

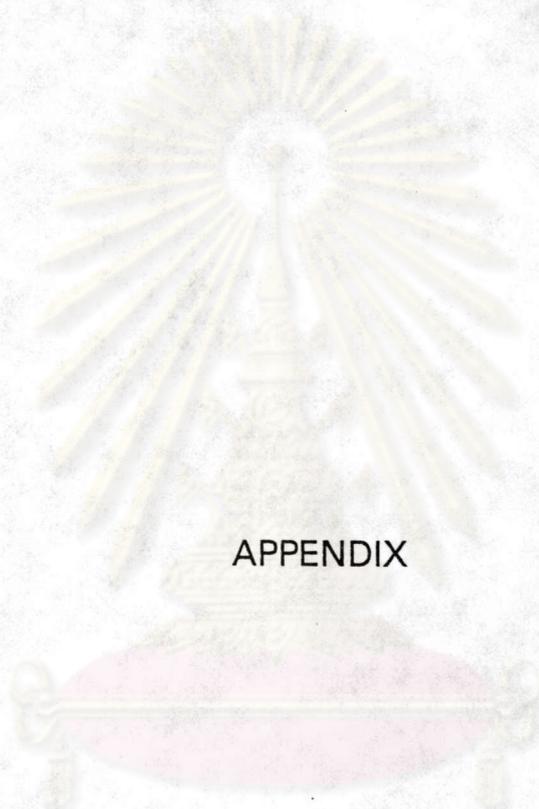
REFERENCE

1. Smitinand, T. 1980. Thai Plant Names(Botanical names-Vernacular names). 2nd ed. Bangkok: Royal Forest Department. 55.
2. Pharmacology(Botany) and Pharmacogmosy department. 1980. The Identification of Botany. Vol.2. Bangkok: Chulalongkorn University. 138-139.
3. Burkill, I.H. 1935. Euphorbiaceae: A Dictionary of the Economic Products of the Malay Peninsula. Vol. 1: London. 365-6.
4. "Bridelia". The wealth of India: A Dictionary of the Indian Raw Material and Industrial Products. Vol. 1: Delhi. 227-228.
5. Sengupta, P. and Ghosh, B.N. 1963. Chemical Investigation of the Bark of Bridelia stipularis Blume. J. Indian Chem. Soc. 40(3): 247-248.
6. Nakanishi, K.B., et al. 1965. Plants Preliminary Chemical and Pharmacological Screening. Chem. Pharm. Bull. 13: 882-890.
7. Pegel, K.H., and Roger, C.B. 1968. Constituents of Bridelia micrantha. Phytochemistry. 7: 655-656.
8. Hui, W.H., and Fung, M.L.. 1968. An Examination of the Euphorbiaceae of Hong Kong. Phytochemistry. 7: 2069.
9. Neeja, Y., and Nigrams, S.K. 1975. Chemical Examination of Bridelia montana Leaves. Quart. J. Crde Drug Res. 13: 127-128.
10. Rochan, C.C., and Sotheeswaran, S. 1980. Triterpenes of Five Euphorbiaceae Species of Sri Lanka. 19: 1171-1174.
11. Ivan, A.M., and Hans, A. 1985. Terpenoids and Flavonoid of Bridelia ferruginea. Phytochemistry 24: 1817-1819.

12. Boonyaratavej, S., and Petsom, A. 1991. Chemical constituents of the roots of Bridelia tometosa Bl. J. Sci. Soc. 17: 61-69.
13. Boonyaratavej, S., et al. 1992. Trans-triacontyl-4-hydroxy-3-methoxy cinnamate: a new compound from the thai plant Bridelia ovata. J. Nat. Prod. 55: 1761-1763.
14. Medicinal Scientific Department. 1985. The Traditional Herbs Used Medicinally. 2nd ed. Vol.1: Ministry of Public Health.64.
15. Pongboonrod, S. 1976. The Plant of foreign breed. Bangkok: Kasem Bannakich. 391-392.
16. Muanvongyart, P. 1983. A Handbook of Herbs Used Medicinally. Bangkok: Medical media.65.
17. Thai News Agency. 1983. Makaa Used as Purgative. The News of Committee of international research. Vol.24: Bangkok.
18. Pharmacology Department, Faculty of Phrmacology. 1987. The Herbs Used Medically Names and Utilizations. Bangkok: Chulalongkorn University. 52.
19. Autsavavilai, S. 1984. The Activities Elucidation of Purgative From The Leaves of Makaa in Animals. Bangkok: Chulalongkorn University.
20. Boonyaratavej, S. et al. 1980. The Screening Test in Herbs Used Medicinally. A research report of faculty of science. Bangkok: Chulalongkorn University. 157-158.
21. Chumsri, P. 1980. Phytochemical Screening Techniques. Seminar of Phytochemical Studies. Vol.2: Mahidon University. 160-186.
22. Pouchert, C.J. 1975. The Aldrich Library of Infrared Spectra. 2nd ed. USA: Aldrich Chemical Company.

23. Shannon, J.S. 1963. Studies in Mass Spectrometry, Triterpenoid: Ifflatonio Acid. Aust. J.Chem. 16: 683-689.
24. Patra, A., et al. 1981. Carbon-13 Resonance Assignments of some Friedelanes and Taraxasteranes. Organic Magnetic Resonance. 17(3): 166-168.
25. Hiroto, H., et al. 1975. The High Resolution Mass Spectra of Shionane and Friedelane Derivatives. Bulletin of the Chemical Society of Japan. 48(6): 1884-1888.
26. Sengupta , P. and Chakraborty, A.K. 1968. Chemical Investigation on Putrajiva roxburghii the Structure of a New Triterpene, Putranjivadiene. Tetrahedron. 24: 1205- 1213.
27. Papipit Kitchanachai, "Chemical Constituents of the branches of Bridelia ovata Decne." (Master's Thesis, Chulalongkorn University, 1988)

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

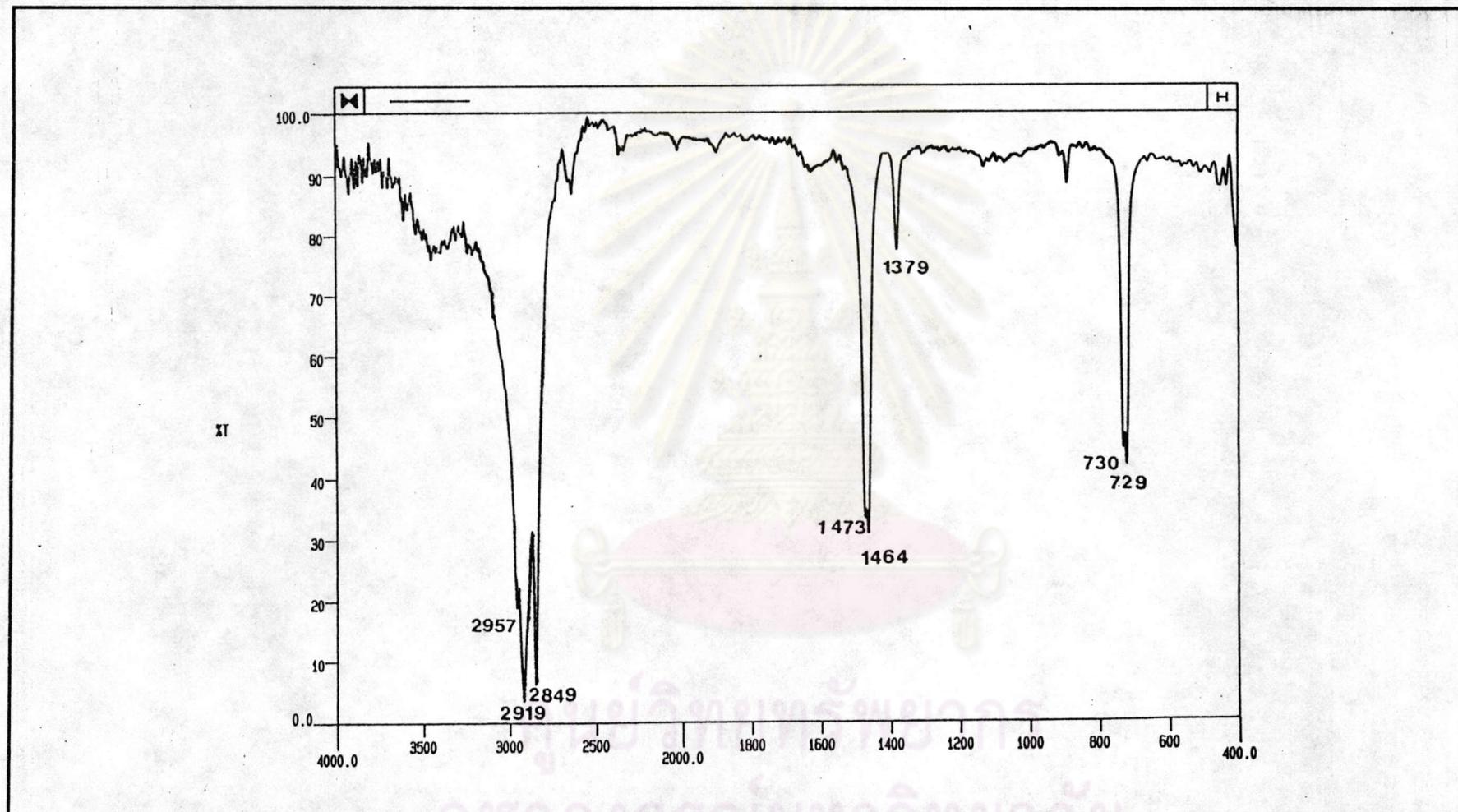


Fig. 3 The IR spectrum of BOV1

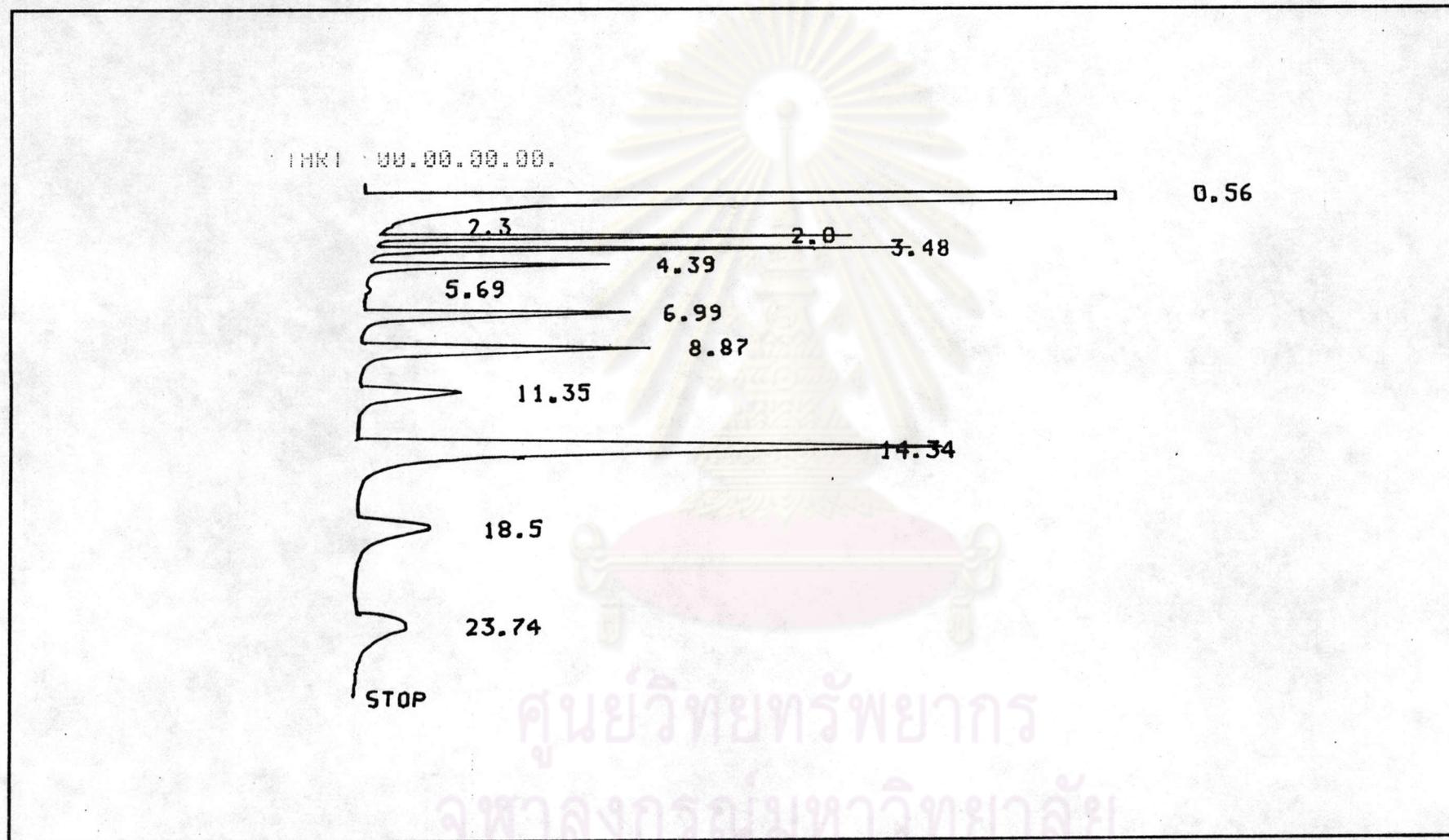


Fig. 4 The Gas-Liquid chromatogram of standard long chain aliphatic hydrocarbons(C = 24-33)

