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APPENDIX

ศูนย์วิทยทรัพยากร
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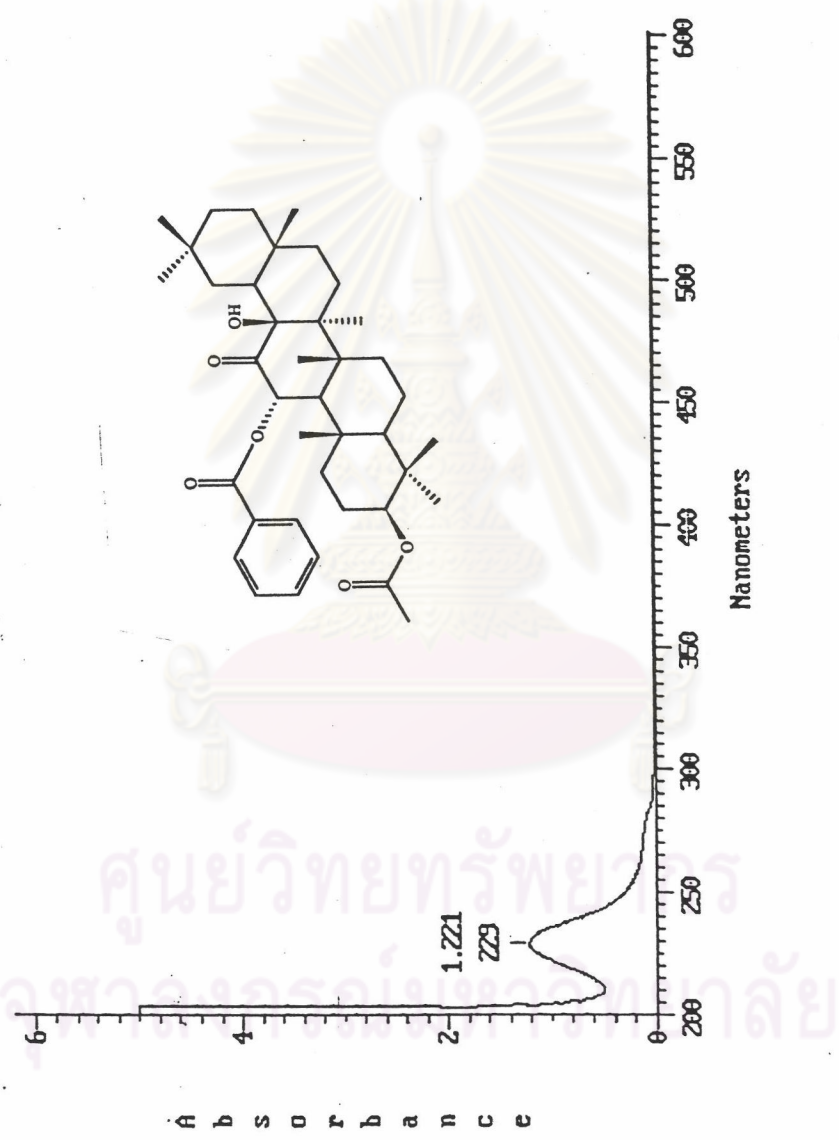


Figure 6. UV absorption spectrum of SC1 (36) (in MeOH).

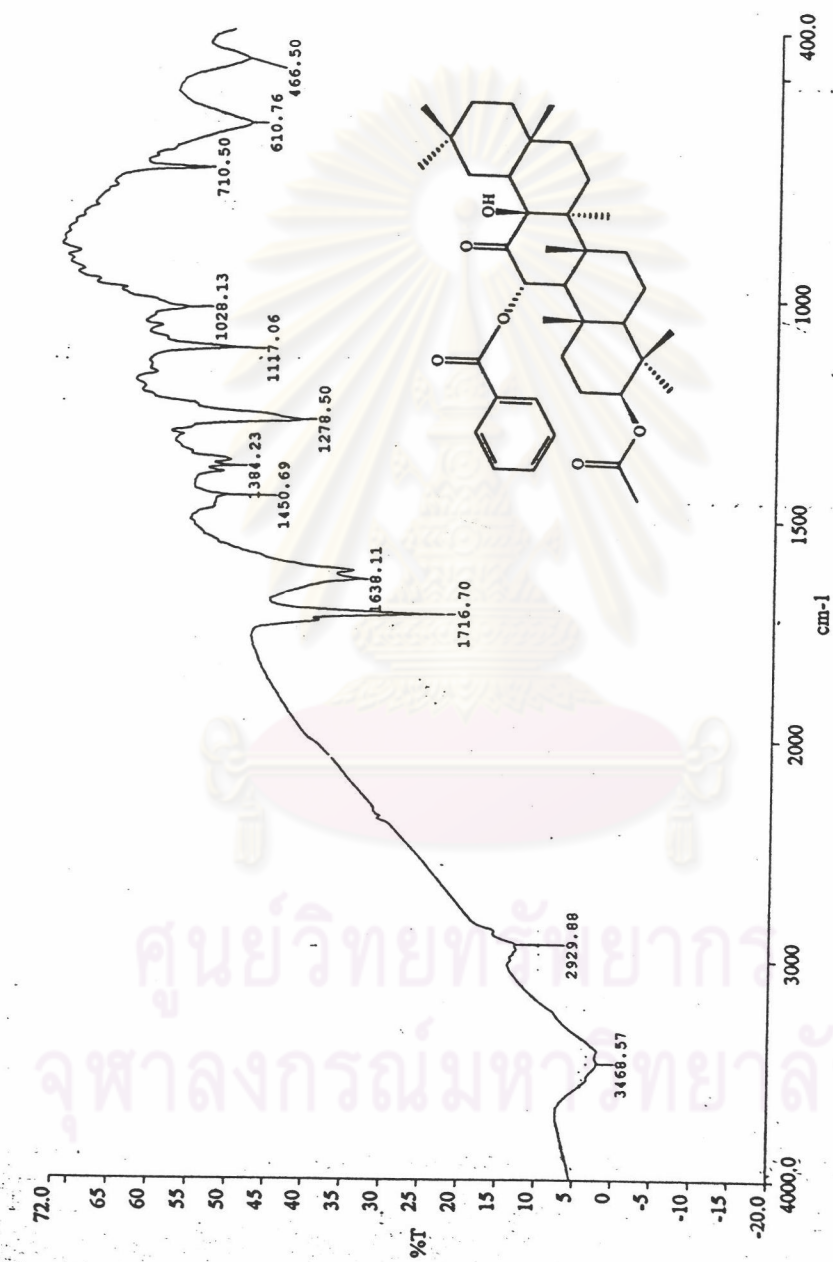


Figure 7. IR spectrum of SC1 (36) (in KBr).

[Mass Spectrum]
 Date : 31-Oct-2001 17:29
 Data : L834-002
 Sample: Rimi SCI +HCOONa in NBR
 Note : Operator R.Hara
 Inlet : Direct
 Ion Mode : FAB+
 Spectrum Type : Normal Ion [MF-Linear]
 RT : 0.09 min Scan# : (2,3)
 BP : m/z 154.0000 Int. : 76.63
 Output m/z range : 12.6250 to 782.9096
 803504

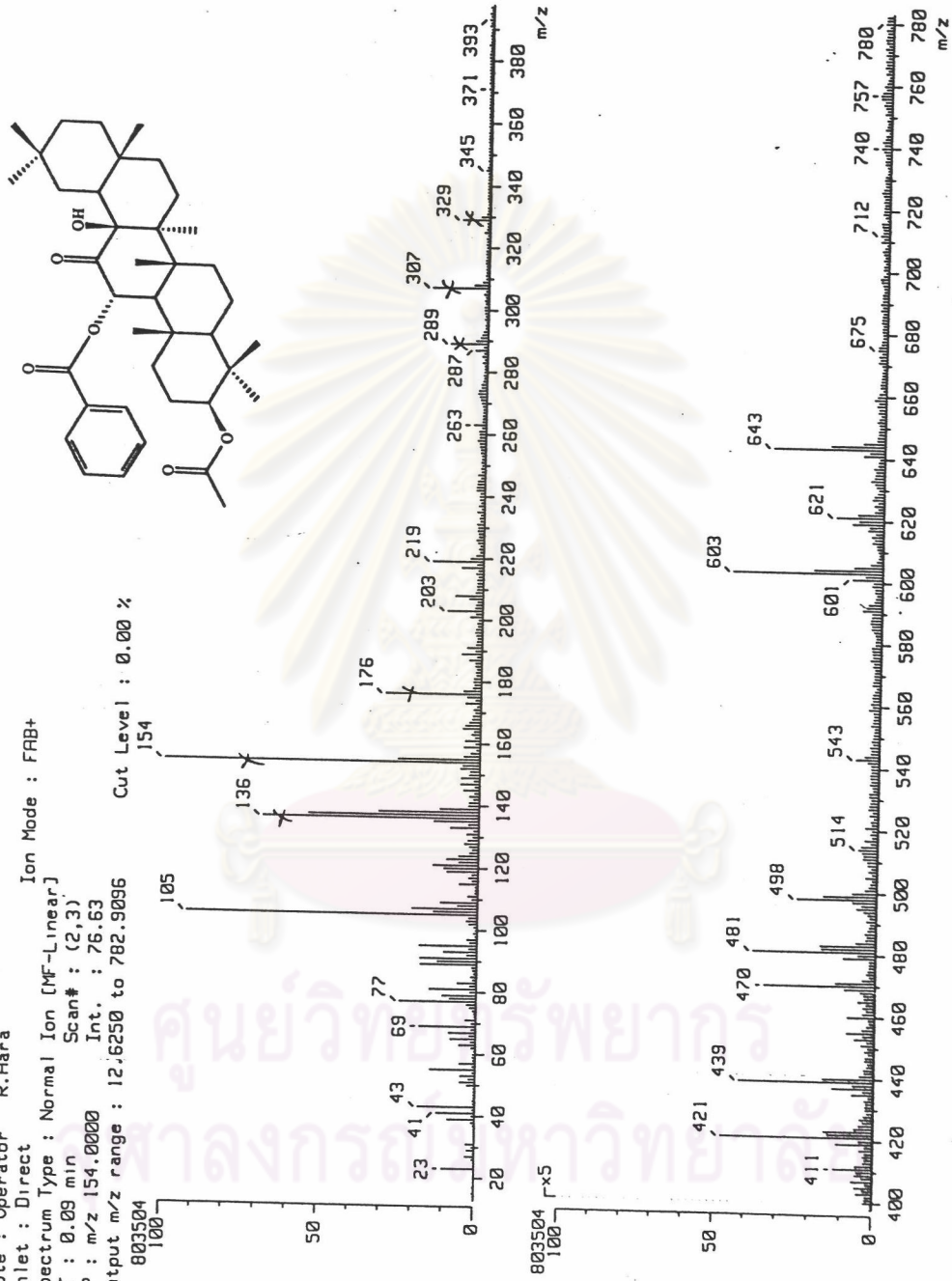


Figure 8. FAB - MS of SCI (36).

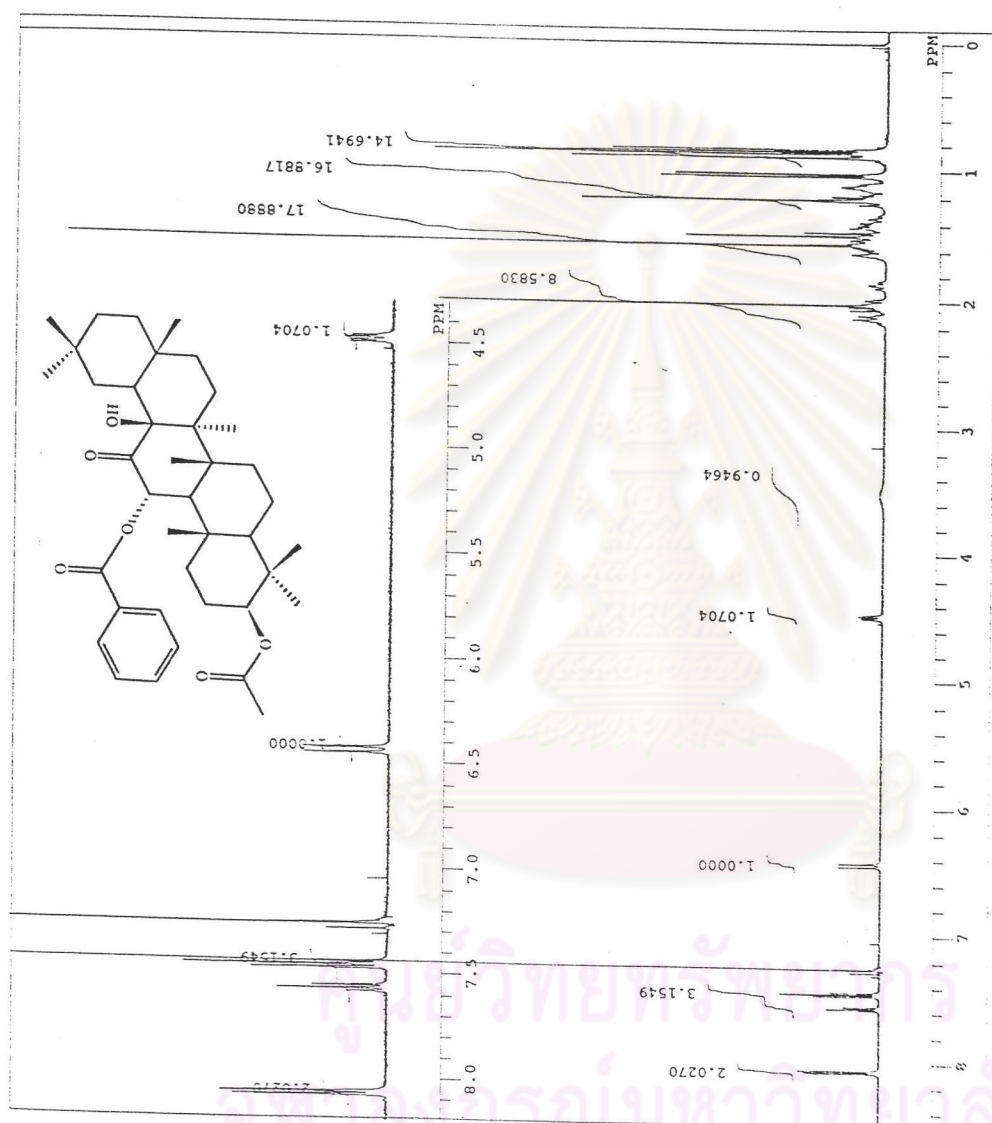


Figure 9. (a) ^1H -NMR spectrum (600 MHz) of SCI (36) (in CDCl_3).

