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## APPENDICES

Appendix A



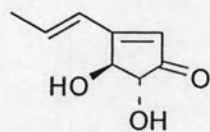
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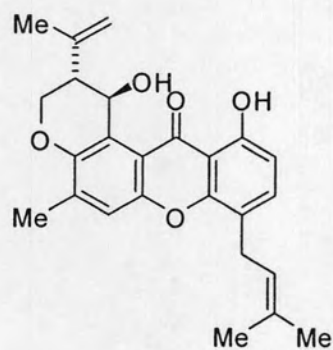
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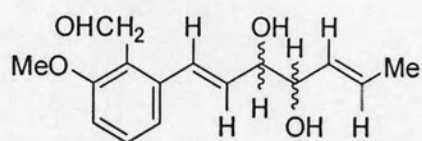
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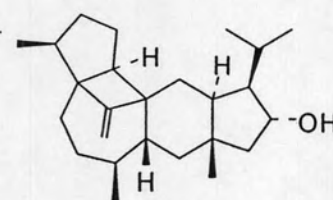
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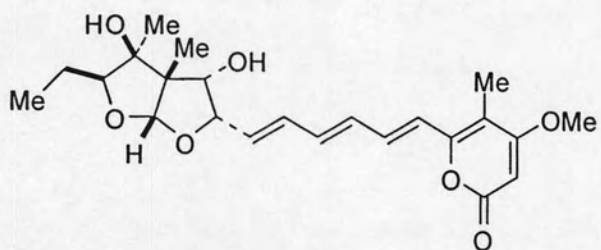
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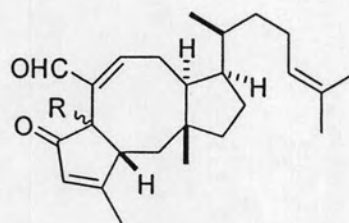
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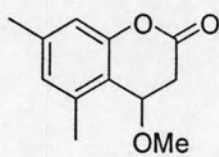
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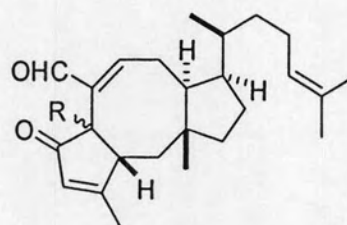
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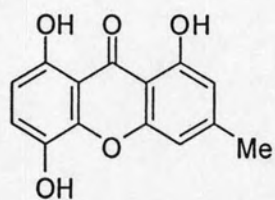
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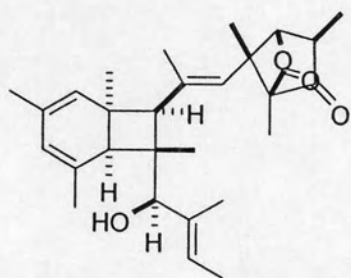
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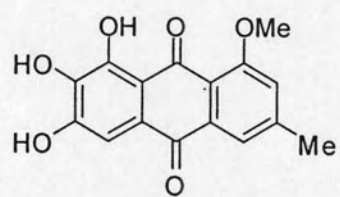
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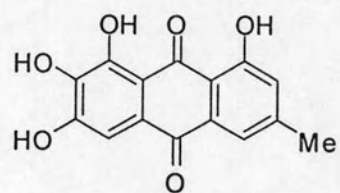
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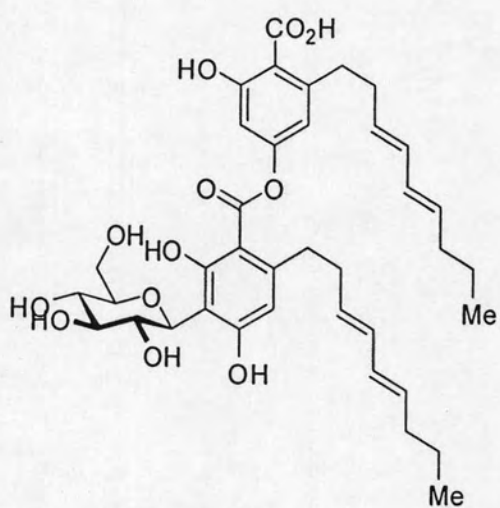
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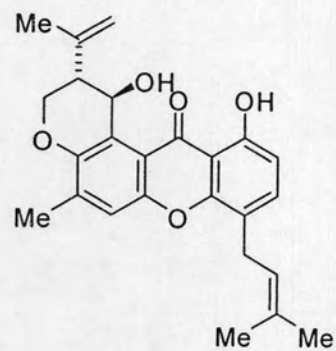
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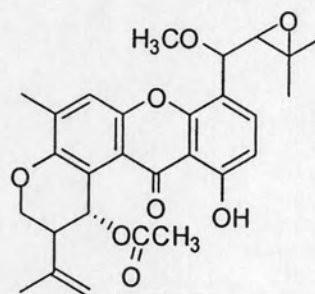
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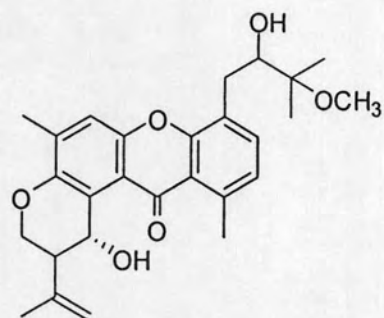
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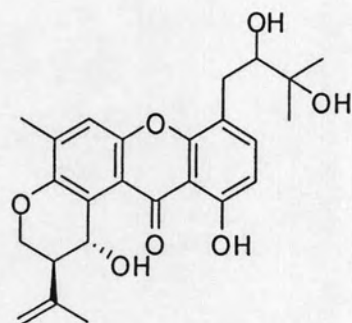
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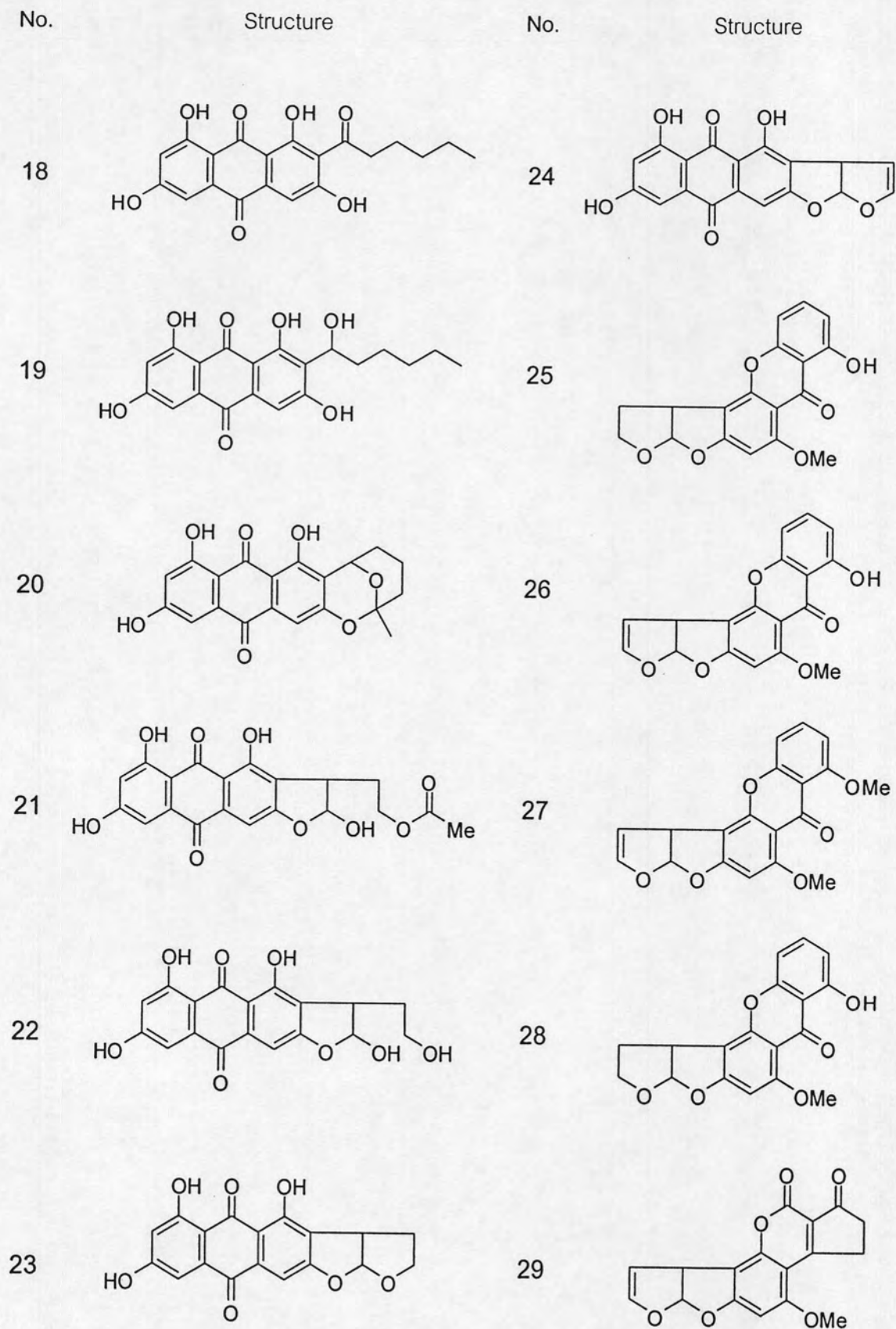


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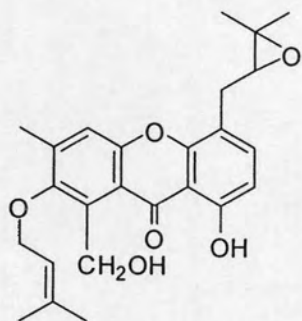


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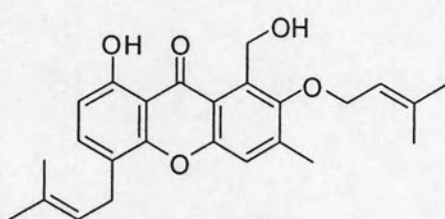
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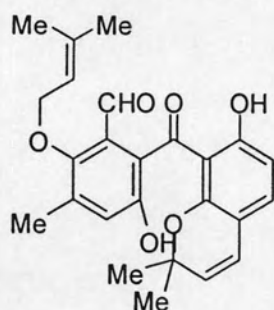
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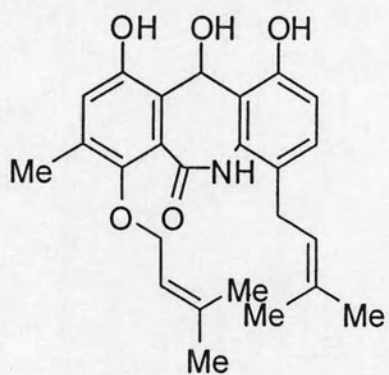
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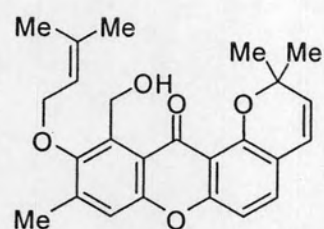
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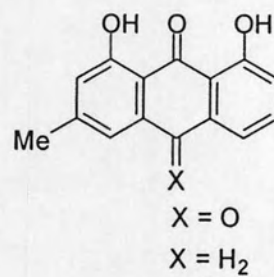
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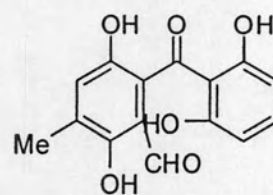
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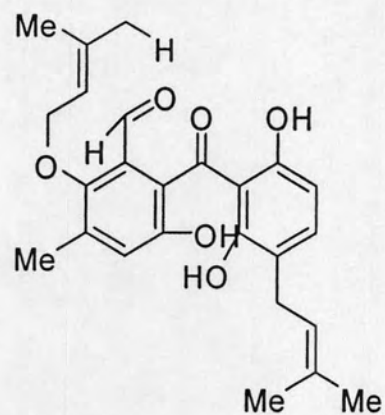
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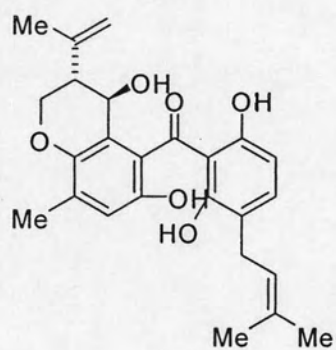
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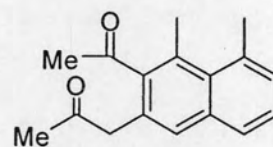
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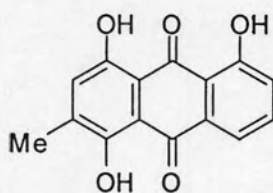
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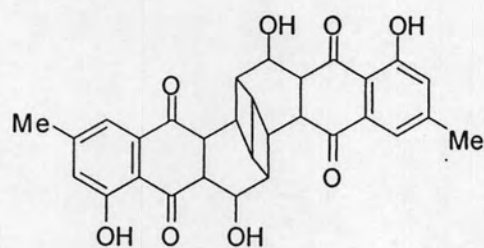
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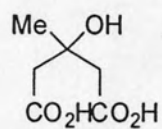
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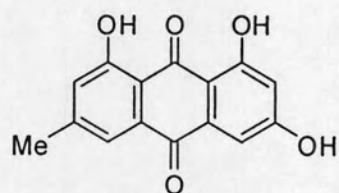
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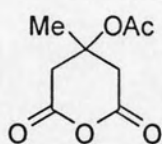
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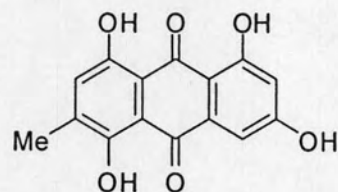
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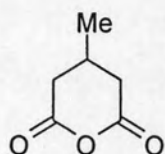
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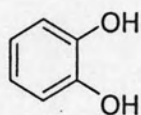
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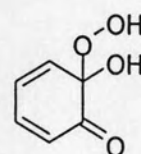
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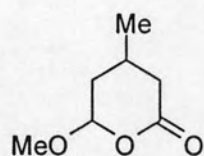
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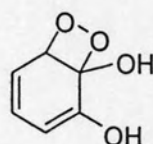
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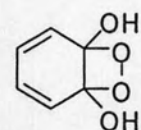
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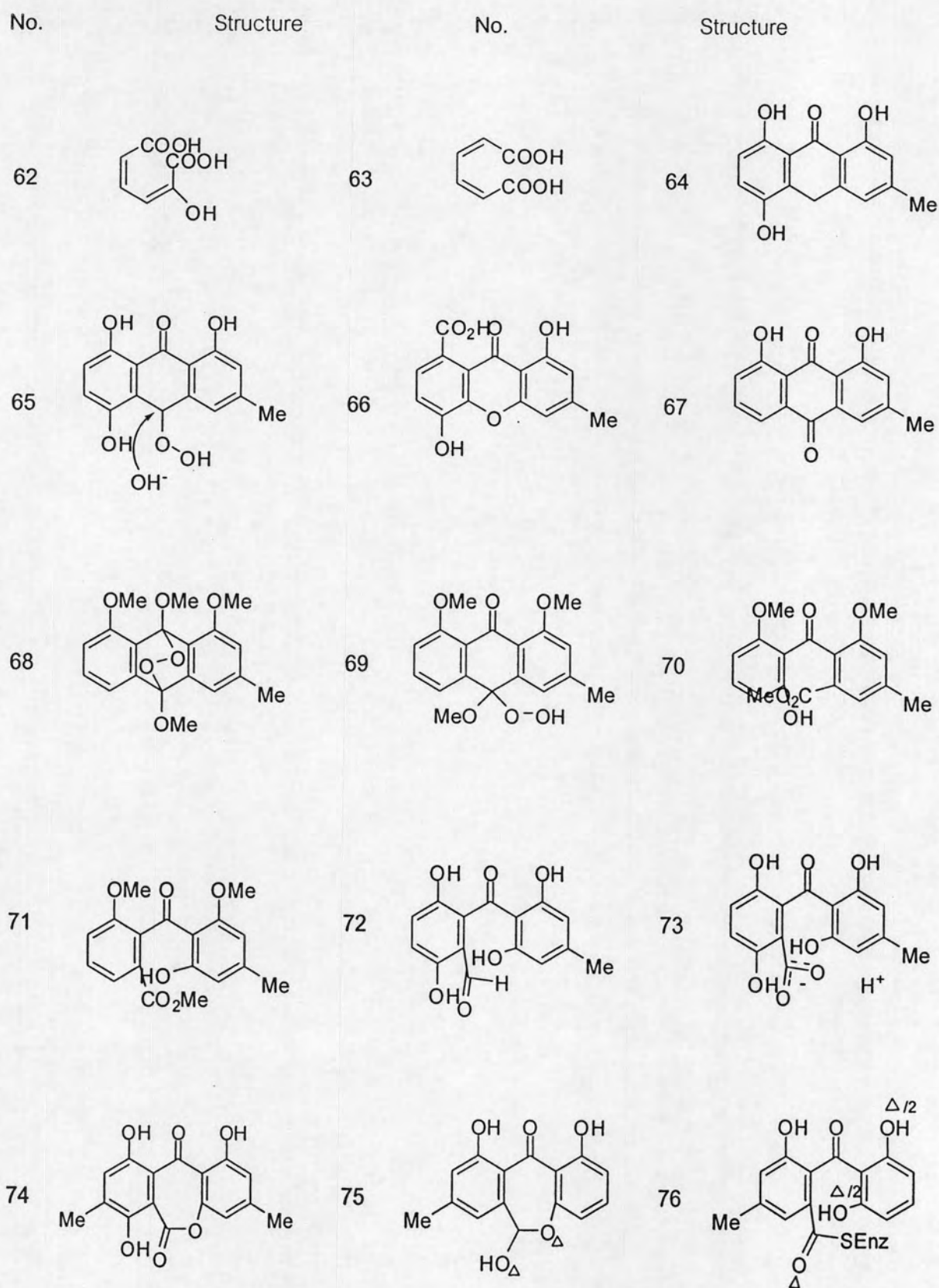


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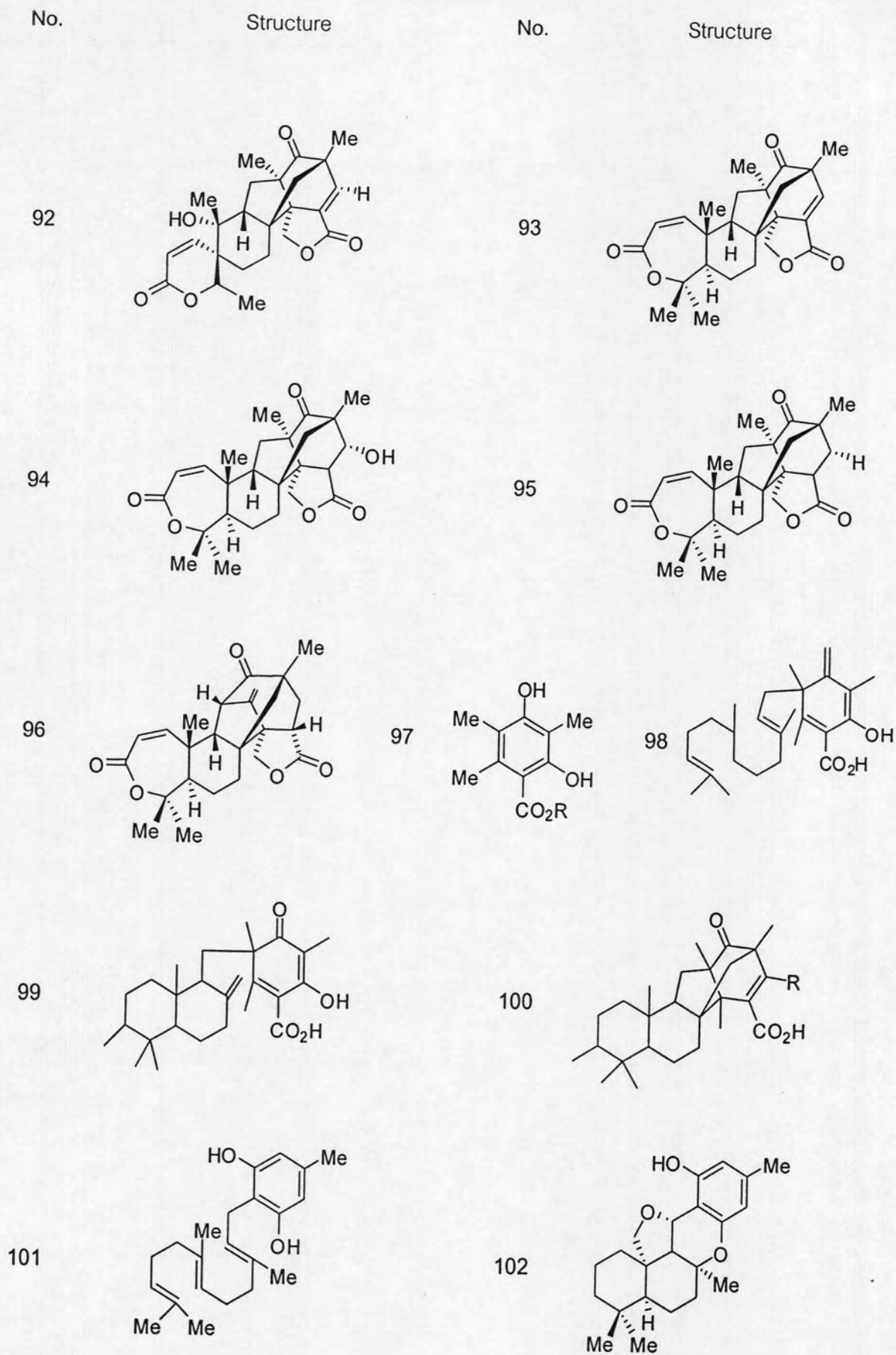
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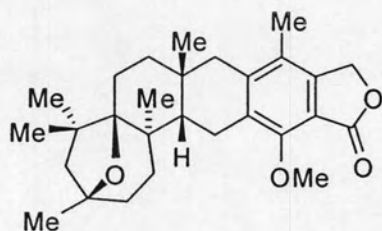
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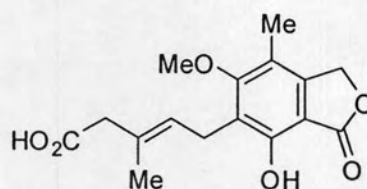
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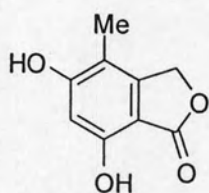
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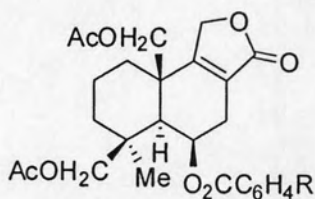
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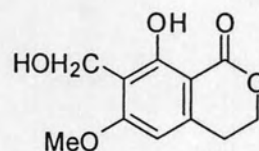
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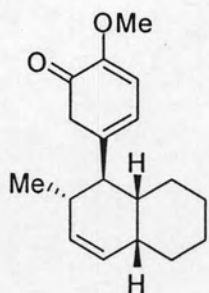
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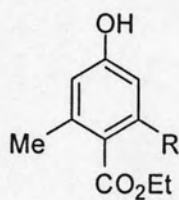
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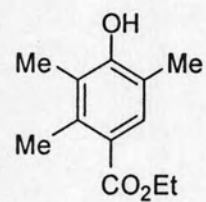
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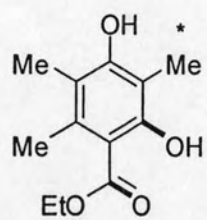
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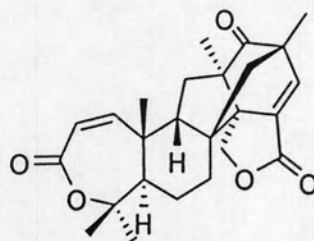
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113-114

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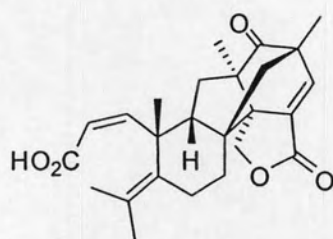
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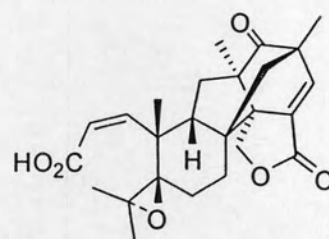
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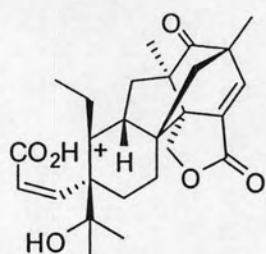
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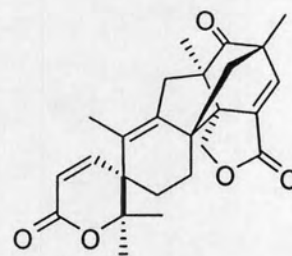
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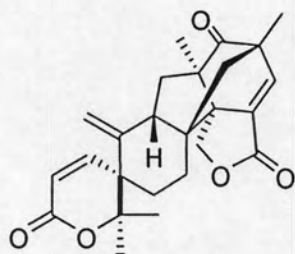
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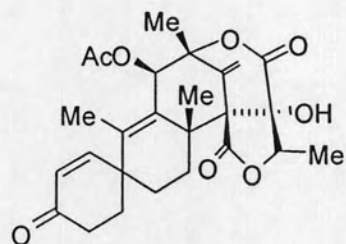
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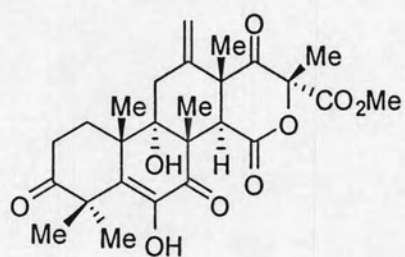
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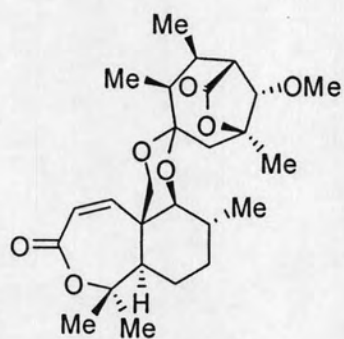
121



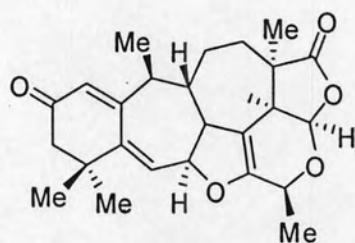
122



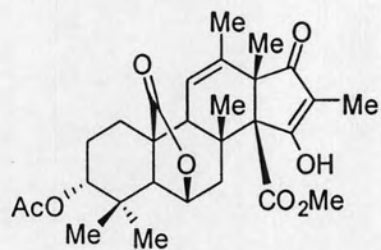
123



124



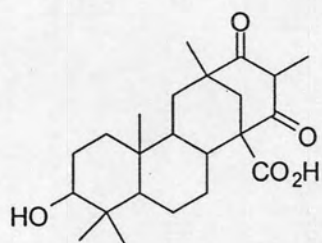
125



No.

Structure

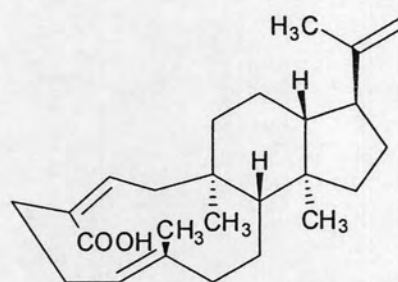
126



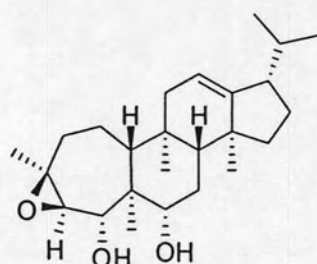
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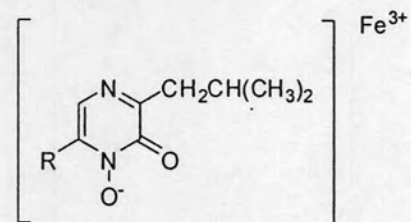
127



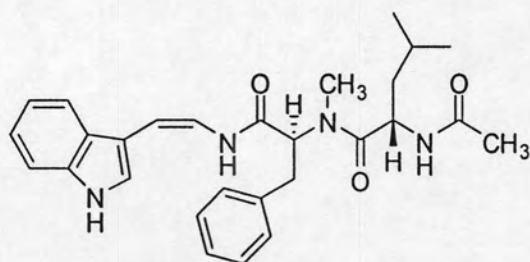
128



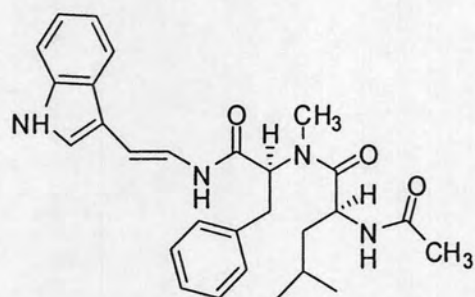
129-130

129 R = CH<sub>3</sub>CH<sub>2</sub>CH  
CH<sub>3</sub>130 R = (CH<sub>3</sub>)<sub>2</sub>CHCH<sub>2</sub>

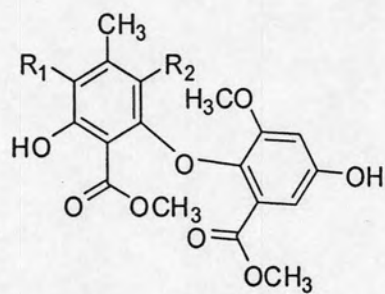
131



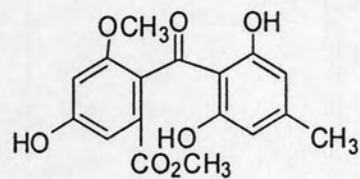
132



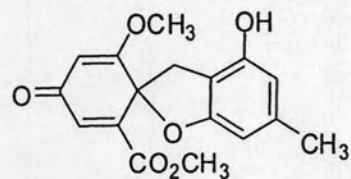
133-134

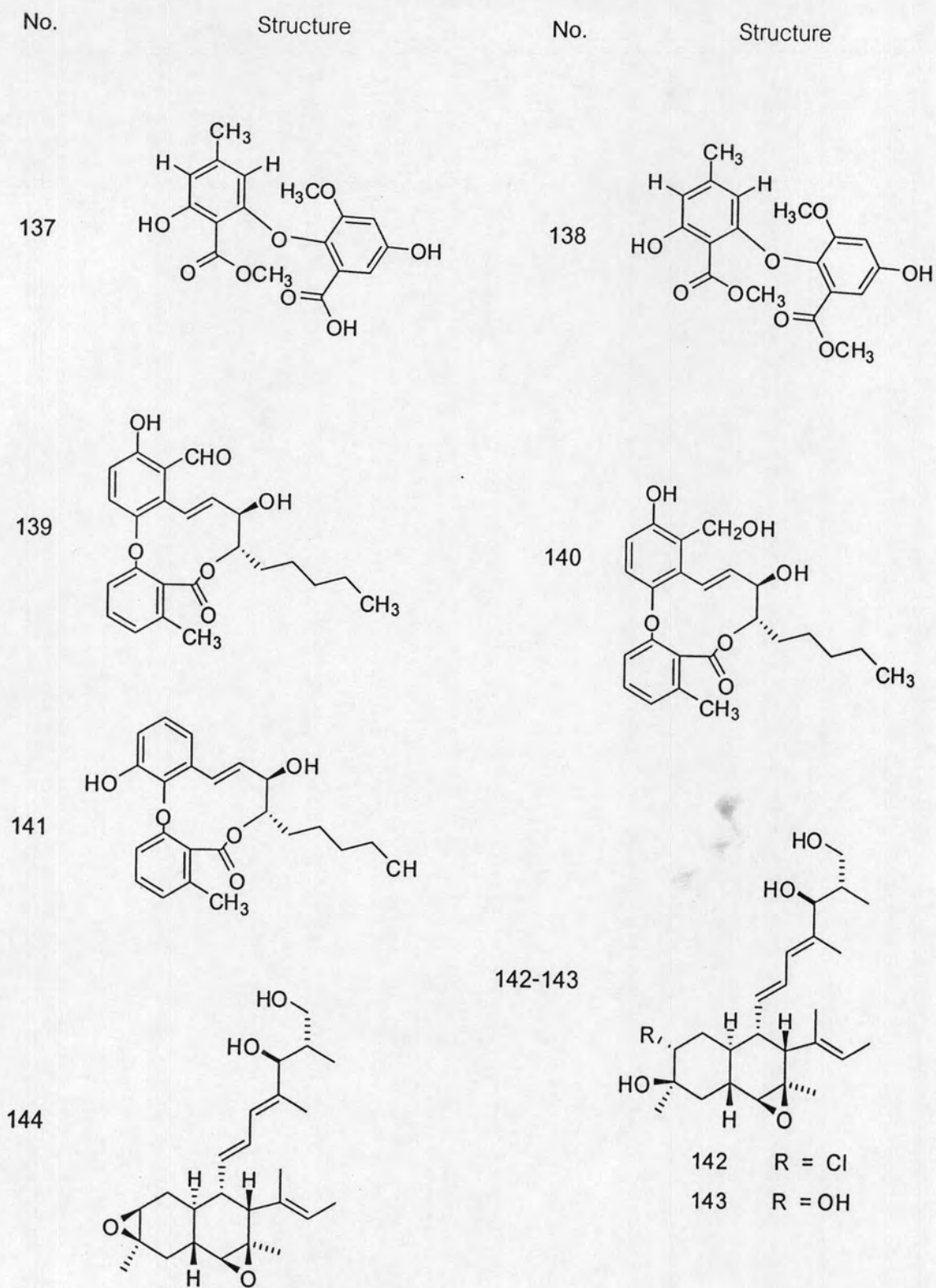
133 R<sub>1</sub> = Cl R<sub>2</sub> = Cl134 R<sub>1</sub> = Cl R<sub>2</sub> = H

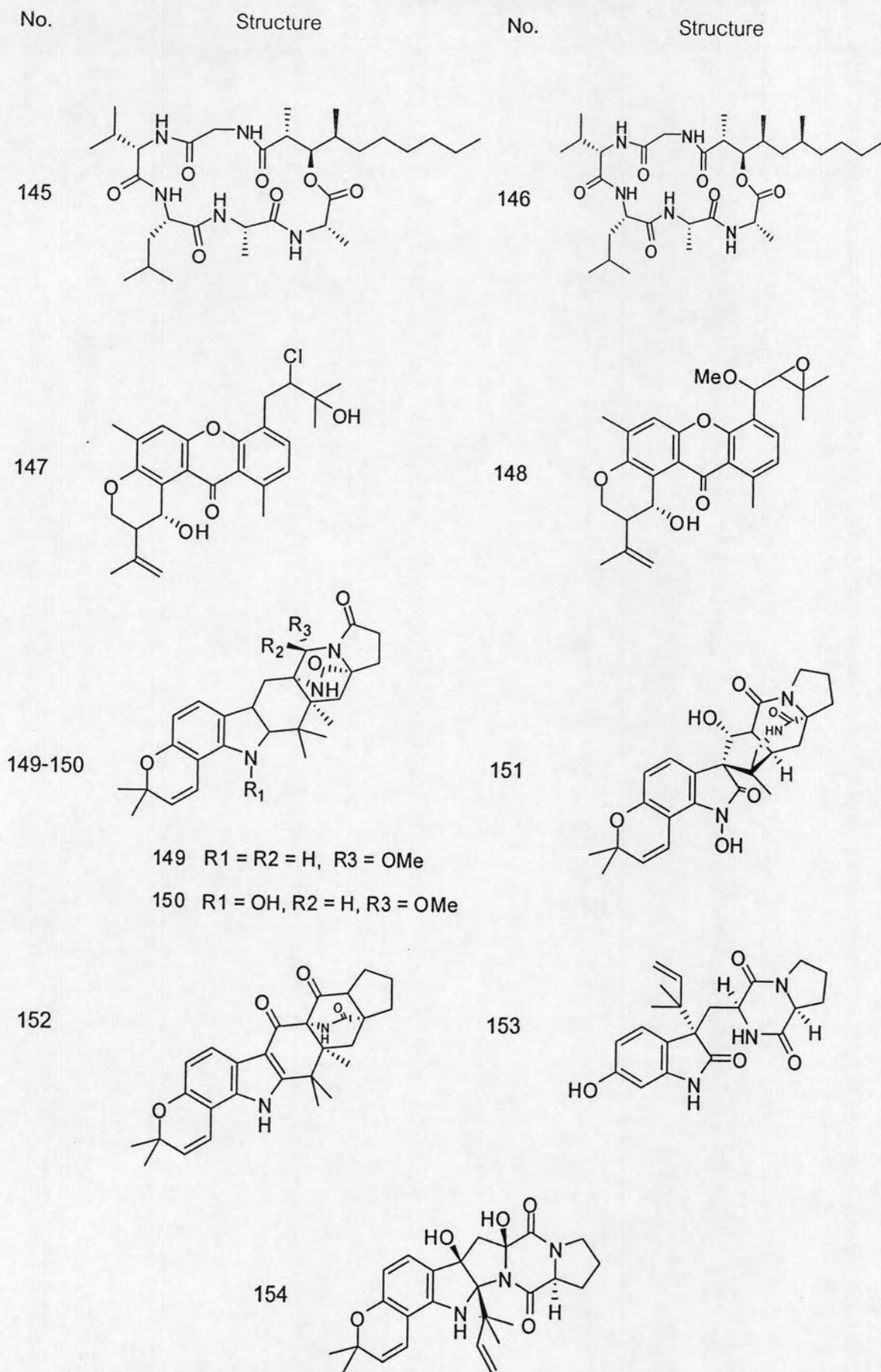
135



136







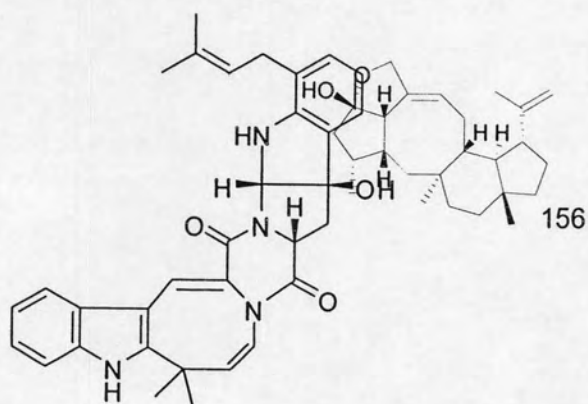
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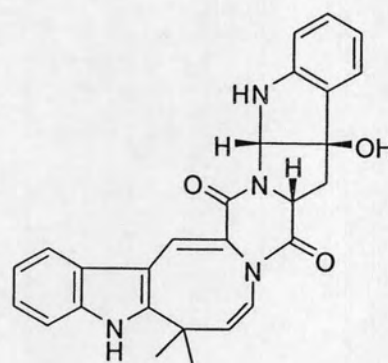
No.

Structure

155

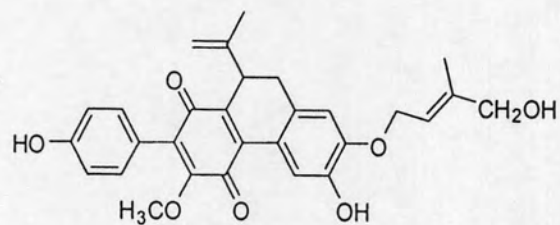
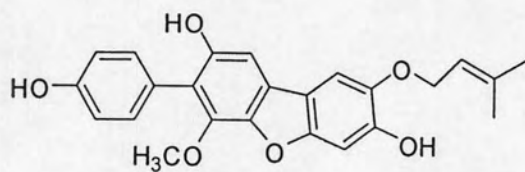


156



158-159

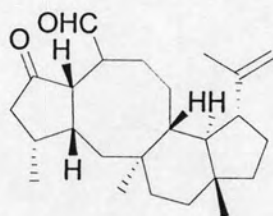
157



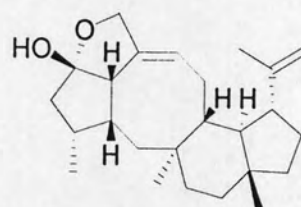
158 R = H

159 R = CH<sub>3</sub>

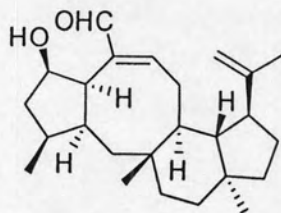
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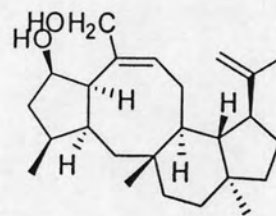
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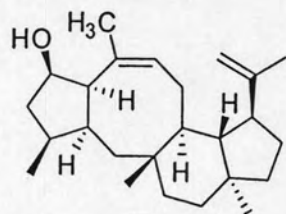
162



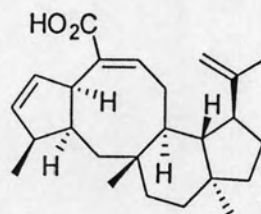
163



164



165

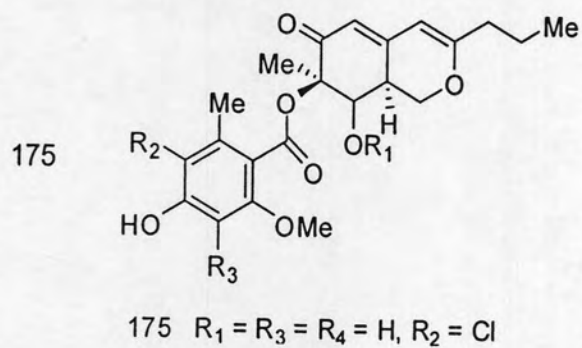
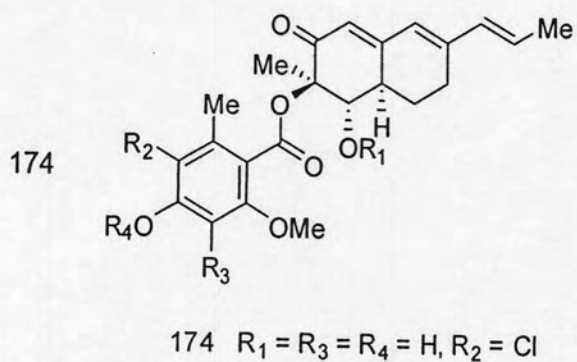
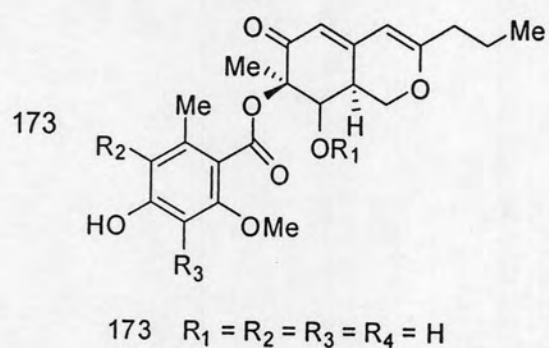
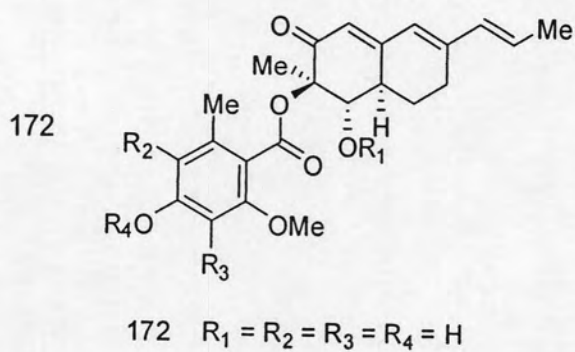
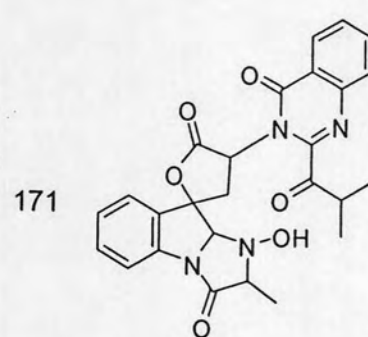
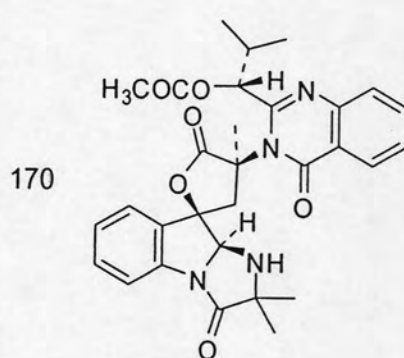
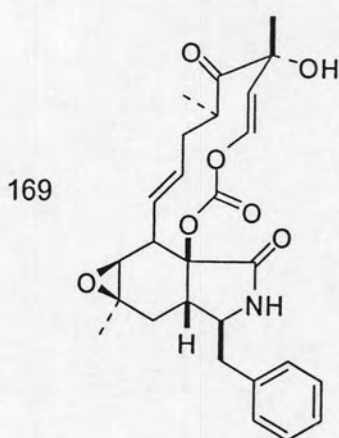
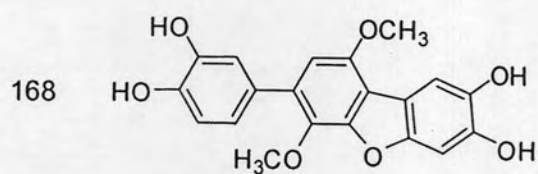
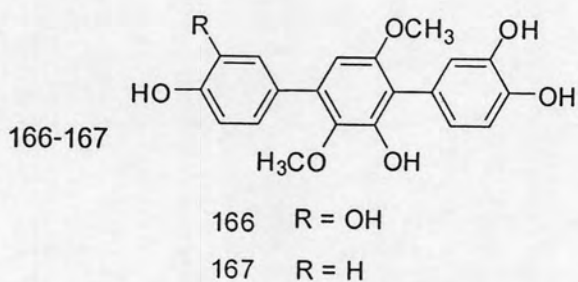


No.

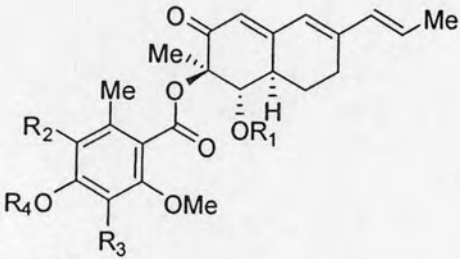
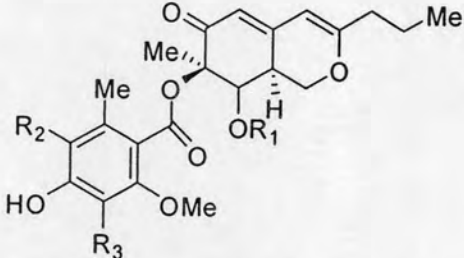
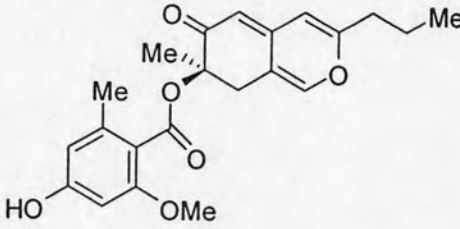
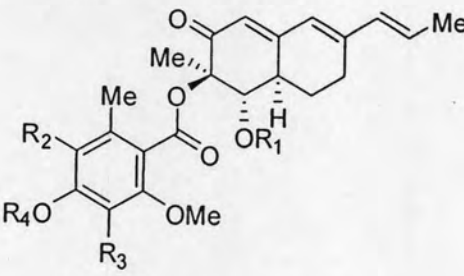
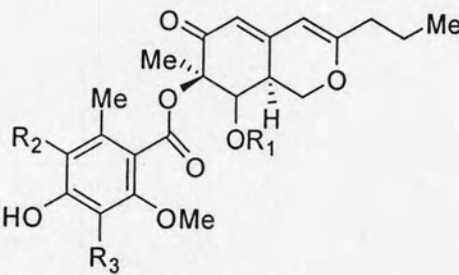
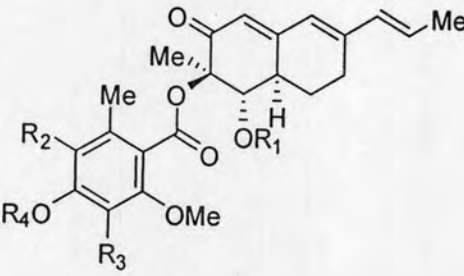
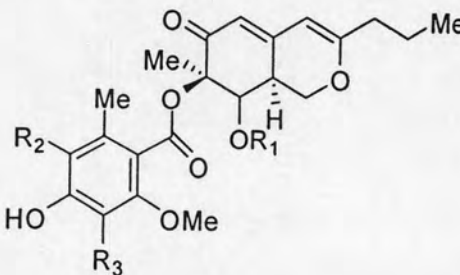
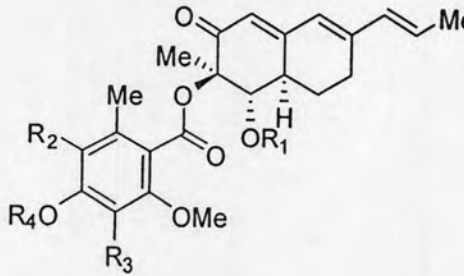
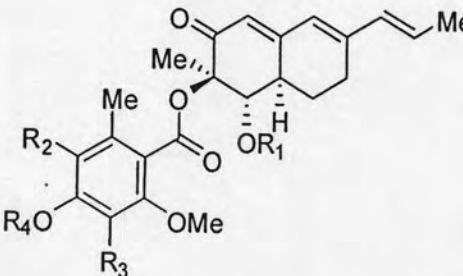
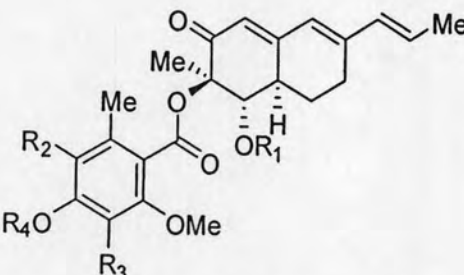
Structure

No.

Structure





- | No.                                      | Structure   | No.                                     | Structure  |
|--|---|---|--|
| 176                                      |    | 177                                     |    |
| 176 $R_1 = R_4 = H, R_2 = R_3 = Cl$      |   | 177 $R_1 = R_4 = H, R_2 = R_3 = Cl$     |  |
| 178                                      |    | 179                                     |    |
| 178 $R_1 = H, R_2 = R_3 = Cl, R_4 = Me$  |   | 179 $R = H, R_2 = R_3 = Cl, R_4 = Me$   |  |
| 180                                      |  | 181                                     |  |
| 180 $R_1 = H, R_2 = R_3 = Cl, R_4 = Me$  |   | 181 $R = Ac, R_2 = R_3 = Cl, R_4 = Me$  |  |
| 182                                      |  | 183                                     |  |
| 182 $R_1 = Ac, R_2 = R_3 = Cl, R_4 = Me$ |   | 183 $R_1 = R_3 = H, R_2 = Cl, R_4 = Me$ |  |
| 184                                      |  | 185                                     |  |
| 184 $R_1 = R_2 = R_3 = H, R_4 = Me$      |   | 185 $R_1 = Ac, R_2 = R_3 = H, R_4 = Me$ |  |

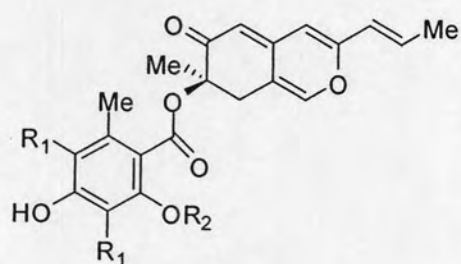
No.

Structure

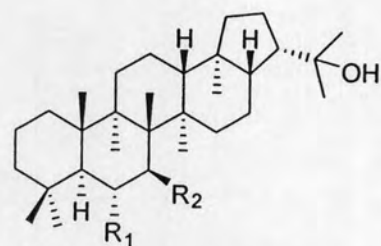
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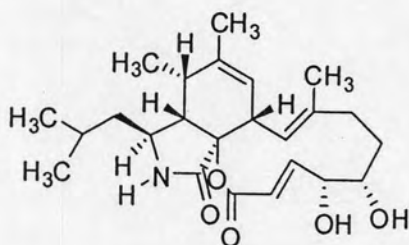
186-187

186 R = Cl, R<sub>2</sub> = Me187 R<sub>1</sub> = R<sub>2</sub> = H

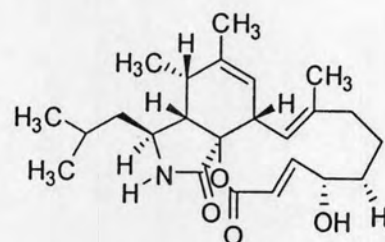
188-190

188 R<sub>1</sub> = OH, R<sub>2</sub> = H189 R<sub>1</sub> = H, R<sub>2</sub> = OH190 R<sub>1</sub> = R<sub>2</sub> = OH

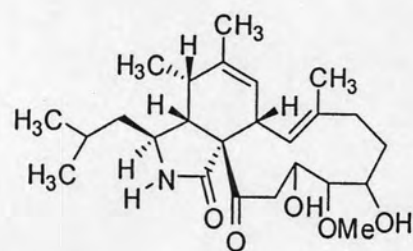
191



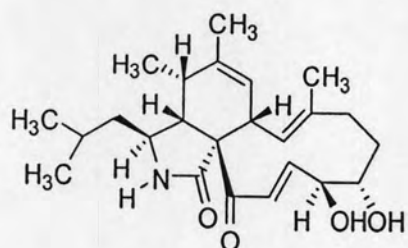
192



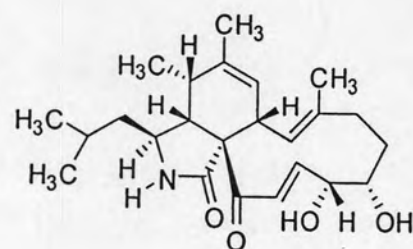
193



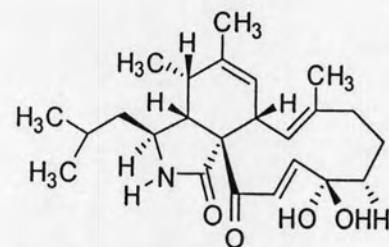
194



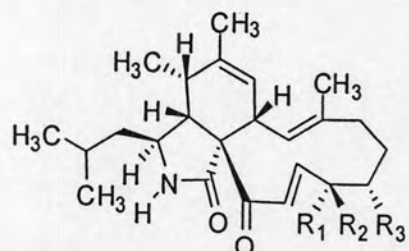
195



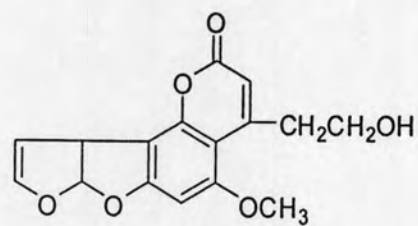
196

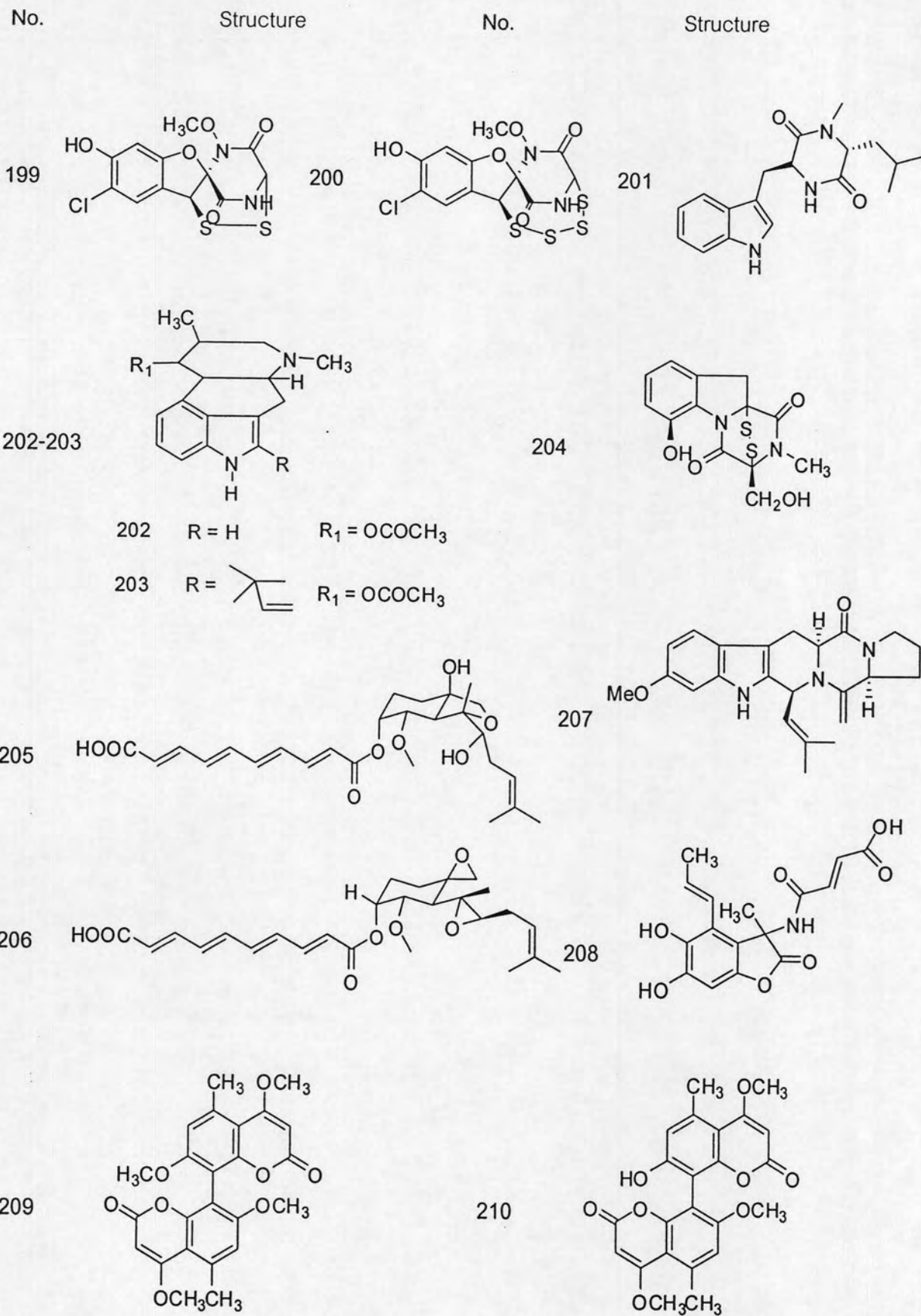


197

197 R<sub>1</sub> or R<sub>2</sub> = OH R<sub>3</sub> = H

198





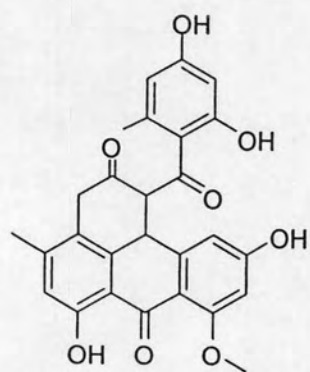
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Structure

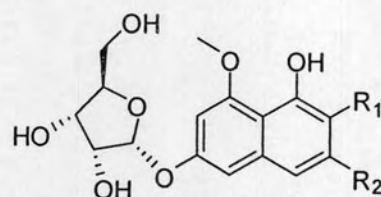
No.

Structure

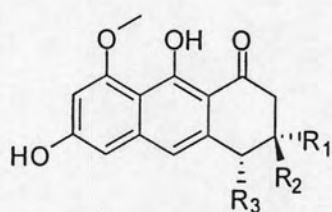
211



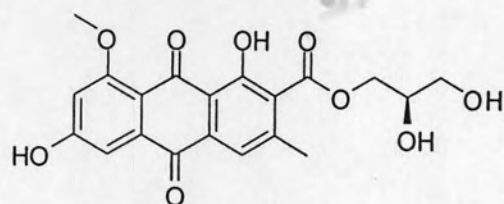
212-214

212  $R_1 = \text{Ac}, R_2 = \text{Me}$ 213  $R_1 = \text{H}, R_2 = \text{Me}$ 214  $R_1 = \text{H}, R_2 = \text{H}$ 

215

215  $R_1 = \text{H}, R_2 = \text{Me}, R_3 = \text{OH}$ 

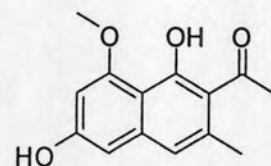
216



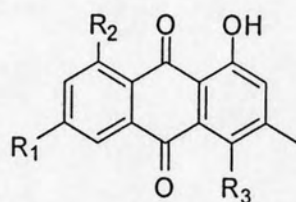
217-218

217  $R_1 = R_2 = R_4 = \text{OH}, R_3 = \text{OCH}_3, \text{trans H-10/ H-10}'$ 218  $R_1 = R_2 = R_4 = \text{OH}, R_3 = \text{OCH}_3, \text{cis H-10/ H-10}'$ 

219

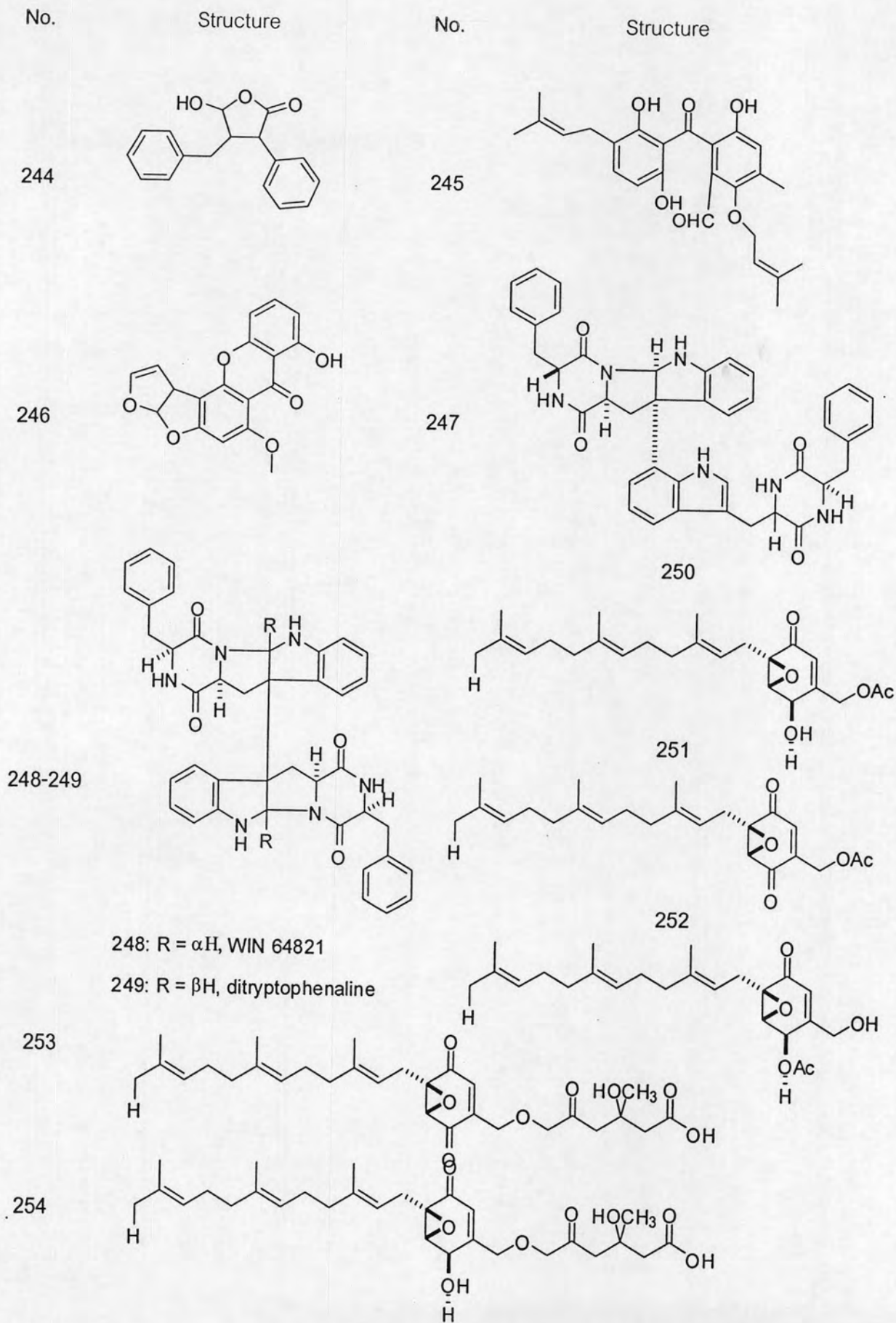


220-224

220  $R_1 = \text{OH}, R_2 = \text{OH}, R_3 = \text{H}$ 221  $R_1 = \text{OCH}_3, R_2 = \text{OH}, R_3 = \text{H}$ 222  $R_1 = \text{OH}, R_2 = \text{OCH}_3, R_3 = \text{H}$ 223  $R_1 = \text{OH}, R_2 = \text{OH}, R_3 = \text{OH}$ 224  $R_1 = \text{OH}, R_2 = \text{OCH}_3, R_3 = \text{OH}$

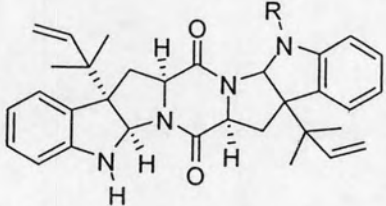
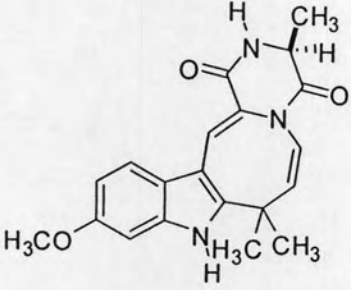
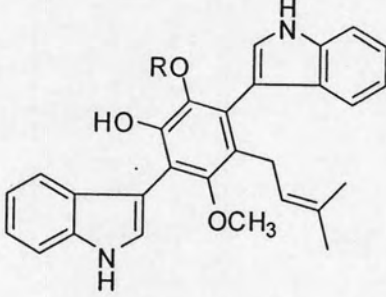
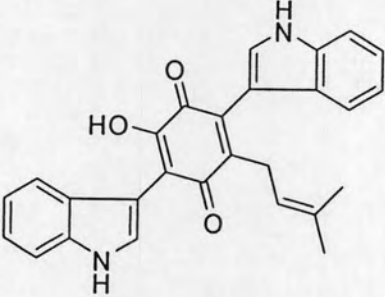
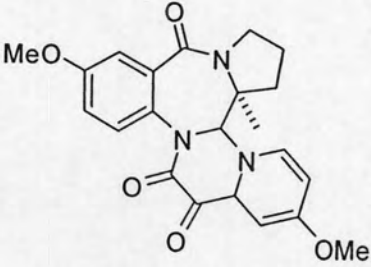
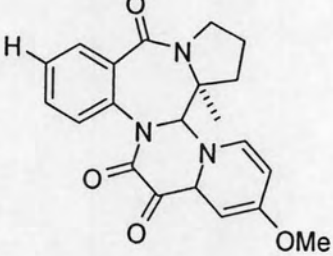
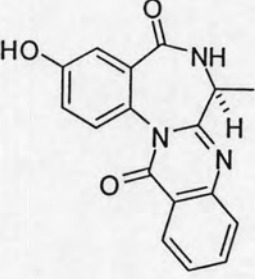
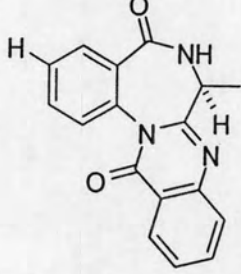
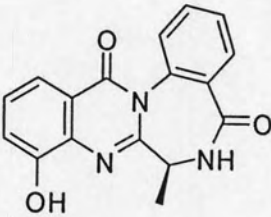
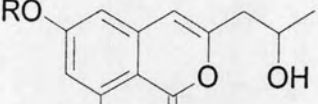
No.	Structure	No.	Structure		
225		225 R1 = R3 = OCH3, R2 = R4 = OH, meso and (±)-racemic C-10/ C-10'			
226		227			
228		229		230	
231		232			
234		235			
			235 R = H		

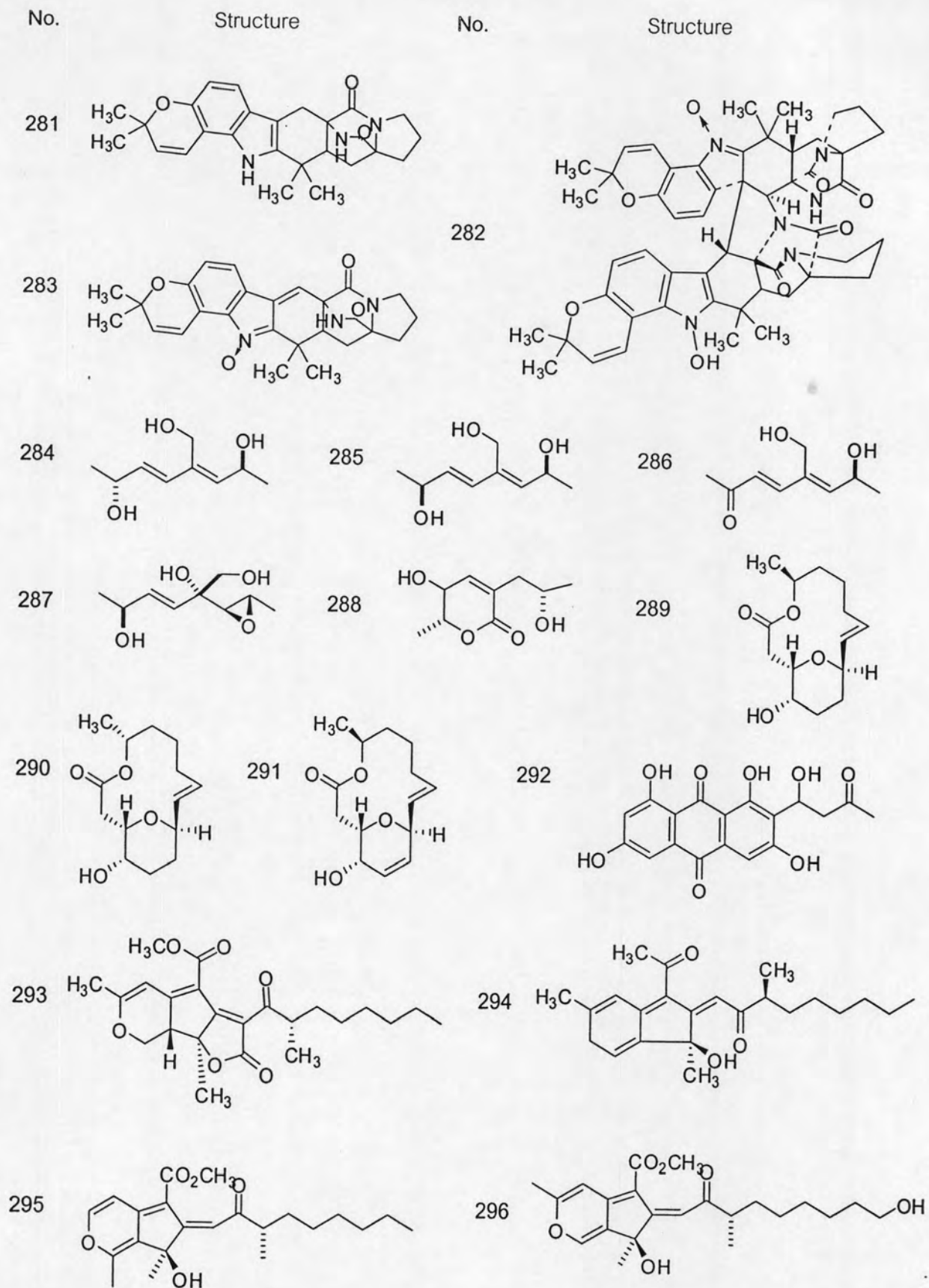
No.	Structure	No.	Structure
236		237	
238	<p data-bbox="540 1230 705 1260">238 R = CH<sub>3</sub></p>	239	
240		241	
242		243	

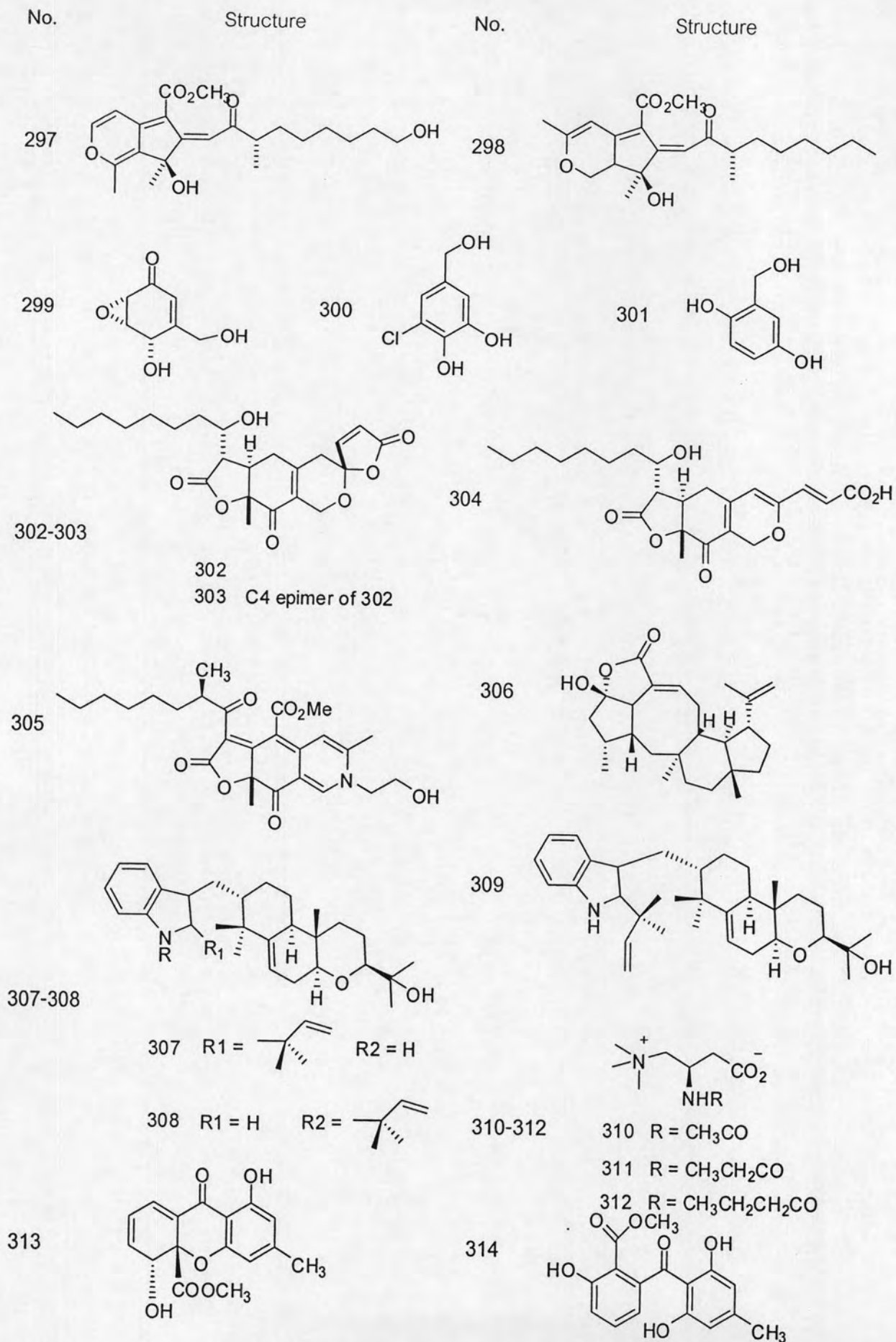


No.	Structure	No.	Structure
255-257			
	255	R1 = OH, R2 = $\text{---OH''''H}$	R3 = Ac
	256	R1 = OH, R2 = $\text{---OAc''''H}$	R3 = H
	257	R1 = OH, R2 = $\text{---OH''''H}$	R3 = H
258			
	259		
	260		
261			
	262		
263			
	264		
265			
	266		

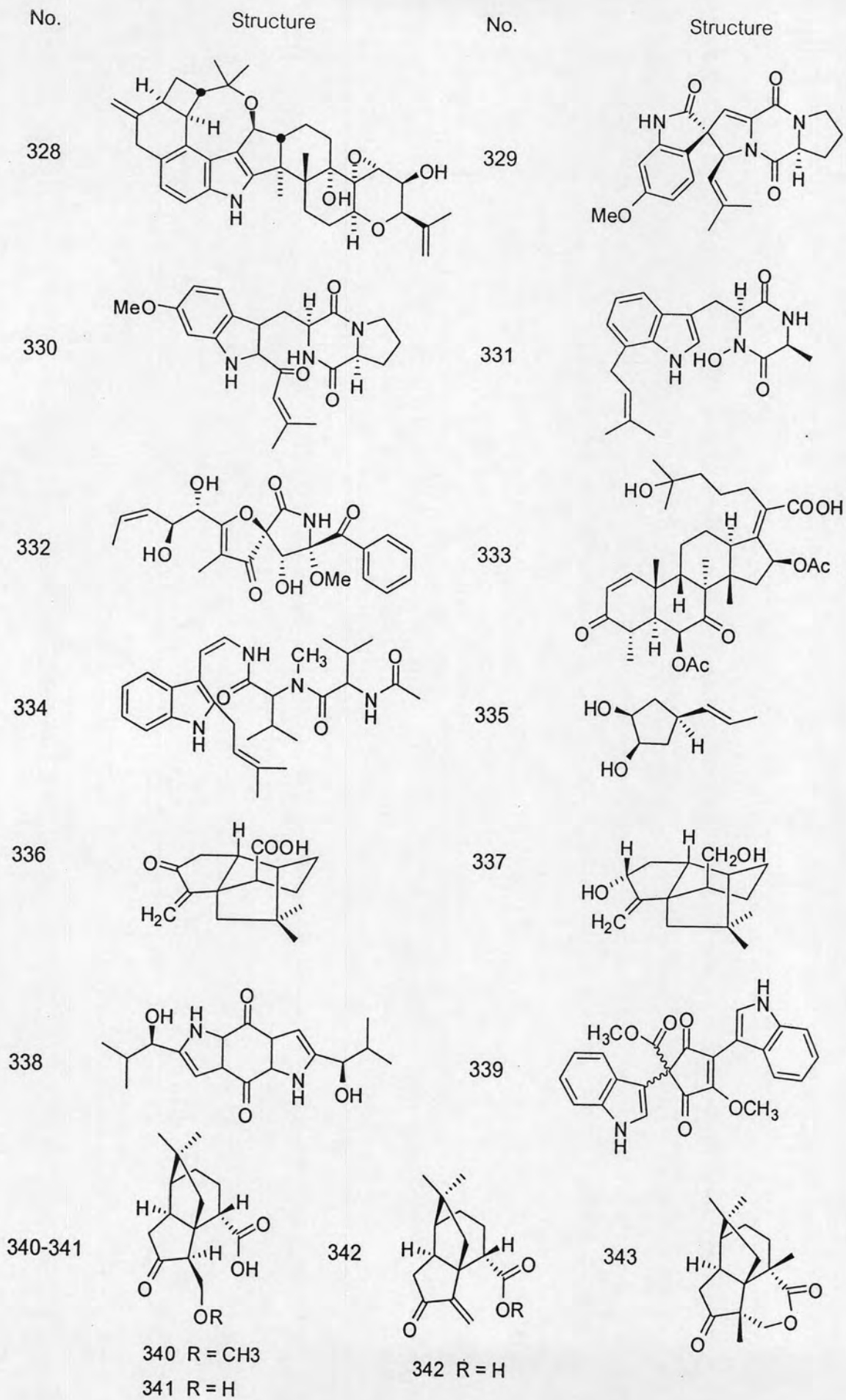


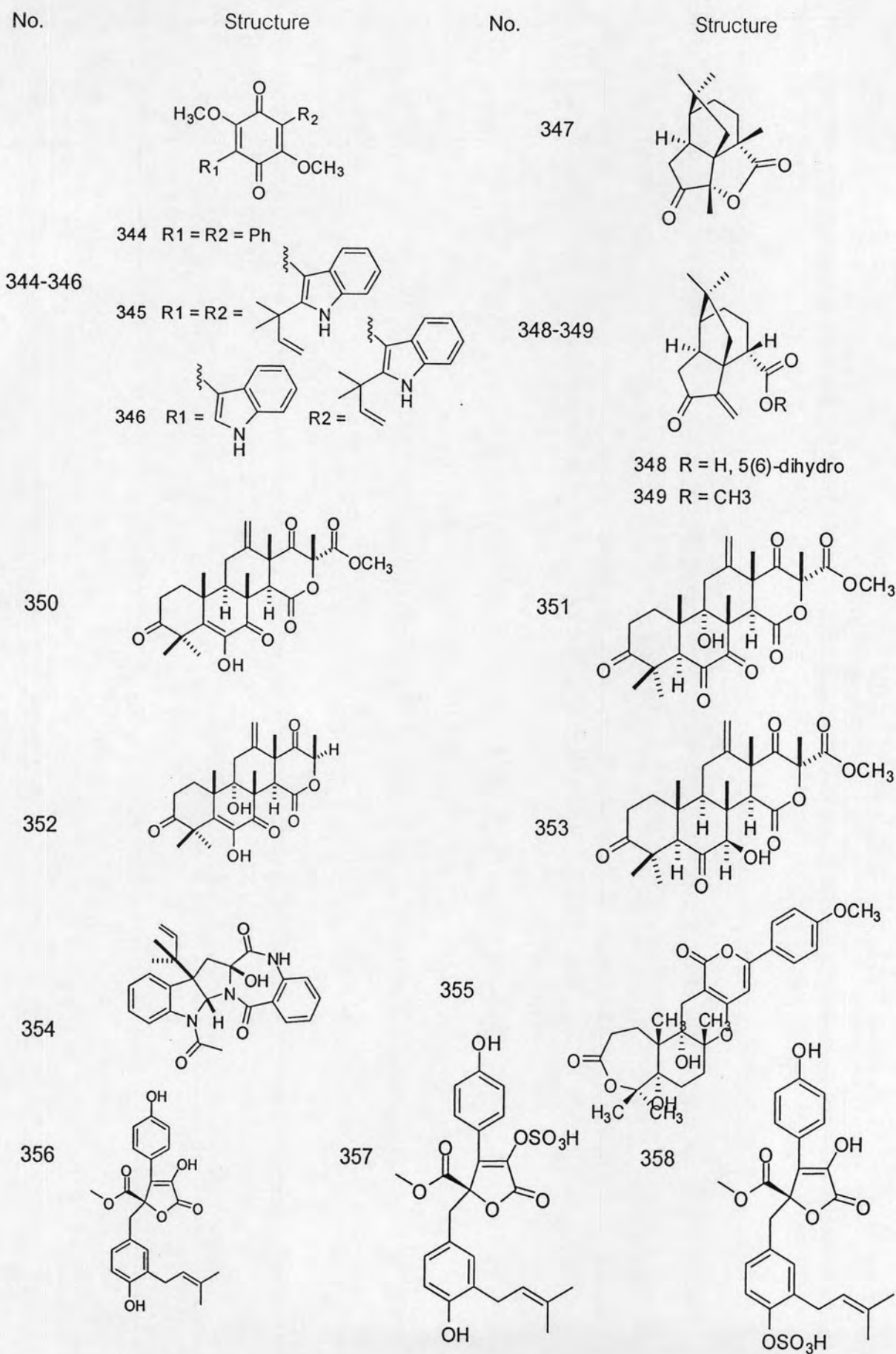
- | No.     | Structure   | No.  | Structure  |
|---------|---|------|--|
| 267-268 |        | 269  |    |
|         | 267 R = Me<br>268 R = H   |      |  |
| 270-272 |        | 273  |    |
|         | 270 R = CH <sub>3</sub> , R' = H<br>271 R = CH <sub>3</sub> , R' = OH<br>272 R = R' = H |      |  |
| 274     |      | 275  |  |
| 276     |      | 277  |  |
| 278     |      | 279- |  |
|         |   | 280  | 279 R = Me<br>280 R = H  |