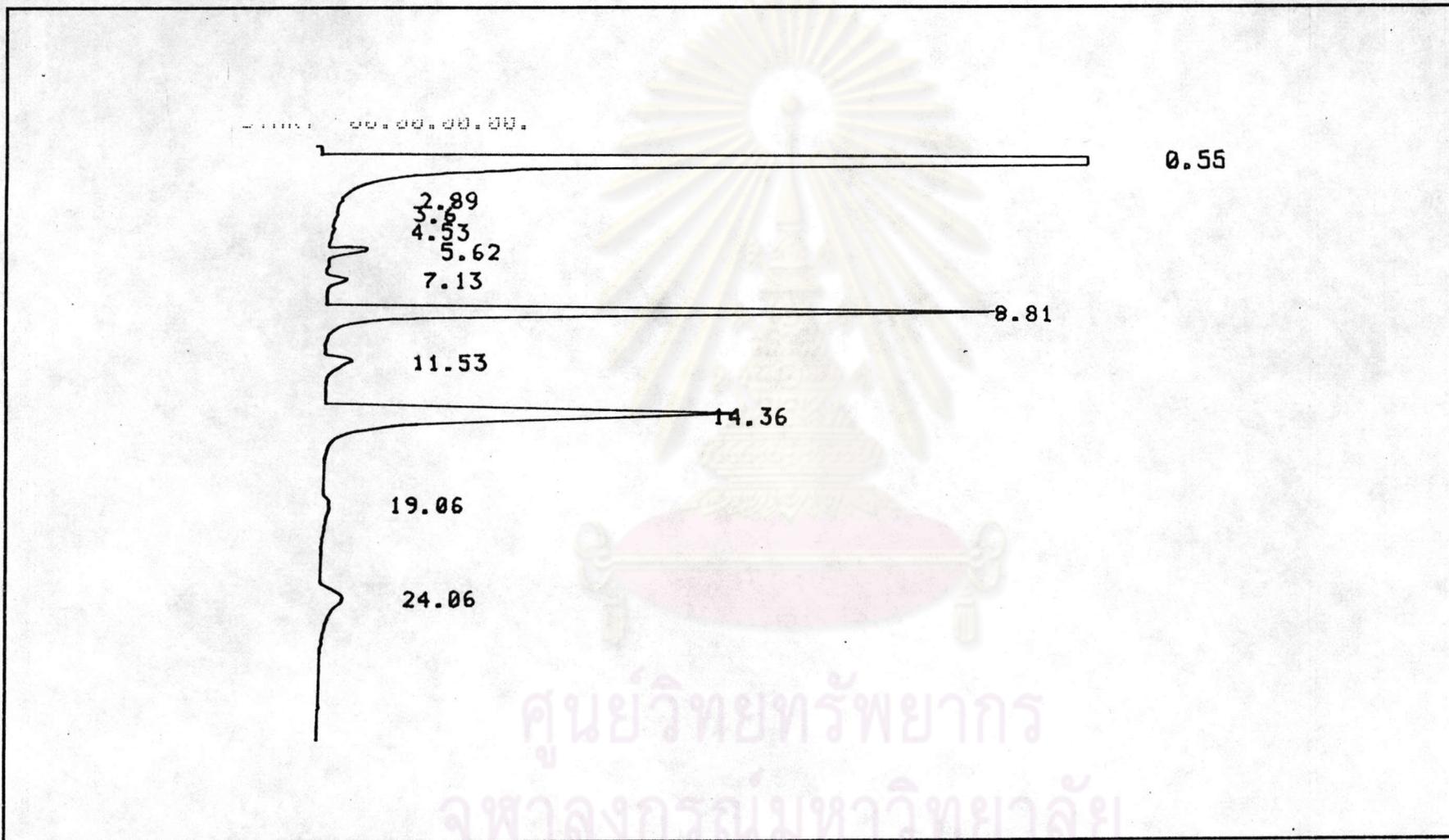


Fig. 5 The Gas-Liquid chromatogram of BOV1

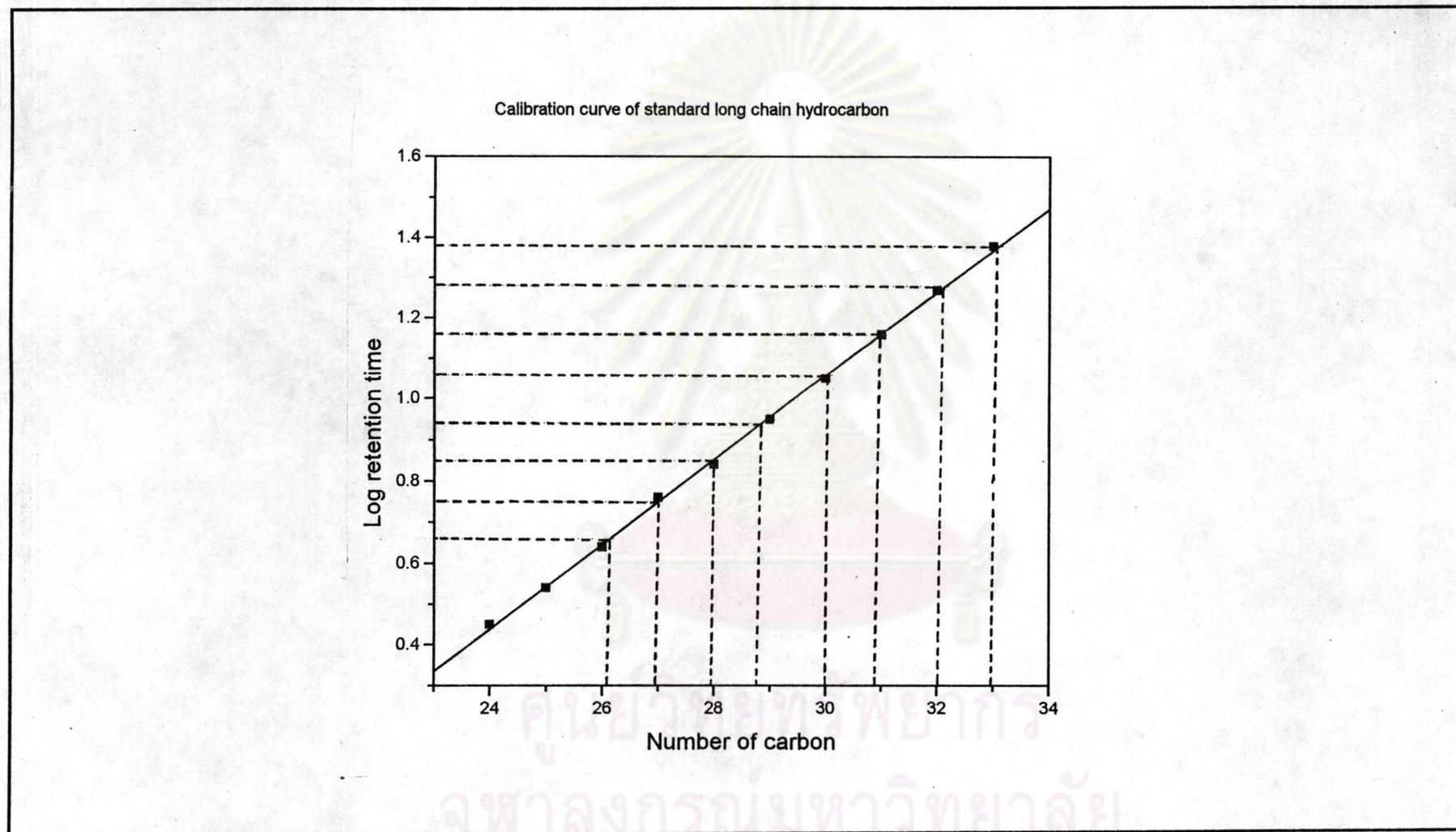


Fig. 6 The calibration curve of standard long chain aliphatic hydrocarbons

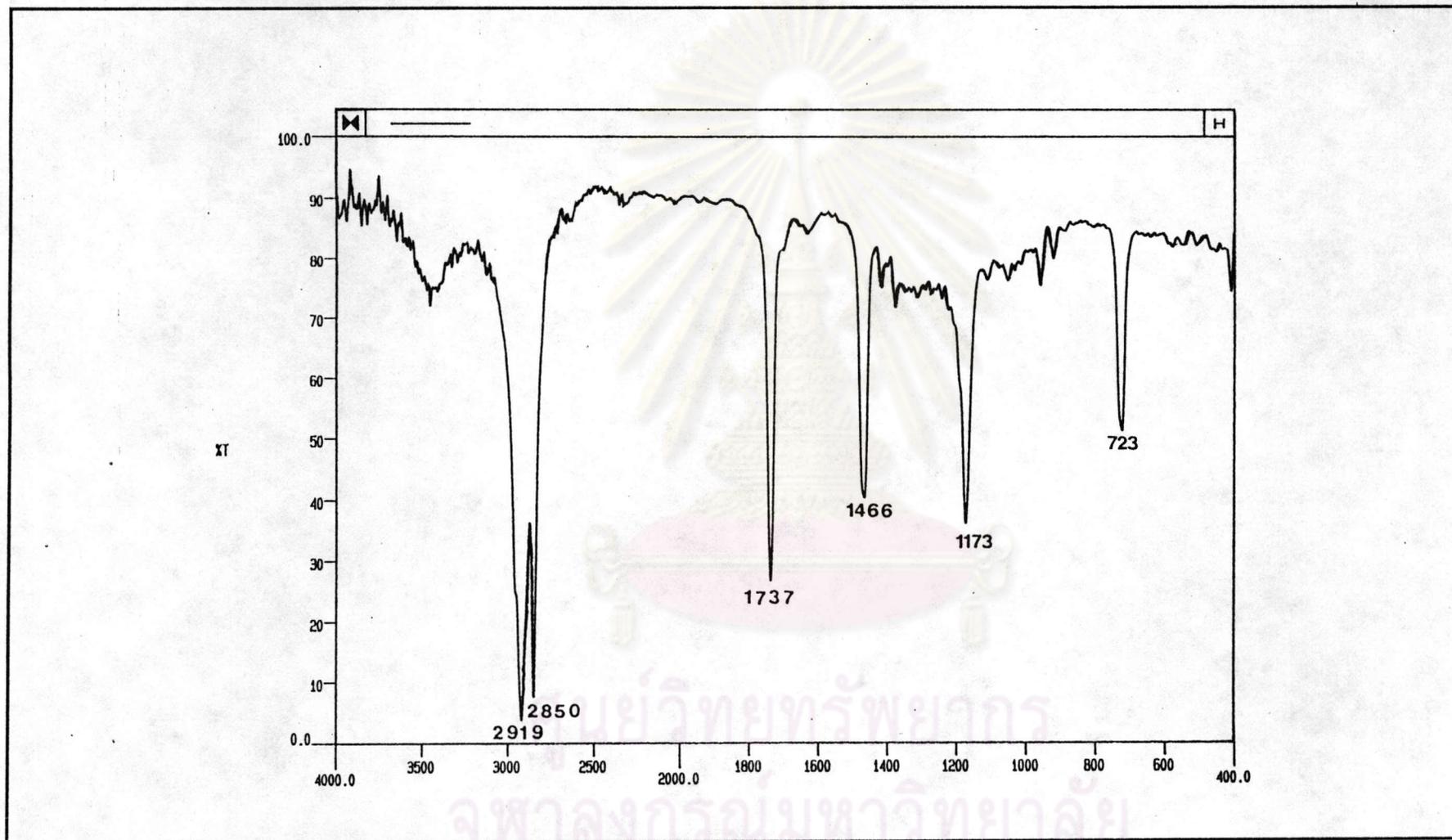


Fig. 7 The IR spectrum of BOV2

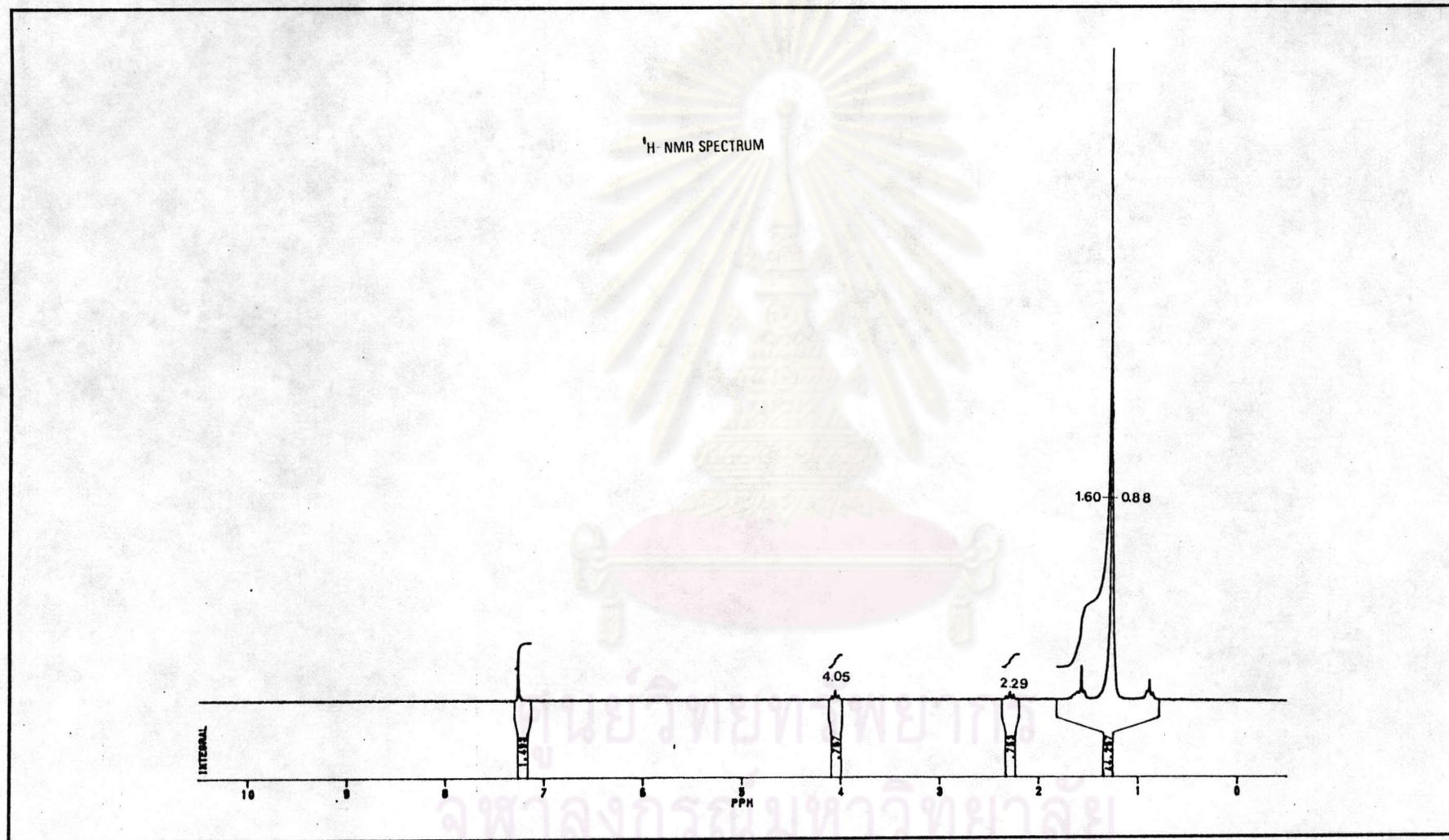


Fig. 8 The ¹H-NMR spectrum of BOV2 in CDCl₃

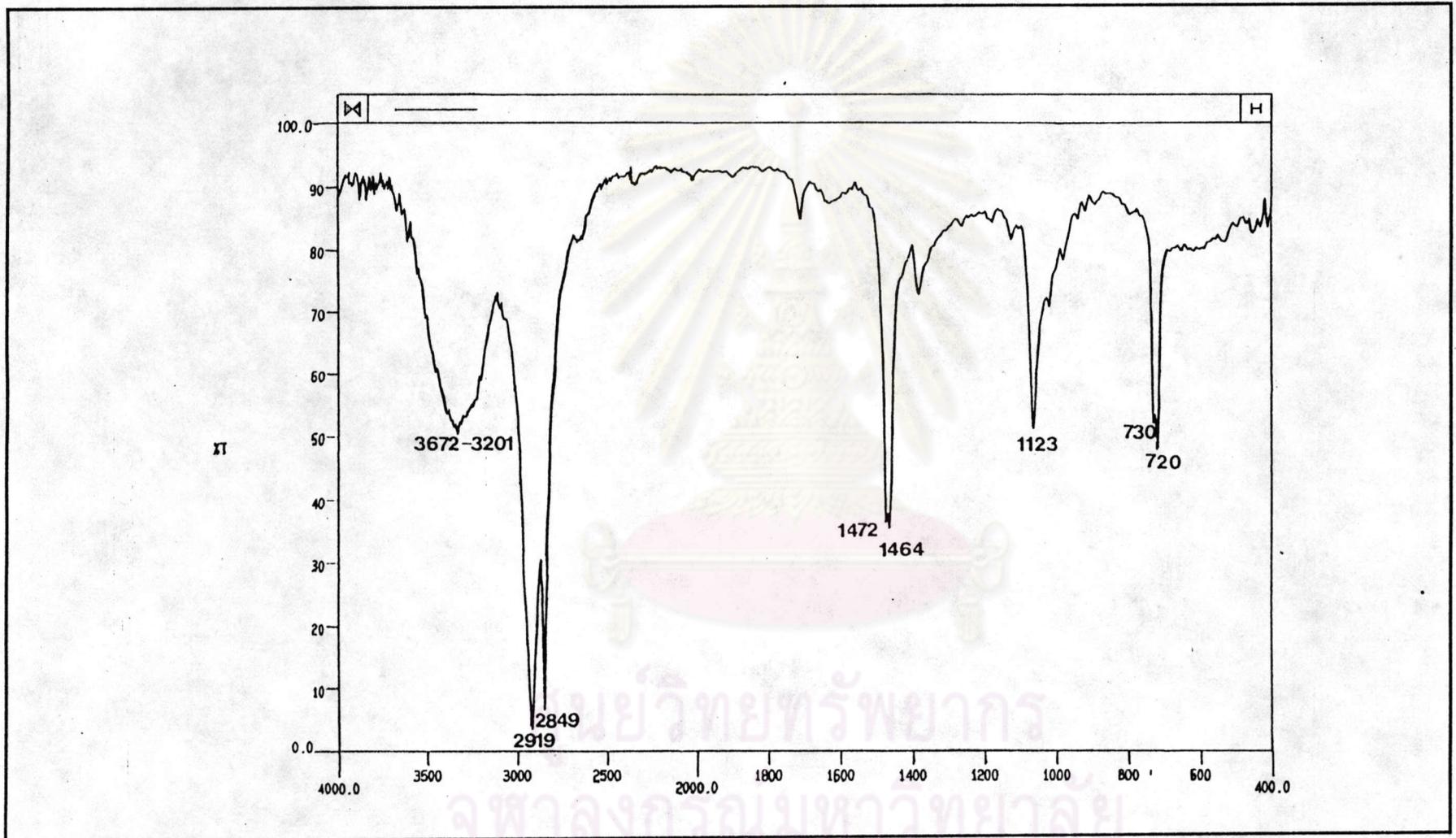


Fig. 9 The IR spectrum of BOV3

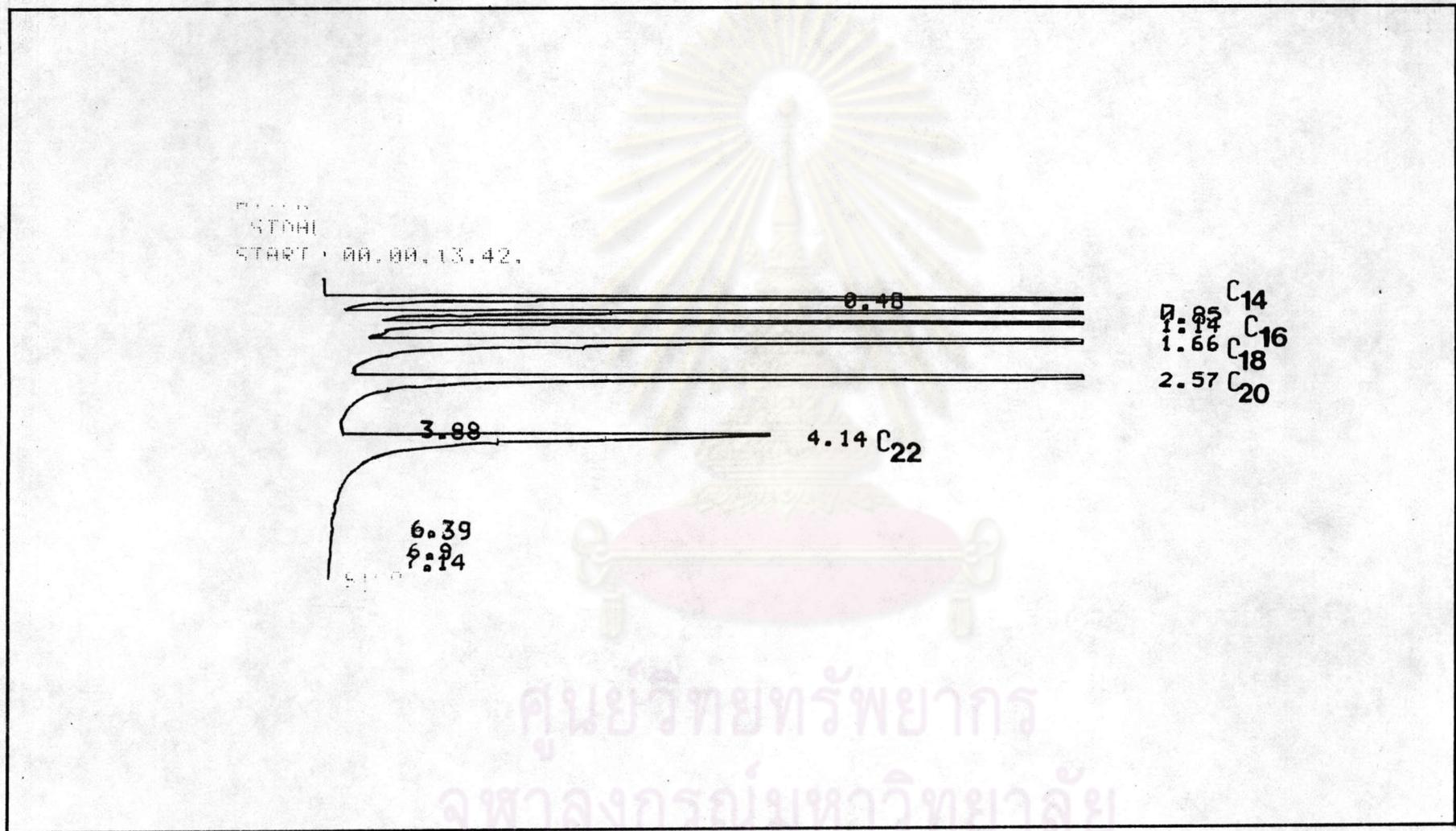


Fig. 10 The Gas-Liquid chromatogram of standard long chain aliphatic alcohols(C= 14, 16, 18, 20, 22)

