIM]	**[C_{18}]**	**δ (ppm)**	**Shape**	**Integral**
$C(2)H_{\text{imidazolium}}$	-	10,99	s	0,80
$CHCl_3$	-	7.26	s	-
$C(4\text{-}5)H_{\text{imidaziolium}}$	-	7,24	t	1,91
$C(1)\ H_{2\ \text{chain}}$	-	4,20	m	2,01
$C\ (1')H_{3\ \text{chain}}$	-	3,89	s	3,00
MeOH		3,20	s	-
-	$C(2)H_2$	1,96	t	1,99
-	$C(3)H_2$	1,47	p	2,22
$C(2)\ _{\text{chain}}H_3$	-	1,40	t	3,28
-	$C(4\text{ to }17)H_2$	1,24-0,98	m	28,2
-	$C(18)H_3$	0,72	t	3,04

Table S4. Peak assignments of the ^{13}C-NMR spectrum of **2** at 25°C.

[EMIM]	**[C_{18}]**	**δ (ppm)**	**[EMIM]**	**[C_{18}]**	**δ (ppm)**
-	C(1)OO-	180,3	-	$C(\text{chain})H_2$	29,9
$C(2)H_{\text{imidazolium}}$	-	139,8	-	$C(\text{chain})H_2$	29,6-
$C(4)H_{\text{imidazolium}}$	-	122,9			29,5
$C(5)H_{\text{imidazolium}}$	-	121,0	-	$C(\text{chain})H_2$	29,5
				$C(\text{chain})H_2$	29,2
$CDCl_3$, $CHCl_3$		77.7-76.7, 77.2	-	$C(\text{chain})H_2$	22,5
			$C(2)H_{3\ \text{chain}}$	-	15,4
MeOD		49,4	-	$C(16)H_3$	14,0
$C(1)H_{2\ \text{chain}}$	-	44,7			
-	$C(1)H_2$	38.8			
$C(1')H_3$	-	36,0			
-	$C(16)H_2$	31,8			

Fig S5: ^{1}H NMR of **3** at 25 °C

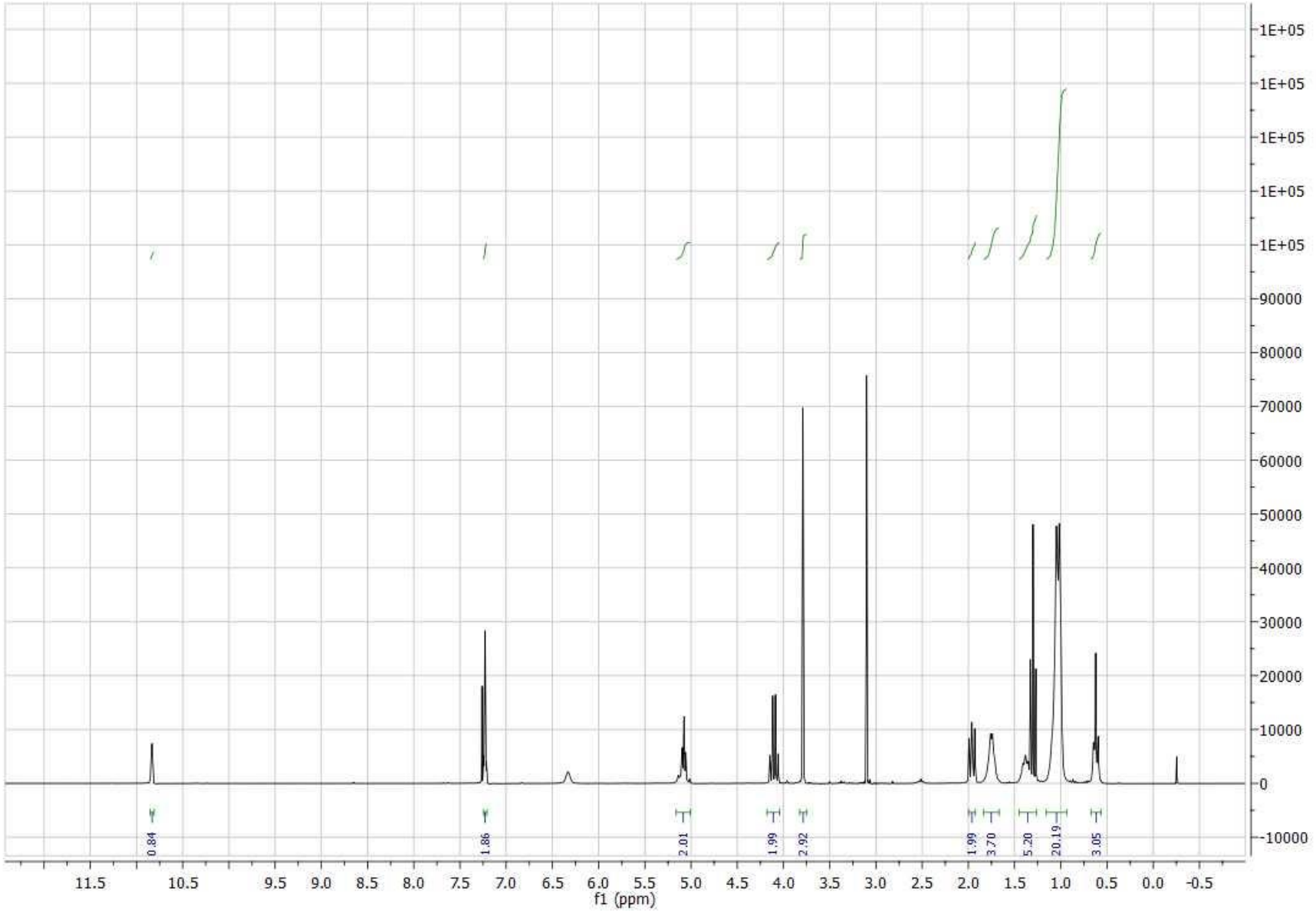


Fig S6: ^{13}C NMR of **3** at 25 °C

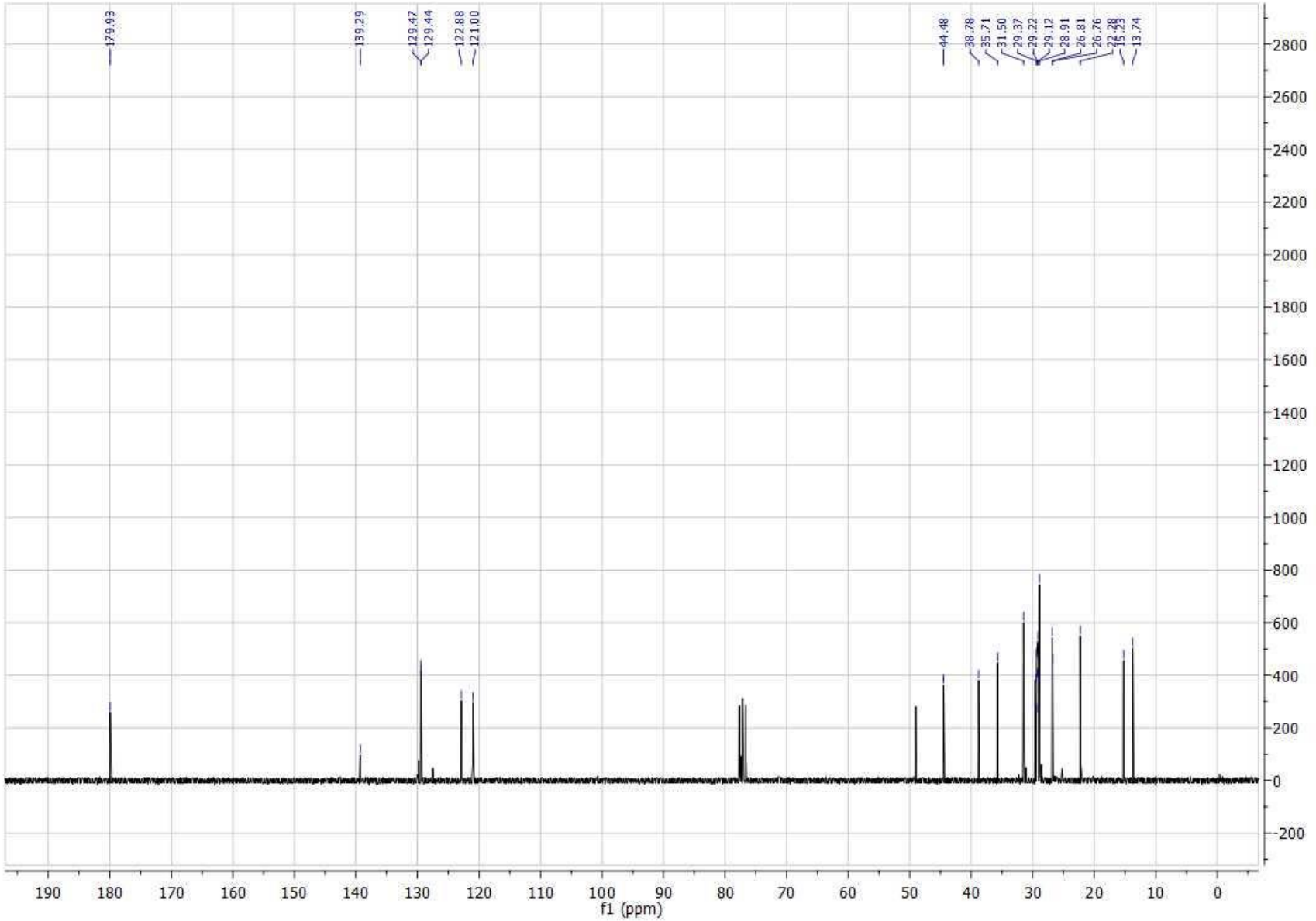


Table S5. Peak assignments and integrals of the ^{1}H-NMR spectrum of **3** at 25°C.

[EMIM]	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**	**Shape**	**Integral**
C(2)H imidazolium	-	10,83	s	0,84
$CHCl_3$	-	7.26	s	-
C(4-5)H imidaziolium	-	7,23	t	1,86
-	C(9,10)H	5,15-5,00	m	2,01
C(1) H_2 chain	-	4,10	m	1,99
C (1')H_3 chain	-	3,79	s	2,92
MeOH		3,10	s	-
-	C(2)H_2	1,96	t	1,99
-	C(8,11)H_2	1,84-1,65	m	3,70
-	C(3)H_2	1,38	p	2,08
C(2) chainH_3	-	1,30	t	3,12
-	C(4 to 8, 12-17)H_2	1,15-0,91	m	20,19
-	C(18)H_3	0,62	t	3,05

Table S6. Peak assignments of the ^{13}C-NMR spectrum of **3** at 25°C.

[EMIM]	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**	**[EMIM]**	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**
-	C(1)OO-	179,8	-	C(chain)H_2	29,6-28,9
C(2)H imidazolium	-	139,8	-	C(11)H_2	26,9
-	C(9,10)H	129,5-129,4	-	C(9)H_2	26,8
-	C(linoleic)H	127,5	-	C(3)H_2	26,8
C(4)H imidazolium	-	122,9		C(17)H_2	22,4
C(5)H imidazolium	-	121,0	C(2)H_3 chain	-	15,2
$CDCl_3$, $CHCl_3$		77.7-76.7, 77.2	-	C(18)H_3	13,7
MeOD		49,0			
C(1) H_2 chain	-	44,5			
-	C(1)H_2	38.8			
C(1')H_3	-	35,7			
-	C(16)H_2	31,8			

Fig S7: ^{1}H NMR of **4** at 25 °C

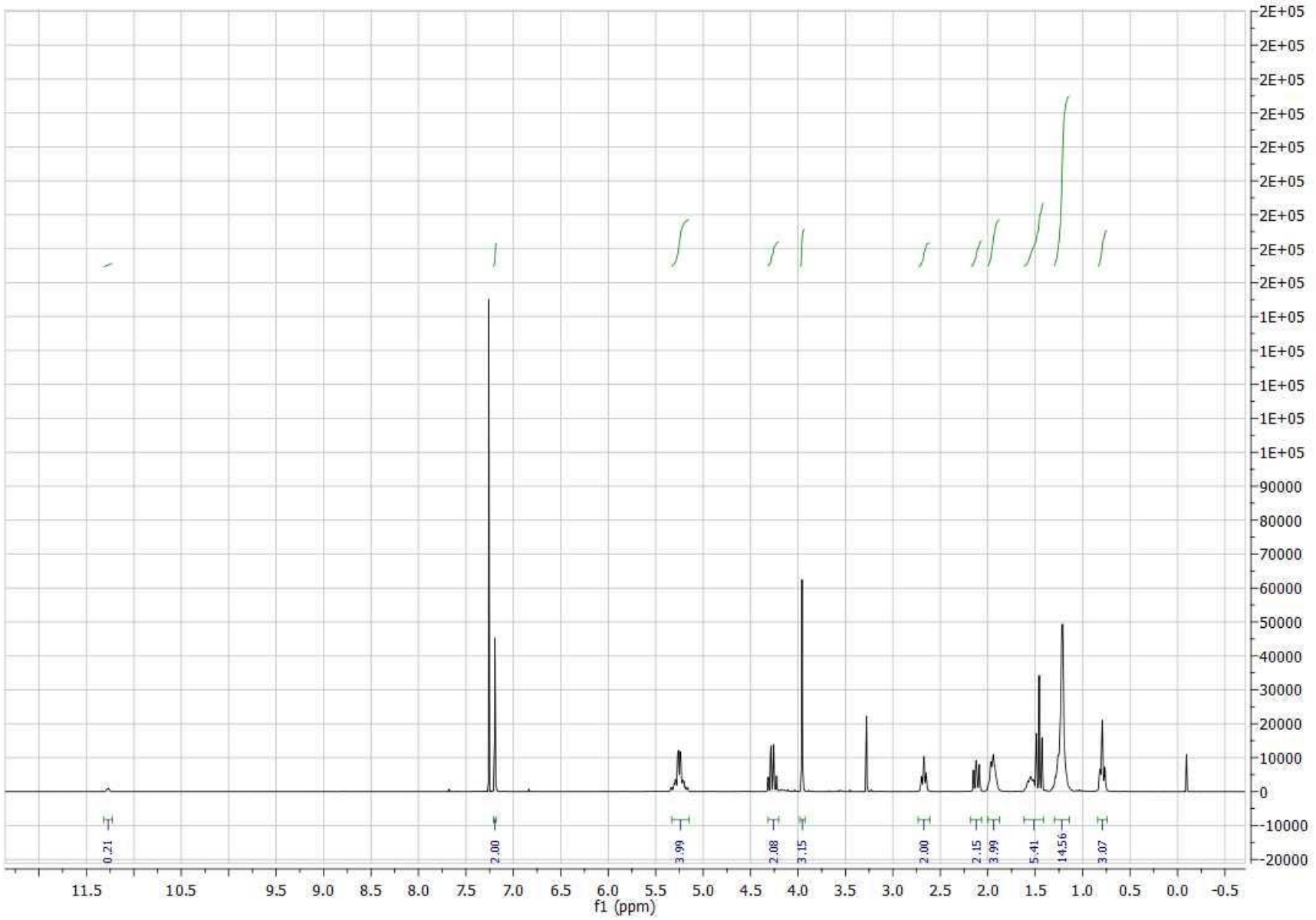


Fig S8: ^{13}C NMR of **4** at 25 °C

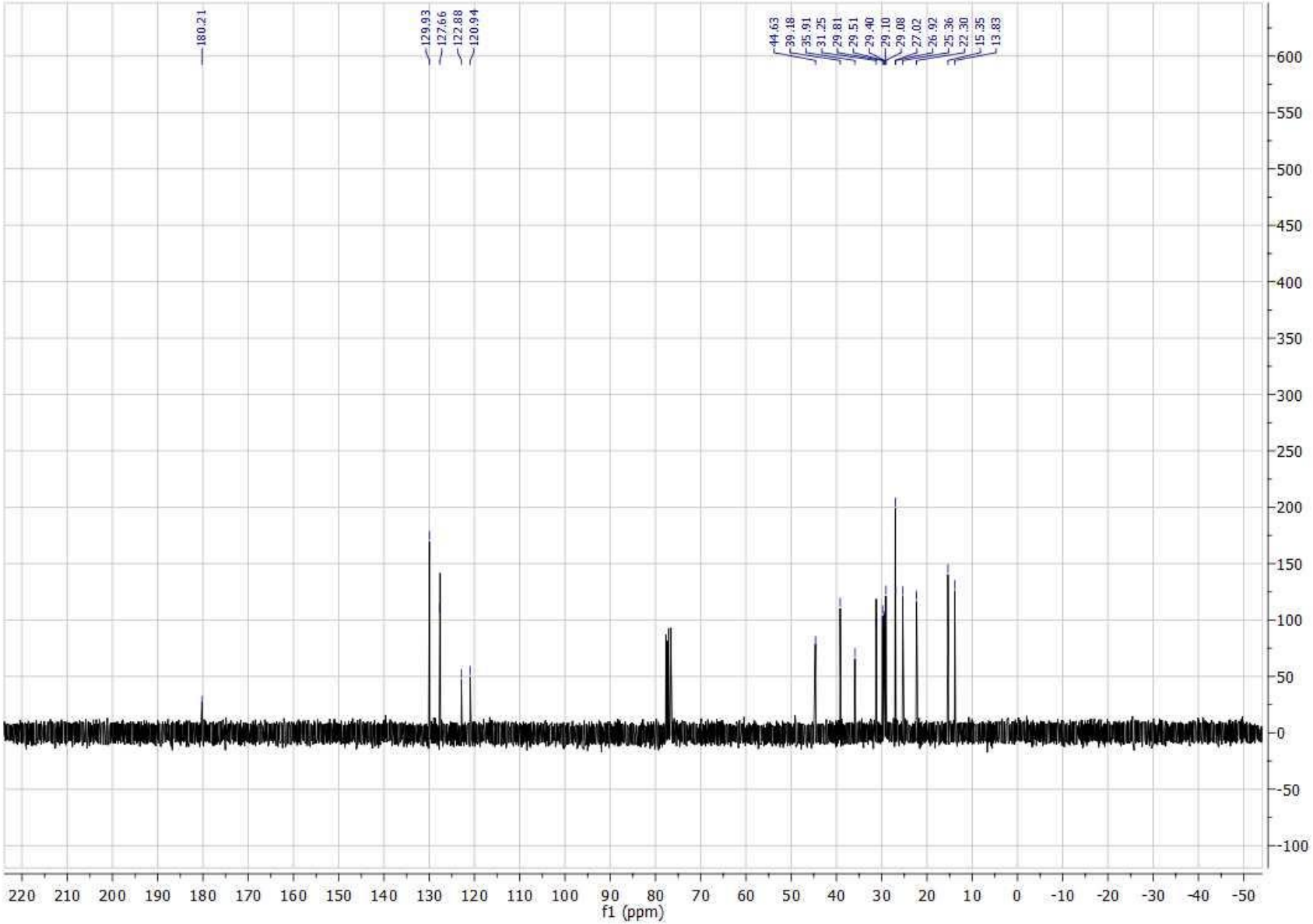


Table S7. Peak assignments and integrals of the ^{1}H-NMR spectrum of **4** at 25°C.

[EMIM]	**[$C_{18:2}$]**	**δ (ppm)**	**Shape**	**Integral**
C(2)H $_{imidazolium}$	-	11,27	s	0,21
$CHCl_3$	-	7.26	s	-
C(4-5)H $_{imidaziolium}$	-	7,19	t	2,00
-	C(9,10,12,13)H	5,36-5,14	m	3,99
C(1) $H_{2\ chain}$	-	4,27	tt	2,08
C (1')$H_{3\ chain}$	-	3,96	s	3,15
MeOH		3,26	s	-
-	C(11)H_2	2,67	t	2,00
-	C(2)H_2	2,11	t	2,15
-	C(8,14)H_2	2,01-1,84	m	3,99
-	C(3)H_2	1,55	p	2,18
C(2) $_{chain}H_3$	-	1,45	t	3,23
-	C(4 to 7, 15-17)H_2	1,34-1,10	m	14,56
-	C(18)H_3	0,79	t	3,07

Table S8. Peak assignments of the ^{13}C-NMR spectrum of **4** at 25°C.

[EMIM]	**[$C_{18:2}$]**	**δ (ppm)**	**[EMIM]**	**[$C_{18:2}$]**	**δ (ppm)**
-	C(1)OO-	180,2	-	C(chain)H_2	29,8-29,1
C(2)H $_{imidazolium}$	-	130,0	-	C(14)H_2	27,0
-	C(9,10,12,13)H	127,7	-	C(8)H_2	26,9
C(4)H $_{imidazolium}$	-	123,0'	-	C(11)H_2	25,4
C(5)H $_{imidazolium}$	-	121,0		C(17)H_2	22,3
$CDCl_3$, $CHCl_3$		77.7-76.7, 77.2	C(2)$H_{3\ chain}$	-	15,4
MeOD		49,0	-	C(18)H_3	13,9
C(1) $H_{2\ chain}$	-	44,7			
-	C(1)H_2	39,2			
C(1')H_3	-	35,9			
-	C(16)H_2	31,3			

Fig S9: ^{1}H NMR of **5** at 25 °C

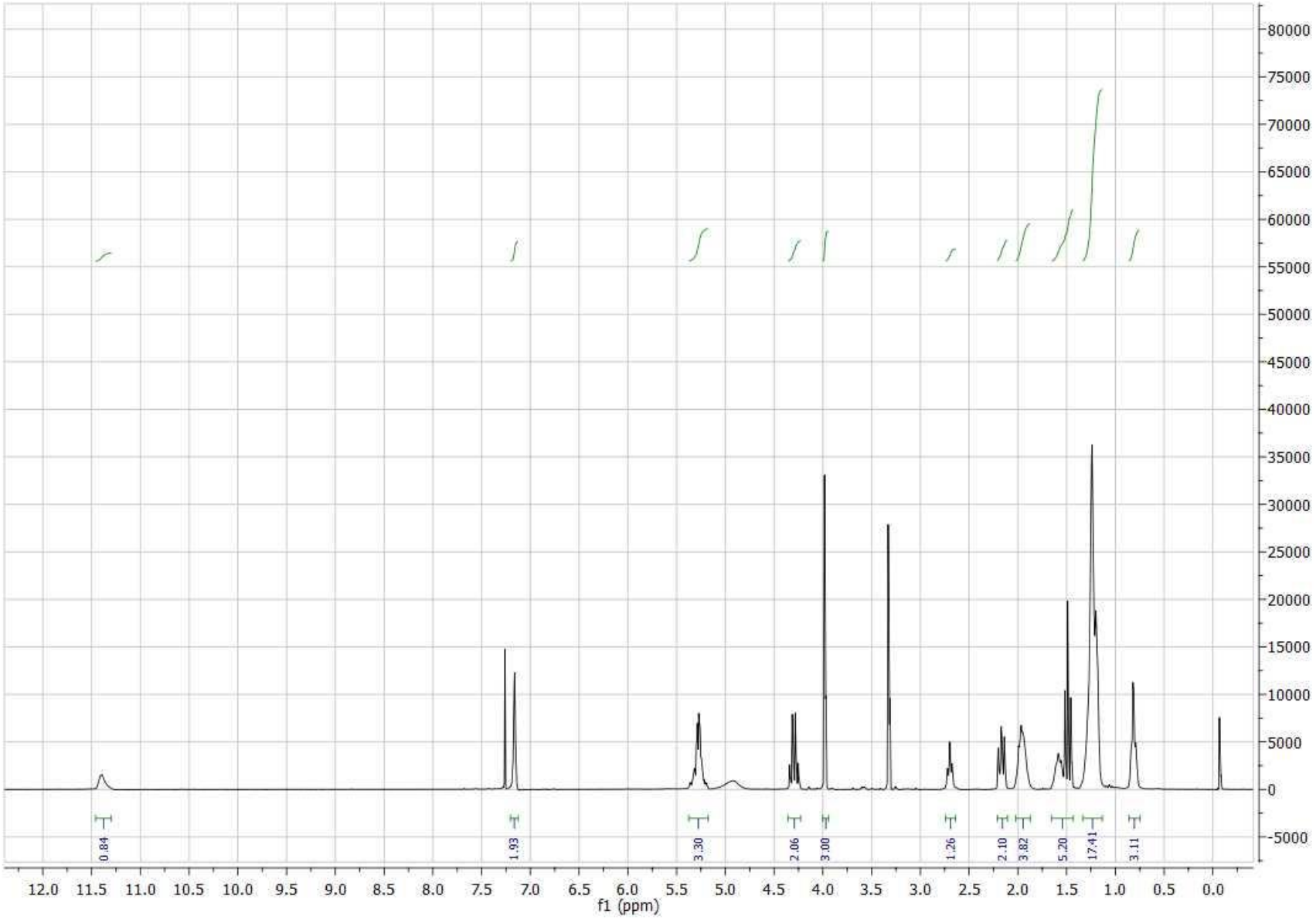


Fig S10: ^{13}C NMR of **5** at 25 °C

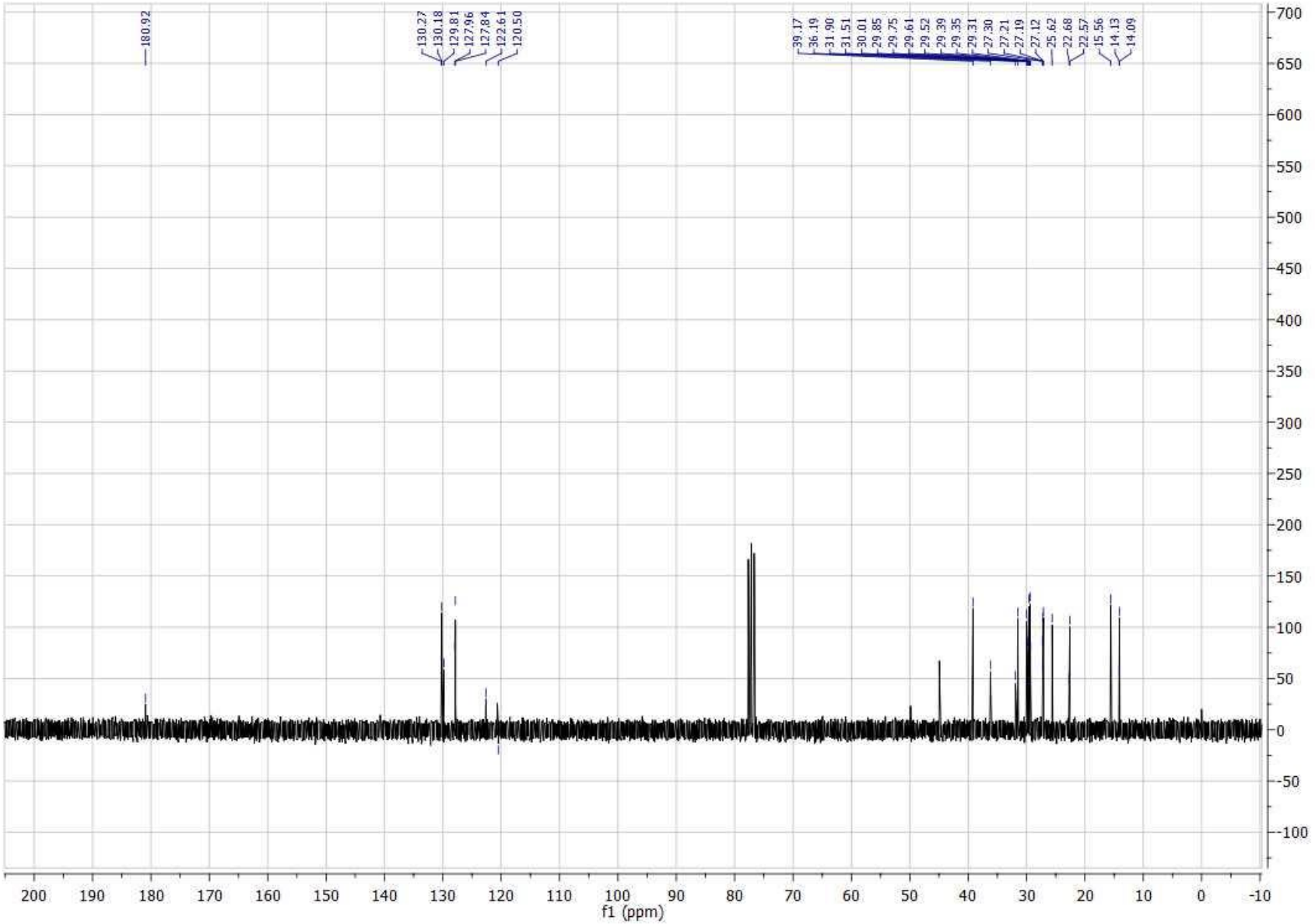


Table S9. Peak assignments and integrals of the ^{1}H-NMR spectrum of **5** at 25°C.