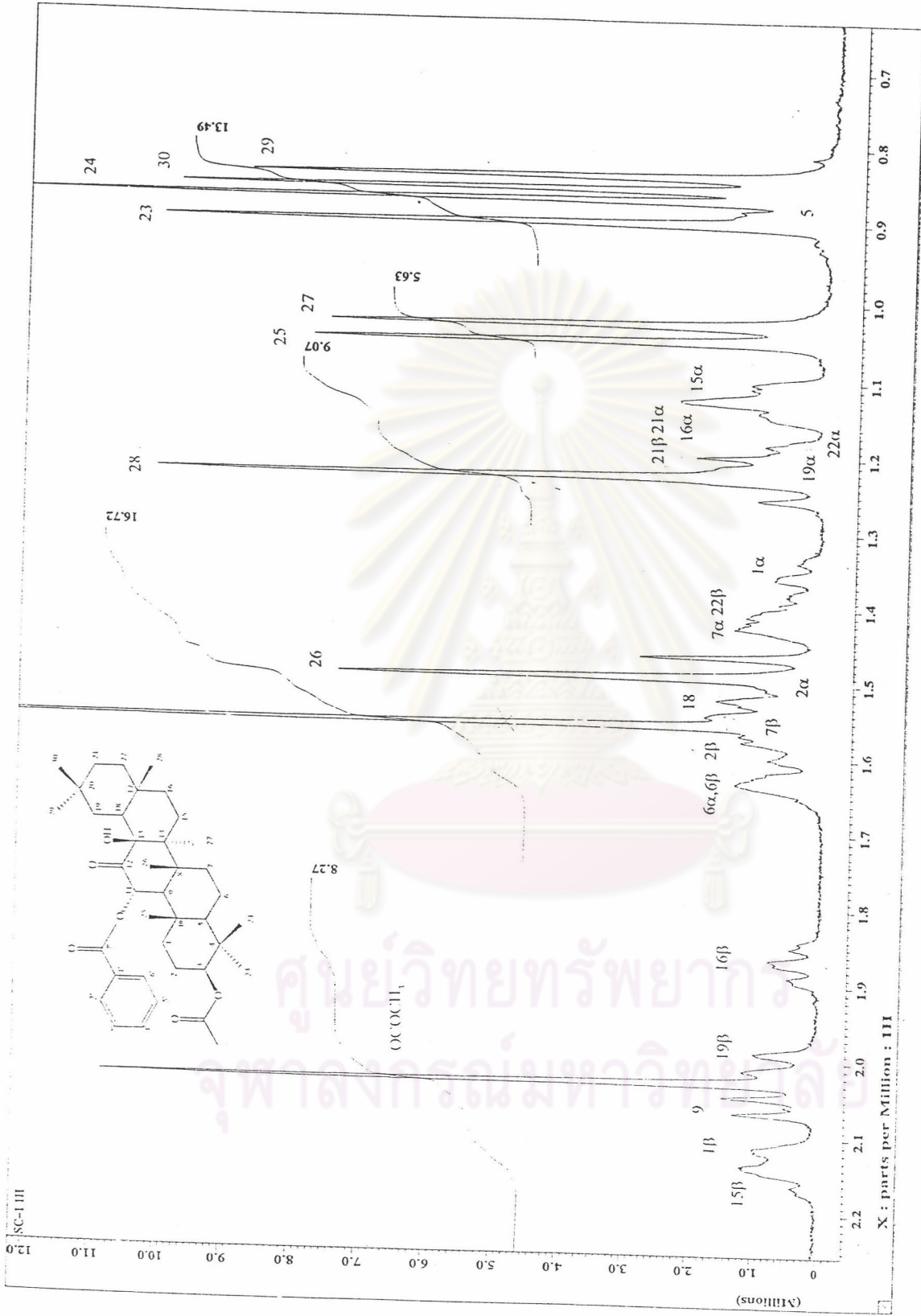


Figure 9. (b) Expanded ^1H -NMR spectrum (600 MHz) of SC1 (36) (in CDCl_3) in the range of δ 2.2 - 0.7 ppm.

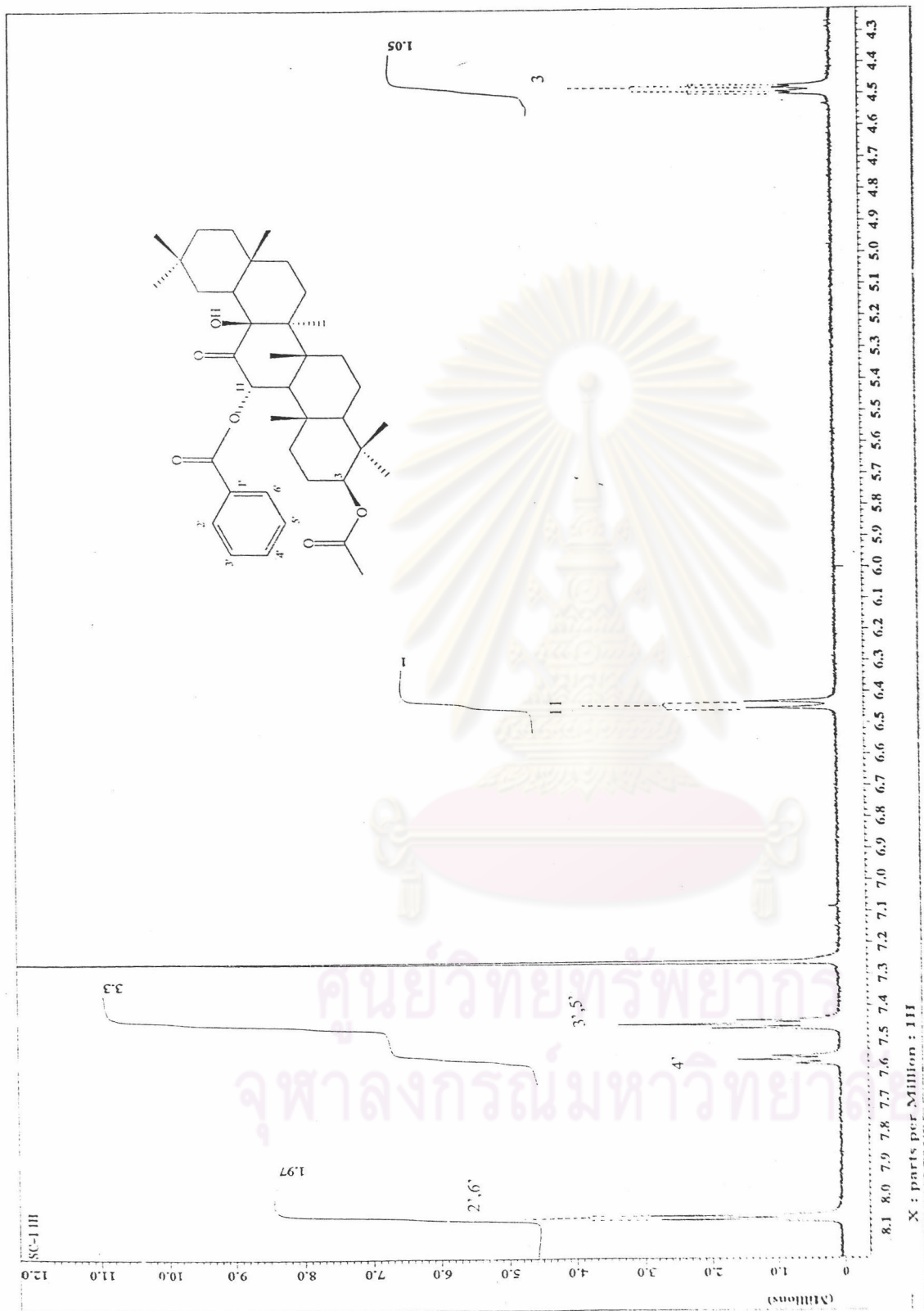


Figure 9. (c) Expanded ¹H - NMR spectrum (600 MHz) of SC1 (36) (in CDCl₃) in the range of δ 8.1 - 4.3 ppm.

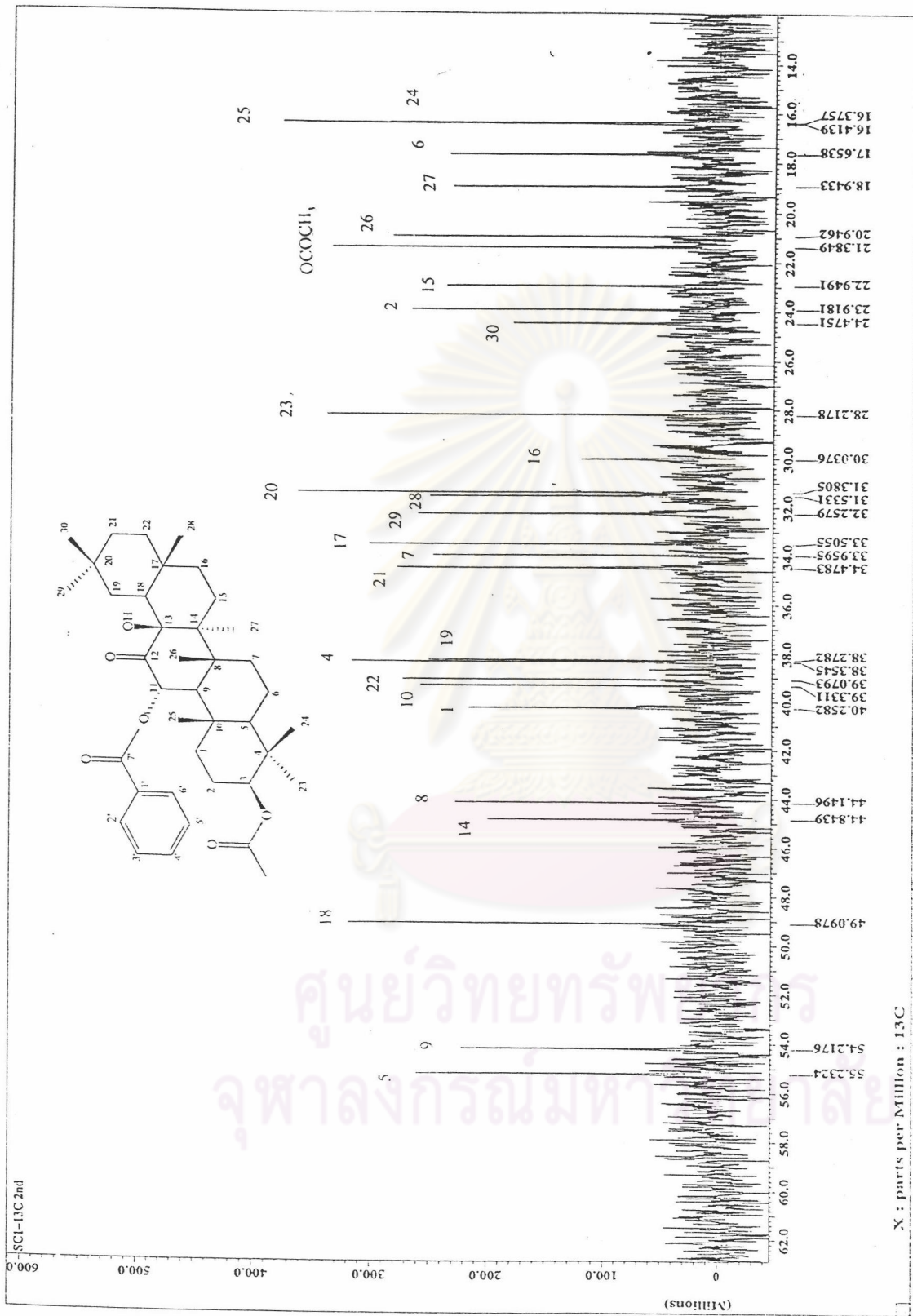


Figure 10. (b) Expanded ¹³C - NMR spectrum (150 MHz) of SCI (36) (in CDCl₃) in the range of δ 62 - 14 ppm.

