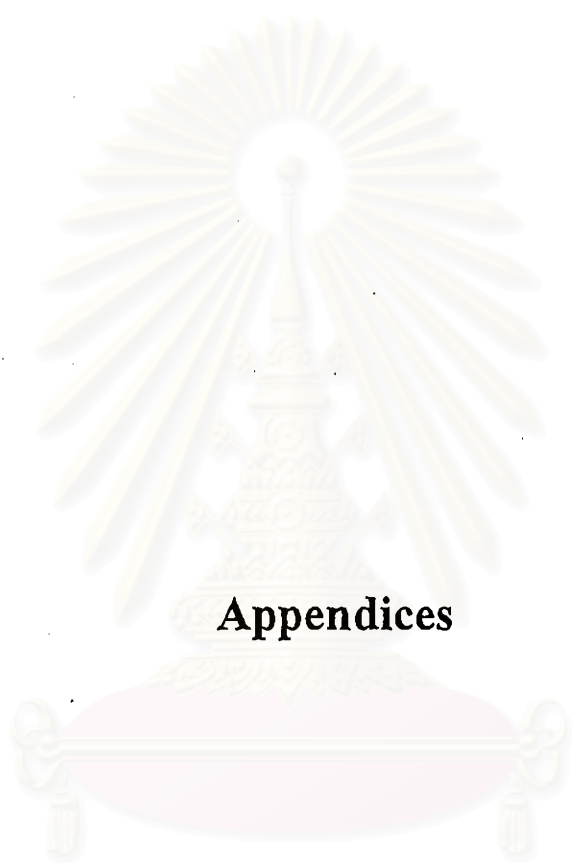


## References

1. Sood, R.S., Roy, K., Reddy, G.C.S. Products from *Aspergillus sp.* in Media Culture *J. Antibiotics*, 1982, 35, 985.
2. Axberg, K. and Gatenbeck, S. Intermediates in the Penicillic Acid Biosynthesis in *Penicillium cyclopium* *Acta Chem. Scand.*, 1975, B29, 749.
3. Thomson, R. H. *Naturally Occurring Quinones III (Recent Advances)*, Cambridge University Press, 1987, p.13.
4. Weygand, F., Weber, H. and Maekawa, E. Synthesen von *o*-Diacylbenzolen, Phthaliden und Naphthochinonen *Chem. Ber.* 1957, 90, 1879.
5. Bogentoft, C., Klaudy, A. V. and Folkers, K. Antimetabolites of Coenzyme Q. 17. Improved Synthesis of 5-Hydroxy-1,4-benzoquinone Analogs and Their Indices *J. Med. Chem.*, 1972, 15, 1135.
6. Muller, W. U. and Leistner, E. Aglycones and Glycosides of Oxygenated Naphthalenes and a Glycosyltransferase from *Juglans* *Phytochemistry*, 1978, 17, 1739.
7. Mehendale, A. R. and Thomson, R. H. Binaphthoquinones in *Lomatia ferruginea* *Phytochemistry*, 1975, 14, 801.
8. Thomson, R. H. *Naturally Occurring Quinones*, 1971, Cambridge University Press, pp.367.
9. Torssell, K. Diels-Alder Reactions of Thiophene Oxides Generated *in situ* *Acta Chem. Scand.*, 1976, B30, 353.
10. Thomson, R. H. *Naturally Occurring Quinones III (Recent Advances)*, Cambridge University Press, 1987, p.382 and 392.
11. Pearl, I. A., Darling, S. F. Barks of the Family Salicaceae. XIX. Continued Studies on the Hot Water Extractives of *Populus balsamifera* Bark. *Phytochemistry*, 1968, 7, 1851.
12. Le-Van-Thoi, Nguyen-Ngoc-Suong Constituents of *Eurycoma longifolia* *J. Org. Chem.*, 1970, 35, 1104.

13. Stend, W. Antibacterial Effects of Iodinine, 2-Methylquinoline di-N-oxide, and 2,6-Dimethoxybenzoquinone *in vitro* *Acta Path. Microbiol. Scand.* 1945, 22, 379.
14. Sunday, S. A. Synthesis of Primin and Miconidin and Their 3-Methoxy Isomers *Org. Prep. Proc. Int.*, 1991, 23, 639.
15. McOmie, J. F.W. And Robbins, A. I. Synthesis of 2,3-Dimethoxy-5-(1-propyl)-1,4-benzoquinone *Chem. Ind. (London)*, 1978, 888.
16. Nair, M. S. R. and Anchel, M. An Antibacterial Quinone Hydroquinone Pair from the Ascomycete, *Nectria coryli* *Tetrahedron Lett.*, 1972, 795.
17. Maruyama, K., Saimoto, K. and Yamamoto, Y. Reaction of Organoboranes with 2,5-Dihydroxy-1,4-benzoquinone and Related Compounds, and Its Application to the Synthesis of Rapanone *J. Org. Chem.*, 1978, 43, 4895.
18. Eldridge, A. C. and Anderson, R. L. Chemical Constituents from *Ircinia muscarum* (Marine Sponges) *Pharm. Res. Comm.*, 1988, 20, 23.
19. Hensens, O. D. and Lewis, K. G. Extractives of the Bark of *Aegiceras corniculatum* *Aust. J. Chem.*, 1966, 19, 169.
20. Patil, V. B., Rao, A. V. and Venkataraman, K. Cassiamin A, B, and C, Three 2,2'-Bianthraquinonyls in *Cassia siamea* *Indian J. Chem.*, 1970, 8, 109.
21. Rai, K. N. and Prasad, S. N. Chemical Examination of the Stem of *Cassia alata* *Linn. J. Indian Chem. Soc.*, 1994, 71, 653.
22. Mace, M. E. and Hebert, T. T. Naturally Occurring Quinones in Wheat and Barley and Their Toxicity to Loose Smut Fungi *Phytopathology*, 1963, 53, 692.
23. Hayashi, S., Ueki, H., Ueki, Y., Aoki, H., Tanaka, K., Fujimoto, J., Katsukawa, K. and Mori, M. The Relation between the Antitumor and the Antibacterial Activities of Quinone Derivatives *Chem. Pharm. Bull.*, 1963, 11, 948.
24. Ozawa, H., Momose, K., Machida, M., Natori, S. and Yoshihira, K. Biochemical Studies on Benzoquinone Derivatives. V. Structure-Activity Relationship between Benzoquinone Derivatives and Inhibition of Respiration of Rat Liver Intact Mitochondria *Chem Pharm Bull.*, 1968, 16, 853.