[EMIM]	**[C18:1-C18:2 30%-70%]**	**δ (ppm)**	**Shape**	**Integral**
C(2)H $_{imidazolium}$	-	11,40	s	0,84
$CHCl_3$	-	7.26	s	-
C(4-5)H $_{imidaziolium}$	-	7,16	s	1,93
-	C(9,10,12,13)H	5,37-5,17	m	3,30
C(1) $H_{2\ chain}$	-	4,29	tt	2,06
C (1')$H_{3\ chain}$	-	3,98	s	3,00
MeOH		3,26	s	-
-	$C(11)H_2$	2,70	t	1,26
-	$C(2)H_2$	2,17	t	2,10
-	$C(8,14)H_2$	2,04-1,86	m	3,82
-	$C(3)H_2$	1,58	p	2,03
C(2) $_{chain}H_3$	-	1,49	t	3,17
-	C(4 to 8, 15-17)H_2	1,36-1,12	m	17,41
-	$C(18)H_3$	0,80	t	3,11

Table S10. Peak assignments of the ^{13}C-NMR spectrum of **5** at 25°C.

[EMIM]	**[C18:1-C18:2 30%-70%]**	**δ (ppm)**	**[EMIM]**	**[C18:1-C18:2 30%-70%]**	**δ (ppm)**
-	C(1)OO-	180,9	-	$C(chain)H_2$	30,0-29,3
C(2)H $_{imidazolium}$	-	130,0	-	$C(14)H_2$	27,3
-	C(9,10,12,13)H	128,0-127,8	-	$C(8)H_2$	27,1
C(4)H $_{imidazolium}$	-	122,6	-	$C(11)H_2$	25,6
C(5)H $_{imidazolium}$	-	120,5		$C(17)H_2$	22,6
$CDCl_3$, $CHCl_3$		77.7-76.7, 77.2	C(2)$H_{3\ chain}$	-	15,6
MeOD		49,0	-	$C(18)H_3$	14,1
C(1) $H_{2\ chain}$	-	44,9			
-	$C(1)H_2$	39,2			
C(1')H_3	-	36,2			
		31,9			
-	$C(16)H_2$	31,5			

Fig S11: ^{1}H NMR of **6** at 25 °C

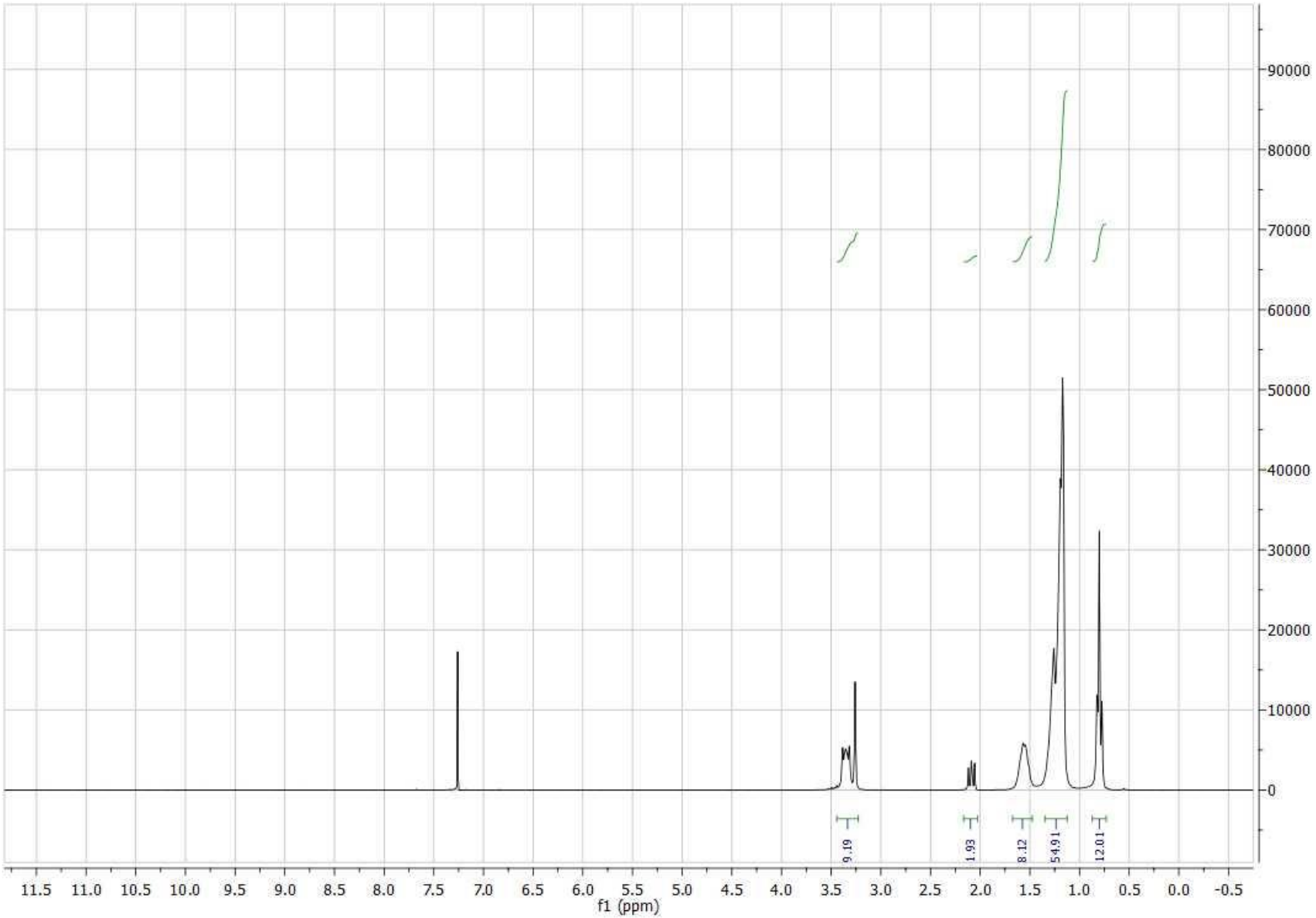


Fig S12: ^{13}C NMR of **6** at 25 °C

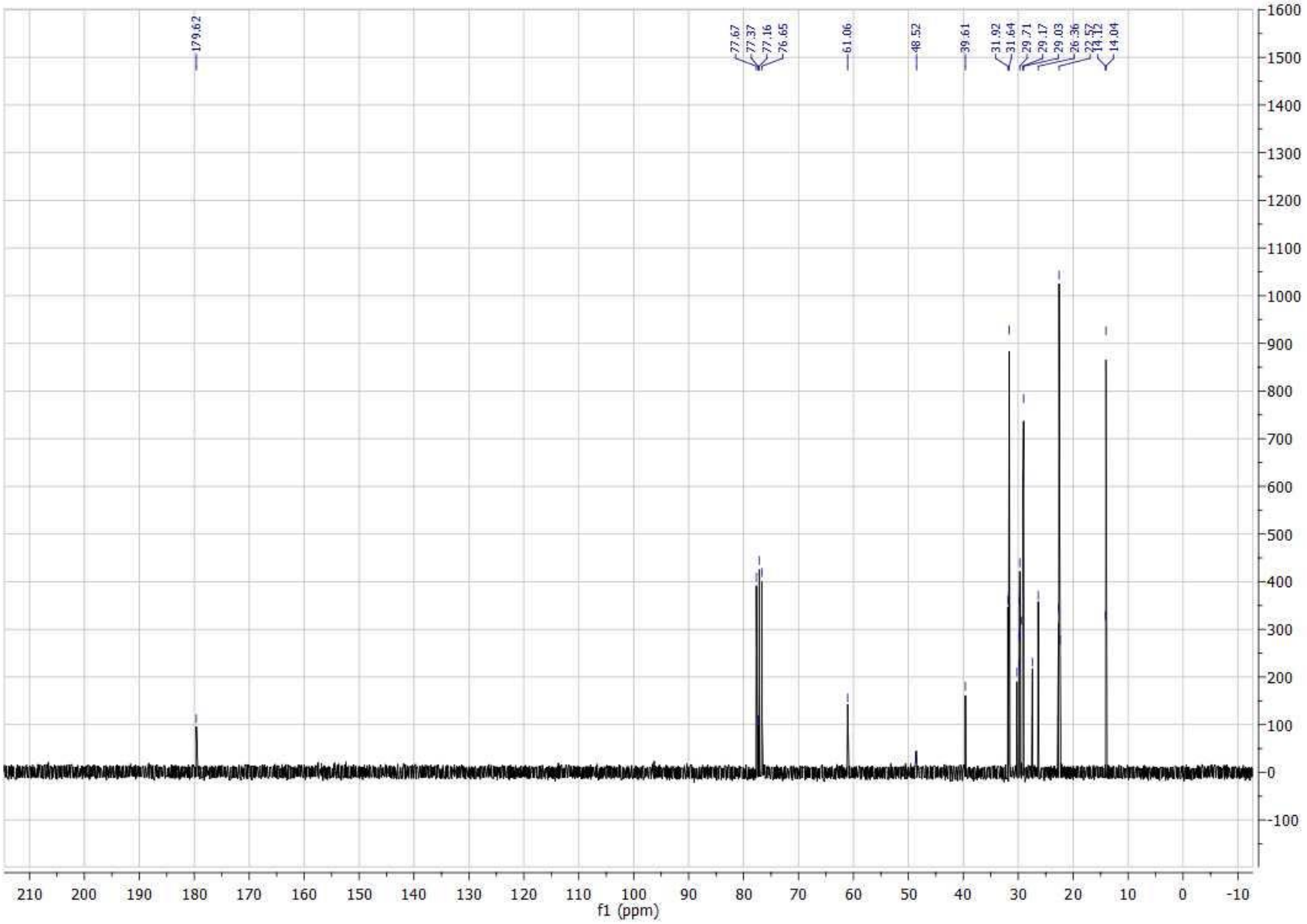


Table S11. Peak assignments and integrals of the ^{1}H-NMR spectrum of **6** at 25°C.

[N_{8881}]	**[C_{16}]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$			s	-
H_2O				
$C(1,1',1'')H_2$	-	3,48-3,26	m	9,19
$C(1''')H_3$	-	3,29	s	
-	$C(2)H_2$	2,15	t	1,93
$C(3,3',3'')H_2$	$C(3)H_2$	1,70 - 1,51	m	8,12
$C(4\text{-}7,4'\text{-}7',4''\text{-}7'')H_2$	$C(4\text{-}15)H_2$	1,42 - 1,10	m	54,91
$C(8,8',8'')H_3$	$C(16)H_3$	0,85 - 0,70	m	12,01

Table S12. Peak assignments of the ^{13}C-NMR spectrum of **6** at 25°C.

[N_{8881}]	**[C_{16}]**	**δ (ppm)**	**[N_{8881}]**	**[C_{16}]**	**δ (ppm)**
-	C(1)OO-	179,6	$C(5,5',5'')H_2$		28,8
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	$C(3)H_2$	27,1
$C(1,1',1'')H_2$	-	61,1	$C(3,3',3'')H_2$	-	26,4
$C(1''')H_3$	-	48,5	-	$C(15)H_2$	22,5
-	$C(2)H_2$	39,6	$C(7,7',7'')H_2$	-	22,3-22,1
-	$C(14)H_2$	31,9	-	$C(16)H_3$	14,1
$C(6,6',6'')H_2$		31,6	$C(8,8',8'')H_2$	-	14,0
-	$C(4\text{-}13)H_2$	29,7-29,0			
$C(4,4',4'')H_2$	-	28,9			

Fig S13: ^{1}H NMR of **7** at 25 °C

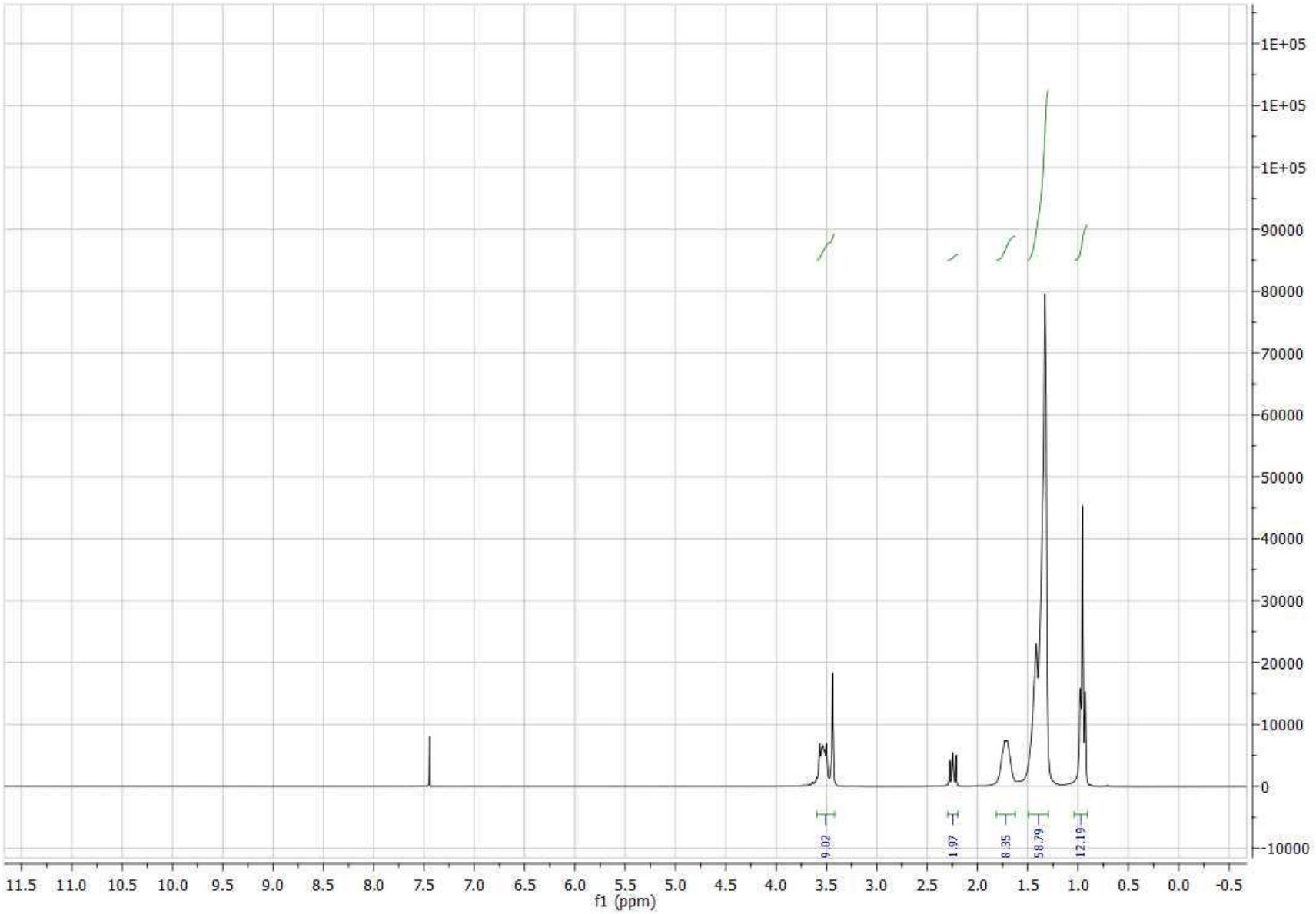


Fig S14: ^{13}C NMR of **7** at 25 °C

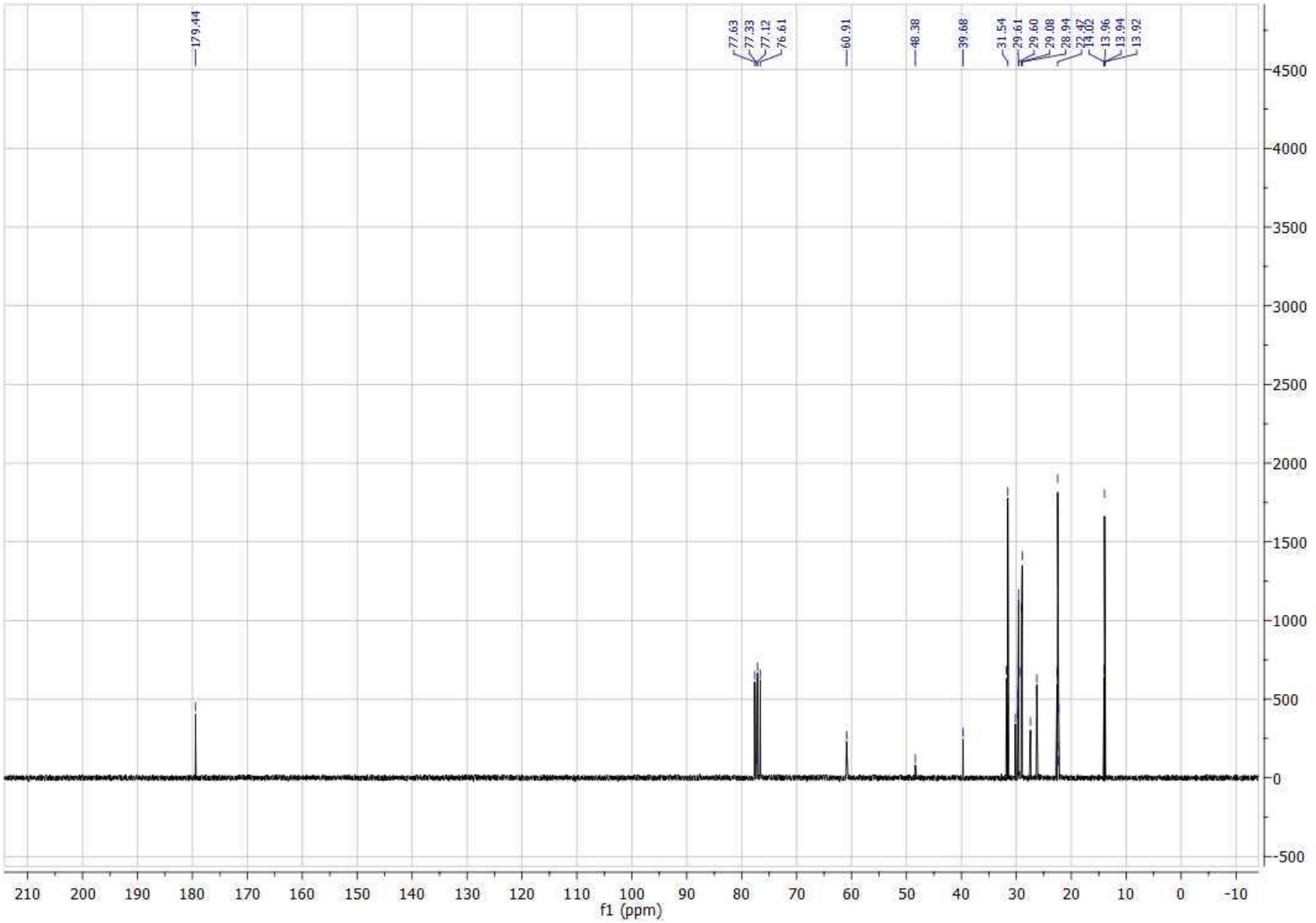


Table S13. Peak assignments and integrals of the ^{1}H-NMR spectrum of **7** at 25°C.

[N_{8881}]	**[C_{18}]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$			s	-
H_2O				
$C(1,1',1'')H_2$	-	3,58-3,31	m	9,02
$C(1''')H_3$	-	3,29	s	
-	$C(2)H_2$	2,15	t	1,97
$C(3,3',3'')H_2$	$C(3)H_2$	1,78-1,57	m	8,35
$C(4\text{-}7,4'\text{-}7',4''\text{-}7'')H_2$	$C(4\text{-}17)H_2$	1,52-1,20	m	58,79
$C(8,8',8'')H_3$	$C(18)H_3$	1,05-0,70	m	12,19

Table S14. Peak assignments of the ^{13}C-NMR spectrum of **7** at 25°C.

[N_{8881}]	**[C_{18}]**	**δ (ppm)**	**[N_{8881}]**	**[C_{18}]**	**δ (ppm)**
-	C(1)OO-	179,4	$C(5,5',5'')H_2$		28,9
			-	$C(3)H_2$	27,2
			$C(3,3',3'')H_2$	-	26,2
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	$C(17)H_2$	22,5
$C(1,1',1'')H_2$	-	60,9	$C(7,7',7'')H_2$	-	22,5 -22,4
$C(1''')H_3$	-	48,4	-	$C(18)H_3$	14,0
-	$C(2)H_2$	39,7	$C(8,8',8'')H_2$	-	13,9
-	$C(16)H_2$	31,7			
$C(6,6',6'')H_2$		31,5			
-	$C(4\text{-}15)H_2$	29,6-29,1			
$C(4,4',4'')H_2$	-	29,0			

Fig S15: ^{1}H NMR of **8** at 25 °C

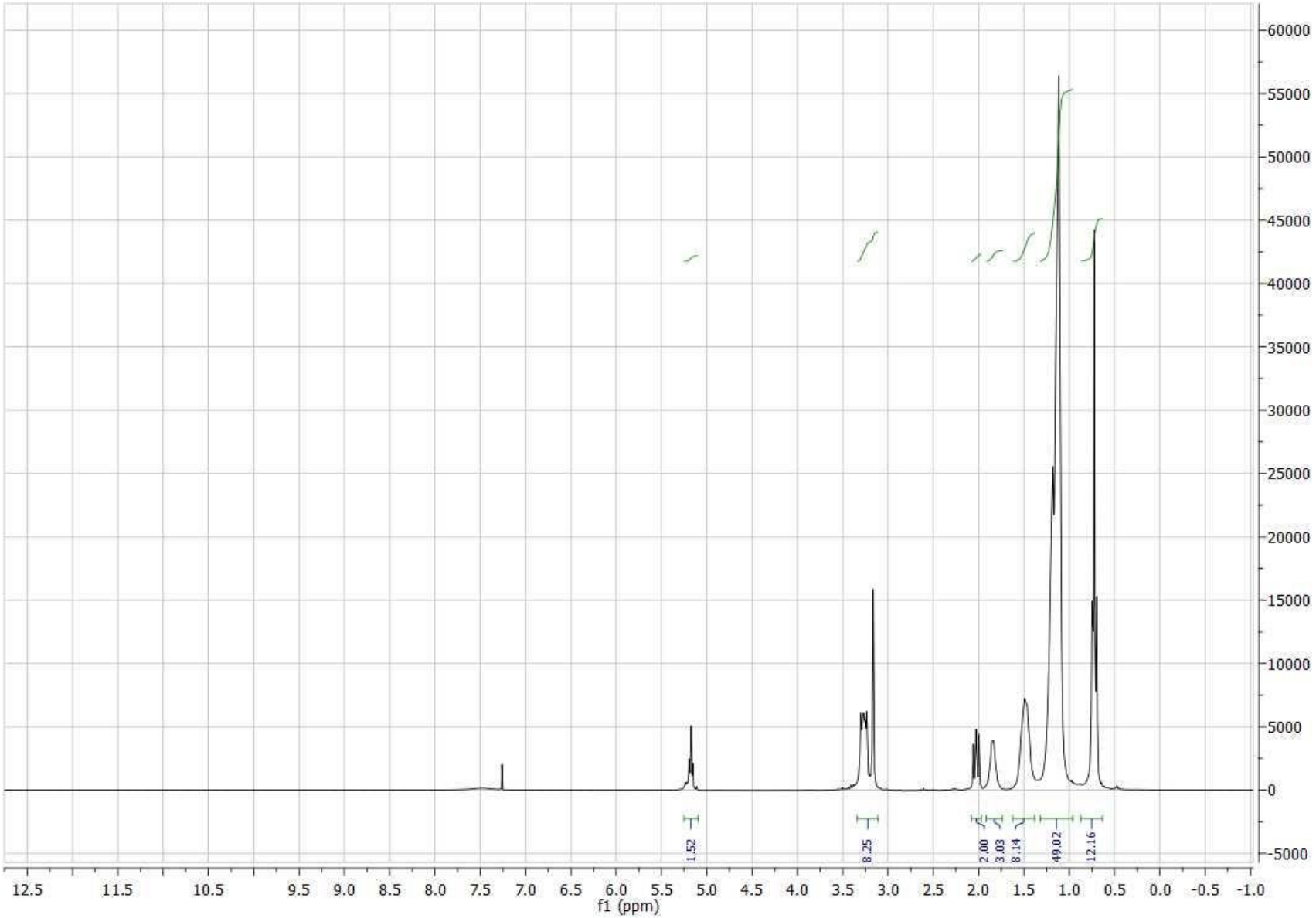


Fig S16: ^{13}C NMR of **8** at 25 °C

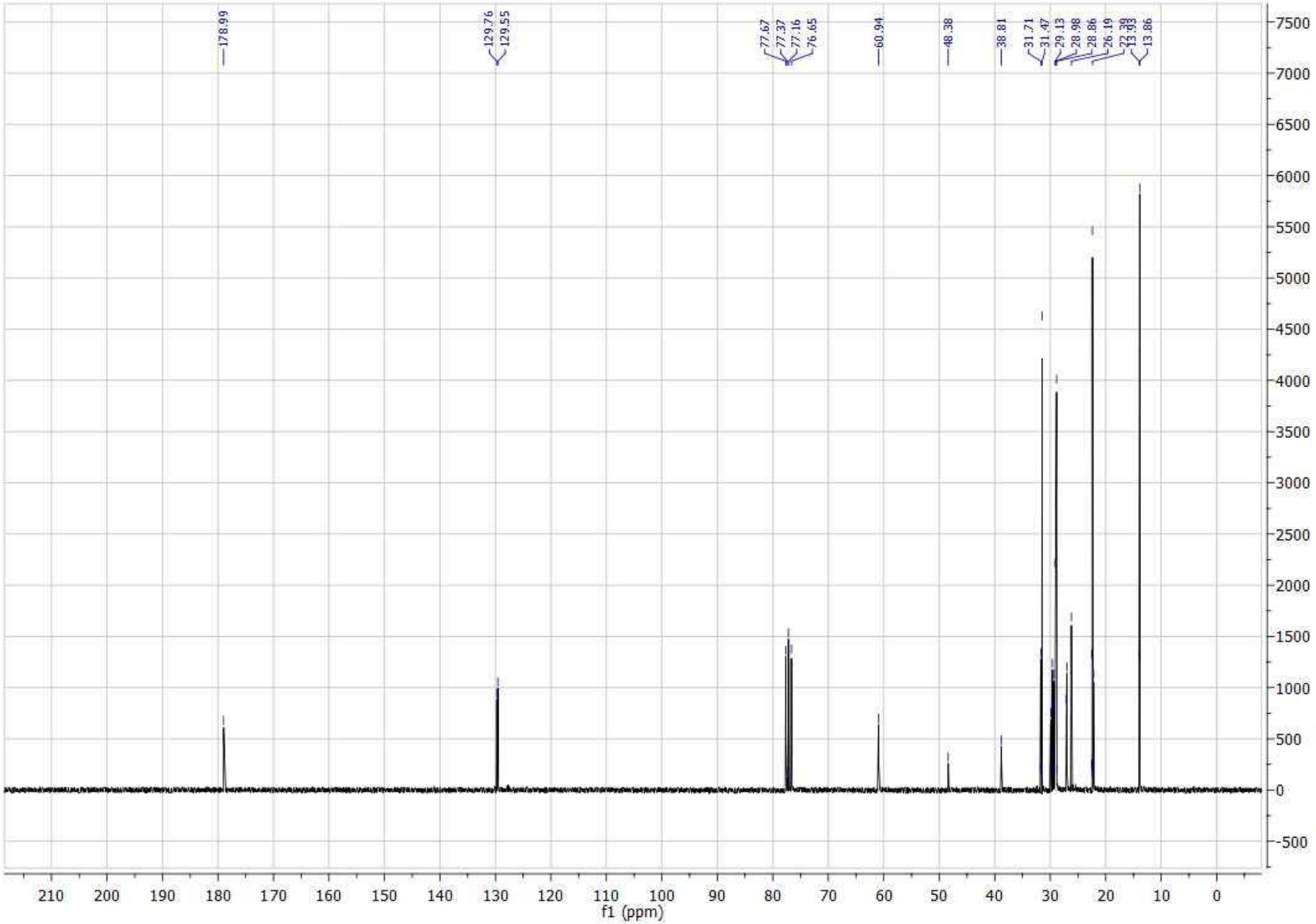


Table S15. Peak assignments and integrals of the ^{1}H-NMR spectrum of **8** at 25°C.