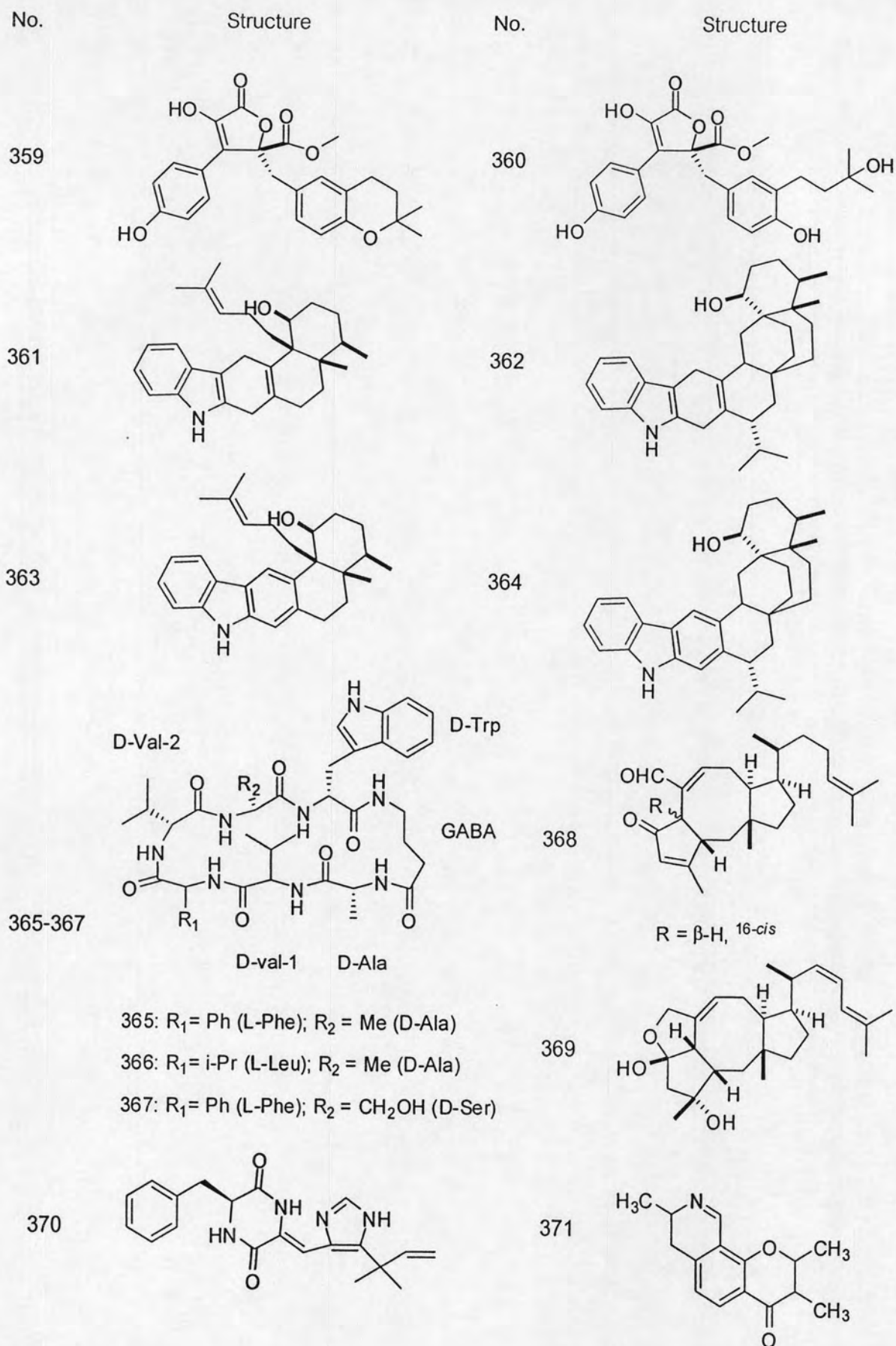




No.	Structure	No.	Structure
315		316	
317		318	
319		320	
321		322	
323		326	
324		327	
325			







No.	Structure	No.	Structure
372-373	<p>372 R = CH<sub>3</sub> 373 R = H</p>	374	
375		376-377	<p>376 R = CH<sub>3</sub> 377 R = H</p>
378-380	<p>378 R<sub>1</sub> = R<sub>2</sub> = CH<sub>3</sub>; R<sub>3</sub> = H 379 R<sub>1</sub> = CH<sub>3</sub>; R<sub>2</sub> = R<sub>3</sub> = H 380 R<sub>1</sub> = R<sub>3</sub> = H; R<sub>2</sub> = CH<sub>3</sub></p>	381	<p>381 R<sub>1</sub> = CH<sub>3</sub>; R<sub>2</sub> = H</p>
382		383	<p>383 R<sub>1</sub> = R<sub>3</sub> = CH<sub>3</sub>; R<sub>2</sub> = H</p>

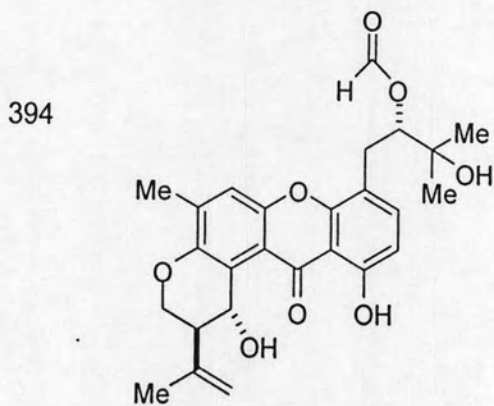
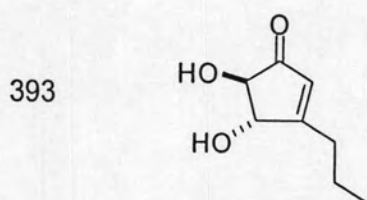
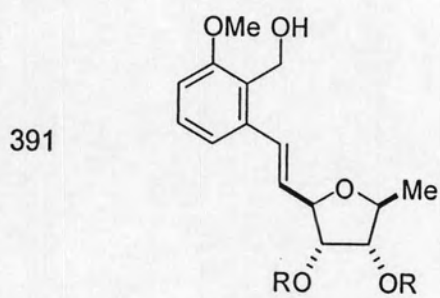
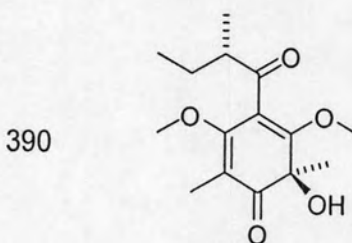
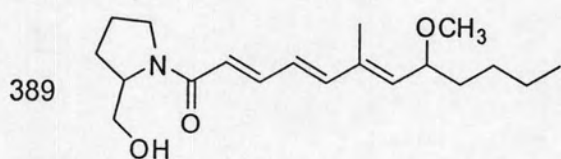
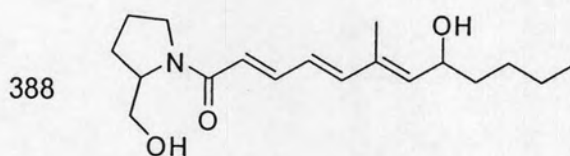
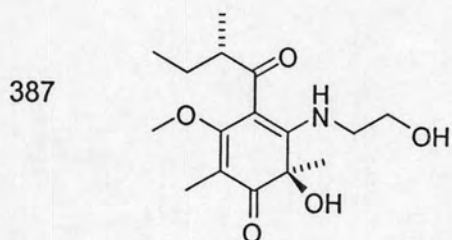
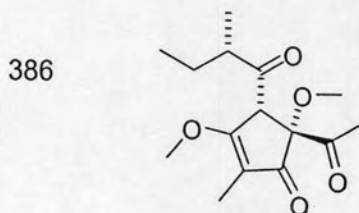
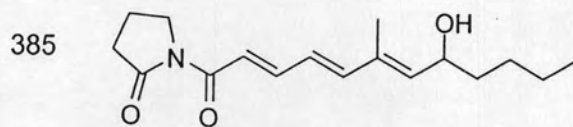
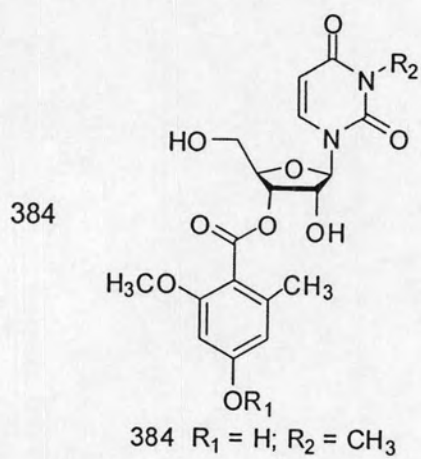


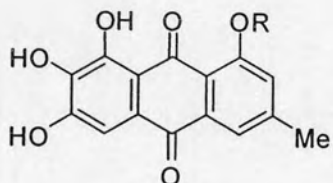
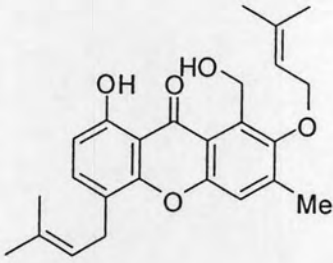
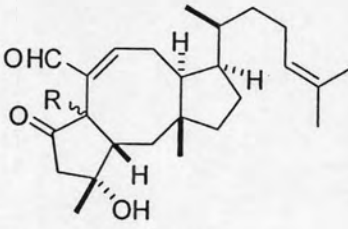
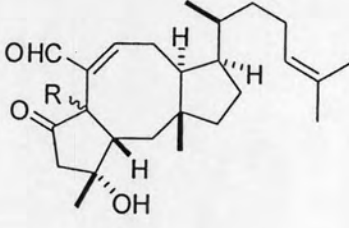
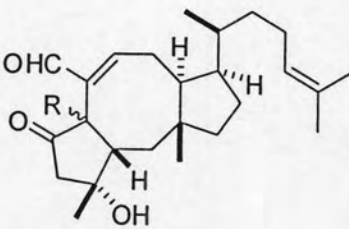
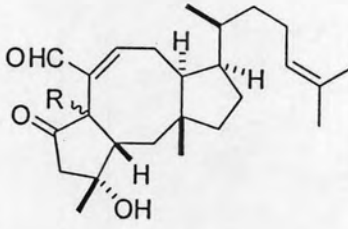
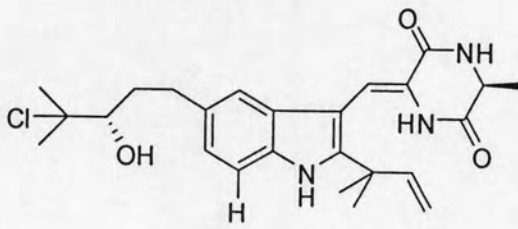
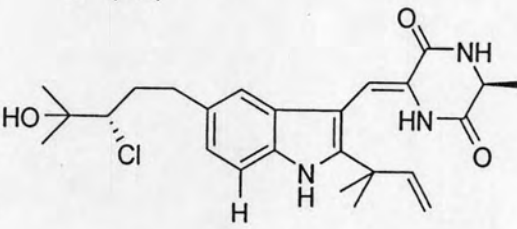
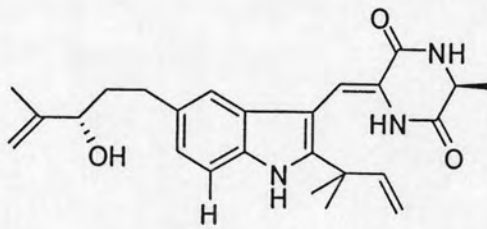
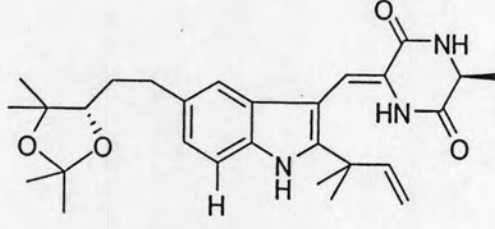
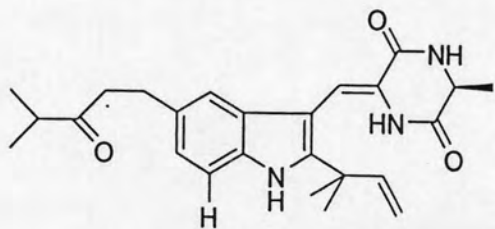
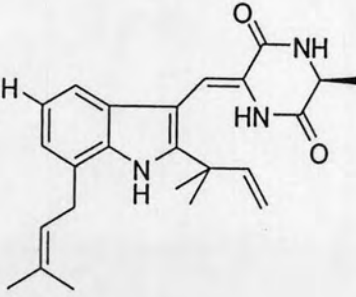
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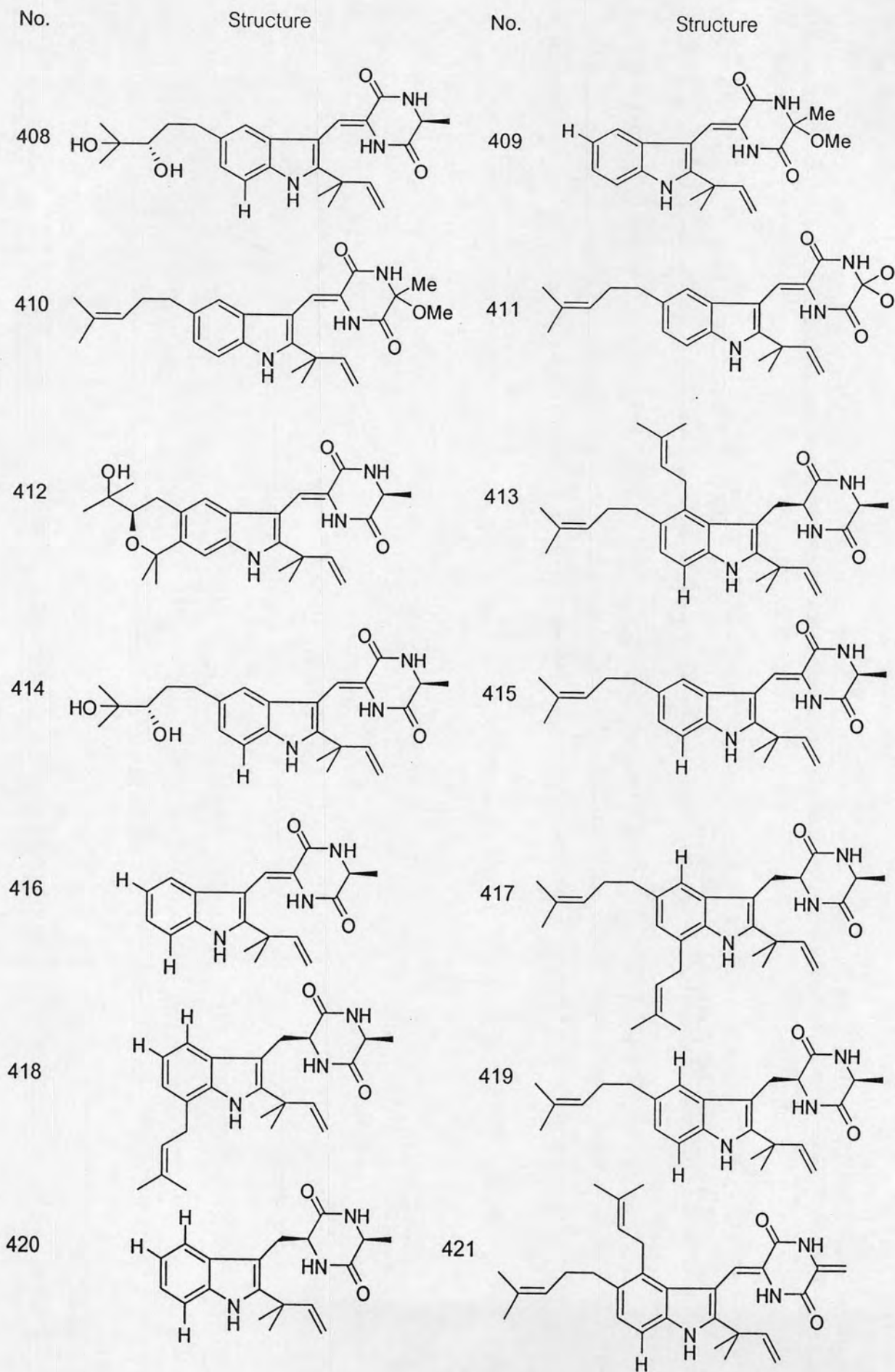
Structure

No.

Structure



No.	Structure	No.	Structure
395-396		397	
	395 R = Me 396 R = H		
398		399	
	R = $\alpha$ -H		R = $\beta$ -H
400		401	
	R = $\alpha$ -H, 16- <i>cis</i>		R = $\beta$ -H, 16- <i>cis</i>
402		403	
404		405	
406		407	

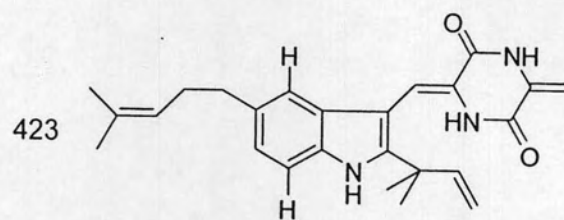
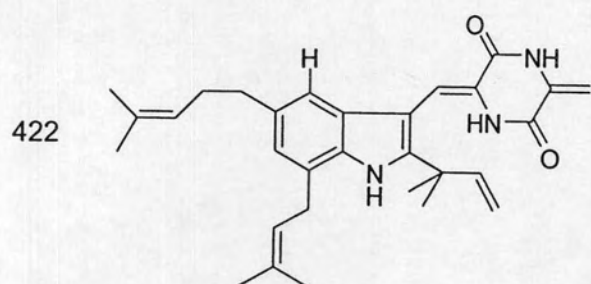


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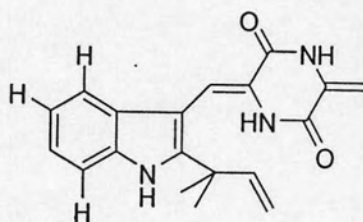
Structure

No.

