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## **APPENDIX**

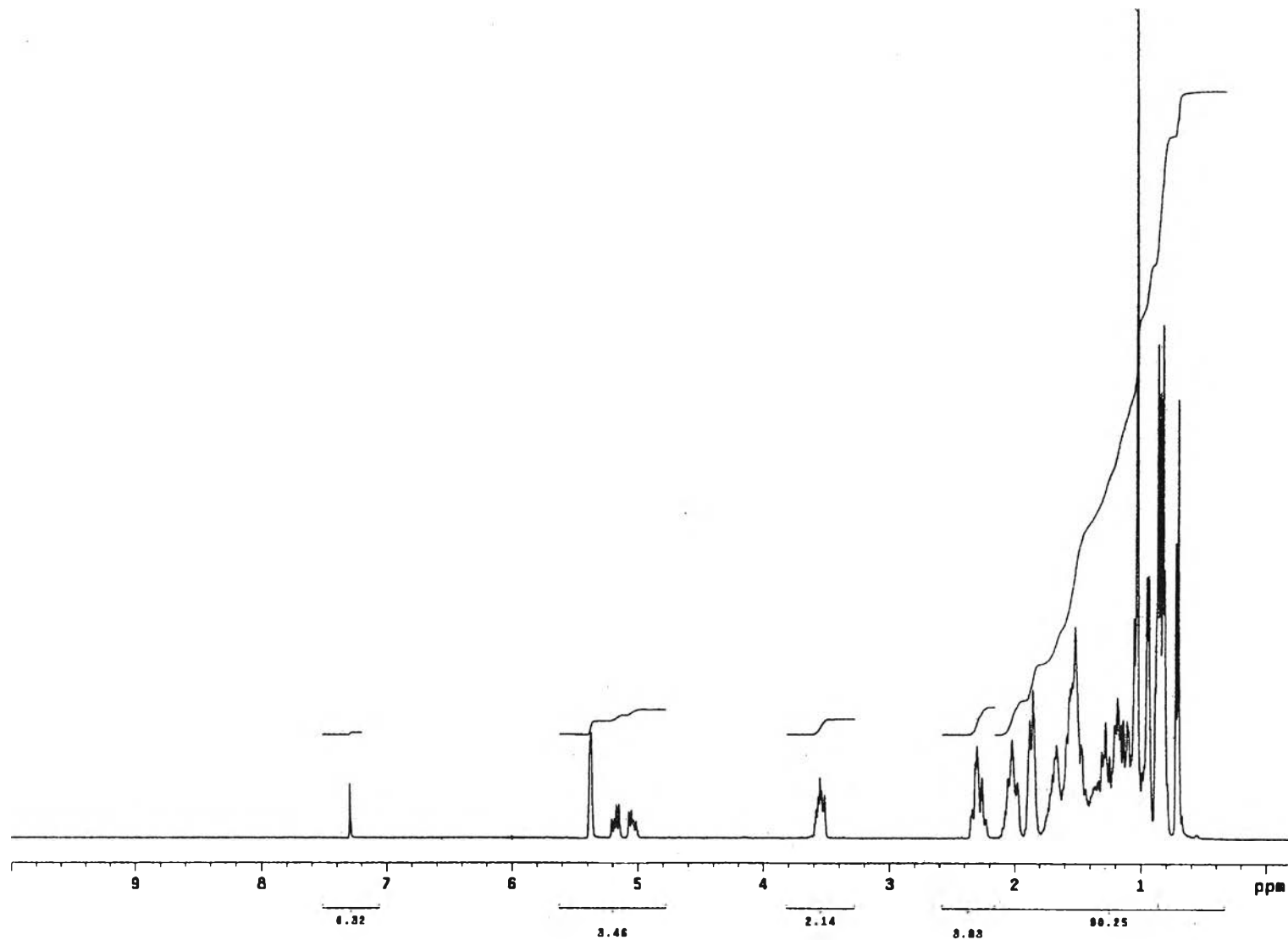


Fig. 26  $^1\text{H-NMR}$  spectrum of mixture 1



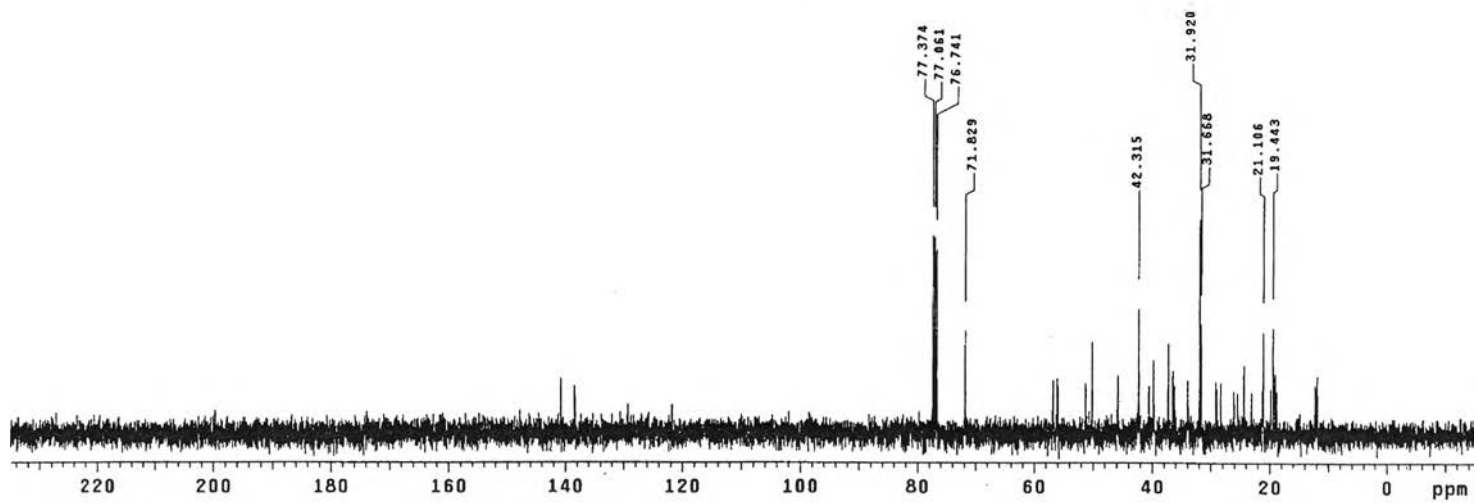


Fig. 27  $^{13}\text{C}$ -NMR spectrum of mixture 1

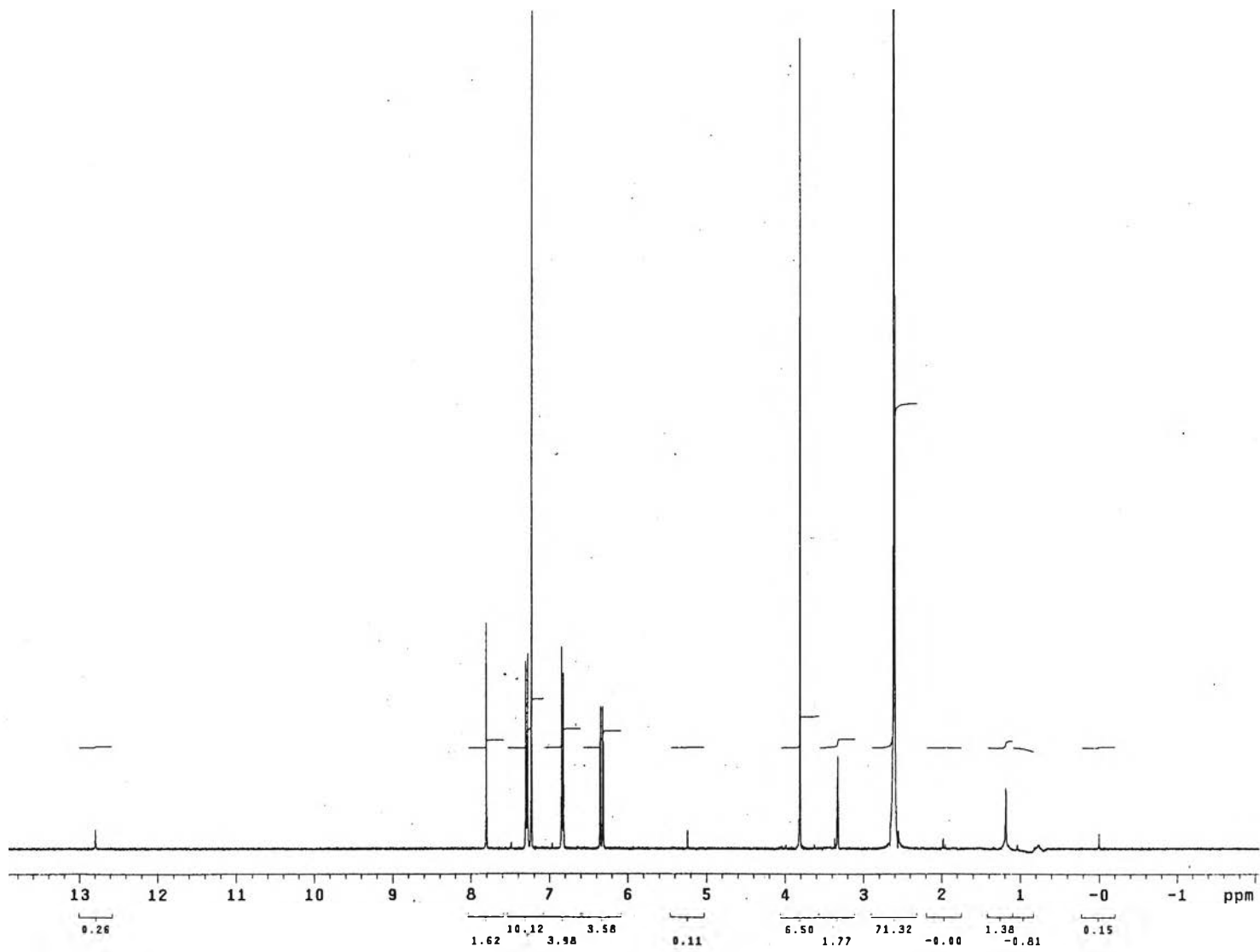


Fig. 28  $^1\text{H-NMR}$  spectrum of compound 1

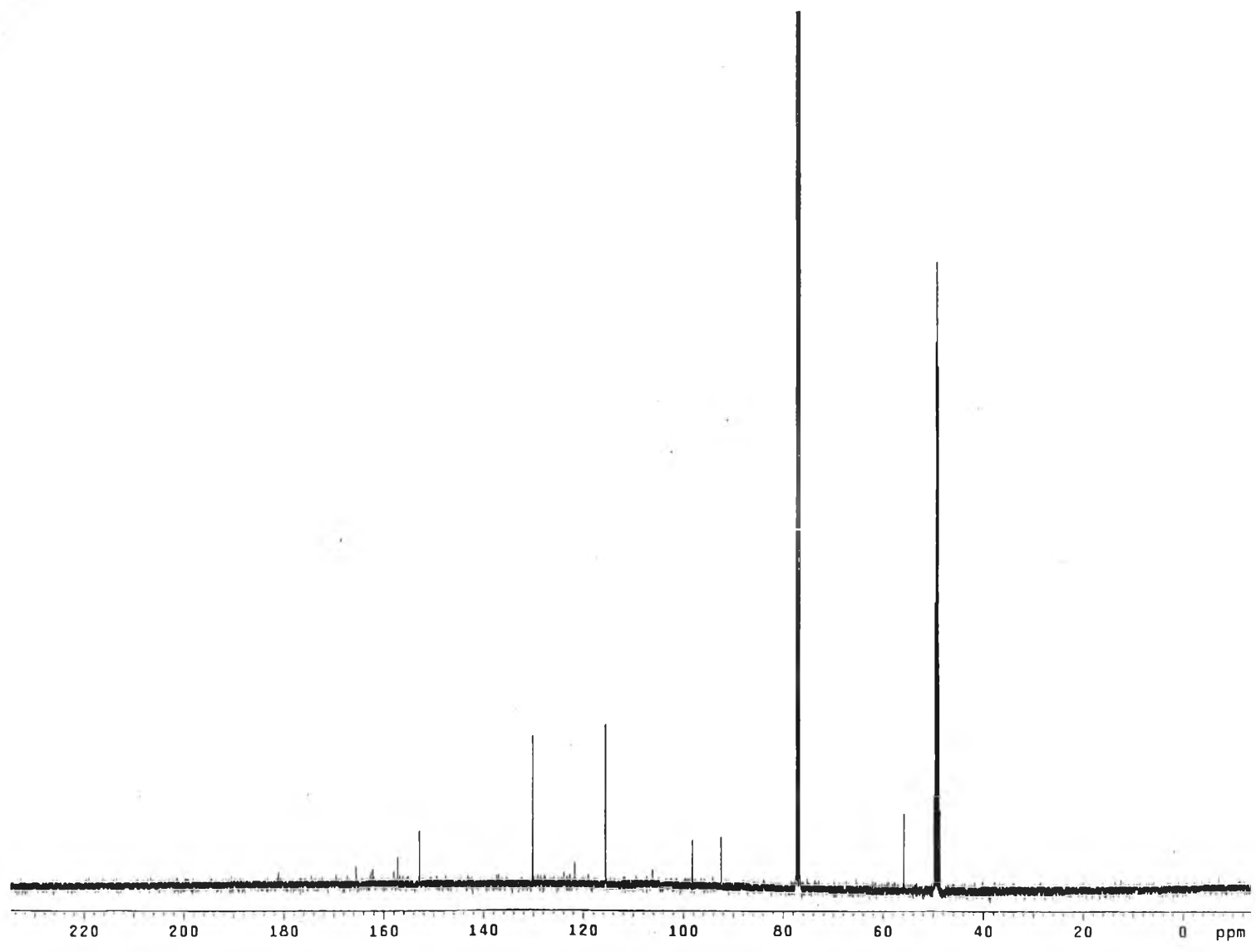


Fig. 29  $^{13}\text{C}$ -NMR spectrum of compound 1

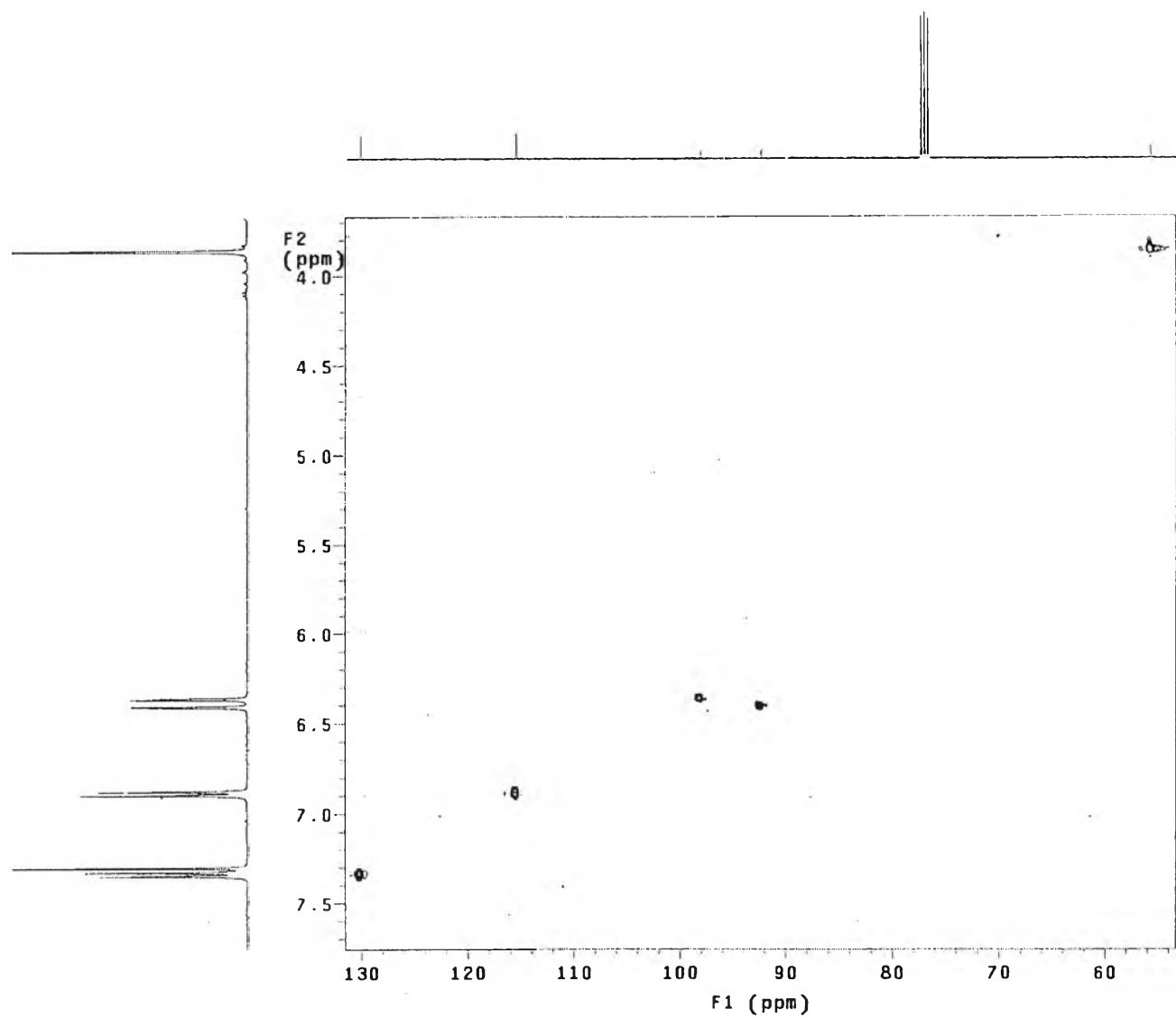


Fig . 30 gHSQC spectrum of compound 1

