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APPENDICES

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

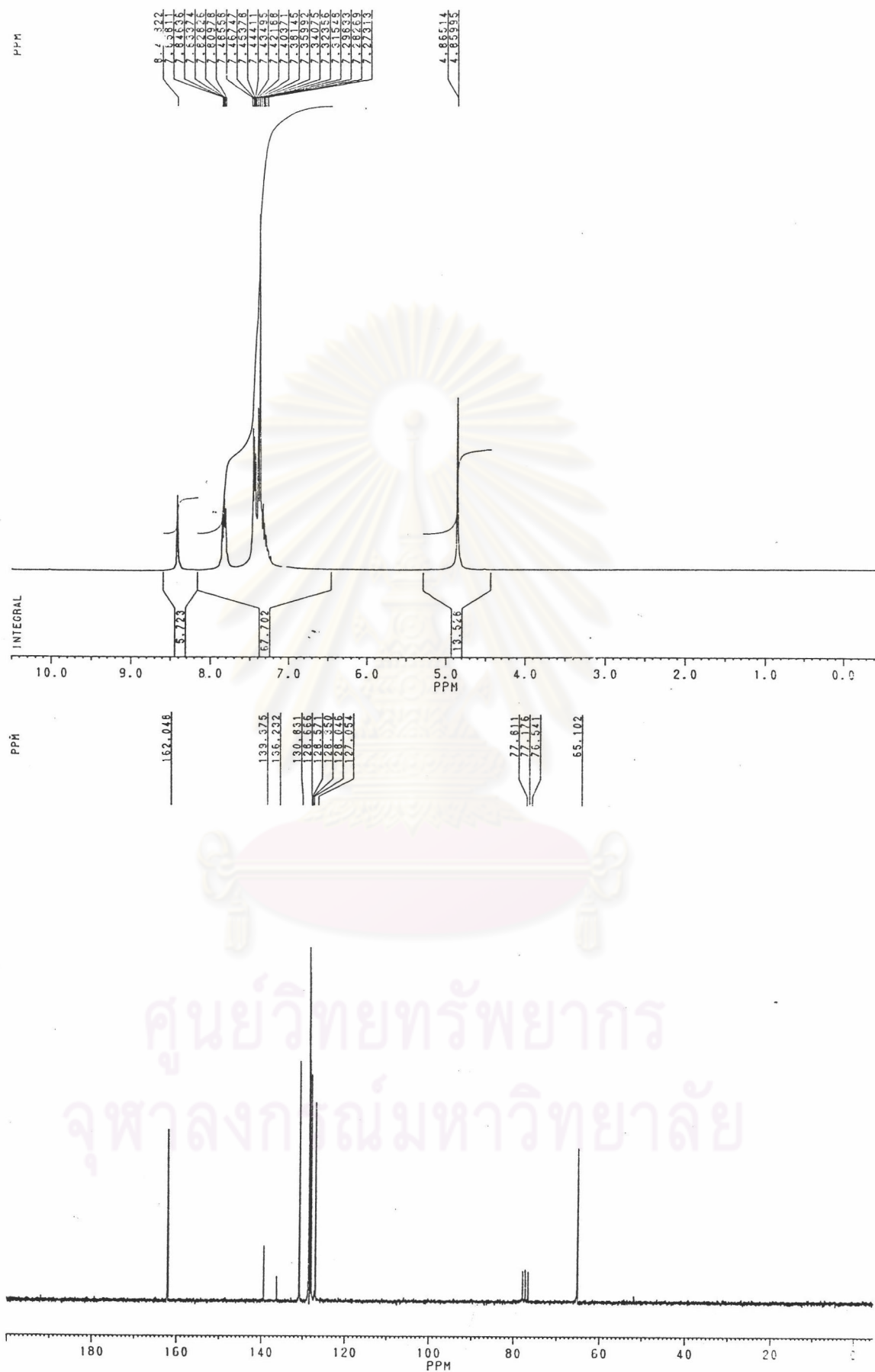


Fig 1 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of imine 42

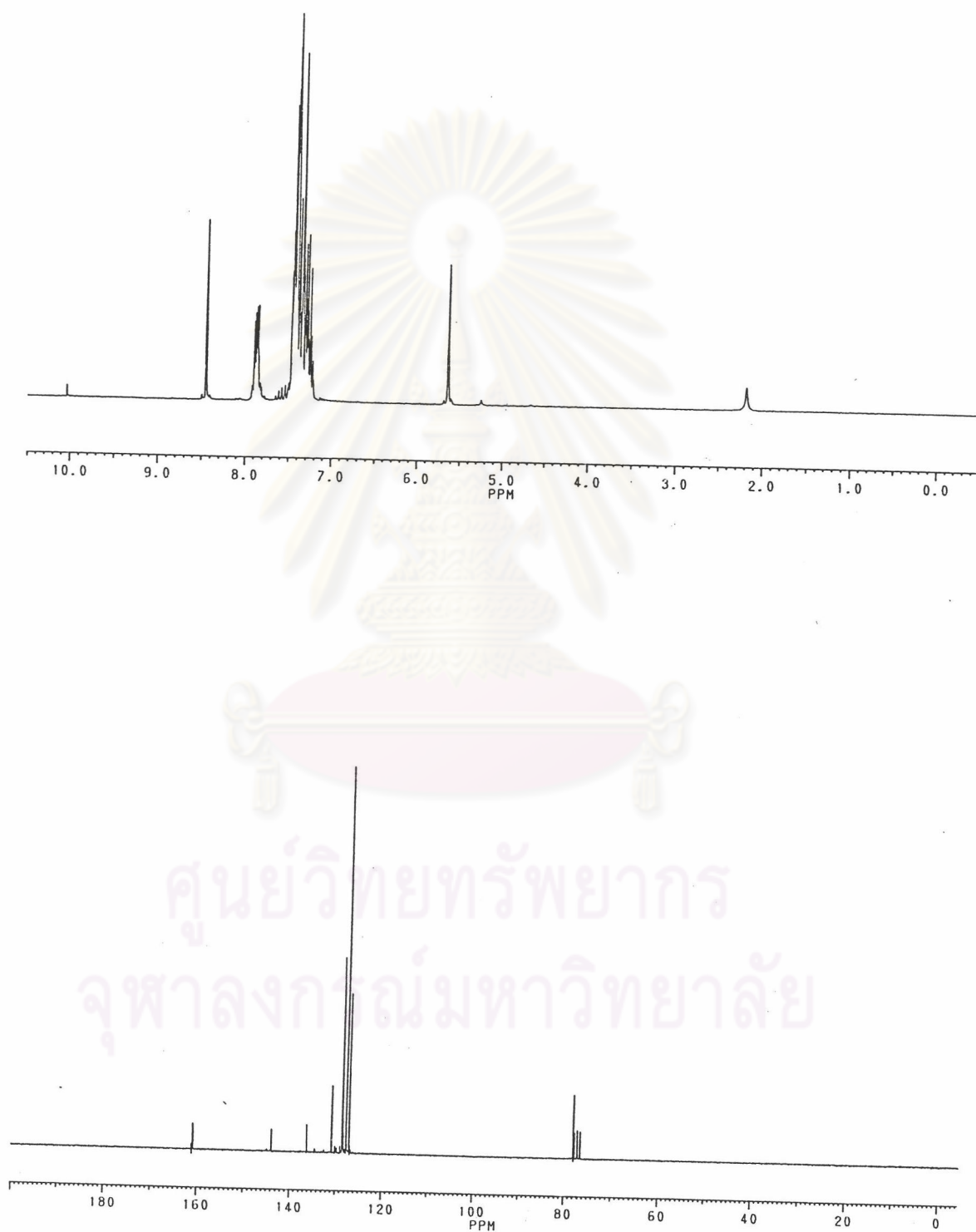


Fig 2 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of imine 24a

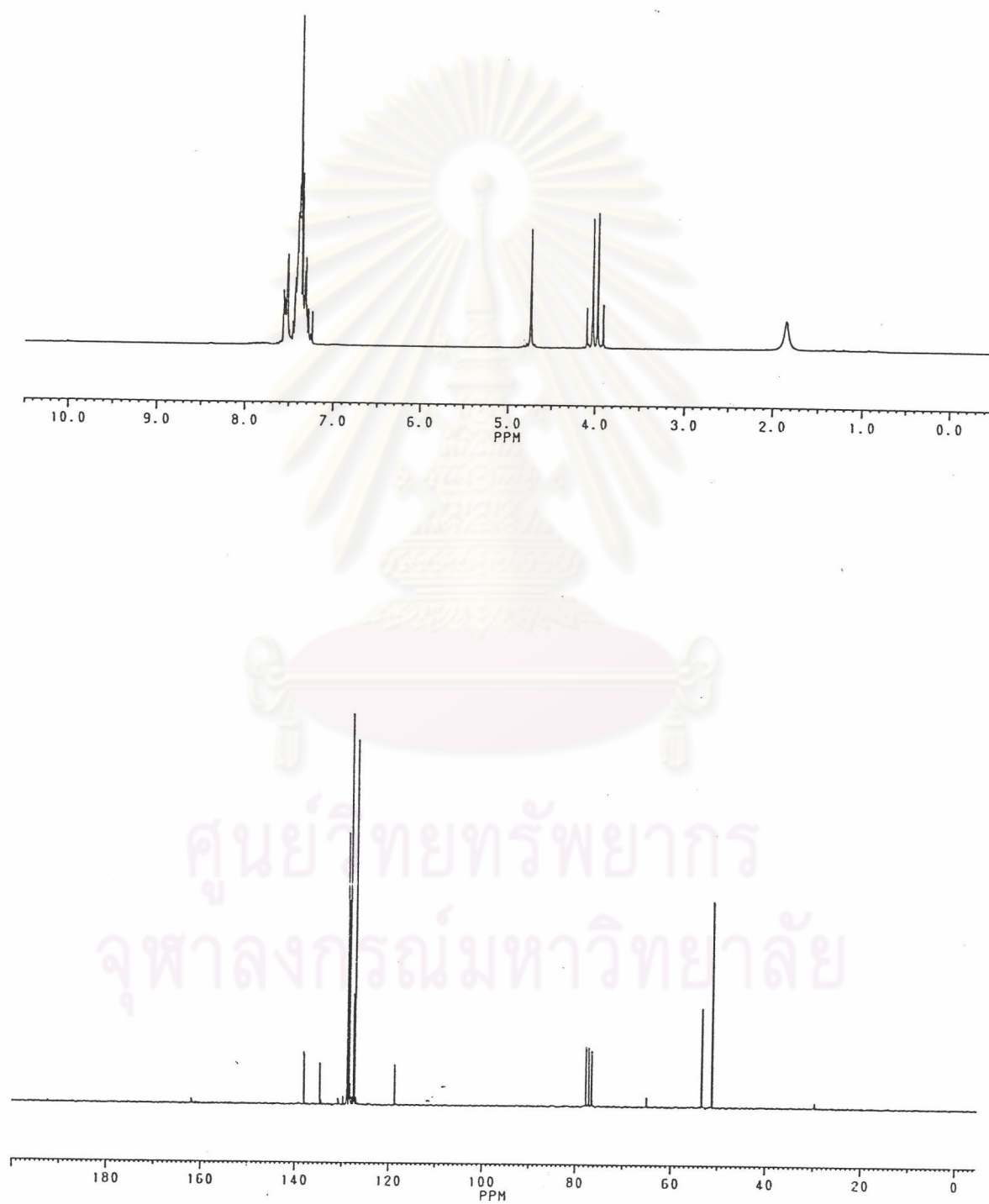


Fig 3 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of aminonitrile 43

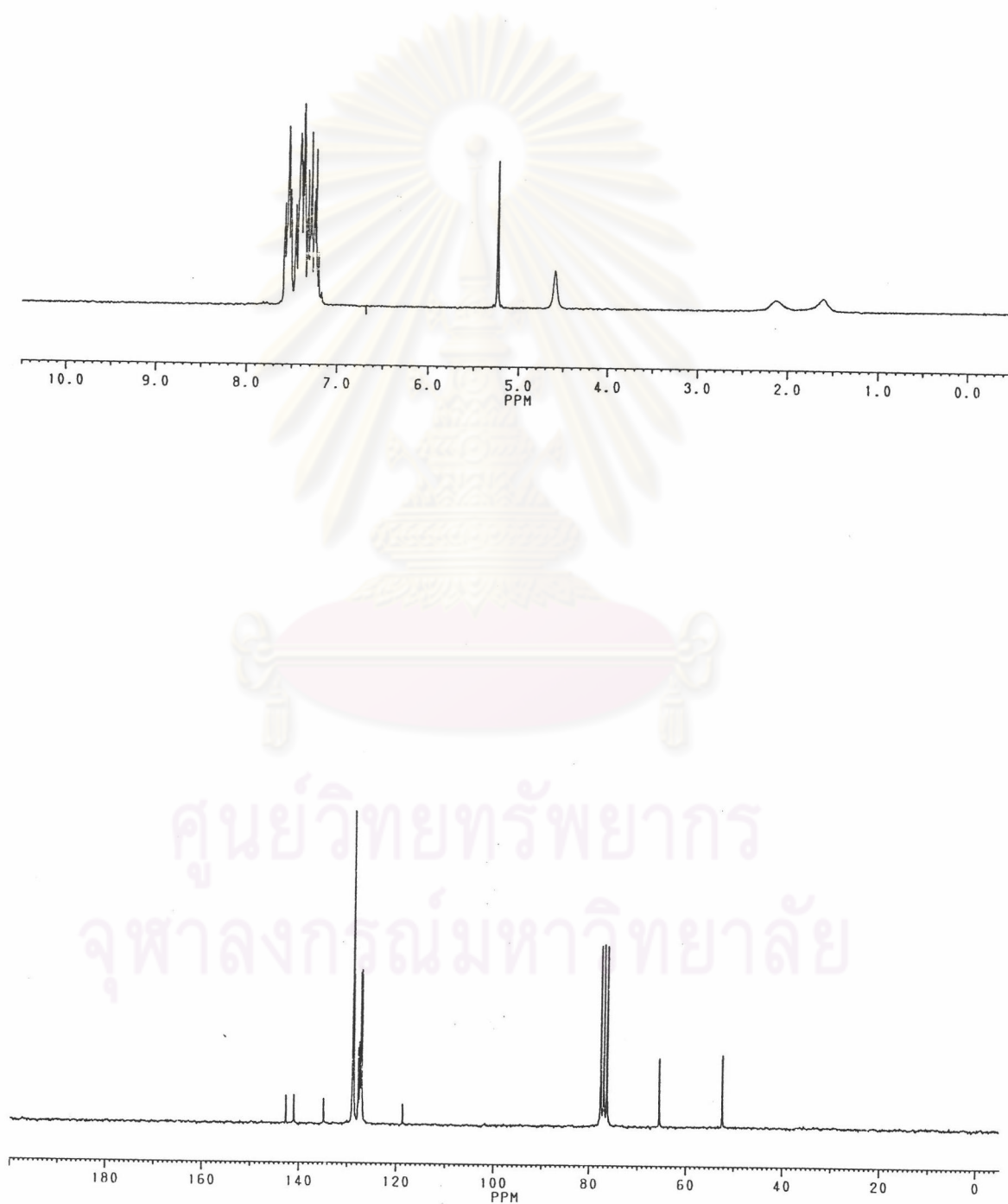


Fig 4 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of aminonitrile 25a

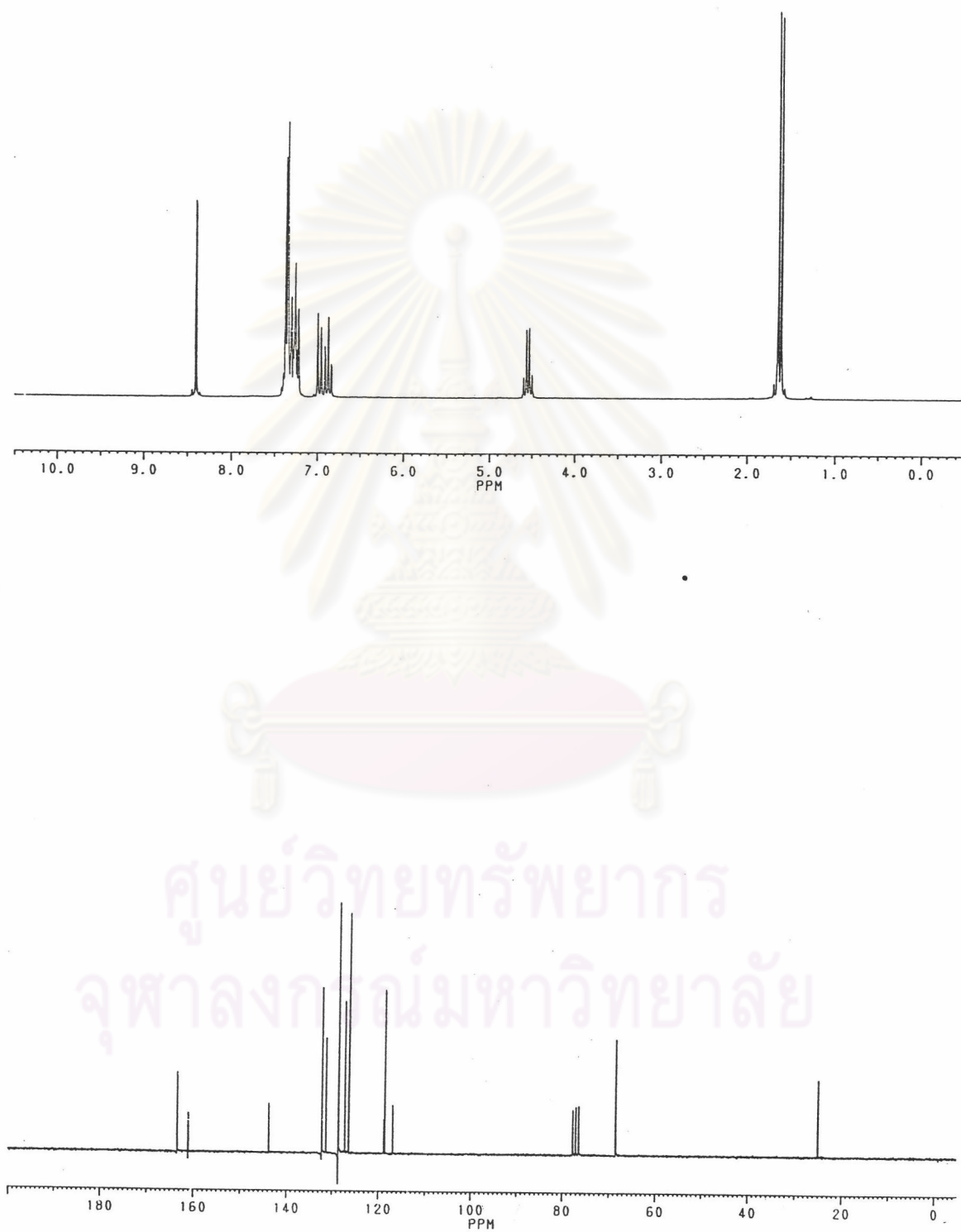


Fig 5 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 48

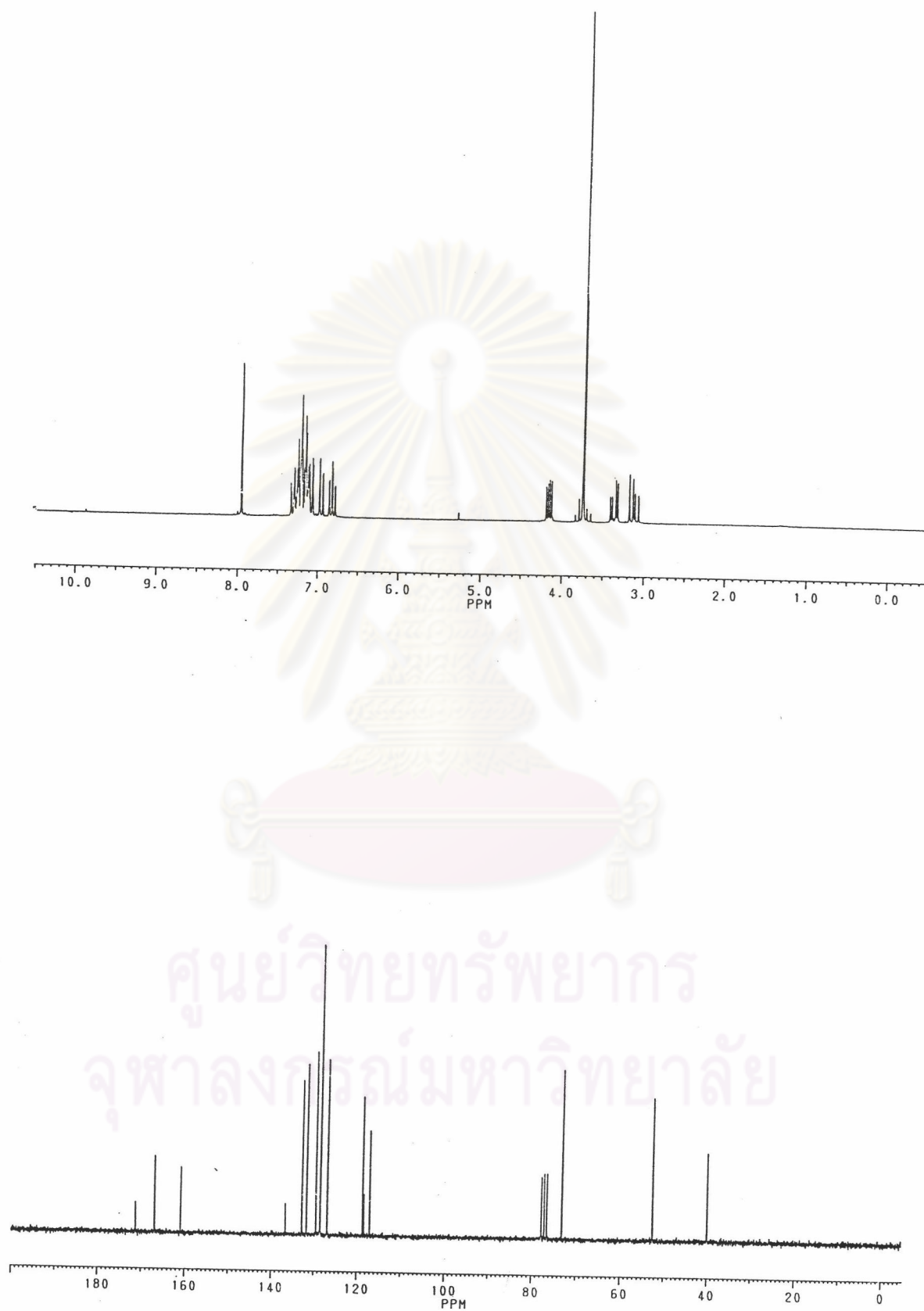