25. Gu, L., Liu, C., Xu, J. and King, T. E. Synthesis and Inhibitory Activity of Bromoquinone Derivatives *Tetrahedron*, 1990, 46, 3199.
26. Meyer, B. N., Ferrigni, N. R., Putnum, J. E., Jacobsen, L. B., Nichols, D. E. and McLaughlin, J. L. Brine Shrimp: A Convenient General Bioassay for Active Plant Constituents *Planta Med.*, 1982, 45, 31.
27. Colegate, S. M. and Molyneux, R. J. *Bioactive Natural Products*, CRC Press, pp. 441-456.
28. Bunyaratavech, S. and Veerachato, G. *Organic Chemistry Laboratory Manual*, 1993, p.159-161.
29. Hodgson, H. H. and Nixon, J. The Action of Fuming Nitric Acid on the 4-Halogen-2,6-bromo-phenols and -anisoles. Anomalous Behavior of Fluorine Derivatives *J. Chem. Soc.*, 1930, 1085.
30. Furniss, B. S., Hannaford, A. J., Rogers, V., Smith, P. W. G. and Tatchell, A. R. *Vogel's Textbook of Practical Organic Chemistry*, 1978, 4 th ed., English Language Book Society/Longman, Essex, pp.788-789.
31. Tietze, L. F. and Eicher, T. *Reactions and Syntheses in the Organic Chemistry Laboratory*, 1989, University Science Books Mill Valley, California, pp.253.
32. Pollock, J. R. A. and Stevens, R. *Dictionary of Organic Compounds*, 4<sup>th</sup> ed., Completely revised, enlarge and re-set edition in five volumes; London Eyre & Spottis woode. Publishers Ltd. E & F. N. SPON Ltd.
33. Solis, P. N., Wright, W. C., Anderson, M. M., Gupta, M. P., and Phillipson, J. D. A Microwell Cytotoxicity Assay using *Artemia salina* (Brine Shrimp) *Planta Med.*, 1993, 59, 250.