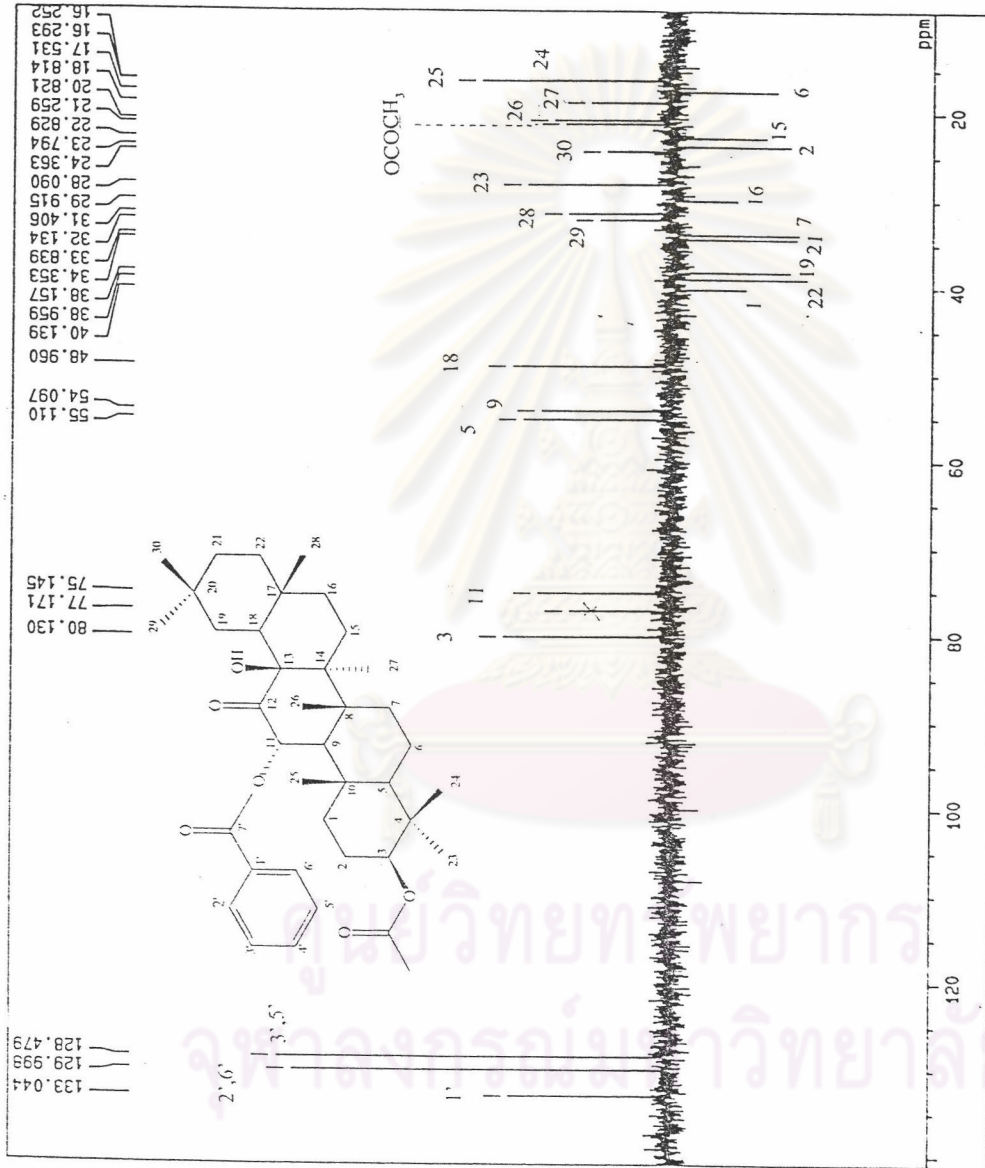


Figure 11. DEPT 135 spectrum of SC1 (36) (in CDCl₃).

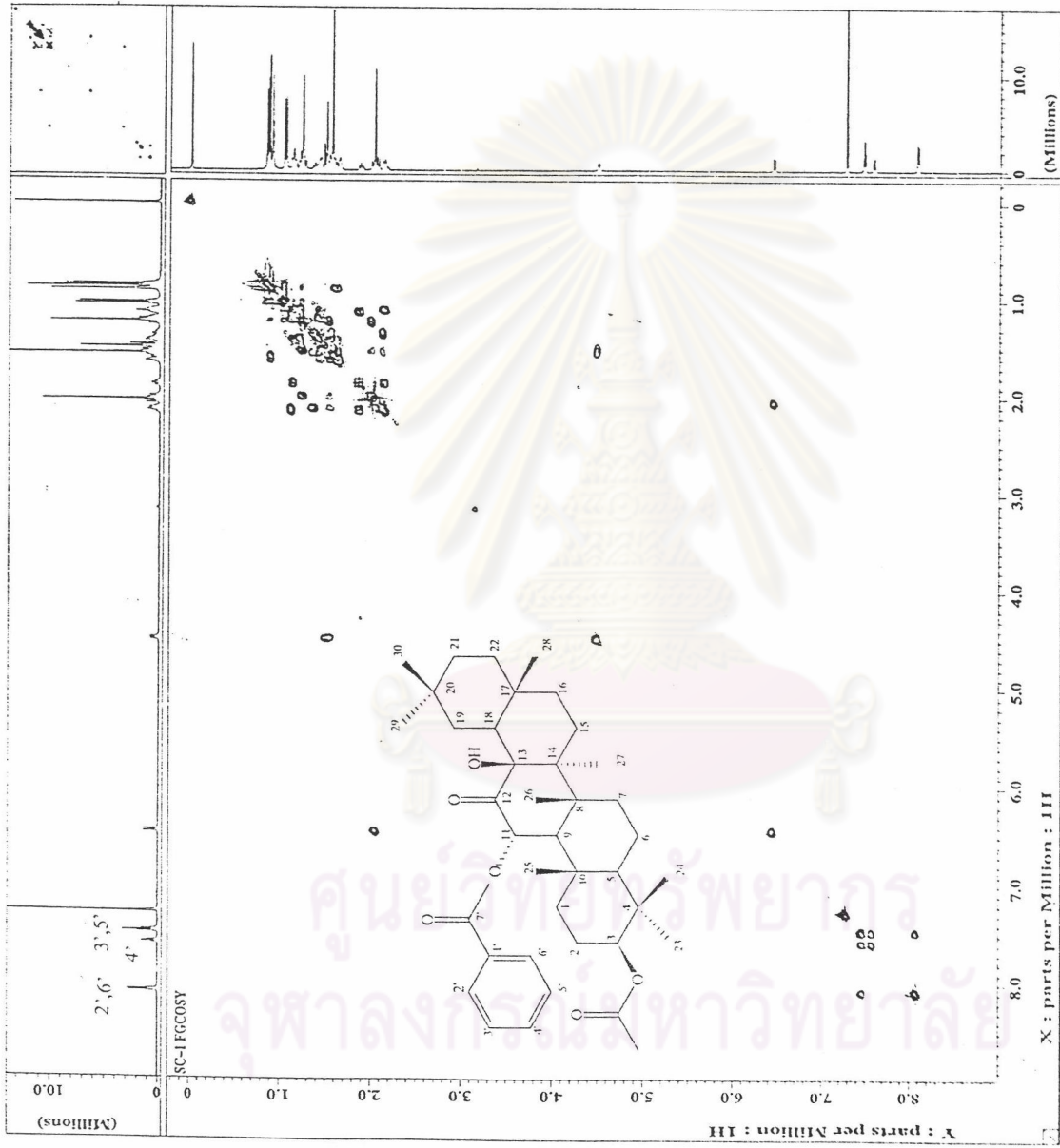


Figure 12 (a) ^1H - ^1H COSY spectrum of SC1 (36) (in CDCl_3).

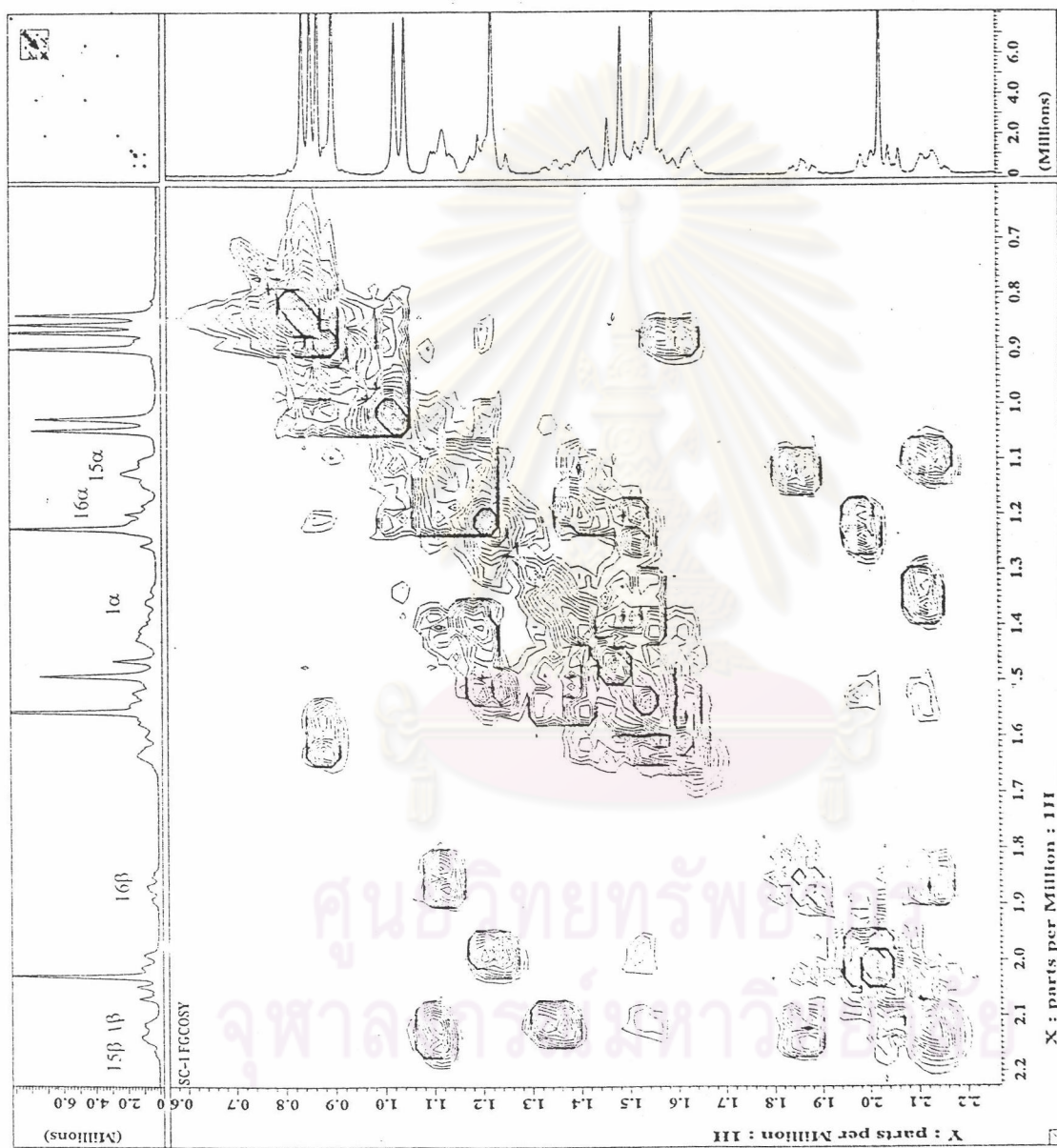
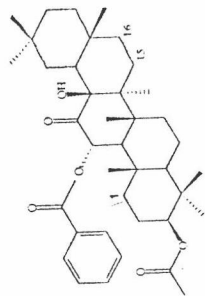


Figure 12. (b) Expanded ^1H - ^1H COSY spectrum of SC1 (36) (in CDCl_3) in the range of δ 2.2 - 0.6 ppm.



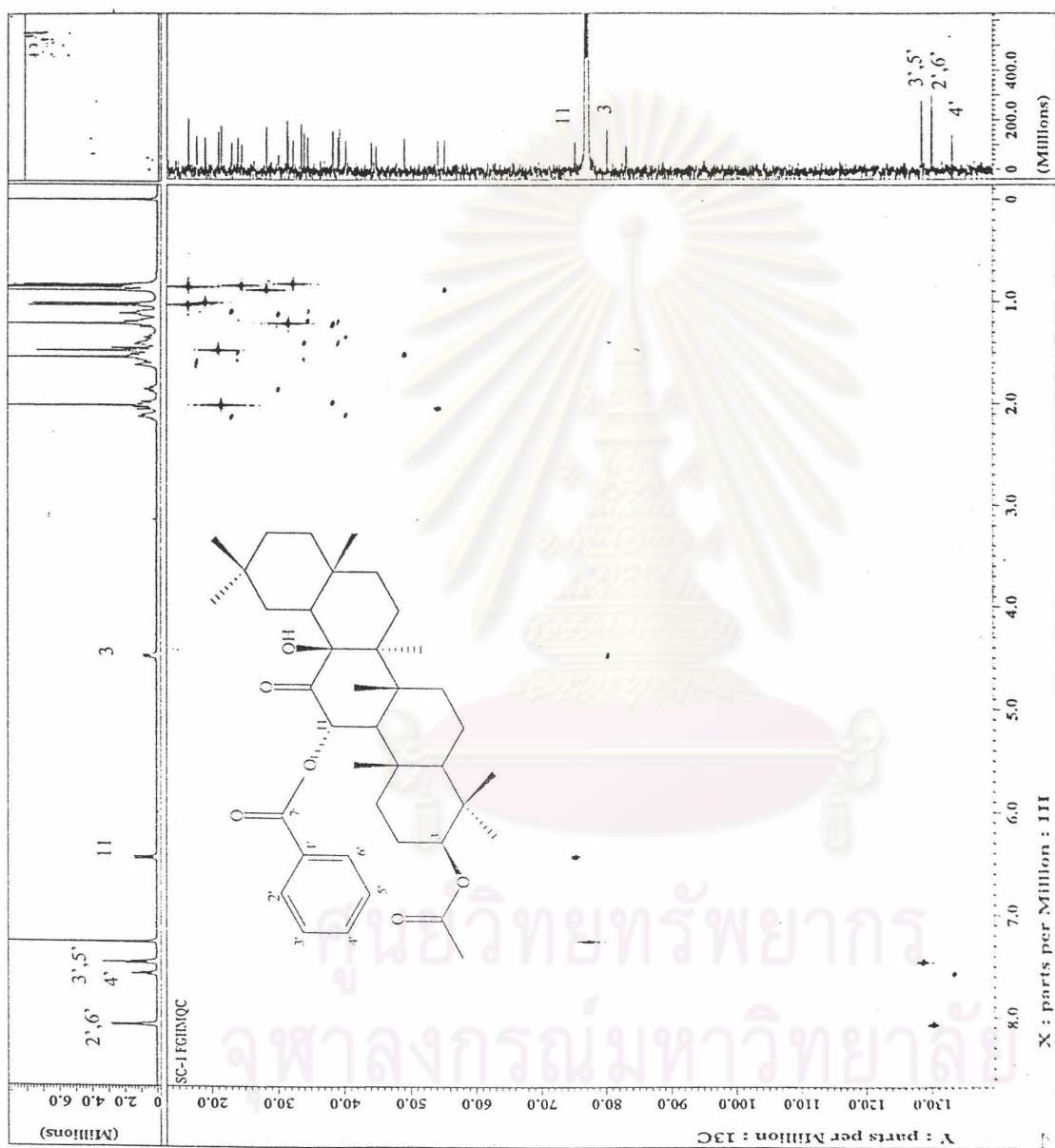


Figure 13. (a) HMQC spectrum of SC1 (36) (in CDCl₃).

