

## References

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## Appendices



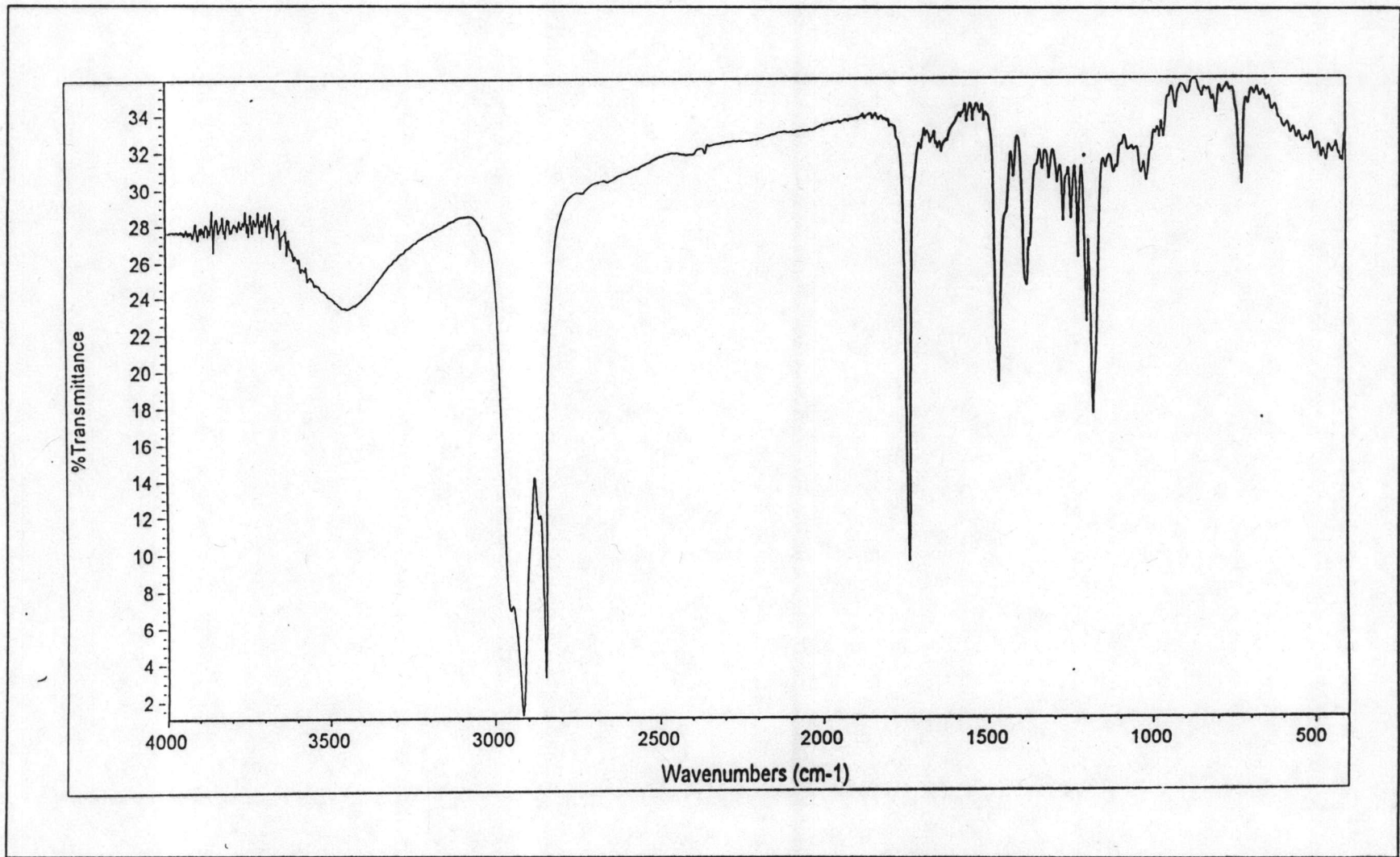


Fig. 3 The FT-IR spectrum of Mixture 1

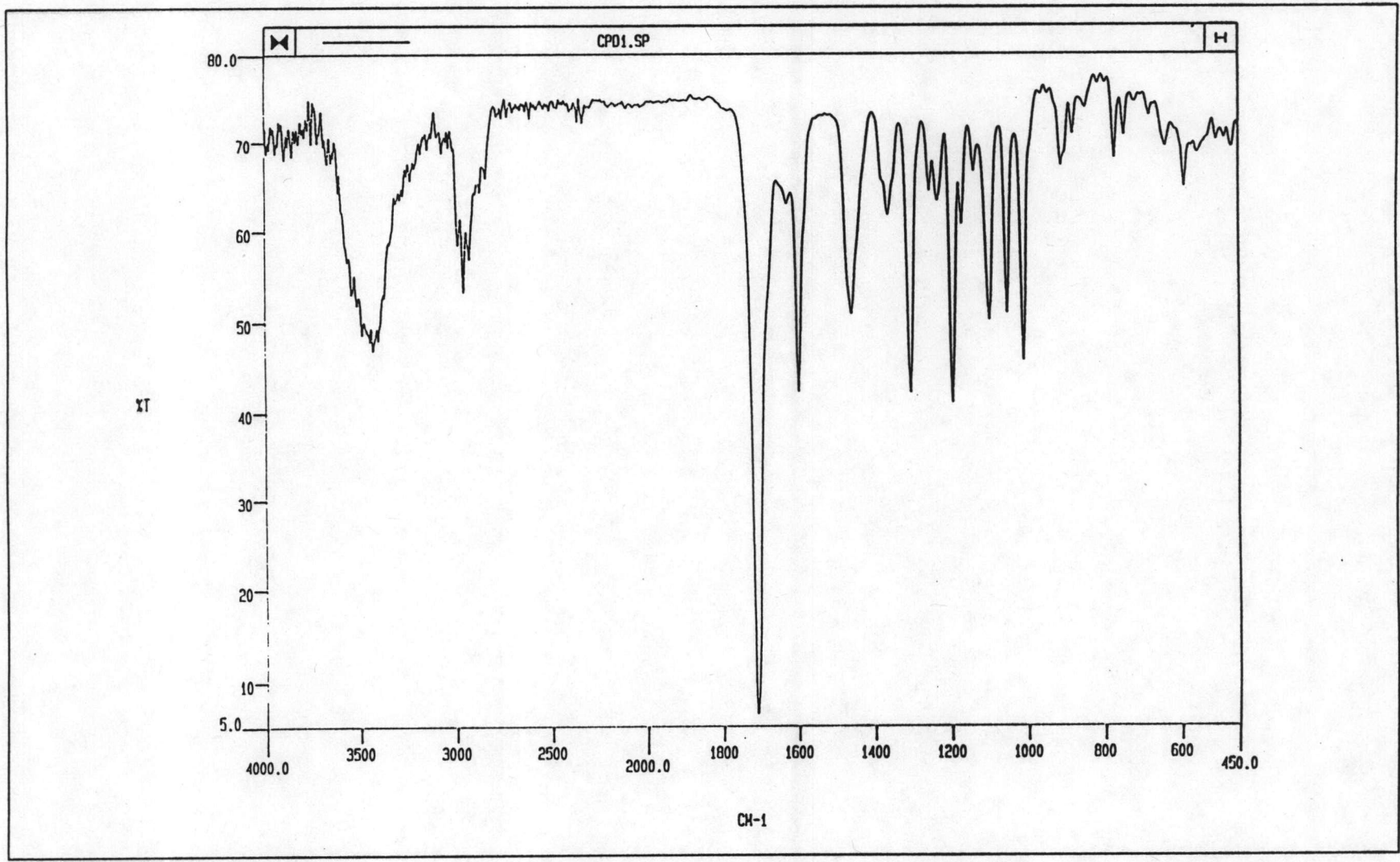


Fig. 4 The FT-IR spectrum of Compound 2

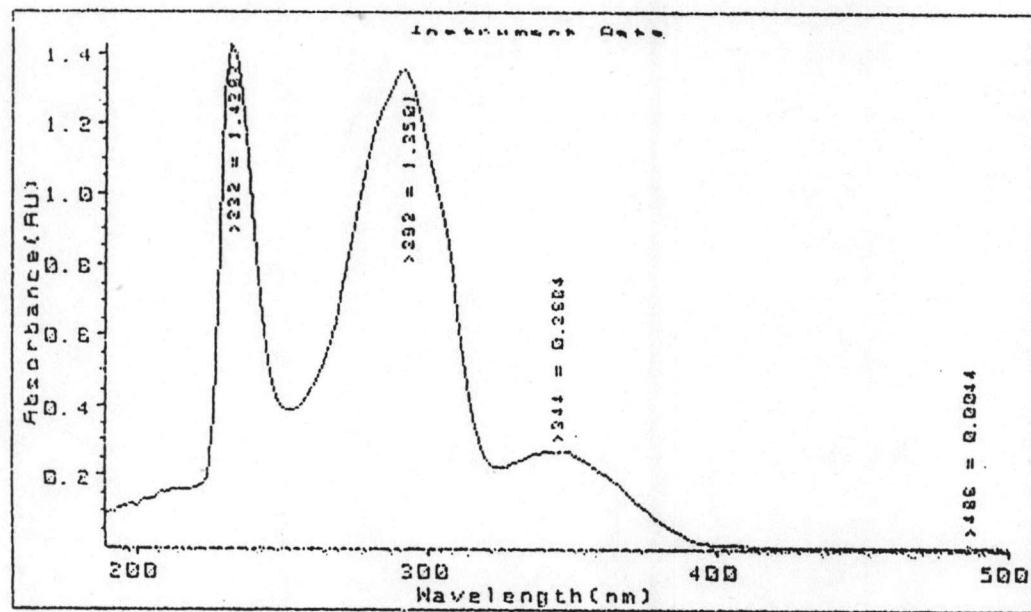


Fig. 5 The UV spectrum of Compound 2

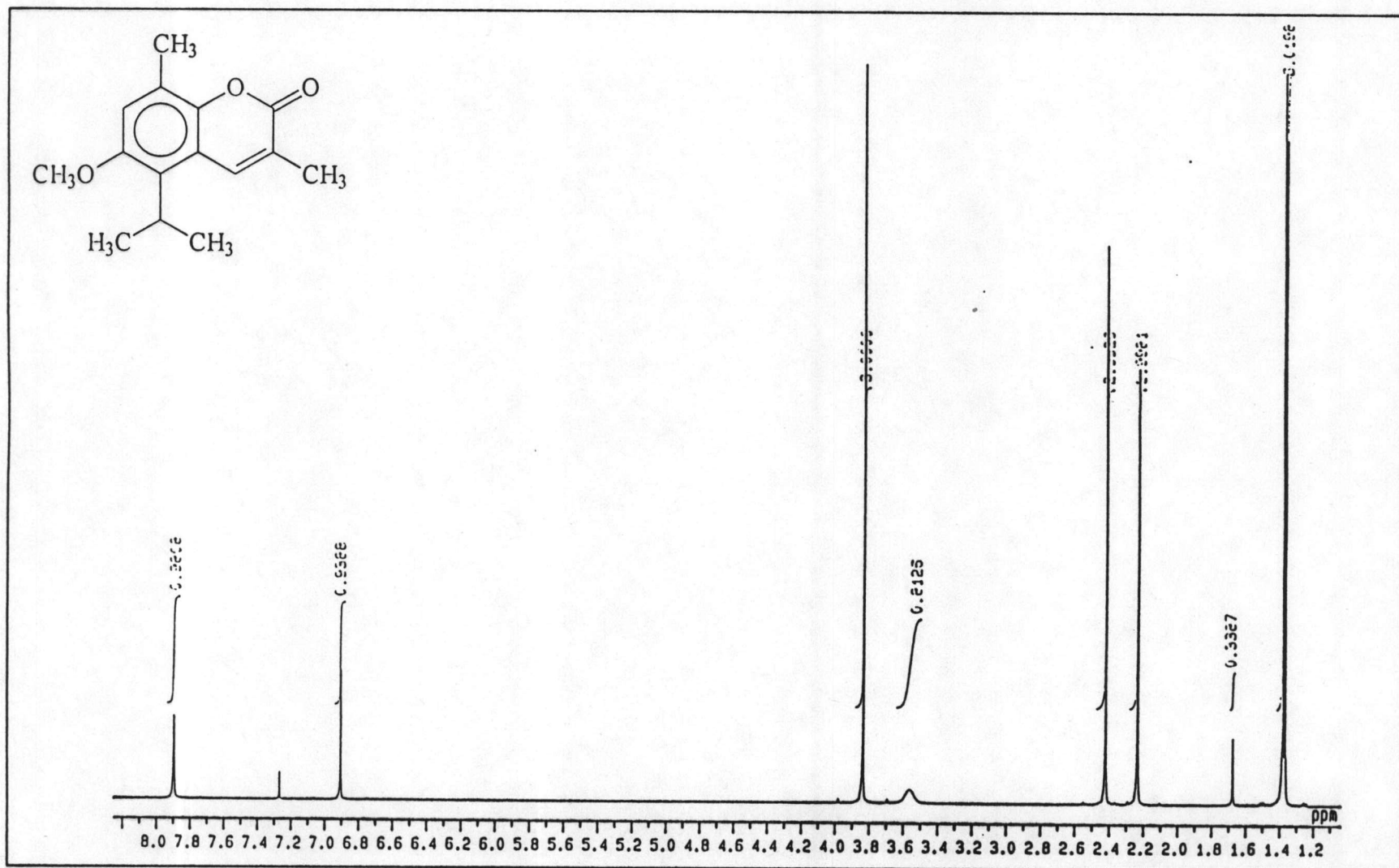


Fig. 6 The <sup>1</sup>H NMR spectrum of Compound 2

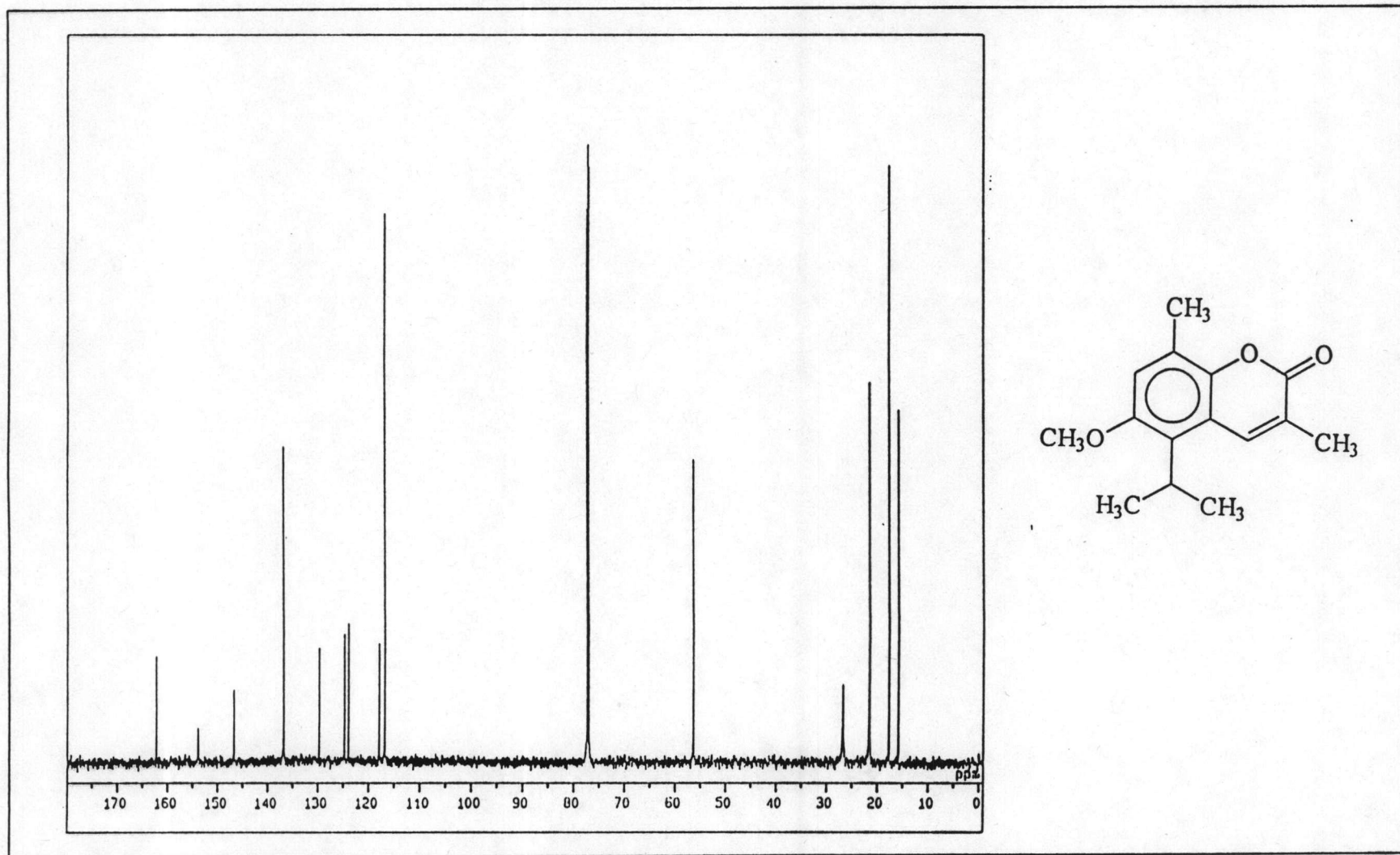


Fig. 7 The  $^{13}\text{C}$  NMR spectrum of Compound 2



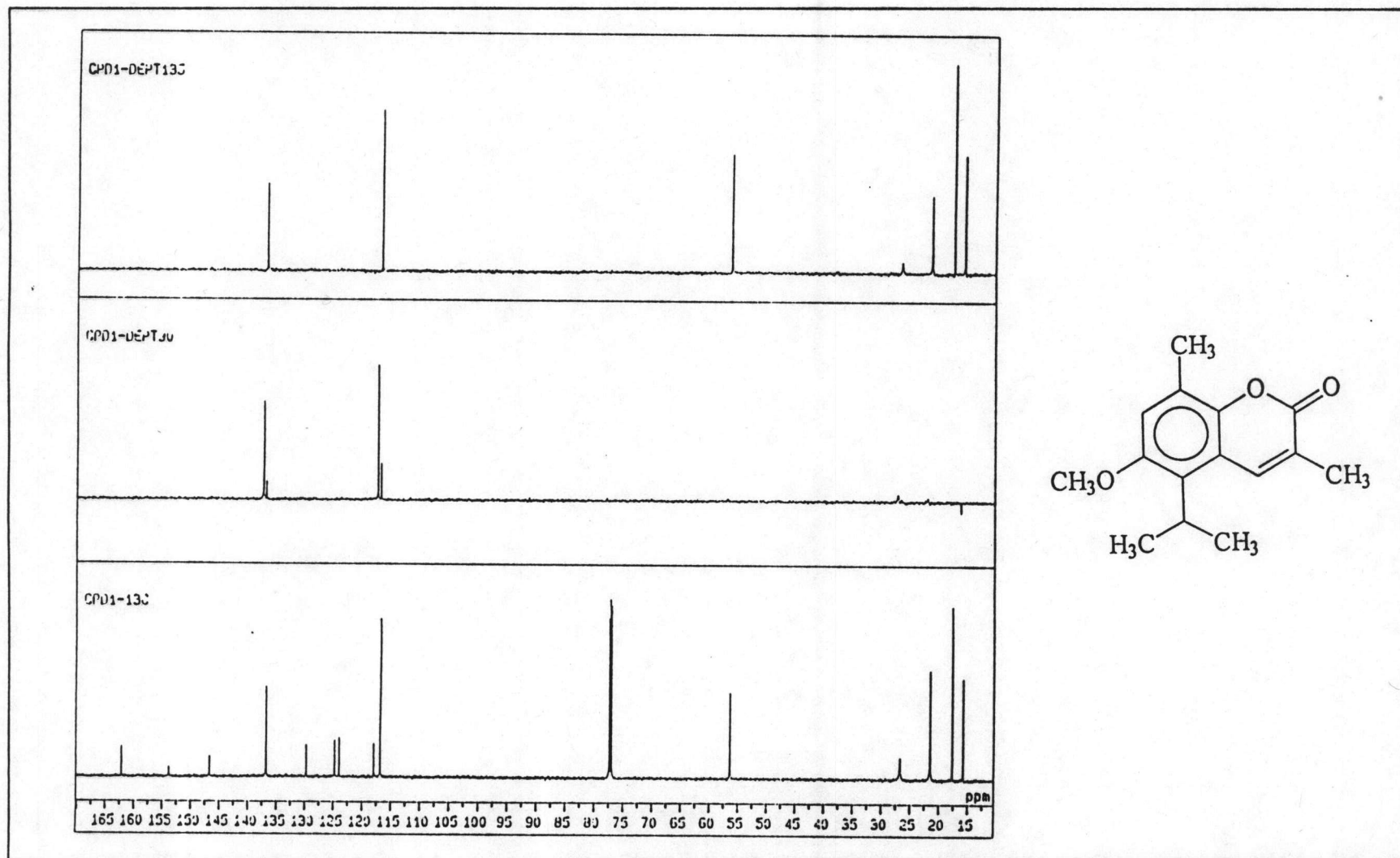


Fig. 8 The DEPT 90 and 135 spectra of Compound 2

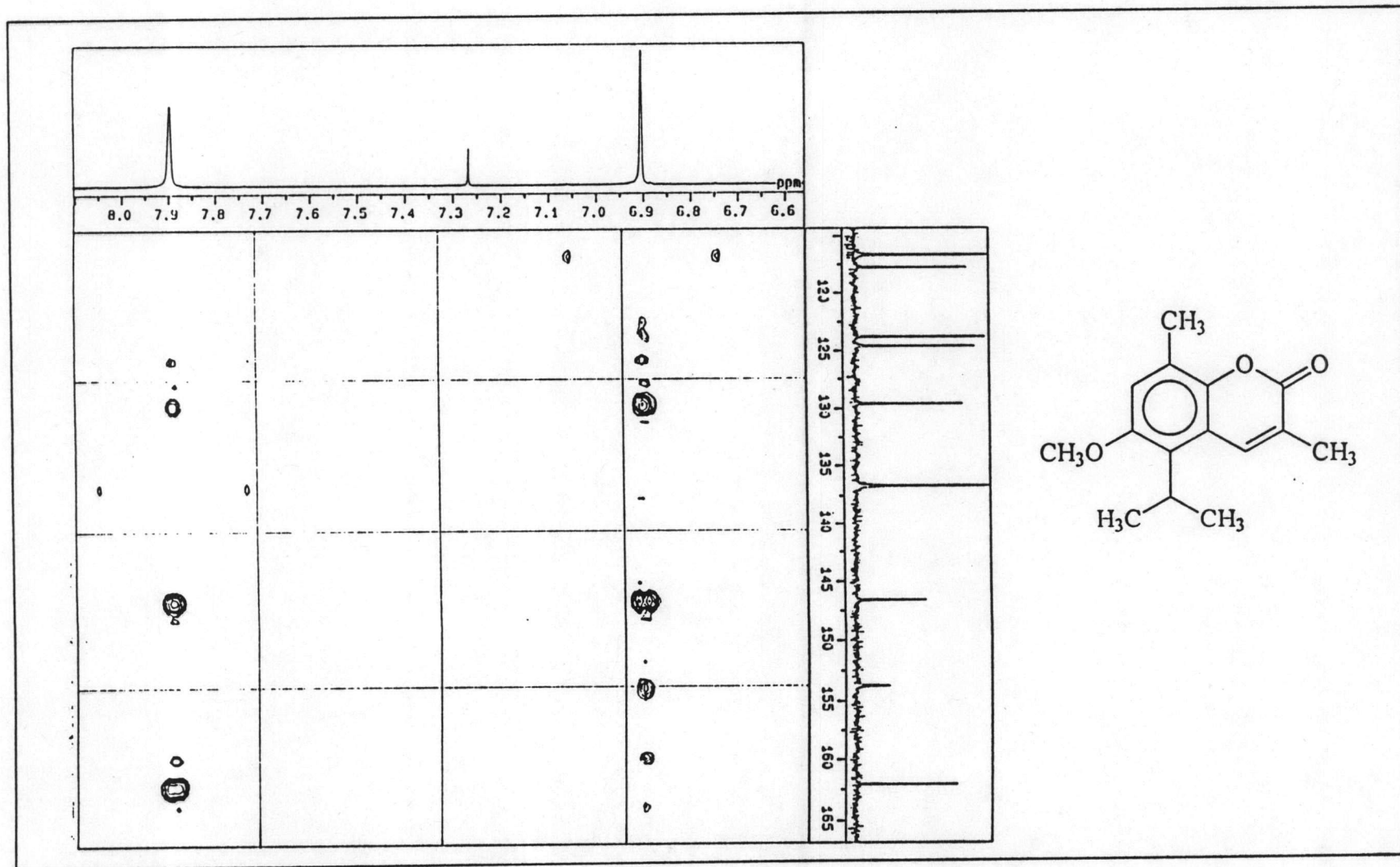