Fig 6 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 49

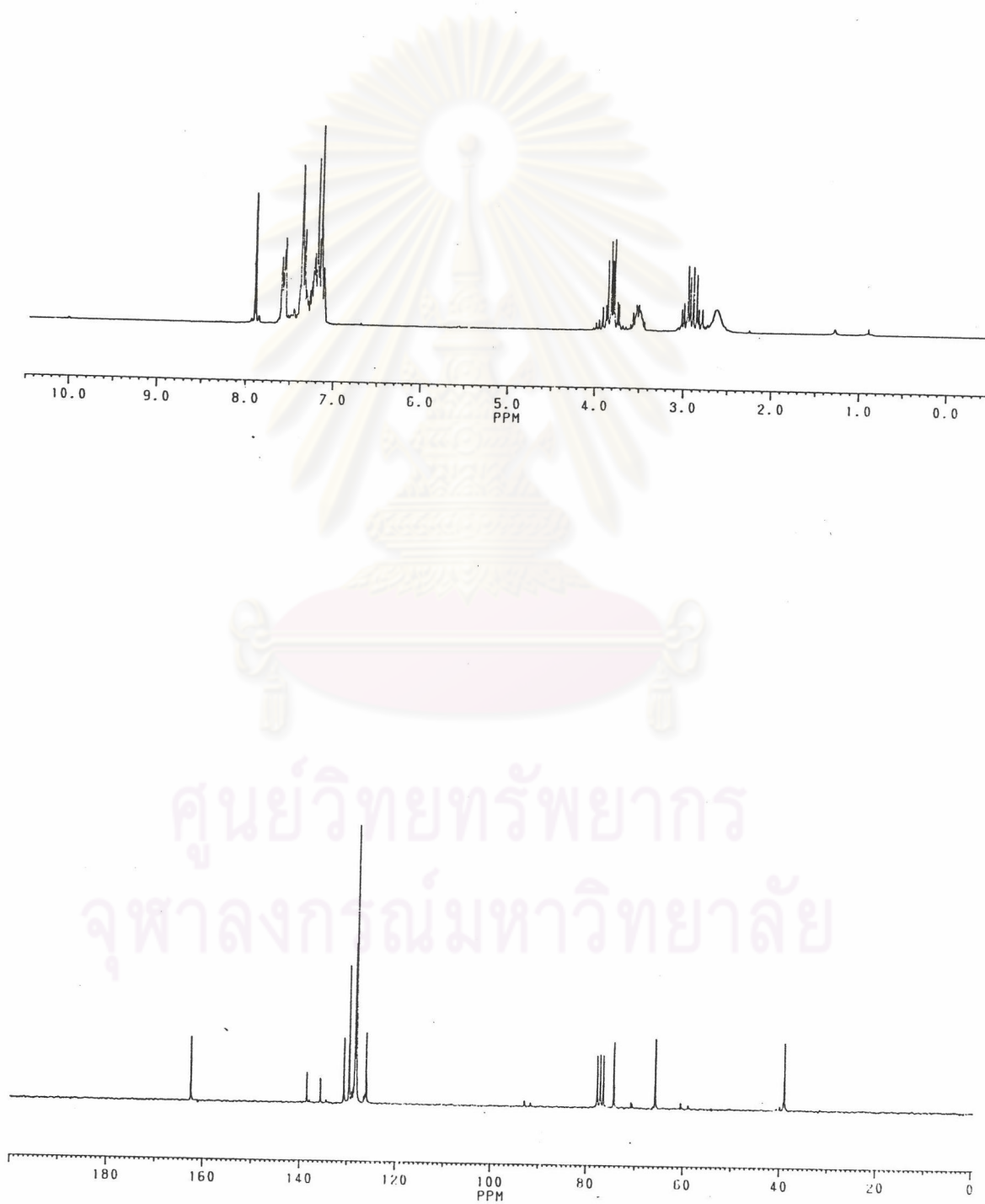


Fig 7 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 50

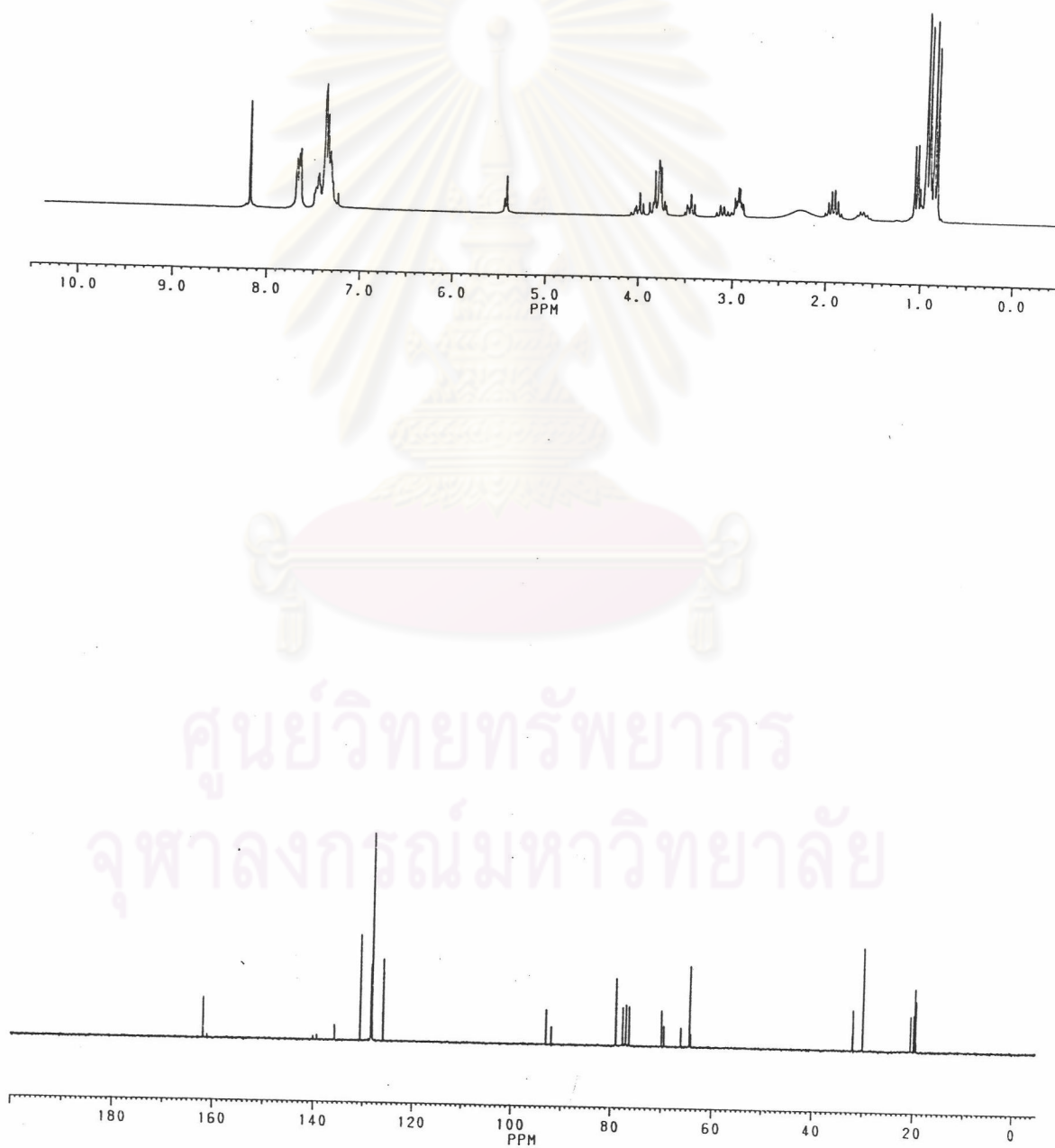


Fig 8 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 51

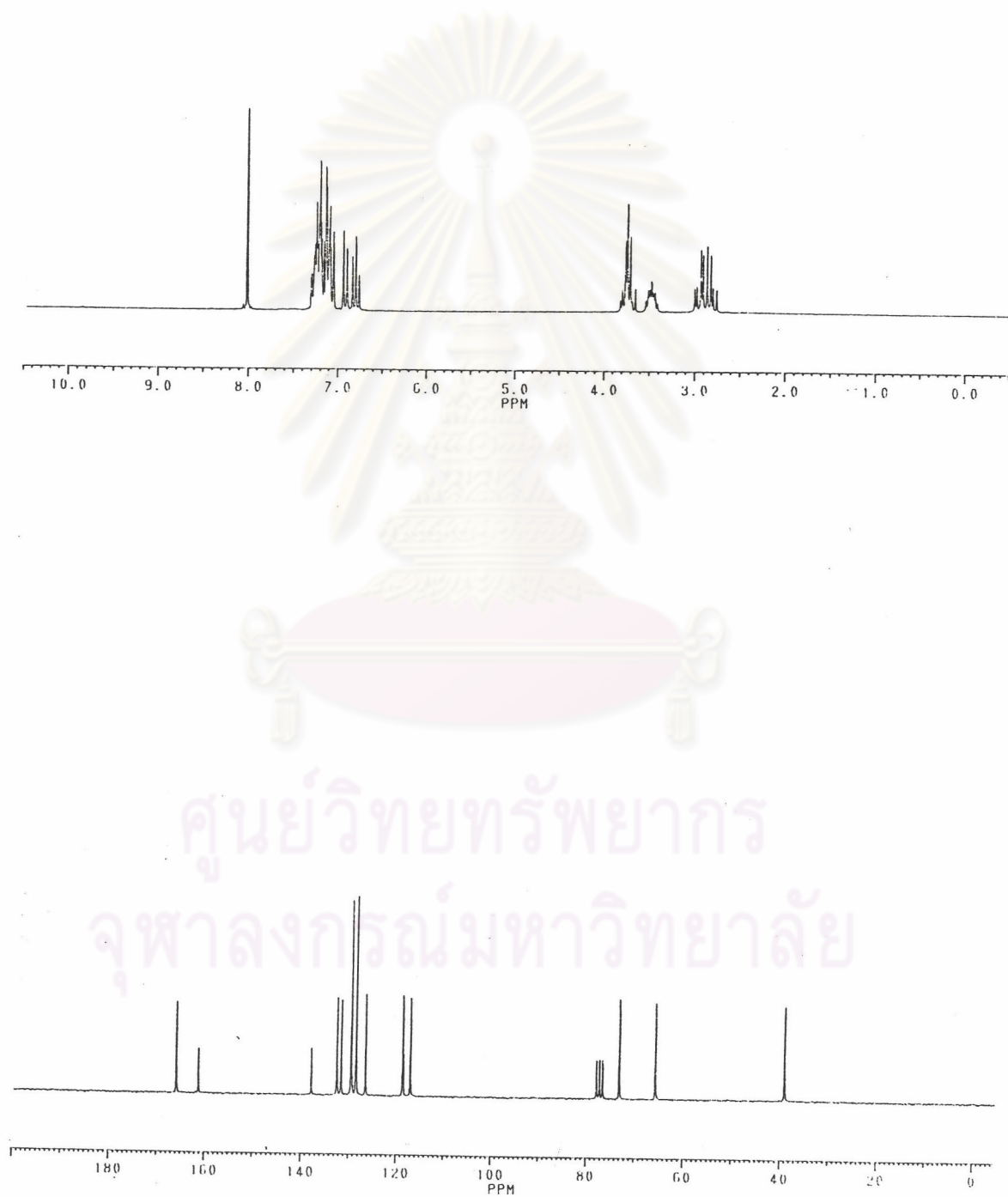


Fig 9 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 52

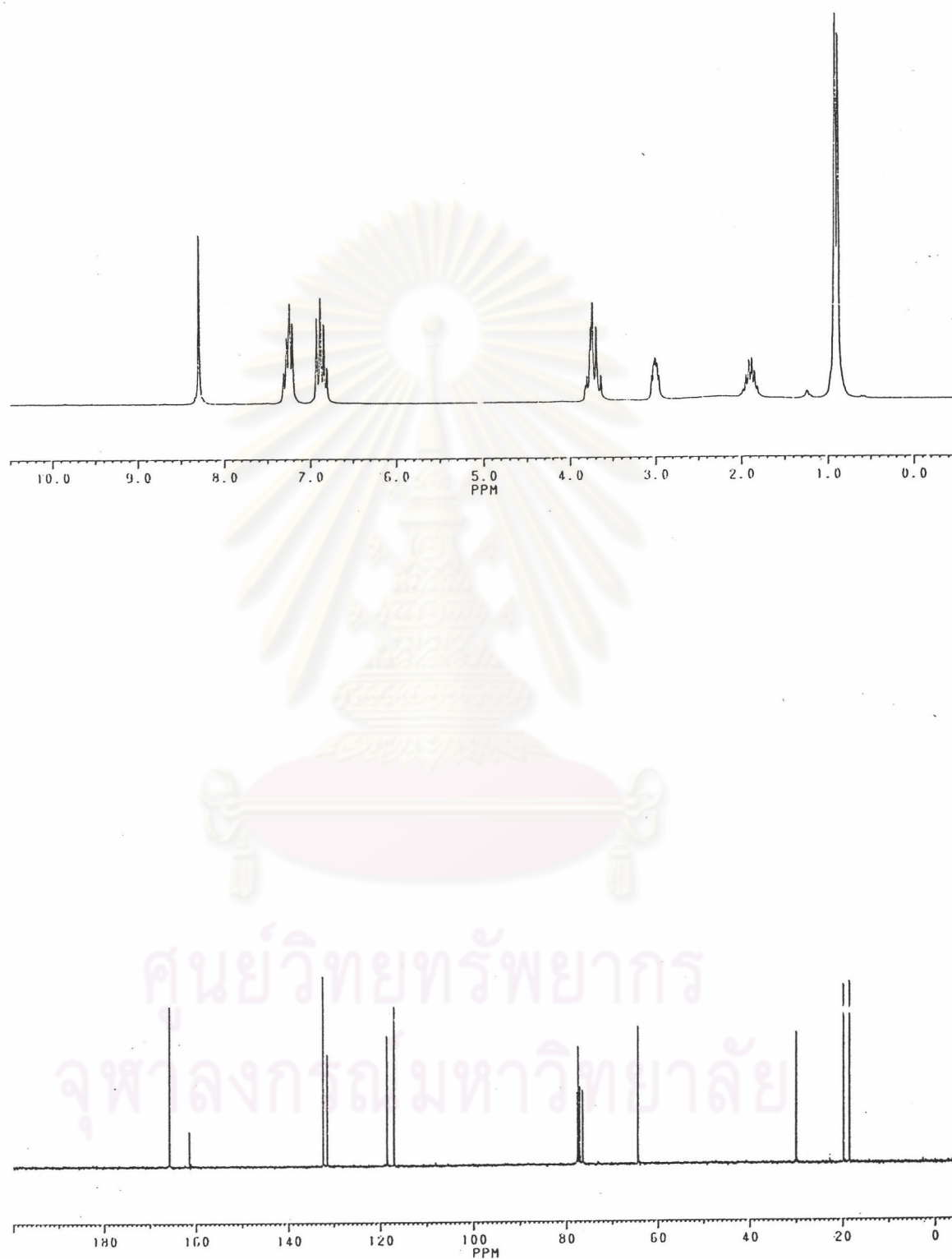
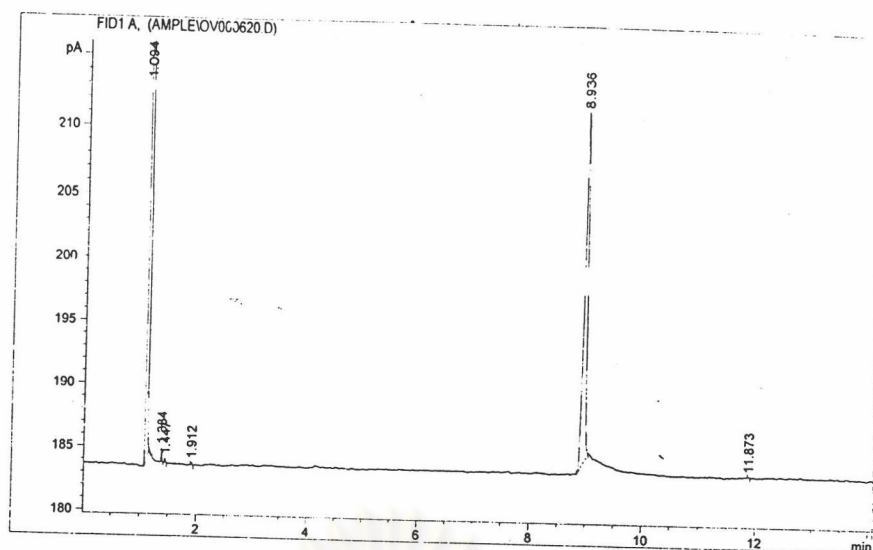


Fig 10 The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectra of compound 53

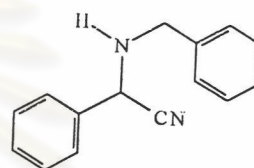


Area Percent Report

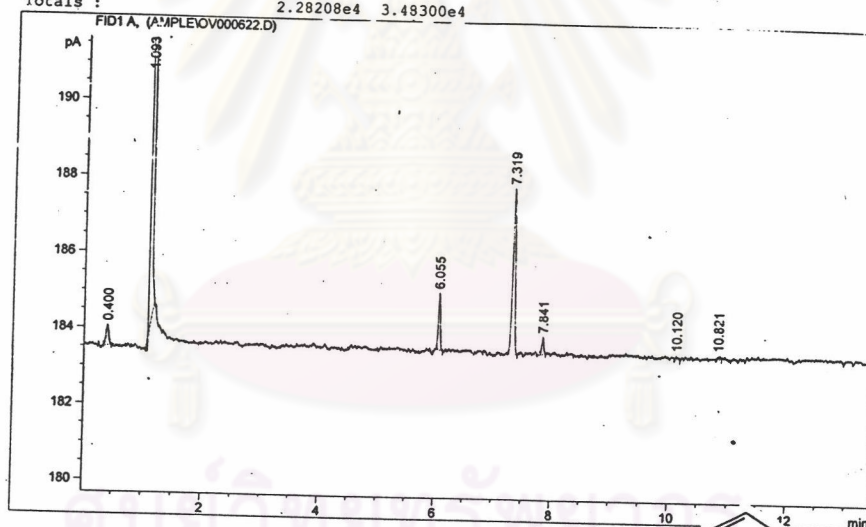
Sorted By : Signal
 Multiplier : 1.0000
 Dilution : 1.0000