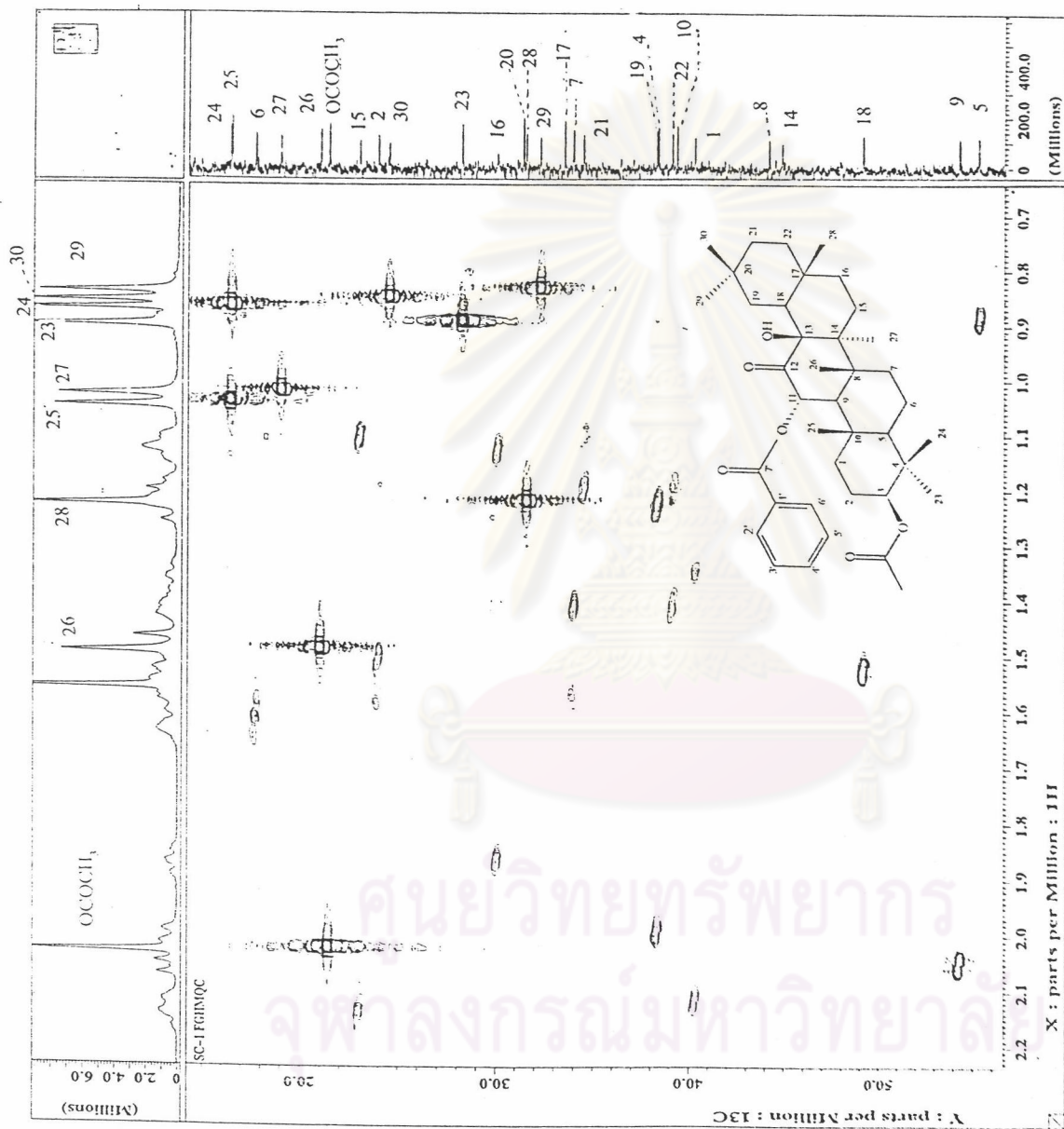


Figure 13. (b) Expanded 1HMQC spectrum of SC1 (36) (in CDCl₃) in the range of δ¹H 2.2 - 0.7 ppm and δ¹³C 60 - 10 ppm .

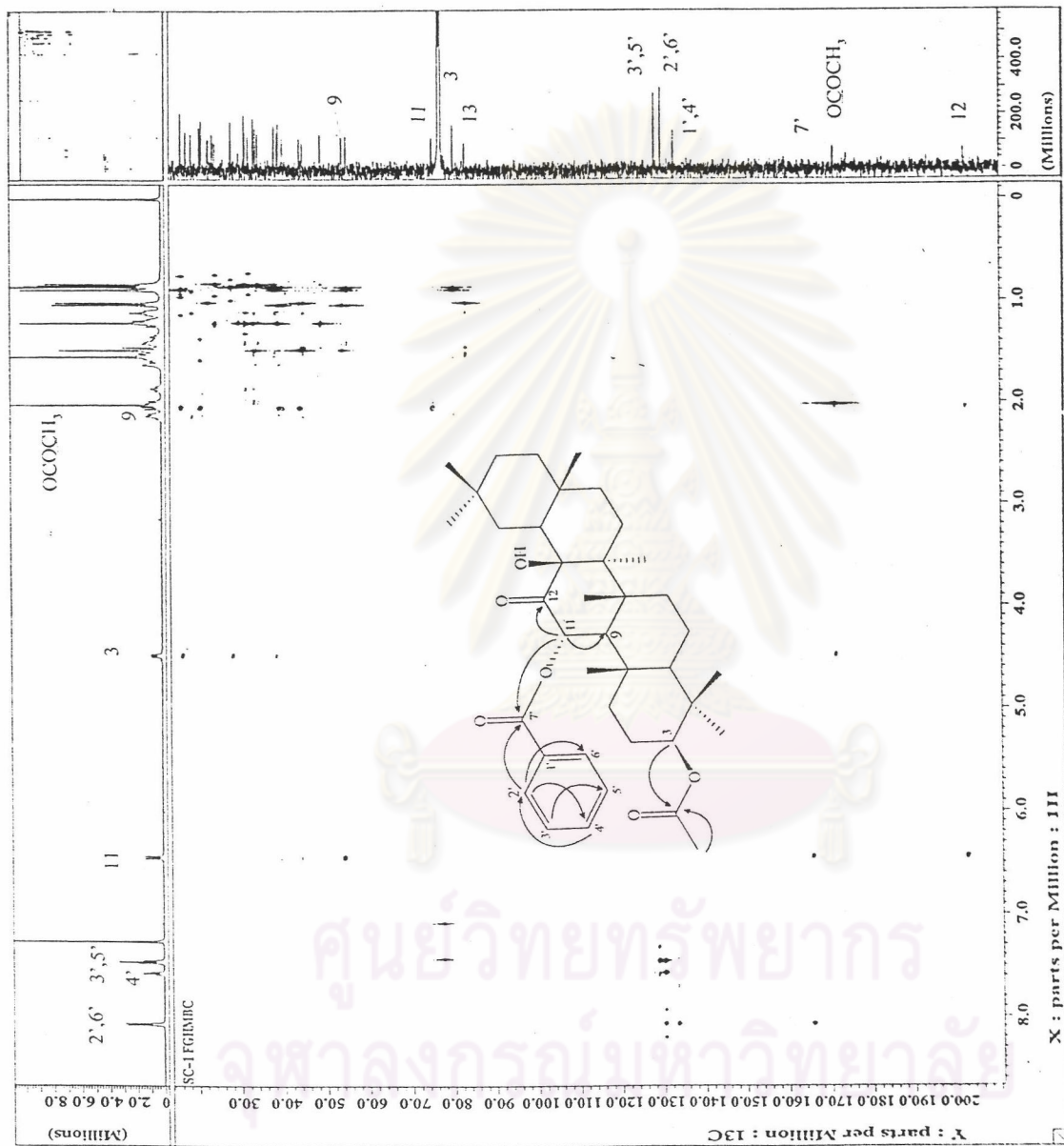


Figure 14. (a) HMBC spectrum of SC1 (36) (in CDCl_3).

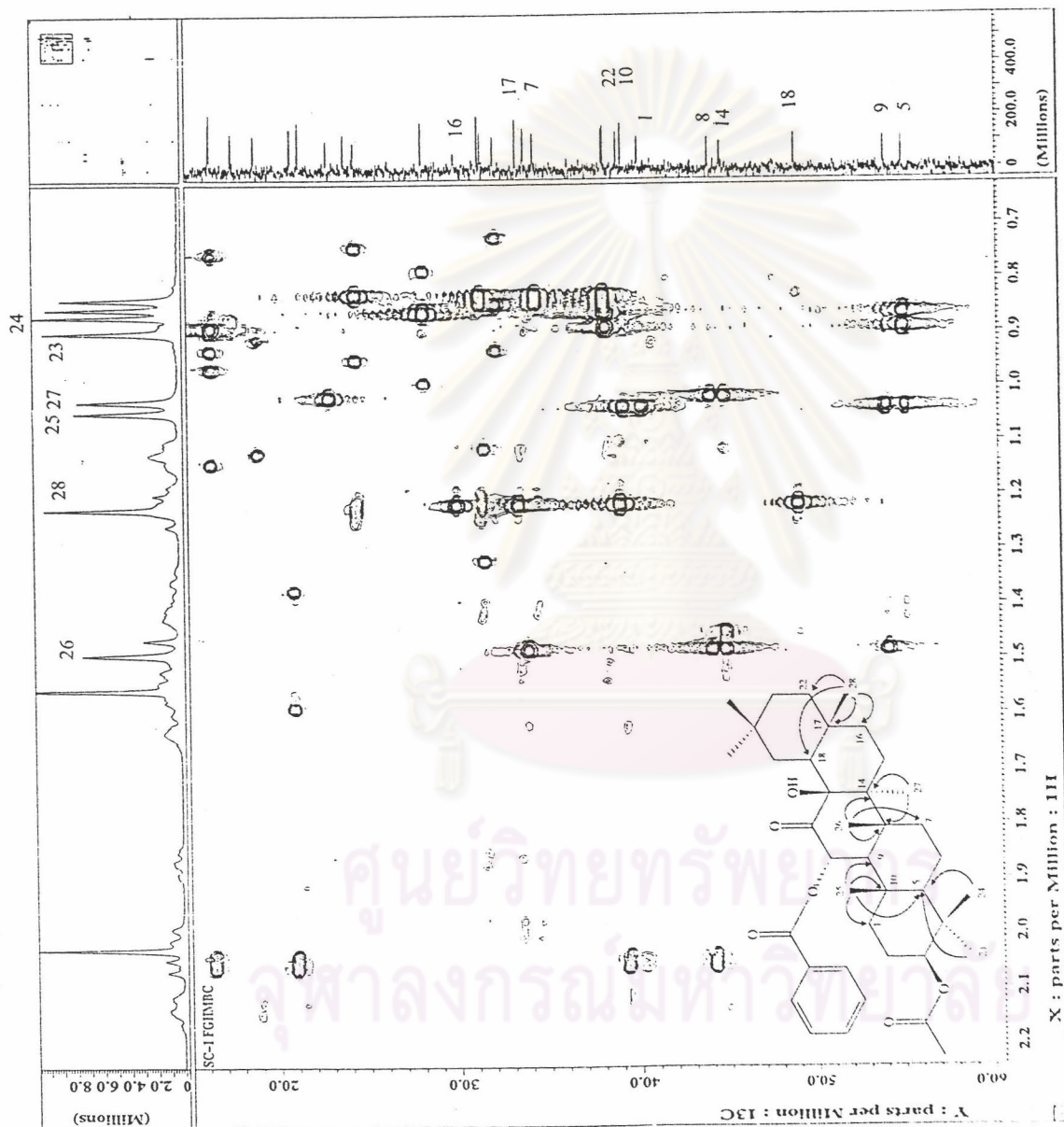


Figure 14. (b) Expanded HMBBC spectrum of SCI (36) (in CDCl_3) in the range of δ H 2.2 - 0.7 ppm and δ ^{13}C 60 - 10 ppm.

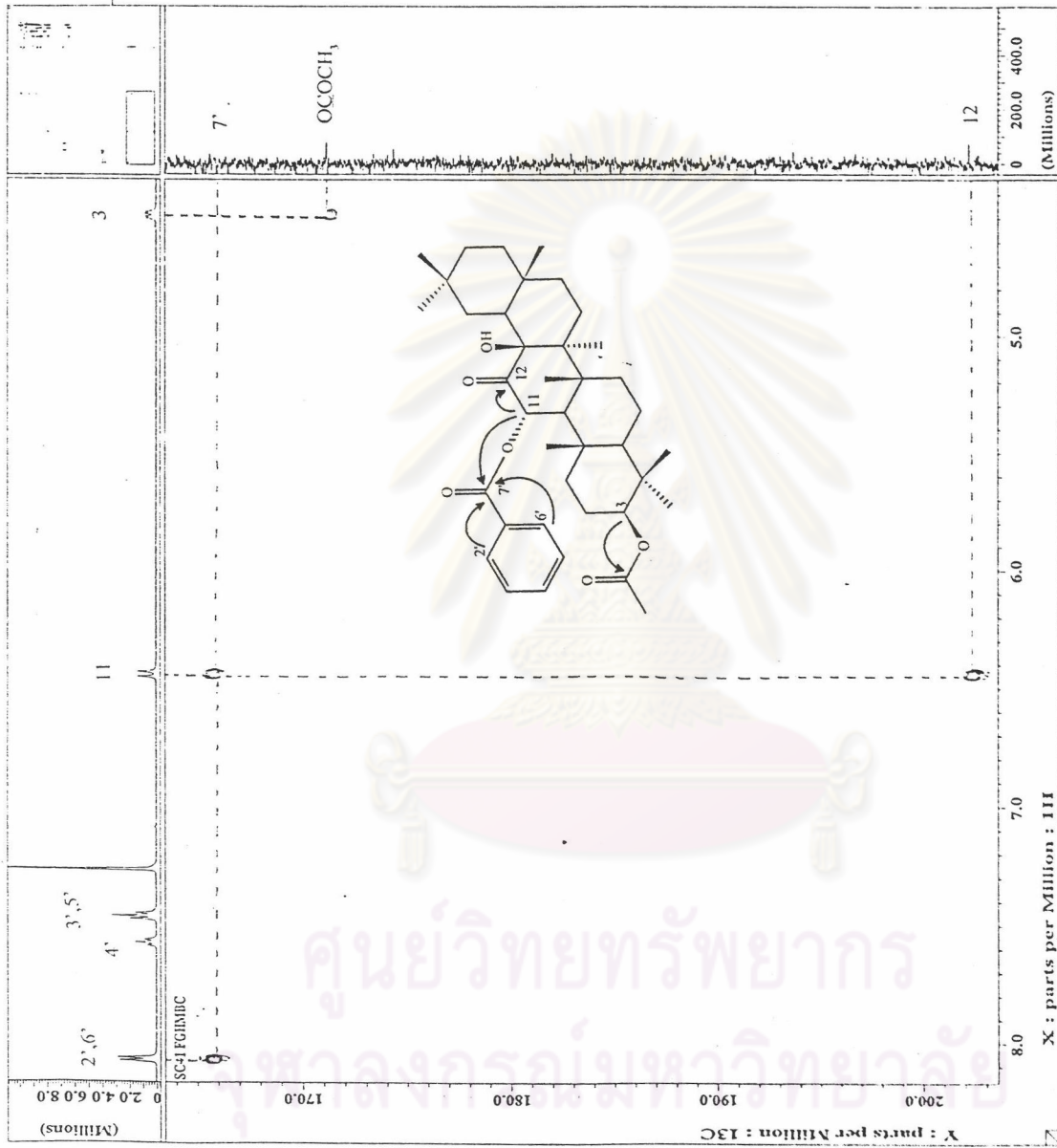


Figure 14. (c) Expanded HMBC spectrum of SC1 (36) (in CDCl_3) in the range of δ ^1H 8.2 - 4.3 ppm and δ ^{13}C 203 - 164 ppm.