Fig. 9A The HMBC spectrum of Compound 2

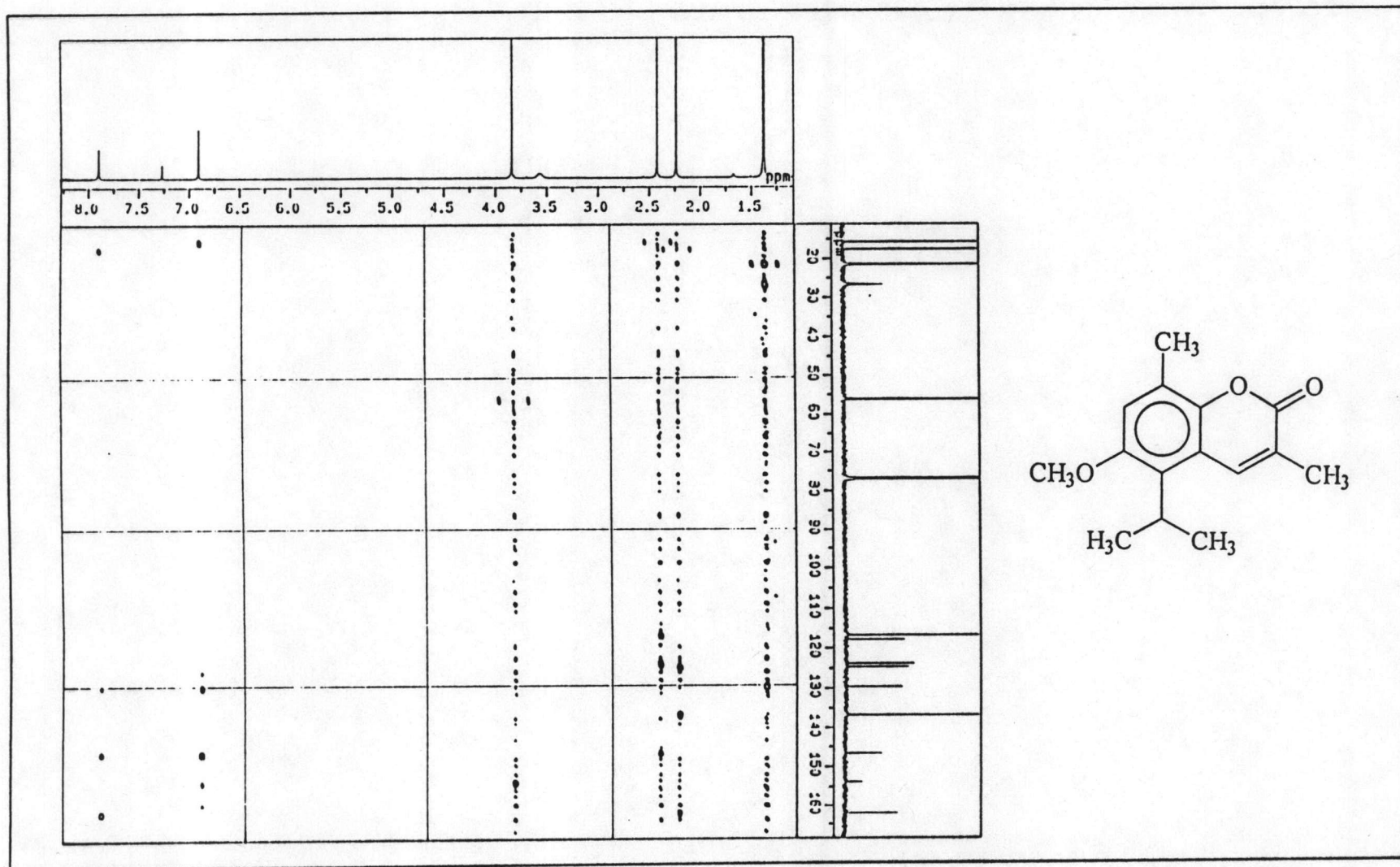


Fig. 9B The HMBC spectrum of Compound 2

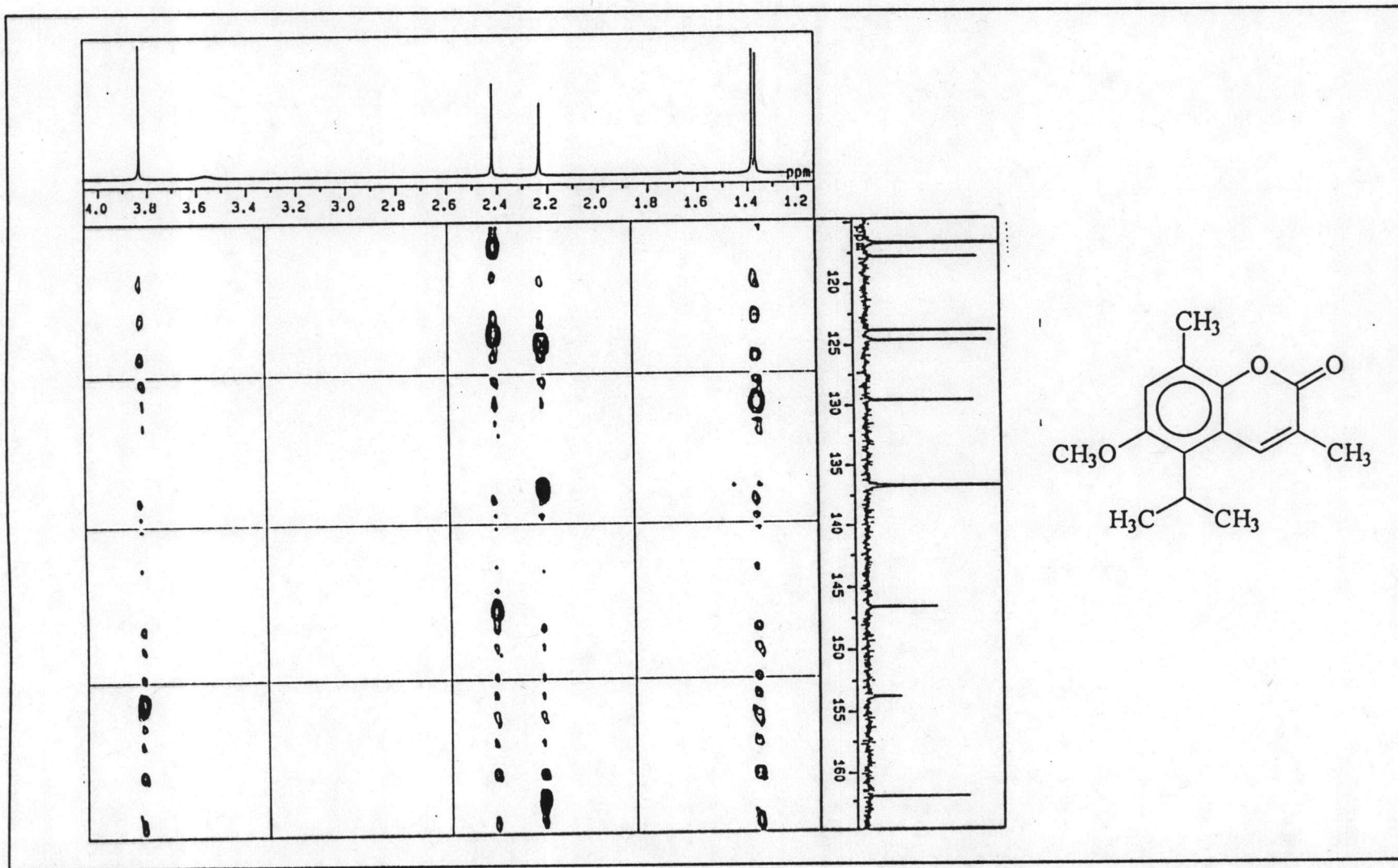


Fig. 9C The HMBC spectrum of Compound 2



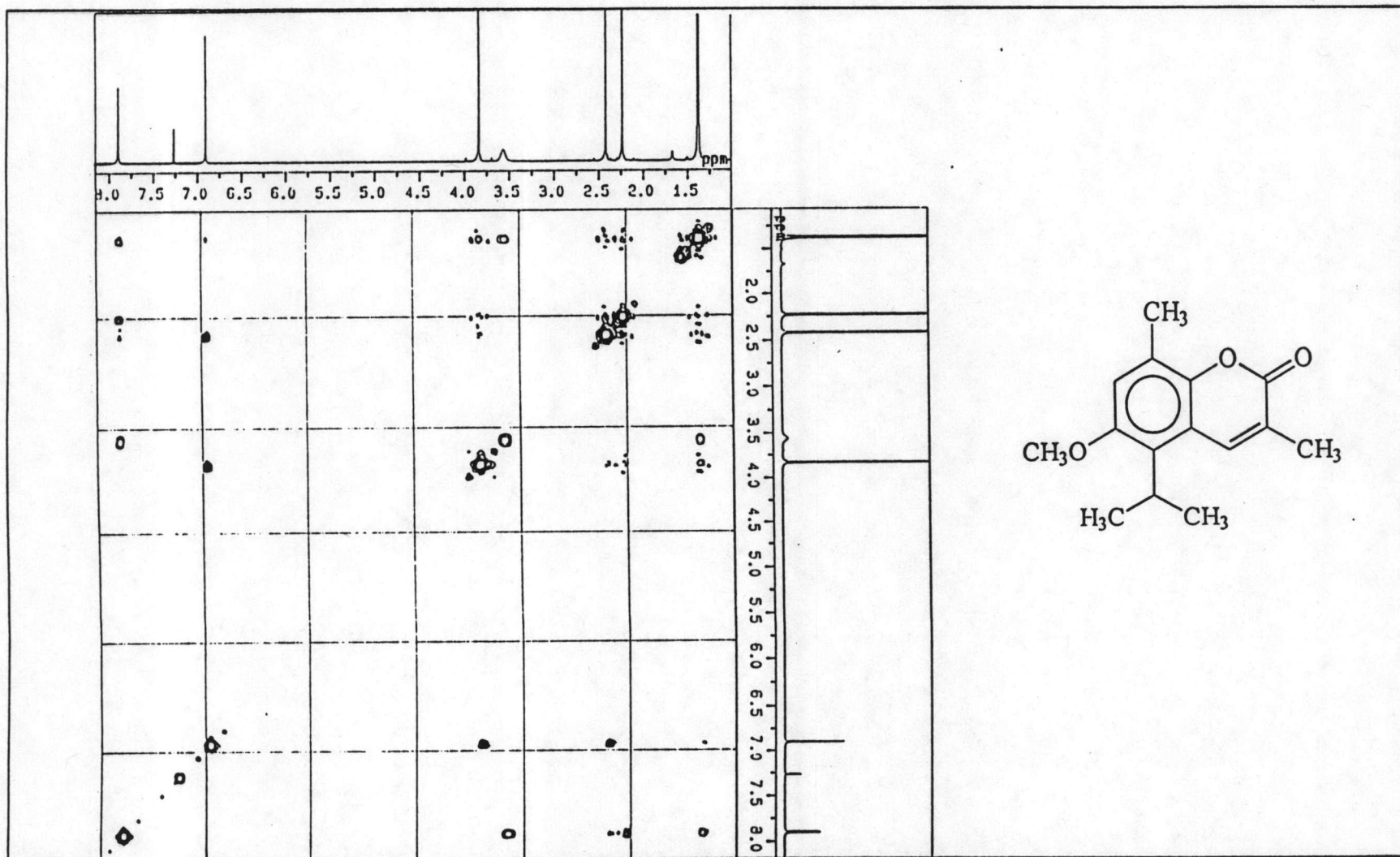


Fig. 10 The NOESY spectrum of Compound 2



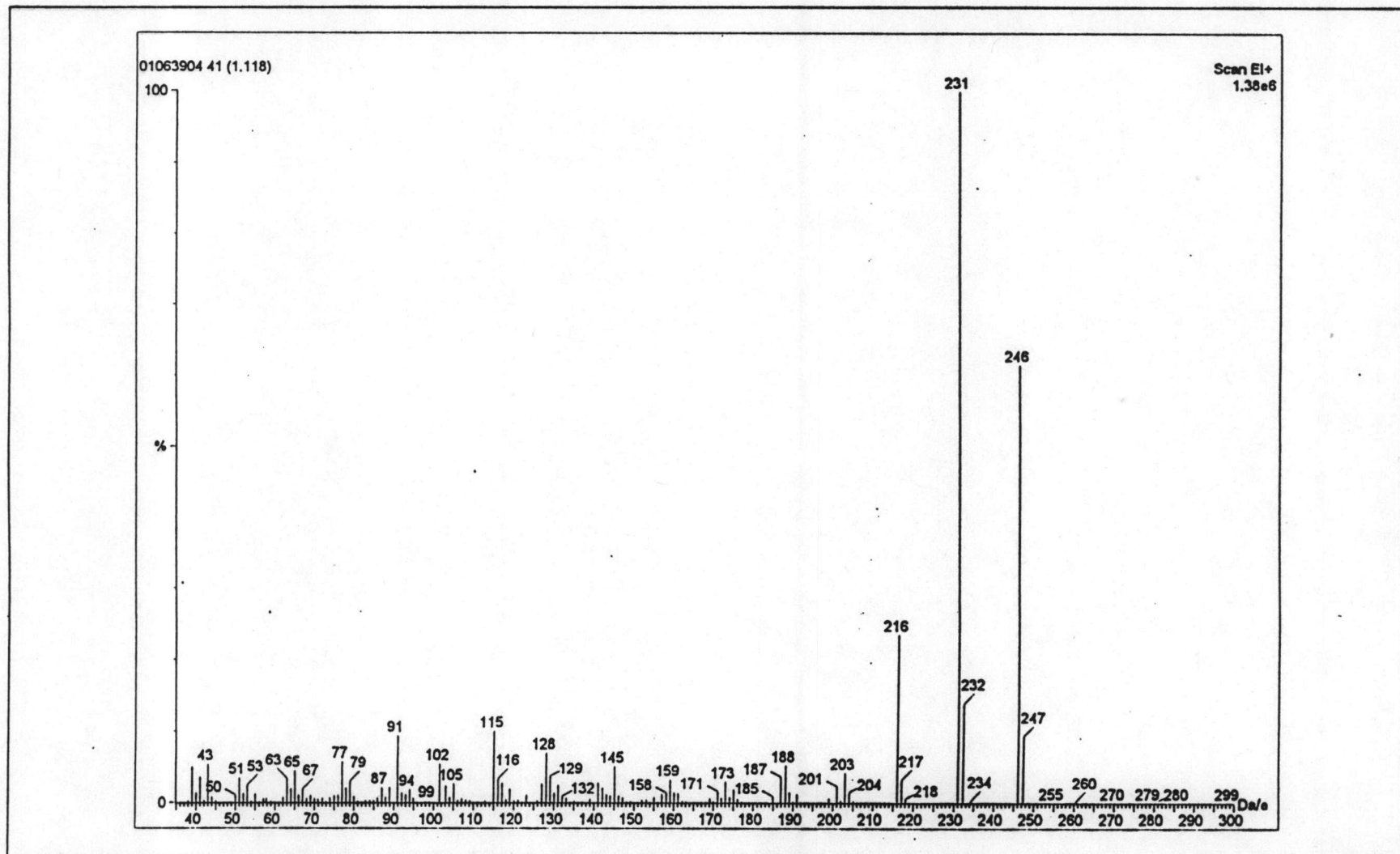


Fig. 11 The mass spectrum of Compound 2

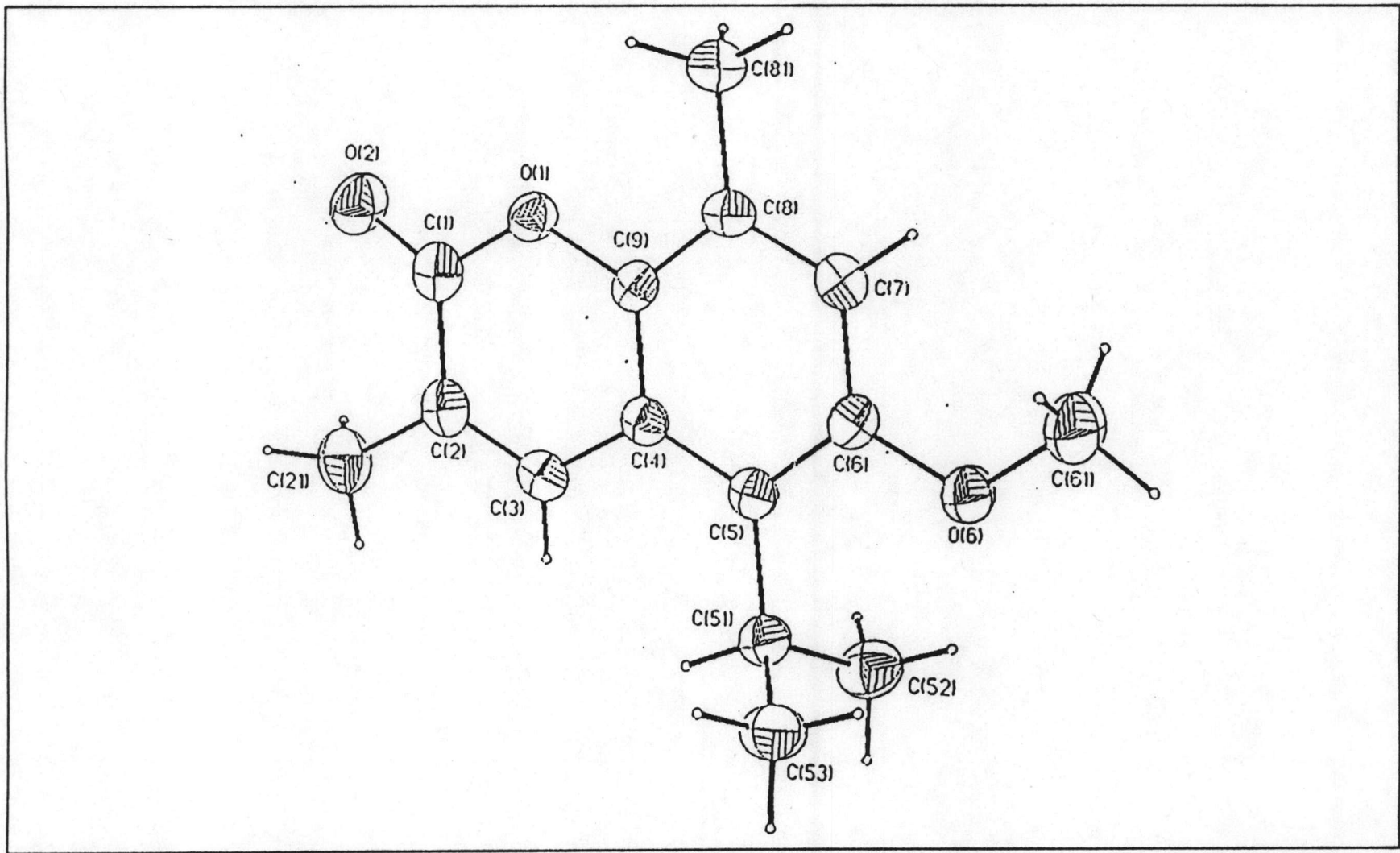


Fig. 12 The ORTEP of Compound 2

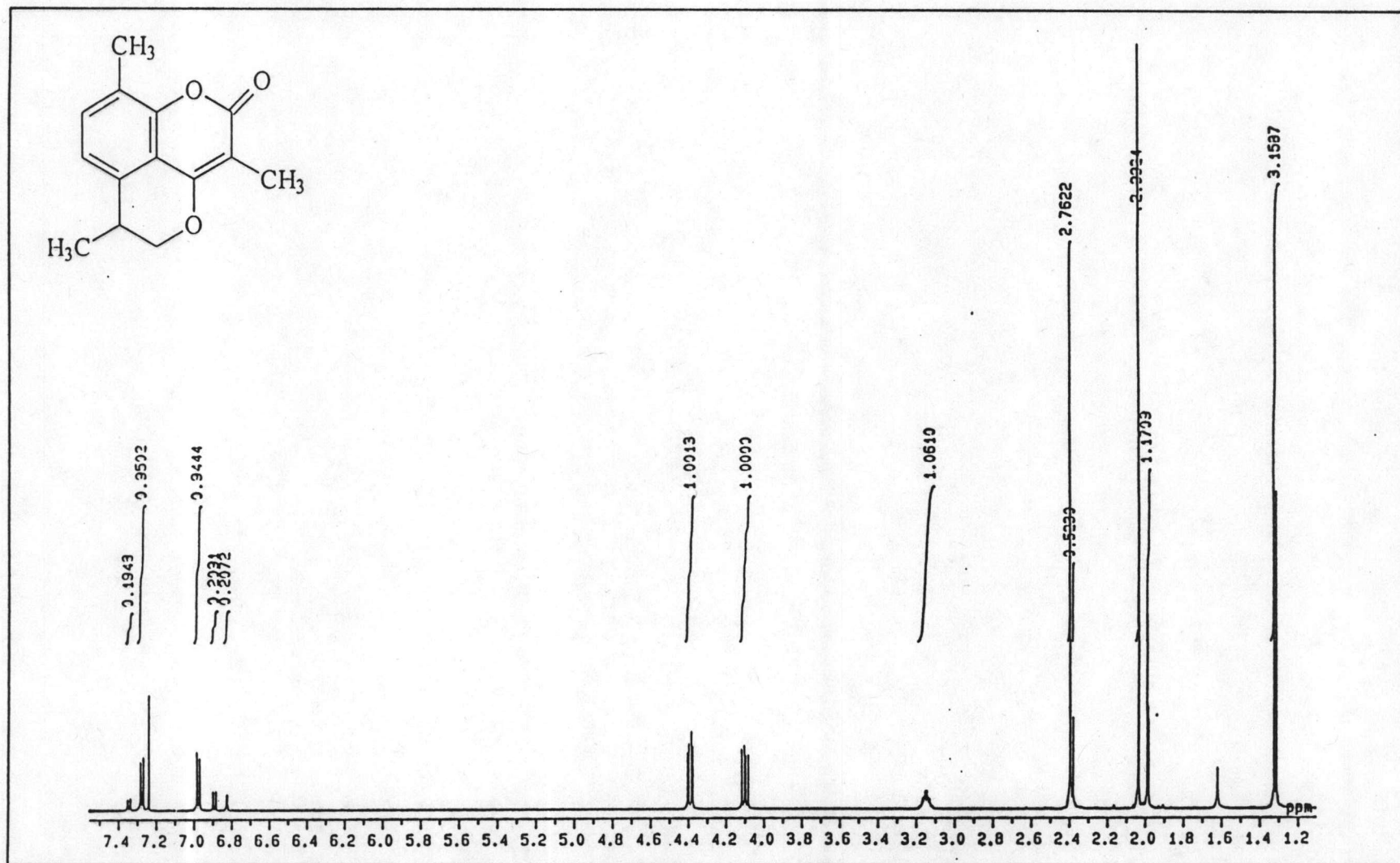


Fig. 13 The <sup>1</sup>H-NMR spectrum of Compound 3

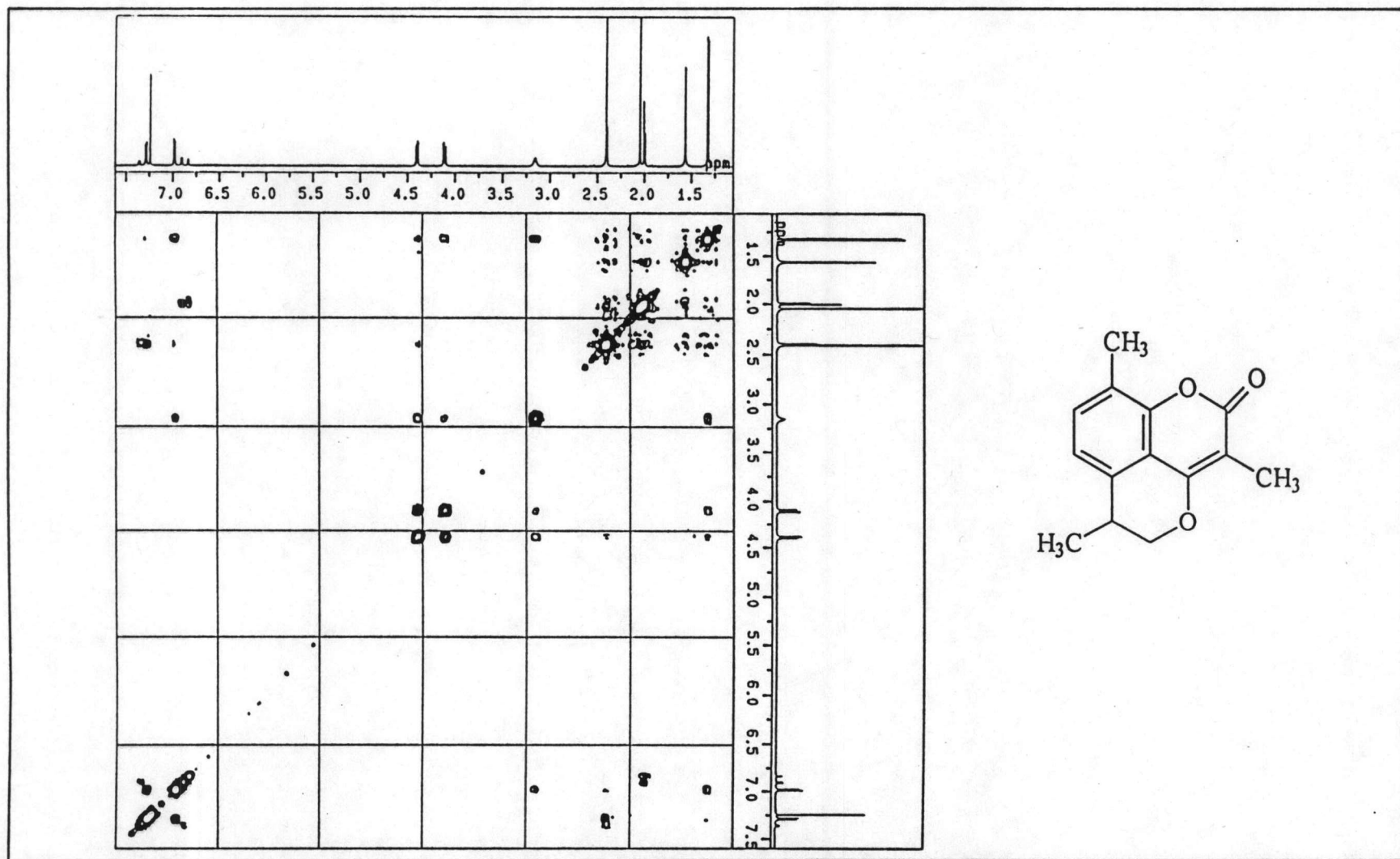


Fig. 14 The NOESY spectrum of Compound 3