Signal 1: FID1 A,

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1	1.094	PB S	9.87e-3	2.27179e4	3.48008e4	99.54912
2	1.384	BB	0.0101	7.38445e-1	1.12814	0.00324
3	1.447	BB	0.0117	3.37480e-1	3.76730e-1	0.00148
4	1.912	BP	0.0133	2.62398e-1	2.44358e-1	0.00115
5	8.936	PB	0.0456	101.22764	27.25443	0.44358
6	11.873	VB	0.0234	3.27723e-1	1.58834e-1	0.00144



Totals : 2.28208e4 3.48300e4

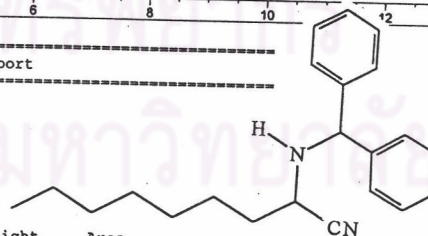


Area Percent Report

Sorted By : Signal
 Multiplier : 1.0000
 Dilution : 1.0000

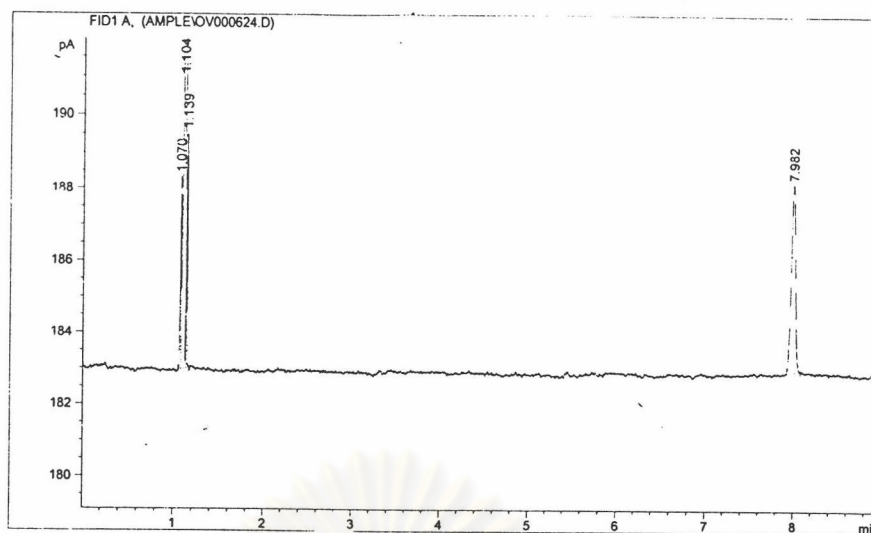
Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.400	BP	0.0381	1.73464	5.45199e-1	0.01101
2	1.093	PB S	9.69e-3	1.57347e4	2.38868e4	99.87031
3	6.055	BP	0.0293	3.58024	1.50209	0.02272
4	7.319	VB	0.0378	13.36108	4.38330	0.08480
5	7.841	PB	0.0270	1.04885	4.66830e-1	0.00666
6	10.120	PP	0.0286	3.28039e-1	1.38849e-1	0.00208
7	10.821	PP	0.0330	3.80381e-1	1.38836e-1	0.00241



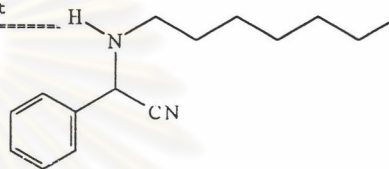
Totals : 1.57552e4 2.38939e4

Fig 11 The results of chiral GC analysis; 180 °C isothermal: (a) aminonitrile 43;
 (b) aminonitrile 56.



Area Percent Report

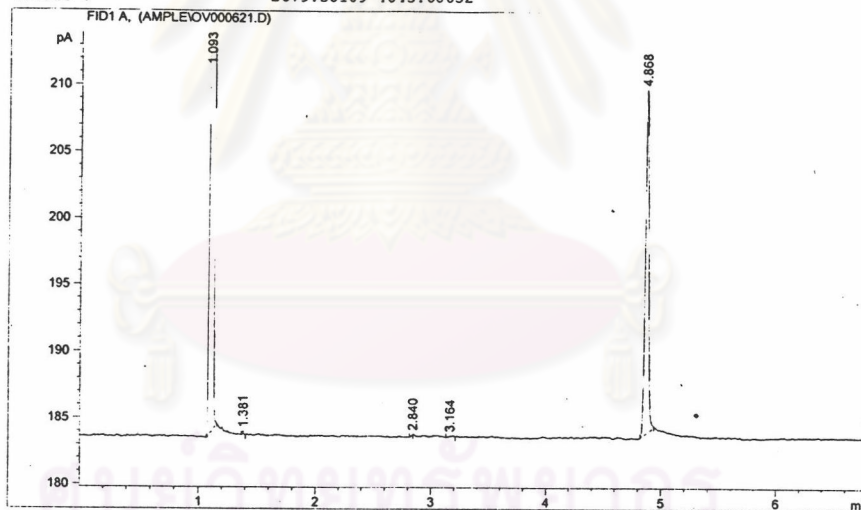
Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000



Signal 1: FID1 A,

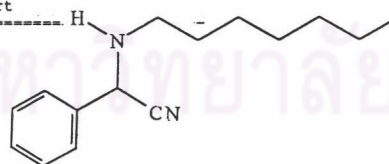
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	1.070	BV	0.0120	4.16840	5.38353	0.15557
2	1.104	VB S	0.0107	2653.73437	4028.62061	99.04281
3	1.139	BB X	0.0106	4.15972	6.42658	0.15525
4	7.982	BP	0.0412	17.31860	5.25580	0.64637

Totals : 2679.38109 4045.68652



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

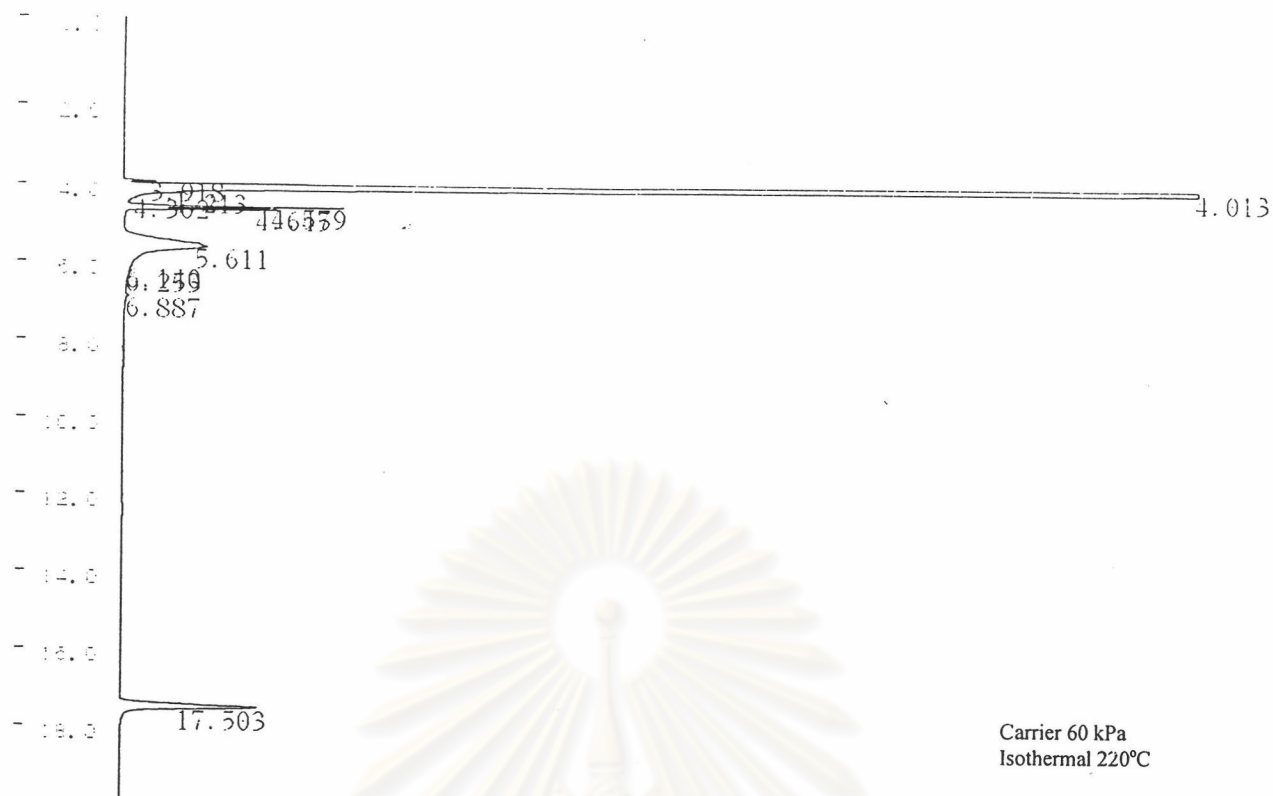


Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	1.093	VB S	9.37e-3	1.95725e4	3.09636e4	99.72502
2	1.381	VP	0.0117	2.48862e-1	3.06930e-1	0.00127
3	2.840	PV	0.0121	1.77756e-1	1.86868e-1	0.00091
4	3.164	PP	0.0317	3.44036e-1	1.31650e-1	0.00175
5	4.868	PB	0.0322	53.19839	25.89967	0.27105

Totals : 1.96265e4 3.09902e4

Fig 12 The results of chiral GC analysis; aminonitrile 55: (a) 165 °C isothermal;
(b) 180 °C isothermal.



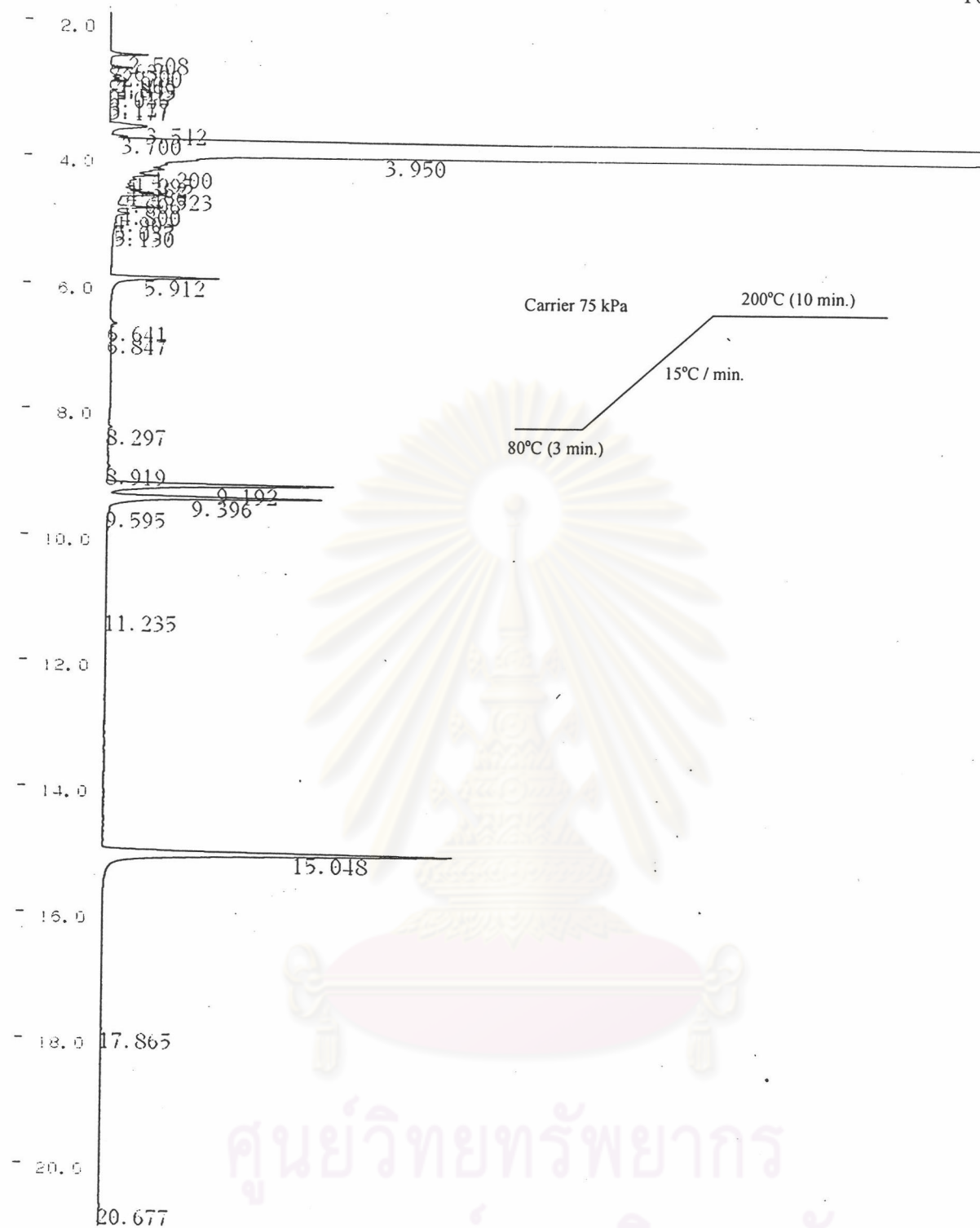
C-RSA CHROMATOPAC CH=1 Report No.=23 DATA=1:@CHRM1.C00 00 12/23 20:41:14

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	2	4.013	1662994	621191	SV		99.1892	
	5	4.579	1929	811	T		0.115	
	6	4.645	1196	566	TV		0.0714	
	7	5.611	6043	305	S		0.3604	
	11	17.503	4426	517			0.264	
TOTAL			1676588	623390			100	

Fig 13 The results of chiral GC analysis; 220 °C isothermal:
derivatized aminonitrile **25a**.

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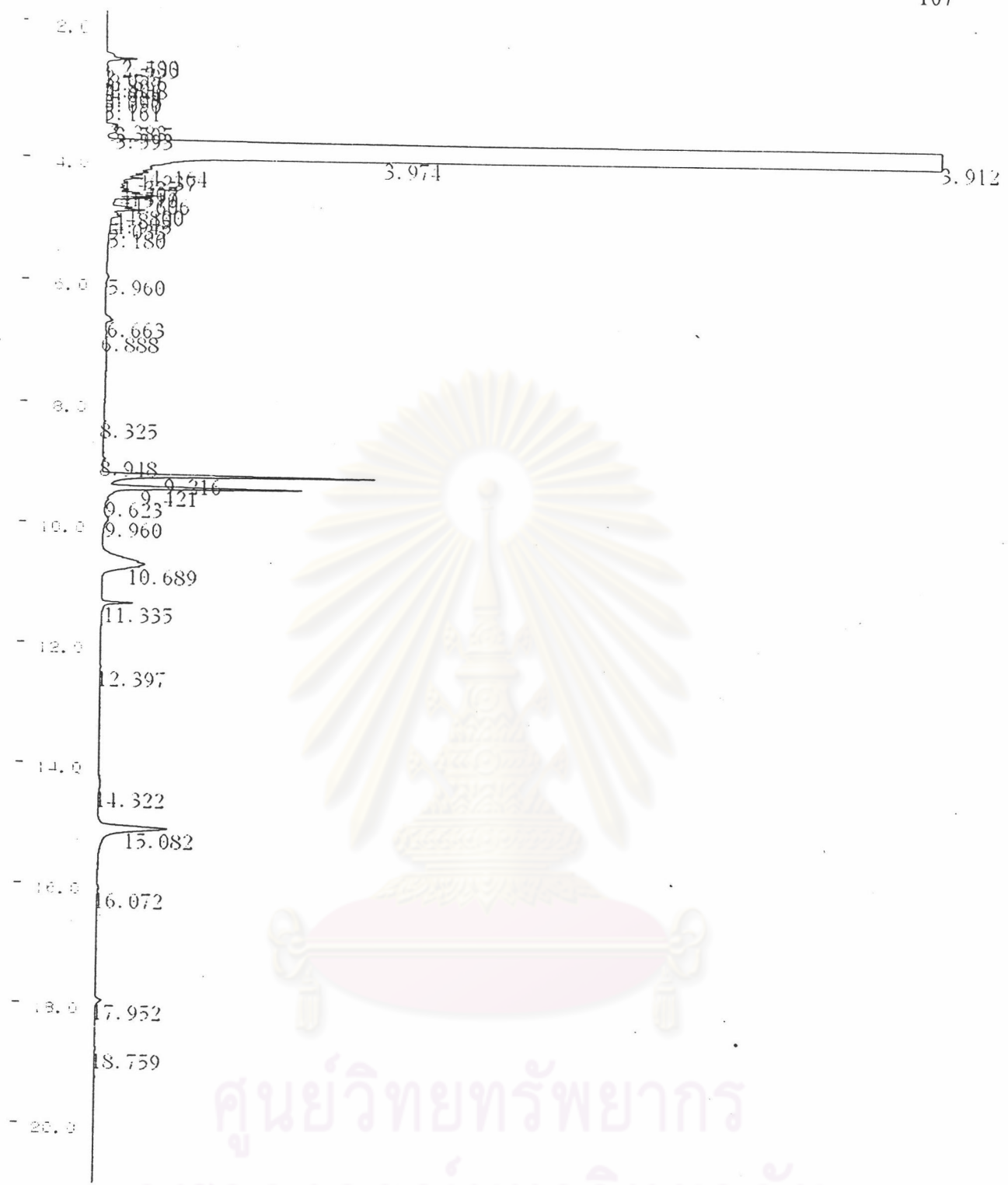


C-RSA CHROMATOPAC CH=1 Report No.=4 DATA=1:@CHRM1.C00 00/12/06 17:54:00

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	12	3.95	3307312	477894	SV		99.5073	
	23	5.912	1550	499			0.0466	
	28	9.192	3758	1039			0.1131	
	29	9.396	3350	970	SV		0.1008	
	32	15.048	7717	1599			0.2322	
TOTAL			3323688	482001			100	

Fig 14 The results of chiral GC analysis in temperature program condition: derivatized aminonitrile 55.

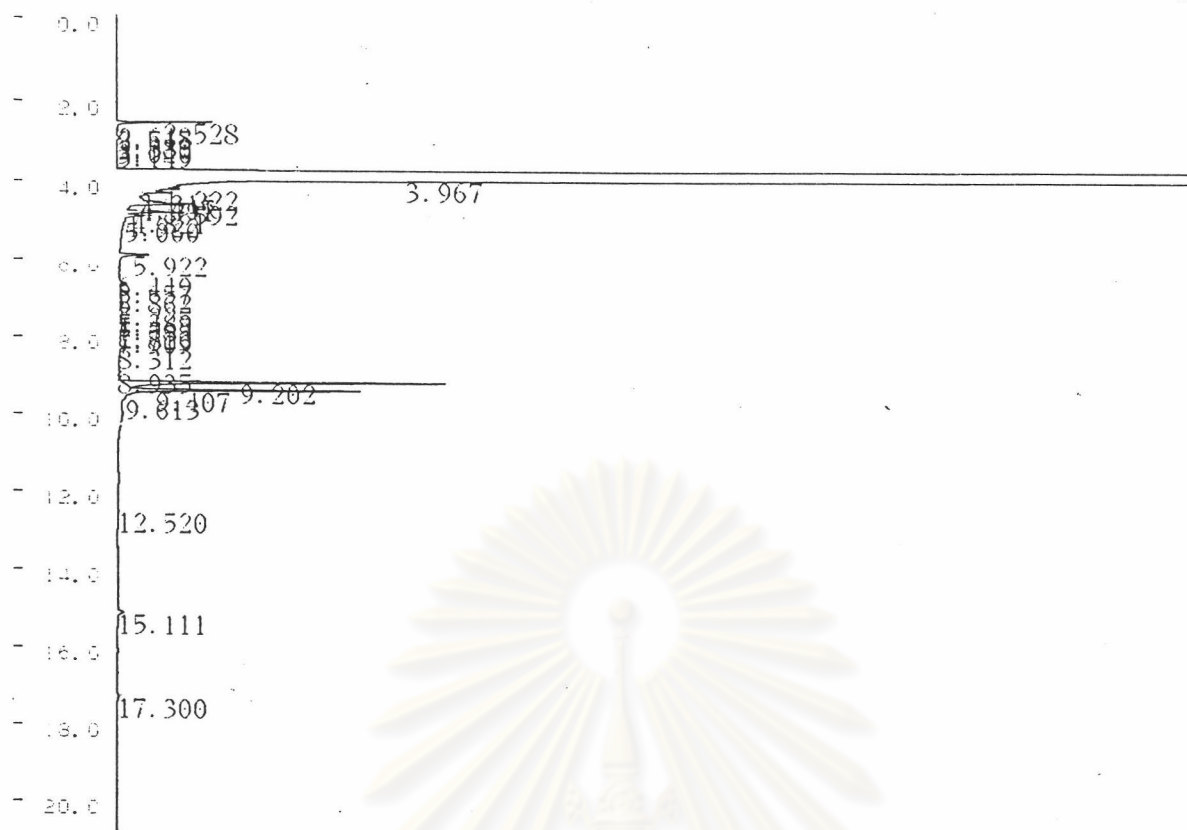


C-RSA CHROMATOPAC CH=1 Report No.=6 DATA=1:@CHRM1.C00 00.12.06 18:48:04

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	15	3.912	2617404	405924	V		69.1702	
	16	3.974	1154935	390843	SV		30.5215	
	34	9.216	3562	1310			0.0941	
	35	9.421	3111	950	SV		0.0822	
	38	10.689	2525	207			0.0667	
	42	15.082	2471	338			0.0653	
TOTAL			3784007	799572			100	

Fig 15 The results of chiral GC analysis in temperature program condition: derivatized aminonitrile 56.