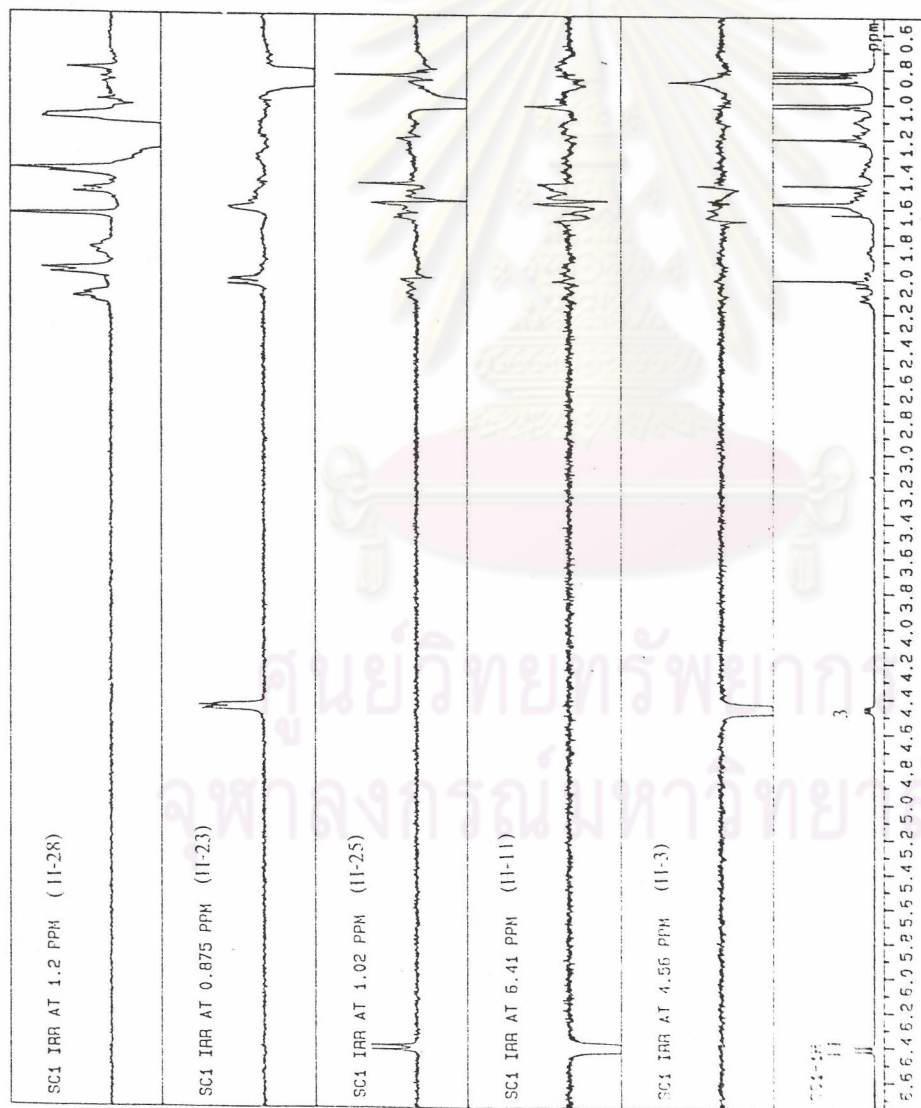


Figure 15 . NOE difference spectrum of SCI (36) (in $CDCl_3$).

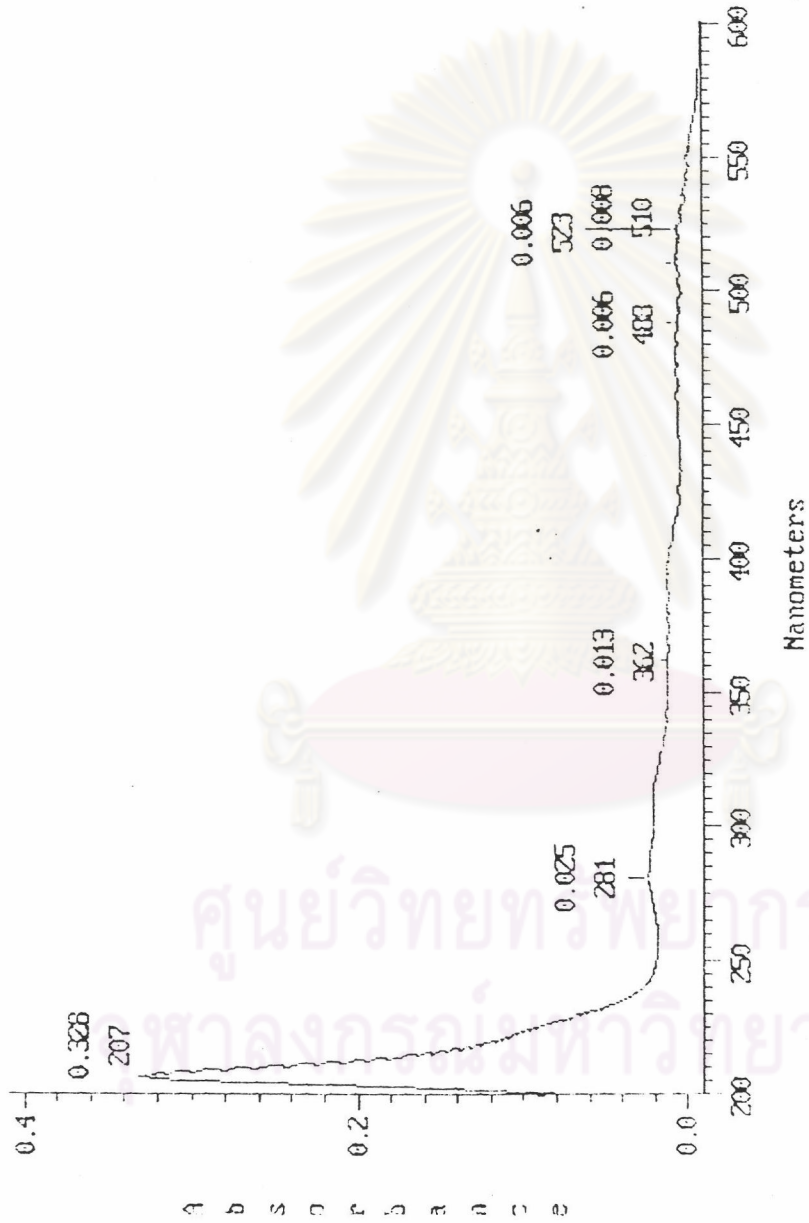
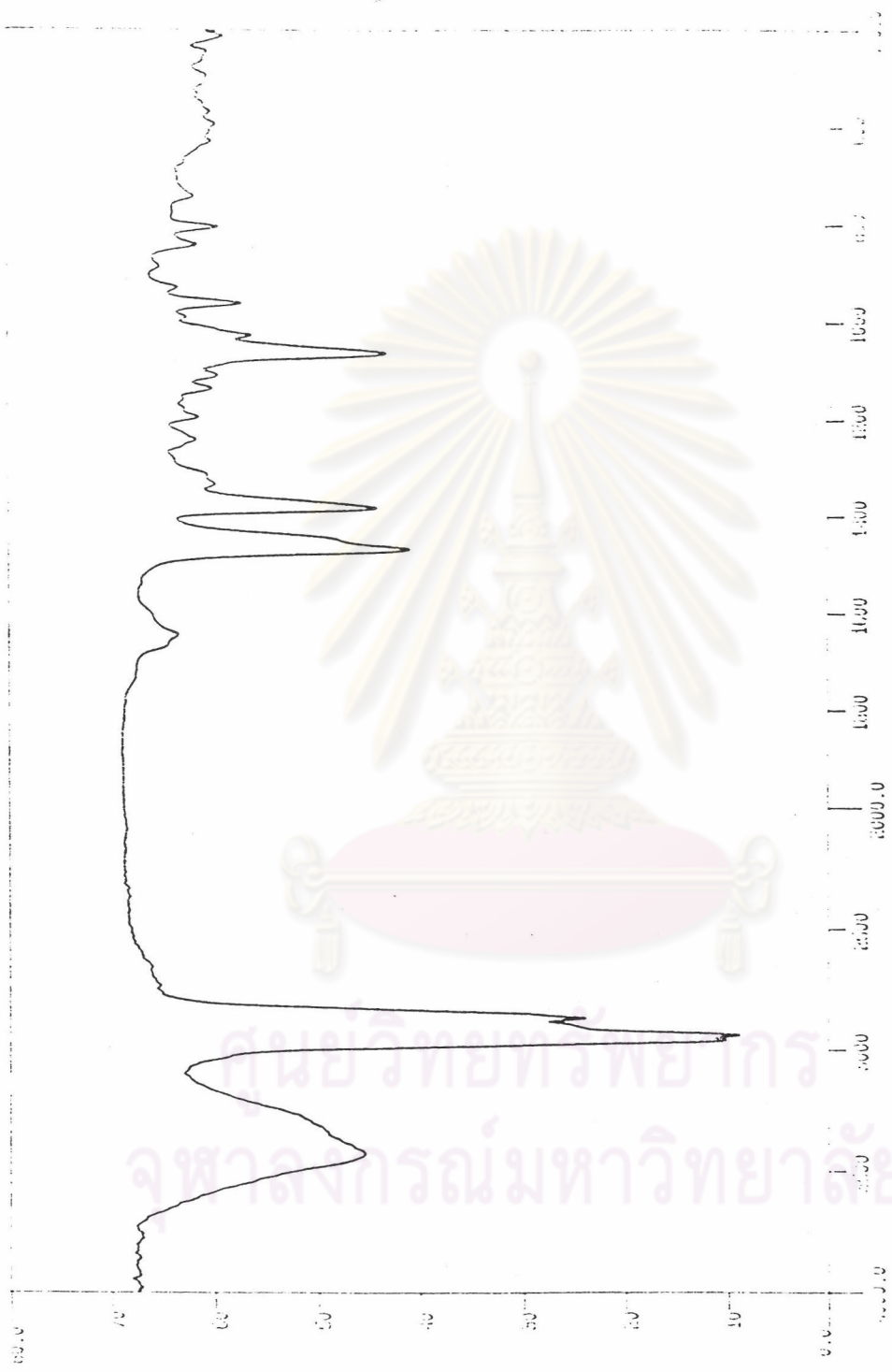


Figure 16. UV absorption spectrum of SC2 (39)

ศูนย์วิทยทวพยกร
ศาลงกรณัฒทาวิทยาลัย



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Figure 17. IR spectrum of SC2 (39)



Figure 18. EI - MS of SC2 (39)