**Appendices**

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

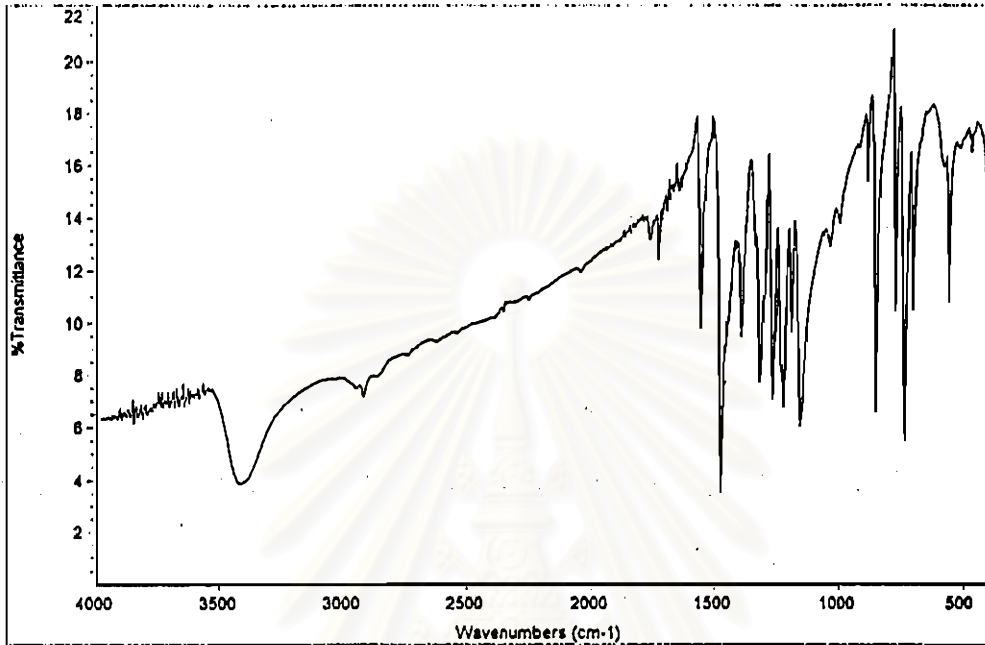


Fig. A1 The IR spectrum of Compound 5a

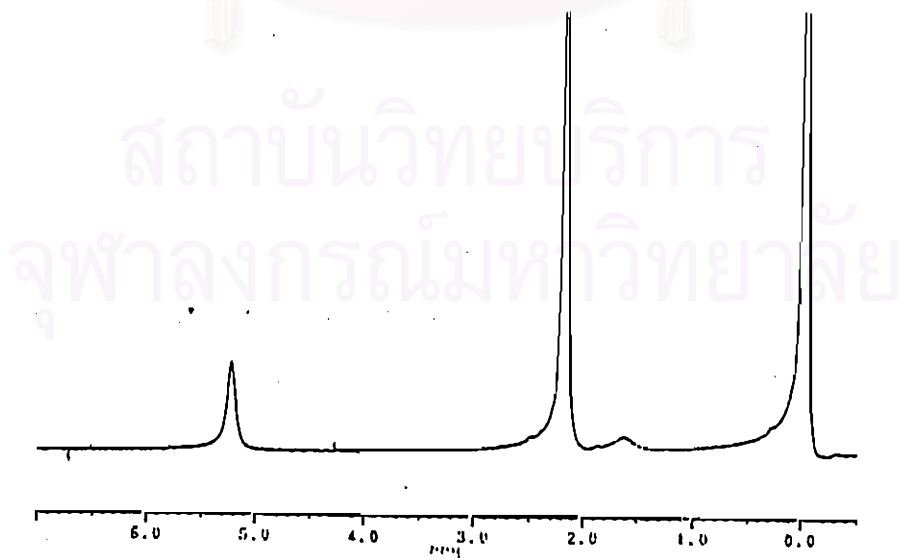


Fig. A2 The <sup>1</sup>H-NMR spectrum of Compound 5a

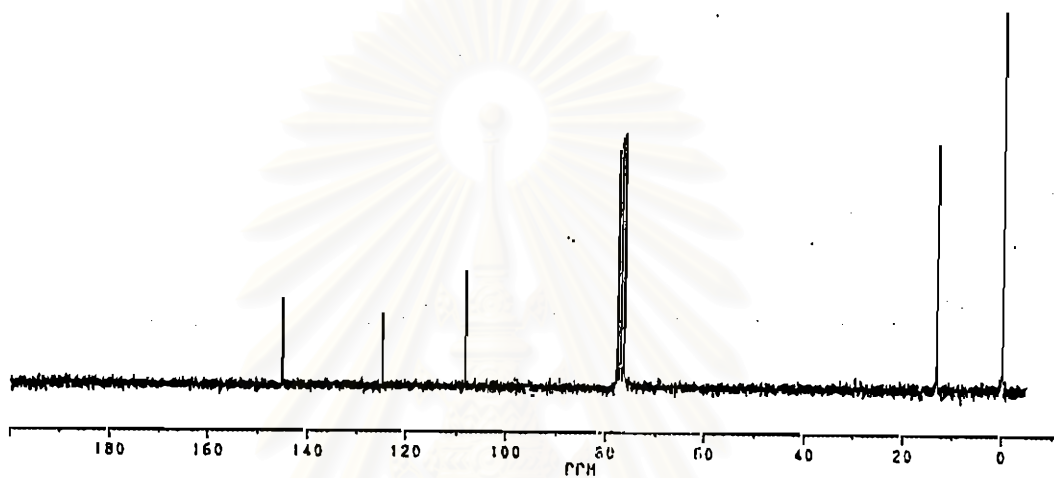
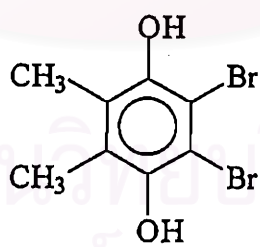