Structure



424



APPENDIX B

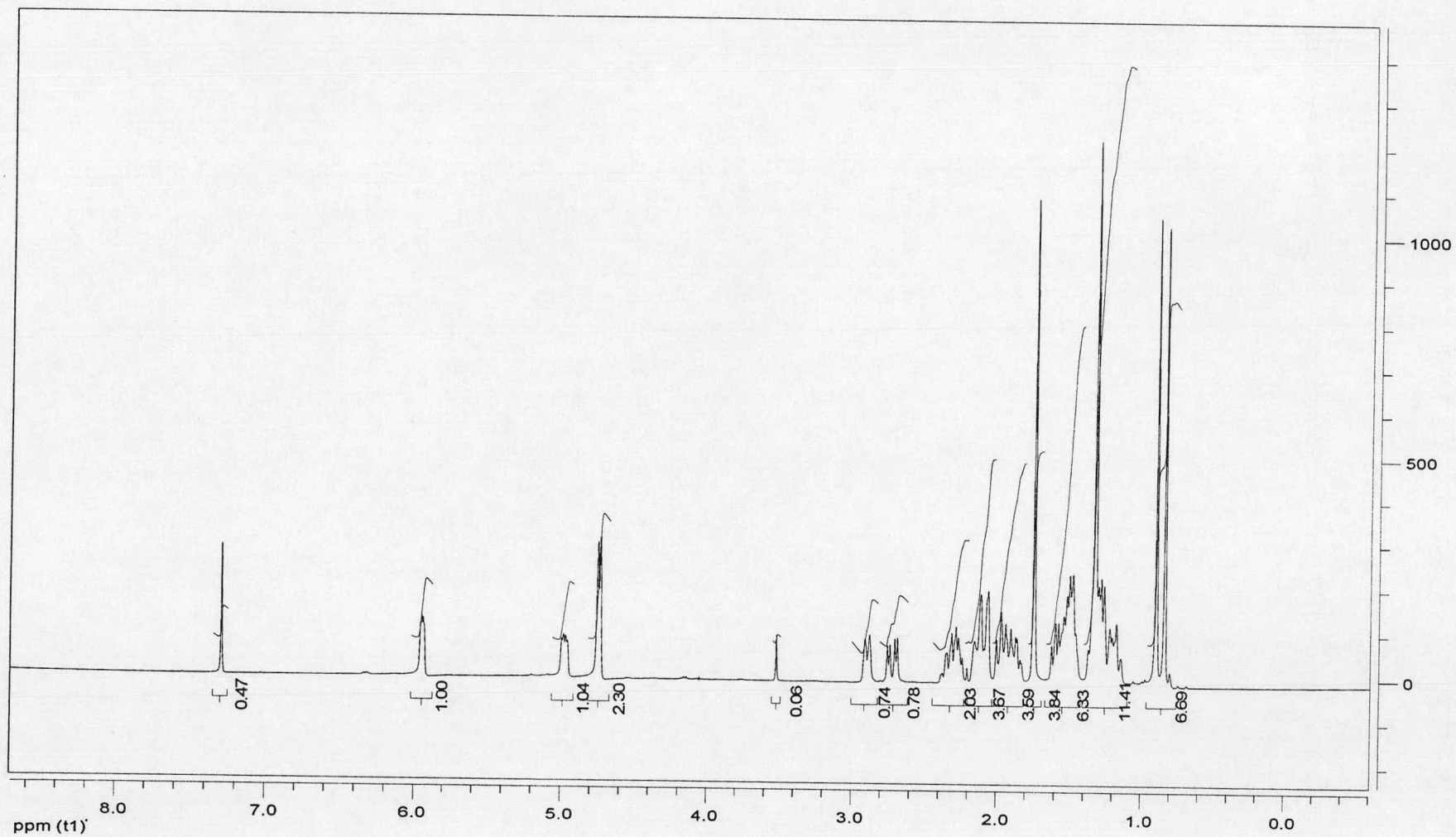


Figure B1 The  $^1\text{H-NMR}$  spectrum of compound A

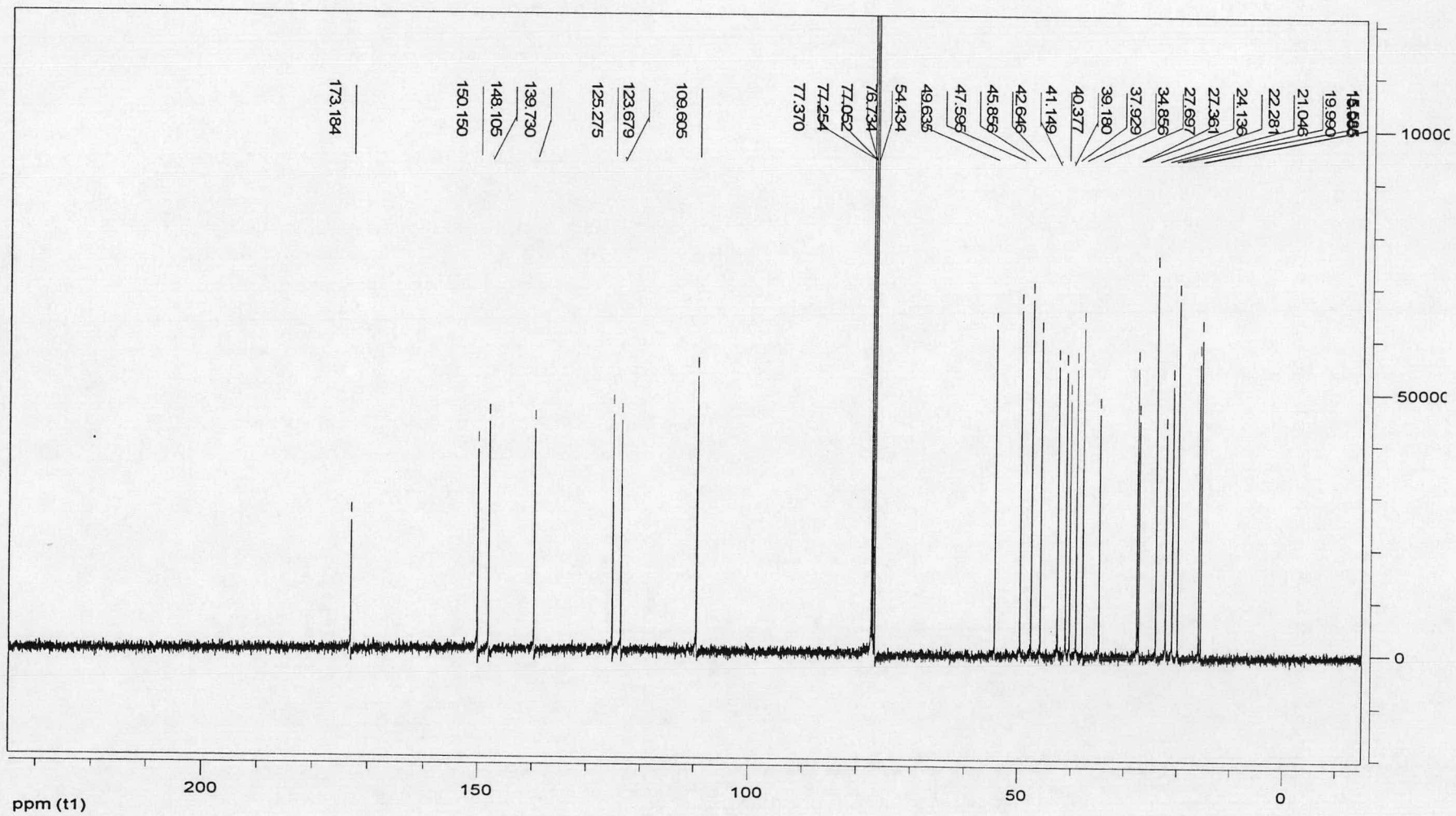


Figure B2 The  $^{13}\text{C}$ -NMR spectrum of compound A

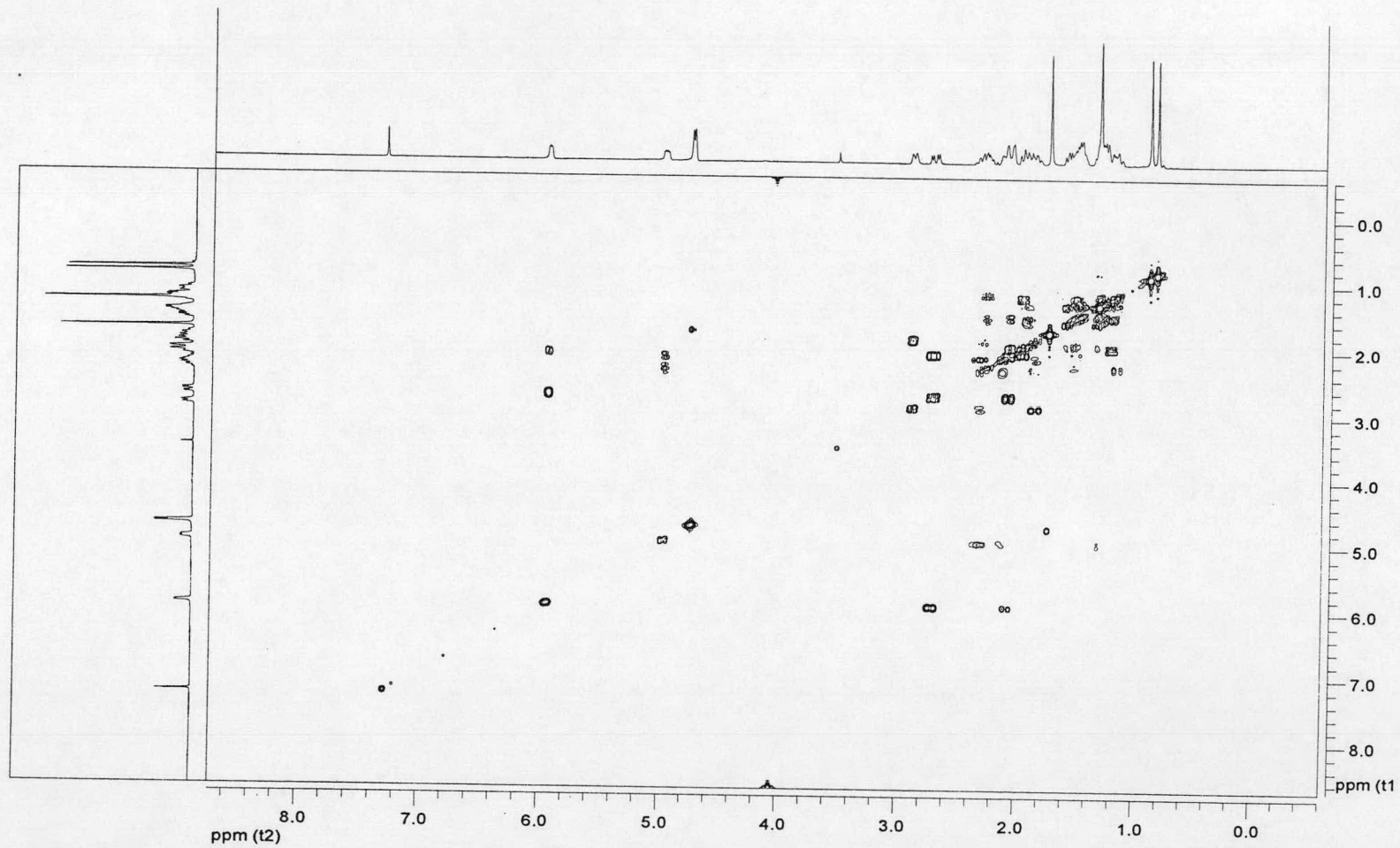


Figure B3 The gCOSY spectrum of compound A



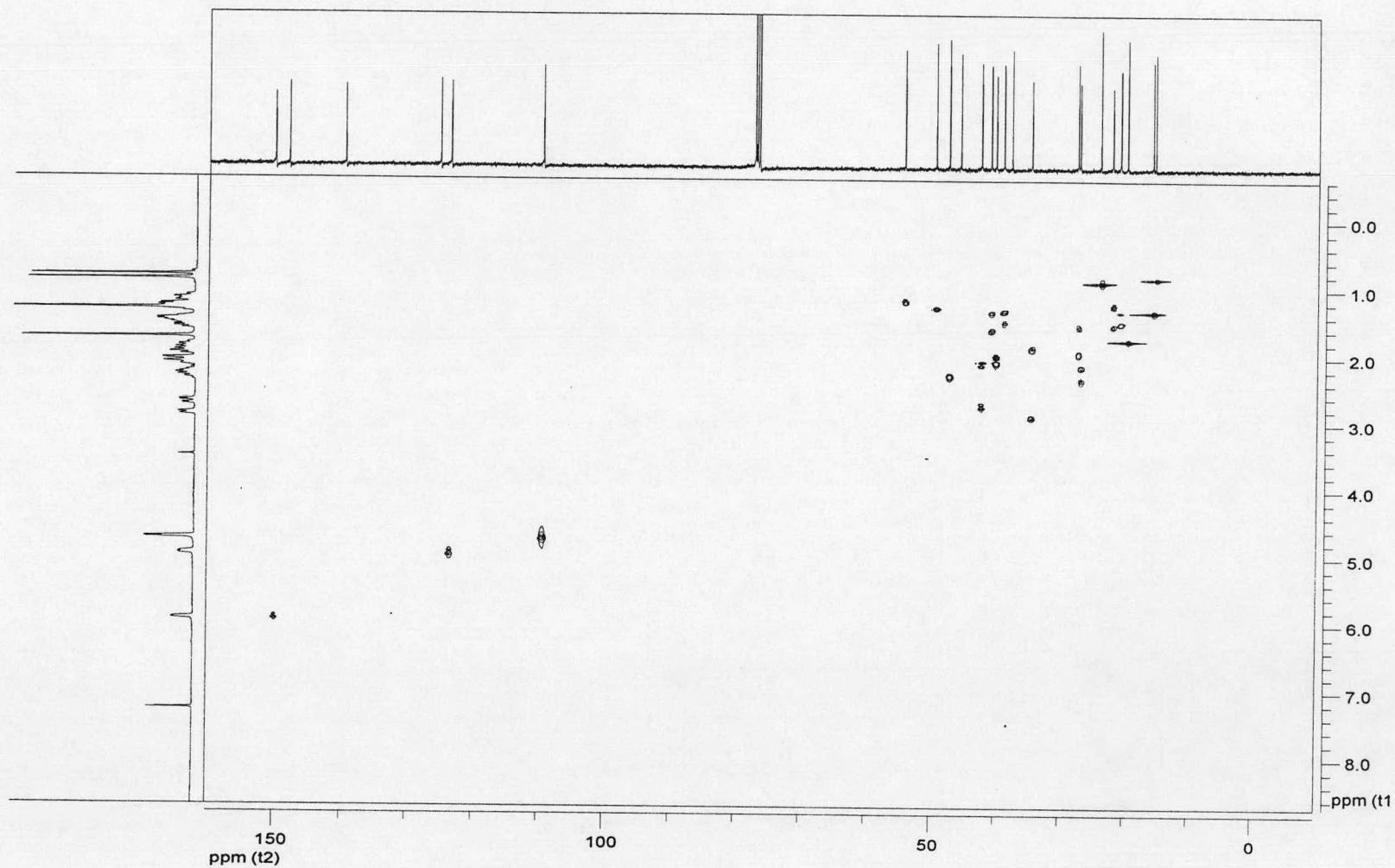


Figure B4 The gHSQC spectrum of compound A

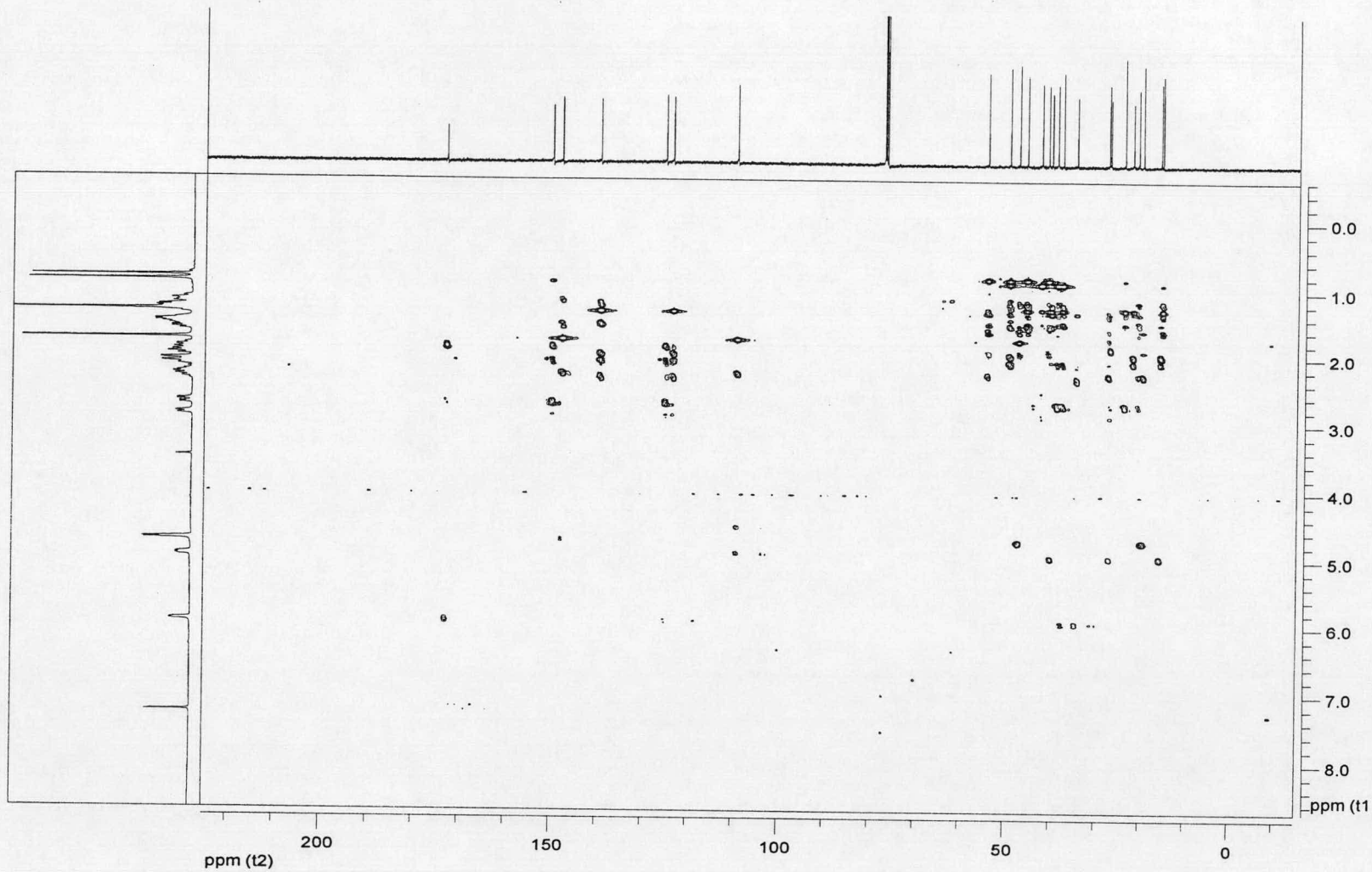


Figure B5 The gHMBC spectrum of compound A

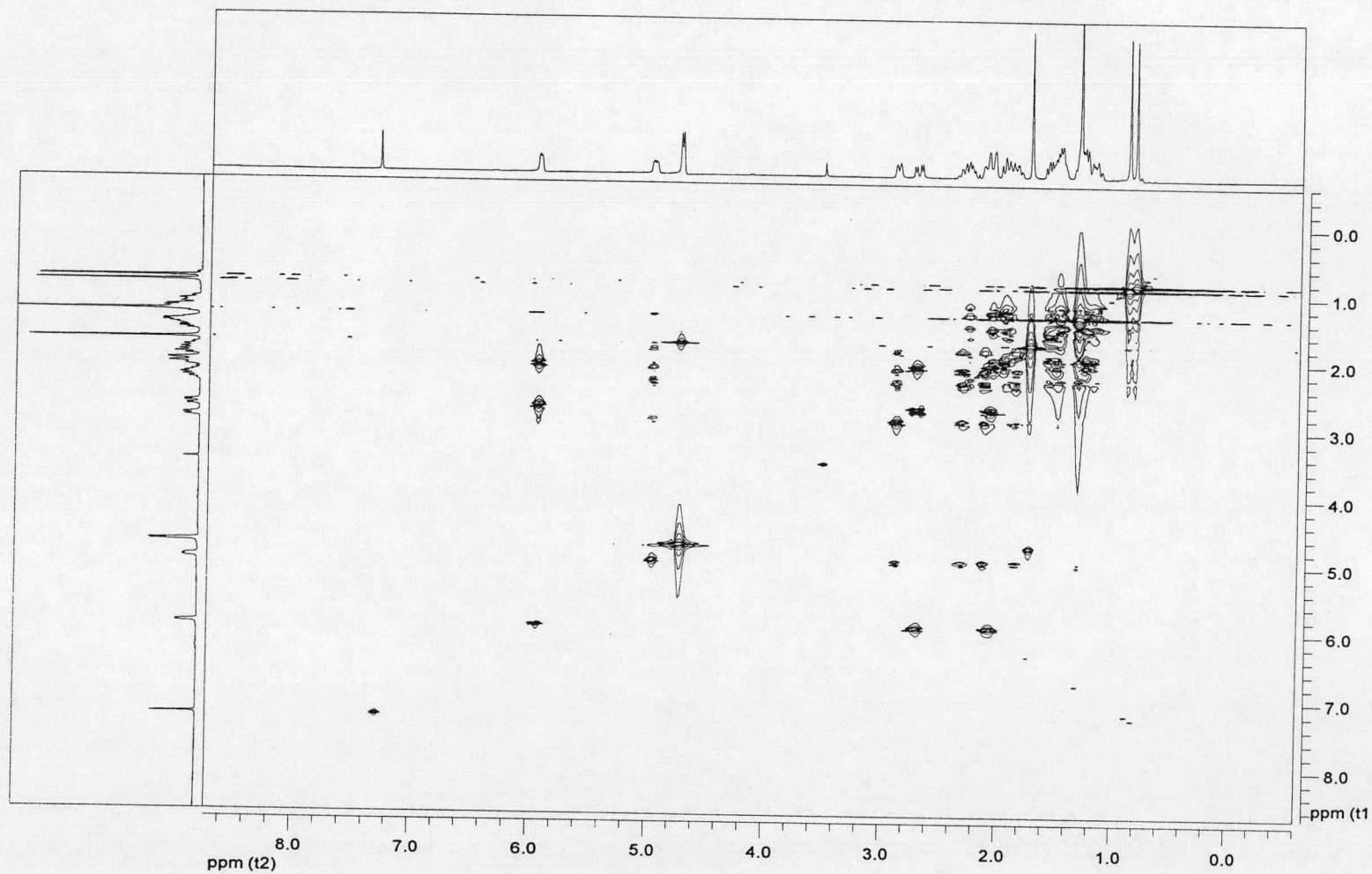


Figure B6 The TOCSY spectrum of compound A

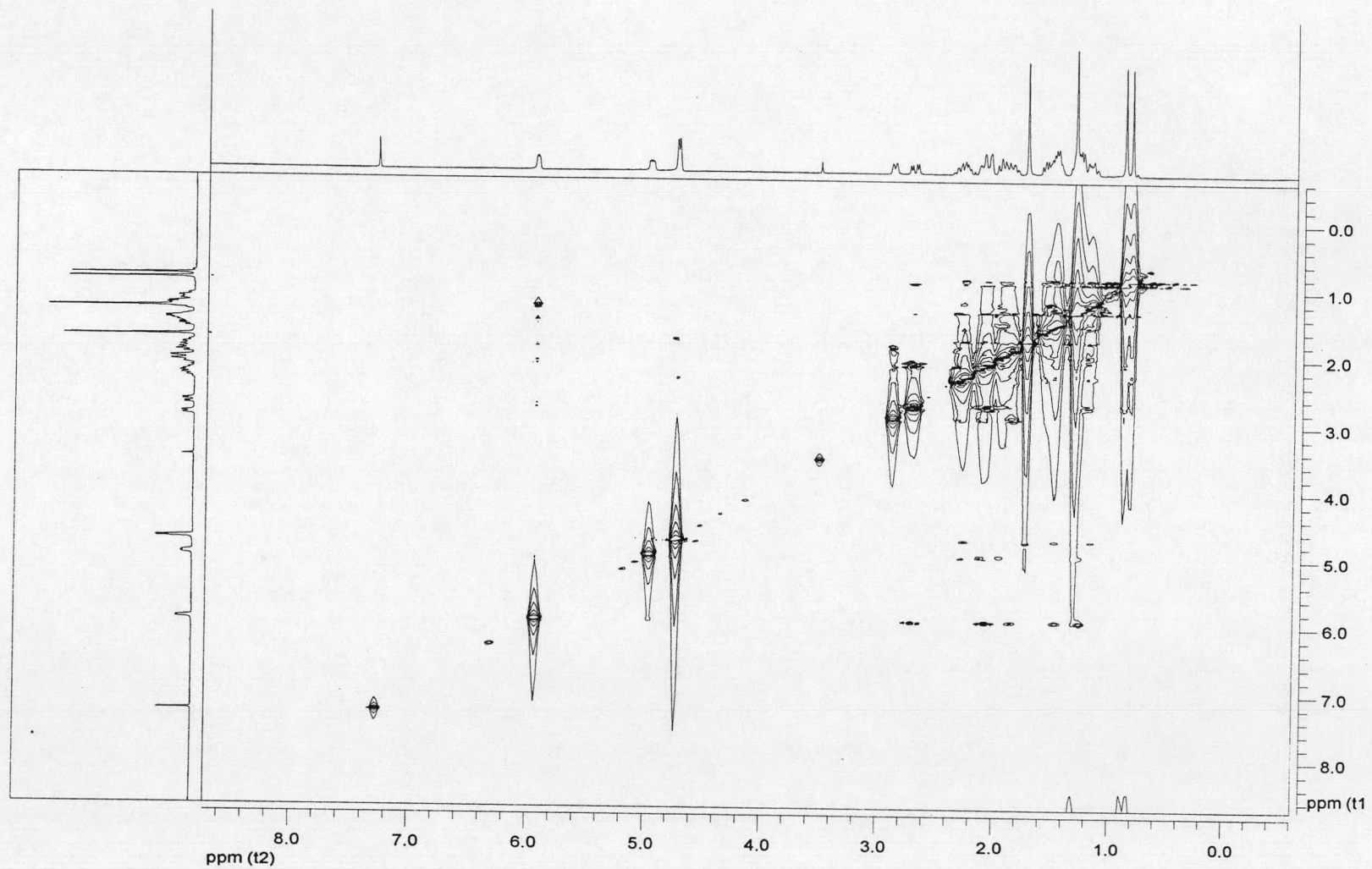


Figure B7 The NOESY spectrum of compound A

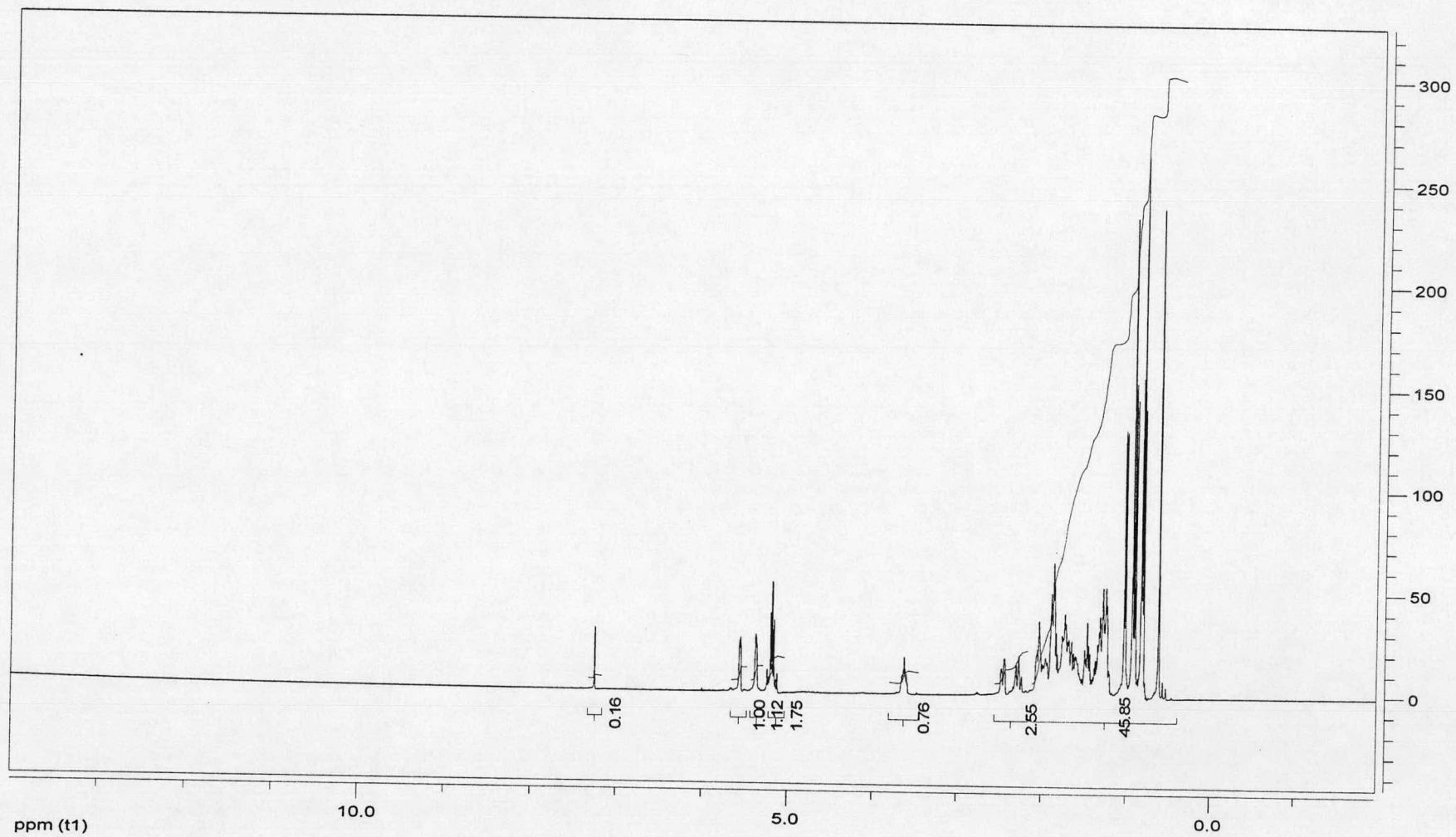


Figure B8 The  $^1\text{H-NMR}$  spectrum of compound B

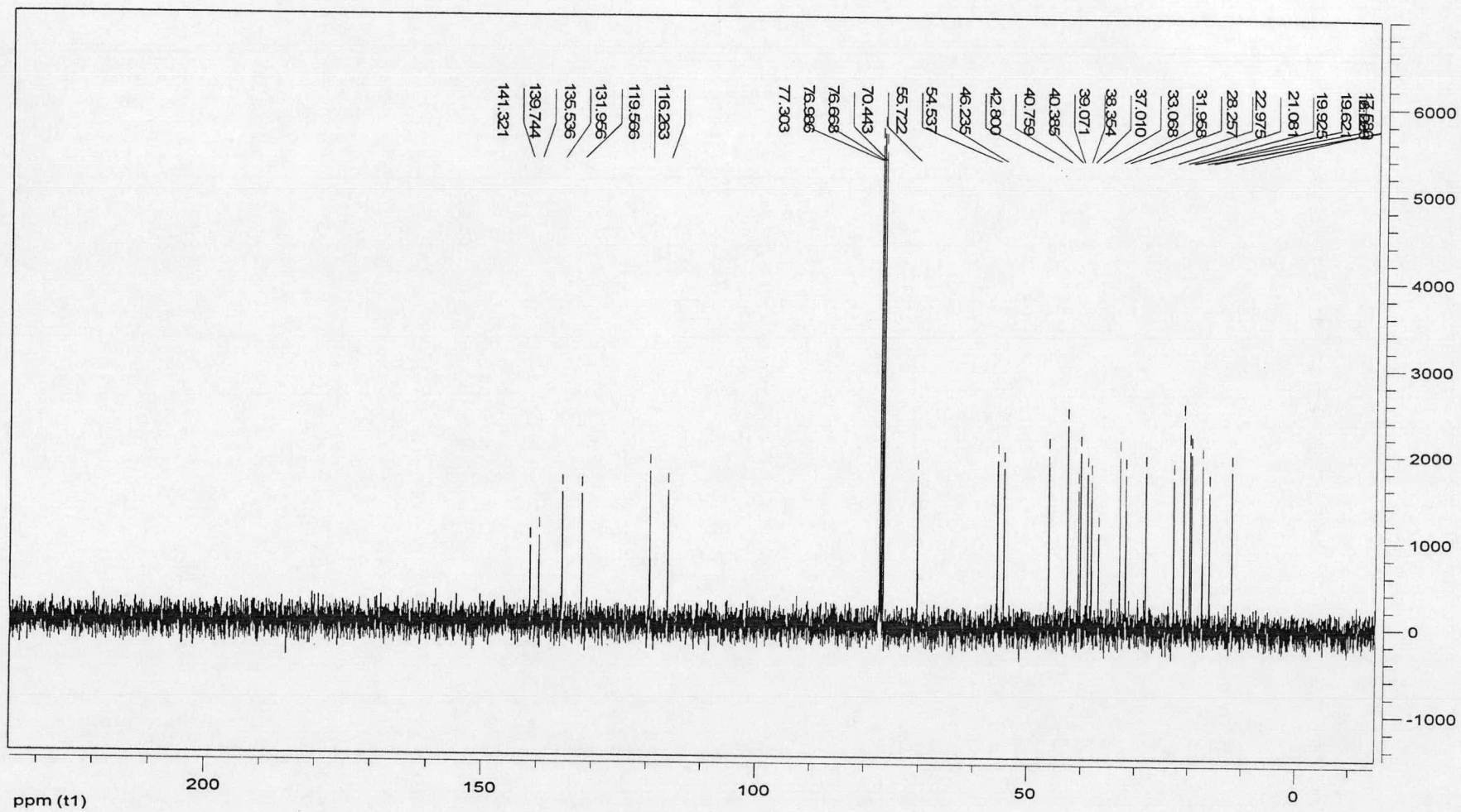


Figure B9 The  $^{13}\text{C}$ -NMR spectrum of compound B

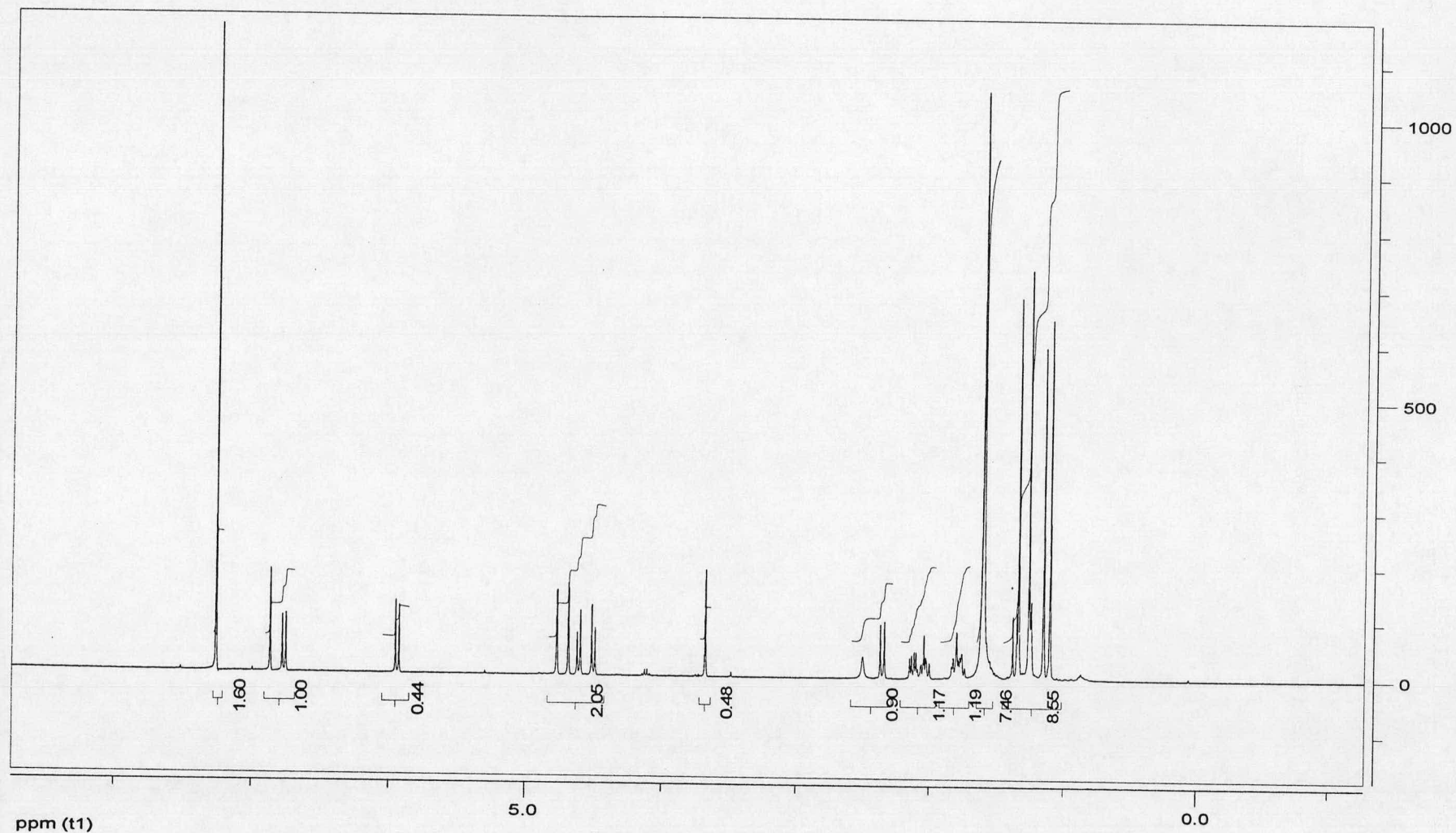


Figure B10 The 1H-NMR spectrum of compound C1

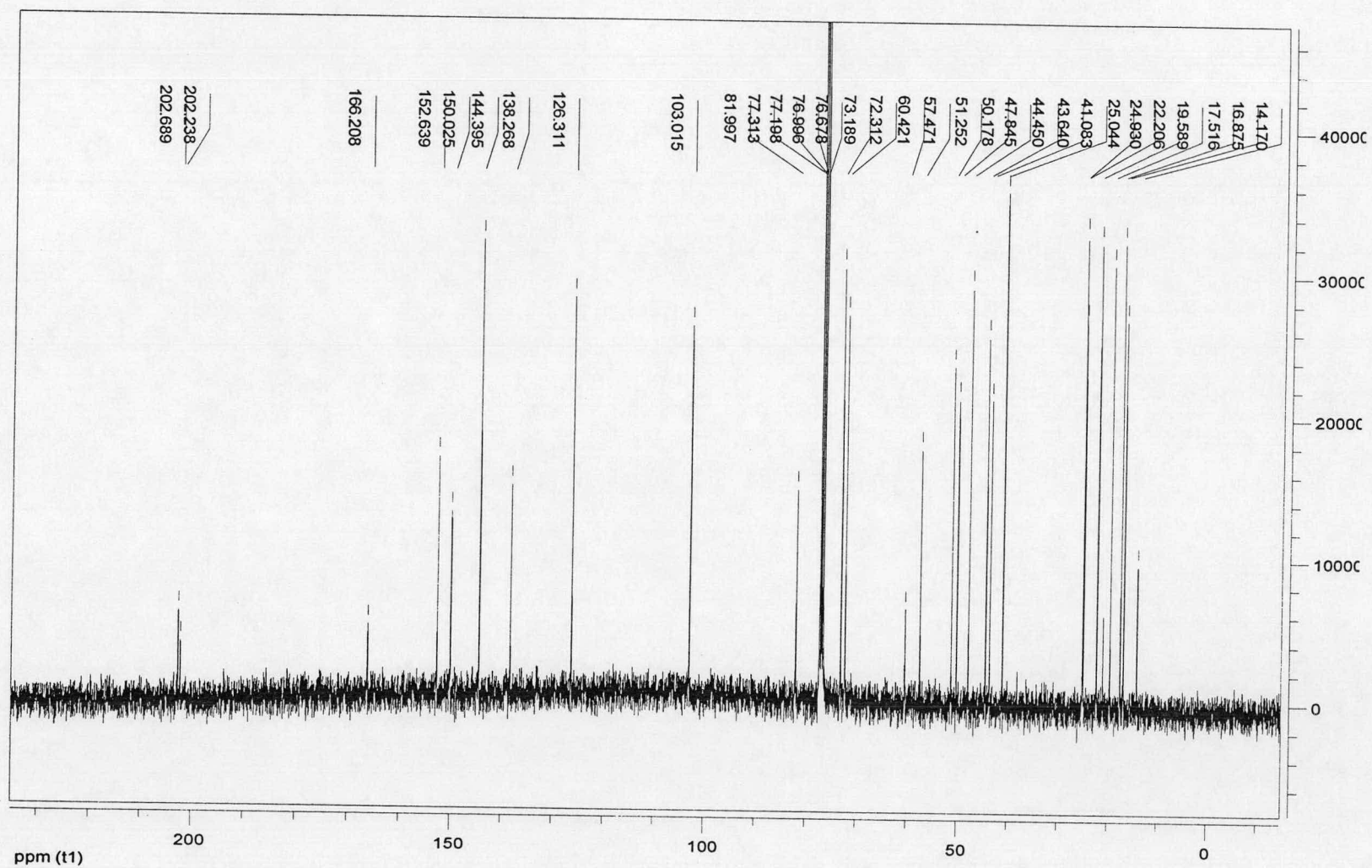


Figure B11 The  $^{13}\text{C}$ -NMR spectrum of compound C1



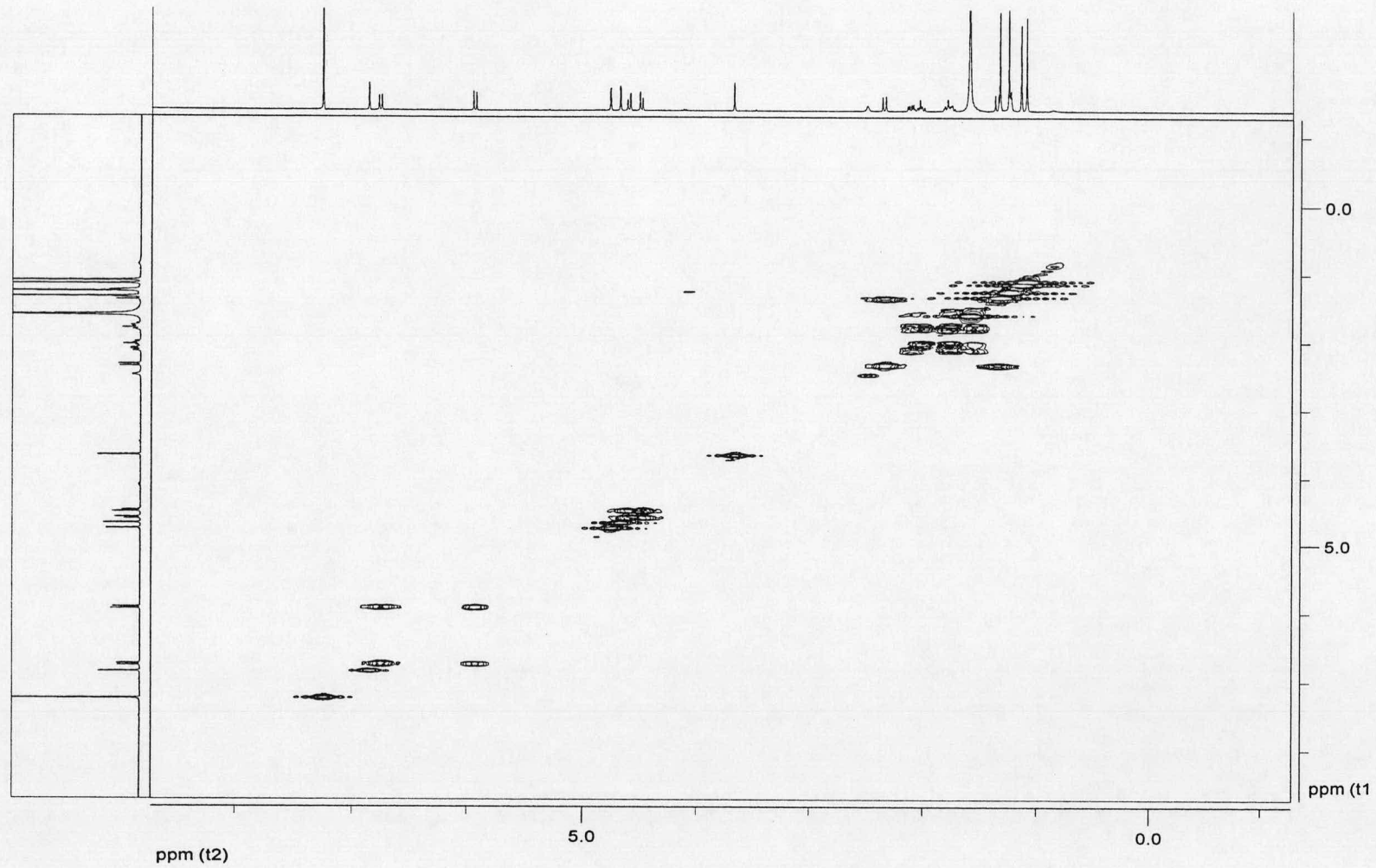


Figure B12 The gCOSY spectrum of compound C1

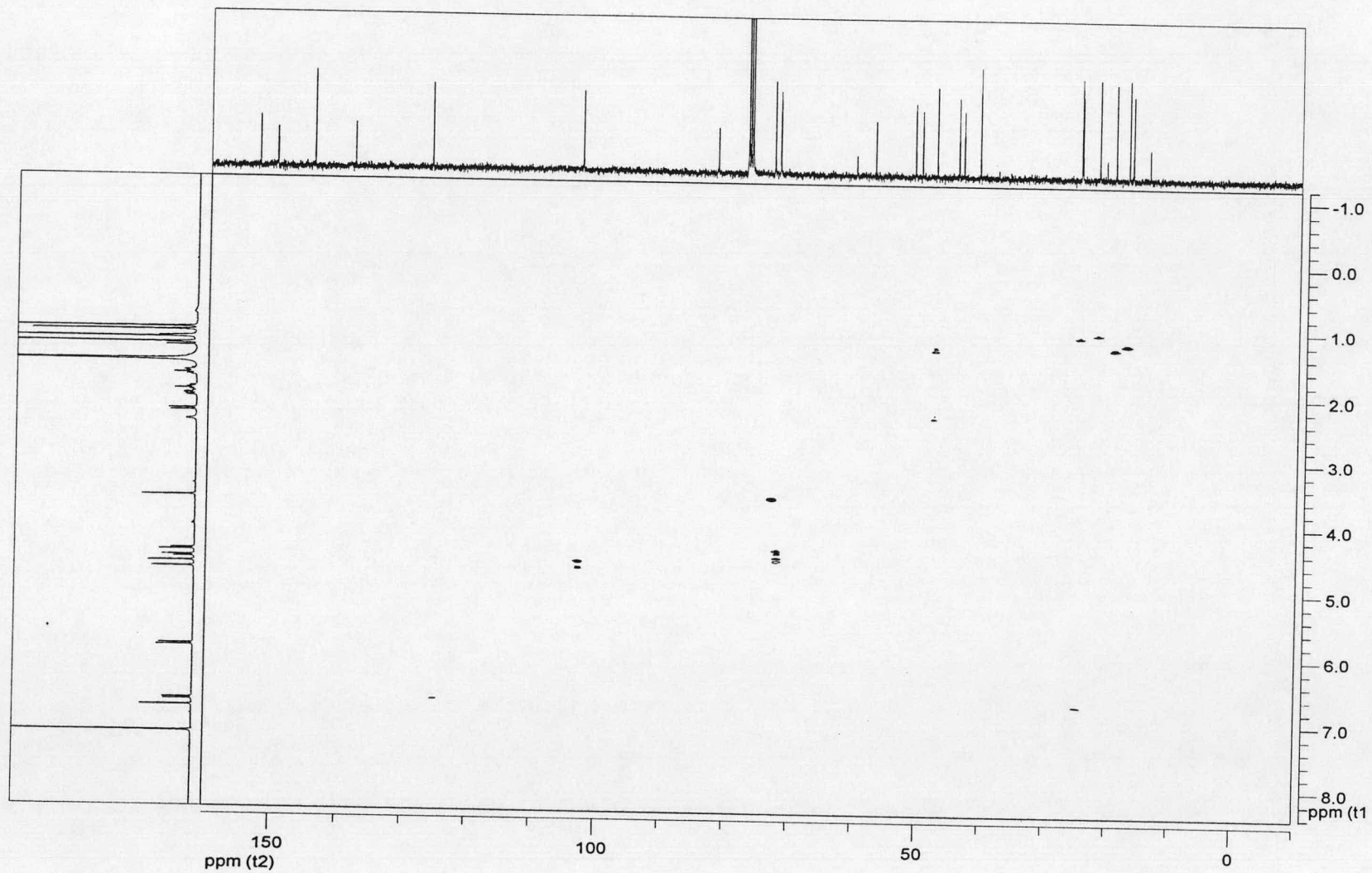


Figure B13 The gHSQC spectrum of compound C1

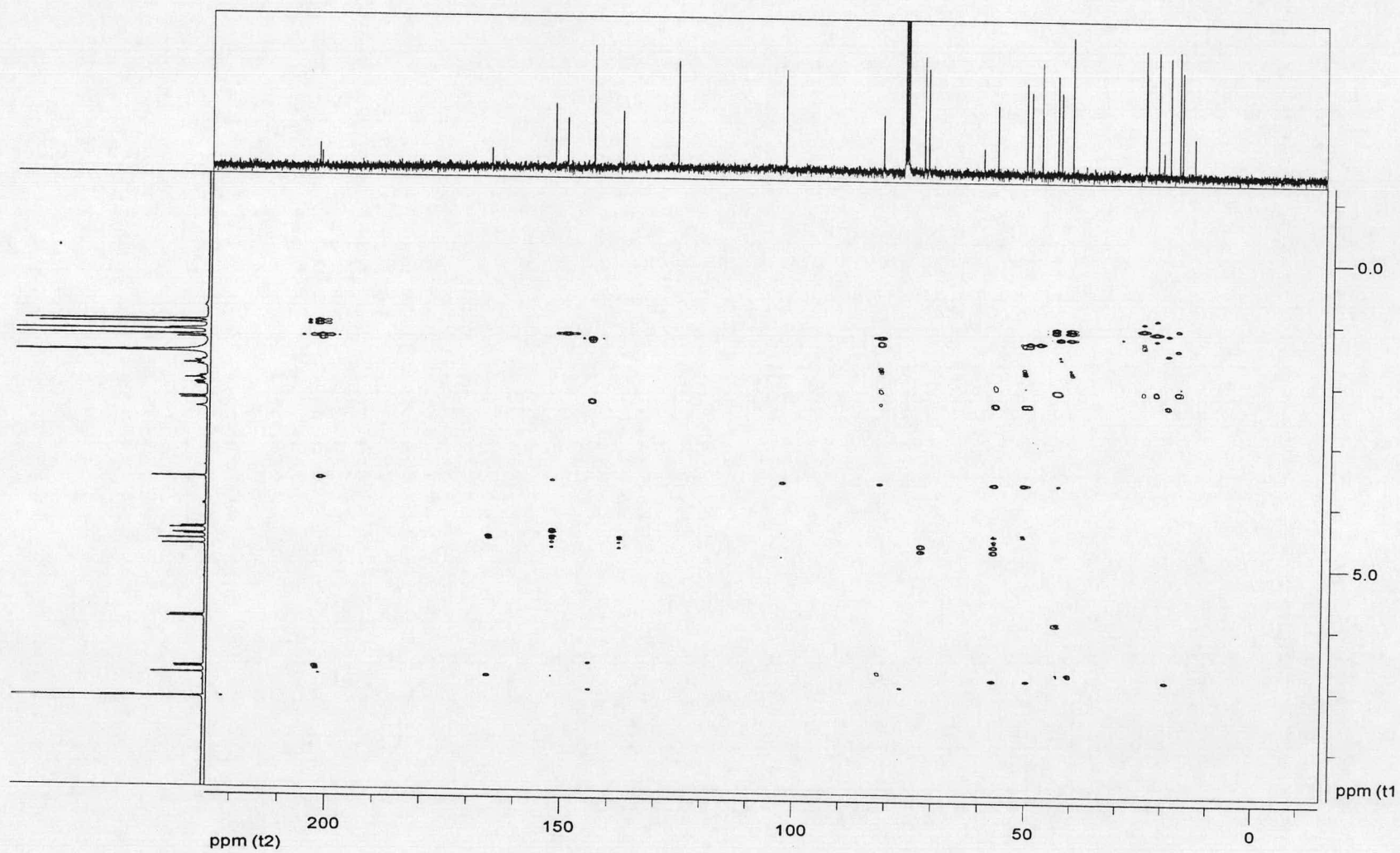


Figure B14 The gHMBC spectrum of compound C1

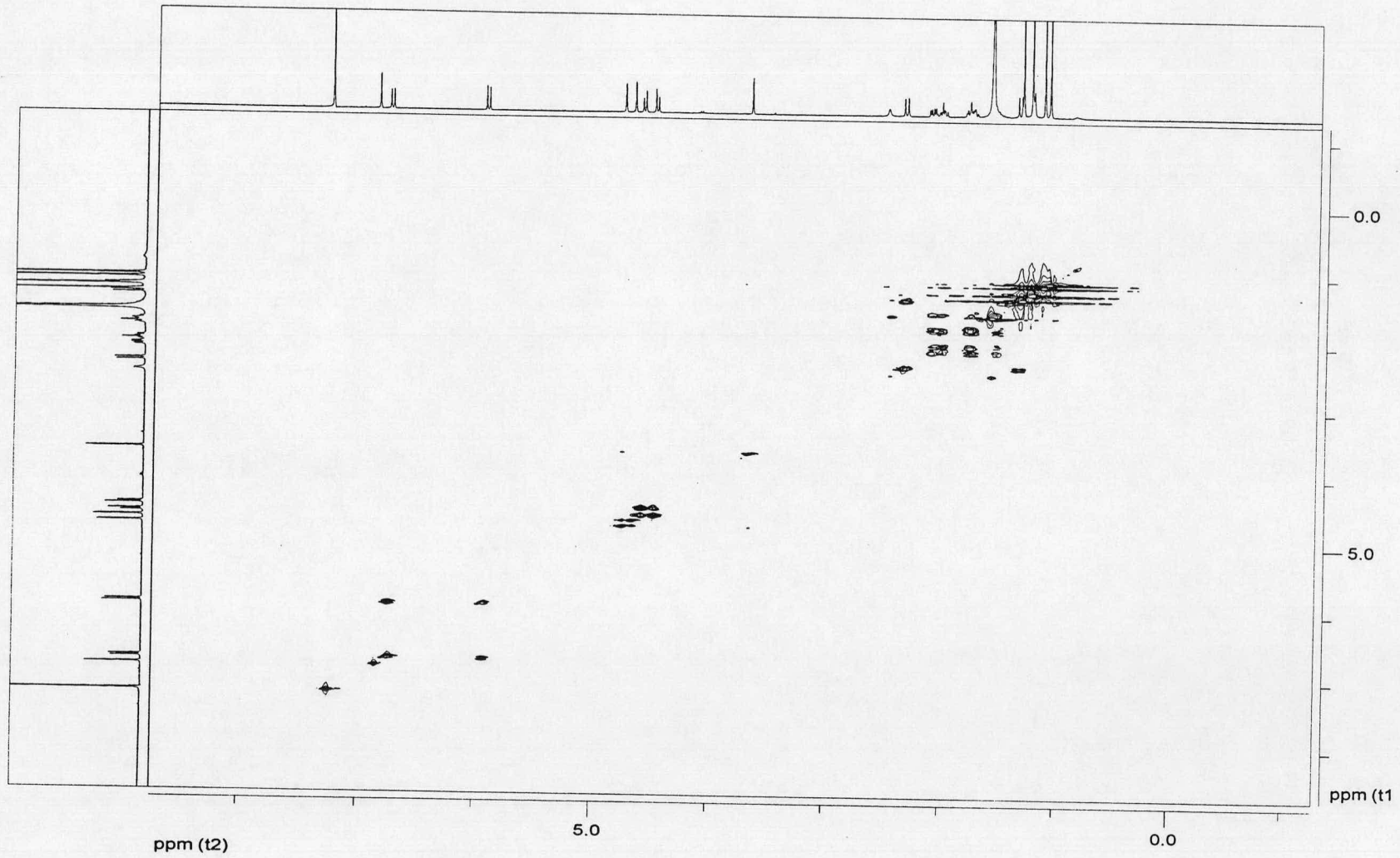


Figure B15 The TOCSY spectrum of compound C1

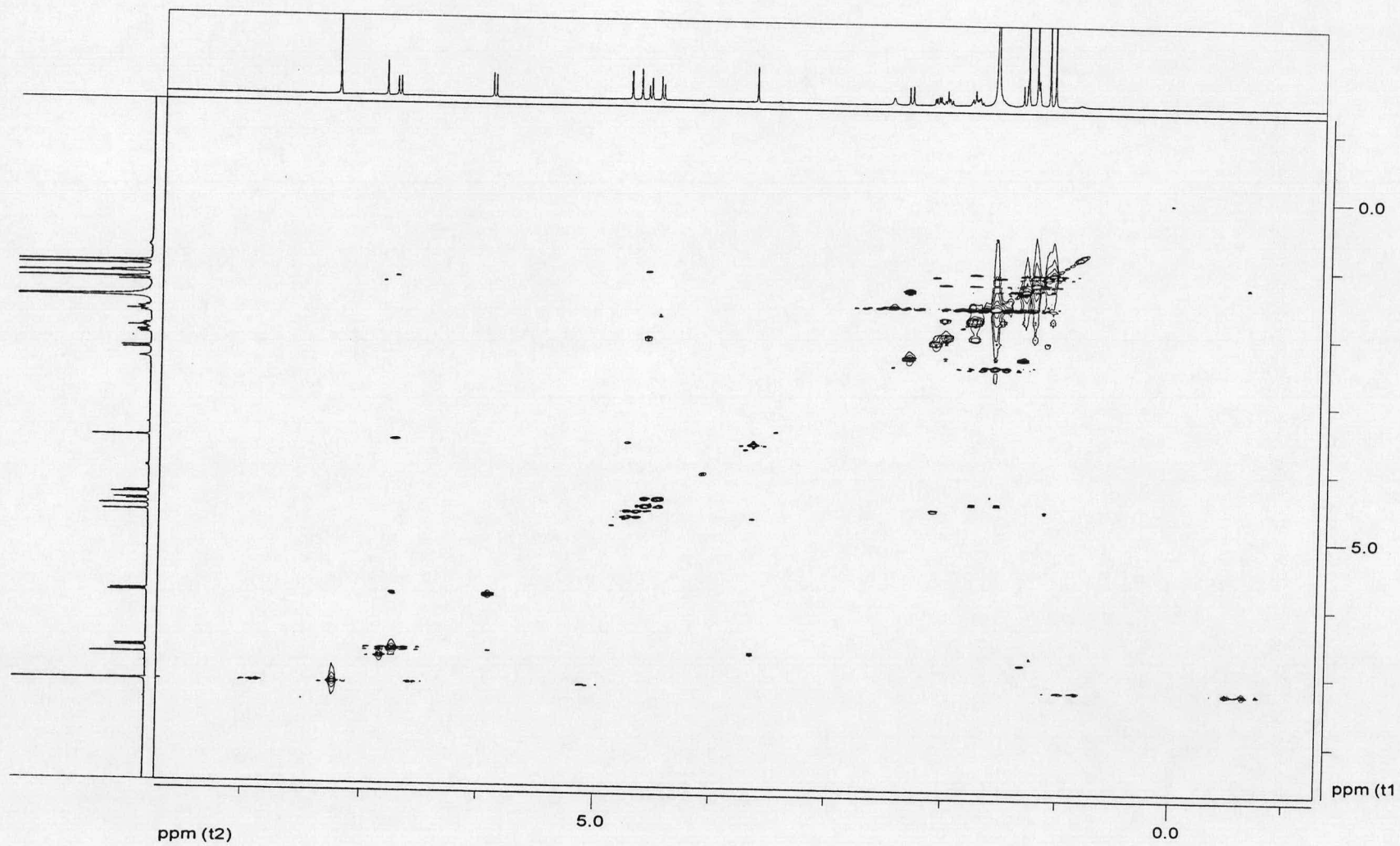


Figure B16 The NOESY spectrum of compound C1

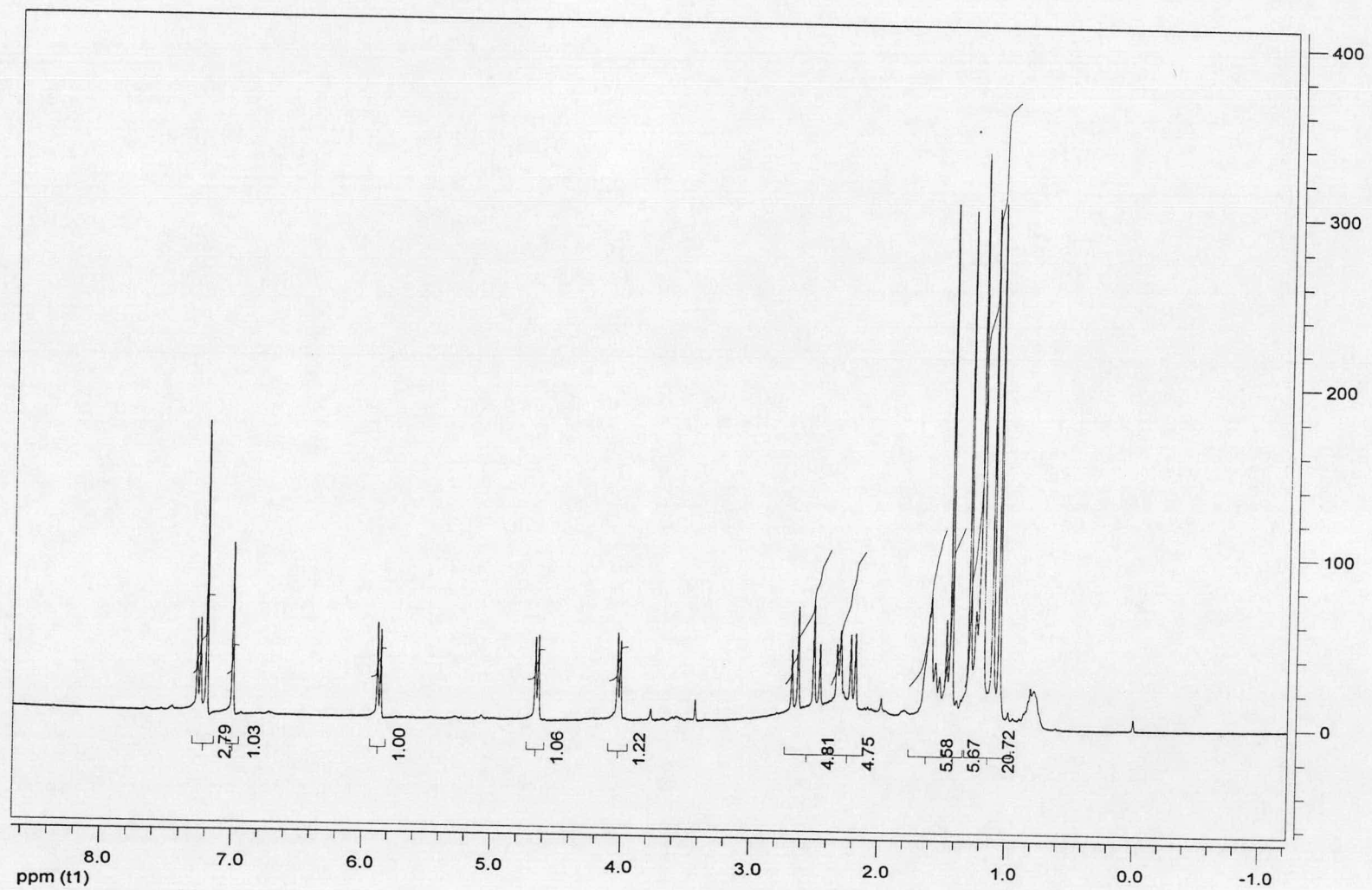


Figure B17 The 1H-NMR spectrum of compound C2

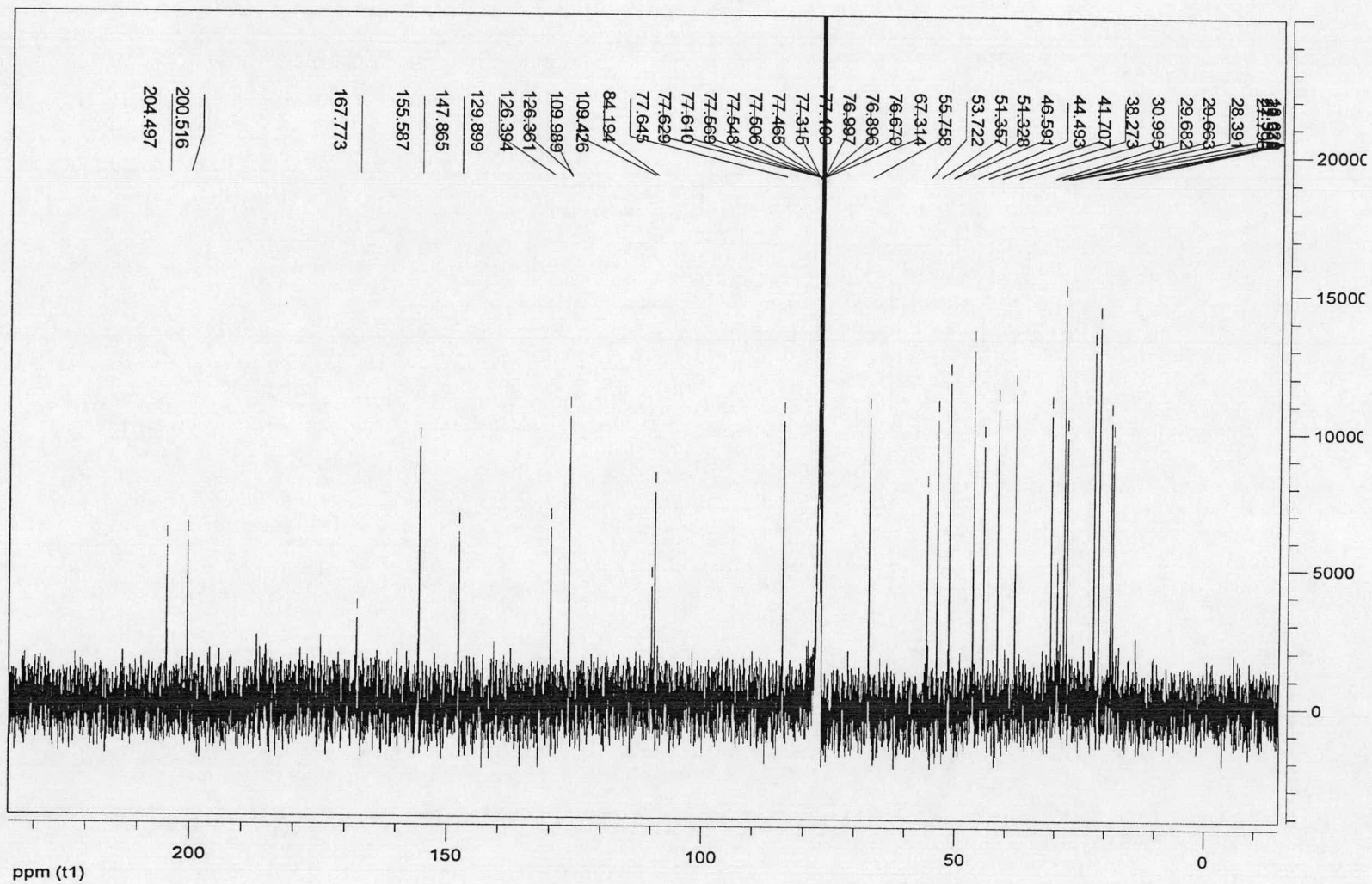


Figure B18 The  $^{13}\text{C}$ -NMR spectrum of compound C2

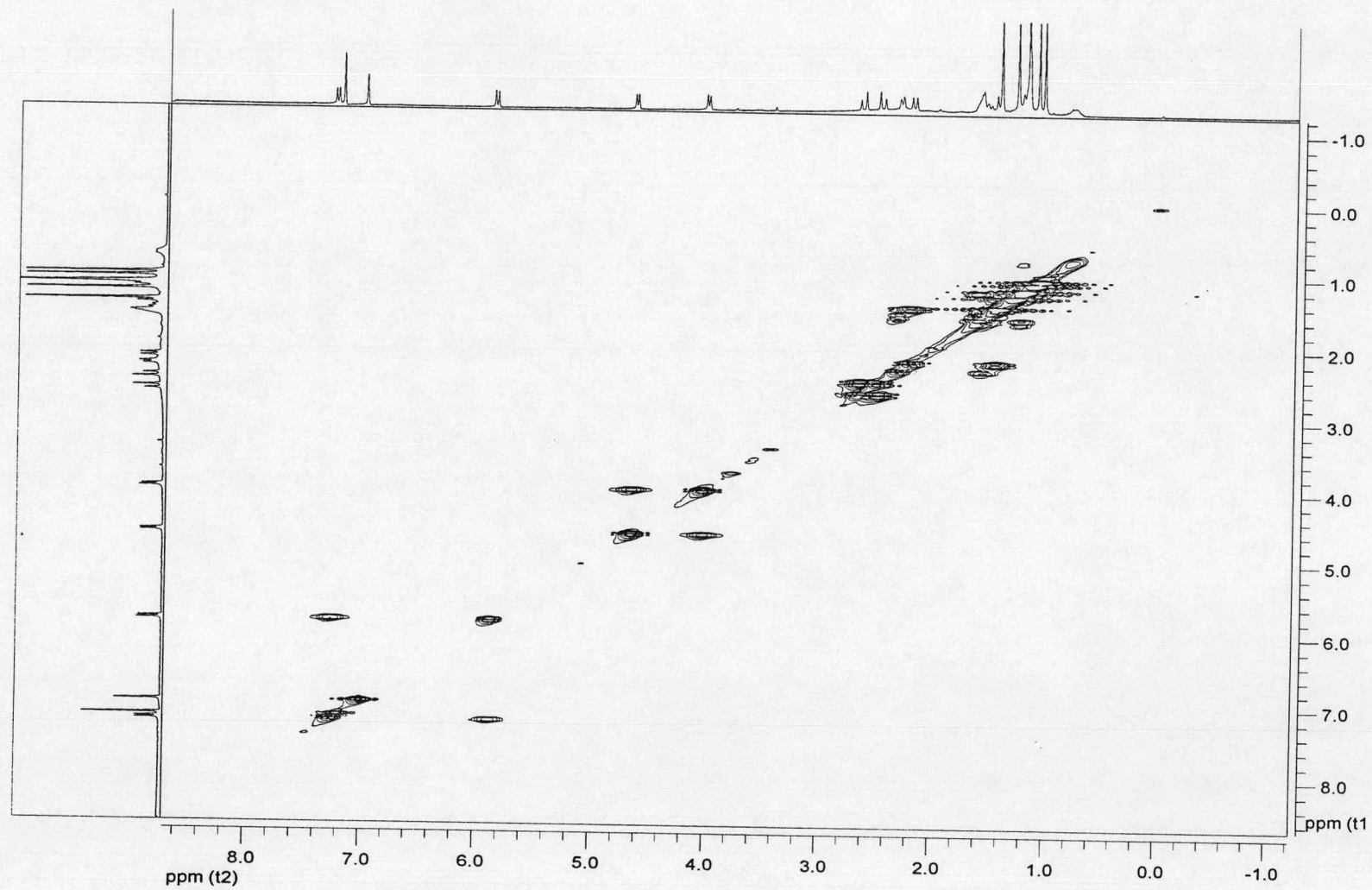


Figure B19 The gCOSY spectrum of compound C2



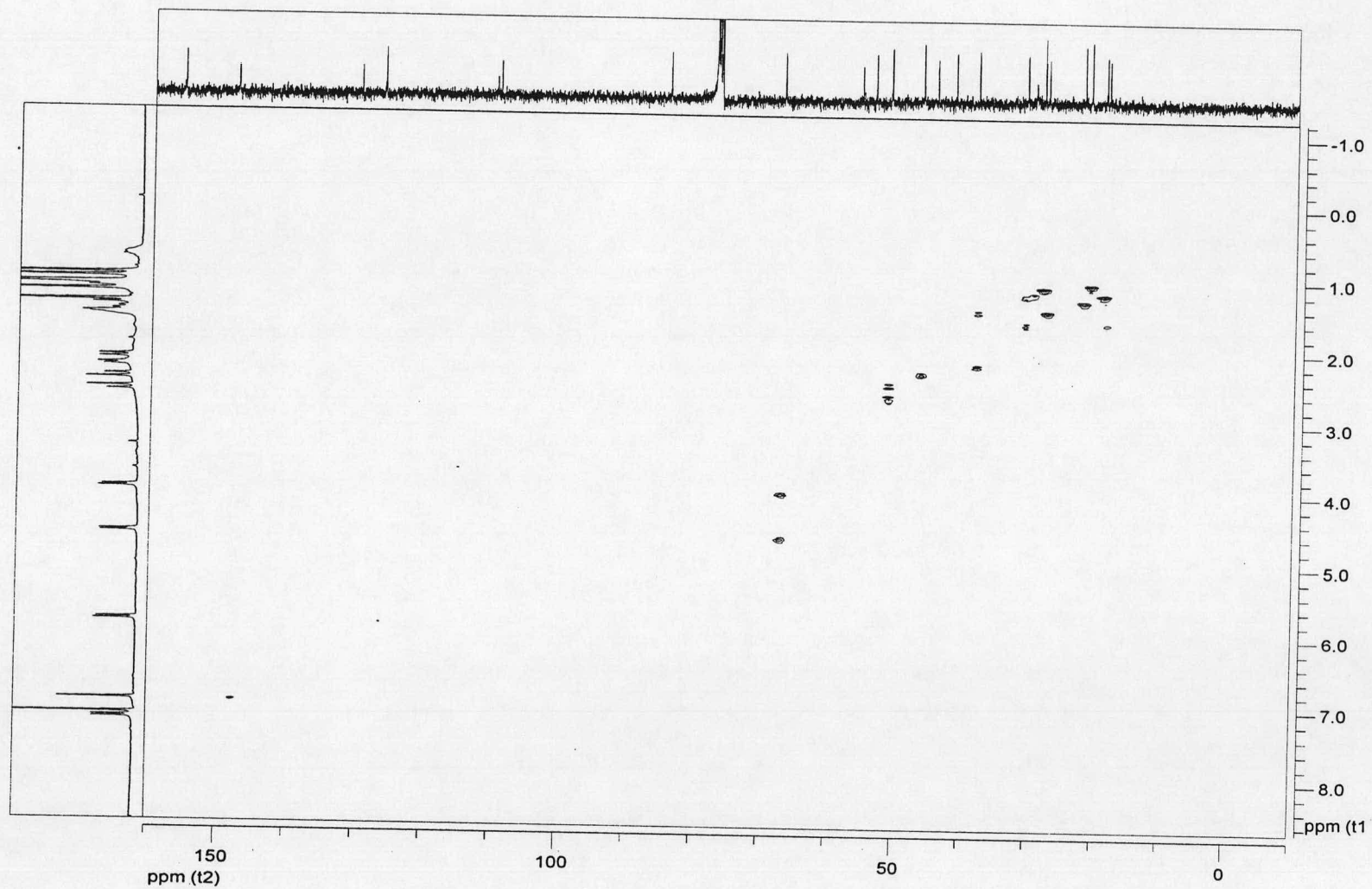


Figure B20 The gHSQC spectrum of compound C2

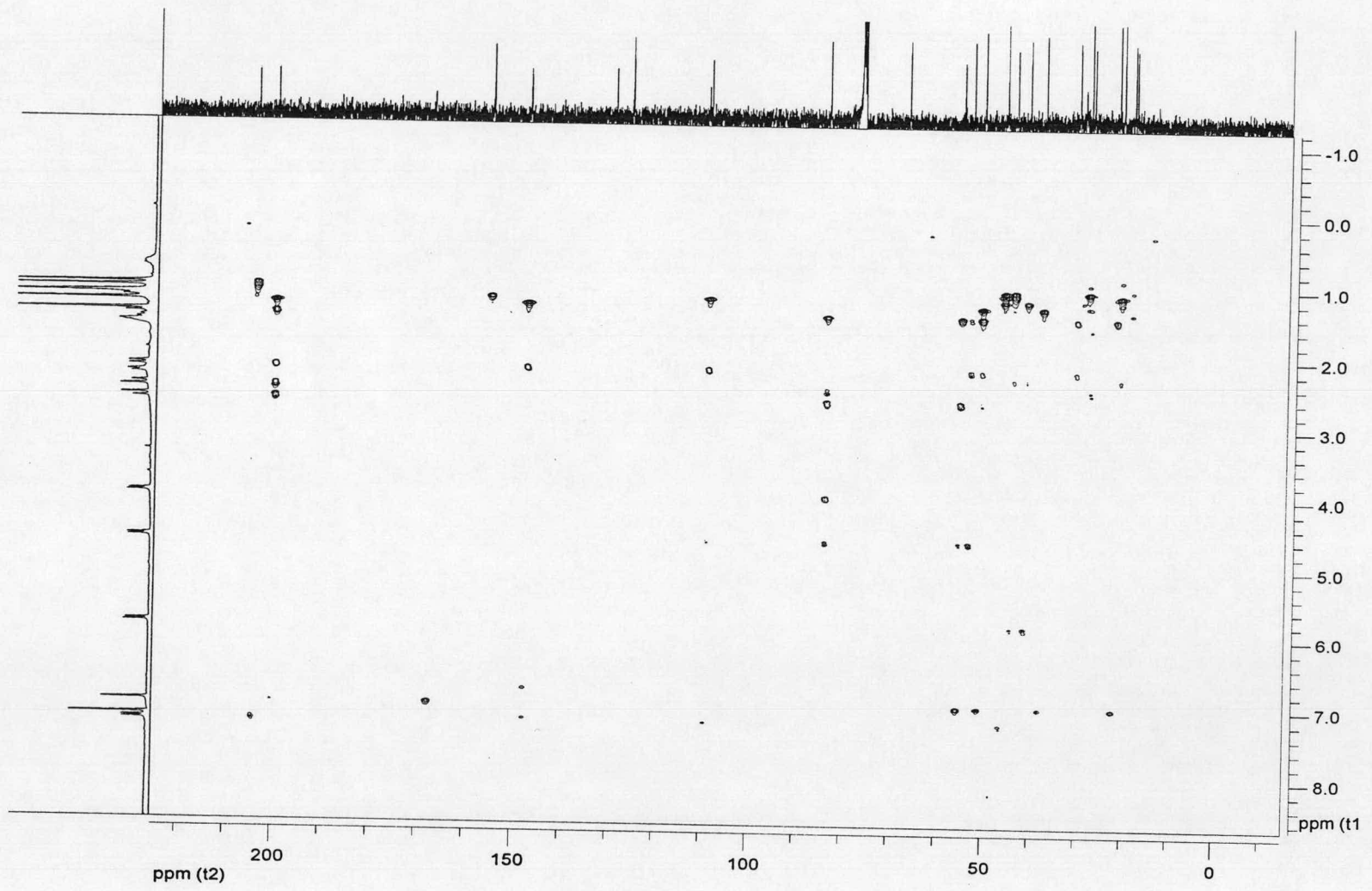


Figure B21 The gHMBC spectrum of compound C2

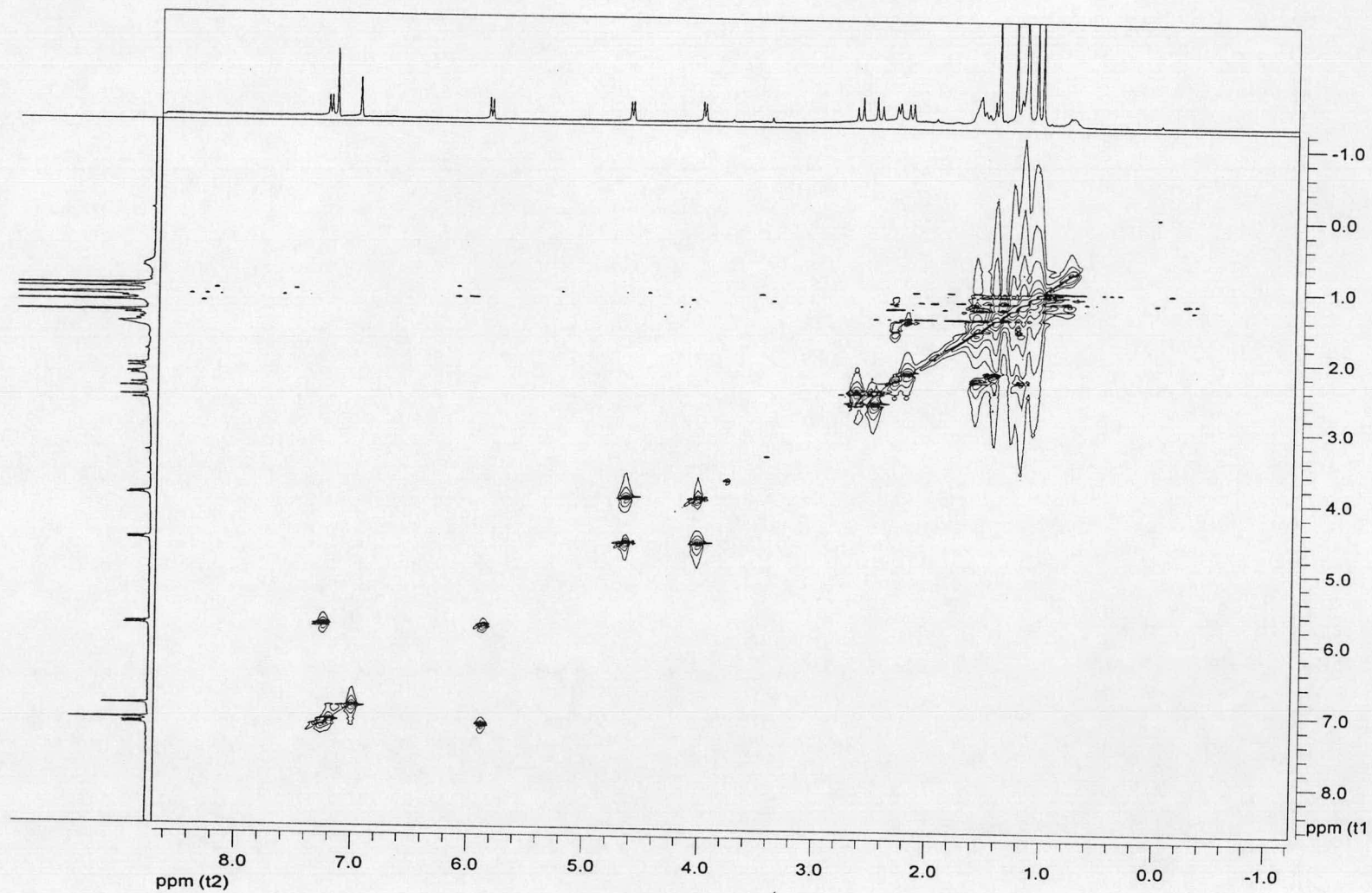


Figure B22 The TOCSY spectrum of compound C2

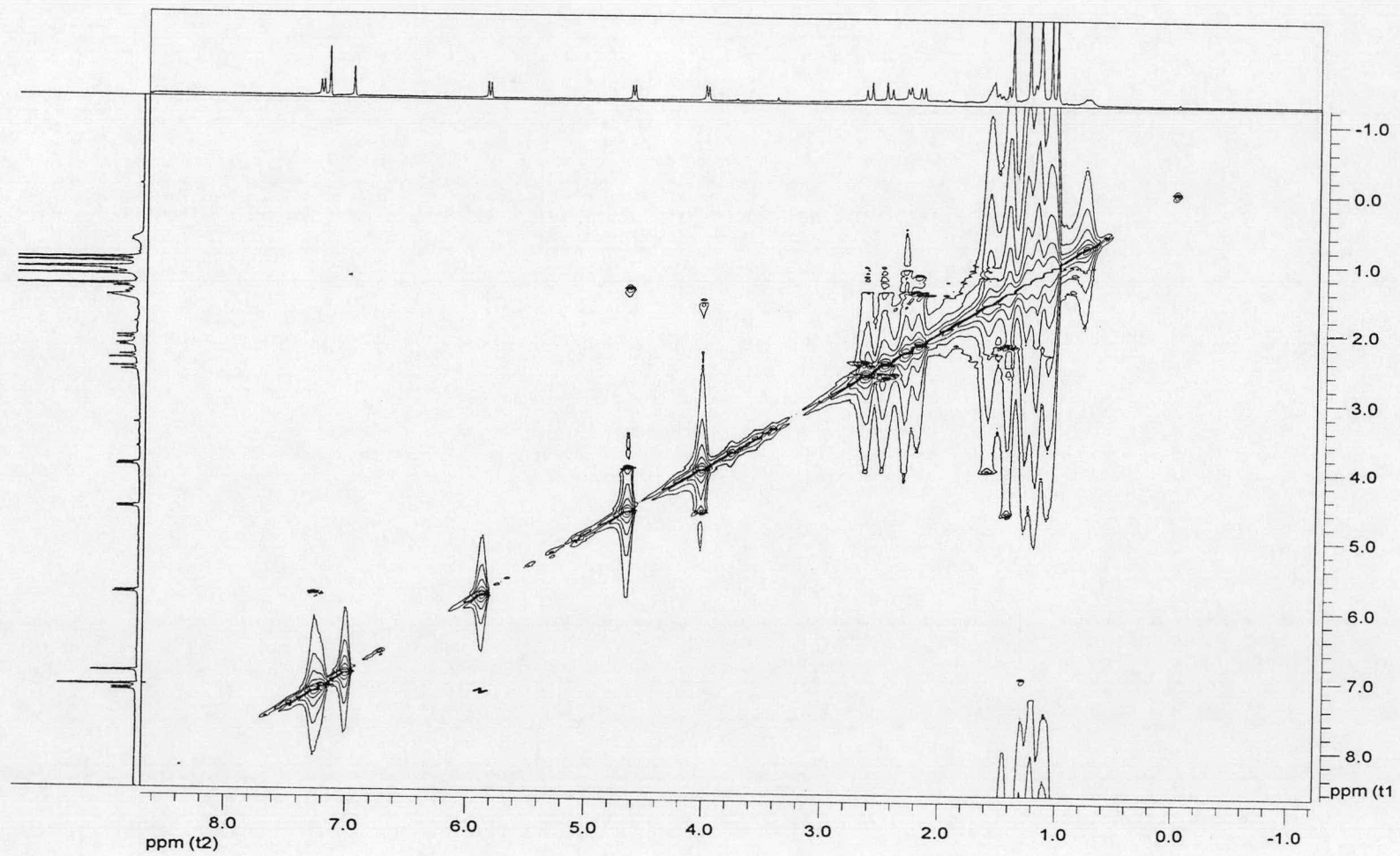


Figure B23 The NOESY spectrum of compound C2

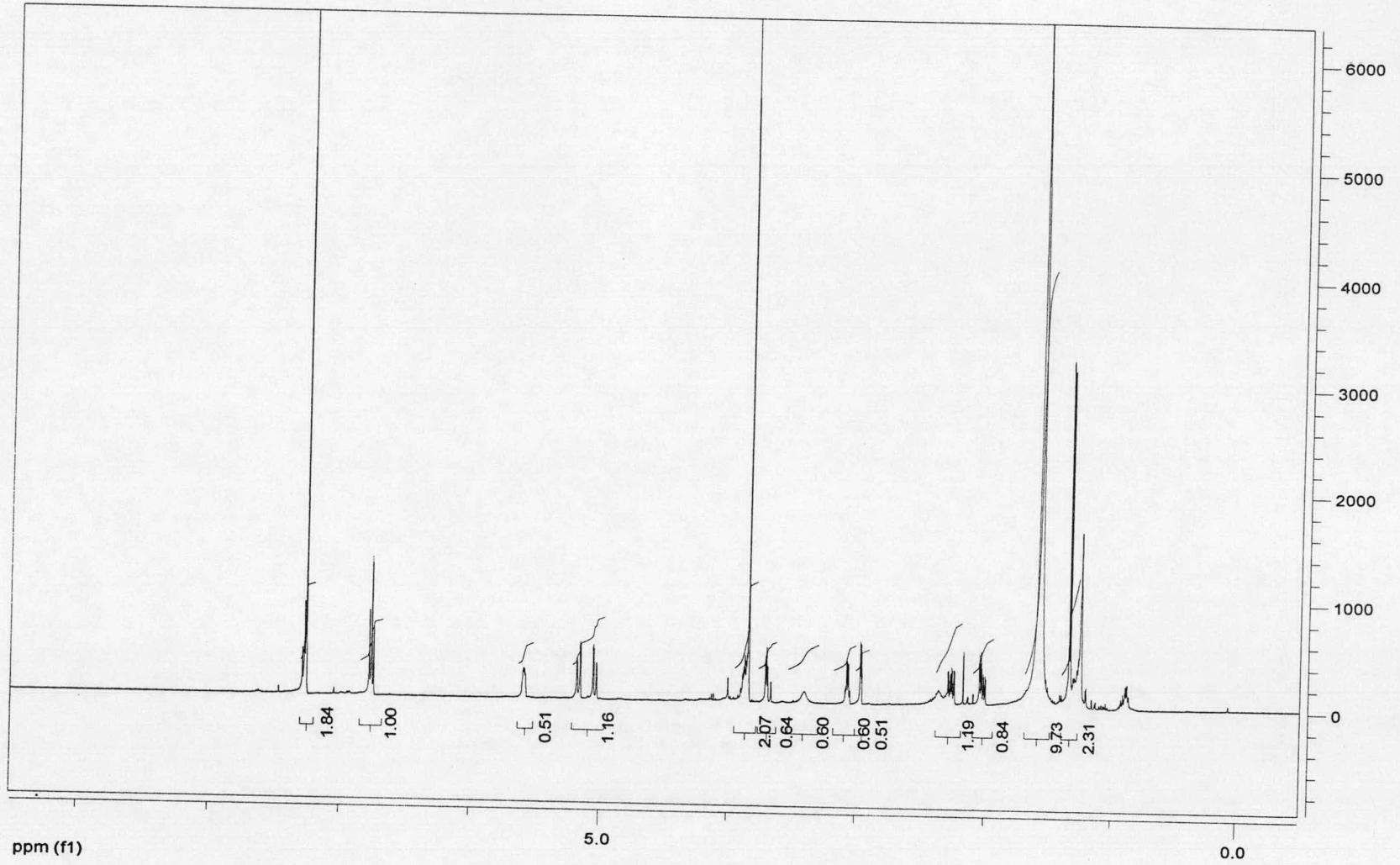


Figure B24 The <sup>1</sup>H-NMR spectrum of compound D1

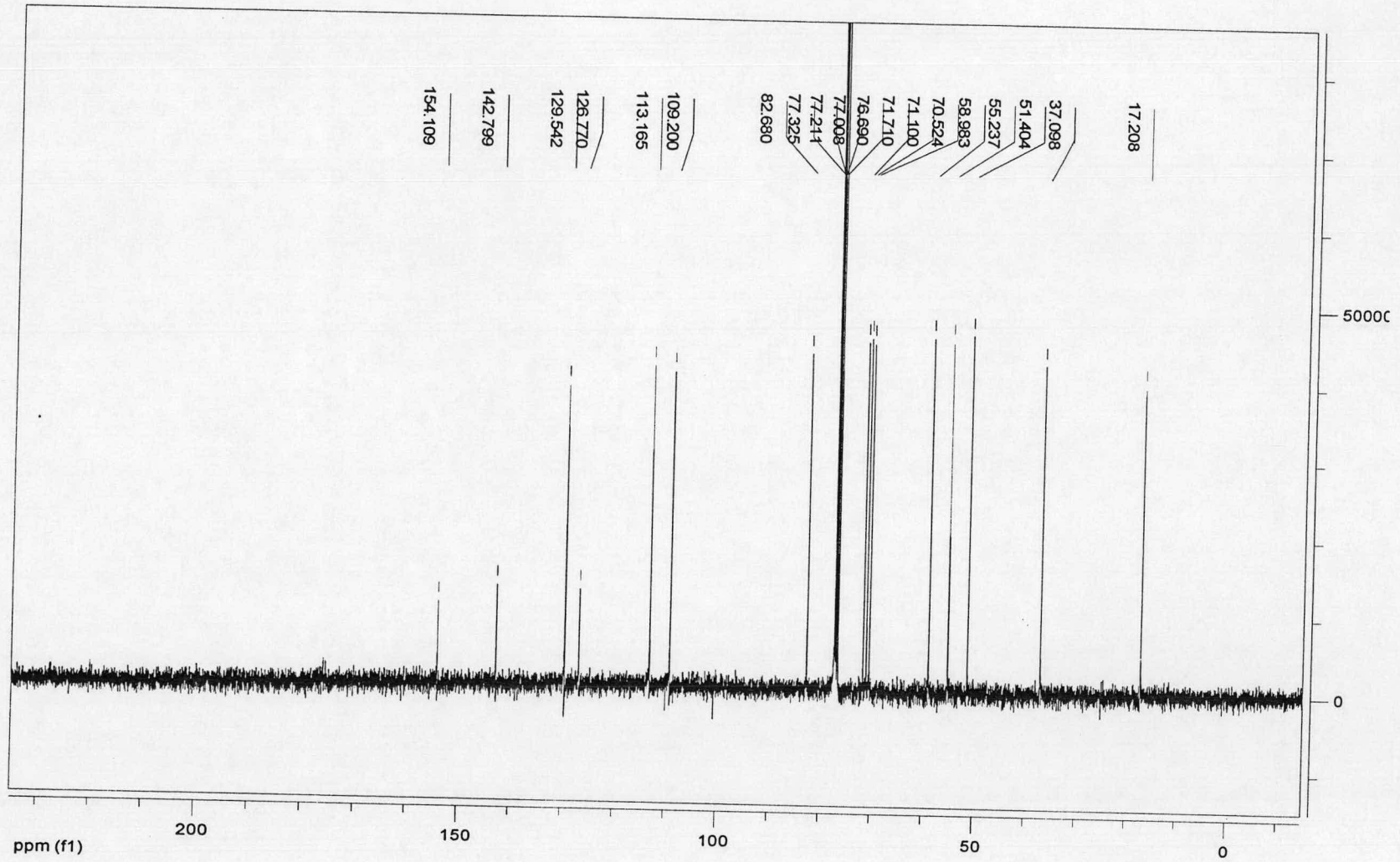


Figure B25 The  $^{13}\text{C}$ -NMR spectrum of compound D1

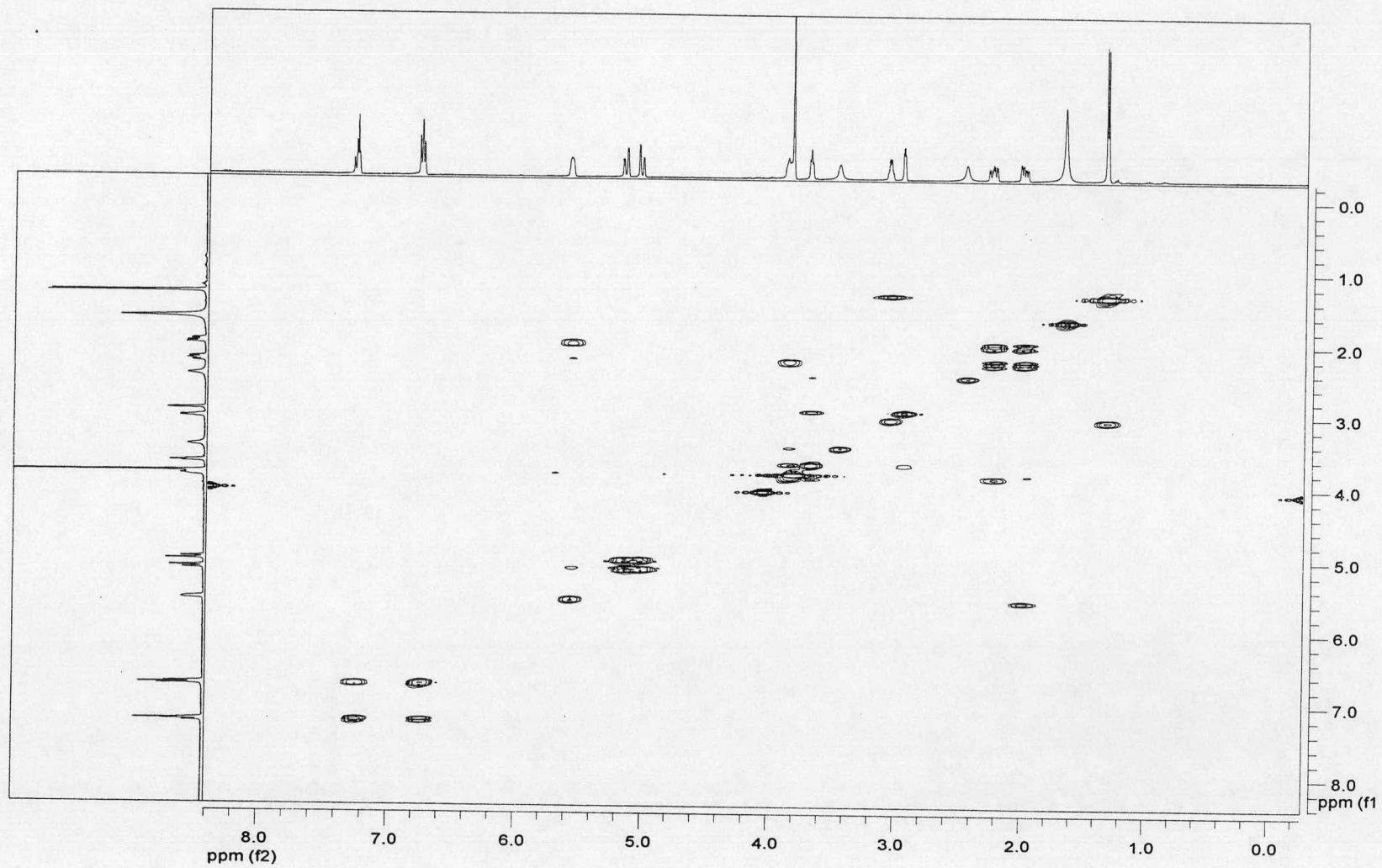


Figure B26 The gCOSY spectrum of compound D1

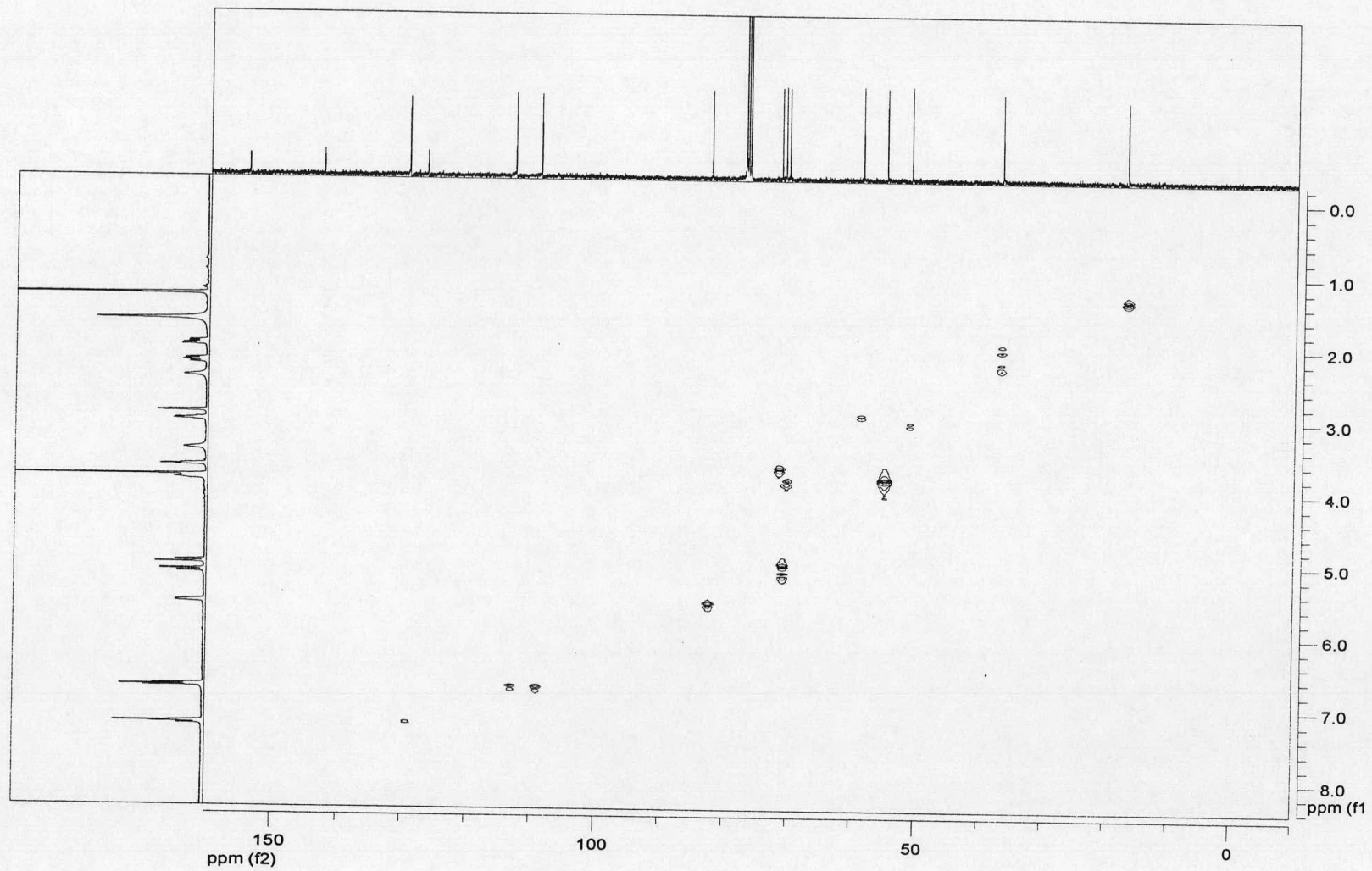


Figure B27 The gHSQC spectrum of compound D1



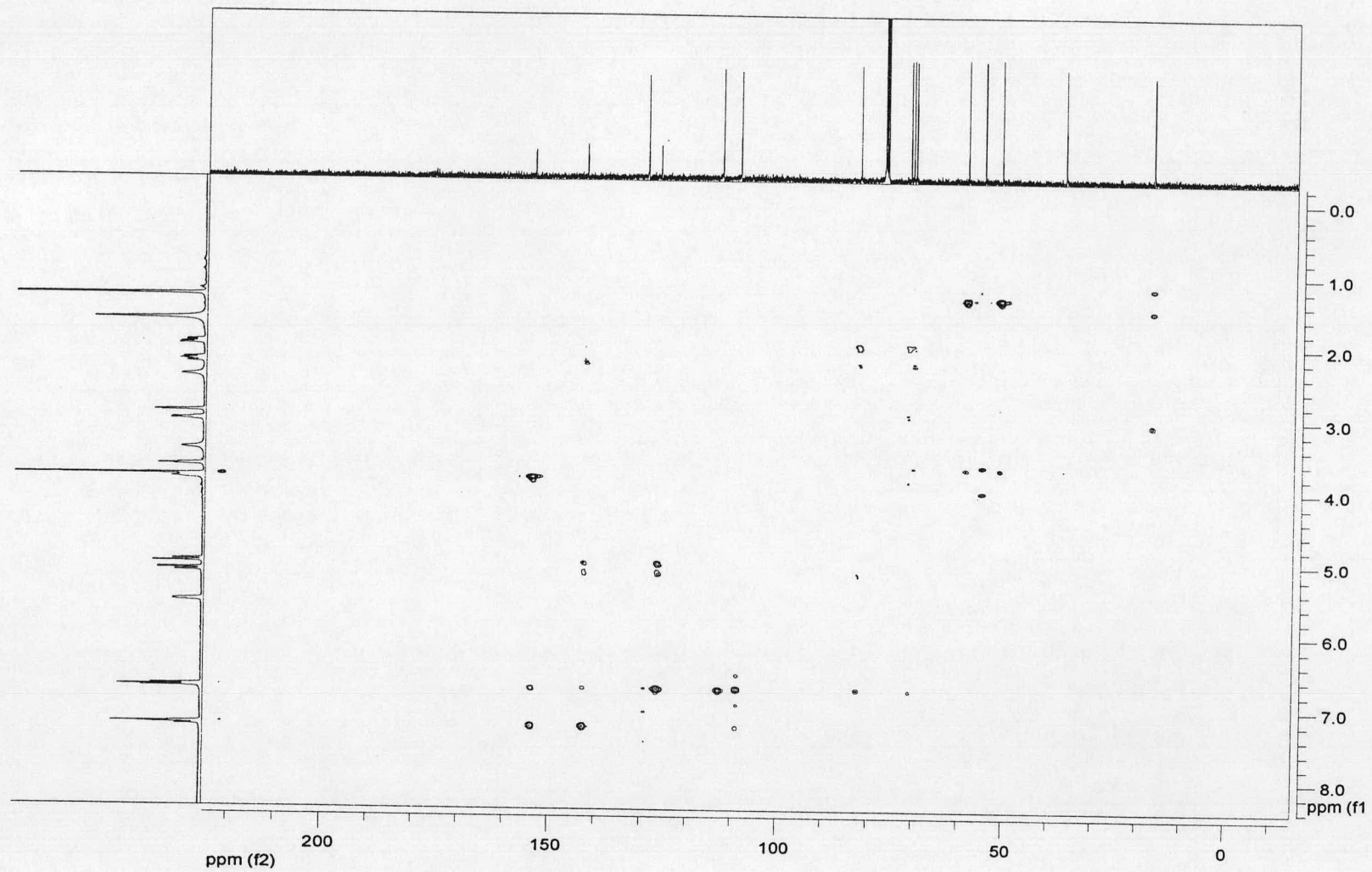


Figure B28 The gHMBC spectrum of compound D1

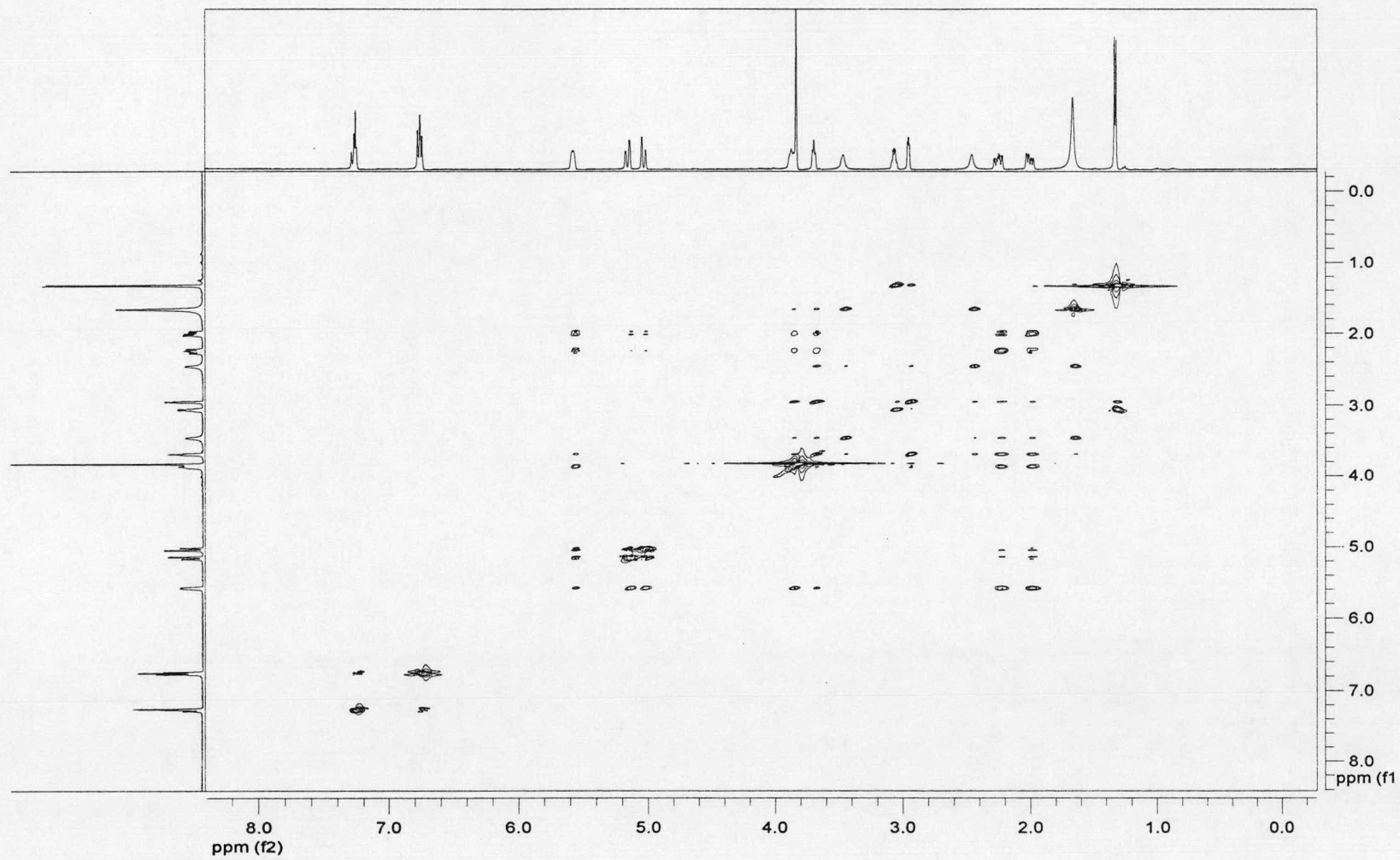


Figure B29 The TOCSY spectrum of compound D1

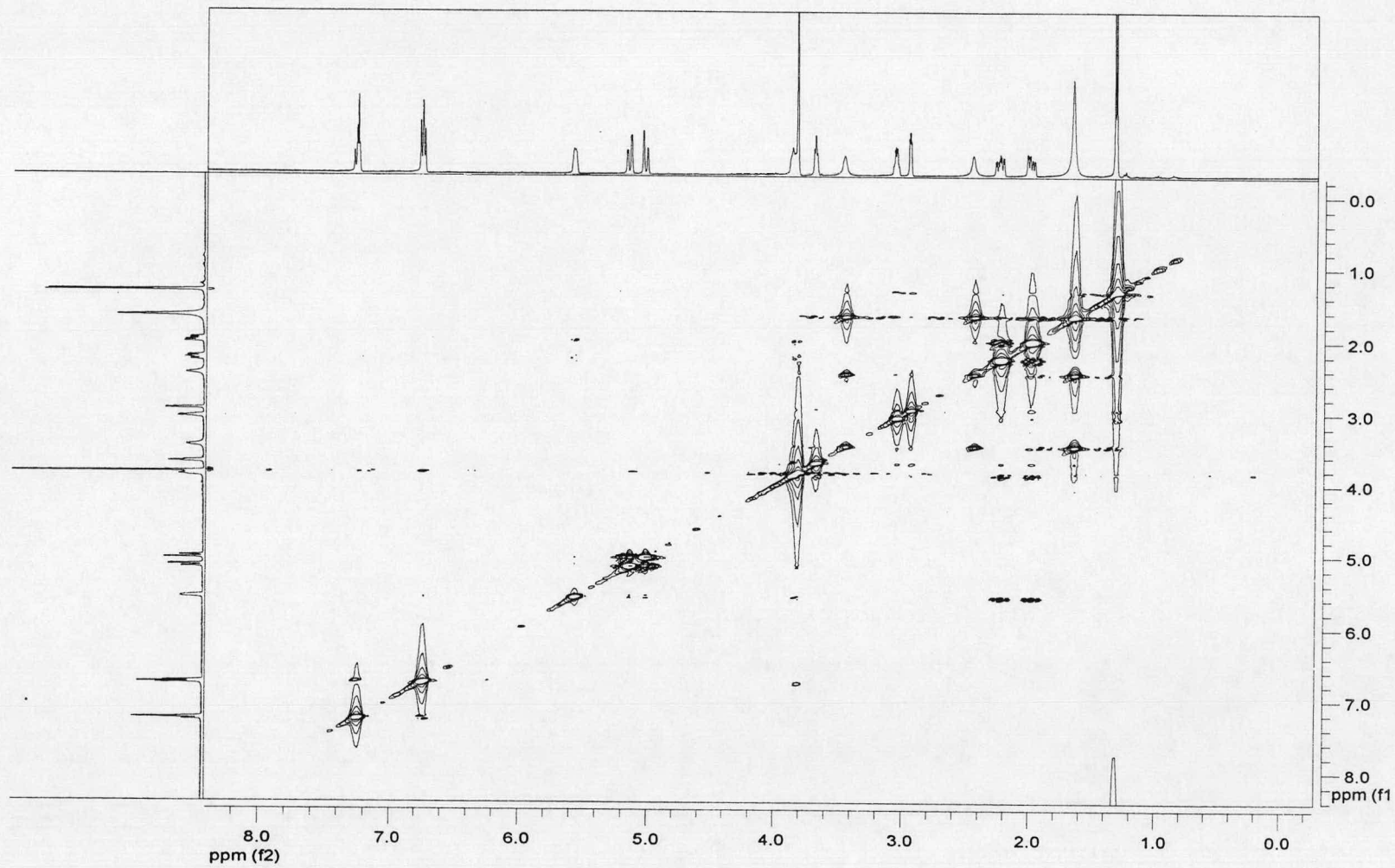


Figure B30 The NOESY spectrum of compound D1

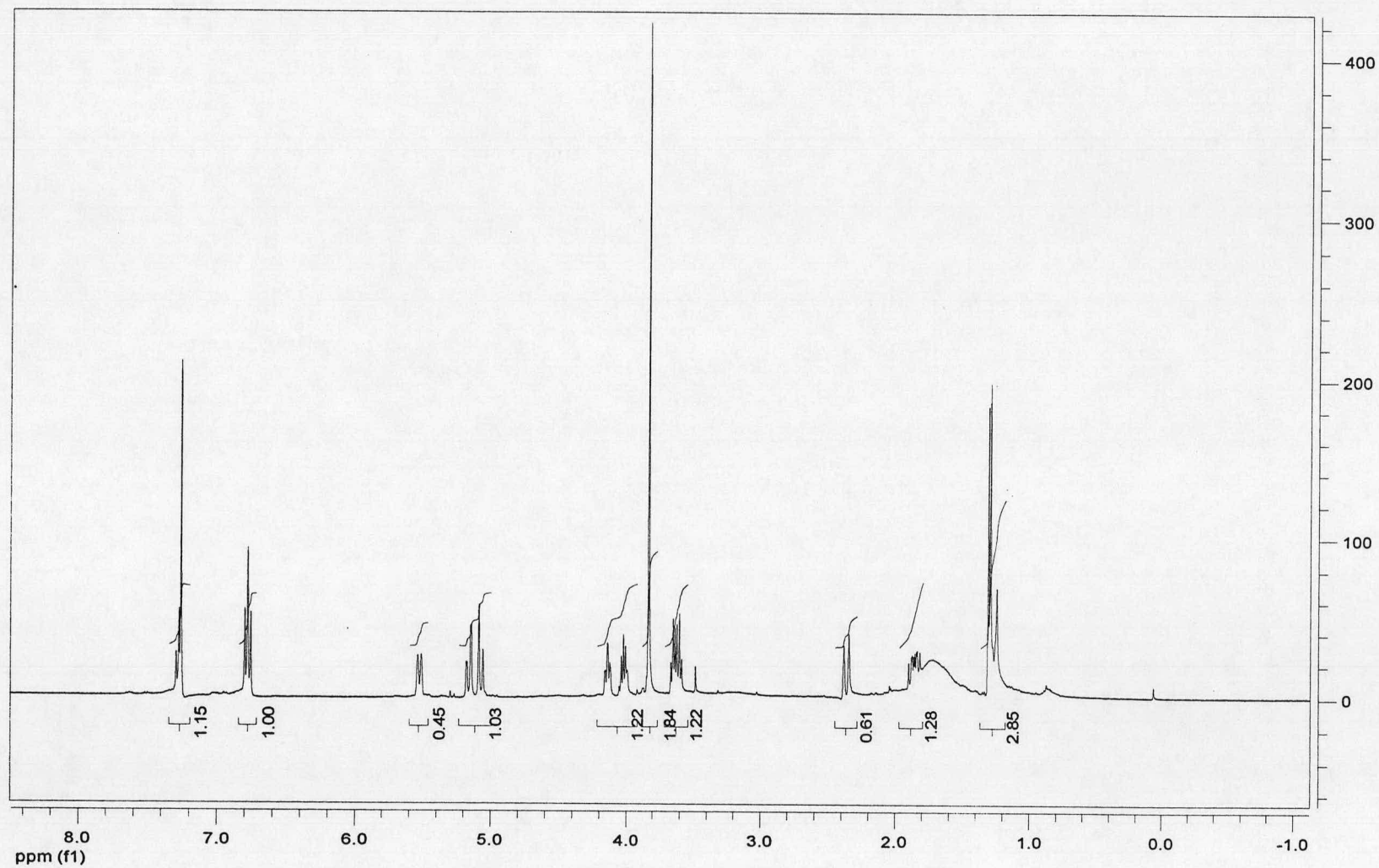


Figure B31 The  $^1\text{H-NMR}$  spectrum of compound D2

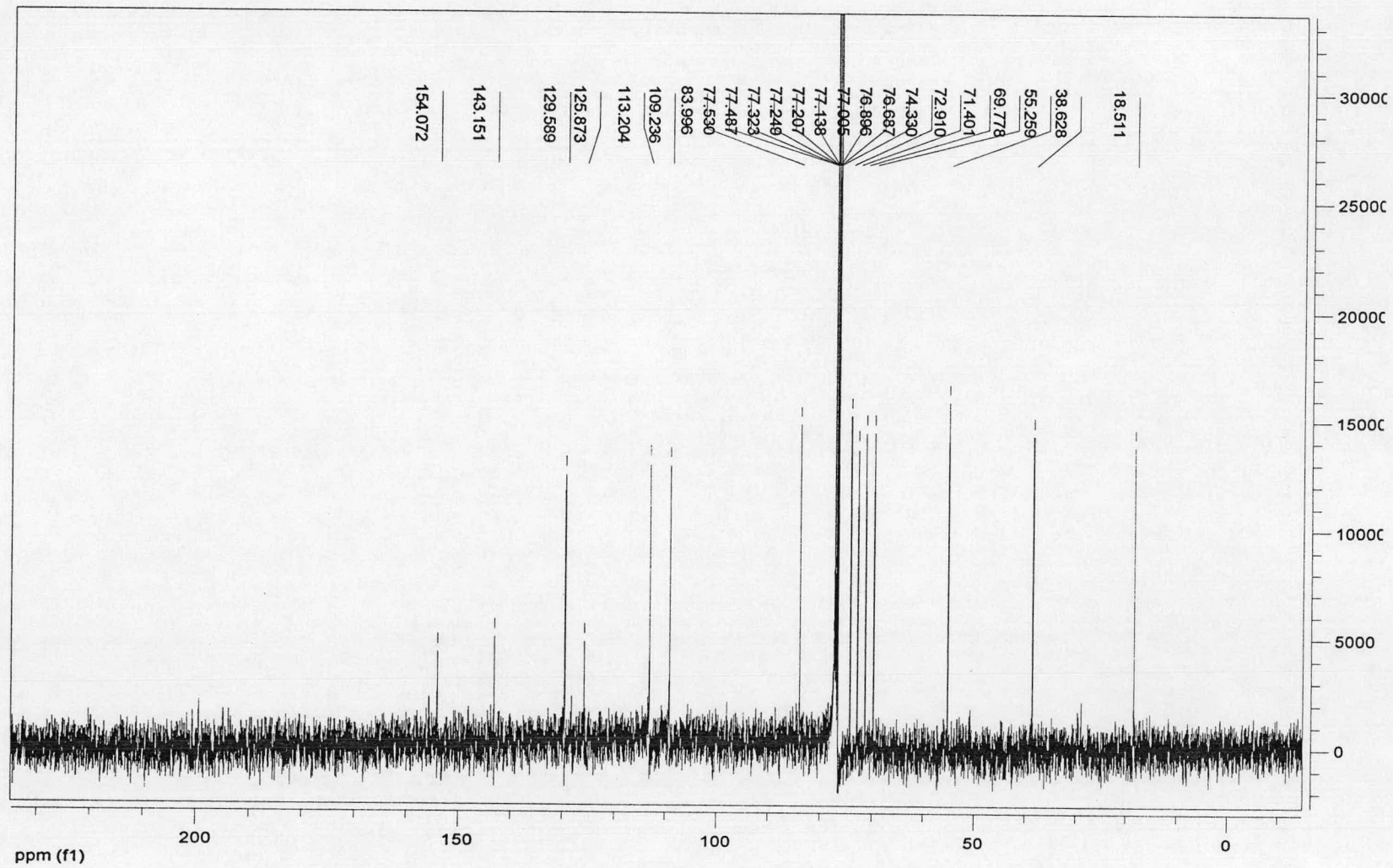


Figure B32 The  $^{13}\text{C}$ -NMR spectrum of compound D2

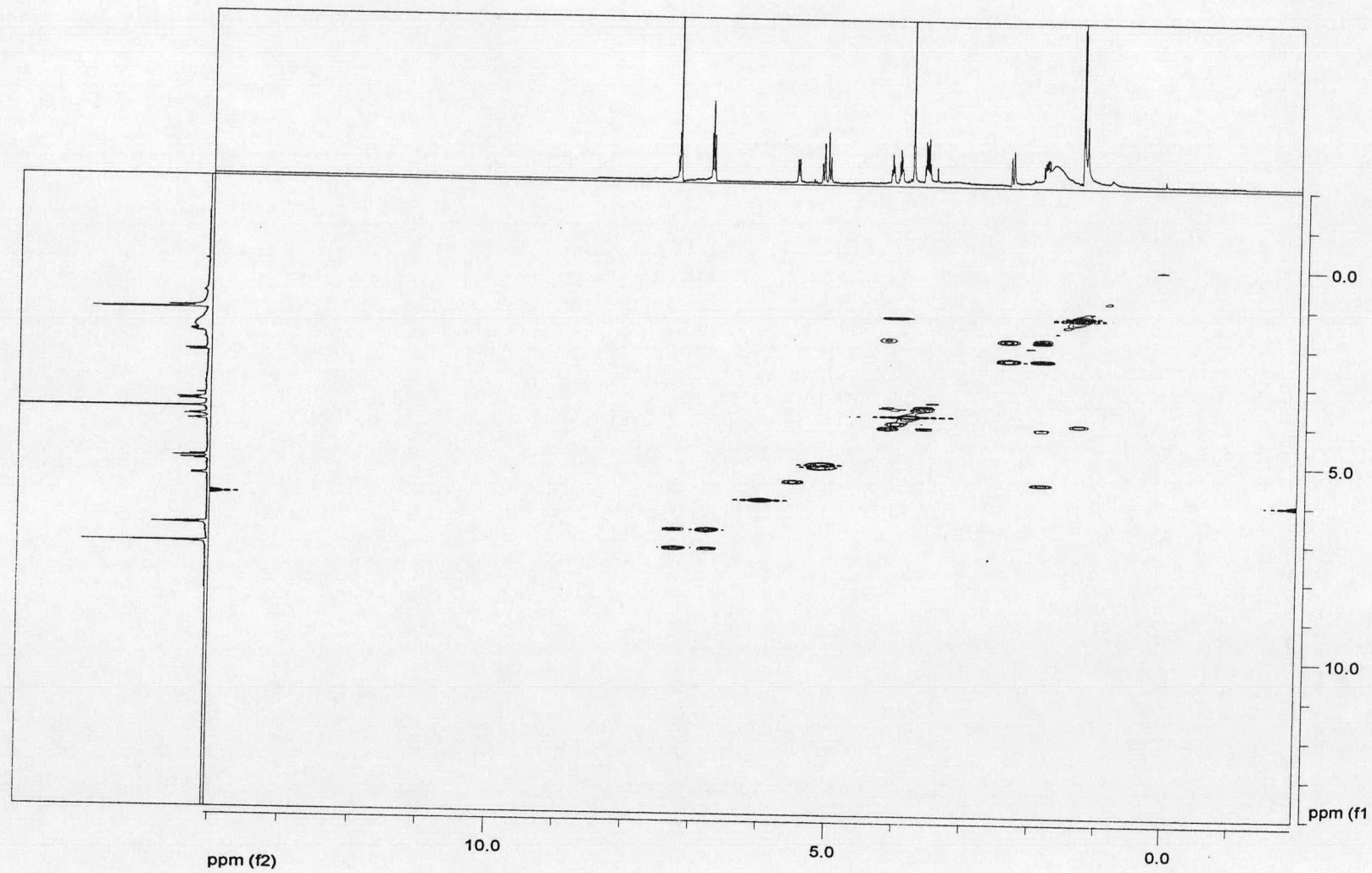


Figure B33 The gCOSY spectrum of compound D2

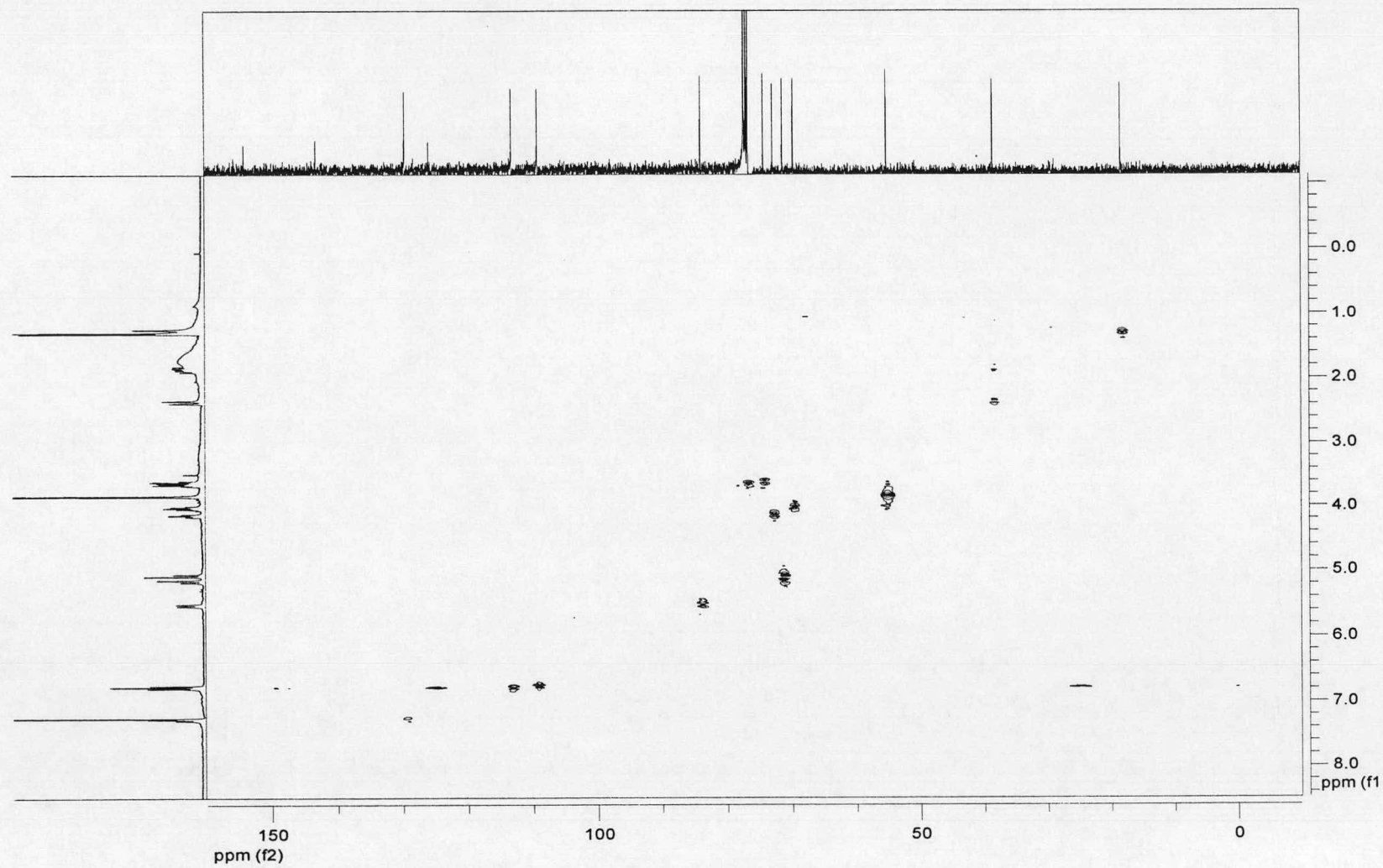


Figure B34 The gHSQC spectrum of compound D2

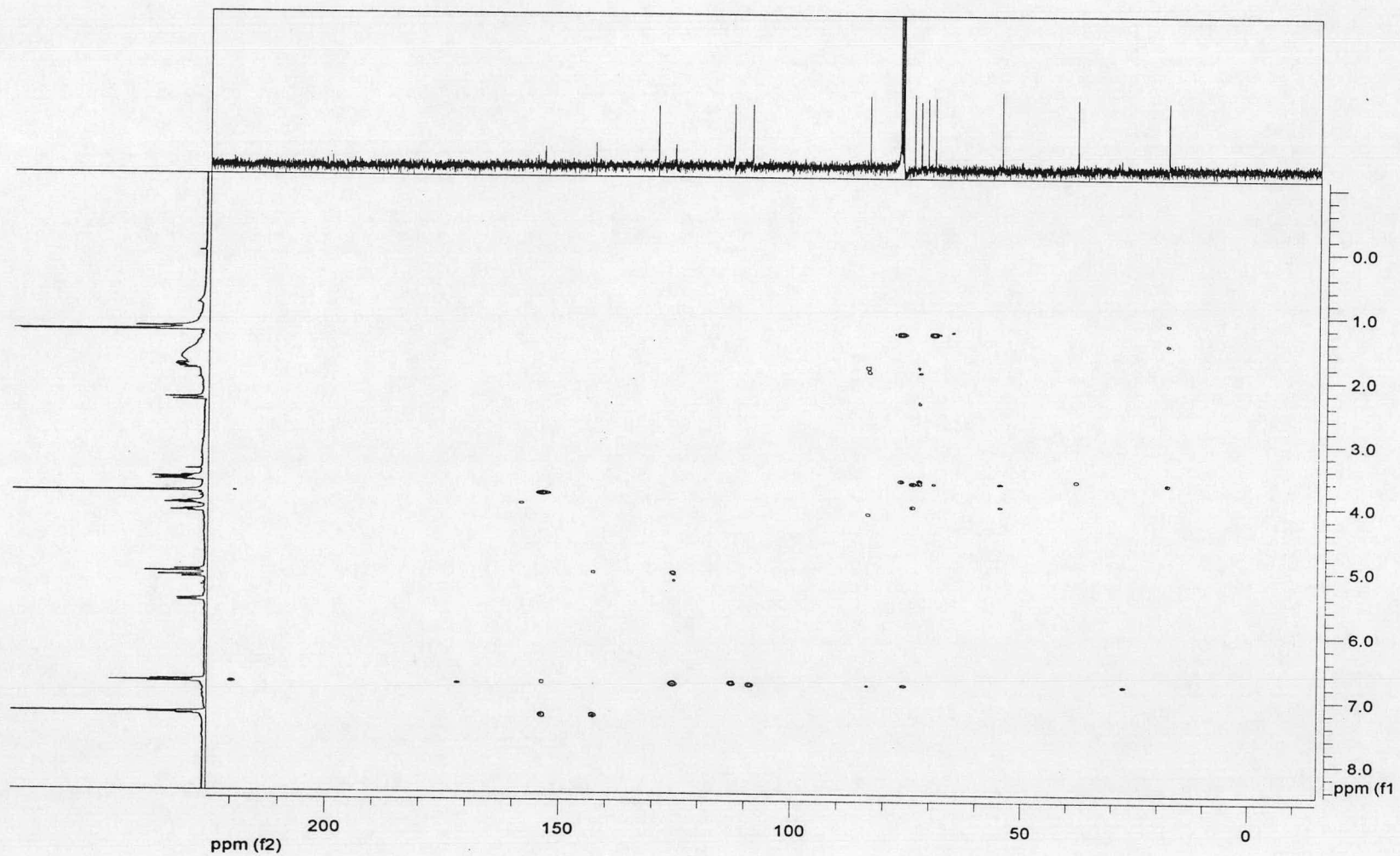


Figure B35 The gHMBC spectrum of compound D2



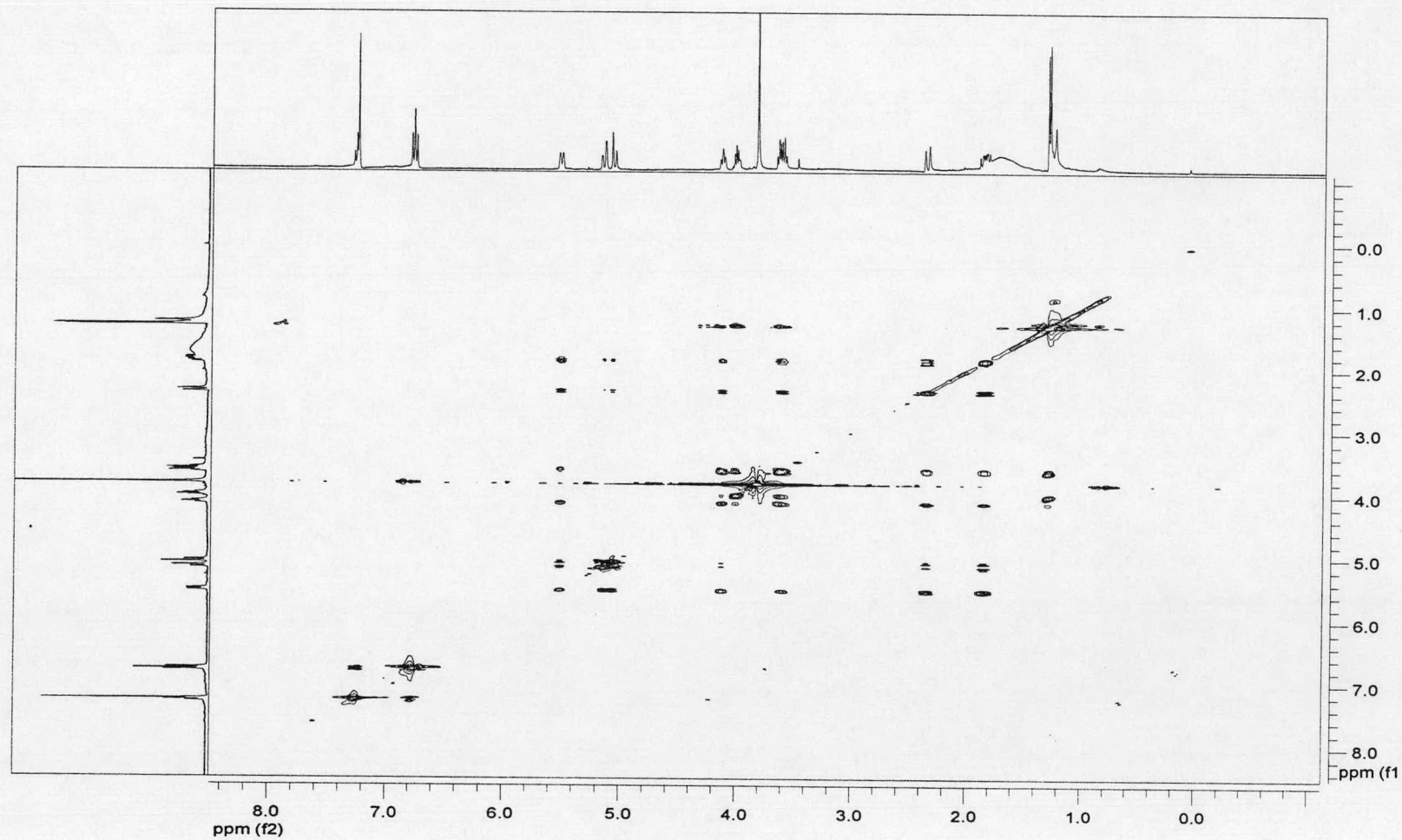


Figure B36 The TOCSY spectrum of compound D2

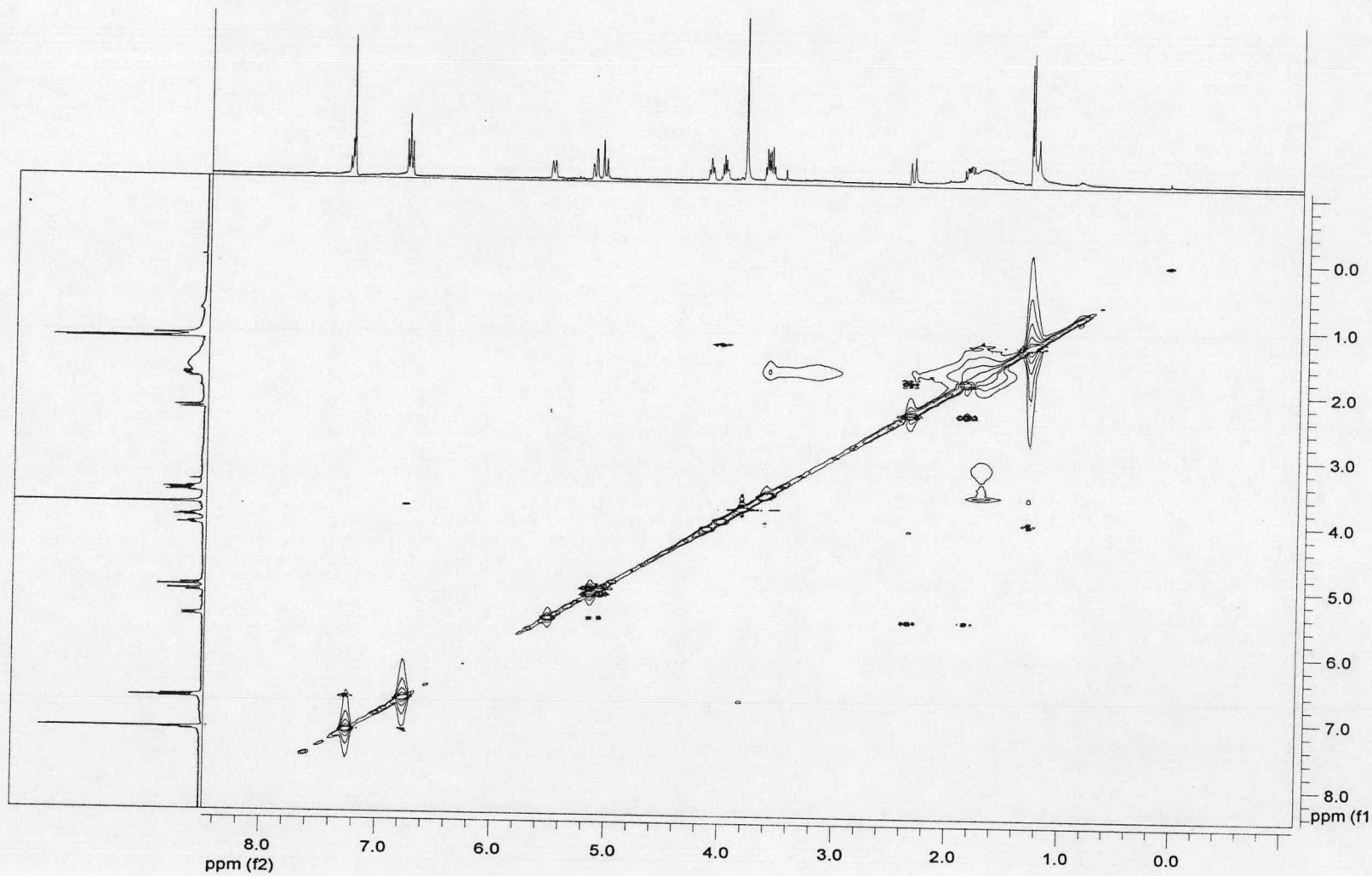


Figure B37 The NOESY spectrum of compound D2

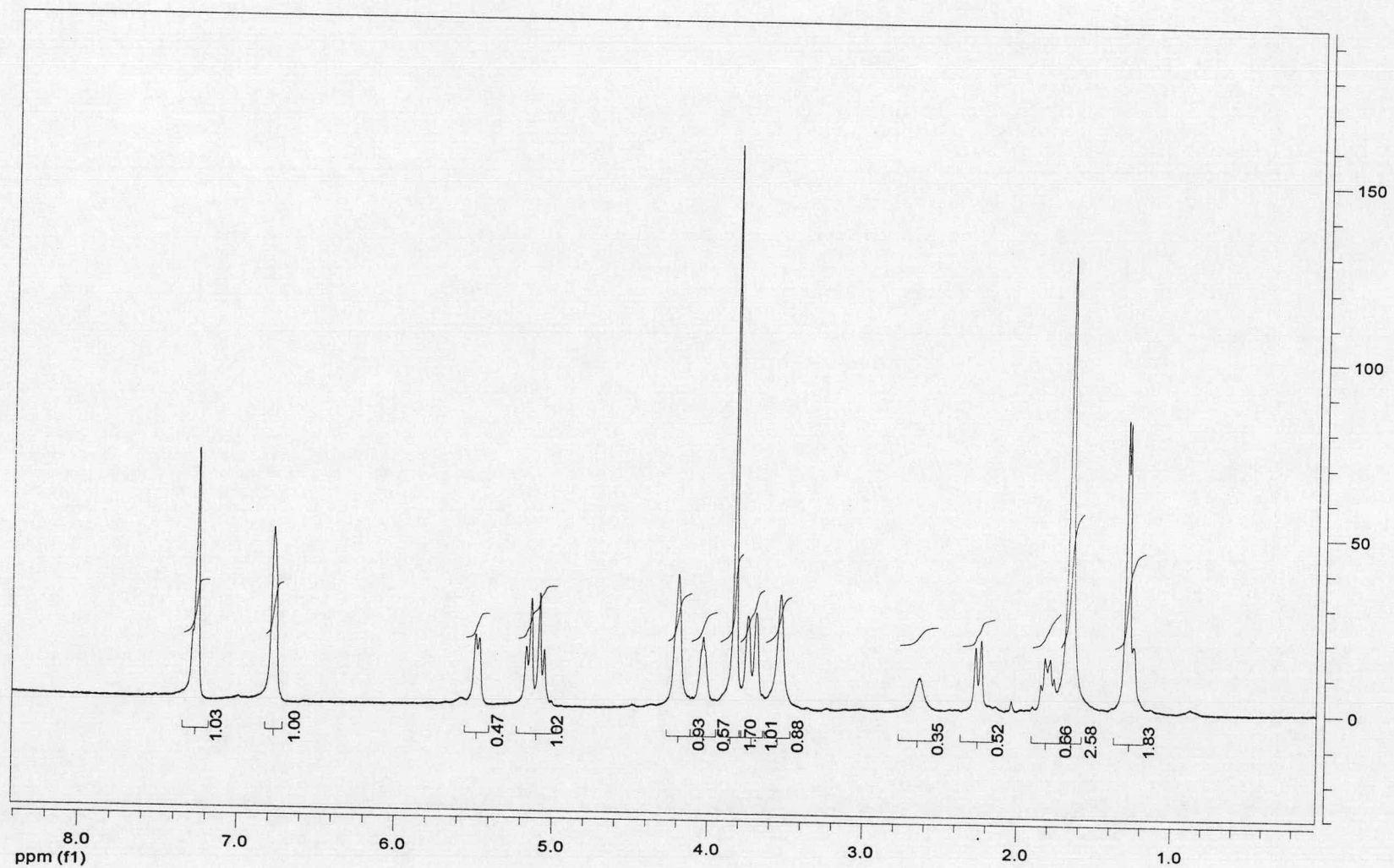


Figure B38 The  $^1\text{H-NMR}$  spectrum of compound D3

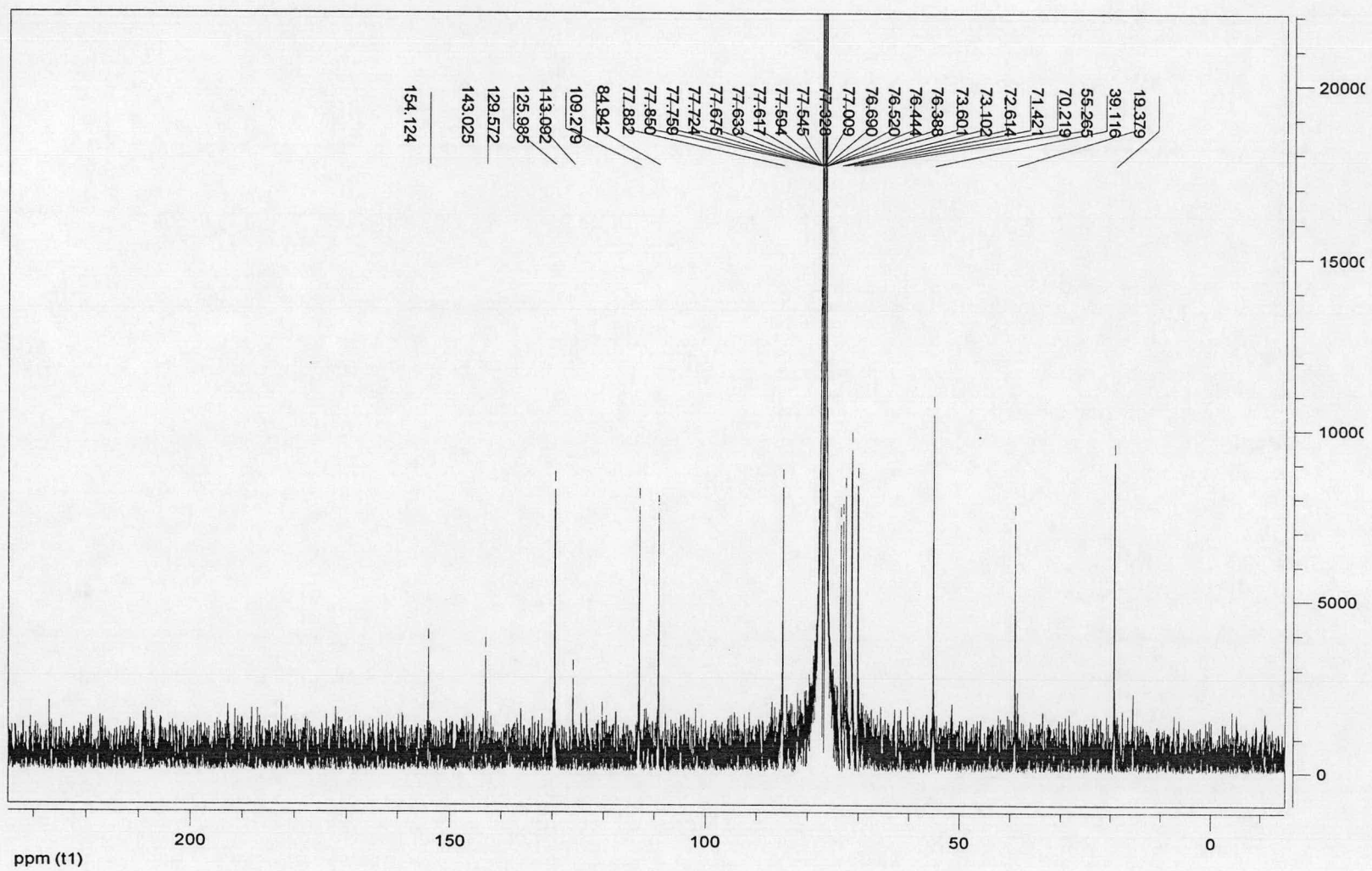


Figure B39 The  $^{13}\text{C}$ -NMR spectrum of compound D3

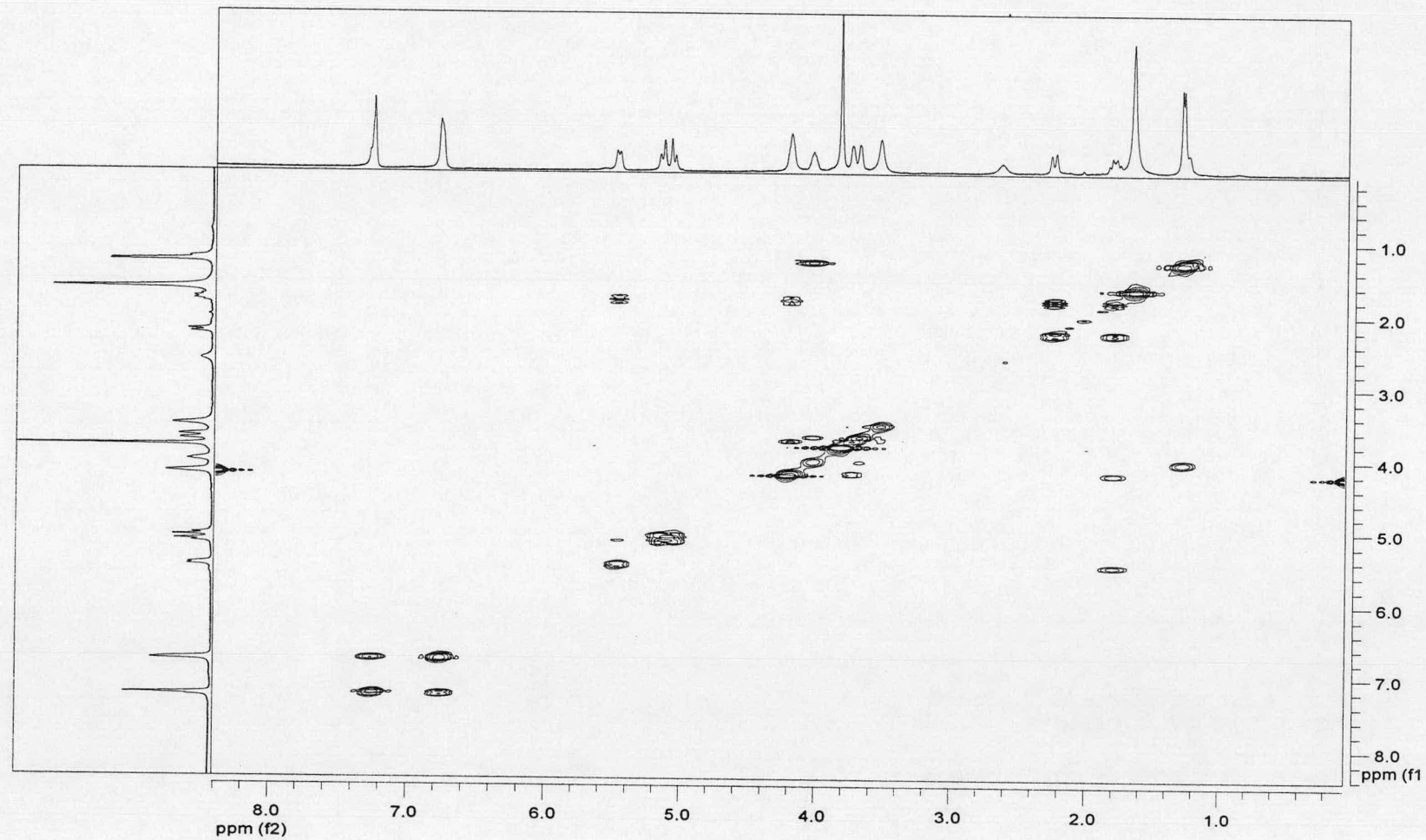


Figure B40 The gCOSY spectrum of compound D3

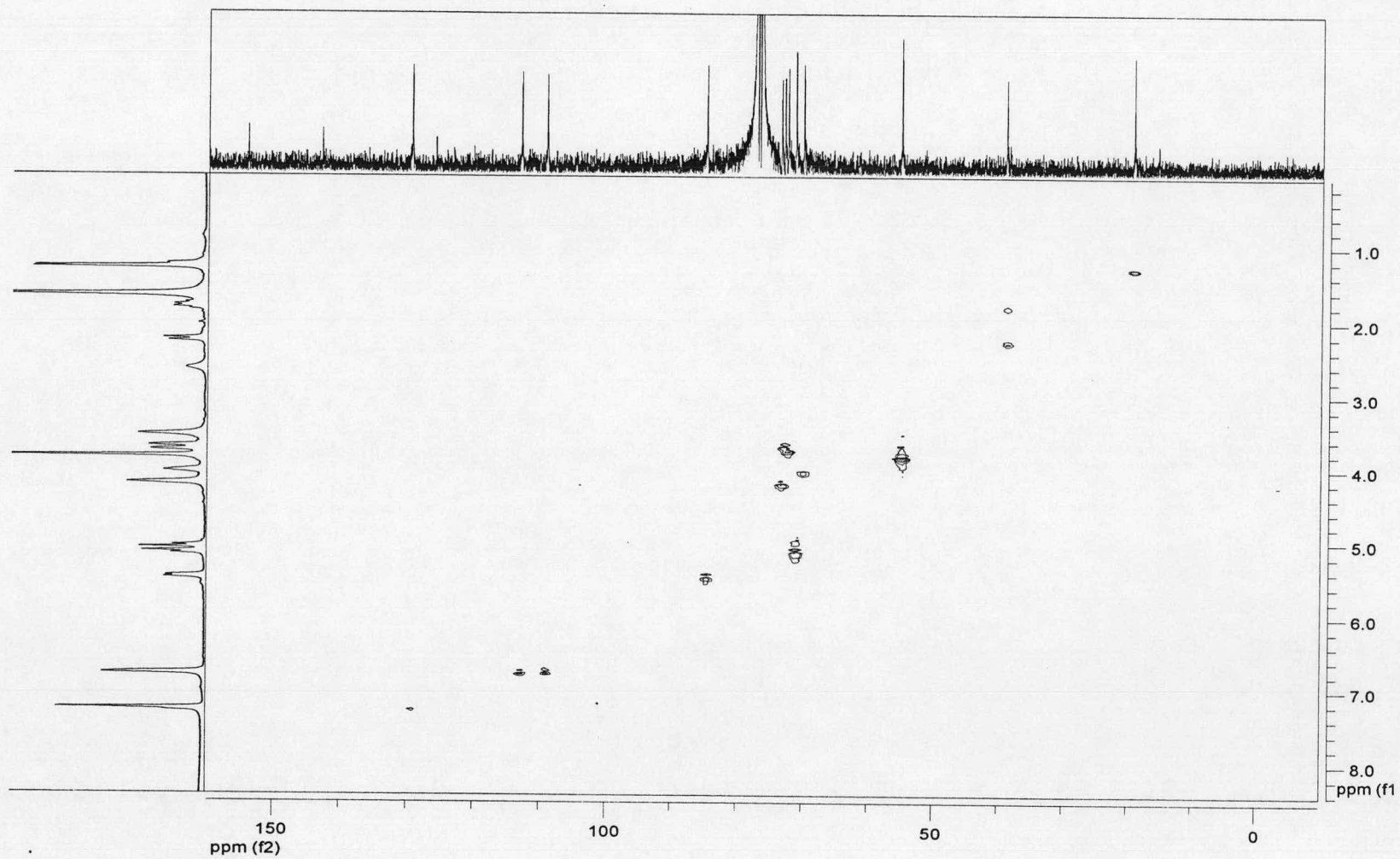


Figure B41 The gHSQC spectrum of compound D3

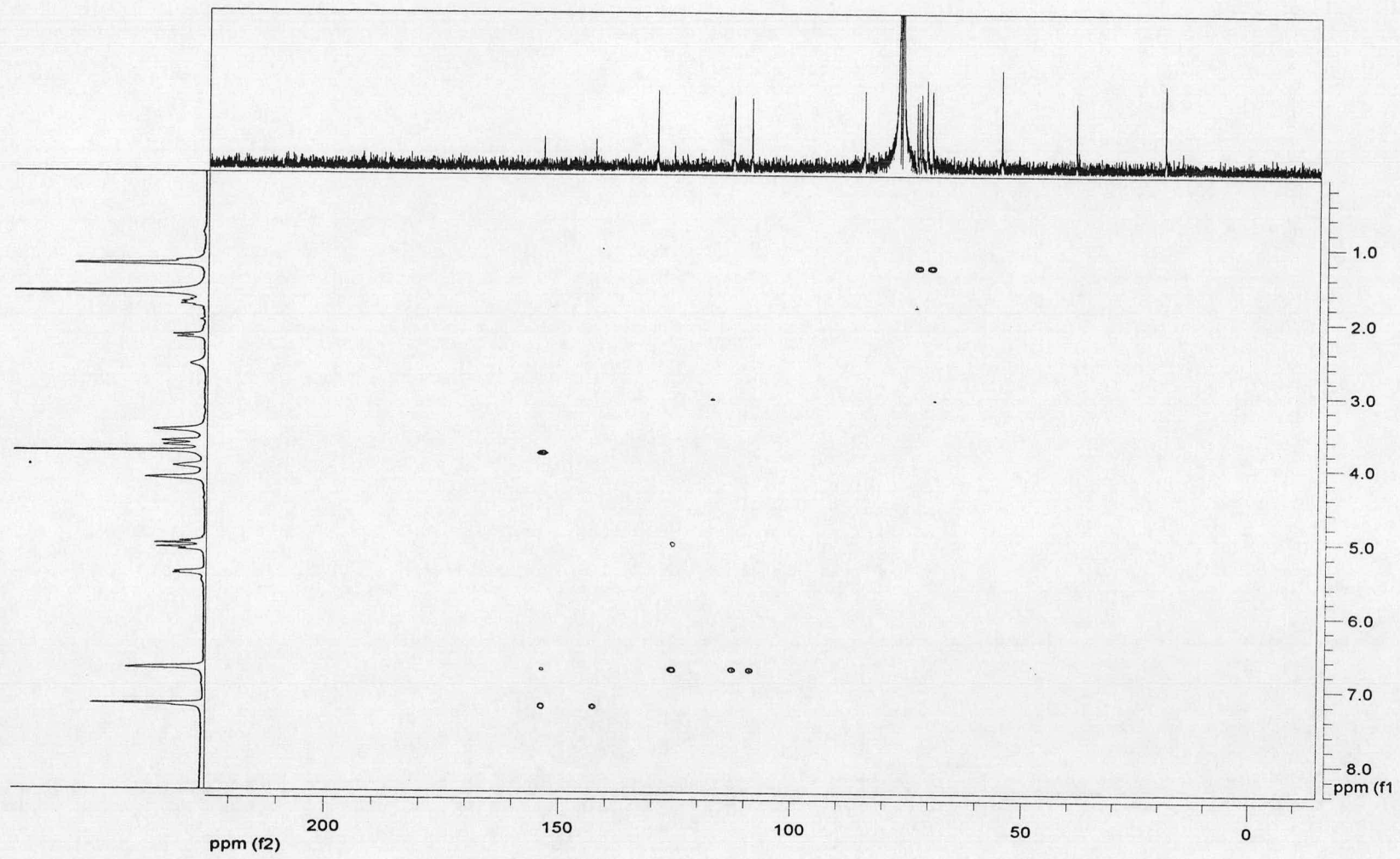


Figure B42 The gHMBC spectrum of compound D3

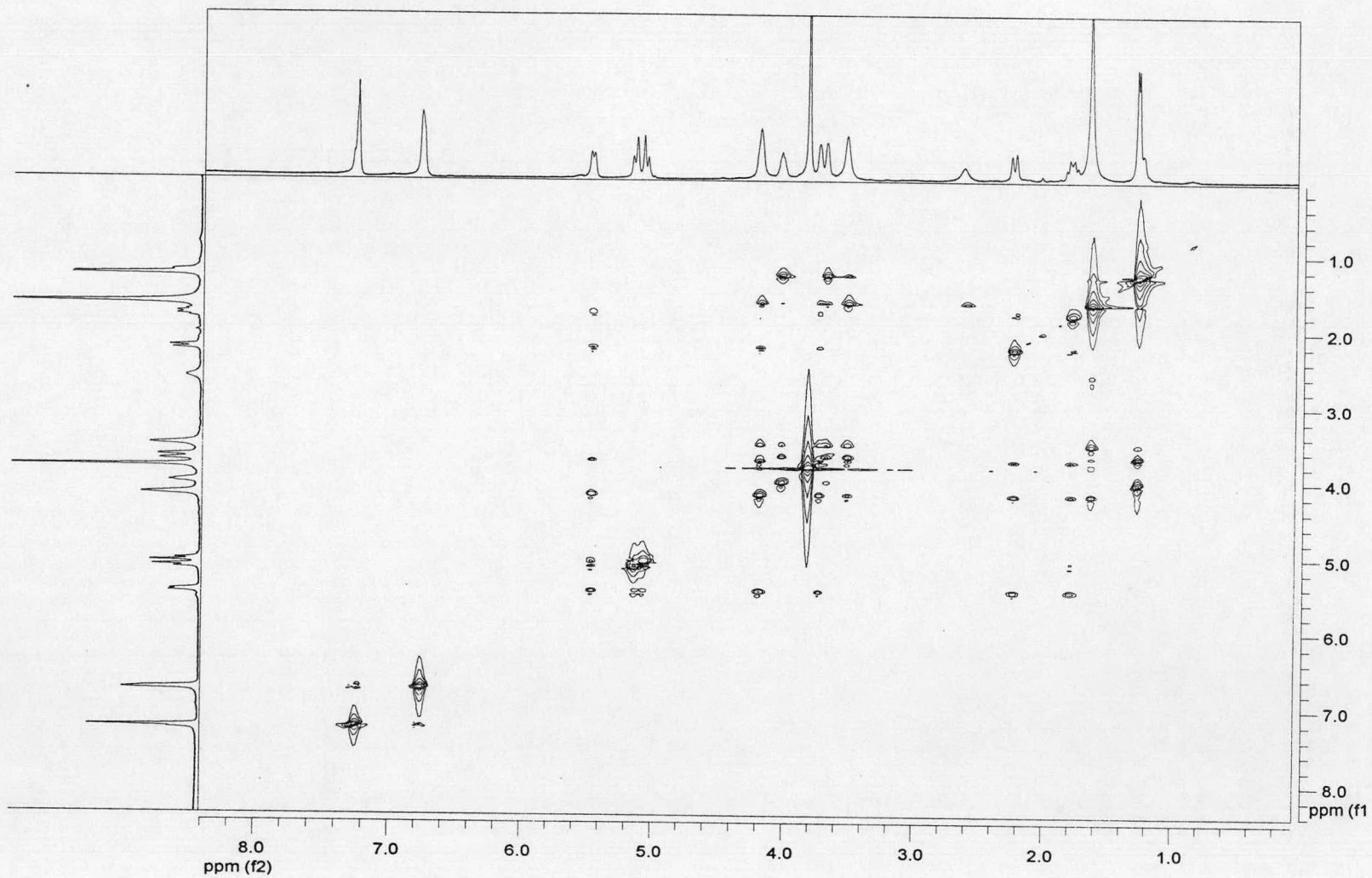


Figure B43 The TOCSY spectrum of compound D3



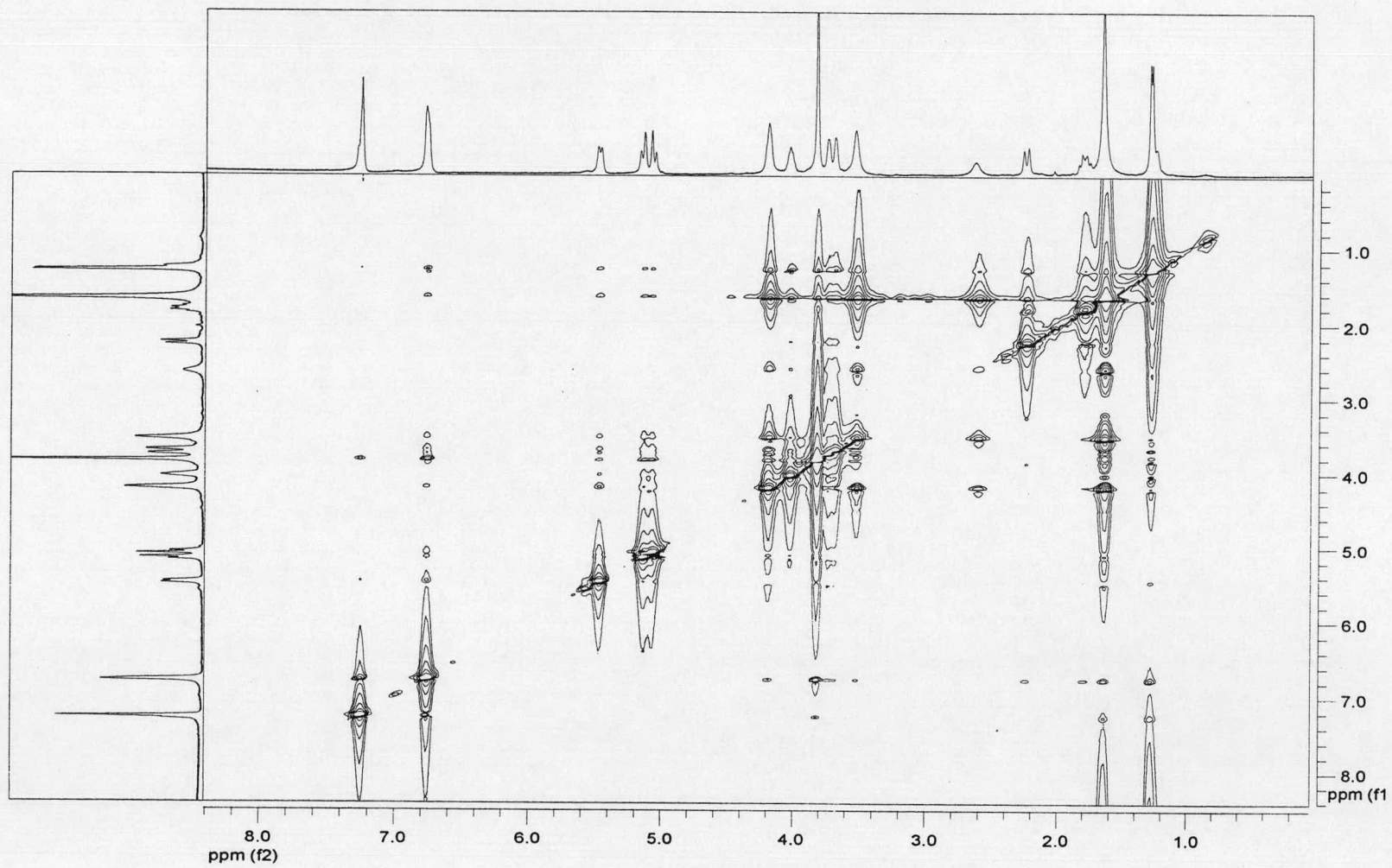


Figure B44 The NOESY spectrum of compound D3

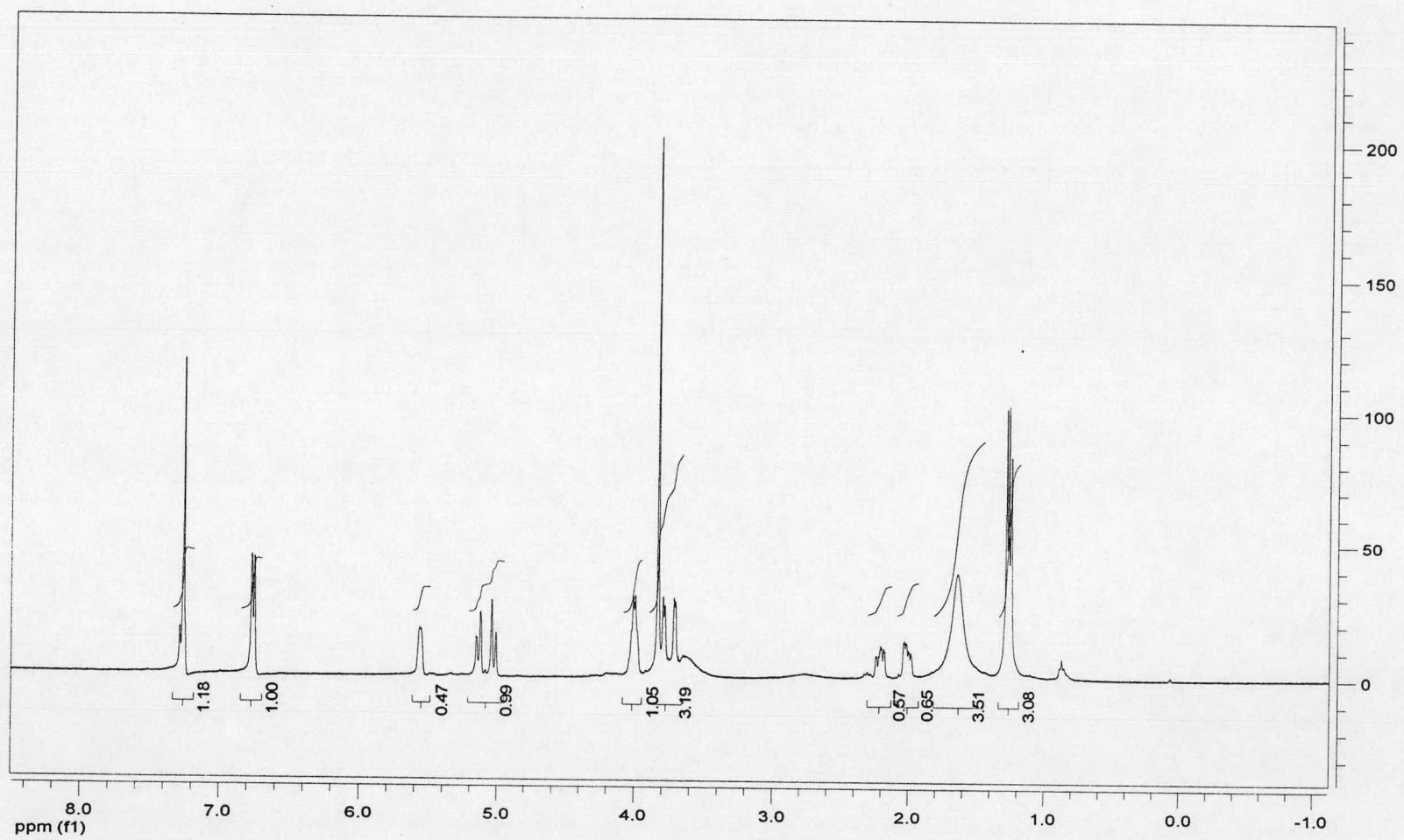


Figure B45 The 1H-NMR spectrum of compound D4

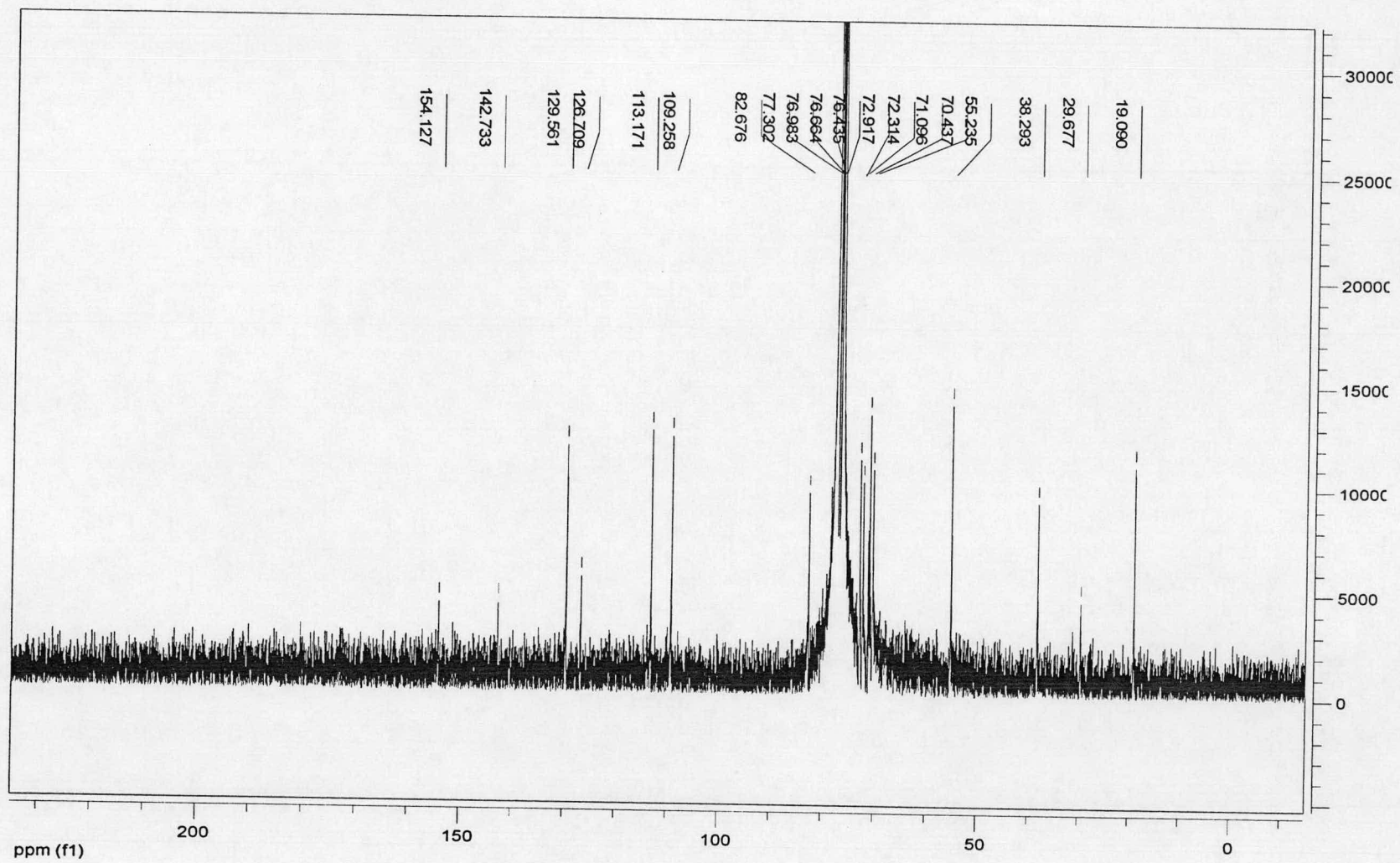


Figure B46 The  $^{13}\text{C}$ -NMR spectrum of compound D4

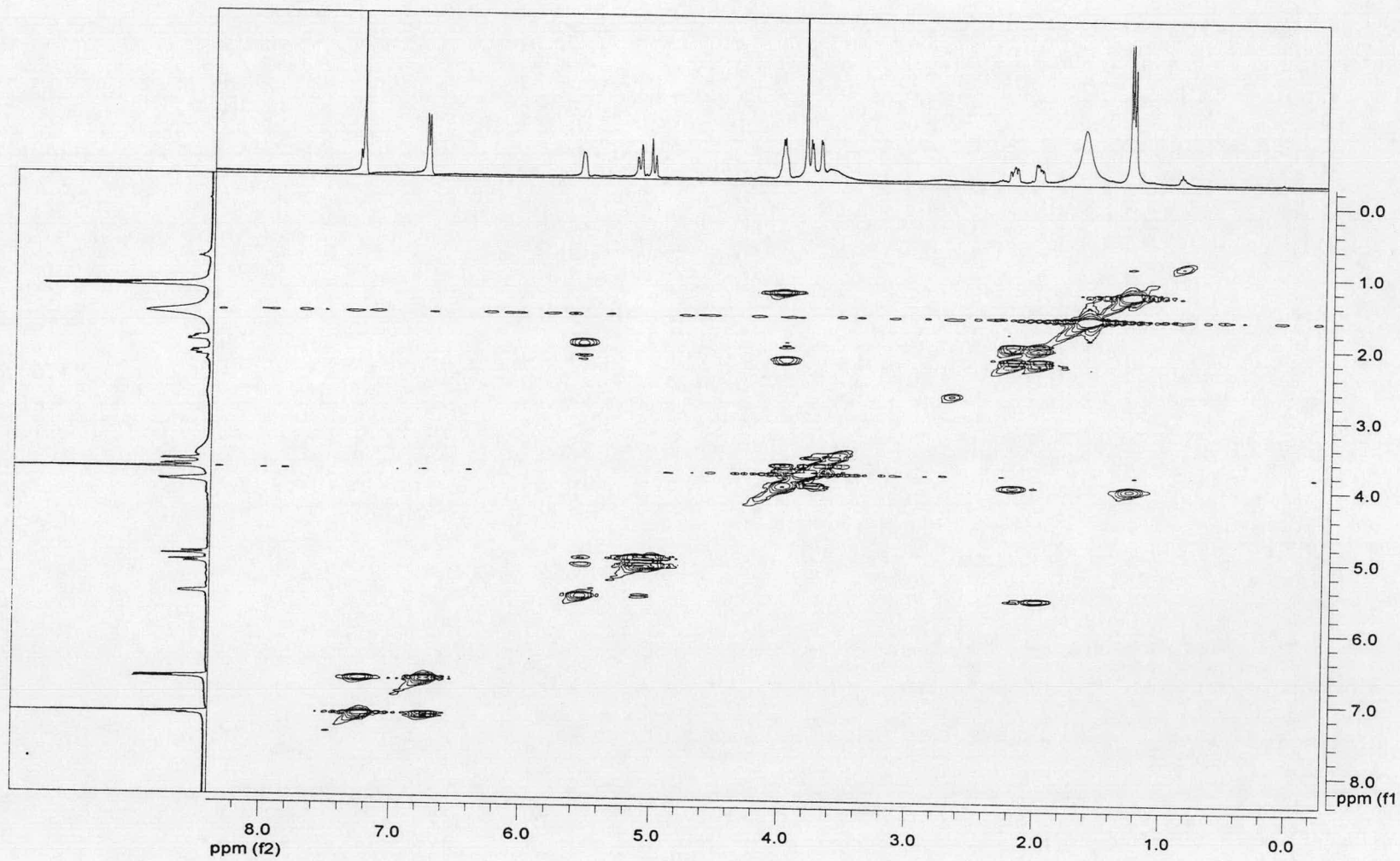


Figure B47 The gCOSY spectrum of compound D4

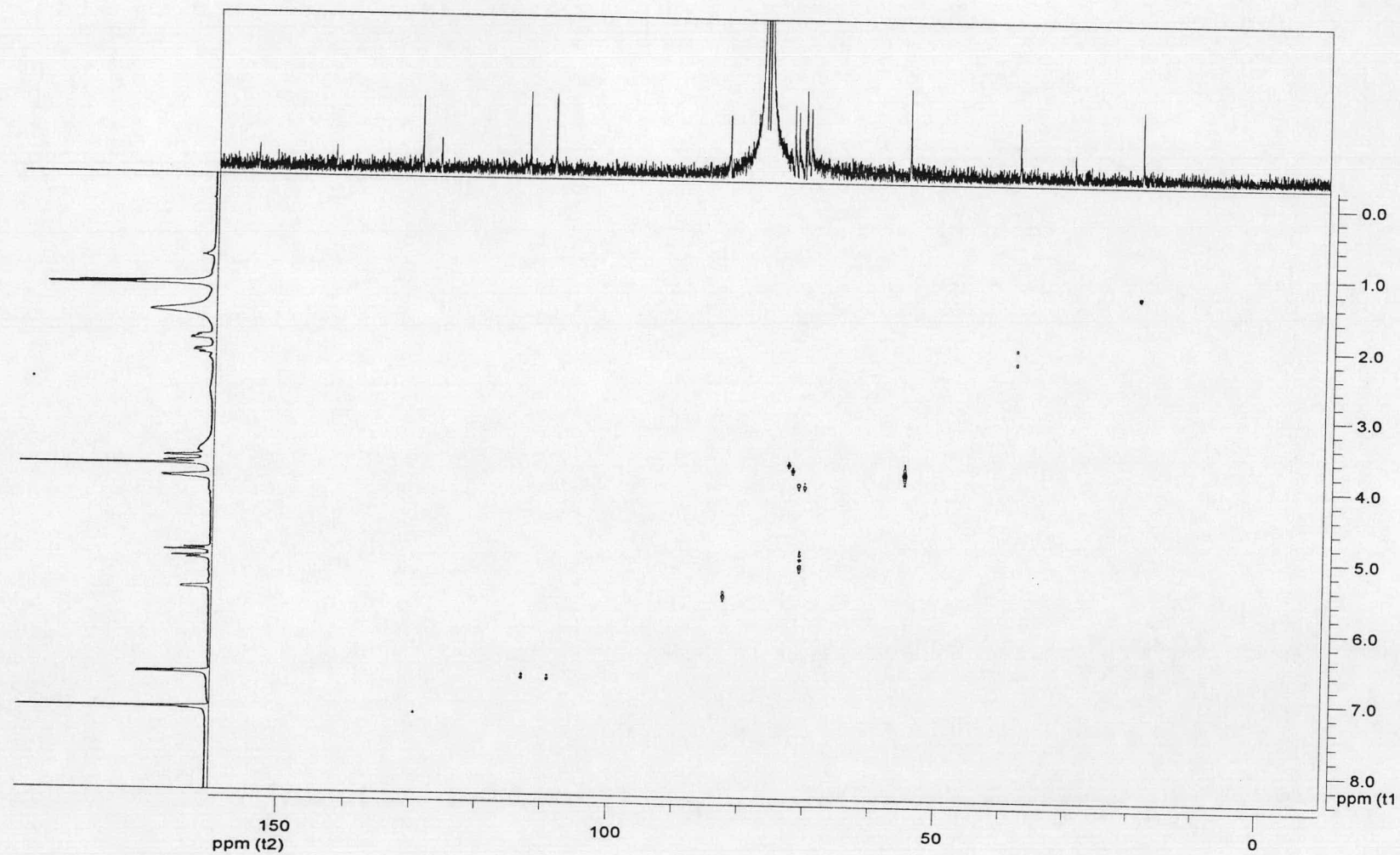


Figure B48 The gHSQC spectrum of compound D4

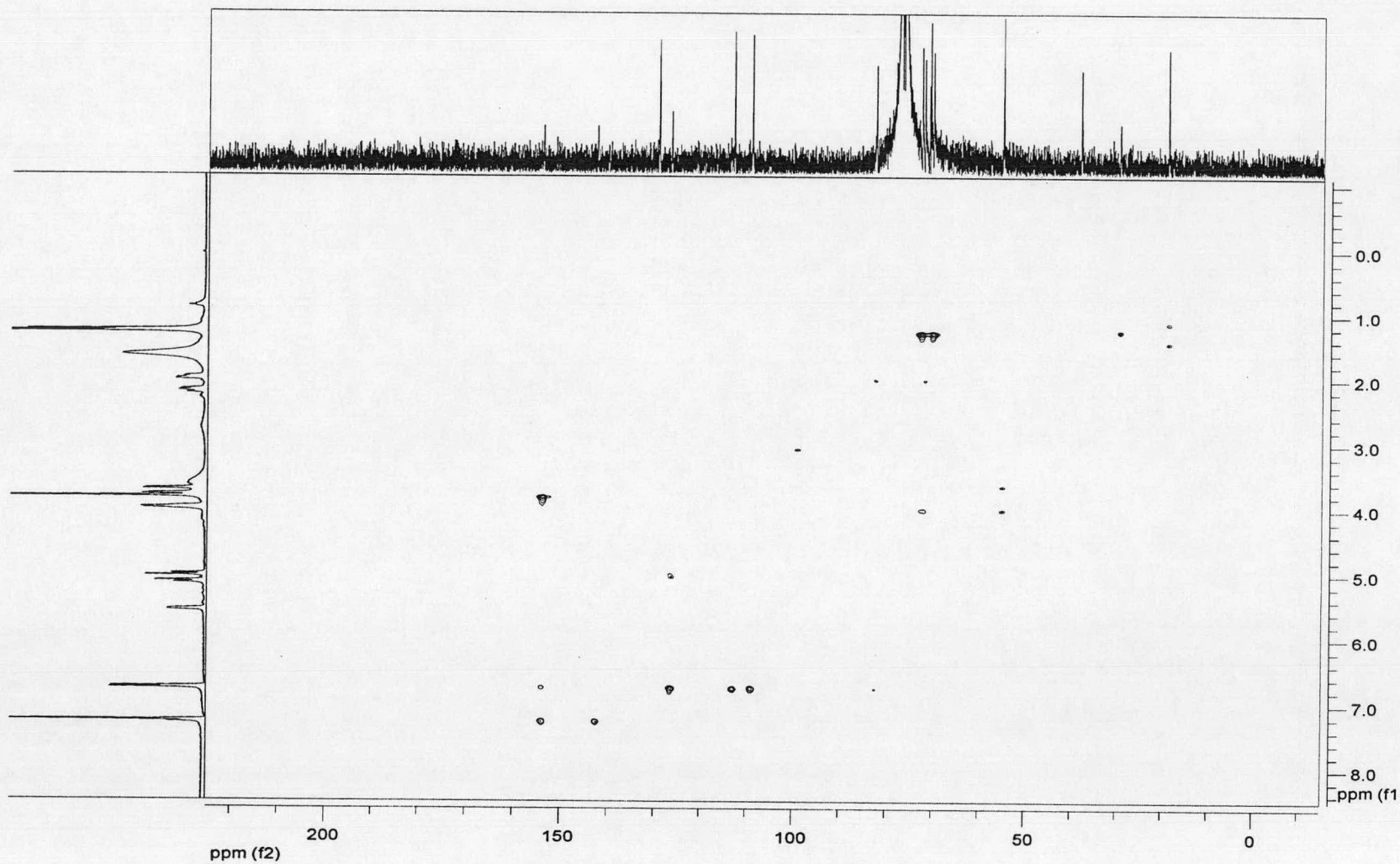


Figure B49 The gHMBC spectrum of compound D4

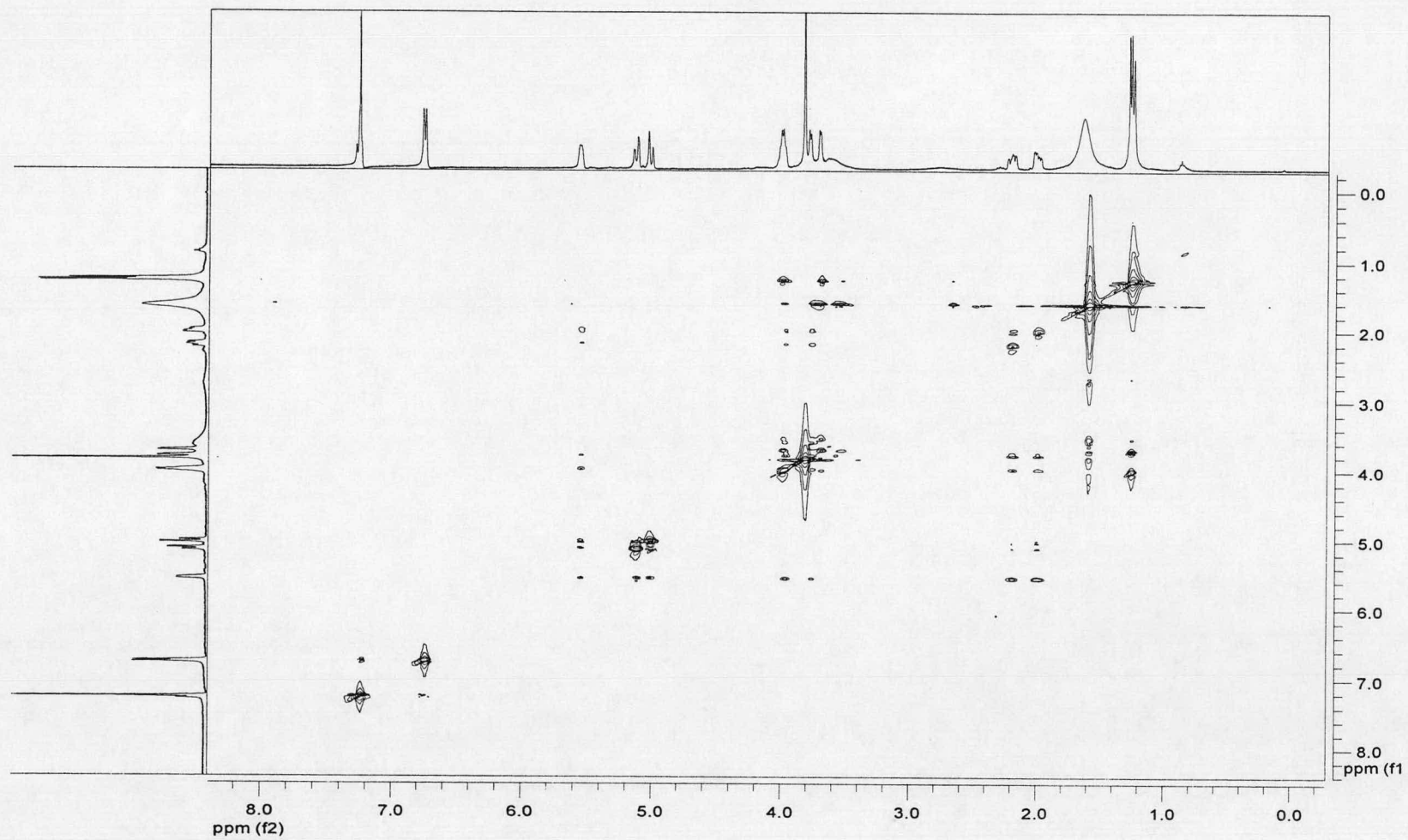


Figure B50 The TOCSY spectrum of compound D4

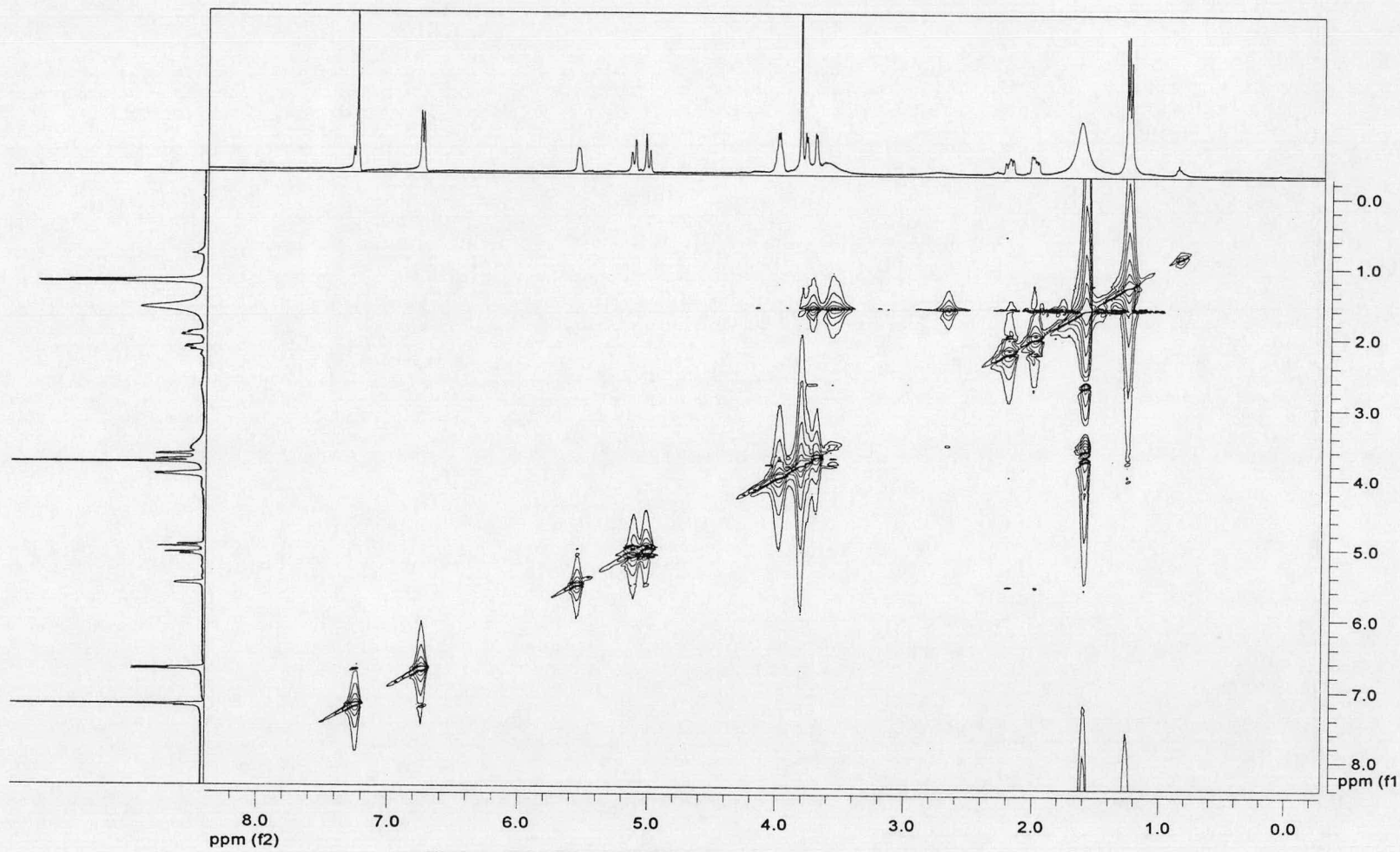


Figure B51 The NOESY spectrum of compound D4



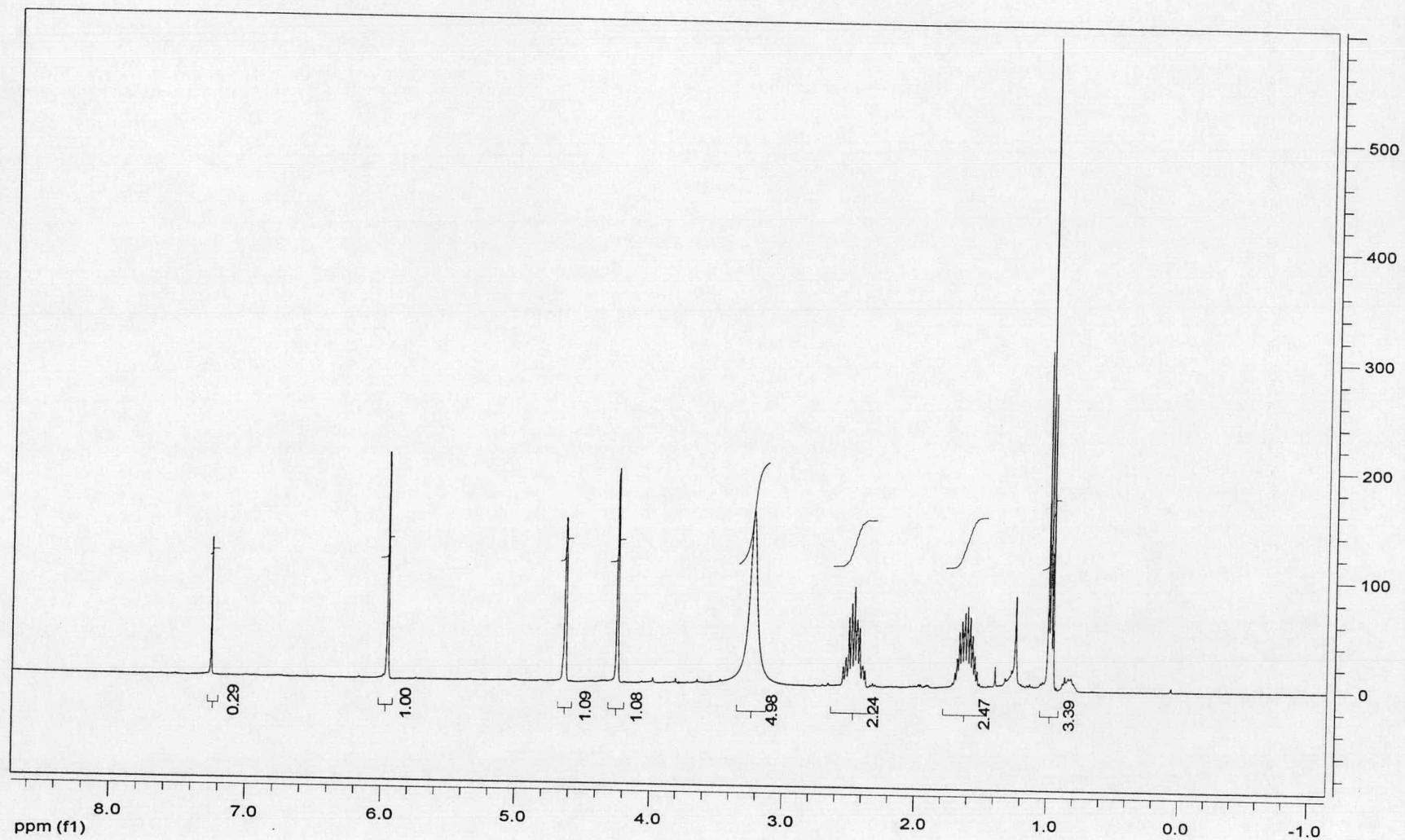


Figure B52  $^1\text{H-NMR}$  spectrum of compound E

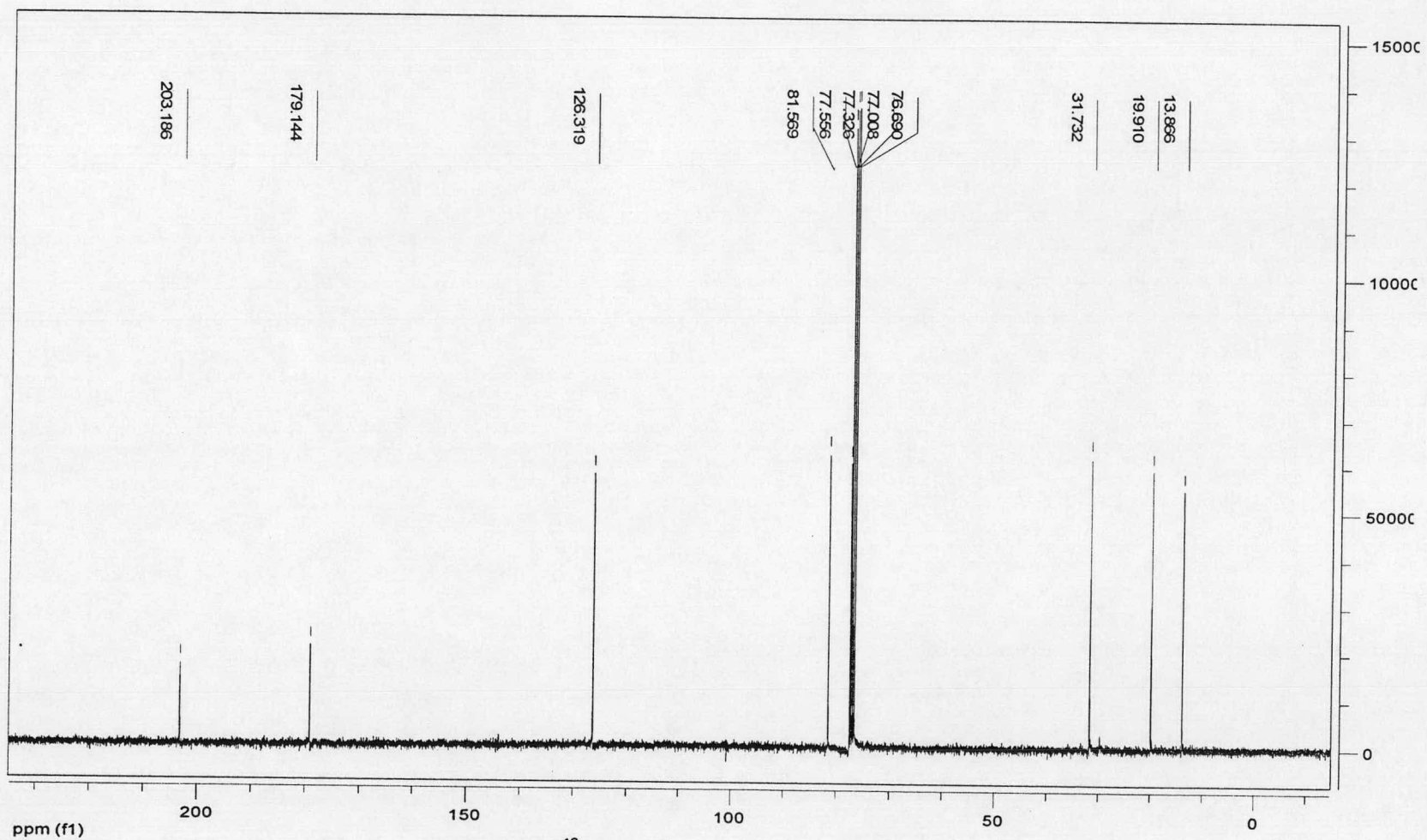


Figure B53  $^{13}\text{C}$ -NMR spectrum of compound E

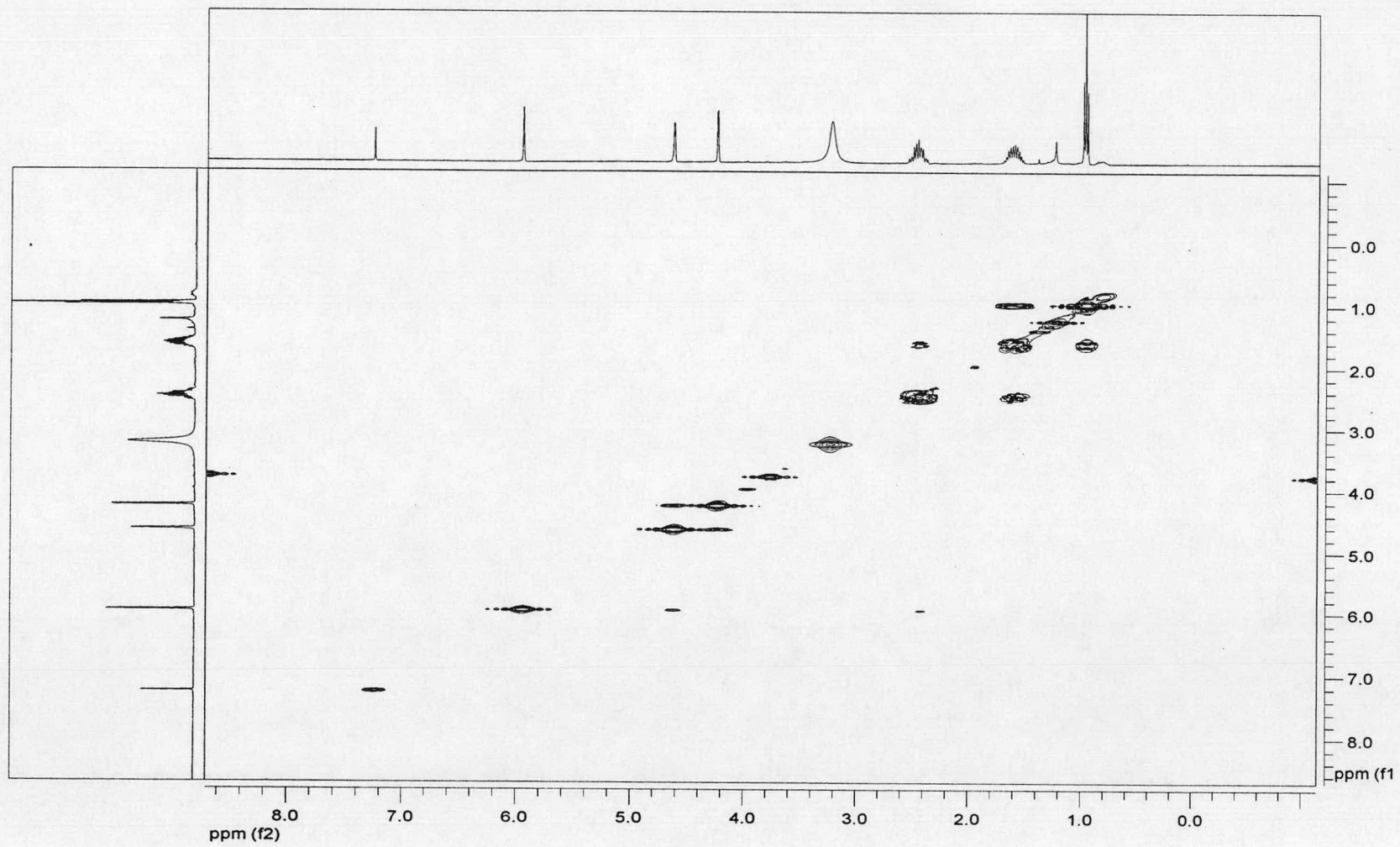


Figure B54 The gCOSY spectrum of compound E

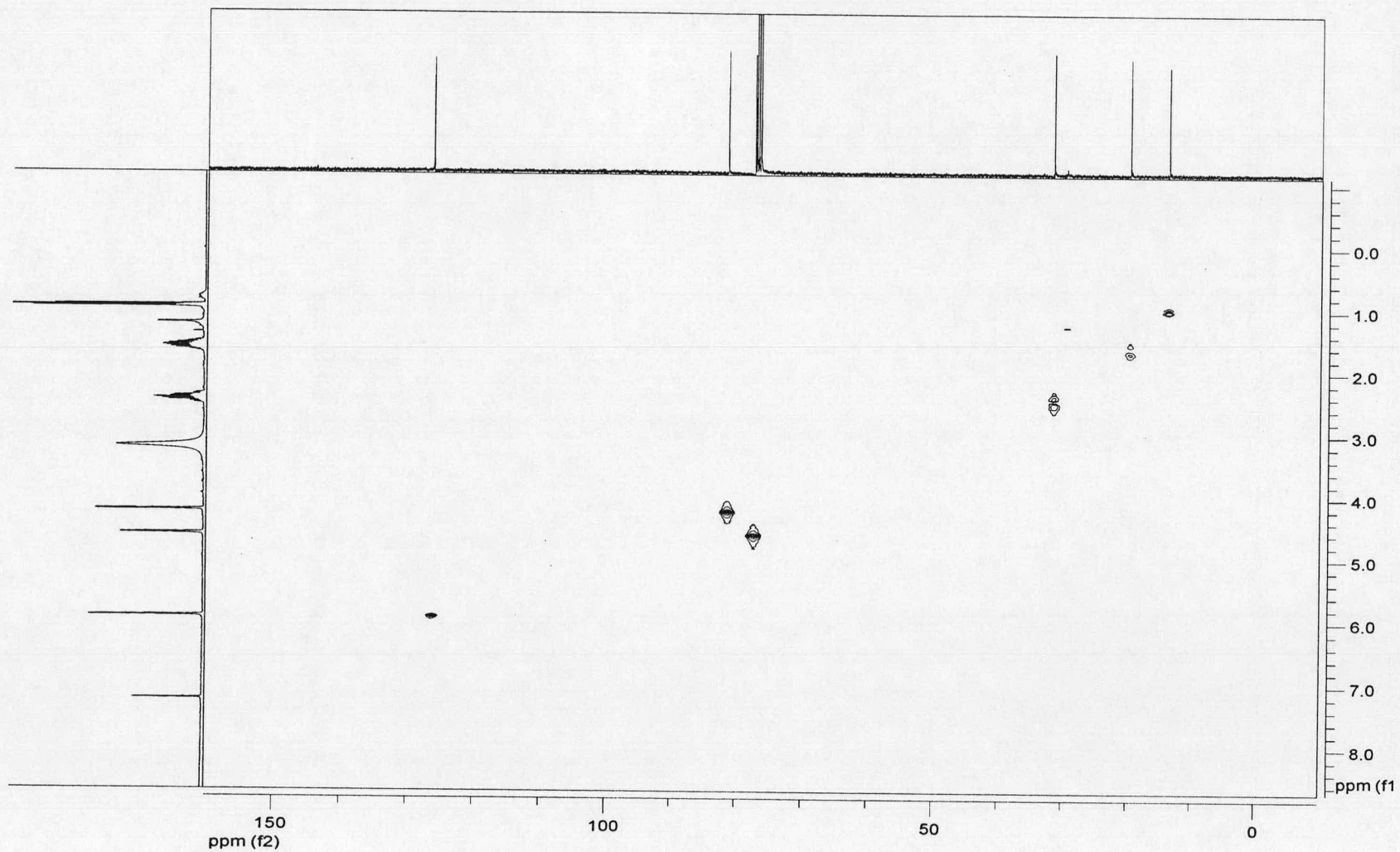


Figure B55 The gHSQC spectrum of compound E

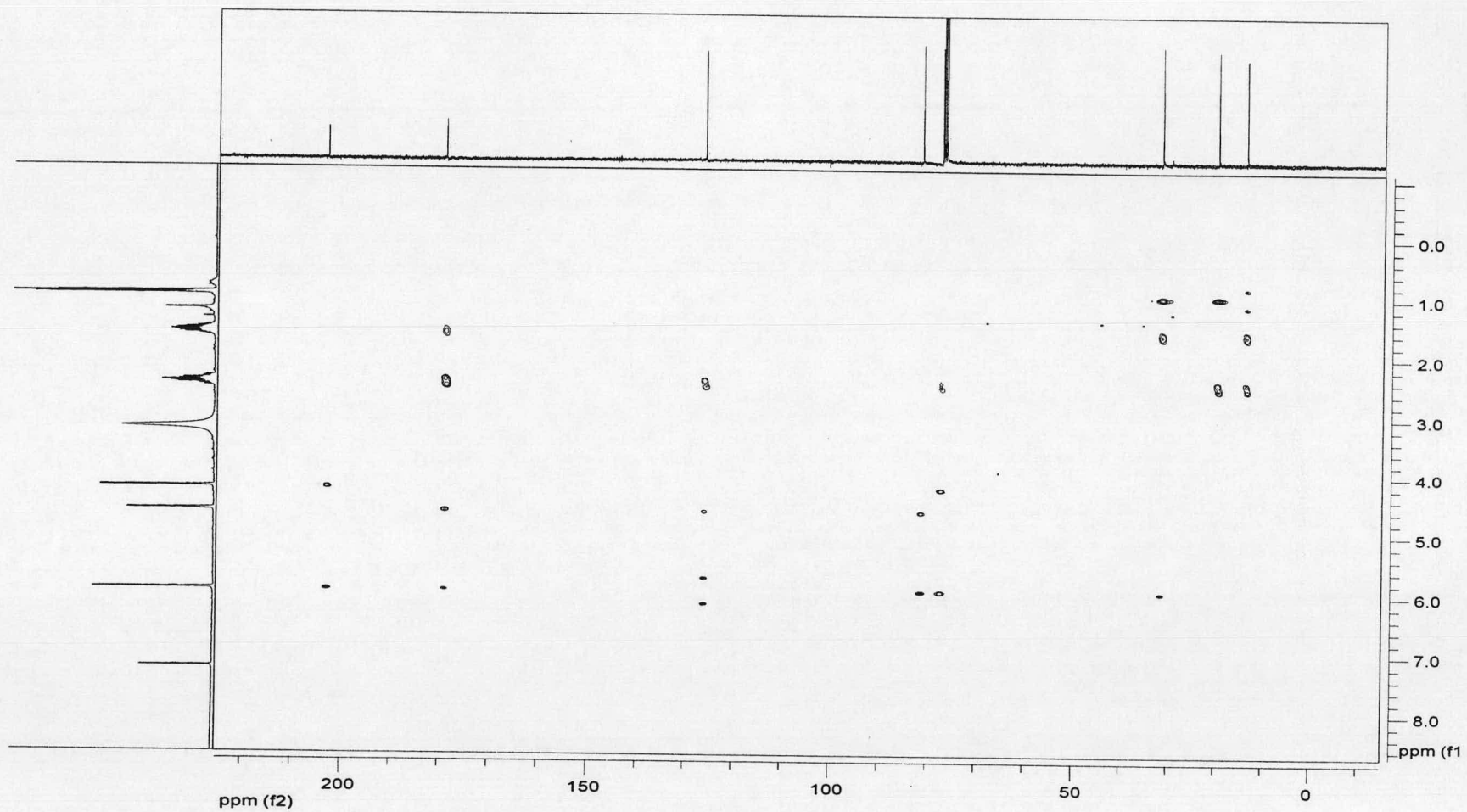


Figure B56 The gHMBC spectrum of compound E

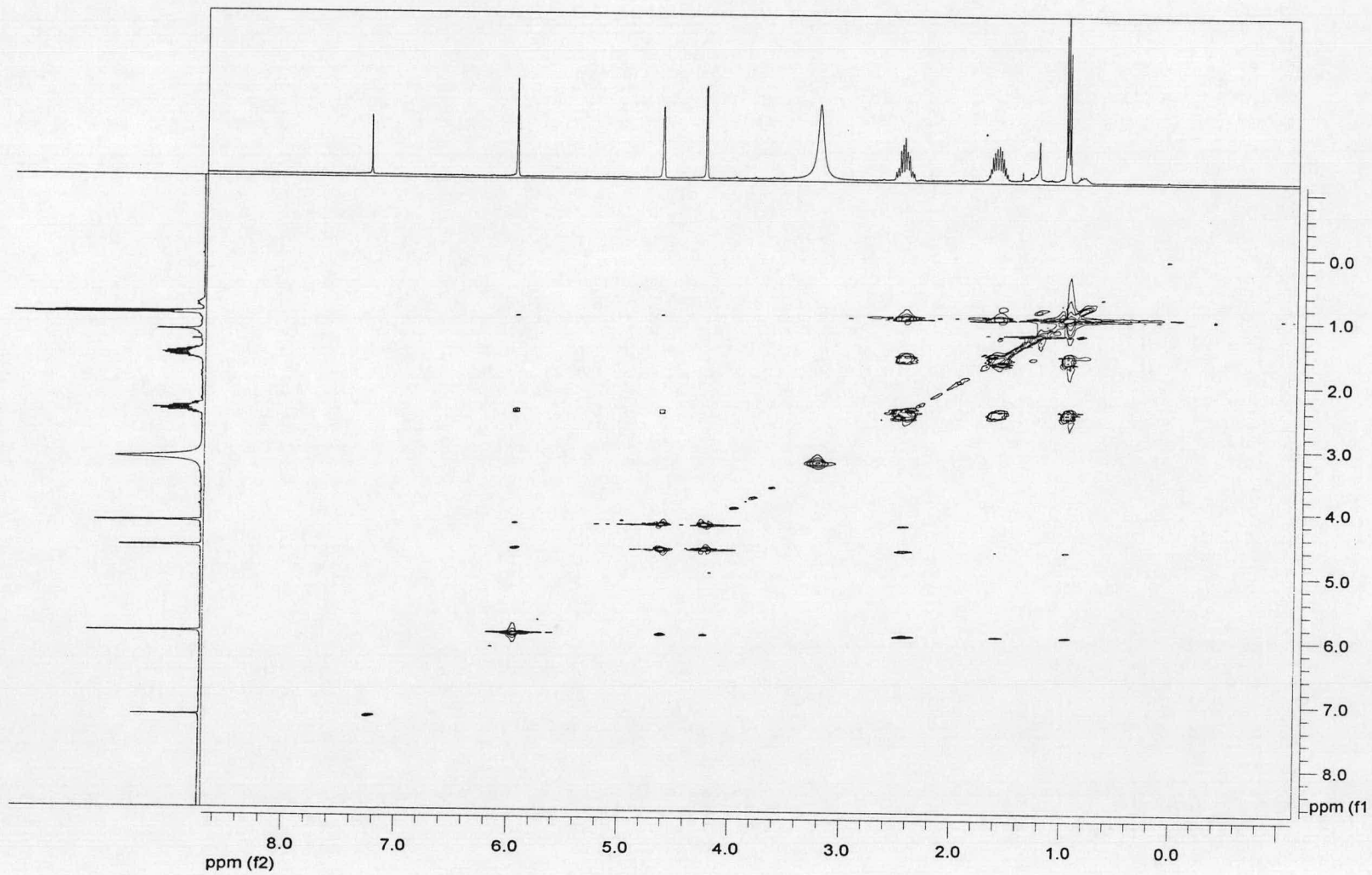


Figure B57 The TOCSY spectrum of compound E

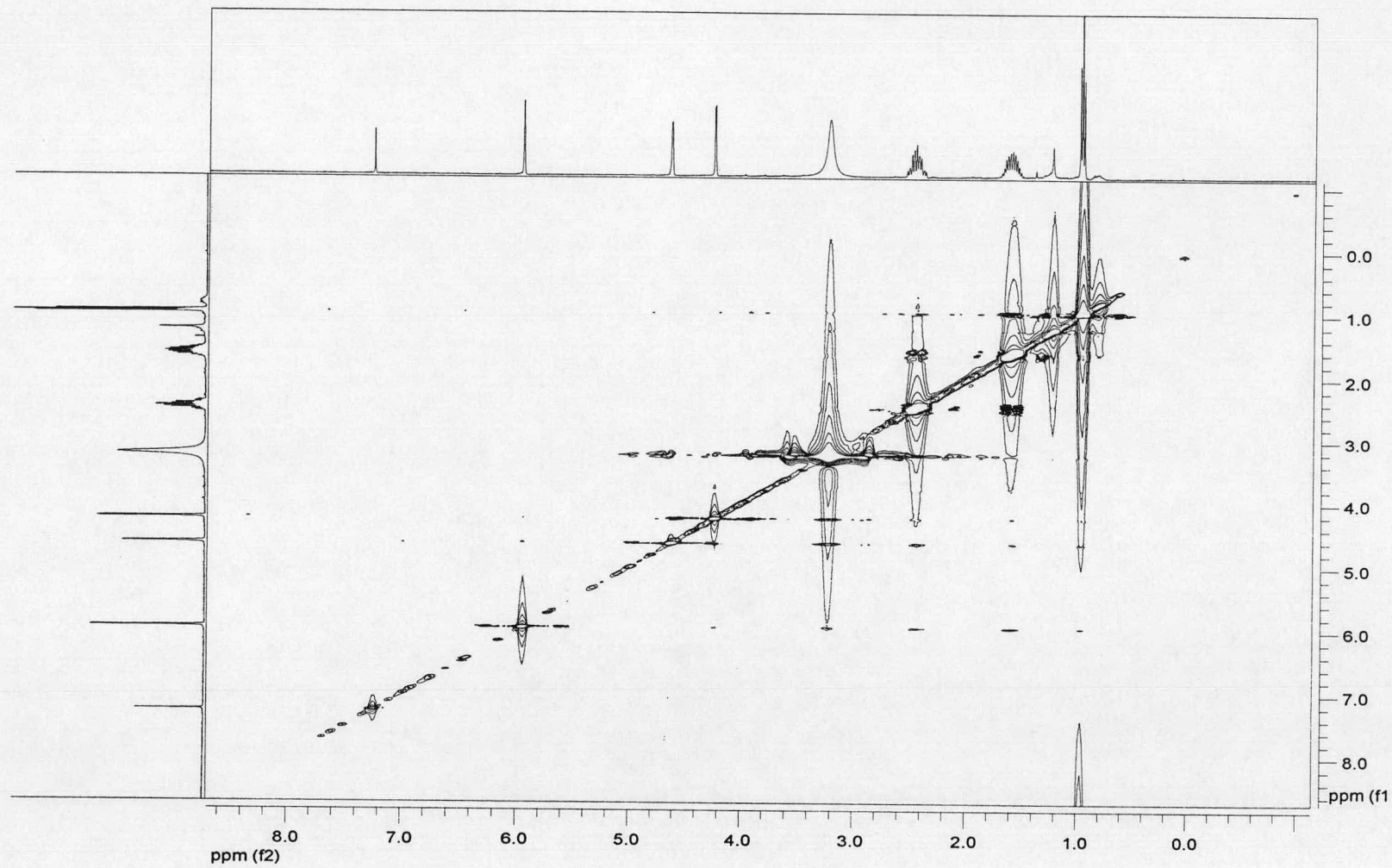


Figure B58 The NOESY spectrum of compound E

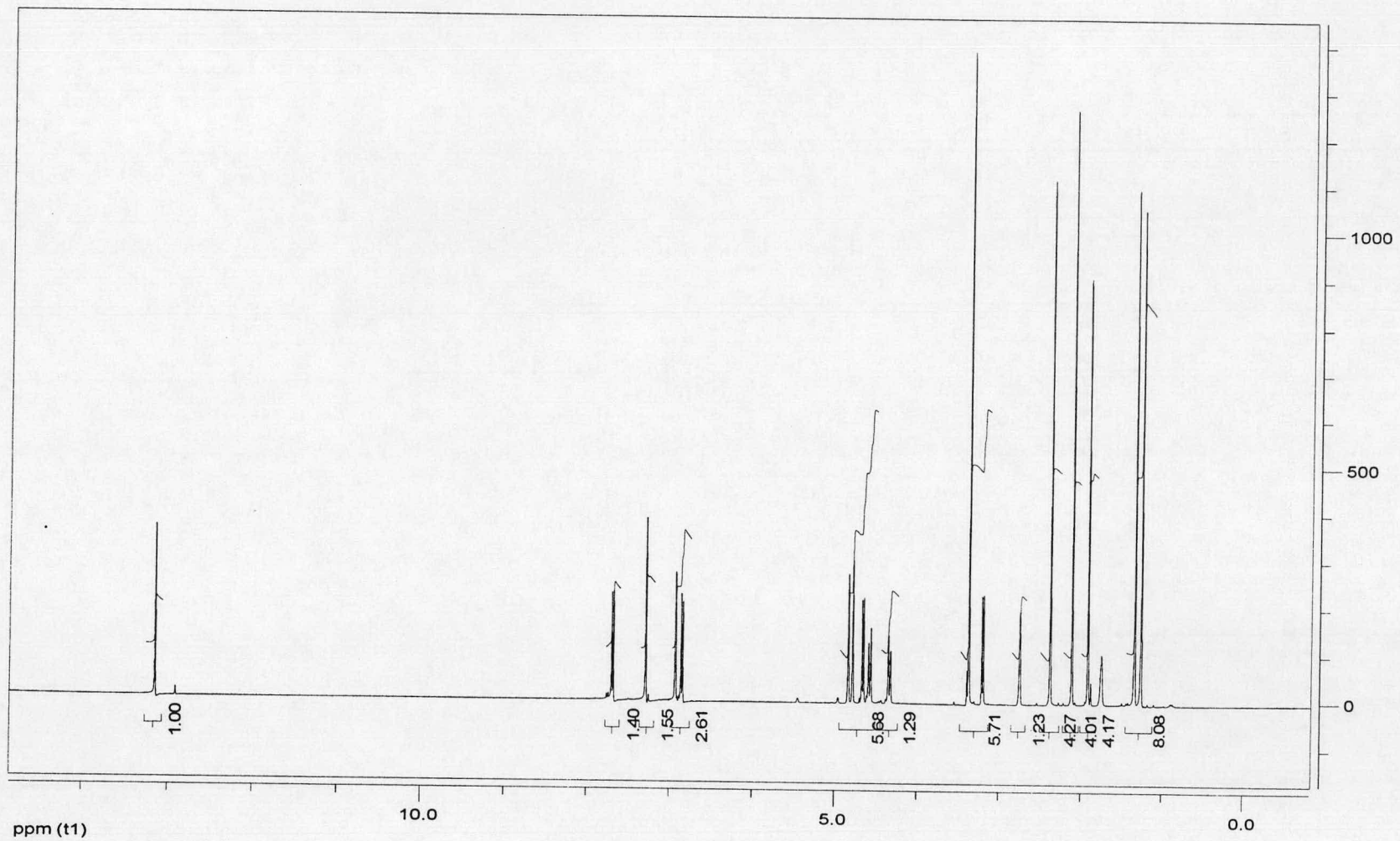


Figure B59 The 1H-NMR spectrum of compound F1



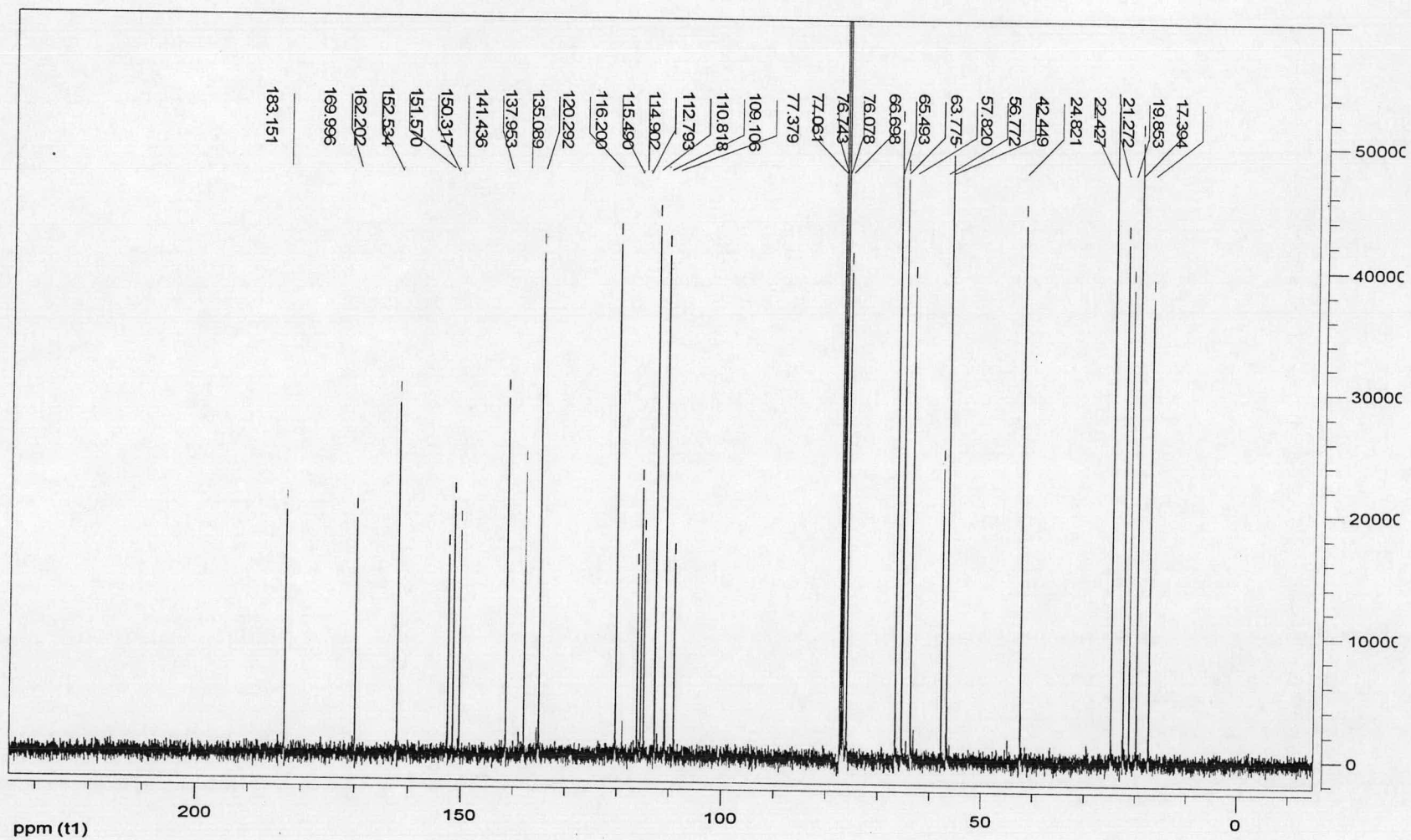