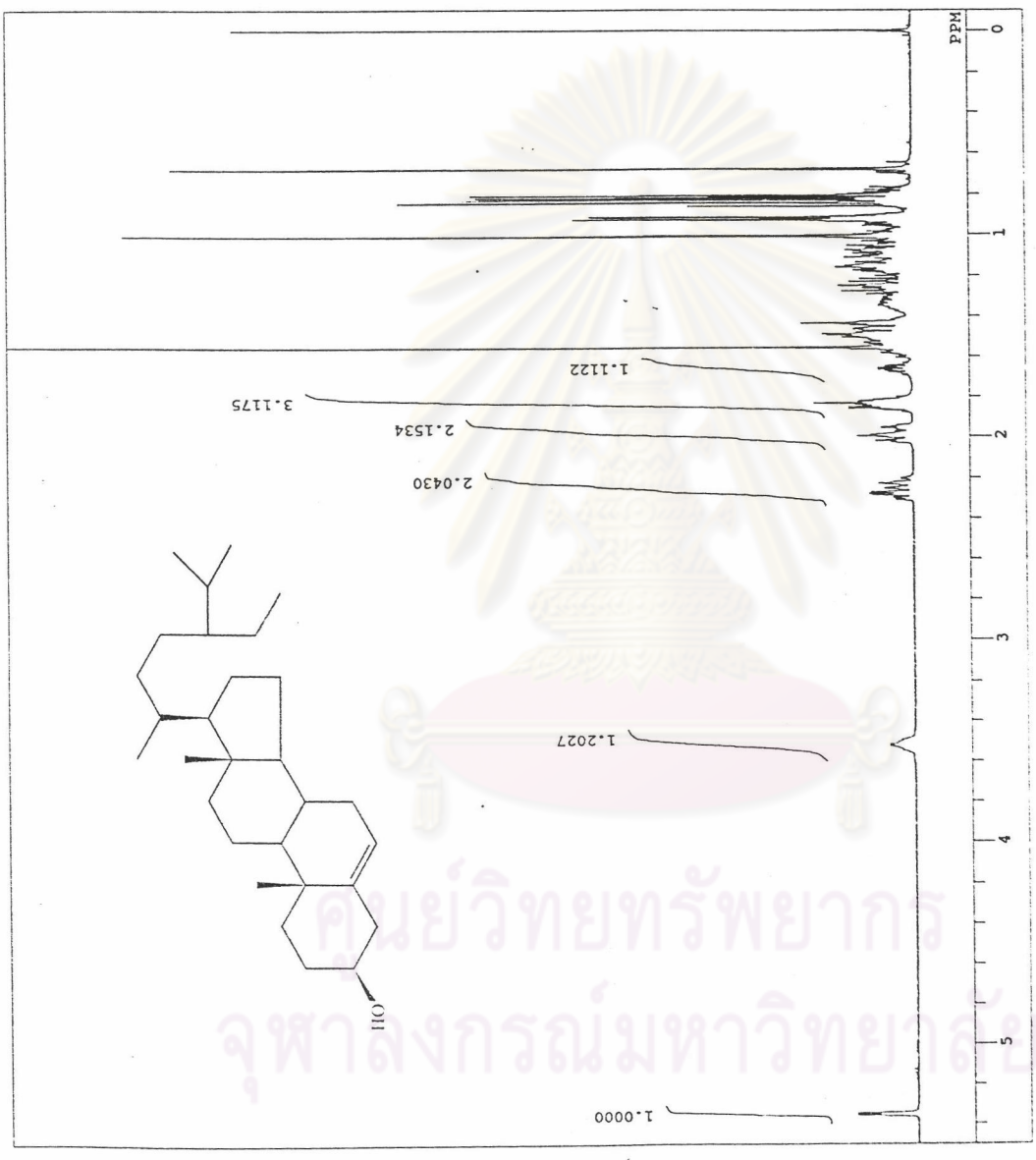
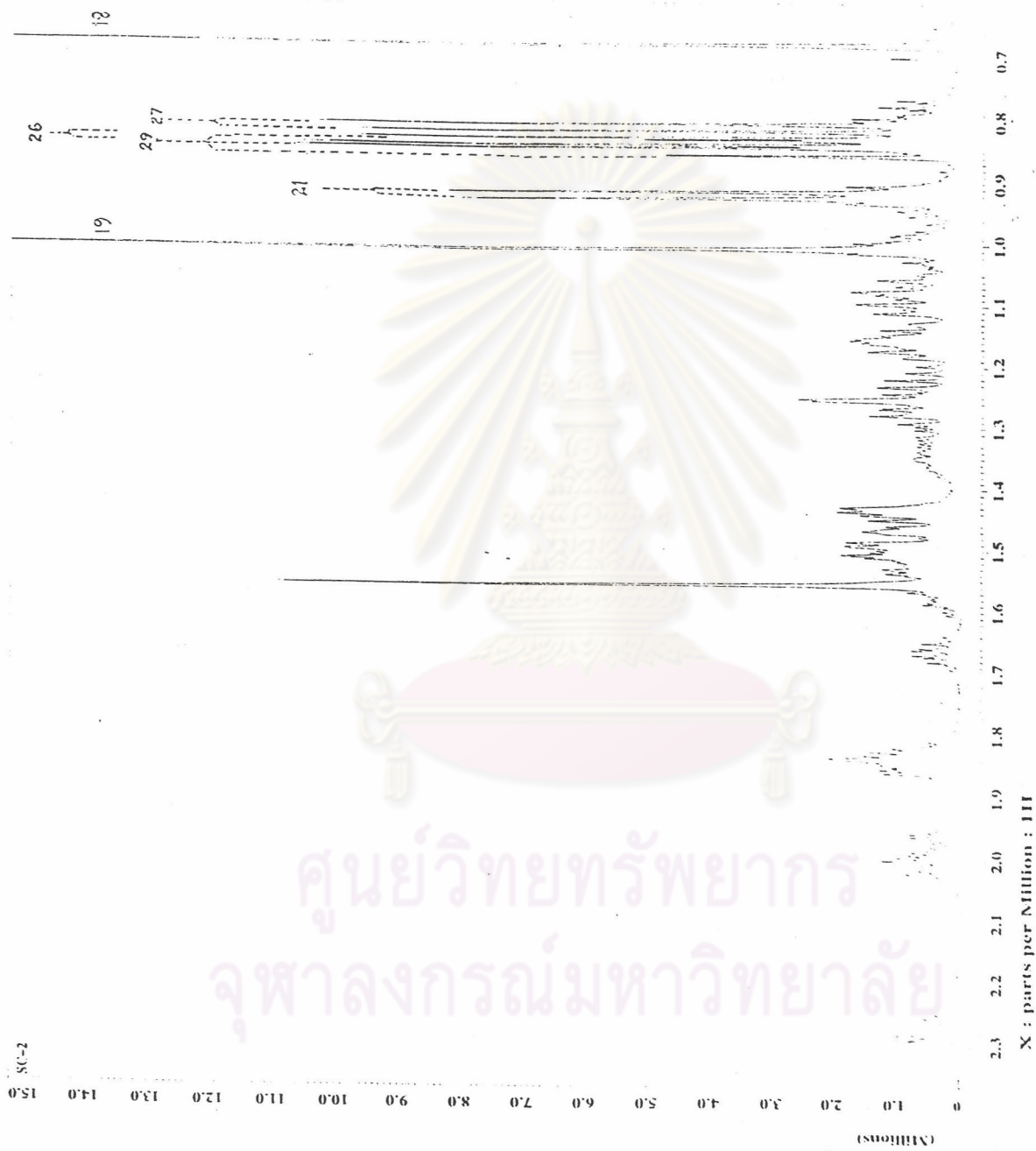


Figure 19. (a) ¹H - NMR spectrum (500 MHz) of SC2 (39) (in CDCl₃).



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Figure 19. (b) ¹H - NMR spectrum (500 MHz) of SC2 (39) (in CDCl₃) in the range of δ 2.3 - 0.7 ppm.

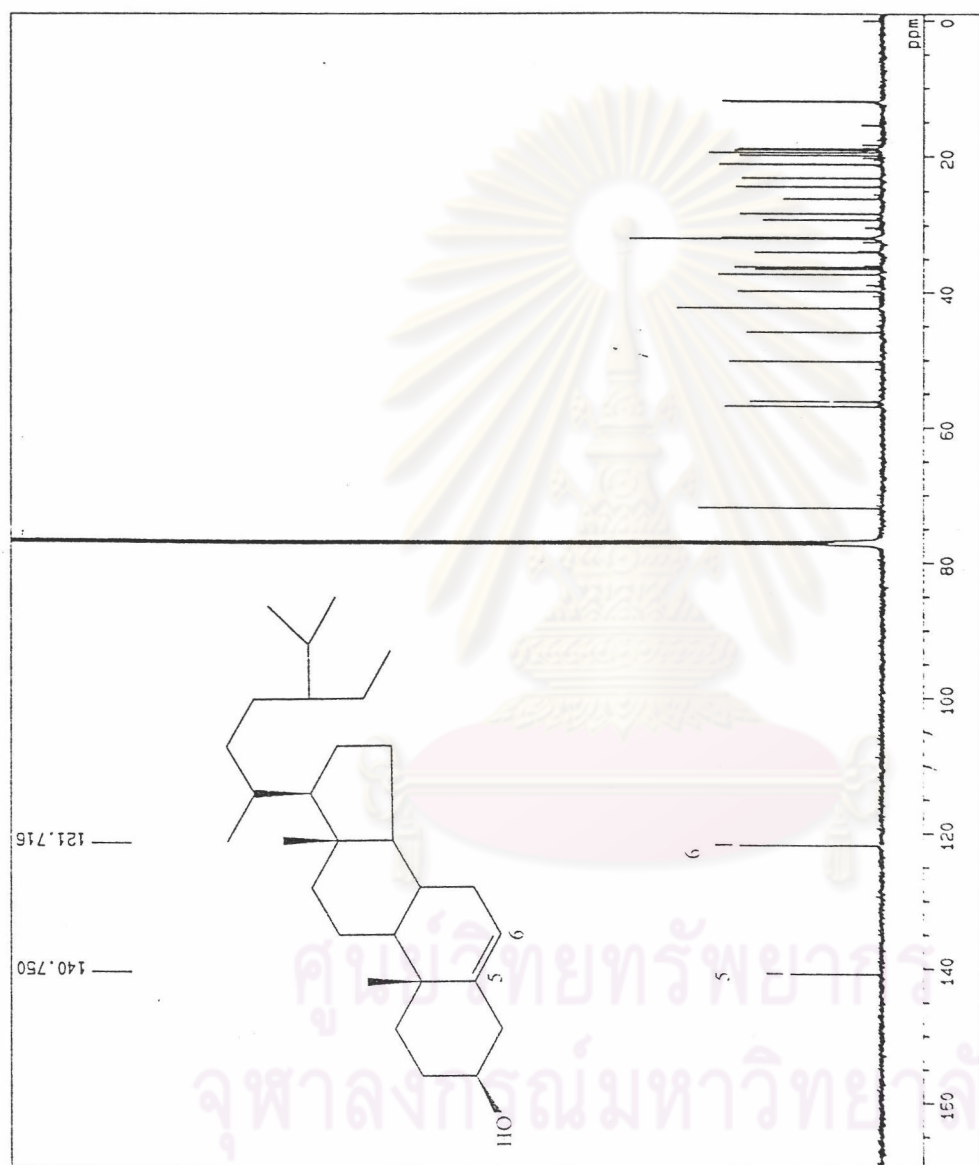


Figure 20. (a) ^{13}C -NMR spectrum (125 MHz) of SC2 (39) (in CDCl₃).

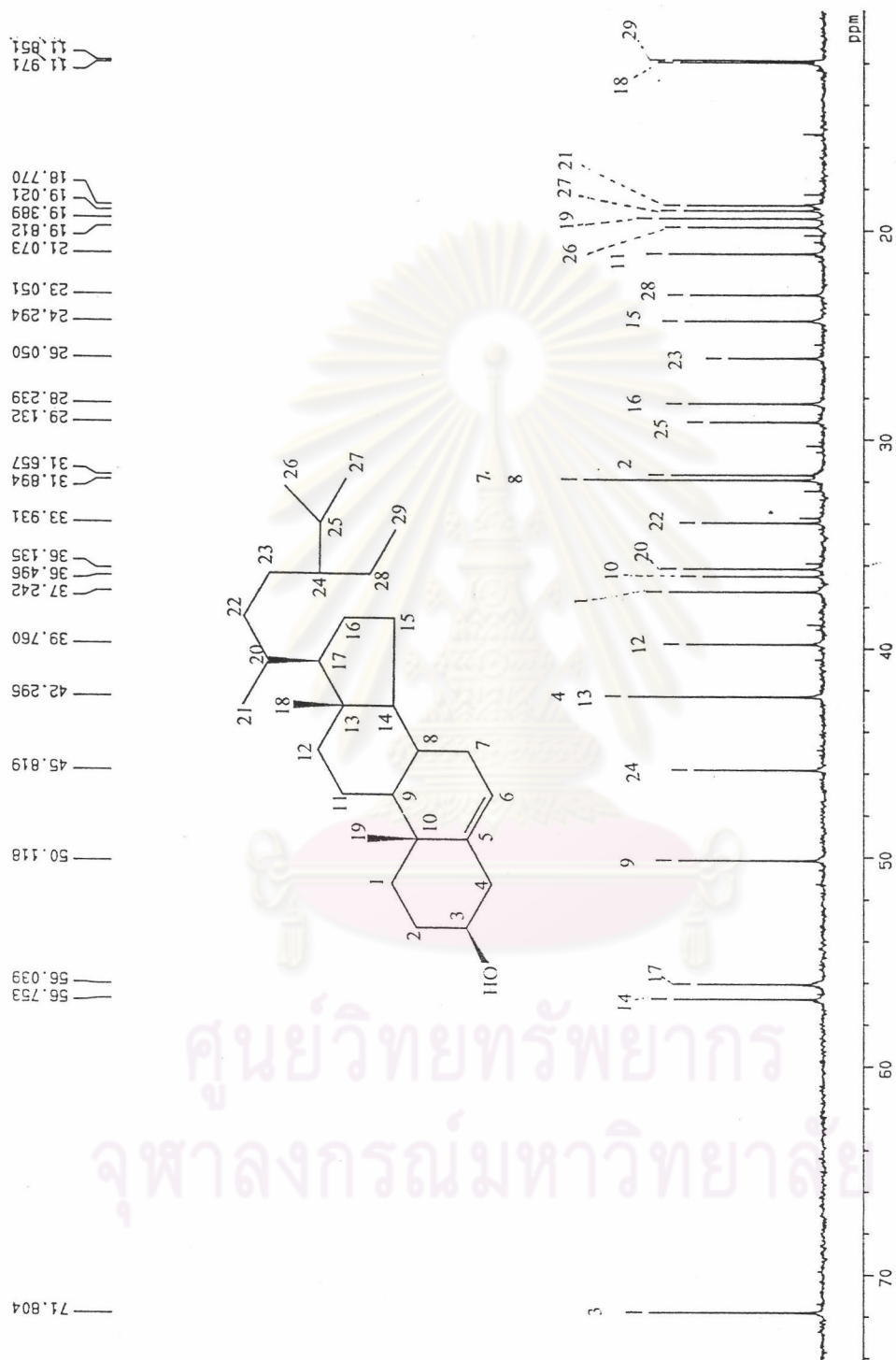


Figure 20. (b) ¹³C-NMR spectrum (125 MHz) of SC2 (39) (in CDCl₃) in the range of δ 72 -10 ppm.