[N_{8881}]	**[C18:1 tested according to Ph.Eur.]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$			s	-
-	C(9,10)	5,26-5,11	m	1,52
H_2O				
C(1,1',1'')H_2	-	3,36-3,17	m	8,25
C(1''')H_3	-	3,16		
-	C(2)H_2	2,03	t	2,00
-	C(8,11)H_2	1,91 - 1,74	m	3,03
C(3,3',3'')H_2	C(3)H_2	1,62 - 1,36	m	8,14
C(4-7,4'-7',4''-7'')H_2	C(4-7,12-17)H_2	1,31 - 0,95	m	49,02
C(8,8',8'')H_3	C(18)H_3	0,85-0,55	m	12,16

Table S16. Peak assignments of the ^{13}C-NMR spectrum of **8** at 25°C.

[N_{8881}]	**[C18:1 tested according to Ph.Eur.]**	**δ (ppm)**	**[N_{8881}]**	**[C18:1 tested according to Ph.Eur.]**	**δ (ppm)**
-	C(1)OO-	179,0	C(5,5',5'')H_2		28,9
-	C(10)H_2	129,8	-	C(8)H_2	27,1
-	C(11)H_2	129,6	-	C(3)H_2	27,0
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3		C(11)H_2	27,0
C(1,1',1'')H_2	-	60,9	C(3,3',3'')H_2	-	26,2
C(1''')H_3	-	48,4	-	C(17)H_2	22,5
-	C(2)H_2	38,8	C(7,7',7'')H_2	-	22,4
-	C(16)H_2	31,7	-	C(18)H_3	13,9
C(6,6',6'')H_2		31,5	C(8,8',8'')H_2	-	13,9
-	C(4-7,12-16)H_2	30,0-29,1			
C(4,4',4'')H_2	-	29,0			

Fig S17: ^{1}H NMR of **9** at 25 °C

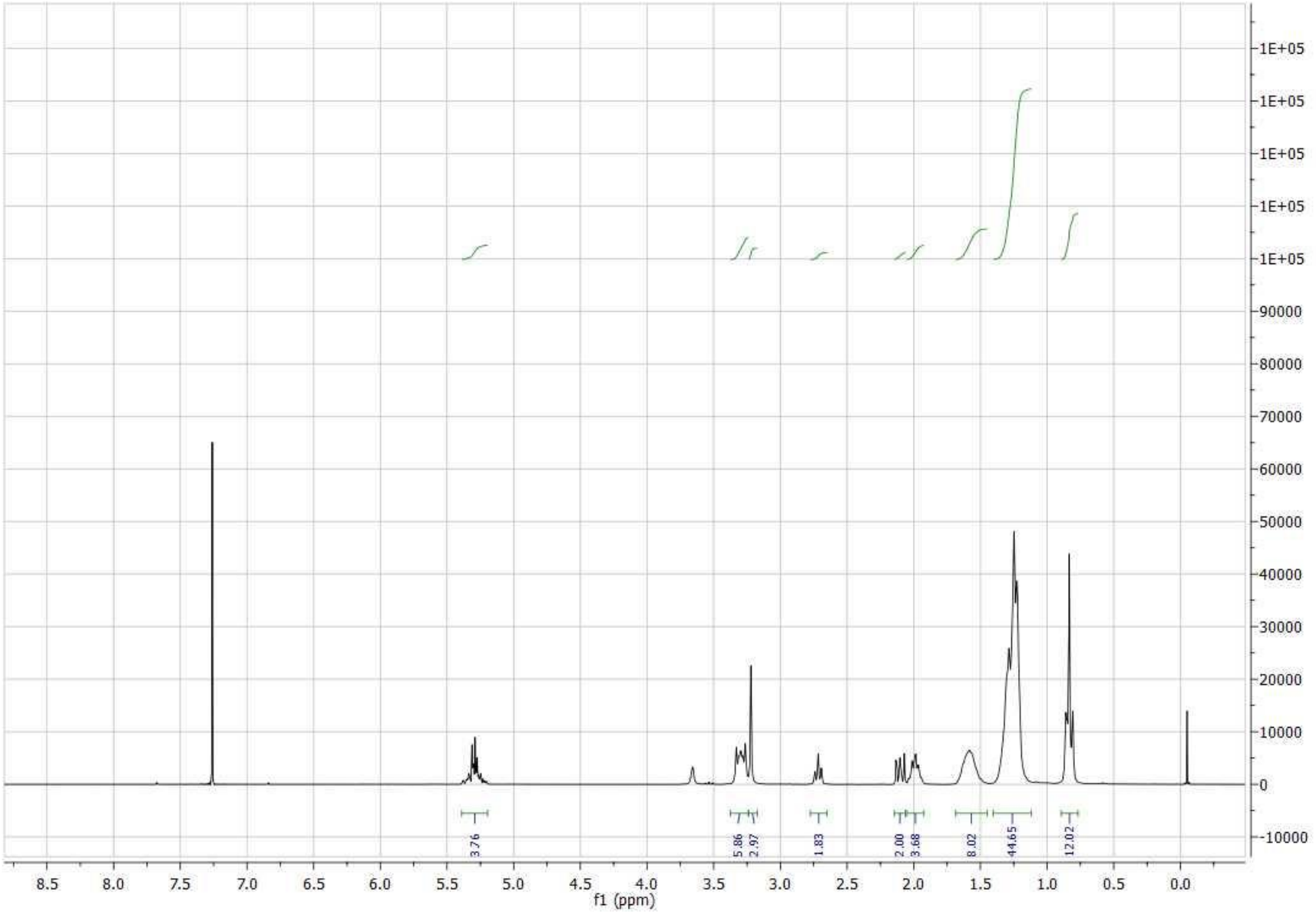


Fig S18: ^{13}C NMR of **9** at 25 °C

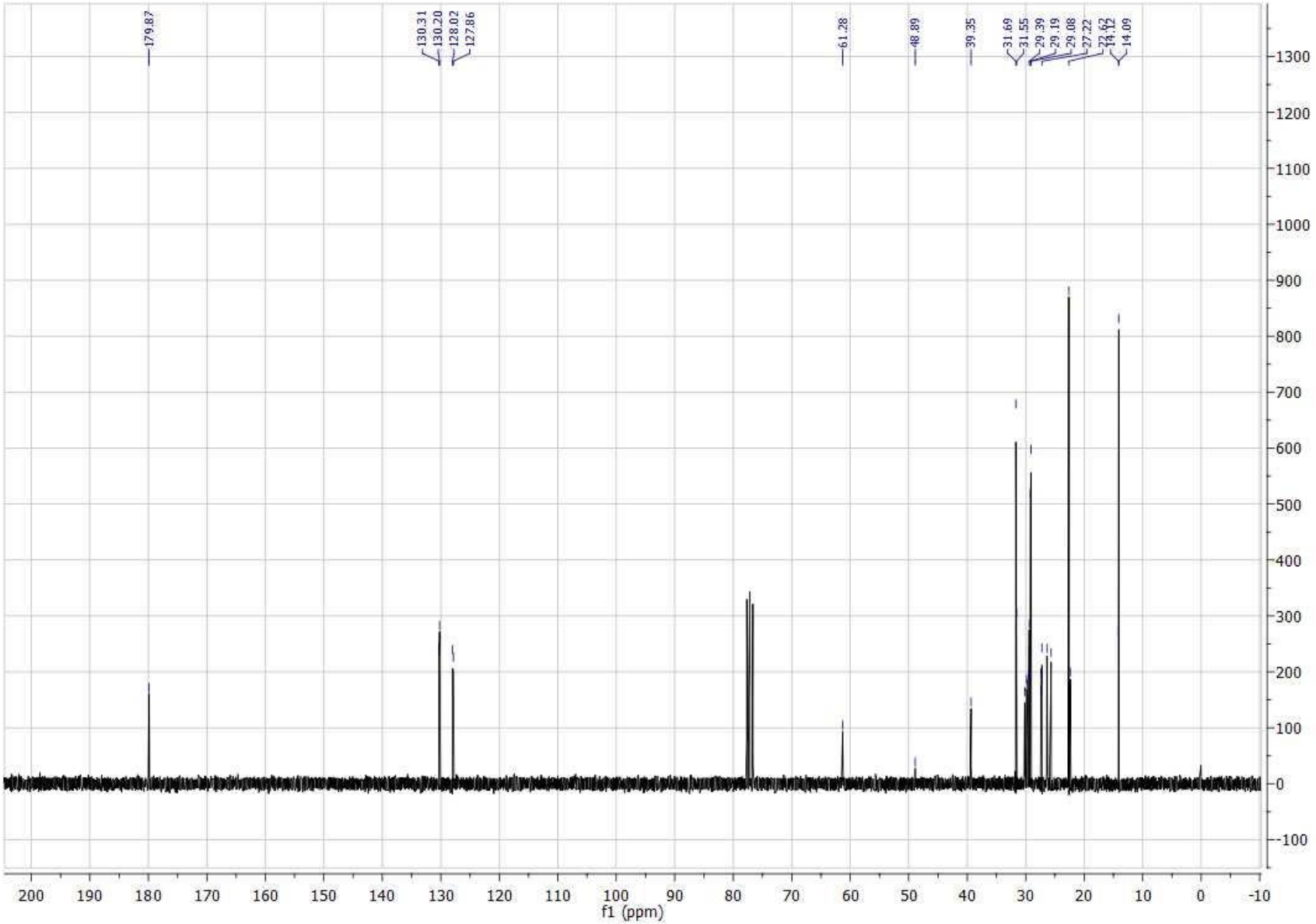


Table S17. Peak assignments and integrals of the ^{1}H-NMR spectrum of **9** at 25°C.

[N_{8881}]	**[C18:2]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$			s	-
-	C(9,10,12,13)	5,44-5,23	m	3,76
H_2O				
C(1,1',1'')H_2	-	3,36-3,21	m	8,83
C(1''')H_3	-	3,17		
-	C(11)H_2	2,76	t	1,83
-	C(2)H_2	2,03	t	2,00
-	C(8,11)H_2	2,08 - 1,95	m	3,68
C(3,3',3'')H_2	C(3)H_2	1,73 - 1,50	m	8,02
C(4-7,4'-7',4''-7'')H_2	C(4-7,14-17)H_2	1,44 – 1,14	m	44,65
C(8,8',8'')H_3	C(18)H_3	0,96-0,78	m	12,02

Table S18. Peak assignments of the ^{13}C-NMR spectrum of **9** at 25°C.

[N_{8881}]	**[C18:2]**	**δ (ppm)**	**[N_{8881}]**	**[C18:2]**	**δ (ppm)**
-	C(1)OO-	179,8	C(5,5',5'')H_2		29,0
-	C(9)H_2	130,2	-	C(8)H_2	27,3
-	C(13)H_2	130,1	-	C(3)H_2	27,2
-	C(10)H_2	127,9	-	C(11)H_2	27,1
-	C(12)H_2	127,8	C(3,3',3'')H_2	-	26,2
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	C(14)H_2	25,6
C(1,1',1'')H_2	-	61,3	C(7,7',7'')H_2	-	22,5
C(1''')H_3	-	48,9	-	C(17)H_2	22,3
-	C(2)H_2	39,4	-	C(18)H_3	14,0
-	C(16)H_2	31,6	C(8,8',8'')H_2	-	14,0
C(6,6',6'')H_2		31,5			
-	C(4-16)H_2	30,1-29,3			
C(4,4',4'')H_2	-	29,1			

Fig S19: ^{1}H NMR of **10** at 25 °C

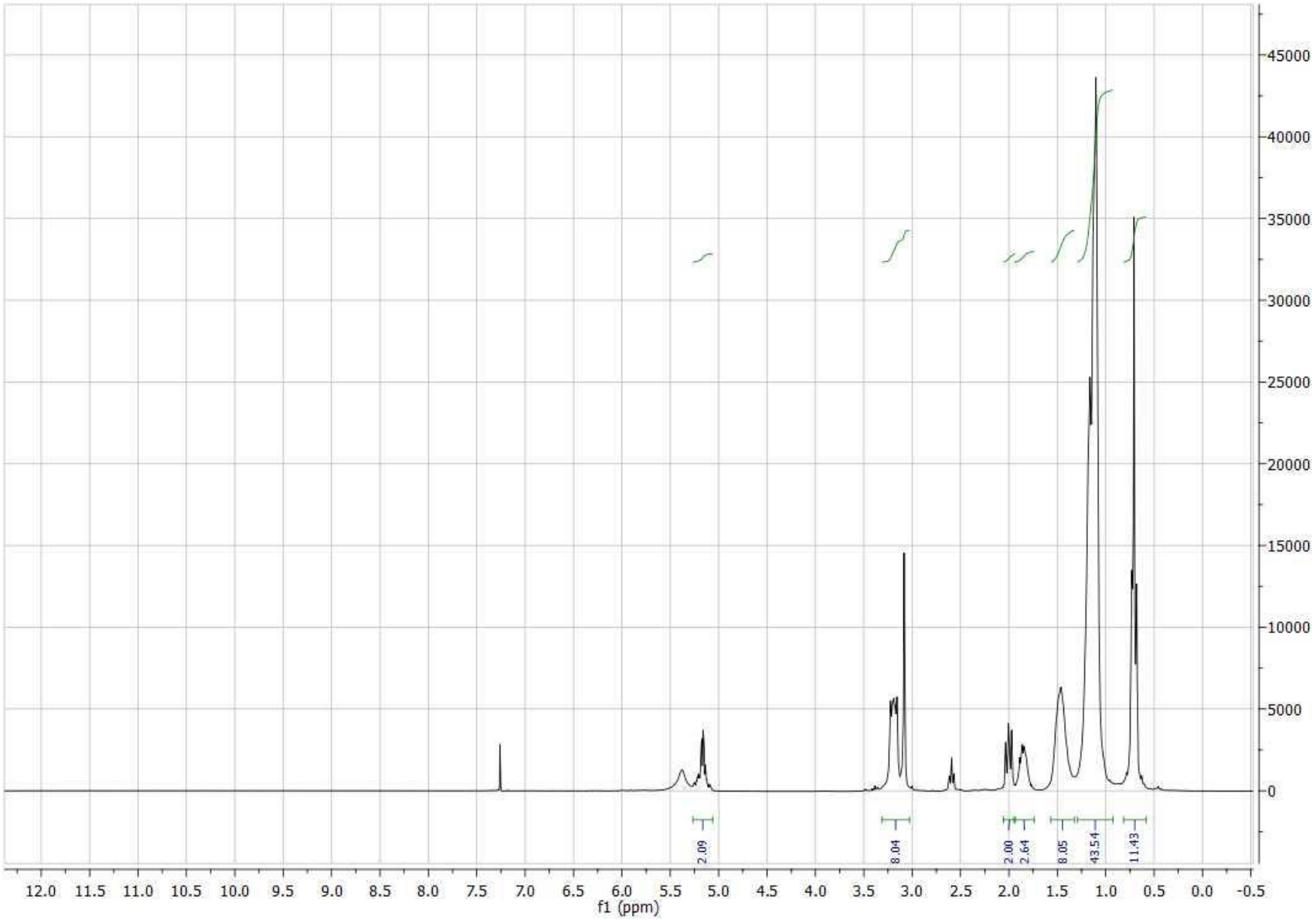


Fig S20: ^{13}C NMR of **10** at 25 °C

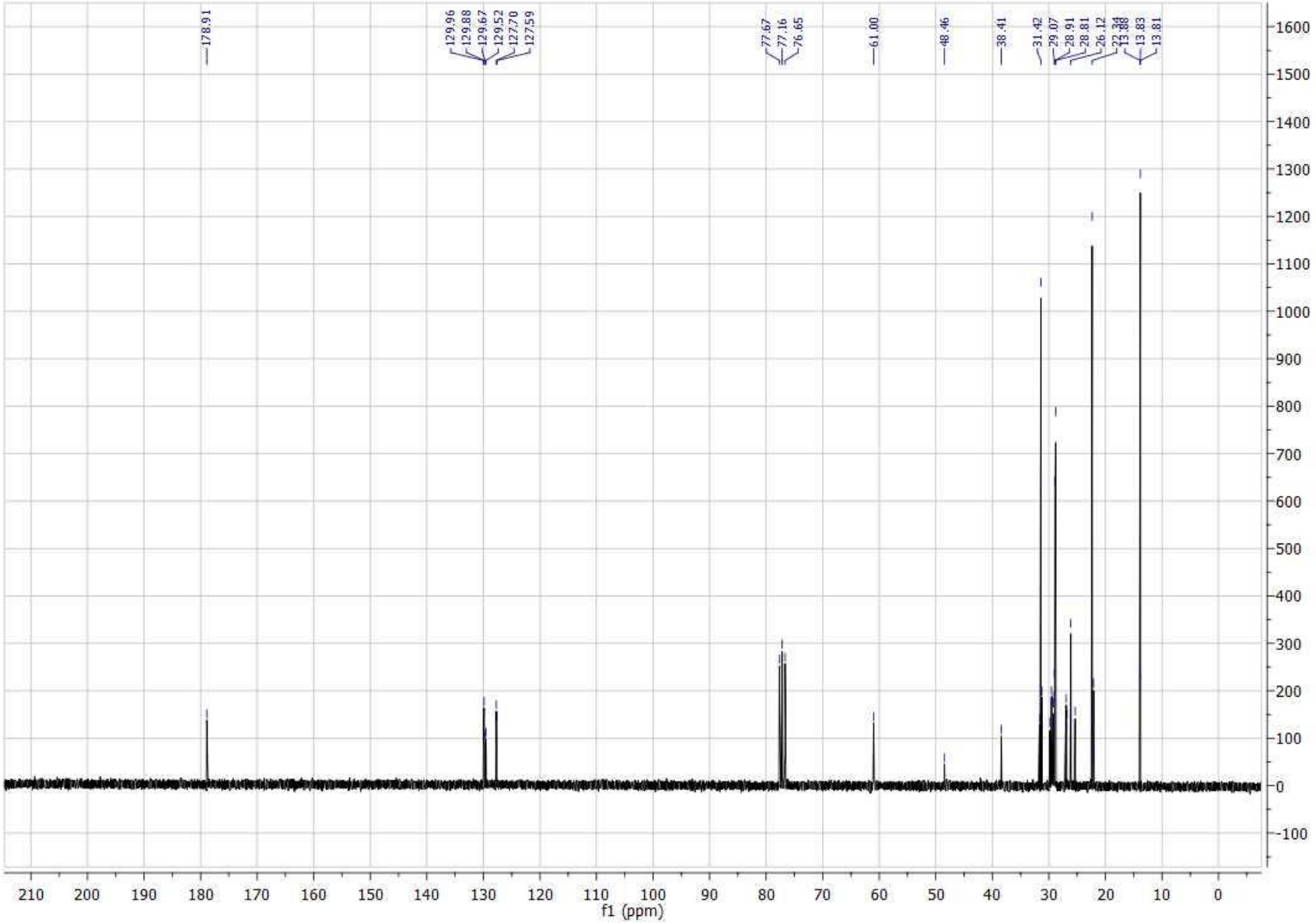


Table S19. Peak assignments and integrals of the ^{1}H-NMR spectrum of 1**0** at 25°C.

[N_{8881}]	**[C18:1-18:2 30%-70%]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$			s	-
-	C(9,10,12,13)	5,26-5,06	m	2,09
H_2O				
C(1,1',1'')H_2	-	3,30-3,12	m	8,04
C(1''')H_3	-	3,08		
-	C(11)H_2	2,59	t	0,68
-	C(2)H_2	2,00	t	2,00
-	C(8,11)H_2	1,94 - 1,73	m	2,64
C(3,3',3'')H_2	C(3)H_2	1,57 - 1,34	m	8,05
C(4-7,4'-7',4''-7'')H_2	C(4-7,14-17)H_2	1,30 – 0,91	m	43,54
C(8,8',8'')H_3	C(18)H_3	0,81-0,58	m	11,43

Table S20. Peak assignments of the ^{13}C-NMR spectrum of **10** at 25°C.

[N_{8881}]	**[C18:1-18:2 30%-70%]**	**δ (ppm)**	**[N_{8881}]**	**[C18:1-18:2 30%-70%]**	**δ (ppm)**
-	C(1)OO-	178,9	C(5,5',5'')H_2		29,8
-	C(9)H_2	130,0	-	C(8)H_2	27,1
-	C(13)H_2	129,9	-	C(3)H_2	27,0
-	C(10)H_2	127,7	-	C(11)H_2	26,9
-	C(12)H_2	127,6	C(3,3',3'')H_2	-	26,1
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	C(14)H_2	25,4
C(1,1',1'')H_2	-	61,0	C(7,7',7'')H_2	-	22,4
C(1''')H_3	-	48,5	-	C(17)H_2	22,1
-	C(2)H_2	38,4	-	C(18)H_3	13,9
-	C(16)H_2	31,6	C(8,8',8'')H_2	-	13,8
C(6,6',6'')H_2		31,3			
-	C(4-16)H_2	29,8-29,1			
C(4,4',4'')H_2	-	29,9			

Fig S21: ^{1}H NMR of **11** at 25 °C

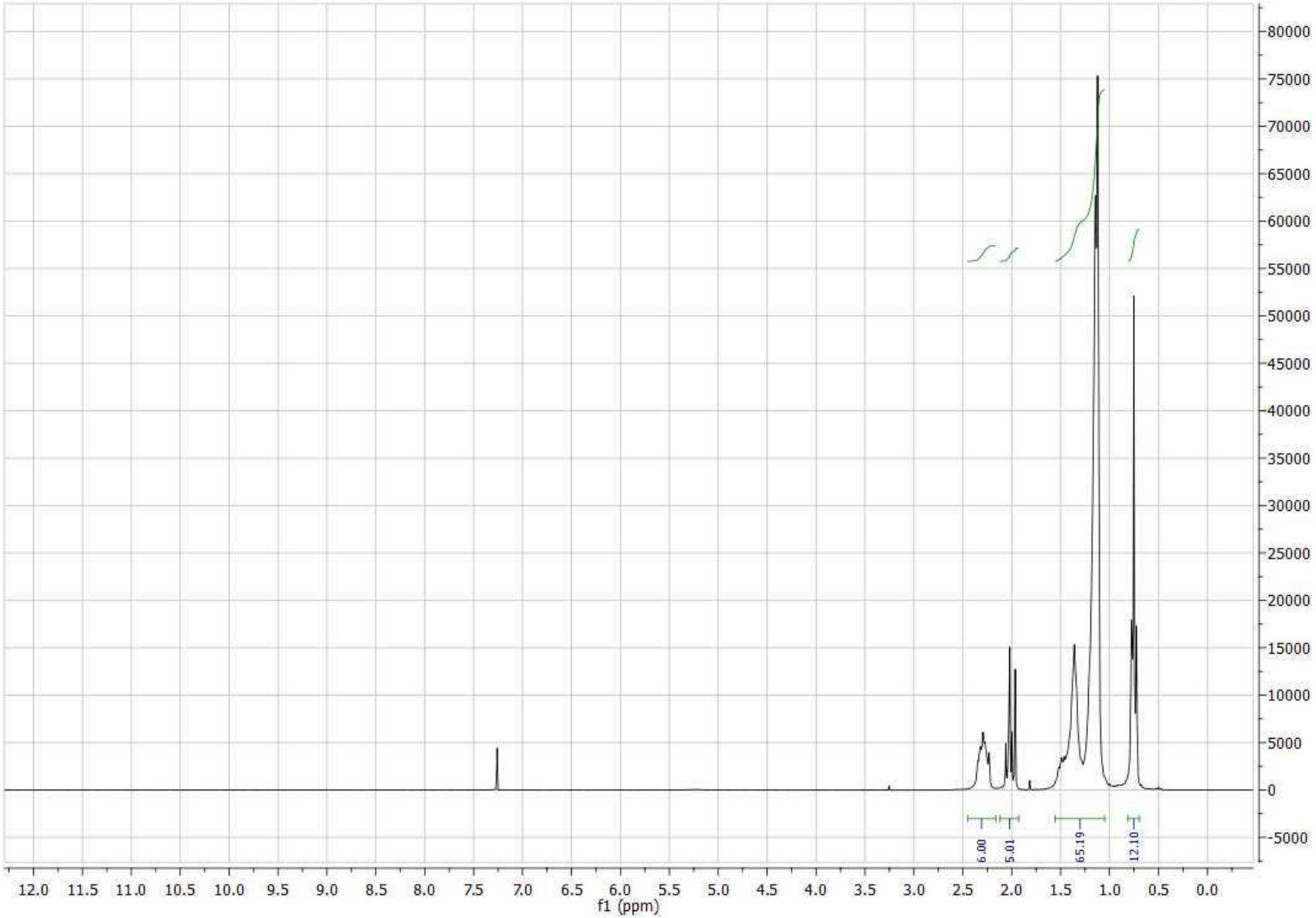


Fig S22: ^{13}C NMR of **11** at 25 °C

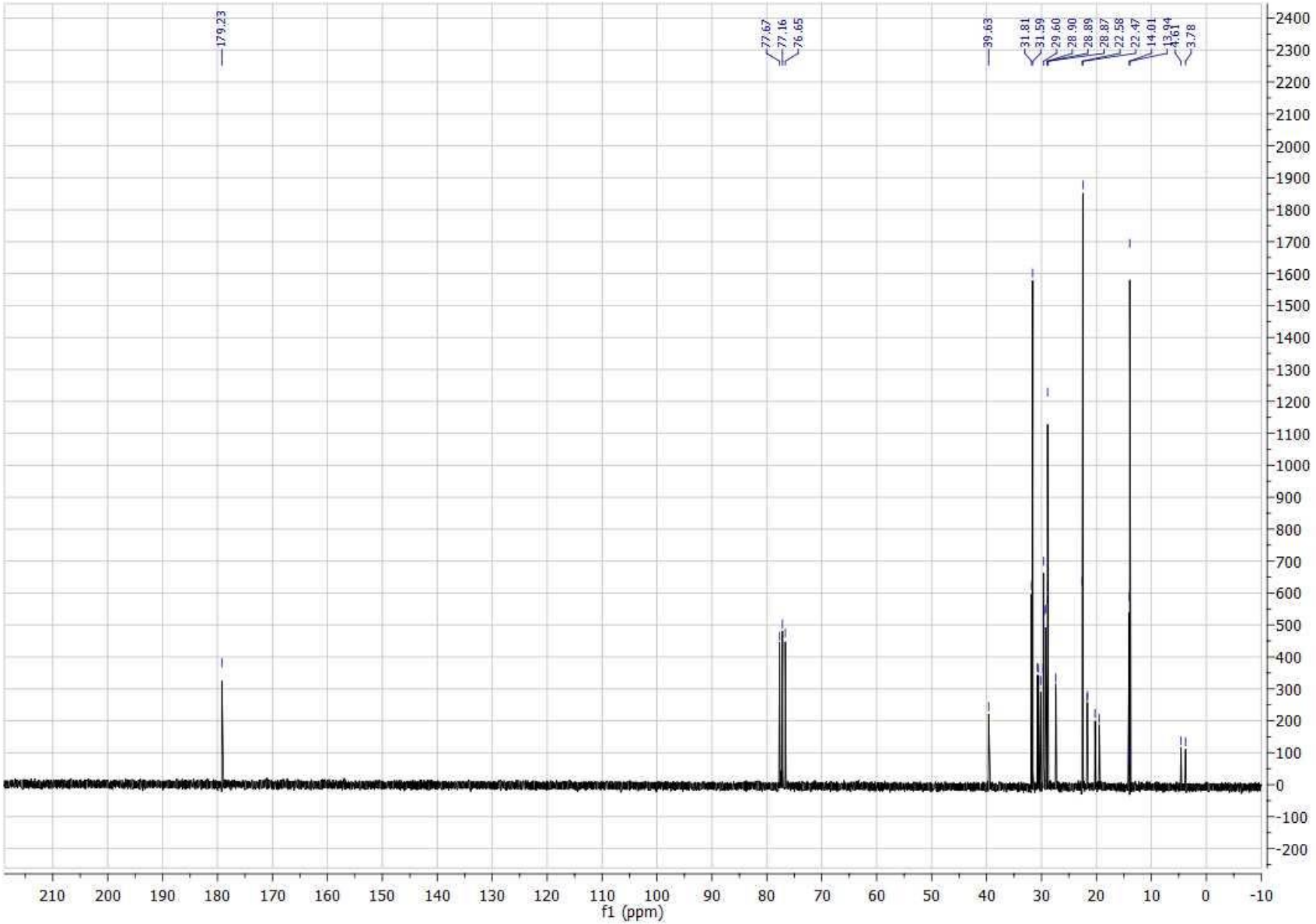


Table S21. Peak assignments and integrals of the ^{1}H-NMR spectrum of **11** at 25°C.