Figure B60 The  $^{13}\text{C}$ -NMR spectrum of compound F1

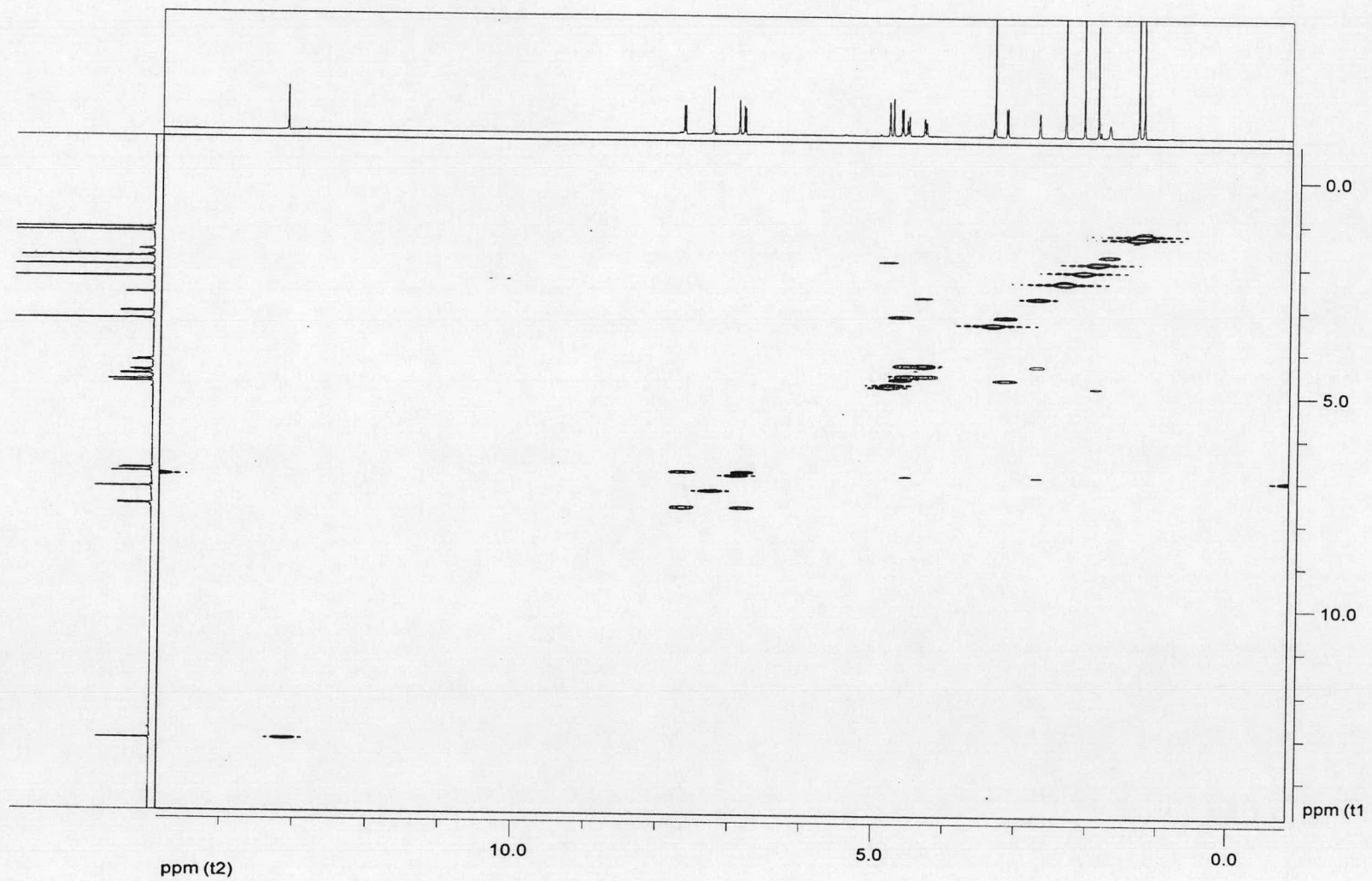


Figure B61 The gCOSY spectrum of compound F1

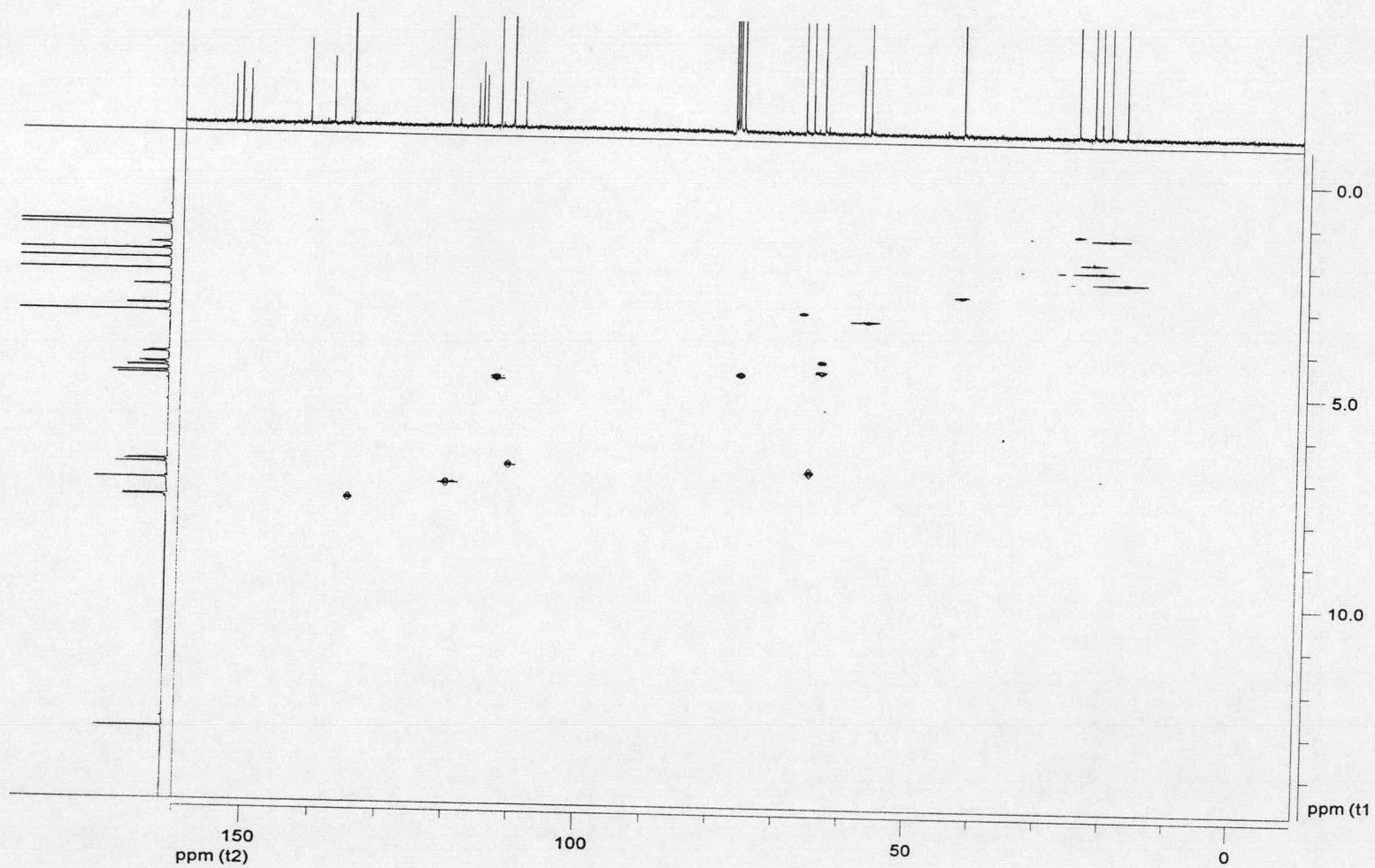


Figure B62 The gHSQC spectrum of compound F1

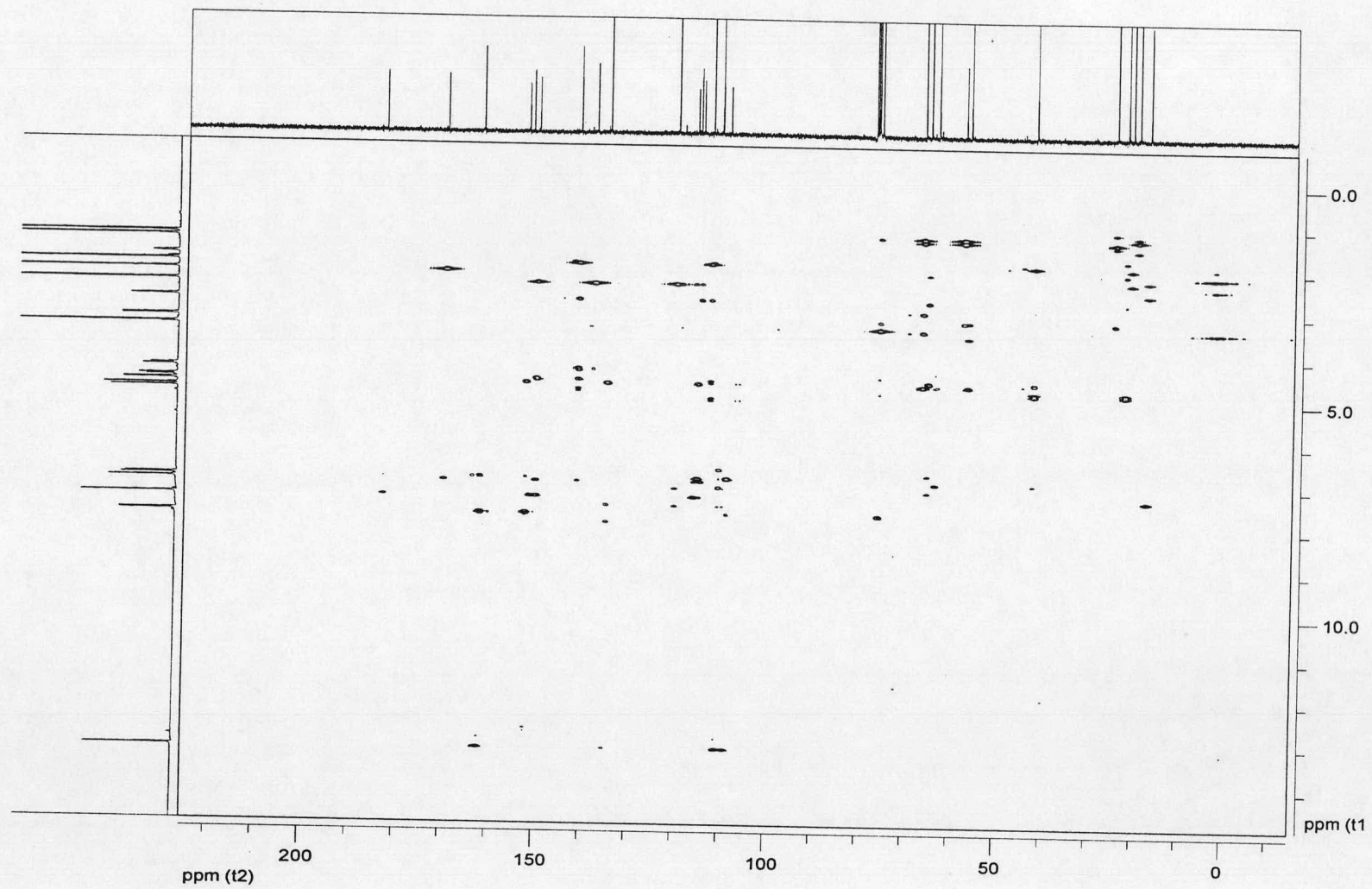


Figure B63 The gHMBC spectrum of compound F1

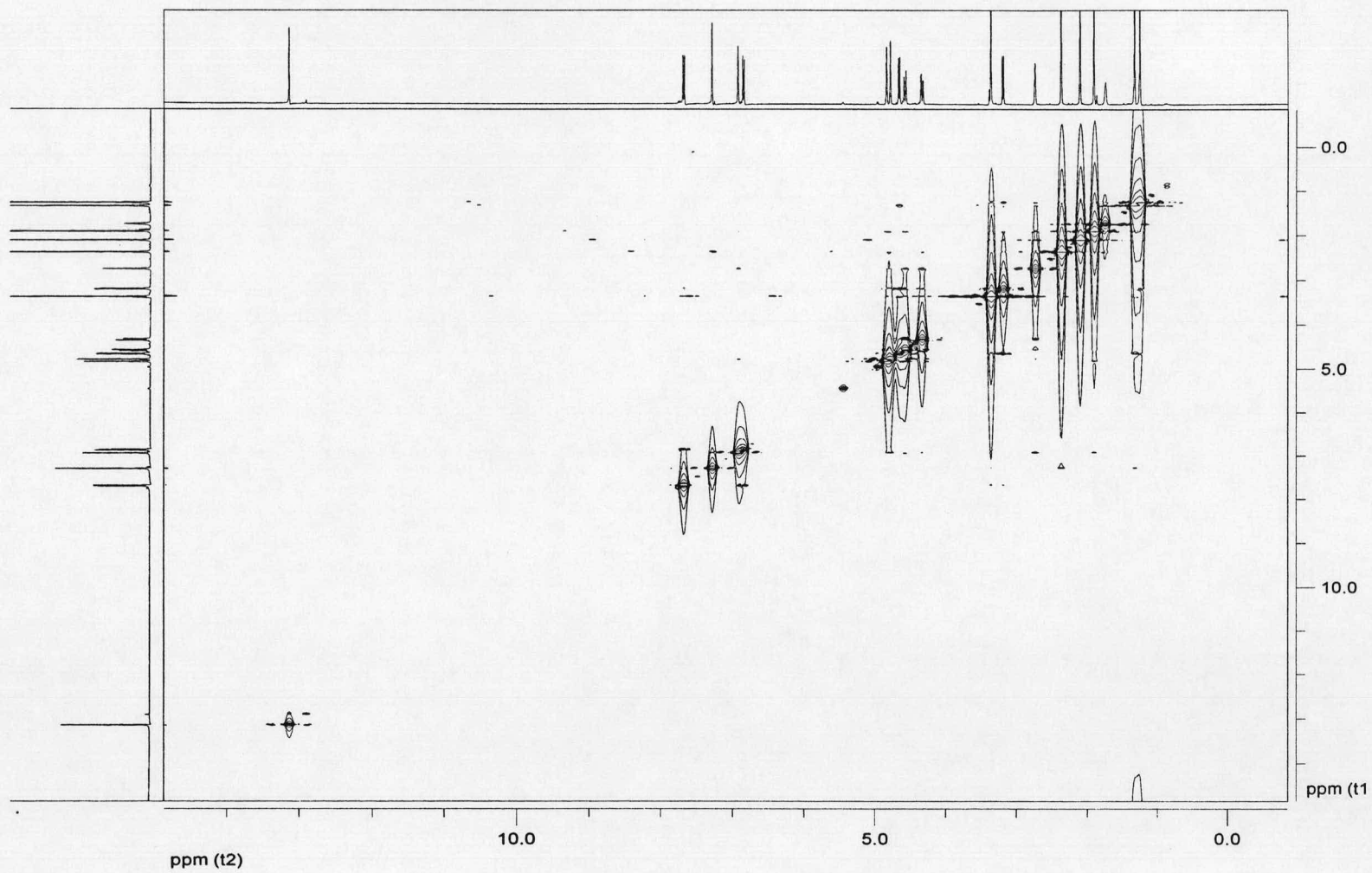


Figure B64 The NOESY spectrum of compound F1

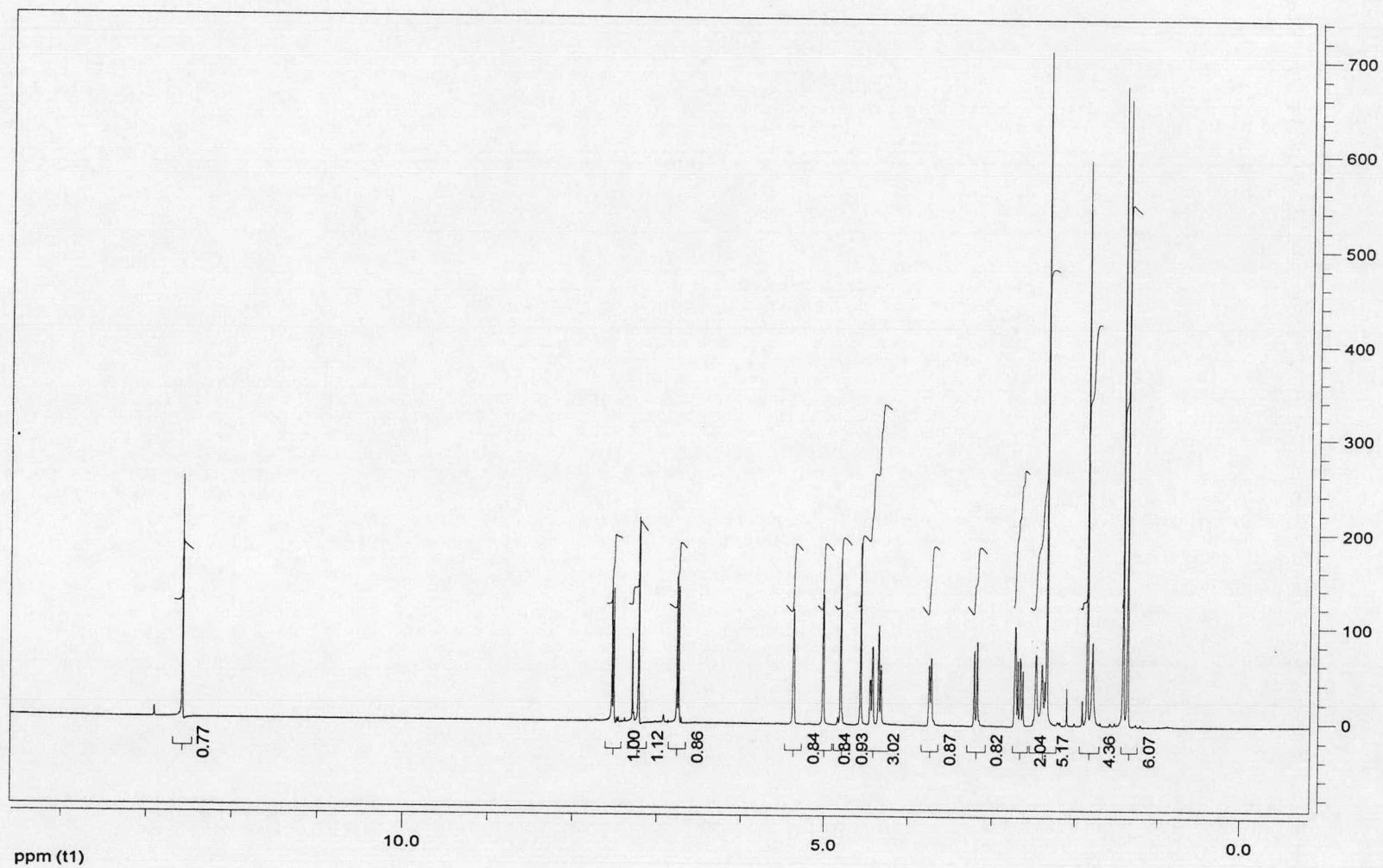


Figure B65 The 1H-NMR spectrum of compound F2

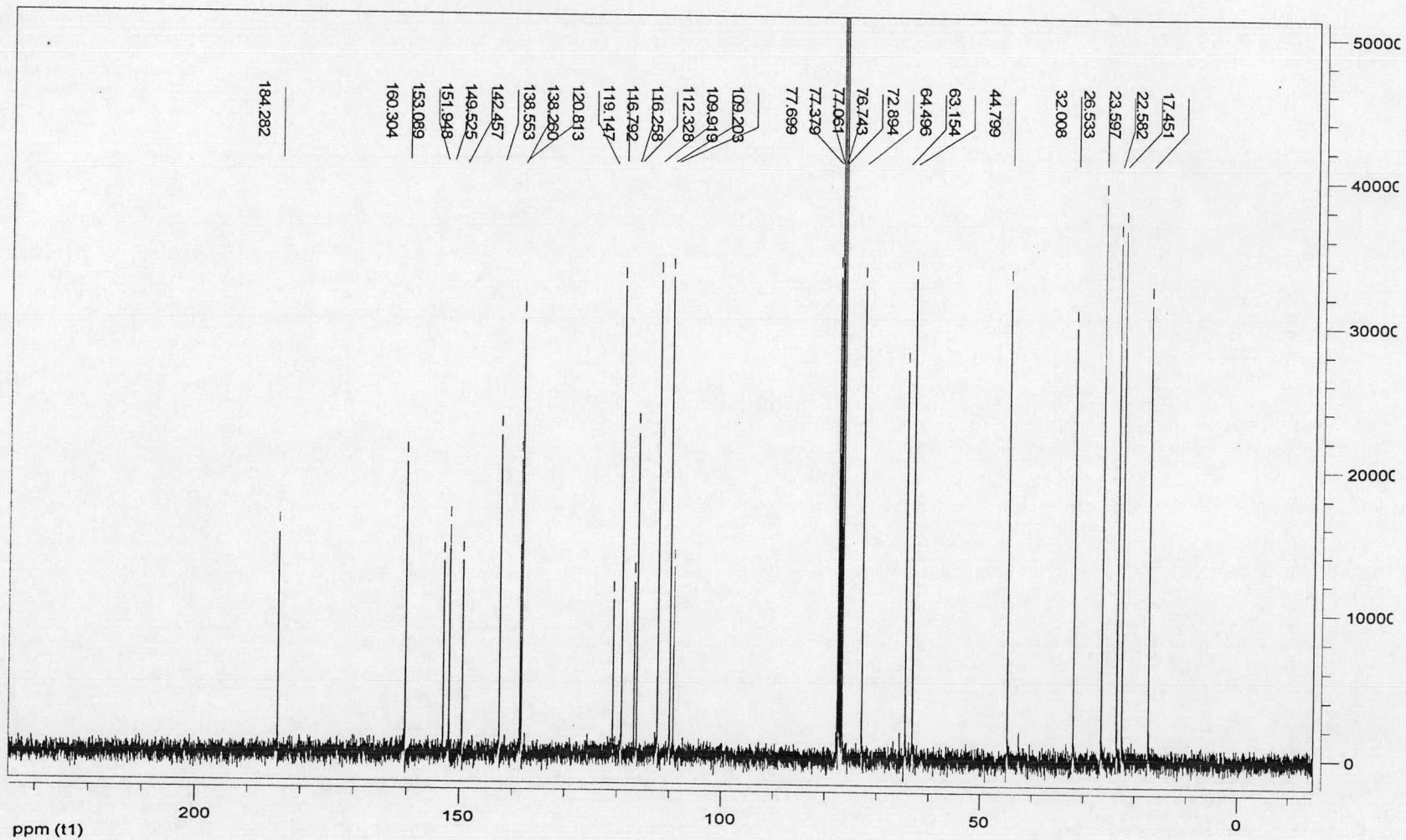


Figure B66 The <sup>13</sup>C-NMR spectrum of compound F2

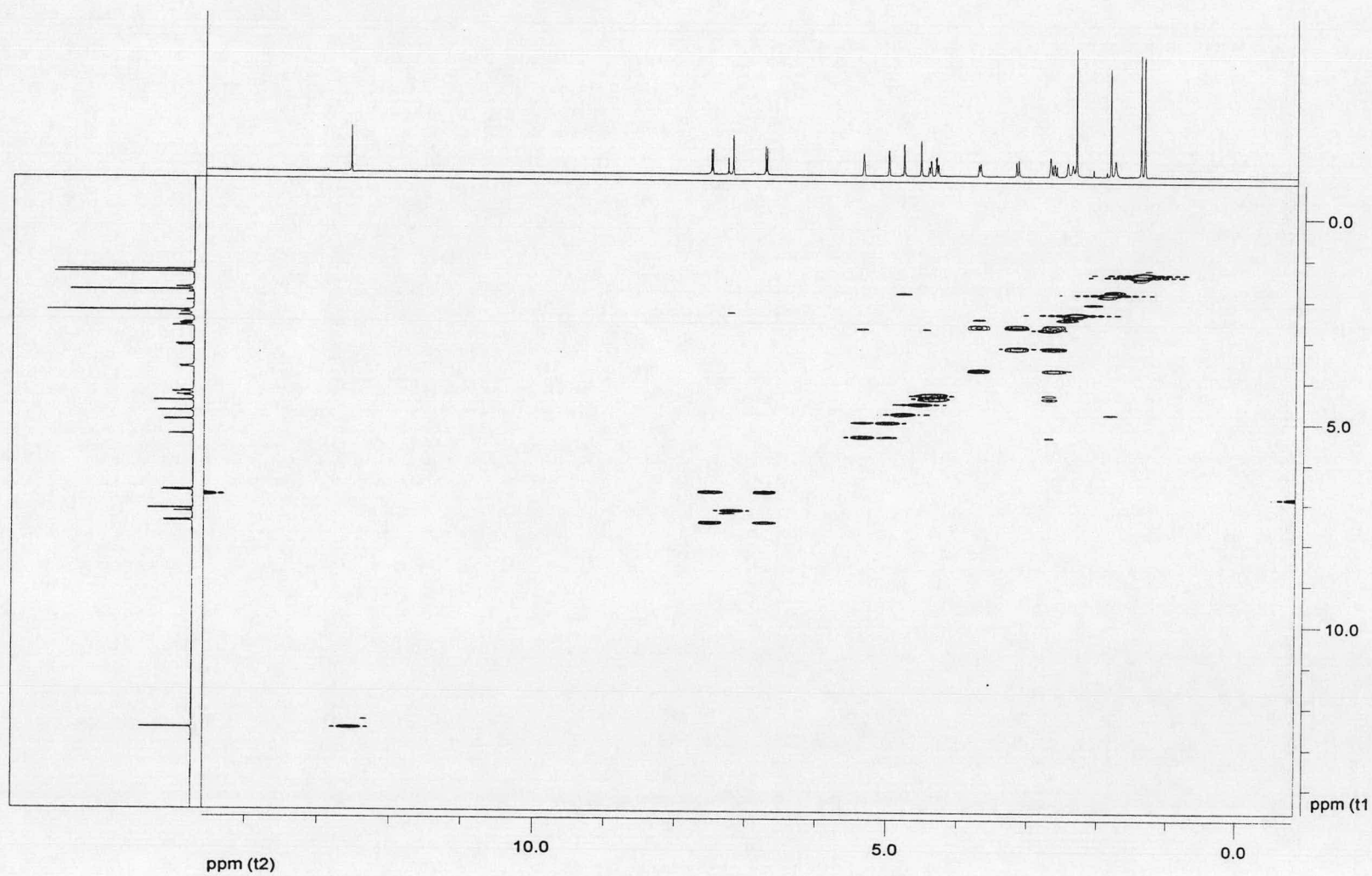


Figure B67 The gCOSY spectrum of compound F2



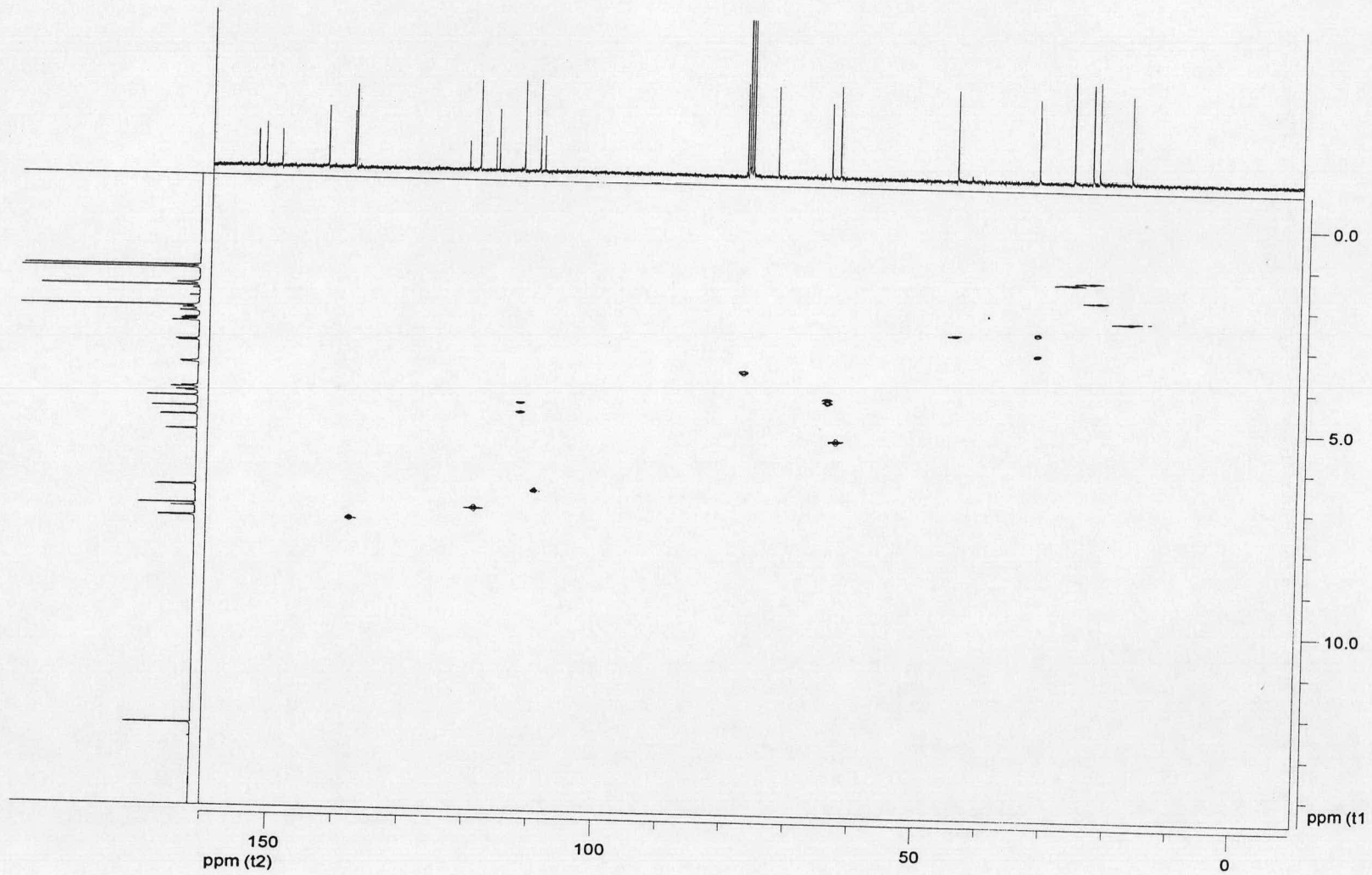


Figure B68 The gHSQC spectrum of compound F2

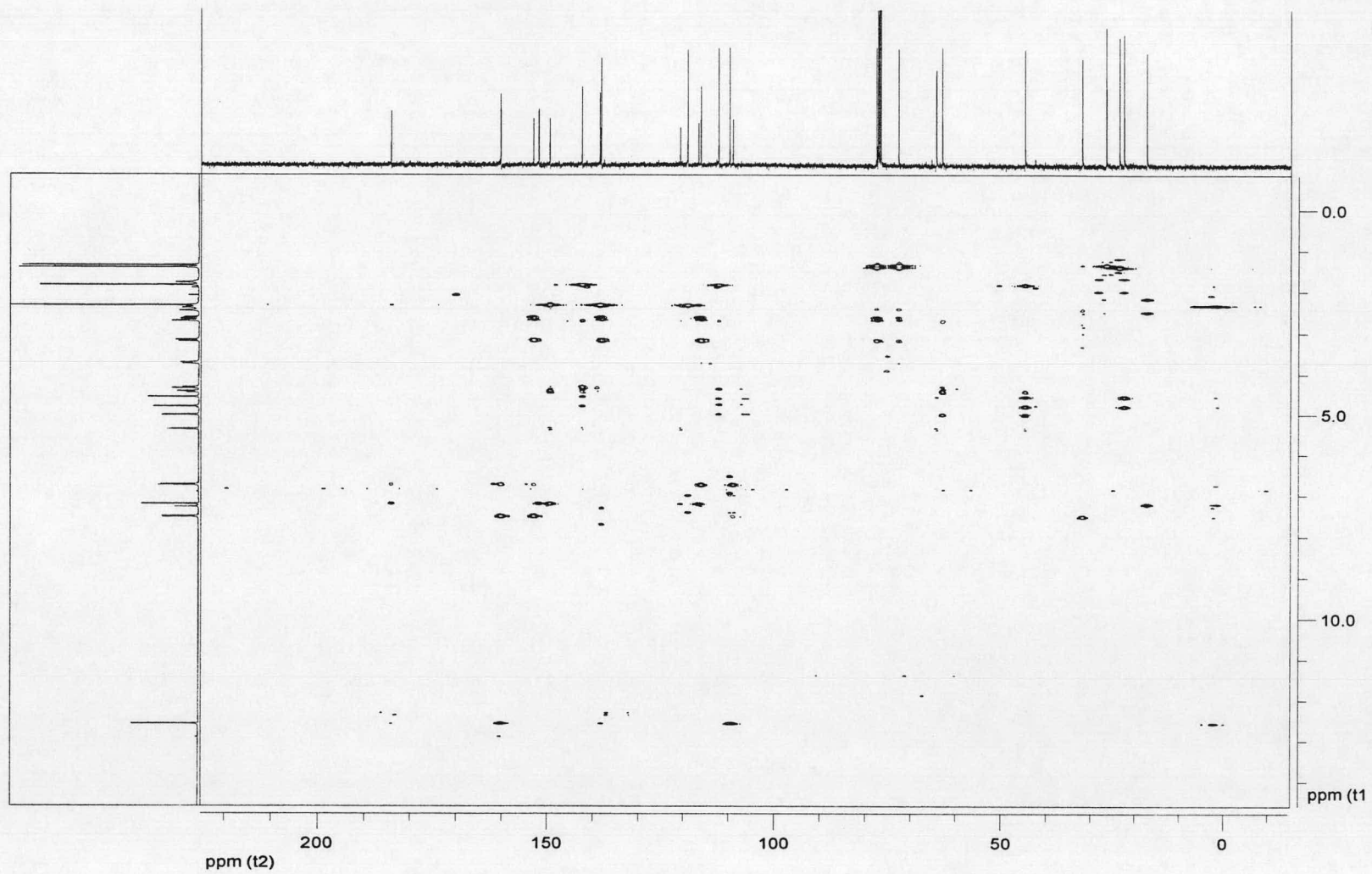


Figure B69 The gHMBC spectrum of compound F2

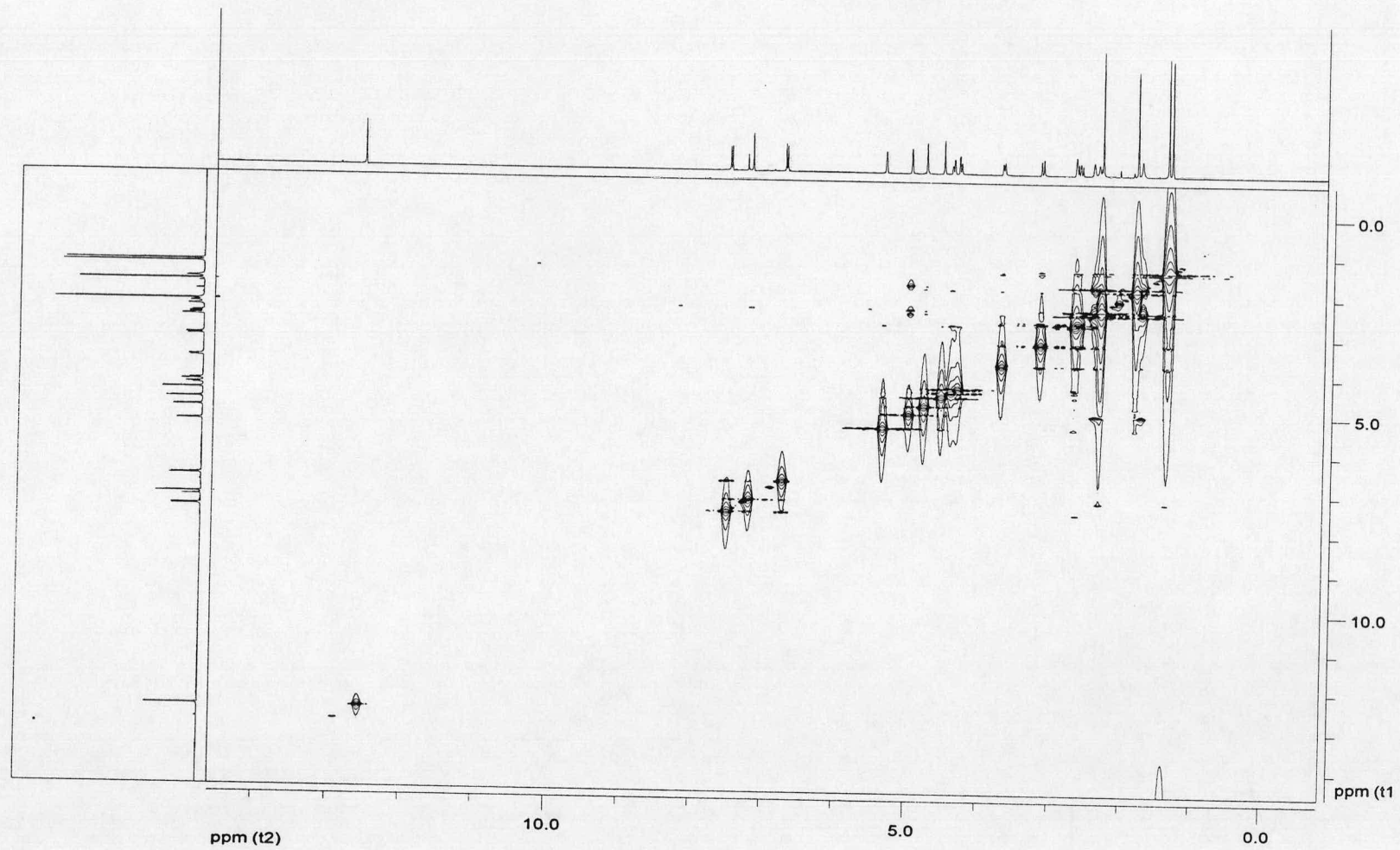


Figure B70 The NOESY spectrum of compound F2

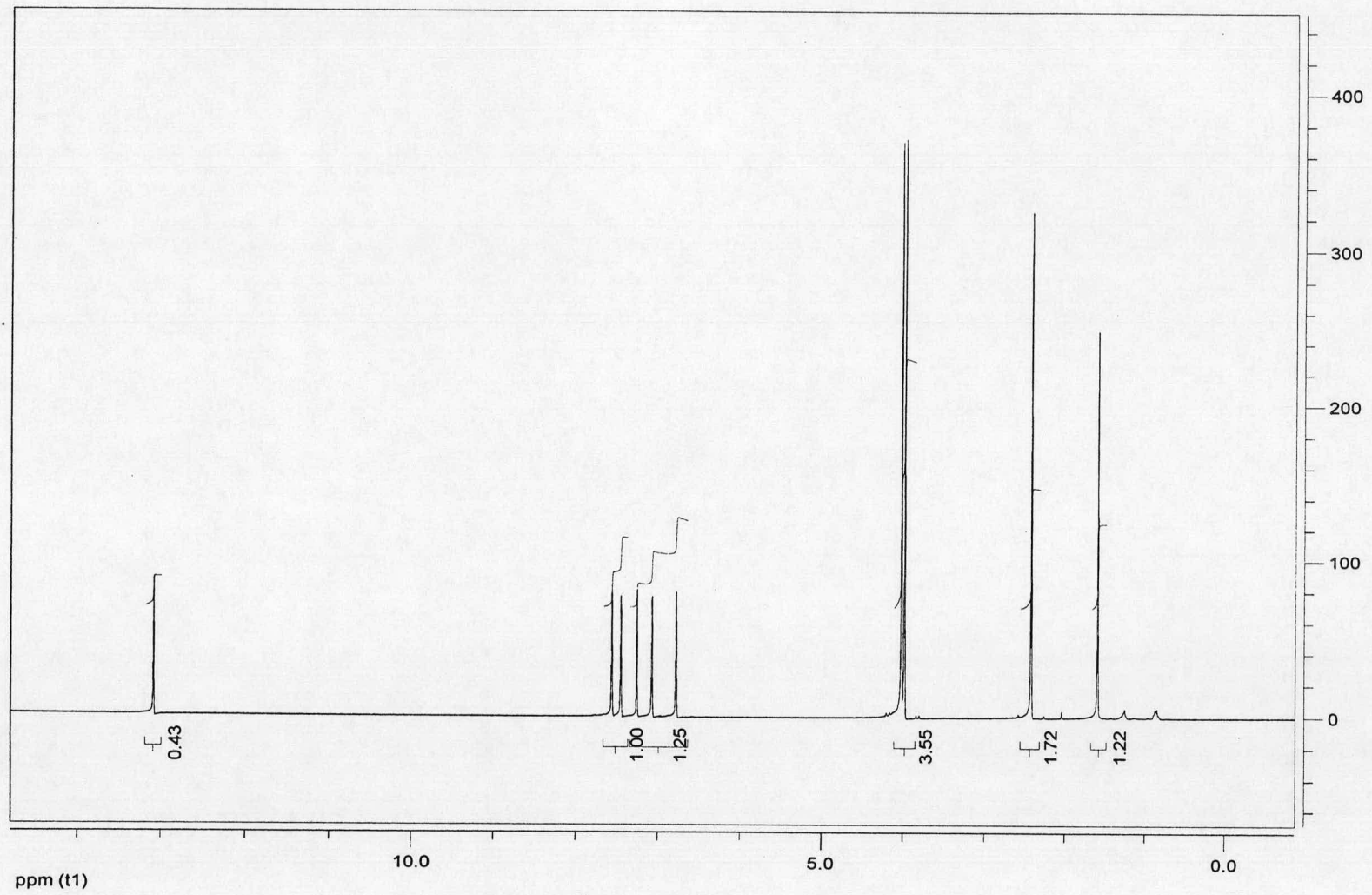


Figure B71 The  $^1\text{H-NMR}$  spectrum of compound G1

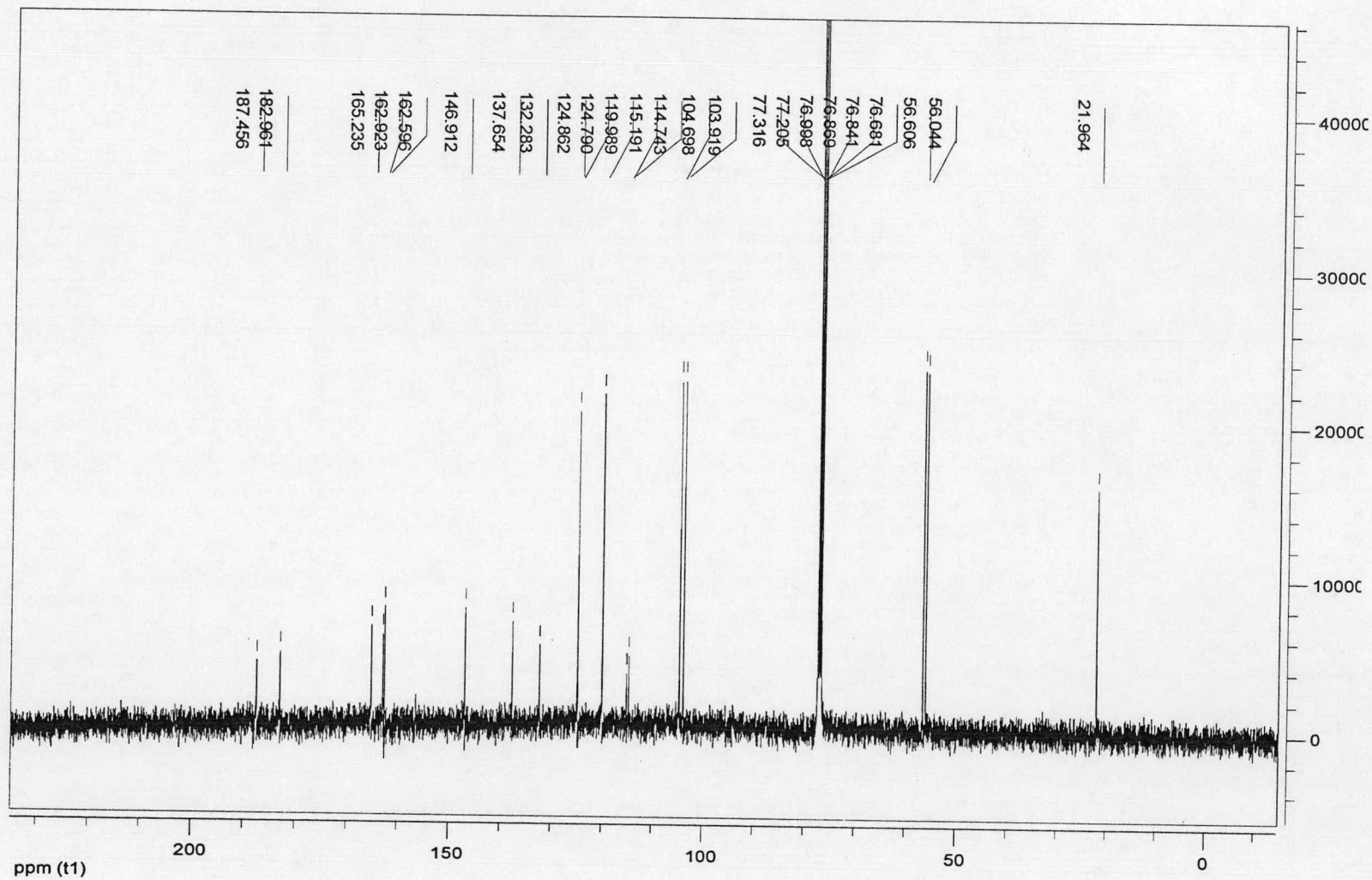


Figure B72 The  $^{13}\text{C}$ -NMR spectrum of compound G1

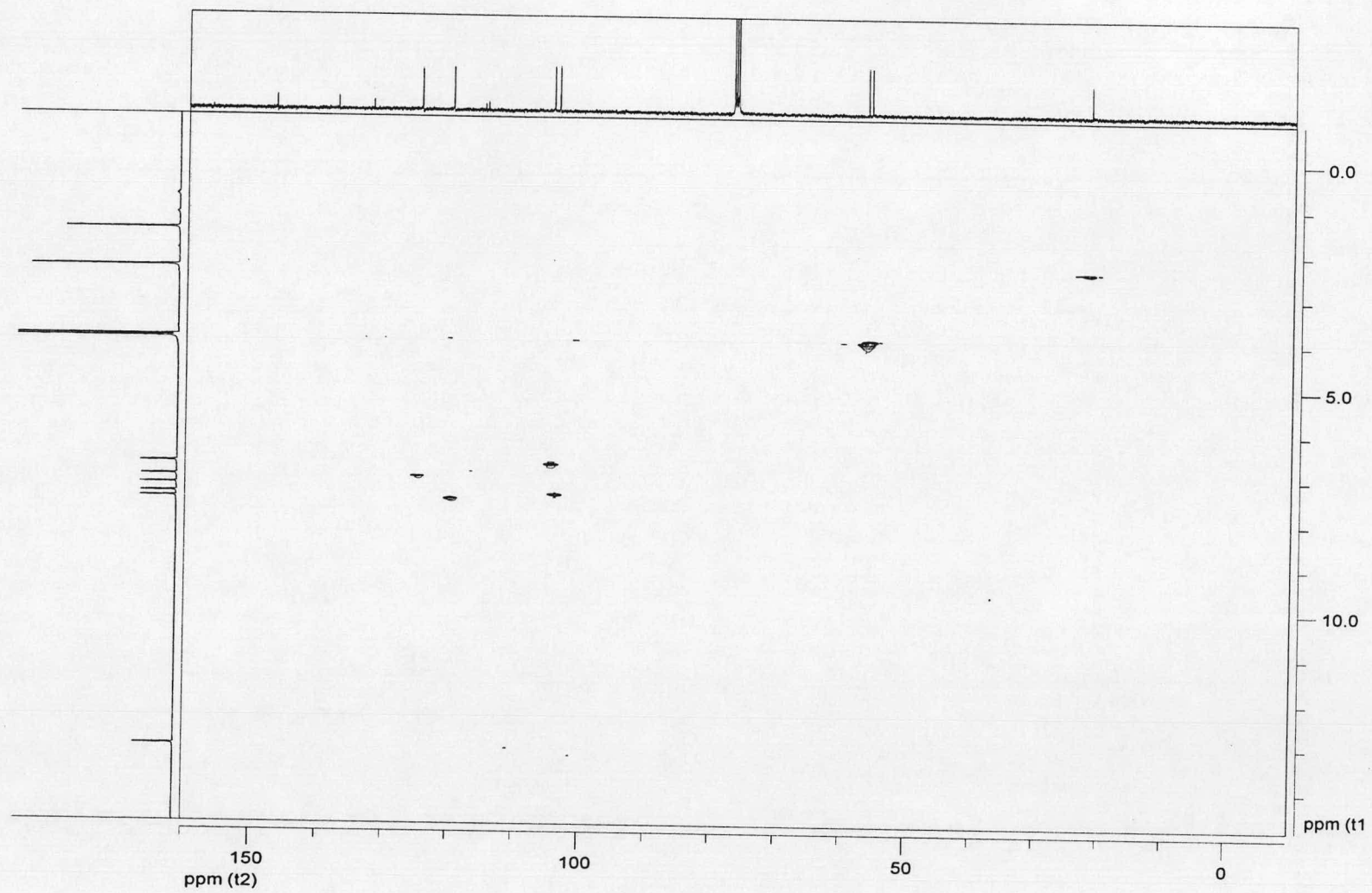


Figure B73 The gHSQC spectrum of compound G1

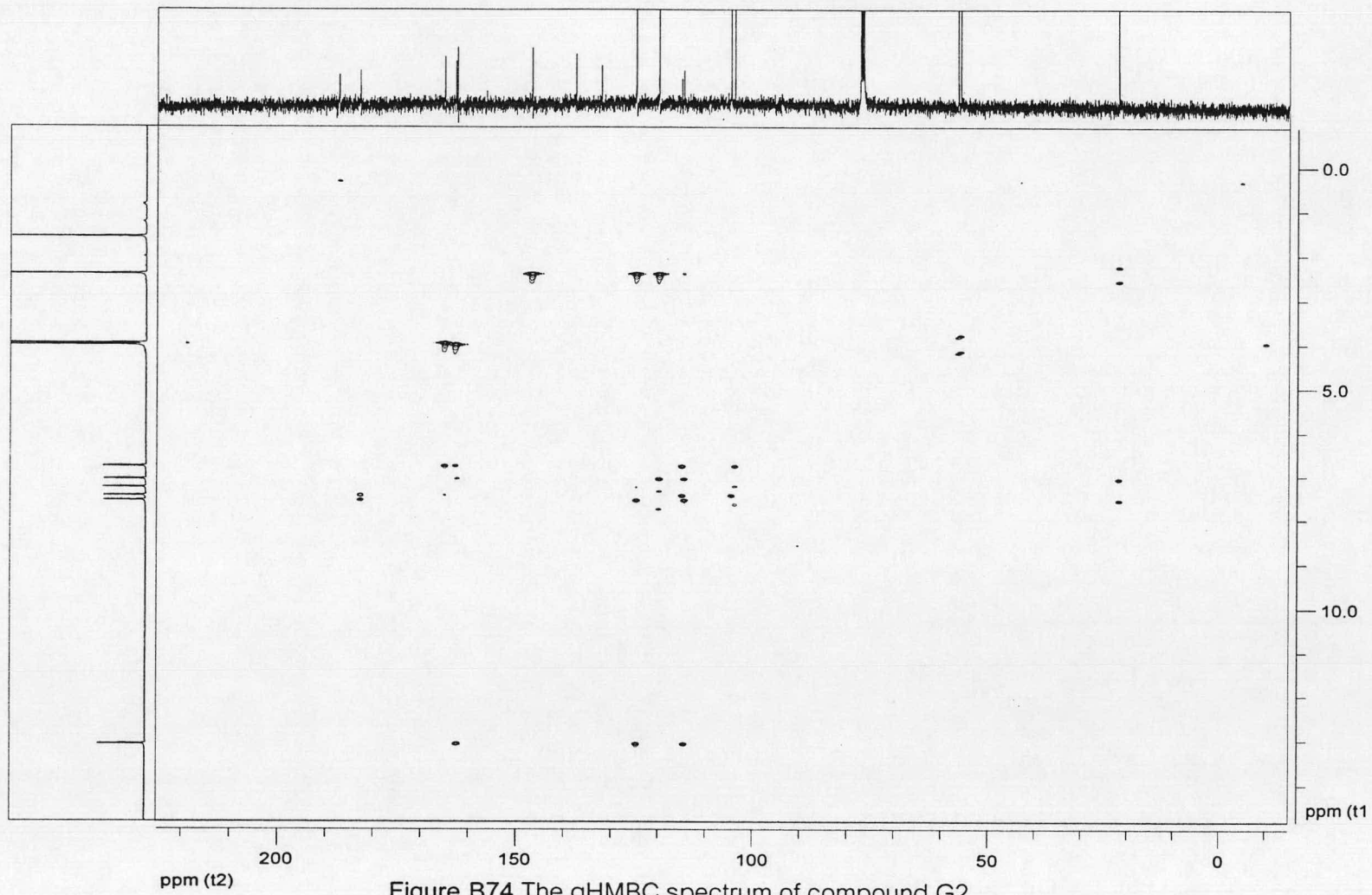


Figure B74 The gHMBC spectrum of compound G2

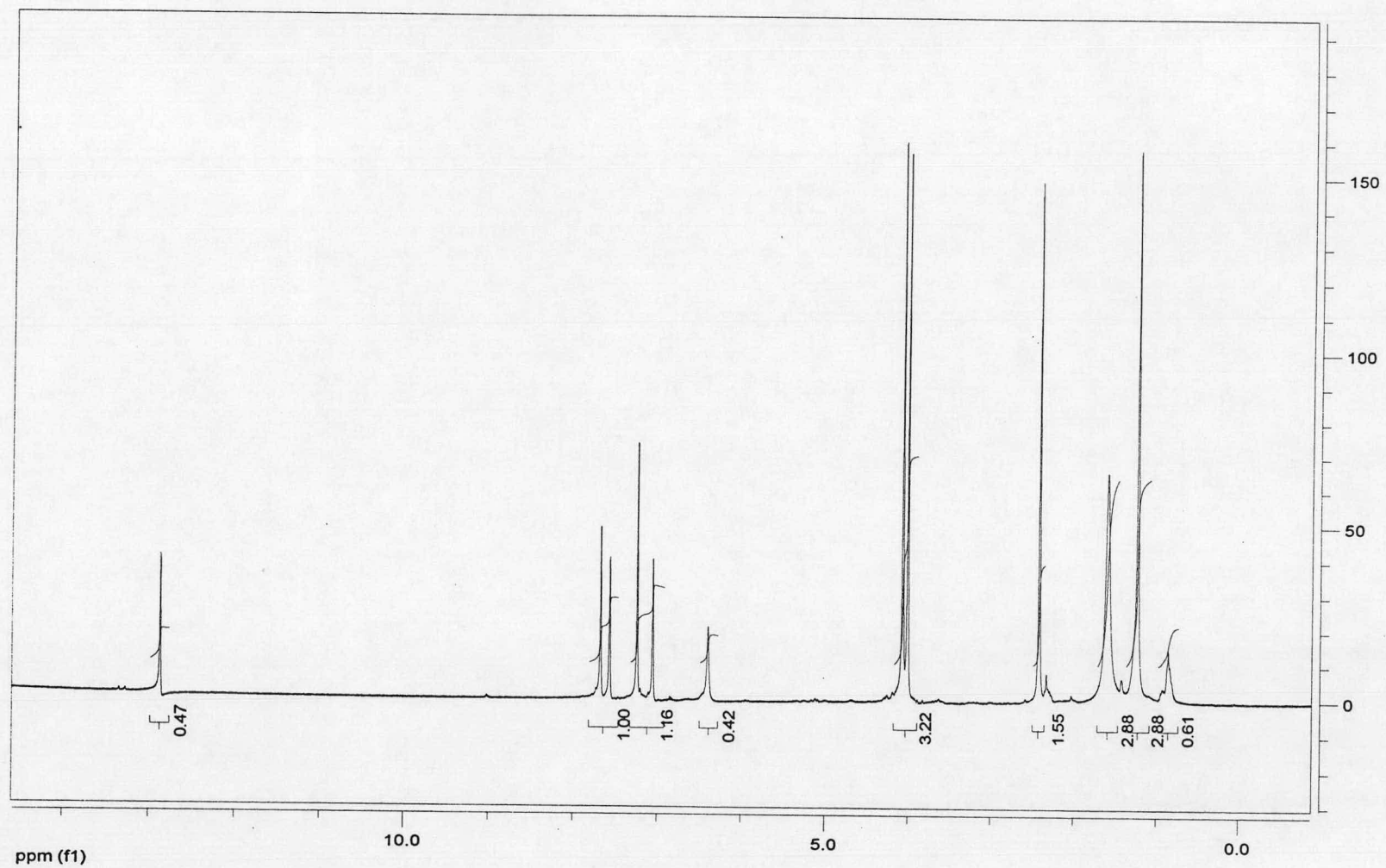


Figure B75 The  $^1\text{H-NMR}$  spectrum of compound G2



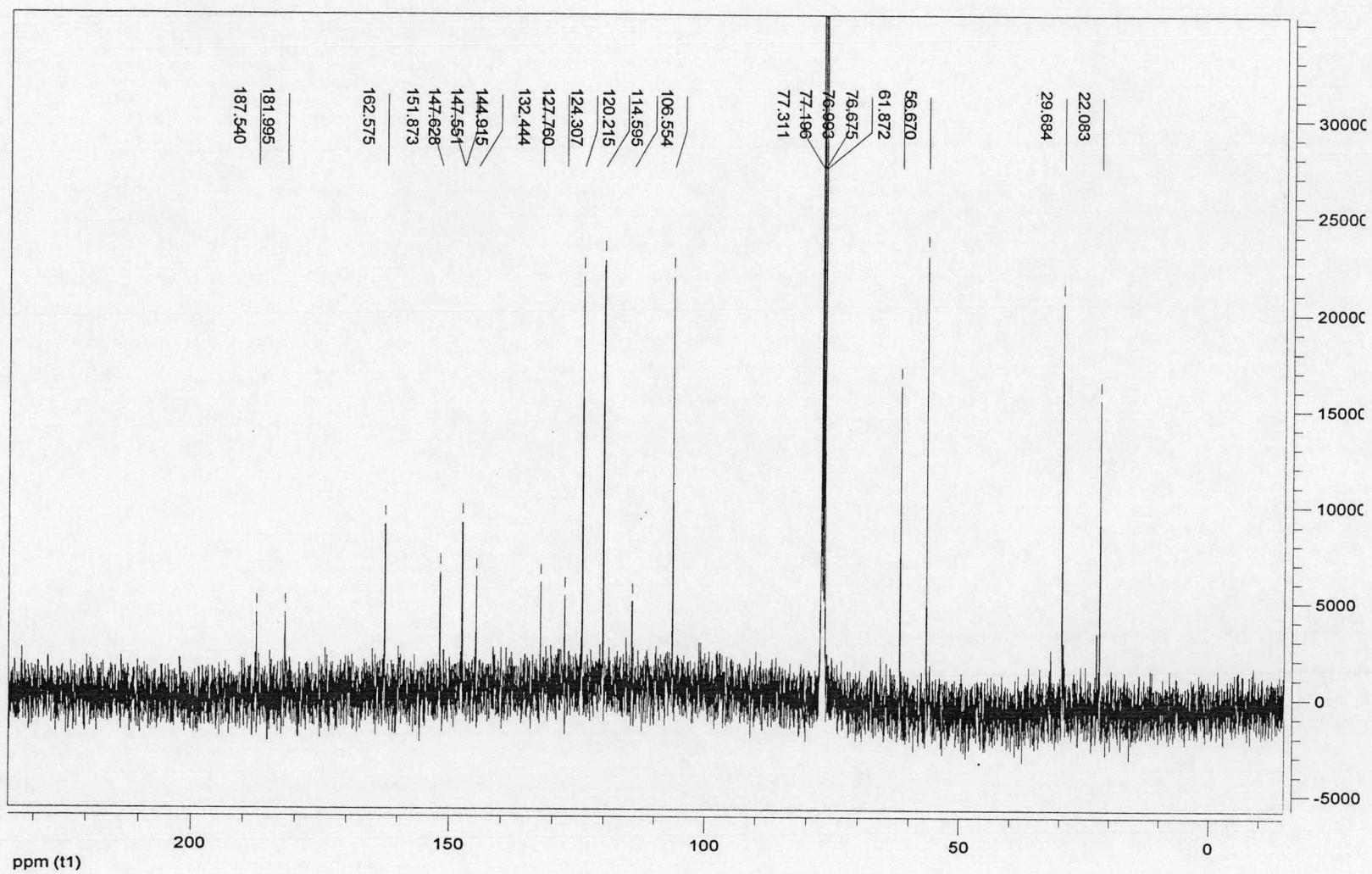


Figure B76 The  $^{13}\text{C}$ -NMR spectrum of compound G2

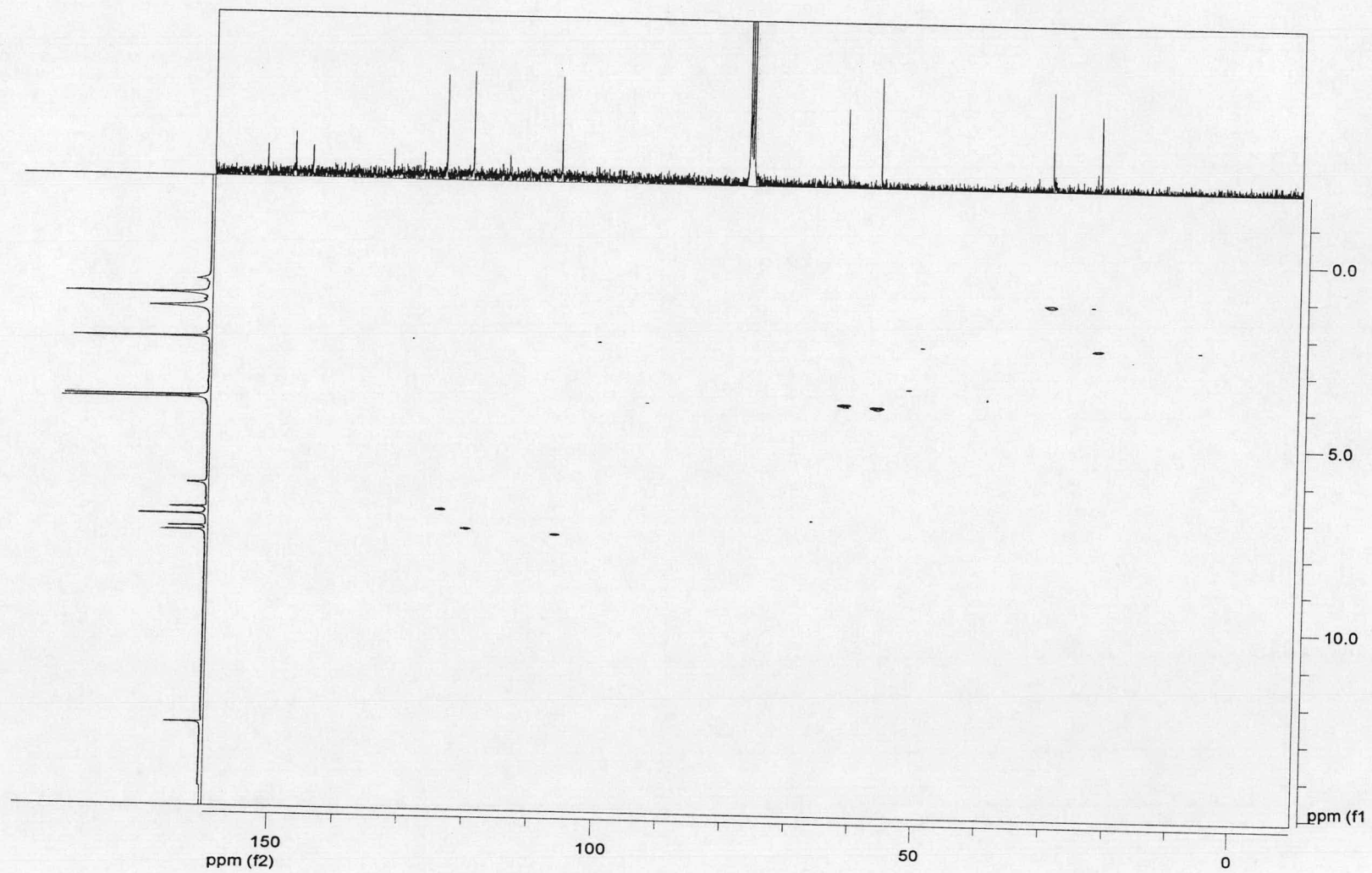


Figure B77 The gHSQC spectrum of compound G2

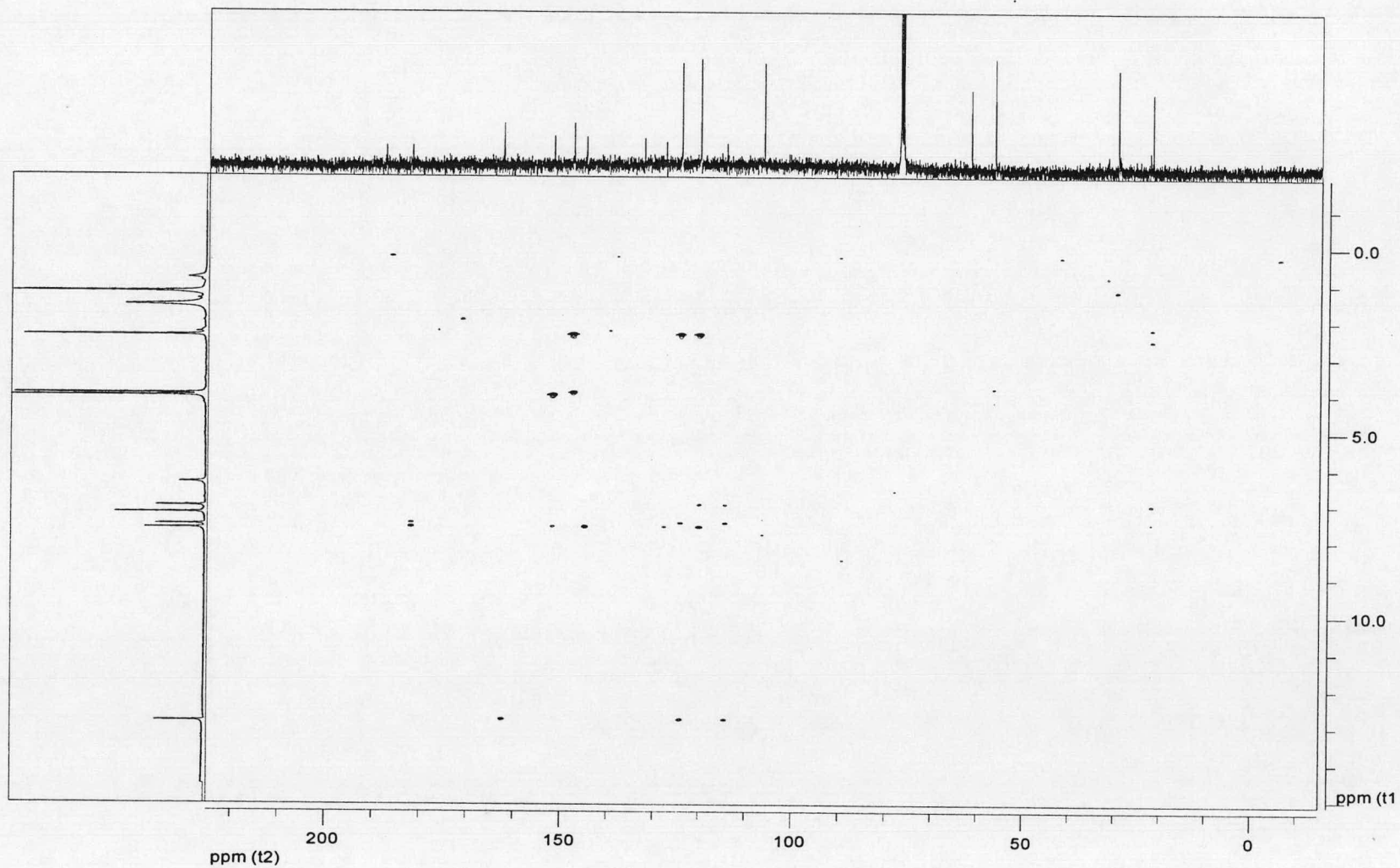


Figure B78 The gHMBC spectrum of compound G2

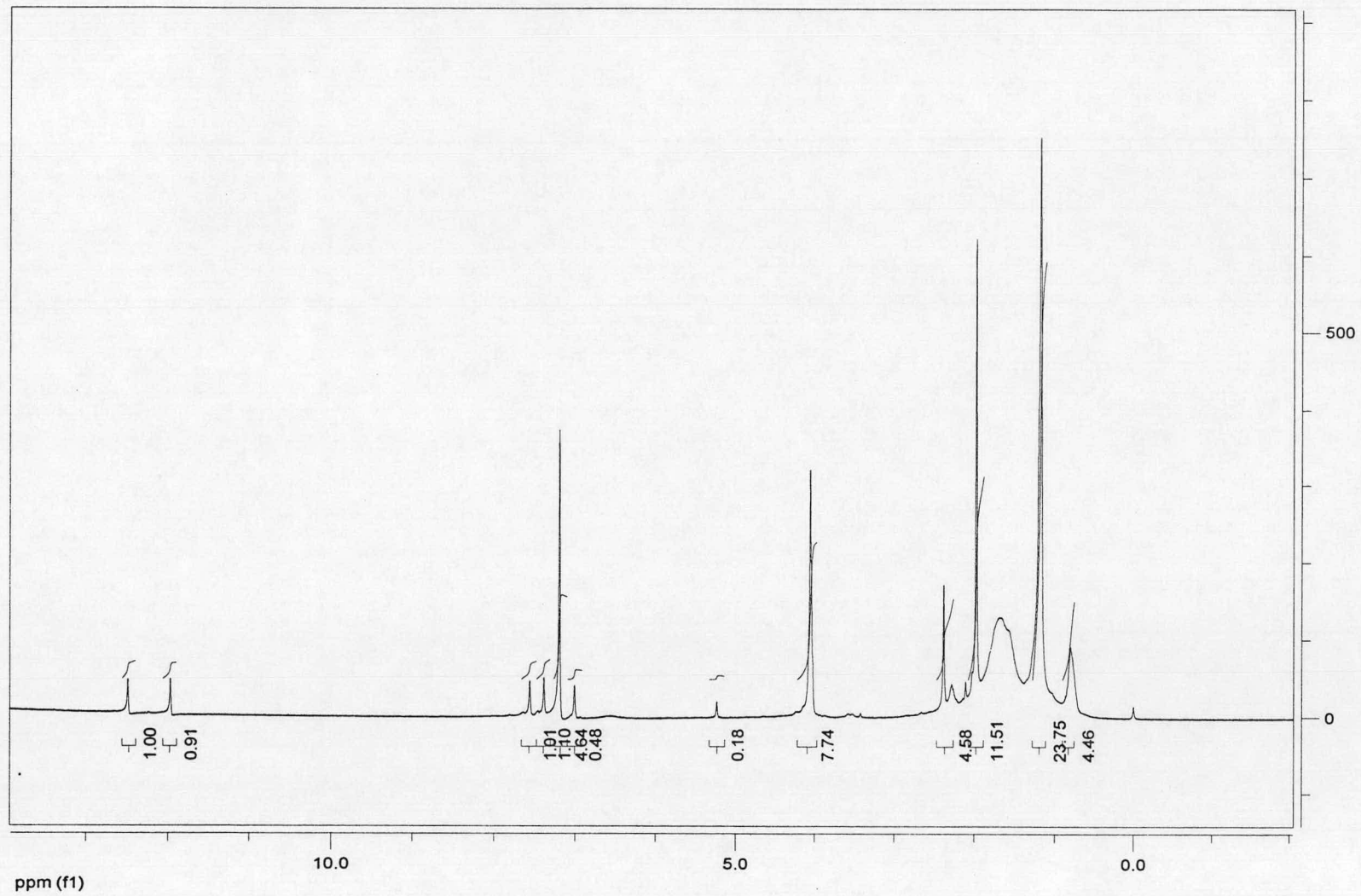


Figure B79 The 1H-NMR spectrum of compound G3

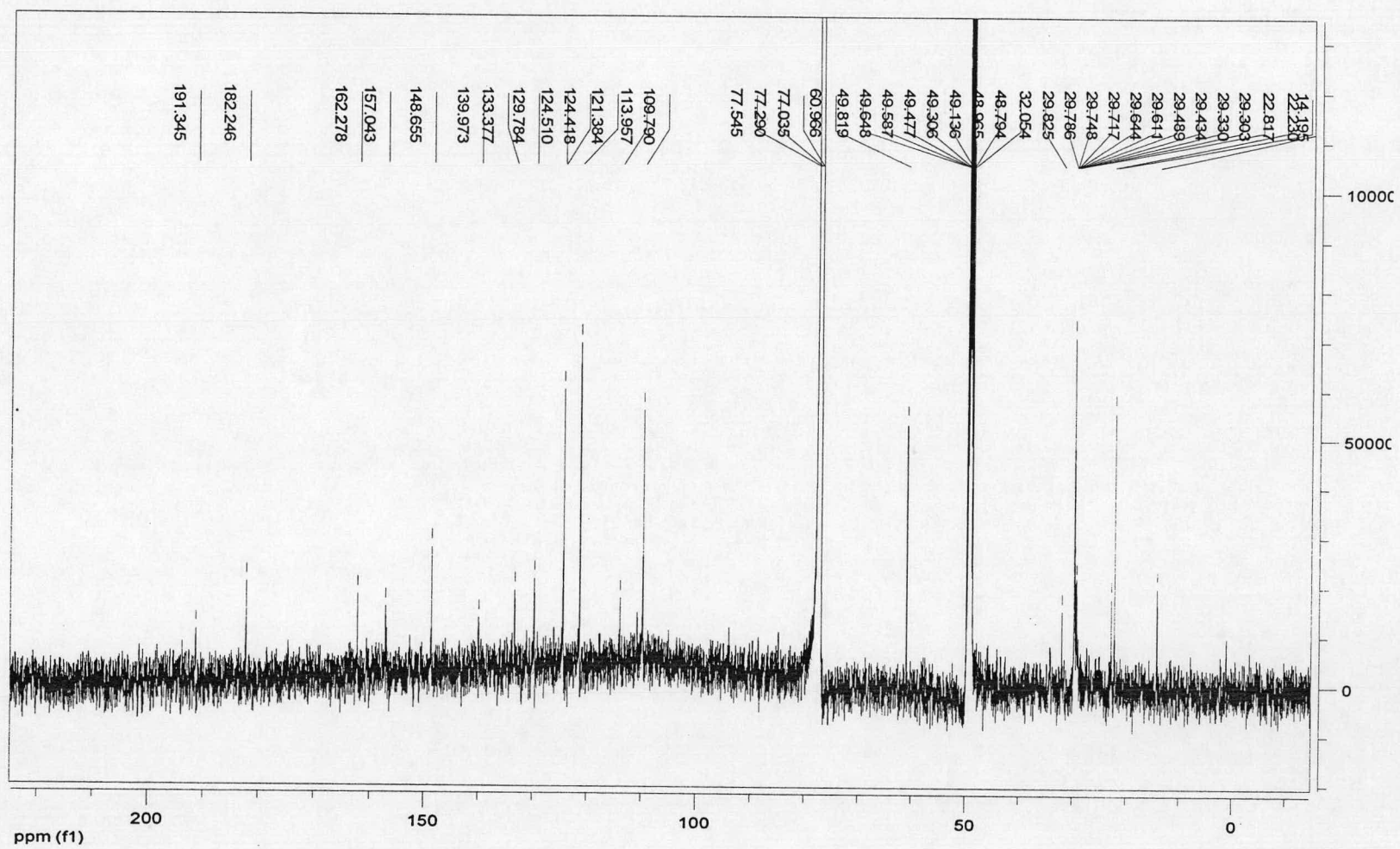


Figure B80 The  $^{13}\text{C}$ -NMR spectrum of compound G3

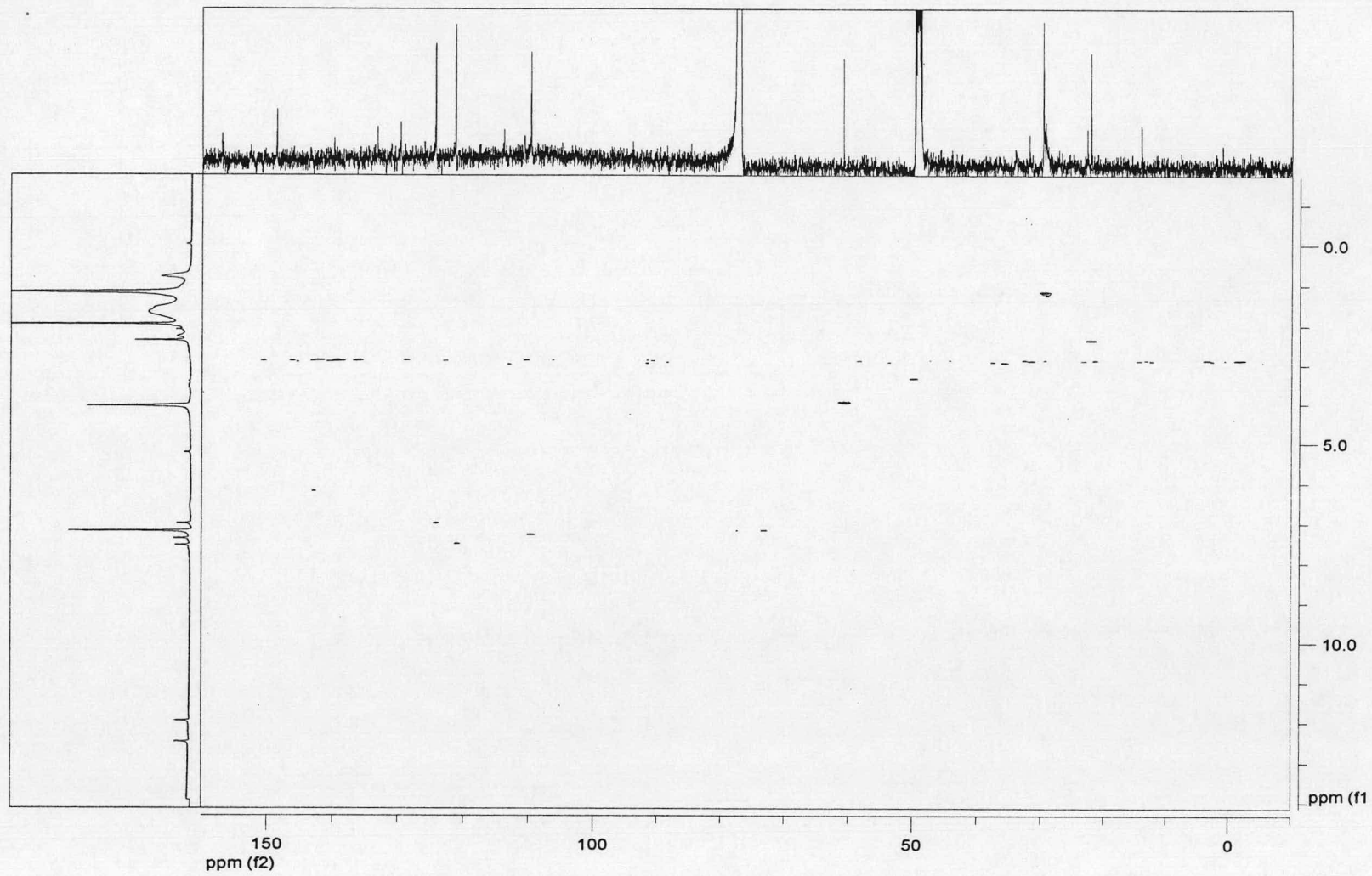


Figure B81 The gHSQC spectrum of compound G3

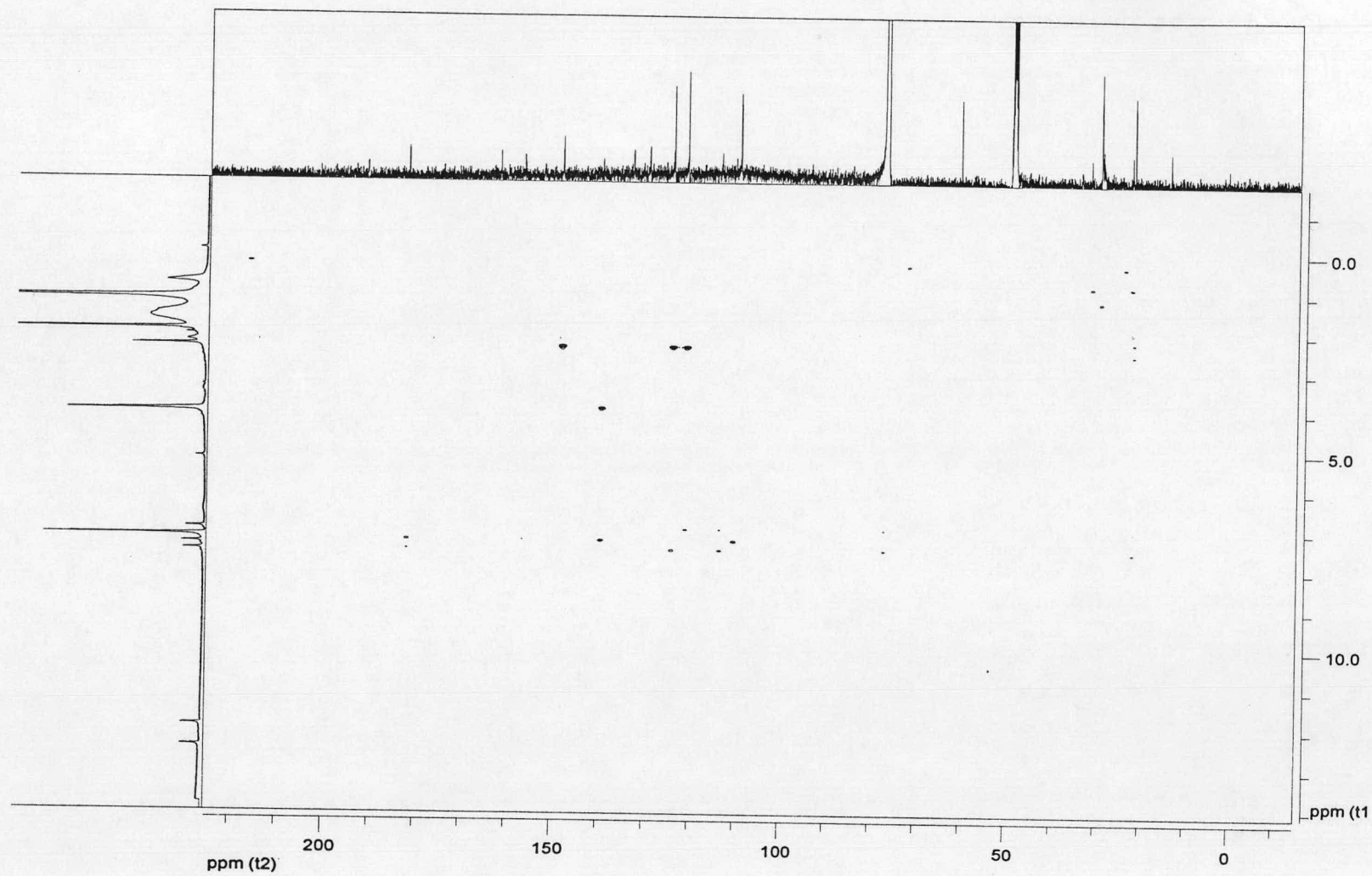


Figure B82 The gHMBC spectrum of compound G3

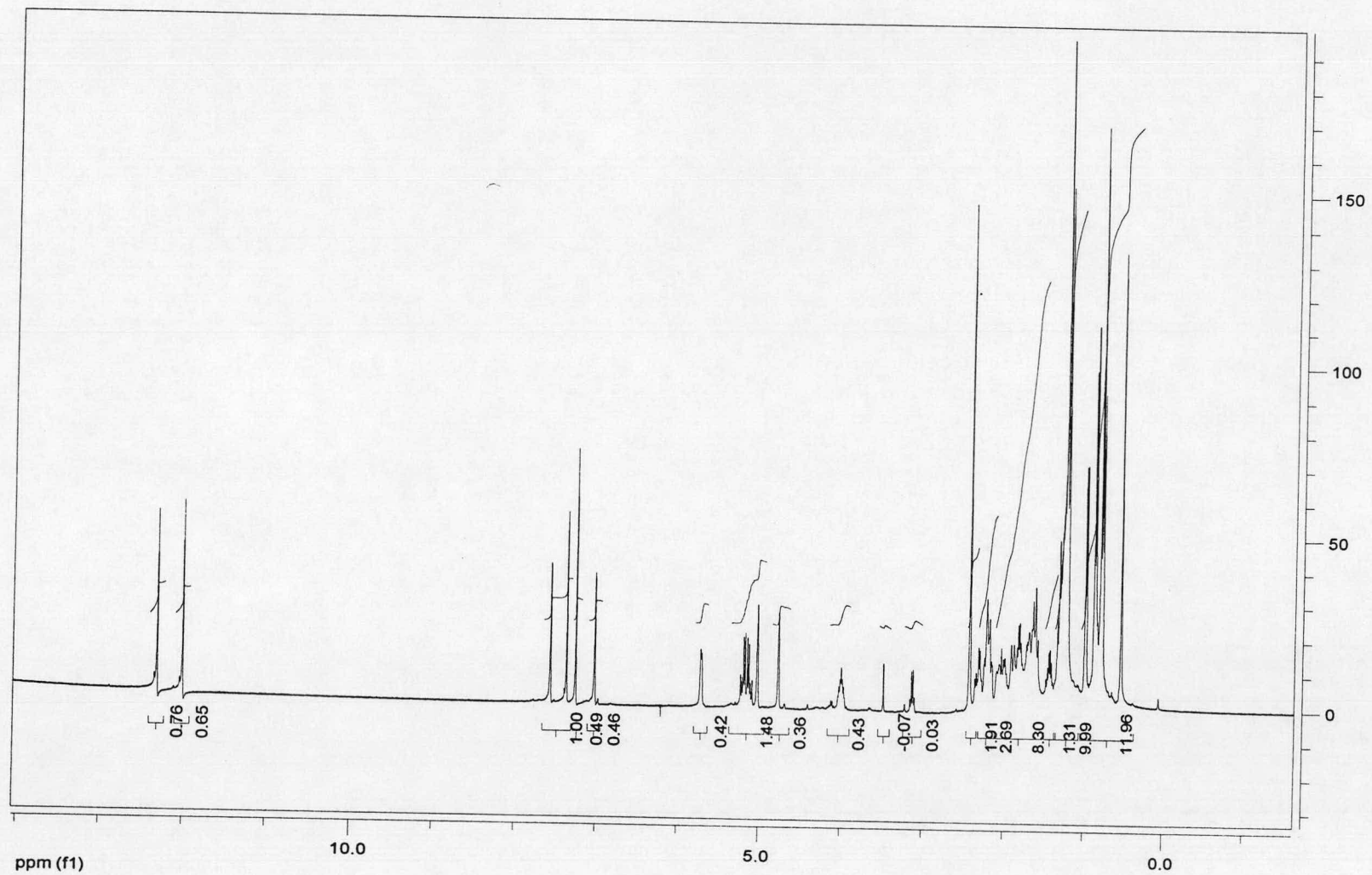


Figure B83 The  $^1\text{H-NMR}$  spectrum of compound H1



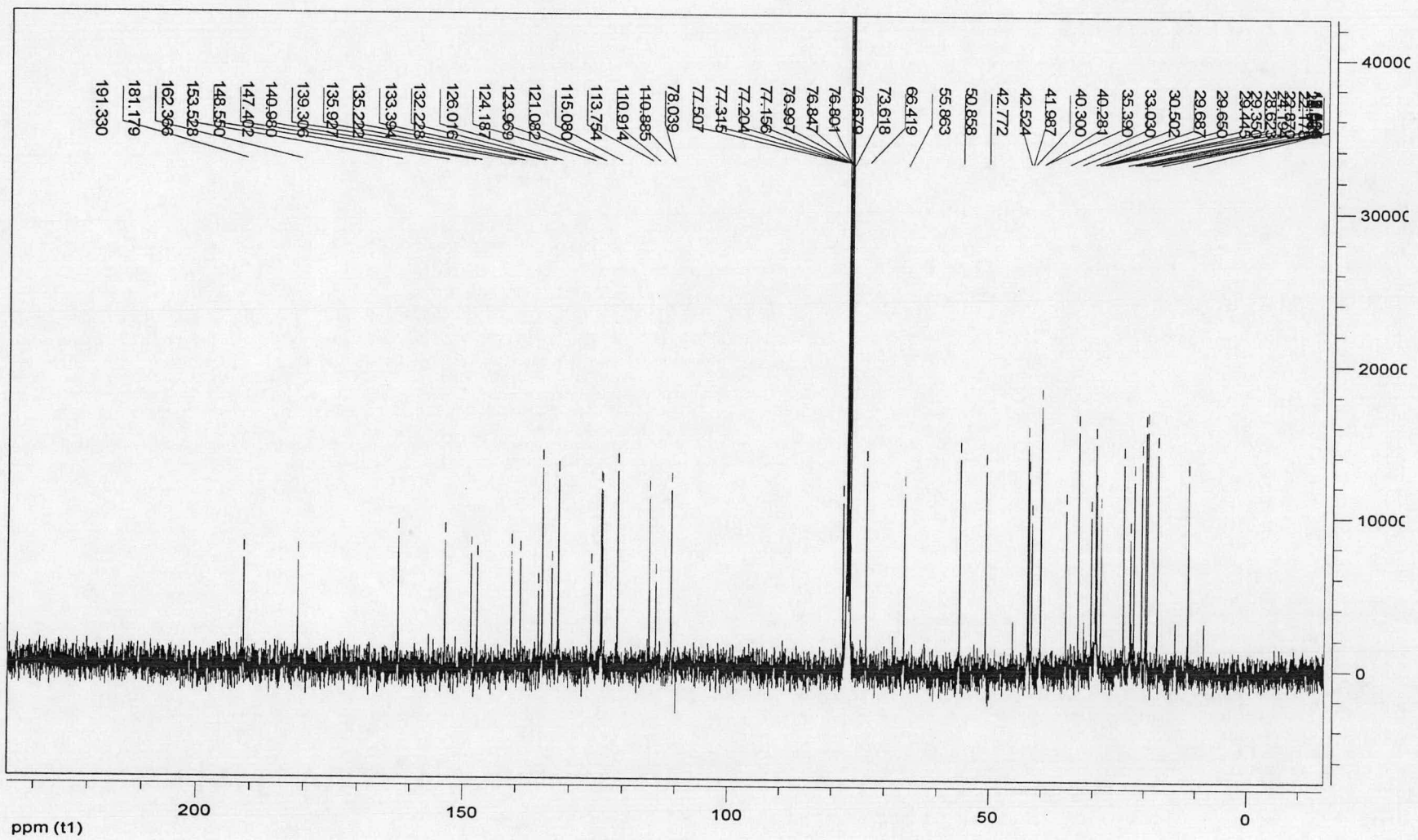


Figure B84 The  $^{13}\text{C}$ -NMR spectrum of compound H1

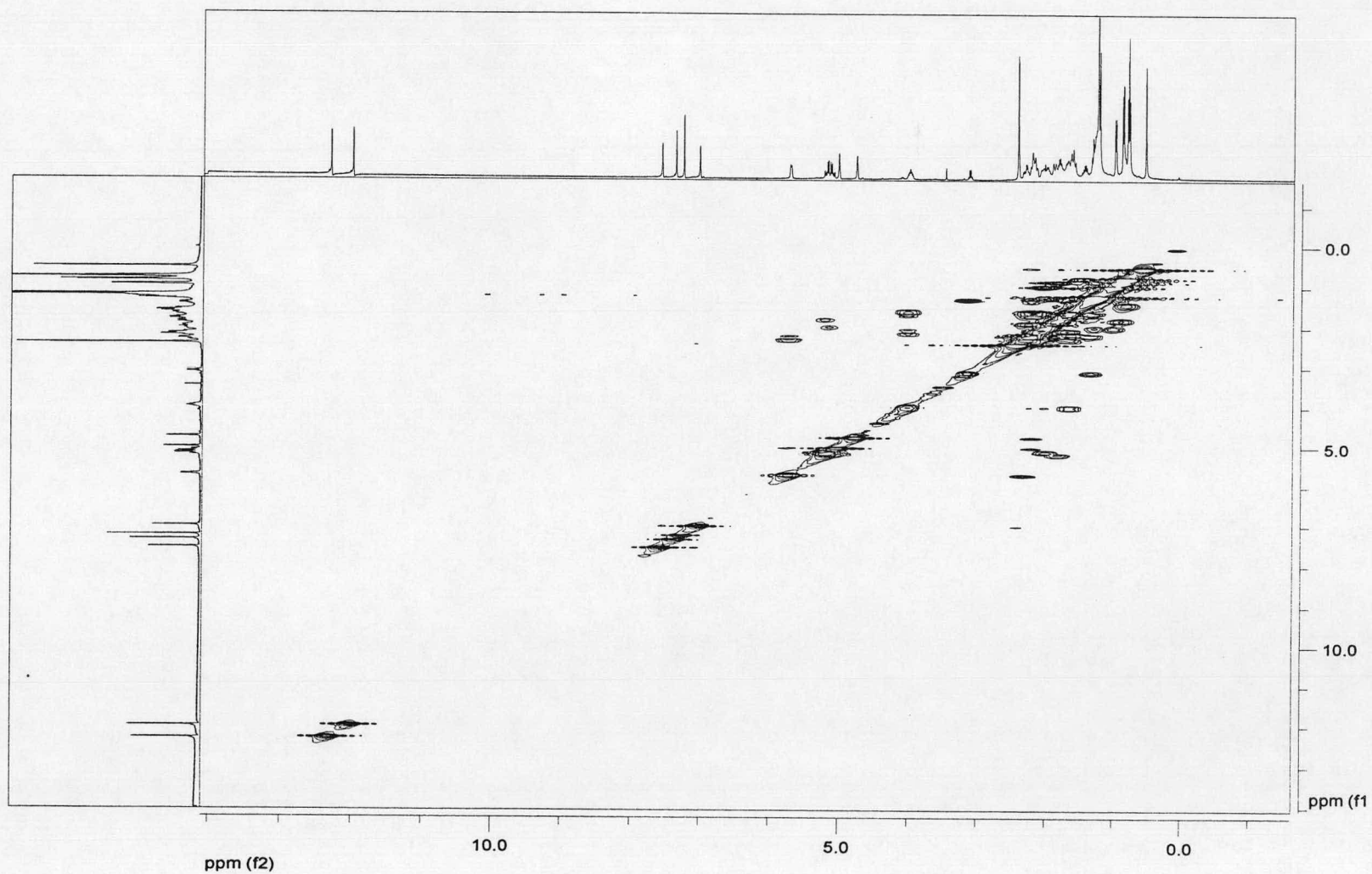


Figure B85 The gCOSY spectrum of compound H1

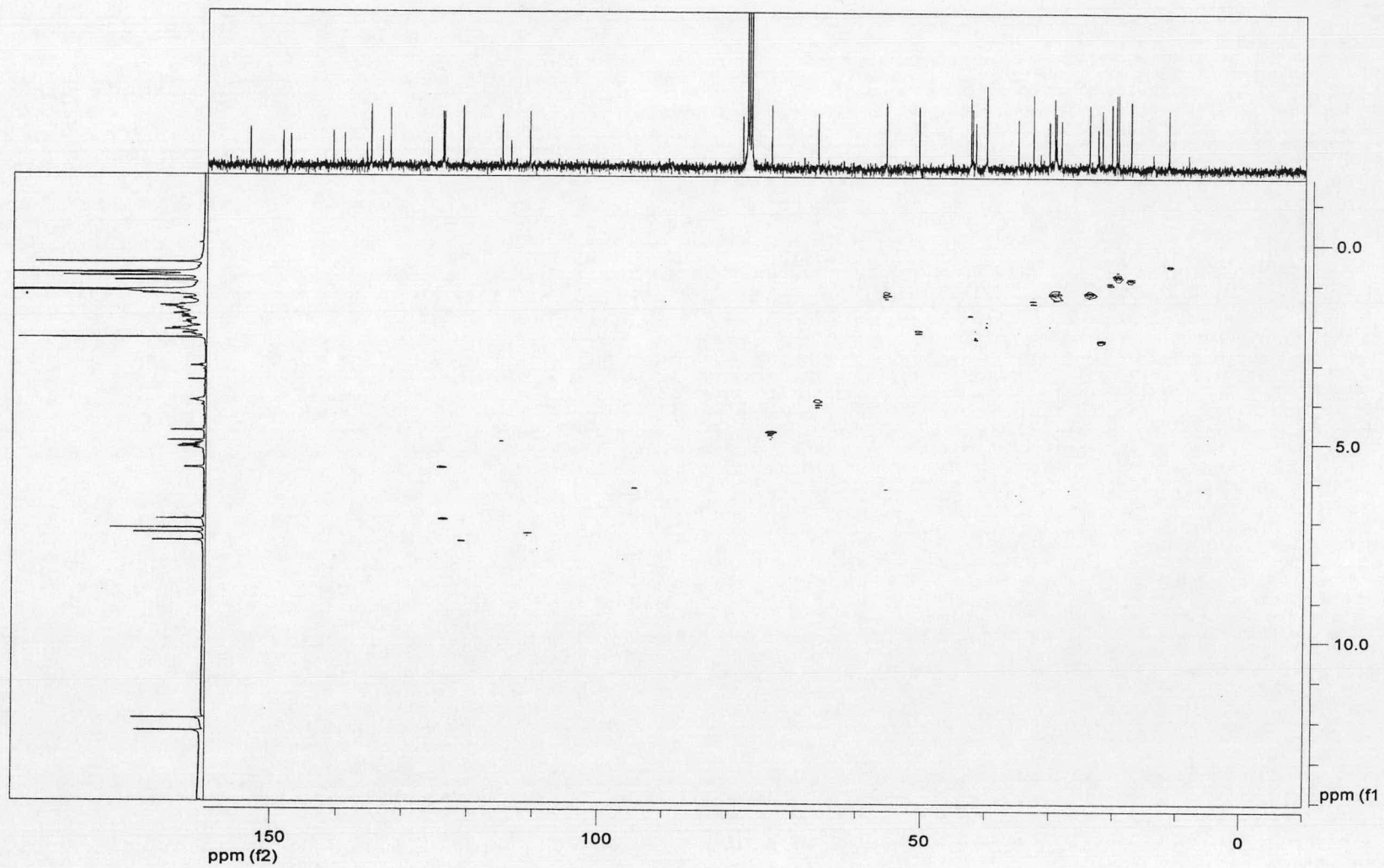


Figure B86 The gHSQC spectrum of compound H1

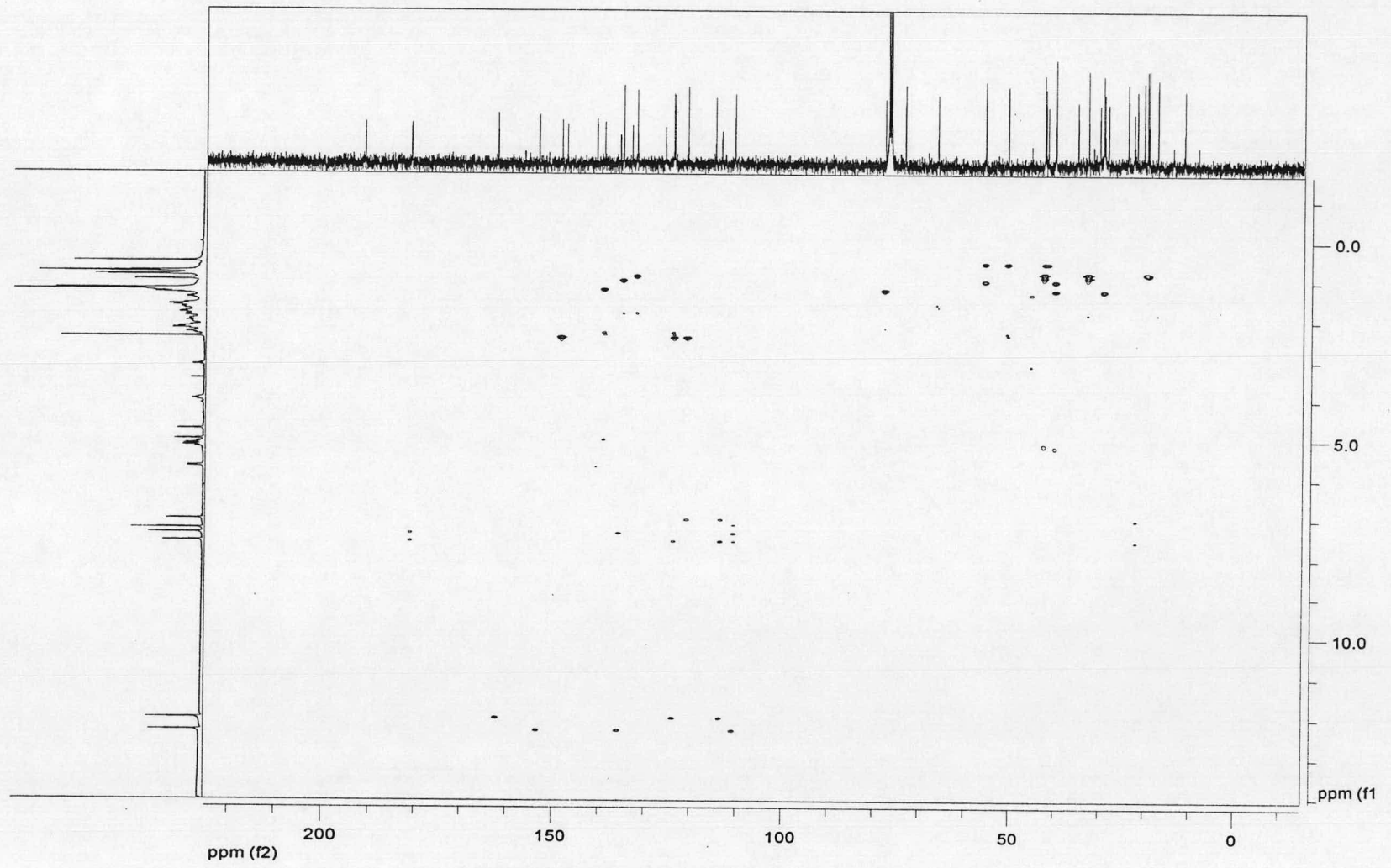


Figure B87 The gHMBC spectrum of compound H1

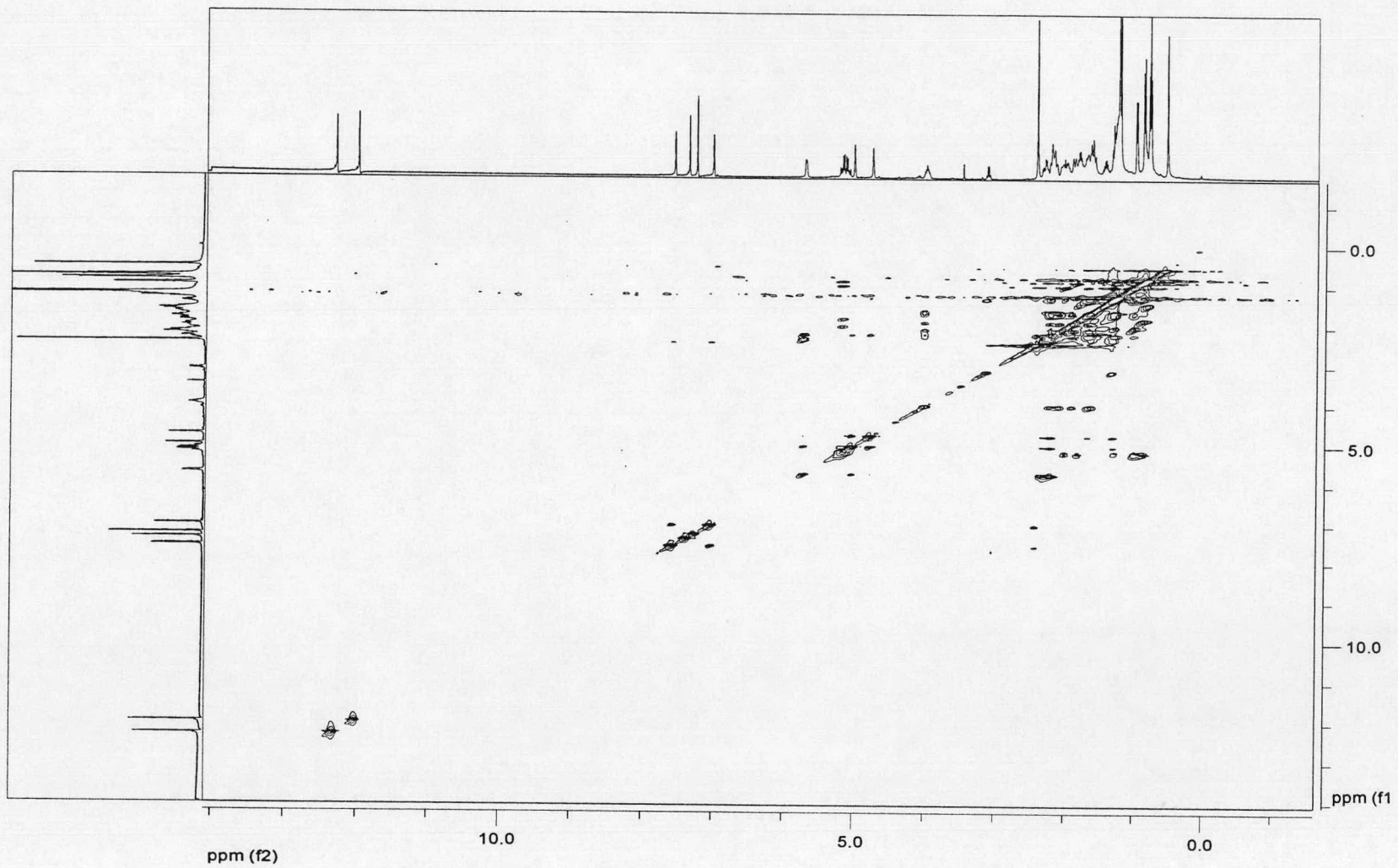


Figure B88 The TOCSY spectrum of compound H1

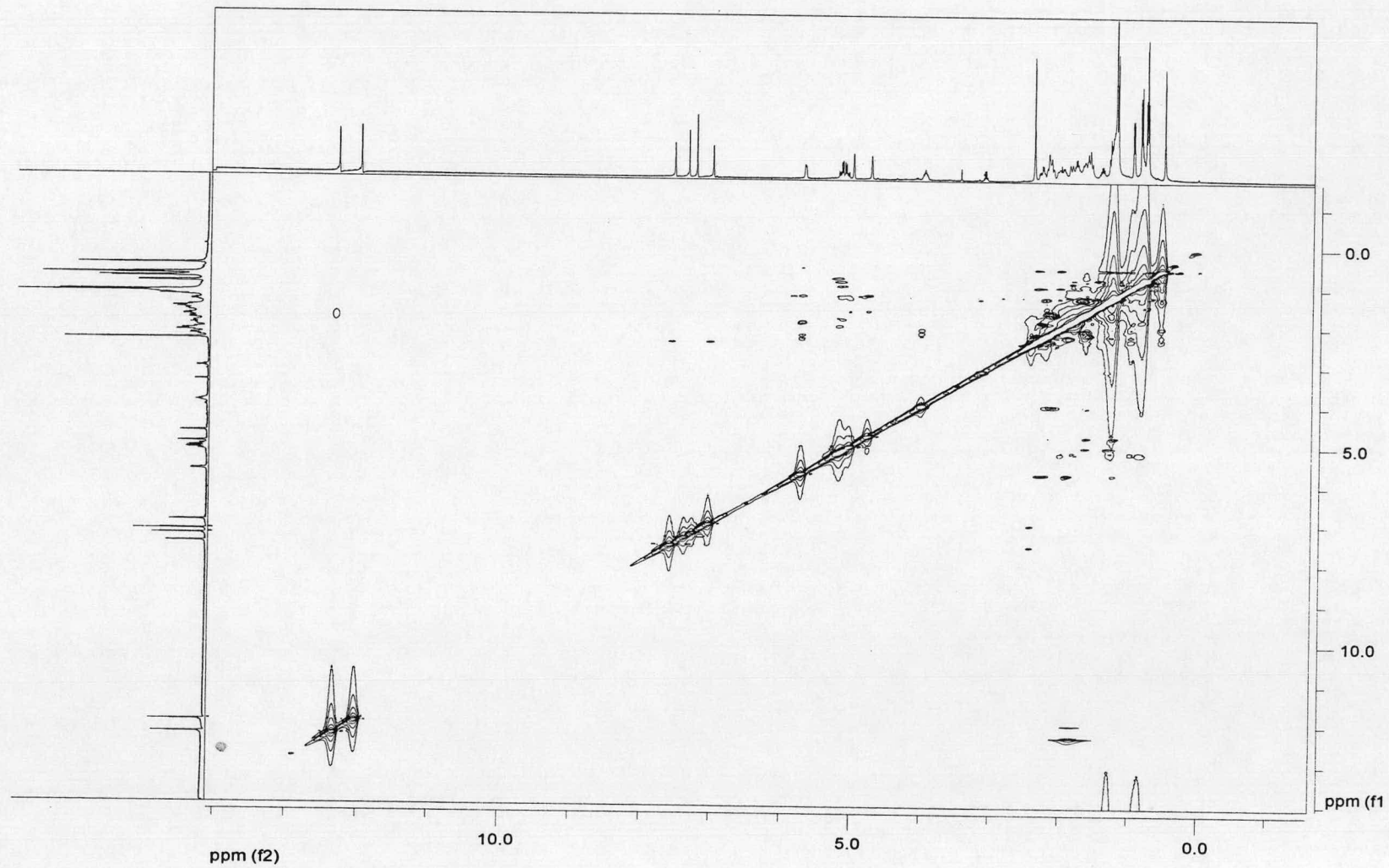


Figure B89 The NOESY spectrum of compound H1

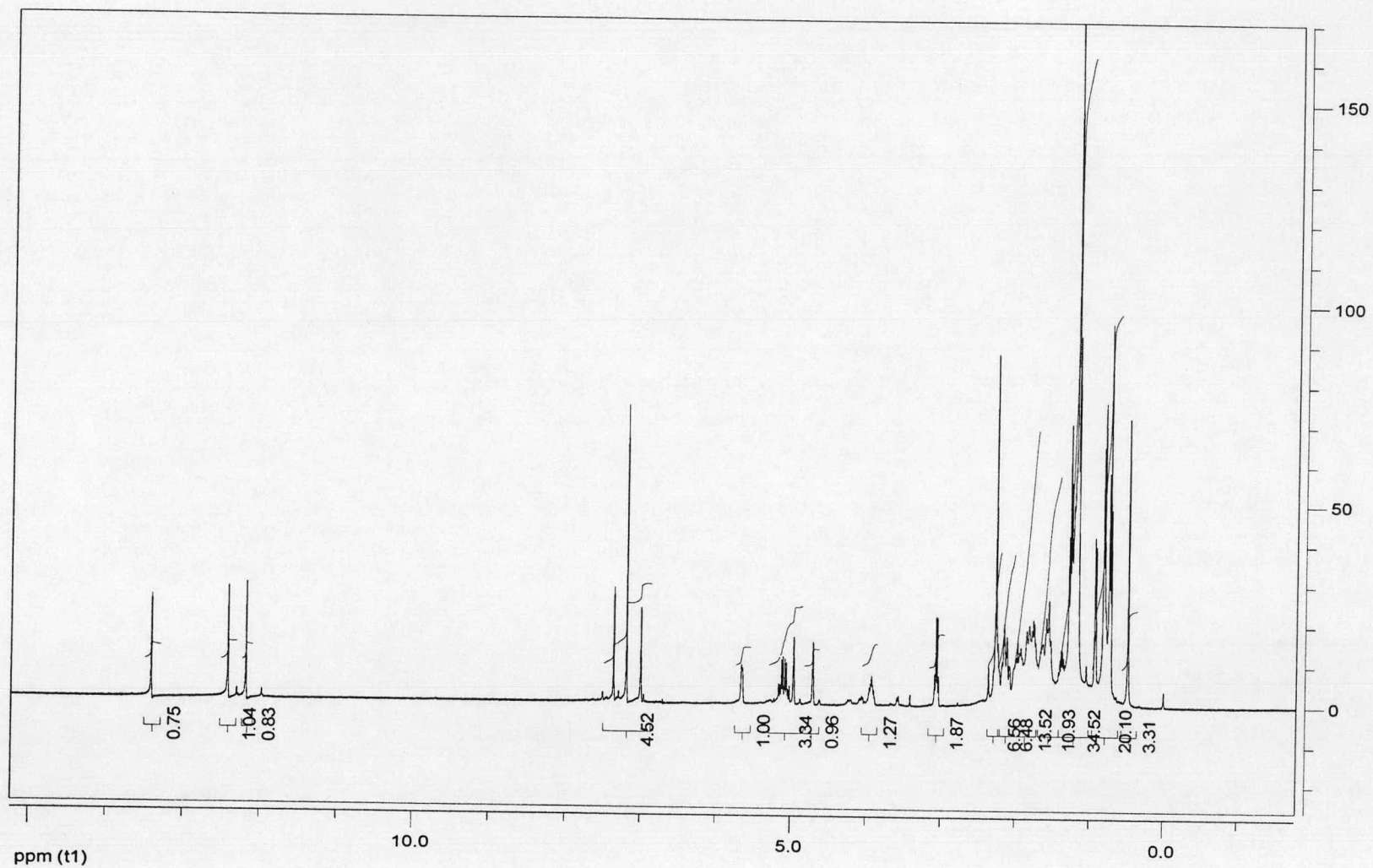


Figure B90 The <sup>1</sup>H-NMR spectrum of compound H2

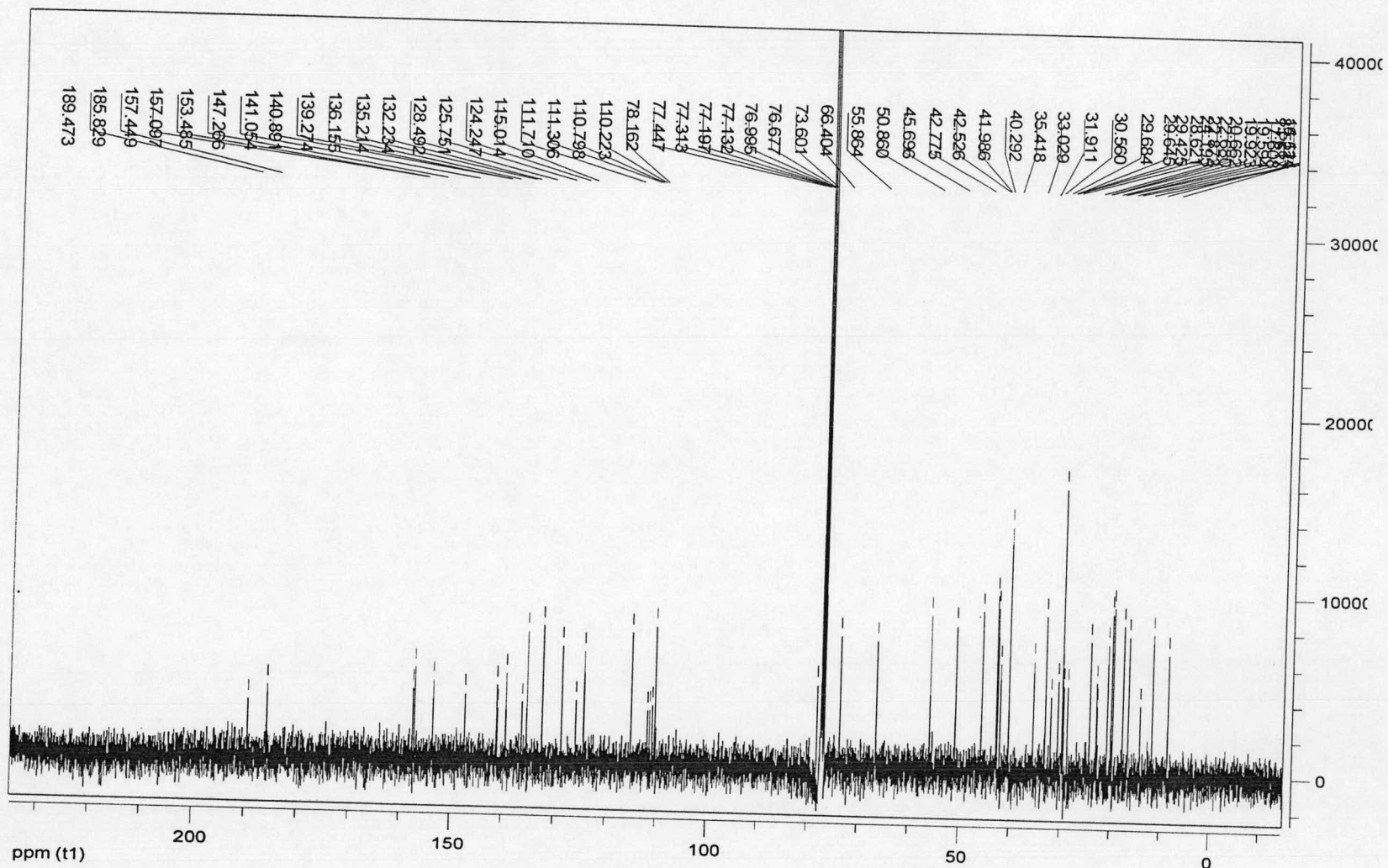


Figure B91 The  $^{13}\text{C}$ -NMR spectrum of compound H2



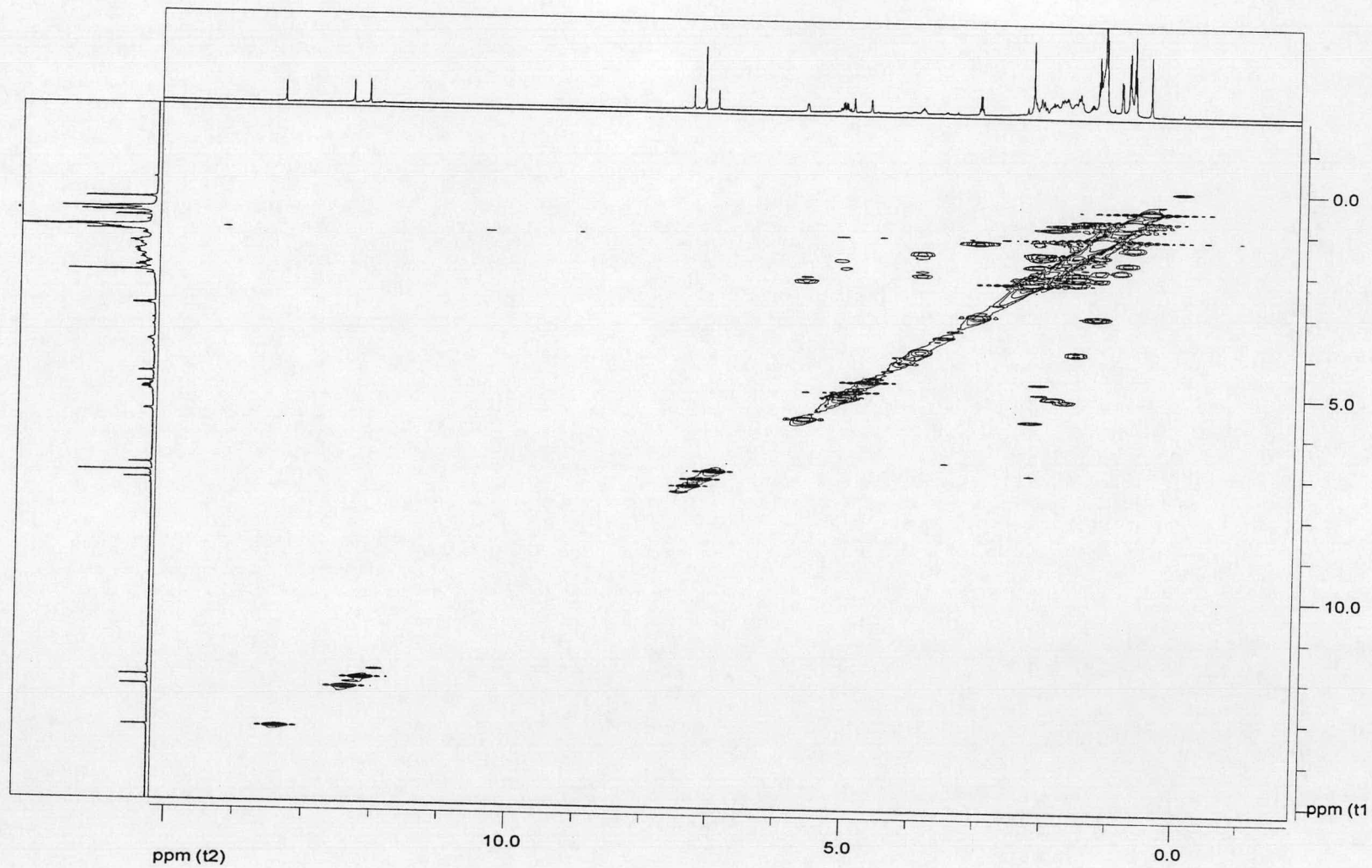


Figure B92 The gCOSY spectrum of compound H2

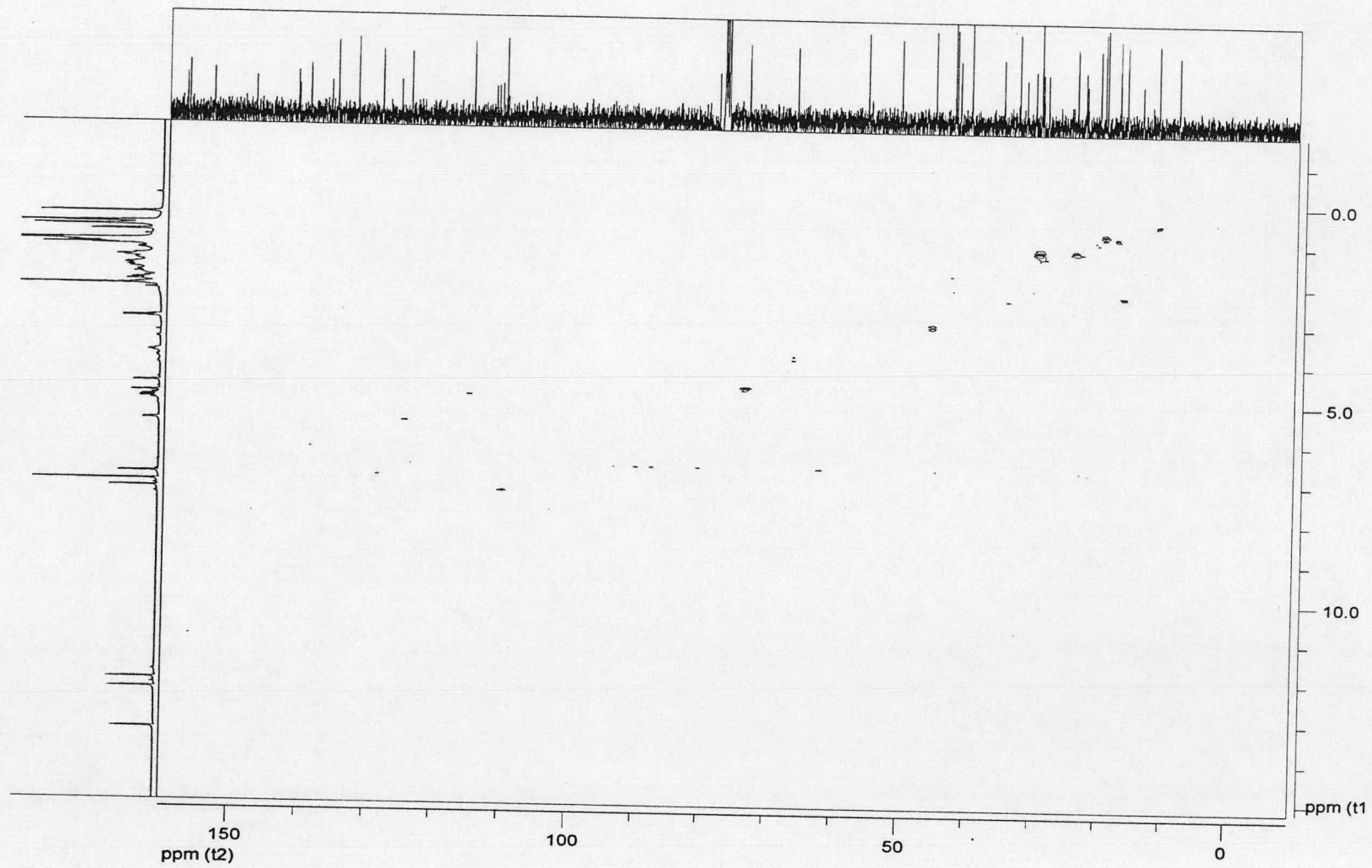


Figure B93 The gHSQC spectrum of compound H2

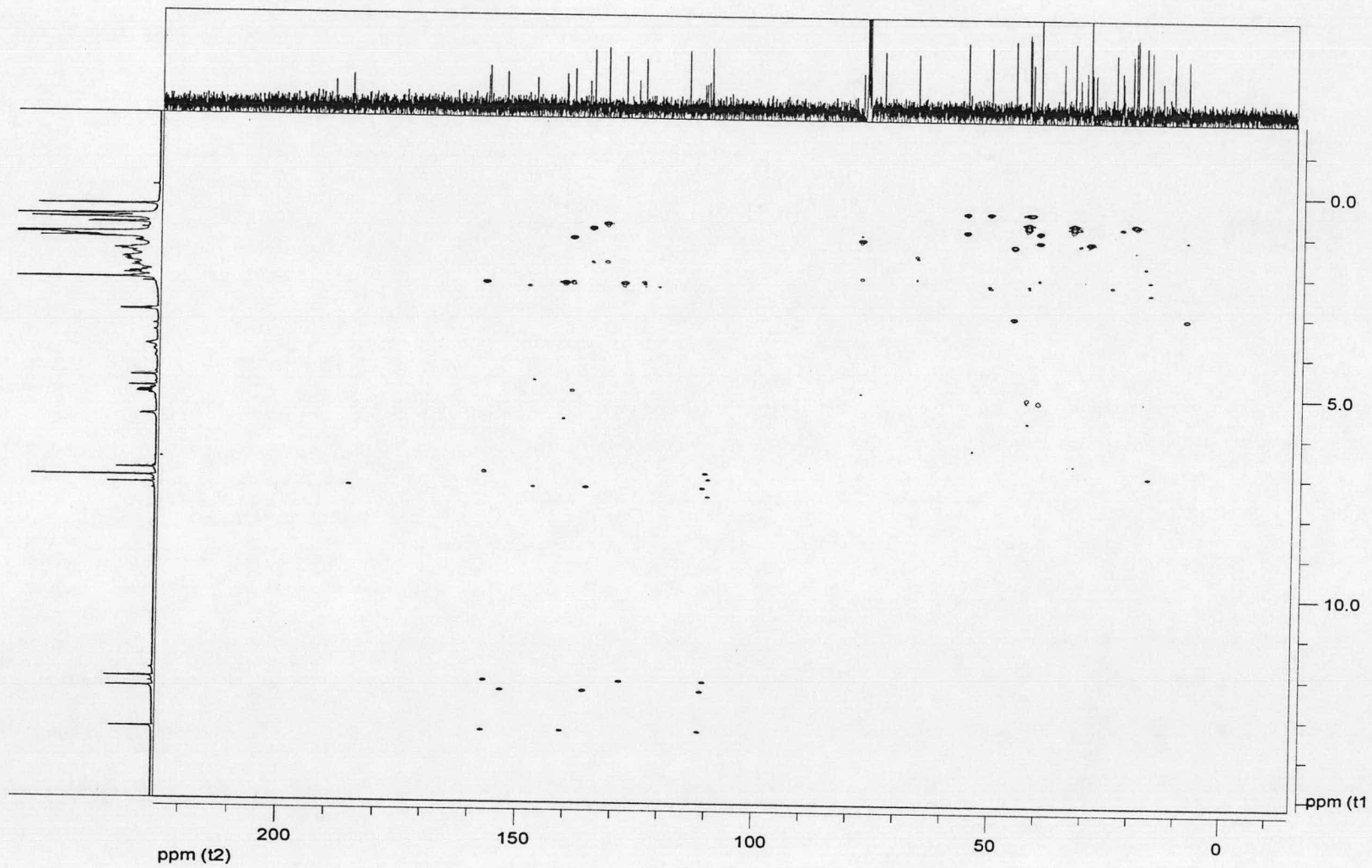


Figure B94 The gHMBC spectrum of compound H2

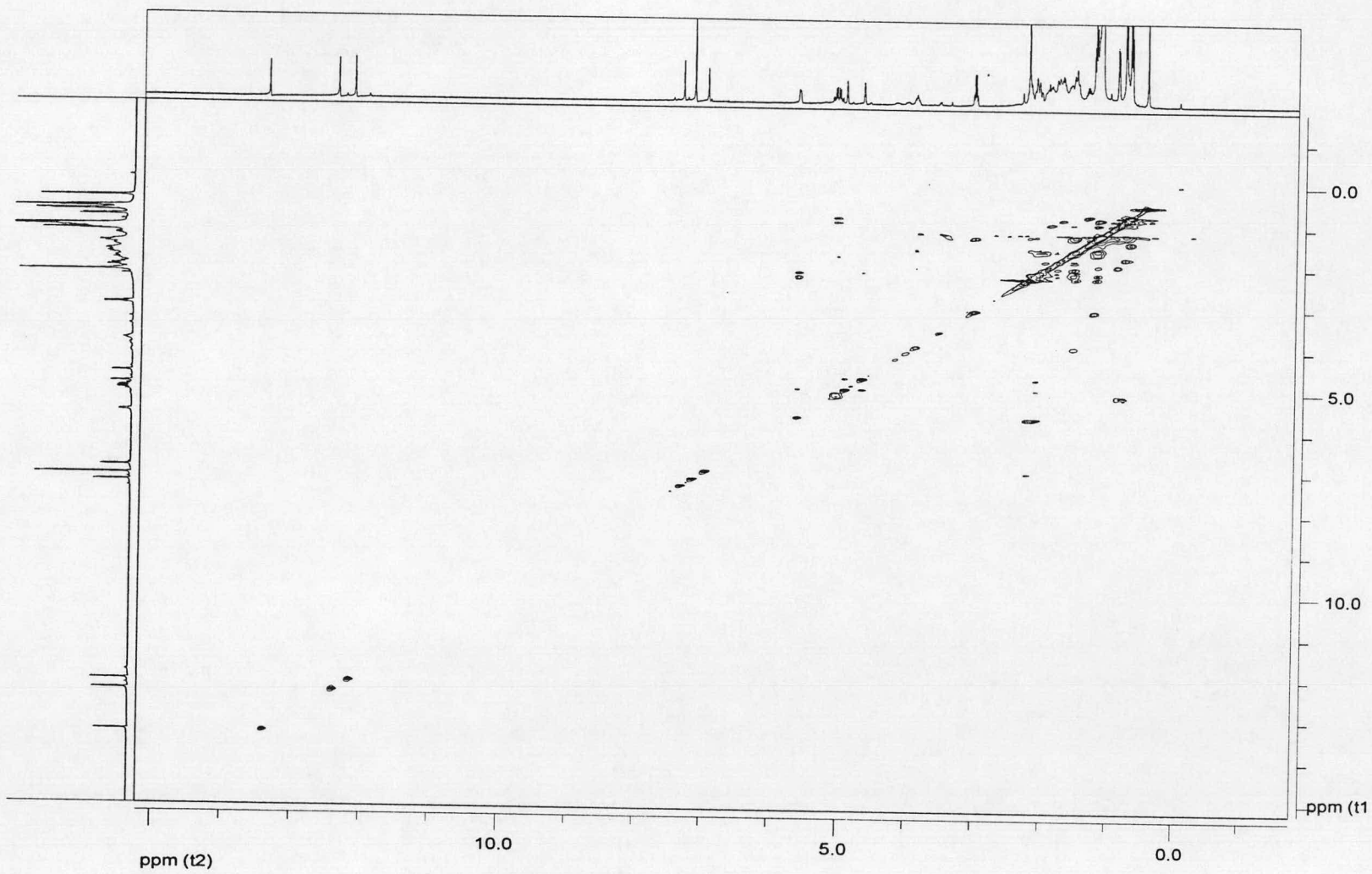


Figure B95 The TOCSY spectrum of compound H2

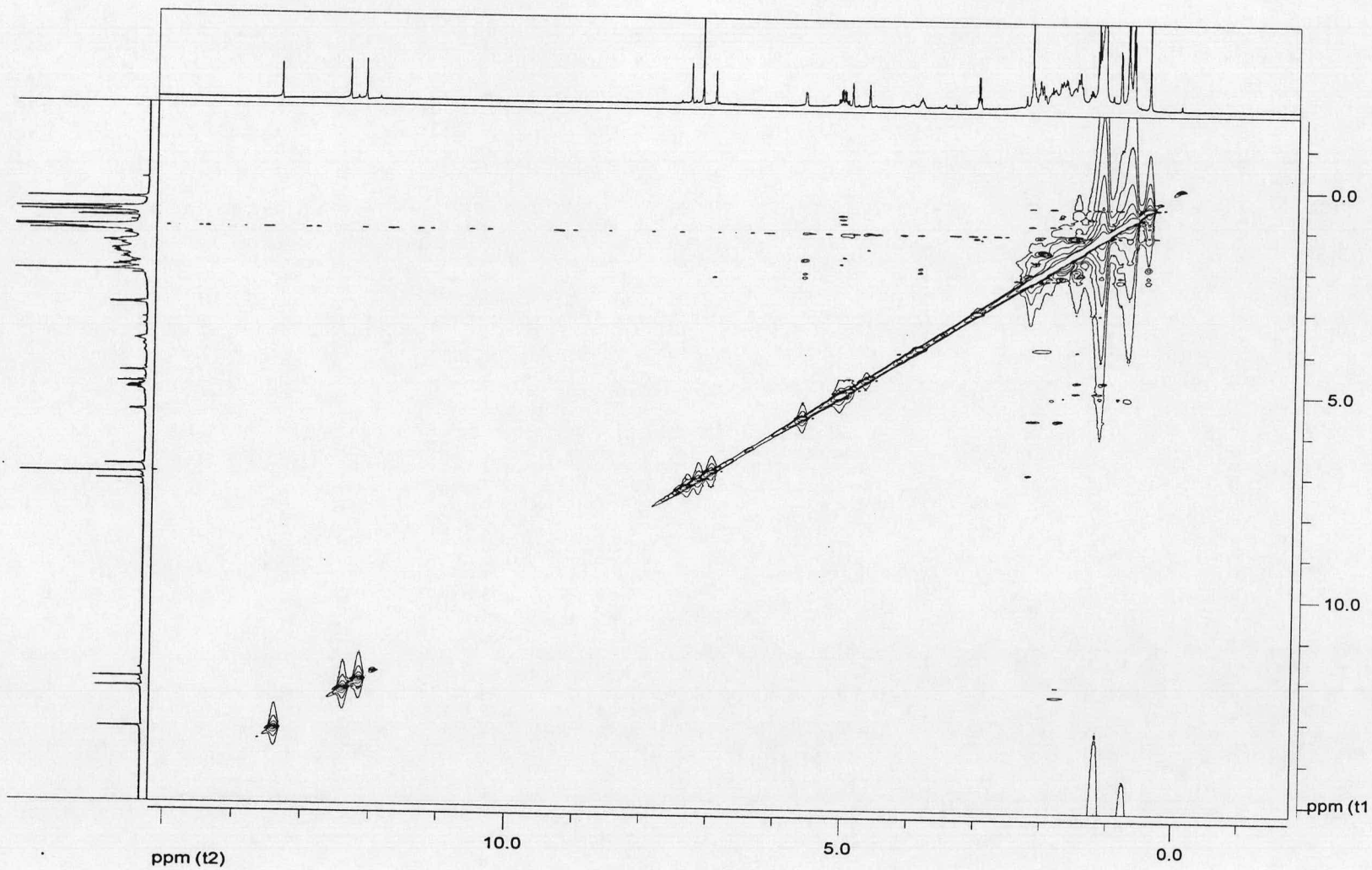


Figure B96 The NOESY spectrum of compound H2

APPENDIX C

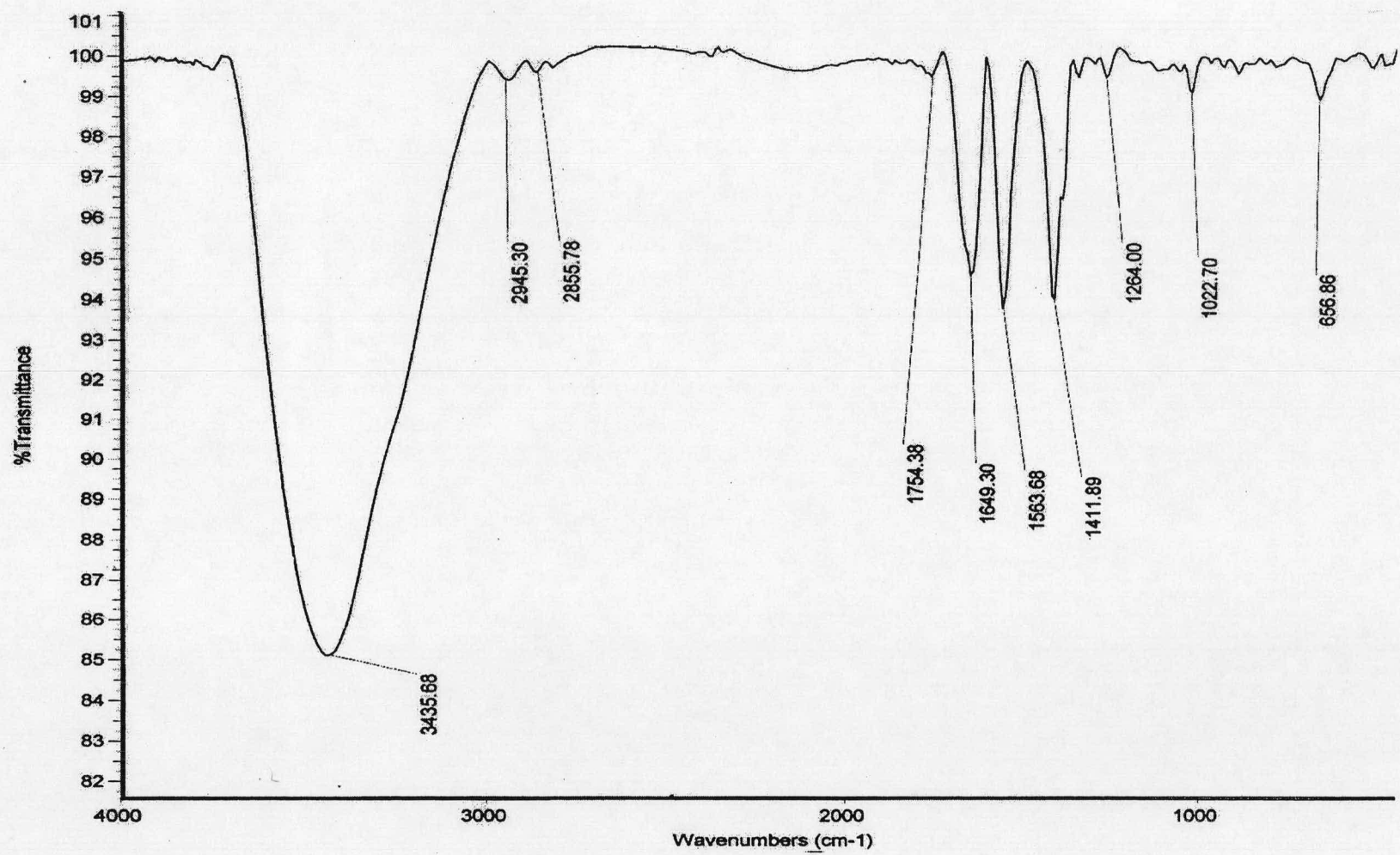


Figure C1 IR spectrum of compound A

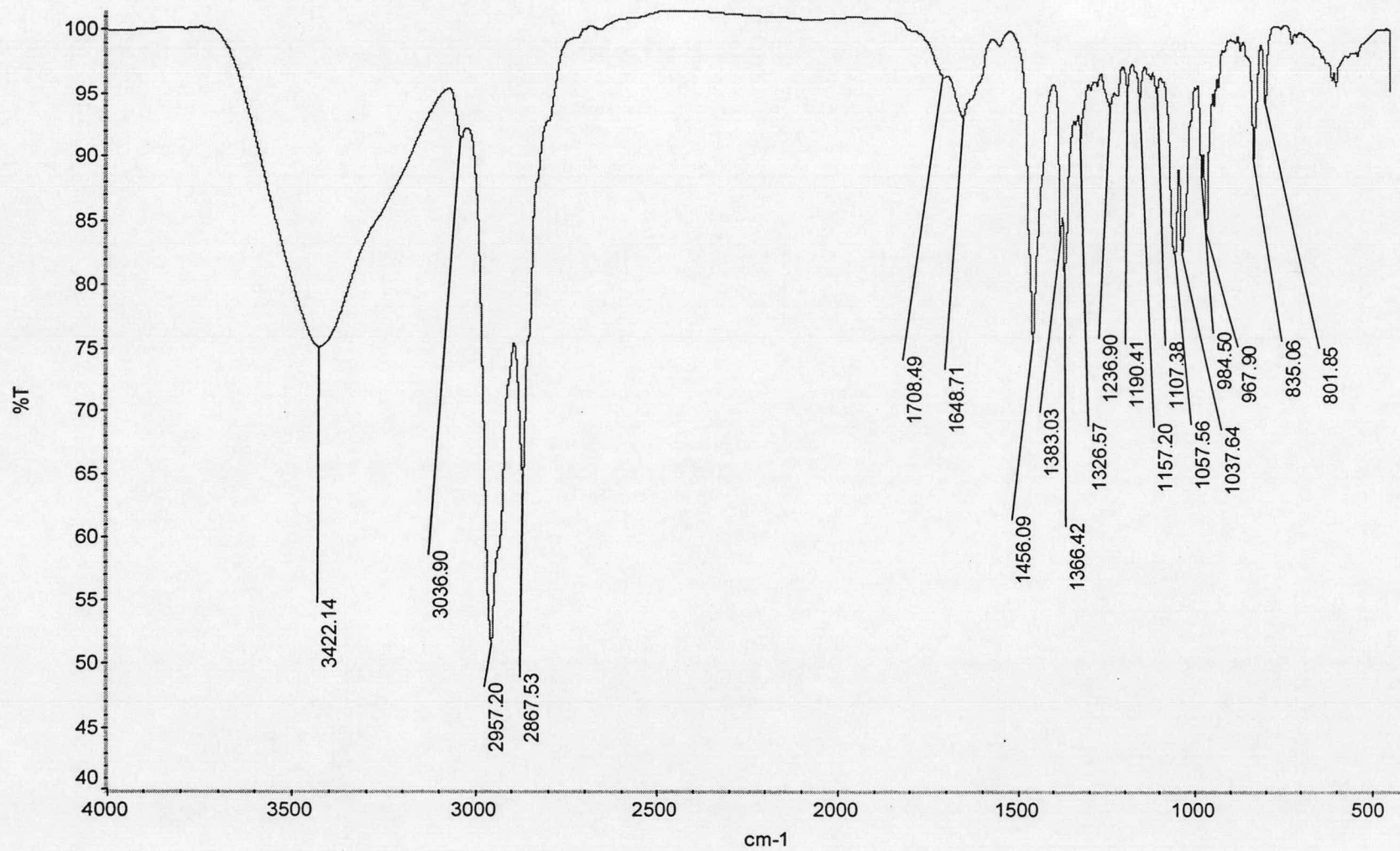


Figure C2 IR spectrum of compound B



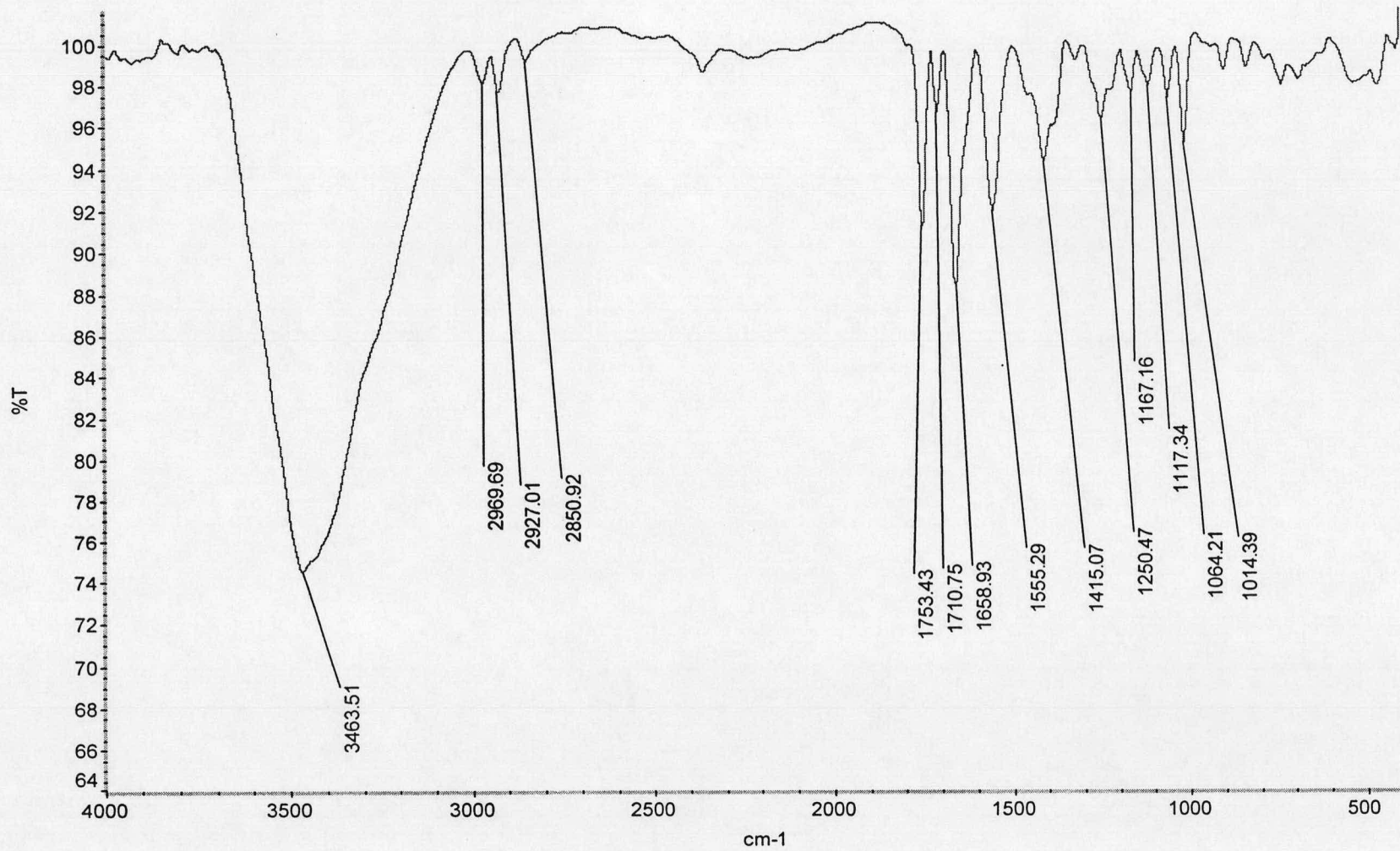


Figure C3 IR spectrum of compound C1

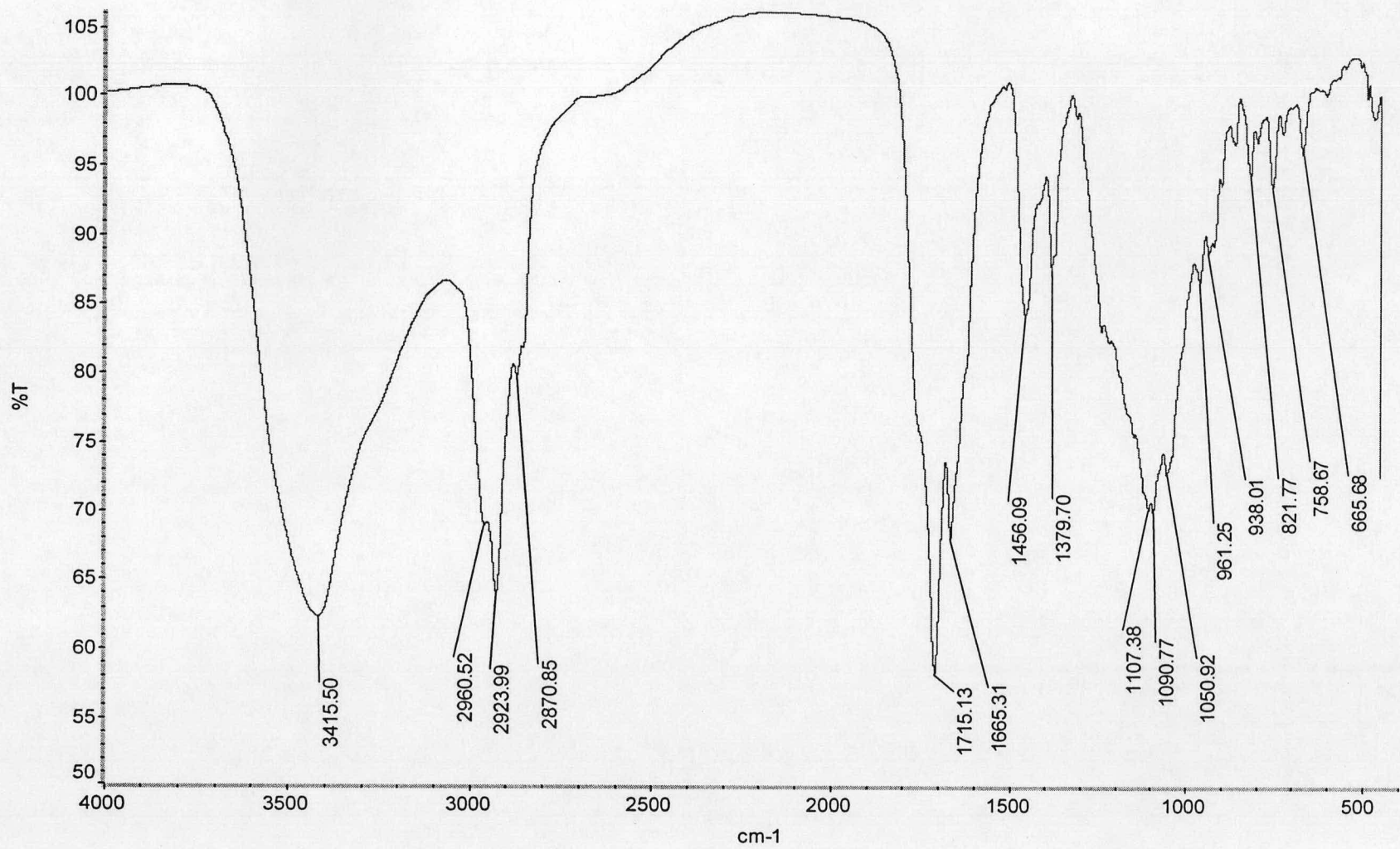


Figure C4 IR spectrum of compound C2

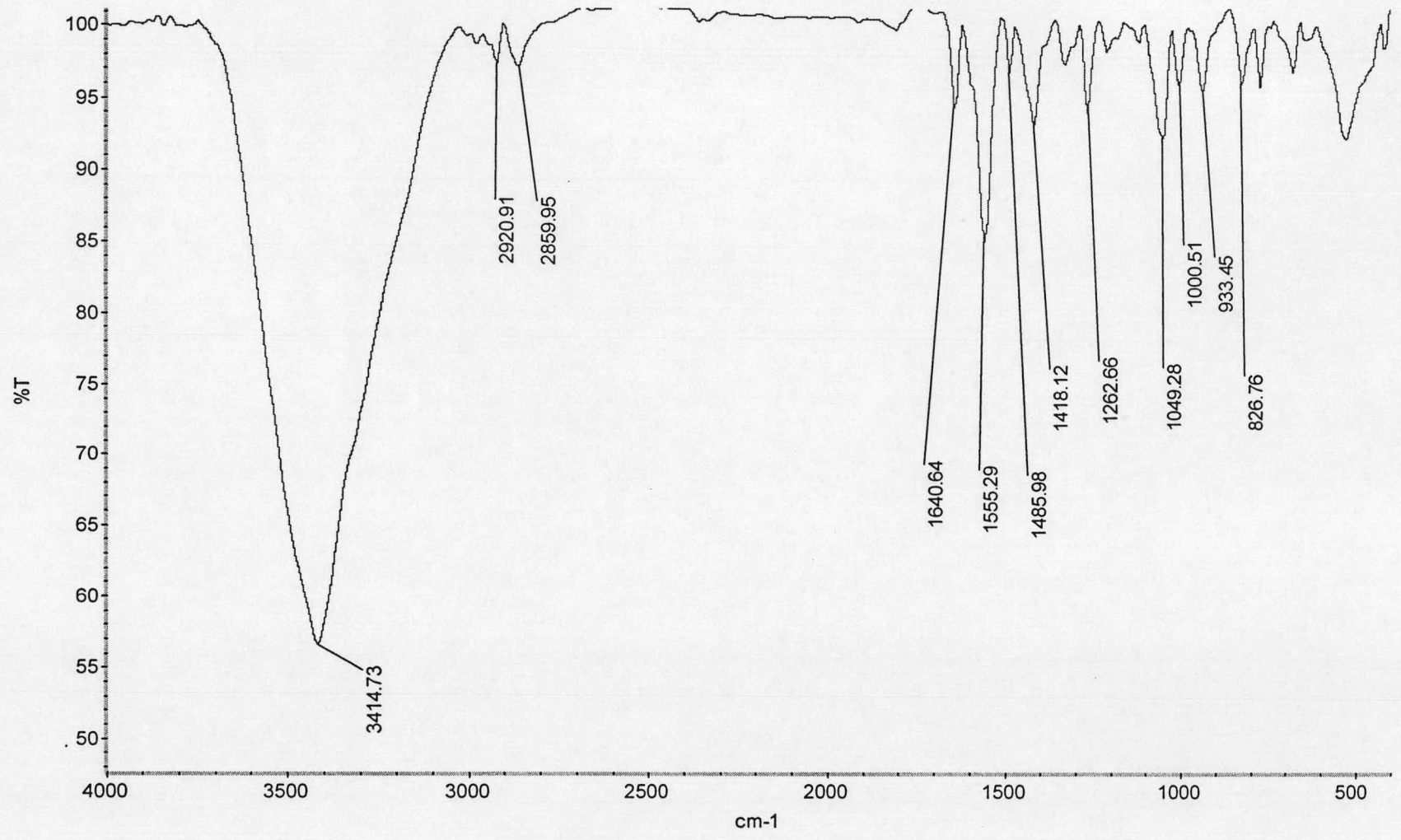


Figure C5 IR spectrum of compound D1

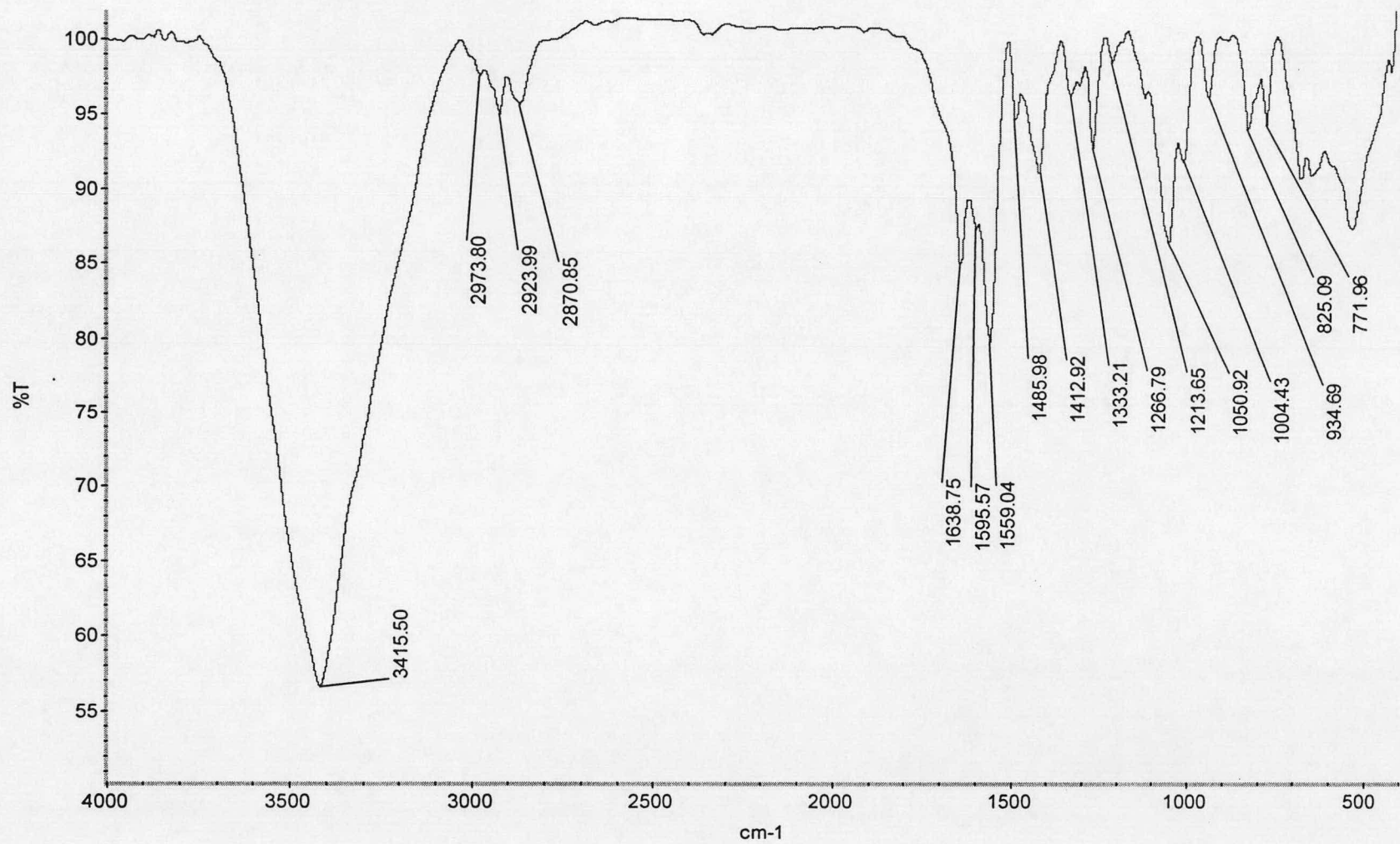


Figure C6 IR spectrum of compound D2

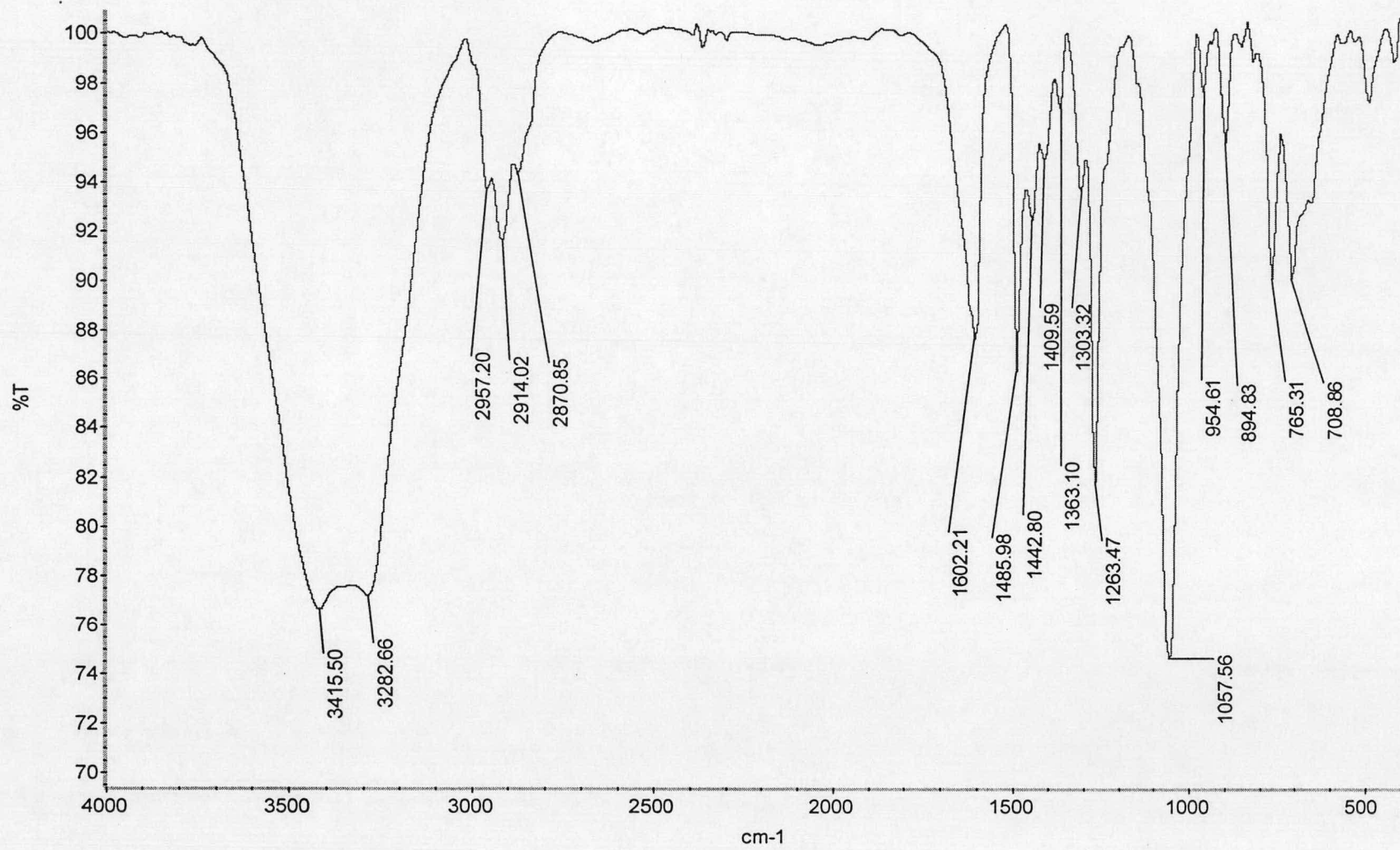


Figure C7 IR spectrum of compound D3

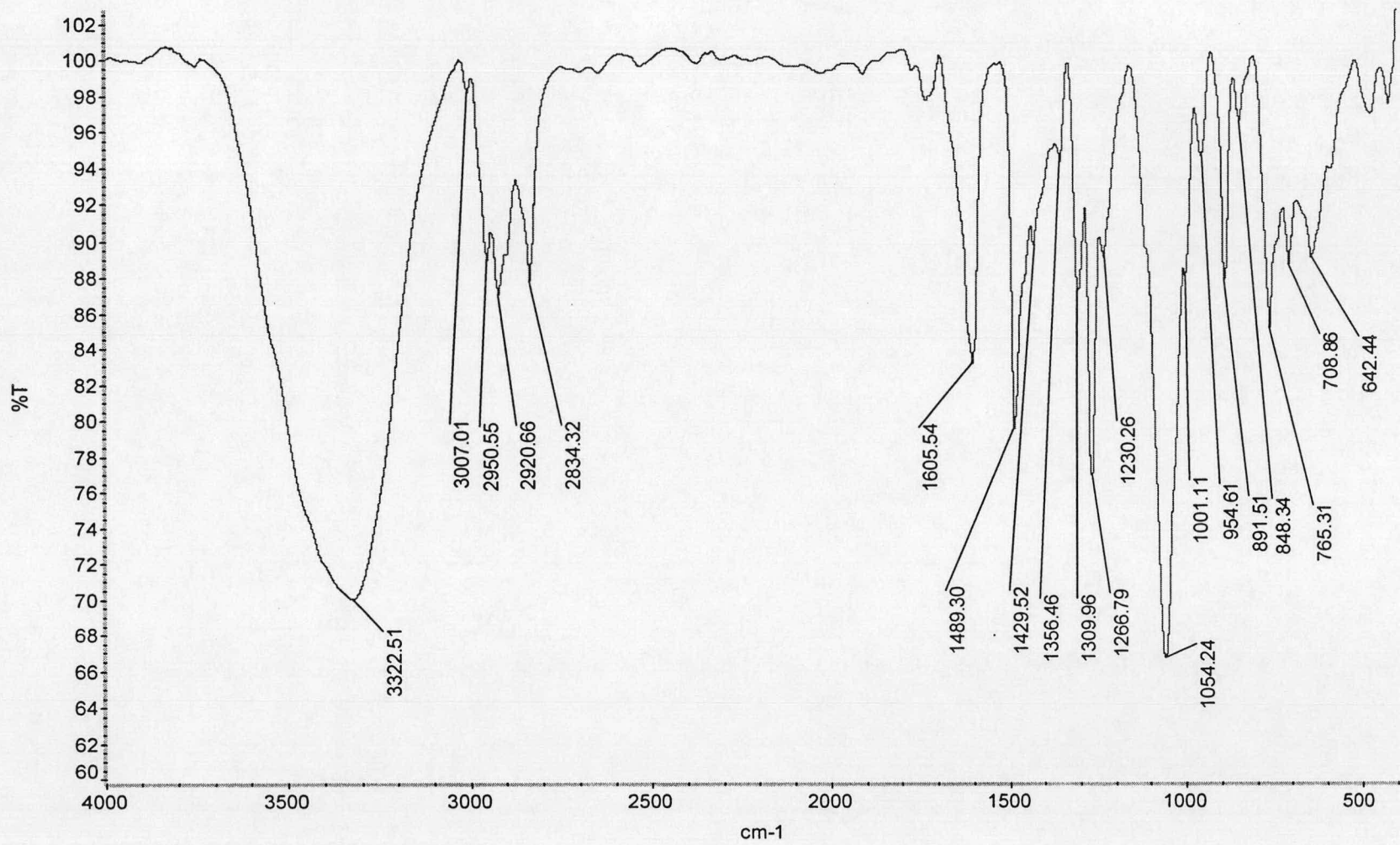


Figure C8 IR spectrum of compound D4

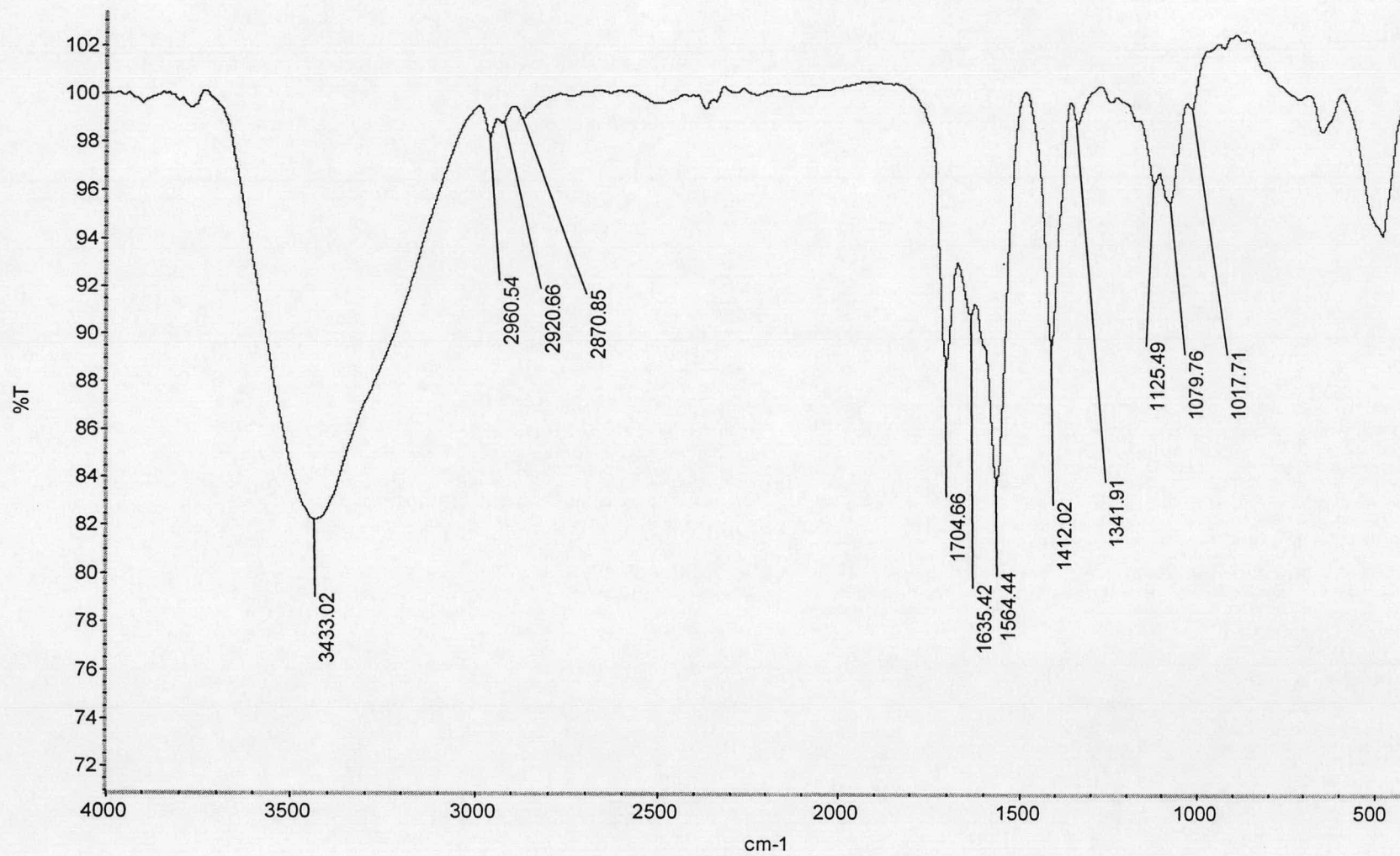


Figure C9 IR spectrum of compound E

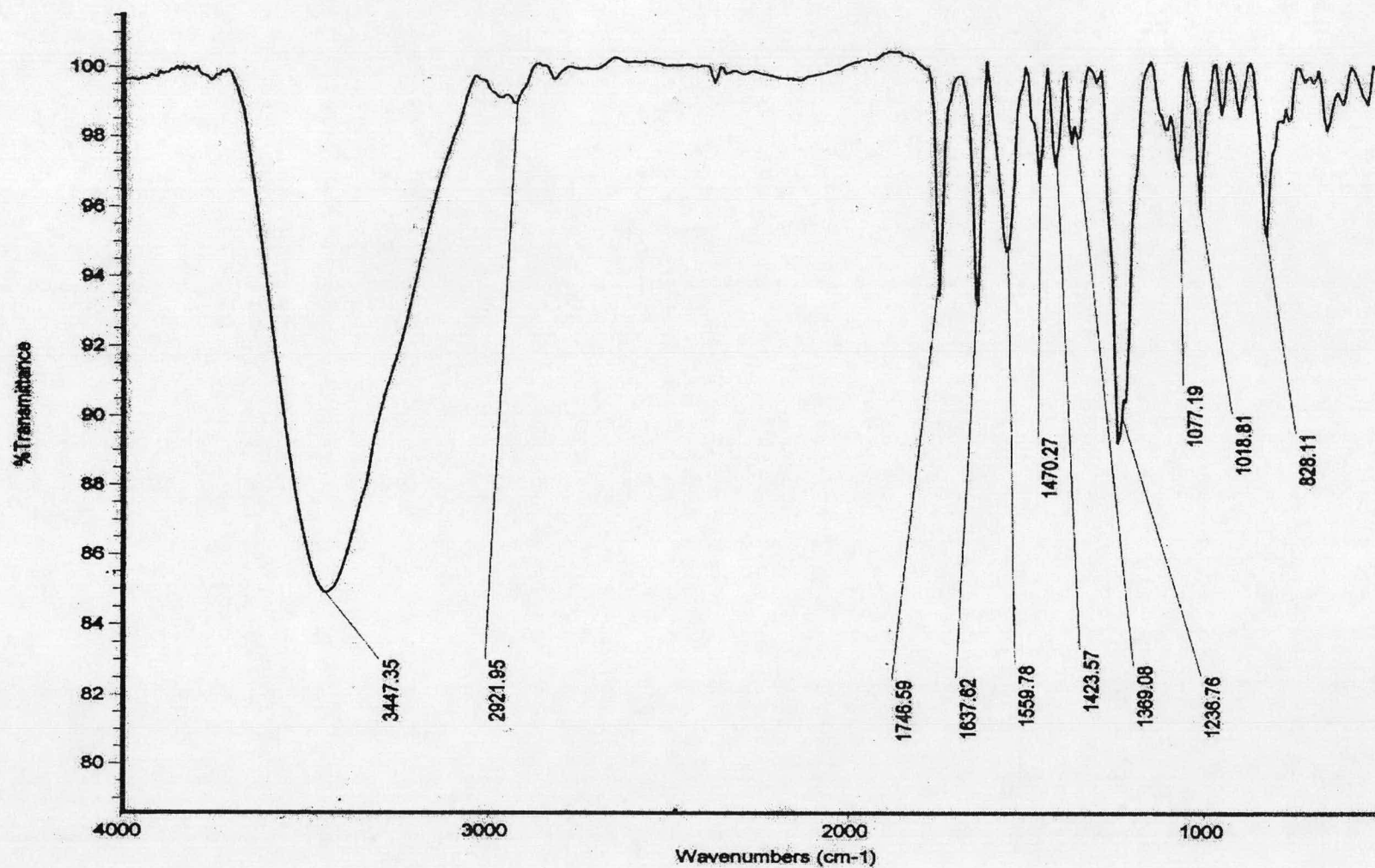


Figure C10 IR spectrum of compound F1



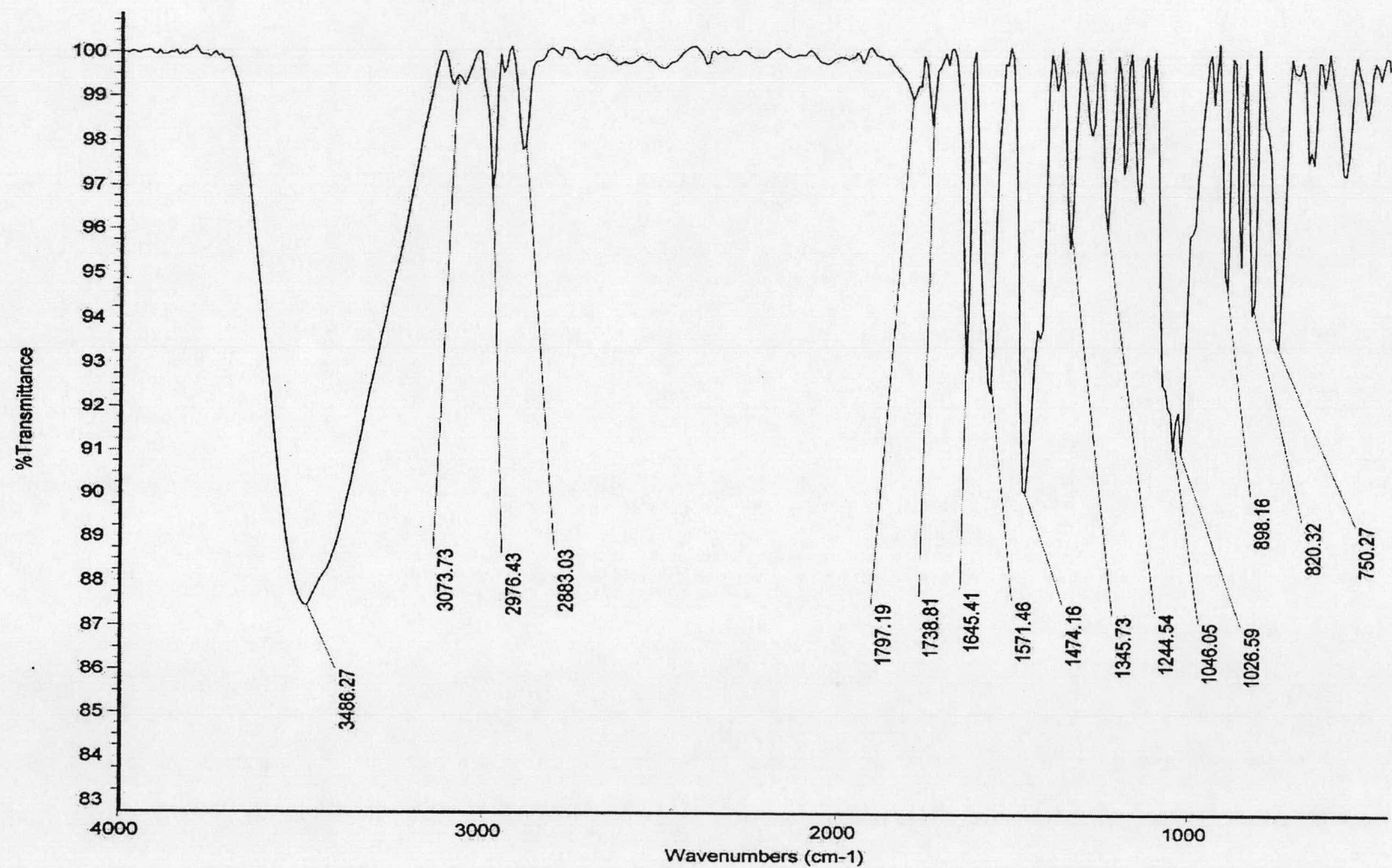


Figure D11 IR spectrum of compound F2

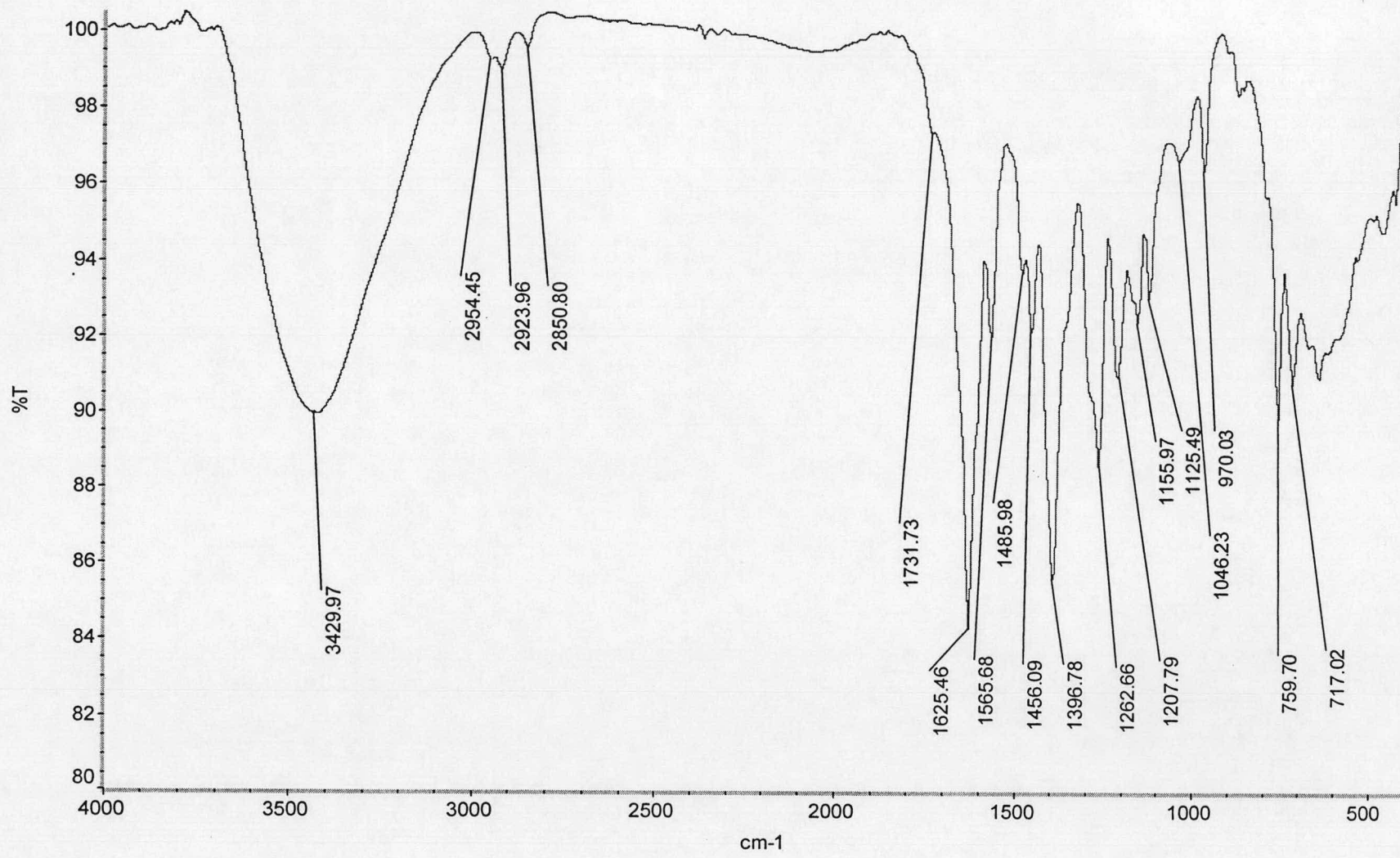


Figure C12 IR spectrum of compound G1

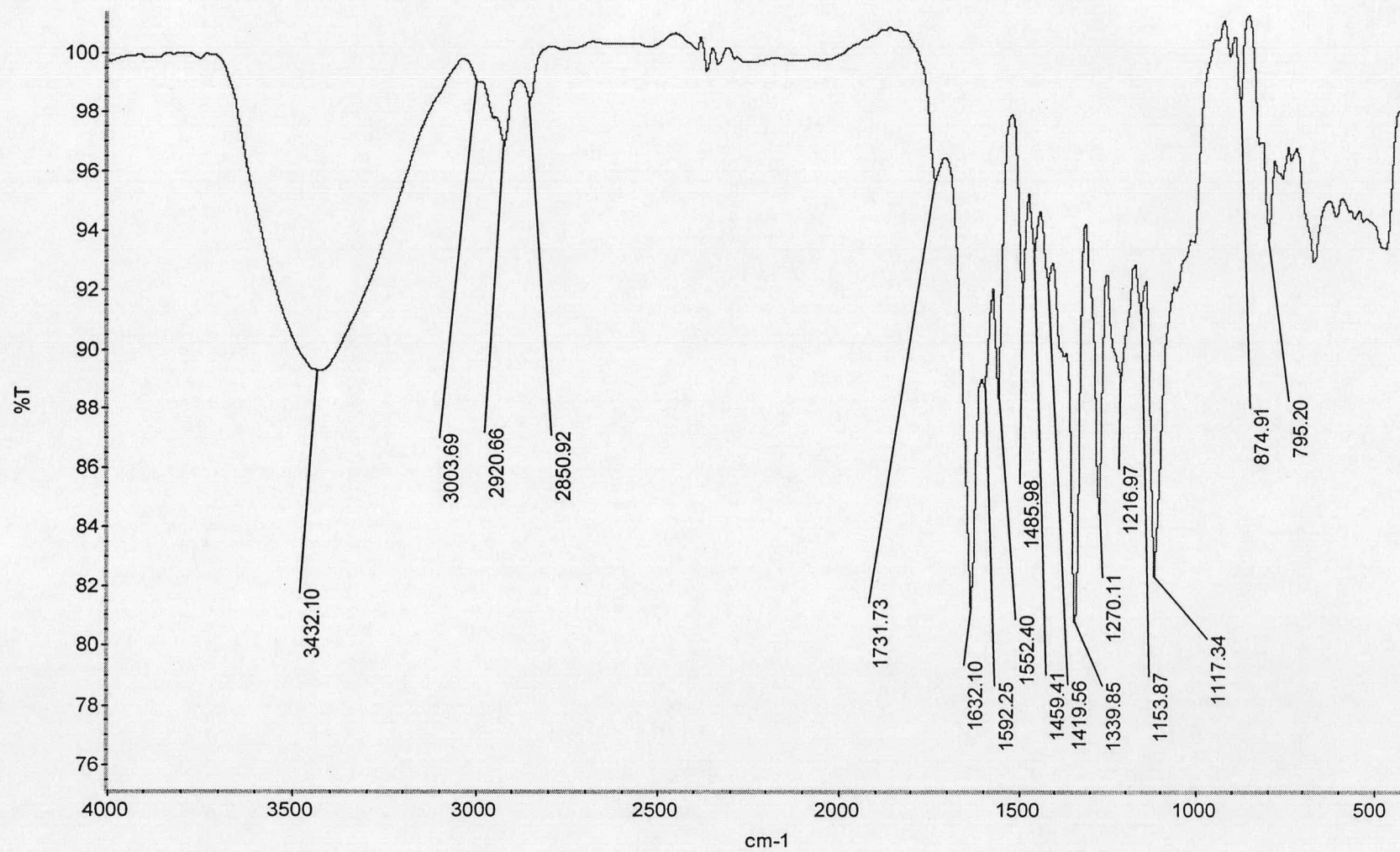


Figure C13 IR spectrum of compound G2

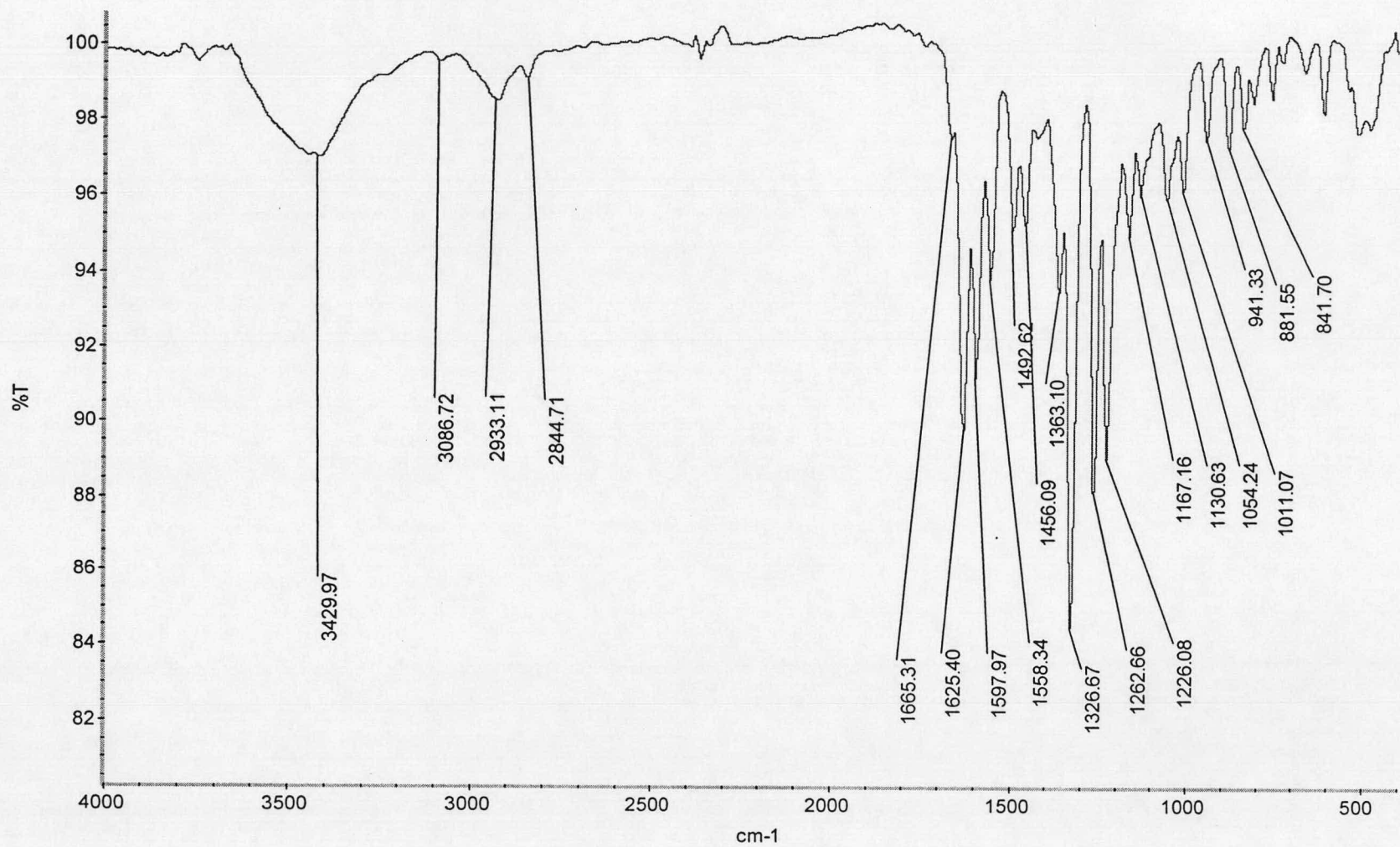


Figure C14 IR spectrum of compound G3

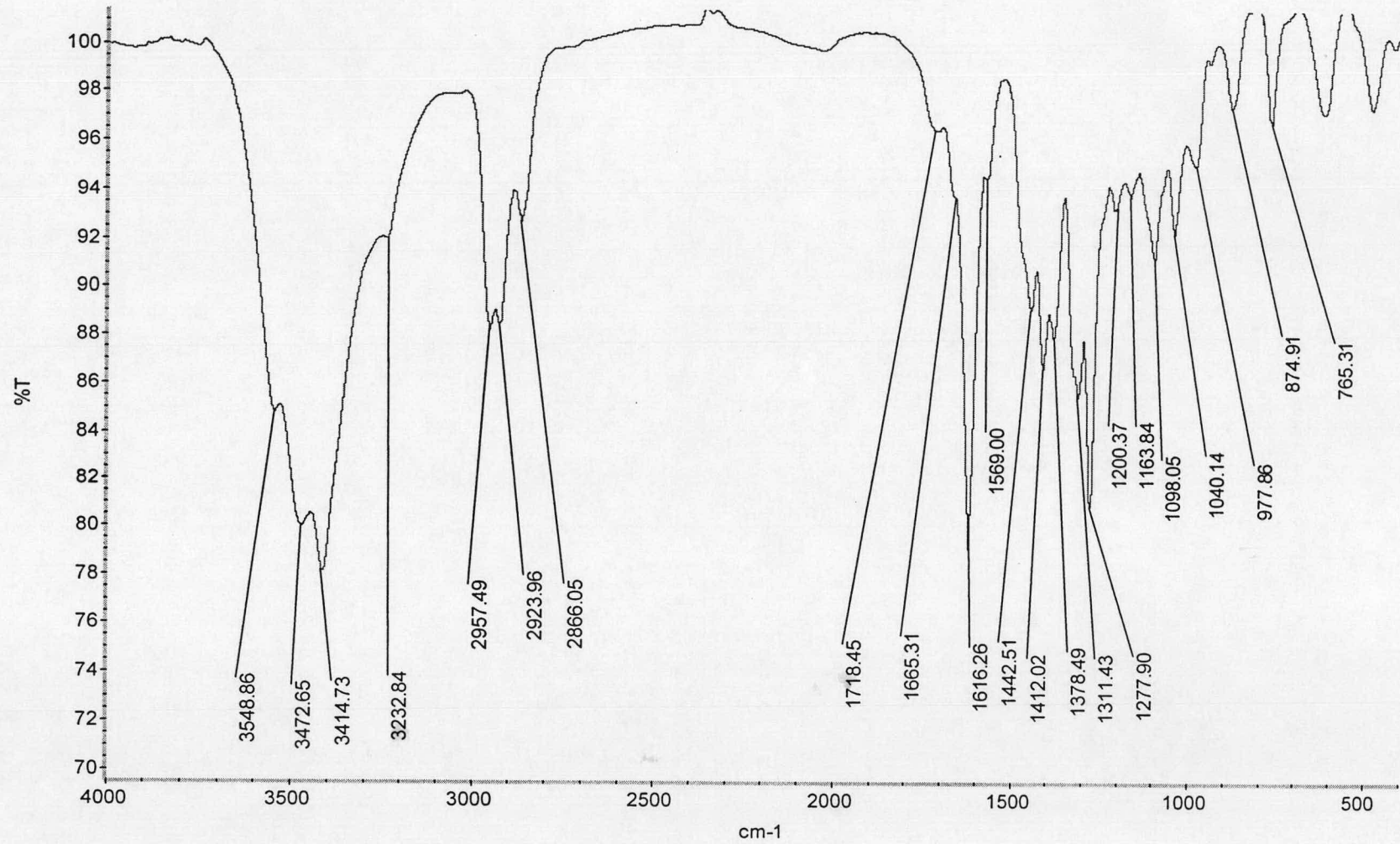


Figure C15 IR spectrum of compound H1

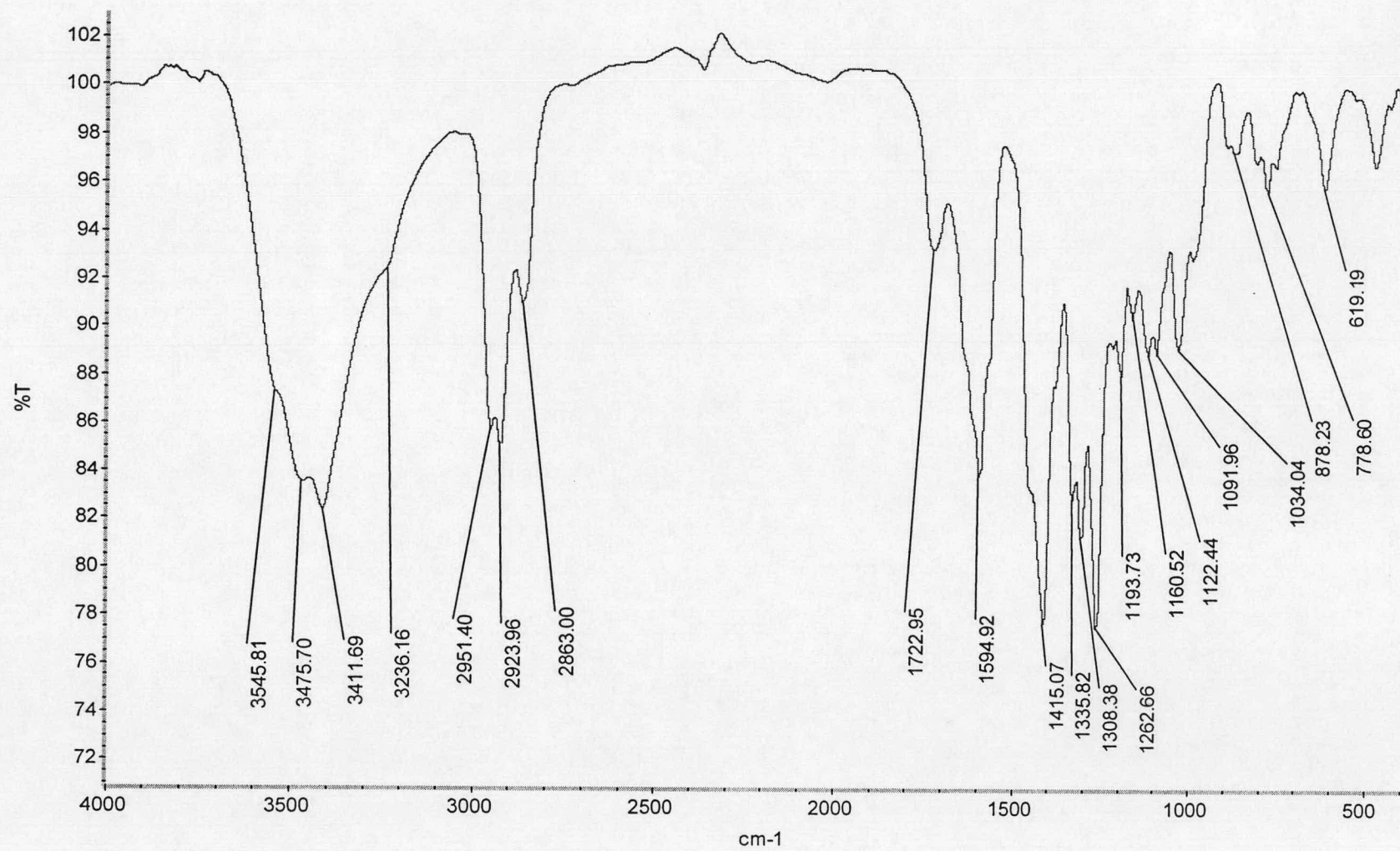


Figure C16 IR spectrum of compound H2

APPENDIX D

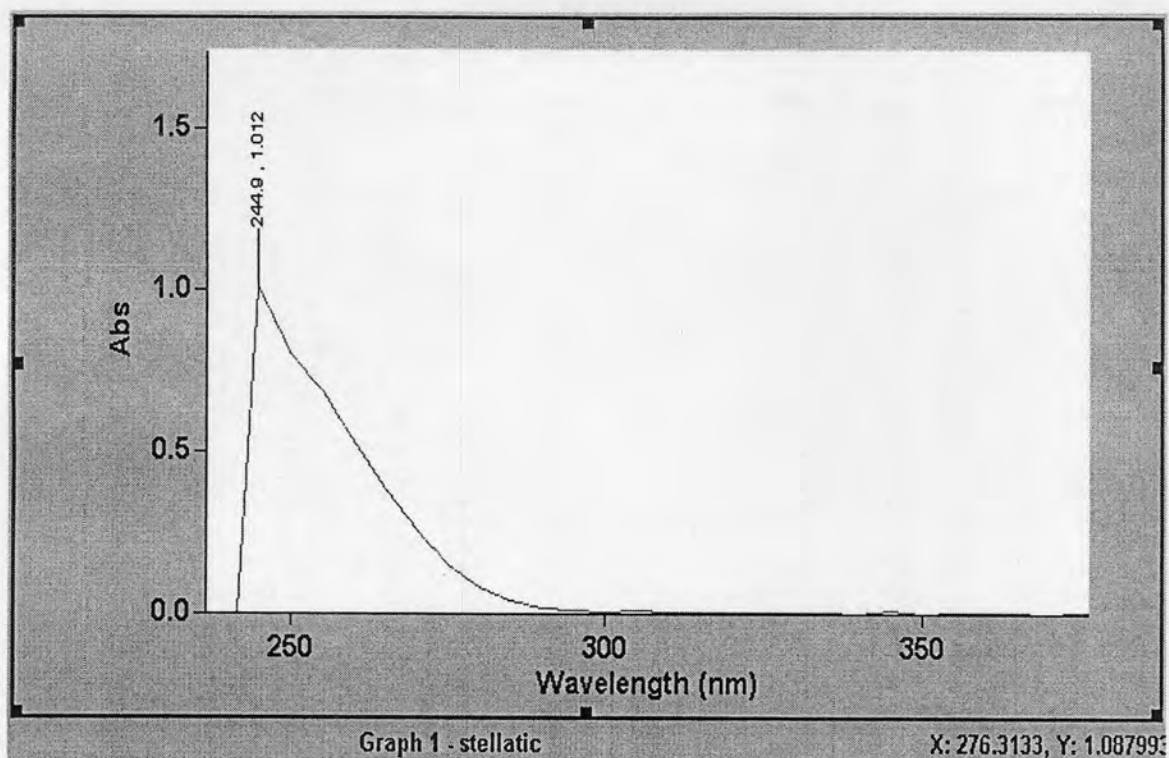


Figure D1 UV-VIS spectrum of compound A

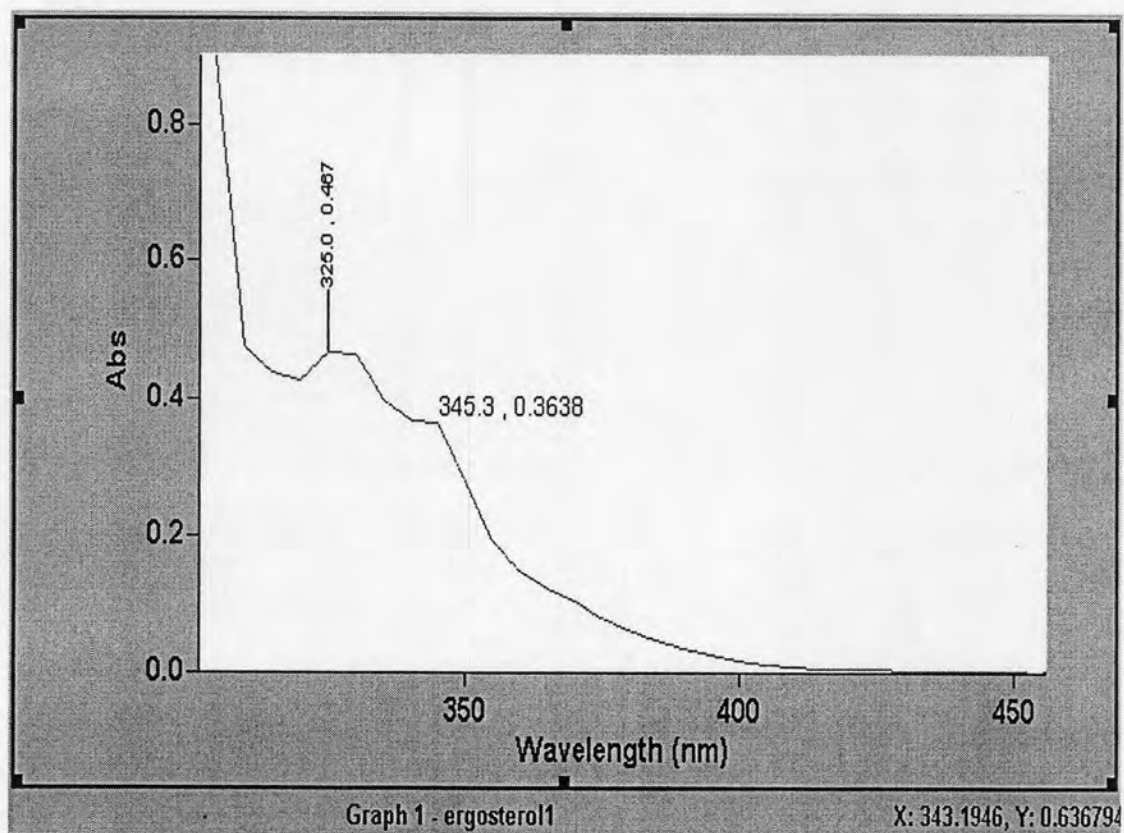


Figure D2 UV-VIS spectrum of compound B



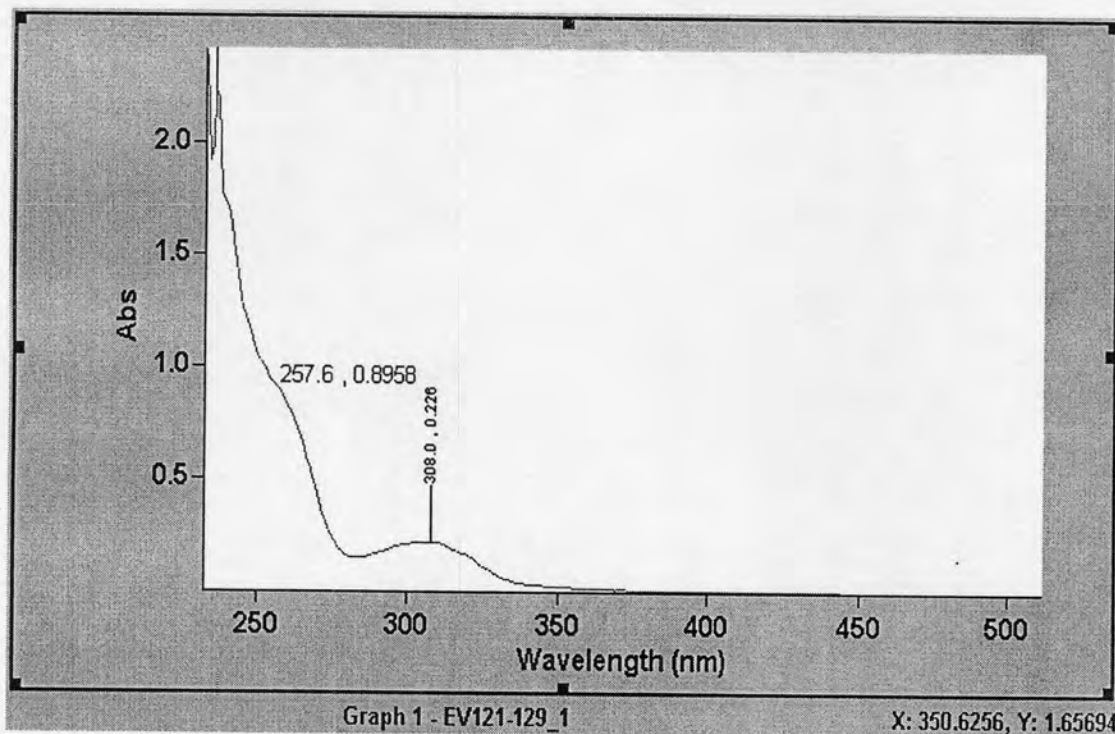


Figure D3 UV-VIS spectrum of compound C1

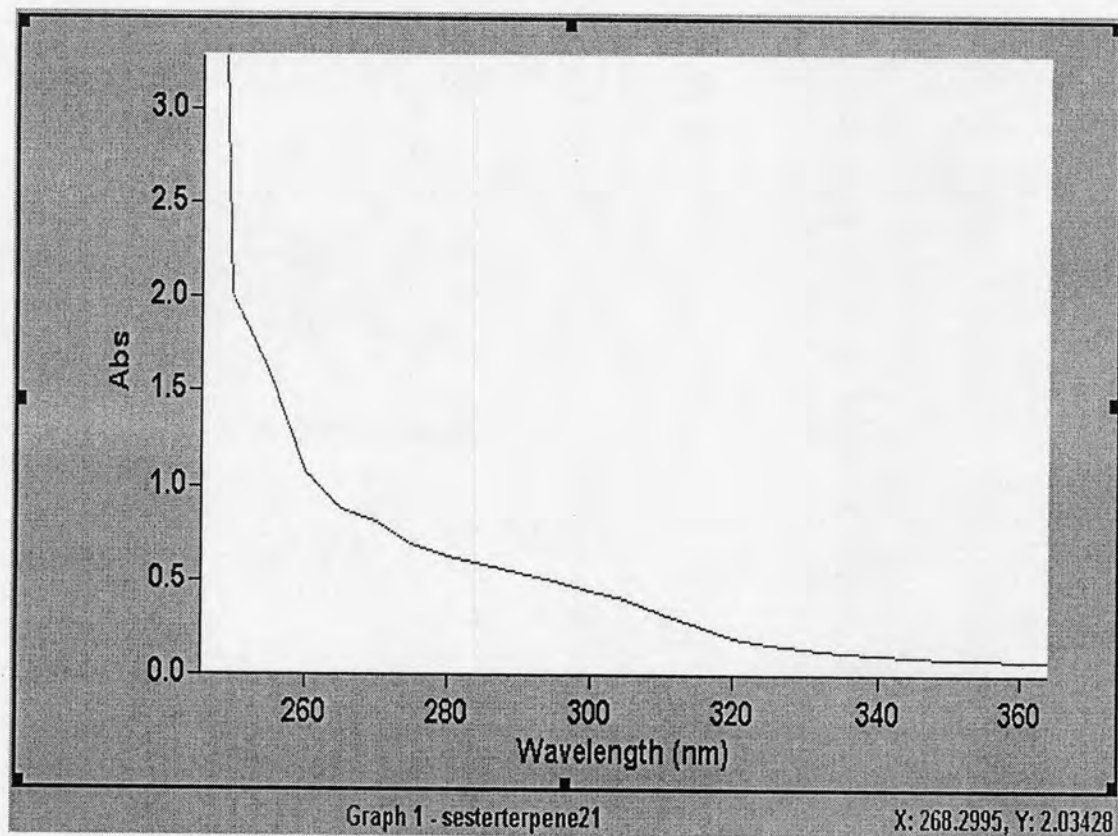


Figure D4 UV-VIS spectrum of compound C2

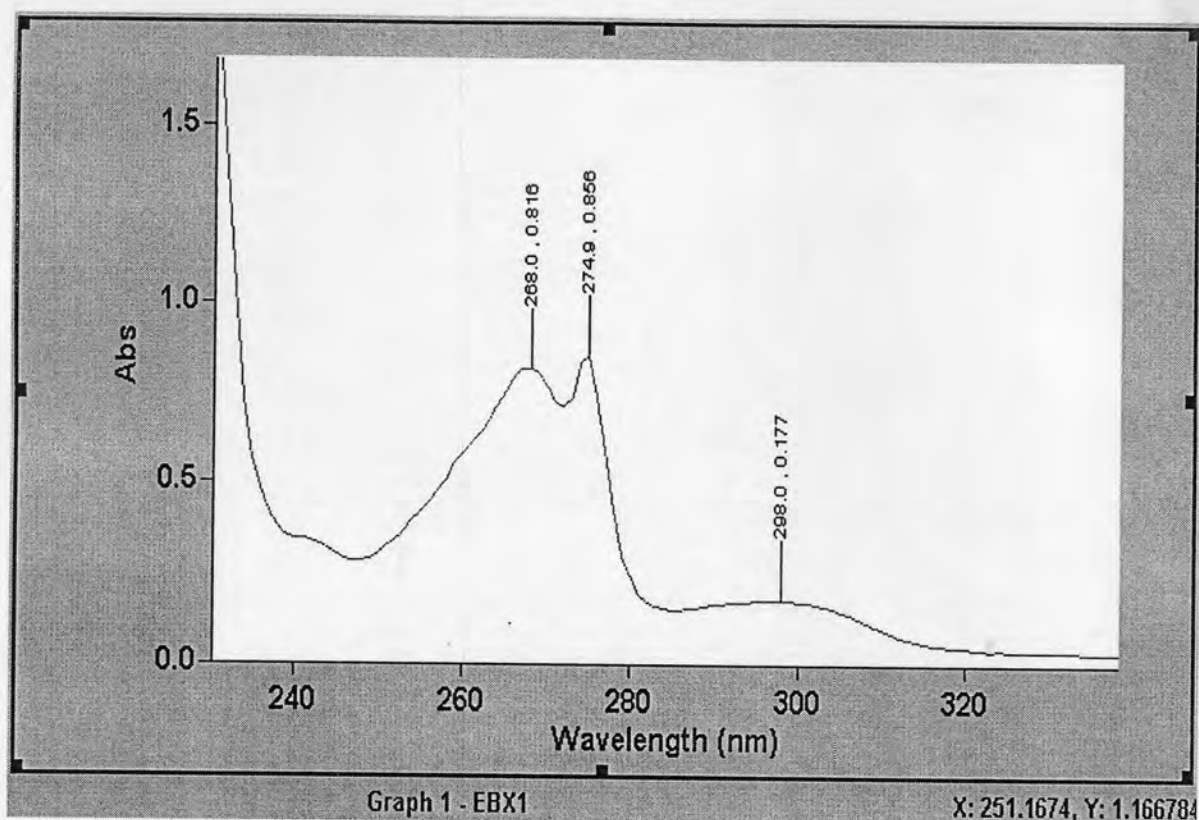


Figure D5 UV-VIS spectrum of compound D1

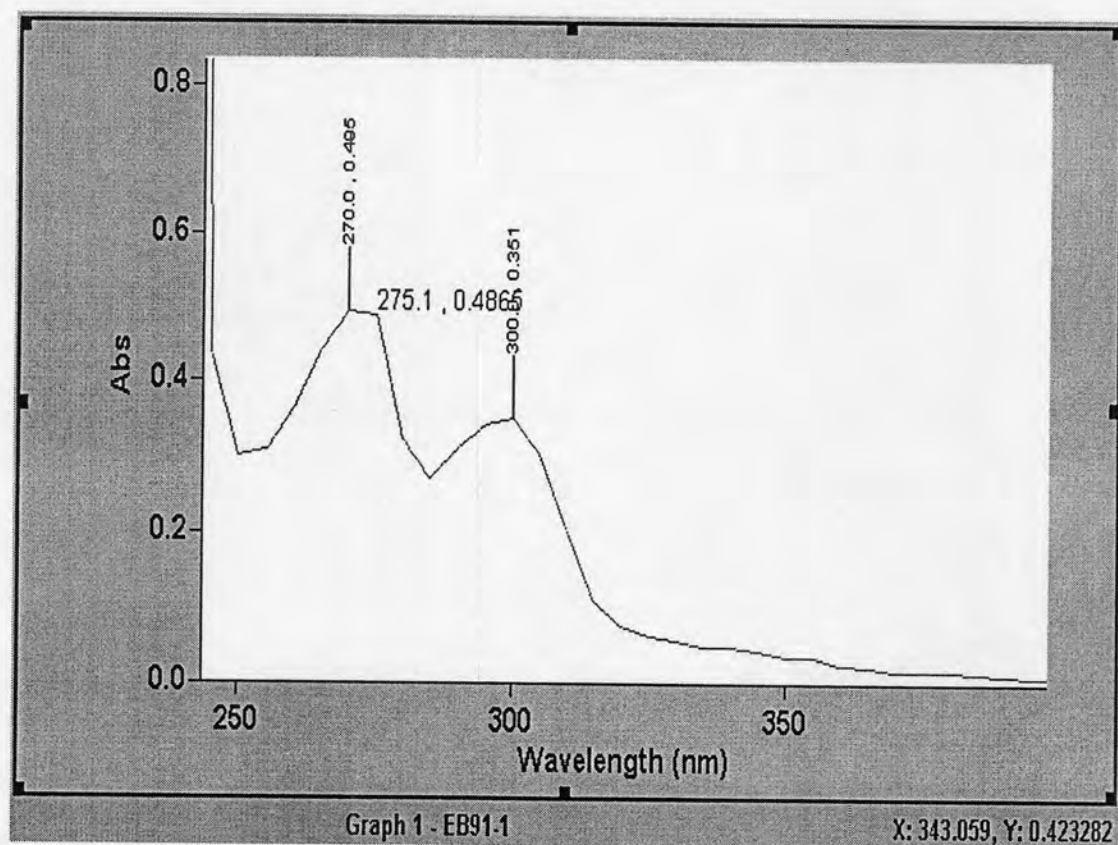


Figure D6 UV-VIS spectrum of compound D2

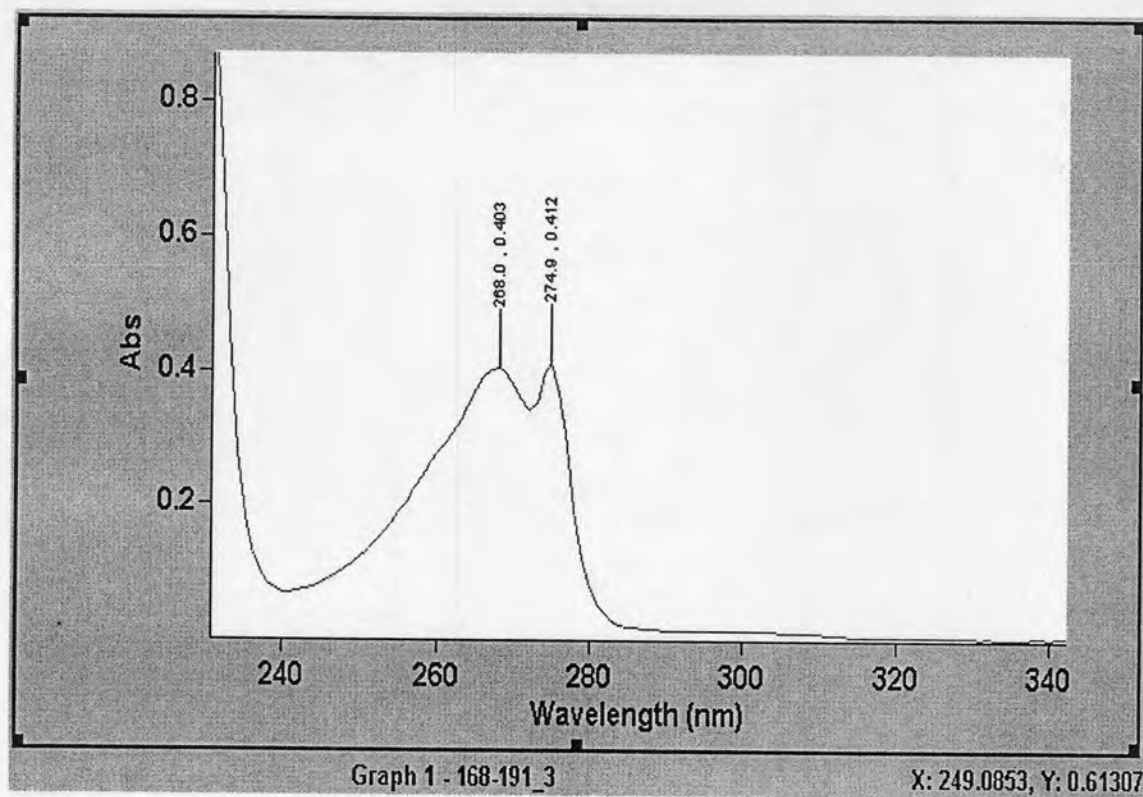


Figure D7 UV-VIS spectrum of compound D3

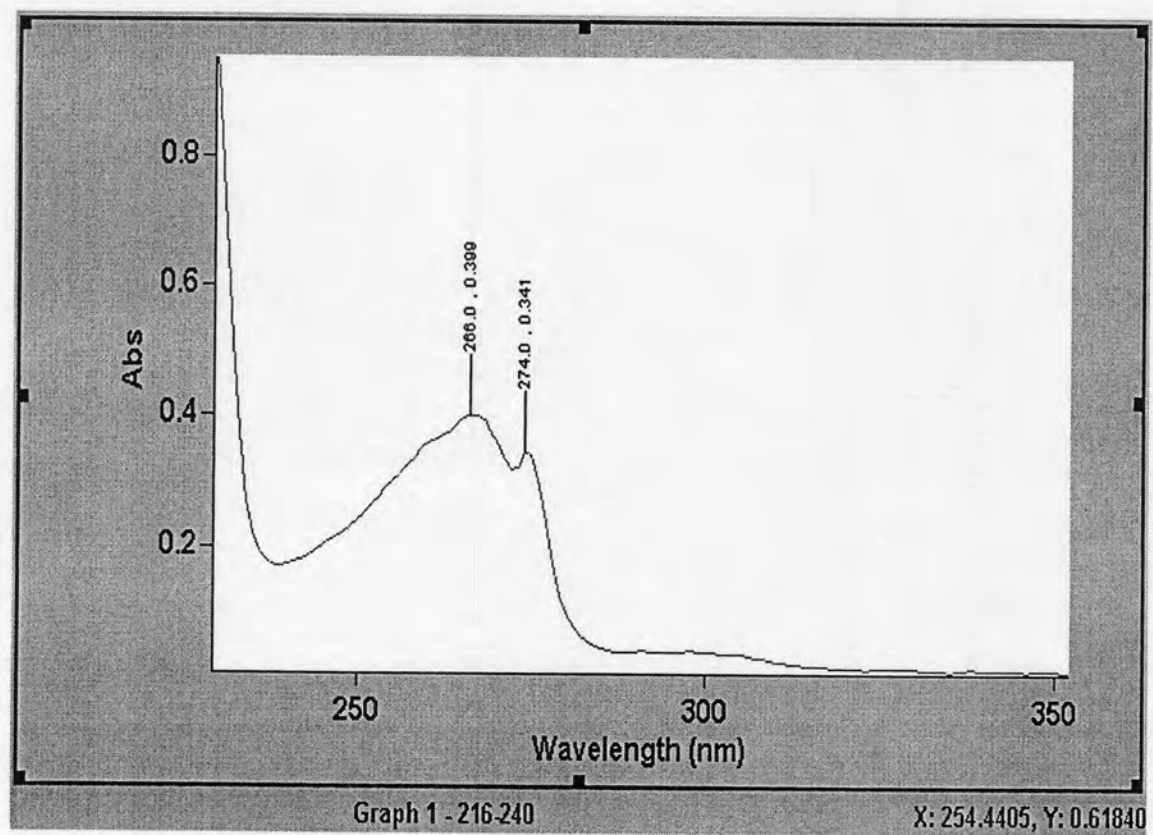


Figure D8 UV-VIS spectrum of compound D4

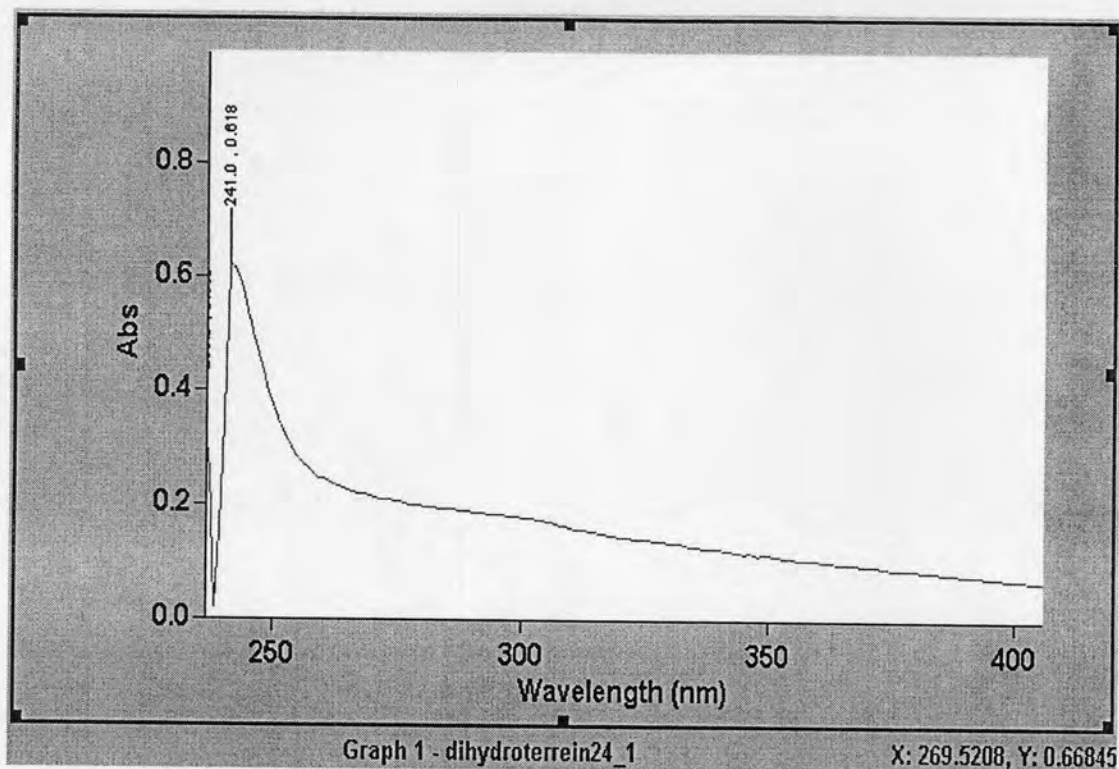


Figure D9 UV-VIS spectrum of compound E

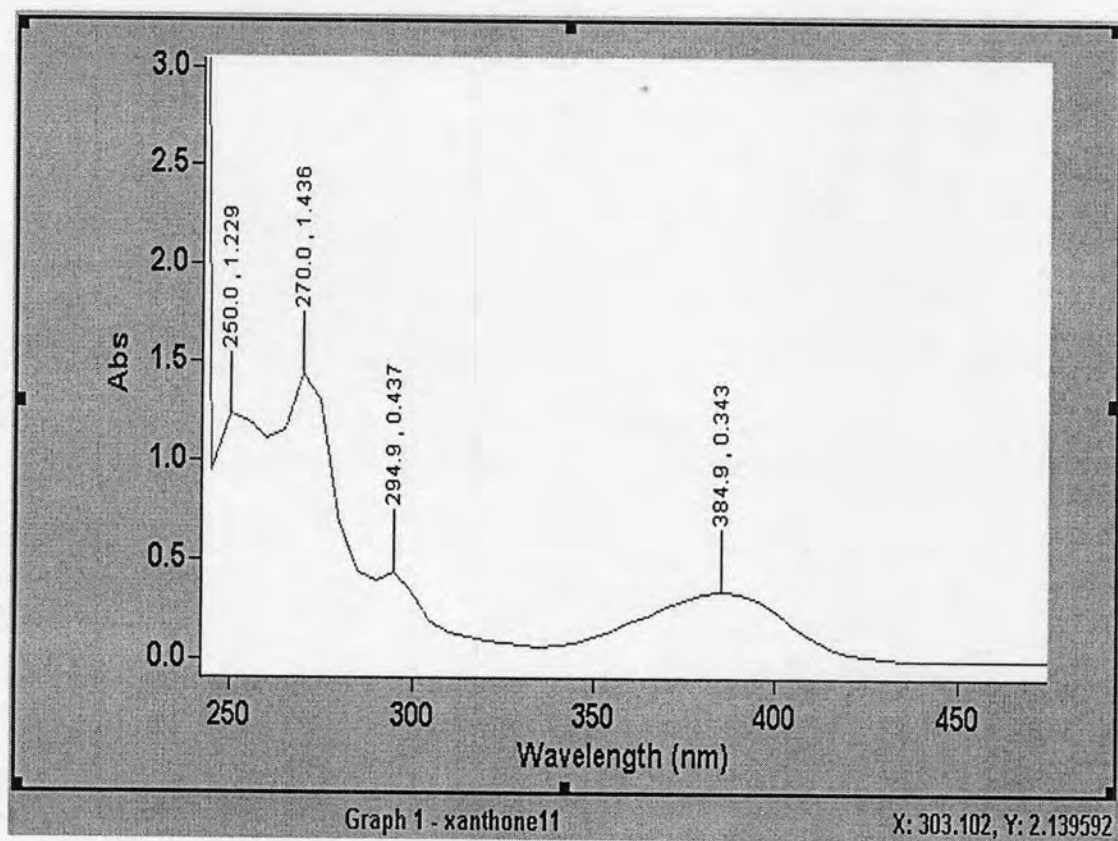