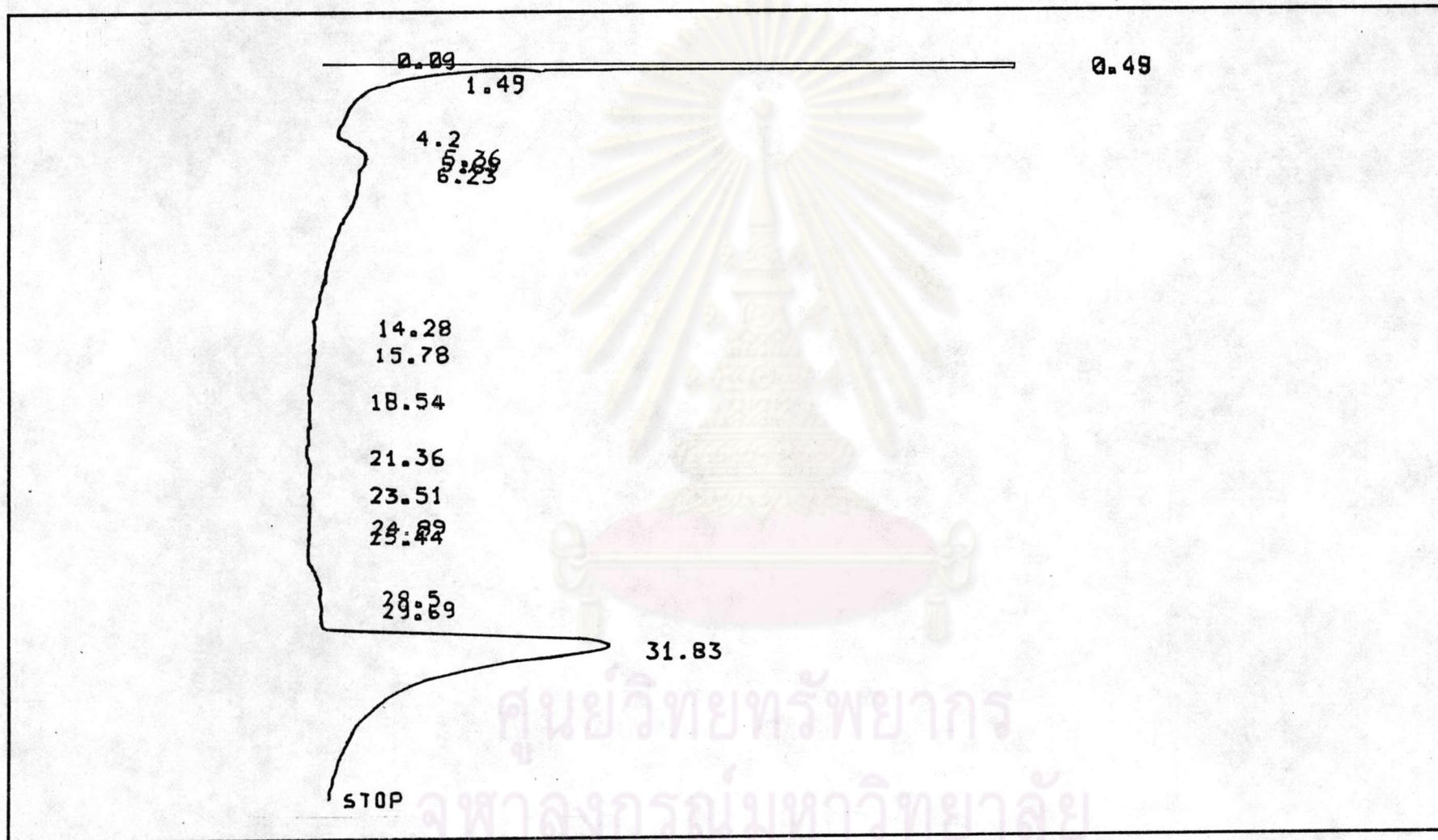


Fig. 11 The Gas-Liquid chromatogram of BOV3

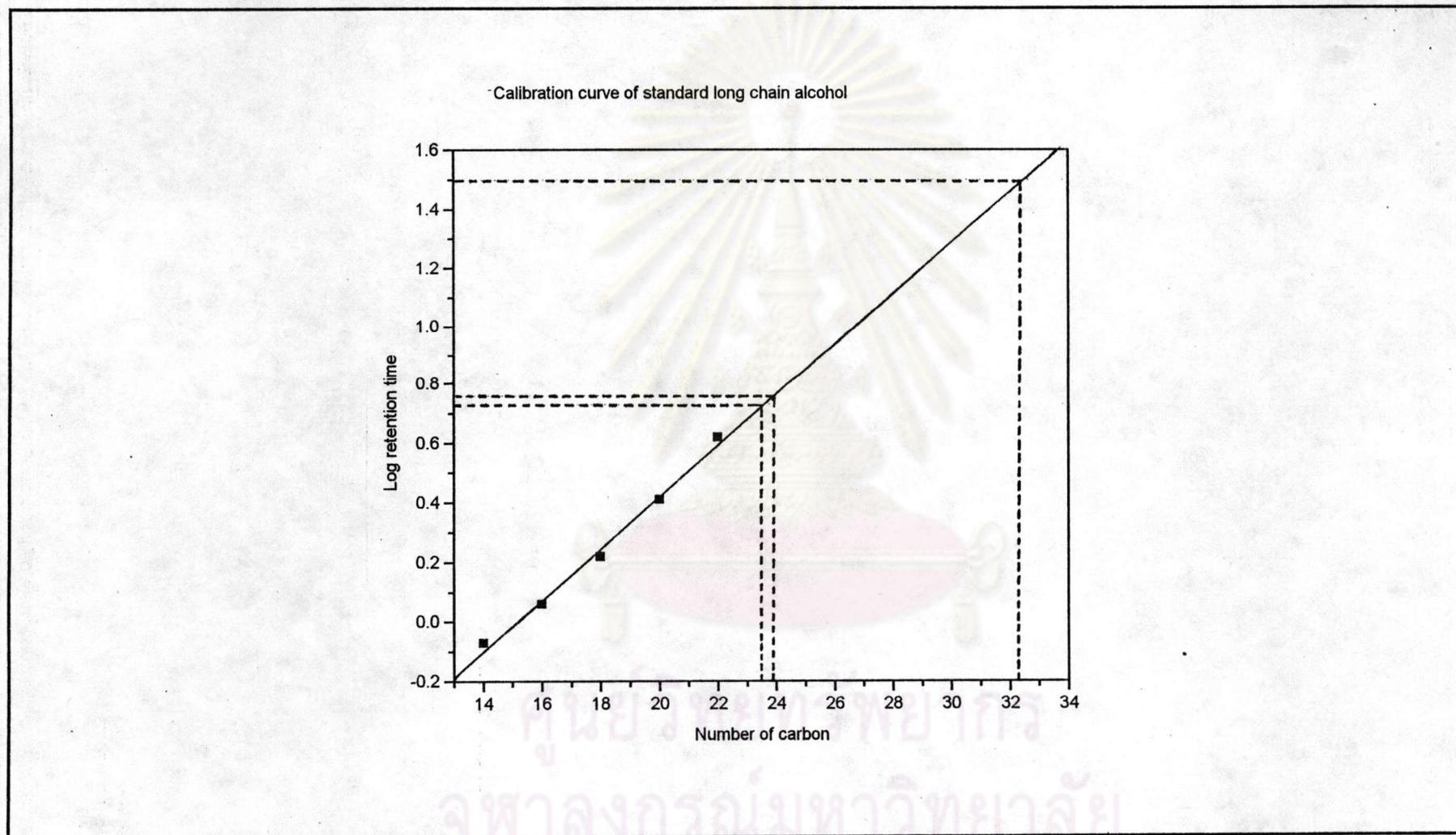


Fig. 12 The calibration curve of standard long chain aliphatic alcohols

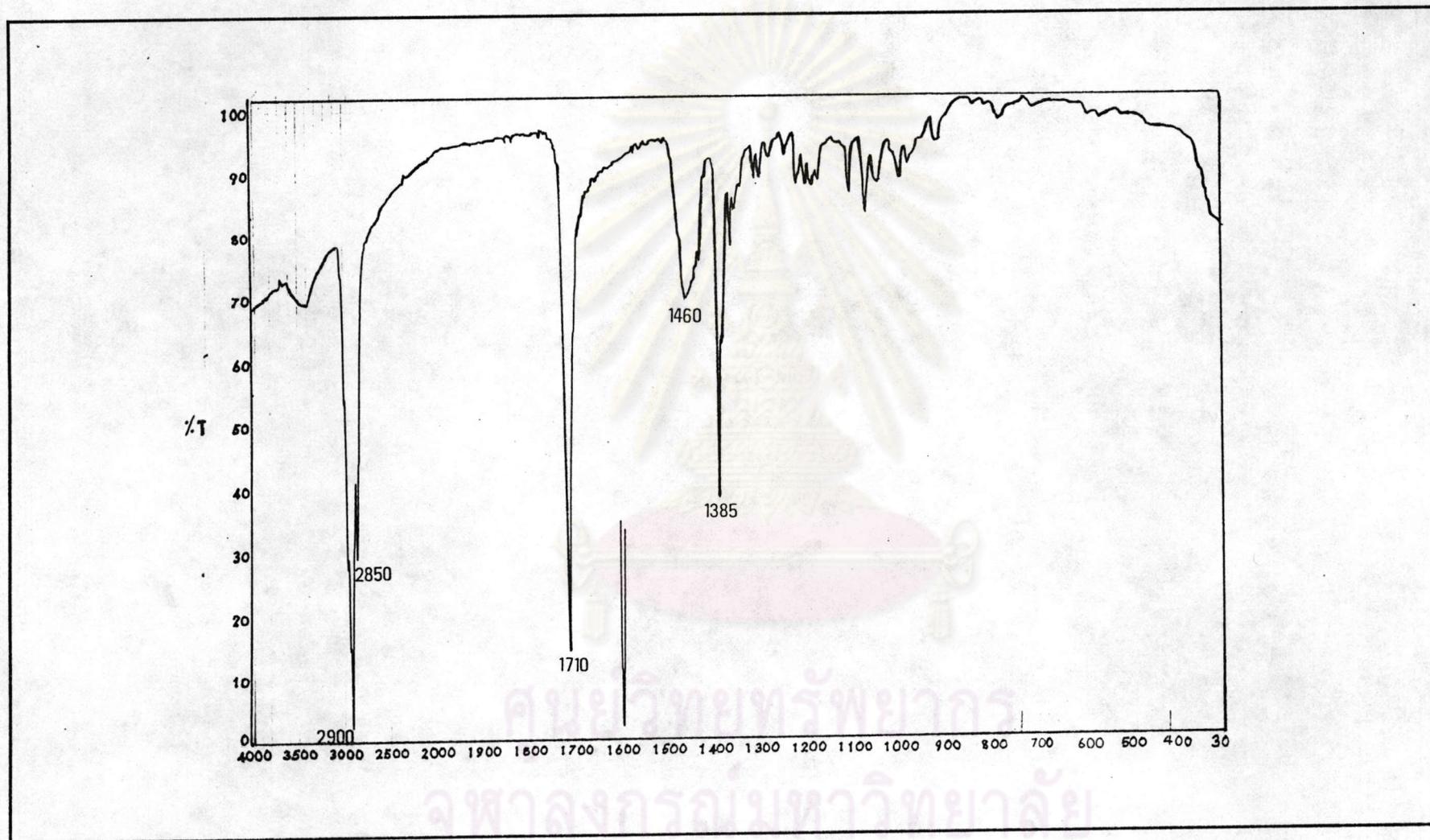


Fig. 13 The IR spectrum of BOV4

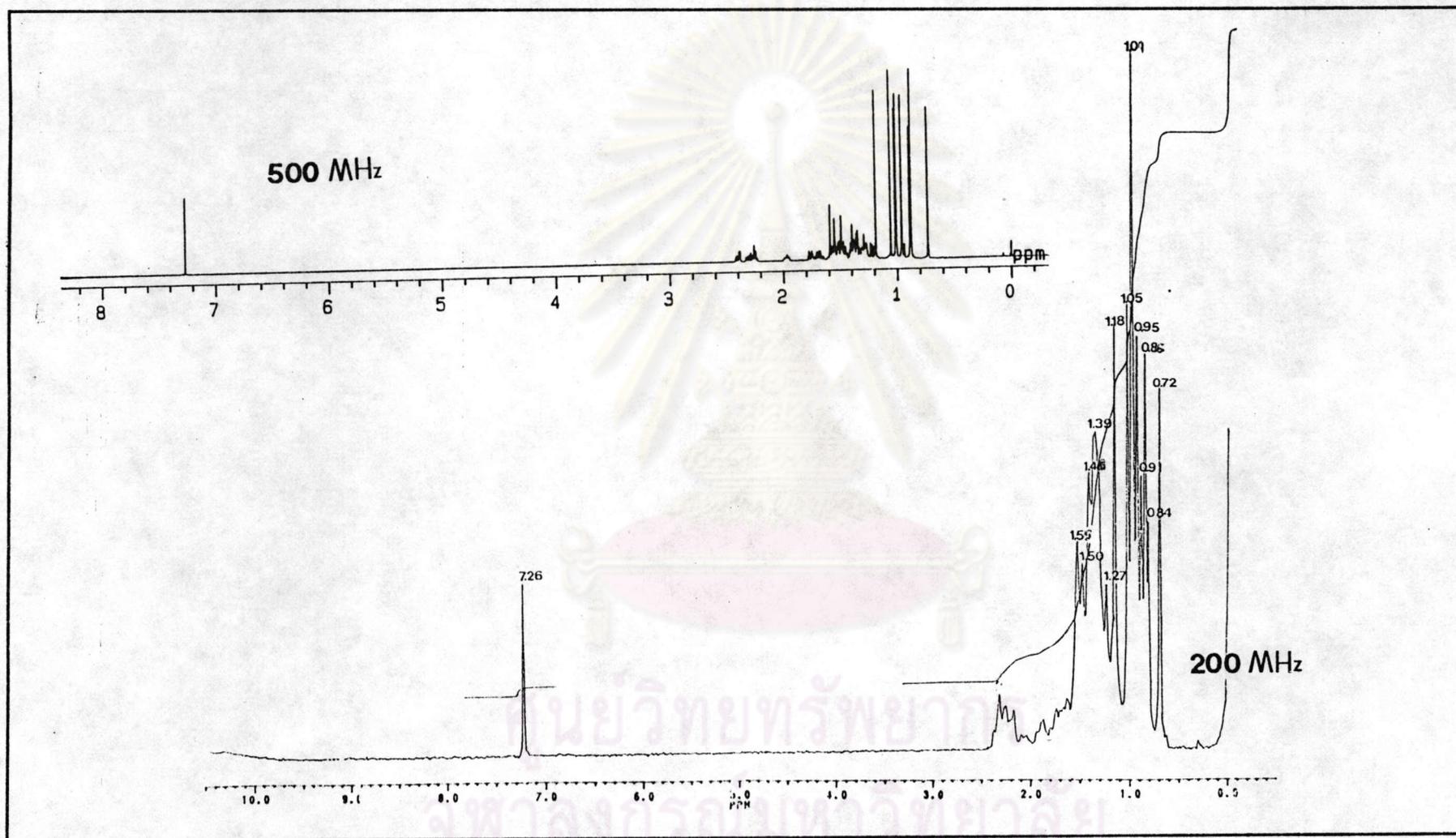


Fig. 14 The $^1\text{H-NMR}$ spectrum of BOV4 in CDCl_3

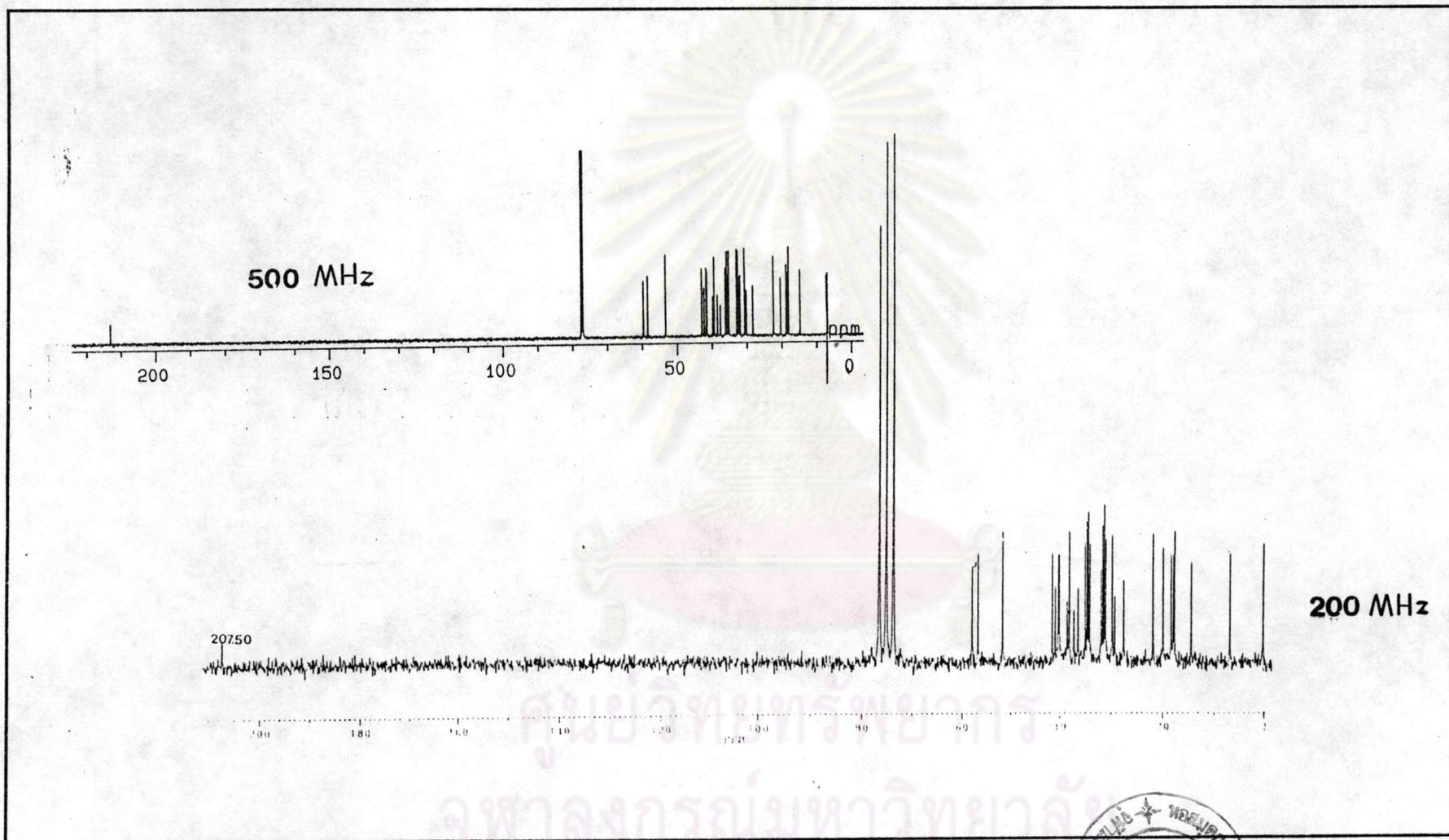


Fig. 15 The ¹³C-NMR spectrum of BOV4 in CDCl₃



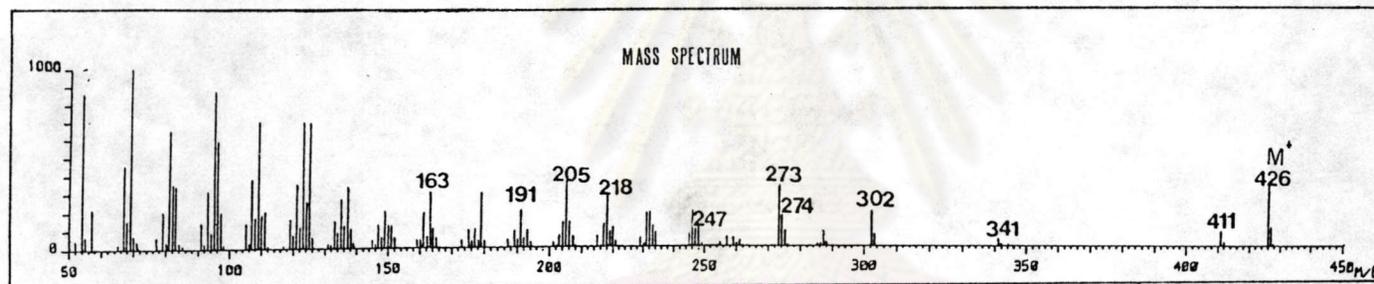


Fig. 16 The mass spectrum of BOV4

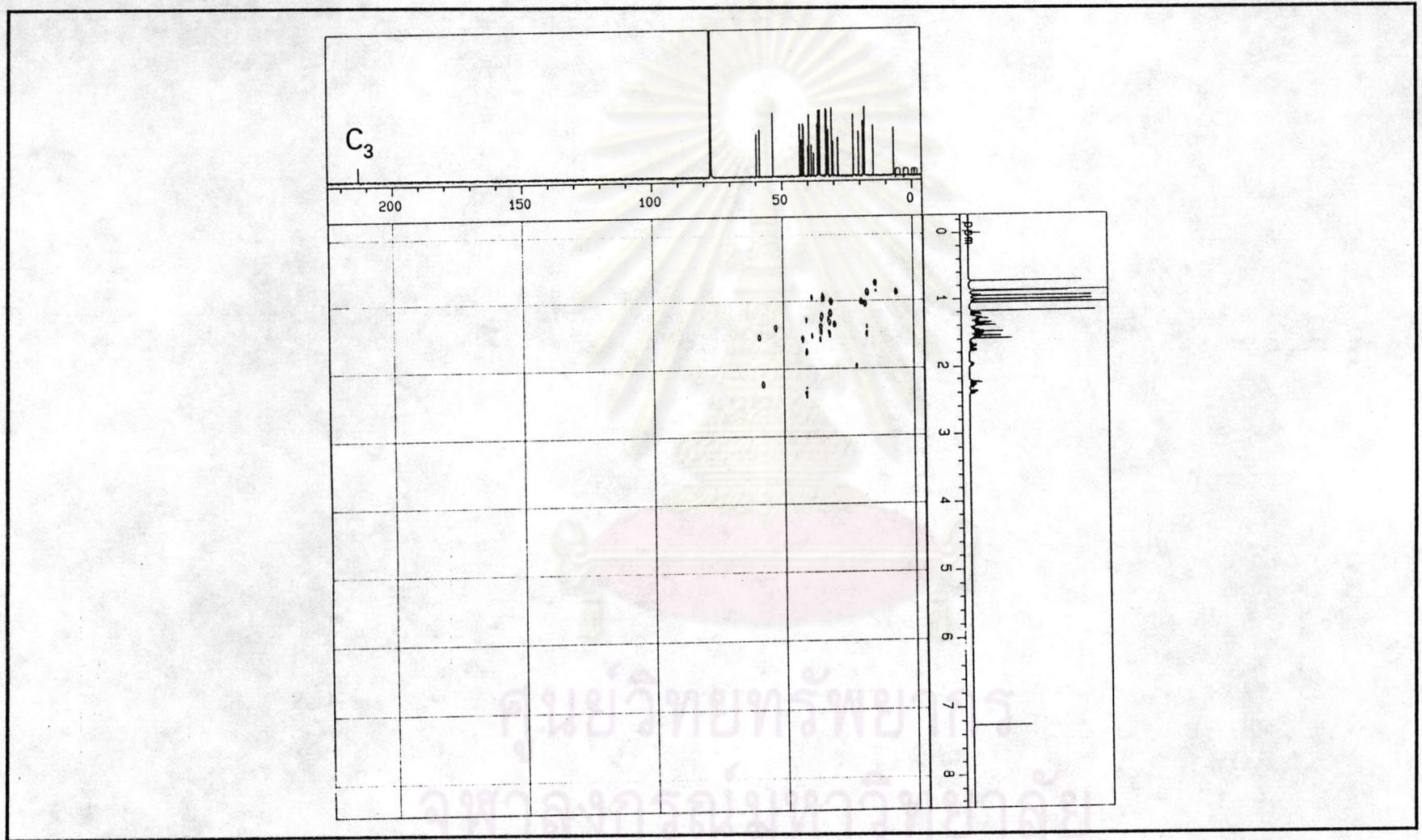


Fig. 17 The ^{13}C - ^1H correlation of BOV4

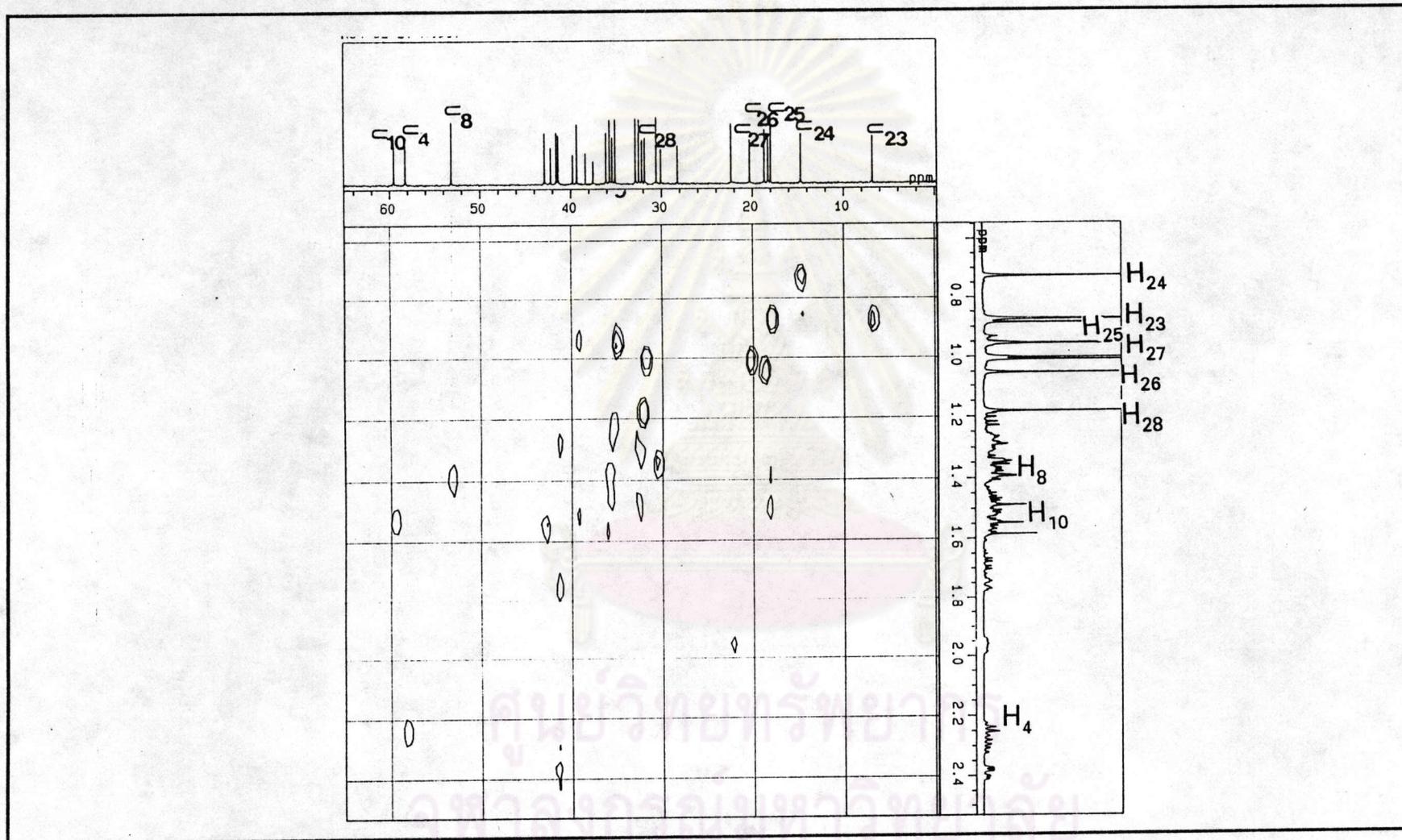