[P_{8881}]	**[C_{16}]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$		7,26	s	-
$C(1,1',1'')H_2$	-	2,42-2,17	m	6,00
$C(1''')H_3$	$C(2)H_2$	2,10-1,92	m	5,01
$C(3\text{-}7,3'\text{-}7',3''\text{-}7'')H_2$	$C(3\text{-}15)H_2$	1,55-1,04	m	65,19
$C(8,8',8'')H_3$	$C(16)H_3$	0,81 - 0,68	m	12,10

Table S22. Peak assignments of the ^{13}C-NMR spectrum of **11** at 25°C.

[P_{8881}]	**[C_{16}]**	**δ (ppm)**	**[P_{8881}]**	**[C_{16}]**	**δ (ppm)**
-	C(1)OO-	179,2	$C(3,3',3'')H_2$	-	26,4
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	$C(15)H_2$	22,6
-	$C(2)H_2$	39,7	$C(7,7',7'')H_2$	-	22,5
-	$C(14)H_2$	31,8	$C(3,3',3'')H_2$	-	21,7;21,6
$C(6,6',6'')H_2$		31,6	$C(2,2',2'')H_2$	-	20,3;19,5
-	$C(4\text{-}13)H_2$	30,8-28,9	-	$C(16)H_3$	14,0
$C(4,4',4'')H_2$	-	29,6	$C(8,8',8'')H_2$	-	13,9
$C(5,5',5'')H_2$	-	28,9	$C(1''')H_3$	-	4,6 ; 3,8
-	$C(3)H_2$	27,4			

Fig S23: ^{1}H NMR of **12** at 25 °C

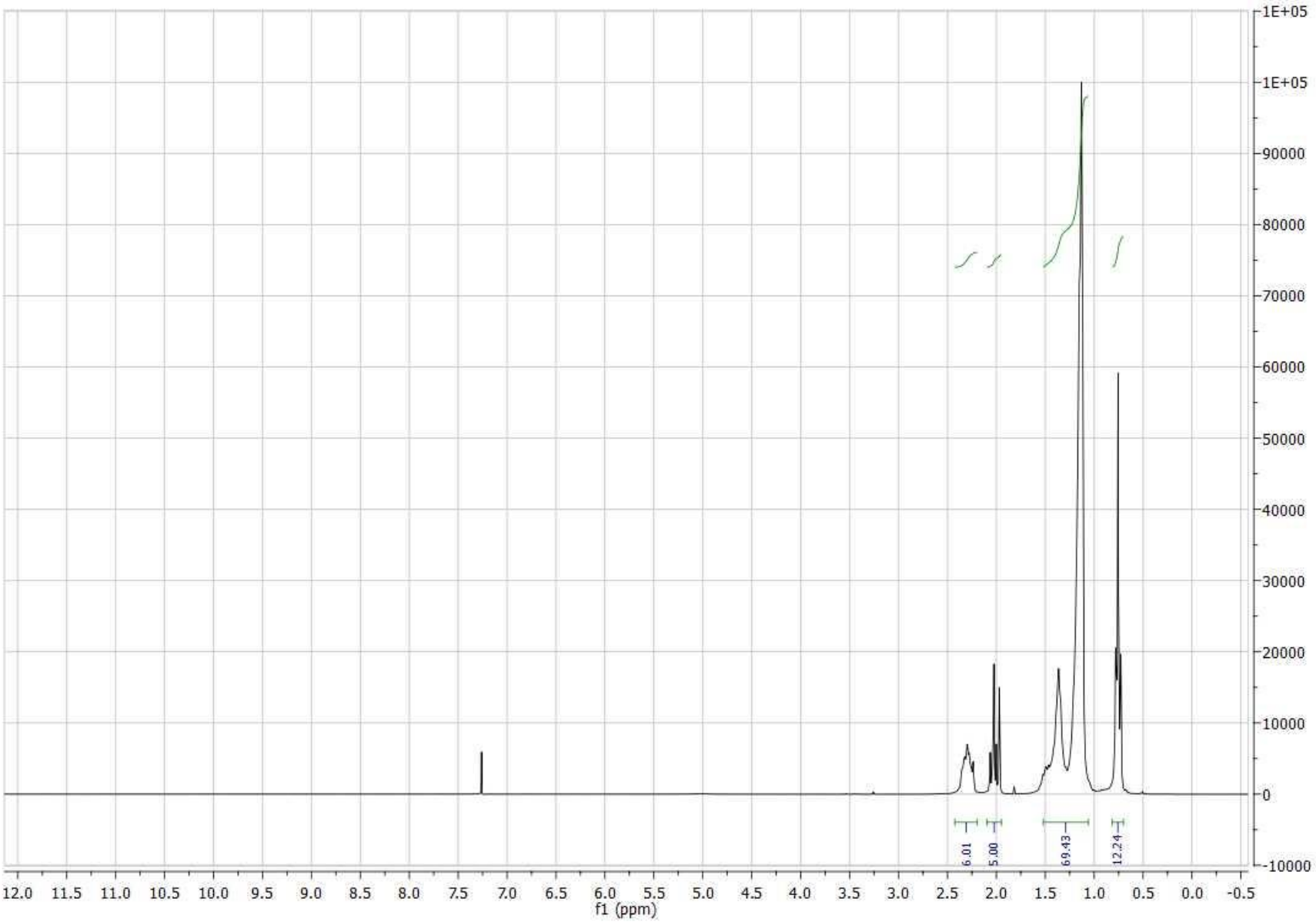


Fig S24: ^{13}C NMR of **12** at 25 °C

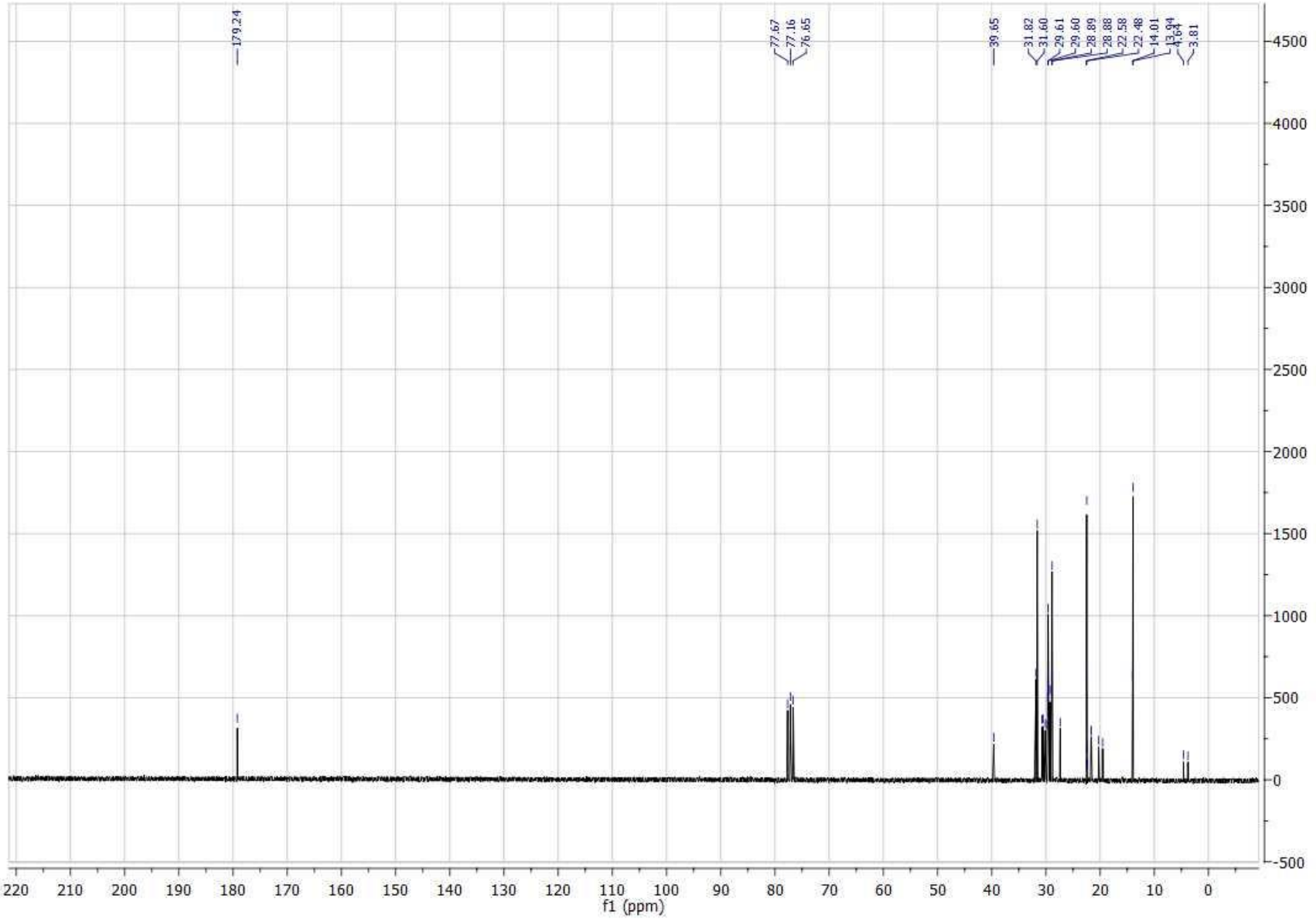


Table S23. Peak assignments and integrals of the ^{1}H-NMR spectrum of **12** at 25°C.

[P_{8881}]	**[C_{18}]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$		7,26	s	-
$C(1,1',1'')H_2$	-	2,42-2,19	m	6,01
$C(1''')H_3$	$C(2)H_2$	2,09-1,94	m	5,00
$C(3\text{-}7,3'\text{-}7',3''\text{-}7'')H_2$	$C(3\text{-}17)H_2$	1,59-1,00	m	69,43
$C(8,8',8'')H_3$	$C(18)H_3$	0,82 - 0,69	m	12,24

Table S24. Peak assignments of the ^{13}C-NMR spectrum of **12** at 25°C.

[P_{8881}]	**[C_{18}]**	**δ (ppm)**	**[P_{8881}]**	**[C_{18}]**	**δ (ppm)**
-	C(1)OO-	179,2	$C(3,3',3'')H_2$	-	26,4
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	$C(17)H_2$	22,6
-	$C(2)H_2$	39,7	$C(7,7',7'')H_2$	-	22,5
-	$C(16)H_2$	31,8	$C(3,3',3'')H_2$	-	21,7;21,6
$C(6,6',6'')H_2$		31,6	$C(2,2',2'')H_2$	-	20,3;19,5
-	$C(4\text{-}15)H_2$	29,7-28,9	-	$C(18)H_3$	14,0
$C(4,4',4'')H_2$	-	29,6	$C(8,8',8'')H_2$	-	13,9
$C(5,5',5'')H_2$	-	28,9	$C(1''')H_3$	-	4,6 ; 3,8
-	$C(3)H_2$	27,4			

Fig S25: ^{1}H NMR of **13** at 25 °C

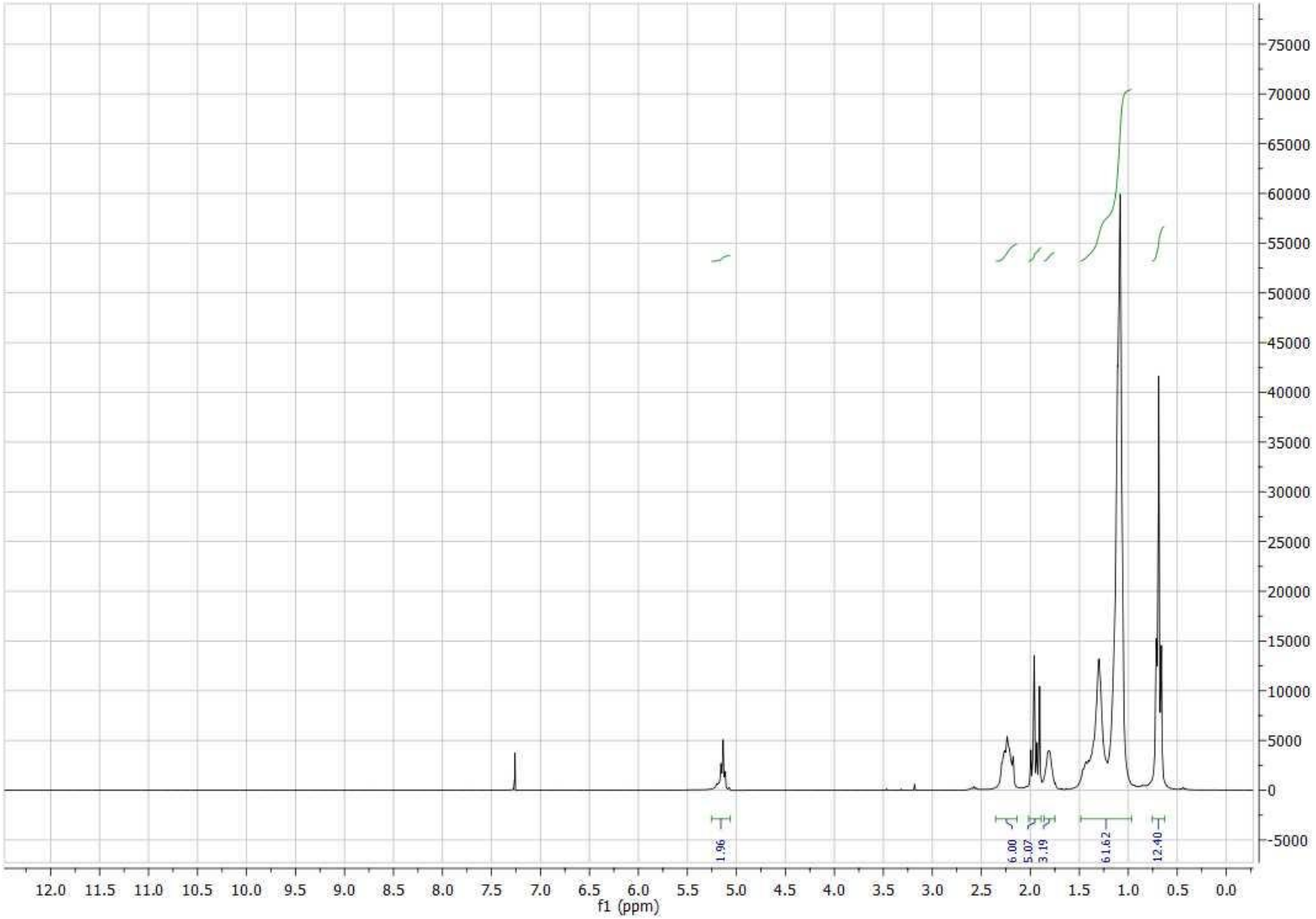


Fig S26: ^{13}C NMR of **13** at 25 °C

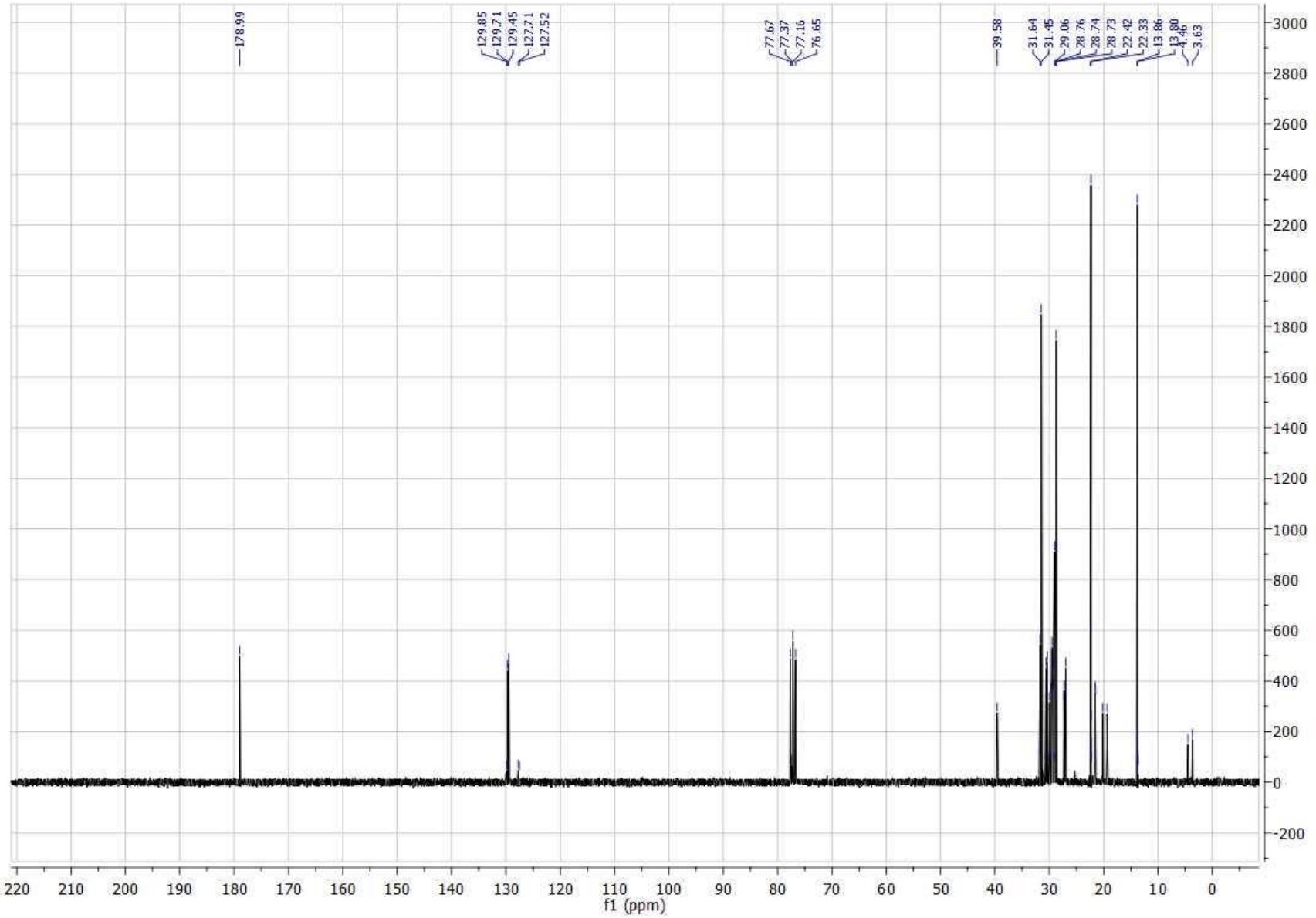


Table S25. Peak assignments and integrals of the ^{1}H-NMR spectrum of **13** at 25°C.

[P_{8881}]	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$		7,26	s	-
-	$C(9,10)H_2$	5,25-5,06	m	1,96
$C(1,1',1'')H_2$	-	2,42-2,19	m	6,00
$C(1''')H_3$	$C(2)H_2$	2,09-1,94	m	5,07
-	$C(8,11)H_2$	1,86-1,74	m	3,19
$C(3\text{-}7,3'\text{-}7',3''\text{-}7'')H_2$	$C(3\text{-}15)H_2$	1,49-0,96	m	61,62
$C(8,8',8'')H_3$	$C(18)H_3$	0,76 - 0,63	m	12,40

Table S26. Peak assignments of the ^{13}C-NMR spectrum of **13** at 25°C.

[P_{8881}]	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**	**[P_{8881}]**	**[$C_{18:1}$ tested according to Ph.Eur.]**	**δ (ppm)**
-	C(1)OO-	179,2	-	$C(3)H_2$	27,0
-	$C(9)H_2$	129,7	-	$C(11)H_2$	26,9
-	$C(10)H_2$	129,5	$C(3,3',3'')H_2$	-	26,4
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	-	$C(17)H_2$	22,4
-	$C(2)H_2$	39,6	$C(7,7',7'')H_2$	-	22,3
-	$C(16)H_2$	31,6	$C(3,3',3'')H_2$	-	21,6;21,5
$C(6,6',6'')H_2$		31,5	$C(2,2',2'')H_2$	-	20,1;19,4
-	$C(4\text{-}7,12\text{-}15)H_2$	30,6-28,8	-	$C(18)H_3$	13,9
$C(4,4',4'')H_2$	-	28,7	$C(8,8',8'')H_2$	-	13,8
$C(5,5',5'')H_2$	-	28,7	$C(1''')H_3$	-	4,5 ; 3,6
-	$C(8)H_2$	27,3			

Fig S27: ^{1}H NMR of **14** at 25 °C

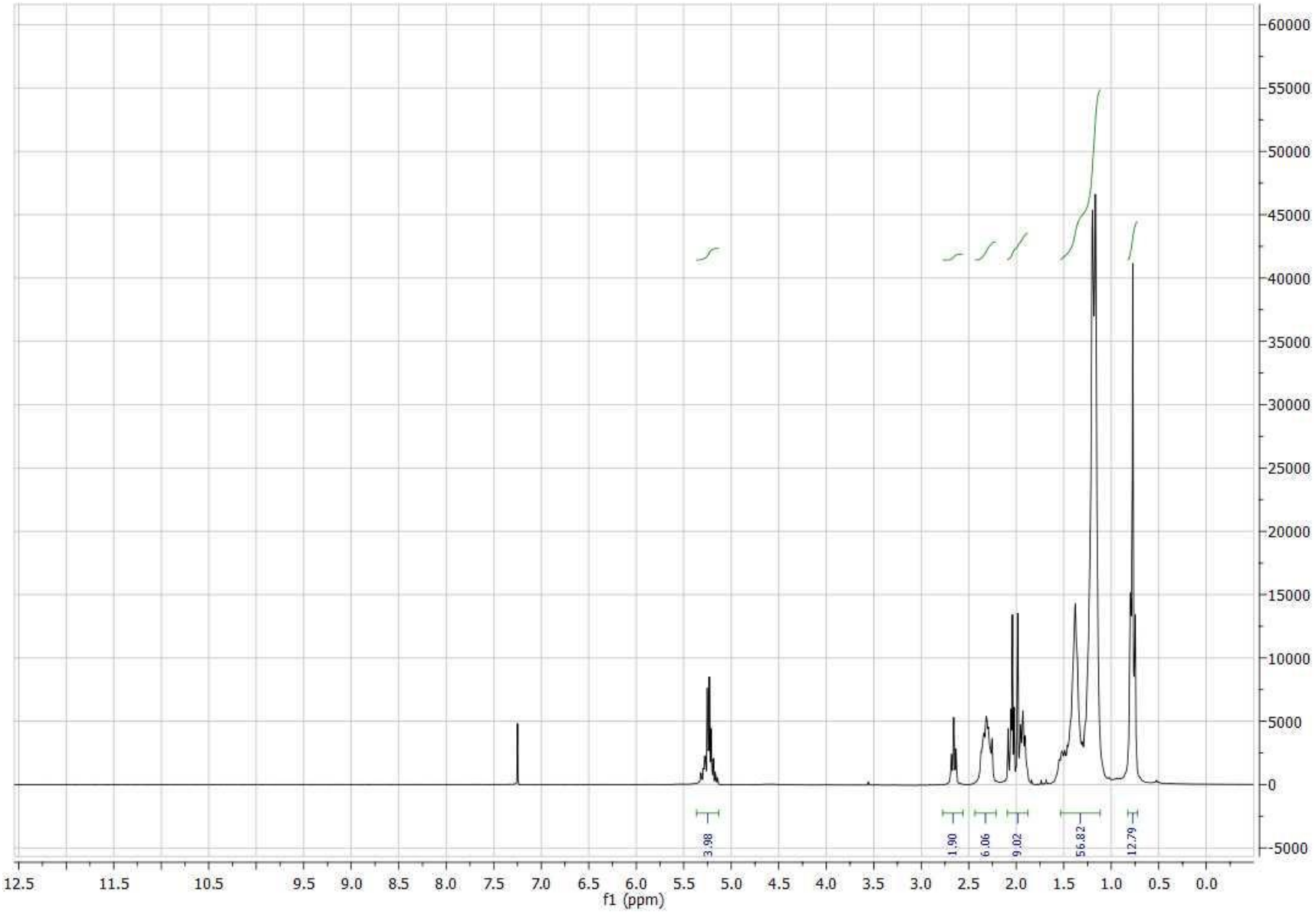


Fig S28: ^{13}C NMR of **14** at 25 °C

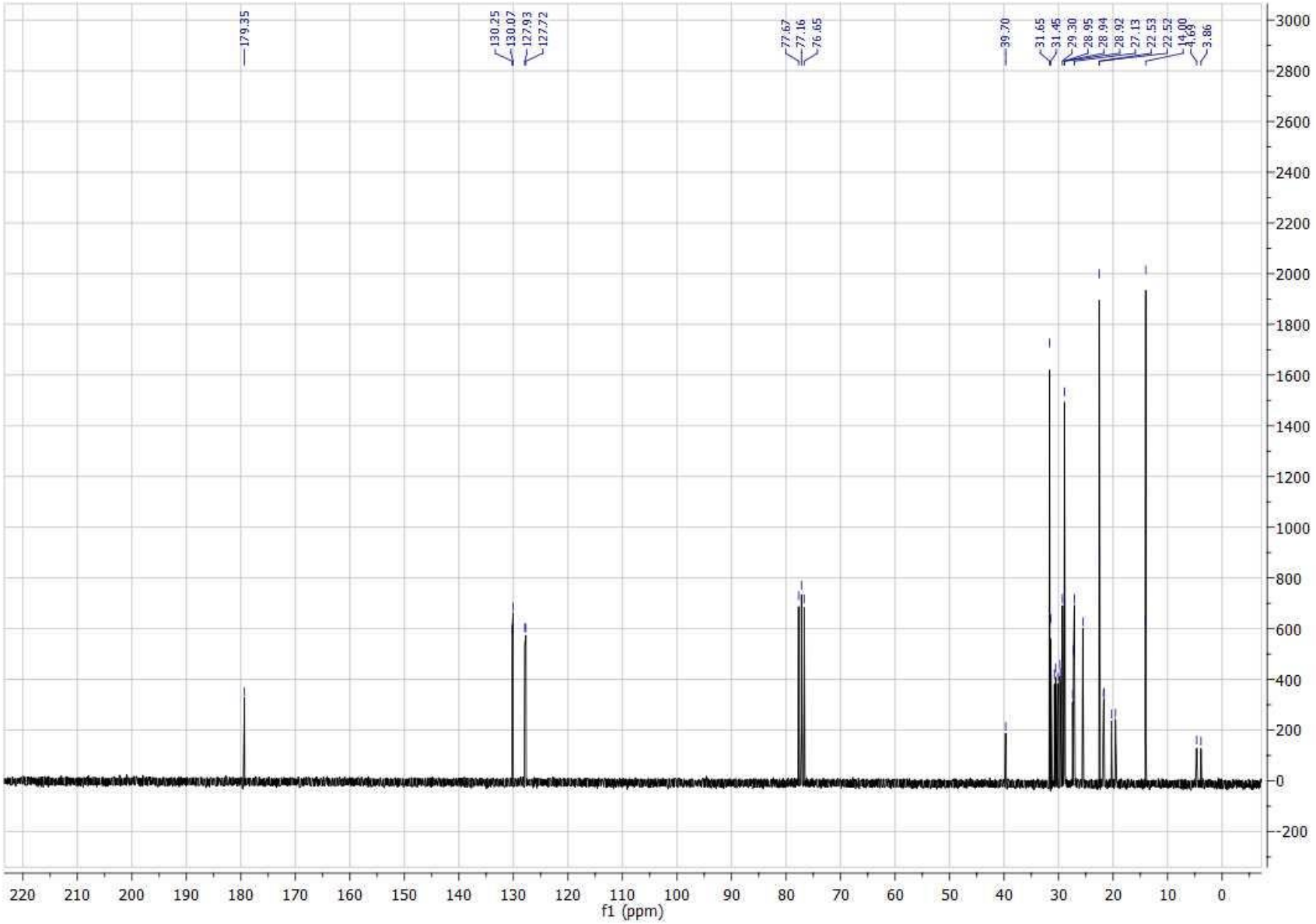


Table S27. Peak assignments and integrals of the ^{1}H-NMR spectrum of **14** at 25°C.