Fig. A3 The  $^{13}\text{C}$ -NMR spectrum of Compound 5a



Compound 5a

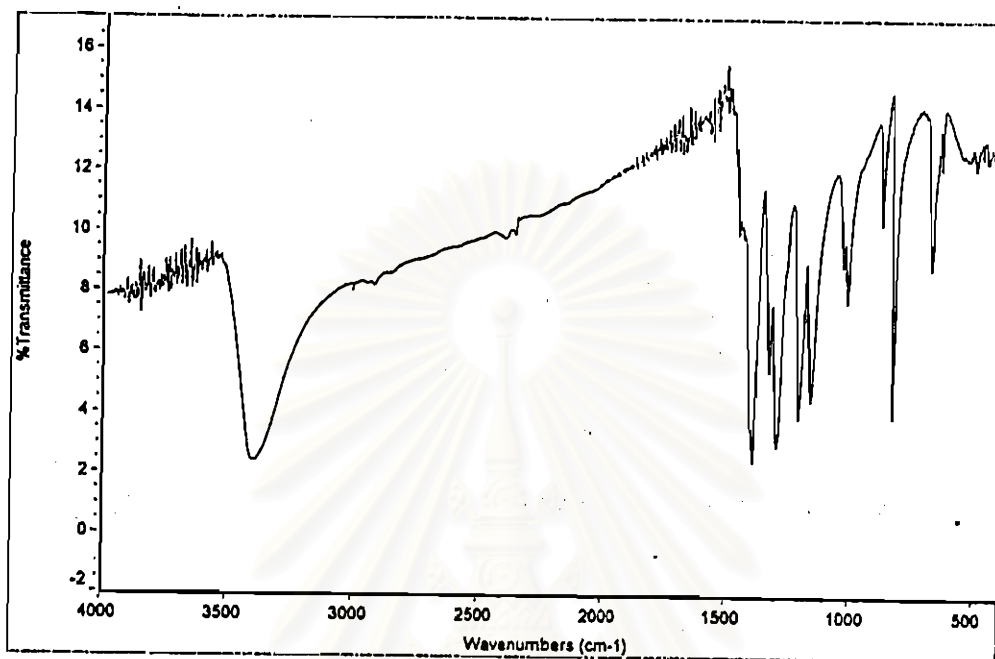


Fig. A4 The IR spectrum of Compound 14a

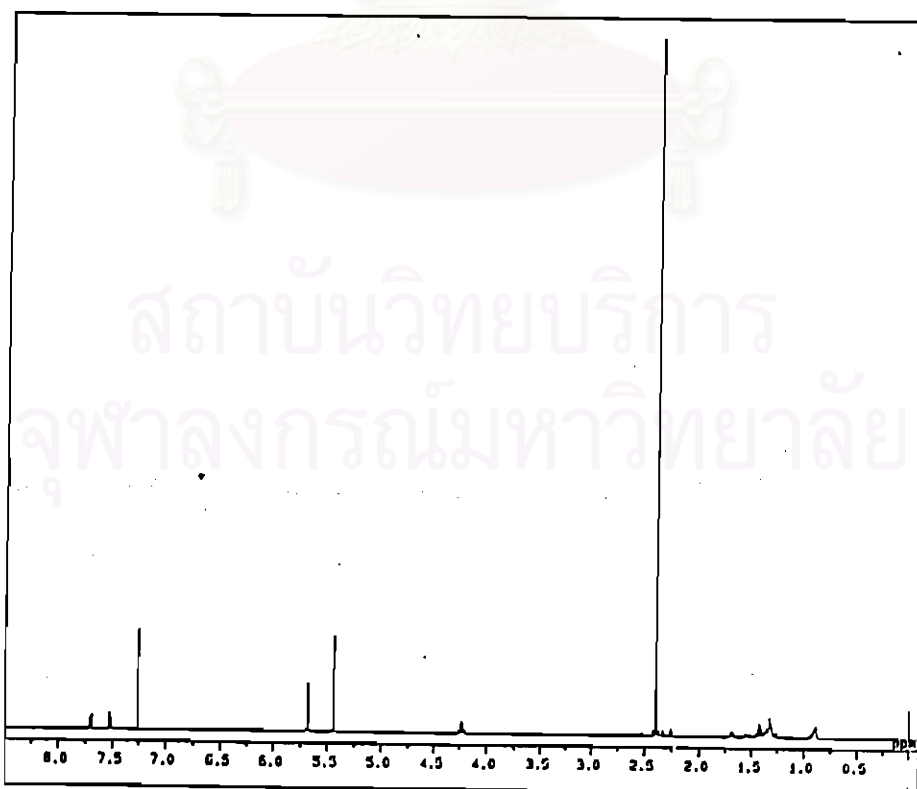


Fig. A5 The <sup>1</sup>H-NMR spectrum of Compound 14a

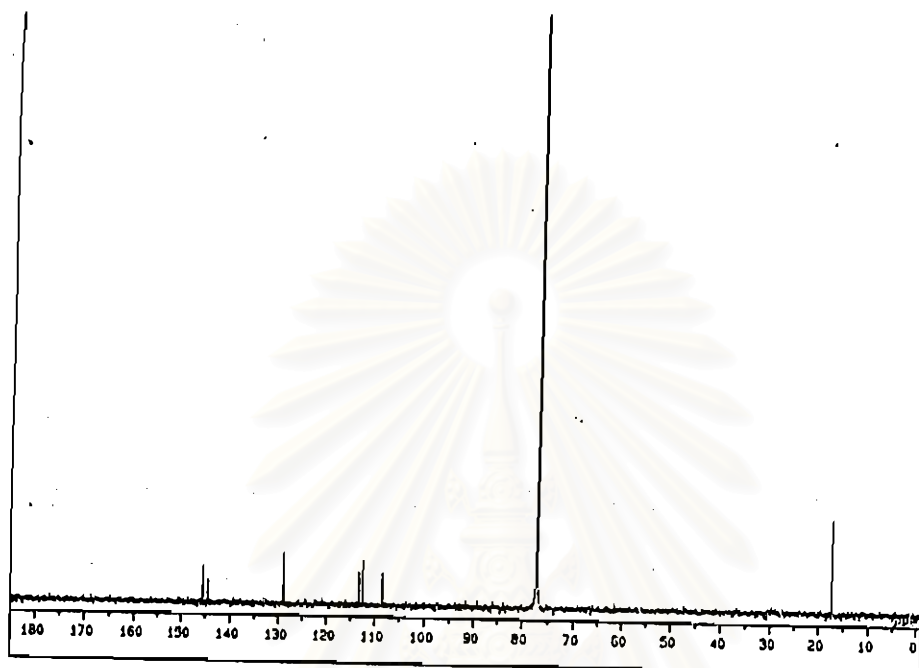
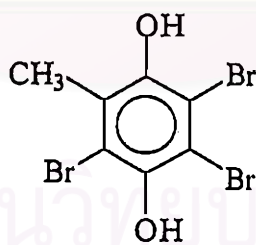