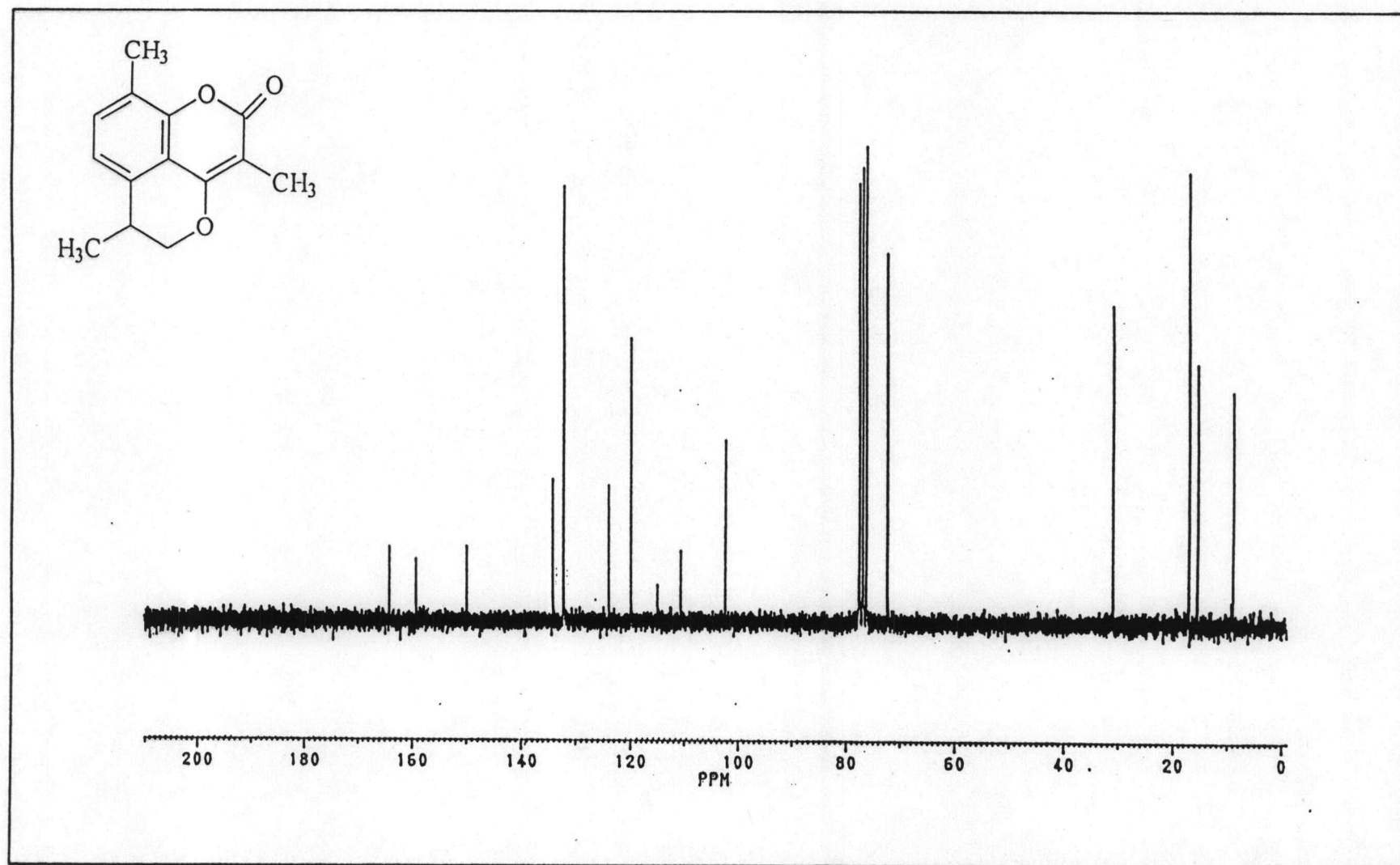


Fig. 15 The <sup>13</sup>C NMR spectrum of Compound 3



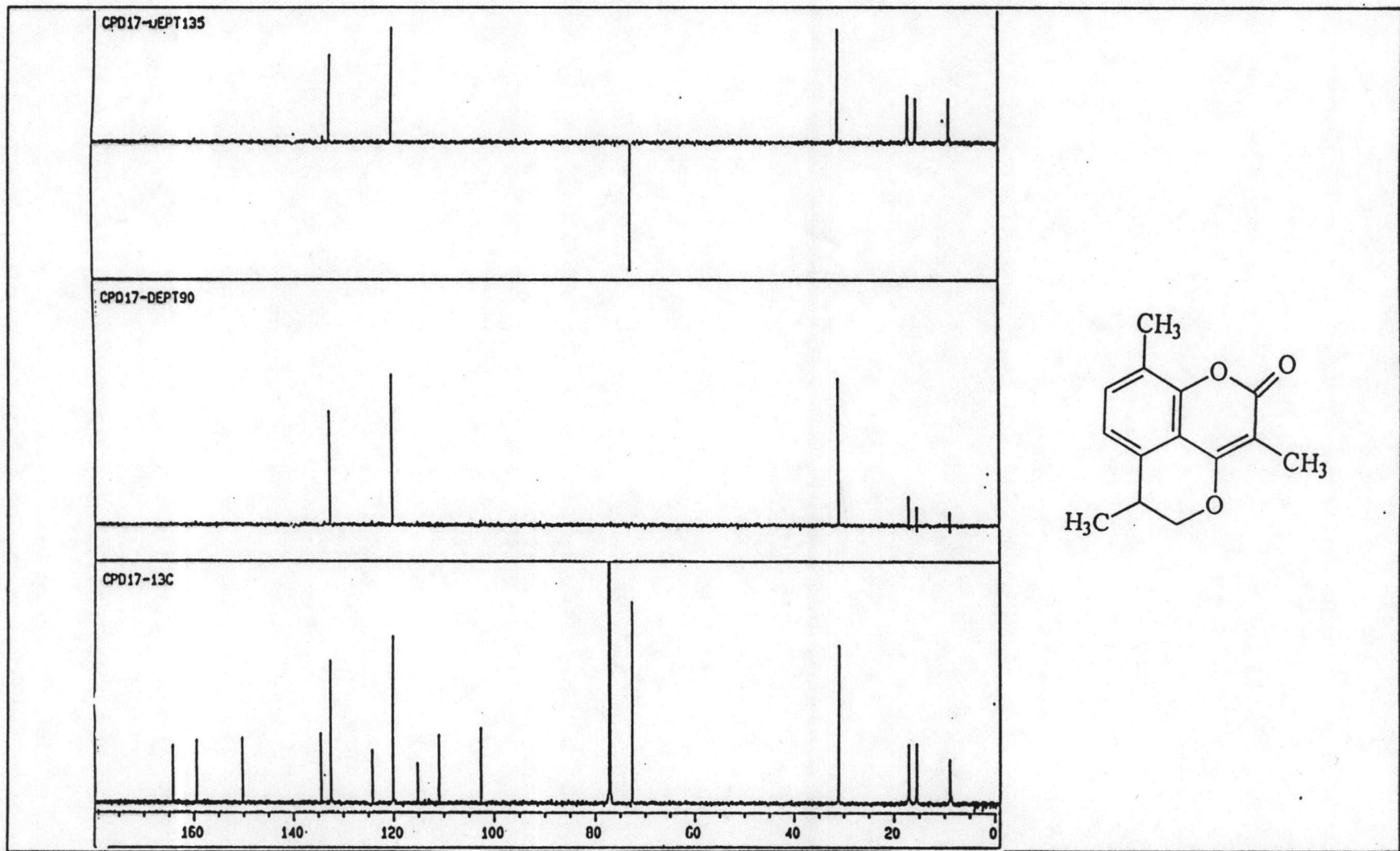


Fig. 16 The DEPT 90 and 135 spectra of Compound 3

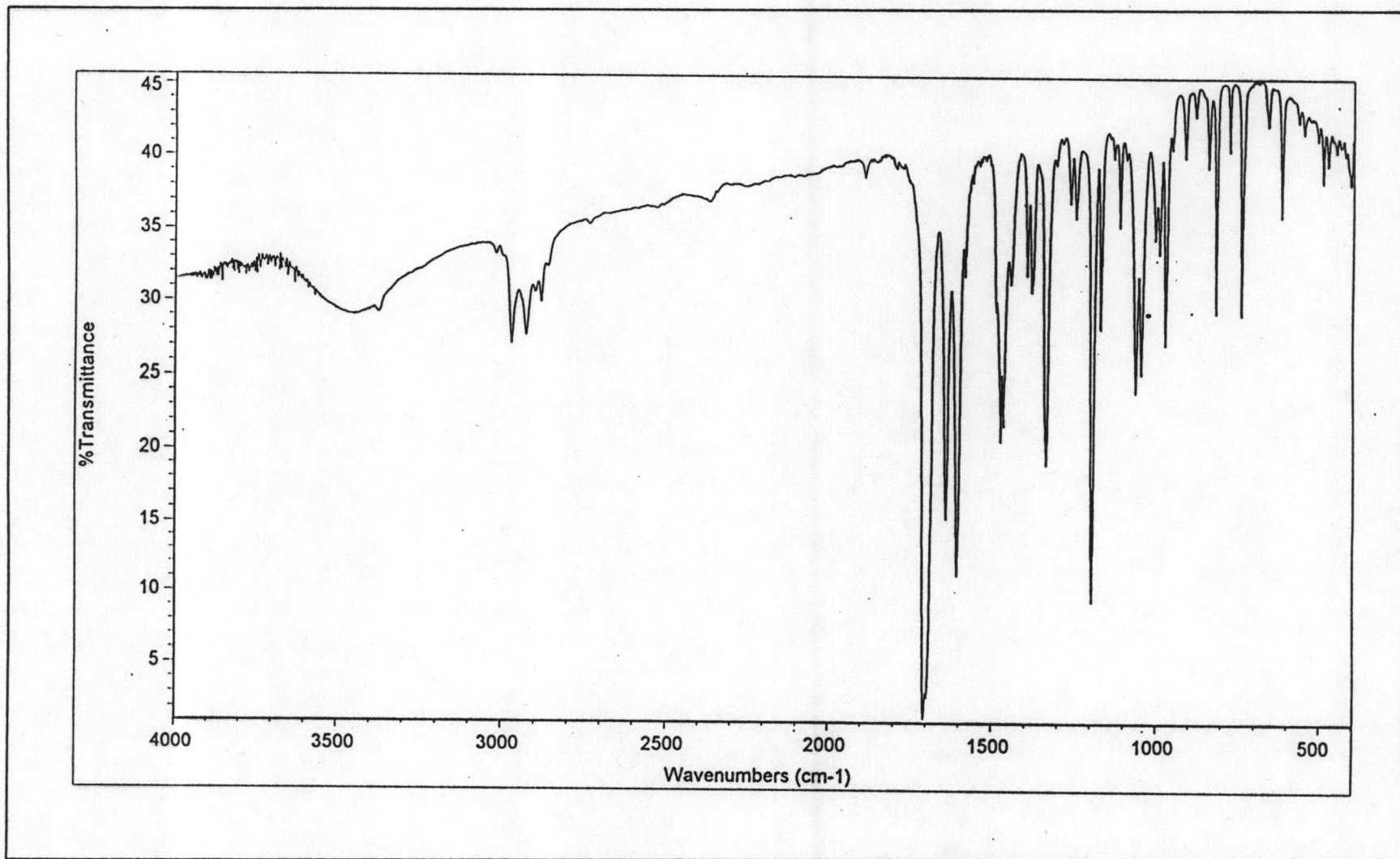


Fig. 17 The FT-IR spectrum of Compound 3

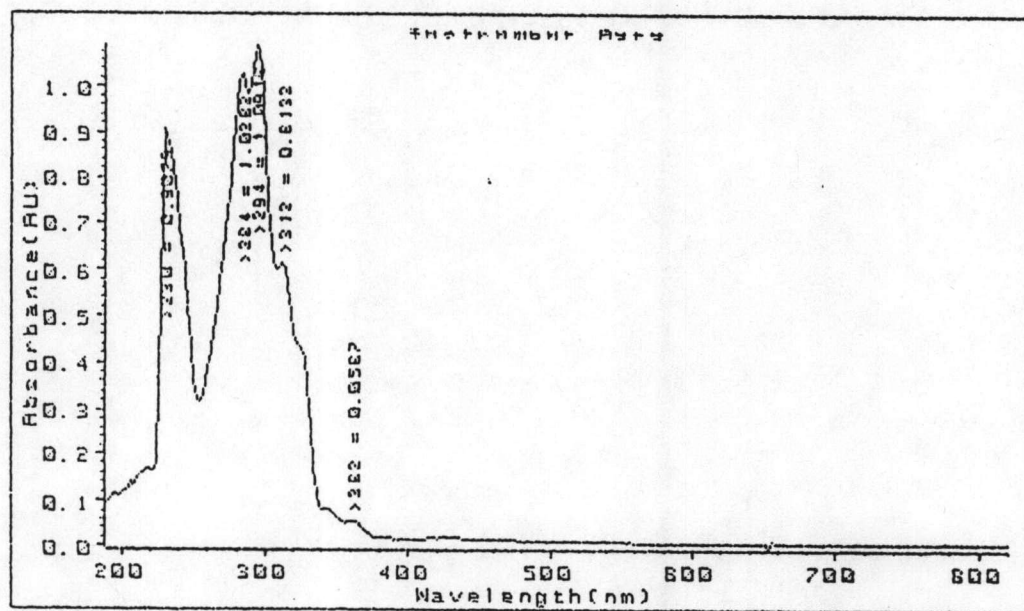


Fig. 18 The UV spectrum of Compound 3

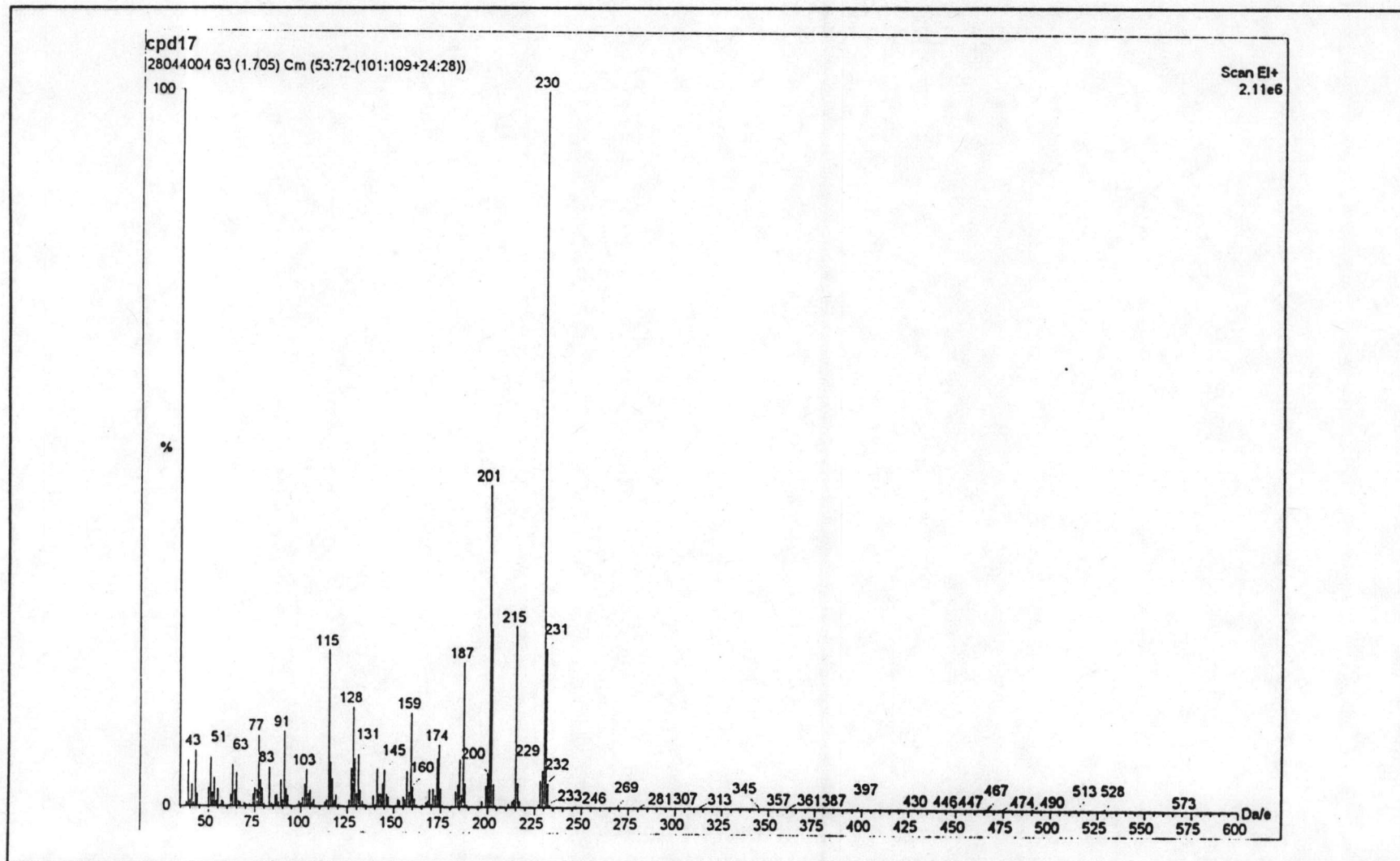


Fig. 19 The mass spectrum of Compound 3

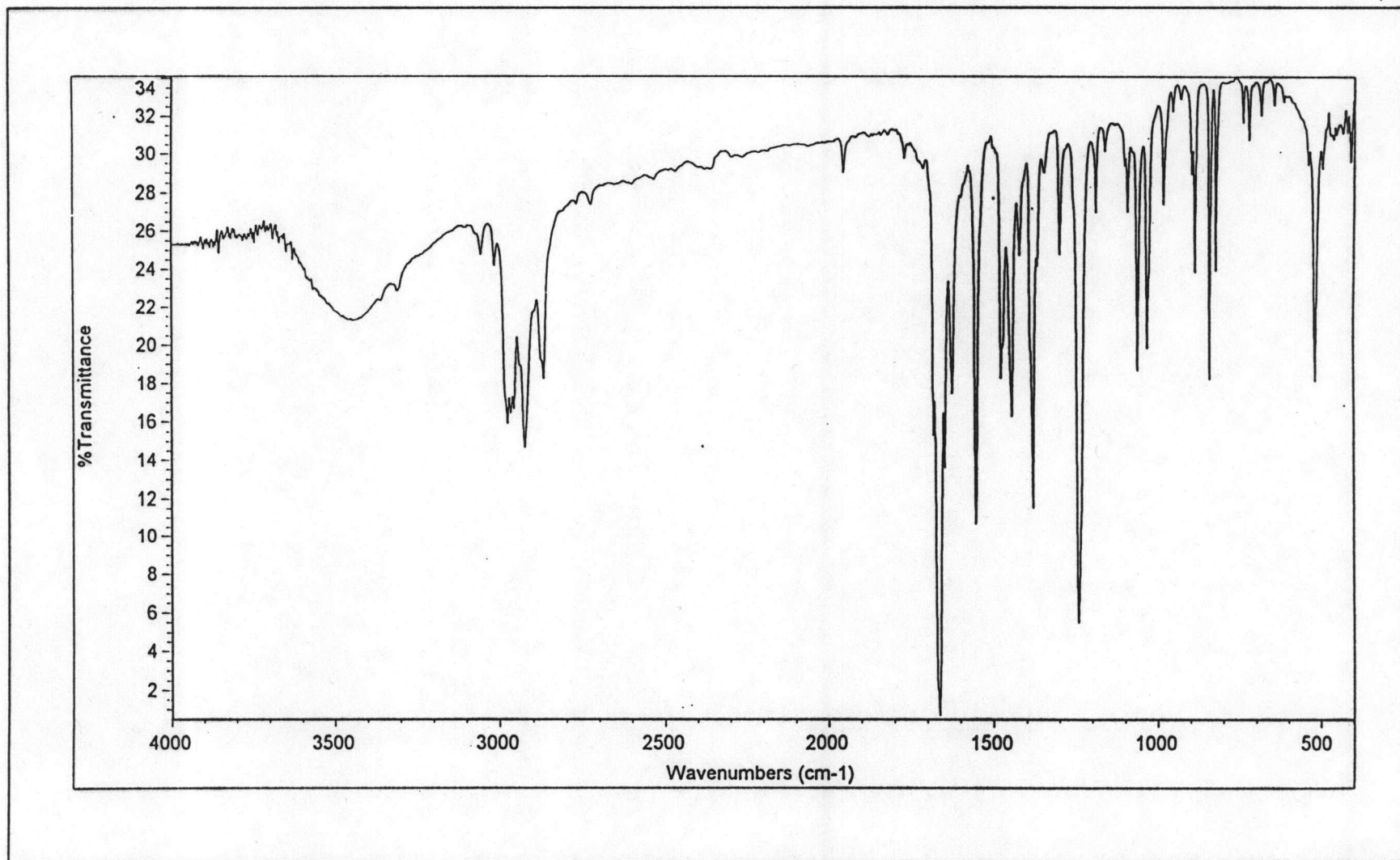


Fig. 20 The FT-IR spectrum of Compound 4



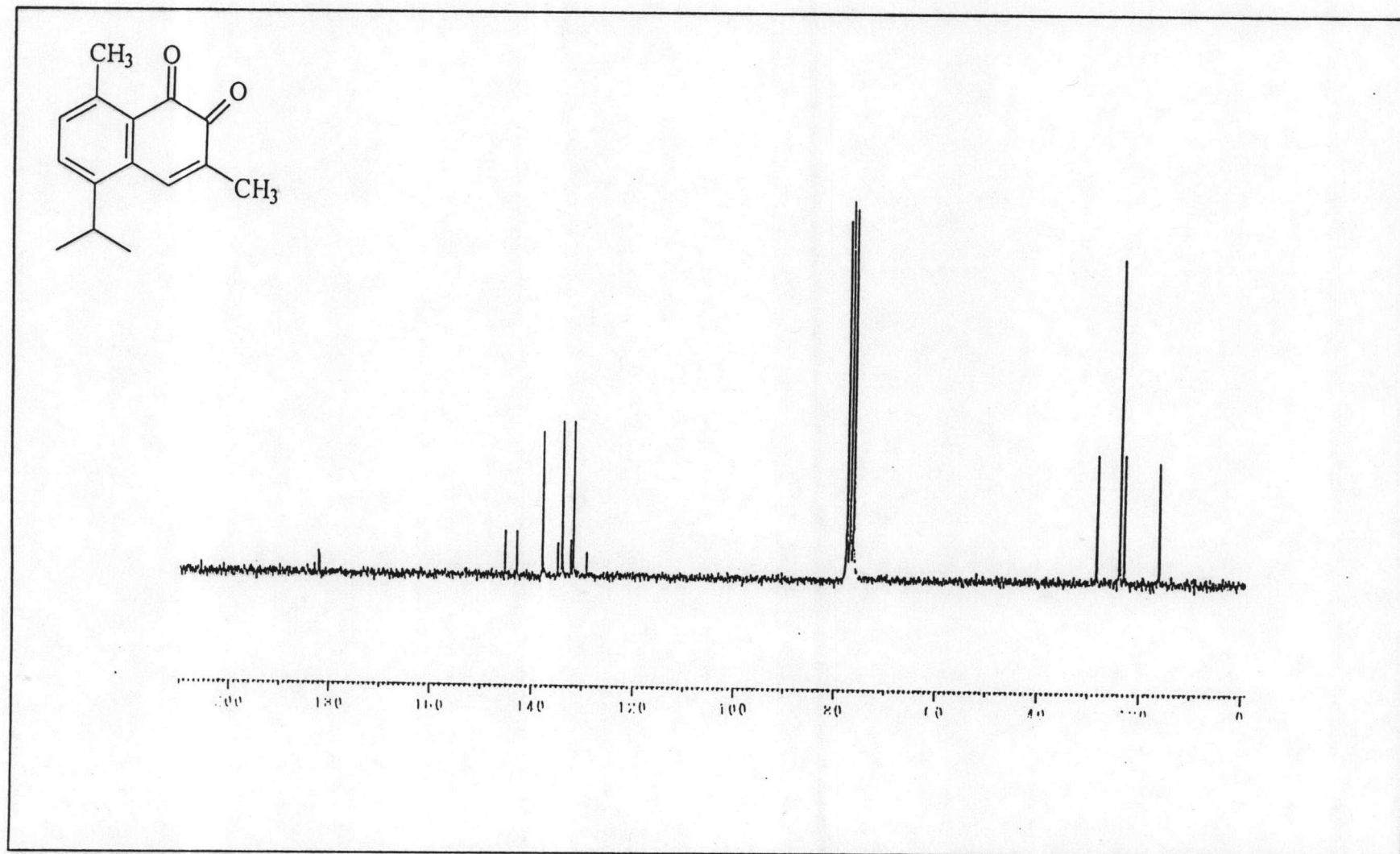


Fig. 21 The  $^{13}\text{C}$  NMR spectrum of Compound 4