[P_{8881}]	**[$C_{18:2}$]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$		7,26	s	-
-	$C(9,10,12,13)H_2$	5,36-5,12	m	3,98
-	$C(11)H_2$	2,64	t	1,90
$C(1,1',1'')H_2$	-	2,42-2,19	m	6,06
$C(1''')H_3$	$C(2)H_2$	2,10-1,84	m	9,02
-	$C(8,11)H_2$			
$C(3\text{-}7,3'\text{-}7',3''\text{-}7'')H_2$	$C(3\text{-}15)H_2$	1,61-0,99	m	56,82
$C(8,8',8'')H_3$	$C(18)H_3$	0,88 - 0,65	m	12,79

Table S28. Peak assignments of the ^{13}C-NMR spectrum of **14** at 25°C.

[P_{8881}]	**[$C_{18:2}$]**	**δ (ppm)**	**[P_{8881}]**	**[$C_{18:2}$]**	**δ (ppm)**
-	$C(1)OO^-$	179,4	-	$C(8,14)H_2$	27,3
-	$C(9)H_2$	130,3	$C(3,3',3'')H_2$	-	27,1
-	$C(13)H_2$	130,1	-	$C(11)H_2$	25,6
-	$C(10)H_2$	128,0	$C(7,7',7'')H_2$	-	22,5
-	$C(12)H_2$	127,7	-	$C(17)H_2$	22,5
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	$C(3,3',3'')H_2$	-	21,8;21,7
-	$C(2)H_2$	39,7	$C(2,2',2'')H_2$	-	20,3;19,6
$C(6,6',6'')H_2$	-	31,7	-	$C(18)H_3$	14,0
-	$C(16)H_2$	31,5	$C(8,8',8'')H_2$	-	14,0
-	$C(4\text{-}8,15)H_2$	30,8-29,0	$C(1''')H_3$	-	4,7 ; 3,9
$C(4,4',4'')H_2$	-	29,3			
$C(5,5',5'')H_2$	-	28,9			
-	$C(3)H_2$	27,4			

Fig S29: ^{1}H NMR of **15** at 25 °C

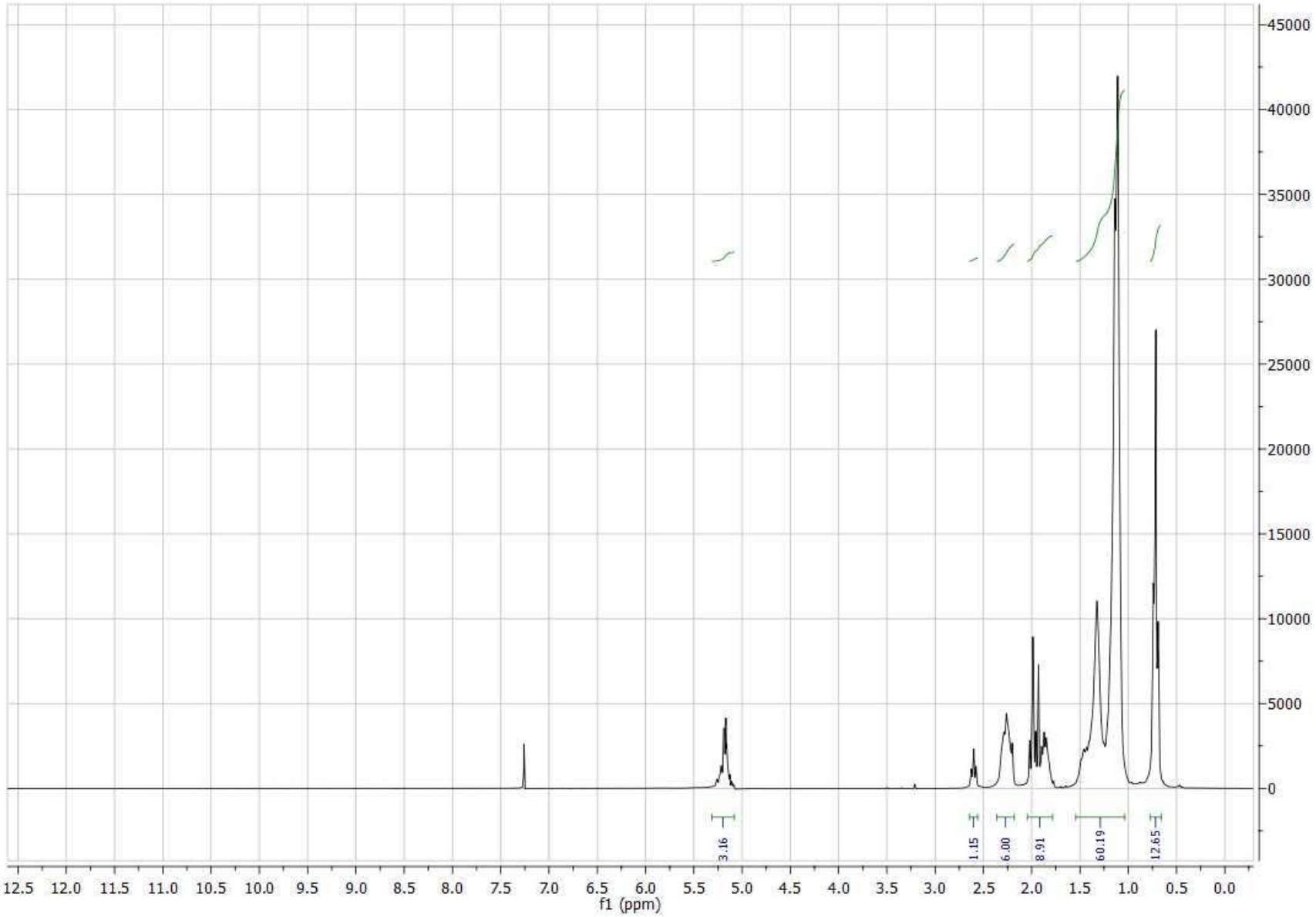


Fig S30: ^{13}C NMR of **15** at 25 °C

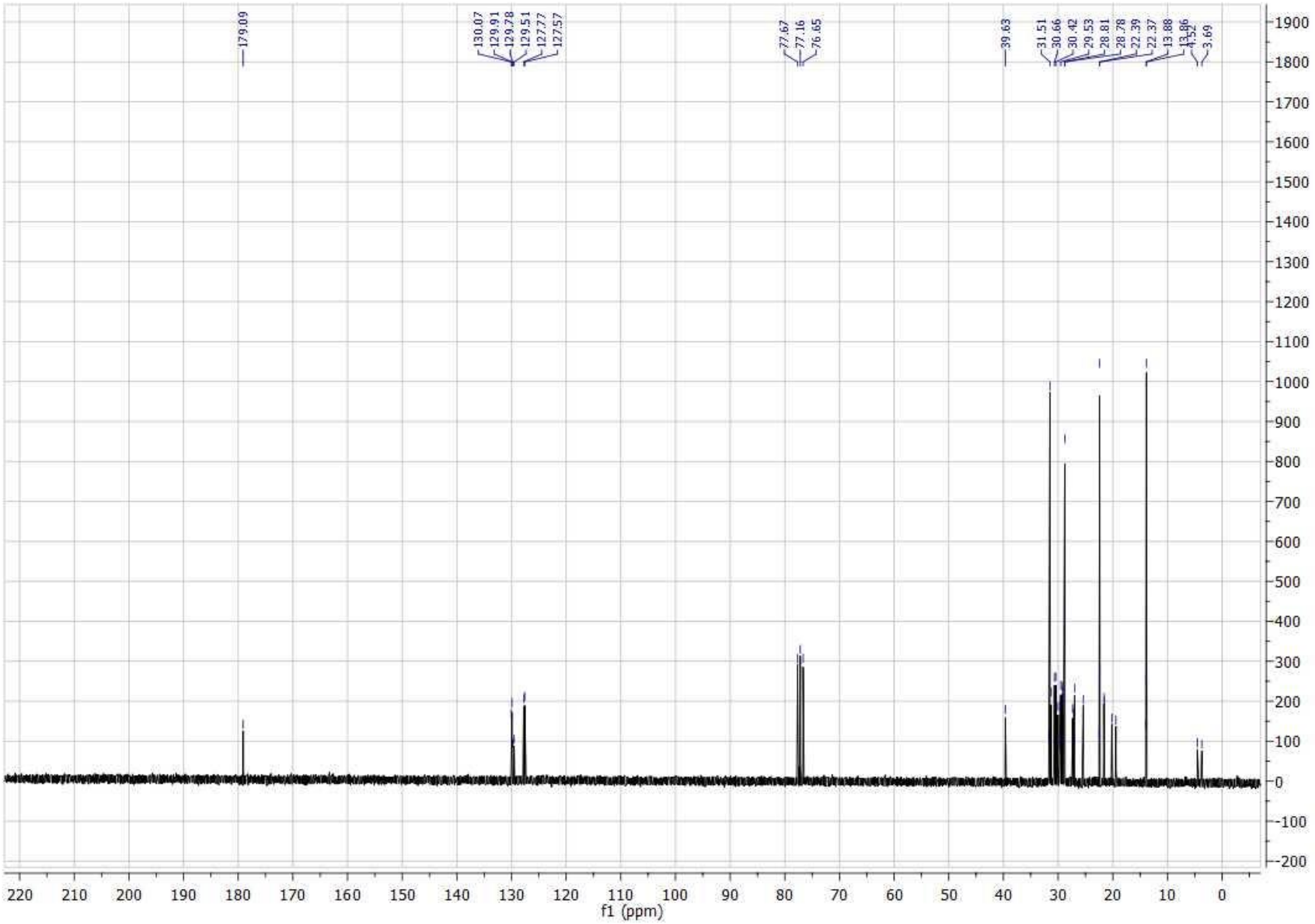


Table S29. Peak assignments and integrals of the ^{1}H-NMR spectrum of **14** at 25°C.

[P_{8881}]	**[$C_{18:2}$]**	**δ (ppm)**	**Shape**	**Integral**
$CHCl_3$		7,26	s	-
-	C(9,10,12,13)H_2	5,32-5,08	m	3,16
-	C(11)H_2	2,60	t	1,15
C(1,1',1'')H_2	-	2,36-2,17	m	6,00
C(1''')H_3	C(2)H_2	2,06-1,75	m	8,91
-	C(8,11)H_2			
C(3-7,3'-7',3''-7'')H_2	C(3-15)H_2	1,55-0,97	m	60,19
C(8,8',8'')H_3	C(18)H_3	0,81 - 0,58	m	12,65

Table S30. Peak assignments of the ^{13}C-NMR spectrum of **14** at 25°C.

[P_{8881}]	**[$C_{18:2}$]**	**δ (ppm)**	**[P_{8881}]**	**[$C_{18:2}$]**	**δ (ppm)**
-	C(1)OO^-	179,1	-	C(8,14)H_2	27,3
-	C(9)H_2	130,1	C(3,3',3'')H_2	-	27,0
-	C(13)H_2	129,1	-	C(11)H_2	25,4
-	C(10)H_2	127,8	C(7,7',7'')H_2	-	22,5
-	C(12)H_2	127,6	-	C(17)H_2	22,4
$CDCl_3$, $CHCl_3$		77,5-76.6, 77,3	C(3,3',3'')H_2	-	21,6;21,5
-	C(2)H_2	39,6	C(2,2',2'')H_2	-	20,2;19,4
C(6,6',6'')H_2	-	31,5	-	C(18)H_3	13,8
-	C(16)H_2	31,3	C(8,8',8'')H_2	-	13,8
-	C(4-8,15)H_2	30,7-28,8	C(1''')H_3	-	4,5 ; 3,7
C(4,4',4'')H_2	-	28,8			
C(5,5',5'')H_2	-	28,8			
-	C(3)H_2	27,3			