Fig. 18 The ^{13}C - ^1H correlation of BOV4

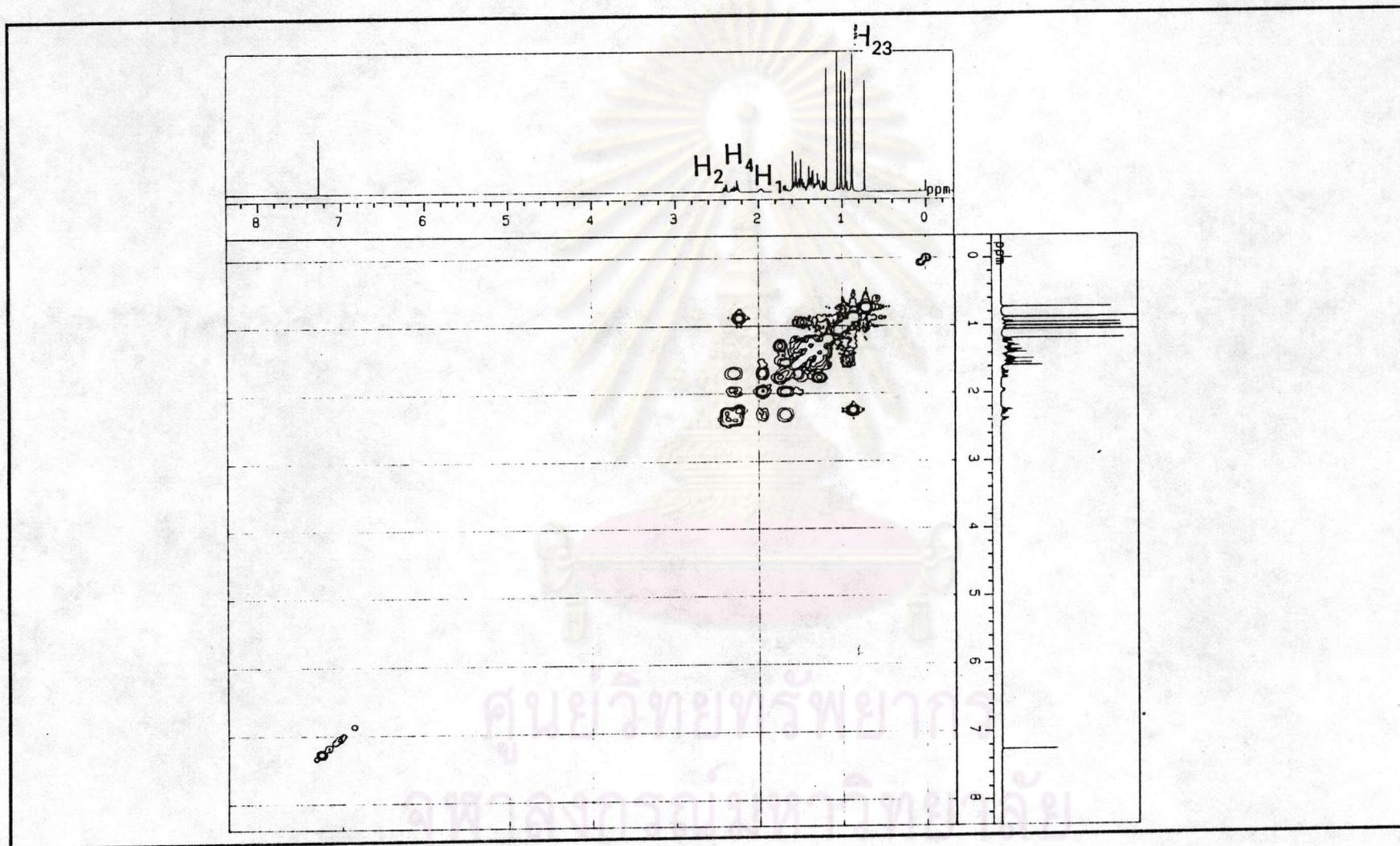


Fig. 19 The ^1H - ^1H COSY of BOV4

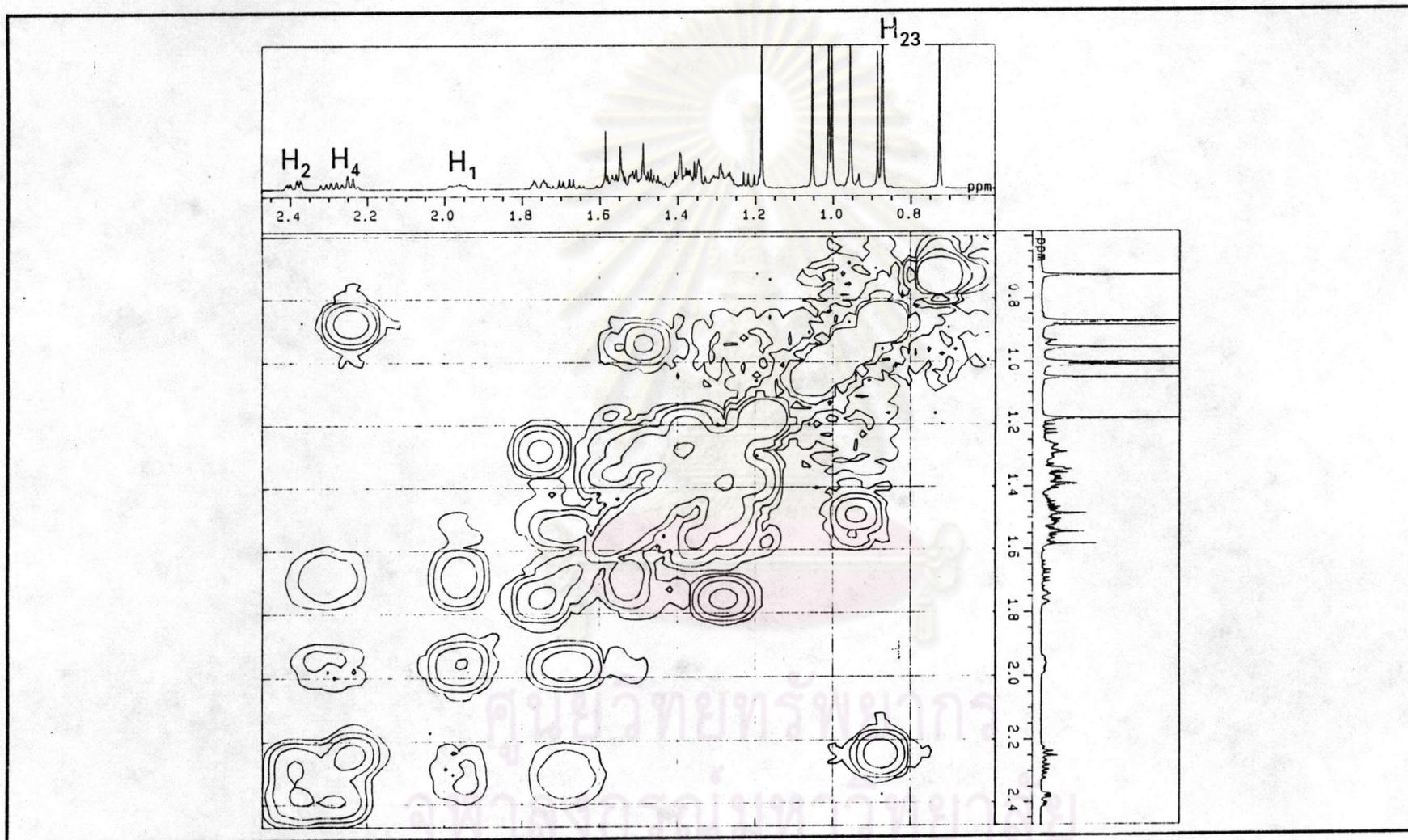


Fig. 20 The ^1H - ^1H COSY of BOV4

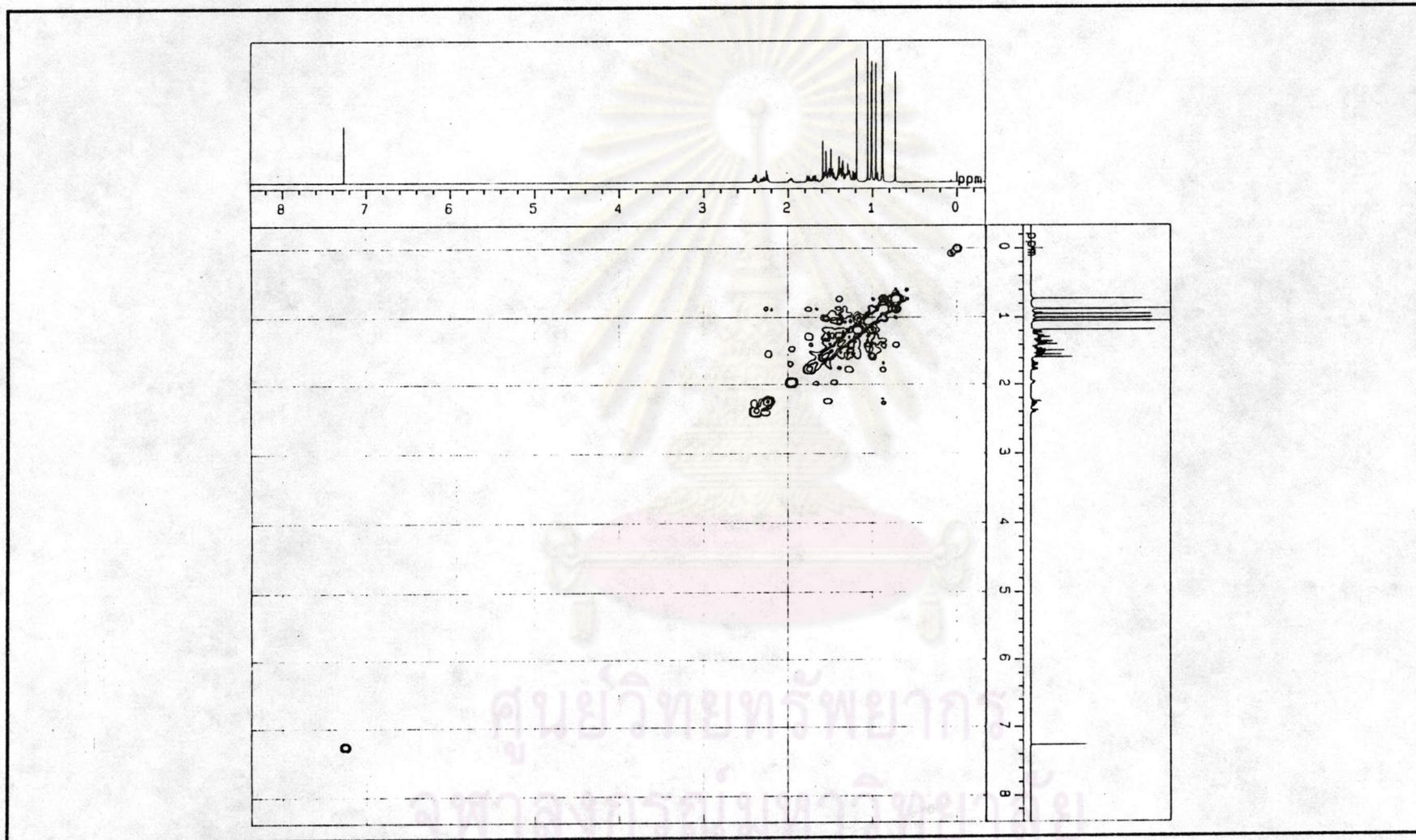


Fig. 21 The ^1H - ^1H NOESY of BOV4

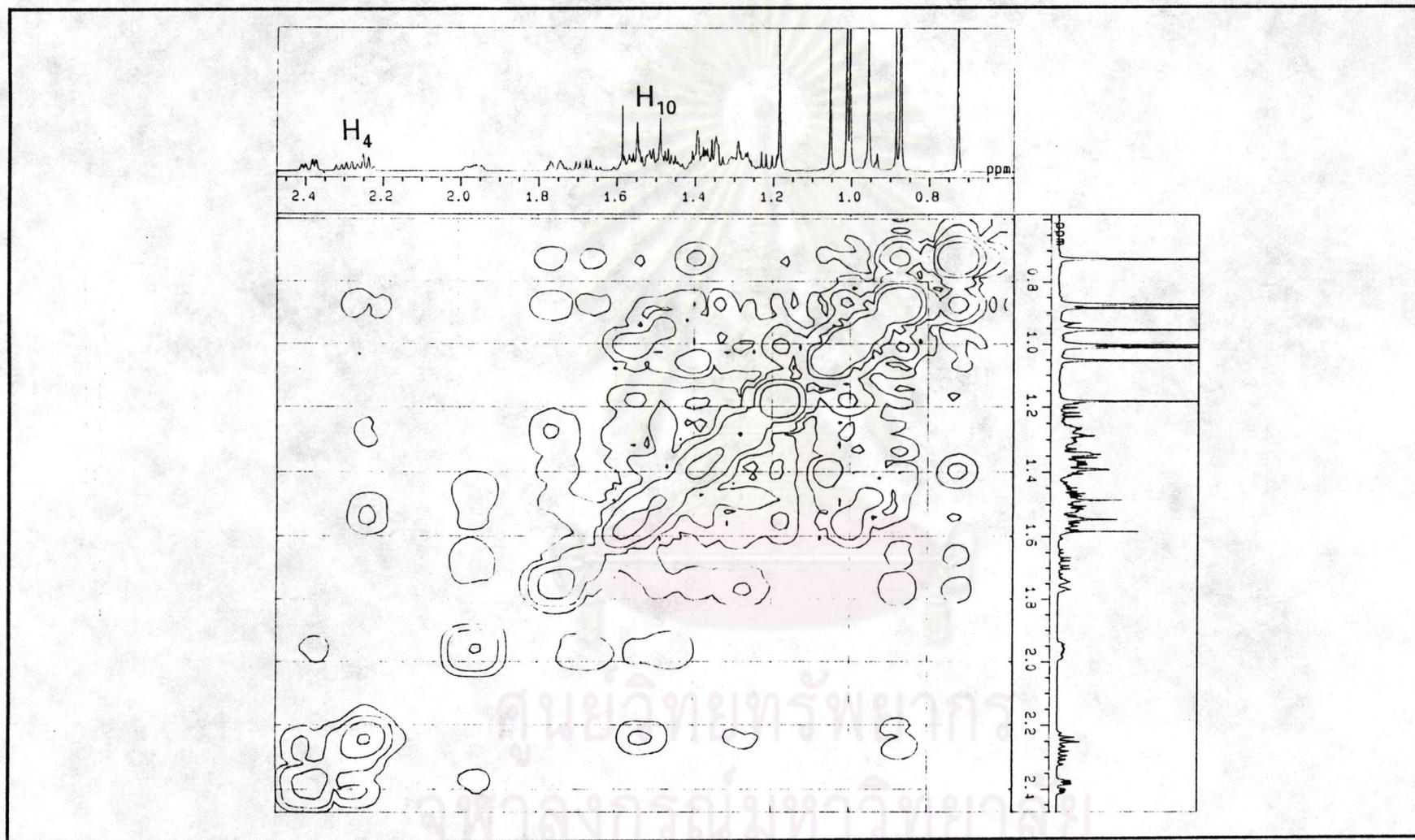


Fig. 22 The ^1H - ^1H NOESY of BOV4

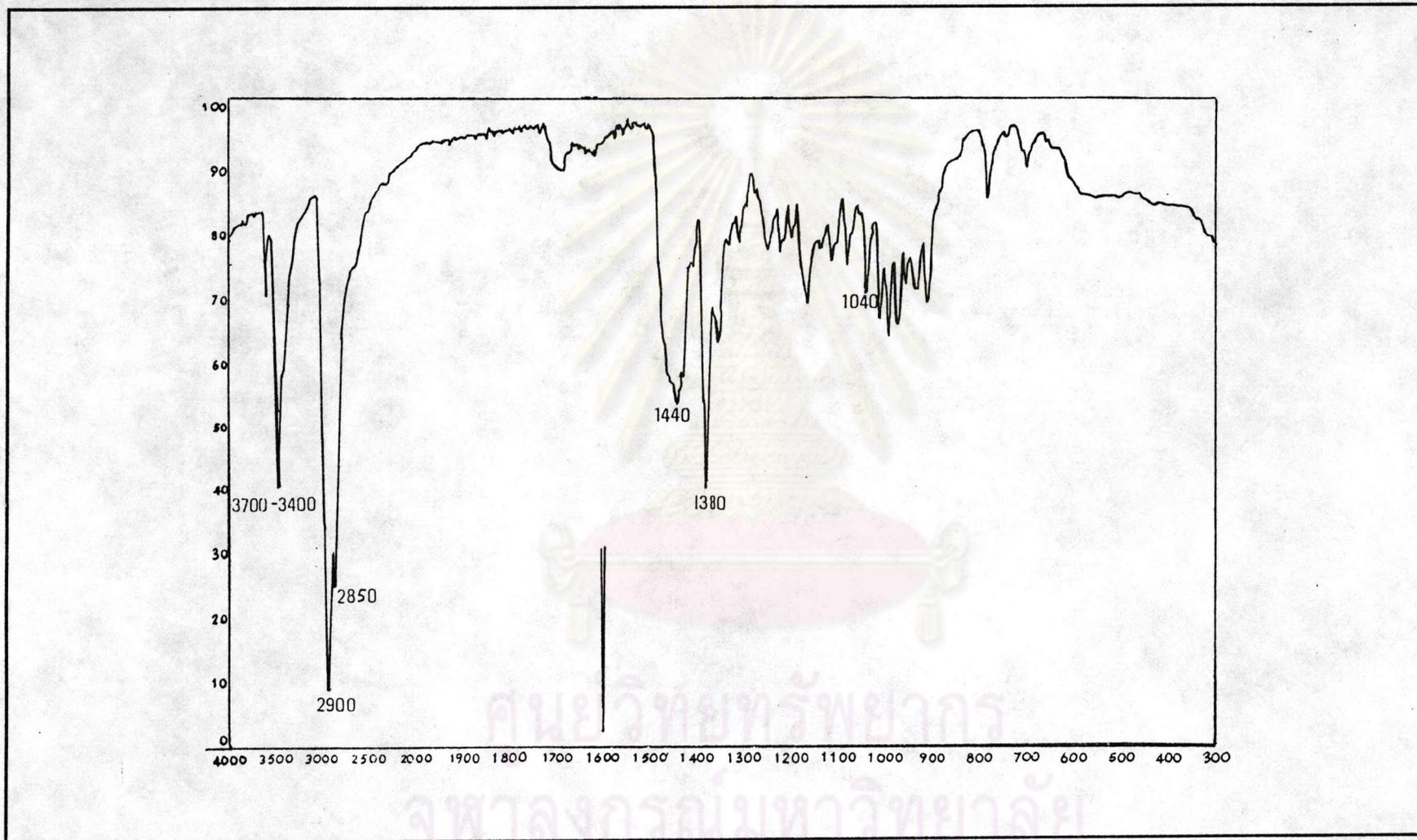


Fig. 23 The IR spectrum of BOV5

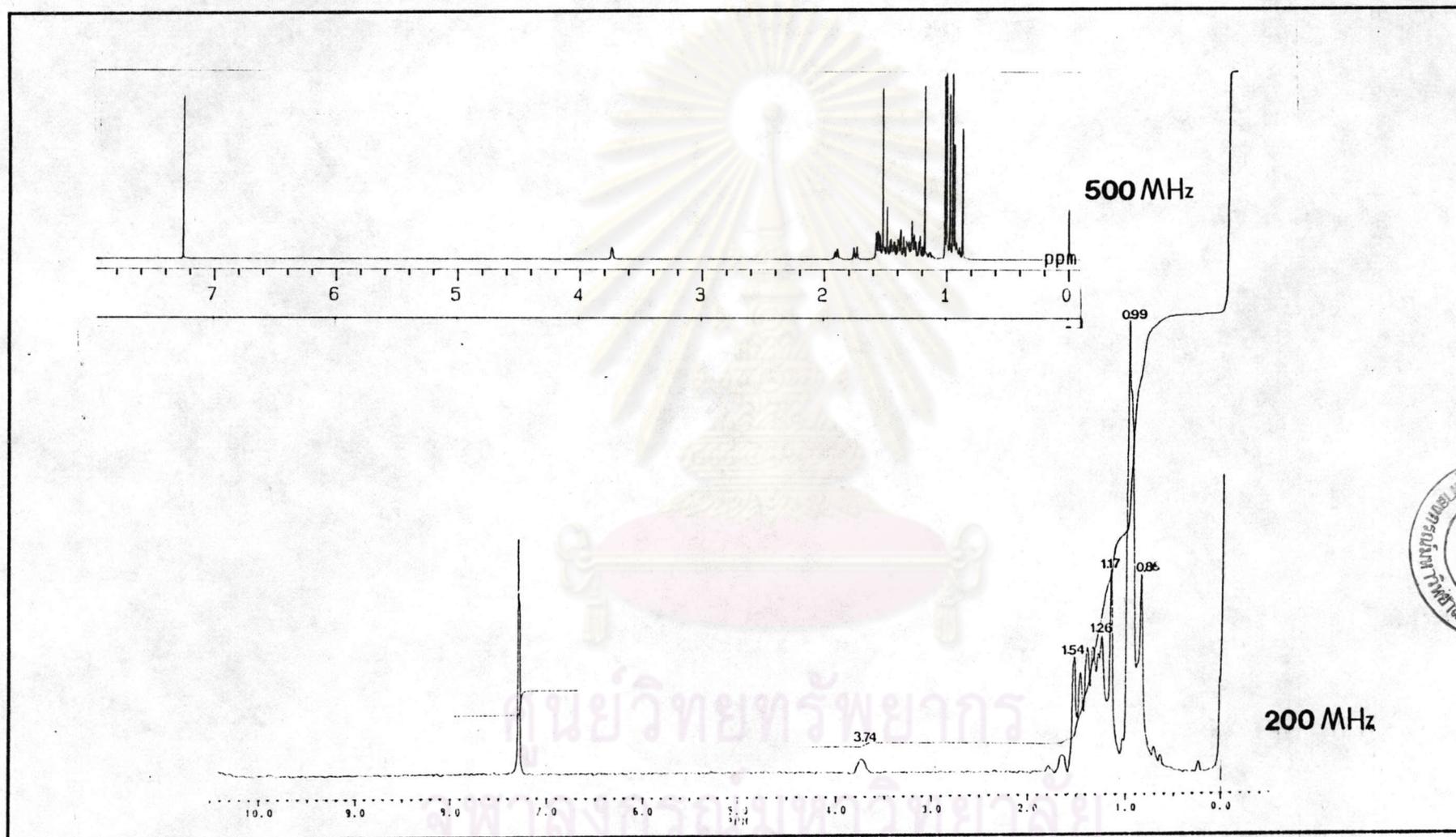


Fig. 24 The $^1\text{H-NMR}$ spectrum of BOV5 in CDCl_3 .

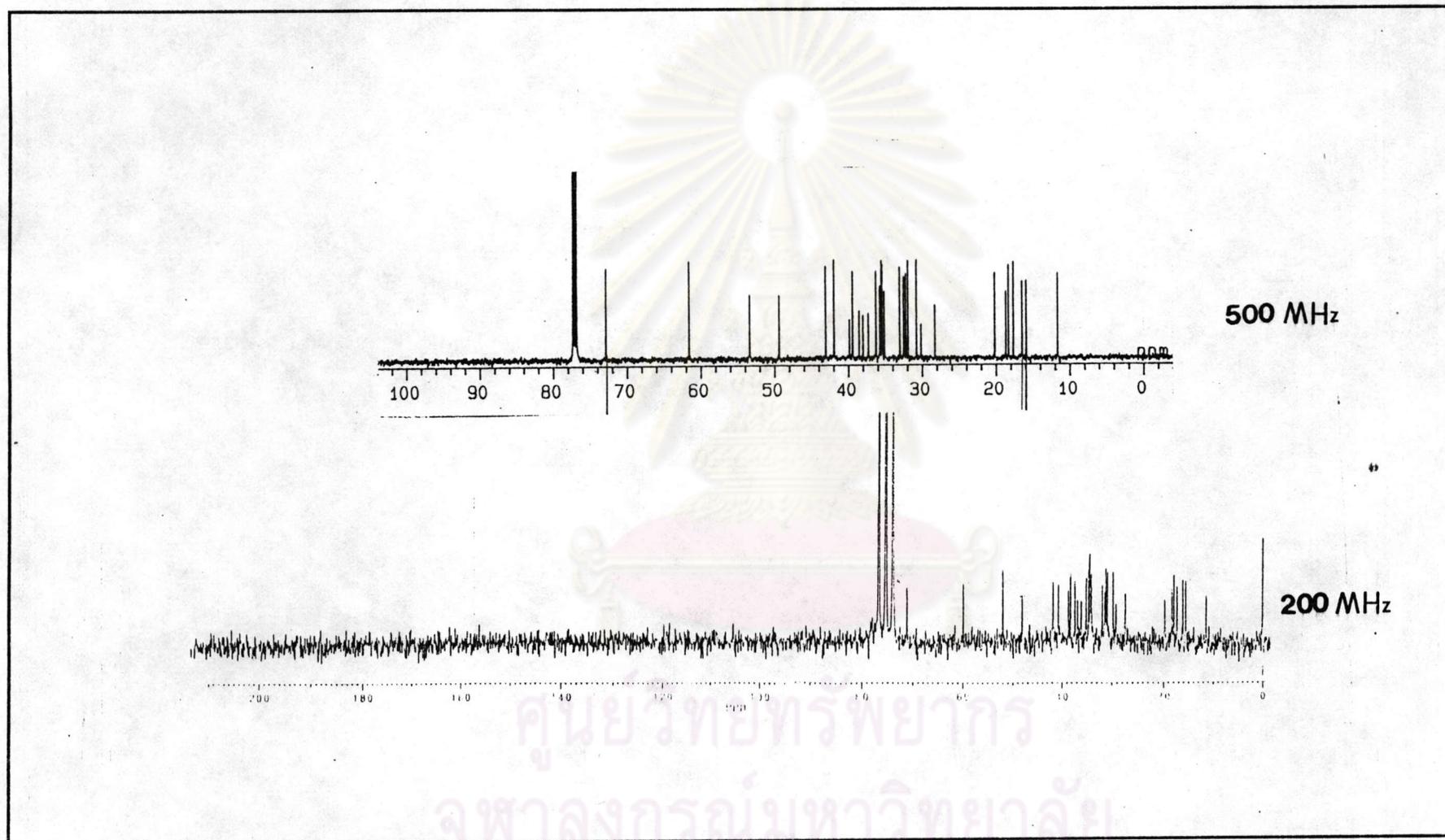


Fig. 25 The ^{13}C -NMR spectrum of BOV5 in CDCl_3

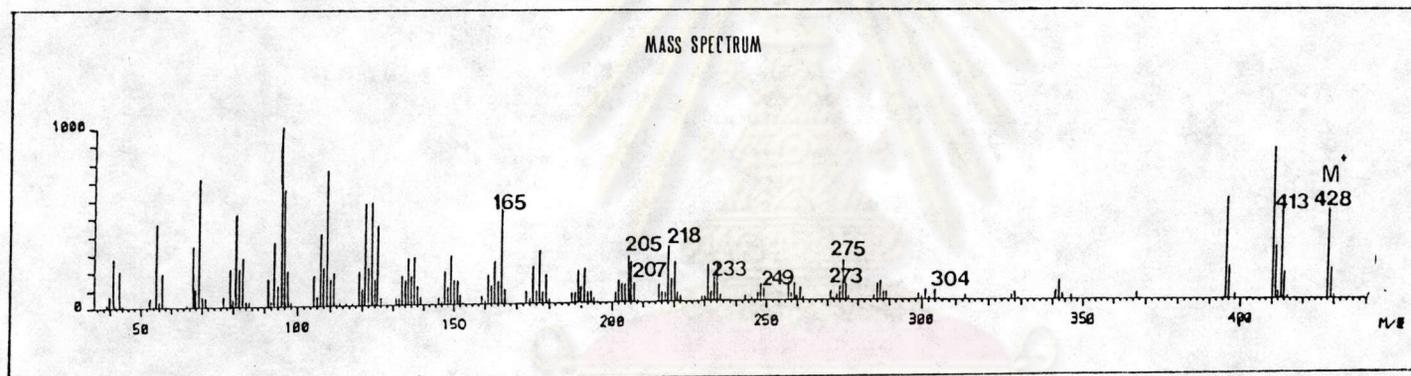
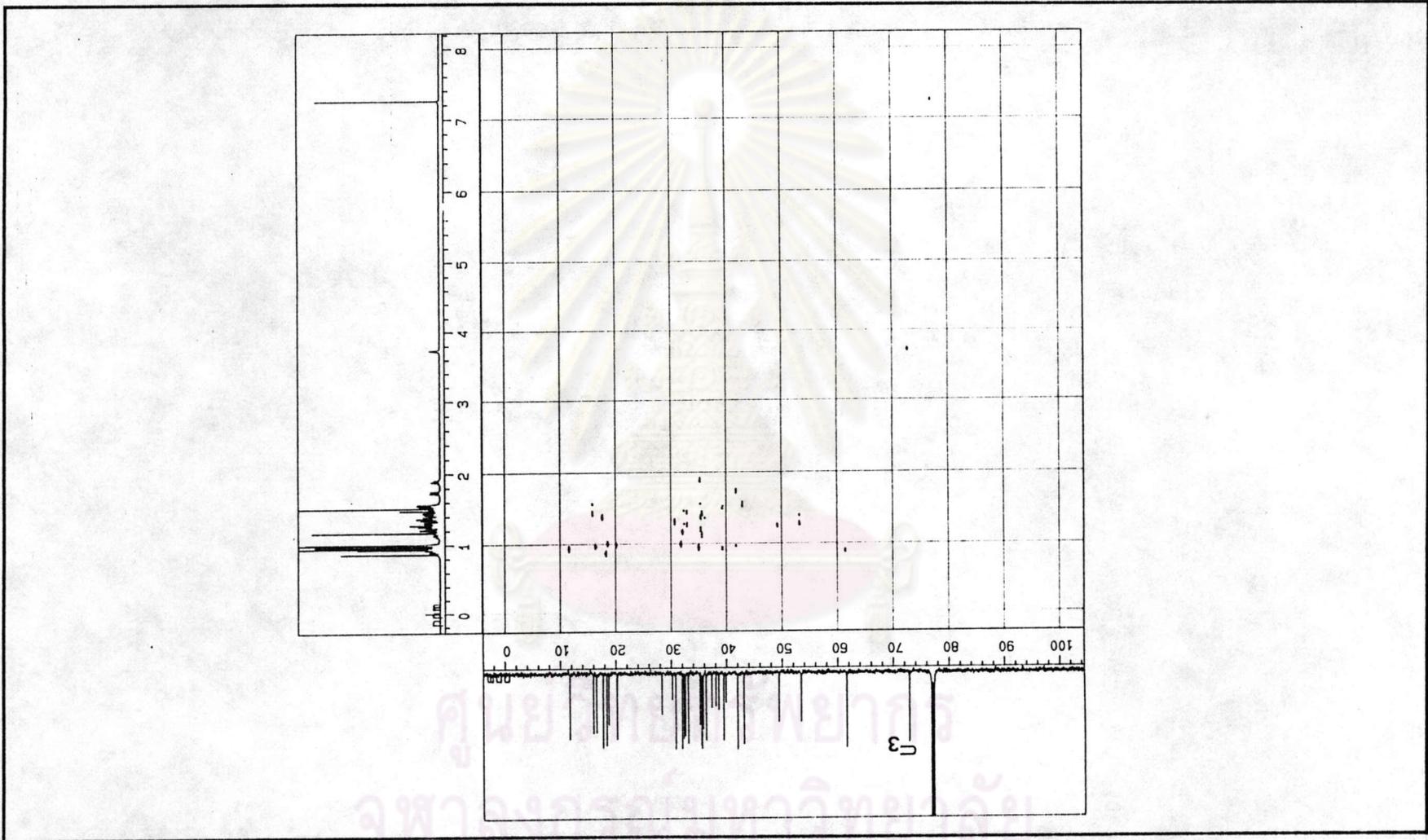