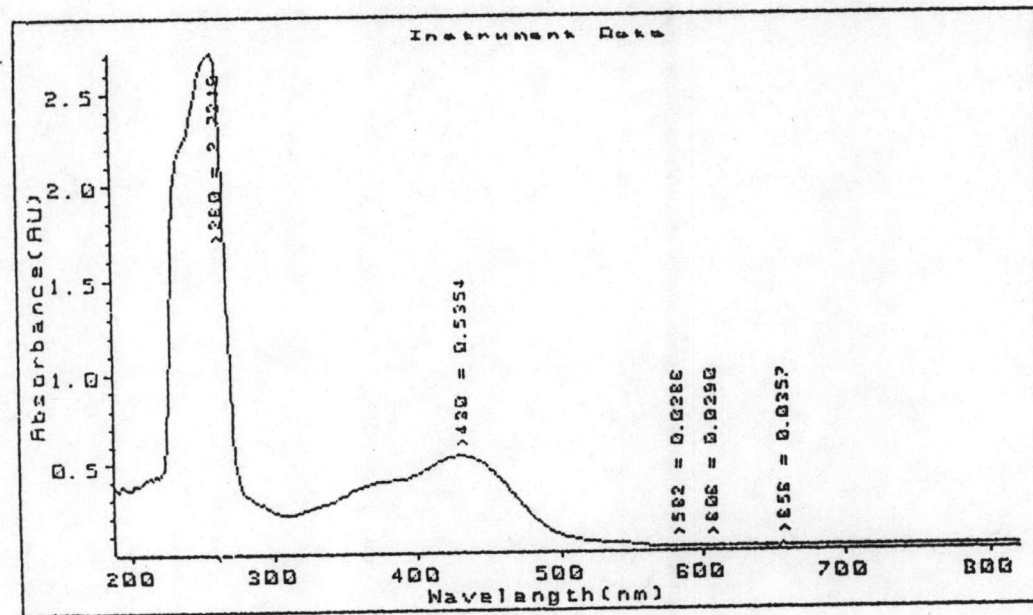


Fig. 22 The UV spectrum of Compound 4

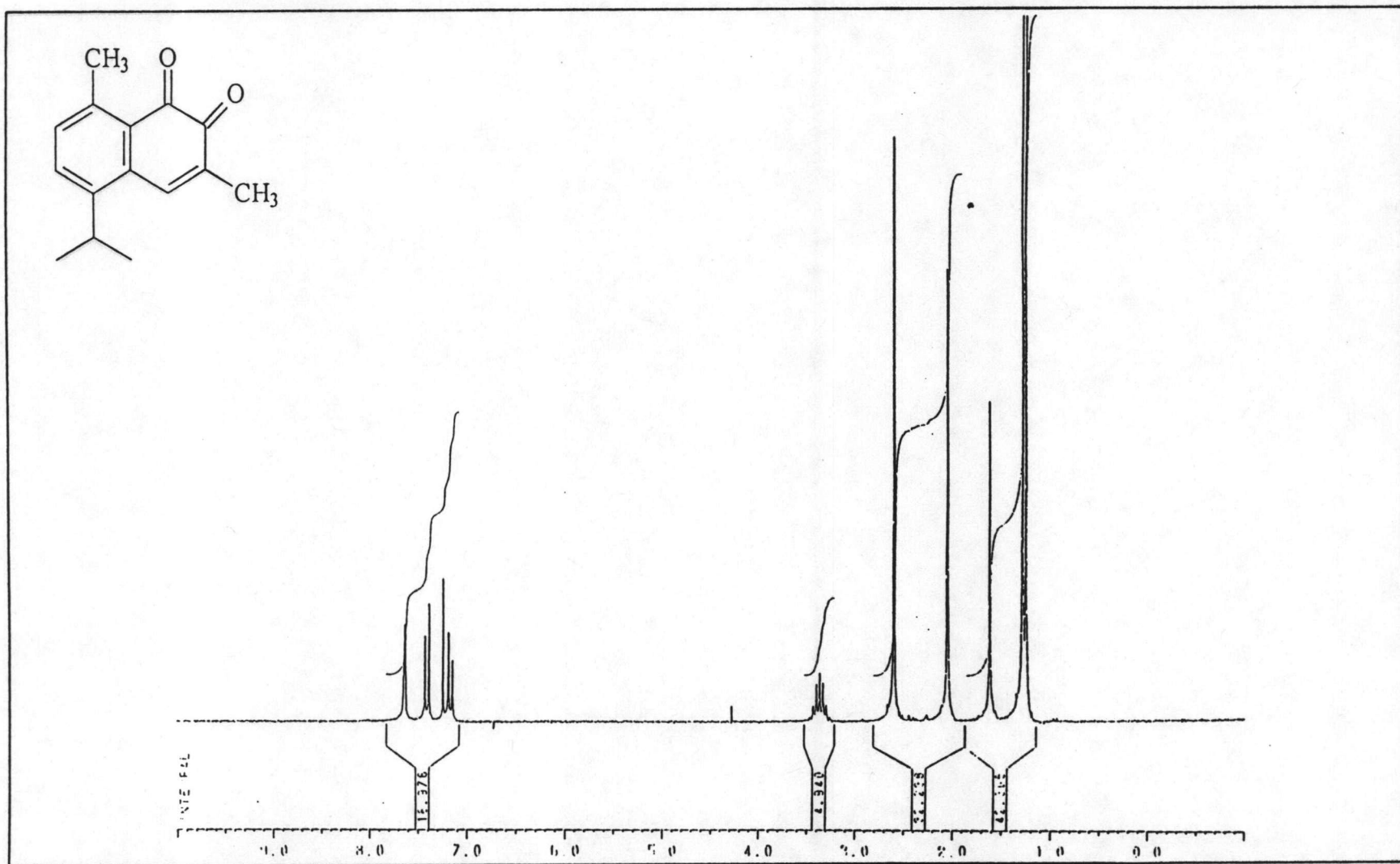


Fig. 23 The <sup>1</sup>H-NMR spectrum of Compound 4

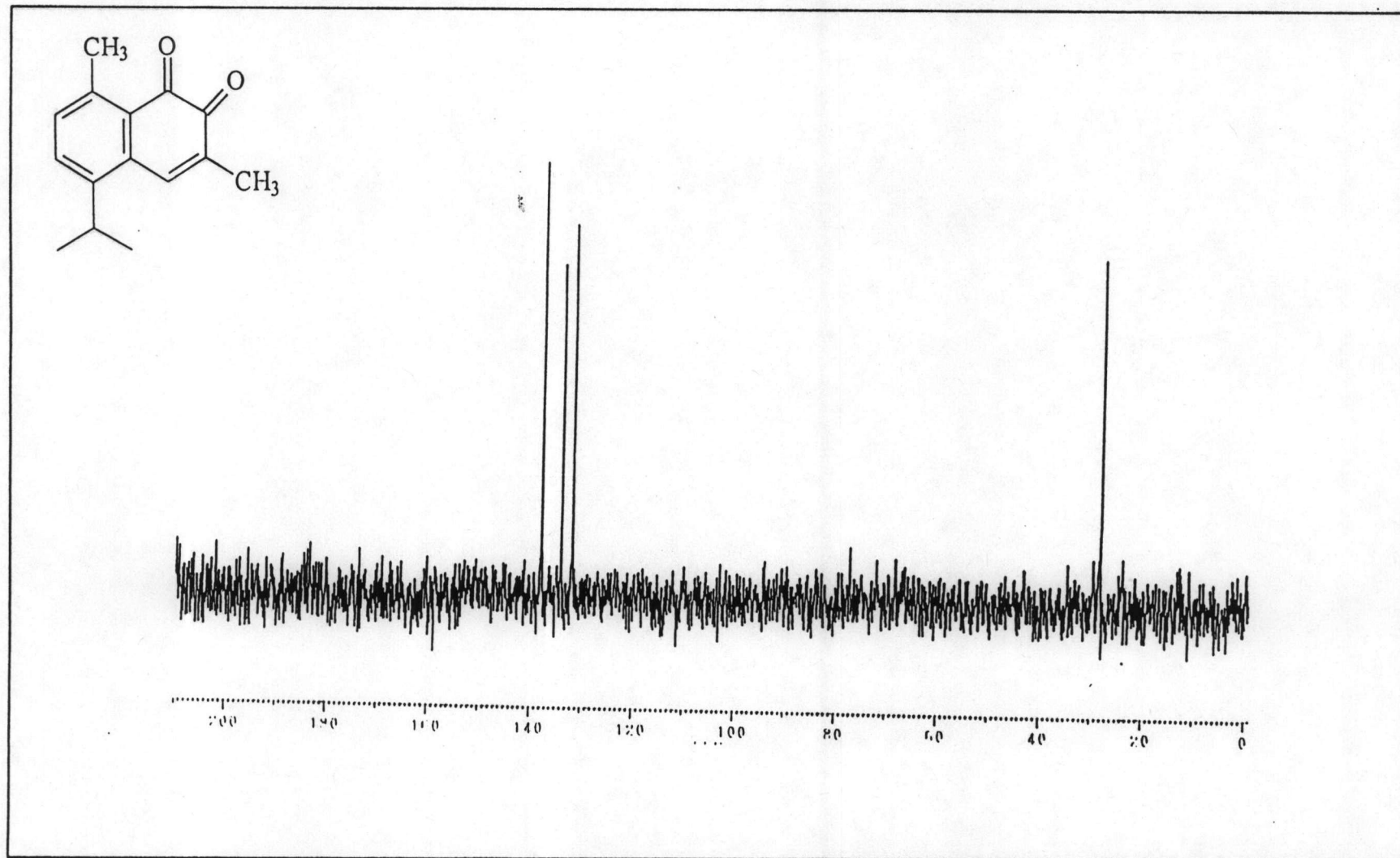


Fig. 24 The DEPT 90 spectrum of Compound 4

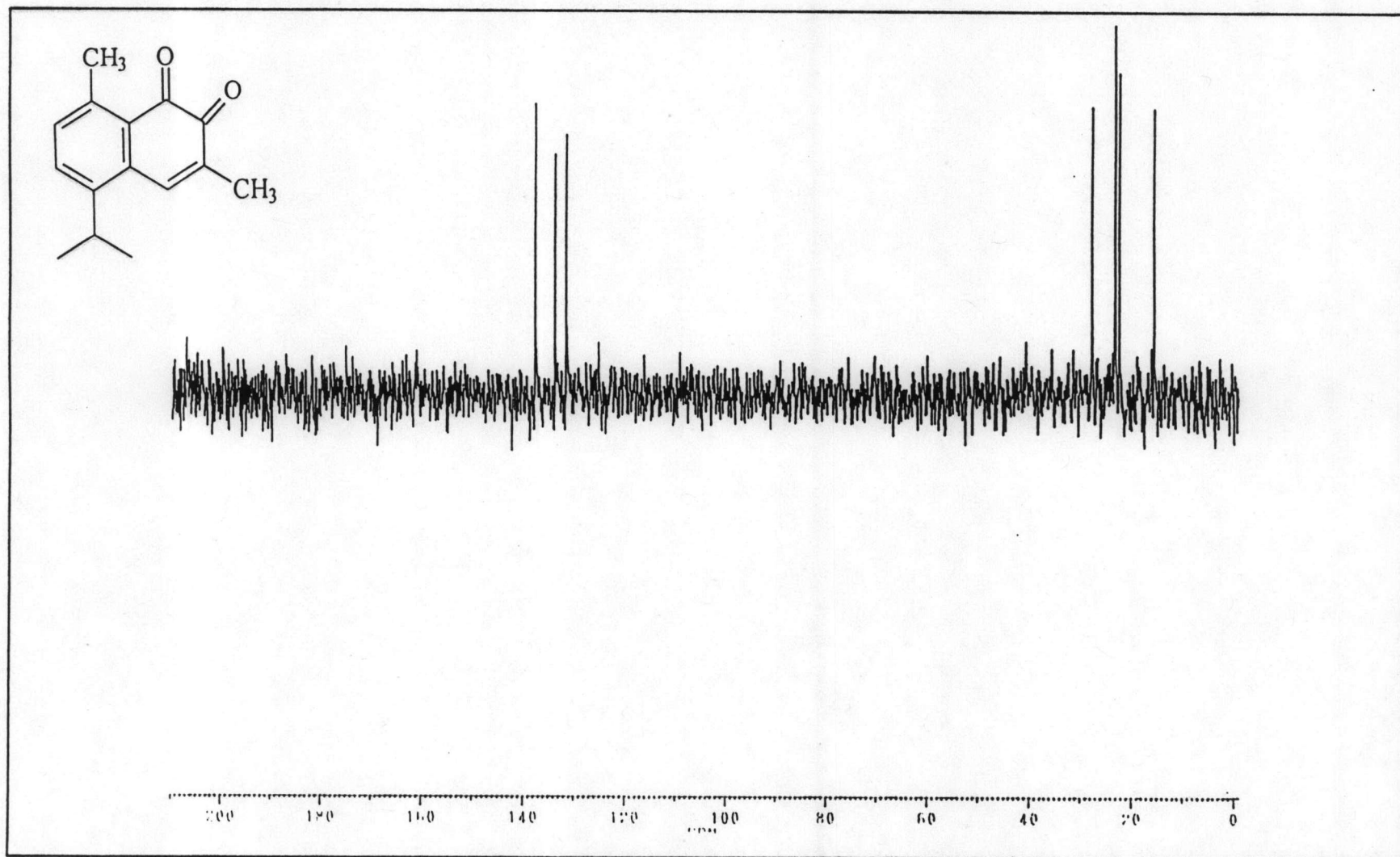


Fig. 25 The DEPT 135 spectrum of Compound 4



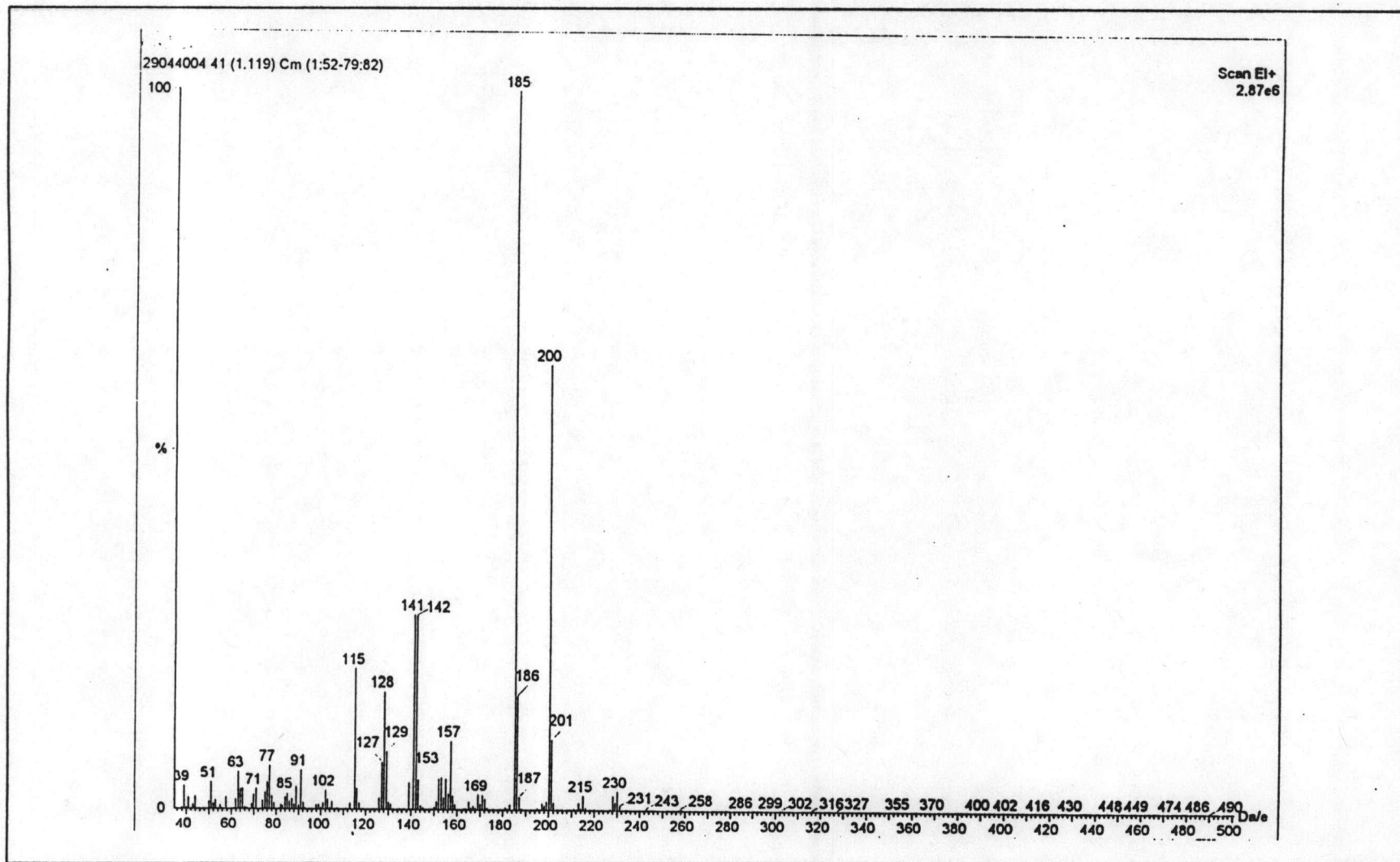


Fig. 26 The mass spectrum of Compound 4

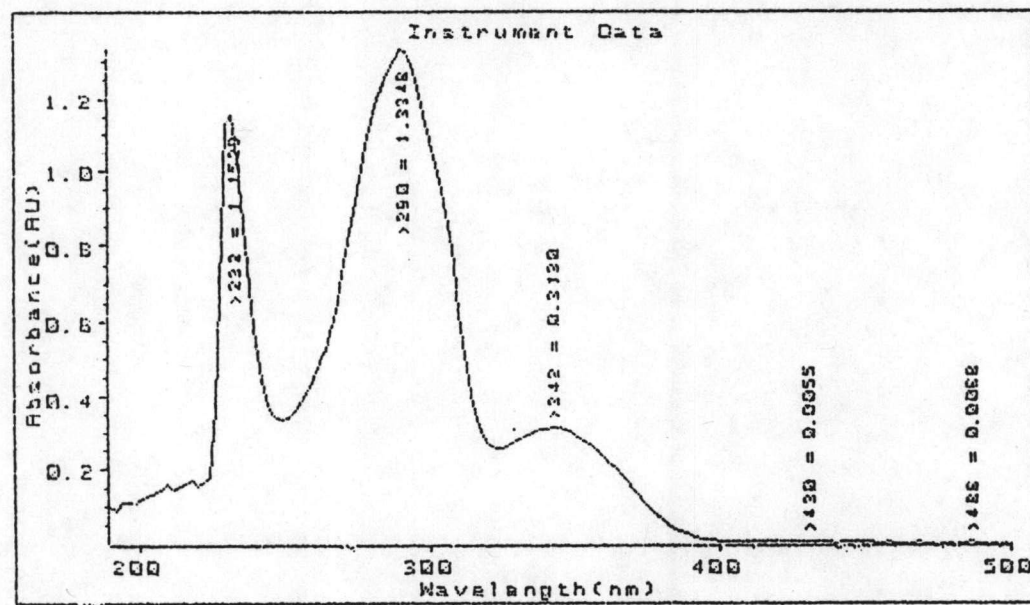


Fig. 27 The UV spectrum of Compound 5

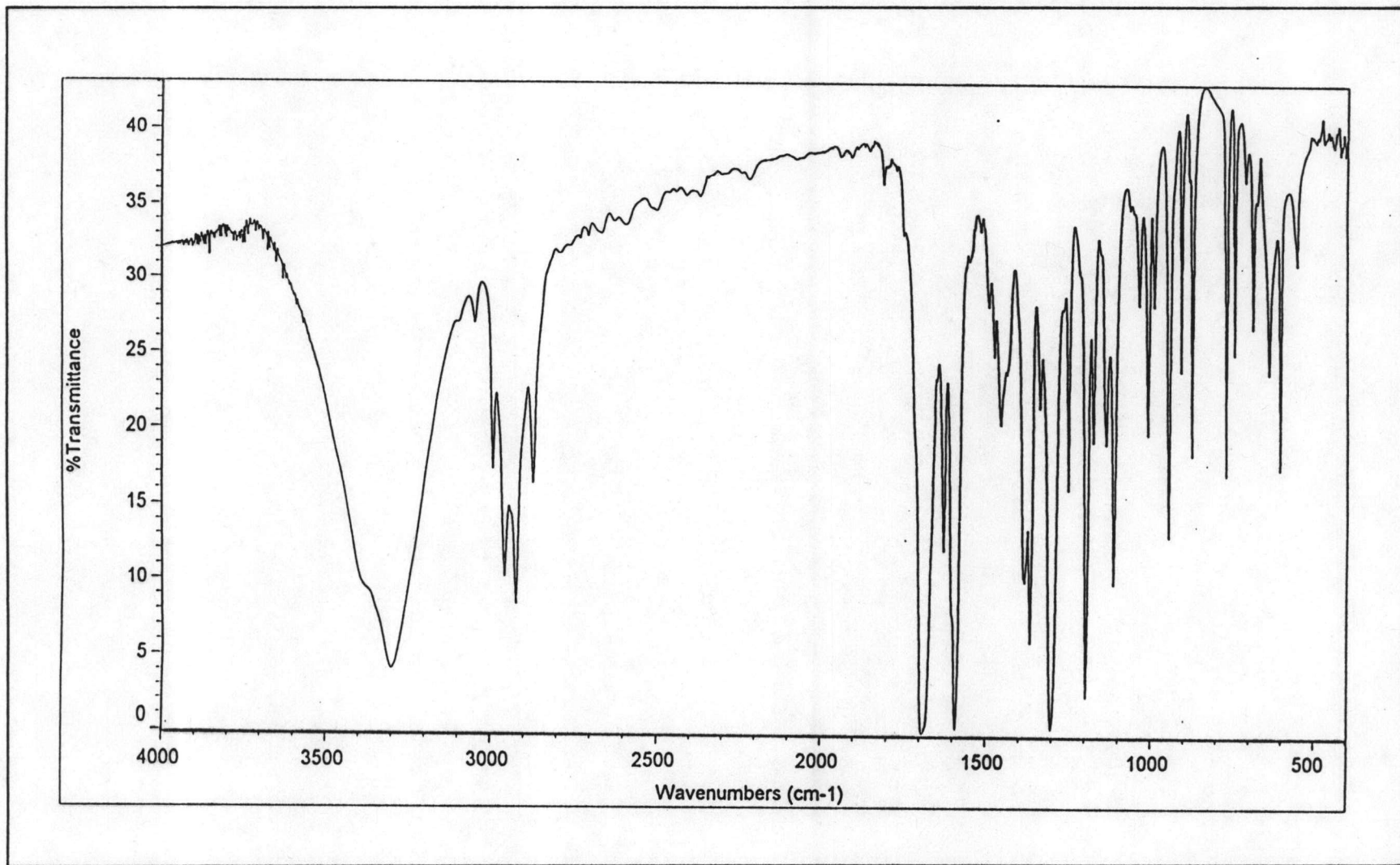


Fig. 28 The FT-IR spectrum of Compound 5

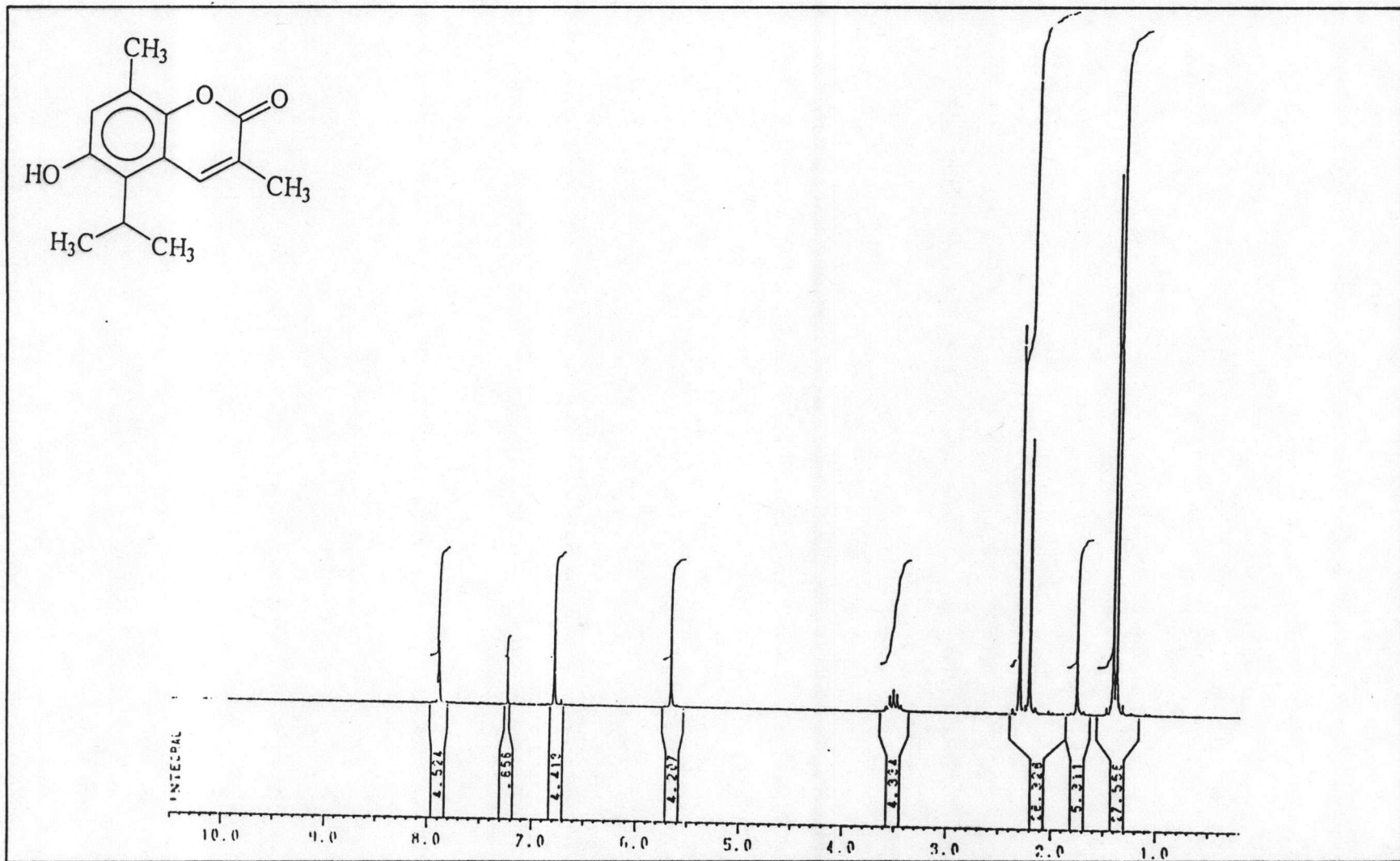