Fig S31 IR of **1** at 25 °C

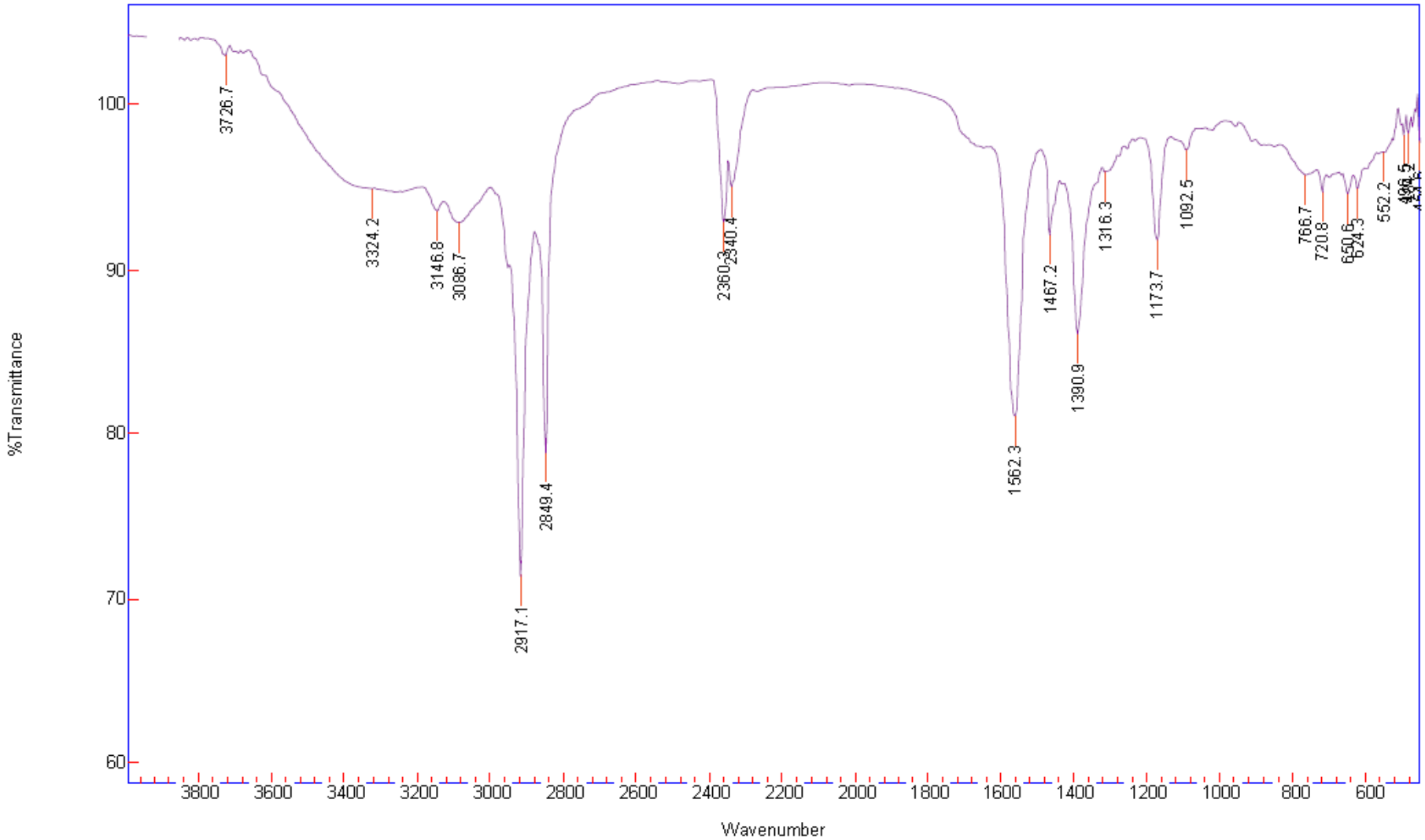


Fig S32 IR of **2** at 25 °C

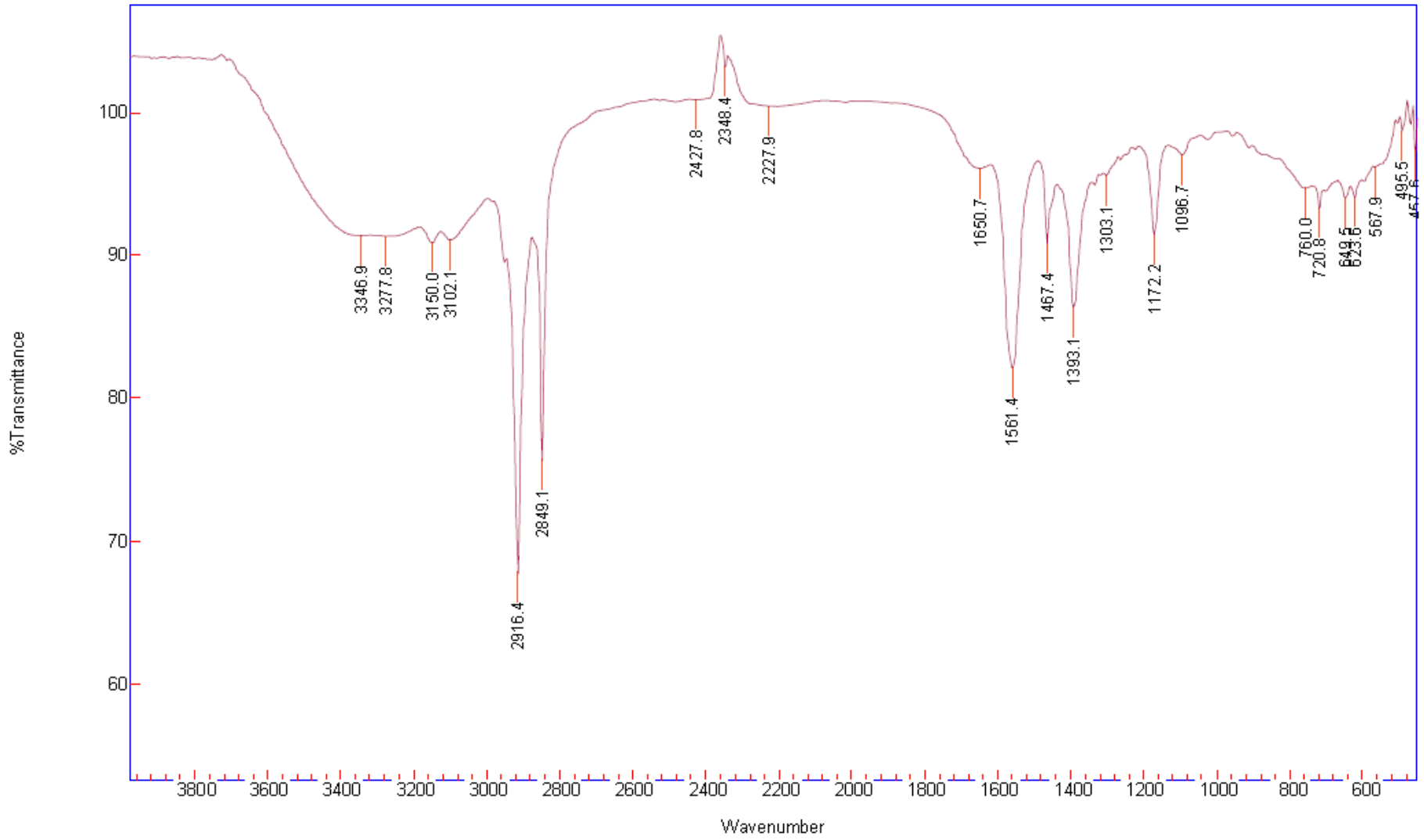


Fig S33 IR of **3** at 25 °C

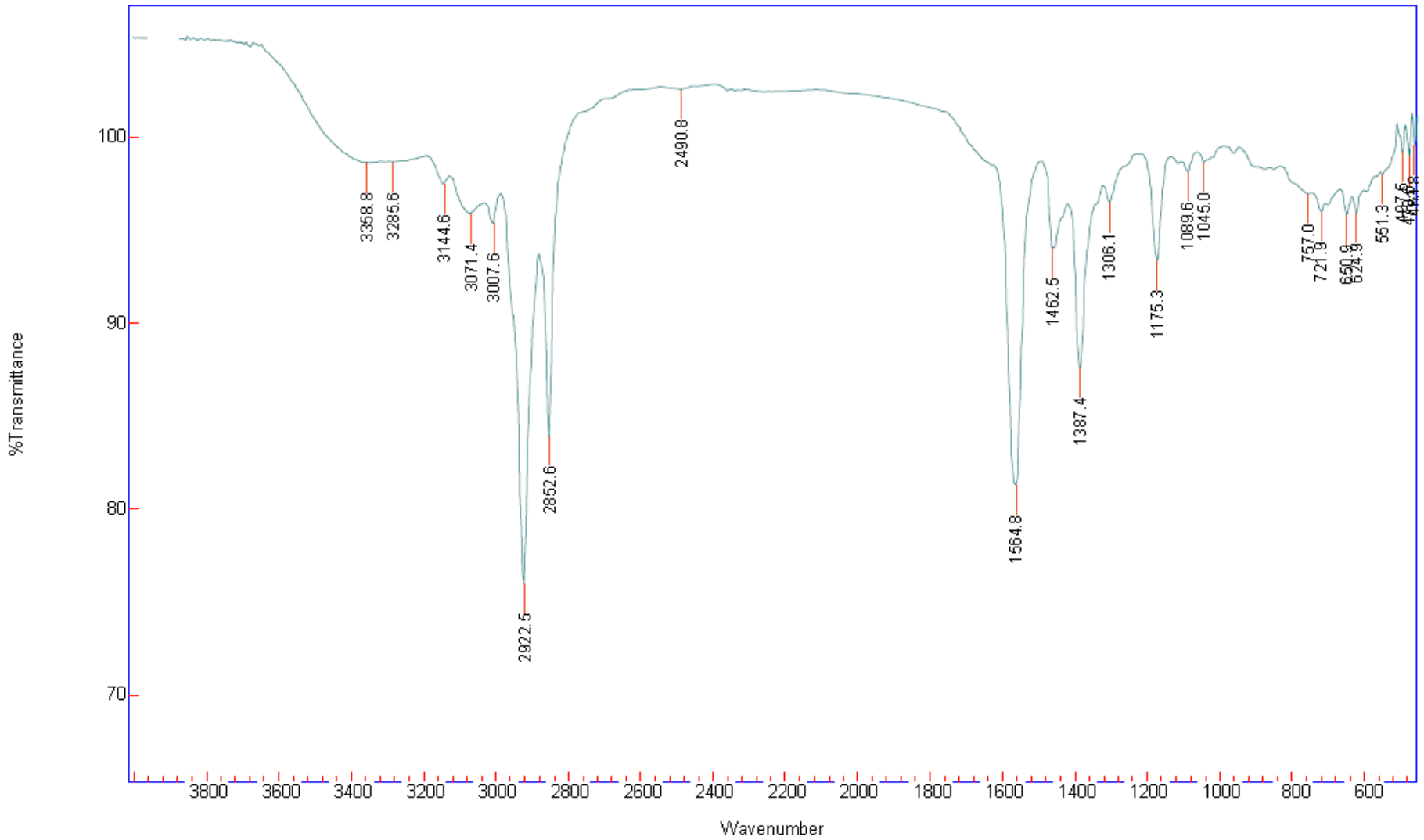


Fig S34 IR of **4** at 25 °C

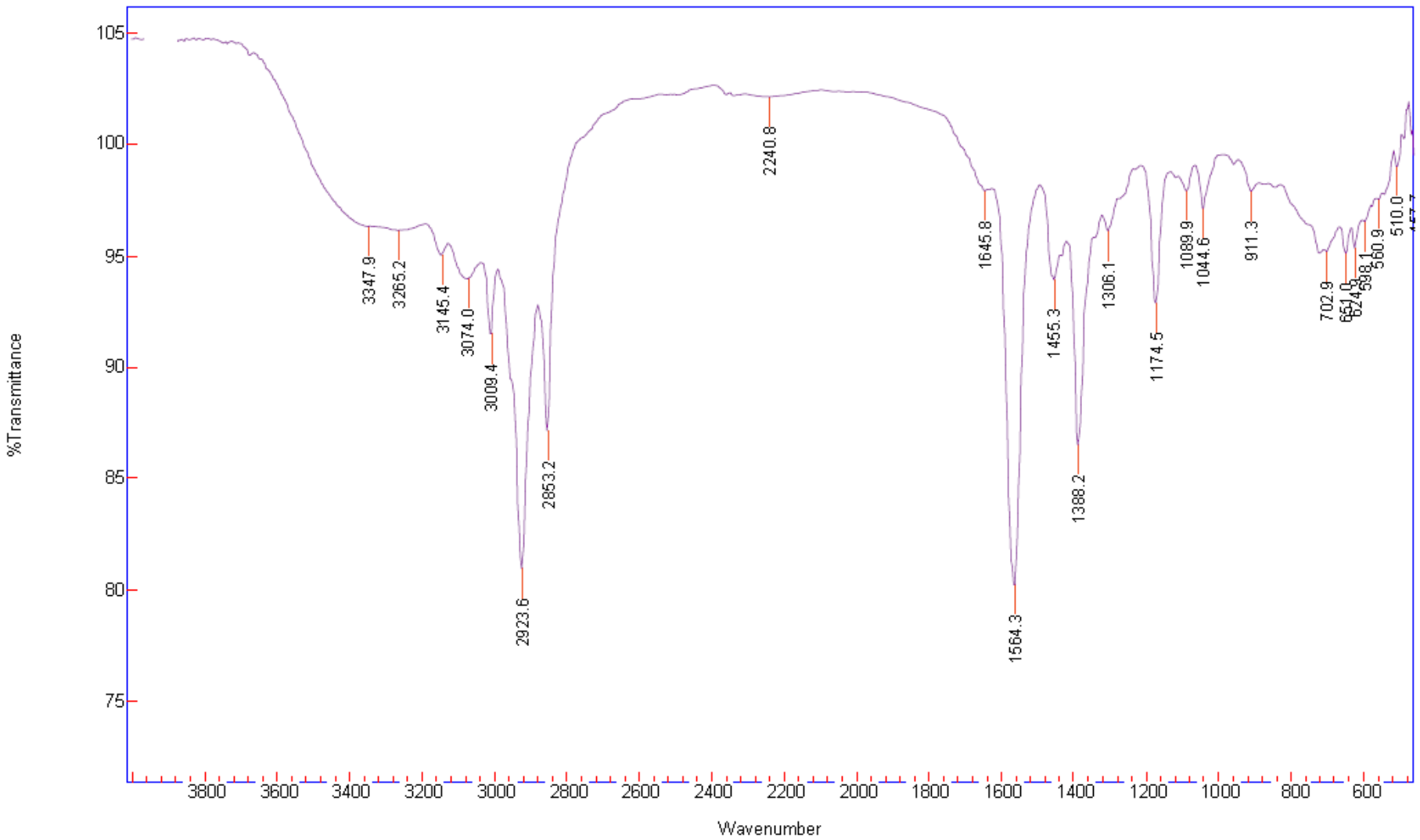


Fig S35 IR of **5** at 25 °C

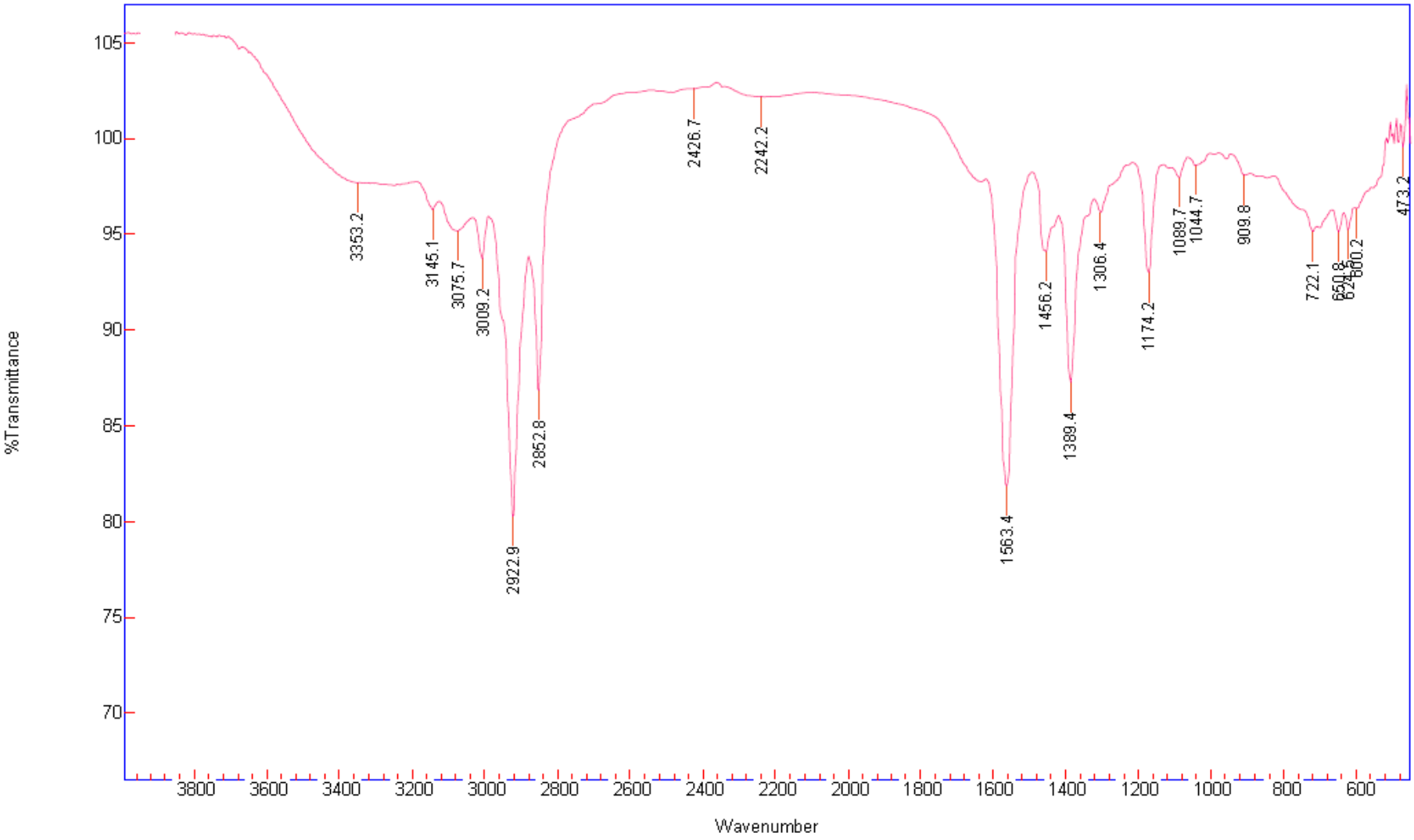


Fig S36 IR of **6** at 25 °C

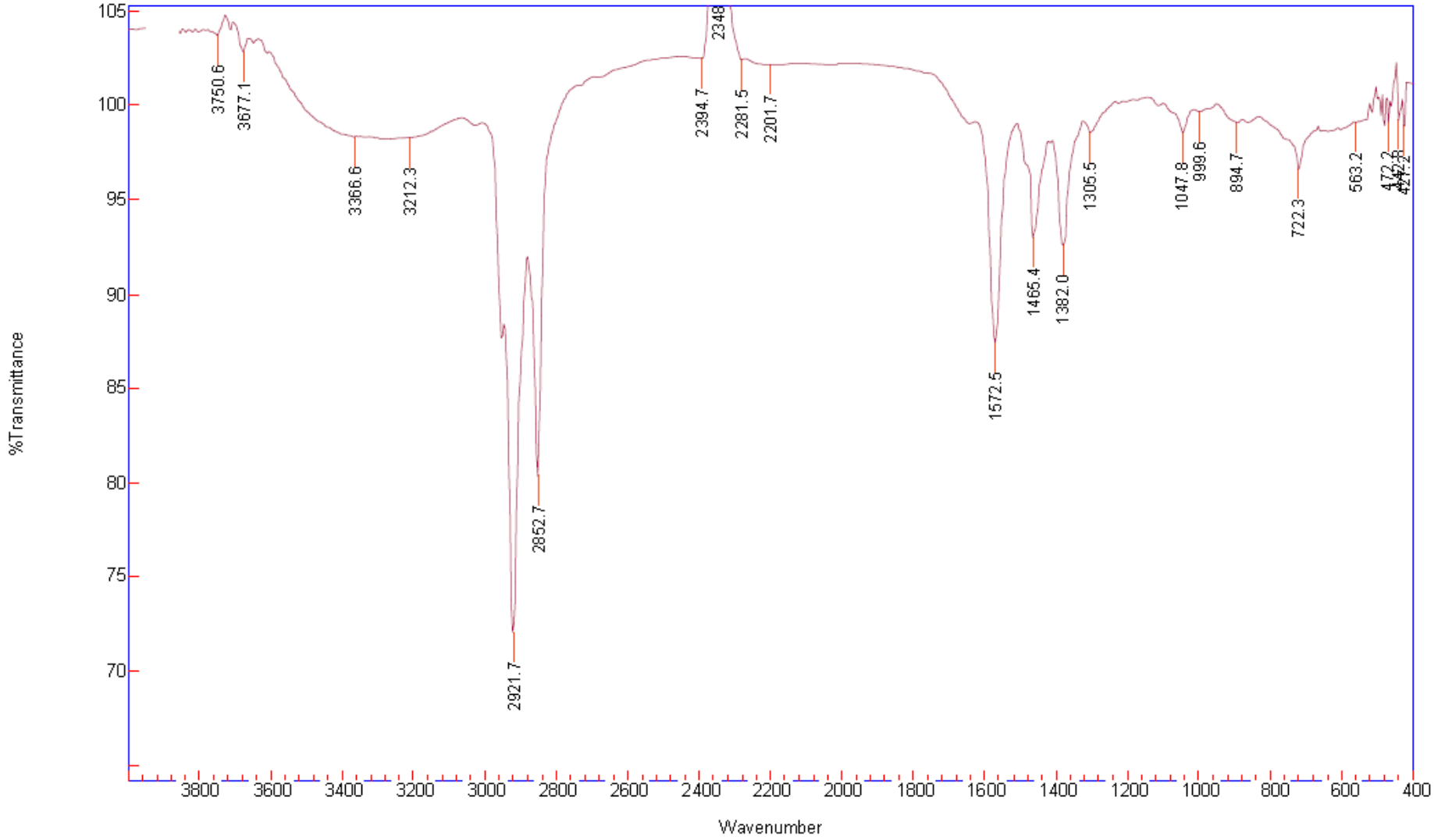


Fig S37 IR of **7** at 25 °C

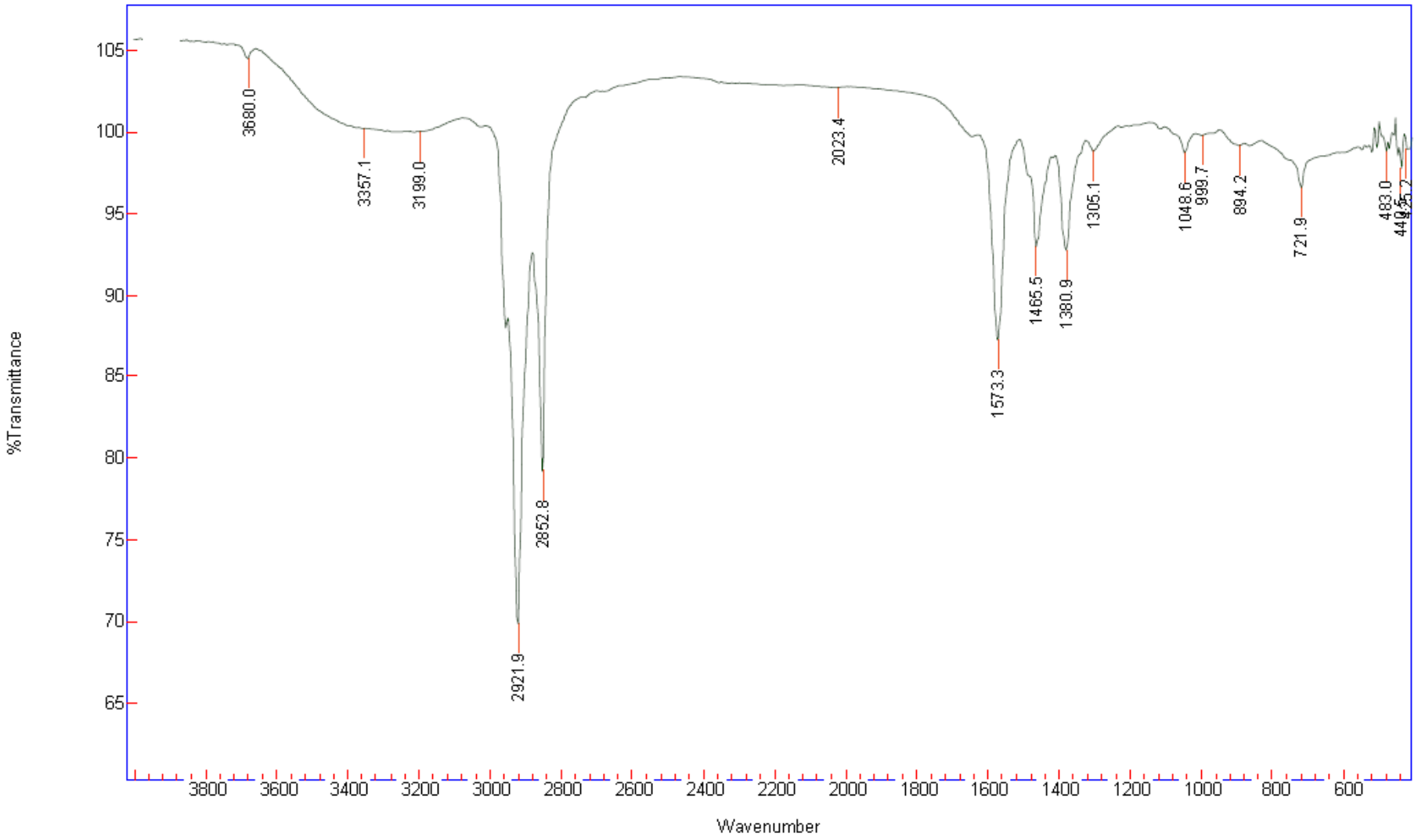


Fig S38 IR of **8** at 25 °C

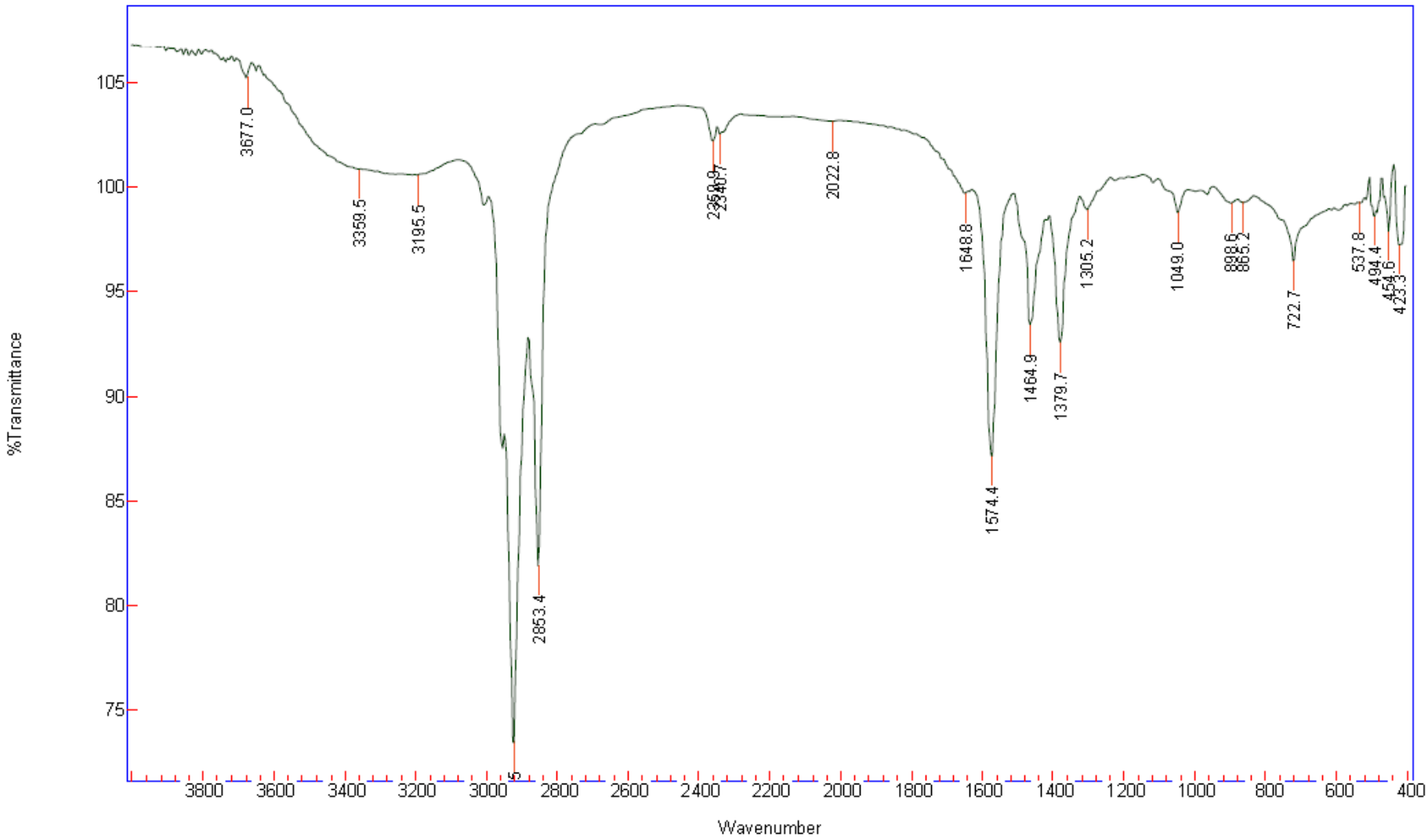


Fig S39 IR of **9** at 25 °C

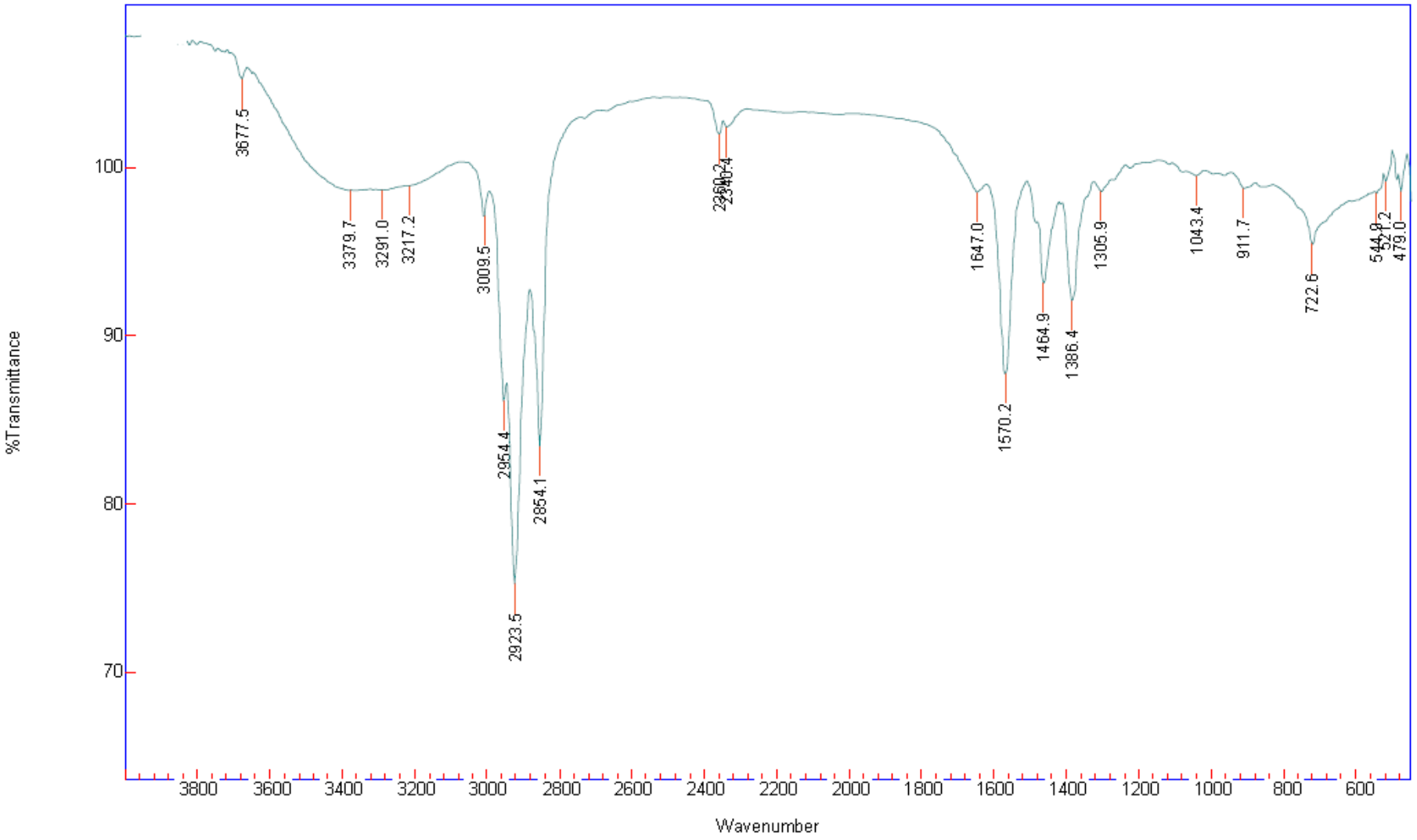


Fig S40 IR of **10** at 25 °C

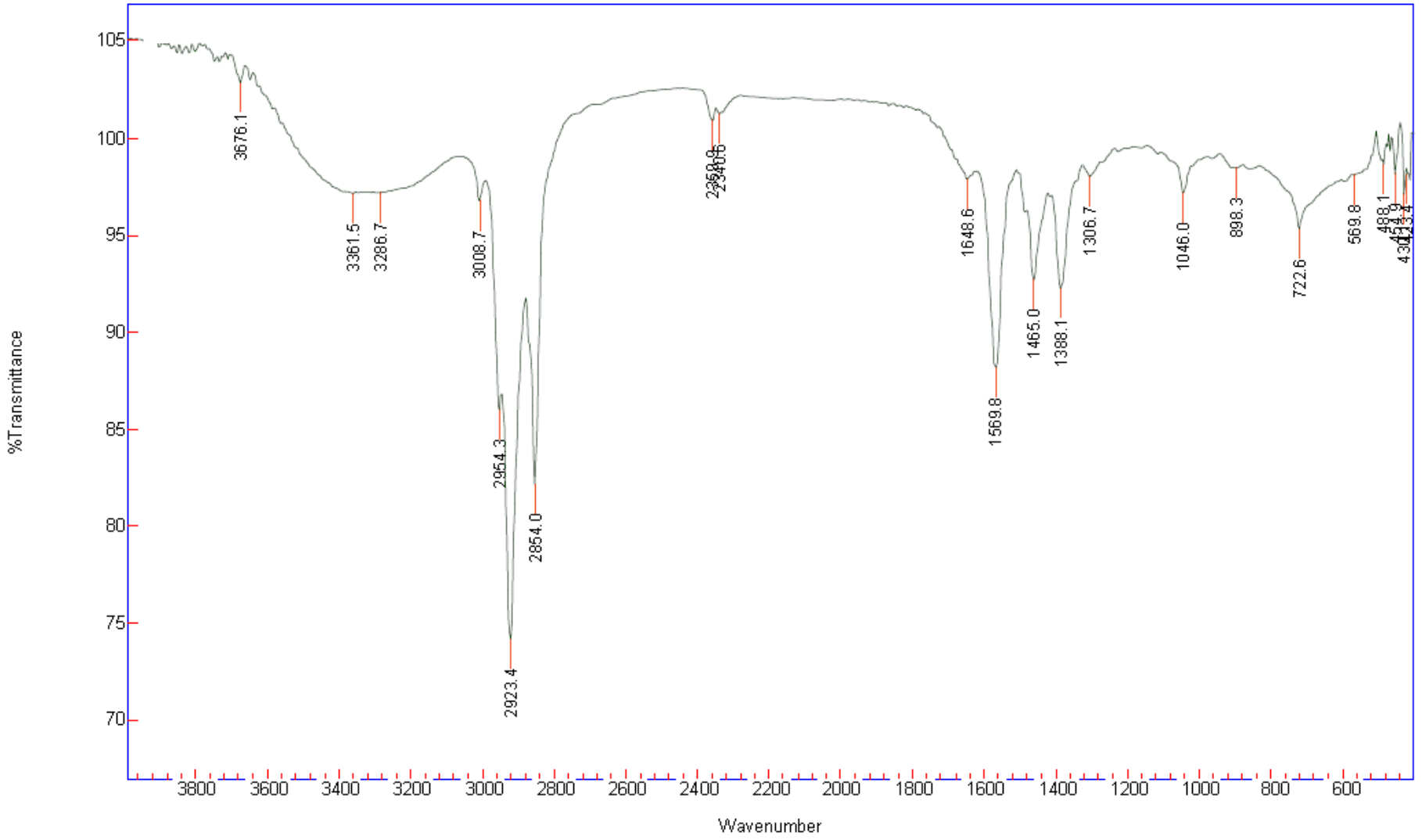


Fig S41 IR of **11** at 25 °C

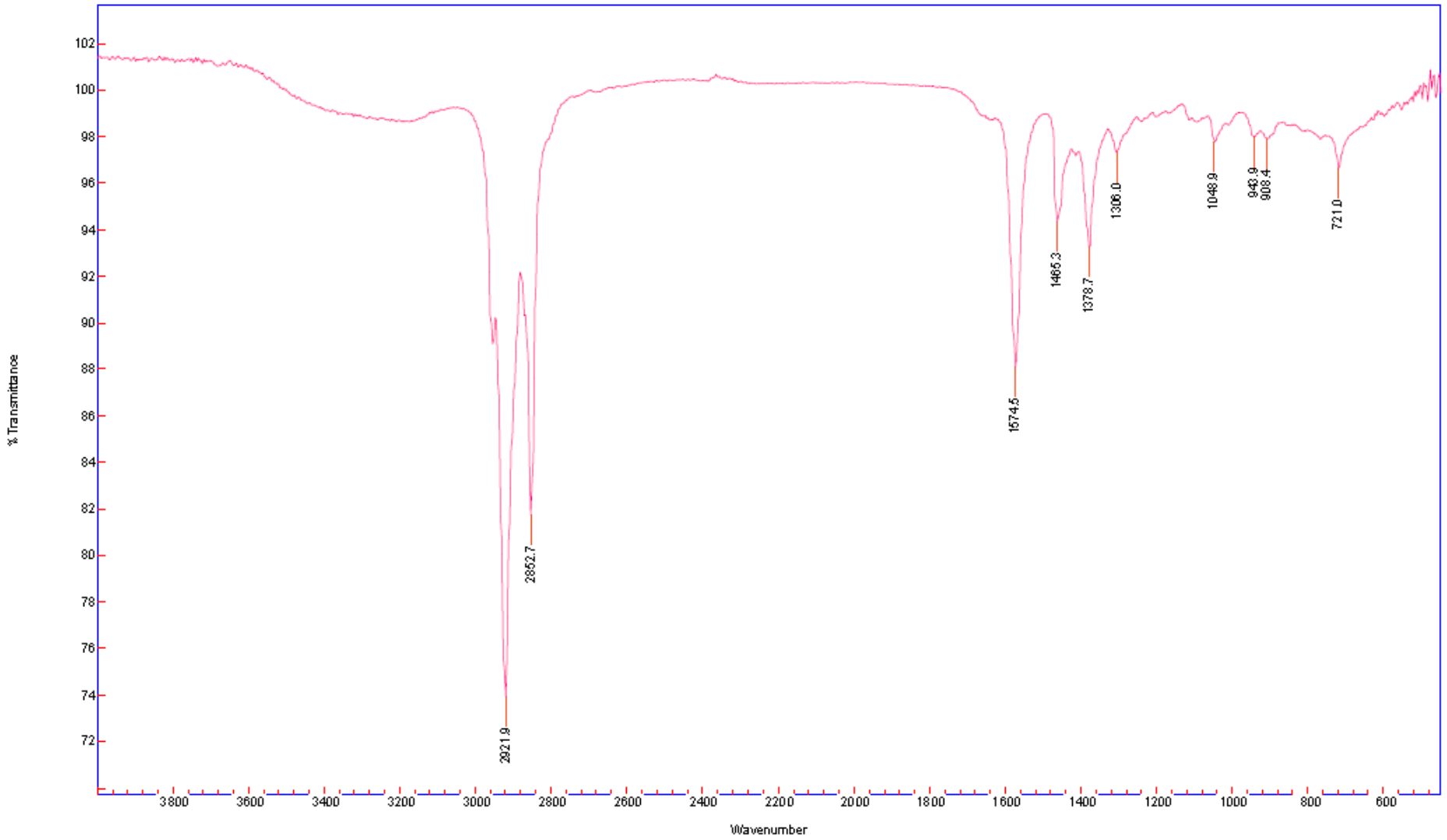


Fig S42 IR of **12** at 25 °C

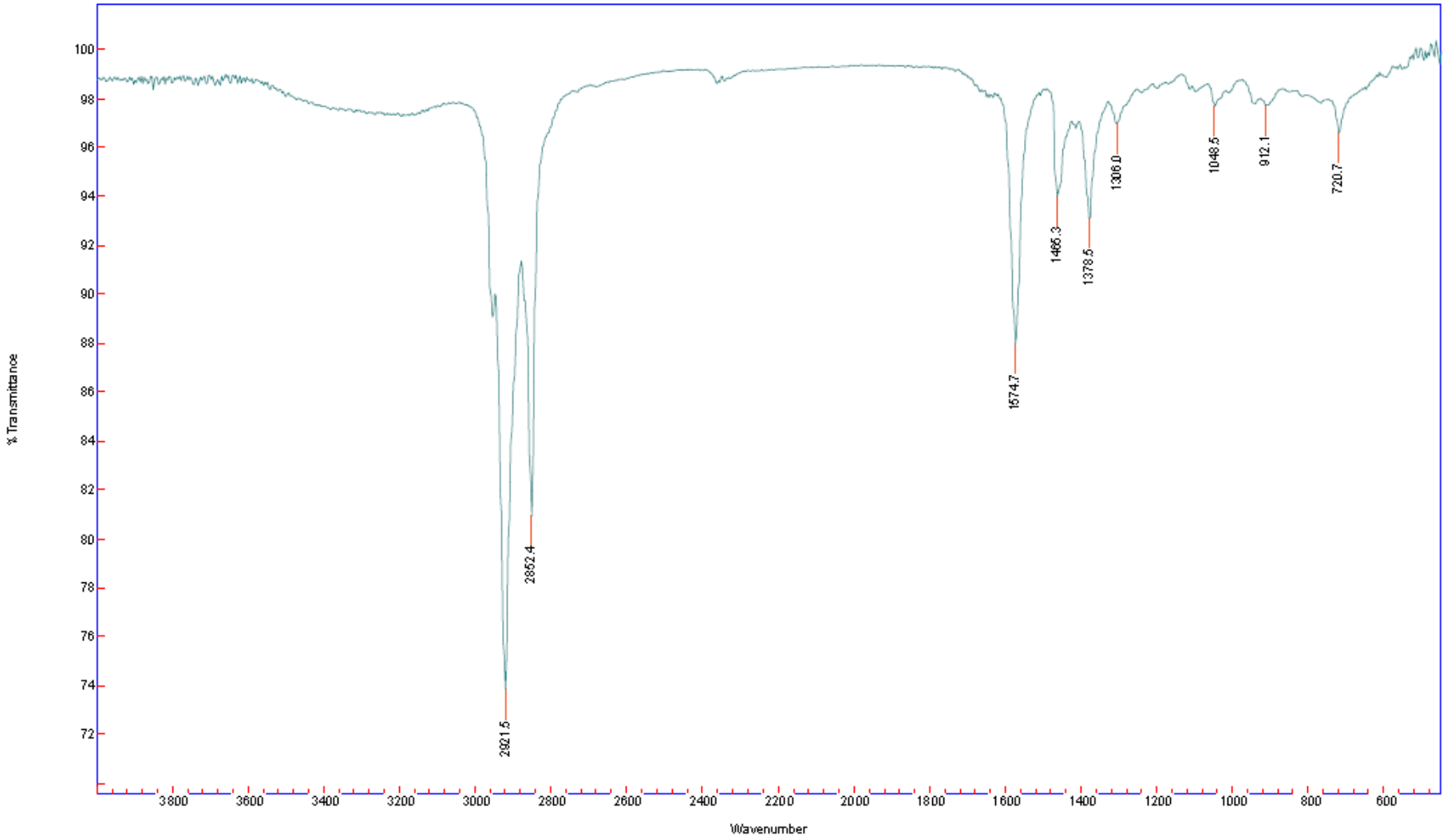


Fig S43 IR of **13** at 25 °C

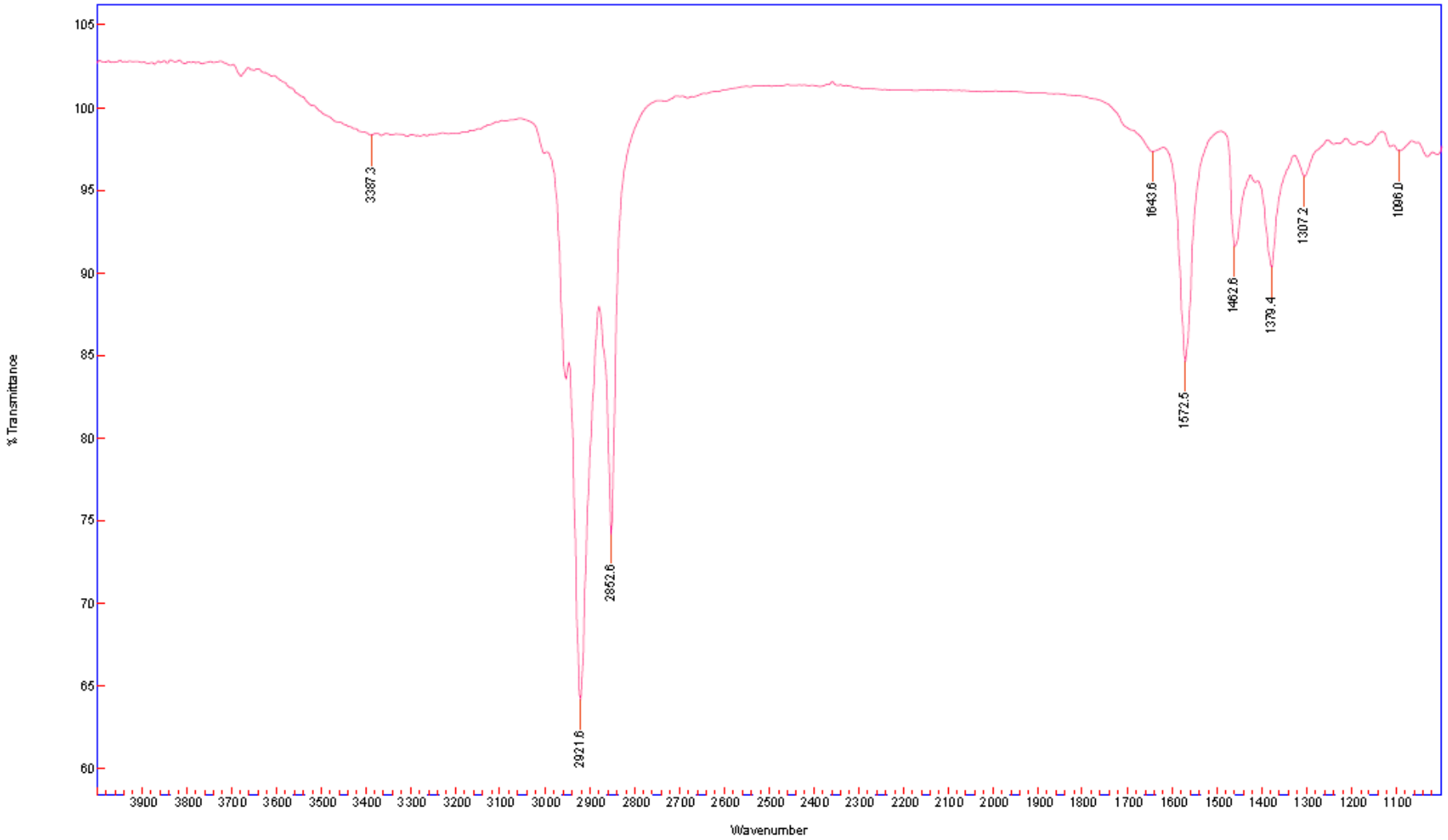


Fig S44 IR of **14** at 25 °C

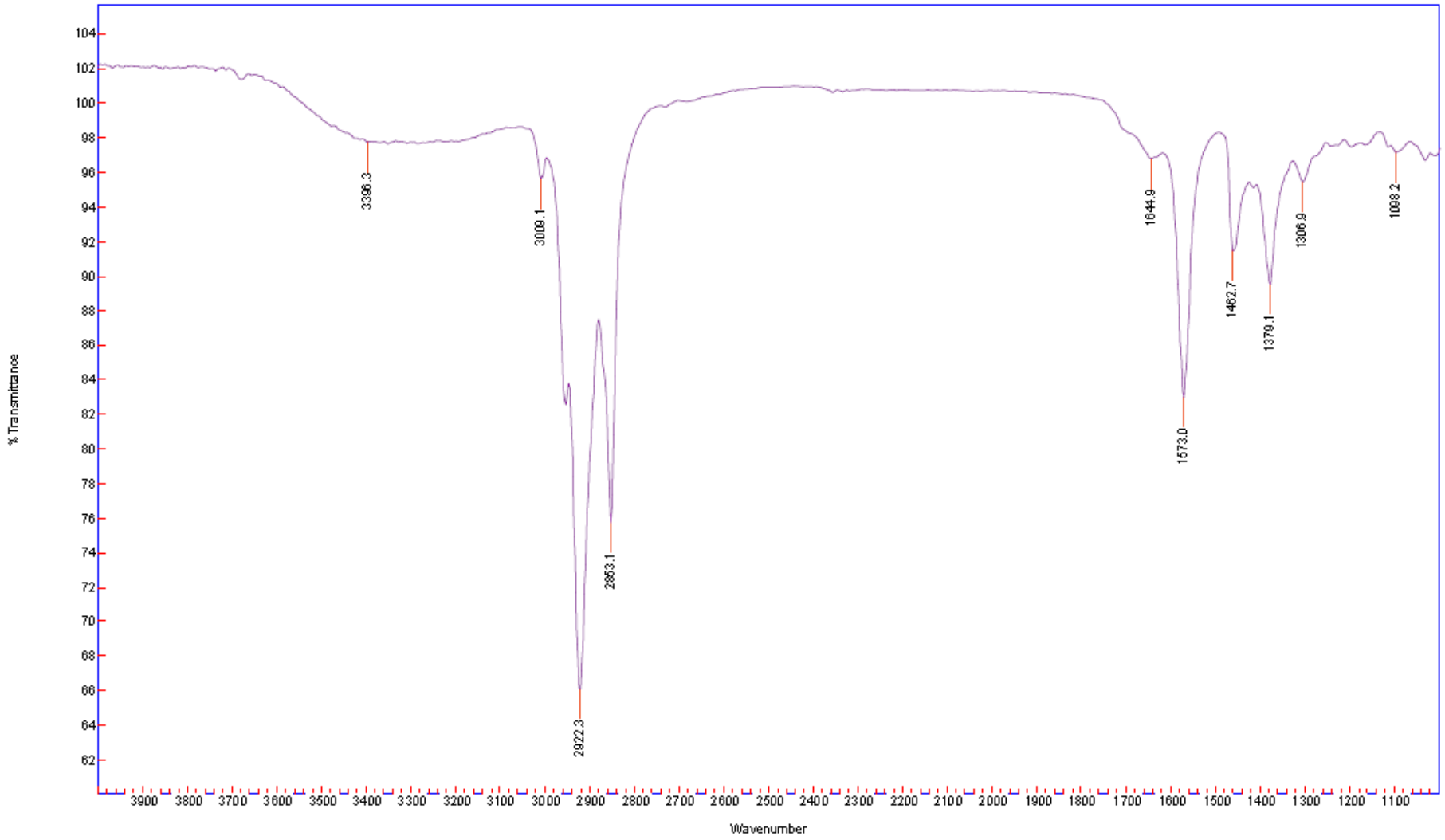


Fig S45 IR of **15** at 25 °C

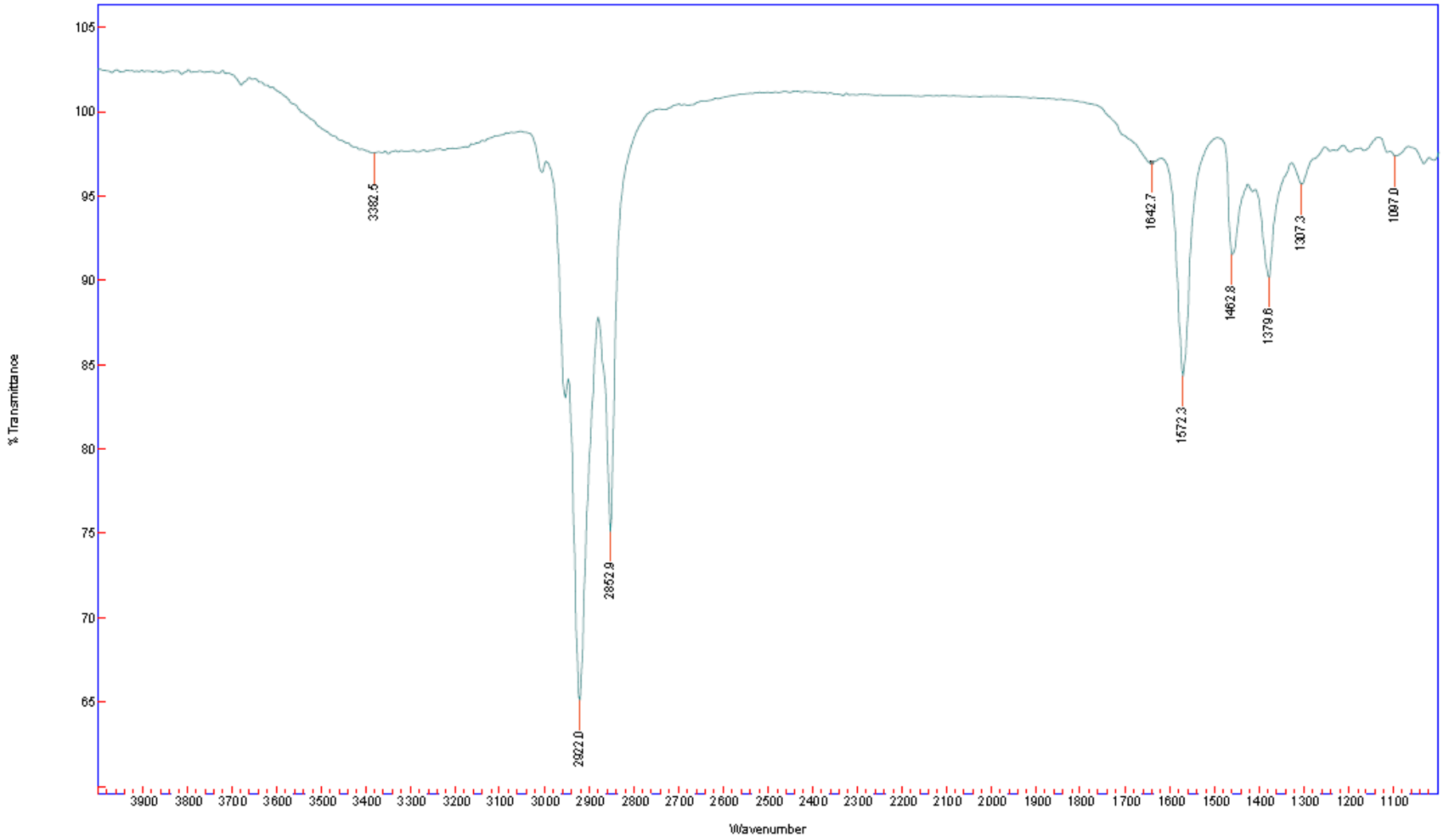


Fig S46 Thermal gravimetric analysis (TGA) of [EMIM] series.

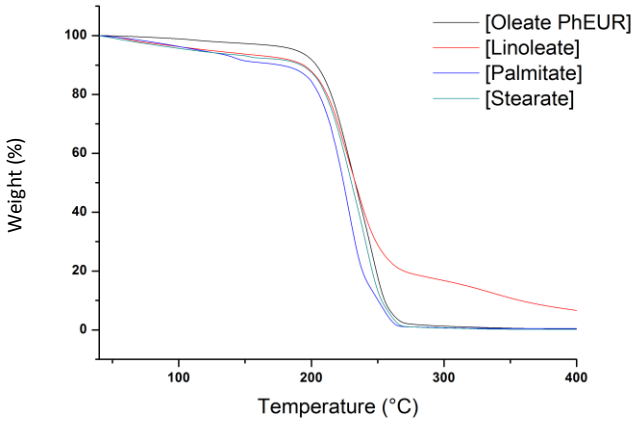


Fig S47 Thermal gravimetric analysis (TGA) of [N_{8881}] series.

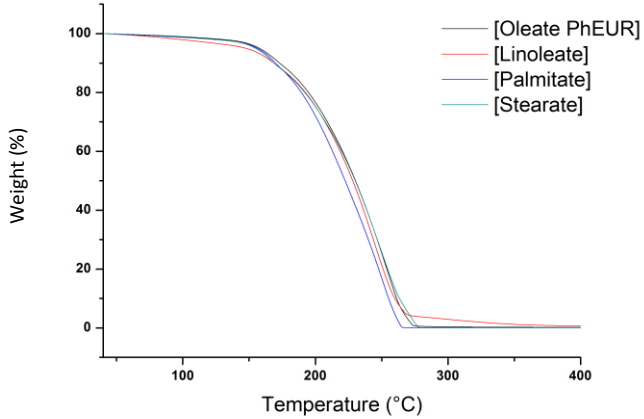