Fig. 26 The mass spectrum of BOV5

Fig. 27 The ^{13}C - ^1H correlation of BOV5



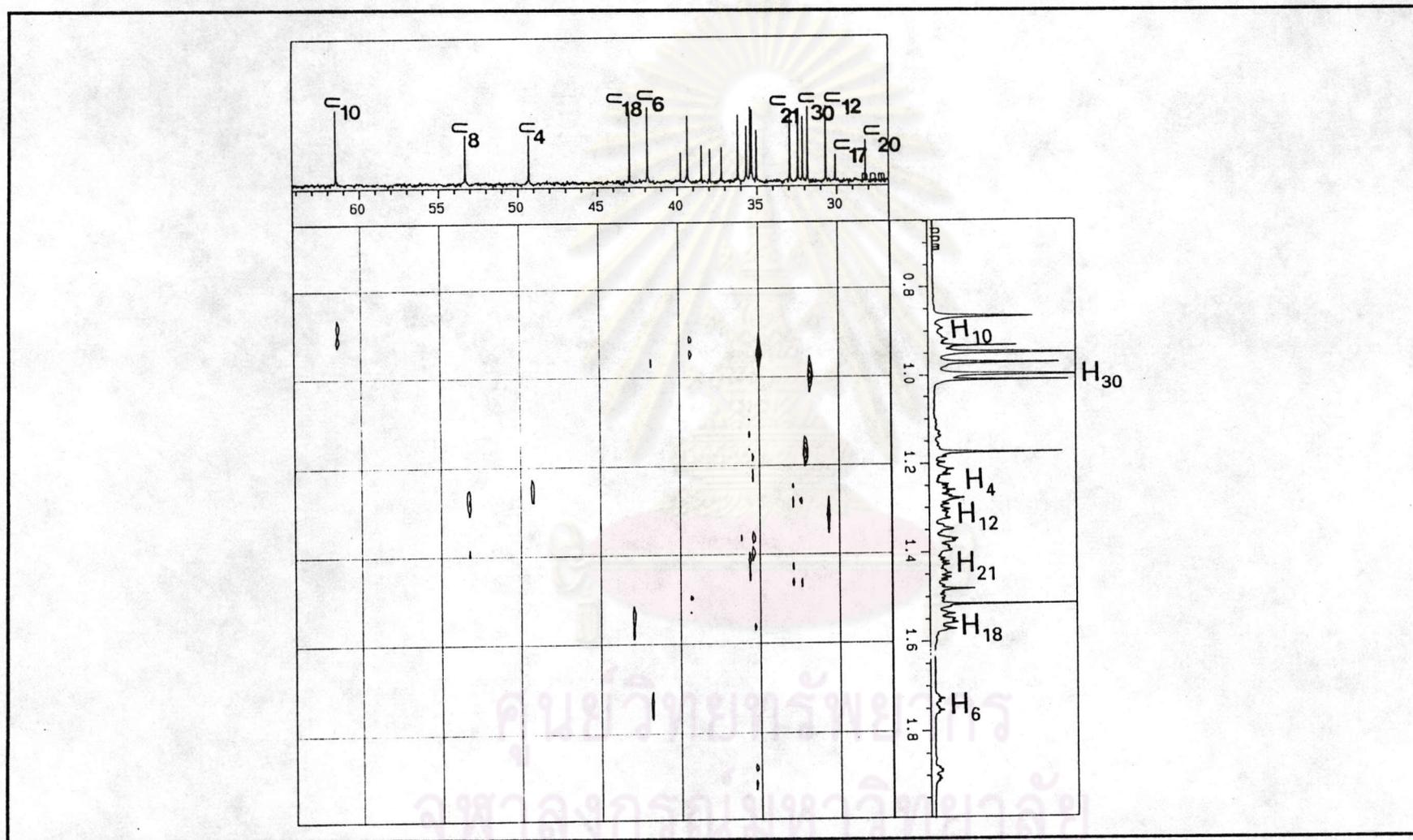


Fig. 28 The ^{13}C - ^1H correlation of BOV5

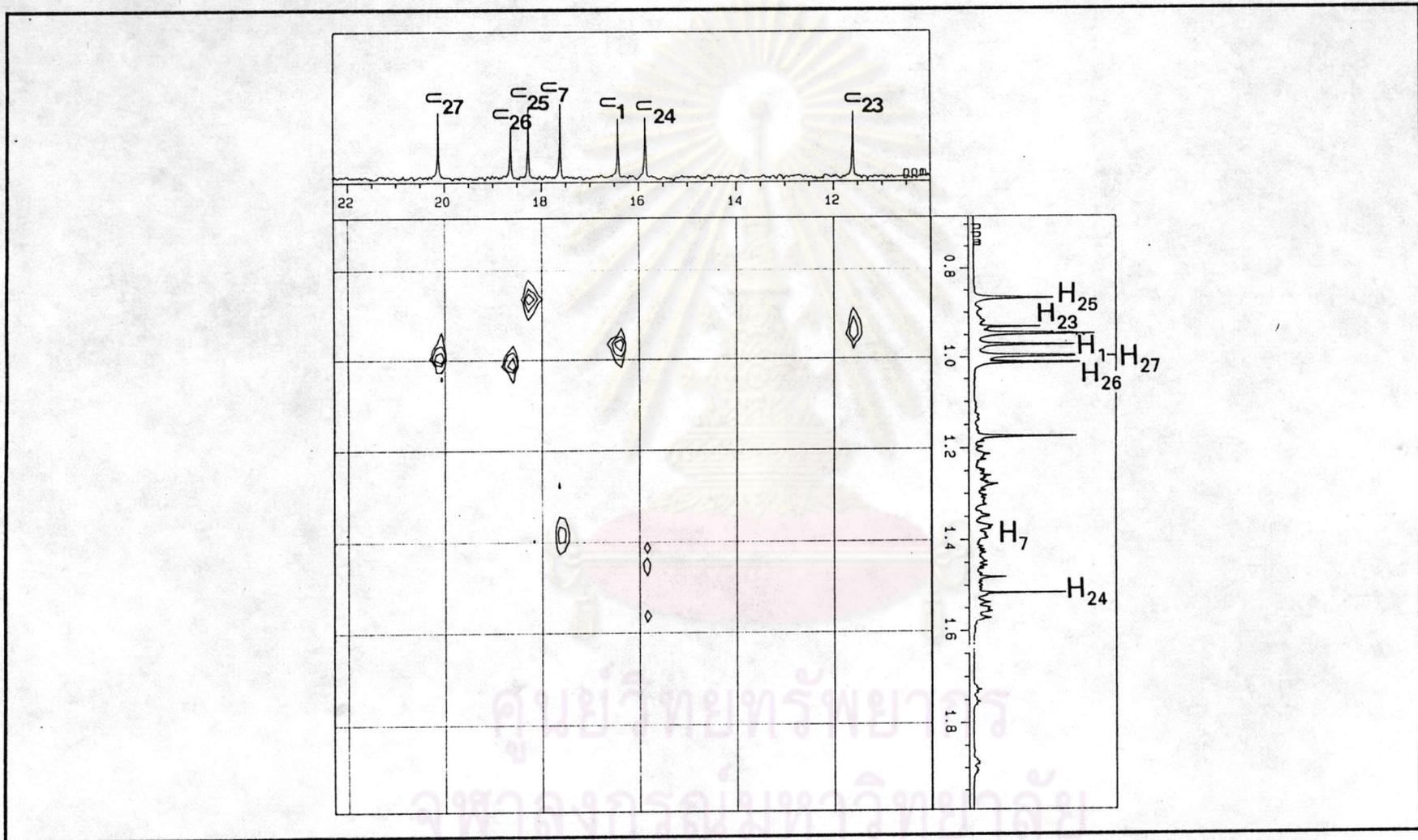


Fig. 29 The ^{13}C - ^1H correlation of BOV5

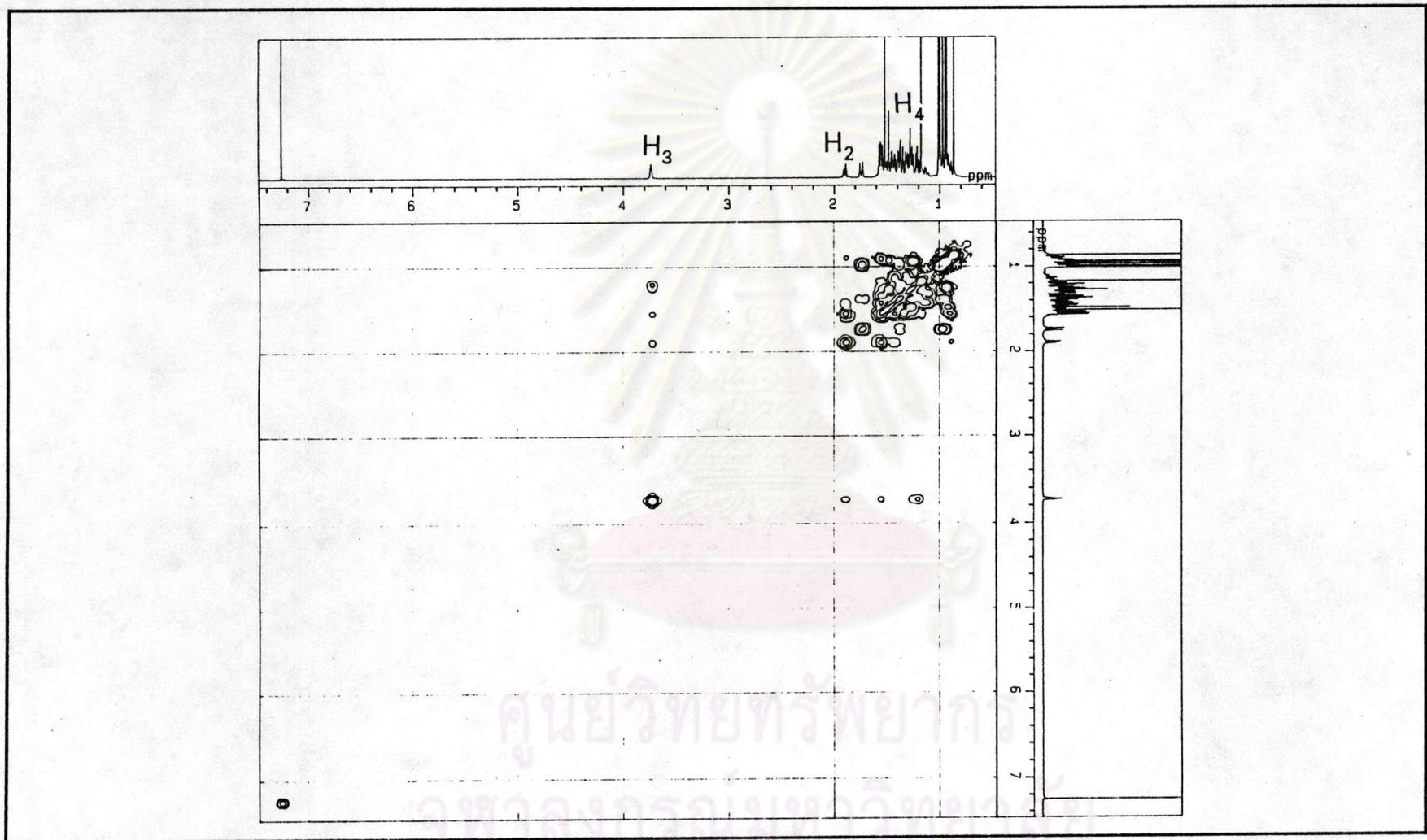


Fig. 30 The ^1H - ^1H COSY of BOV5

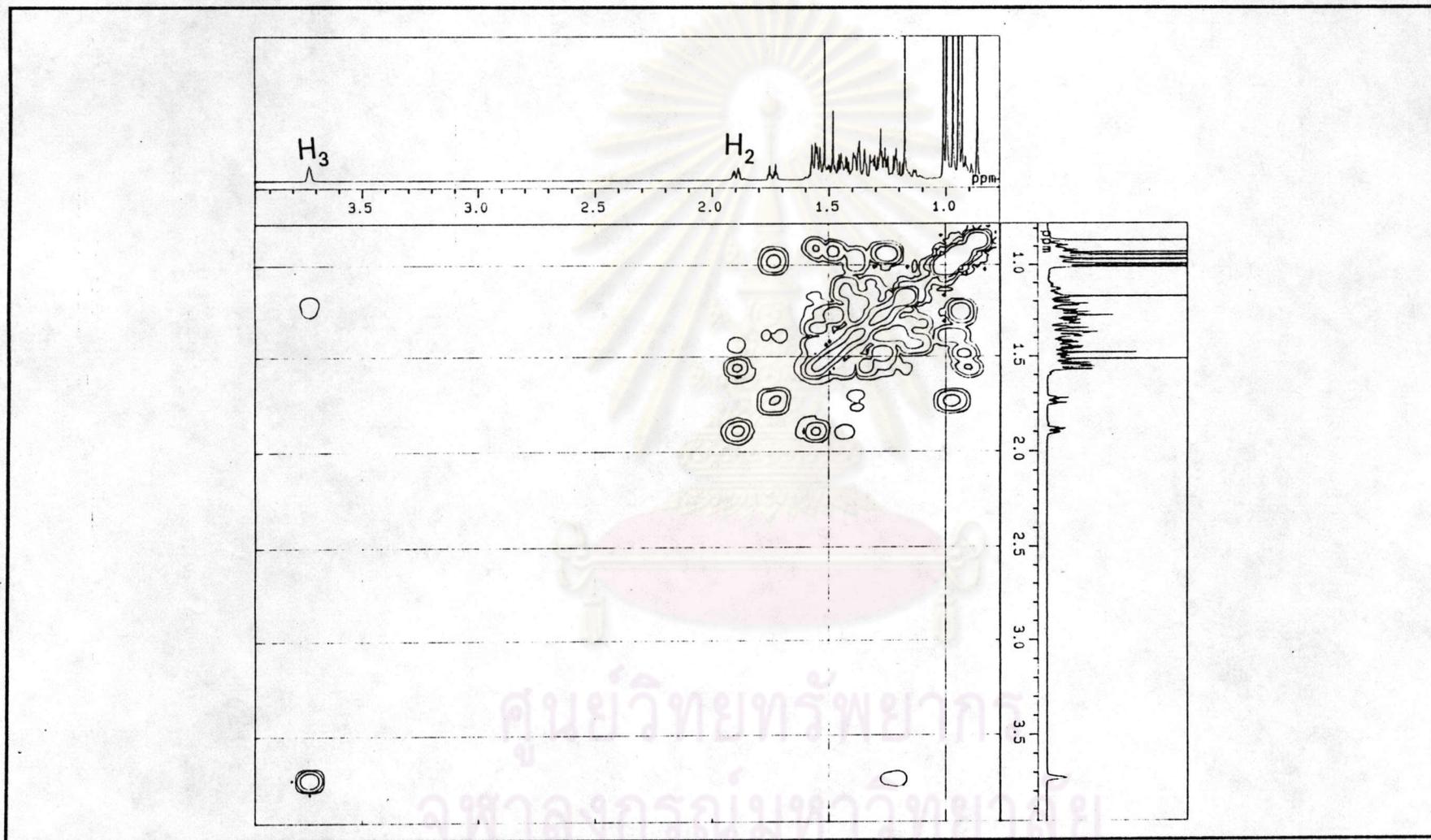


Fig. 31 The ^1H - ^1H COSY of BOV5

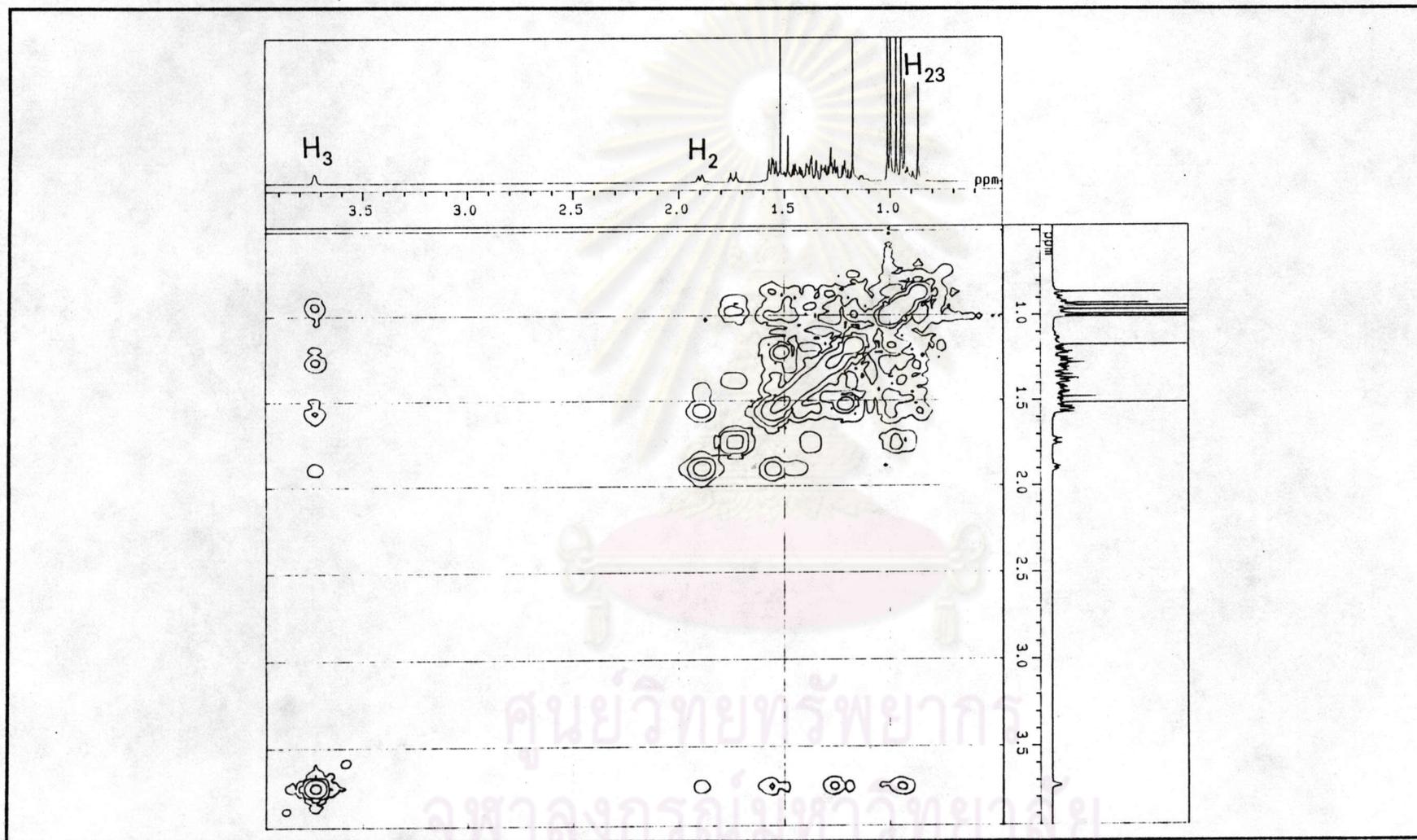


Fig. 32 The ^1H - ^1H NOESY of BOV5

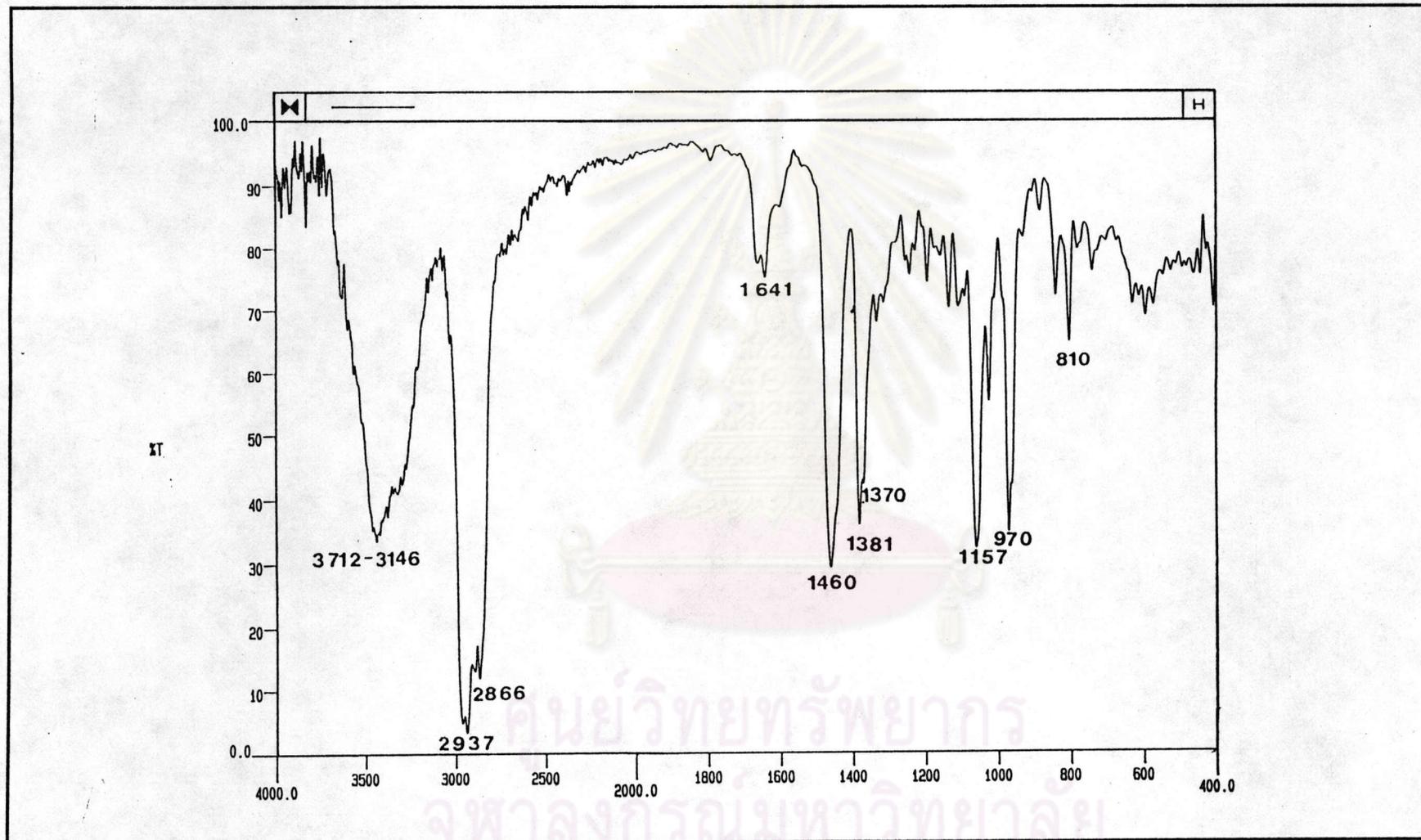


Fig. 33 The IR spectrum of BOV6

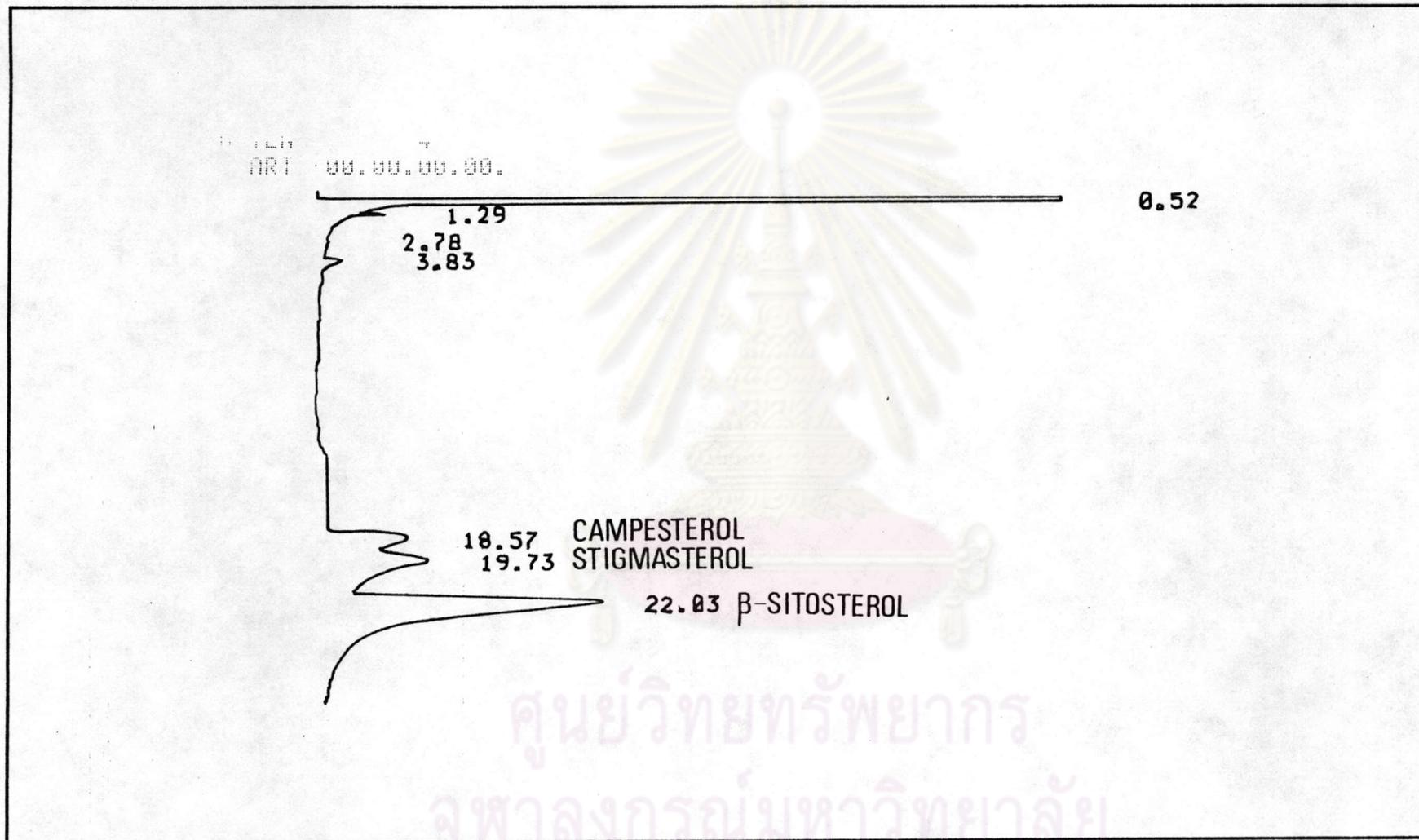


Fig. 34 The Gas-Liquid chromatogram of three standard steroids

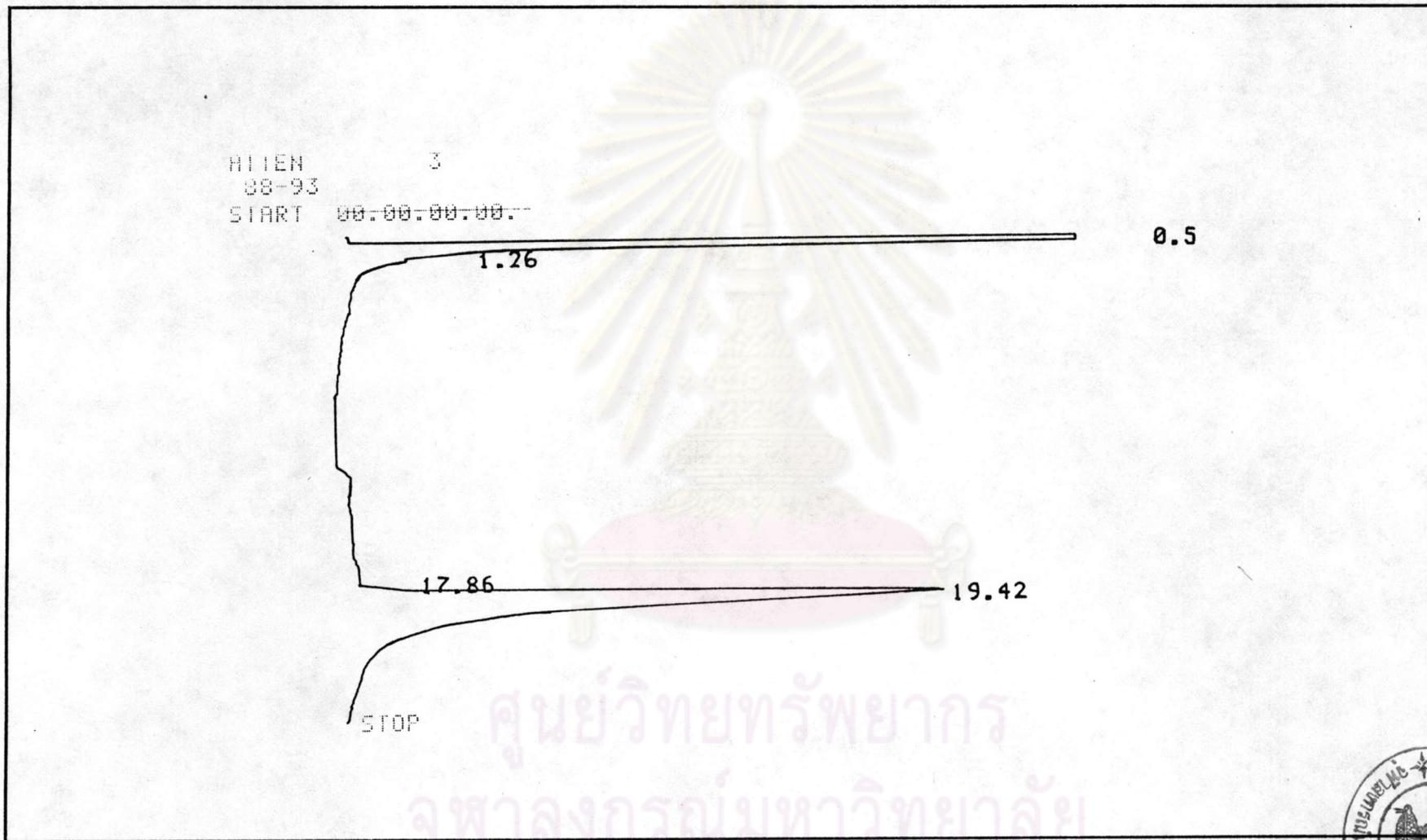