Fig. 29 The <sup>1</sup>H-NMR spectrum of Compound 5

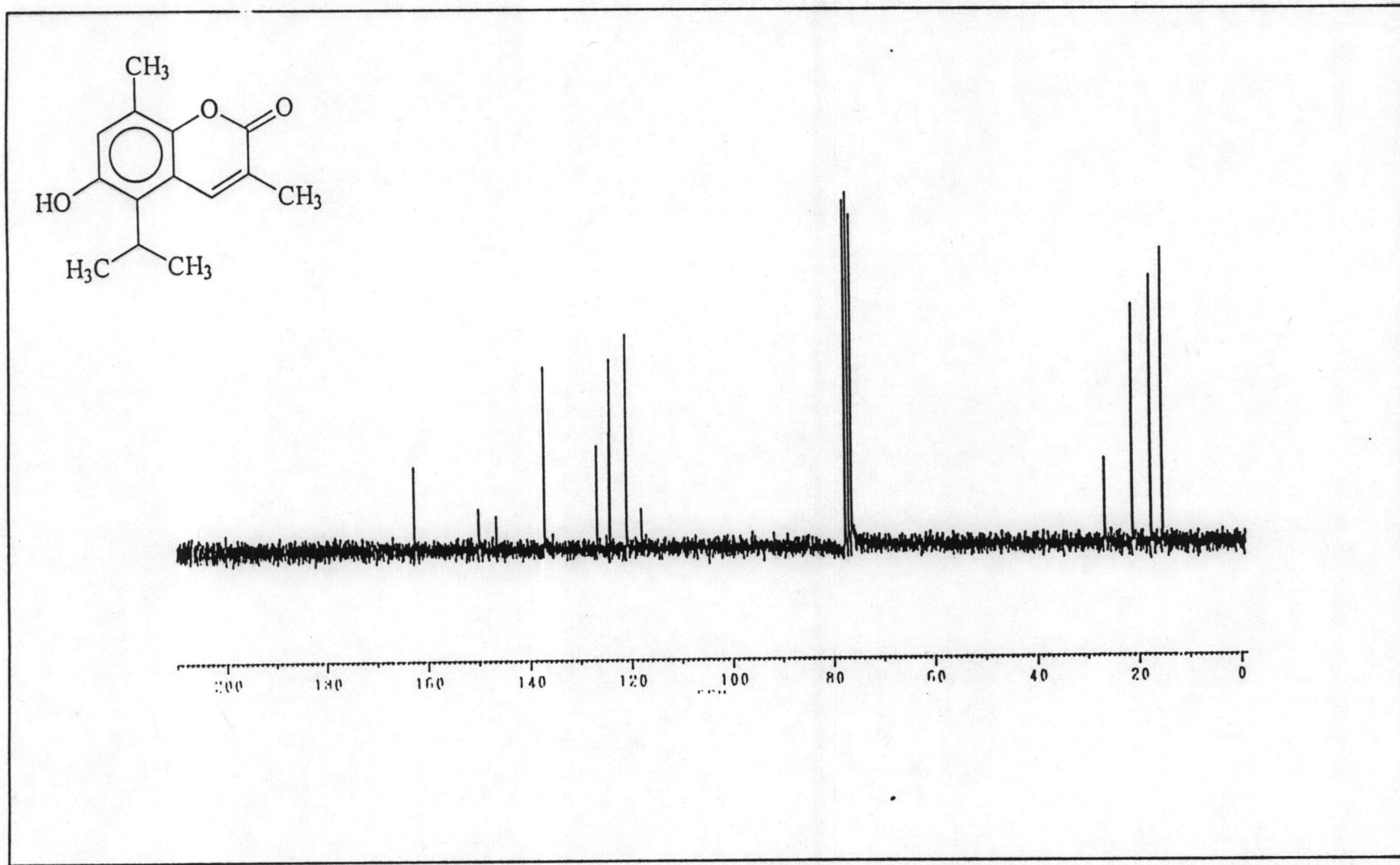


Fig. 30 The <sup>13</sup>C NMR spectrum of Compound 5



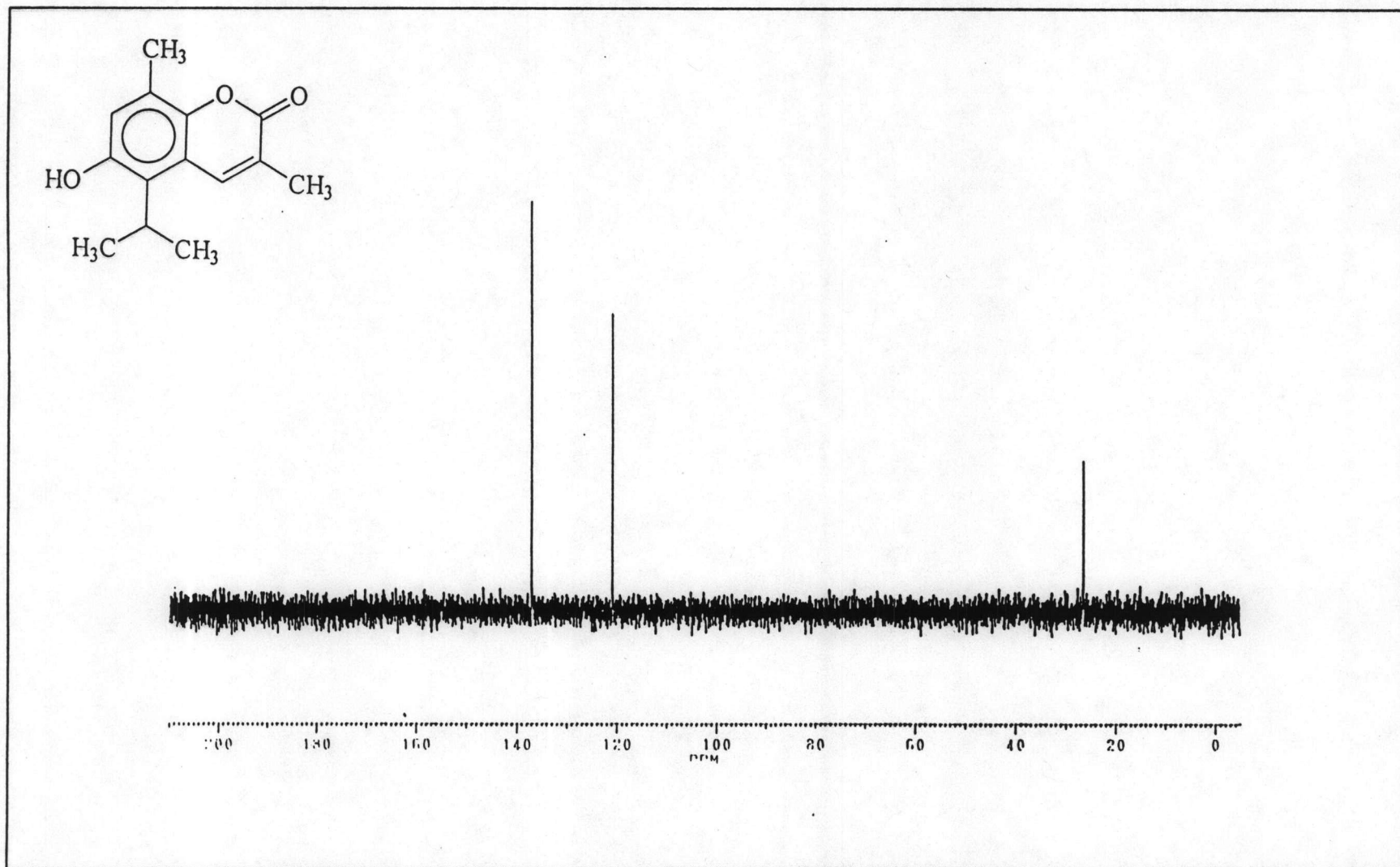


Fig. 31 The DEPT 90 spectrum of Compound 5

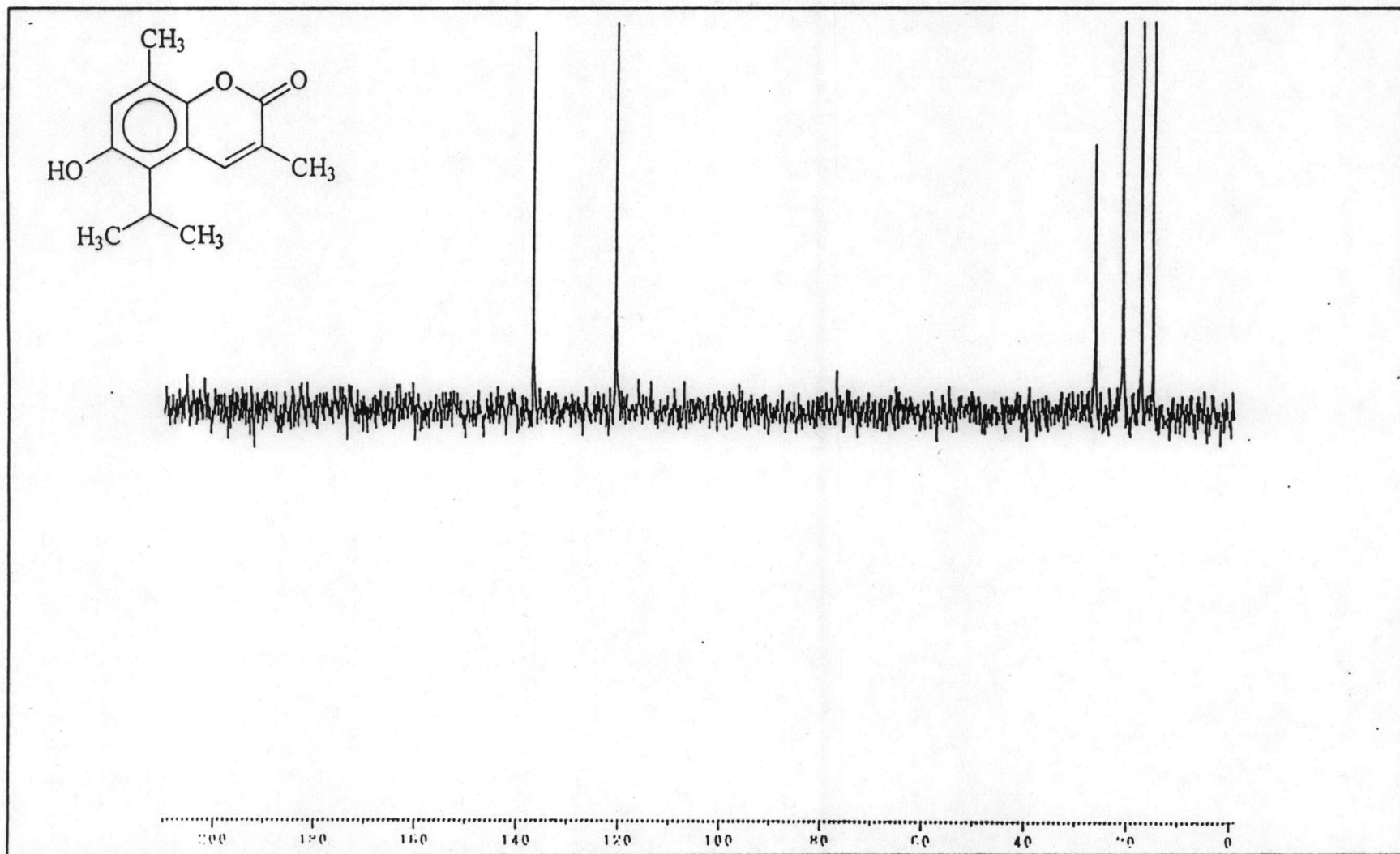


Fig. 32 The DEPT 135 spectrum of Compound 5

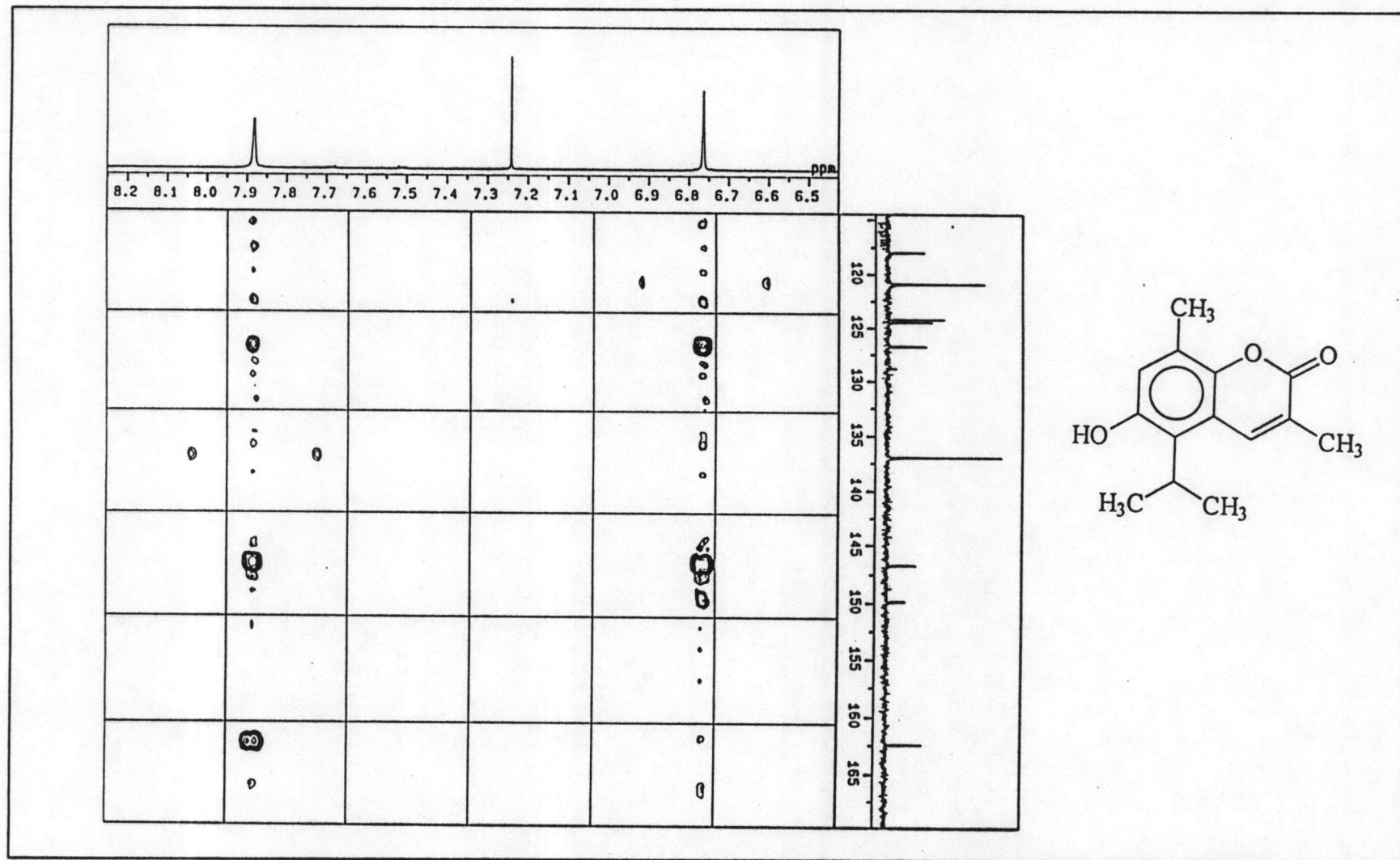


Fig. 33A The HMBC spectrum of Compound 5

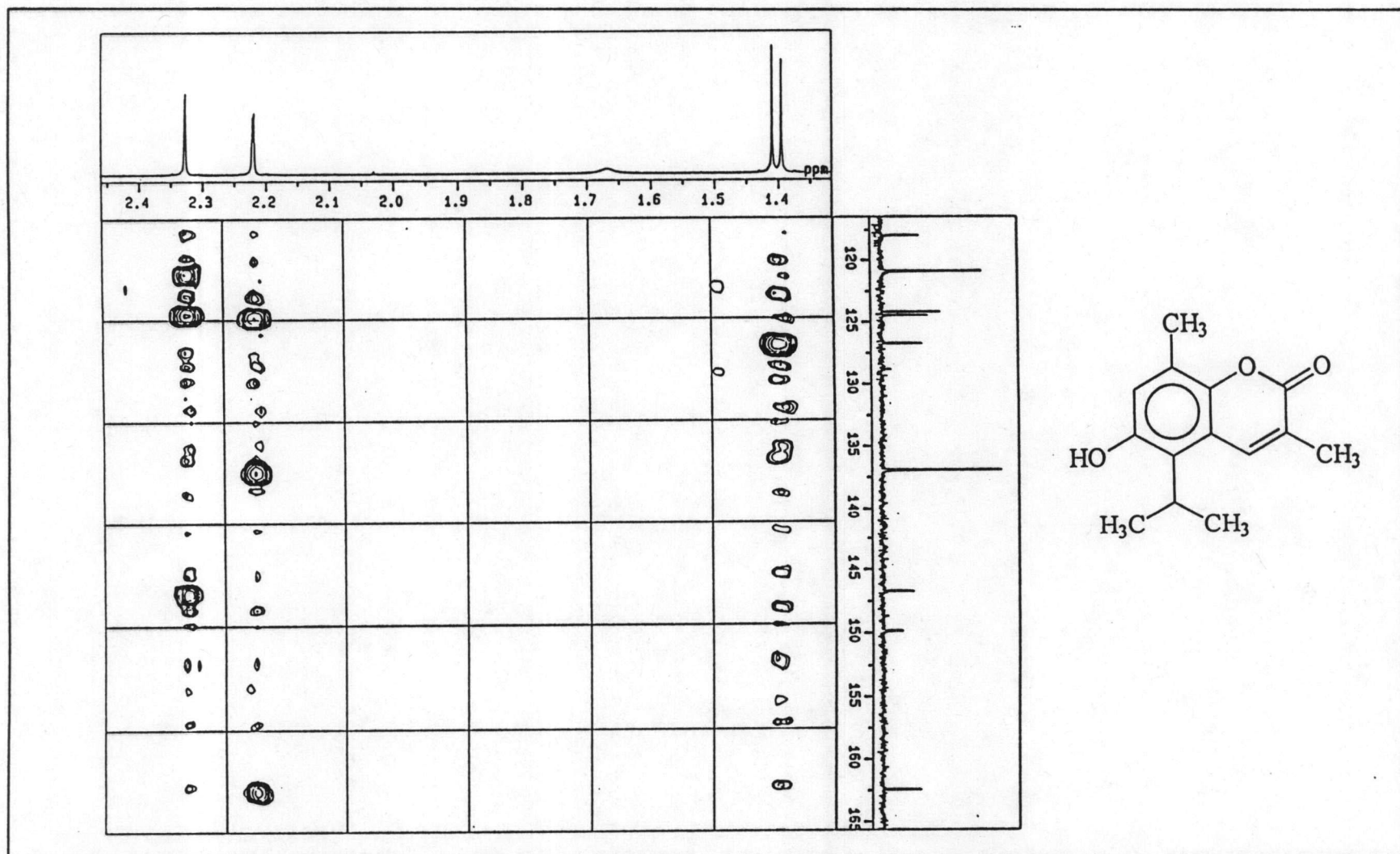


Fig. 33B The HMBC spectrum of Compound 5

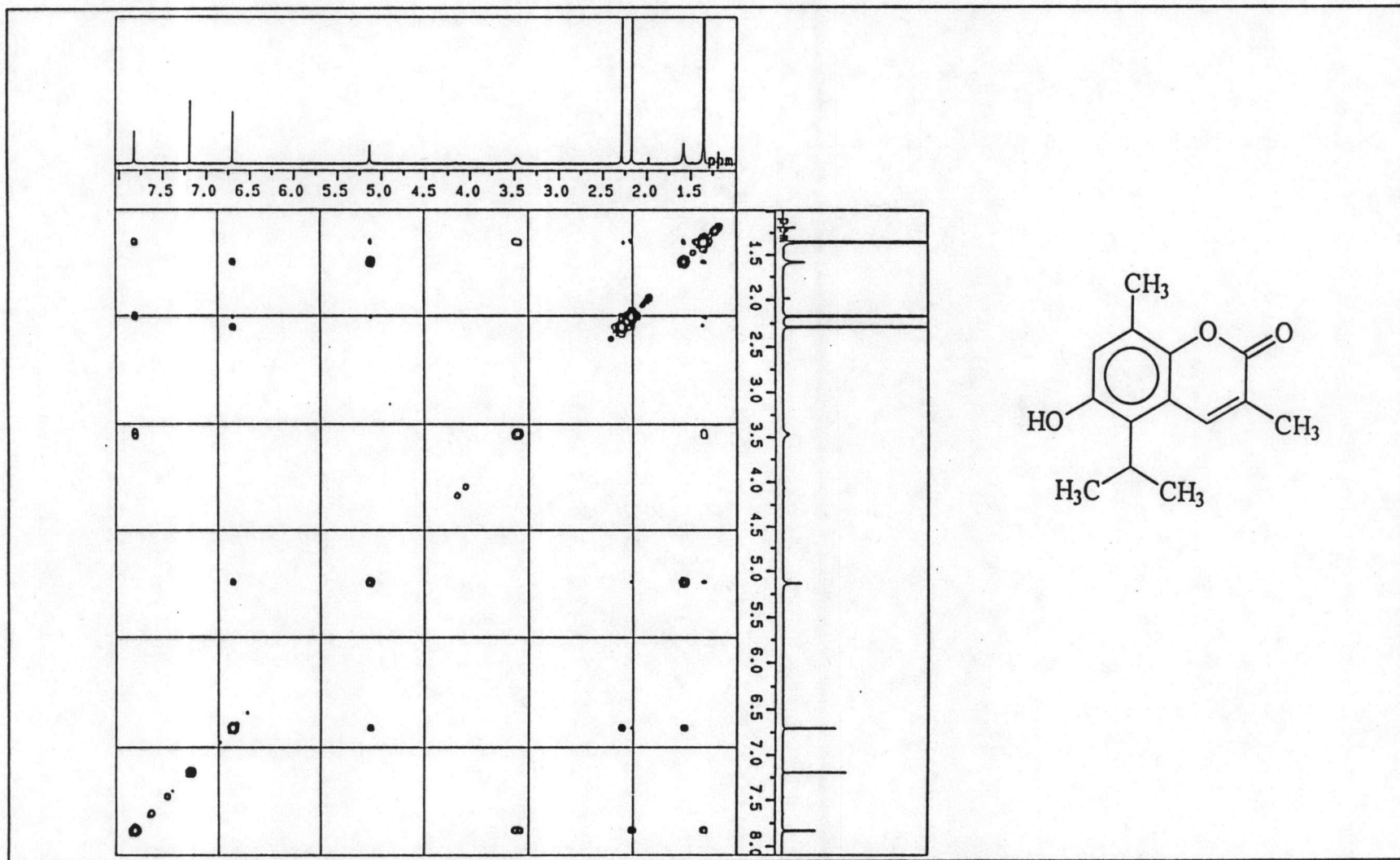


Fig. 34 The NOESY spectrum of Compound 5



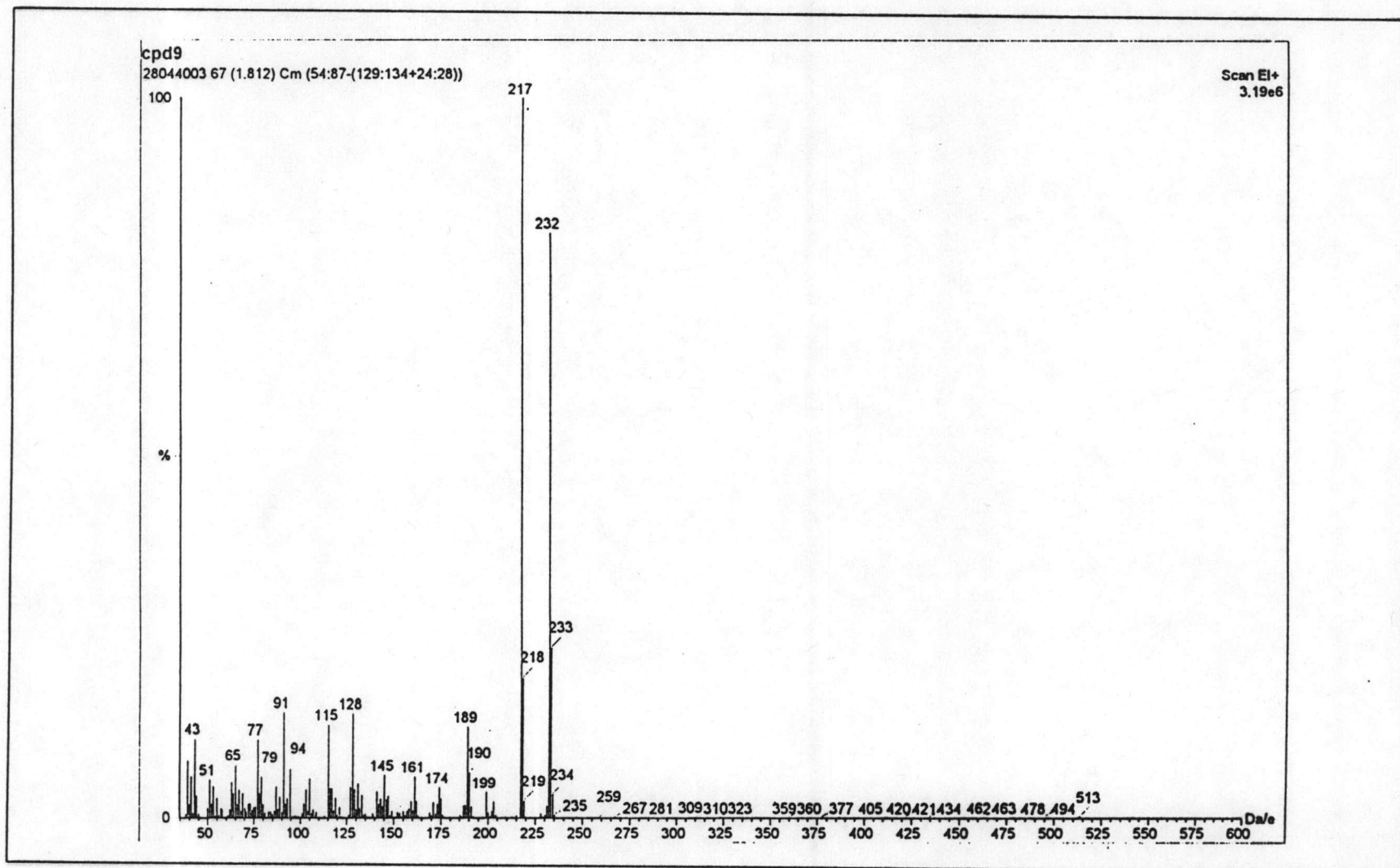
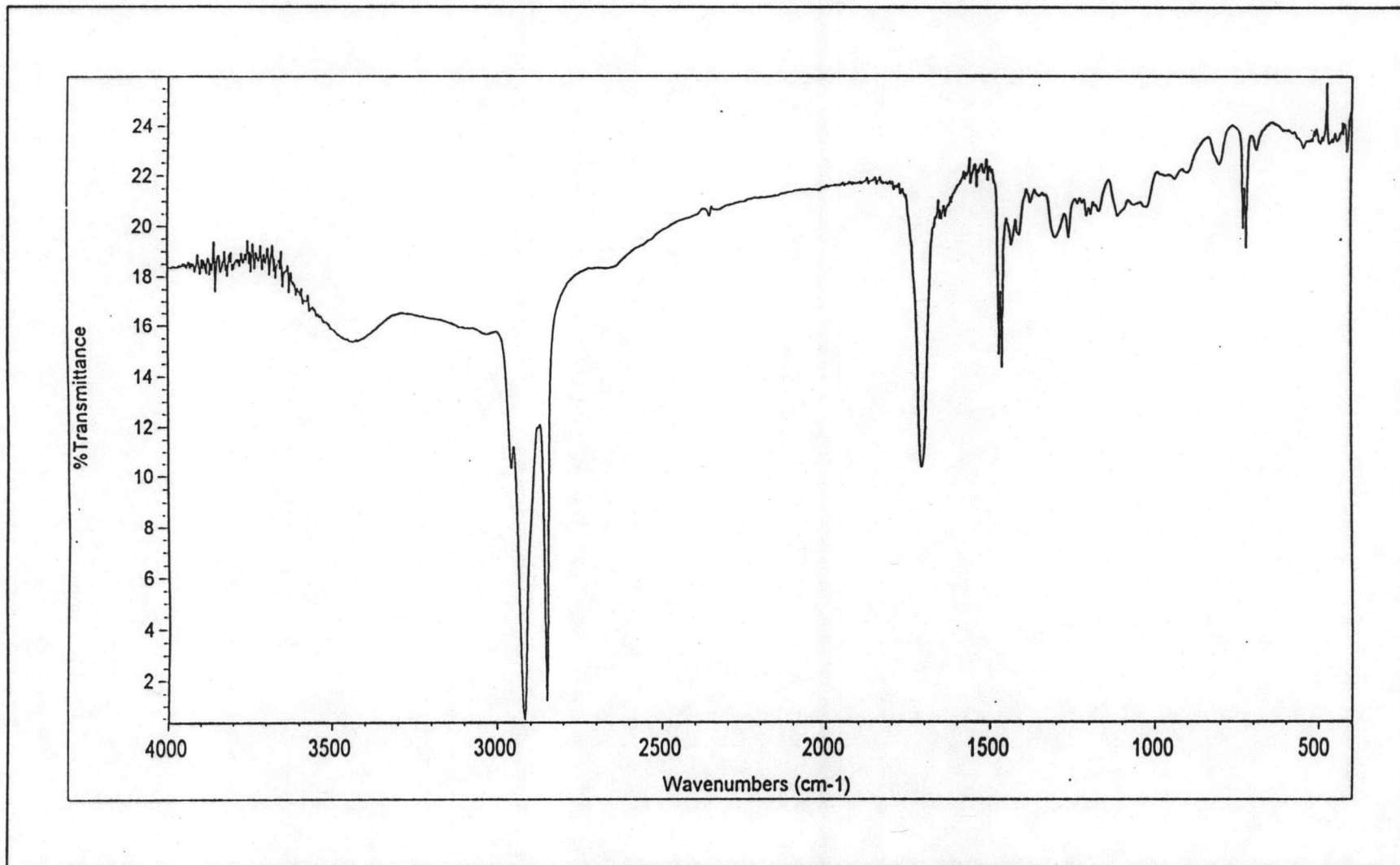