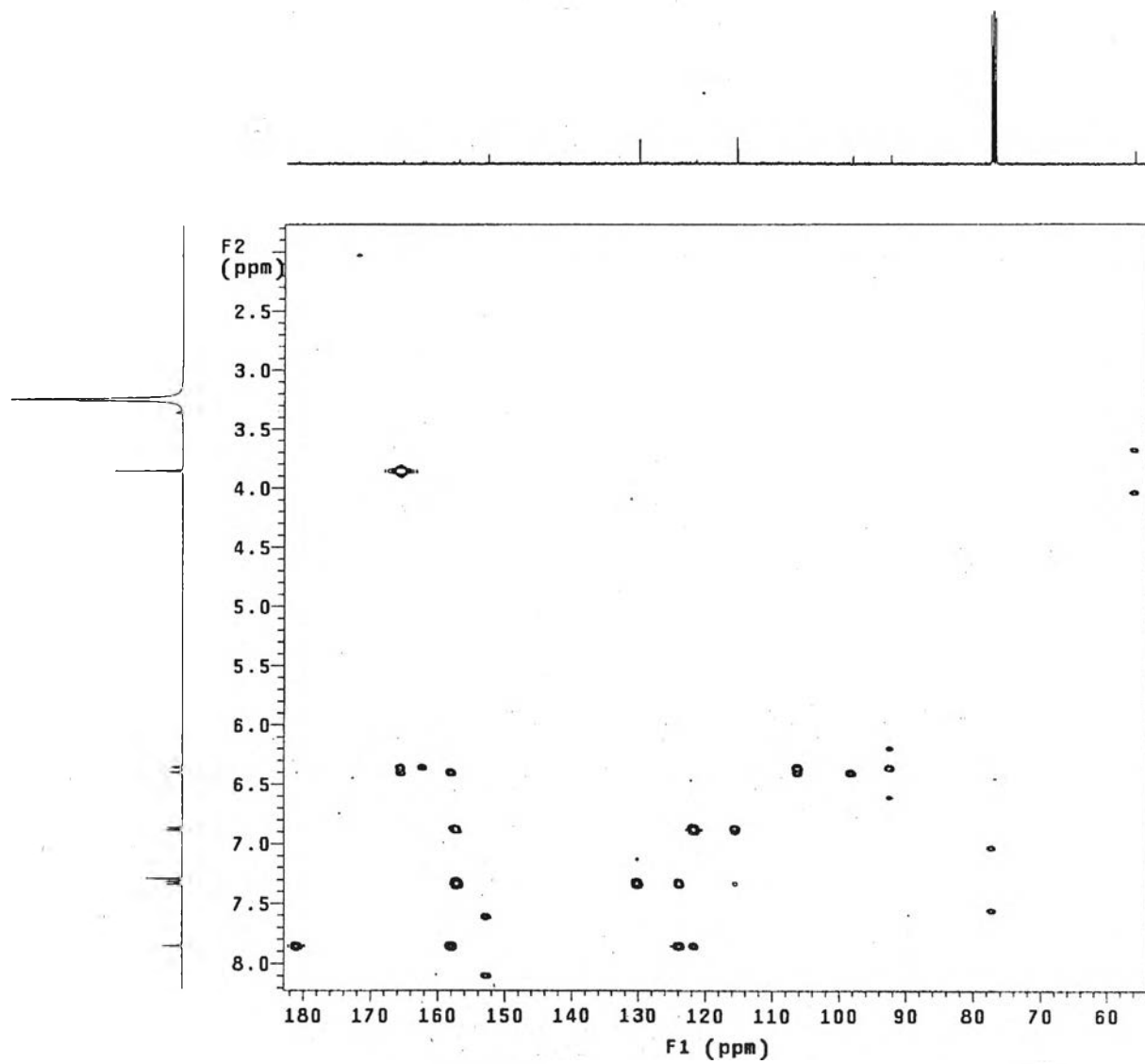


Fig.31 gHMBC spectrum of compound 1

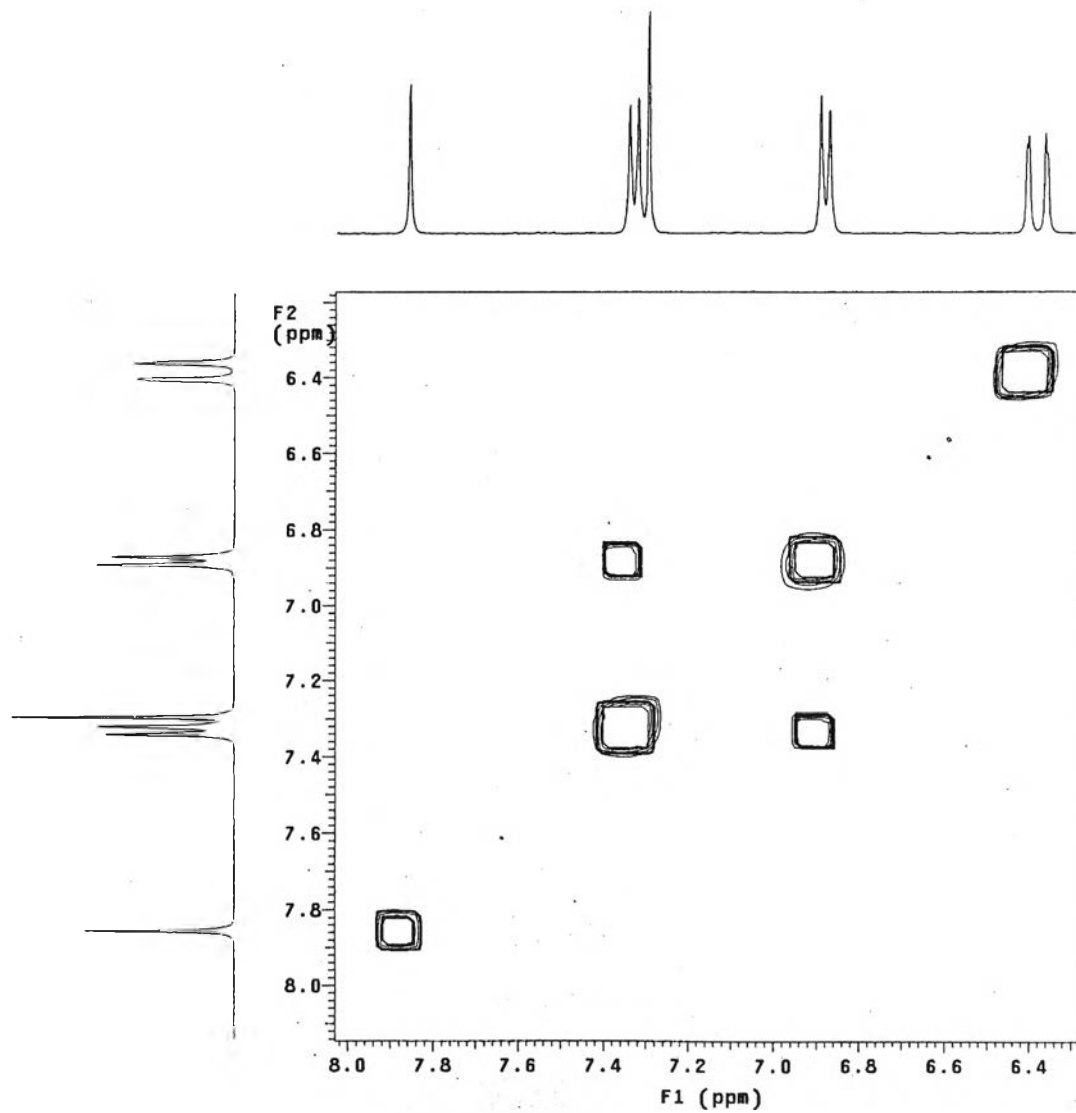


Fig.32 gCOSY spectrum of compound 1

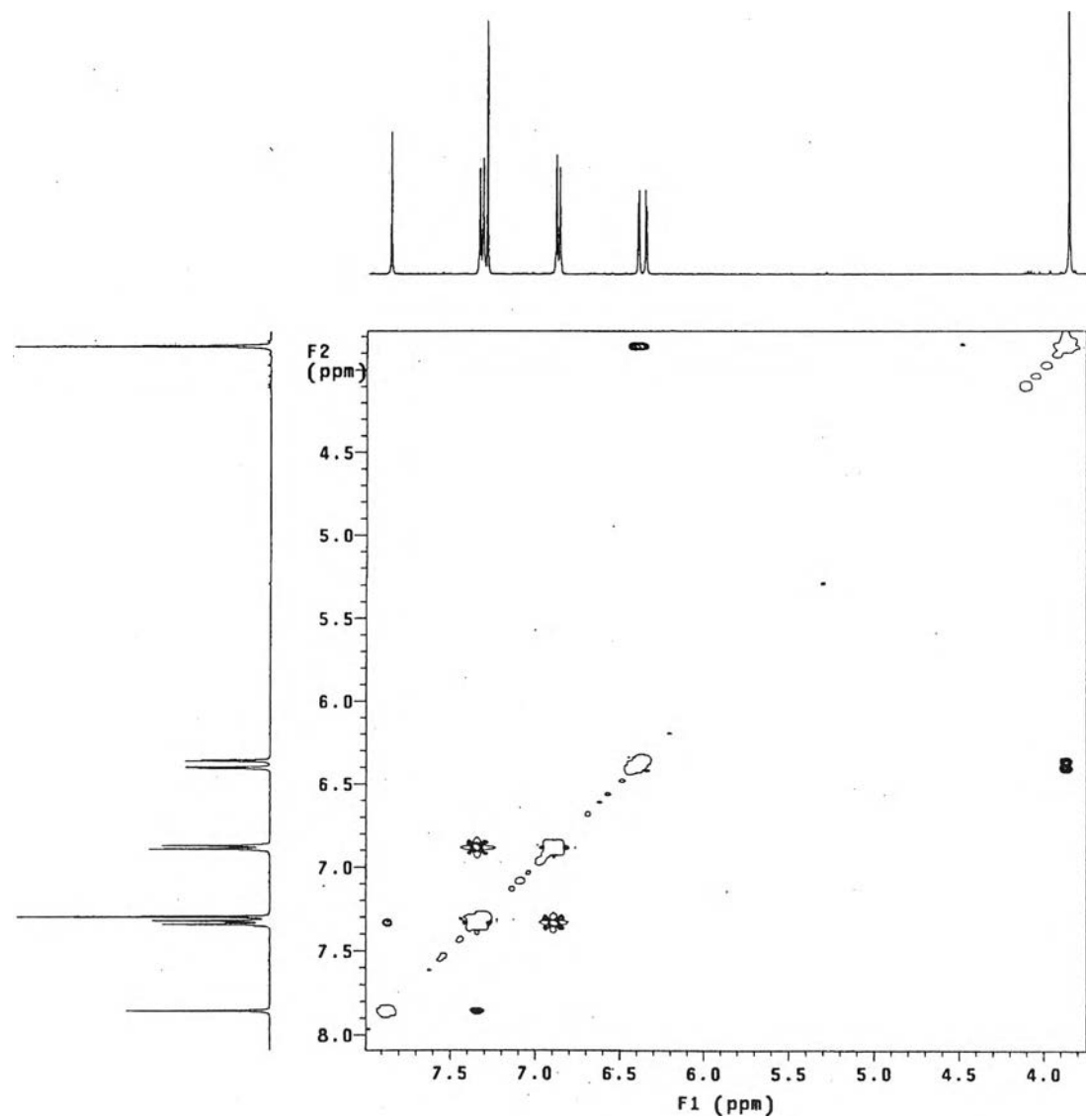


Fig.33 NOESY spectrum of compound 1

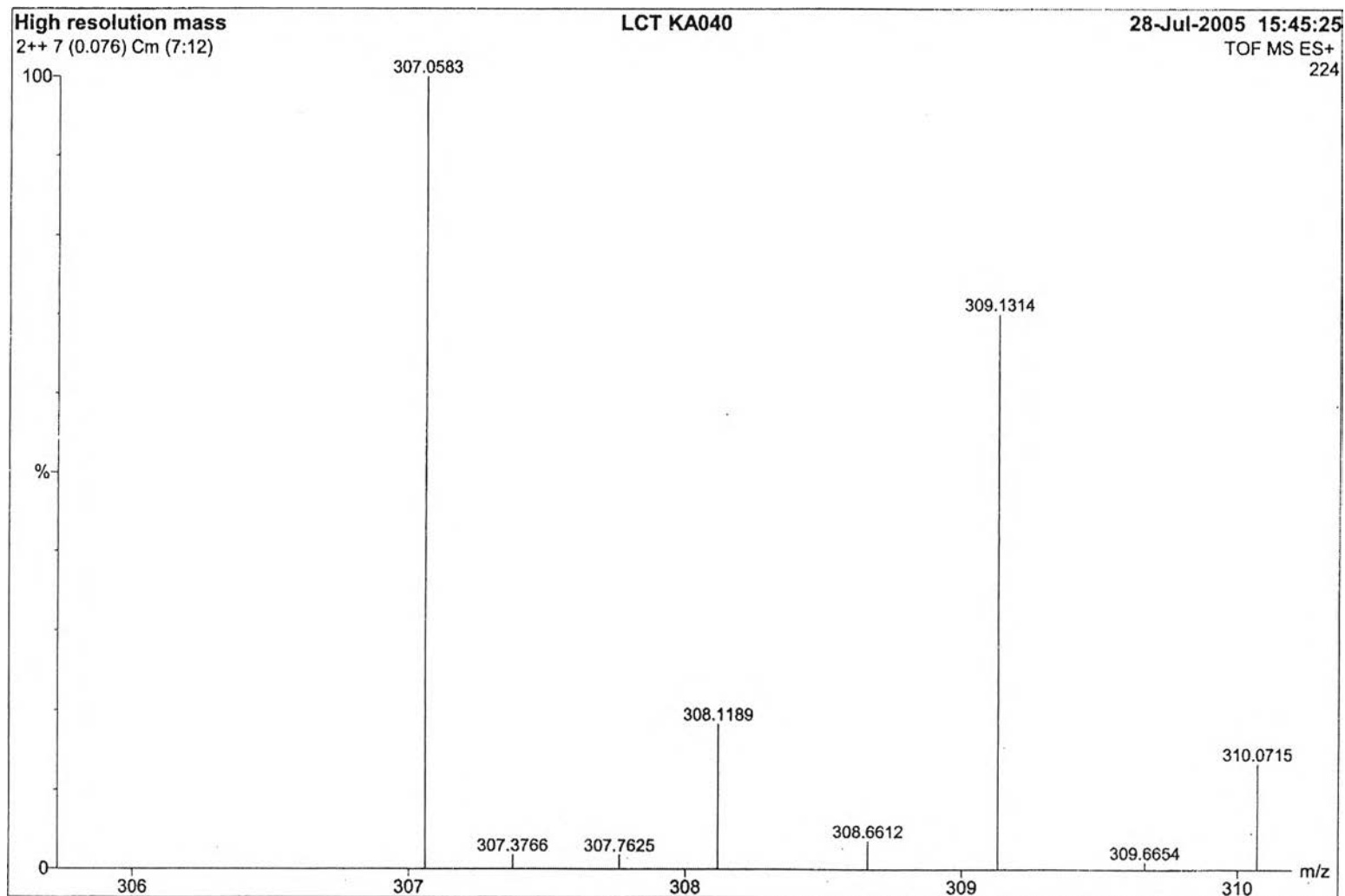


Fig. 34 TOF-MS spectrum of compound 1



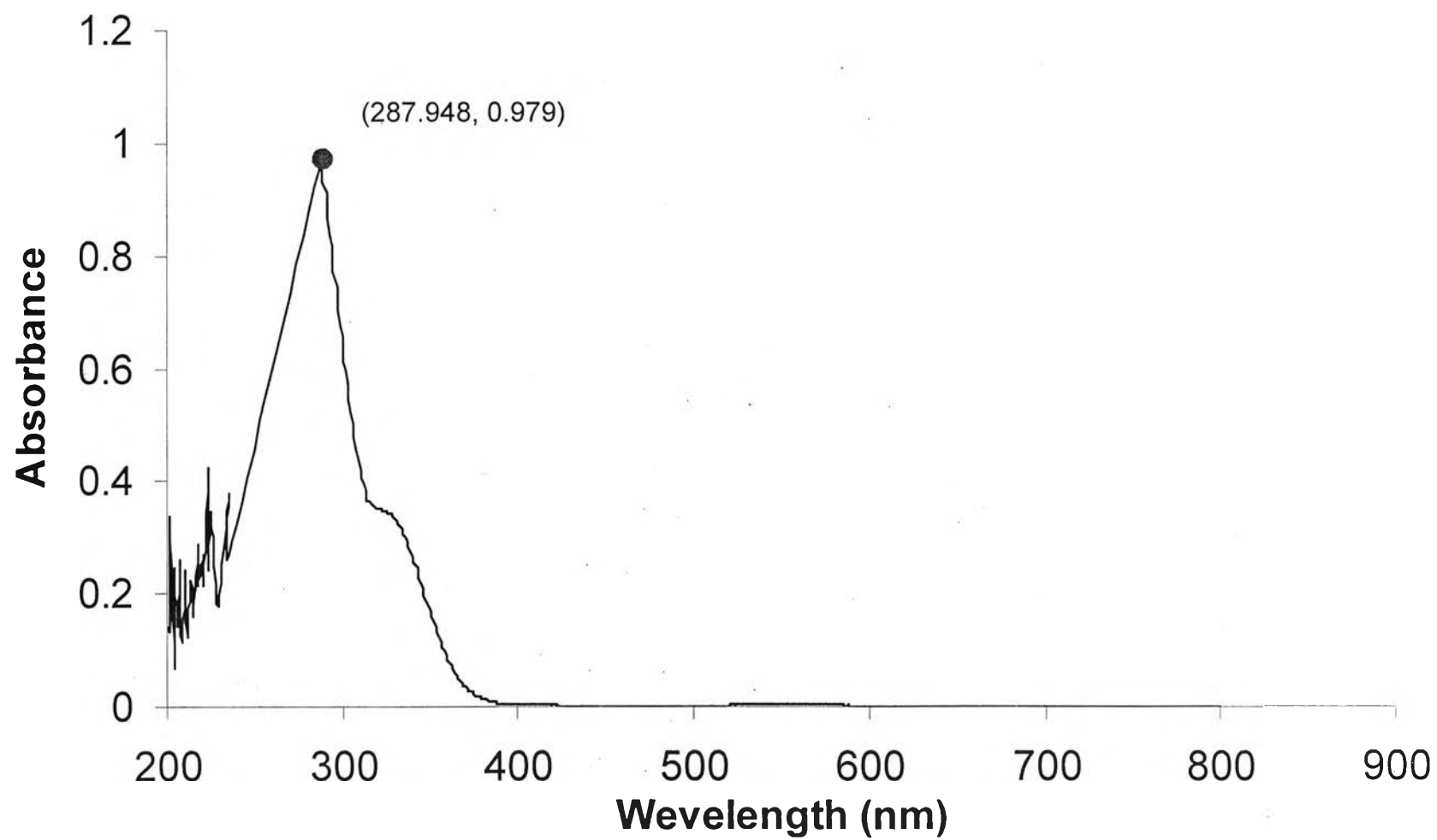


Fig.35 UV spectrum of compound 1

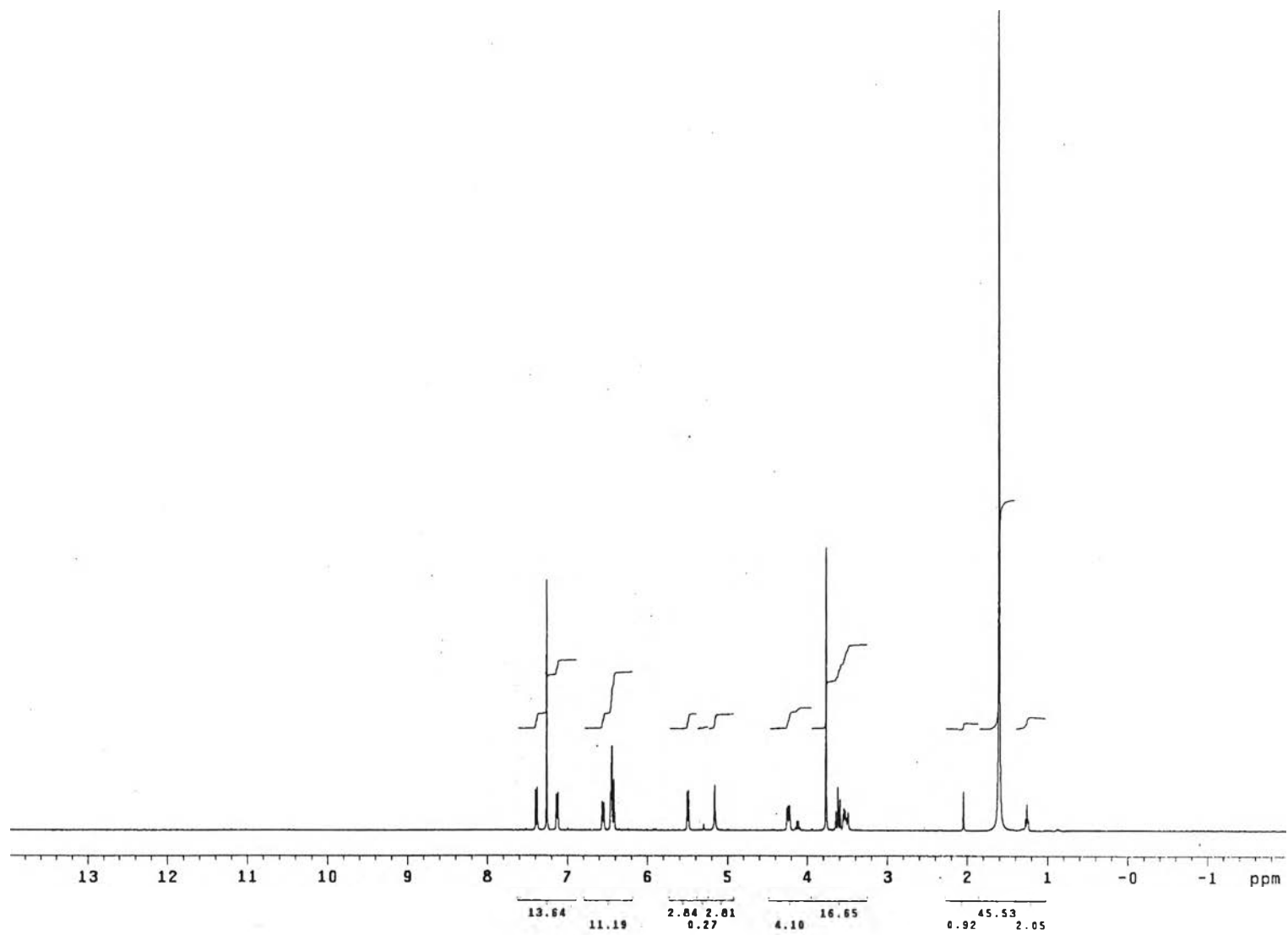


Fig. 36  $^1\text{H-NMR}$  spectrum of compound 2

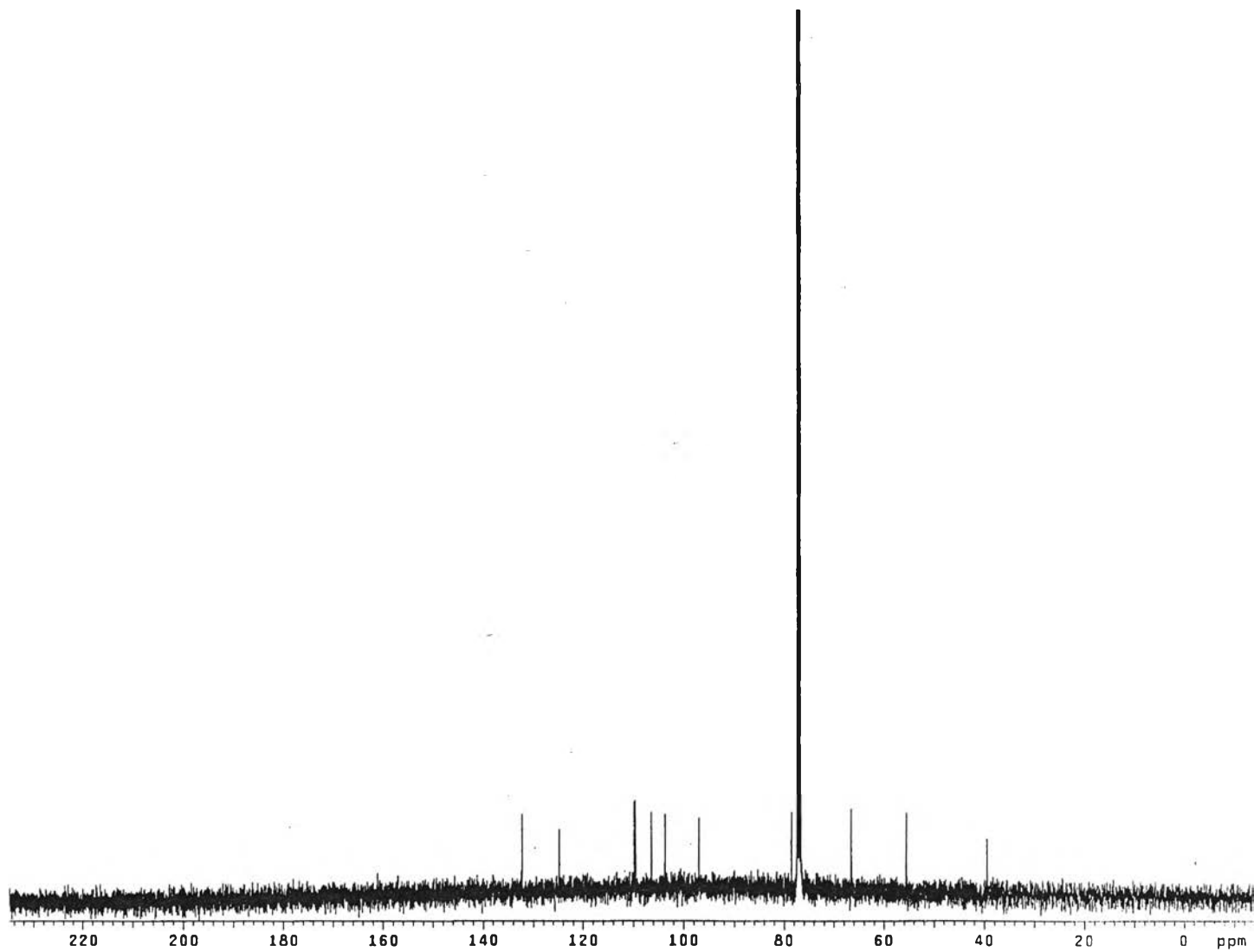