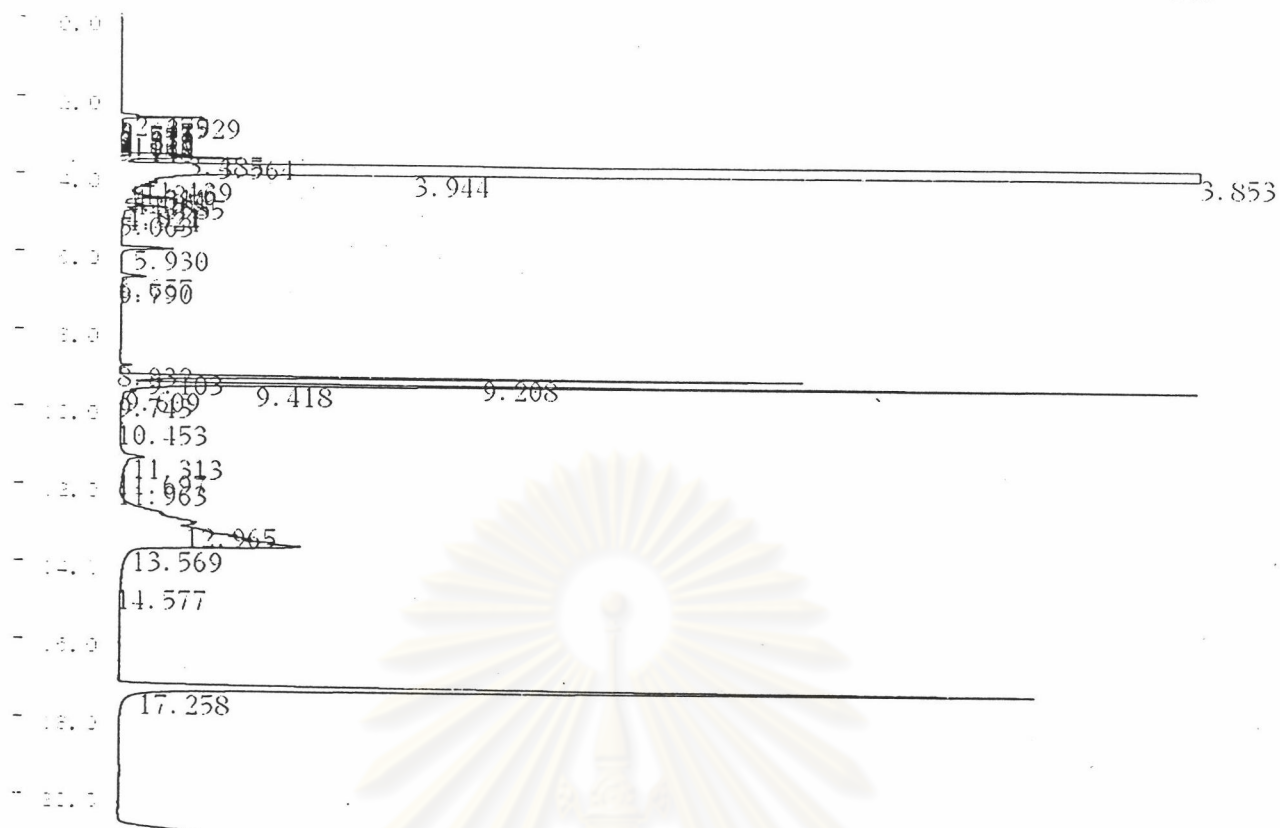
C-RSA CHROMATOPAC CH=1 Report No.=10 DATA=1:@CHRM1.C00 00/12/06 20:30:10

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	8	3.967	3682094	424804	S		99.8277	
	30	9.202	3620	1190			0.0981	
	31	9.407	2736	877	SV		0.0742	
TOTAL			3688449	426871			100	

Fig 16 The results of chiral GC analysis in temperature program condition:
derivatized aminonitrile **25a**.

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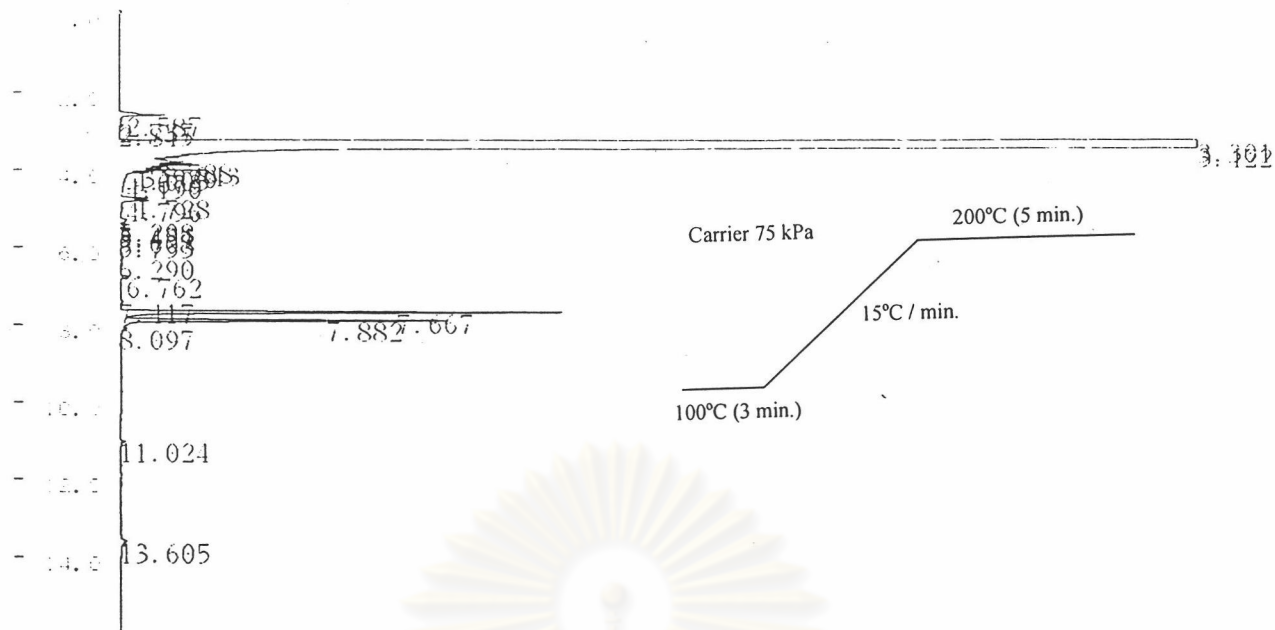


D-RSA CHROMATOPAC CH=1 Report No.=12 DATA=1:@CHRM1.C00 00/12/06 21:22:50

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	13	3.564	1618	453	V		0.055	
	14	3.853	1470461	287951	V		49.9344	
	15	3.944	1410010	360207	SV		47.8816	
	31	9.208	7932	2519	V		0.2694	
	32	9.418	12619	4200	SV		0.4285	
	39	12.965	6527	282			0.2216	
	40	13.569	15614	658	SV		0.5302	
	42	17.258	20004	3165			0.6793	
TOTAL			2944786	659434			100	

Fig 17 The results of chiral GC analysis in temperature program condition:
derivatized aminonitrile 43.



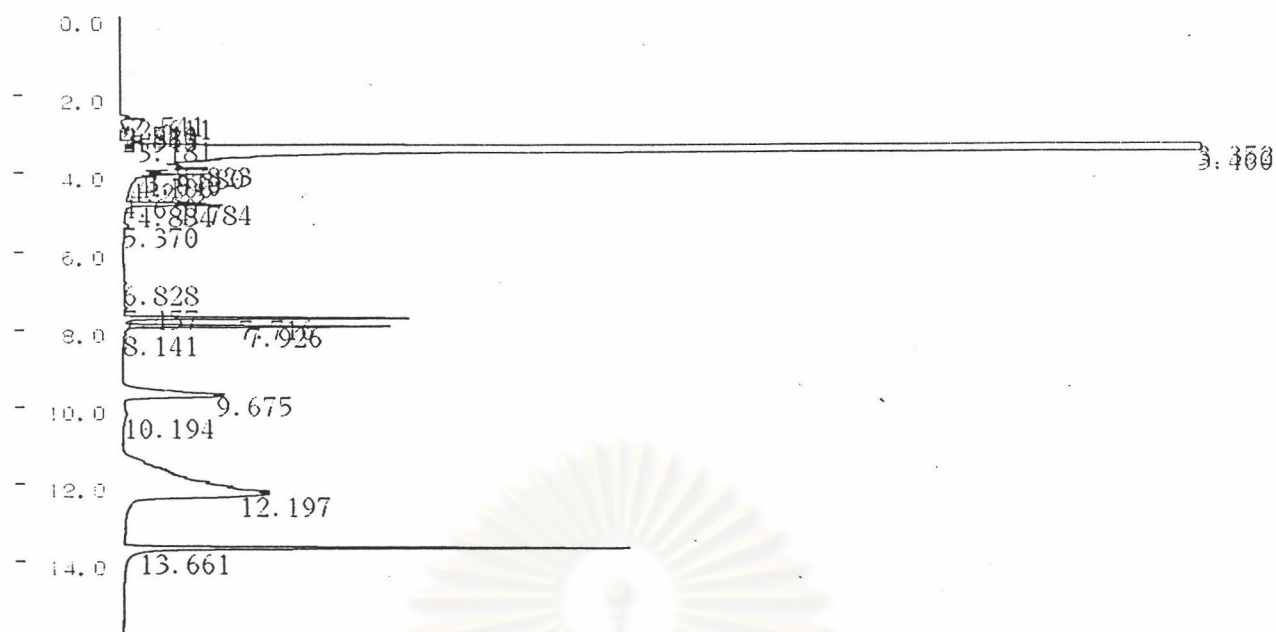
C-RSA CHROMATOPAC CH=1 Report No.=3 DATA=1:@CHRM1.C00 00/12/10 19:23:06

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	4	3.301	1572539	406329			46.0853	
	5	3.422	1830358	721399	SV		53.6411	
	22	7.667	5448	1633		15.22	0.1597	
	23	7.882	3887	1190	SV		0.1139	
TOTAL			3412232	1130551			100	

Fig 18 The results of chiral GC analysis in temperature program condition:
derivatized aminonitrile **25a**.

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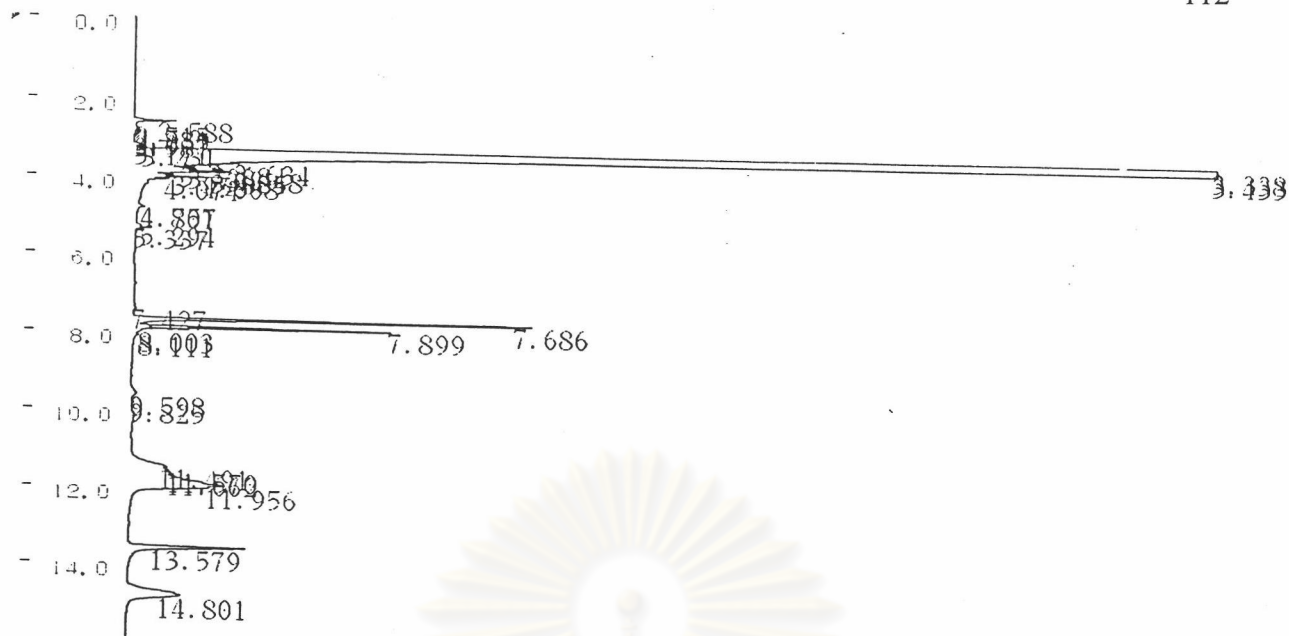
C-RSA CHROMATOPAC CH=1 Report No.=8 DATA=1:@CHRM1.C00 00/12/10 20:57:42

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	8	3.352	1161126	360103	V		33.8174	
	9	3.46	2236333	817430	SV		65.1324	
	22	7.716	3470	1044			0.1011	
	23	7.926	3004	983	V		0.0875	
	25	9.675	4227	372			0.1231	
	27	12.197	17883	536			0.5208	
	28	13.661	7477	1786	V		0.2178	
TOTAL			3433518	1182254			100	

Fig 19 The results of chiral GC analysis in temperature program condition:
derivatized aminonitrile 55.

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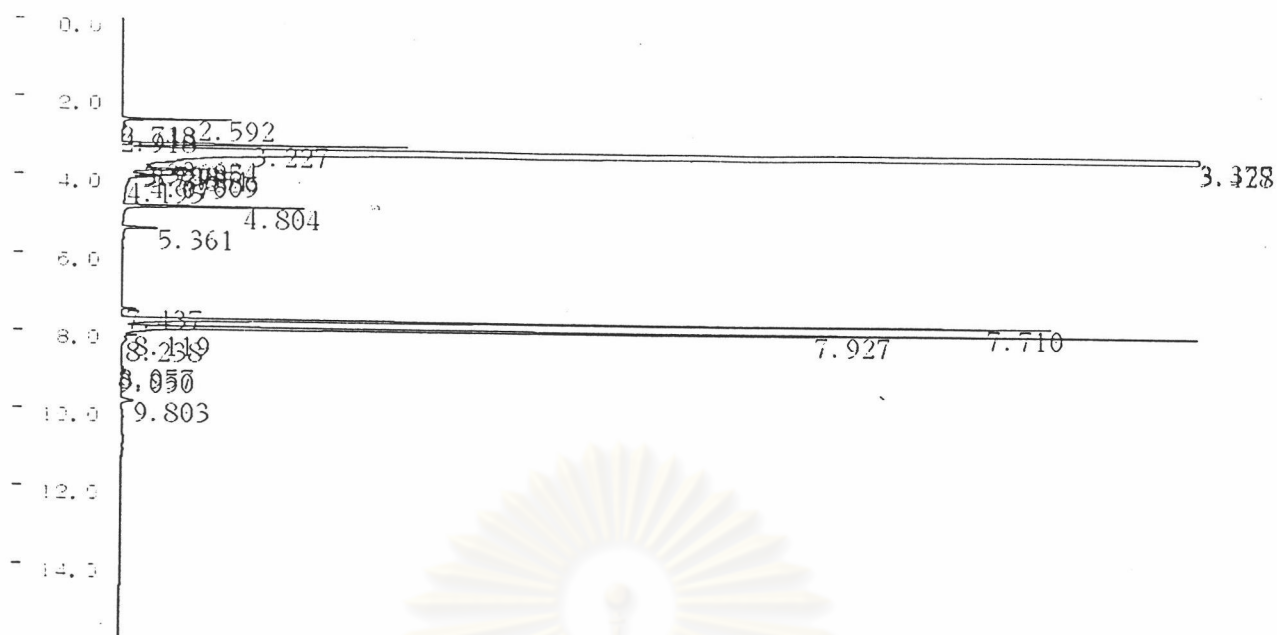
C-RSA CHROMATOPAC CH=1 Report No.=10 DATA=1:CHRMI.C00 00 12/10 21:45:32

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	9	3.338	1253449	412308	V		34.5845	
	10	3.433	2351953	857343	SV		64.8938	
	25	7.686	4264	1462			0.1177	
	26	7.899	2718	946	SV		0.075	
	31	11.491	1205	130			0.0332	
	34	11.956	5605	340	V		0.1546	
	35	13.579	2435	430			0.0672	
	36	14.801	2682	199			0.074	
TOTAL			3624310	1273157			100	

Fig 20 The results of chiral GC analysis in temperature program condition: derivatized aminonitrile 56.

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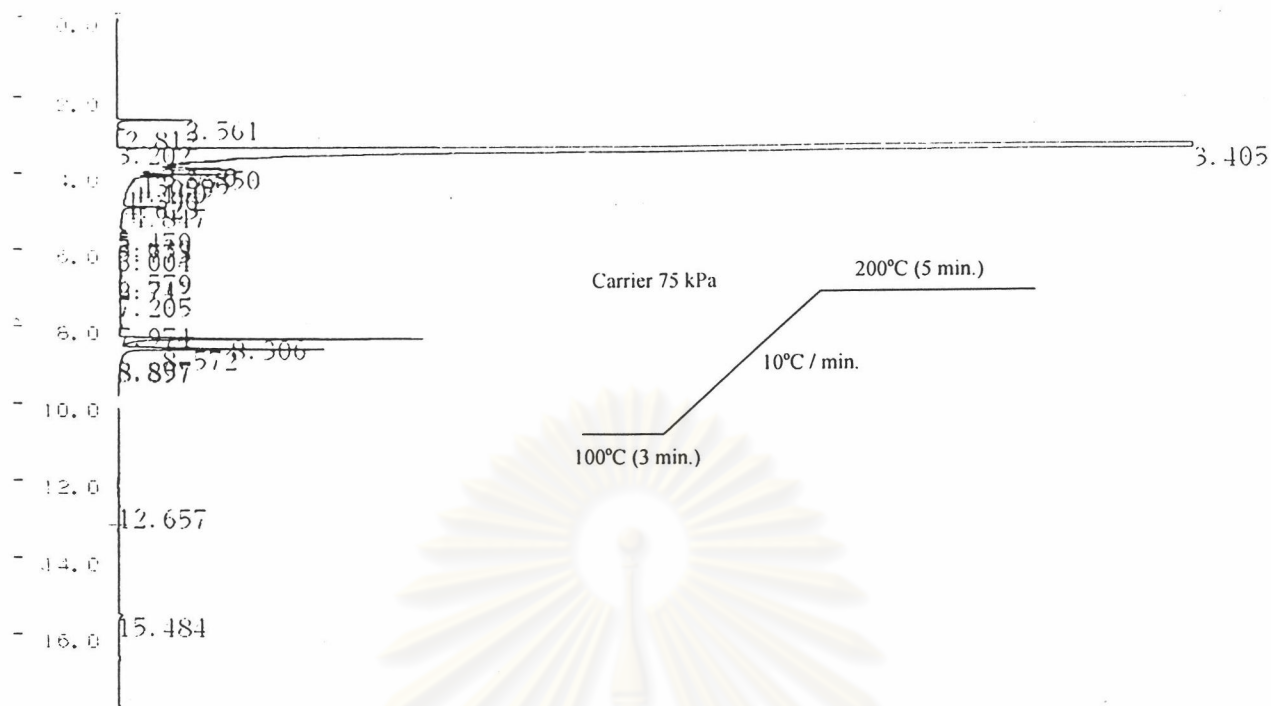
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** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	5	3.227	2506	1052			0.0985	
	6	3.377	814748	370541	V		32.0326	
	7	3.428	1701160	751707	SV		66.8827	
	18	4.804	1639	665			0.0644	
	21	7.71	9282	3462			0.3649	
	22	7.927	14163	5071	SV		0.5568	
TOTAL			2543497	1132497			100	

Fig 21 The results of chiral GC analysis in temperature program condition:
derivatized aminonitrile 43.