Fig. 35 The Gas-Liquid chromatogram of BOV6

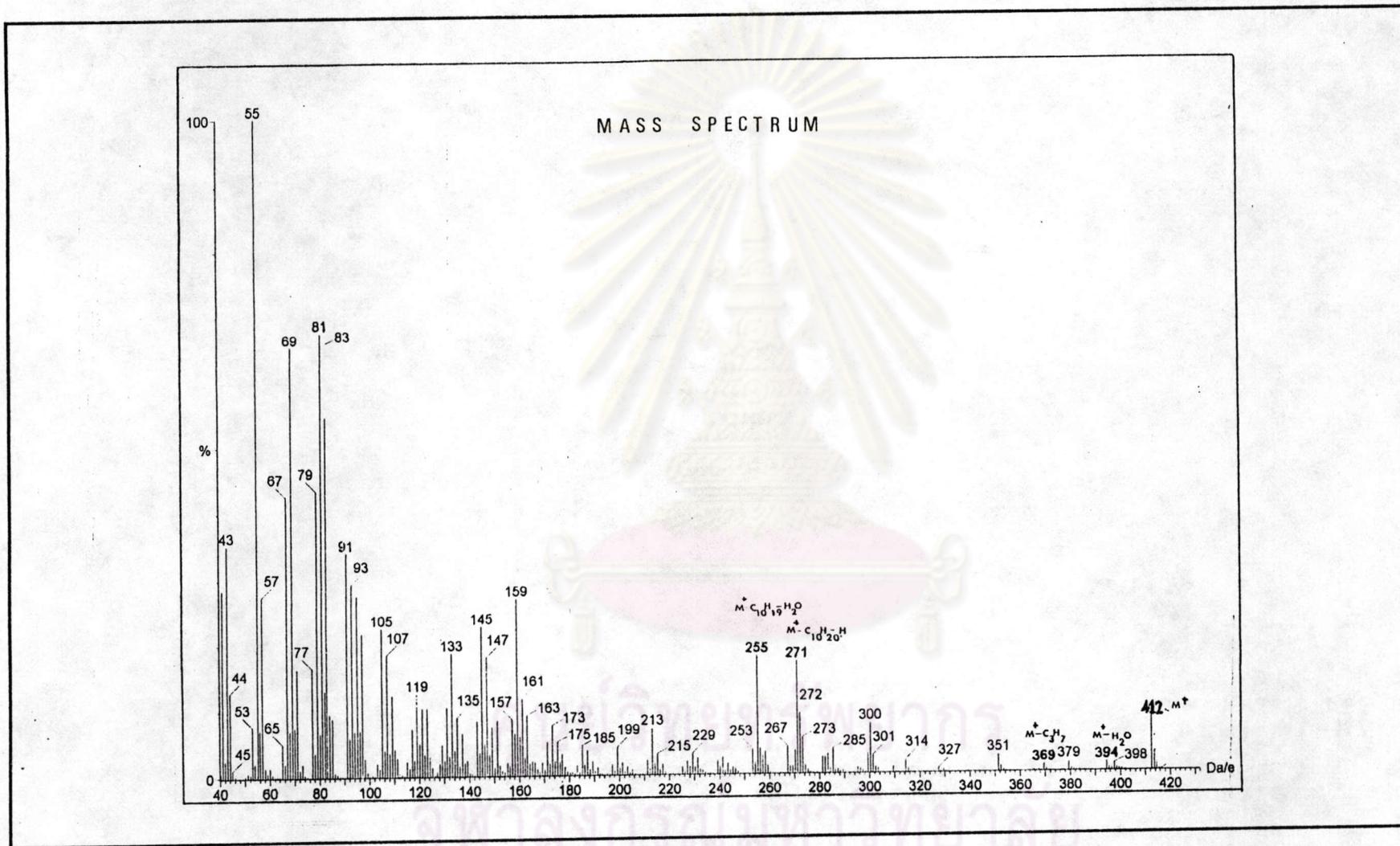


Fig. 36 The mass spectrum of BOV6

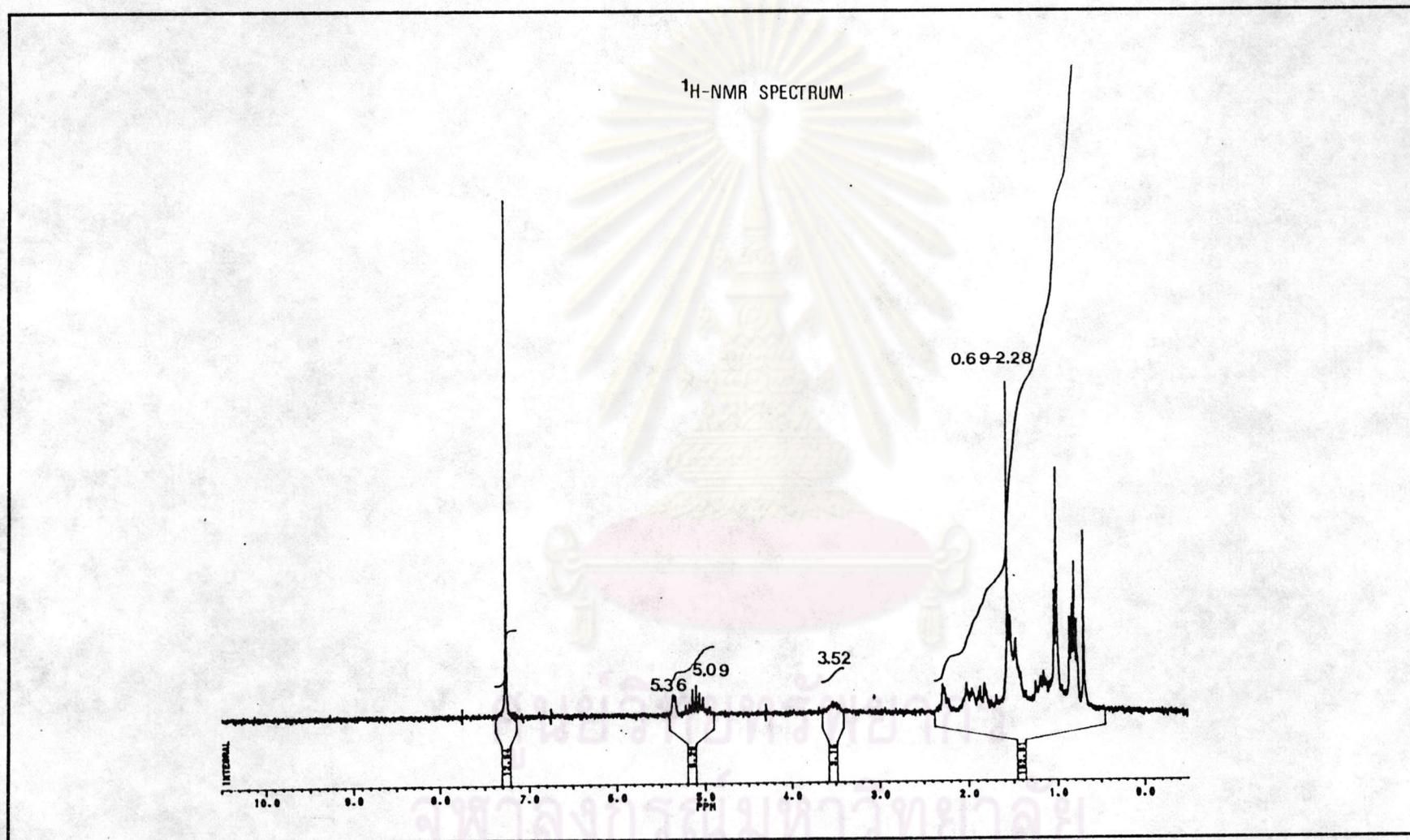


Fig. 37 The $^1\text{H-NMR}$ spectrum of BOV6 in CDCl_3

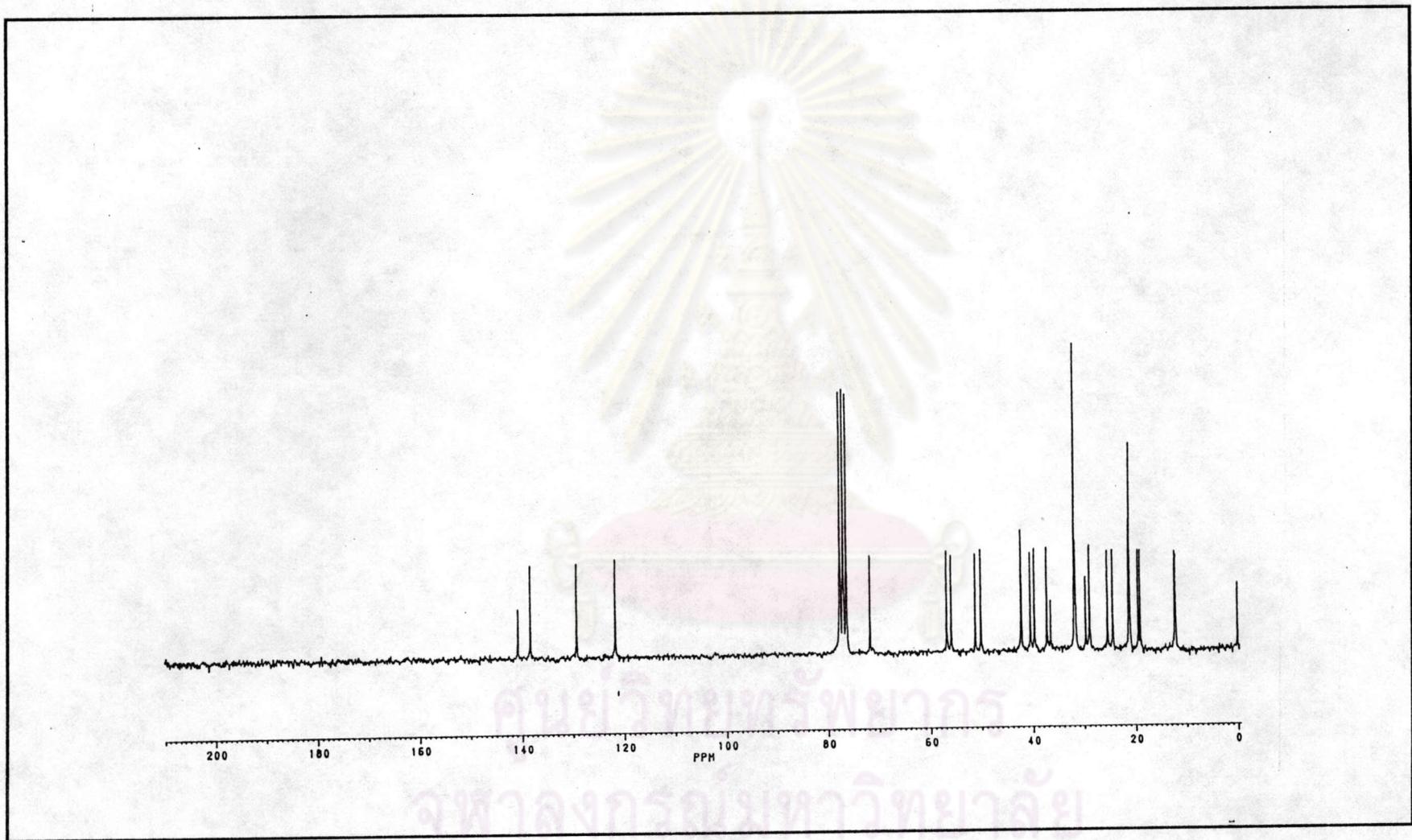


Fig. 38 The ^{13}C -NMR spectrum of BOV6 in CDCl_3

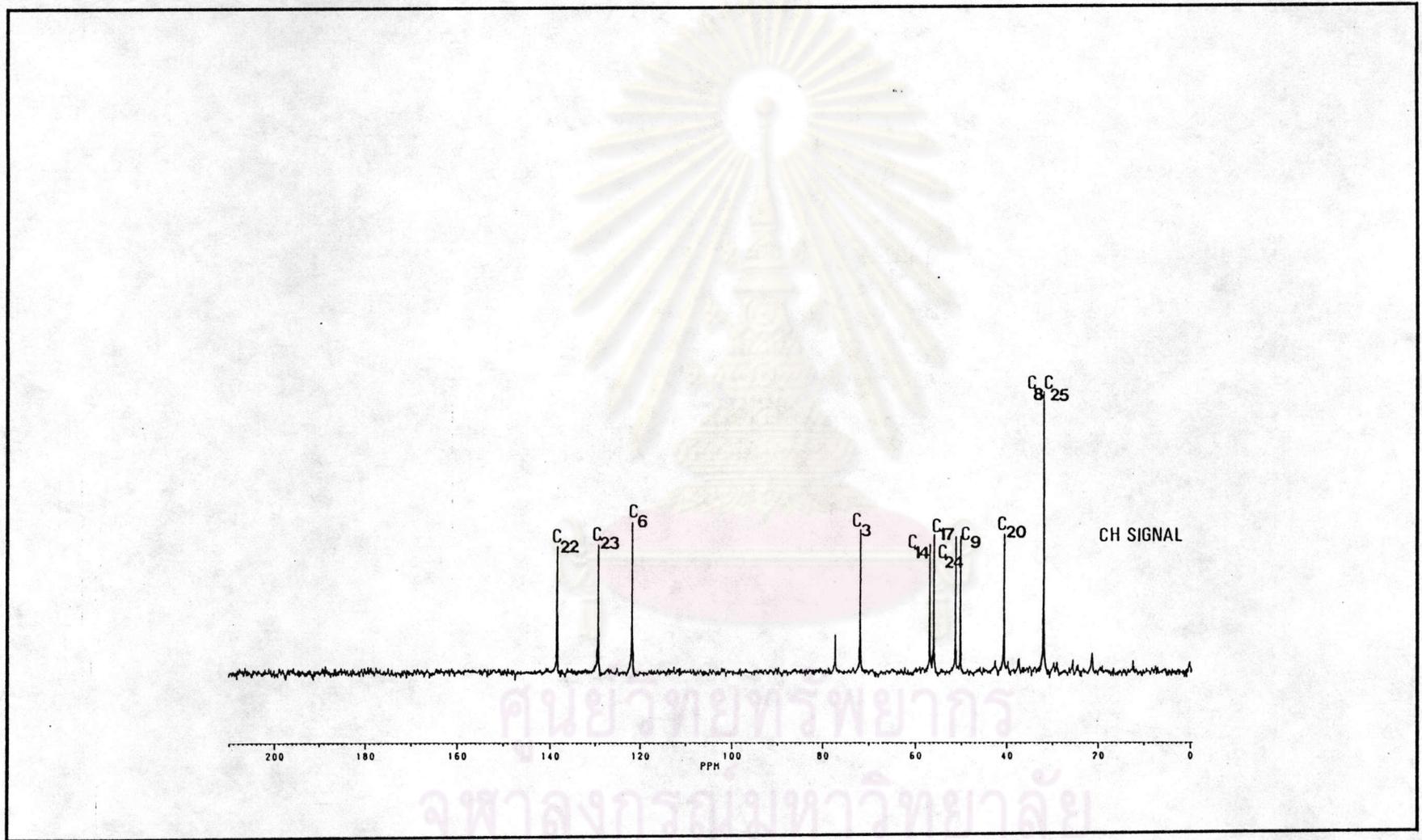


Fig. 39 The DEPT-90 ^{13}C spectrum of BOV6 in CDCl_3

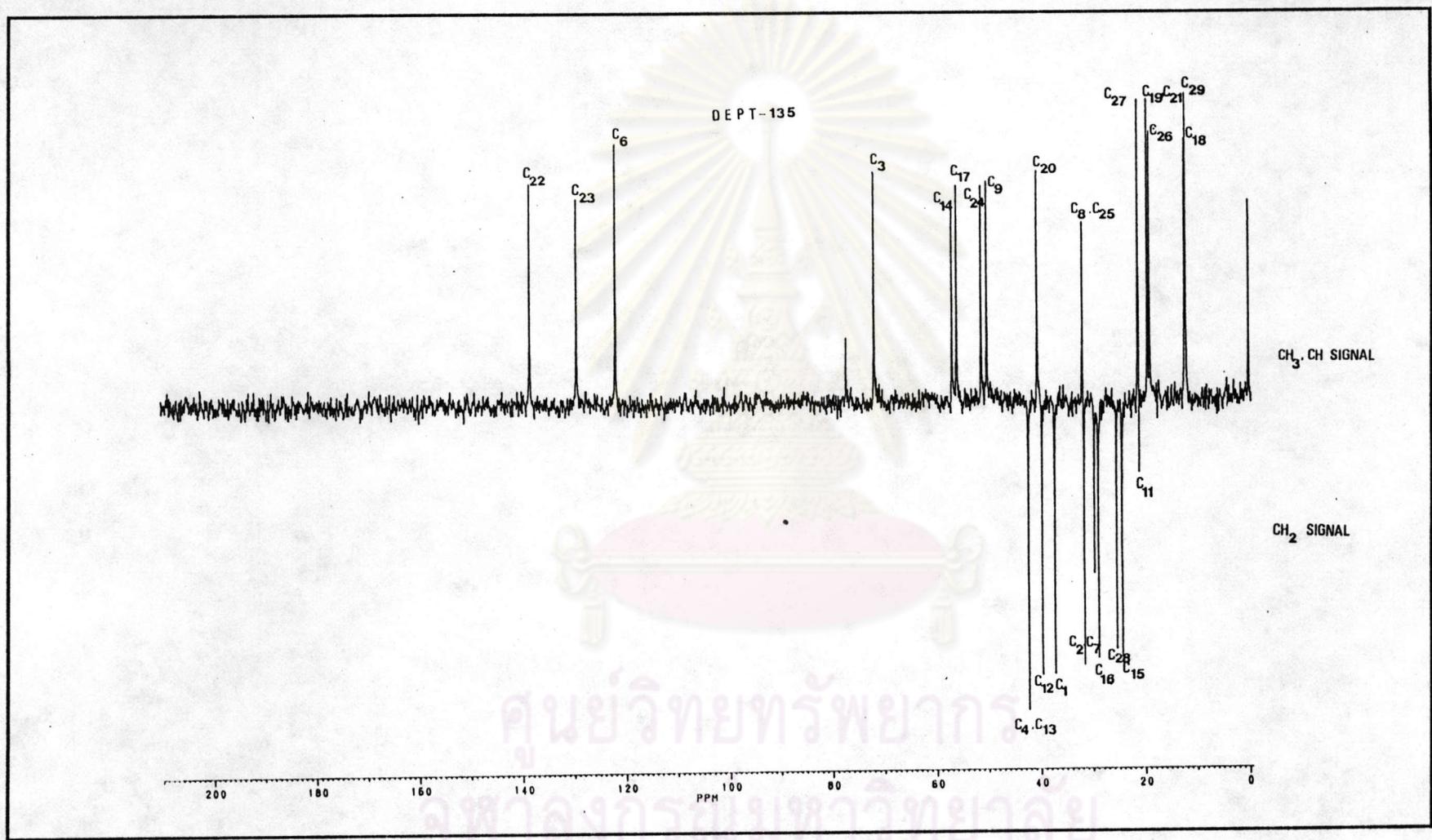


Fig. 40 The DEPT-135 ¹³C spectrum of BOV6 in CDCl₃

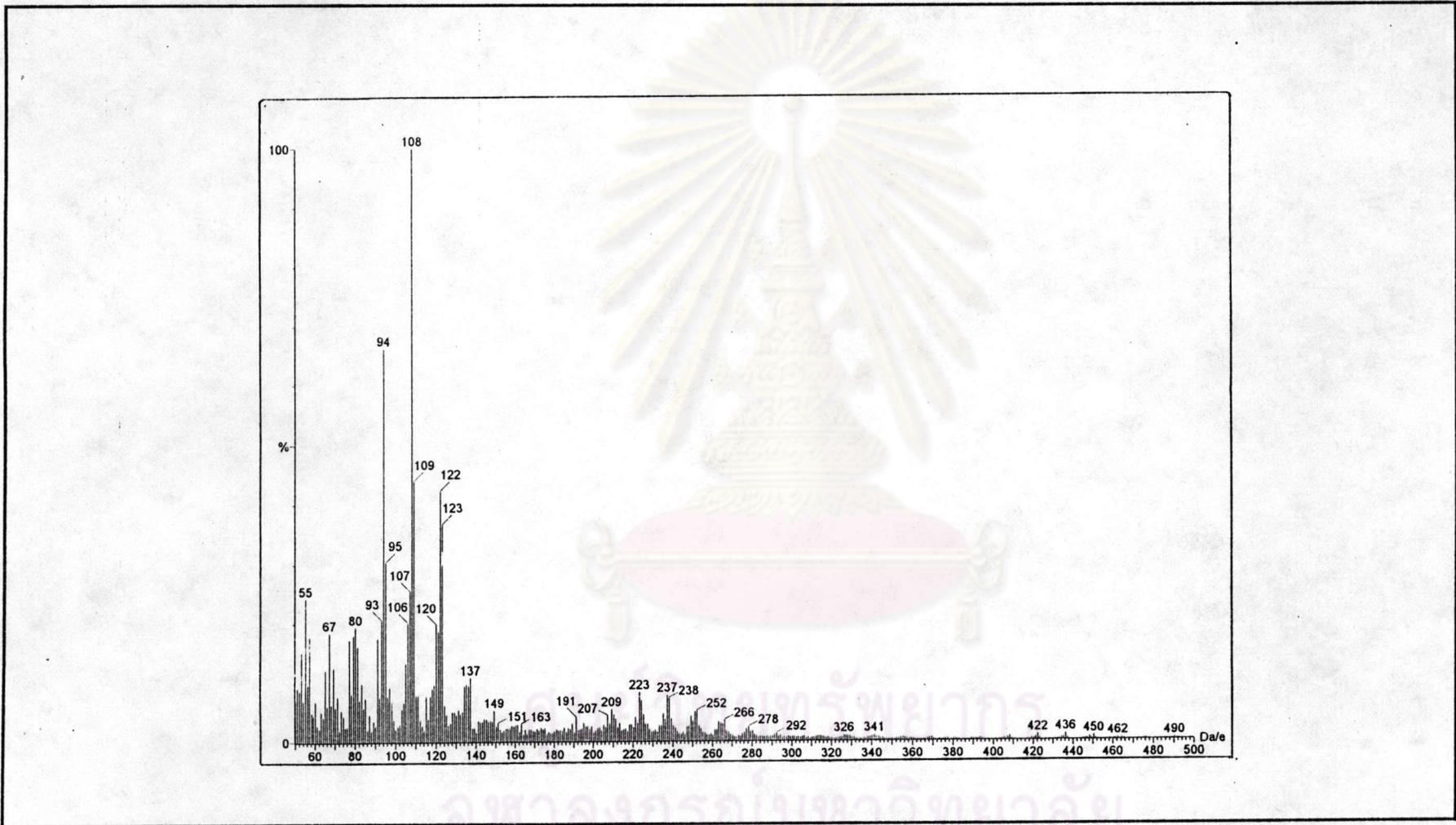


Fig. 41 The mass spectrum a) BOV7 at 70 eV

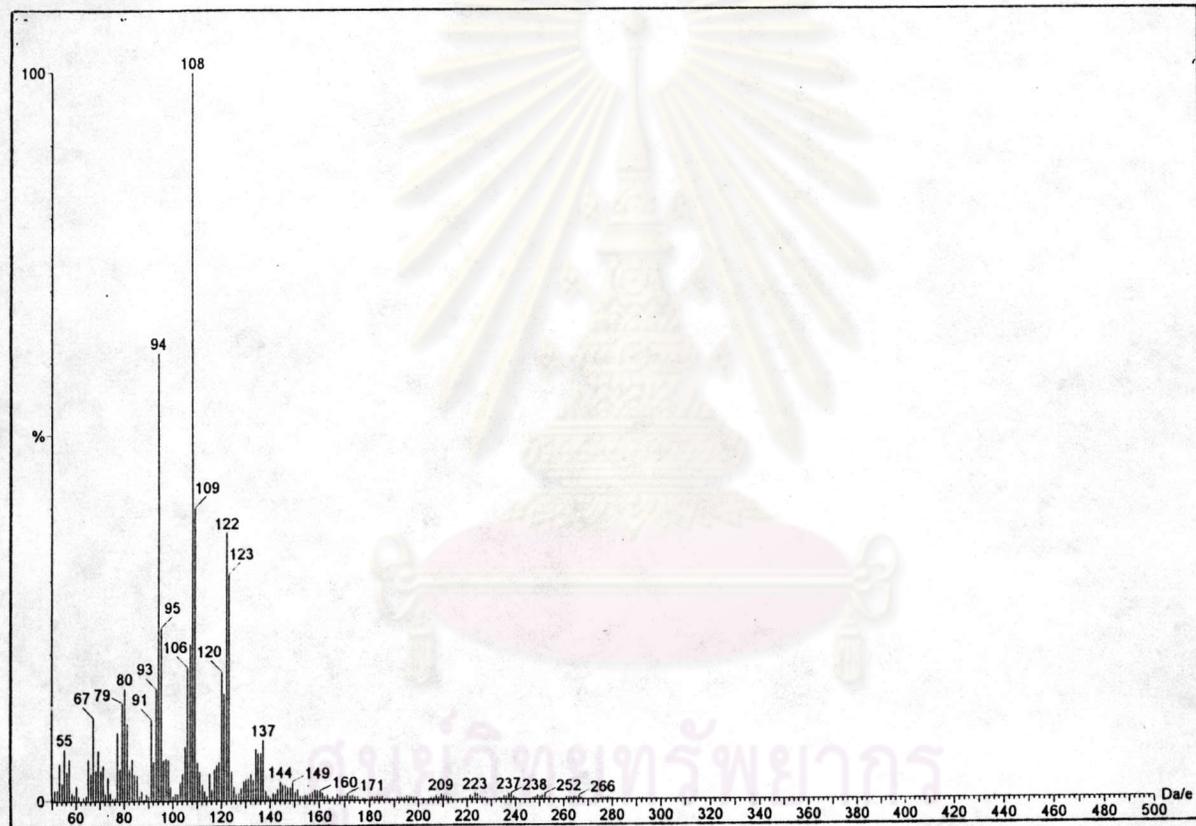


Fig. 41 The mass spectrum b) BOV7 at 30 eV

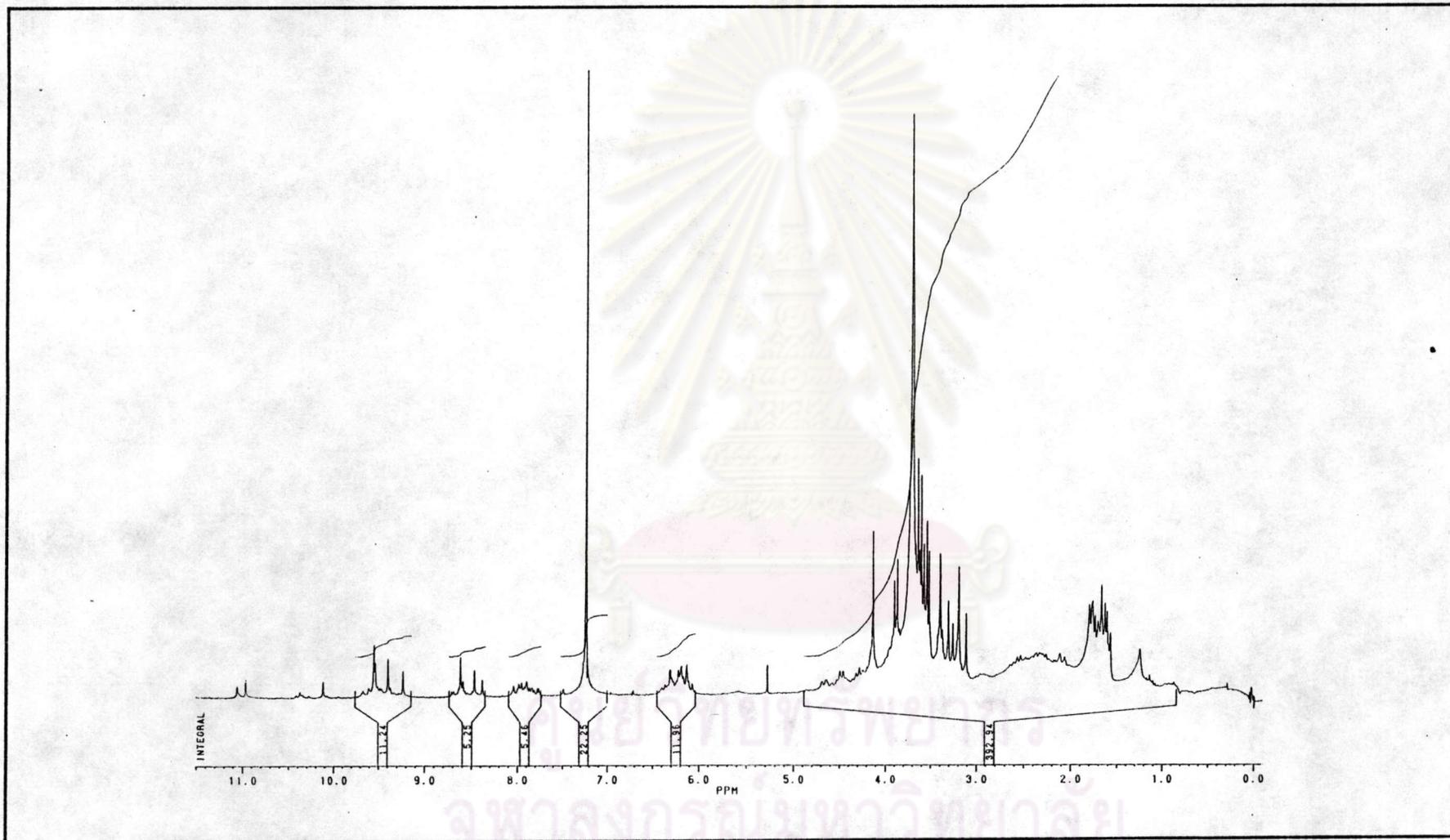