Fig S48 Thermal gravimetric analysis (TGA) of [P_{8881}] series.

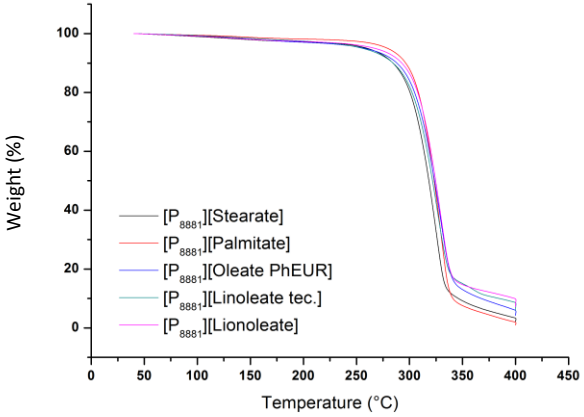
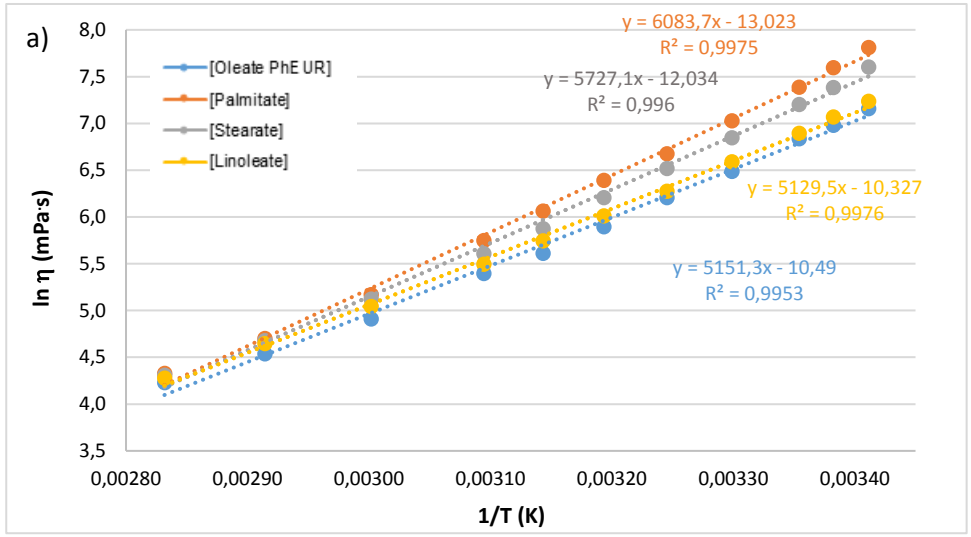


Table S31. Comparison of the viscosity as a function of the temperature of [N_{8881}] and [P_{8881}] series.

T	[N_{8881}]				[P_{8881}]			
°C	[C16]	[C18]	[C18:1$_{PhEur}$]	[C18:2]	[C16]	[C18]	[C18:1$_{PhEur}$]	[C18:2]
20	2463	1998	1283	1385	774.1	720.2	585.7	552.0
22,5	1989	1605	1075	1172	-	-	-	-
25	1615	1342	929.1	985.6	556.6	529.0	435.9	415.6
30	1127	940.2	656.2	727.2	415.0	392.1	333.7	312.4
35	792.2	675.2	495.8	531.3	312.0	301.4	258.9	241.6
40	595.4	494.6	362.9	407.2	244.3	229.7	199.8	190.1
45	429.4	355.6	273.5	311.8	184.6	177.5	157.1	149.8
50	313.0	272.2	220.4	242.8	145.3	142.1	126.0	120.8
60	175.7	167.5	135.7	154.9	95.24	91.22	83.00	80.00
70	109.8	107.2	93.41	104.01	65.15	64.44	58.91	57.31
80	75.76	74.28	68.57	72.01	46.61	46.39	42.66	40.97

Fig S49. Comparison of the Arrhenius fitting of a) [N_{8881}] and b) [P_{8881}] series.



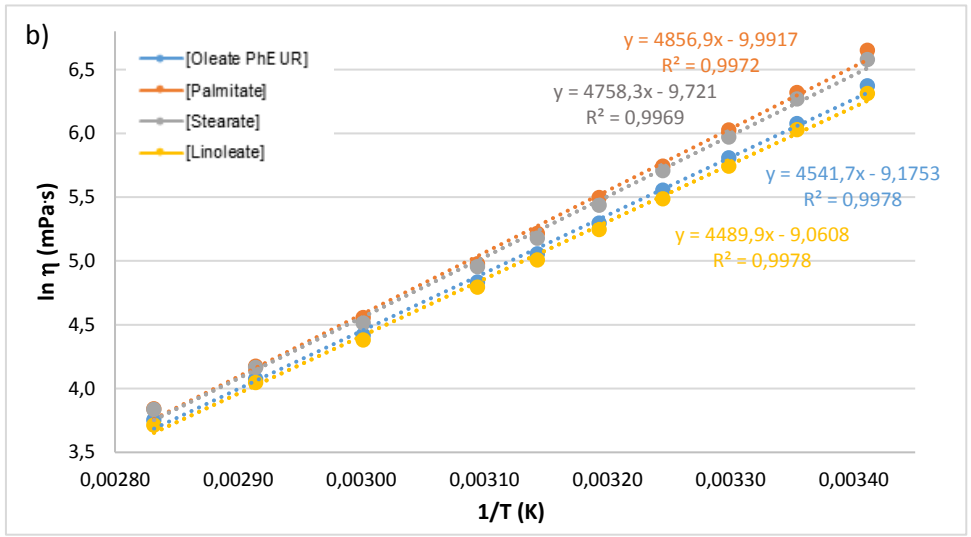


Figure S50. DSC thermogram of **1** (heating rate of 5 $K \cdot min^{-1}$).

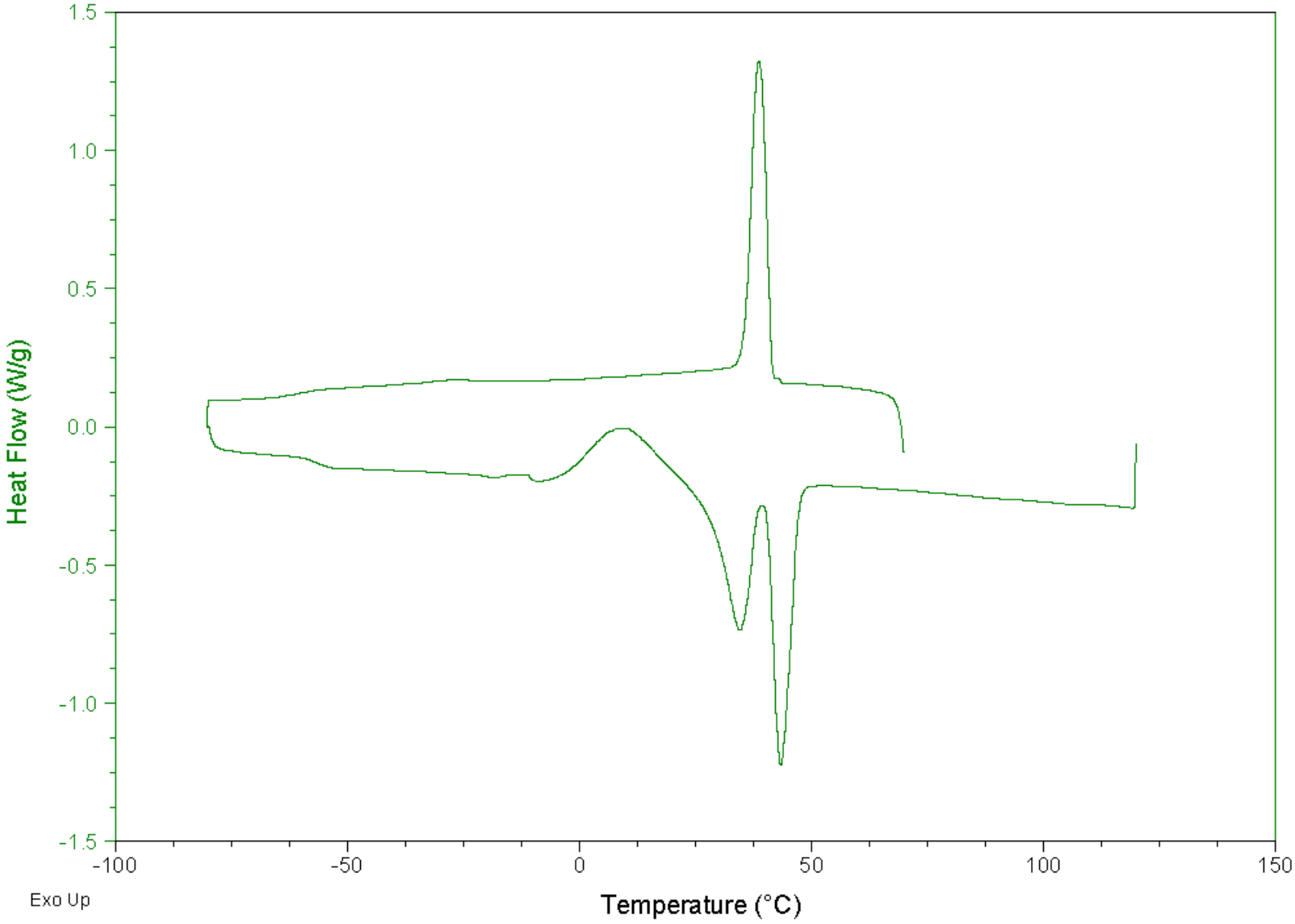


Figure S51. DSC thermogram of **2** (heating rate of 5 $K \cdot min^{-1}$).

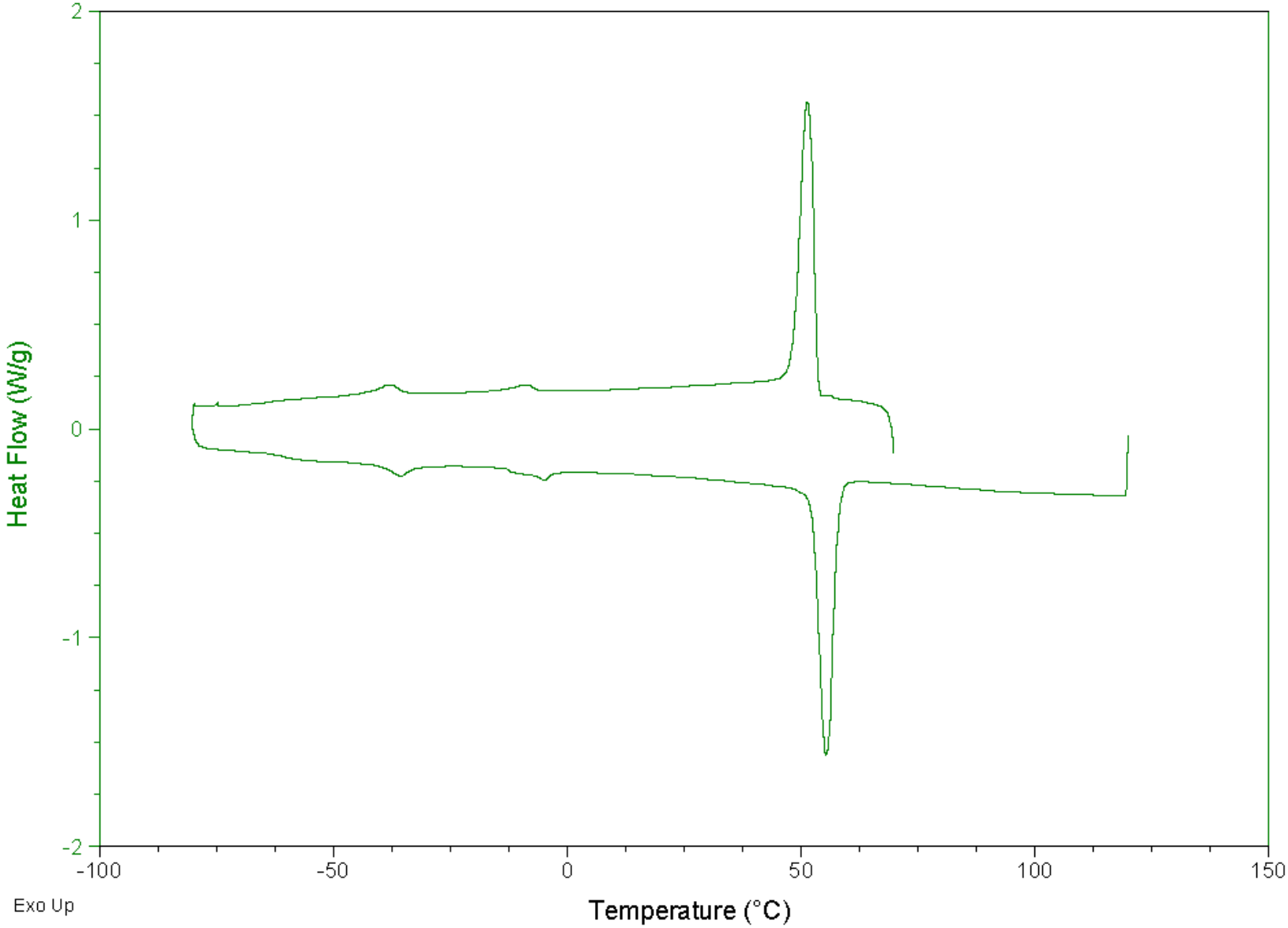


Figure S52. DSC thermogram of **4** (heating rate of 5 $K \cdot min^{-1}$).