Fig. 37  $^{13}\text{C}$ -NMR spectrum of compound 2

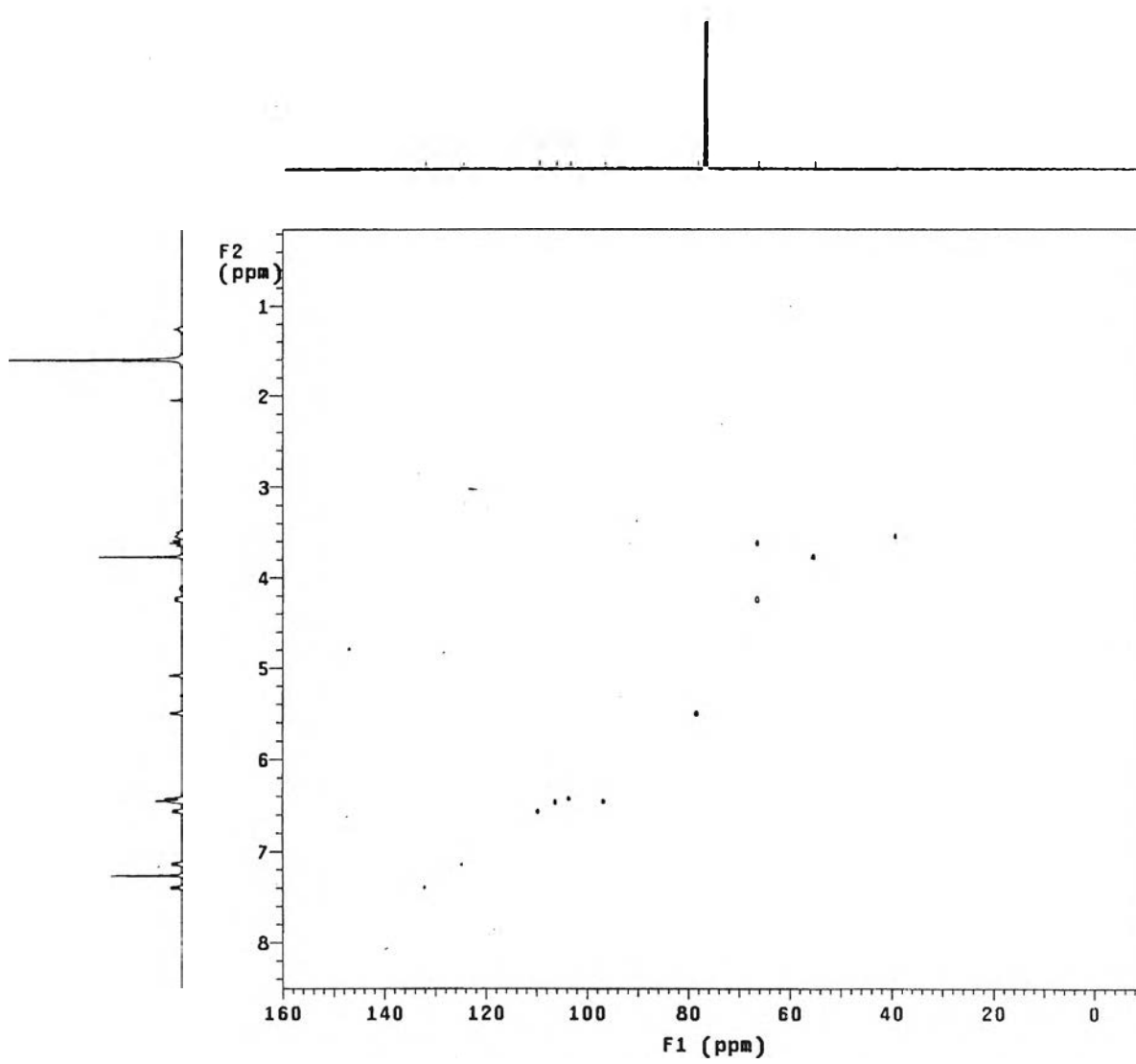


Fig. 38 gHSQC spectrum of compound 2

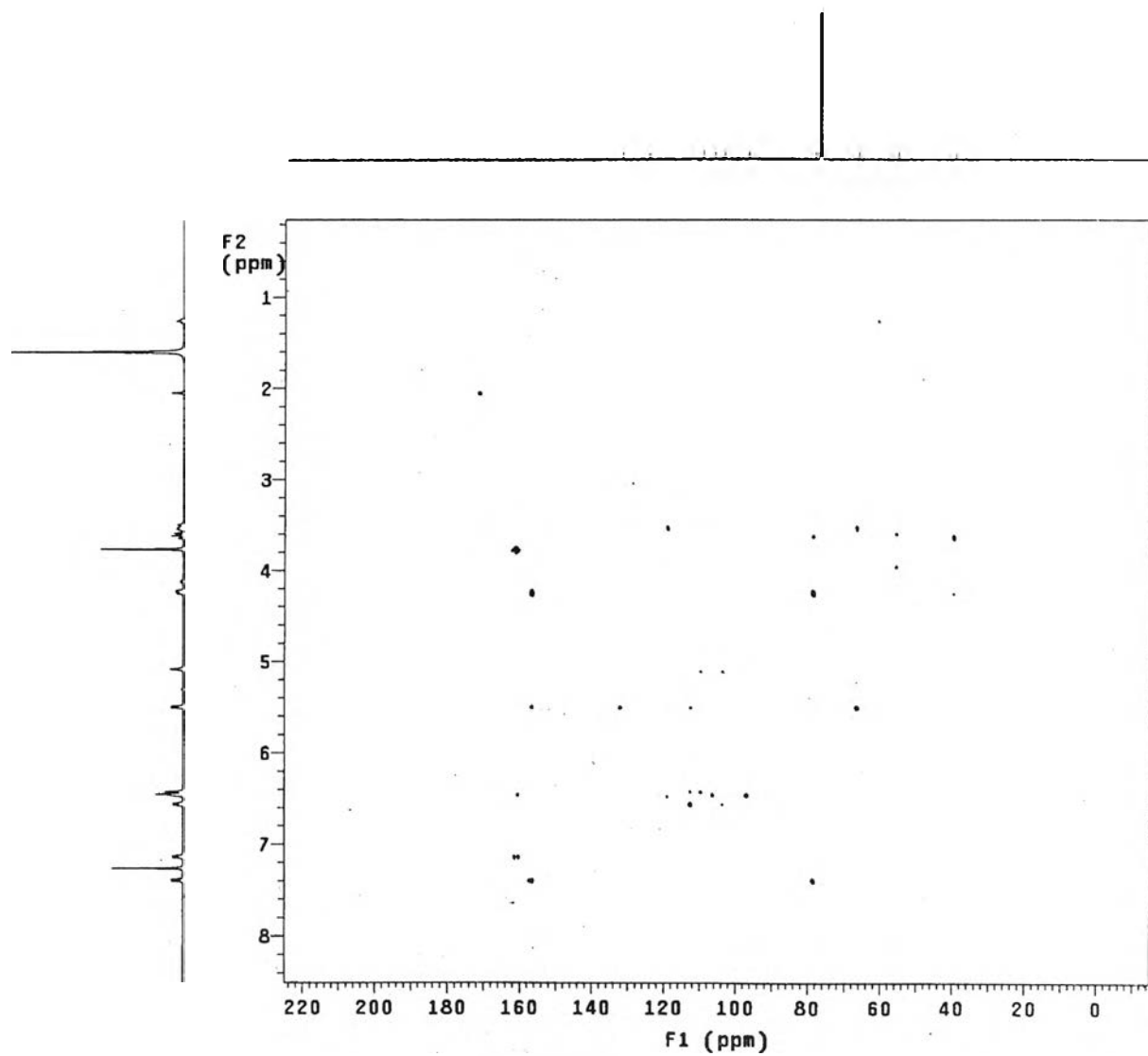


Fig. 39 gHMBC spectrum of compound 2

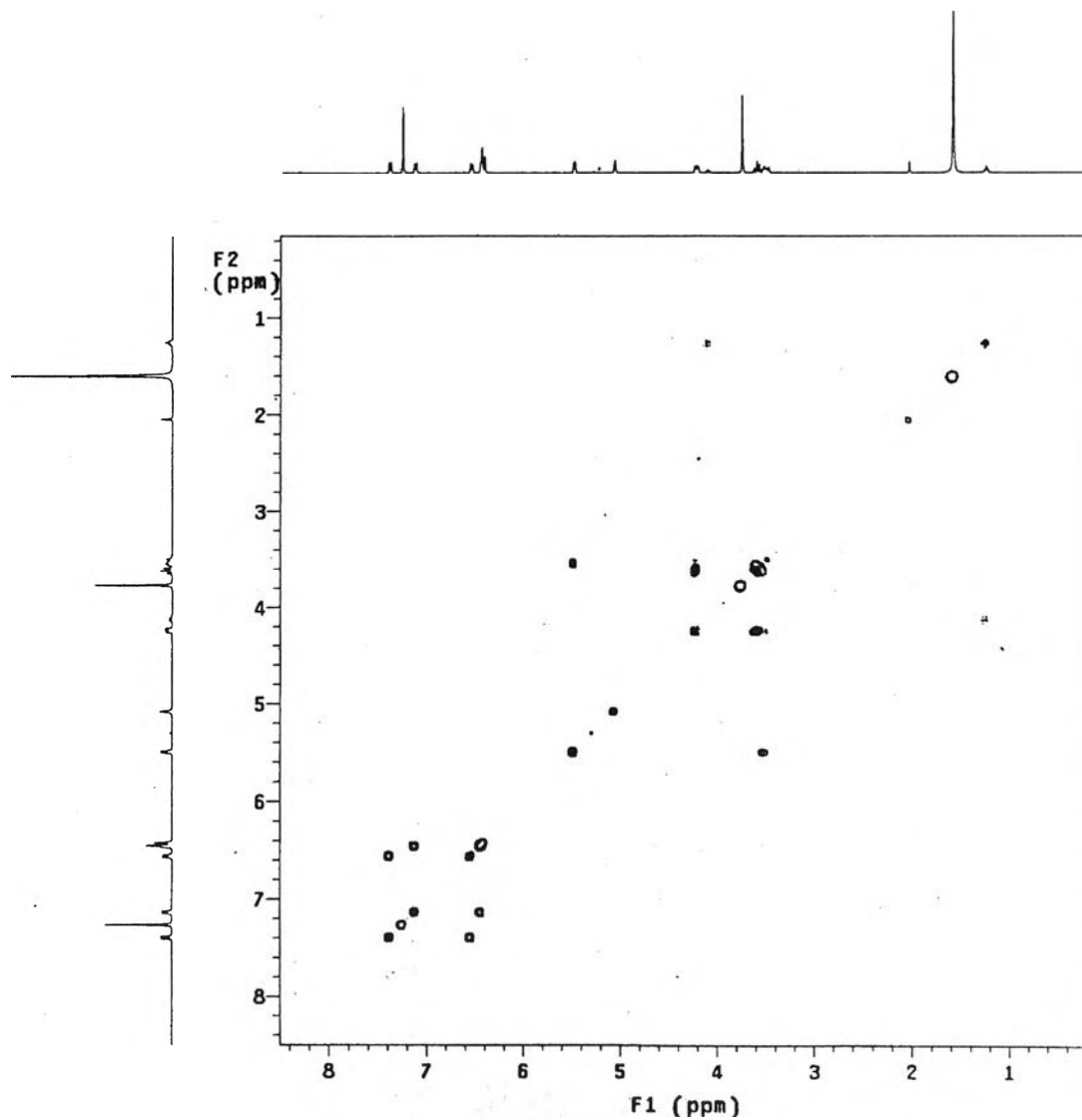


Fig. 40 gCOSY spectrum of compound 2

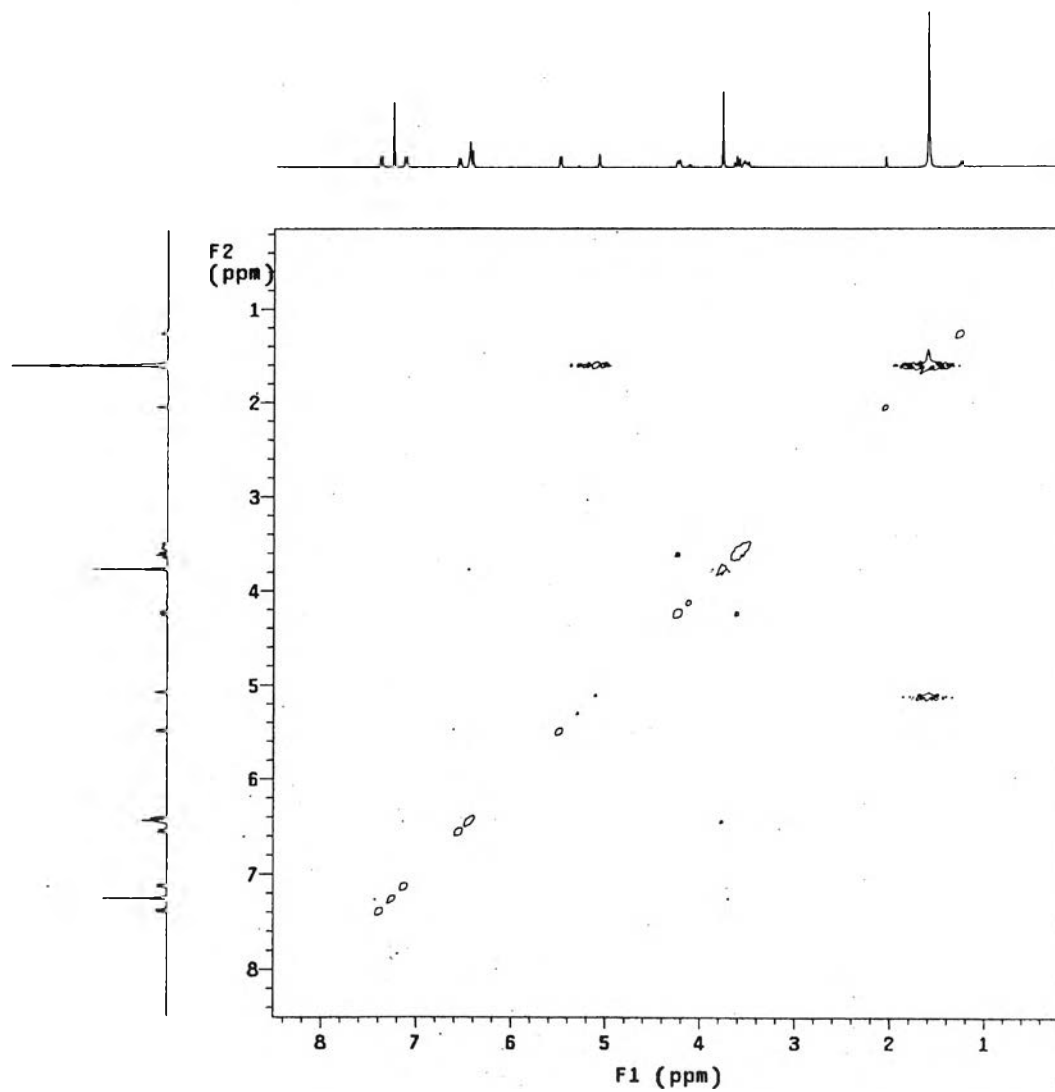


Fig. 41 NOESY spectrum of compound 2

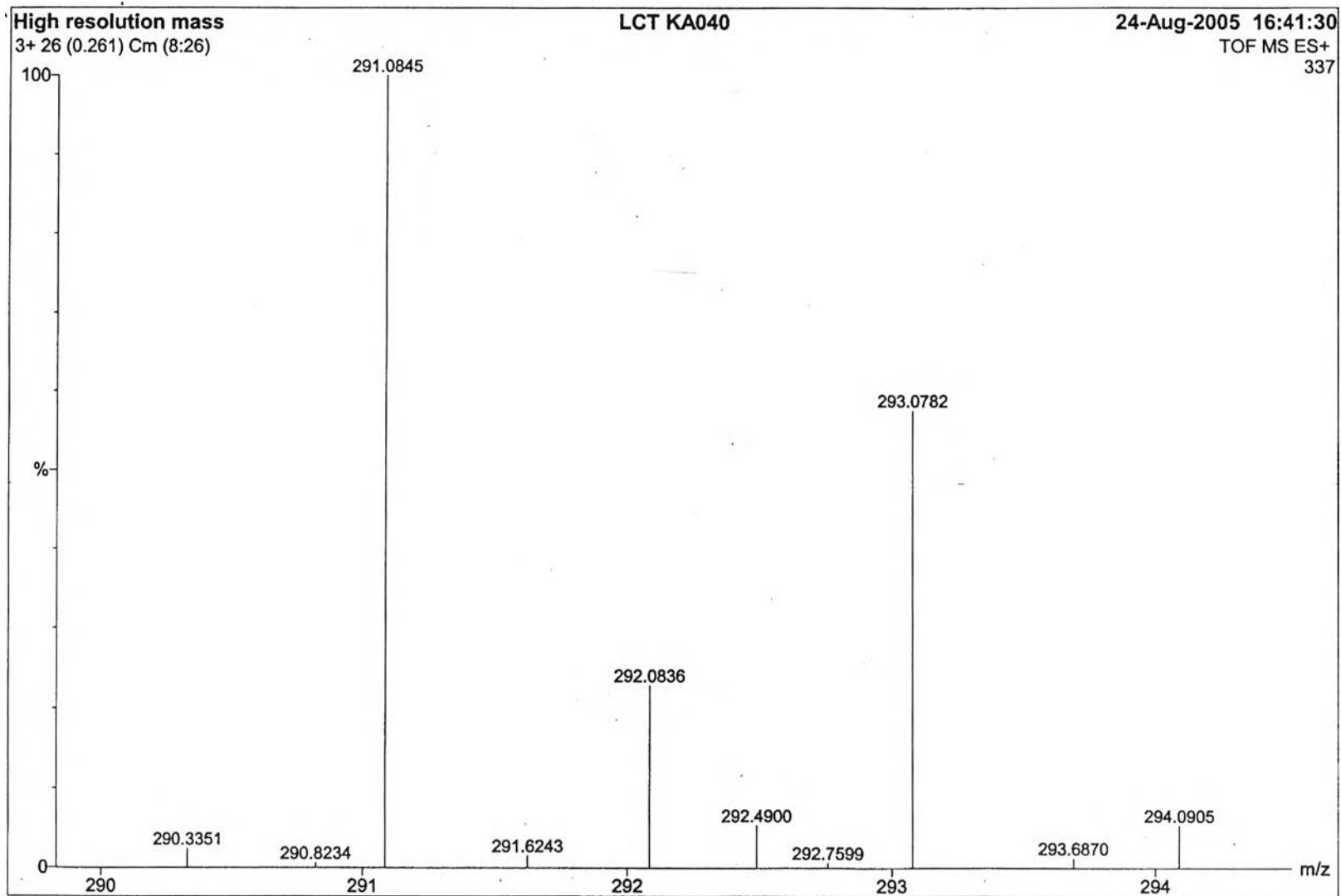


Fig. 42 TOF-MS spectrum of compound 2



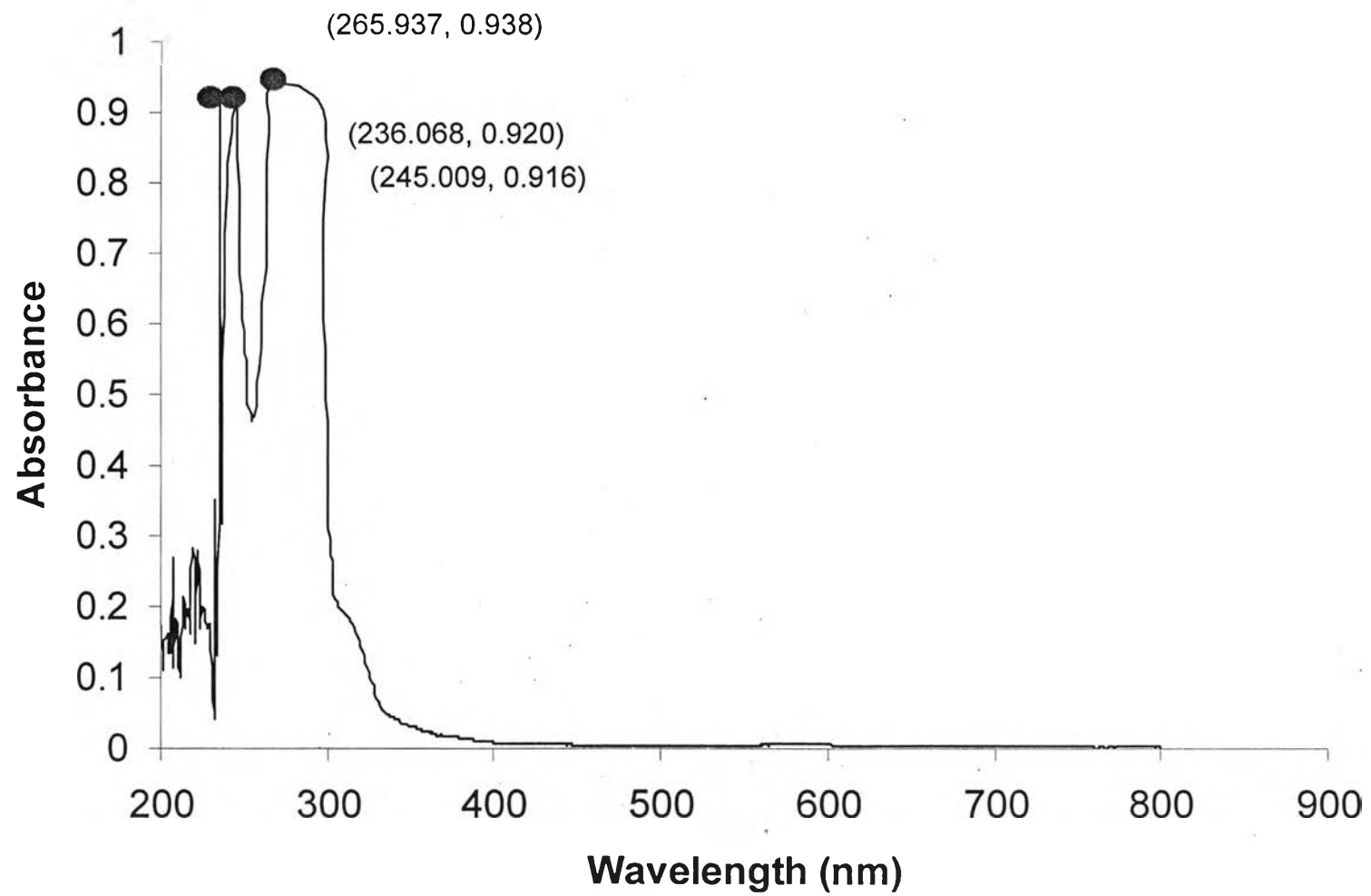


Fig. 43 | UV spectrum of compound 2