Fig. 42 The $^1\text{H-NMR}$ spectrum of BOV7 in CDCl_3

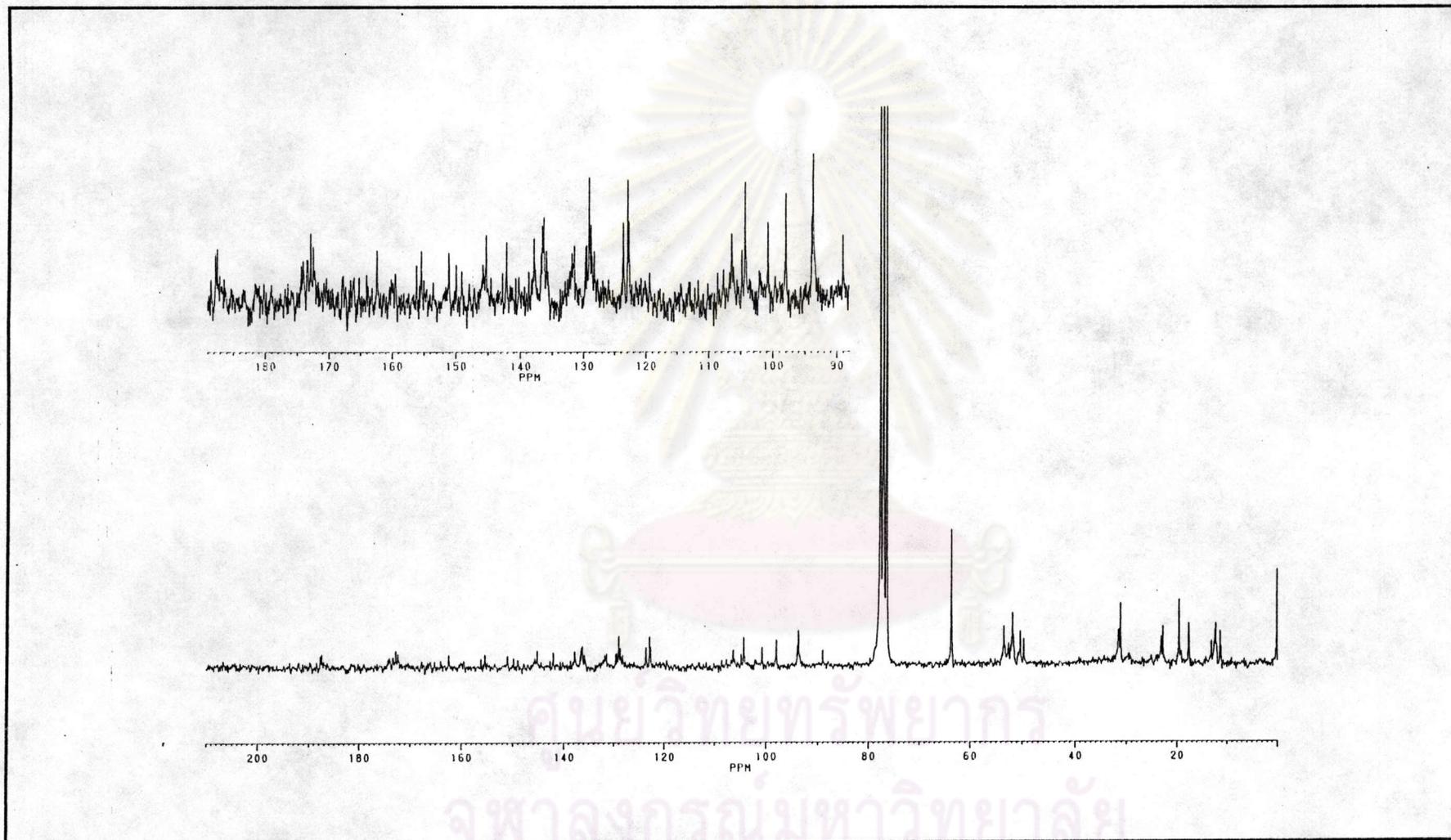


Fig. 43 The ^{13}C -NMR spectrum of BOV7 in CDCl_3

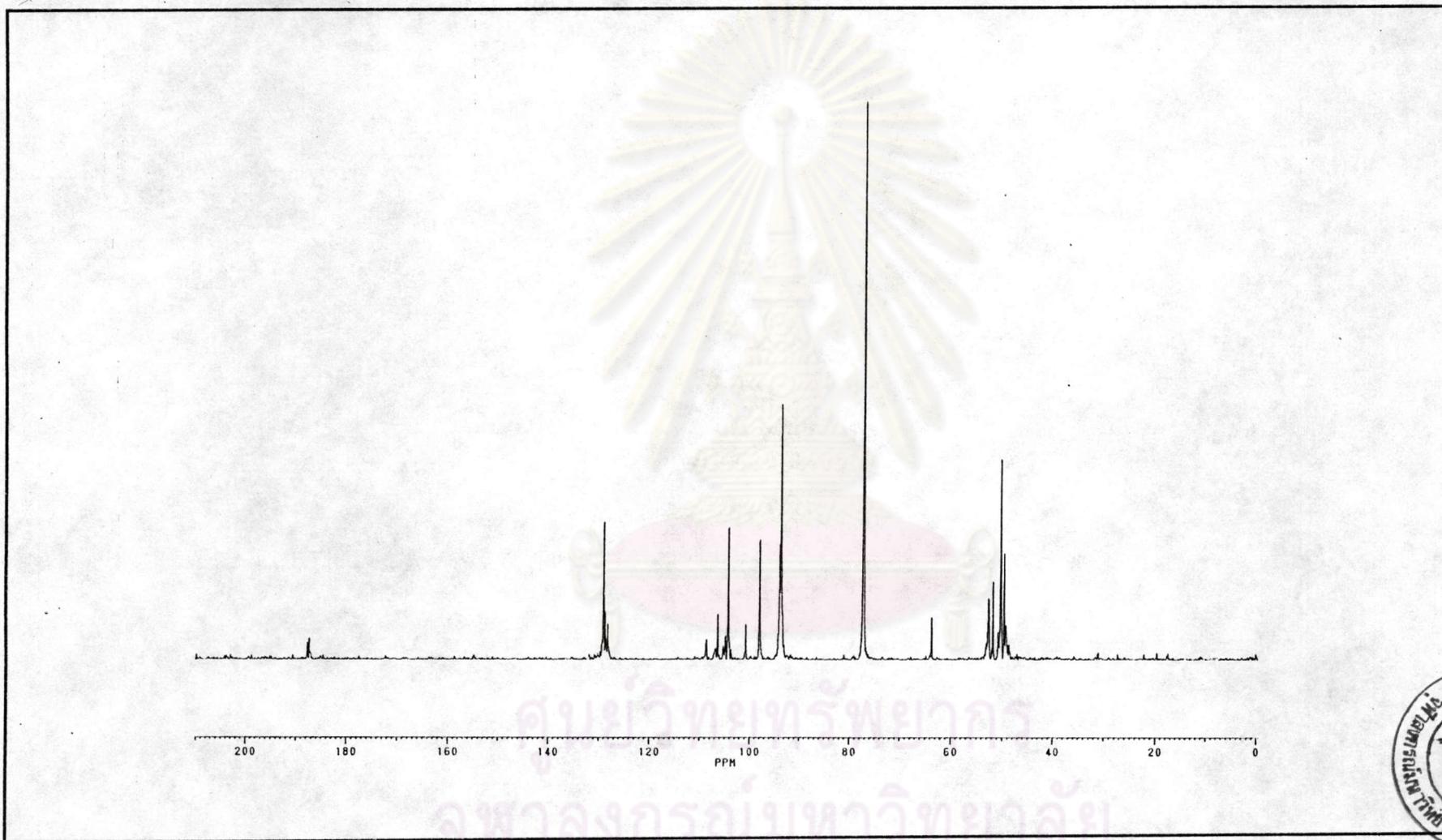


Fig. 44 The DEPT-90 ^{13}C spectrum of BOV7 in CDCl_3



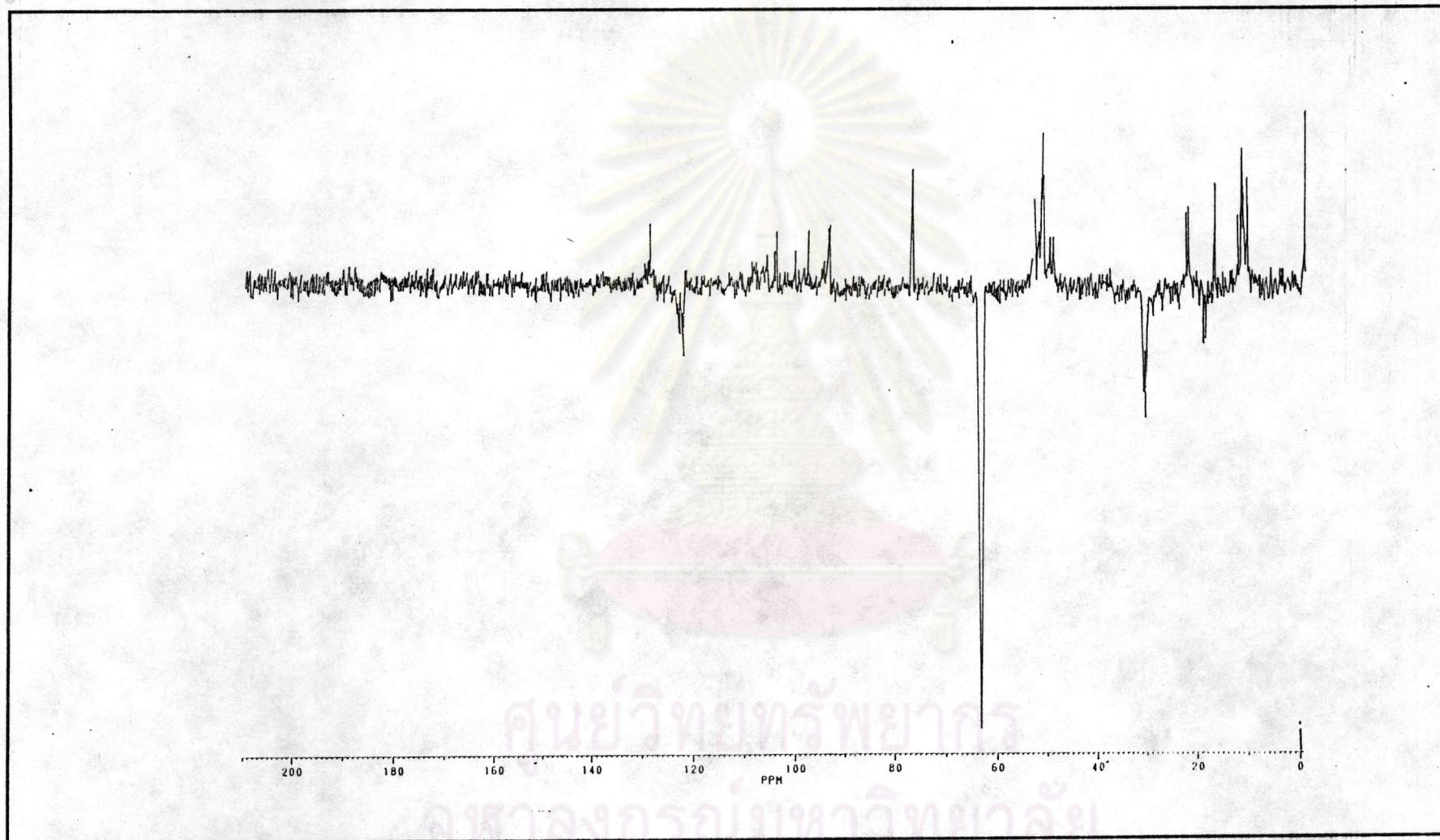


Fig. 45 The DEPT-135 ^{13}C spectrum of BOV7 in CDCl_3

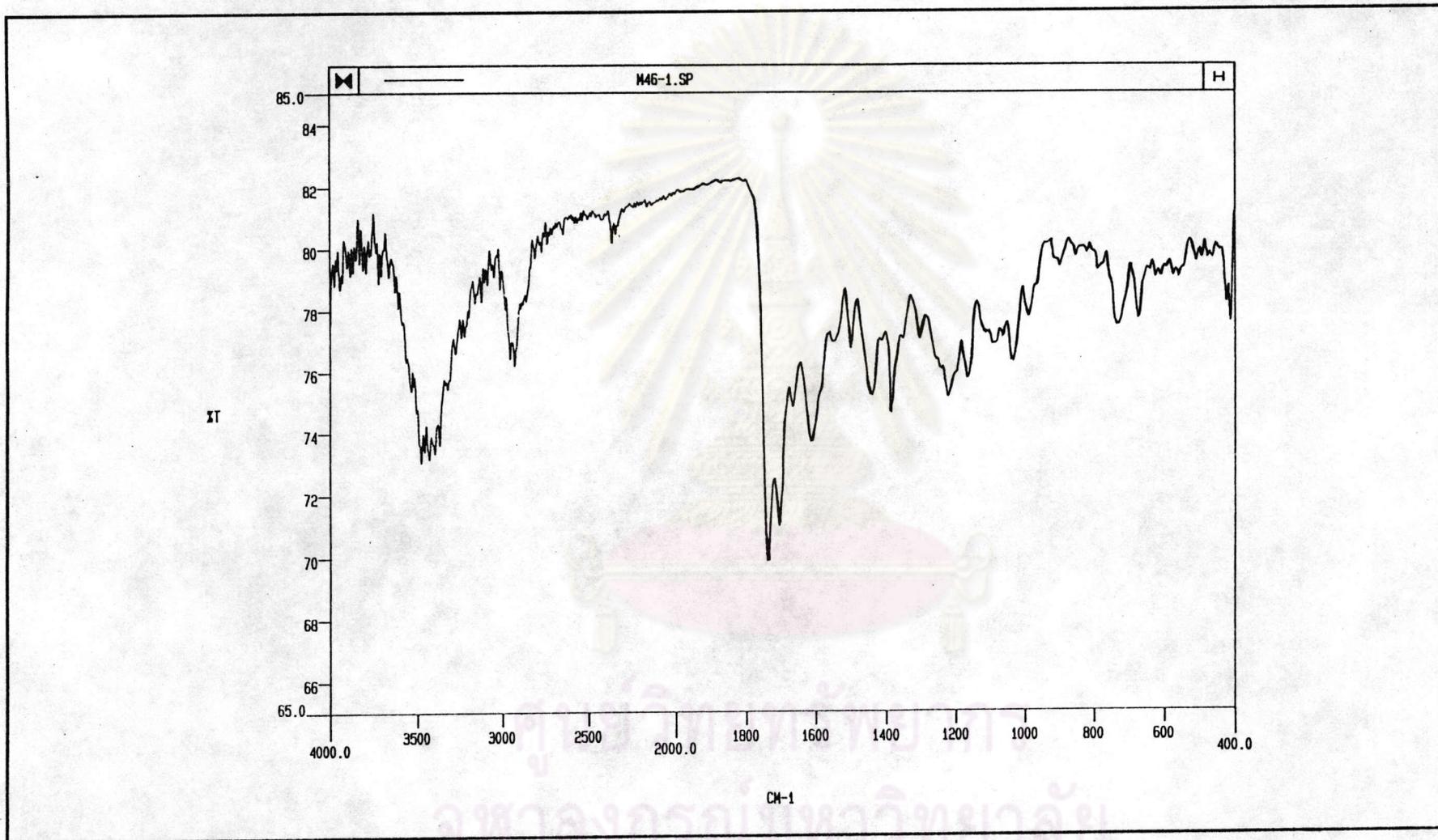


Fig. 46 The IR spectrum of BOV8

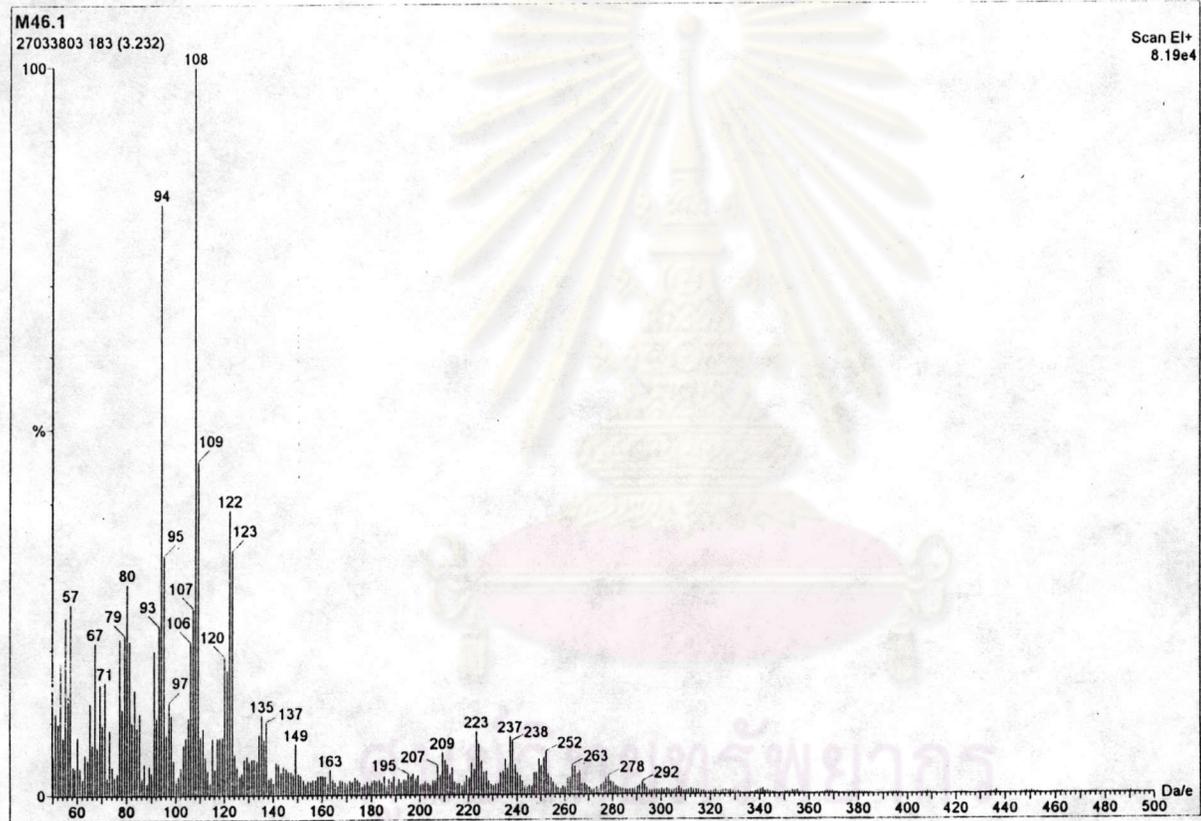


Fig. 47 The mass spectrum a) BOV7 at 70 eV

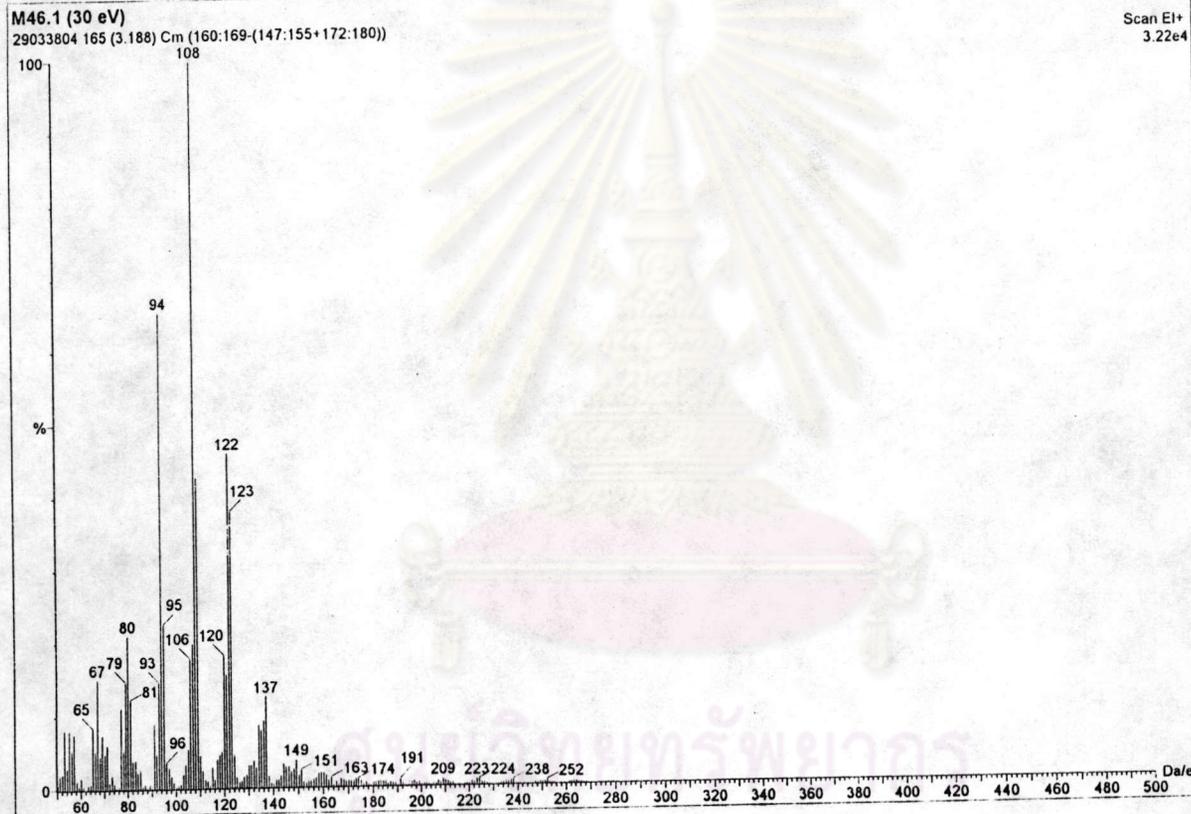


Fig. 47 The mass spectrum b) BOV7 at 30 eV

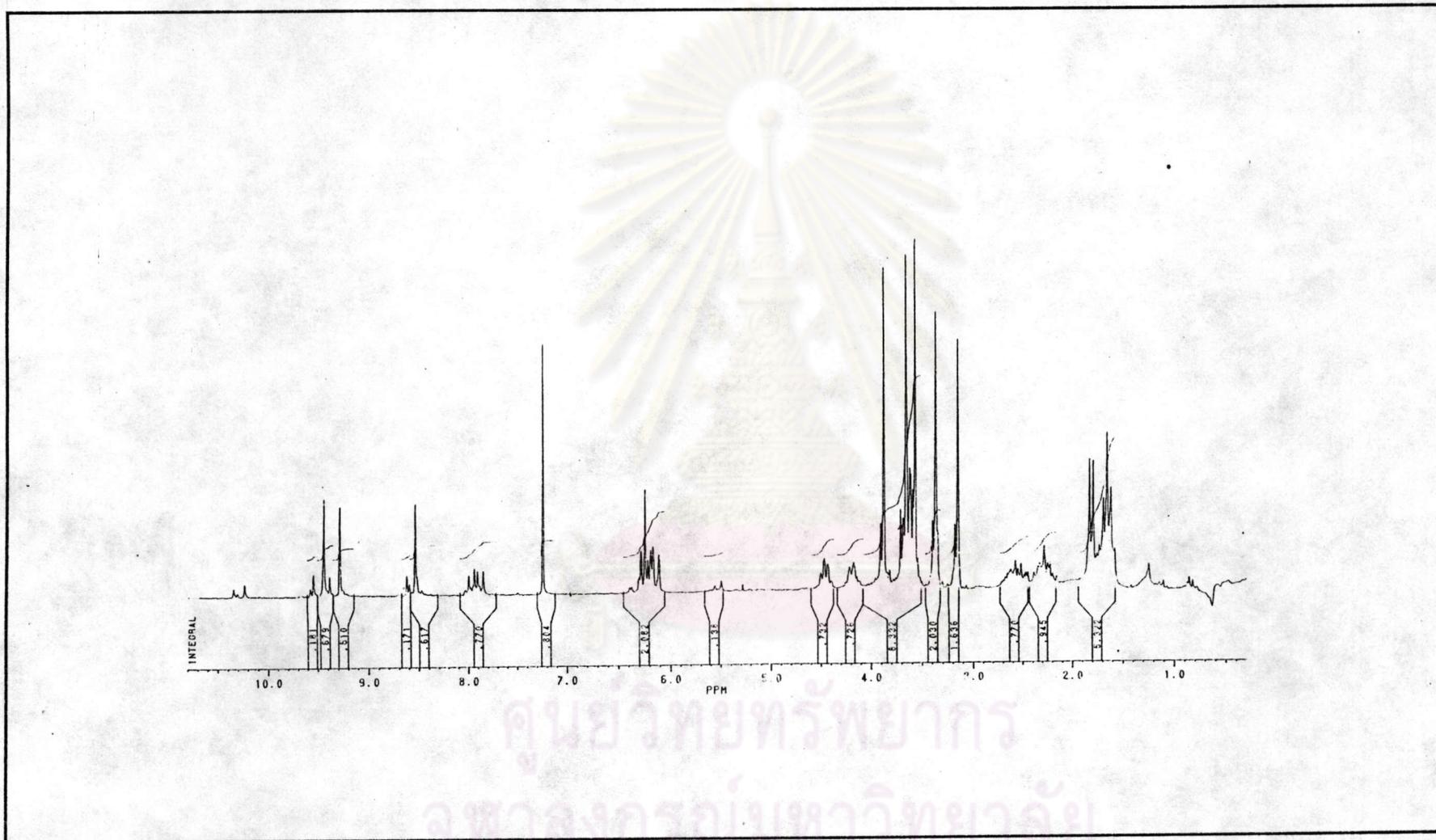


Fig. 48 The $^1\text{H-NMR}$ spectrum of BOV8 in CDCl_3

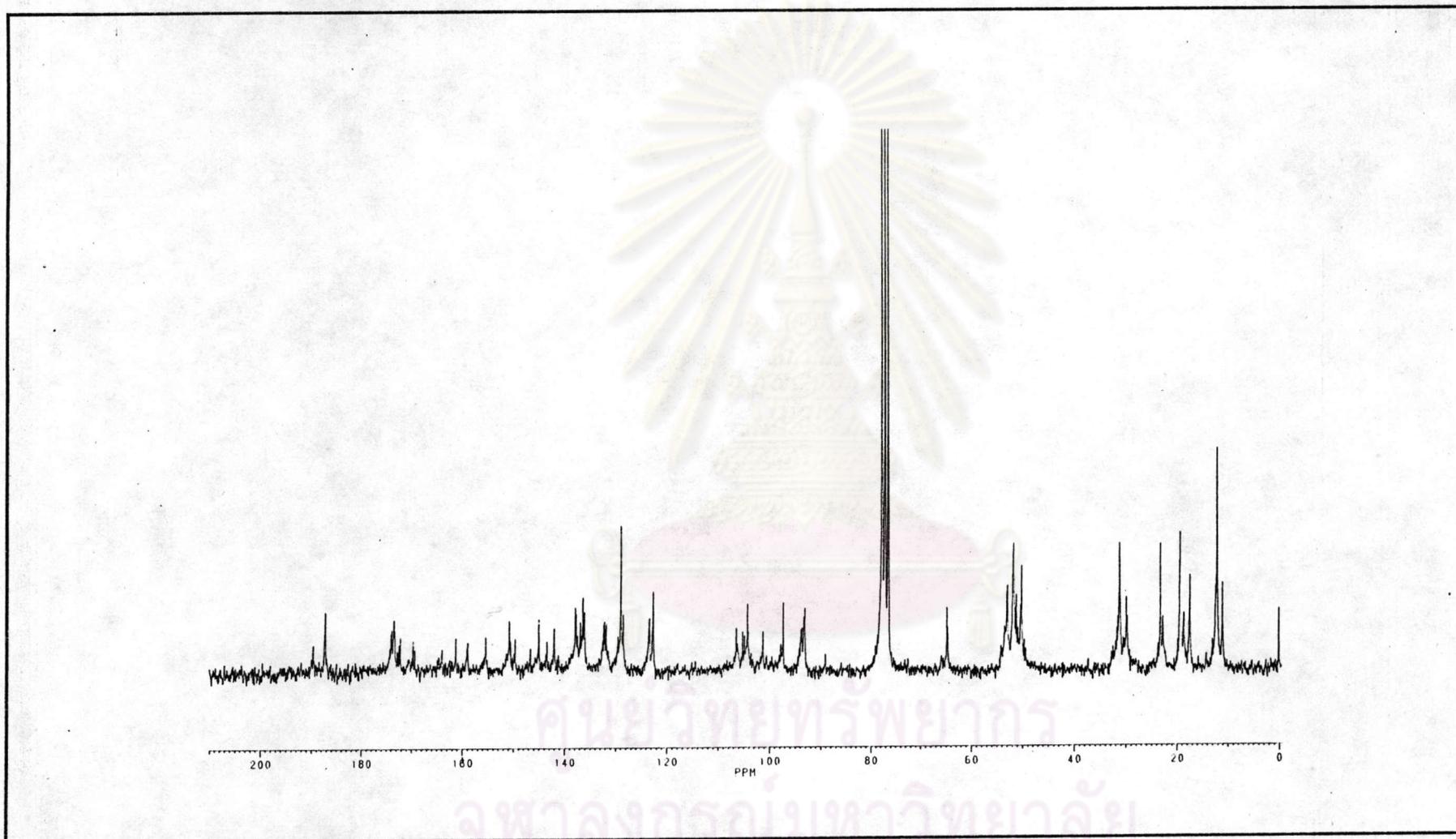