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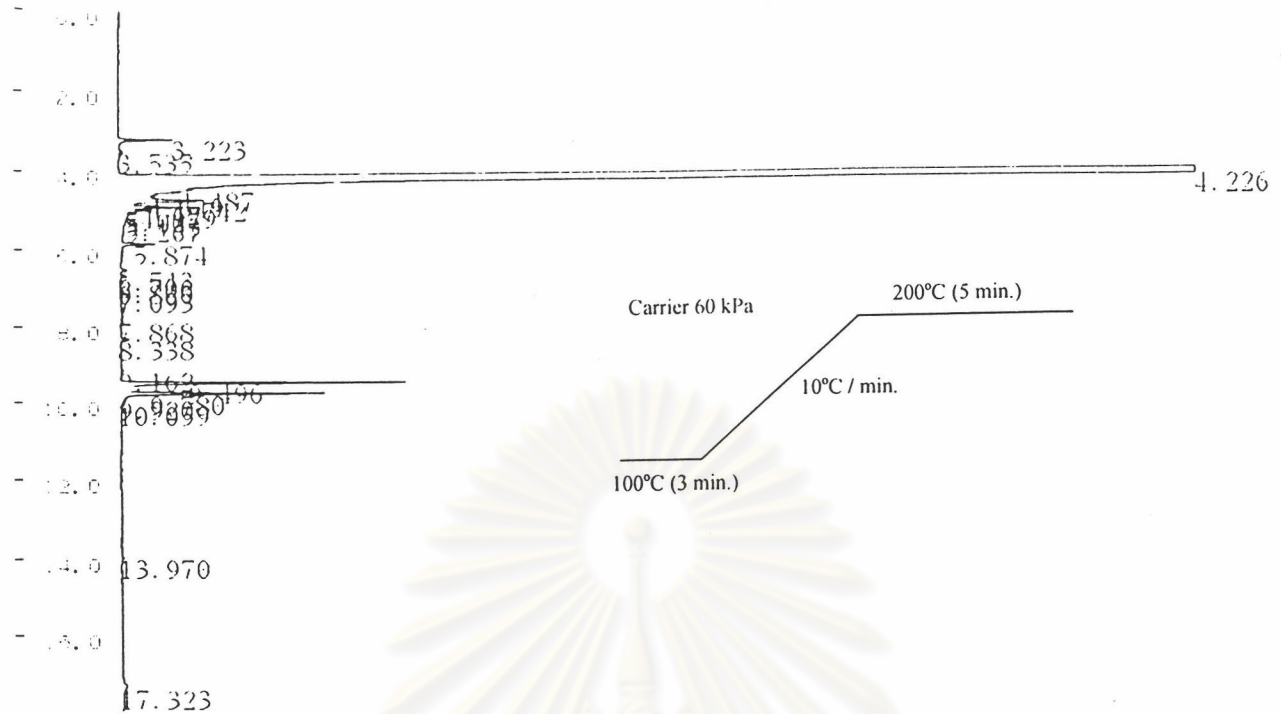
C-RSA CHROMATOPAC CH=1 Report No.=3 DATA=1:@CHRM1.C00 00:12/20 16:47:42

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	4	3.405	3141230	936671	SV		99.8189	
	21	8.306	3216	1125			0.1022	
	22	8.572	2482	762	SV		0.0789	
TOTAL			3146929	938558			100	

Fig 22-Fig 30 The results of GC analysis in various temperature program conditions:
derivatized aminonitrile 25a.

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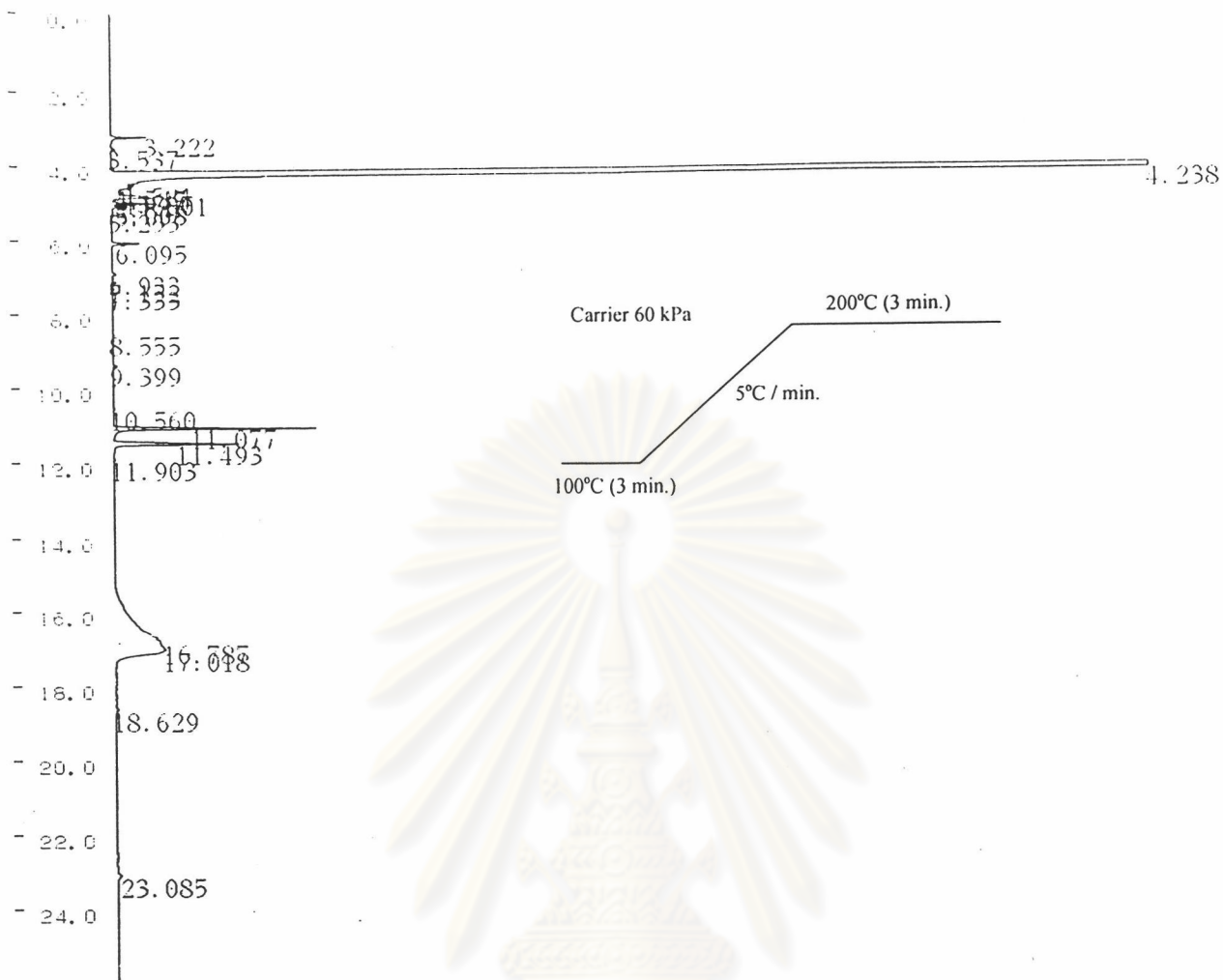
C-RSA CHROMATOPAC CH=1 Report No.=4 DATA=1:@CHRM1.C00 00.12.20 17:10:54

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	3	4.226	3234867	725457	S		99.8272	
	19	9.496	3206	1055			0.0989	
	20	9.78	2393	743	V		0.0738	
TOTAL			3240465	727255			100	

Fig 23

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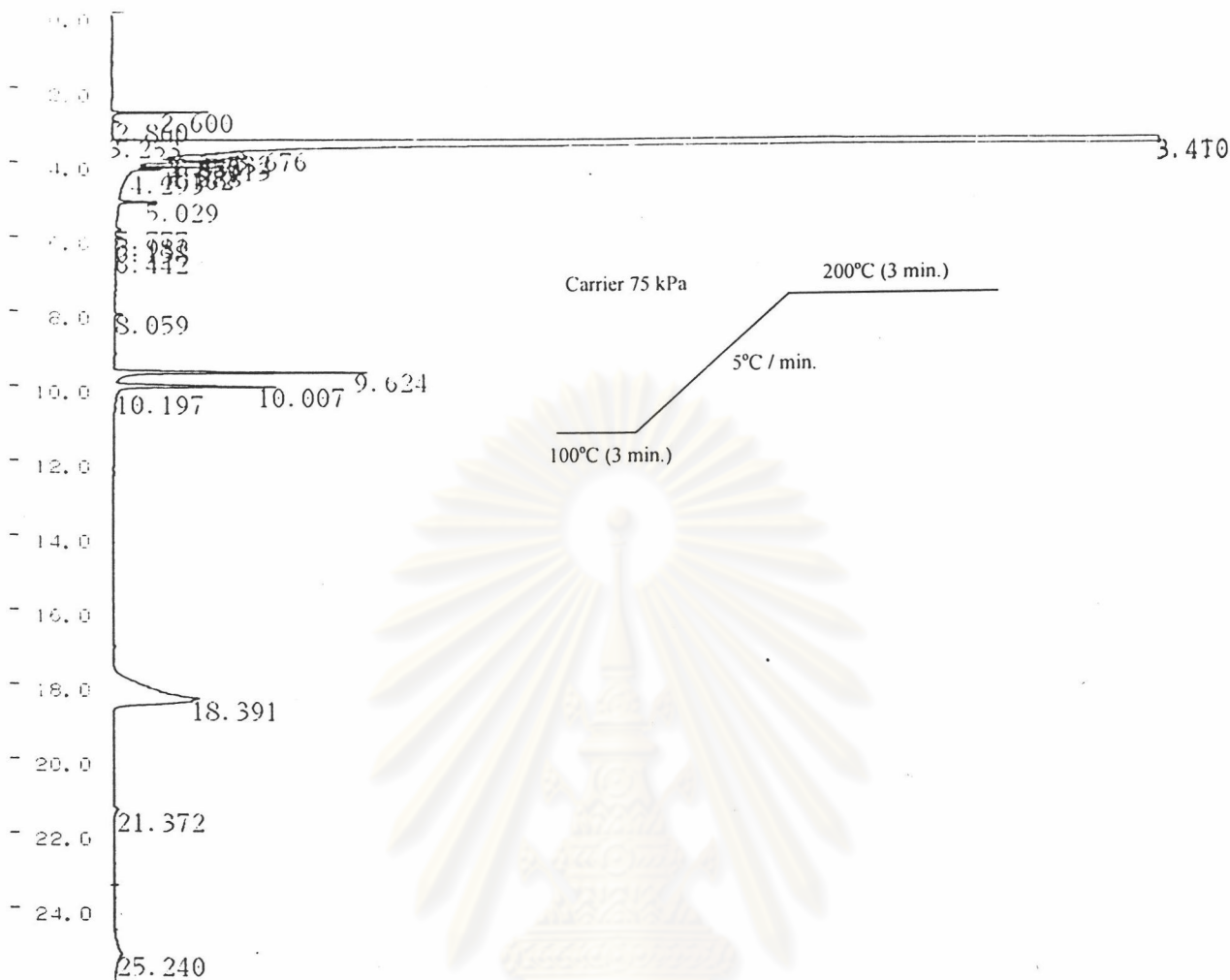
C-RSA CHROMATOPAC CH=1 Report No.=6 DATA=1:@CHRM1.C00 00 12 20 17:35:46

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	3	4.238	2074014	527847	S		99.3682	
	20	11.077	2664	790			0.1277	
	21	11.493	1898	480			0.0909	
	23	16.787	4828	170			0.2313	
	24	17.018	3796	191	V		0.1819	
TOTAL			2087200	529477			100	

Fig 24

ศูนย์วิจัยทรัพยากรชีวภาพและพันธุศาสตร์
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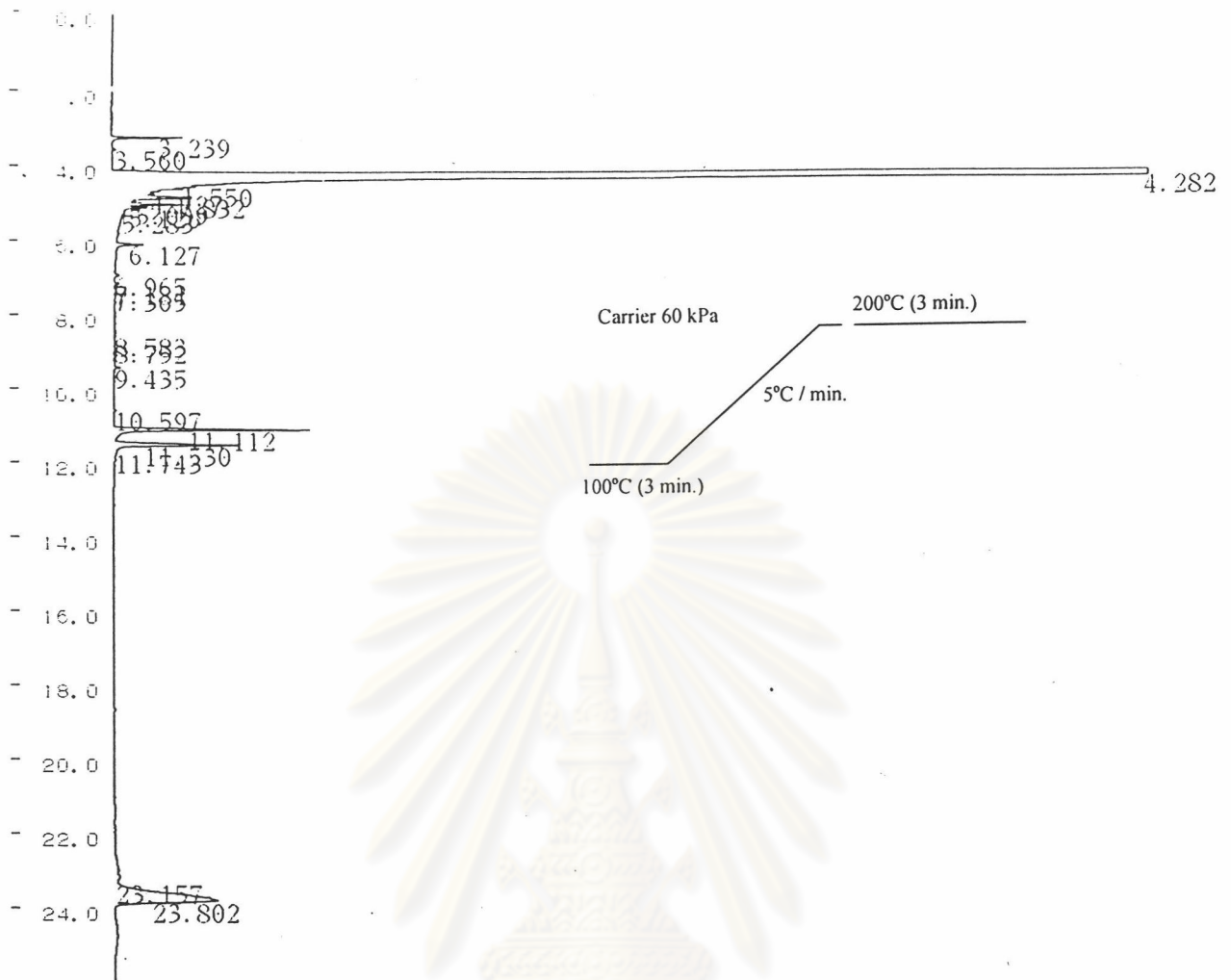
C-RSA CHROMATOPAC CH=1 Report No.=7 DATA=1:@CHRM1.C00 00/12/20 18:07:38

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	4	3.41	1136864	494161			30.7468	
	5	3.47	2545999	934270	SV		68.8573	
	22	9.624	3656	970			0.0989	
	23	10.007	2631	619	SV		0.0712	
	25	18.391	8349	328			0.2258	
TOTAL			3697499	1430348			100	

Fig 25

จุฬาลงกรณ์มหาวิทยาลัย

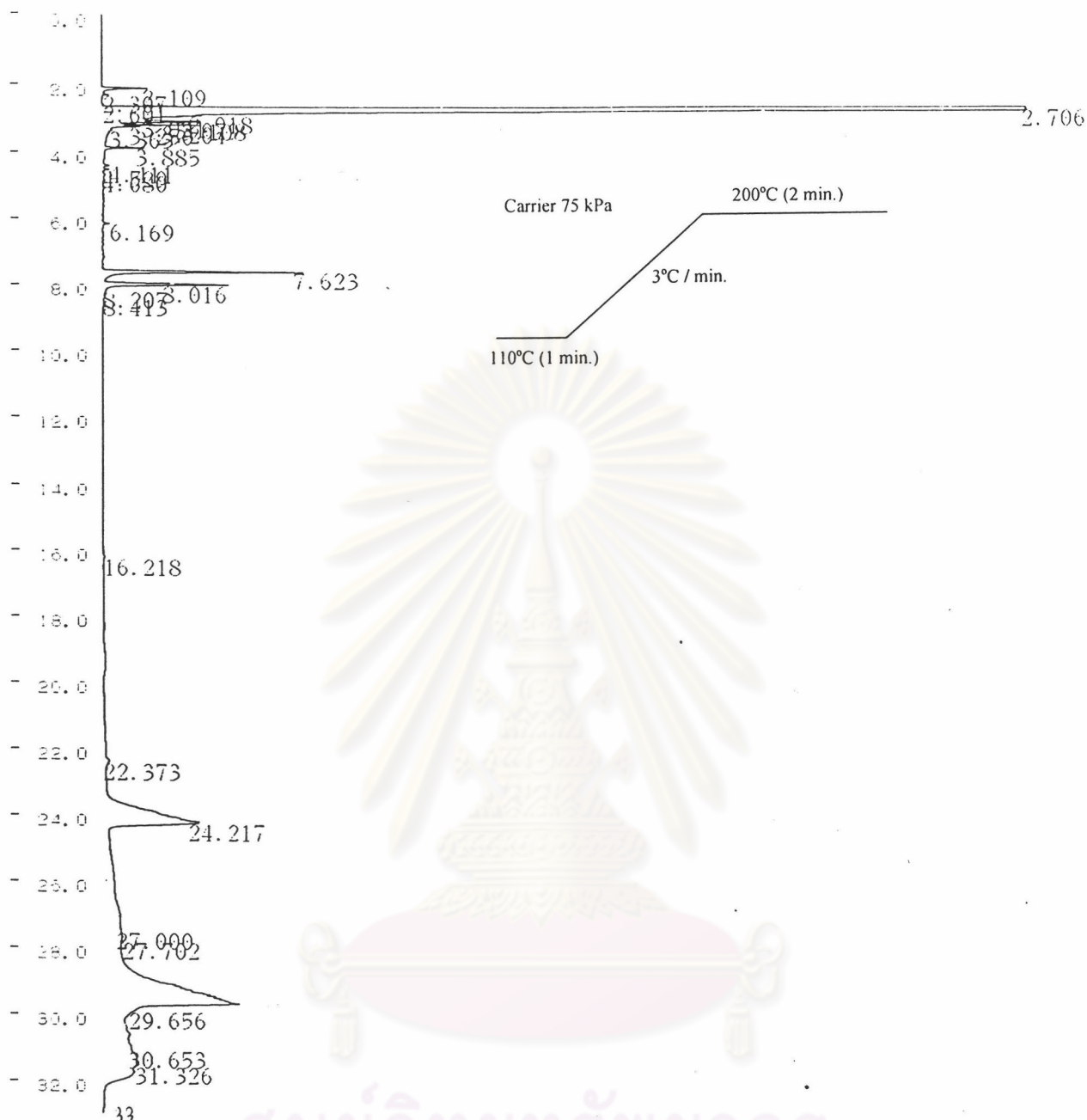


C-RSA CHROMATOPAC CH=1 Report No.=8 DATA=1:@CHRM1.C00 00/12/20 18:42:12

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	3	4.282	3180654	735827	S		99.6335	
	18	11.112	3013	759			0.0944	
	19	11.53	2137	478	V		0.0669	
	22	23.802	6549	395	V		0.2051	
TOTAL			3192352	737460			100	