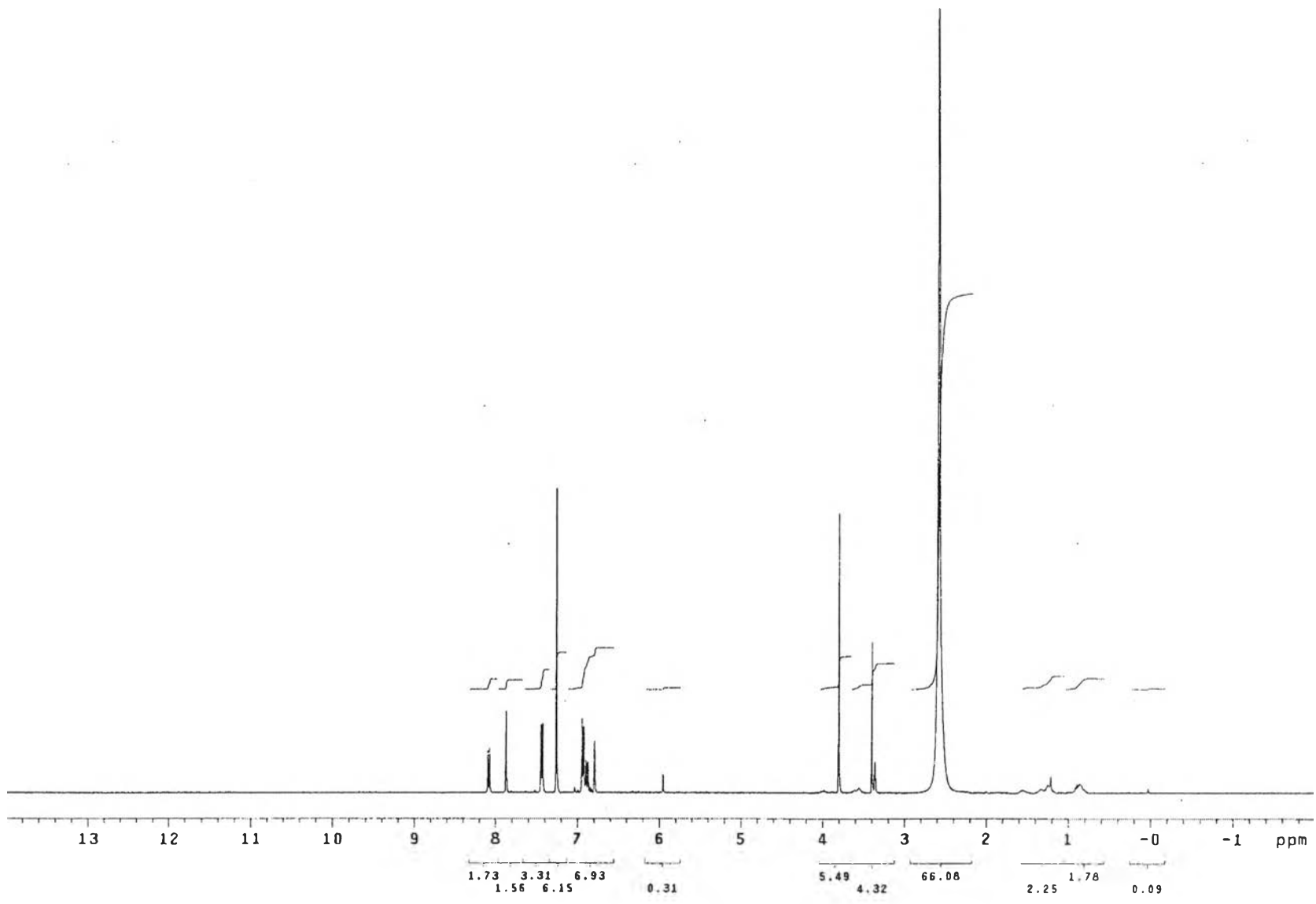


Fig. 44  $^1\text{H-NMR}$  spectrum of compound 3

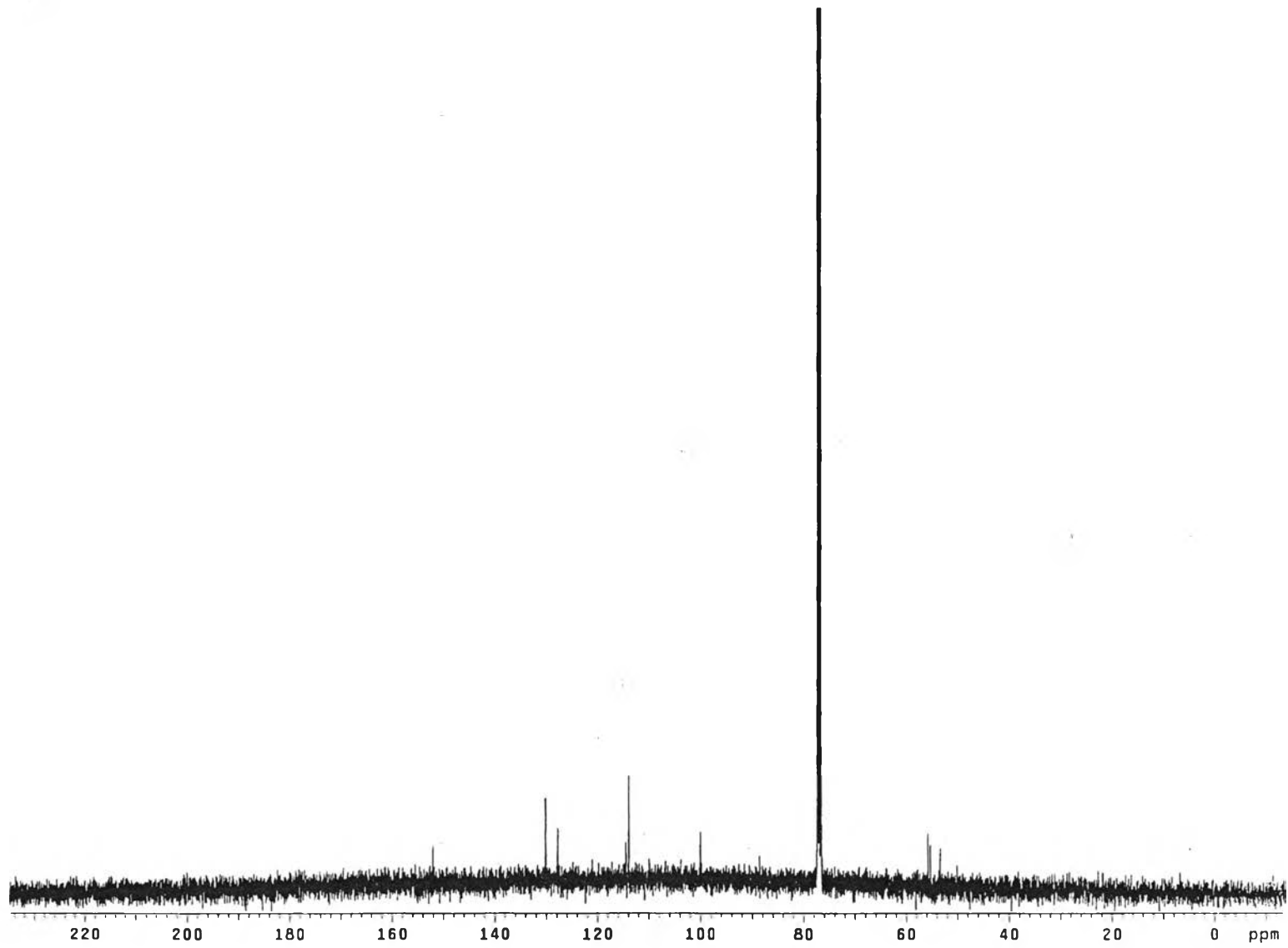


Fig . 45  $^{13}\text{C}$ -NMR spectrum of compound 3

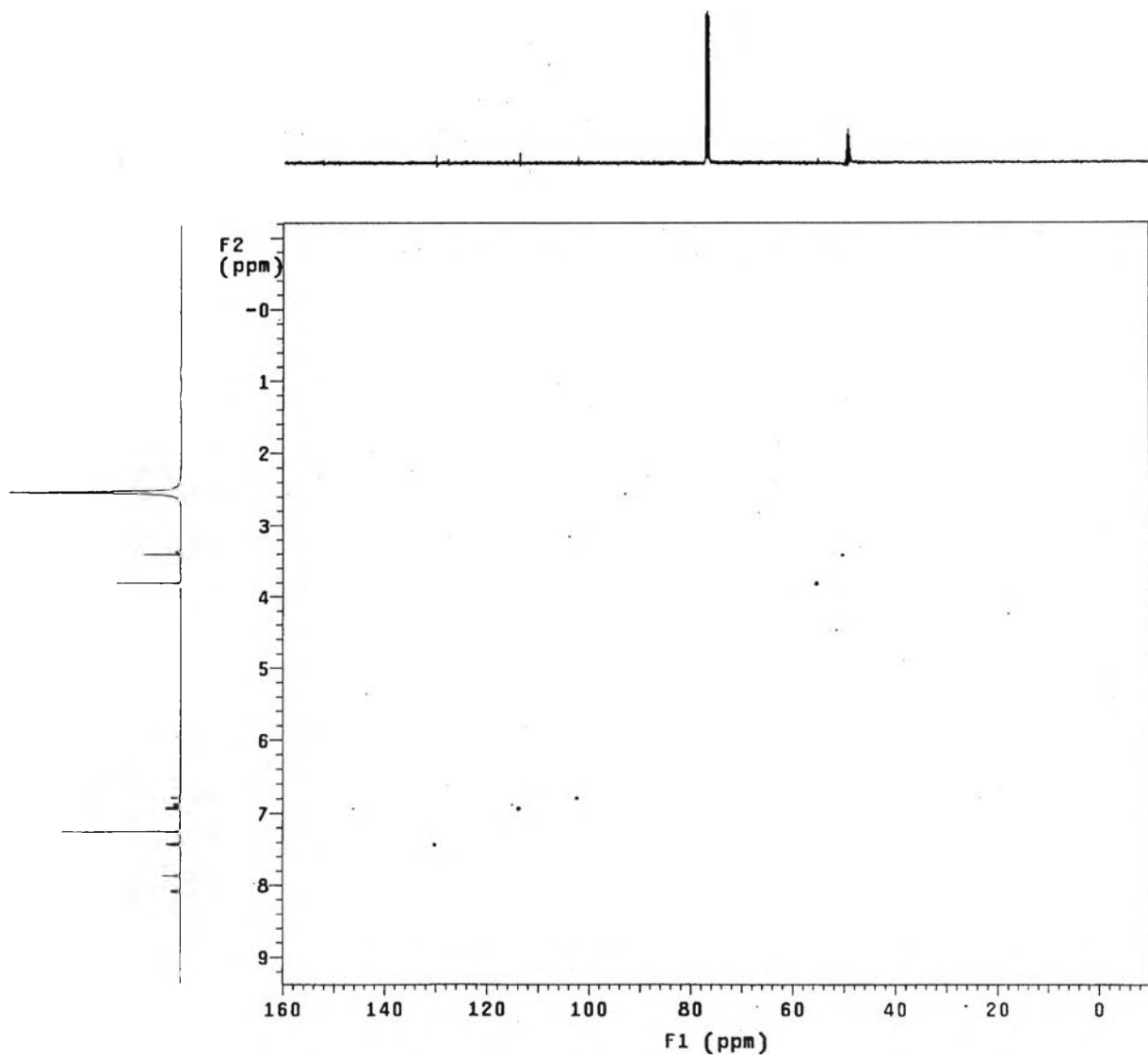


Fig. 46 gHSQC spectrum of compound 3

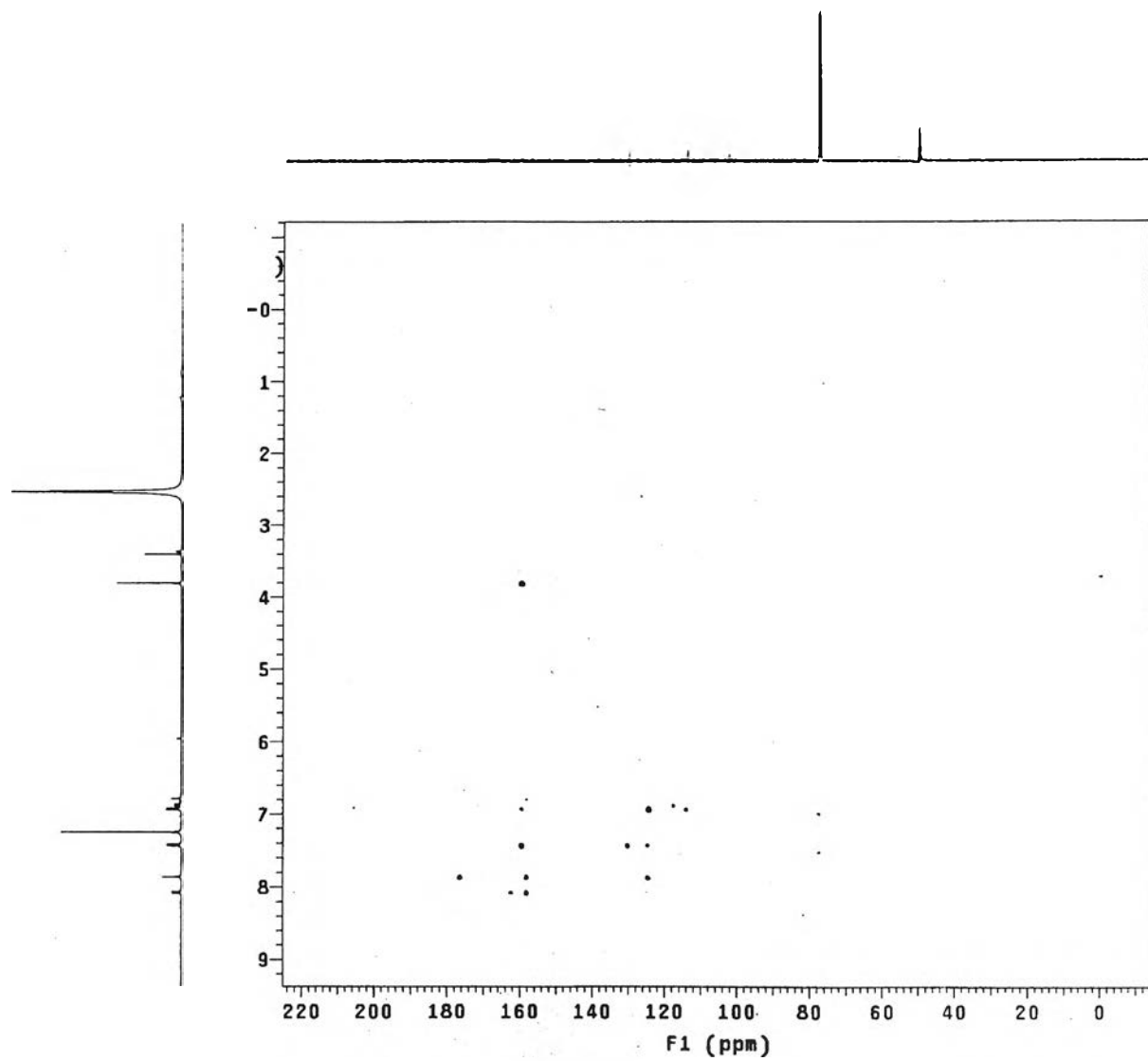


Fig. 47 gHMBC spectrum of compound 3

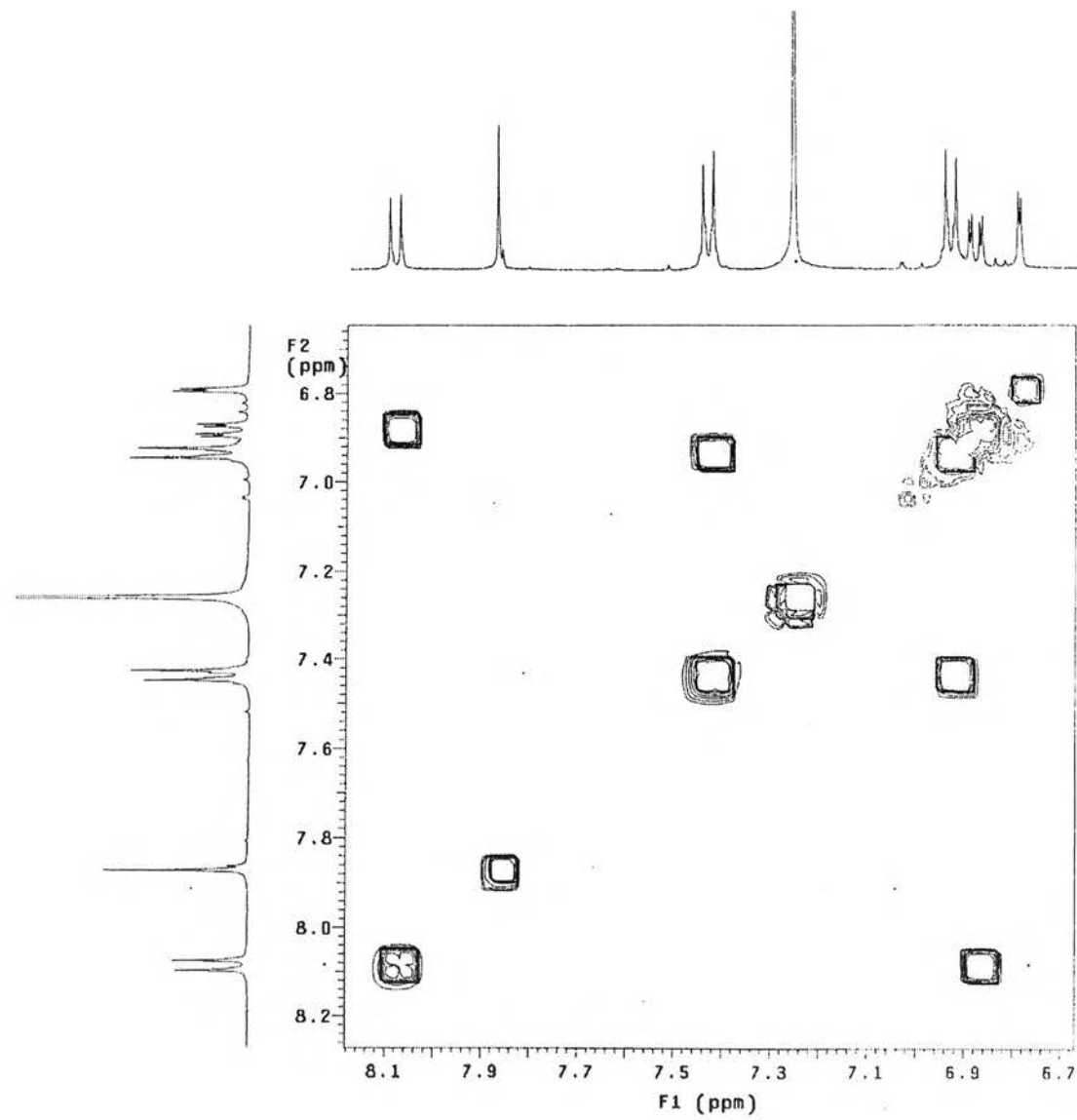


Fig. 48 gCOSY spectrum of compound 3

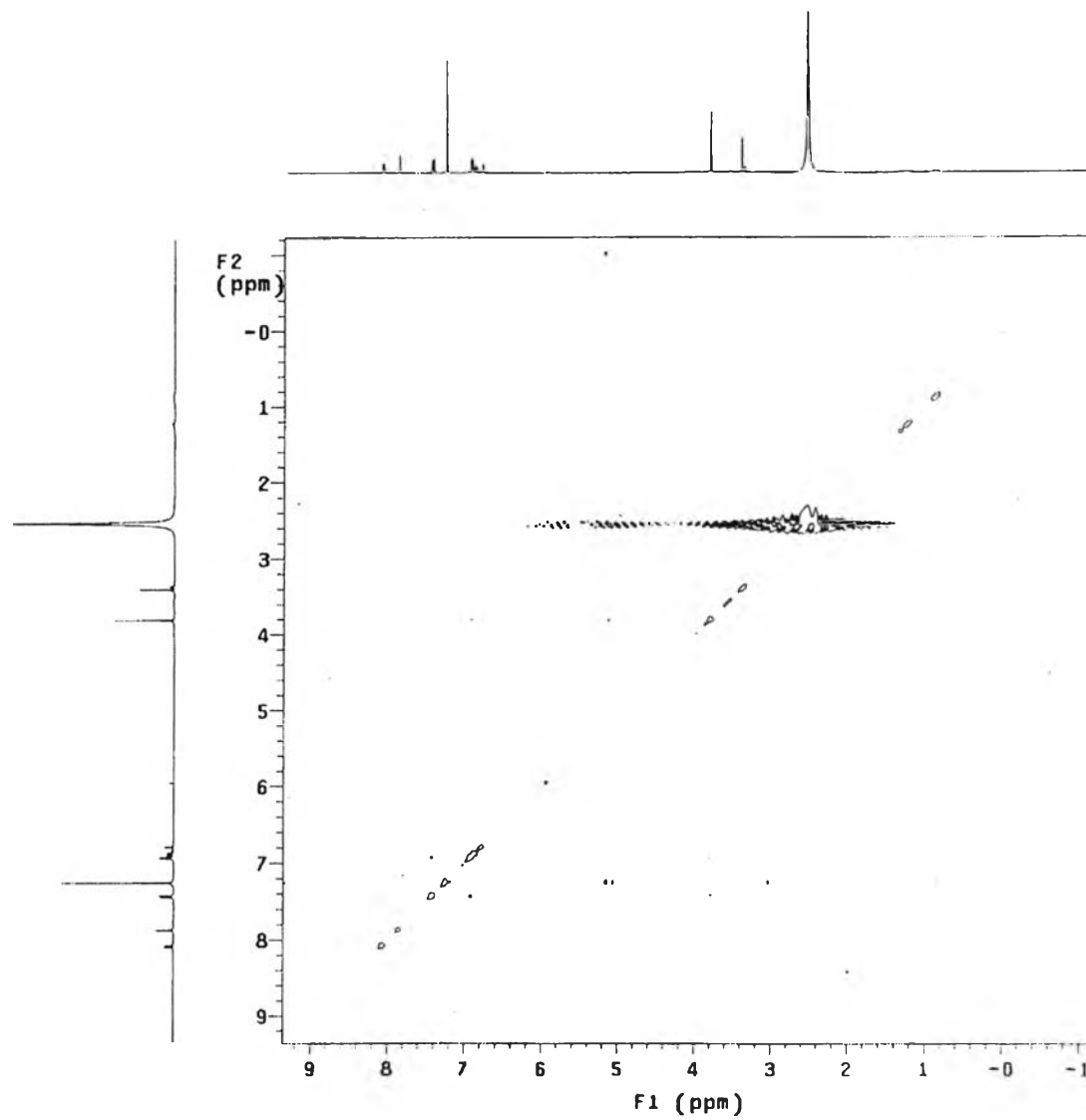


Fig. 49 NOESY spectrum of compound 3

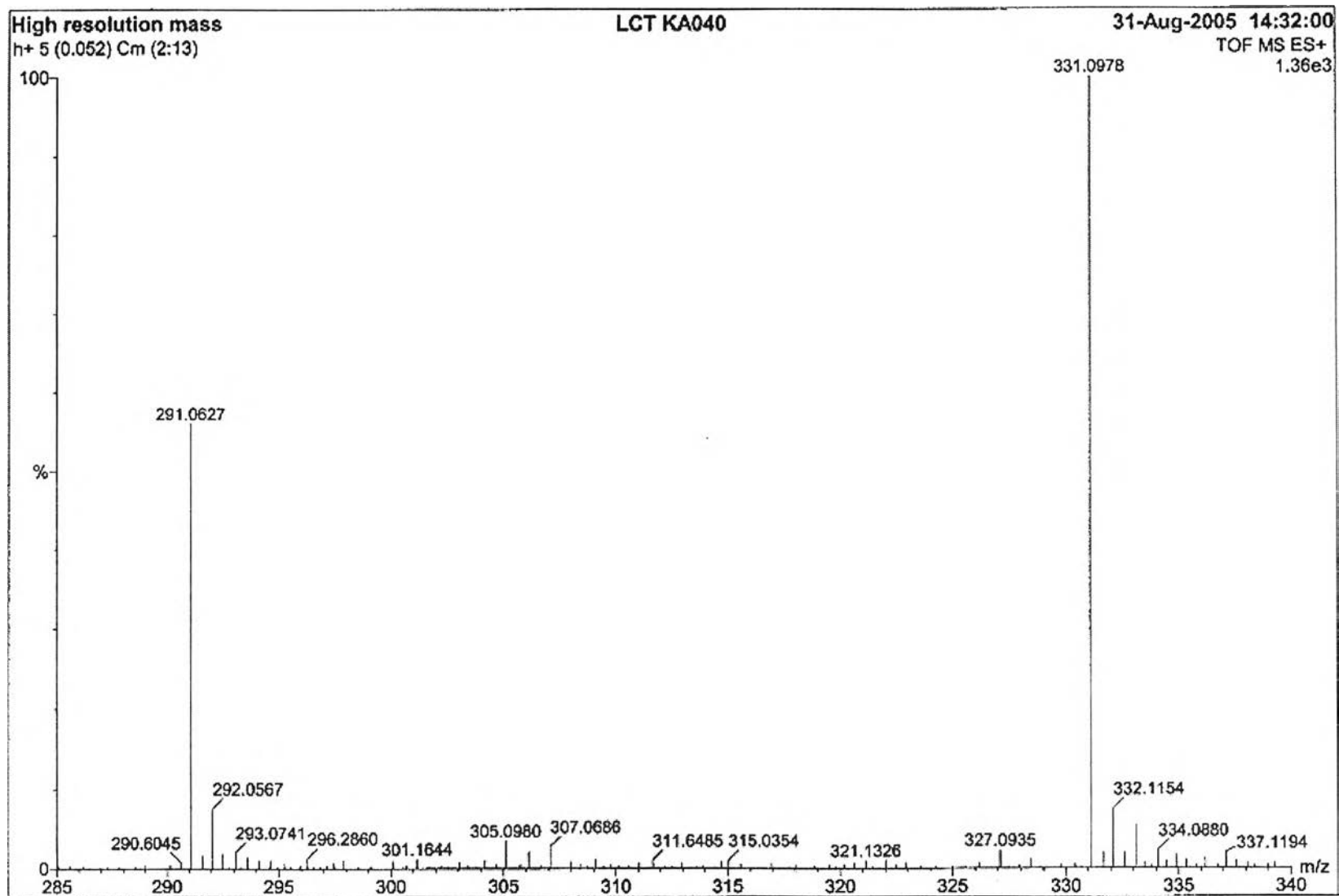