Fig. A6 The  $^{13}\text{C}$ -NMR spectrum of Compound 14a



Compound 14a



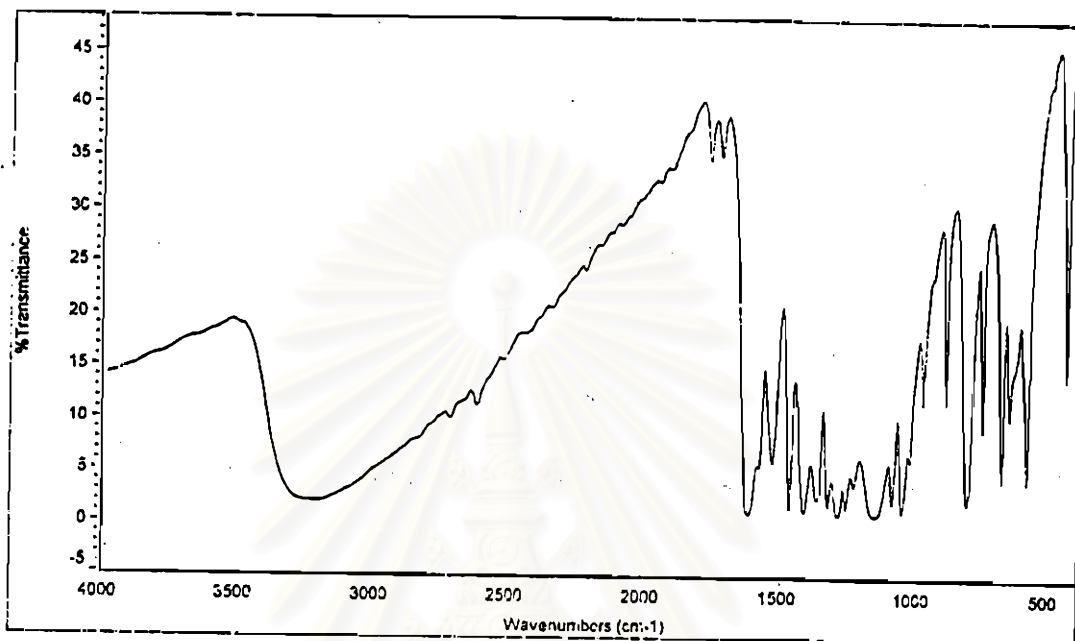


Fig. A7 The IR spectrum of Compound 15a

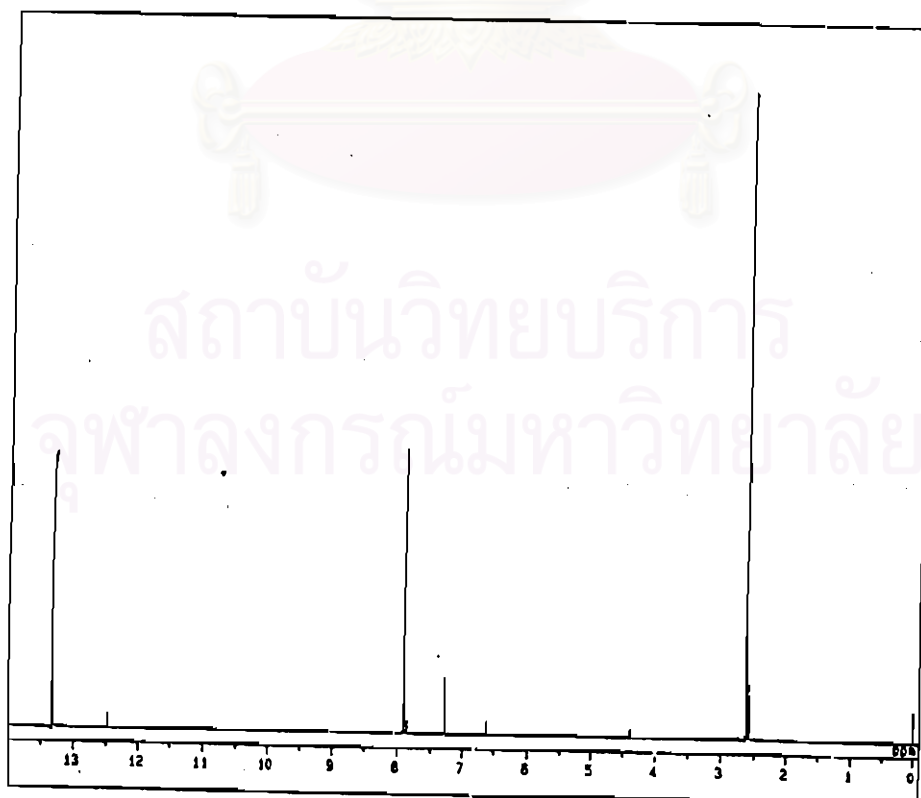


Fig. A8 The <sup>1</sup>H-NMR spectrum of Compound 15a

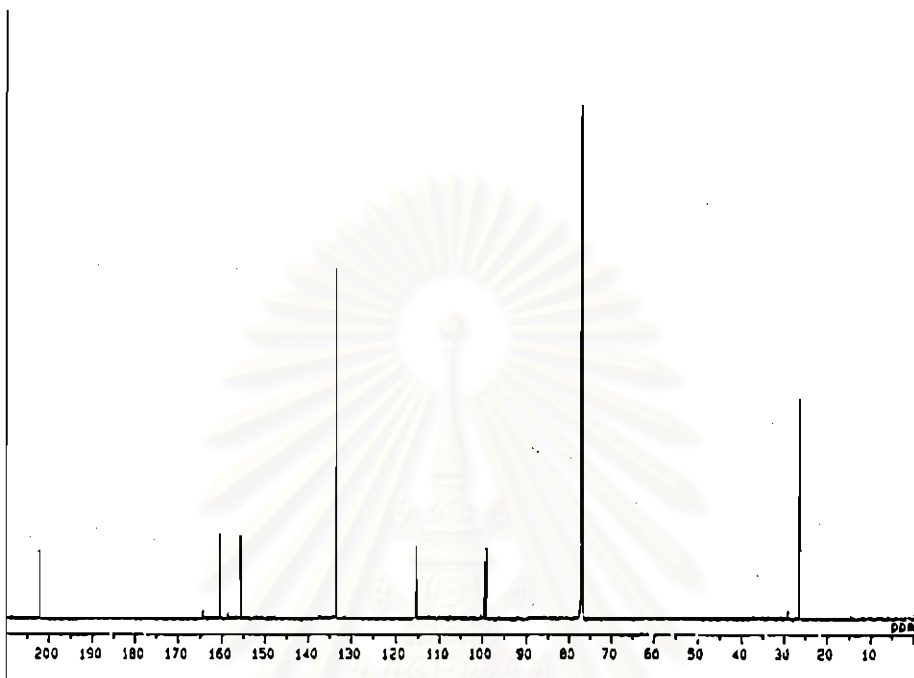
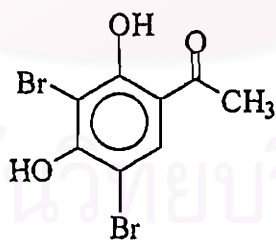