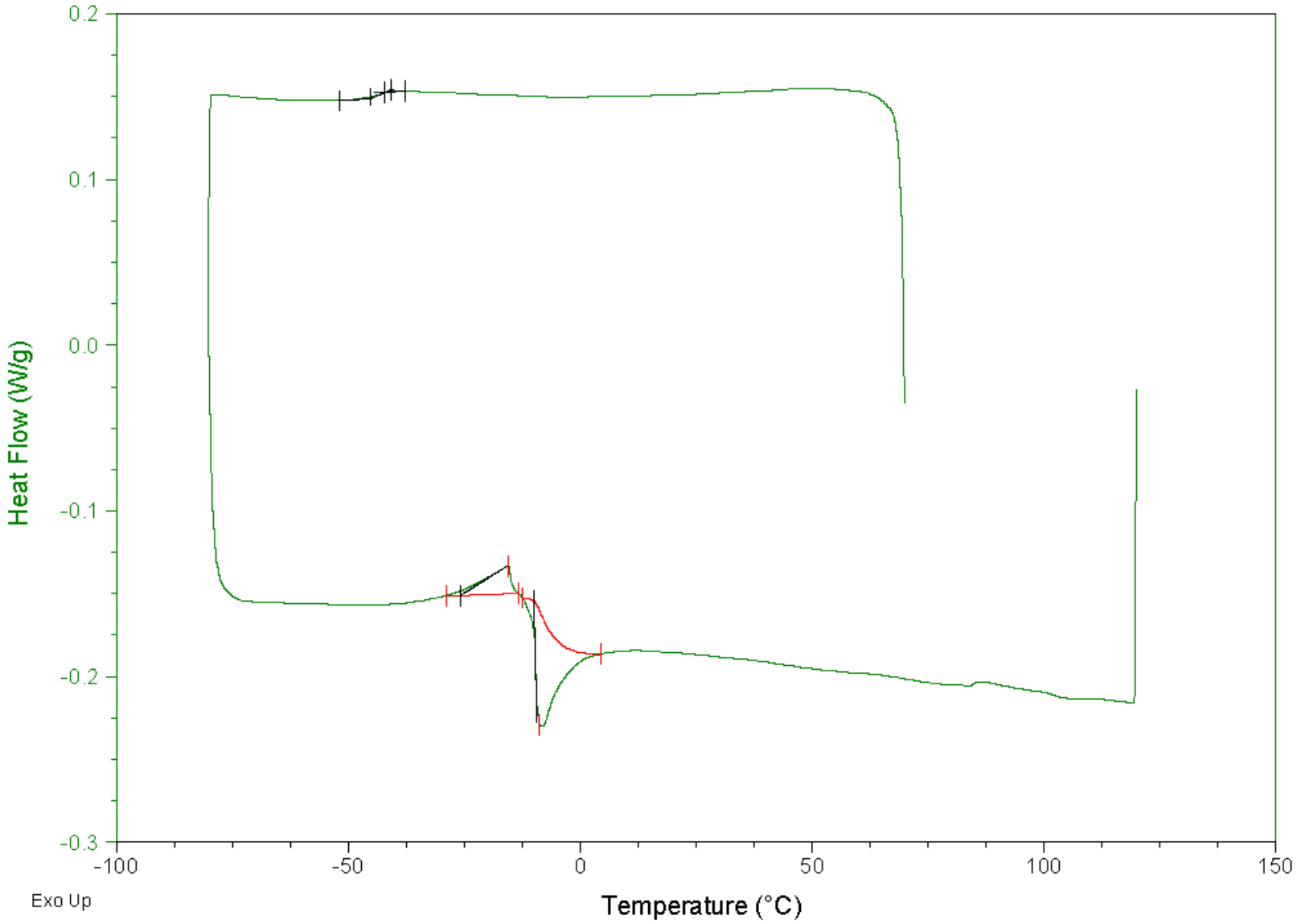


Figure S53. DSC thermogram of **6** (heating rate of 5 $K \cdot min^{-1}$).

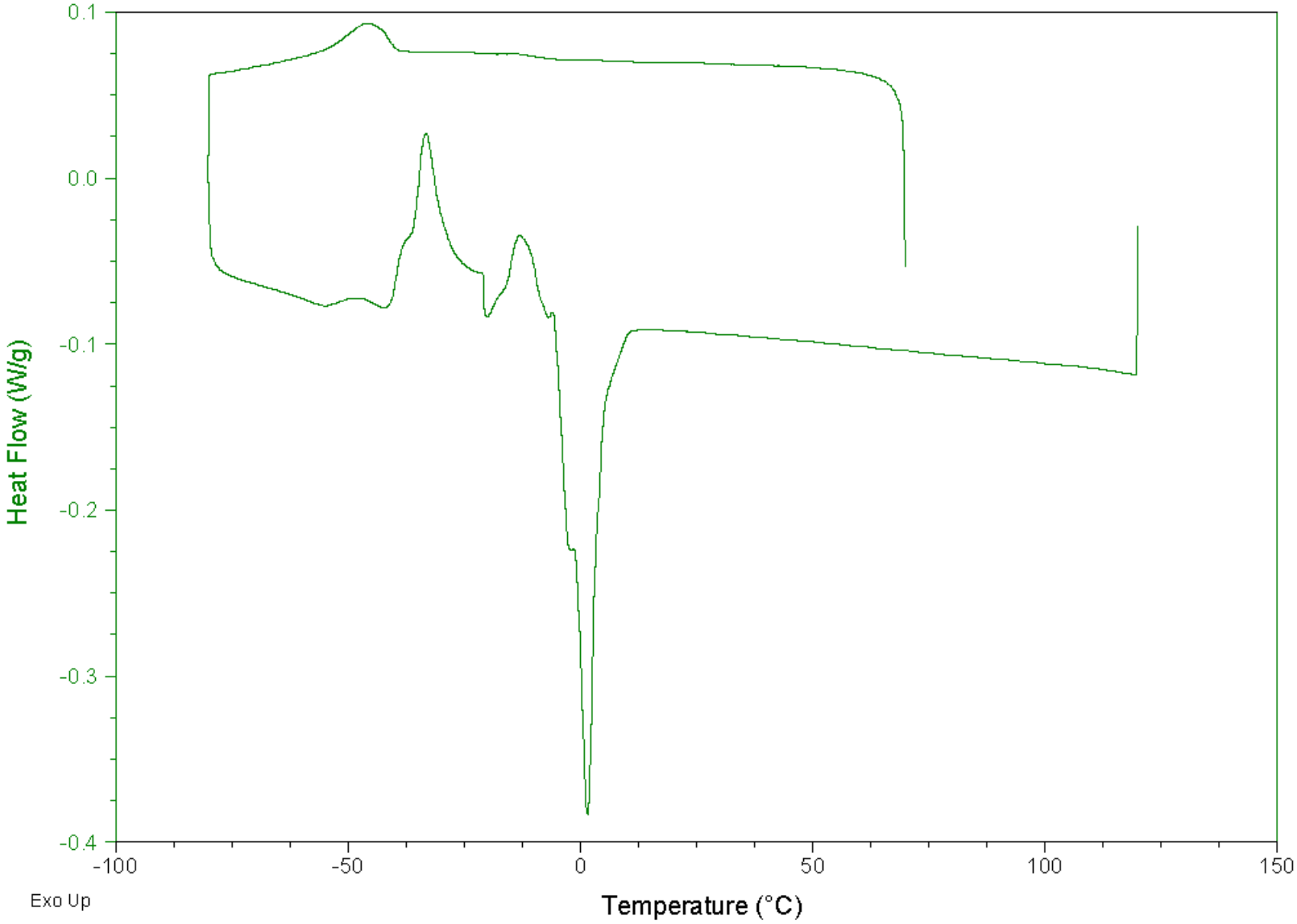


Figure S54. DSC thermogram of **7** (heating rate of 5 $K \cdot min^{-1}$).

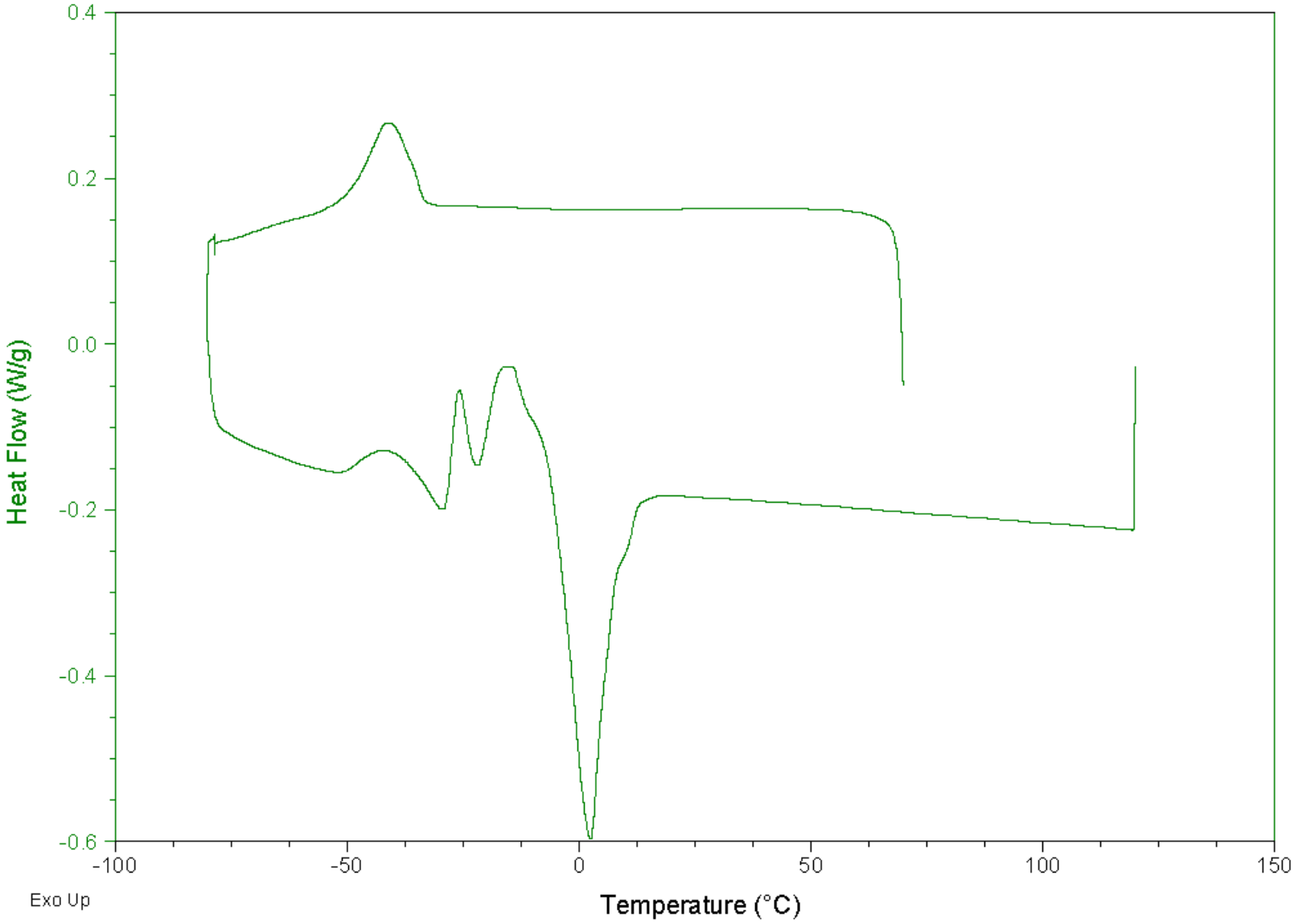


Figure S55. DSC thermogram of **9** (heating rate of 5 $K \cdot min^{-1}$).

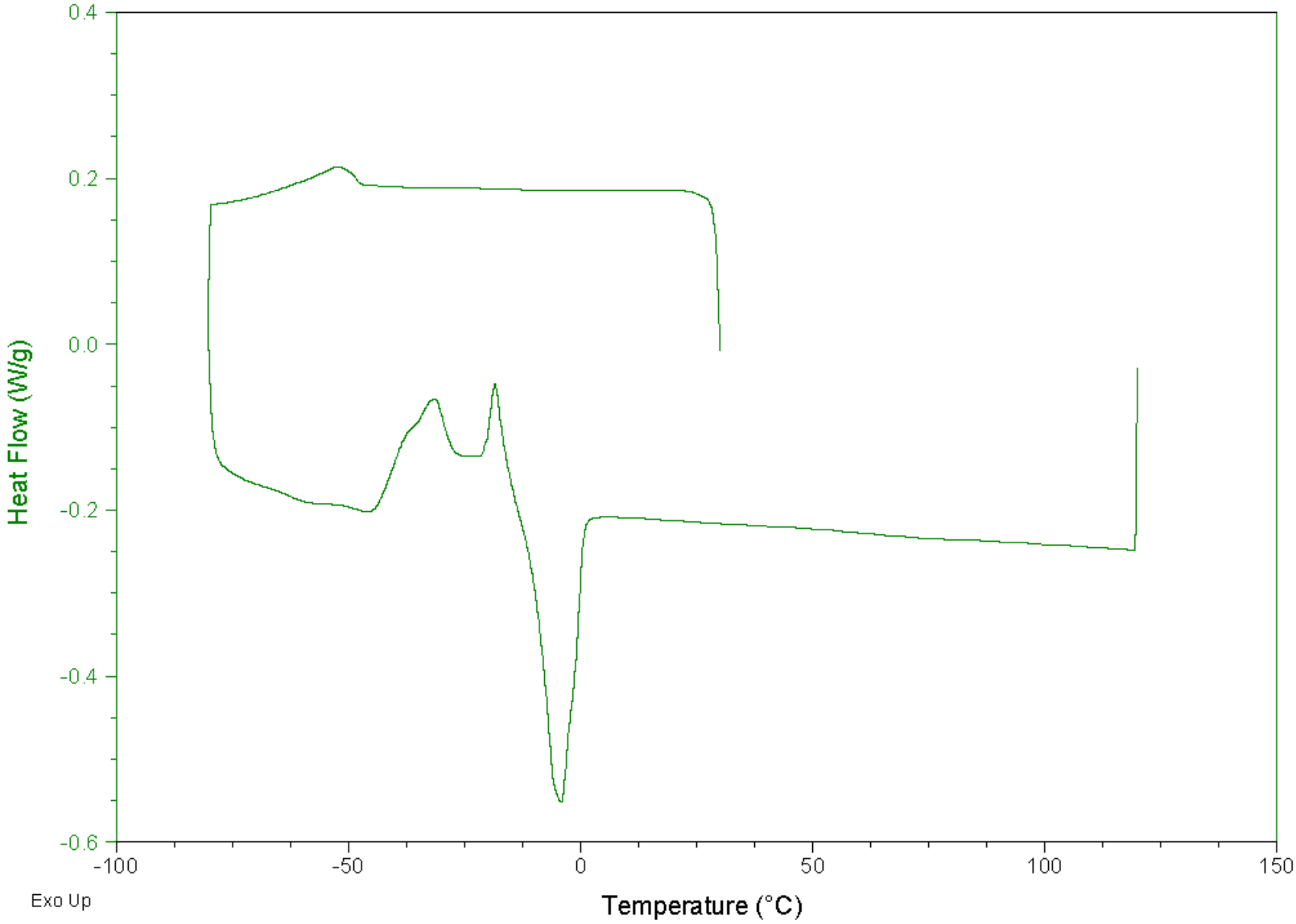


Figure S56. DSC thermogram of **11** (heating rate of 5 $K \cdot min^{-1}$).

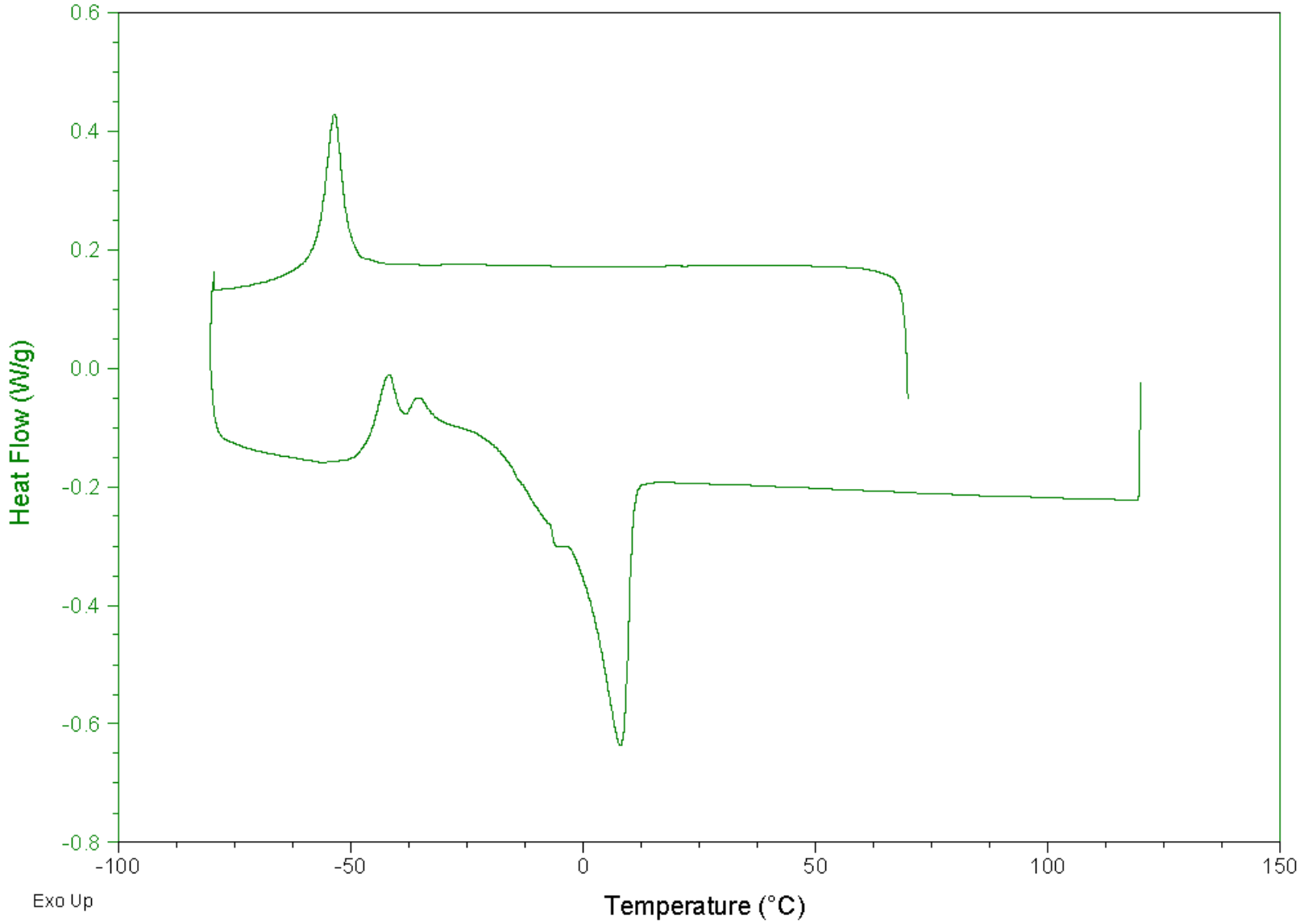


Figure S57. DSC thermogram of **12** (heating rate of 5 $K \cdot min^{-1}$).

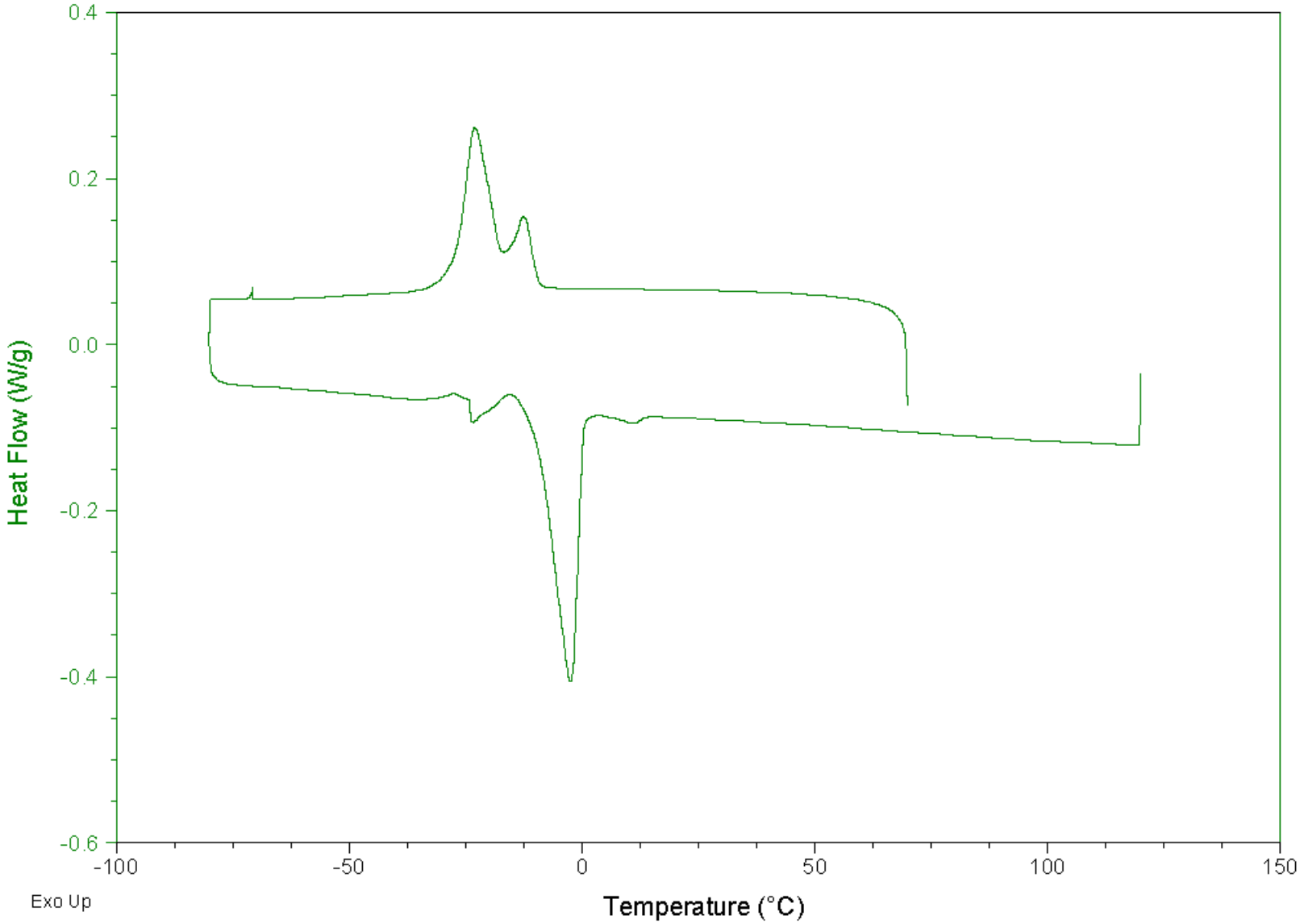


Figure S58. DSC thermogram of **13** (heating rate of 5 $K \cdot min^{-1}$).

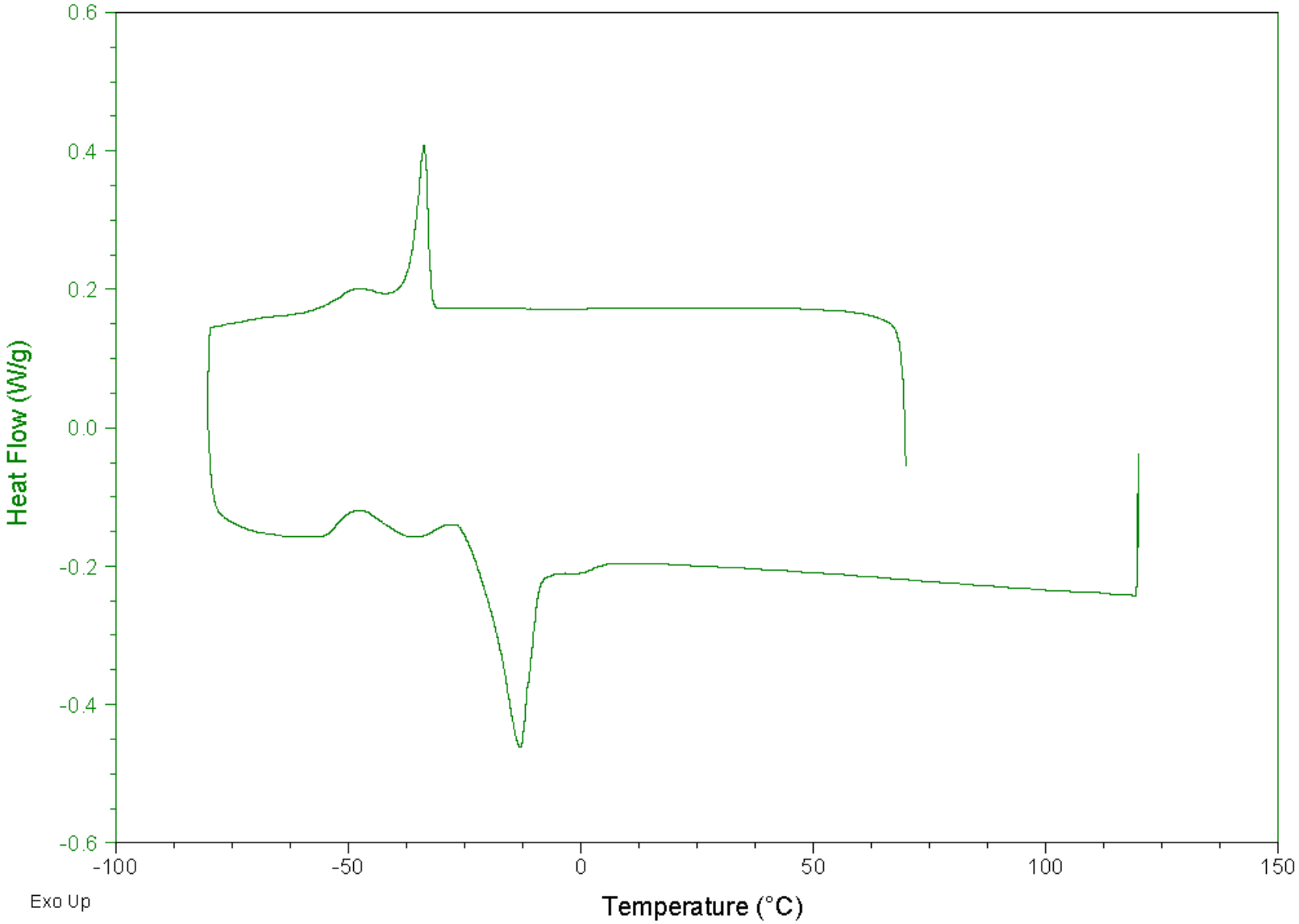


Figure S59. DSC thermogram of **14** (heating rate of 5 $K \cdot min^{-1}$).