Fig. 50 TOF-MS spectrum of compound 3



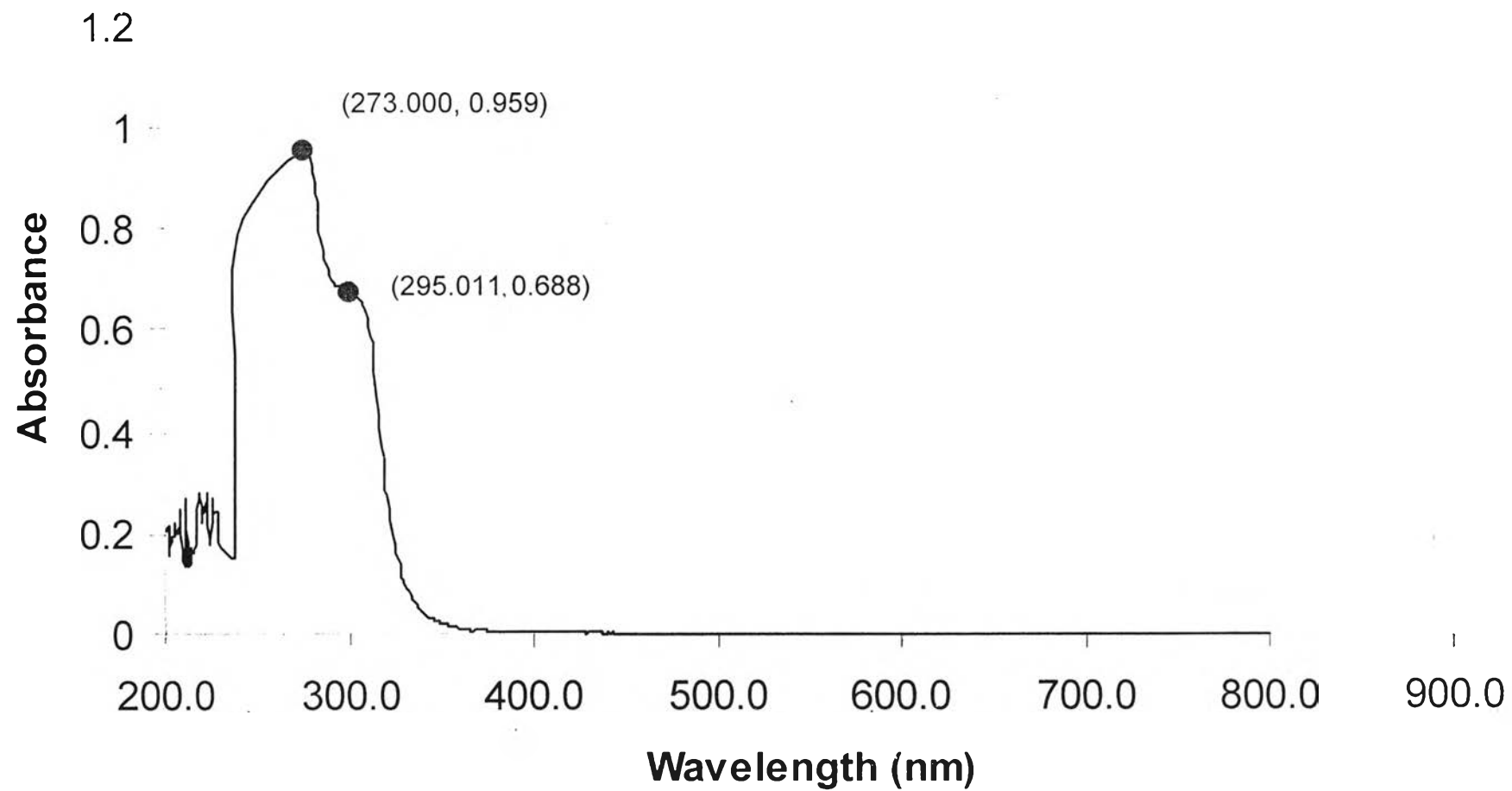


Fig . 51 UV spectrum of compound 3

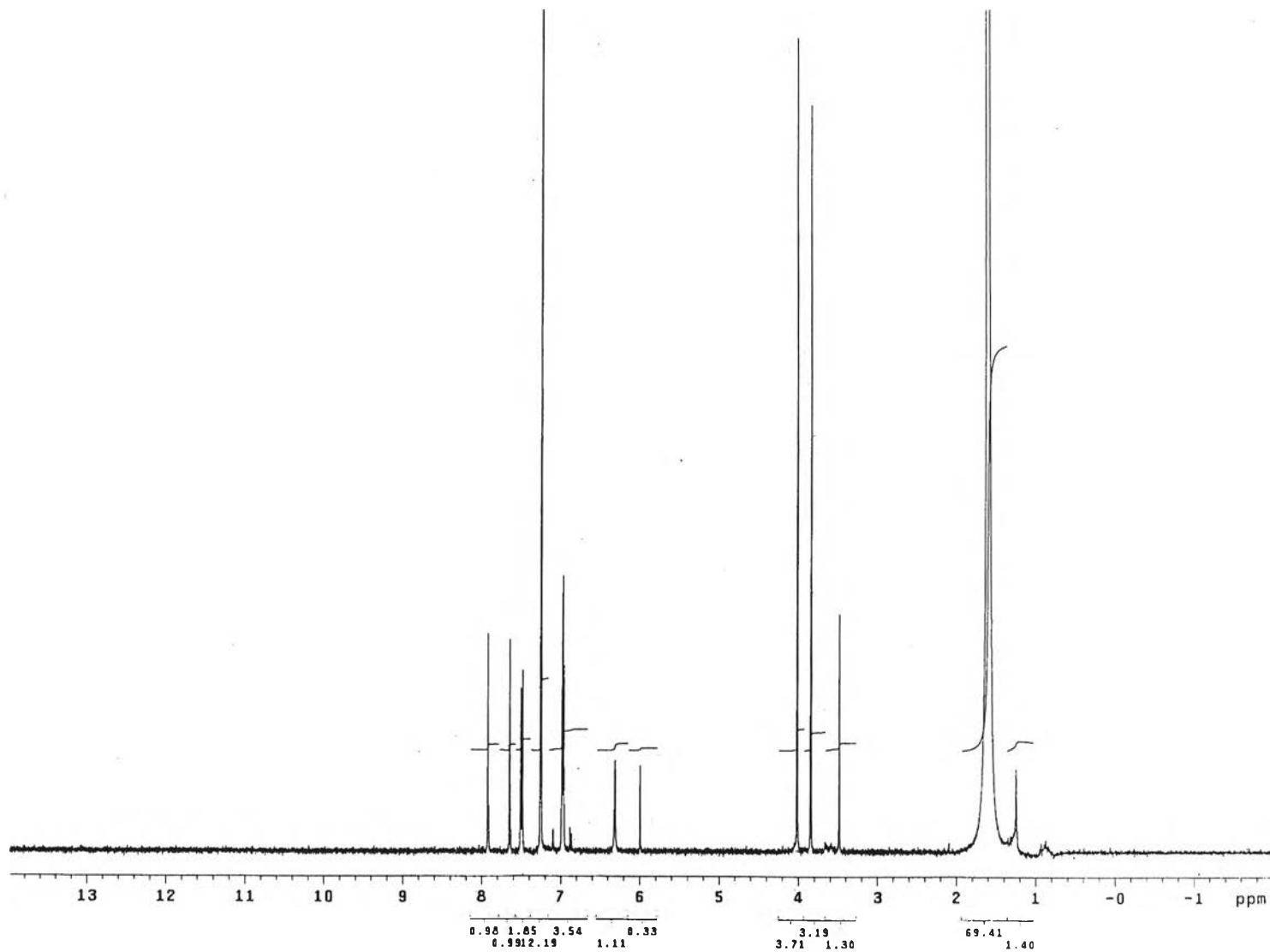


Fig. 52  $^1\text{H-NMR}$  spectrum of compound 4

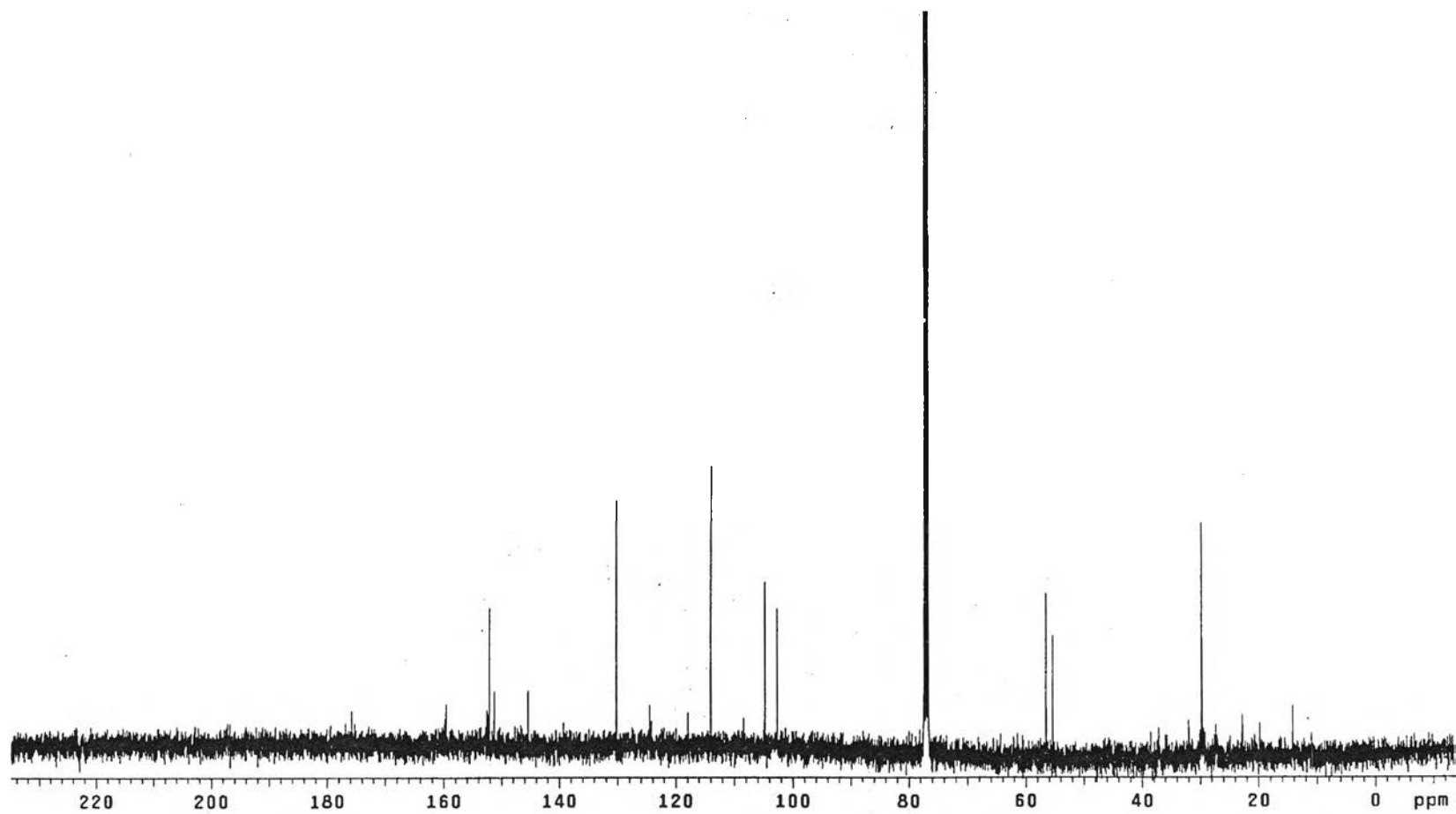


Fig. 53  $^{13}\text{C}$ -NMR spectrum of compound 4

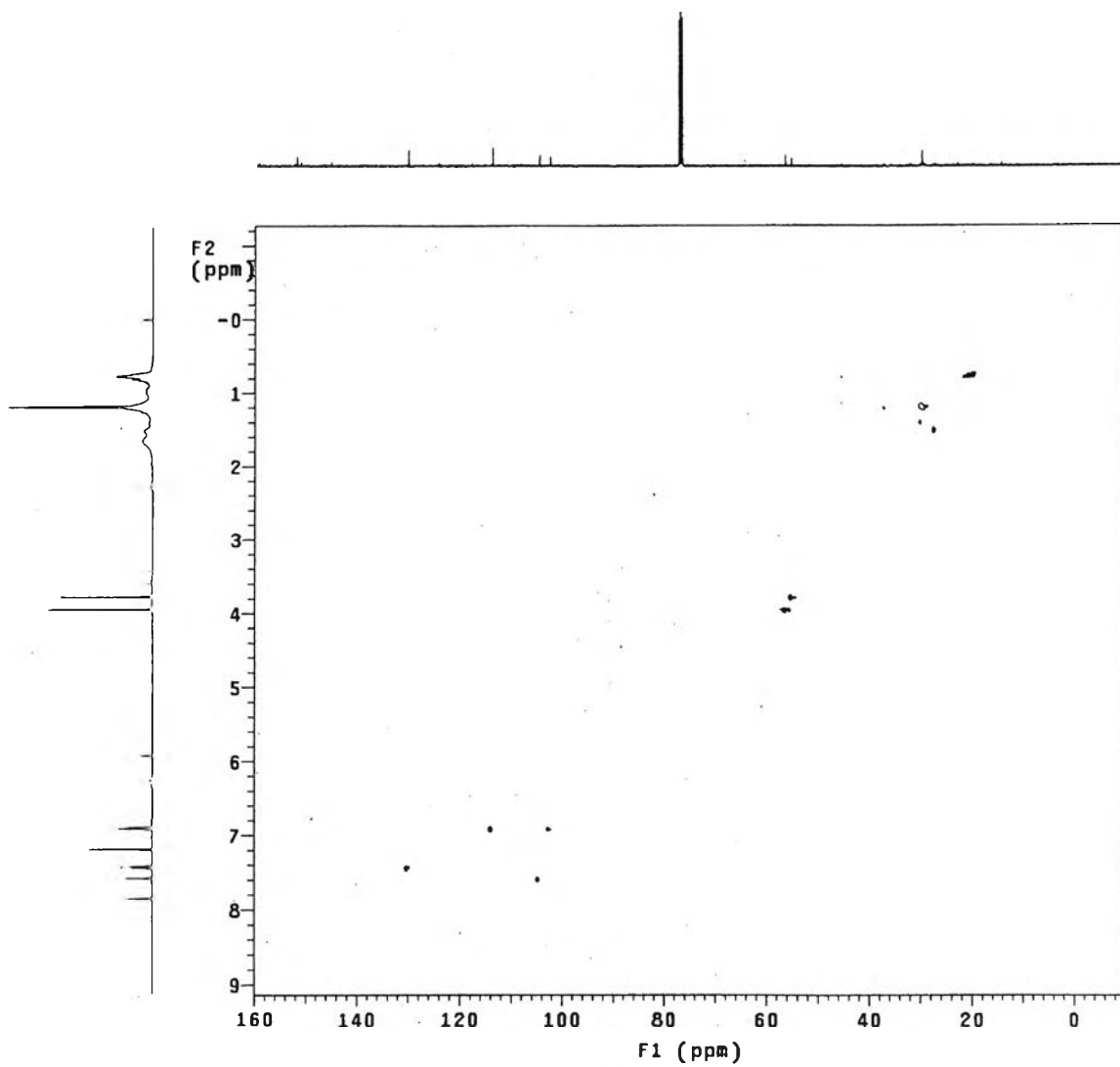


Fig. 54 gHSQC spectrum of compound 4

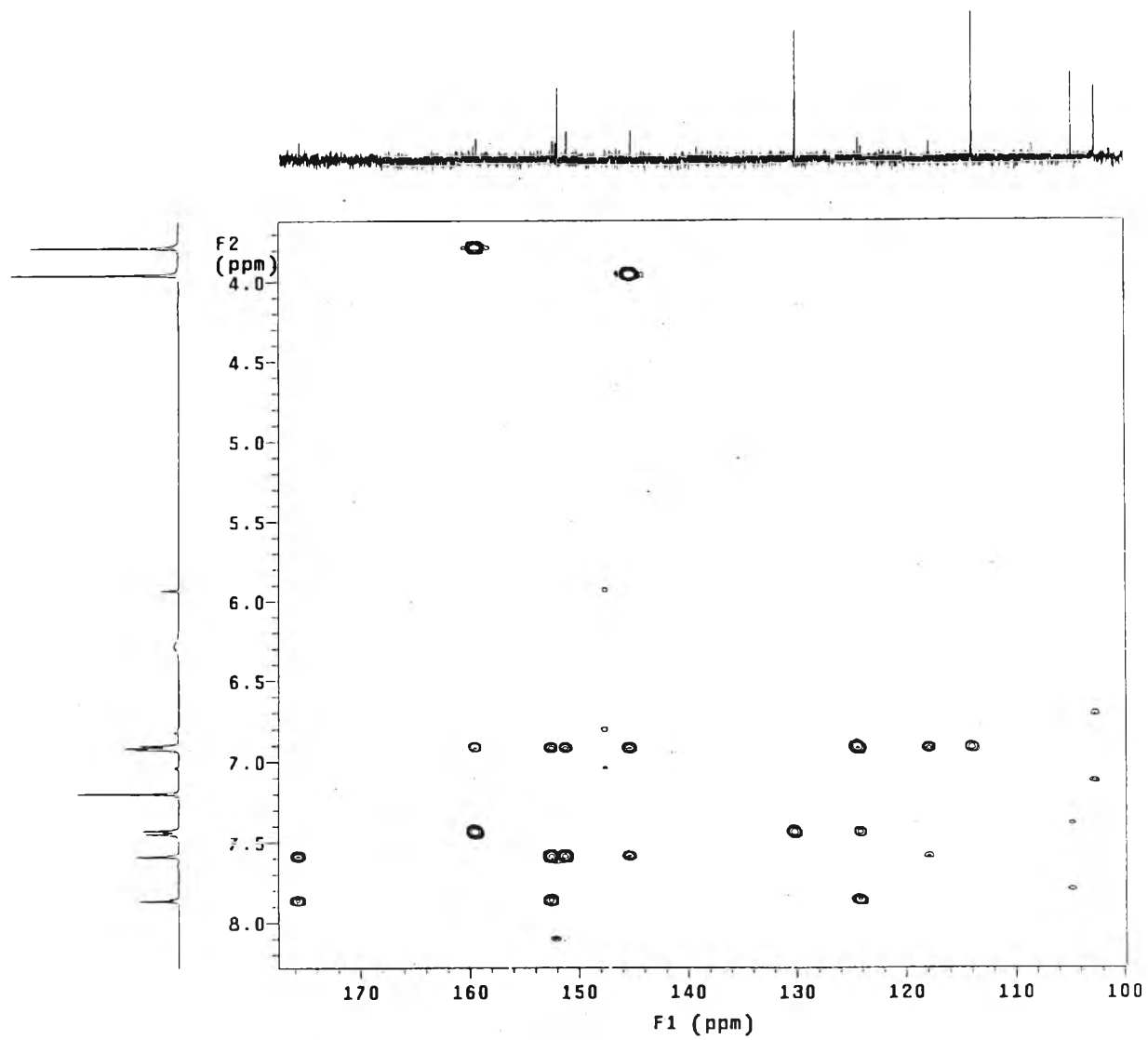


Fig. 55 gHMBC spectrum of compound 4

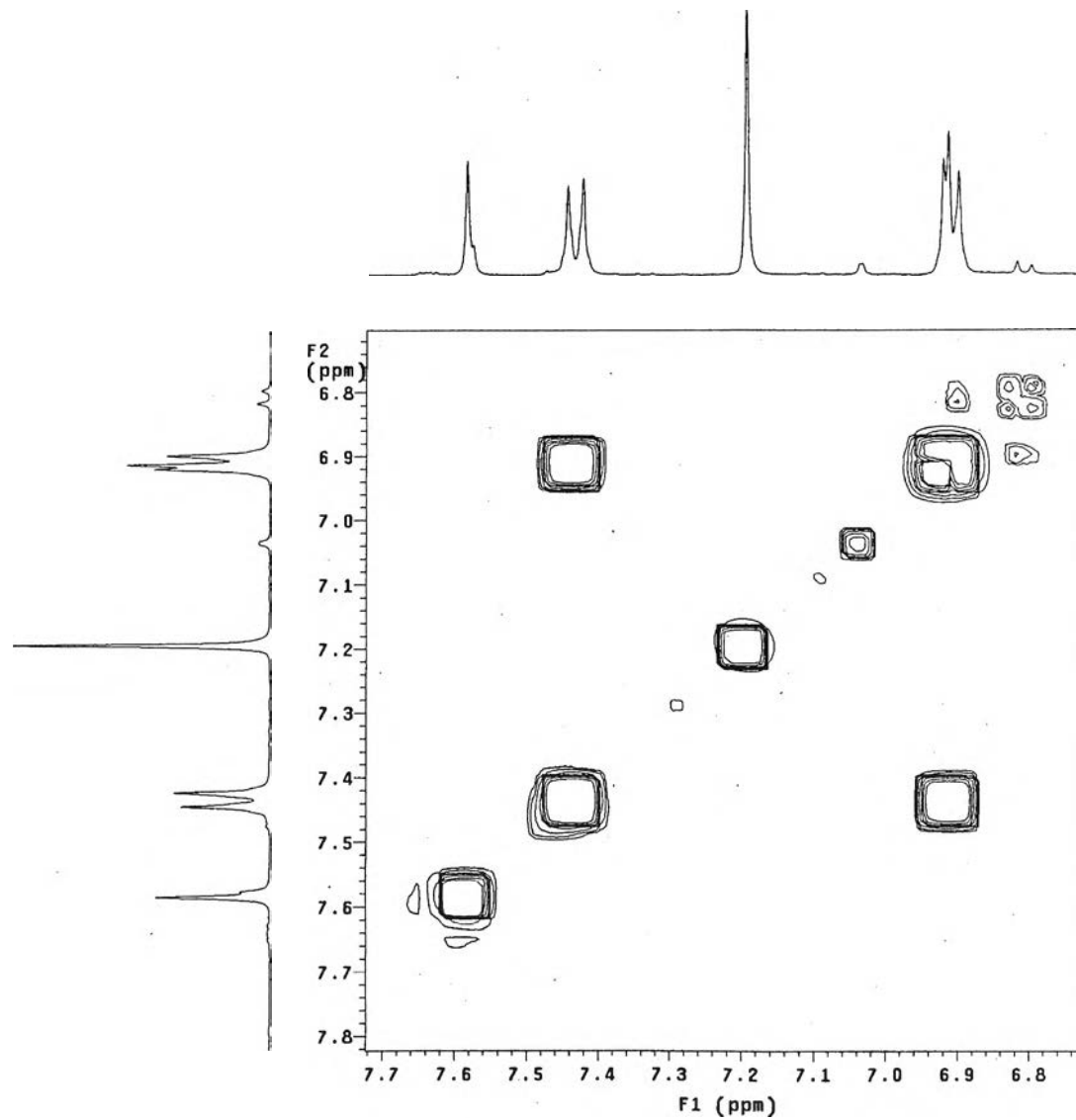