Fig. 35 The mass spectrum of Compound 5



**Fig. 36** The FT-IR spectrum of Component 6

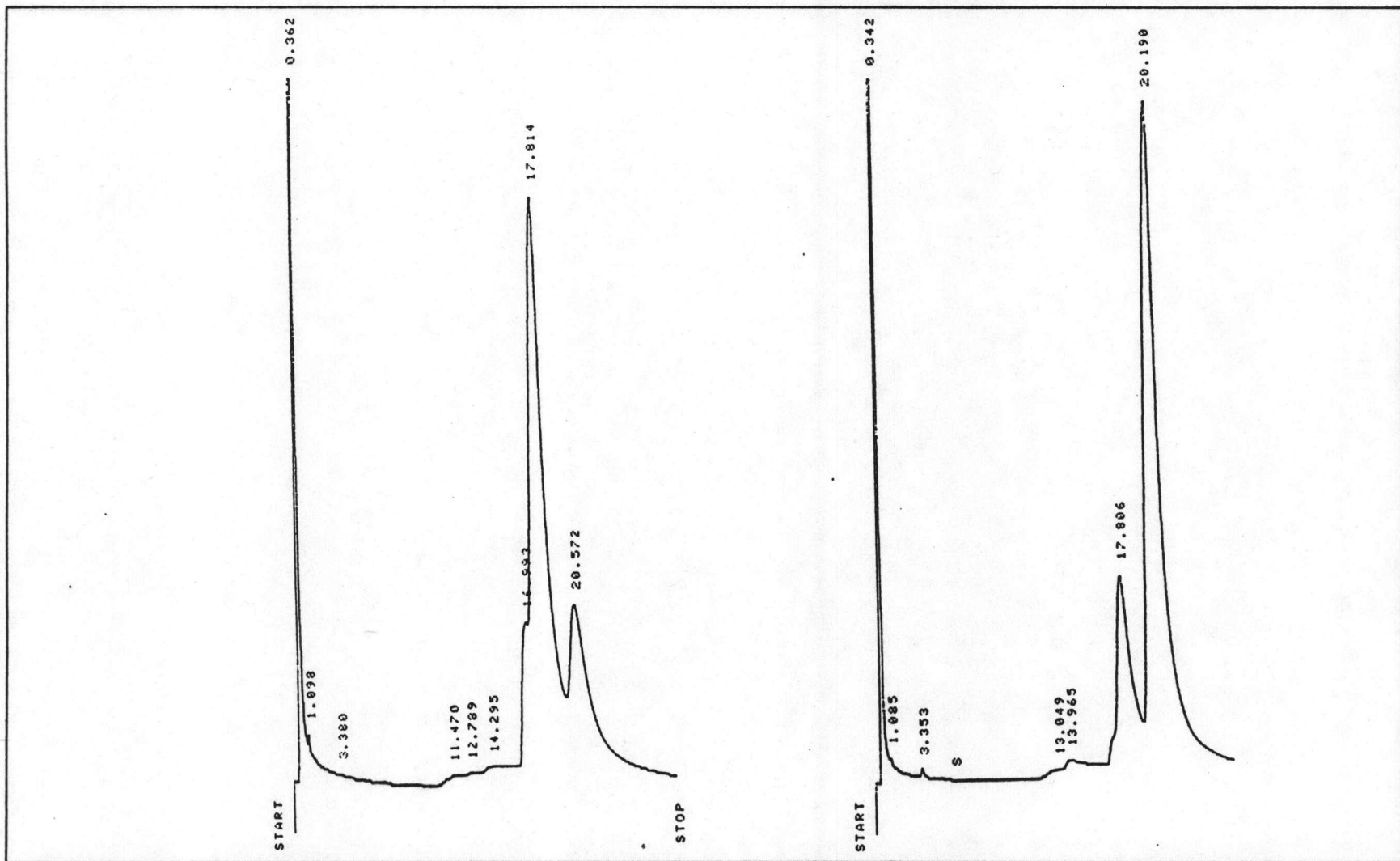


Fig. 37 The GLC analysis of standard steroids and Mixture 7

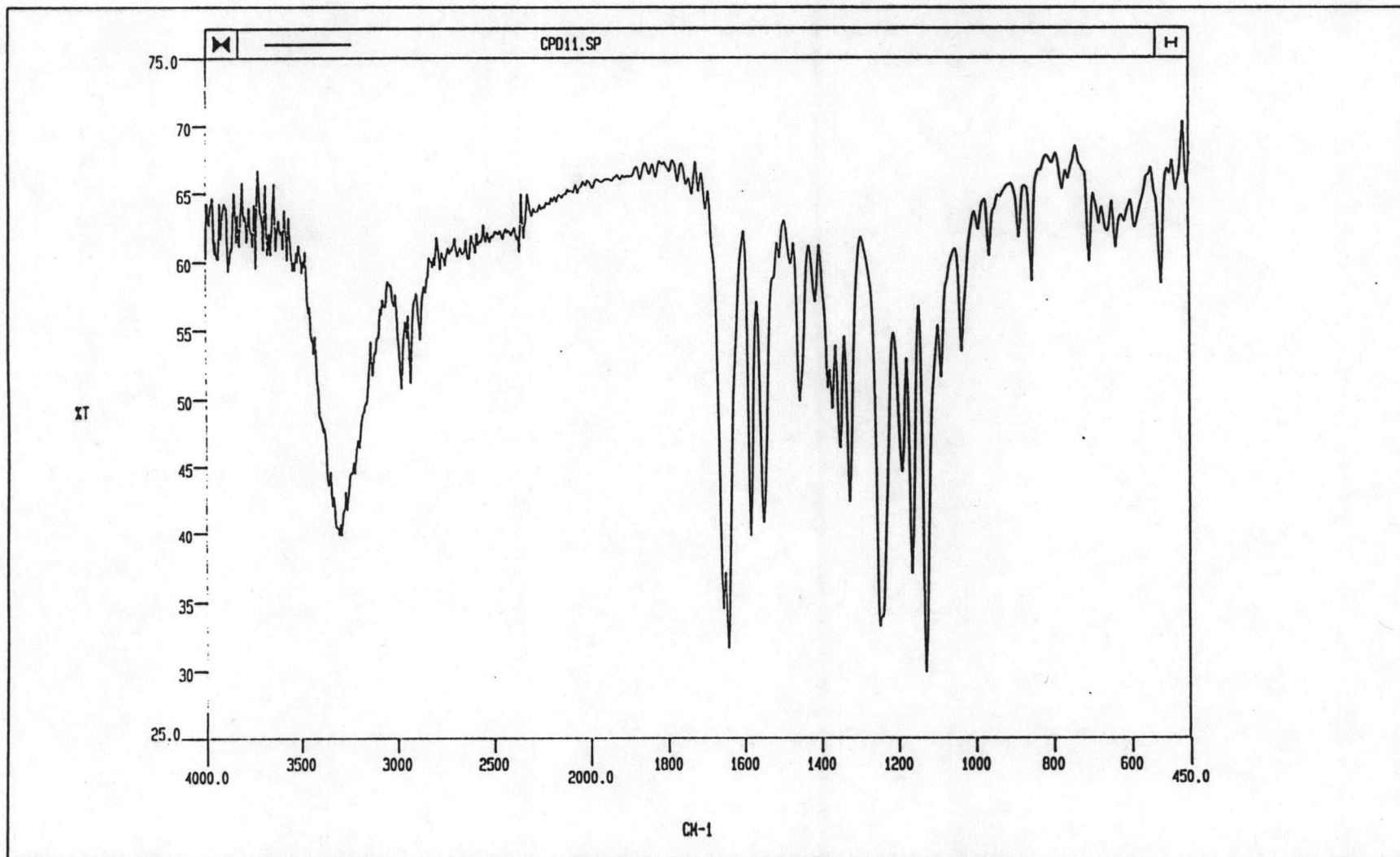


Fig. 38 The FT-IR spectrum of Compound 8

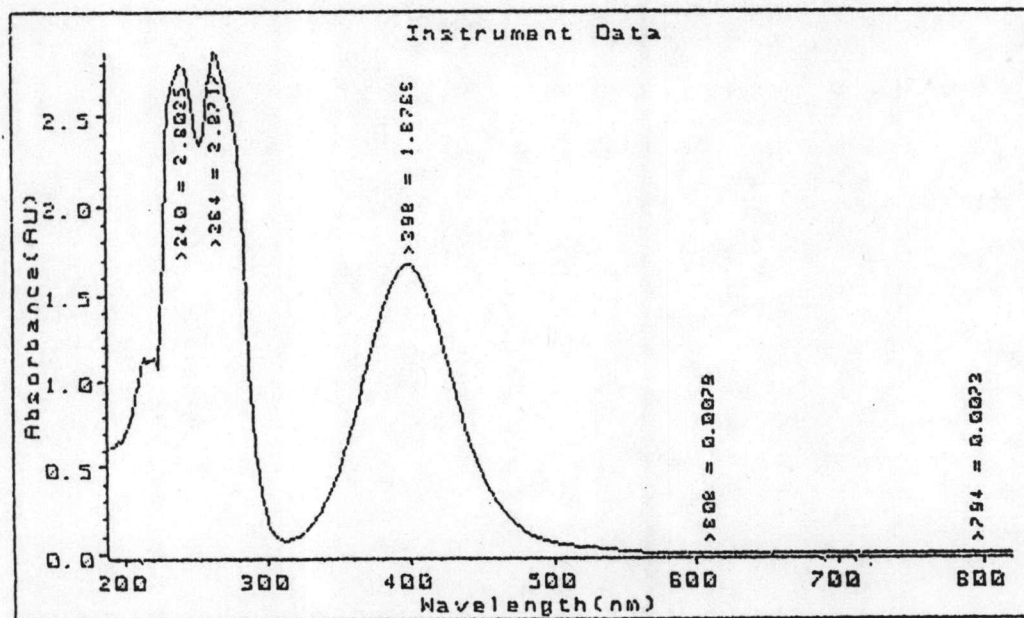


Fig. 39 The UV spectrum of Compound 8



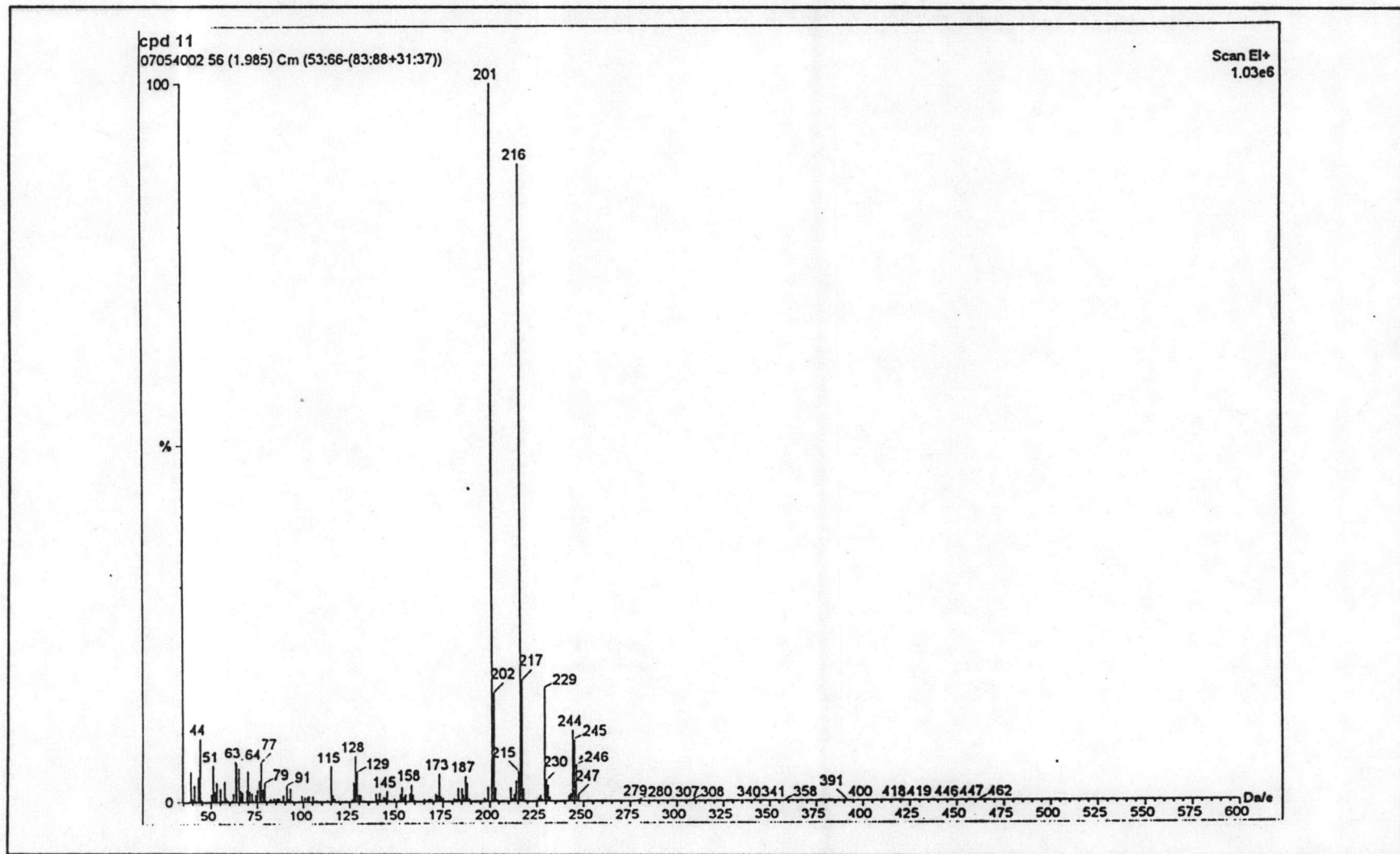


Fig. 40 The mass spectrum of Compound 8

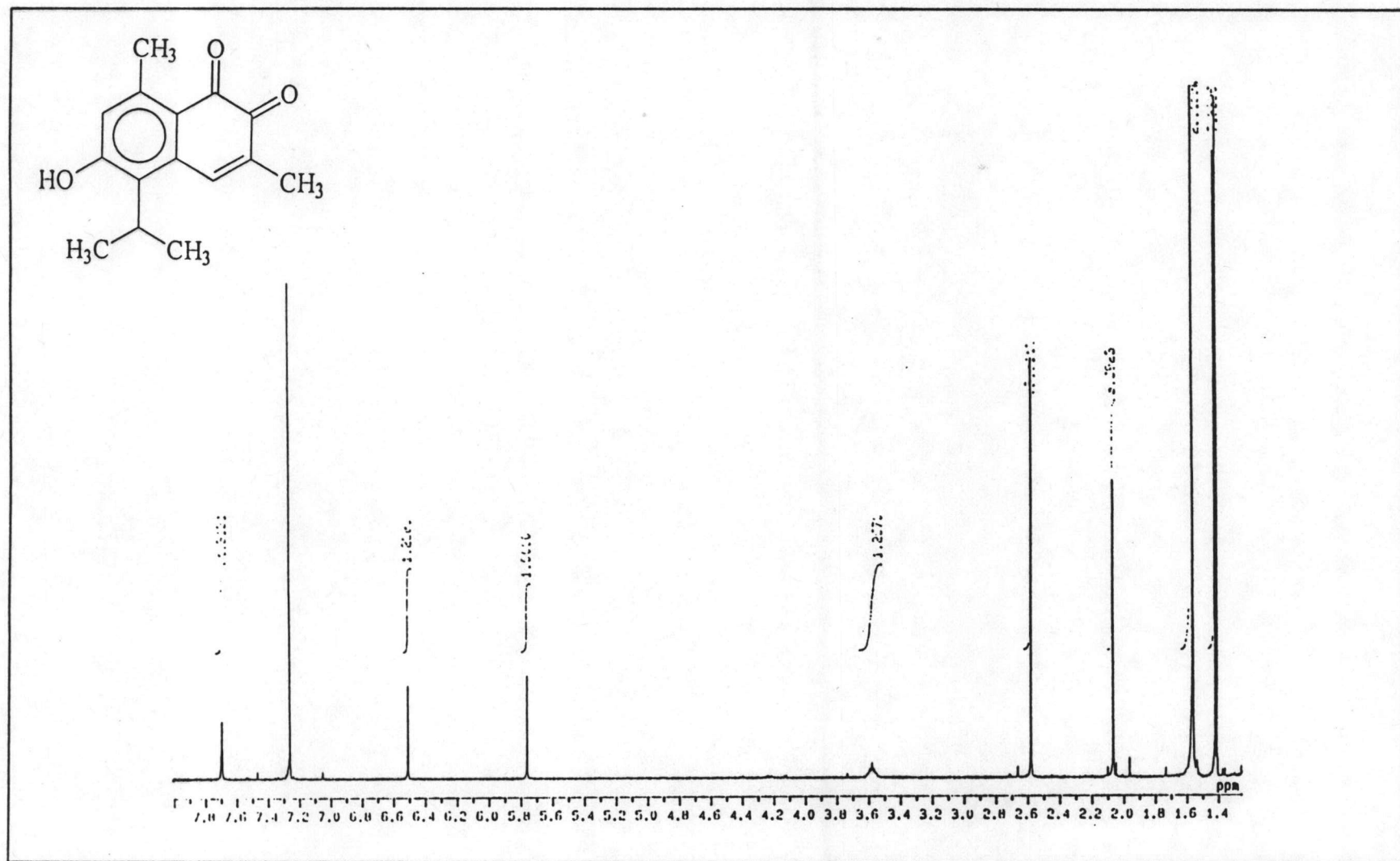


Fig. 41 The <sup>1</sup>H-NMR spectrum of Compound 8

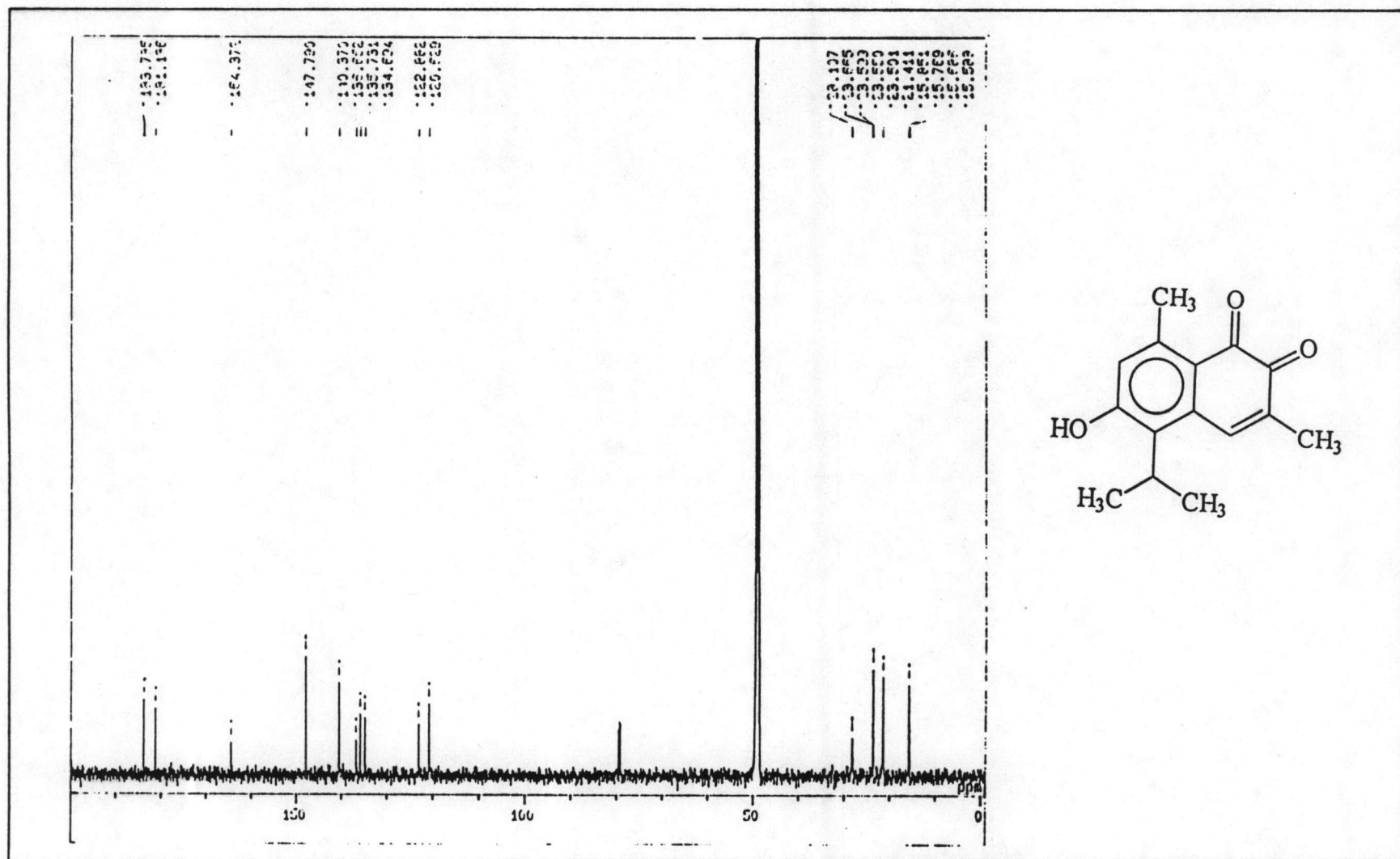


Fig. 42 The  $^{13}\text{C}$ -NMR spectrum of Compound 8

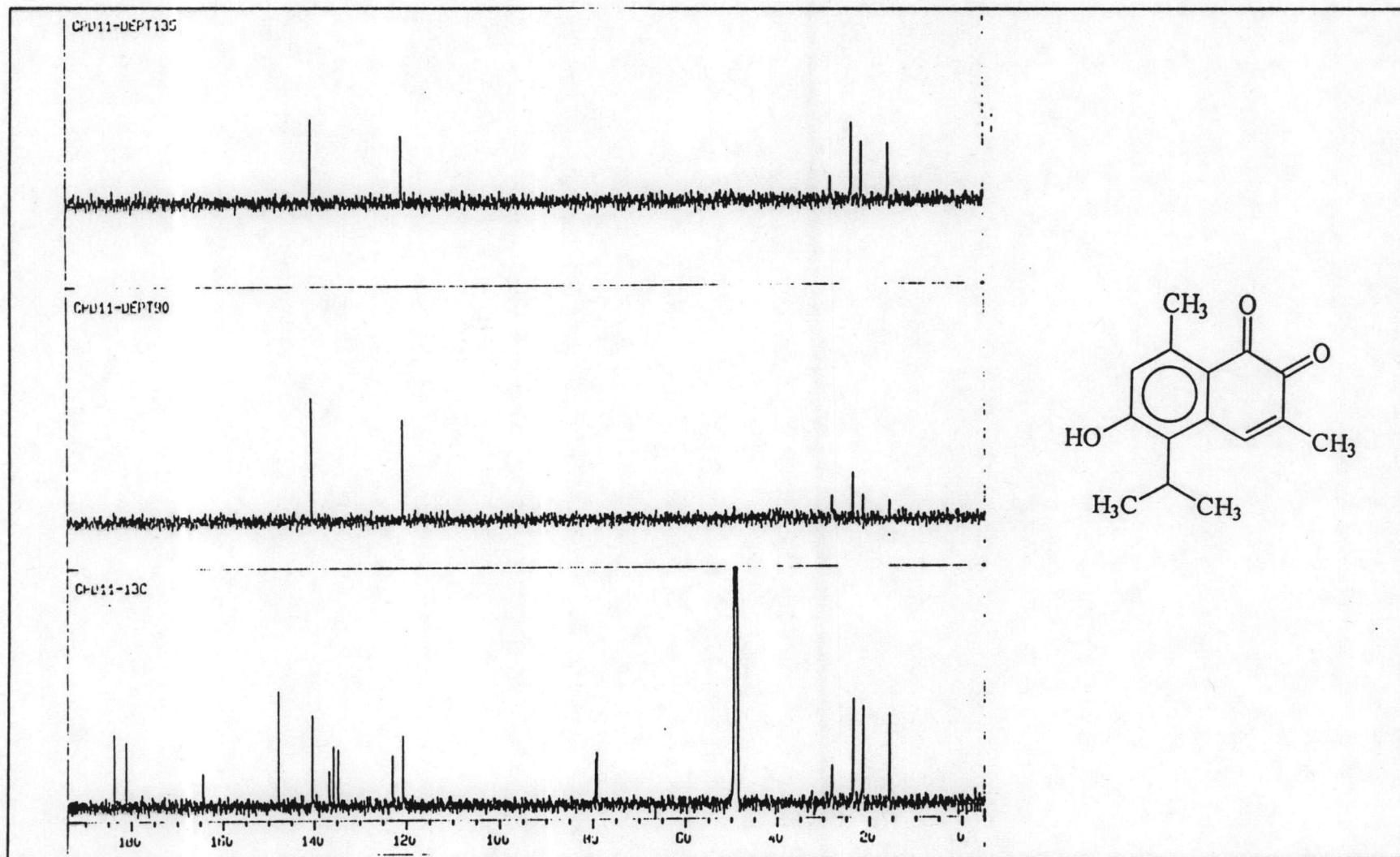


Fig. 43 The DEPT 90 and 135 spectra of Compound 8

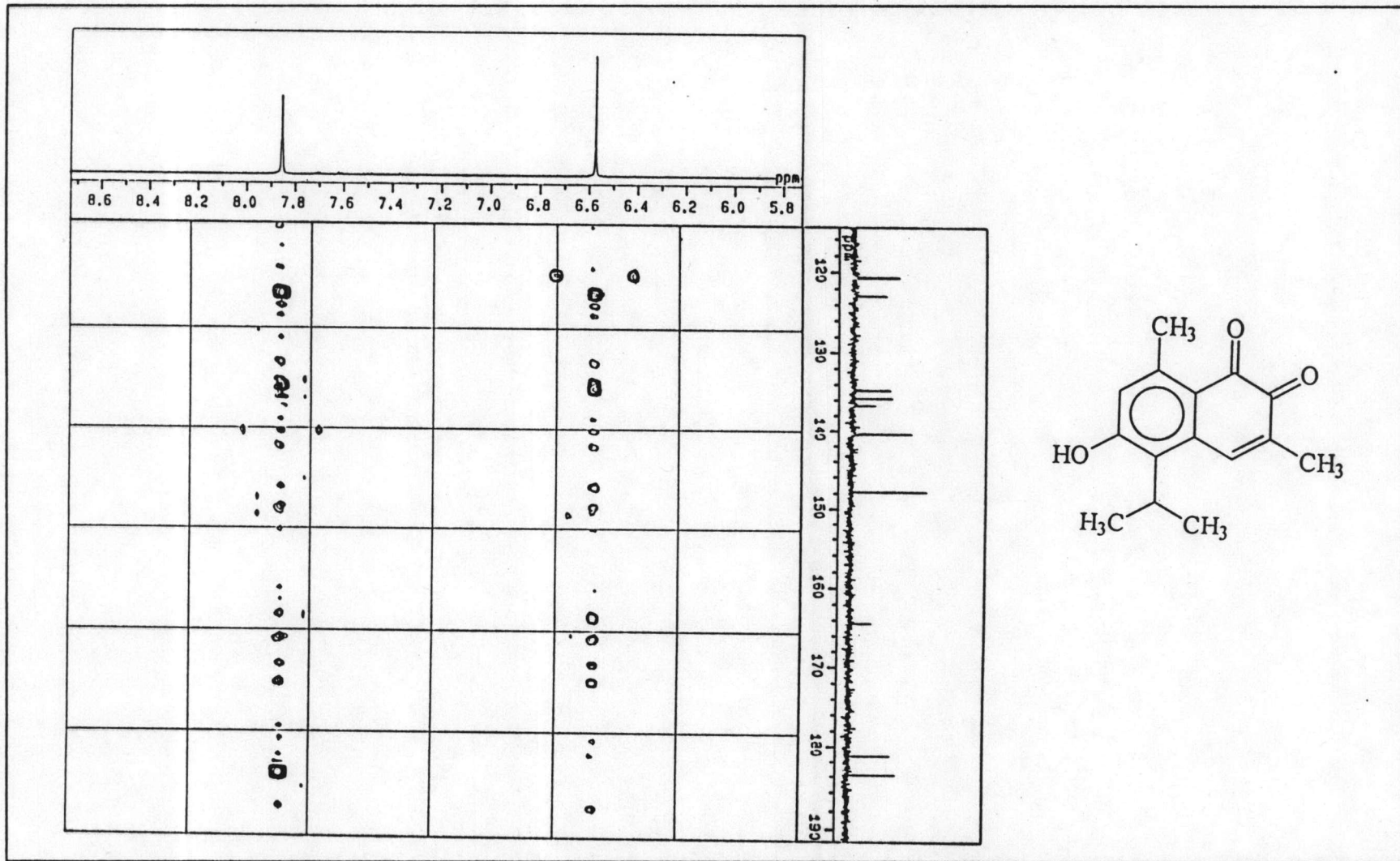


Fig. 44 The HMBC spectrum of Compound 8



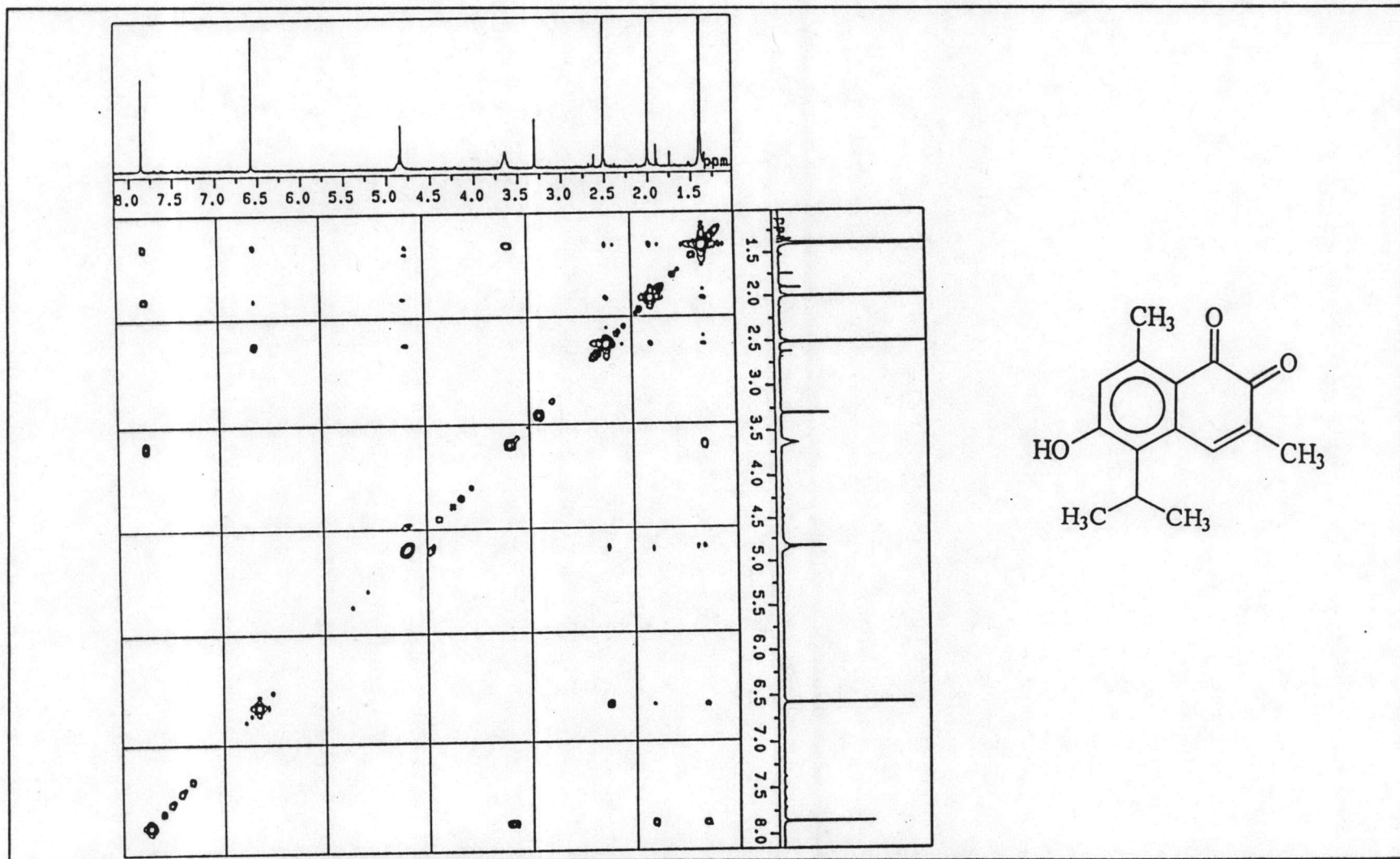


Fig. 45 The NOESY spectrum of Compound 8

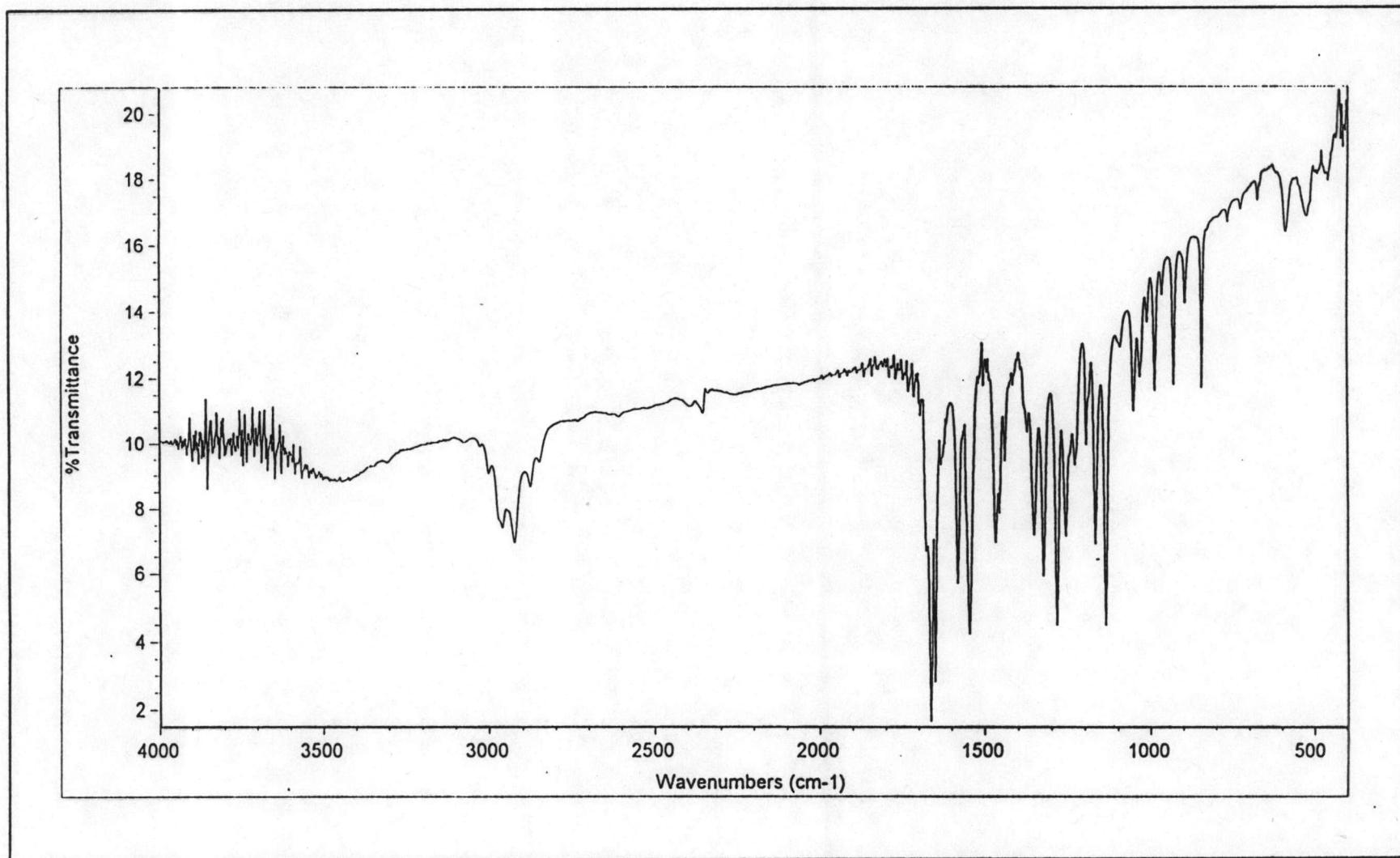


Fig. 46 The FT-IR spectrum of Compound 8A