Fig 26

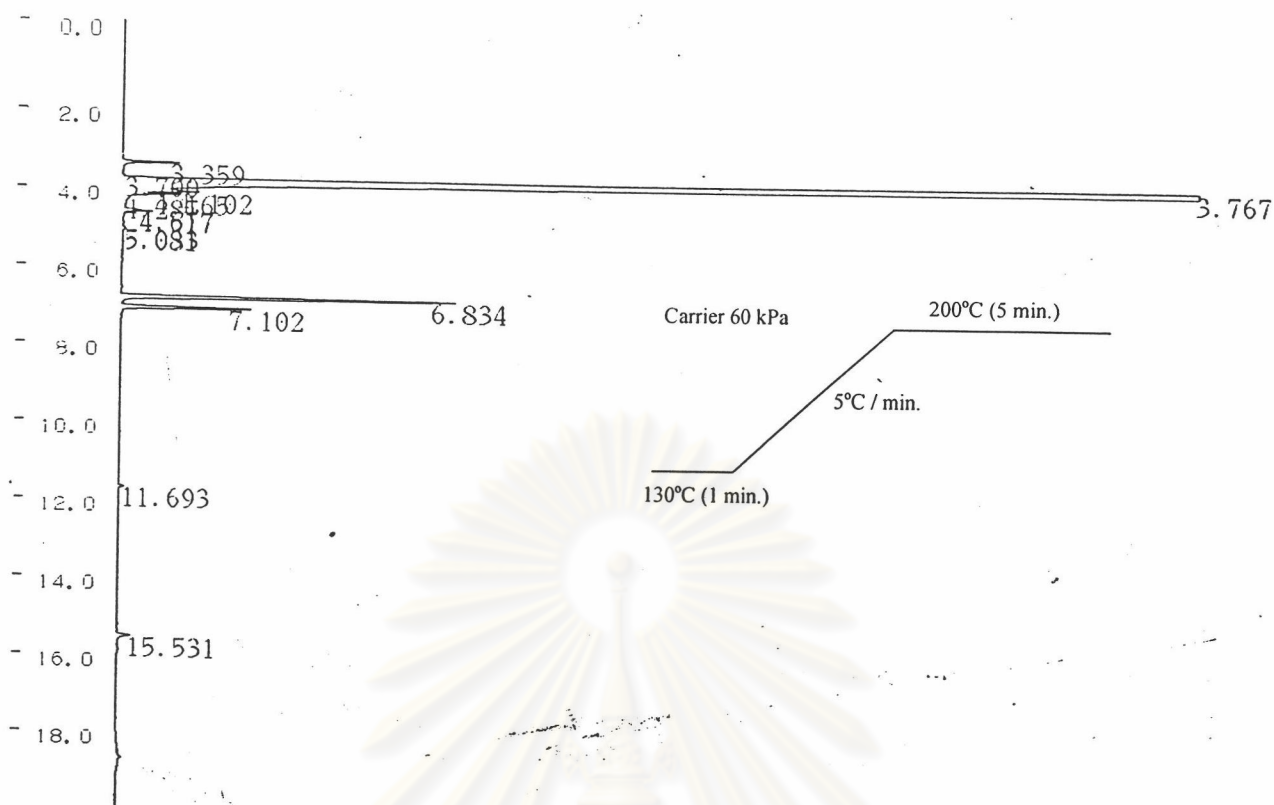


C-RSA CHROMATOPAC CH=1 Report No.=9 DATA=1:@CHRM1.C02 00/12/20 19:22:32

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	4	2.706	2970941	1120562	SVE		98.2247	
	17	7.623	3451	874			0.1141	
	18	8.016	2528	548	SV		0.0836	
	23	24.217	10068	395			0.3329	
	25	27.702	1259	39	V		0.0416	
	26	29.656	24834	540	V		0.821	
	27	30.653	3292	96	V		0.1088	
	28	31.326	8266	133	V		0.2733	
TOTAL			3024639	1123186			100	

Fig 27



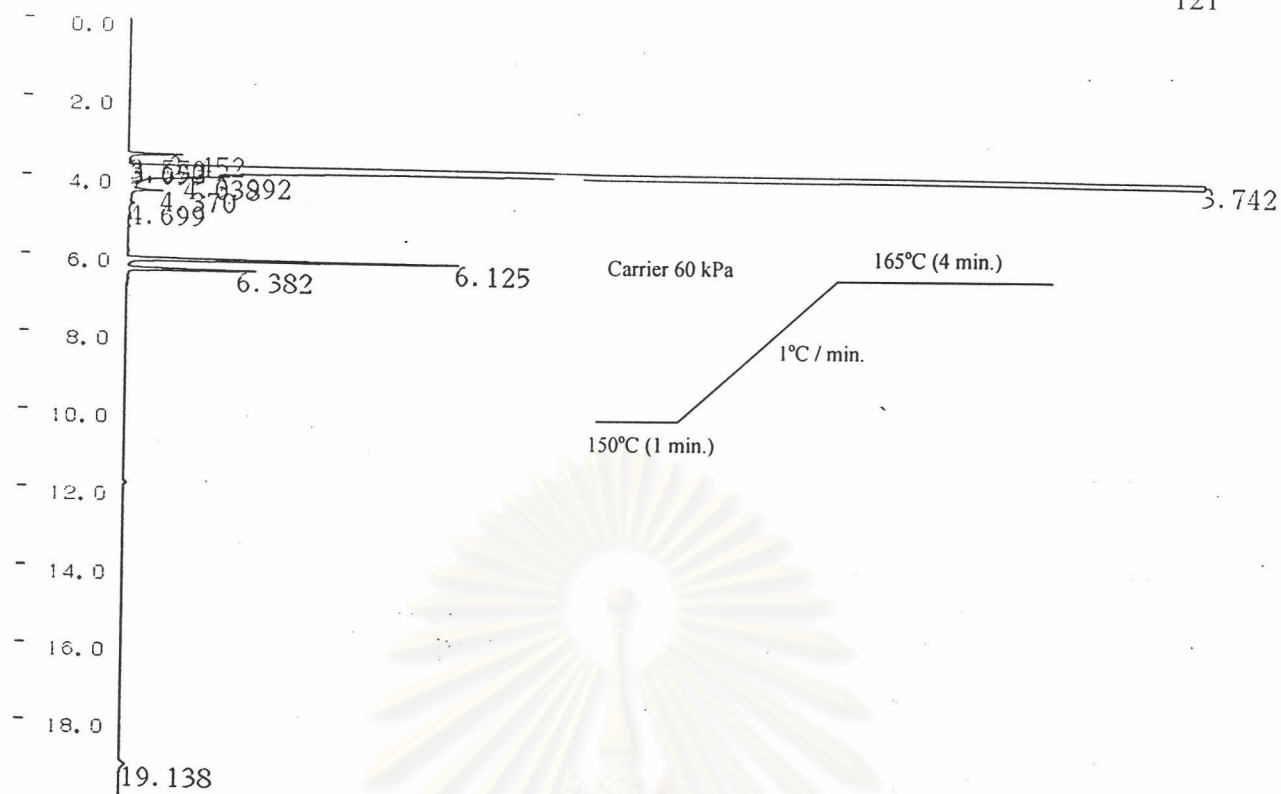
C-R8A CHROMATOPAC CH=1 Report No.=7 DATA=1:@CHRM1.C00 00/12/29 18:55:00

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	3	3.767	2469220	735831	SV		99.7532	
	11	6.834	4338	1245			0.1752	
	12	7.102	1772	489	V		0.0716	
TOTAL			2475330	737565			100	

Fig 28

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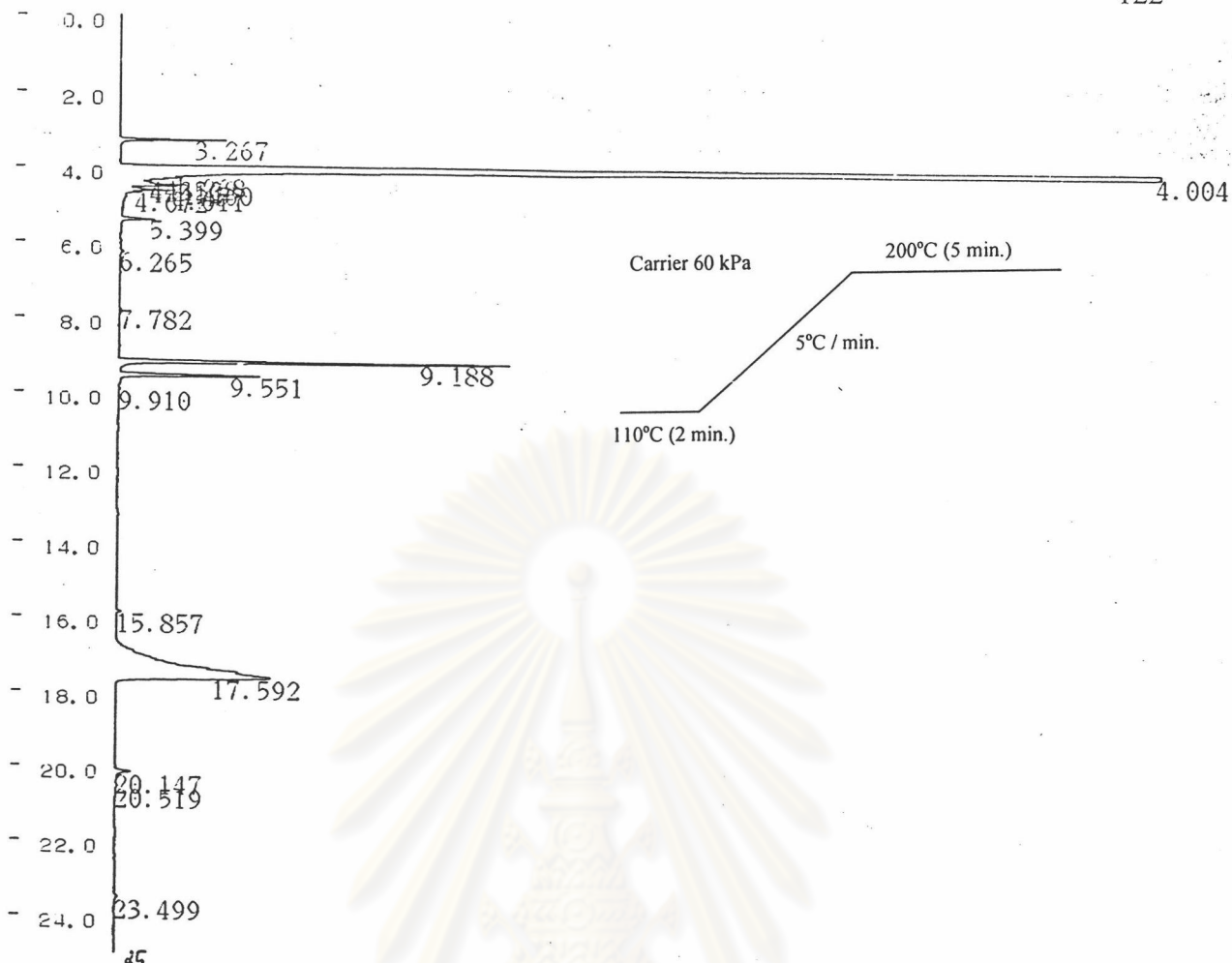
C-RSA CHROMATOPAC CH=1 Report No.=8 DATA=1:@CHRM1.C00 00/12/29 19:19:04

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	5	3.742	2021352	644453	SV		99.7426	
	10	6.125	3684	1222			0.1818	
	11	6.382	1533	475	V		0.0756	
TOTAL			2026568	646150			100	

Fig 29

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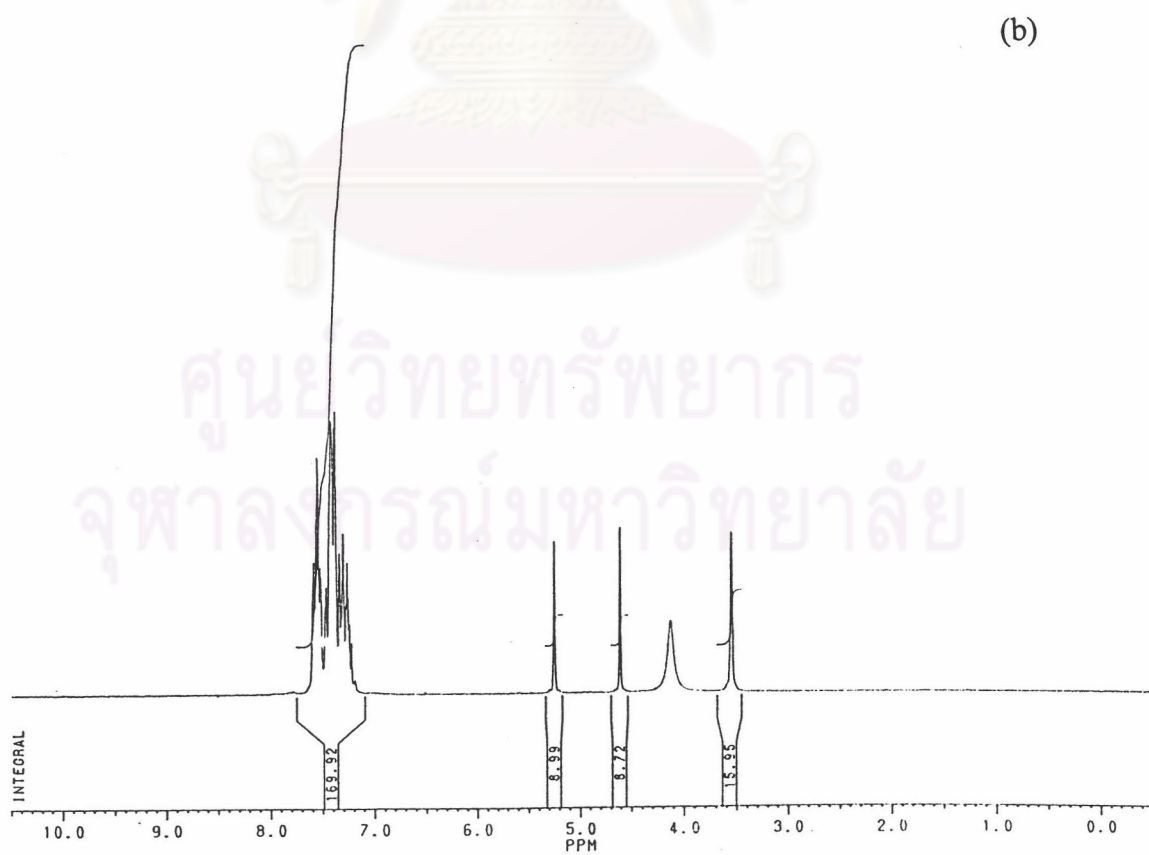
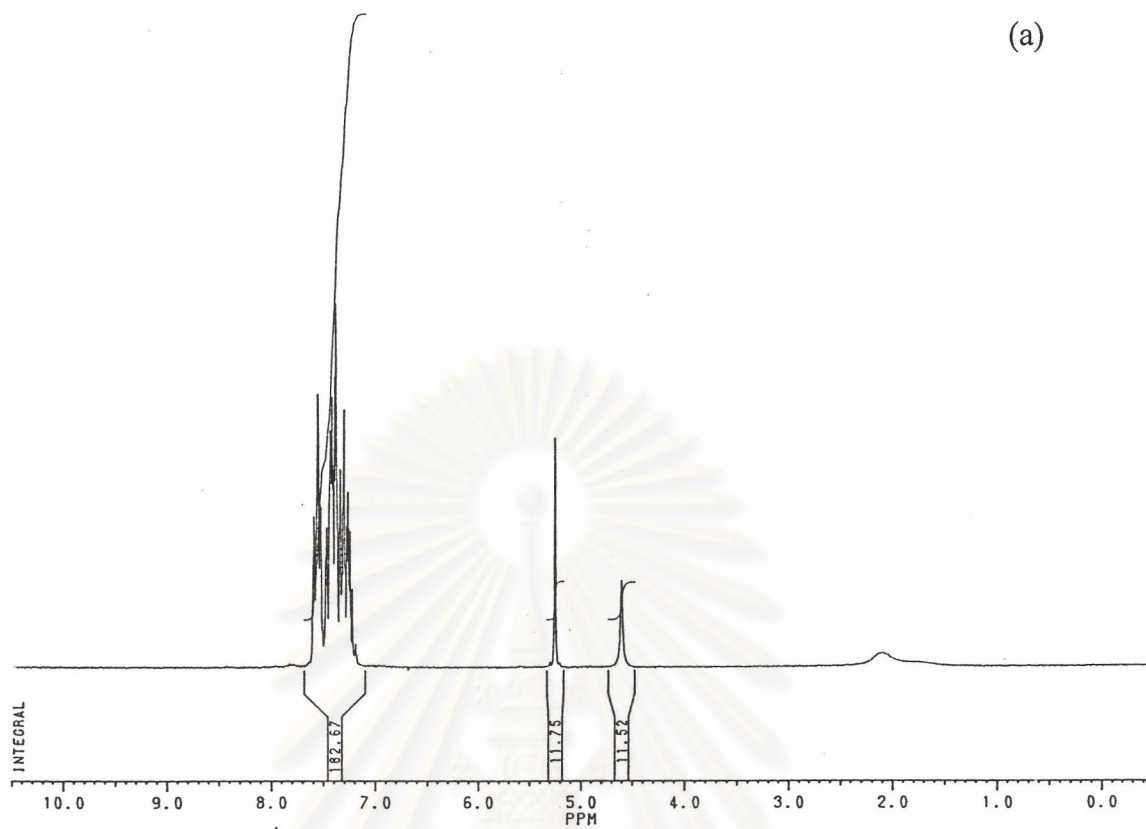
C-RSA CHROMATOPAC CH=1 Report No.=9 DATA=1:@CHRM1.C00 00/12/29 19:44:22

** CALCULATION REPORT **

CH	PKNO	TIME	AREA	HEIGHT	MK	IDNO	CONC	NAME
1	2	4.004	2699914	992054	S E		99.2026	
	14	9.188	5240	1489			0.1925	
	15	9.551	2107	538	V		0.0774	
	18	17.592	14355	593			0.5274	
TOTAL			2721616	994675			100	