Figure D10 UV-VIS spectrum of compound F1

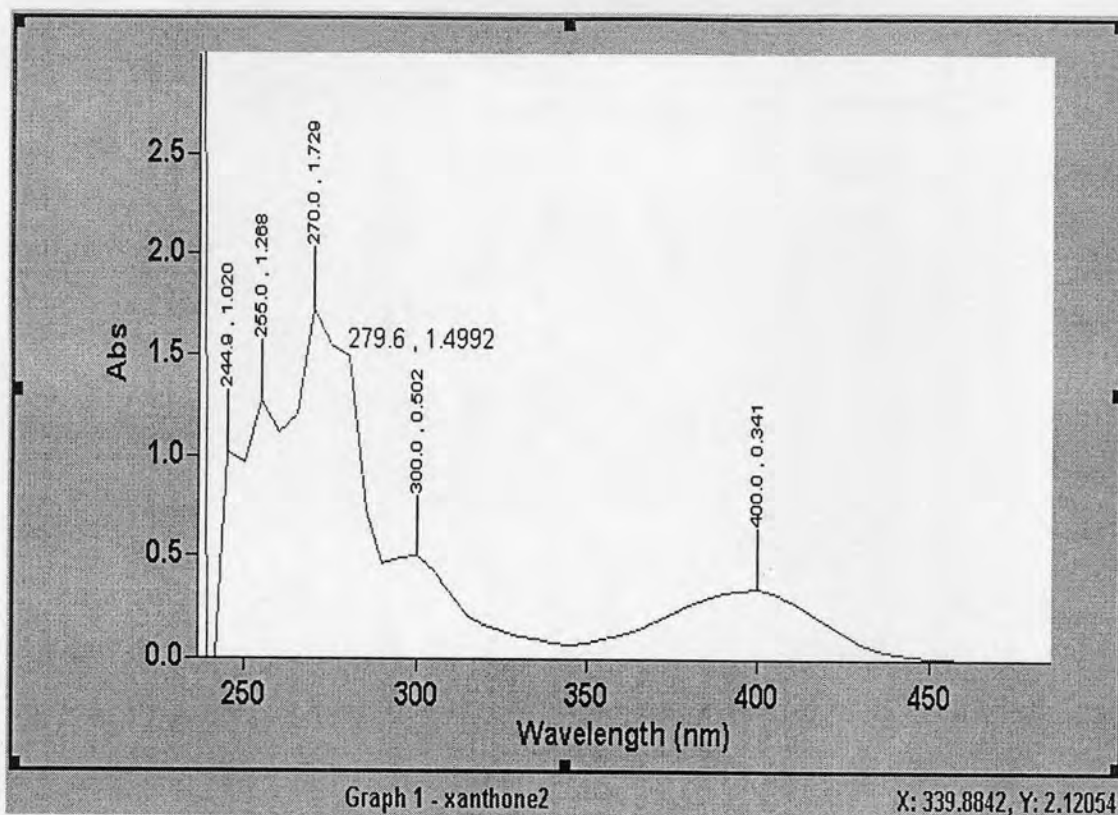


Figure D11 UV-VIS spectrum of compound F2

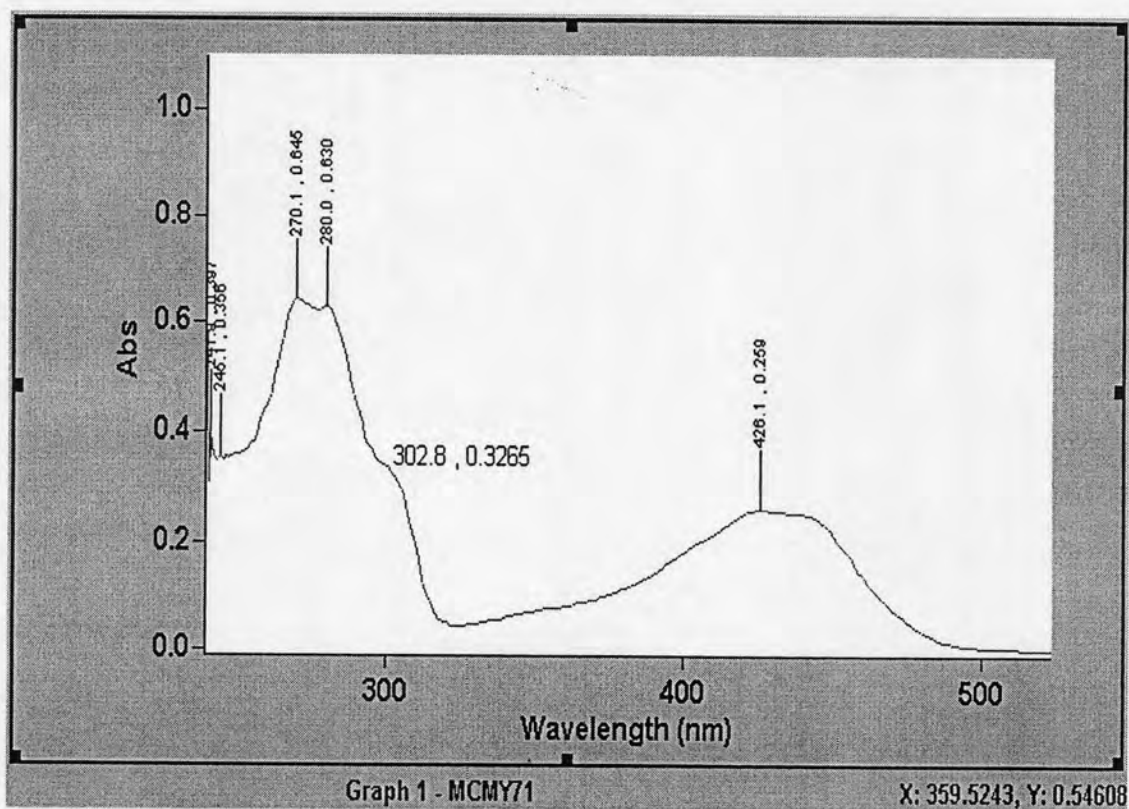


Figure D12 UV-VIS spectrum of compound G1

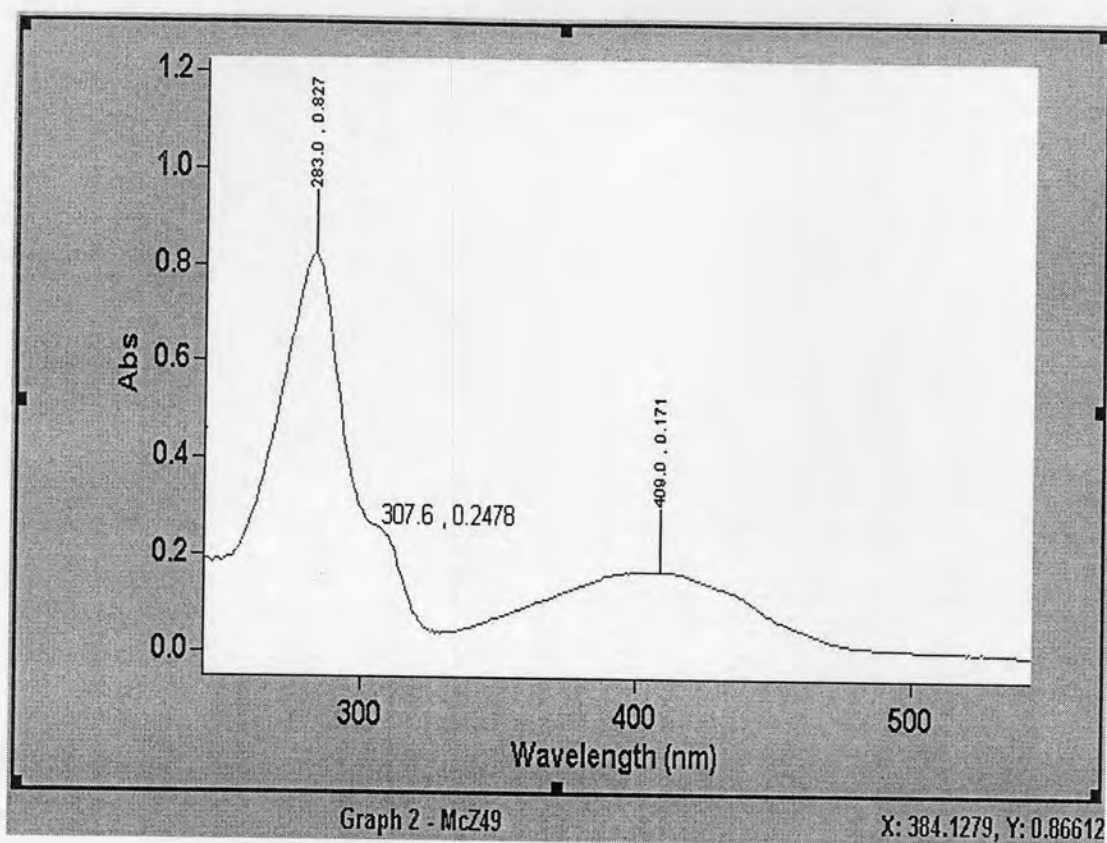


Figure D13 UV-VIS spectrum of compound G2

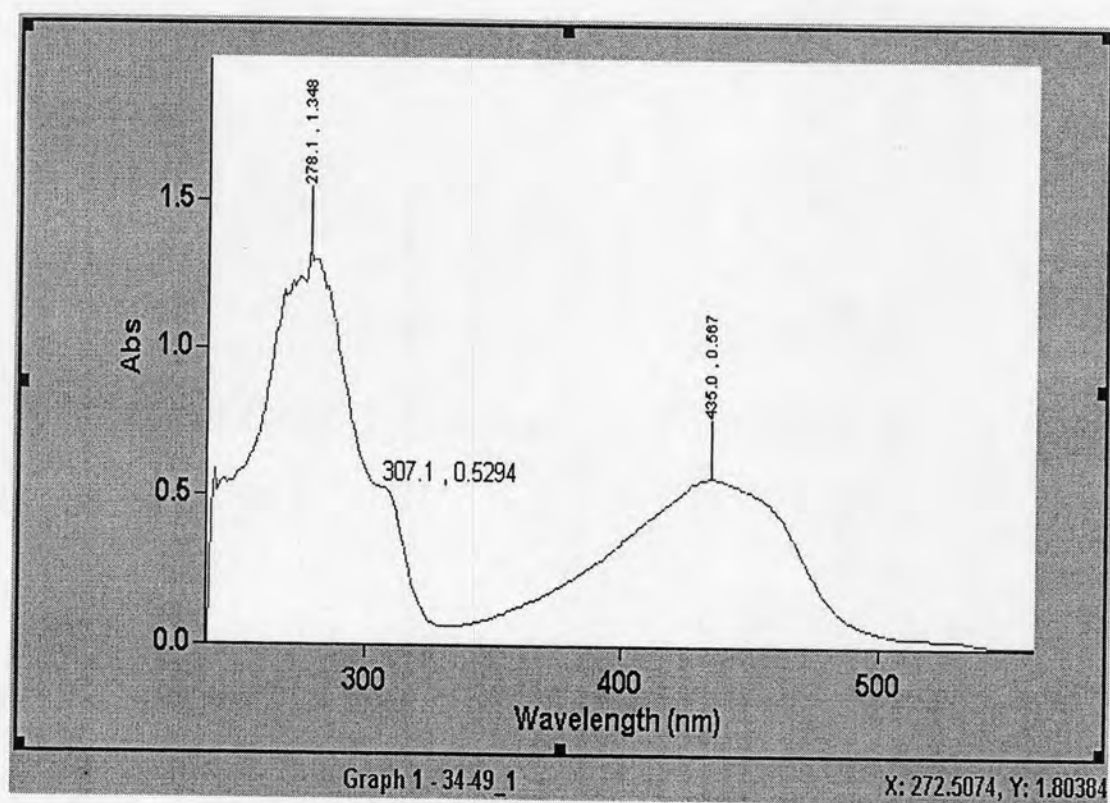


Figure D14 UV-VIS spectrum of compound G3

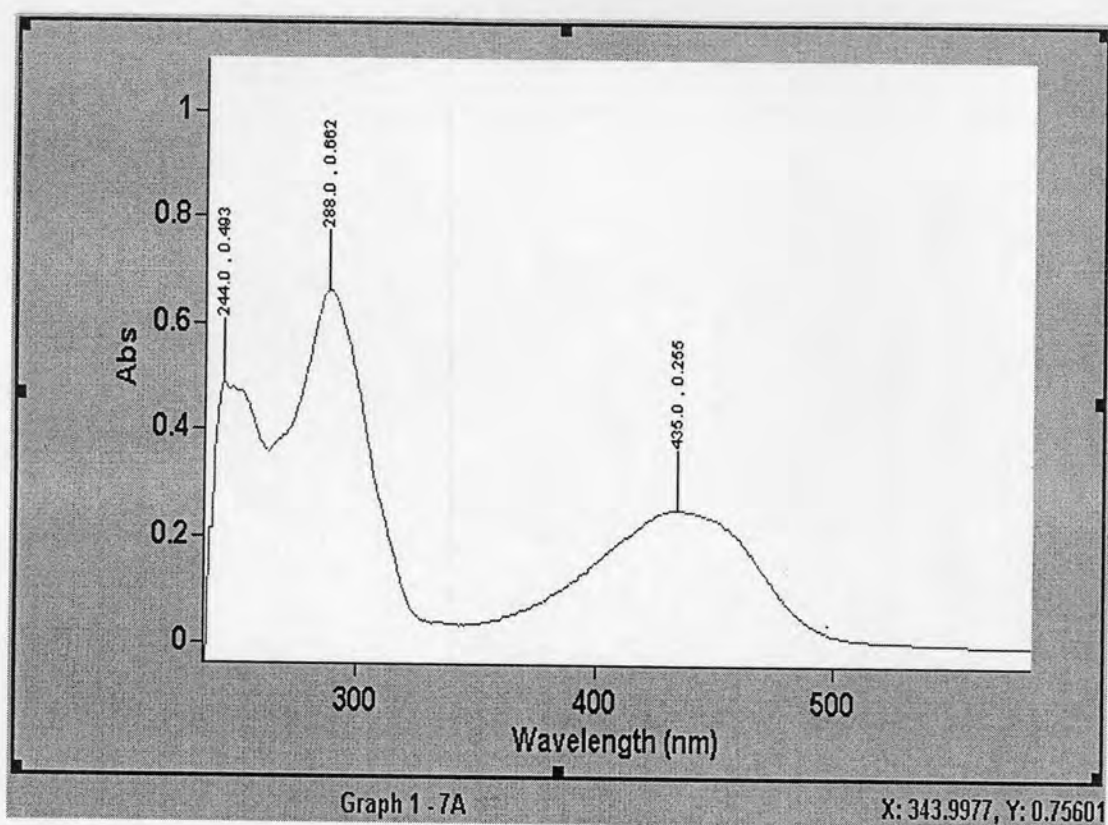


Figure D15 UV-VIS spectrum of compound H1

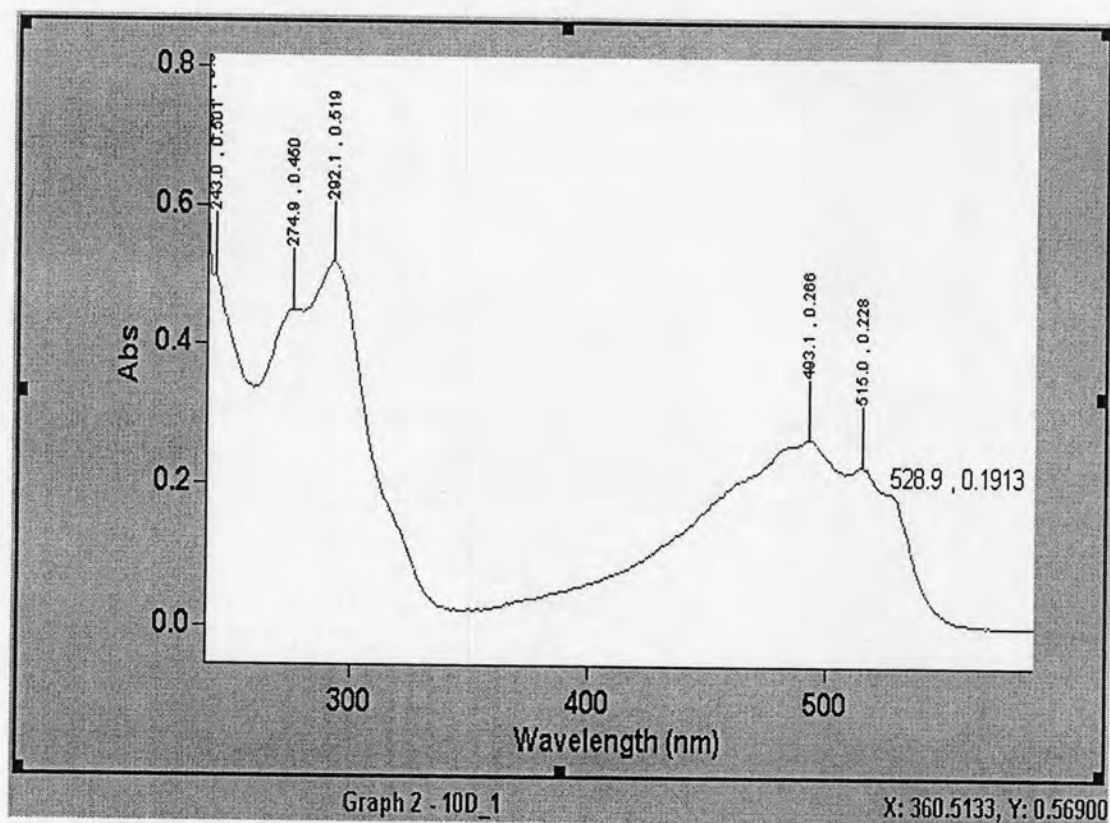


Figure D16 UV-VIS spectrum of compound H2

APPENDIX E



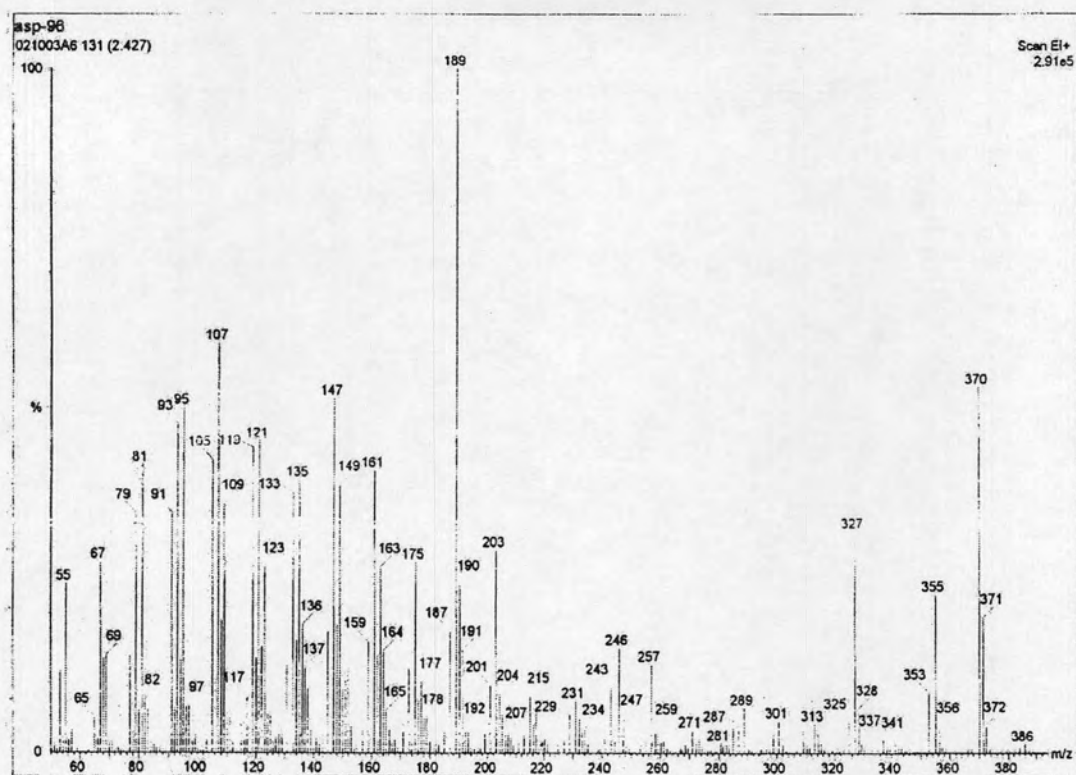


Figure E1 Mass spectrum of compound A

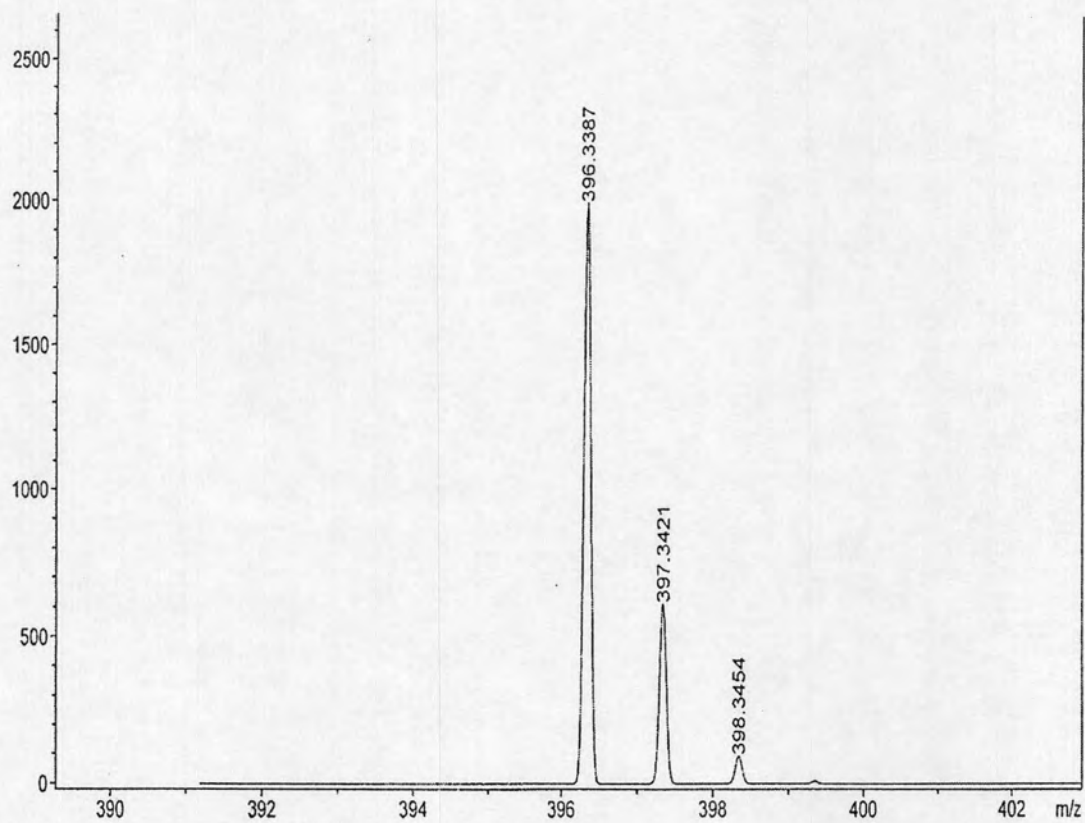


Figure E2 Mass spectrum of compound B

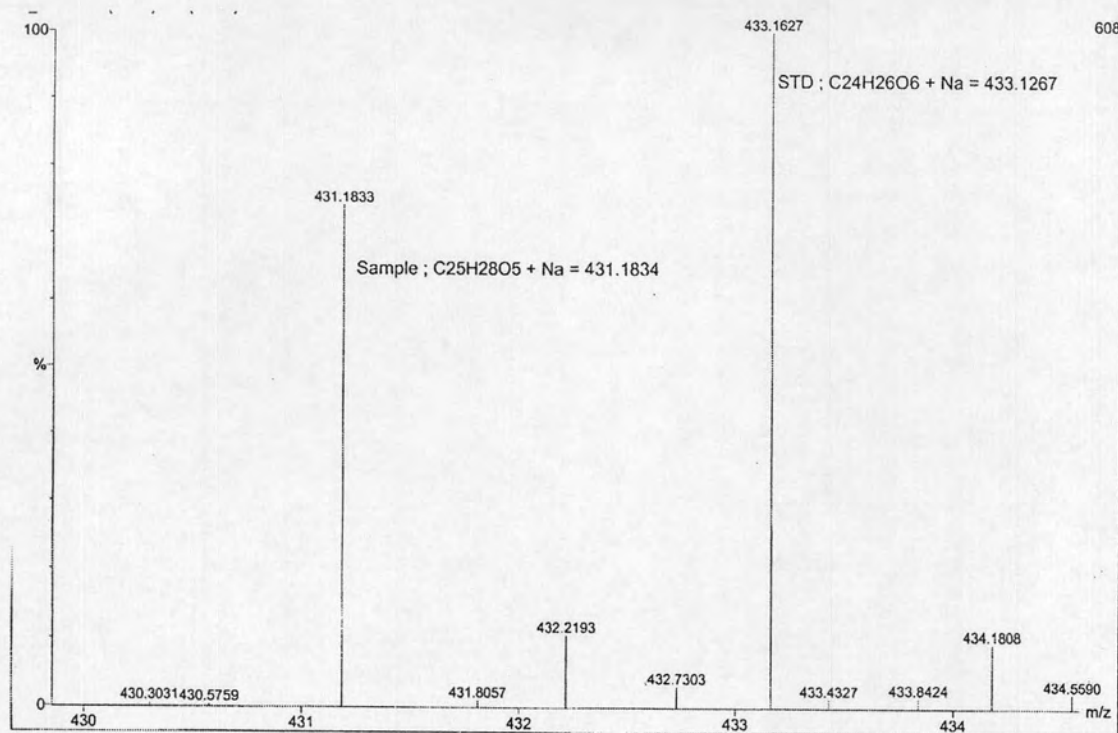


Figure E3 Mass spectrum of compound C1

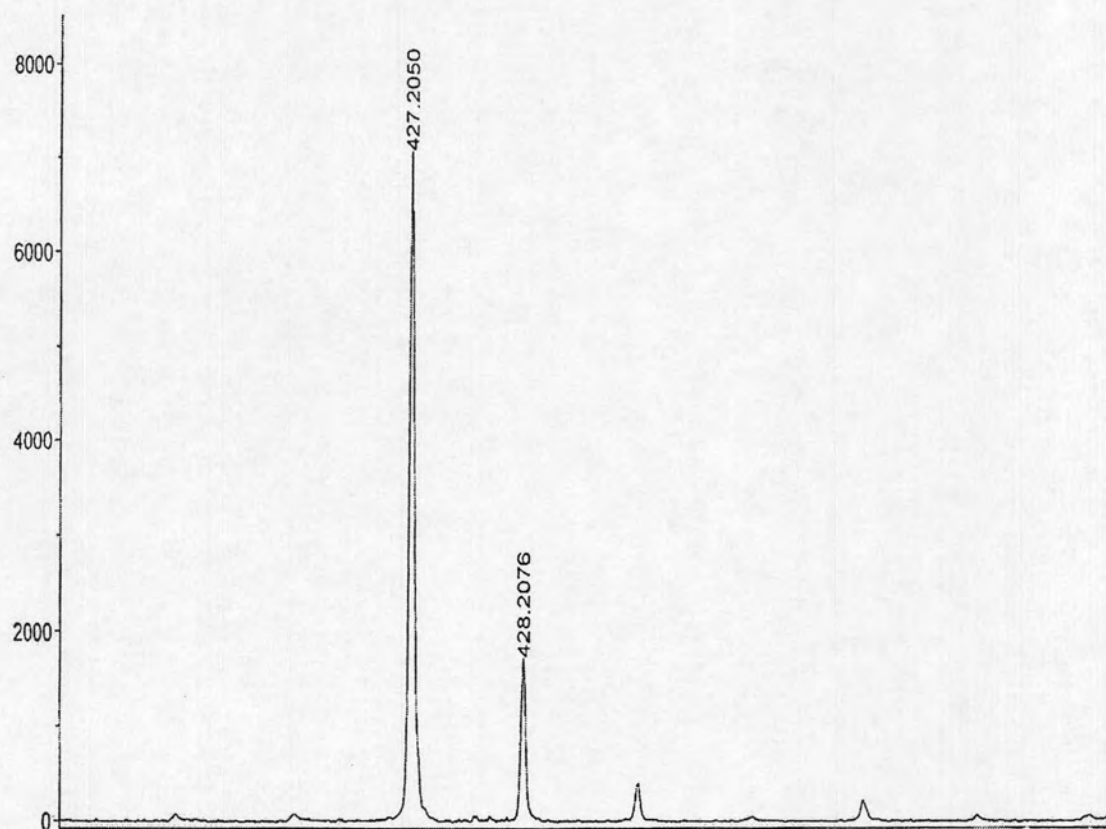


Figure E4 Mass spectrum of compound C2

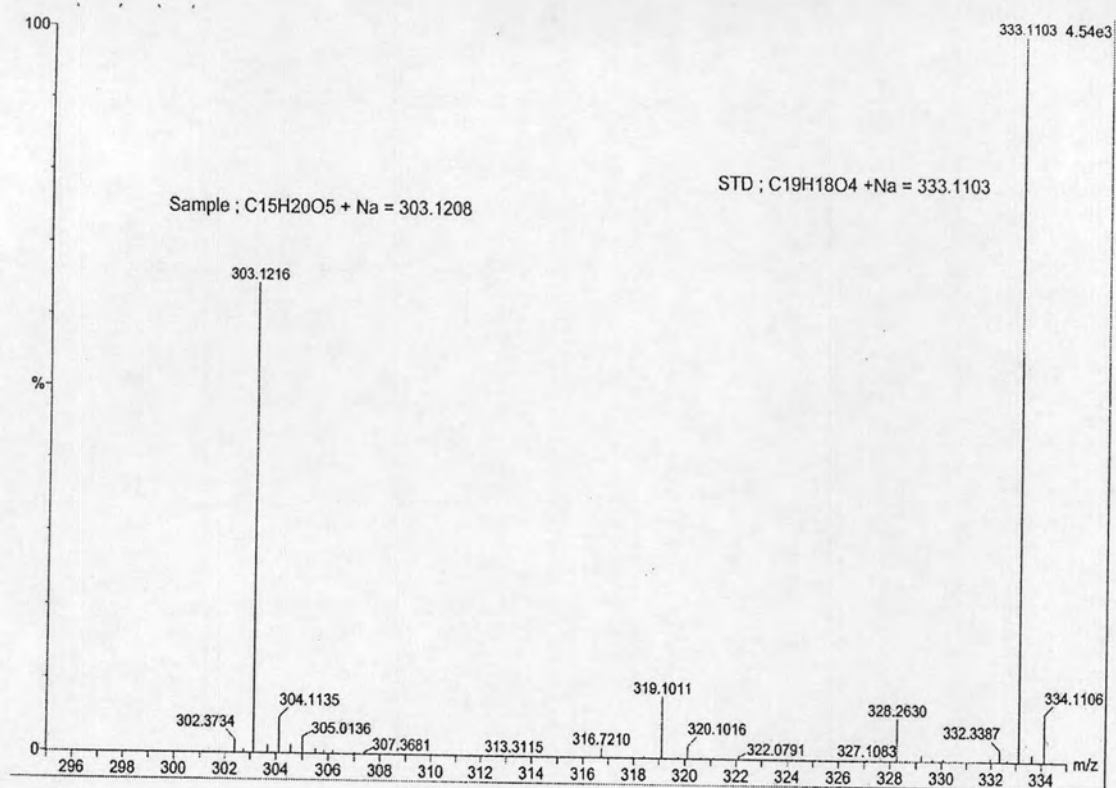


Figure E5 Mass spectrum of compound D1

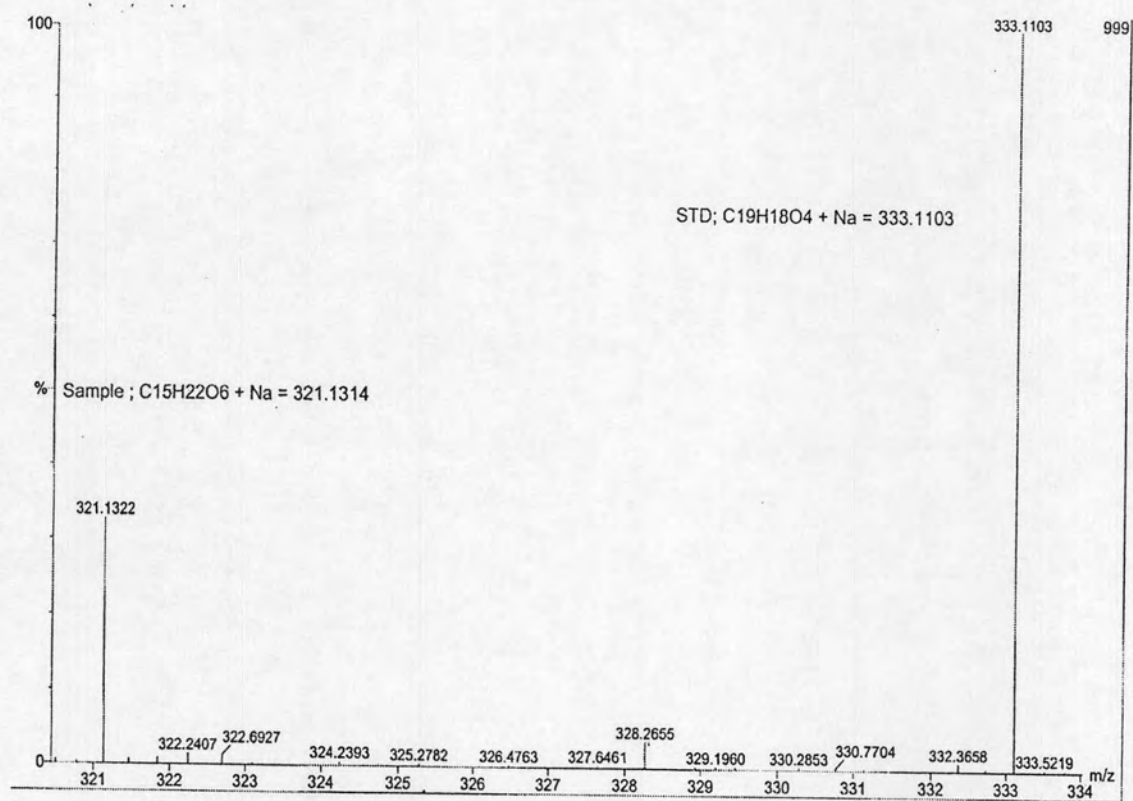
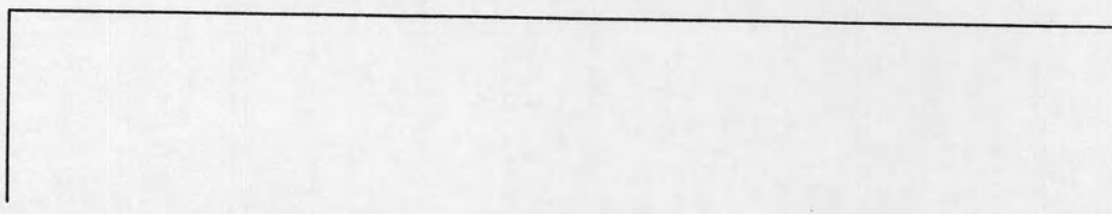


Figure E6 Mass spectrum of compound D2



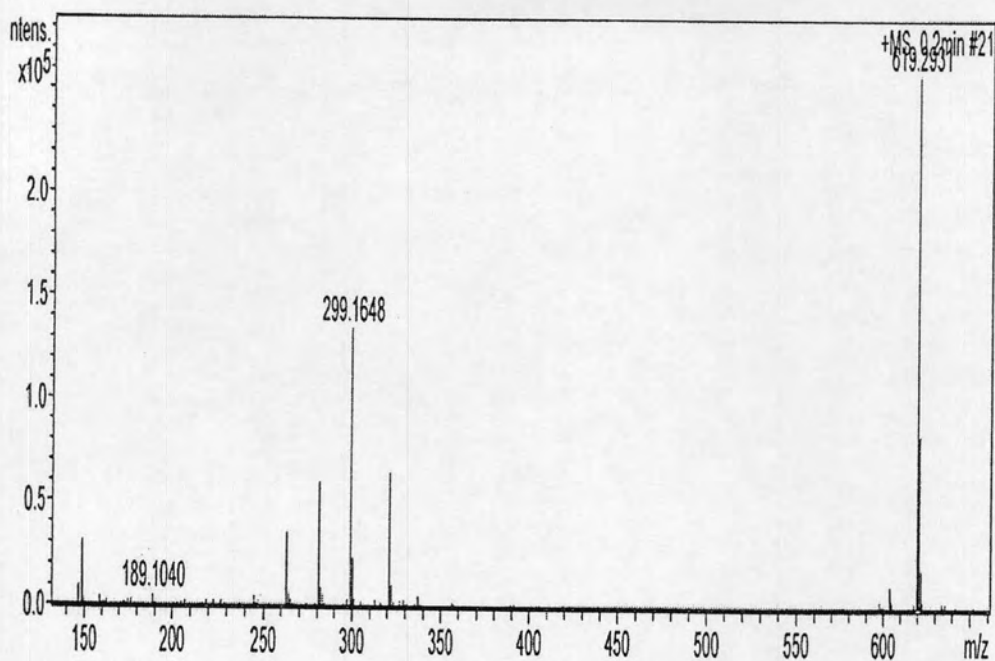


Figure E7 Mass spectrum of compound D3

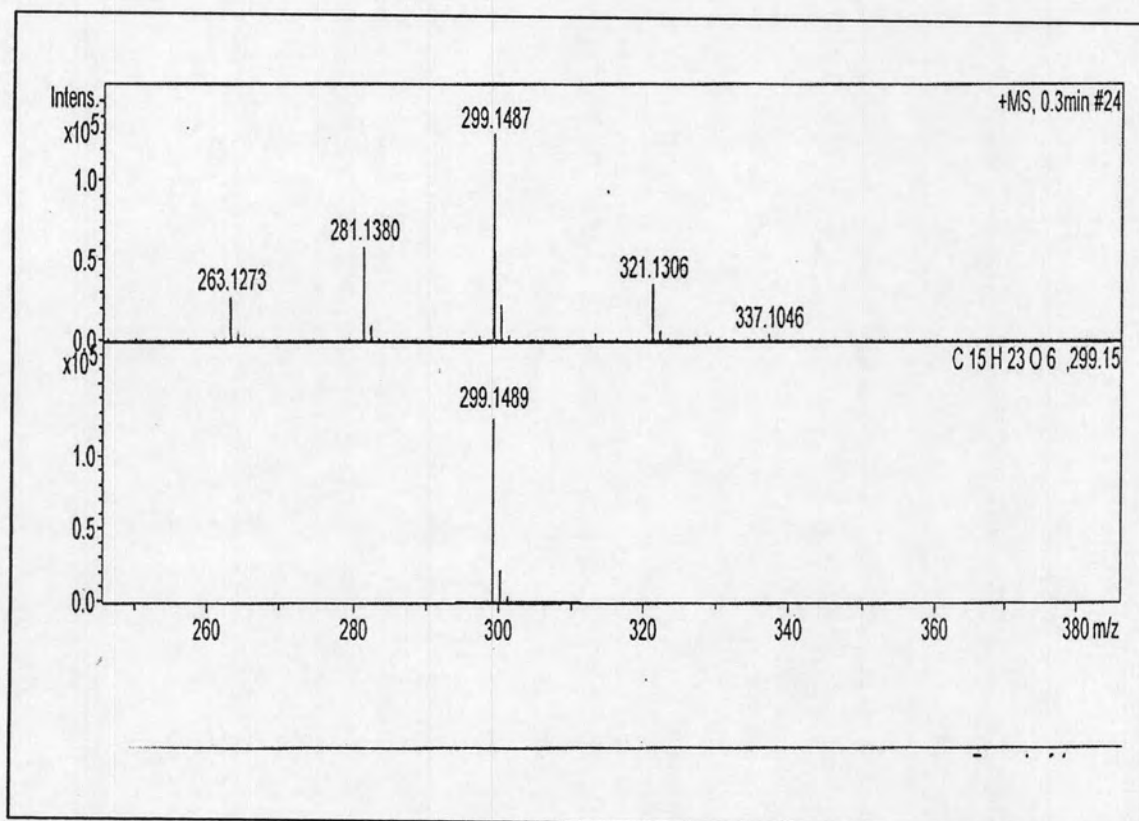


Figure E8 Mass spectrum of compound D4

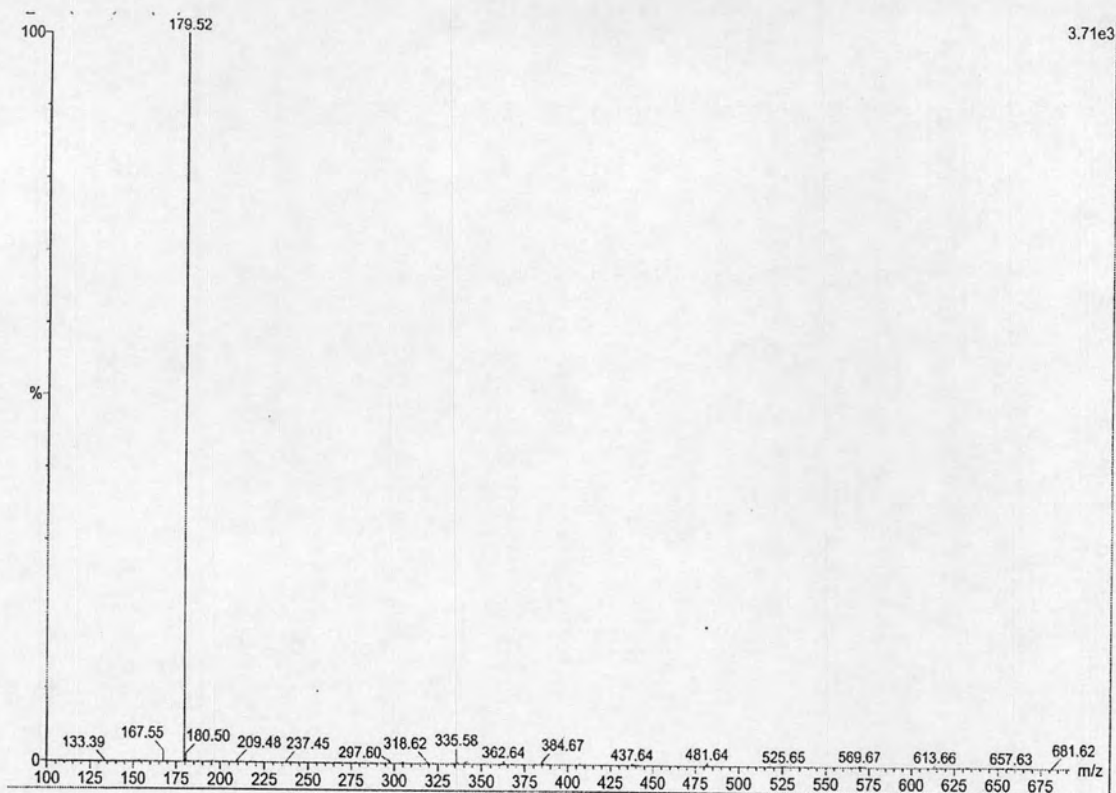


Figure E9 Mass spectrum of compound E

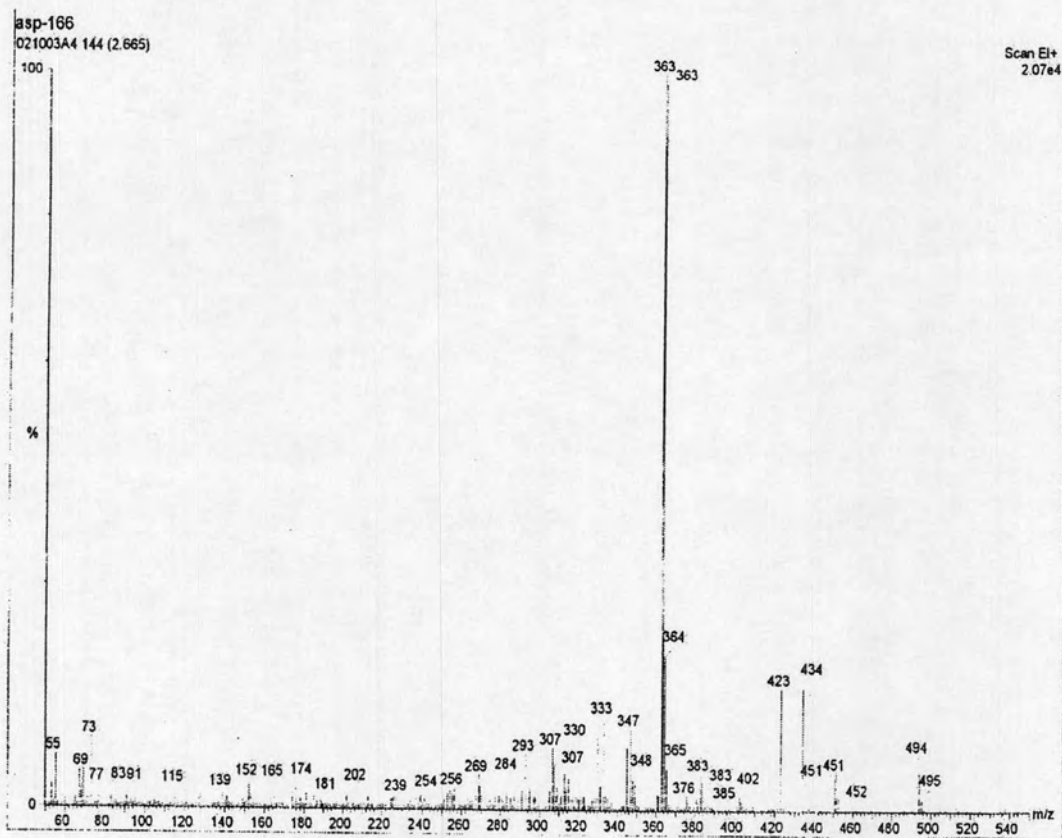


Figure E10 Mass spectrum of compound F1

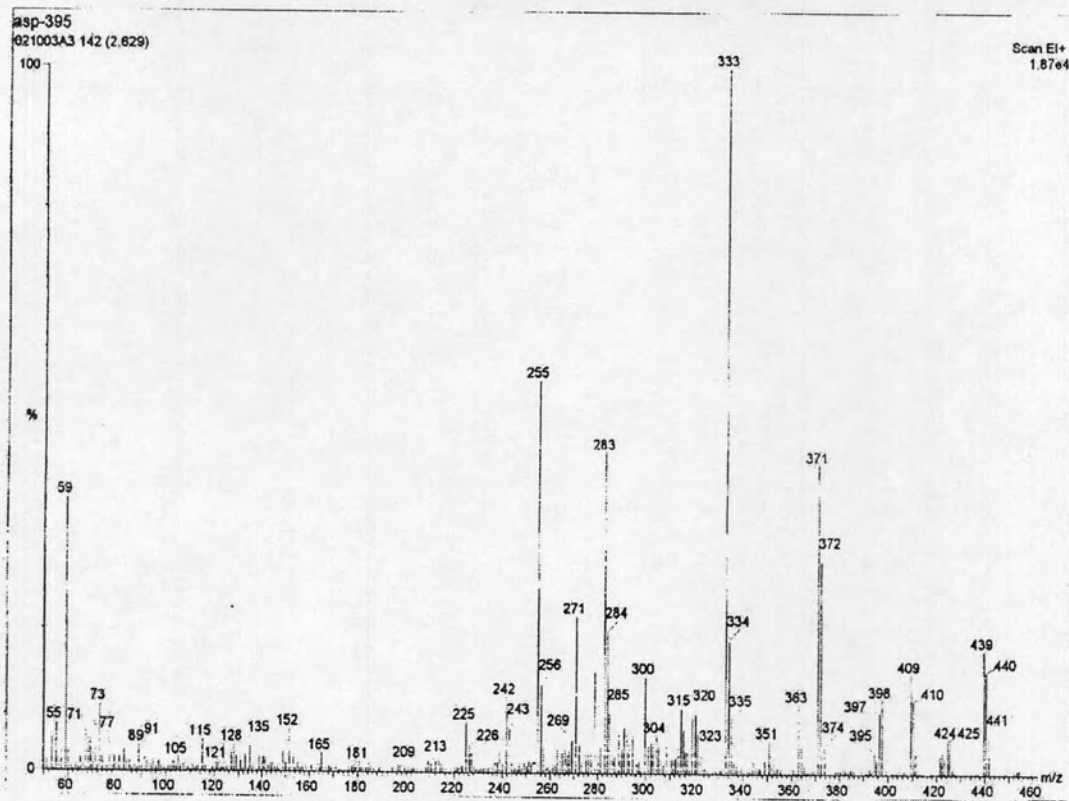


Figure E11 Mass spectrum of compound F2

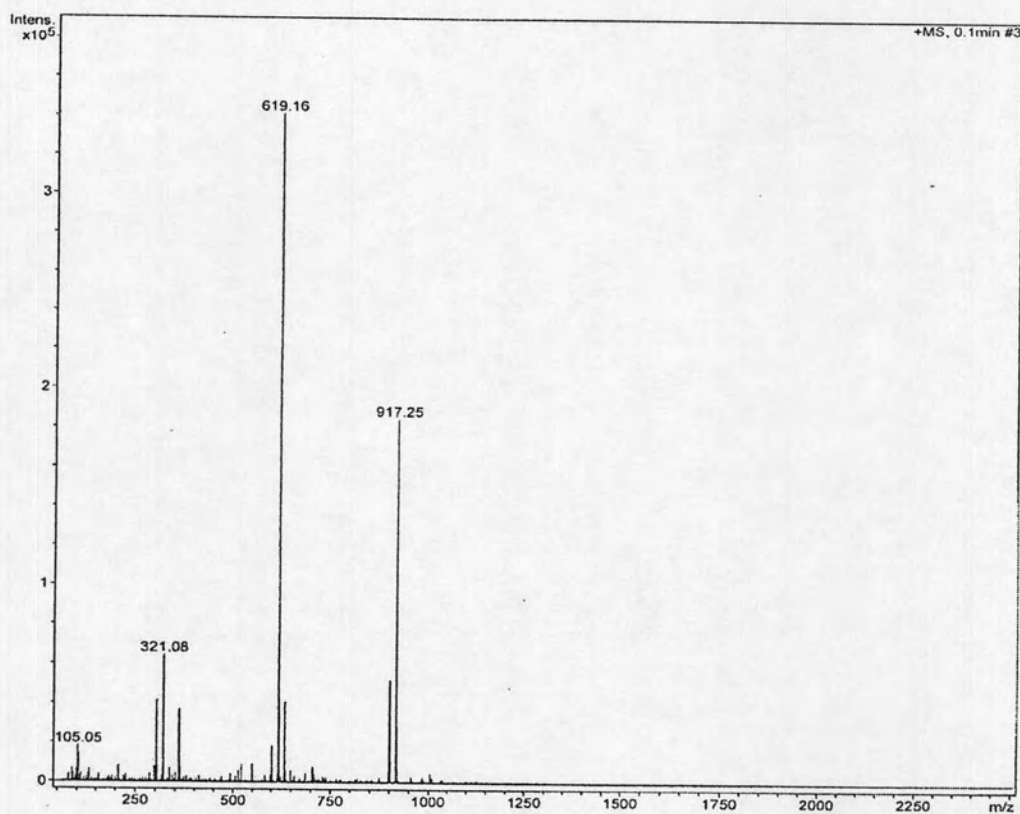


Figure E12 Mass spectrum of compound G1

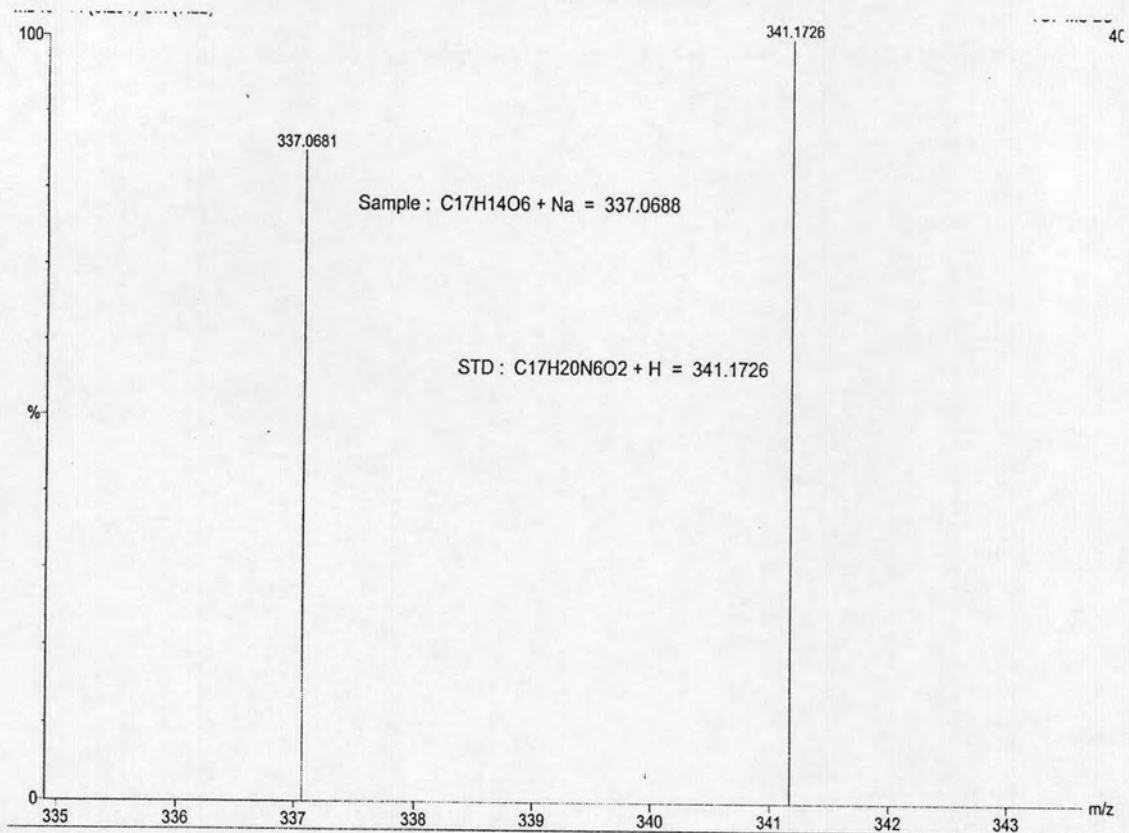


Figure E13 Mass spectrum of compound G2

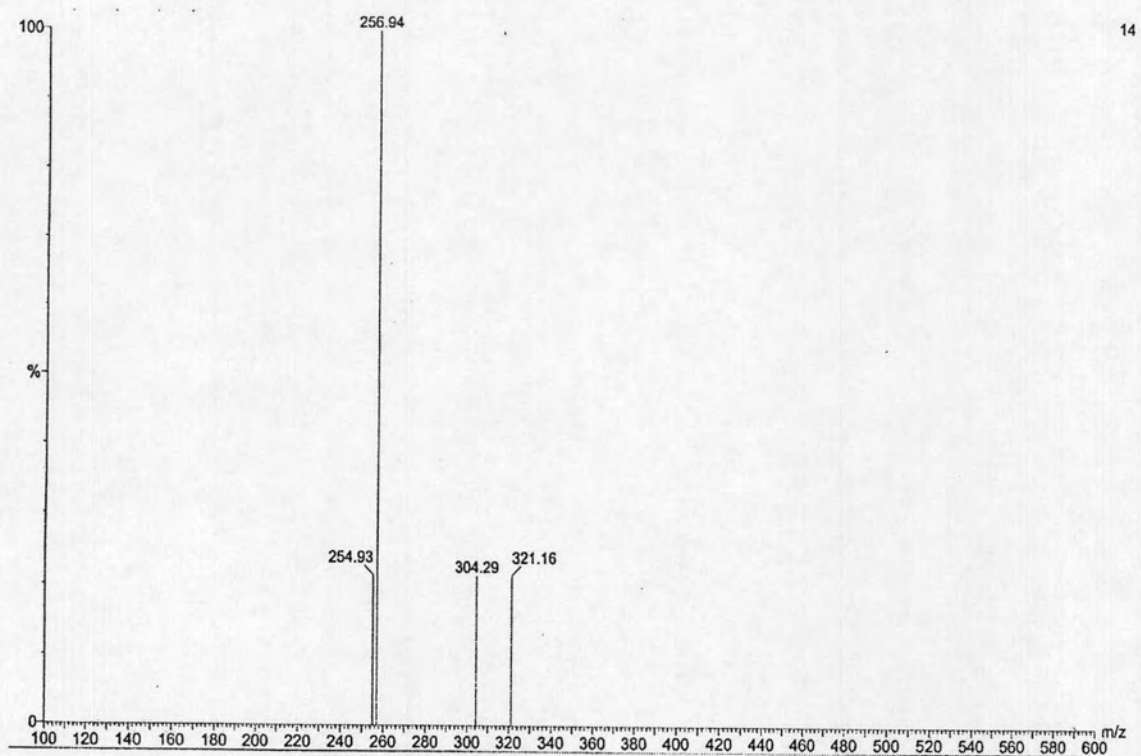


Figure E14 Mass spectrum of compound G3

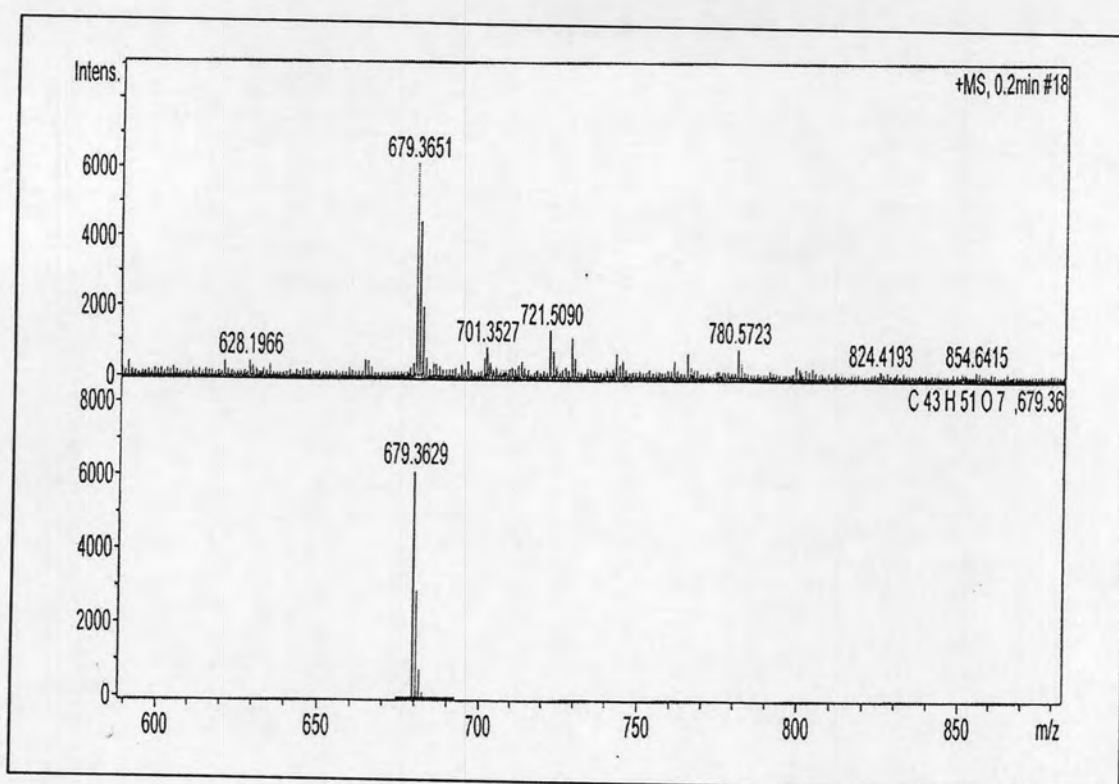


Figure E15 Mass spectrum of compound H1

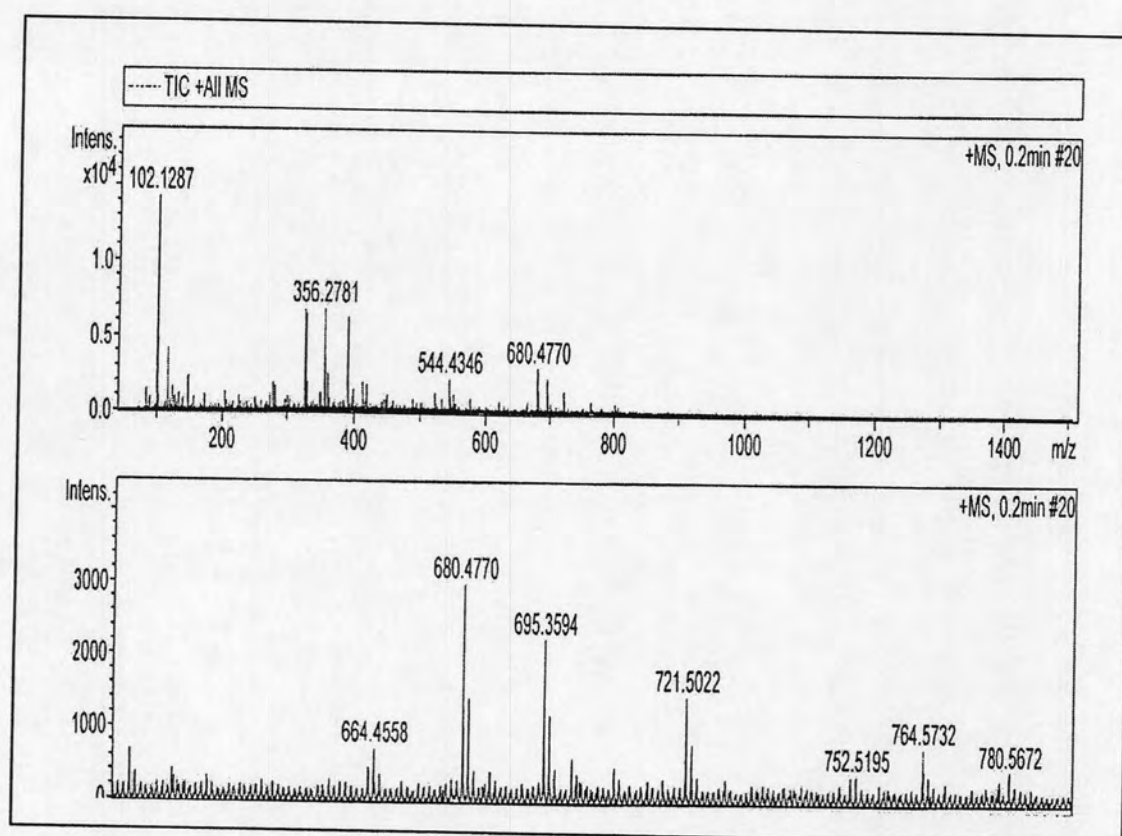


Figure E16 Mass spectrum of compound H2



## Appendix F

Table F1 Crystal data and structure refinement for compound C1

Empirical formula	$C_{25}H_{28}O_5$
Formula weight	408.47
Temperature	293(2) K
Wavelength	0.71073 Å
Crystal system, space group	?, ?
Unit cell dimensions	$a = 8.0139(2)$ Å $\alpha = 90^\circ$ . $b = 12.5981(3)$ Å $\beta = 95.5040(10)^\circ$ . $c = 10.0190(2)$ Å $\gamma = 90^\circ$ .
Volume	$1006.85(4)$ Å <sup>3</sup>
Z, Calculated density	2, 1.347 Mg/m <sup>3</sup>
Absorption coefficient	$0.093$ mm <sup>-1</sup>
F(000)	436
Crystal size	0.40 x 0.40 x 0.25 mm
Theta range for data collection	2.04 to $30.55^\circ$ .
Limiting indices	$-11 \leq h \leq 11$ , $-17 \leq k \leq 11$ , $-11 \leq l \leq 13$
Reflections collected / unique	7496 / 4674 [R(int) = 0.0160]
Completeness to theta = 30.55	93.4 %
Absorption correction	None
Max. and min. transmission	0.9772 and 0.9638
Refinement method	Full-matrix least-squares on $F^2$
Data / restraints / parameters	4674 / 1 / 303
Goodness-of-fit on $F^2$	0.980
Final R indices [ $I > 2\sigma(I)$ ]	R1 = 0.0365, wR2 = 0.1033
R indices (all data)	R1 = 0.0404, wR2 = 0.1068
Absolute structure parameter	-0.3(8)
Largest diff. peak and hole	0.242 and -0.196 e.Å <sup>-3</sup>

Table F2 Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{Å}^2 \times 10^3$ ) for compound C1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	$U(\text{eq})$
c(1')	8218(2)	9556(2)	1782(2)	38(1)
c(1)	5871(2)	6147(1)	3714(2)	34(1)
c(2)	7314(2)	5738(2)	4241(2)	42(1)
c(2')	6700(2)	8871(1)	1246(1)	27(1)
c(3)	8619(2)	6381(2)	5003(2)	48(1)
c(3')	7076(2)	7694(1)	1062(1)	29(1)
c(4)	8221(2)	7527(1)	5319(1)	34(1)
c(4')	4172(2)	7418(1)	-121(1)	33(1)
c(5)	6954(2)	7986(1)	4193(1)	27(1)
c(5')	3621(2)	8593(1)	-339(2)	34(1)
c(6)	6426(2)	9141(1)	4408(2)	35(1)
c(6')	5054(2)	9099(1)	-981(2)	35(1)
c(7')	6425(2)	9295(1)	-179(2)	32(1)
c(7)	5127(2)	9547(1)	3277(2)	34(1)
c(8)	5018(2)	8870(1)	2006(1)	26(1)
c(8')	7906(2)	9899(1)	-490(2)	39(1)
c(9')	8535(2)	7239(2)	922(2)	43(1)
c(9)	4663(2)	7662(1)	2308(1)	25(1)
c(10)	5403(2)	7297(1)	3762(1)	27(1)
c(10')	1984(2)	8658(2)	-1247(2)	49(1)
c(11)	5415(2)	7142(1)	1105(1)	28(1)
c(12)	3558(2)	9221(1)	991(2)	32(1)
c(13)	4029(2)	7381(2)	4745(2)	42(1)

Table F2 Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound C1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	$U(\text{eq})$
c(14)	7657(3)	7523(2)	6748(2)	56(1)
c(15)	9849(2)	8171(2)	5355(2)	55(1)
o(1)	9952(3)	5975(2)	5408(3)	97(1)
o(2)	8972(2)	9968(1)	615(1)	44(1)
o(3)	8179(2)	10300(1)	-1543(2)	52(1)
o(4)	3701(2)	6737(1)	-917(1)	52(1)
o(5)	2890(1)	7485(1)	2160(1)	35(1)

Table F3 Bond lengths [ $\text{\AA}$ ] and angles [ $^\circ$ ] for compound C1

c(13)-c(10)	1.5499(19)
c(1')-o(2)	1.462(2)
c(1')-c(2')	1.545(2)
c(1)-c(2)	1.329(3)
c(1)-c(10)	1.499(2)
c(2)-c(3)	1.476(3)
c(2')-c(7')	1.520(2)
c(2')-c(3')	1.527(2)
c(2')-c(8)	1.6108(19)
c(3)-o(1)	1.218(3)
c(3)-c(4)	1.518(3)
c(3')-c(9')	1.322(2)

Table F3 Bond lengths [Å] and angles [°] for compound C1

c(3')-c(11)	1.506(2)
c(4)-c(15)	1.534(3)
c(4)-c(14)	1.542(2)
c(4)-c(5)	1.5550(19)
c(4')-o(4)	1.207(2)
c(4')-c(11)	1.545(2)
c(4')-c(5')	1.554(2)
c(5)-c(6)	1.536(2)
c(5)-c(10)	1.5440(19)
c(5')-c(6')	1.510(2)
c(5')-c(10')	1.525(2)
c(5')-c(12)	1.555(2)
c(6)-c(7)	1.550(2)
c(6')-c(7')	1.321(2)
c(7')-c(8')	1.468(2)
c(7)-c(8)	1.528(2)
c(8)-c(12)	1.5396(19)
c(8)-c(9)	1.582(2)
c(8')-o(3)	1.208(2)
c(8')-o(2)	1.335(2)
c(9)-o(5)	1.4318(16)
c(9)-c(11)	1.5454(18)
c(9)-c(10)	1.5865(19)
o(2)-c(1')-c(2')	107.00(13)
c(2)-c(1)-c(10)	124.95(16)
c(1)-c(2)-c(3)	122.66(18)
c(7')-c(2')-c(3')	103.91(11)
c(7')-c(2')-c(1')	99.72(12)