Fig. 56 gCOSY spectrum of compound 4

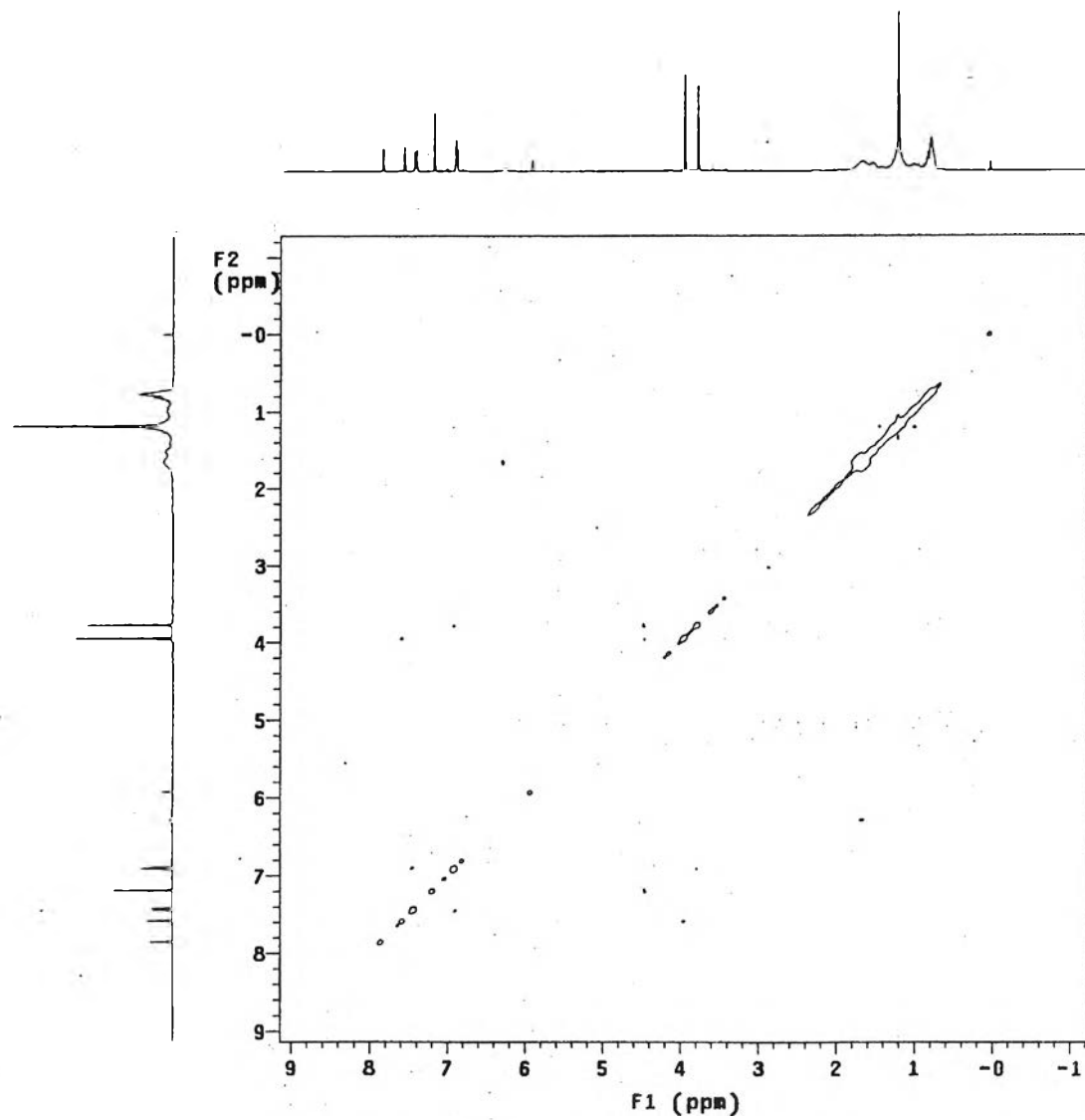


Fig. 57 NOESY spectrum of compound 4

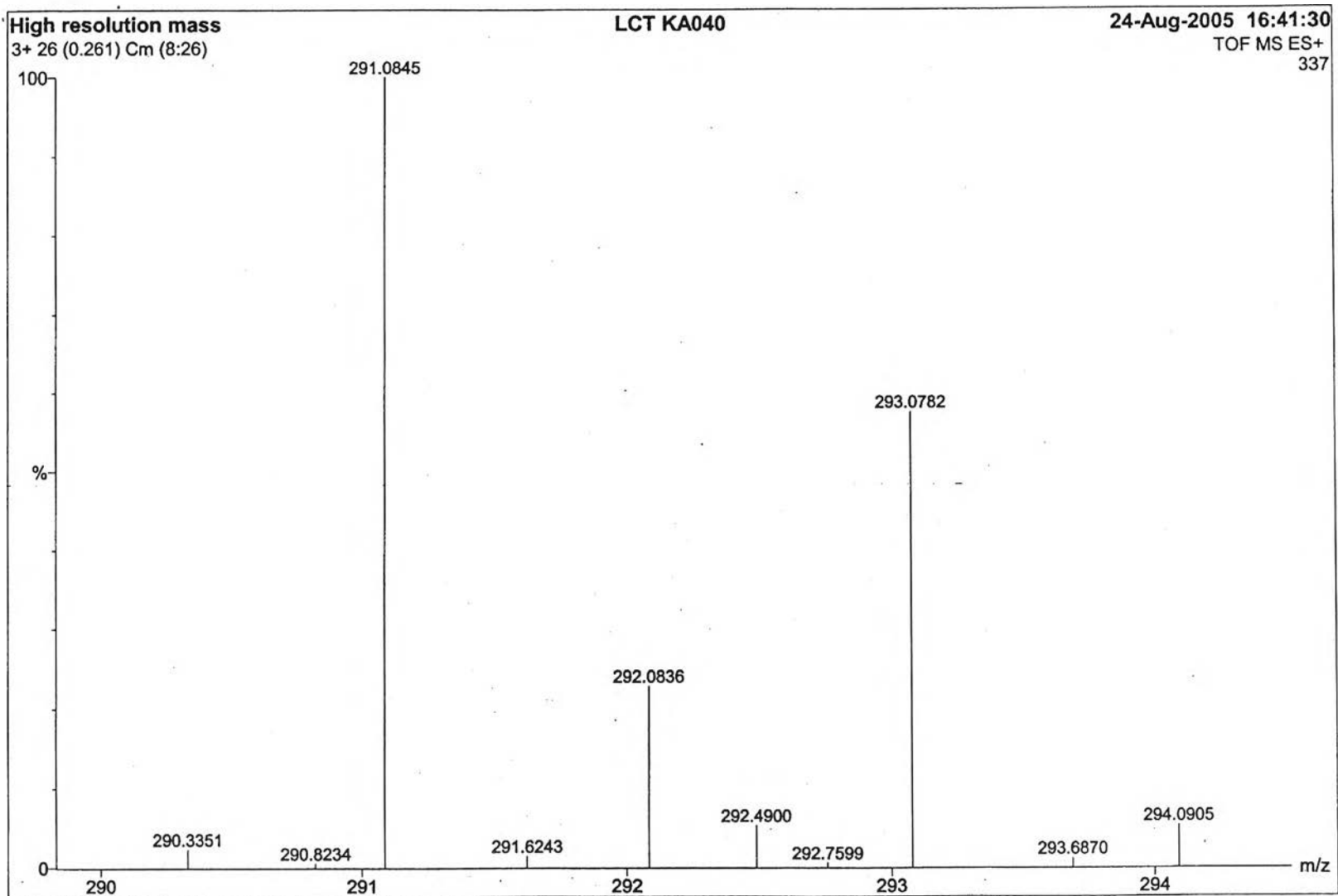


Fig. 58 TOF-MS spectrum of compound 4



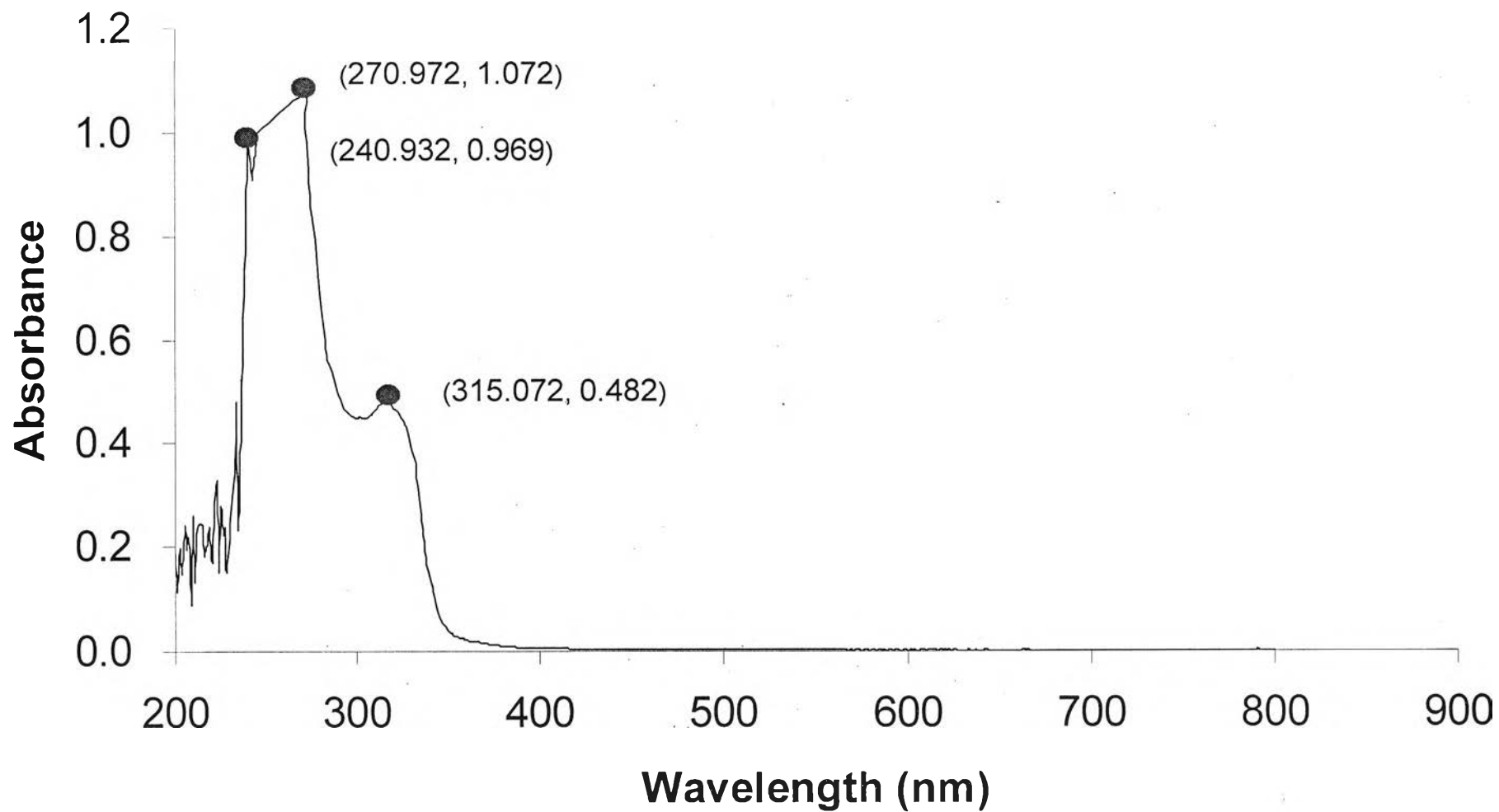


Fig. 59 UV spectrum of compound 4

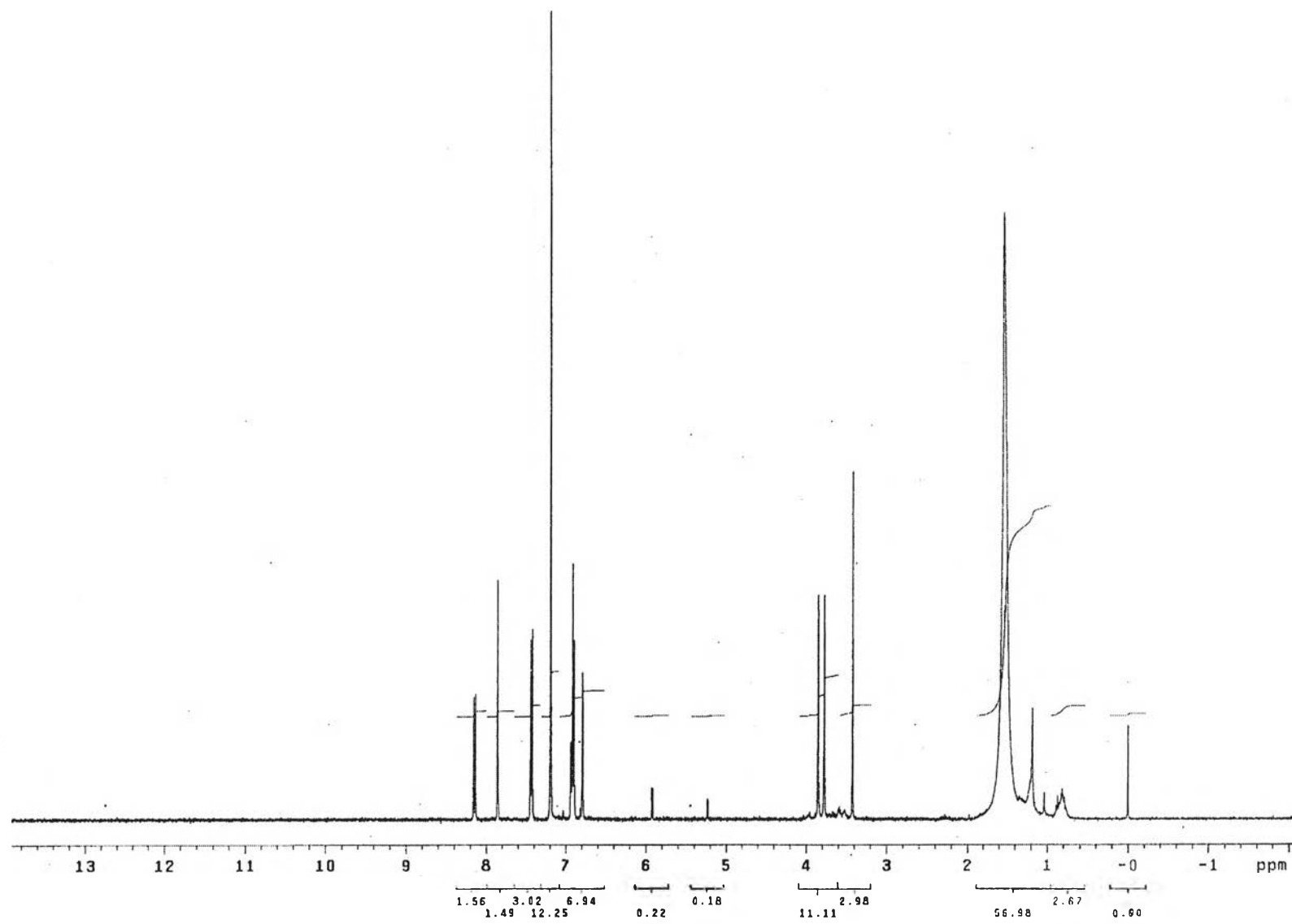


Fig. 60  $^1\text{H-NMR}$  spectrum of compound 5

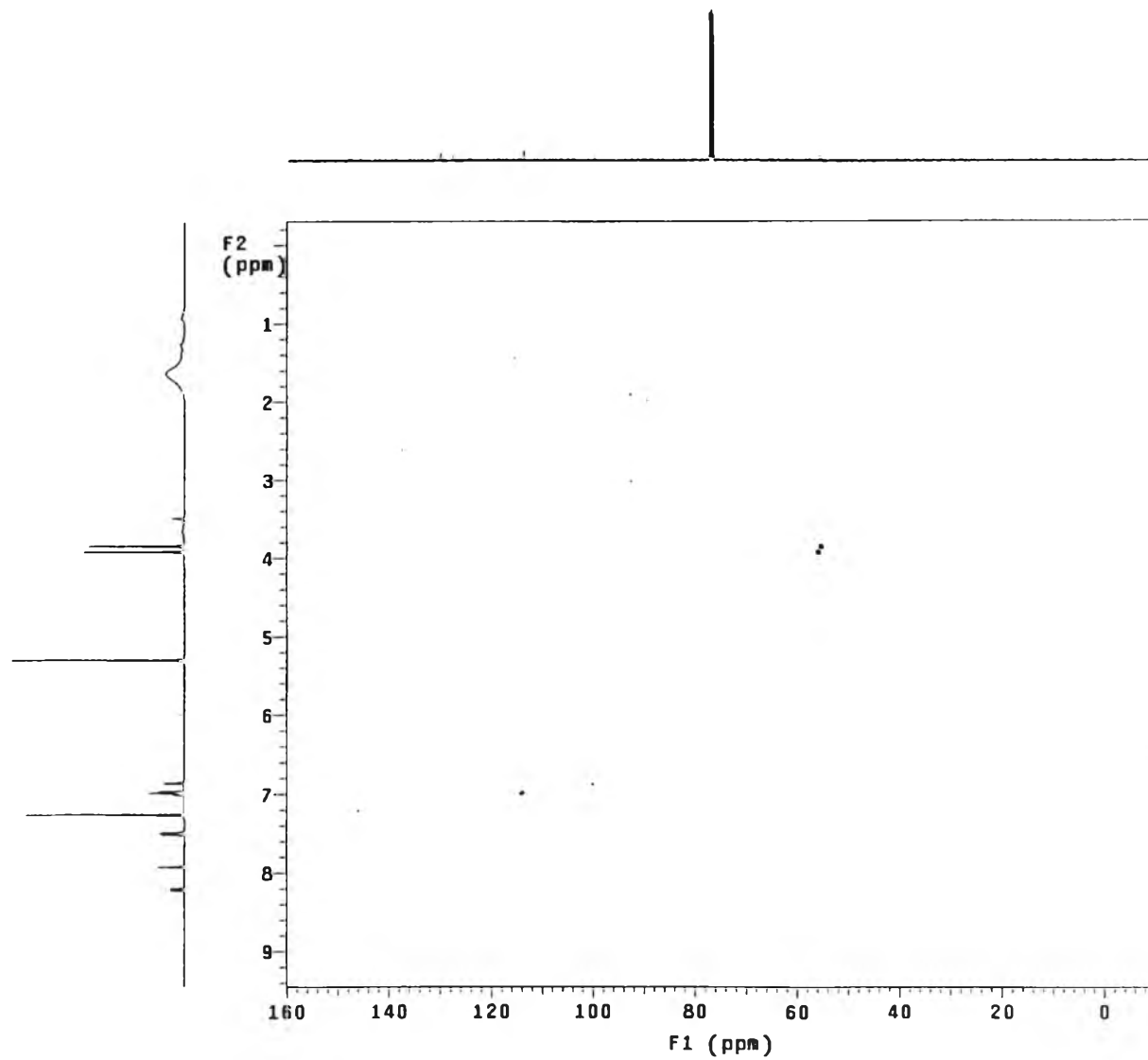


Fig. 62 gHSQC spectrum of compound 5

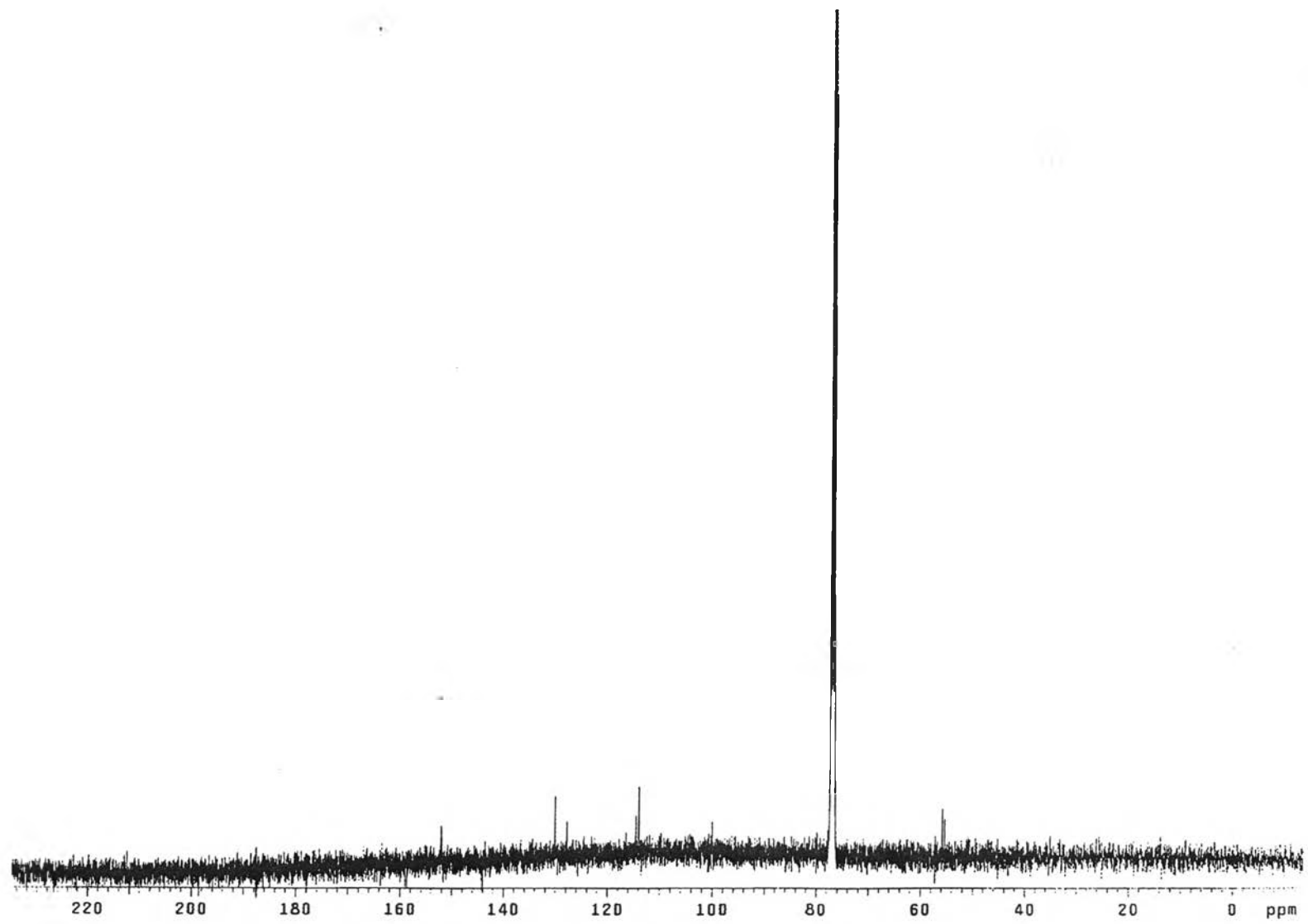


Fig. 61  $^{13}\text{C}$ -NMR spectrum of compound 5