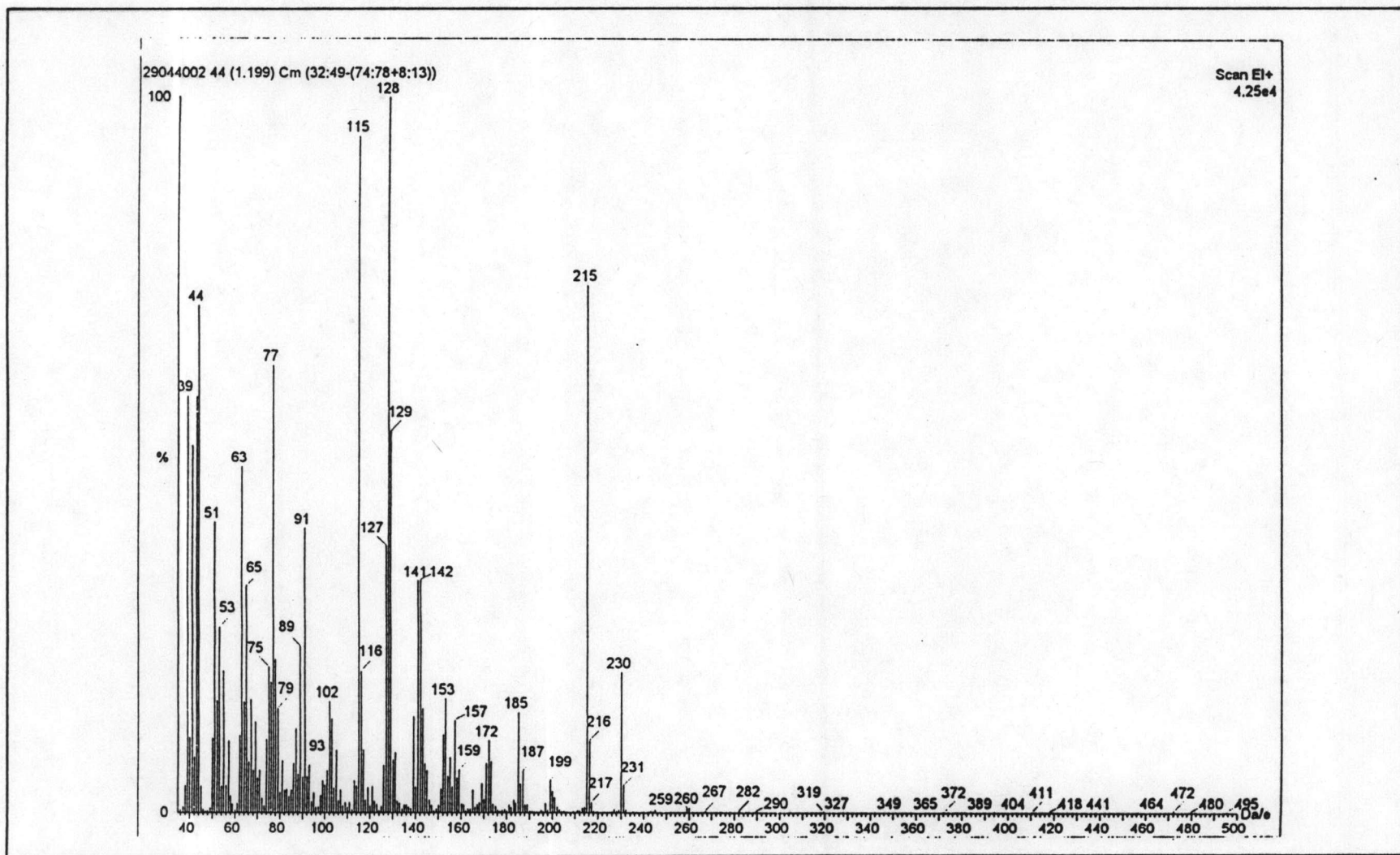


Fig. 47 The mass spectrum of Compound 8A

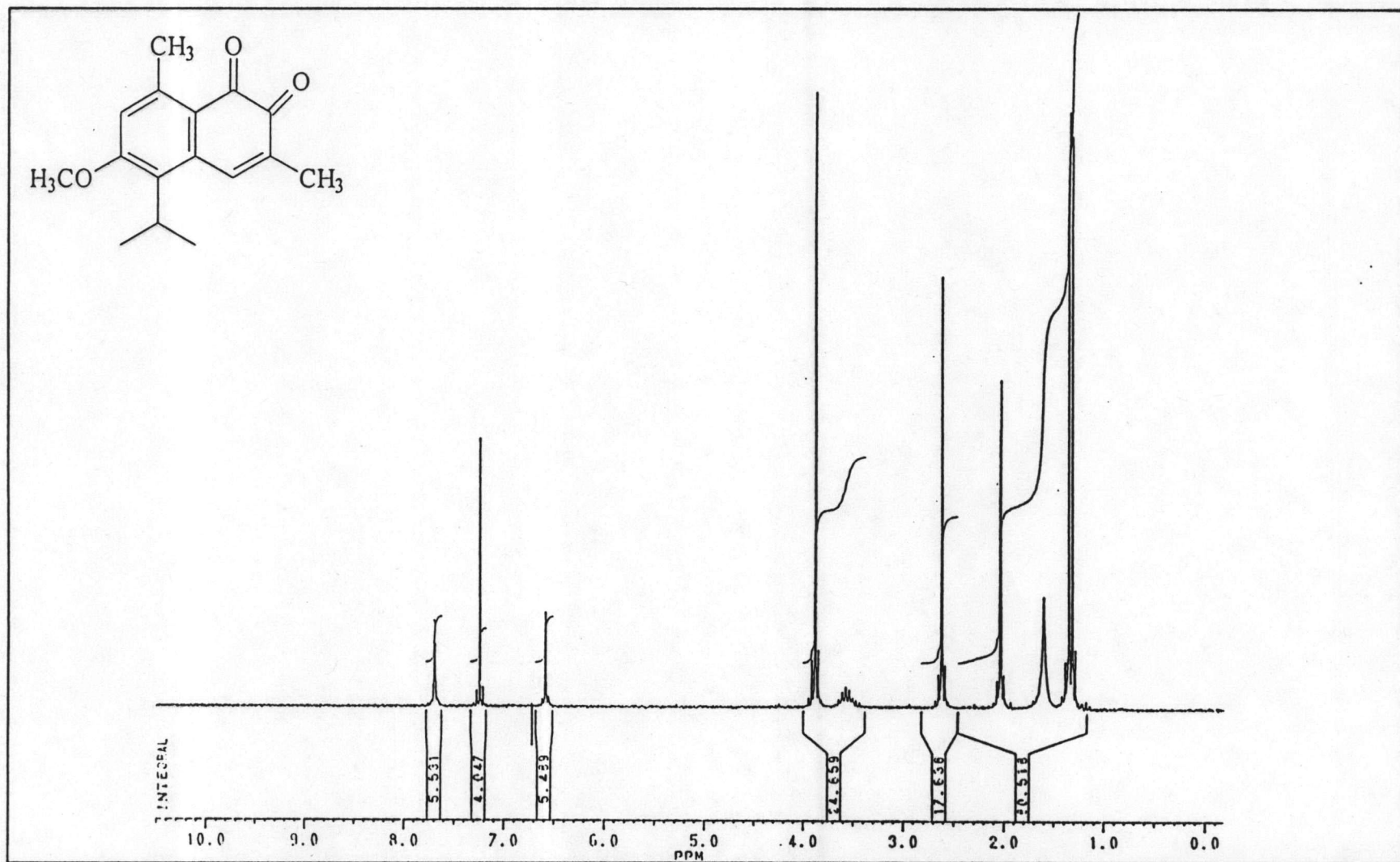


Fig. 48 The <sup>1</sup>H-NMR spectrum of Compound 8A



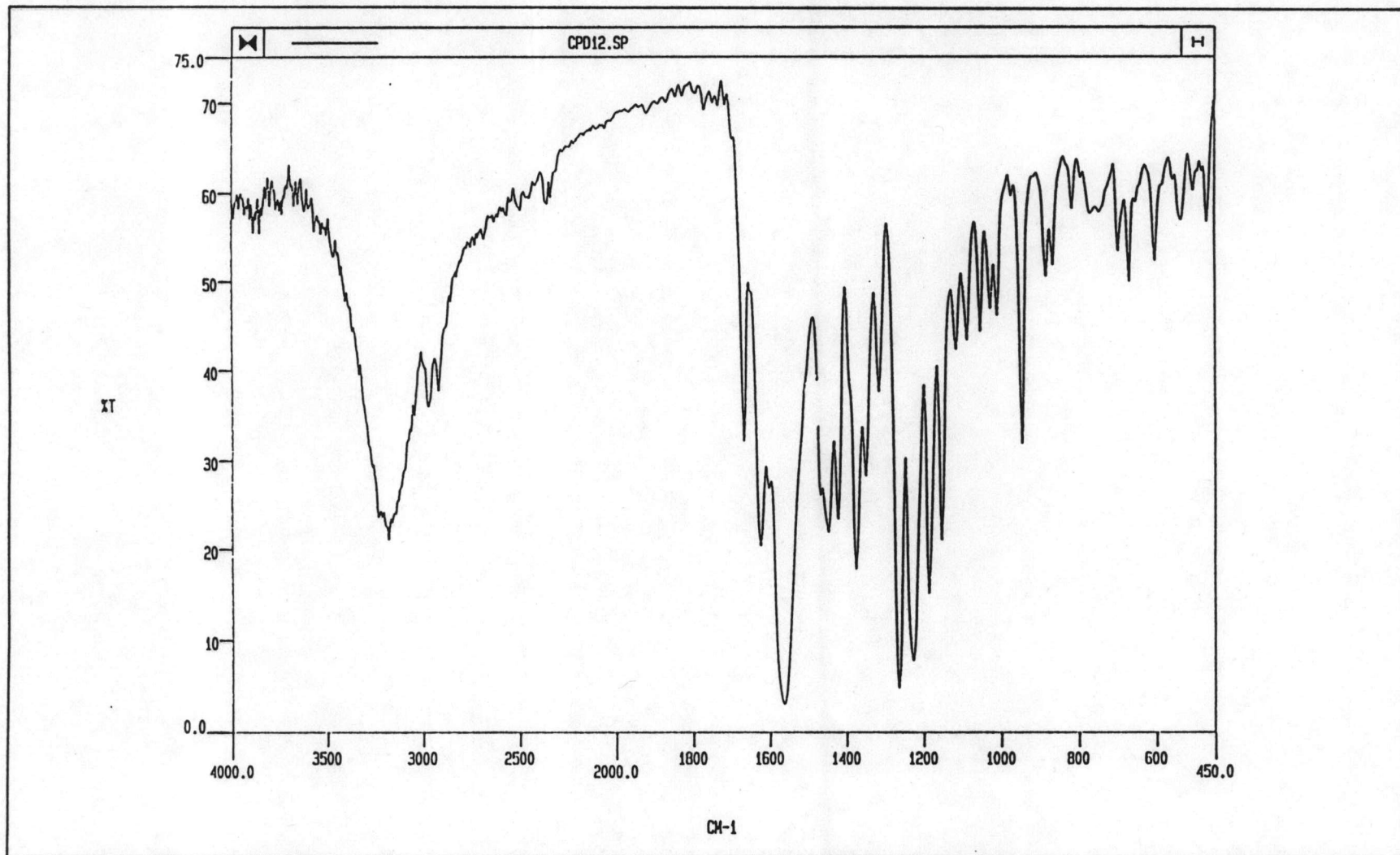


Fig. 49 The FT-IR spectrum of Compound 9



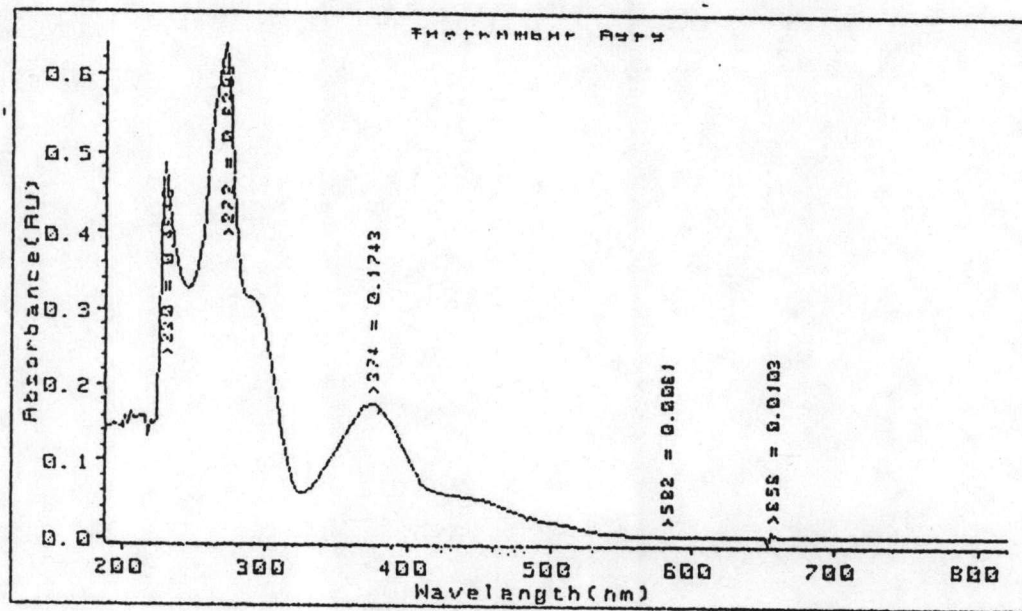


Fig. 50 The UV spectrum of Compound 9

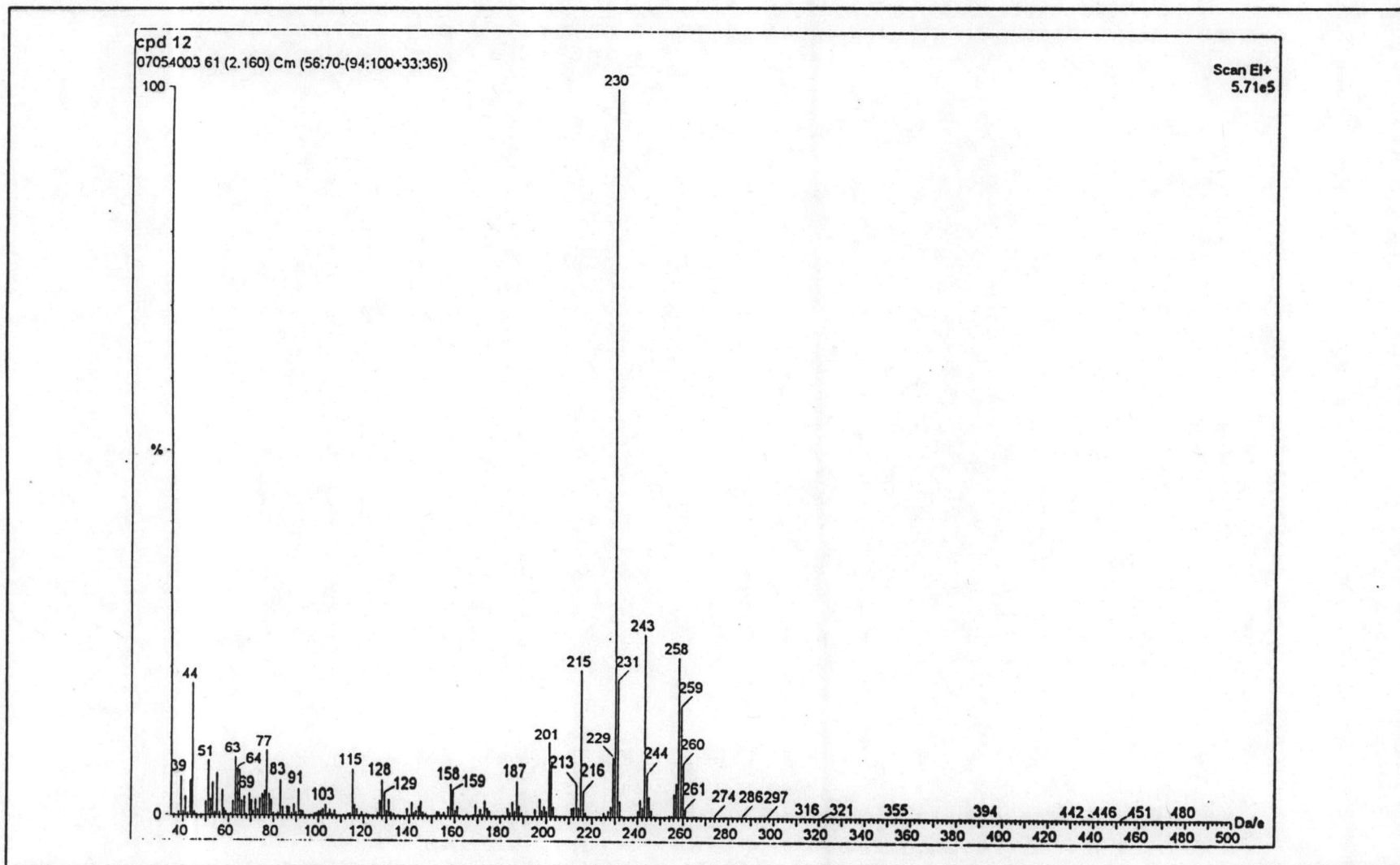


Fig. 51 The mass spectrum of Compound 9

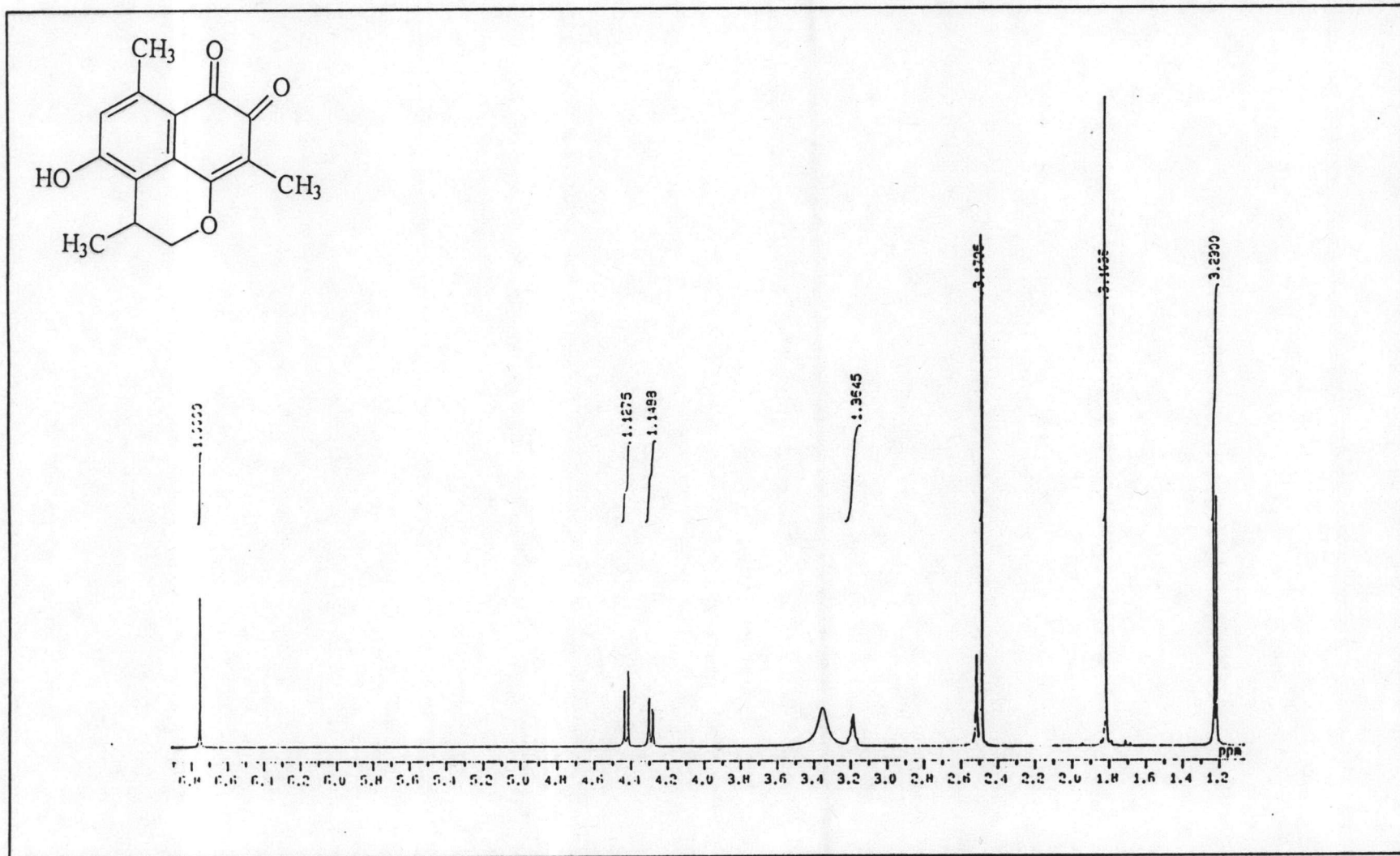


Fig. 52 The <sup>1</sup>H-NMR spectrum of Compound 9

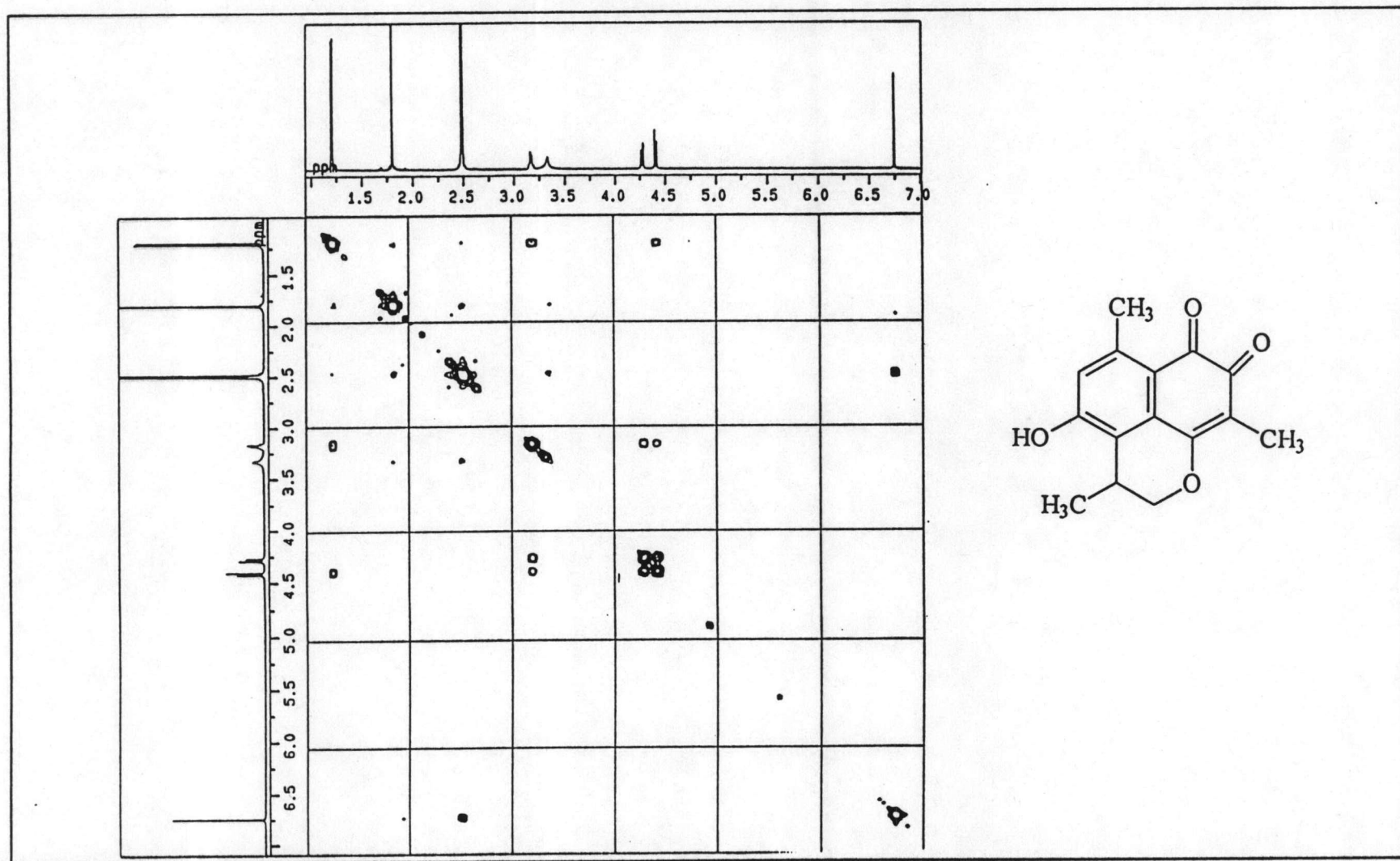


Fig. 53 The NOESY spectrum of Compound 9

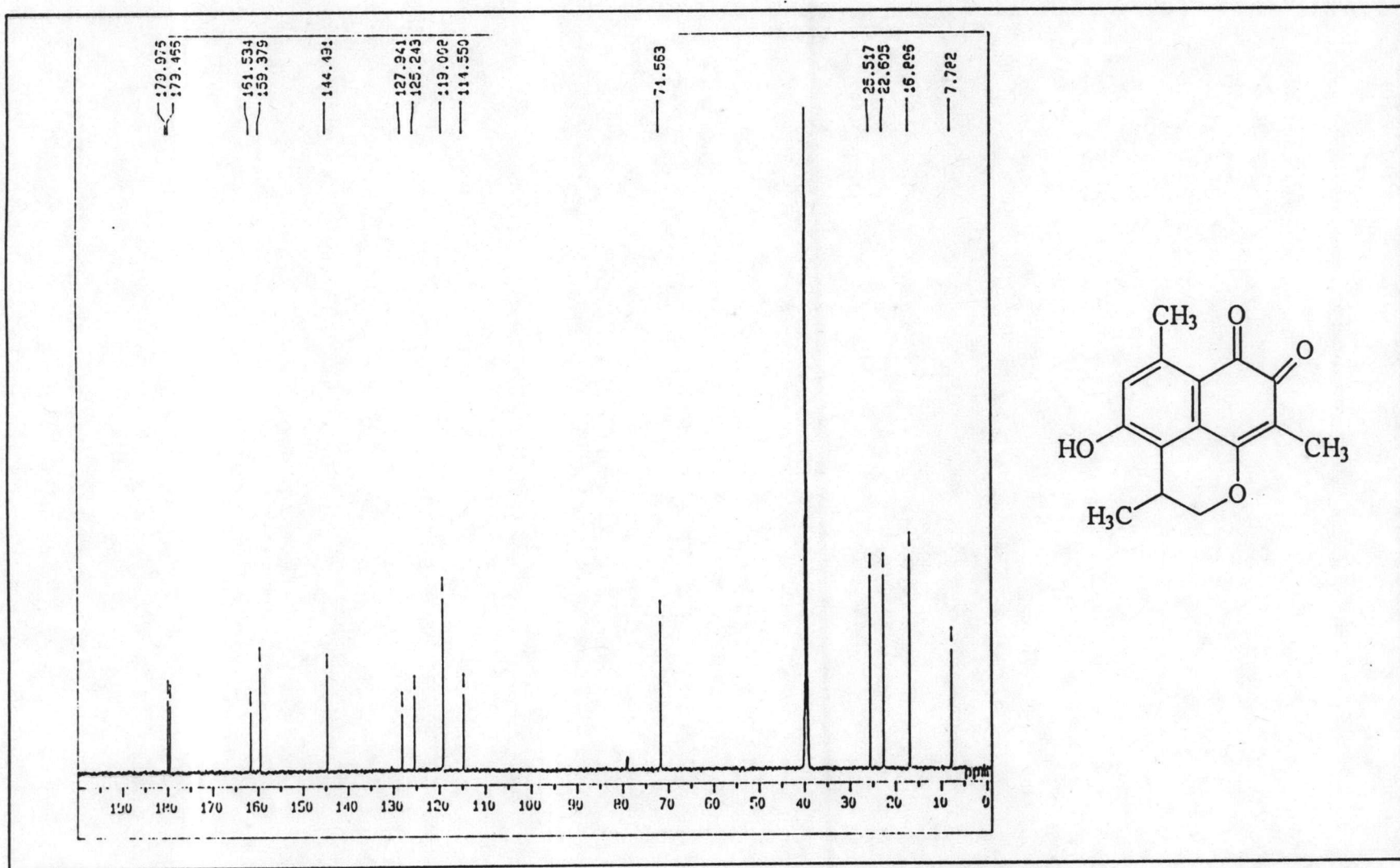


Fig. 54 The  $^{13}\text{C}$ -NMR spectrum of Compound 9 .



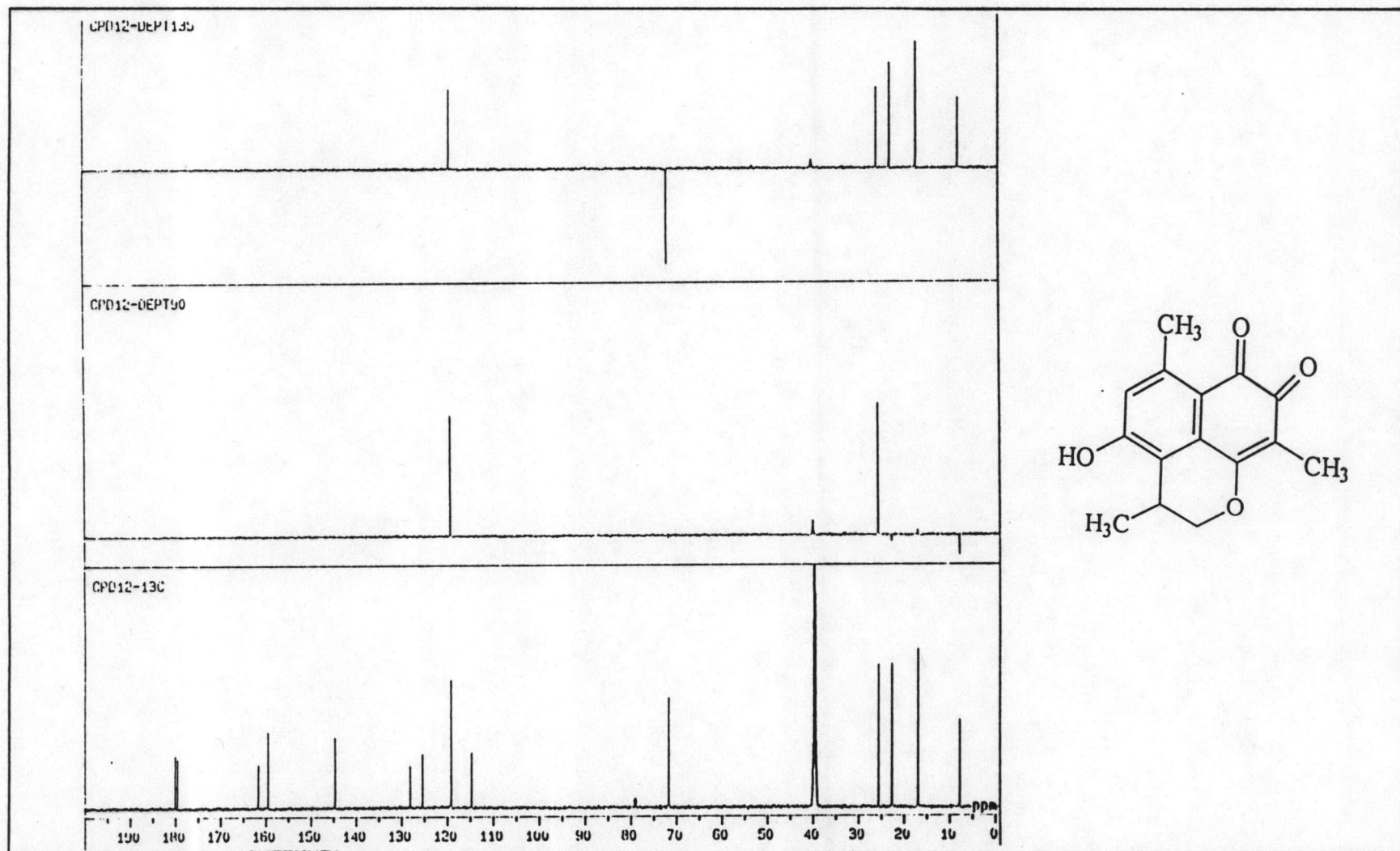


Fig. 55 The DEPT 90 and 135 spectra of Compound 9

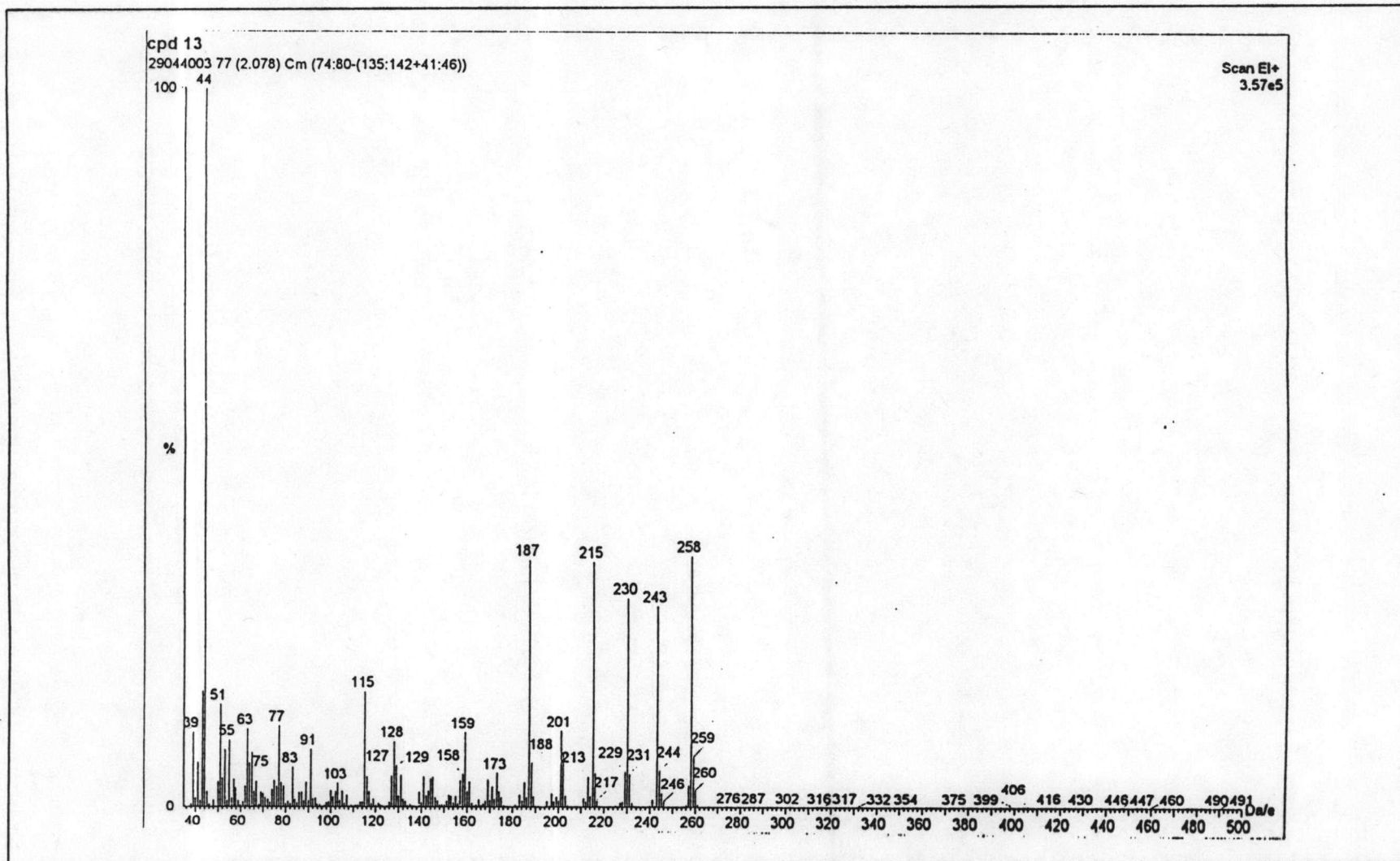


Fig. 56 The mass spectrum of Compound 10

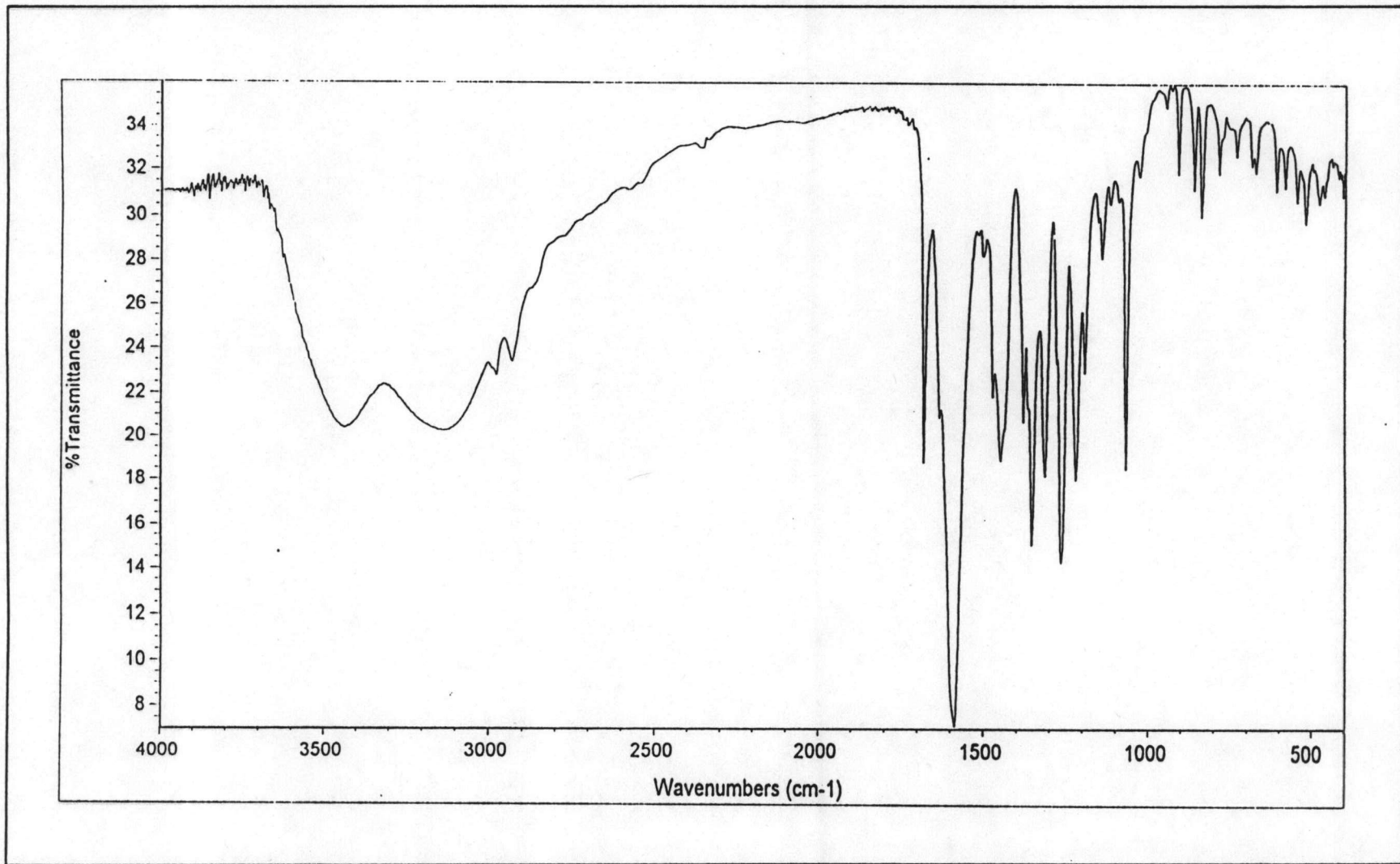


Fig. 57 The FT-IR spectrum of Compound 10

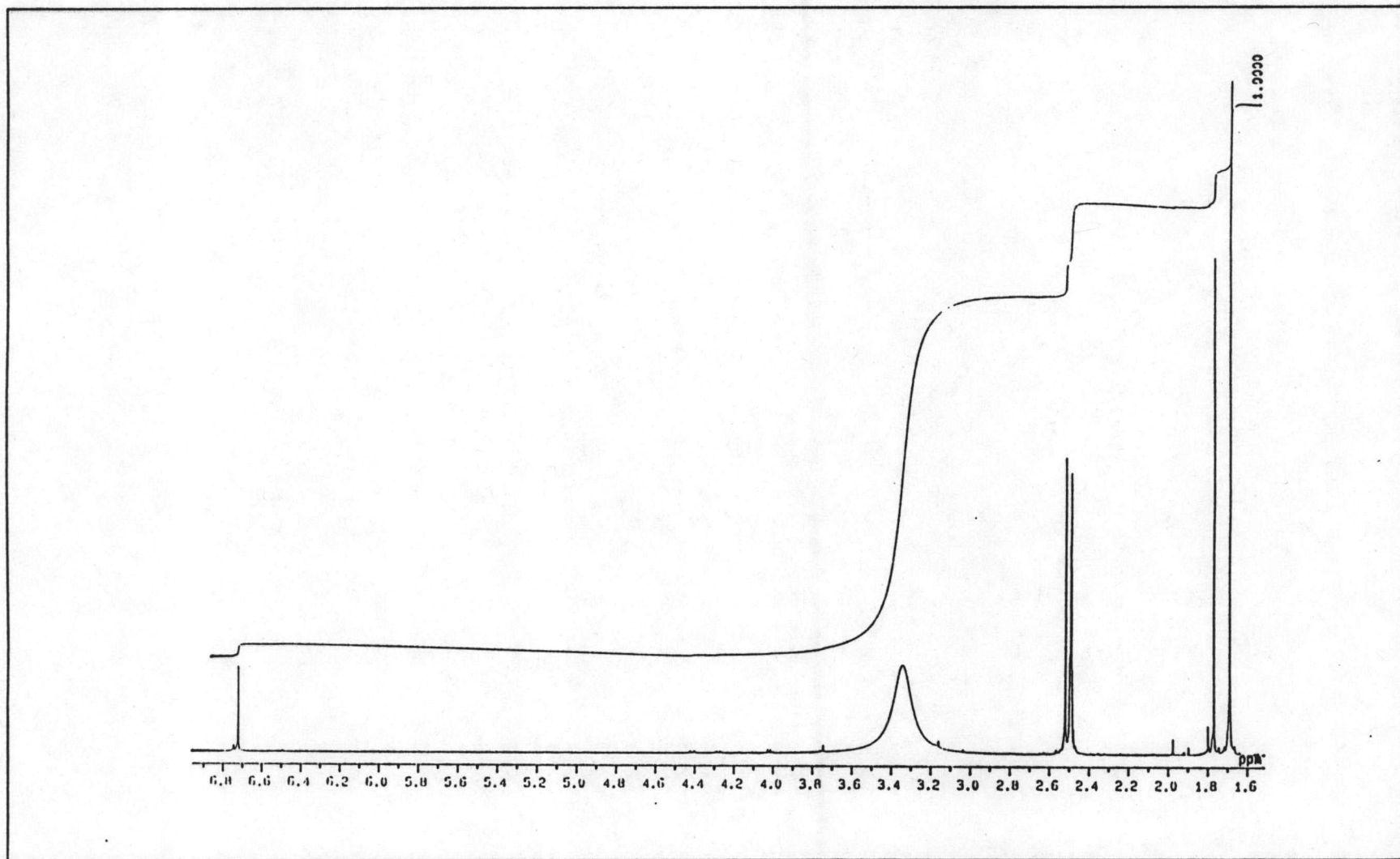