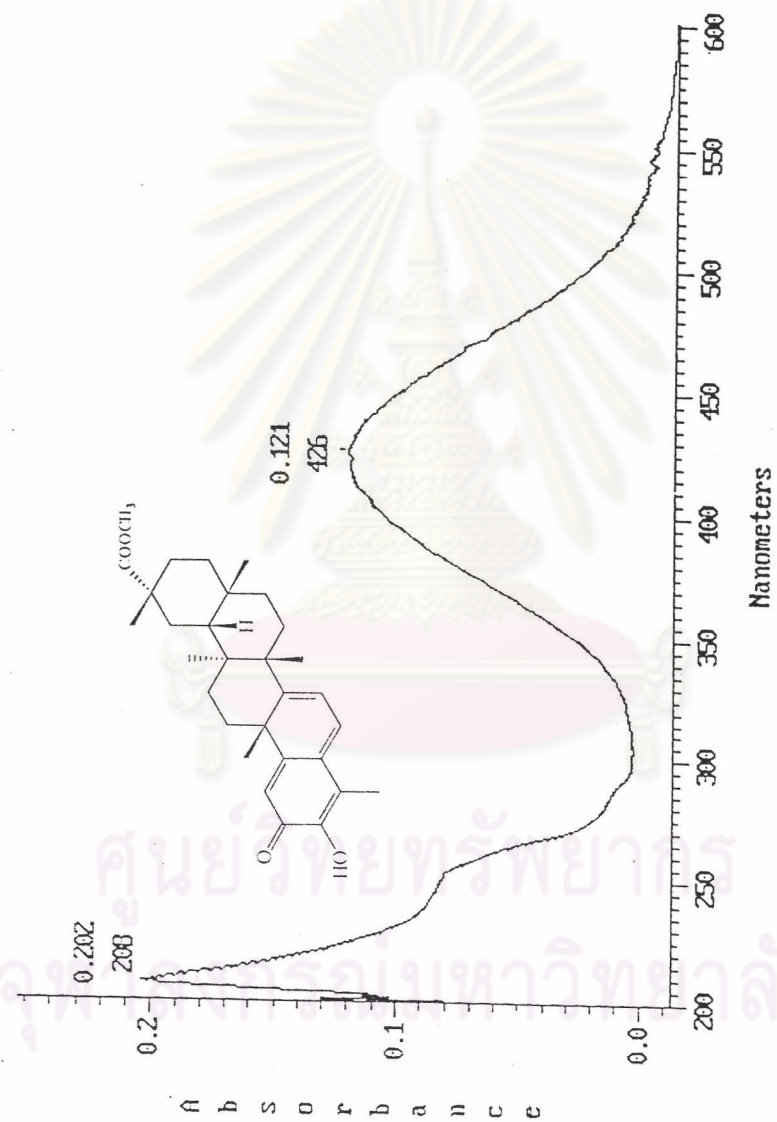


Figure 21. UV absorption spectrum of SC3 (16) (in MeOH).

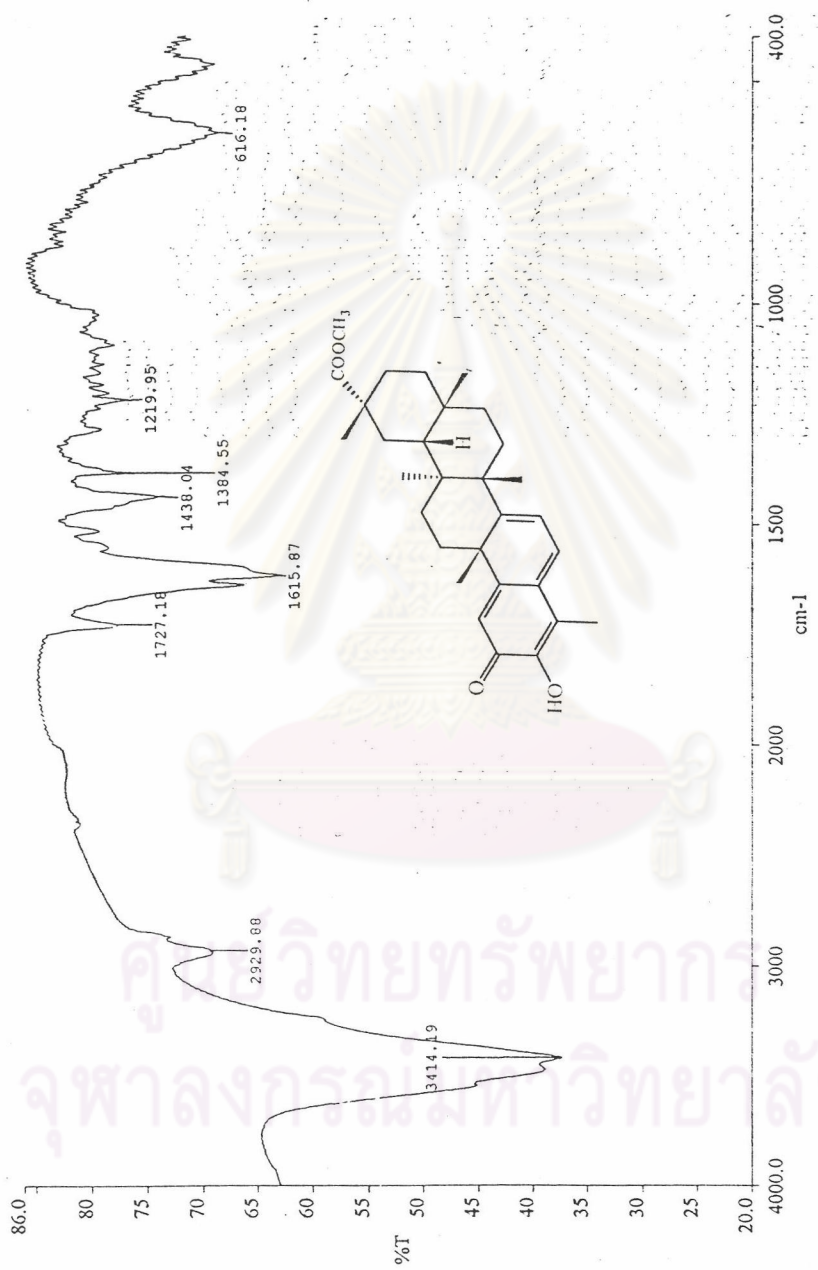
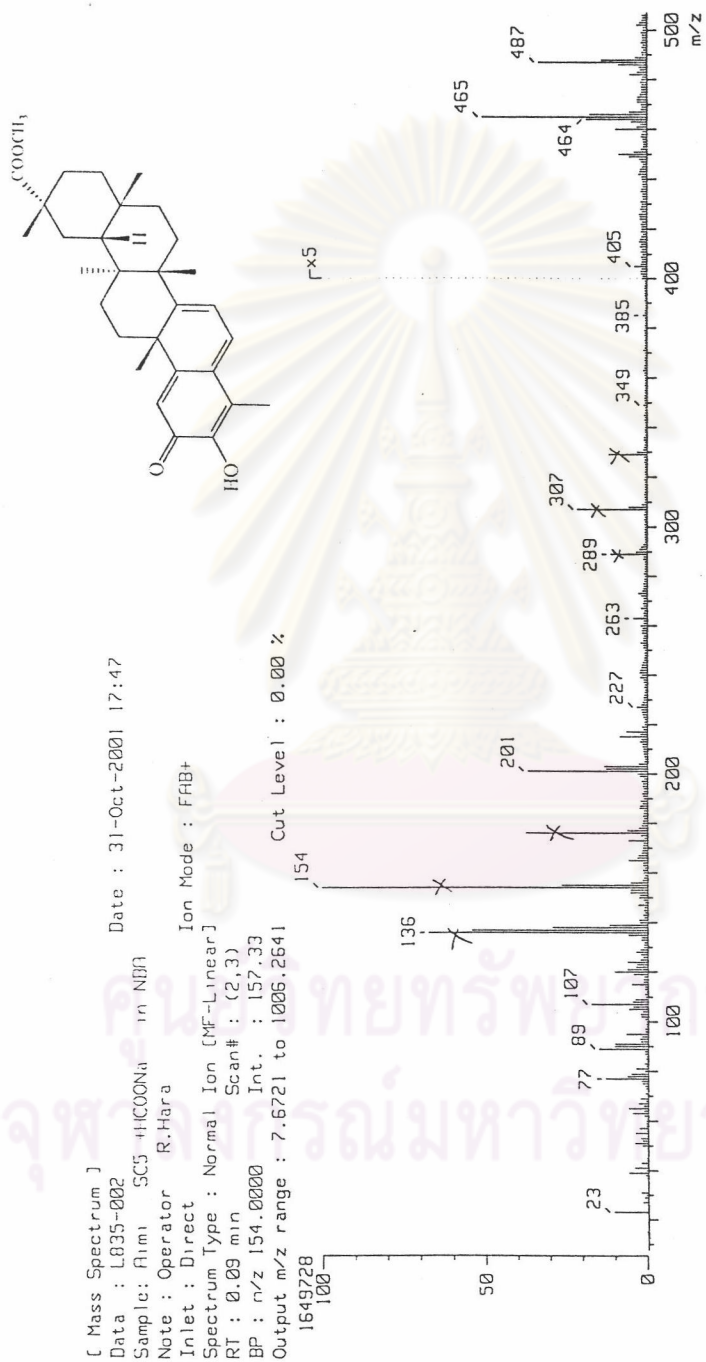


Figure 22. IR spectrum of SC3 (16) (in KBr).



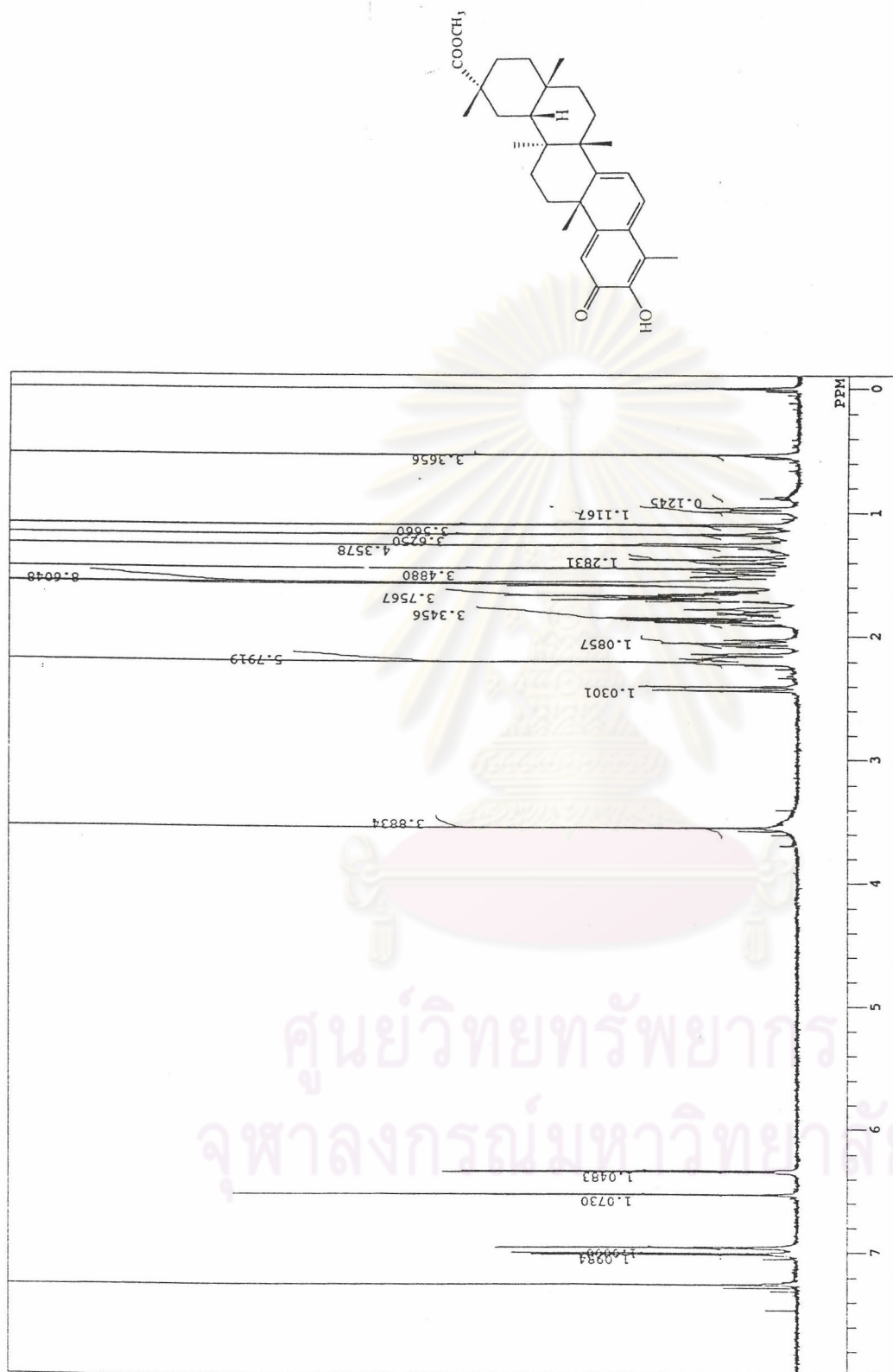


Figure 24. (a) ¹H - NMR spectrum (500 MHz) of SC3 (16) (in CDCl₃).