c(3')-c(2')-c(1')	115.21(12)

Table F3 Bond lengths [Å] and angles [°] for compound C1

c(7')-c(2')-c(8)	113.07(11)
c(3')-c(2')-c(8)	103.87(11)
c(1')-c(2')-c(8)	120.19(12)
o(1)-c(3)-c(2)	119.8(2)
o(1)-c(3)-c(4)	121.7(2)
c(2)-c(3)-c(4)	118.48(15)
c(9')-c(3')-c(11)	126.54(15)
c(9')-c(3')-c(2')	128.37(15)
c(11)-c(3')-c(2')	105.07(11)
c(3)-c(4)-c(15)	108.20(16)
c(3)-c(4)-c(14)	106.08(16)
c(15)-c(4)-c(14)	107.73(15)
c(3)-c(4)-c(5)	109.76(12)
c(15)-c(4)-c(5)	108.32(14)
c(14)-c(4)-c(5)	116.48(13)
o(4)-c(4')-c(11)	120.09(15)
o(4)-c(4')-c(5')	121.19(14)
c(11)-c(4')-c(5')	118.65(12)
c(6)-c(5)-c(10)	110.24(12)
c(6)-c(5)-c(4)	114.87(12)
c(10)-c(5)-c(4)	116.49(13)
c(6')-c(5')-c(10')	111.67(14)
c(6')-c(5')-c(4')	104.17(13)
c(10')-c(5')-c(4')	110.62(14)
c(6')-c(5')-c(12)	103.77(13)
c(10')-c(5')-c(12)	112.75(14)
c(4')-c(5')-c(12)	113.34(12)
c(5)-c(6)-c(7)	112.65(12)
c(7')-c(6')-c(5')	116.27(13)

Table F3 Bond lengths [Å] and angles [°] for compound C1.

c(6')-c(7')-c(8')	127.59(15)
c(6')-c(7')-c(2')	122.86(14)
c(8')-c(7')-c(2')	109.52(13)
c(8)-c(7)-c(6)	113.92(12)
c(7)-c(8)-c(12)	111.64(12)
c(7)-c(8)-c(9)	111.99(12)
c(12)-c(8)-c(9)	105.27(11)
c(7)-c(8)-c(2')	114.20(12)
c(12)-c(8)-c(2')	107.74(11)
c(9)-c(8)-c(2')	105.41(10)
o(3)-c(8')-o(2)	122.79(16)
o(3)-c(8')-c(7')	128.31(17)
o(2)-c(8')-c(7')	108.89(14)
o(5)-c(9)-c(11)	108.08(11)
o(5)-c(9)-c(8)	108.96(11)
c(11)-c(9)-c(8)	99.66(10)
o(5)-c(9)-c(10)	109.28(11)
c(11)-c(9)-c(10)	116.98(11)
c(8)-c(9)-c(10)	113.32(11)
c(1)-c(10)-c(5)	110.80(12)
c(1)-c(10)-c(13)	106.35(13)
c(5)-c(10)-c(13)	112.69(12)
c(1)-c(10)-c(9)	108.87(11)
c(5)-c(10)-c(9)	108.31(11)
c(13)-c(10)-c(9)	109.77(11)
c(3')-c(11)-c(4')	112.17(12)
c(3')-c(11)-c(9)	103.77(11)
c(4')-c(11)-c(9)	104.74(12)
c(8)-c(12)-c(5')	109.57(12)
c(8')-o(2)-c(1')	111.06(12)

Table F4 Anisotropic displacement parameters ( $\text{Å}^2 \times 10^3$ ) for compound C1

The anisotropic displacement factor exponent takes the form:

$$-2\pi^2 [h^2 a^{*2} U_{11} + \dots + 2hk a^* b^* U_{12}]$$

	U11	U22	U33	U23	U13	U12
c(13)	34(1)	59(1)	35(1)	0(1)	11(1)	-3(1)
c(1')	34(1)	36(1)	42(1)	4(1)	1(1)	-8(1)
c(1)	43(1)	28(1)	31(1)	1(1)	3(1)	-4(1)
c(2)	56(1)	30(1)	39(1)	2(1)	2(1)	7(1)
c(2')	26(1)	23(1)	31(1)	1(1)	2(1)	0(1)
c(3)	49(1)	45(1)	47(1)	0(1)	-8(1)	14(1)
c(3')	32(1)	26(1)	29(1)	2(1)	6(1)	3(1)
c(4)	32(1)	39(1)	29(1)	-2(1)	-4(1)	3(1)
c(4')	38(1)	33(1)	28(1)	-1(1)	1(1)	-5(1)
c(5)	26(1)	28(1)	27(1)	-3(1)	1(1)	0(1)
c(5')	33(1)	35(1)	32(1)	3(1)	-3(1)	-1(1)
c(6)	40(1)	30(1)	33(1)	-9(1)	-2(1)	2(1)
c(6')	41(1)	32(1)	31(1)	6(1)	3(1)	3(1)
c(7')	35(1)	26(1)	35(1)	5(1)	6(1)	2(1)
c(7)	37(1)	29(1)	36(1)	-7(1)	1(1)	8(1)
c(8)	23(1)	25(1)	31(1)	-2(1)	2(1)	3(1)
c(8')	37(1)	29(1)	51(1)	7(1)	11(1)	3(1)
c(9')	40(1)	39(1)	53(1)	5(1)	15(1)	10(1)
c(9)	22(1)	26(1)	28(1)	-1(1)	2(1)	-1(1)
c(10)	25(1)	30(1)	26(1)	-1(1)	2(1)	-1(1)
c(10')	40(1)	64(1)	40(1)	4(1)	-12(1)	0(1)
c(11)	34(1)	23(1)	28(1)	-2(1)	4(1)	-1(1)
c(12)	27(1)	32(1)	36(1)	1(1)	0(1)	6(1)



Table F4 Anisotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound C1

The anisotropic displacement factor exponent takes the form:

$$-2\pi^2 [h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12}]$$

	U11	U22	U33	U23	U13	U12
c(14)	54(1)	85(2)	29(1)	0(1)	-2(1)	8(1)
c(15)	34(1)	68(2)	61(1)	6(1)	-13(1)	-8(1)
o(1)	77(1)	68(1)	134(2)	-14(1)	-48(1)	35(1)
o(2)	34(1)	43(1)	56(1)	9(1)	8(1)	-8(1)
o(3)	55(1)	48(1)	56(1)	18(1)	20(1)	0(1)
o(4)	72(1)	41(1)	39(1)	-9(1)	-11(1)	-9(1)
o(5)	24(1)	38(1)	42(1)	0(1)	2(1)	-6(1)

Table F5 Crystal data and structure refinement for compound D1

Empirical formula	$C_{15} H_{20} O_5$
Formula weight	298.33
Temperature	293(2) K
Wavelength	0.71073 \AA
Crystal system, space group	?, ?
Unit cell dimensions	$a = 7.65050(10) \text{ \AA}$ $\alpha = 90 \text{ deg.}$ $b = 7.87170(10) \text{ \AA}$ $\beta = 90 \text{ deg.}$ $c = 25.90040(10) \text{ \AA}$ $\gamma = 90 \text{ deg.}$
Volume	$1559.79(3) \text{ \AA}^3$
Z, Calculated density	4, $1.270 \text{ Mg/m}^3$
Absorption coefficient	$0.098 \text{ mm}^{-1}$
F(000)	640

Crystal size	? x ? x ? mm
Theta range for data collection	1.57 to 30.44 °
Limiting indices	-10<=h<=10, -10<=k<=11, -30<=l<=36
Reflections collected / unique	11400 / 4438 [R(int) = 0.0156]
Completeness to theta = 30.44	96.4 %
Absorption correction	None
Refinement method	Full-matrix least-squares on F <sup>2</sup>
Data / restraints / parameters	4438 / 0 / 266
Goodness-of-fit on F <sup>2</sup>	1.046
Final R indices [I>2sigma(I)]	R1 = 0.0355, wR2 = 0.0901
R indices (all data)	R1 = 0.0402, wR2 = 0.0927
Absolute structure parameter	1.1(7)
Largest diff. peak and hole	0.217 and -0.149 e.A <sup>-3</sup>

**Table F6.** Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound D1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	U(eq)
C(1')	9163(2)	4186(2)	951(1)	36(1)
C(3')	7709(2)	1644(2)	520(1)	35(1)
C(6)	9364(2)	5211(2)	1439(1)	36(1)
C(1)	11071(2)	5118(1)	1604(1)	34(1)
C(2')	7874(2)	2719(2)	1007(1)	37(1)
C(2)	11623(2)	5970(2)	2046(1)	42(1)
C(5')	4848(2)	265(2)	755(1)	39(1)
C(6')	3820(2)	-936(2)	1060(1)	43(1)
C(4')	6736(2)	-23(2)	614(1)	37(1)

Table F6 Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound D1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	$U(\text{eq})$
CH2O	12134(2)	4071(2)	1240(1)	44(1)
C(3)	10404(2)	6928(2)	2320(1)	57(1)
C(7')	1870(2)	-1003(2)	1016(1)	57(1)
C(4)	8696(2)	7009(2)	2151(1)	66(1)
C(5)	8133(2)	6151(2)	1711(1)	55(1)
CH3O	13965(3)	6605(5)	2620(1)	110(1)
O(1)	13347(1)	5806(2)	2167(1)	59(1)
O(2)	6850(1)	2664(1)	138(1)	41(1)
O(1W)	5281(2)	-4042(2)	325(1)	56(1)
O(3)	6860(2)	-963(1)	142(1)	51(1)