Fig 30

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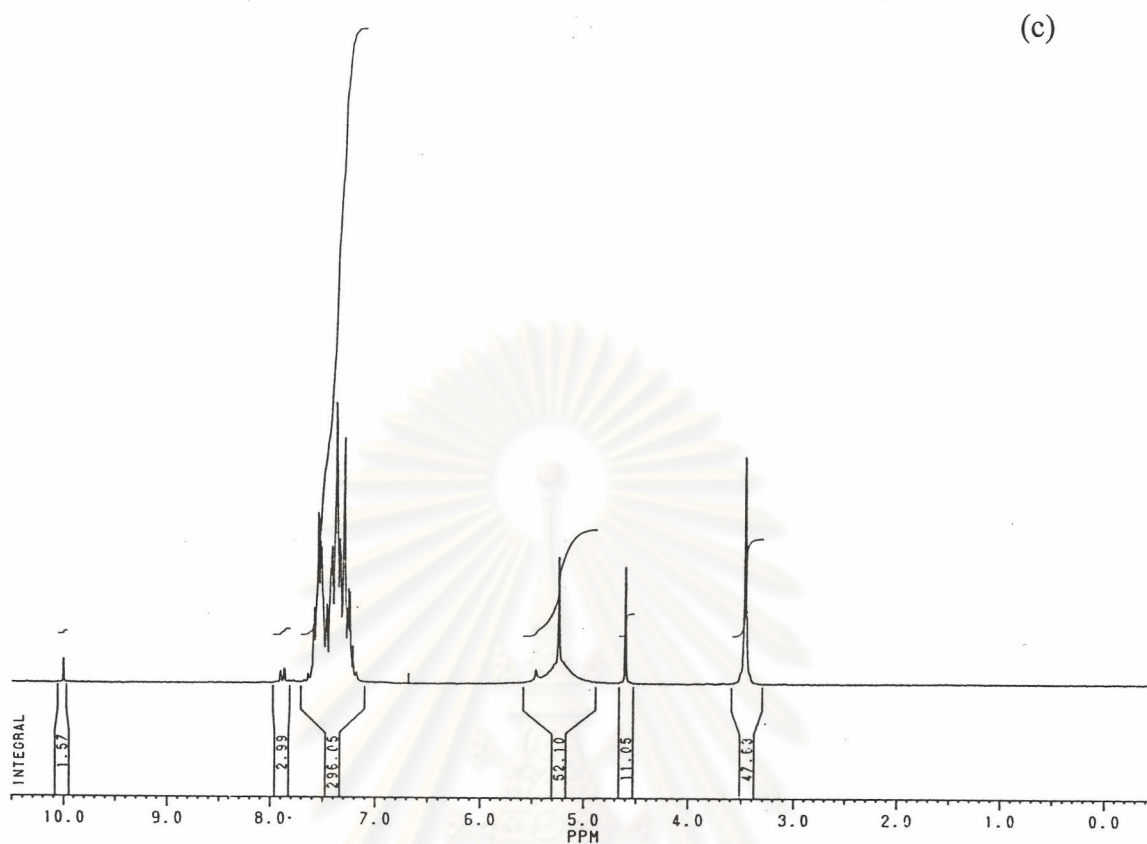
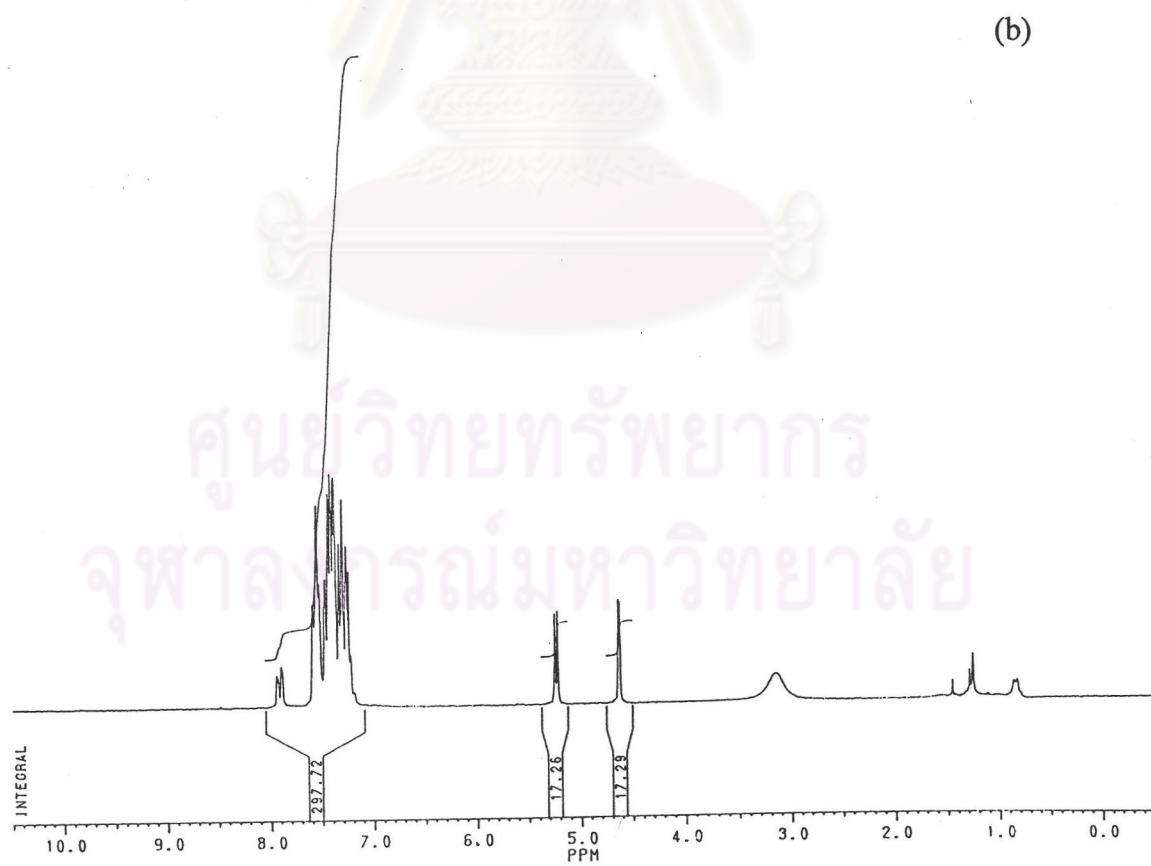
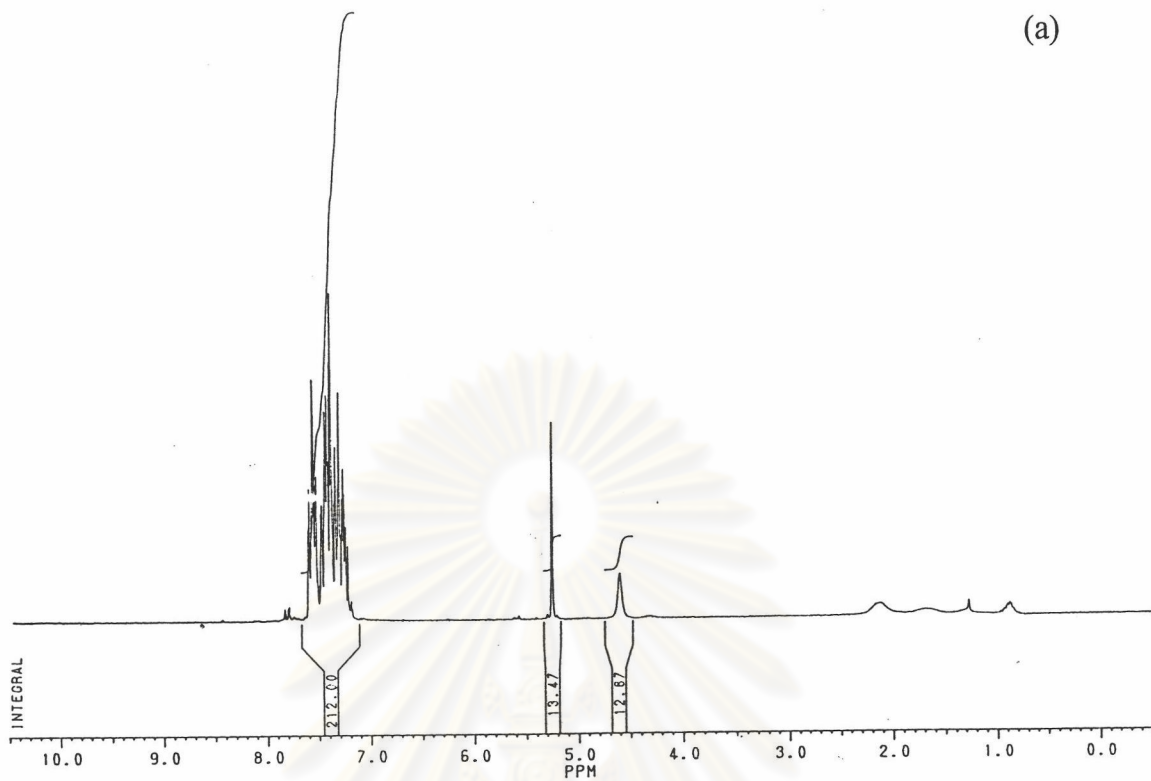


Fig 31 The NMR spectra of racemic **25a**: (a) Racemic **25a** before adding **58**;
(b) After adding 0.5 eq of **58**; (c) After adding 1.0 eq of **58**.

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(c)

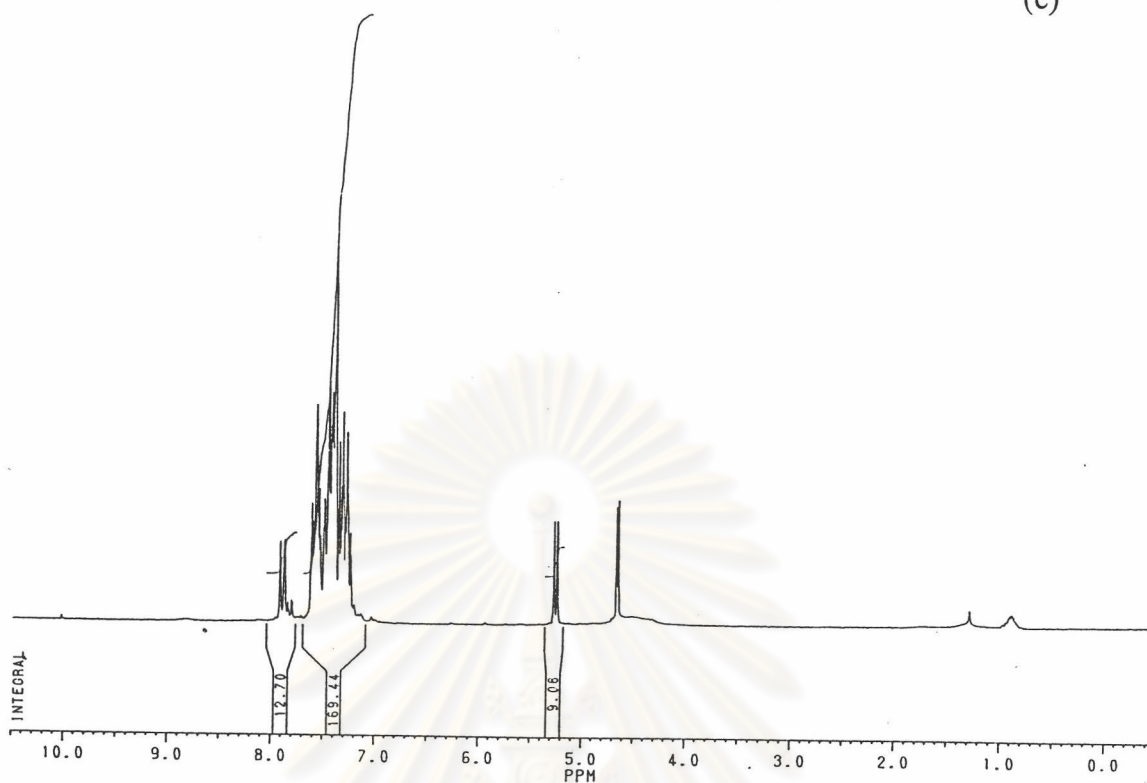
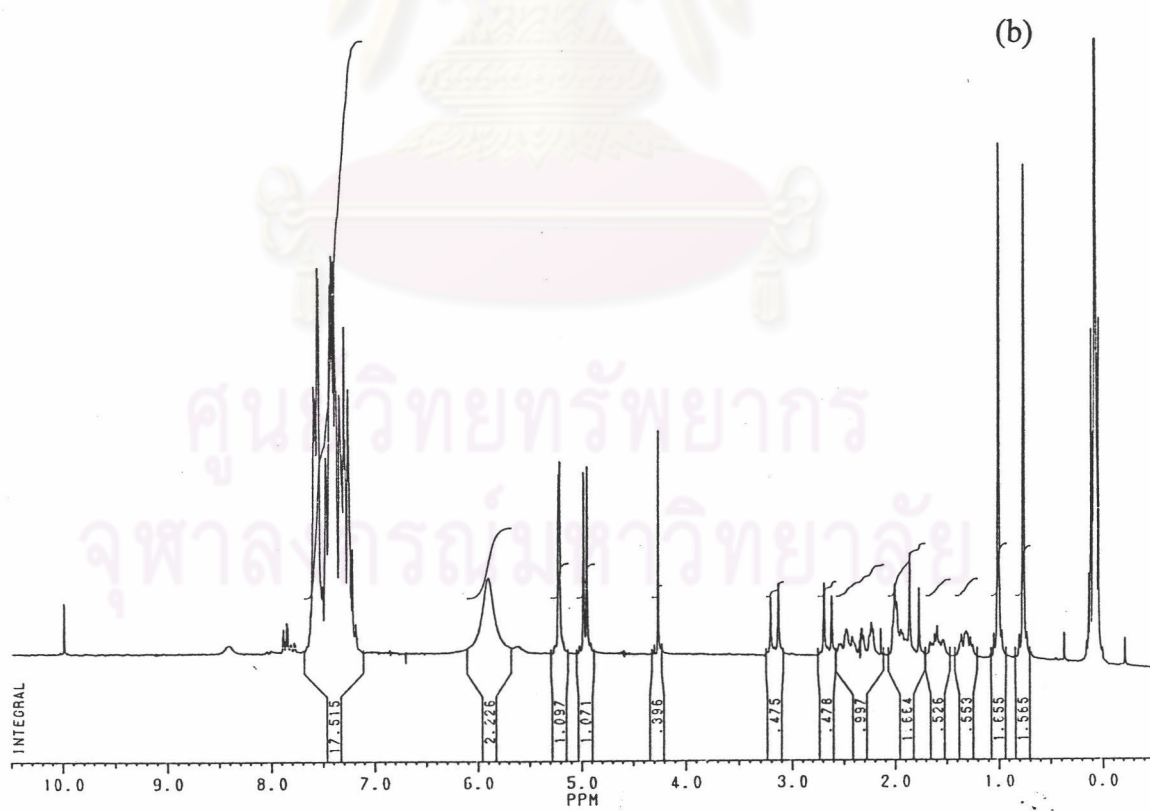
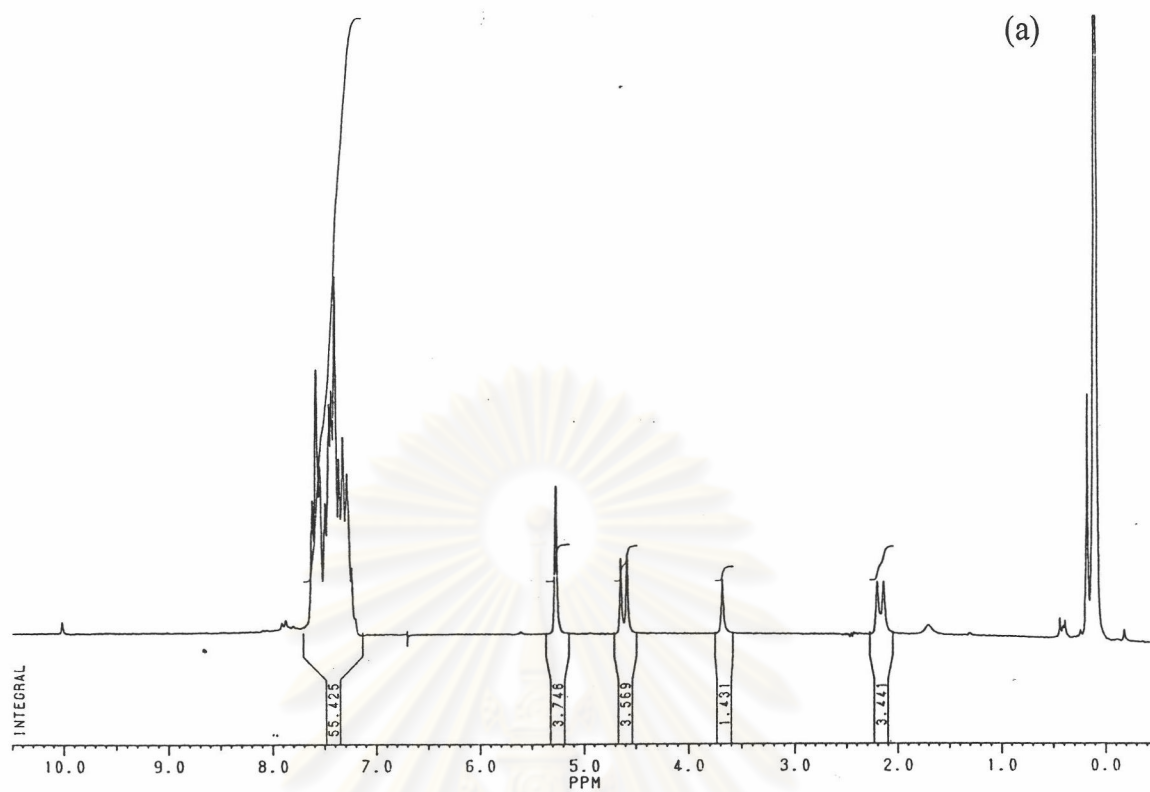


Fig 32 The NMR spectra of racemic **25a**: (a) Racemic **25a** before adding **59**;
(b) After adding 0.25 eq of **59**; (c) After adding 0.5 eq of **59**.

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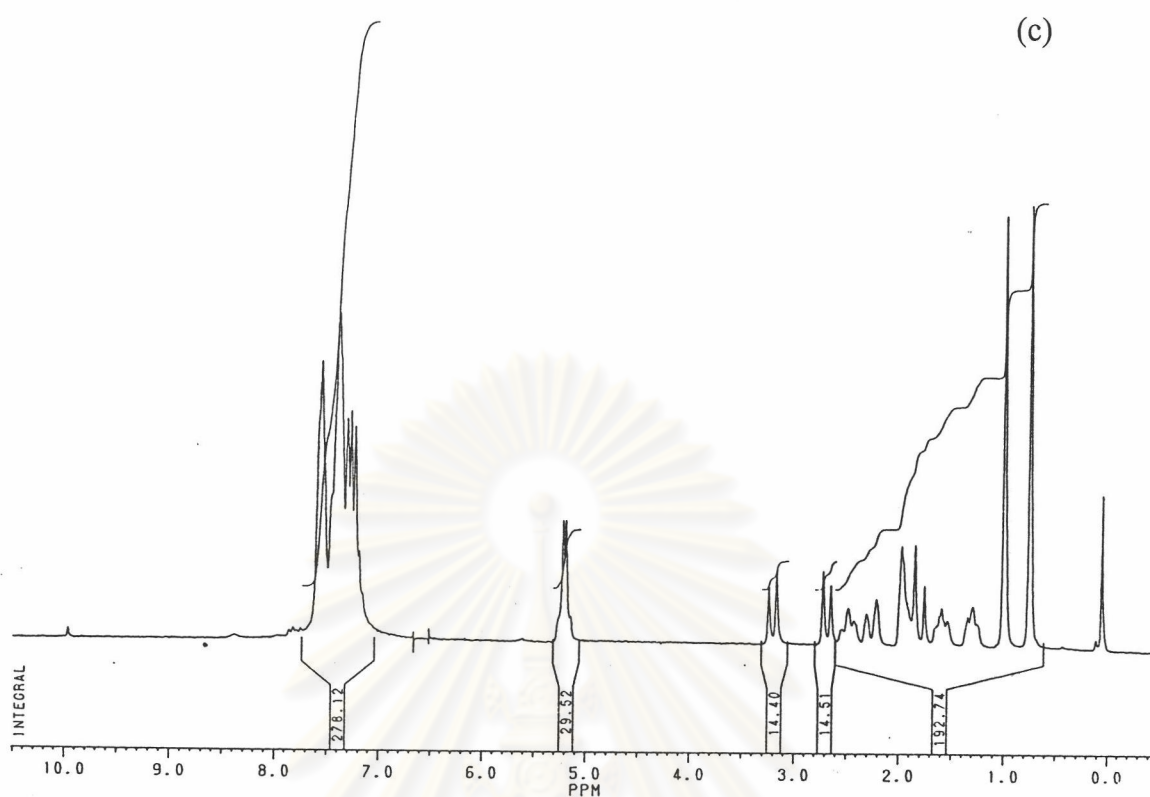
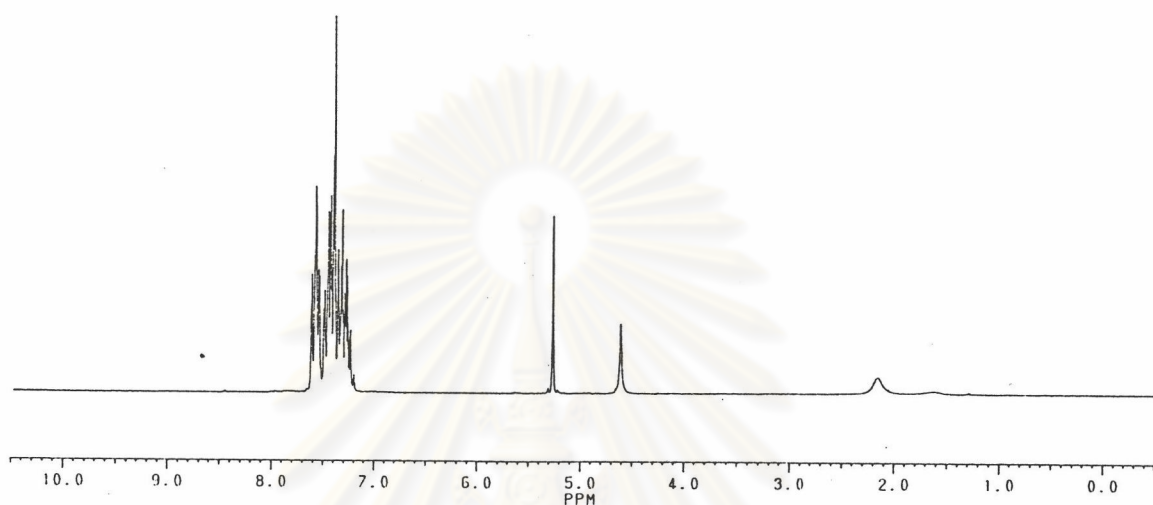


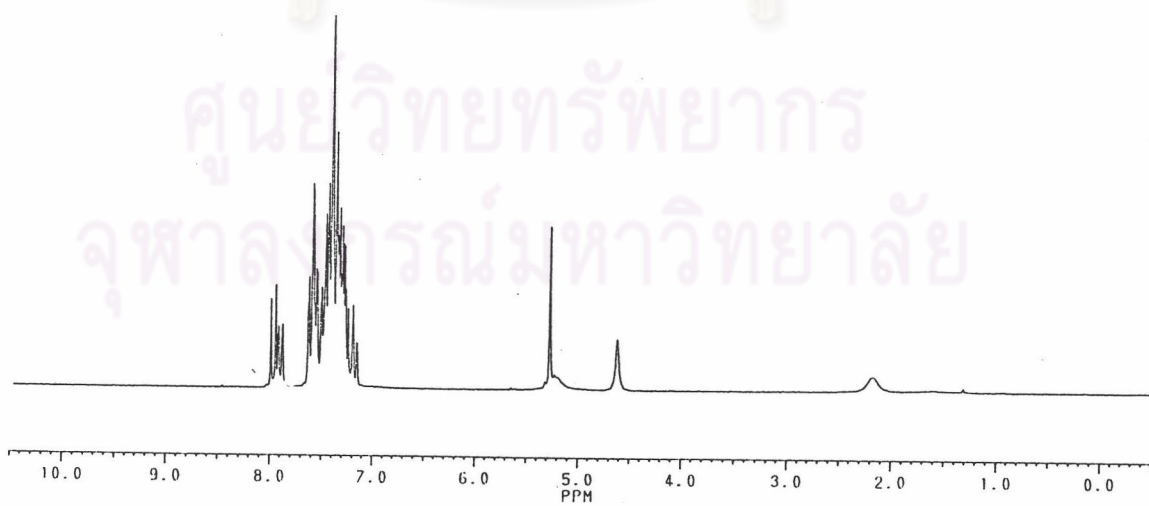
Fig 33 The NMR spectra of racemic **25a**: (a) Racemic **25a** before adding **60**;
(b) After adding 0.5 eq of **60**; (c) After adding 1.0 eq of **60**.