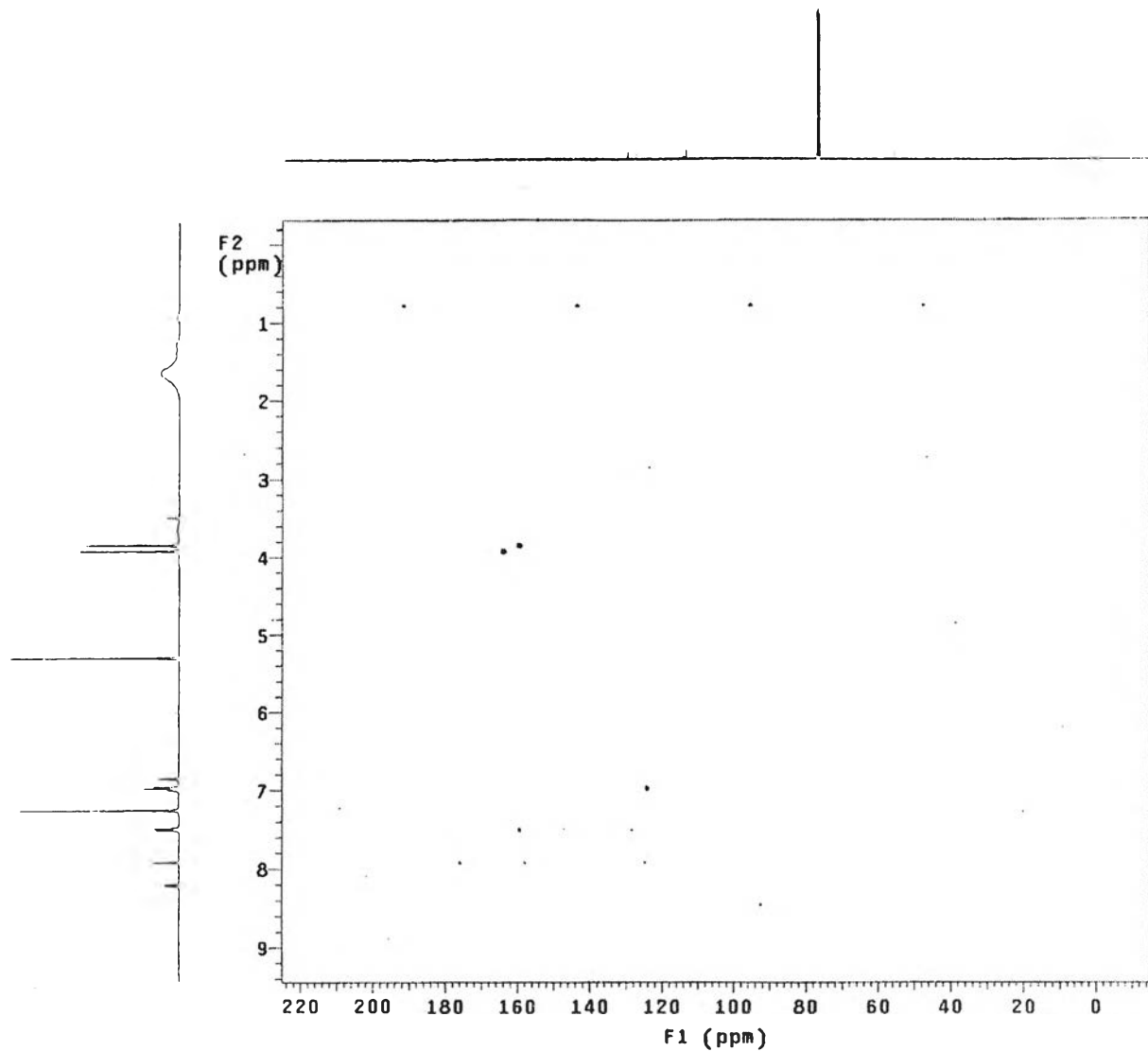


Fig. 63 gHMBC spectrum of compound 5

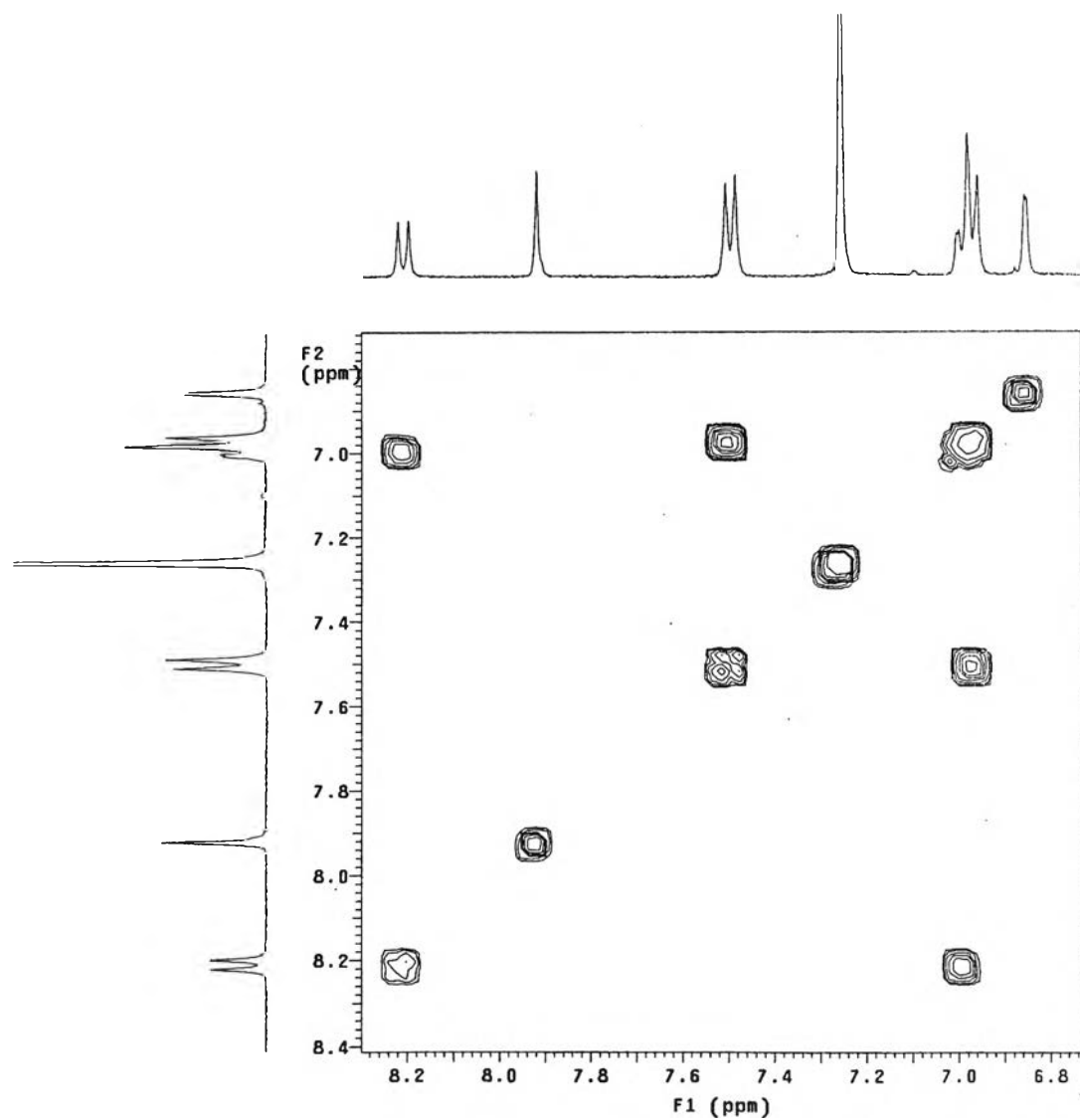


Fig. 64 gCOSY spectrum of compound 5

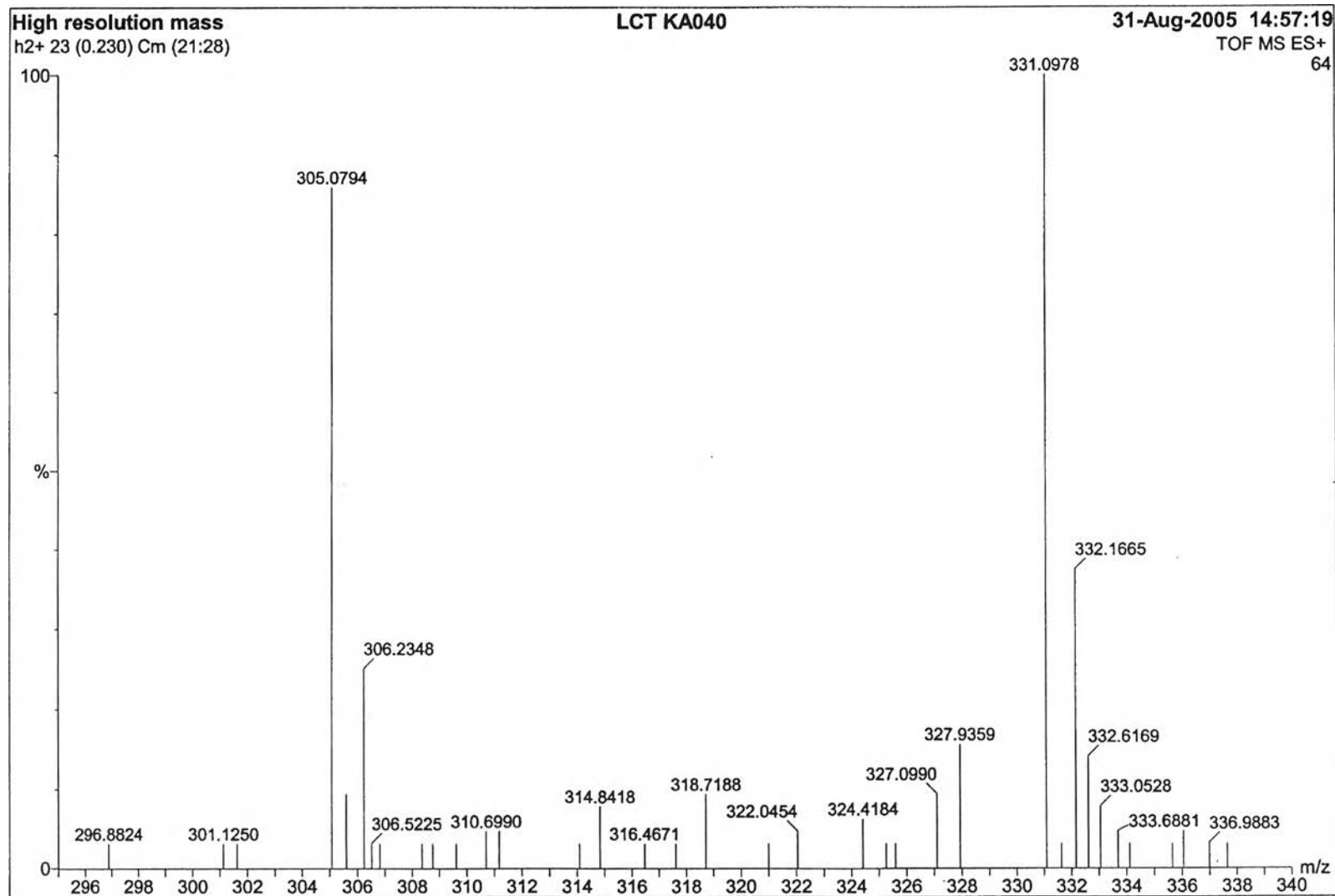


Fig. 65 TOF-MS spectrum of compound 5

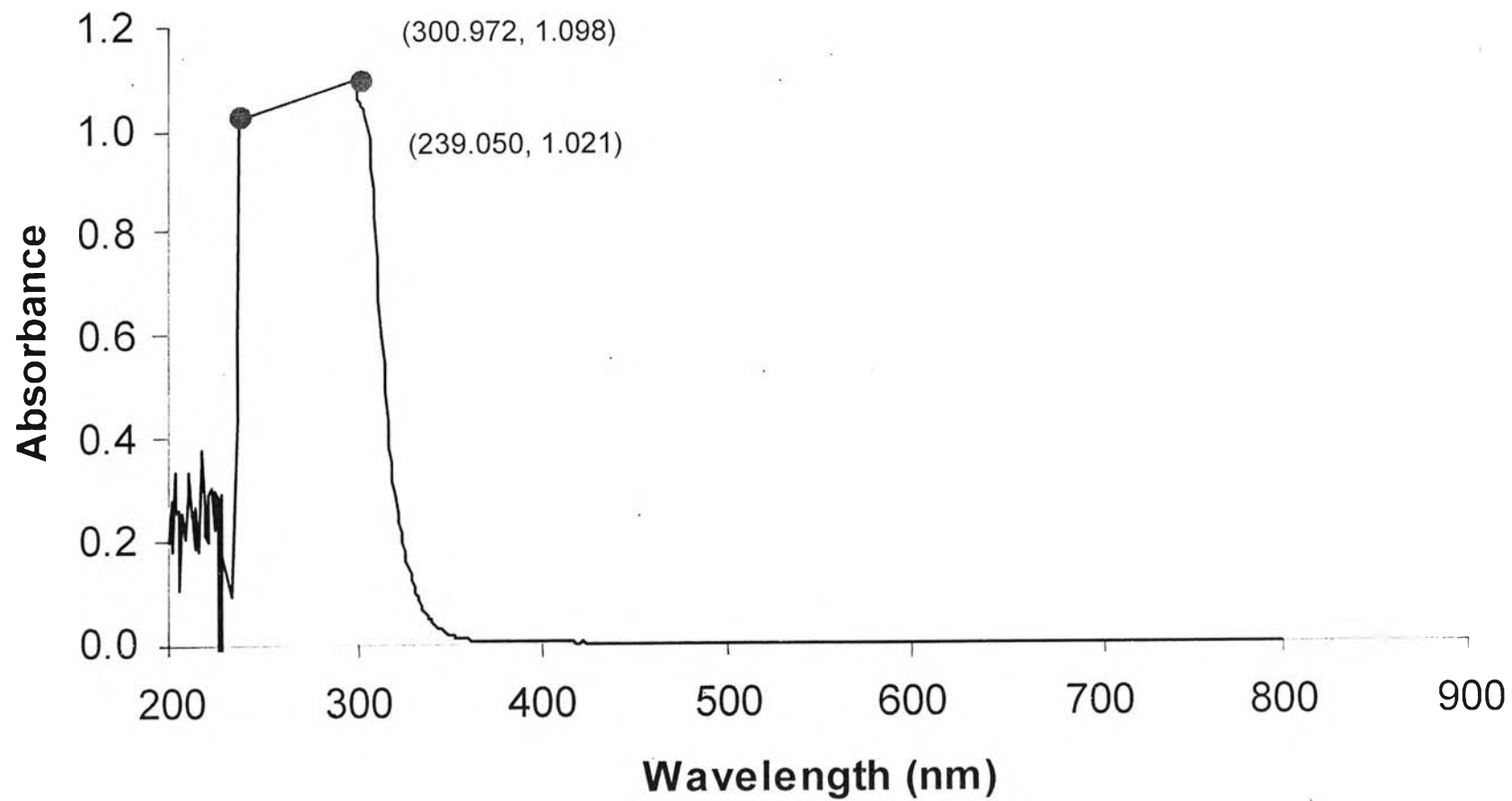


Fig. 66 UV spectrum of compound 5



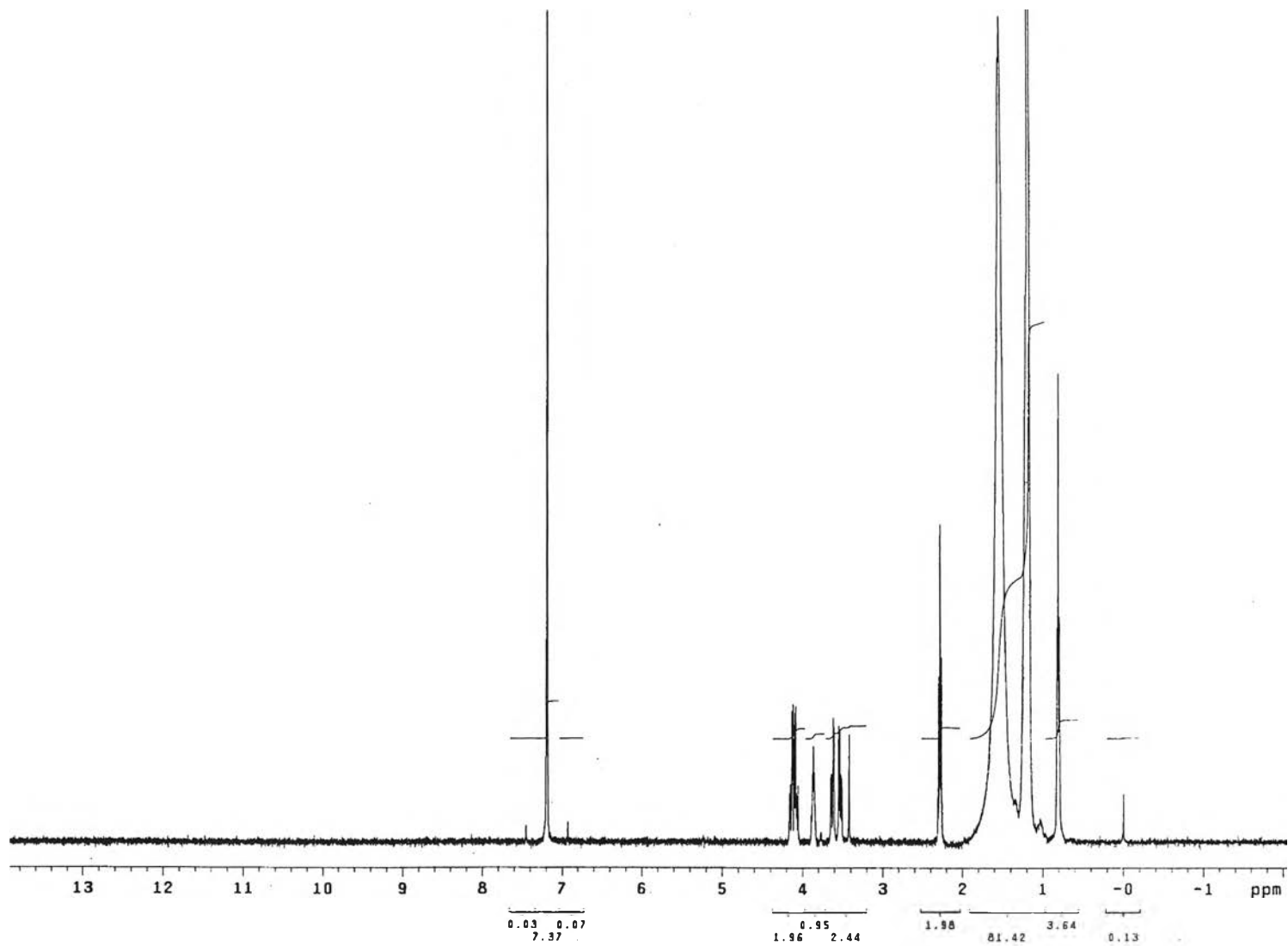


Fig. 67  $^1\text{H-NMR}$  spectrum of compound **6**

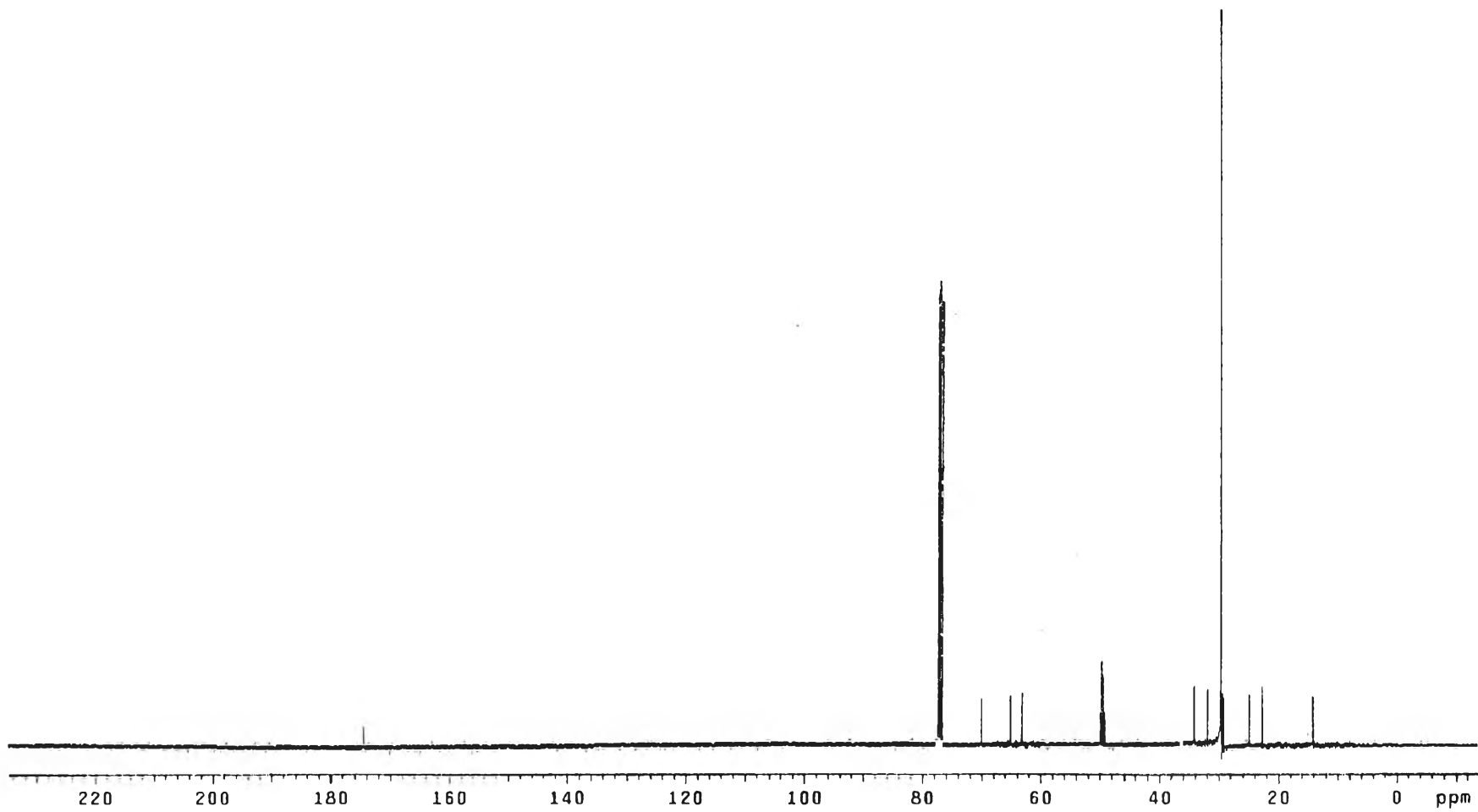


Fig. 68  $^{13}\text{C}$ -NMR spectrum of compound 6