O(4)	4522(2)	585(1)	1292(1)	54(1)
O(5)	10899(1)	3509(1)	856(1)	45(1)

Table F7 Bond lengths [Å] and angles [°] for compound D1.

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C(1')-O(5)	1.4517(16)
C(1')-C(6)	1.5068(16)
C(1')-C(2')	1.5255(17)
C(3')-O(2)	1.4338(15)
C(3')-C(2')	1.5228(15)
C(3')-C(4')	1.5287(17)
C(6)-C(1)	1.3765(18)
C(6)-C(5)	1.3896(19)
C(1)-C(2)	1.3923(16)
C(1)-CH <sub>2</sub> O	1.4934(17)
C(2)-O(1)	1.3614(18)
C(2)-C(3)	1.393(2)
C(5')-O(4)	1.4358(16)
C(5')-C(6')	1.4617(18)
C(5')-C(4')	1.5066(19)
C(6')-O(4)	1.4434(18)
C(6')-C(7')	1.497(2)
C(4')-O(3)	1.4316(15)
CH <sub>2</sub> O-O(5)	1.4407(16)
C(3)-C(4)	1.380(3)
C(4)-C(5)	1.392(2)
CH <sub>3</sub> O-O(1)	1.413(2)
O(5)-C(1')-C(6)	104.22(9)
O(5)-C(1')-C(2')	109.26(10)
C(6)-C(1')-C(2')	113.10(10)
O(2)-C(3')-C(2')	107.38(10)
O(2)-C(3')-C(4')	111.53(10)
C(2')-C(3')-C(4')	112.70(10)

Table F7 Bond lengths [Å] and angles [°] for compound D1.

C(1)-C(6)-C(5)	120.89(12)
C(1)-C(6)-C(1')	109.19(10)
C(5)-C(6)-C(1')	129.91(12)
C(6)-C(1)-C(2)	121.20(11)
C(6)-C(1)-CH <sub>2</sub> O	110.44(10)
C(2)-C(1)-CH <sub>2</sub> O	128.33(12)
C(3')-C(2')-C(1')	113.34(10)
O(1)-C(2)-C(3)	125.72(13)
O(1)-C(2)-C(1)	115.86(12)
C(3)-C(2)-C(1)	118.41(13)
O(4)-C(5')-C(6')	59.75(9)
O(4)-C(5')-C(4')	115.30(11)
C(6')-C(5')-C(4')	123.29(11)
O(4)-C(6')-C(5')	59.23(9)
O(4)-C(6')-C(7')	115.52(13)
C(5')-C(6')-C(7')	121.21(13)
O(3)-C(4')-C(5')	110.37(10)
O(3)-C(4')-C(3')	105.99(10)
C(5')-C(4')-C(3')	112.08(10)
O(5)-CH <sub>2</sub> O-C(1)	104.40(10)
C(4)-C(3)-C(2)	119.88(13)
C(3)-C(4)-C(5)	121.97(15)
C(6)-C(5)-C(4)	117.64(14)
C(2)-O(1)-CH <sub>3</sub> O	118.13(15)
C(5')-O(4)-C(6')	61.02(8)
CH <sub>2</sub> O-O(5)-C(1')	111.71(9)

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Symmetry transformations used to generate equivalent atoms:

Table F8 Anisotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound D1

The anisotropic displacement factor exponent takes the form:

$$-2\pi^2 [ h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12} ]$$

	U11	U22	U33	U23	U13	U12
C(1')	41(1)	32(1)	35(1)	-4(1)	-3(1)	-2(1)
C(3')	38(1)	30(1)	36(1)	-5(1)	-1(1)	-2(1)
C(6)	41(1)	29(1)	39(1)	-5(1)	-2(1)	-2(1)
C(1)	40(1)	30(1)	33(1)	-3(1)	0(1)	-2(1)
C(2')	42(1)	37(1)	34(1)	-5(1)	-1(1)	-5(1)
C(2)	47(1)	45(1)	34(1)	-6(1)	-2(1)	-6(1)
C(5')	40(1)	31(1)	44(1)	3(1)	-3(1)	-1(1)
C(6')	47(1)	36(1)	46(1)	7(1)	-1(1)	1(1)
C(4')	41(1)	28(1)	42(1)	-2(1)	-2(1)	-1(1)
CH2O	41(1)	47(1)	43(1)	-13(1)	-1(1)	2(1)
C(3)	63(1)	62(1)	46(1)	-25(1)	4(1)	-6(1)
C(7')	47(1)	53(1)	70(1)	14(1)	2(1)	-8(1)
C(4)	58(1)	66(1)	73(1)	-36(1)	9(1)	5(1)
C(5)	44(1)	53(1)	69(1)	-22(1)	-2(1)	7(1)
CH3O	69(1)	192(3)	68(1)	-59(2)	-20(1)	-10(2)
O(1)	49(1)	84(1)	45(1)	-15(1)	-11(1)	-5(1)
O(2)	56(1)	31(1)	36(1)	-4(1)	-6(1)	-4(1)
O(1W)	59(1)	38(1)	71(1)	-13(1)	-5(1)	-5(1)
O(3)	61(1)	35(1)	56(1)	-14(1)	9(1)	-11(1)
O(4)	53(1)	58(1)	52(1)	-16(1)	4(1)	-2(1)
O(5)	43(1)	51(1)	40(1)	-18(1)	2(1)	-3(1)

Table F9 Crystal data and structure refinement for 14-methoxy compound F1

Empirical formula	C <sub>28</sub> H <sub>30</sub> Ho <sub>0</sub> O <sub>8</sub>
Formula weight	494.52
Temperature	293(2) K
Wavelength	0.71073 Å
Crystal system, space group	?, ?
Unit cell dimensions	a = 11.33230(10) Å $\alpha = 90^\circ$ . b = 8.8199(2) Å $\beta = 91.7650(10)^\circ$ . c = 12.8741(3) Å $\gamma = 90^\circ$ .
Volume	1286.15(4) Å <sup>3</sup>
Z, Calculated density	2, 1.277 Mg/m <sup>3</sup>
Absorption coefficient	0.093 mm <sup>-1</sup>
F(000)	524
Crystal size	0.40 x 0.40 x 0.40 mm
Theta range for data collection	1.58 to 30.41 deg.
Limiting indices	-16<=h<=15, -9<=k<=12, -18<=l<=17
Reflections collected / unique	9335 / 5380 [R(int) = 0.0272]
Completeness to theta = 30.41	92.9 %
Absorption correction	None
Max. and min. transmission	0.9636 and 0.9636
Refinement method	Full-matrix least-squares on F <sup>2</sup>
Data / restraints / parameters	5380 / 1 / 365
Goodness-of-fit on F <sup>2</sup>	1.036
Final R indices [I>2sigma(I)]	R1 = 0.0602, wR2 = 0.1393
R indices (all data)	R1 = 0.0910, wR2 = 0.1608
Absolute structure parameter	-1.5(14)
Largest diff. peak and hole	0.369 and -0.403 e.Å <sup>-3</sup>

Table F10 Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{Å}^2 \times 10^3$ ) for compound F1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	$U(\text{eq})$
C(1)	1779(3)	232(4)	5299(2)	43(1)
C(2)	881(3)	1243(5)	5083(3)	50(1)
C(3)	633(3)	2366(5)	5797(3)	50(1)
C(4)	1239(3)	2511(4)	6759(2)	42(1)
C(5)	4263(3)	934(4)	9085(2)	42(1)
C(6)	5265(3)	152(4)	9373(2)	41(1)
C(7)	5734(3)	-895(4)	8659(2)	38(1)
C(8)	5180(2)	-1198(4)	7703(2)	34(1)
C(9)	2432(3)	327(4)	6257(2)	37(1)
C(10)	2132(3)	1458(4)	6966(2)	38(1)
C(11)	3703(3)	677(4)	8120(2)	38(1)
C(12)	4106(3)	-408(4)	7433(2)	34(1)
C(13)	3410(3)	-707(4)	6475(2)	36(1)
C(14)	949(3)	3790(4)	7482(3)	47(1)
C(15)	-304(3)	3742(5)	7816(3)	58(1)
C(16)	-710(5)	3086(6)	8793(4)	79(1)
C(17)	-1973(6)	2602(11)	8836(6)	147(3)
C(18)	140(8)	2402(10)	9557(5)	133(3)
C(19)	7213(3)	-2771(5)	8356(3)	49(1)
C(20)	7095(3)	-2383(4)	7205(2)	44(1)
C(21)	7828(3)	-1026(5)	6895(3)	52(1)
C(22)	7413(4)	122(6)	6333(4)	87(2)
C(23)	9091(4)	-1069(8)	7231(4)	88(2)



Table F10 Atomic coordinates ( $\times 10^4$ ) and equivalent isotropic displacement parameters ( $\text{Å}^2 \times 10^3$ ) for compound F1.  $U(\text{eq})$  is defined as one third of the trace of the orthogonalized  $U_{ij}$  tensor.

	x	y	z	U(eq)
C(24)	5864(3)	403(5)	10423(3)	57(1)
C(25)	5768(3)	-2245(4)	6943(2)	37(1)
C(26)	1766(7)	6199(10)	7274(11)	222(7)
C(27)	5133(3)	-4579(4)	6156(3)	51(1)
C(28)	4602(6)	-6080(6)	6385(4)	100(2)