Fig. A9 The  $^{13}\text{C}$ -NMR spectrum of Compound 15a



Compound 15a

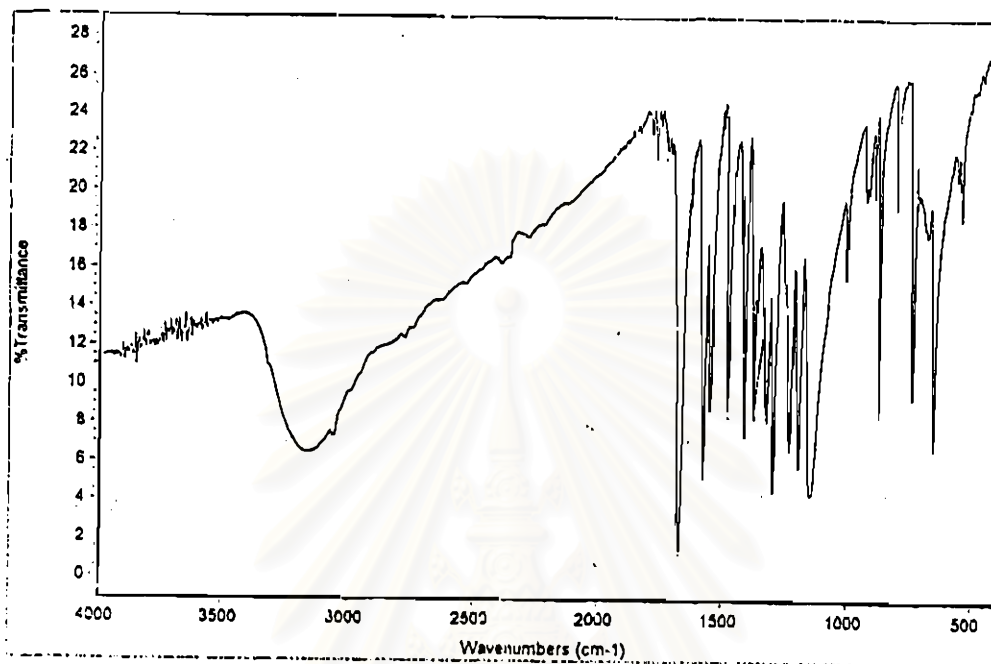


Fig. A10 The IR spectrum of Compound 15b

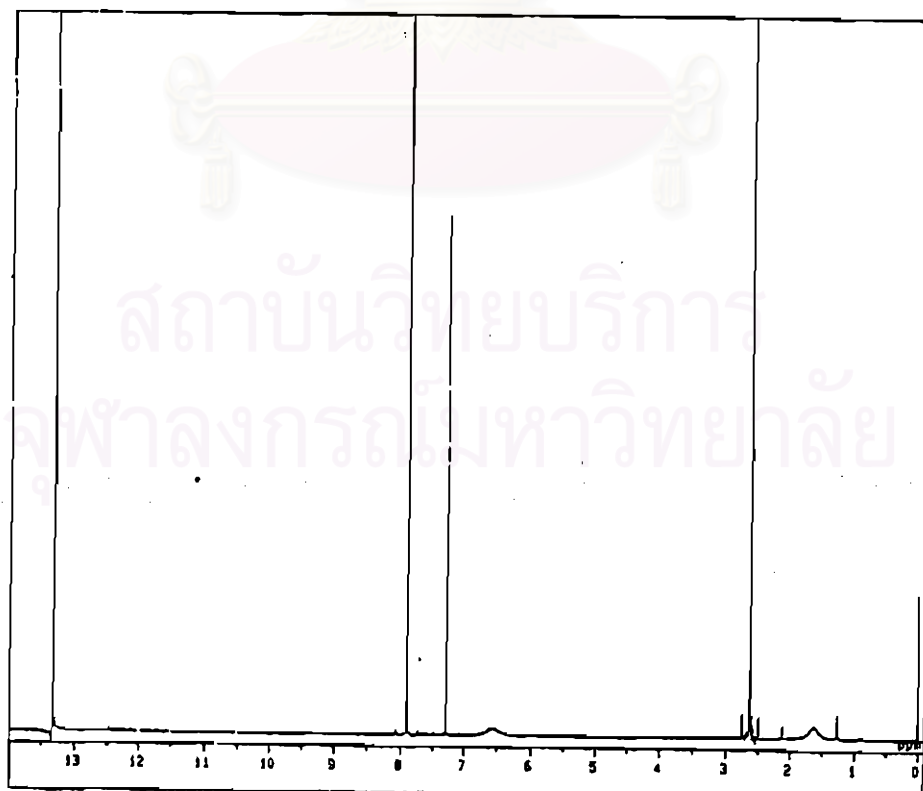


Fig. A11 The <sup>1</sup>H-NMR spectrum of Compound 15b

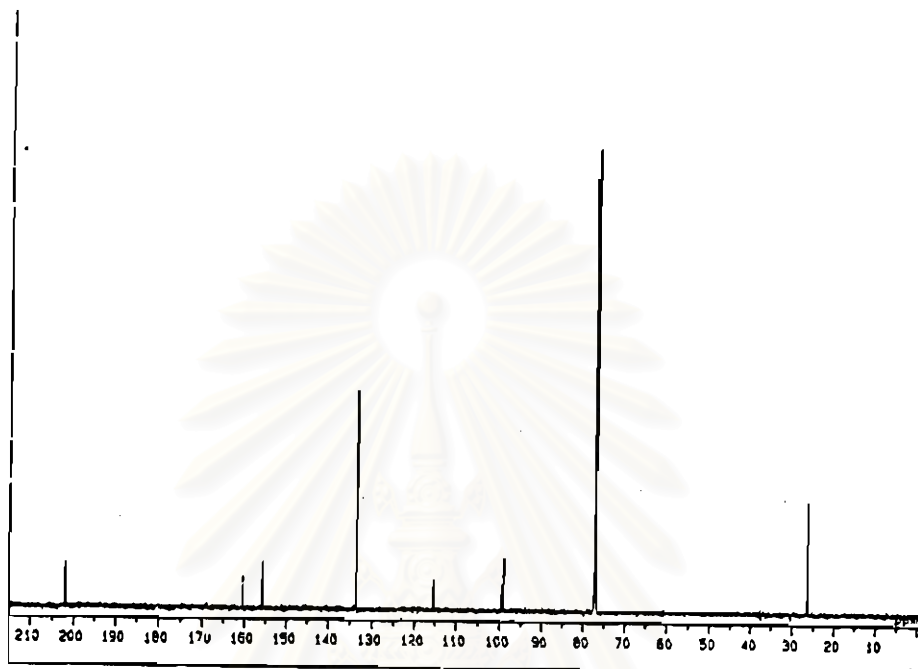
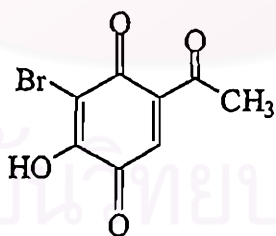