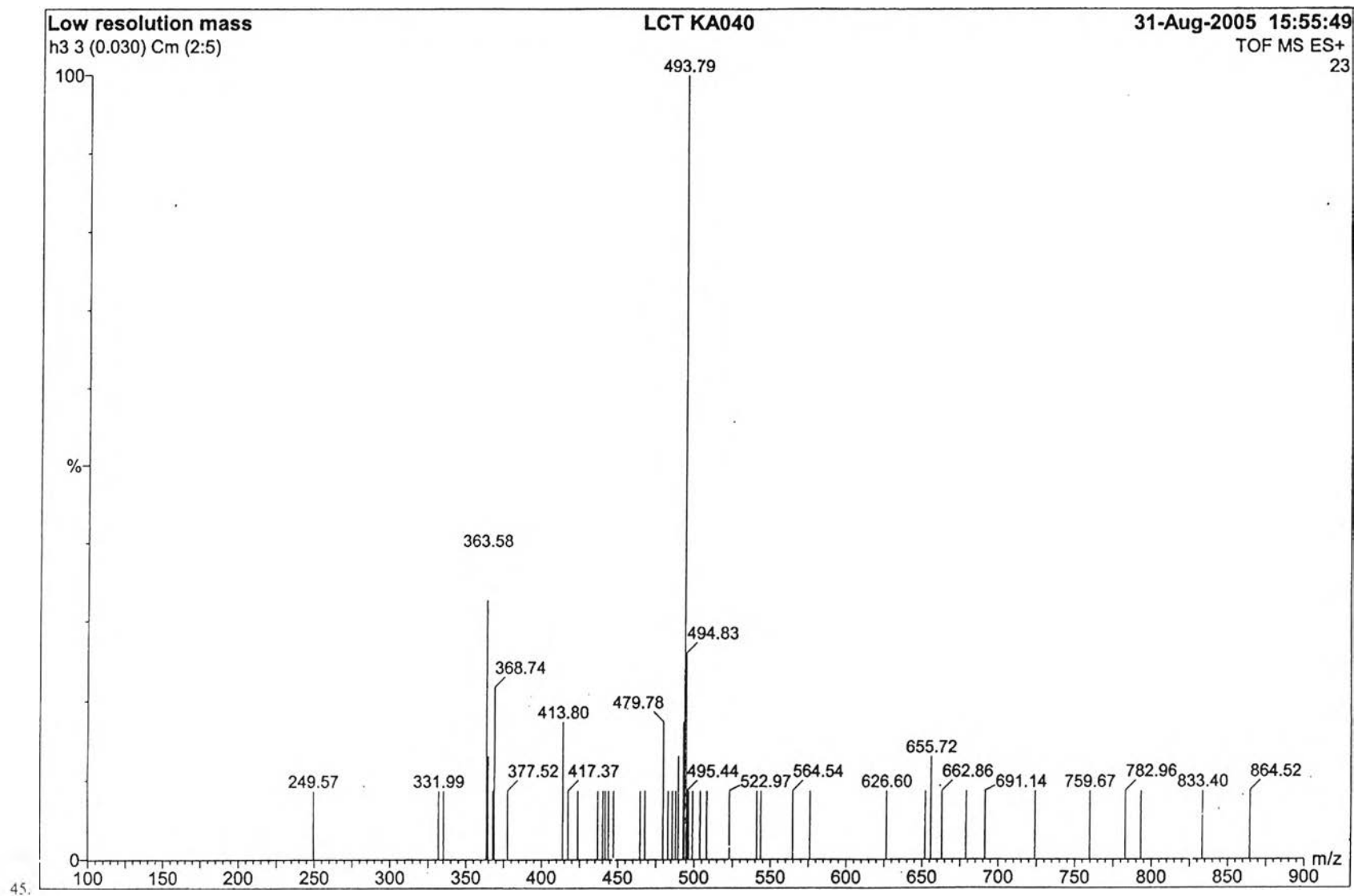


Fig. 69 TOF-MS spectrum of compound 6

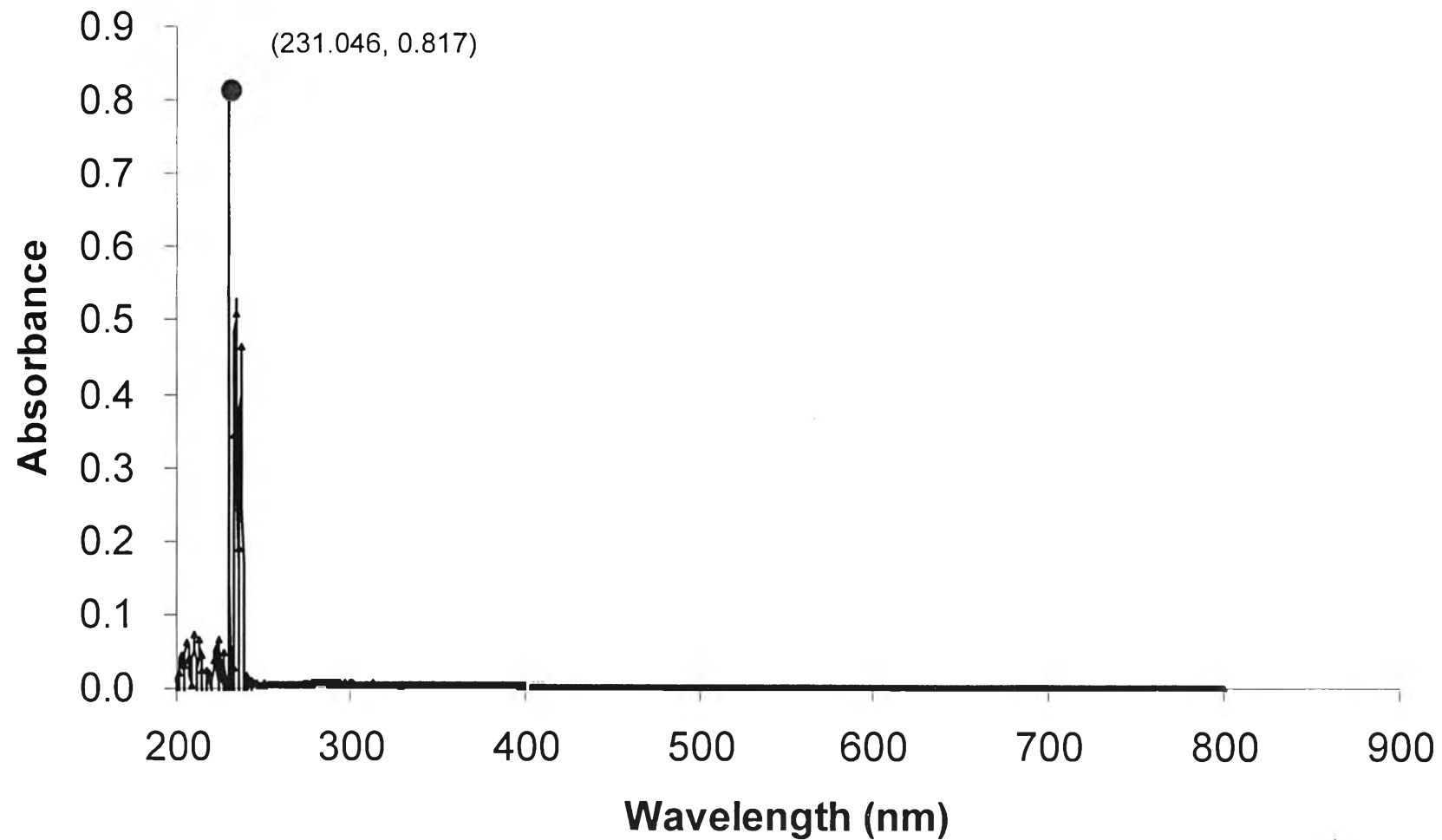


Fig 70 UV spectrum of compound 6

## **BIOGRAPHY**

Miss Aim-on Loontaisong was born on September 1, 1979 in Phayao, Thailand. She graduated with a Bachelor's Degree of Science in Biotechnology from Walailak University in 2002, she has been a graduate student studying Biotechnology in Chulalongkorn University. She was supported by a research grant for her Master Degree's thesis from the graduate school, in Chulalongkorn University.