Fig. 58 The  $^1\text{H-NMR}$  spectrum of Compound 10



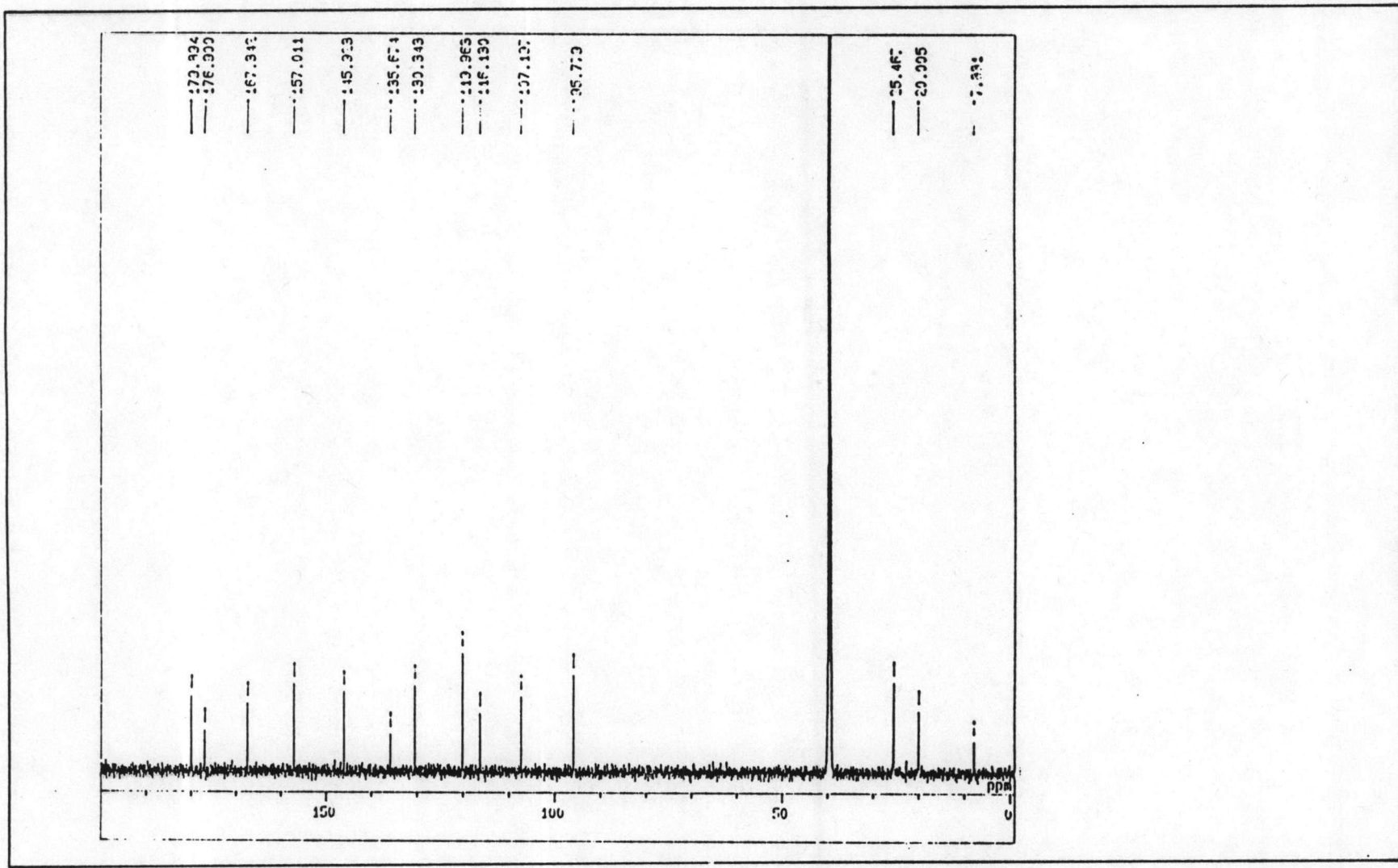


Fig. 59 The <sup>13</sup>C-NMR spectrum of Compound 10



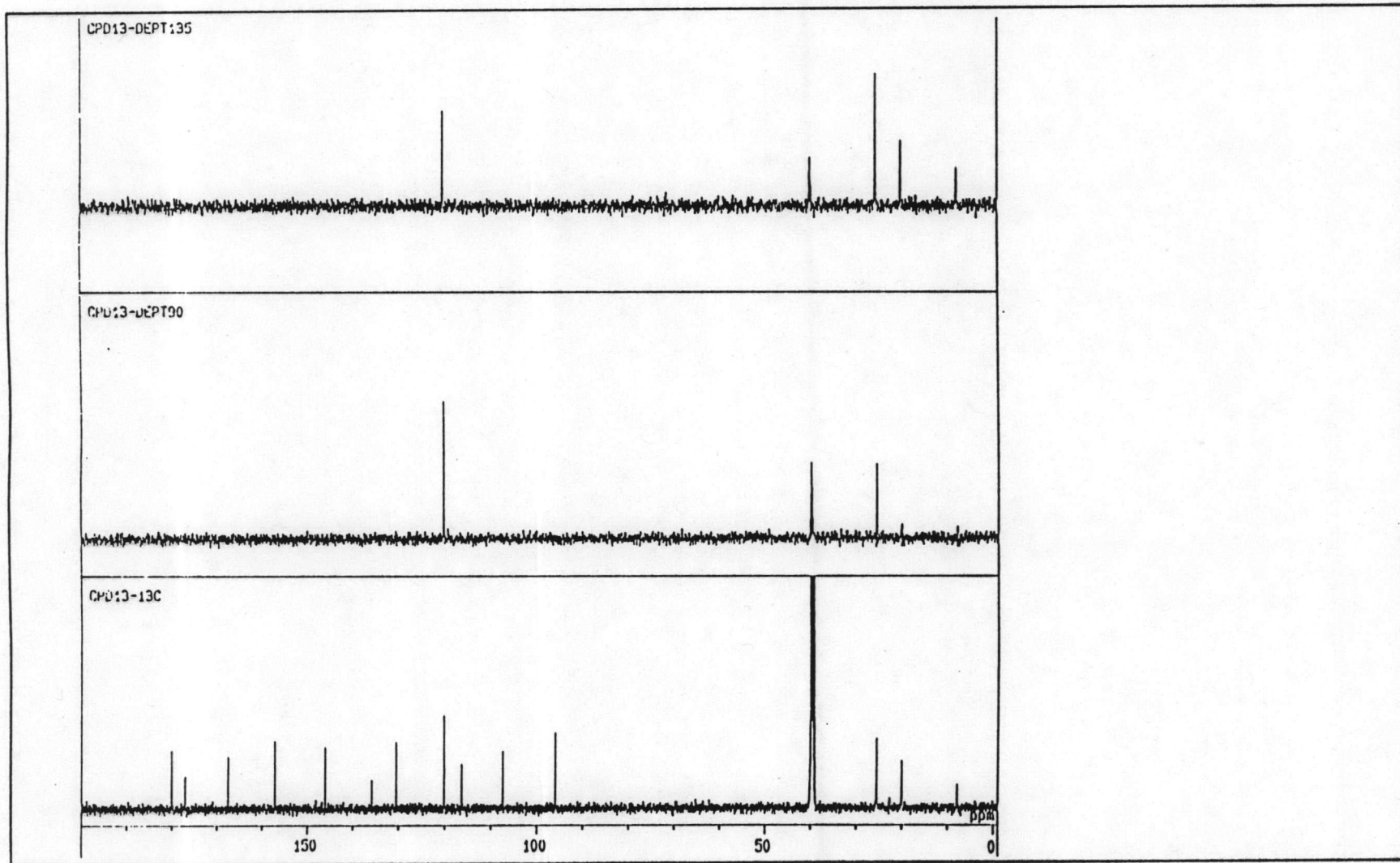


Fig. 60 The DEPT 90 and 135 spectra of Compound 10

### VITA

Mr. Apirak Puntumchai was born on May 26, 1973 in Bangkok, Thailand. He received a Bachelor Degree of Science, majoring in Chemistry at King Mongkut Institute of Technology, Ladkrabang in 1995. Since 1995, he has been a graduate student studying Organic Chemistry at Chulalongkorn University. During the study towards the Master's degree he had been awarded a teaching assistantship by the Faculty of Science during 1995-1996 and supported by a research grant for this Master Degree's thesis from the Graduate School, Chulalongkorn University and from the Natural Products Research Unit of the Department of Chemistry, Chulalongkorn University. His present address is 123/3 Soi Seattakit 42, Laksong, Nongkham, Bangkok, 10160.