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(a)



(b)



(c)

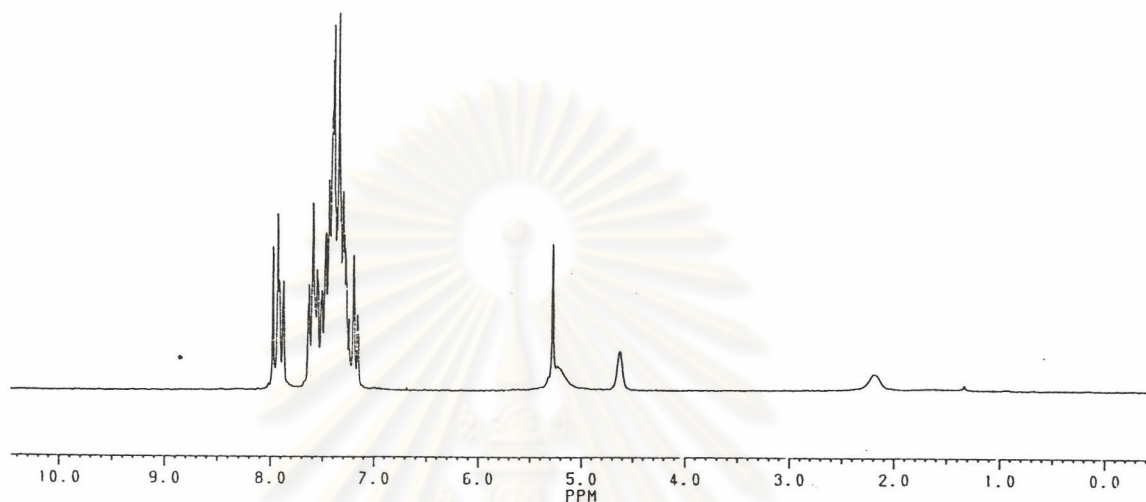
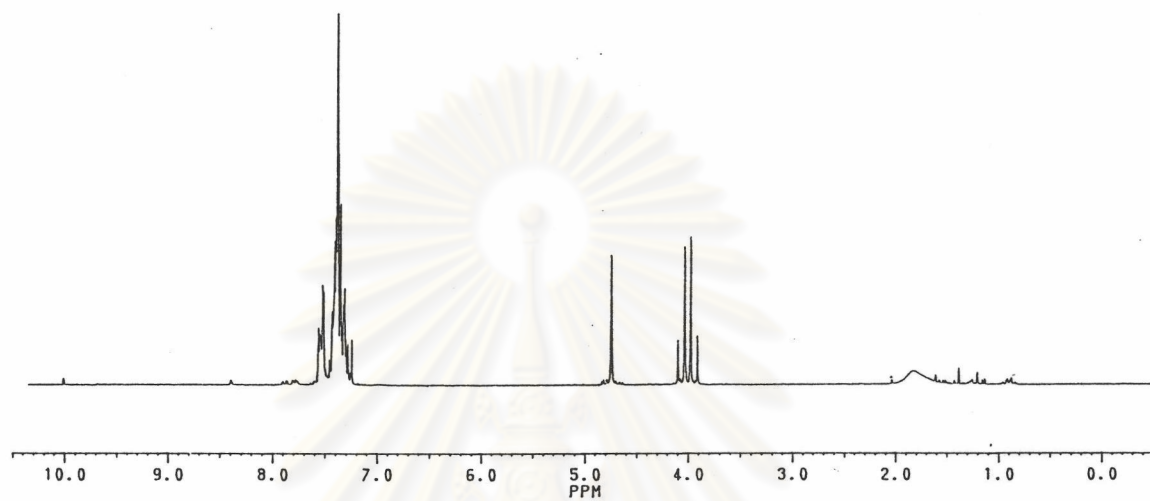


Fig 34 The NMR spectra of racemic **25a**: (a) Racemic **25a** before adding **61**;
(b) After adding 0.5 eq of **61**; (c) After adding 1.0 eq of **61**.

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(a)



(b)

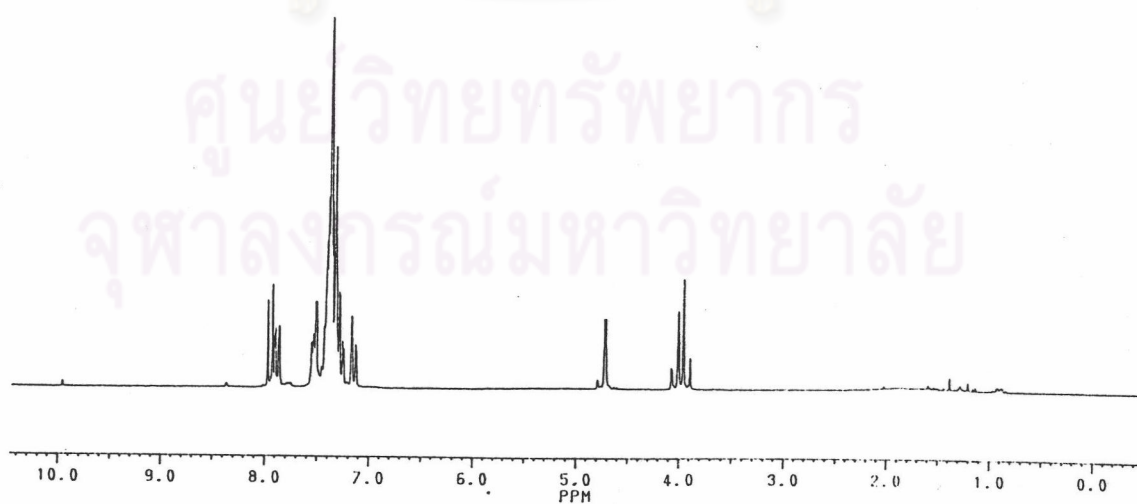
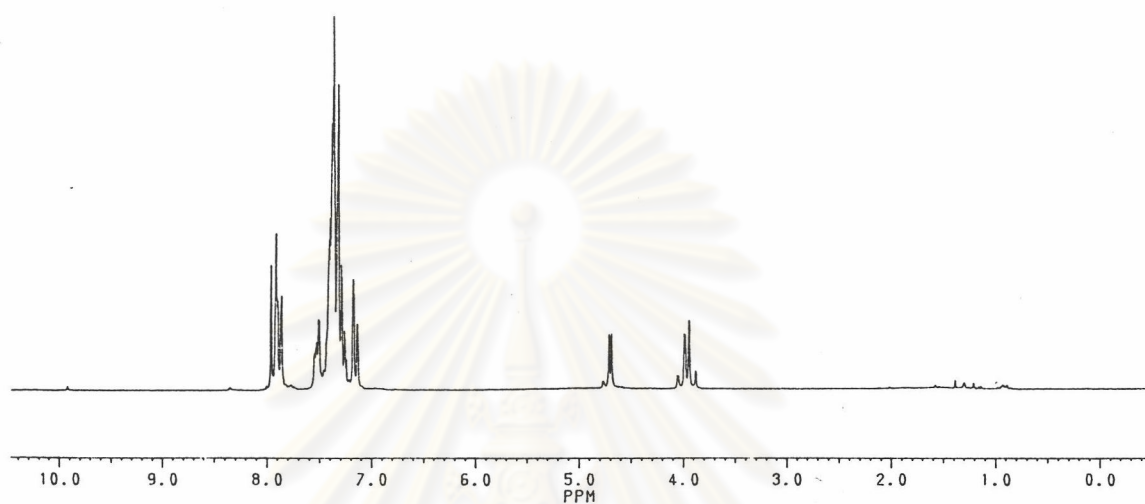


Fig 35 The NMR spectra of racemic **43**: (a) Racemic **43** before adding **61**;
(b) After adding 0.5 eq of **61**.

(a)



(b)

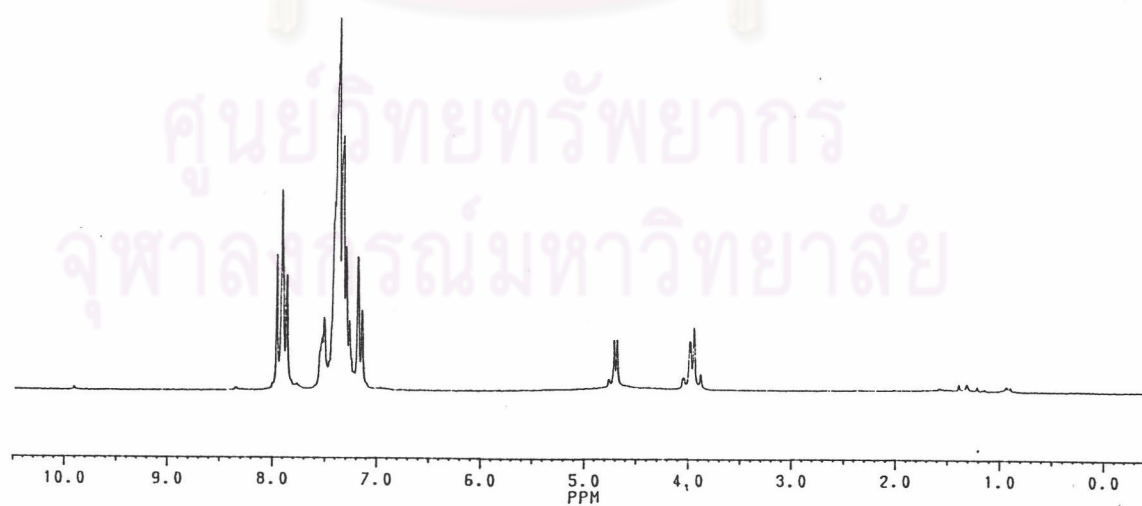


Fig 36 The NMR spectra of racemic **43**: (a) After adding 1.0 eq of **61**;
(b) After adding 1.5 eq of **61**.

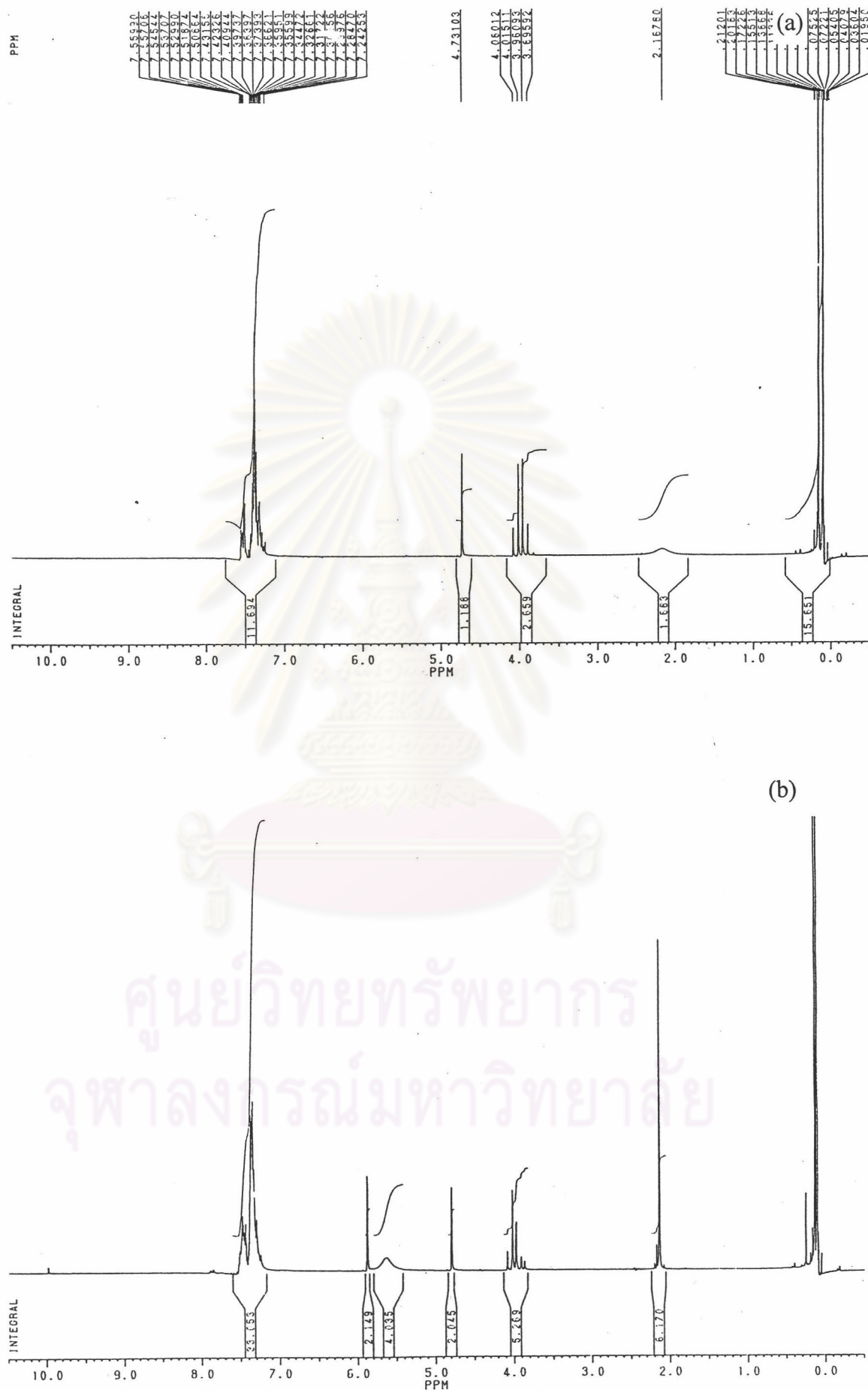


Fig 37 The NMR spectra of racemic 43: (a) Racemic 43 before adding 62;

(b) After adding 1.0 eq of 62.

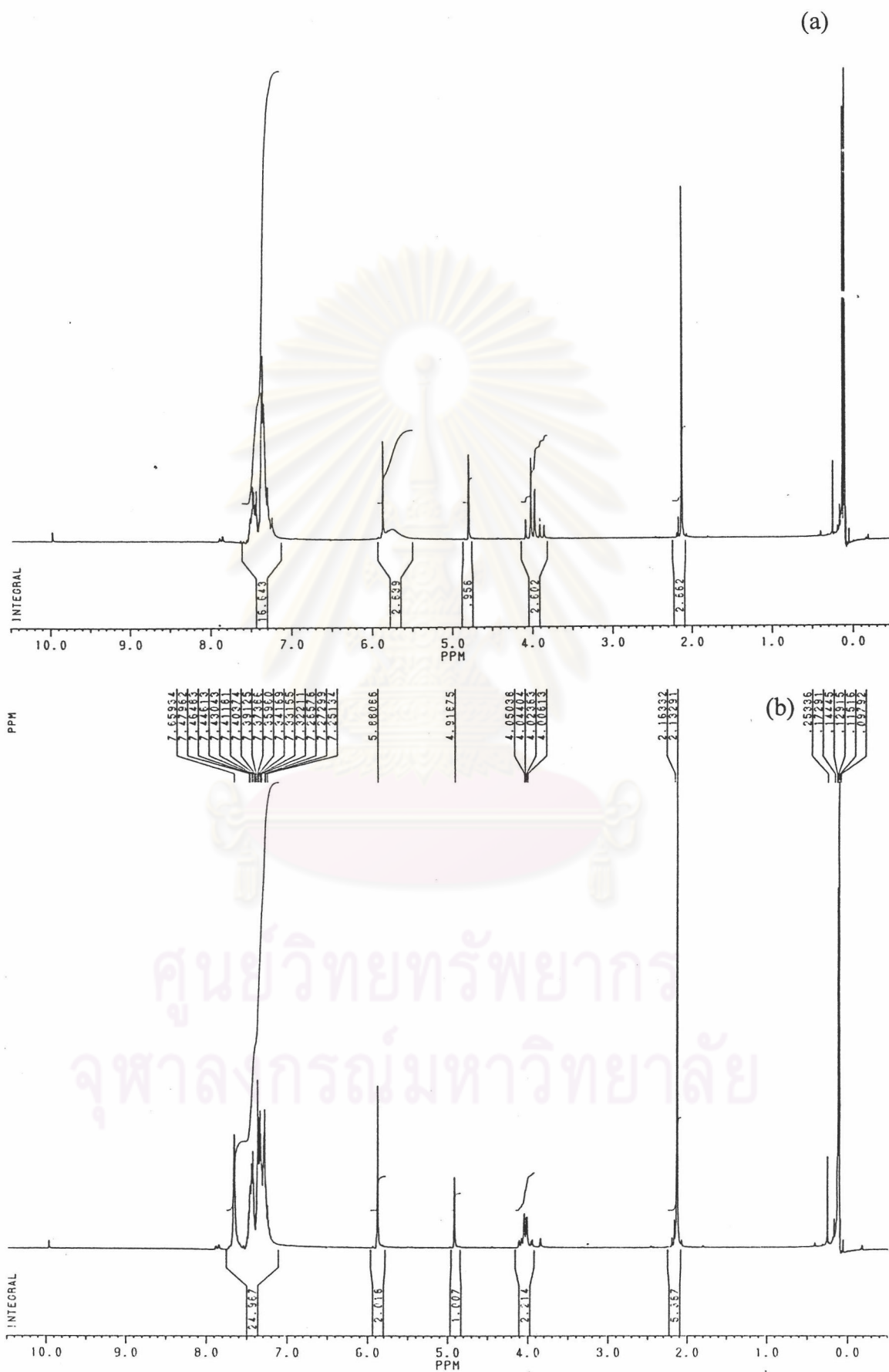


Fig 38 The NMR spectra of racemic **43**: (a) After adding 1.0 eq of **62**;
(b) After adding 2.0 eq of **62**.

CURRICULUM VITAE

Miss Woraluk Mansawat was born on June 14th, 1976 in Phitsanulok, Thailand. She received a Bachelor Degree of Science, majoring in Chemistry from Chulalongkorn University in 1998. Since 1998, she has been a graduate student studying Organic Chemistry as her major course at Chulalongkorn University. During her studies towards the Master's degree, she was awarded a teaching assistant scholarship by the Faculty of Science during 1998-2001 and was supported by a research grant for her Master degree's thesis from the Graduate School, Chulalongkorn University.

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