Fig. 49 The ^{13}C -NMR spectrum of BOV8 in CDCl_3

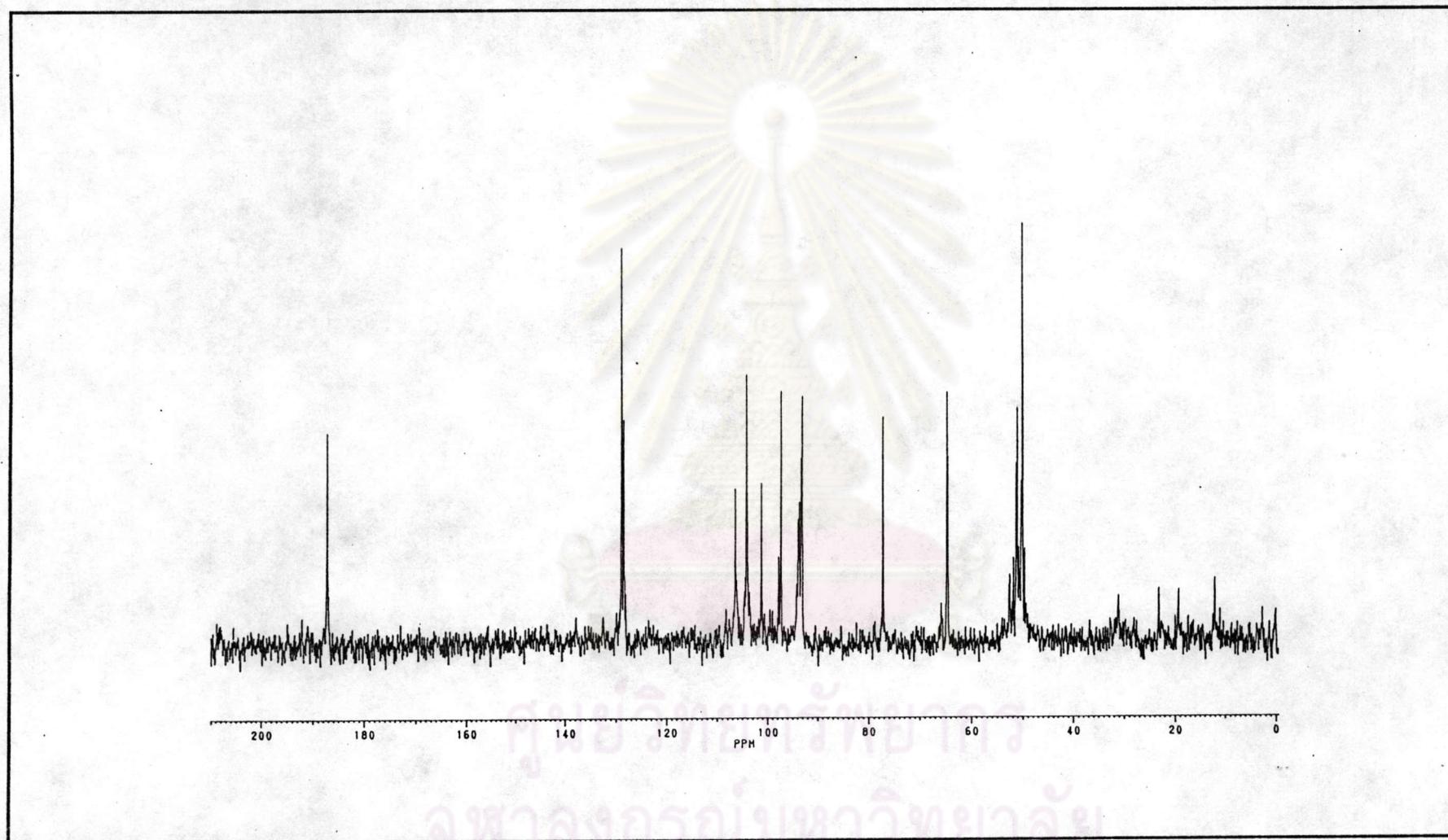


Fig. 50 The DEPT-90 ^{13}C spectrum of BOV8 in CDCl_3

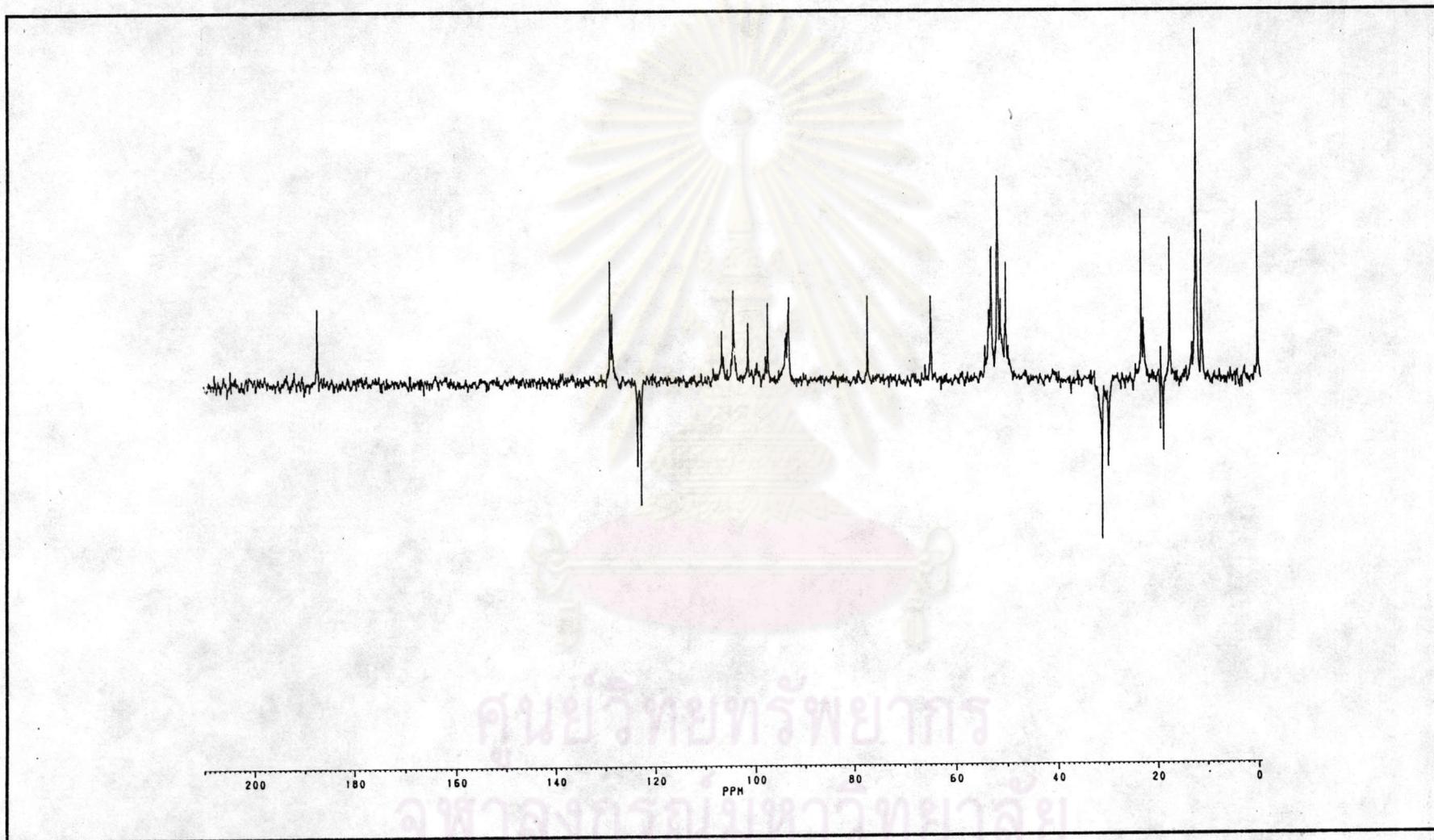


Fig. 51 The DEPT-135 ^{13}C spectrum of BOV8 in CDCl_3



VITA

Miss Nisakorn Thongkon was born on March 8, 1971 in Samutprakarn, Thailand. She graduated with Bachelor Degree of Science in chemistry from Chulalongkorn University in 1993. In the same year, she was admitted into a Master Degree program in organic chemistry at Chulalongkorn University. During her study towards the Master's degree, she received financial support from the french government during 1994-1995.

ศูนย์วิทยพัชร์พยากร
จุฬาลงกรณ์มหาวิทยาลัย