Fig. A12 The  $^{13}\text{C}$ -NMR spectrum of Compound 15b



Compound 15b

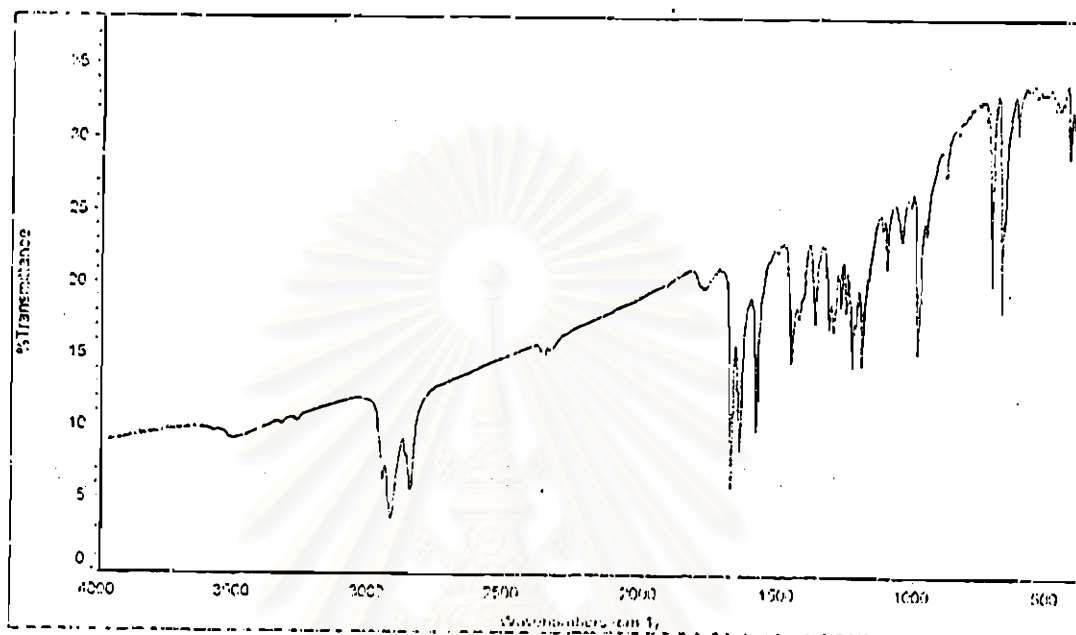


Fig. A13 The IR spectrum of Compound 16

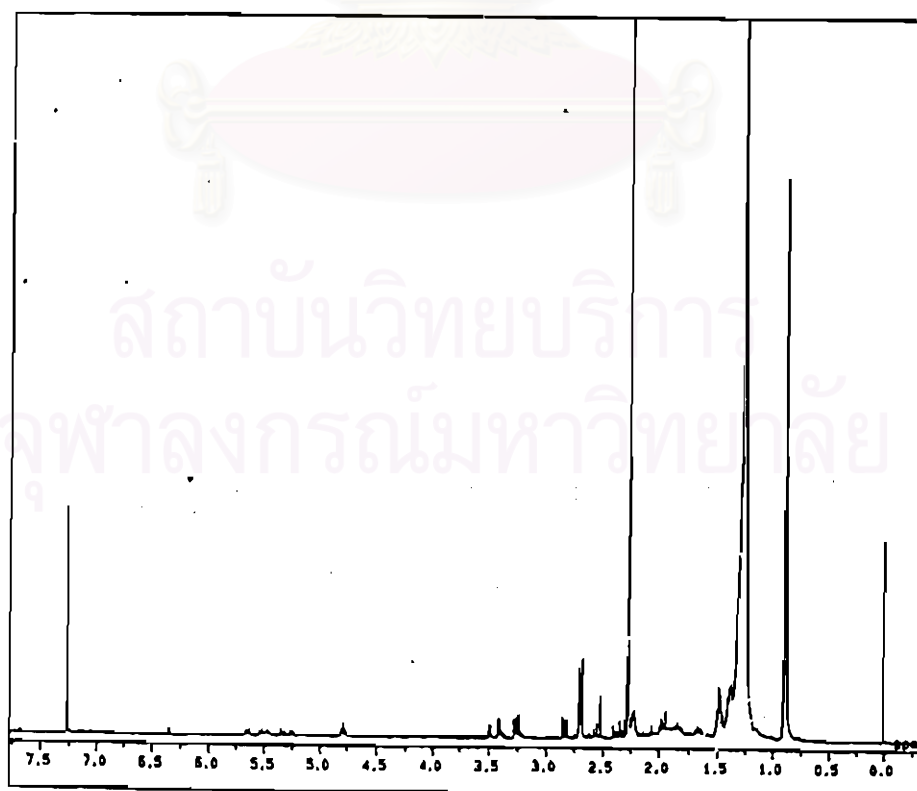


Fig. A14-The <sup>1</sup>H-NMR spectrum of Compound 16

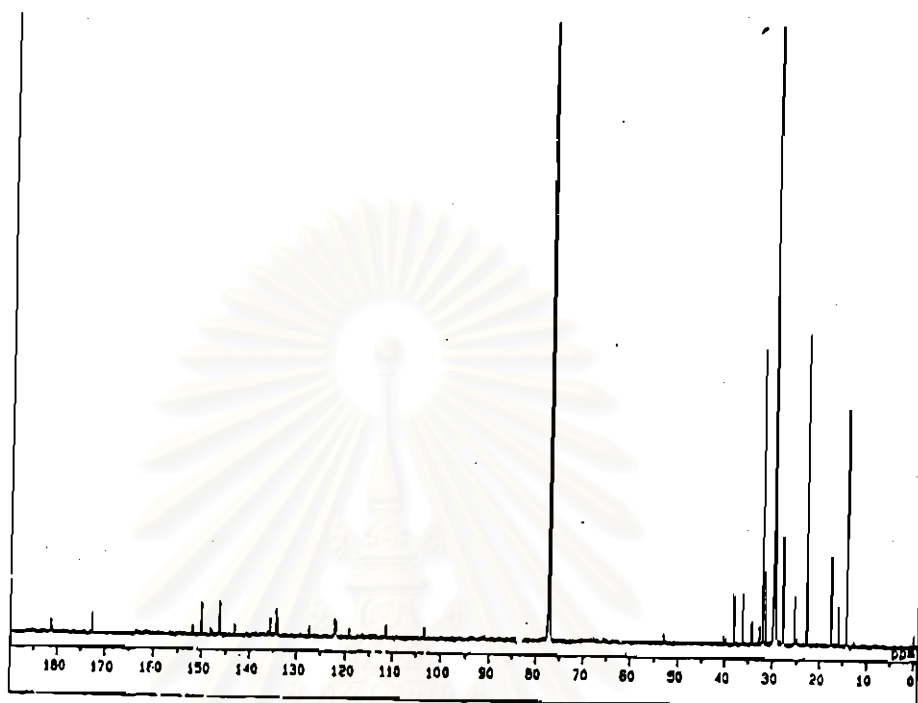
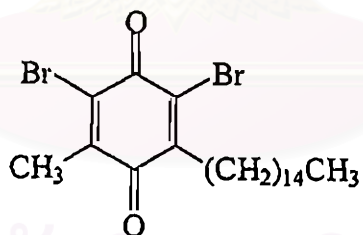


Fig. A15 The  $^{13}\text{C}$ -NMR spectrum of Compound 16



Compound 16

สถาบันทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

## VITA

Miss Siriphon Anyasimaphan was born on November 22, 1974 in Bangkok, Thailand. She received a Bachelor Degree of Science, majoring in Chemistry at Chulalongkorn University in 1996. Since 1996, she has been a graduate student studying Organic Chemistry at Chulalongkorn University. During the study towards the Master's degree she had been awarded a teaching assistantship by the Faculty of Science during 1996-1998 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. Her present address is 318/24 Soi.Chareonsuk, Rama IV Rd., Klong toey, Bangkok, 10110.



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