O(4)	3609(2)	-1798(3)	5891(2)	45(1)
O(8)	5452(2)	-4148(3)	5329(2)	59(1)
O(7)	5238(2)	-3742(3)	7045(2)	45(1)
O(2)	6776(2)	-1551(3)	8987(2)	47(1)
O(1)	2034(2)	-845(3)	4591(2)	55(1)
O(3)	2722(2)	1563(3)	7908(2)	42(1)
O(5)	1077(4)	5194(4)	6941(2)	94(1)
O(6)	-592(3)	4714(4)	8667(2)	77(1)

Table F11 Bond lengths [Å] and angles [°] for compound F1

C(1)-O(1)	1.354(4)
C(1)-C(2)	1.375(5)
C(1)-C(9)	1.422(4)
C(2)-C(3)	1.385(5)
C(3)-C(4)	1.403(4)
C(4)-C(10)	1.394(4)
C(4)-C(14)	1.505(5)
C(5)-C(6)	1.370(5)
C(5)-C(11)	1.397(4)
C(6)-C(7)	1.417(4)
C(6)-C(24)	1.511(4)
C(7)-O(2)	1.371(4)
C(7)-C(8)	1.390(4)
C(8)-C(12)	1.436(4)
C(8)-C(25)	1.514(4)
C(9)-C(10)	1.401(4)
C(9)-C(13)	1.456(4)
C(10)-O(3)	1.369(4)
C(11)-O(3)	1.379(4)
C(11)-C(12)	1.390(4)
C(12)-C(13)	1.467(4)
C(13)-O(4)	1.246(4)
C(14)-O(5)	1.430(5)
C(14)-C(15)	1.497(5)
C(15)-O(6)	1.436(5)
C(15)-C(16)	1.471(6)
C(16)-O(6)	1.451(6)
C(16)-C(18)	1.484(9)
C(16)-C(17)	1.496(8)

Table F11 Bond lengths [Å] and angles [deg] for compound F1.

C(19)-O(2)	1.444(4)
C(19)-C(20)	1.523(5)
C(20)-C(21)	1.518(5)
C(20)-C(25)	1.536(4)
C(21)-C(22)	1.322(6)
C(21)-C(23)	1.484(5)
C(25)-O(7)	1.458(4)
C(26)-O(5)	1.249(9)
C(27)-O(8)	1.197(4)
C(27)-O(7)	1.364(4)
C(27)-C(28)	1.487(6)
O(1)-C(1)-C(2)	119.5(3)
O(1)-C(1)-C(9)	120.6(3)
C(2)-C(1)-C(9)	119.9(3)
C(1)-C(2)-C(3)	119.6(3)
C(2)-C(3)-C(4)	123.2(3)
C(10)-C(4)-C(3)	116.1(3)
C(10)-C(4)-C(14)	123.5(3)
C(3)-C(4)-C(14)	120.3(3)
C(6)-C(5)-C(11)	120.6(3)
C(5)-C(6)-C(7)	118.5(3)
C(5)-C(6)-C(24)	121.0(3)
C(7)-C(6)-C(24)	120.6(3)
O(2)-C(7)-C(8)	123.5(3)
O(2)-C(7)-C(6)	114.3(2)
C(8)-C(7)-C(6)	122.1(3)
C(7)-C(8)-C(12)	118.5(3)
C(7)-C(8)-C(25)	119.6(3)

Table F11 Bond lengths [Å] and angles [deg] for compound F1.

C(12)-C(8)-C(25)	121.7(2)
C(10)-C(9)-C(1)	118.5(3)
C(10)-C(9)-C(13)	121.3(2)
C(1)-C(9)-C(13)	120.2(3)
O(3)-C(10)-C(4)	117.1(3)
O(3)-C(10)-C(9)	120.2(3)
C(4)-C(10)-C(9)	122.6(3)
O(3)-C(11)-C(12)	122.9(3)
O(3)-C(11)-C(5)	115.1(3)
C(12)-C(11)-C(5)	121.9(3)
C(11)-C(12)-C(8)	118.2(3)
C(11)-C(12)-C(13)	118.7(3)
C(8)-C(12)-C(13)	123.1(3)
O(4)-C(13)-C(9)	121.3(3)
O(4)-C(13)-C(12)	122.9(3)
C(9)-C(13)-C(12)	115.8(3)
O(5)-C(14)-C(15)	106.0(3)
O(5)-C(14)-C(4)	108.7(3)
C(15)-C(14)-C(4)	112.6(3)
O(6)-C(15)-C(16)	59.9(3)
O(6)-C(15)-C(14)	116.3(3)
C(16)-C(15)-C(14)	125.6(4)
O(6)-C(16)-C(15)	58.9(3)
O(6)-C(16)-C(18)	114.6(5)
C(15)-C(16)-C(18)	120.8(5)
O(6)-C(16)-C(17)	112.2(6)
C(15)-C(16)-C(17)	117.9(5)
C(18)-C(16)-C(17)	117.5(6)
O(2)-C(19)-C(20)	111.0(3)

Table F11 Bond lengths [Å] and angles [°] for compound F1.

C(21)-C(20)-C(19)	113.7(3)
C(21)-C(20)-C(25)	114.8(3)
C(19)-C(20)-C(25)	106.7(3)
C(22)-C(21)-C(23)	120.2(4)
C(22)-C(21)-C(20)	124.1(3)
C(23)-C(21)-C(20)	115.7(4)
O(7)-C(25)-C(8)	107.7(2)
O(7)-C(25)-C(20)	108.2(3)
C(8)-C(25)-C(20)	110.7(3)
O(8)-C(27)-O(7)	123.6(3)
O(8)-C(27)-C(28)	126.5(4)
O(7)-C(27)-C(28)	109.9(3)
C(27)-O(7)-C(25)	116.1(2)
C(7)-O(2)-C(19)	116.6(2)
C(10)-O(3)-C(11)	120.3(2)
C(26)-O(5)-C(14)	121.3(5)
C(15)-O(6)-C(16)	61.3(3)

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Symmetry transformations used to generate equivalent atoms:

Table F12 Anisotropic displacement parameters ( $\text{Å}^2 \times 10^3$ ) for compound F1.

The anisotropic displacement factor exponent takes the form:

$$-2 \pi^2 [h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12}]$$

	U11	U22	U33	U23	U13	U12
C(1)	35(2)	52(2)	40(2)	-2(2)	-2(1)	-8(2)
C(2)	45(2)	62(3)	43(2)	1(2)	-13(1)	-1(2)
C(3)	45(2)	52(2)	51(2)	7(2)	-13(1)	4(2)
C(4)	40(2)	40(2)	45(2)	4(1)	-3(1)	-1(2)
C(5)	47(2)	46(2)	33(1)	-6(1)	1(1)	11(2)
C(6)	48(2)	44(2)	31(1)	1(1)	-2(1)	1(2)
C(7)	39(2)	39(2)	37(1)	2(1)	0(1)	6(1)
C(8)	36(1)	35(2)	32(1)	1(1)	1(1)	0(1)
C(9)	34(1)	43(2)	35(1)	3(1)	-1(1)	-3(1)
C(10)	34(1)	39(2)	39(1)	2(1)	-1(1)	-5(1)
C(11)	38(2)	39(2)	37(1)	-1(1)	0(1)	5(1)
C(12)	36(1)	35(2)	31(1)	0(1)	2(1)	-2(1)
C(13)	36(1)	37(2)	35(1)	2(1)	0(1)	-8(1)
C(14)	55(2)	41(2)	44(2)	4(2)	-12(2)	5(2)
C(15)	59(2)	53(2)	62(2)	-11(2)	-7(2)	17(2)
C(16)	89(3)	73(3)	76(3)	-14(3)	28(2)	-6(3)
C(17)	124(5)	151(7)	169(6)	-72(6)	78(5)	-51(5)
C(18)	193(8)	127(6)	81(4)	36(4)	28(4)	27(6)
C(19)	47(2)	53(2)	46(2)	0(2)	0(2)	16(2)
C(20)	43(2)	42(2)	46(2)	-4(2)	7(1)	5(2)
C(21)	46(2)	58(2)	54(2)	-5(2)	6(1)	-7(2)
C(22)	71(3)	79(4)	113(4)	34(3)	1(3)	-25(3)
C(23)	61(3)	107(4)	95(3)	-1(3)	-5(2)	-24(3)
C(24)	62(2)	67(3)	40(2)	-12(2)	-12(2)	17(2)

Table F12 Anisotropic displacement parameters ( $\text{\AA}^2 \times 10^3$ ) for compound F1.

The anisotropic displacement factor exponent takes the form:

$$-2 \pi^2 [ h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12} ]$$

	U11	U22	U33	U23	U13	U12
C(25)	43(2)	32(2)	35(1)	-1(1)	4(1)	-1(1)
C(26)	108(5)	114(7)	438(18)	142(9)	-89(8)	-56(5)
C(27)	59(2)	39(2)	57(2)	-10(2)	10(2)	-2(2)
C(28)	156(5)	52(3)	94(3)	-21(3)	32(3)	-38(3)
O(4)	51(1)	42(1)	42(1)	-10(1)	-1(1)	0(1)
O(8)	75(2)	56(2)	46(1)	-10(1)	11(1)	3(1)
O(7)	57(1)	36(1)	41(1)	-3(1)	9(1)	-3(1)
O(2)	45(1)	55(2)	41(1)	-1(1)	-5(1)	14(1)
O(1)	52(1)	64(2)	47(1)	-17(1)	-10(1)	-2(1)
O(3)	45(1)	44(1)	38(1)	-4(1)	-5(1)	14(1)
O(5)	165(4)	42(2)	74(2)	10(2)	-32(2)	-21(2)
O(6)	82(2)	63(2)	86(2)	-24(2)	10(2)	14(2)

## BIOGRAPHY

Mr. Jatupol Liangsakul was born on October 22, 1978 in Takuapa, Pang-nga Province, Thailand. He graduated with Bachelor Degree of Science and Technology Faculty (Chemistry and Biology) from Prince of Songkhla University in 1999. In 2003, he was graduated with a Master Degree of Science in Biotechnology and he has been studying for a Degree of Doctoral Philosophy of Science in Biotechnology, the Faculty of Science, Chulalongkorn University since 2004.