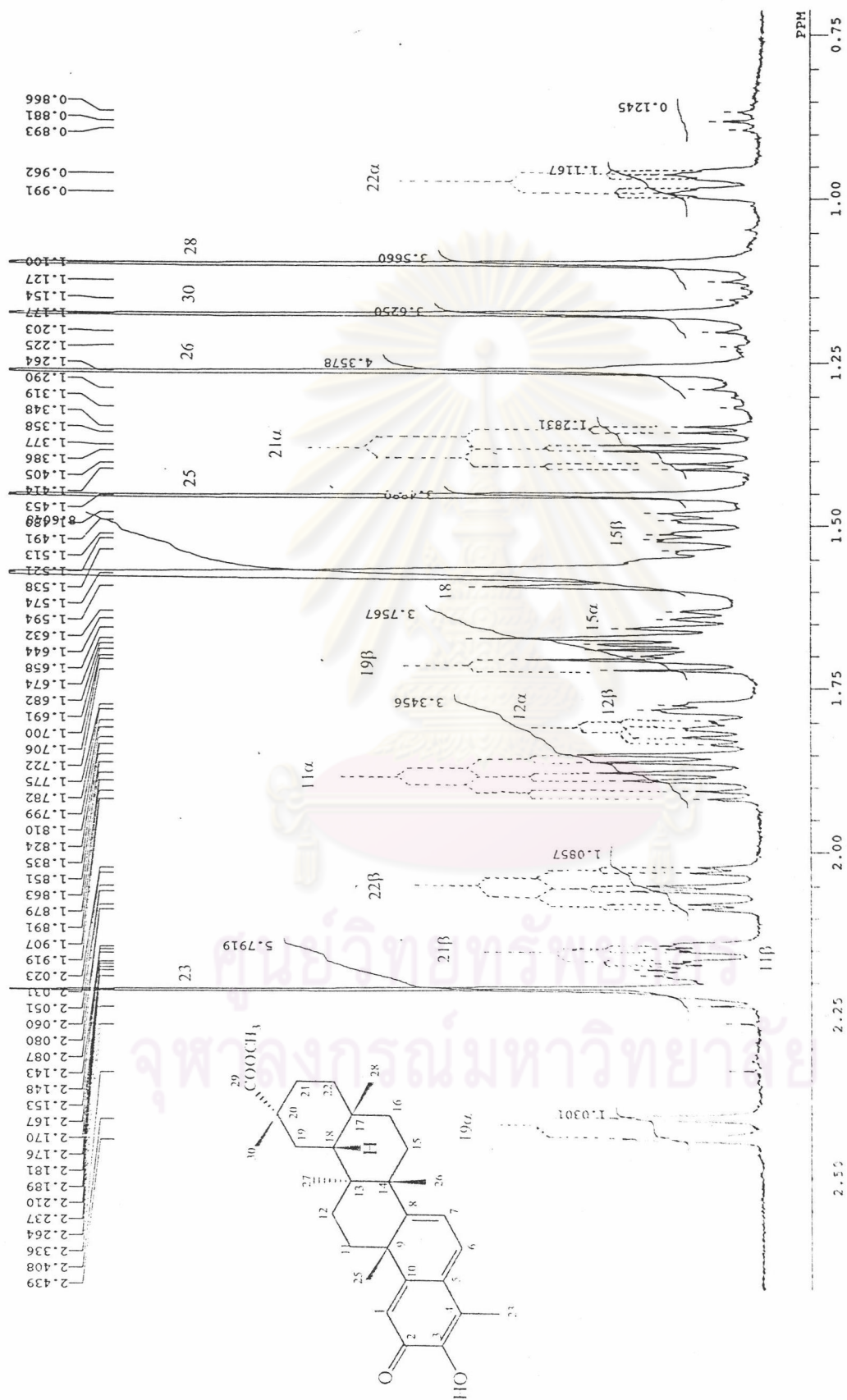


Figure 24. (b) Expanded ¹H - NMR spectrum (500 MHz) of SC3 (16) (in CDCl₃) in the range of δ 2.5- 0.7 ppm

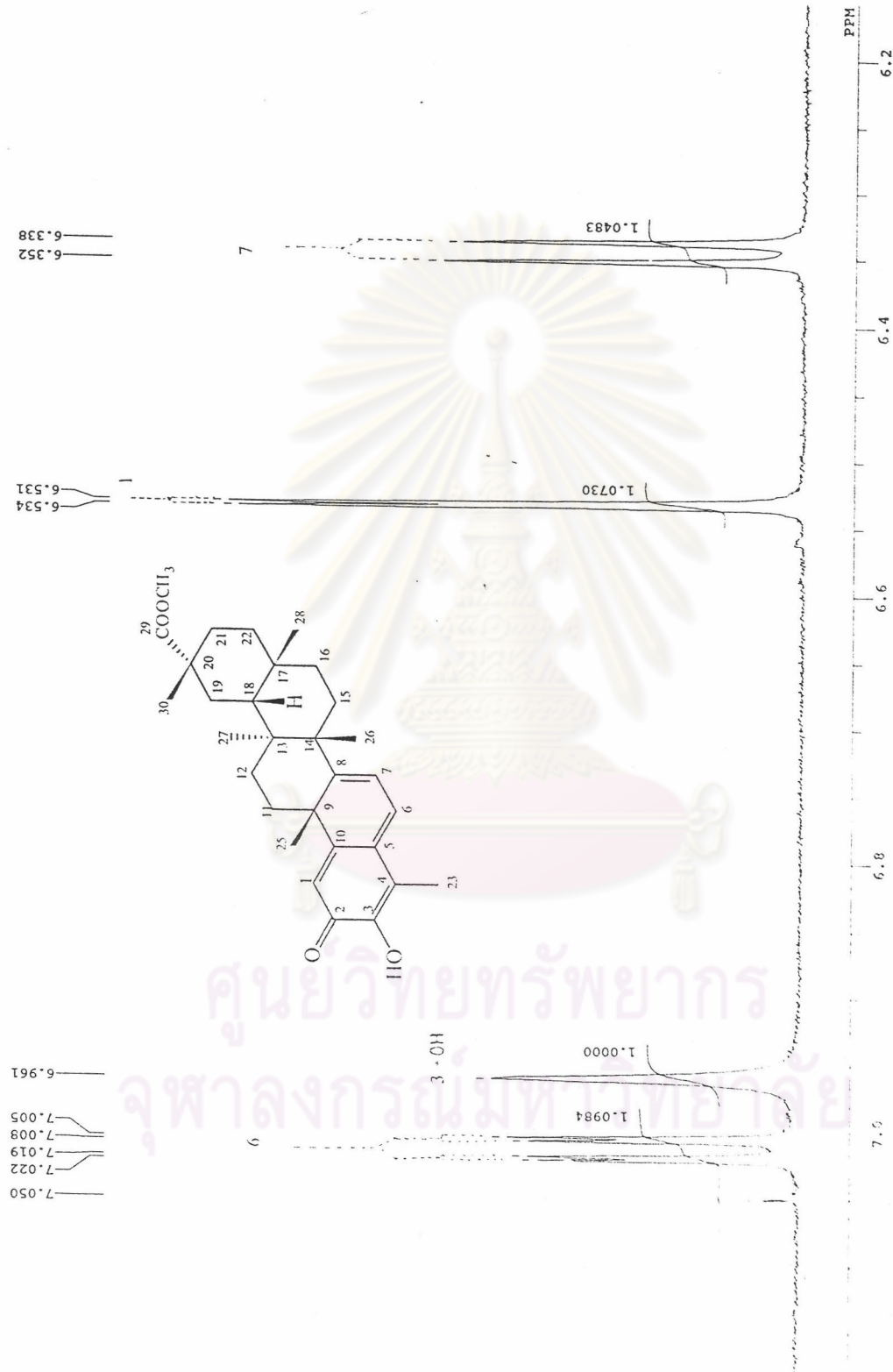


Figure 24. (c) Expanded $^1\text{H-NMR}$ spectrum (500 MHz) of SC3 (16) (in CDCl_3) in the range of δ 7.1 - 6.2 ppm.

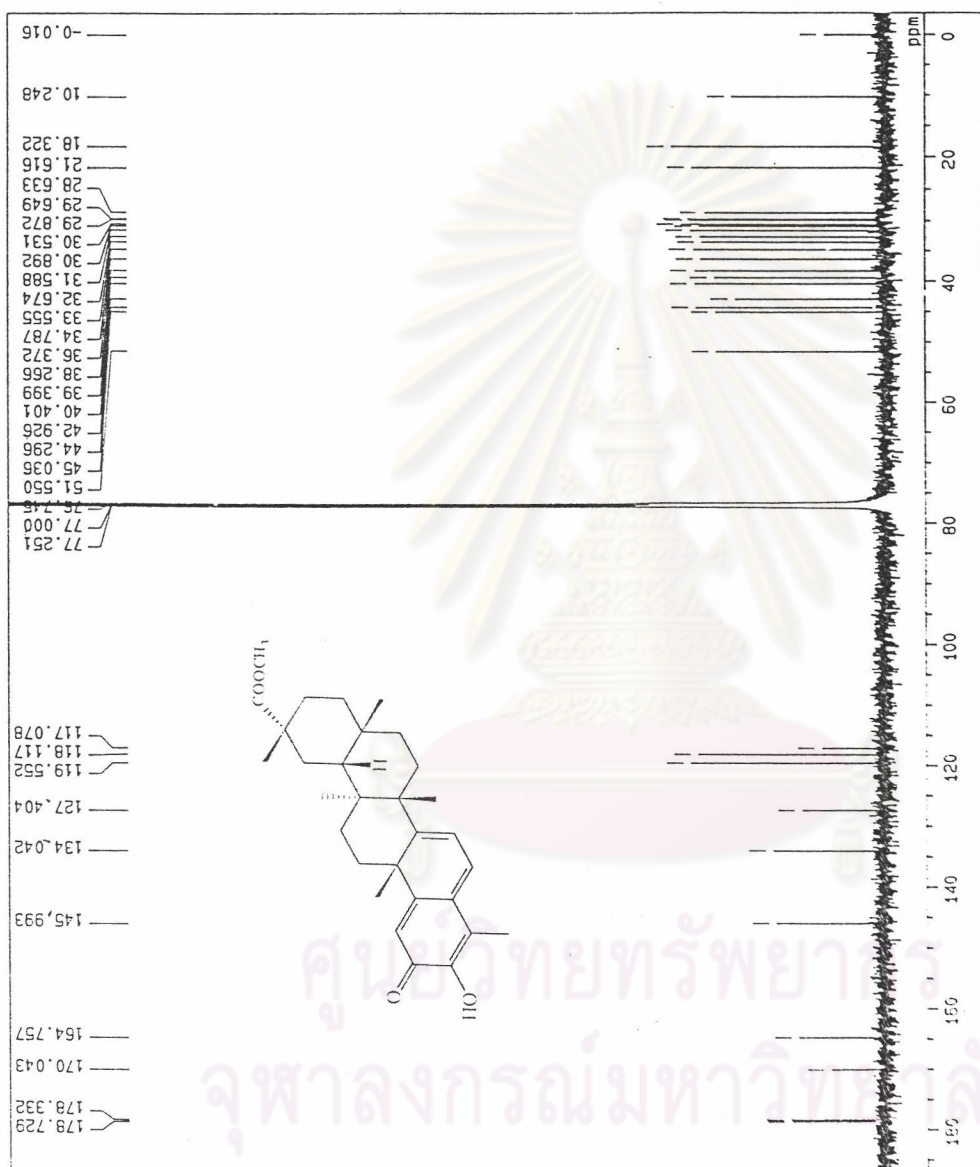


Figure 25. (a) ^{13}C -NMR spectrum (125 MHz) of SC3 (16) (in CDCl_3).

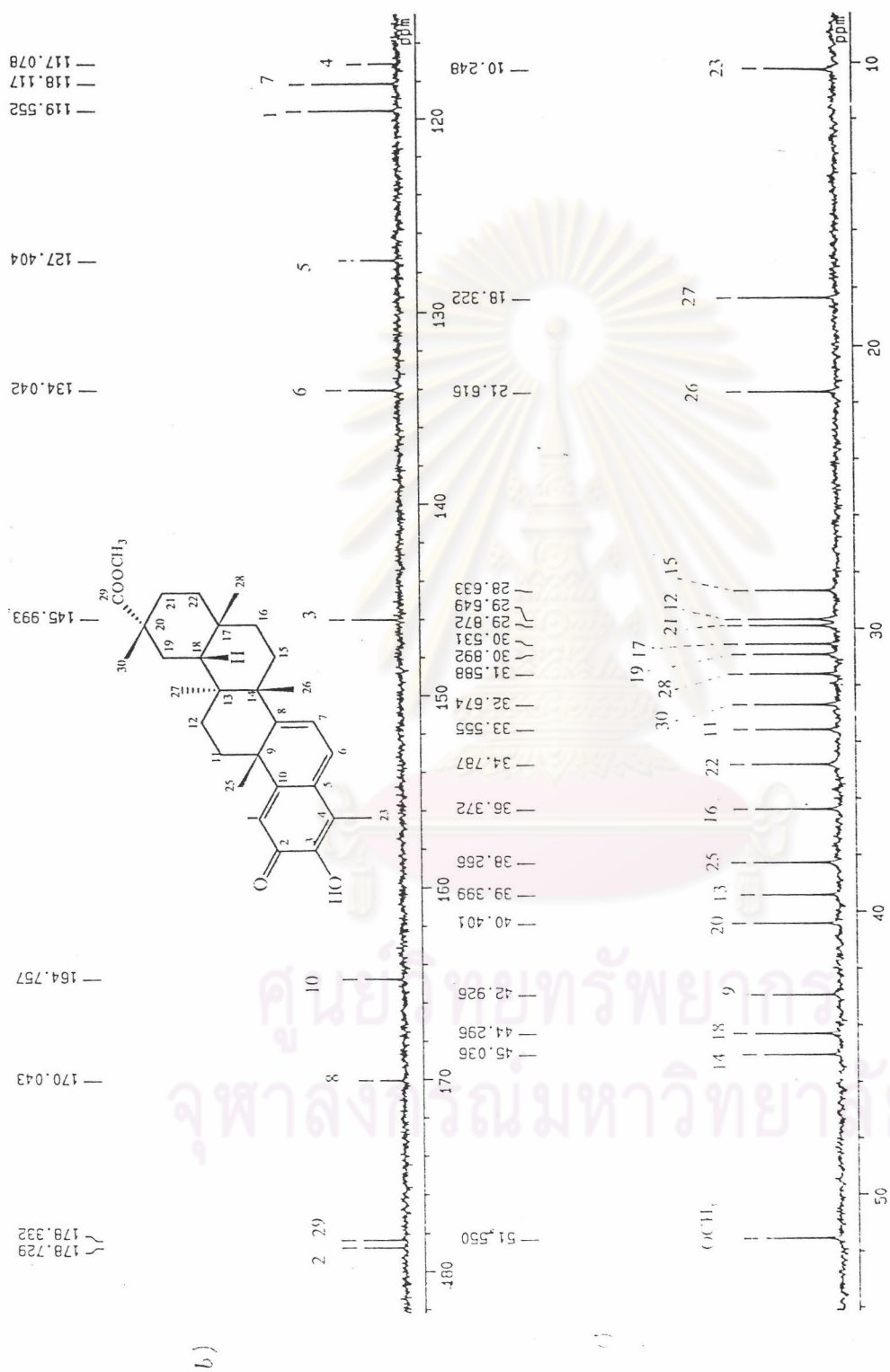
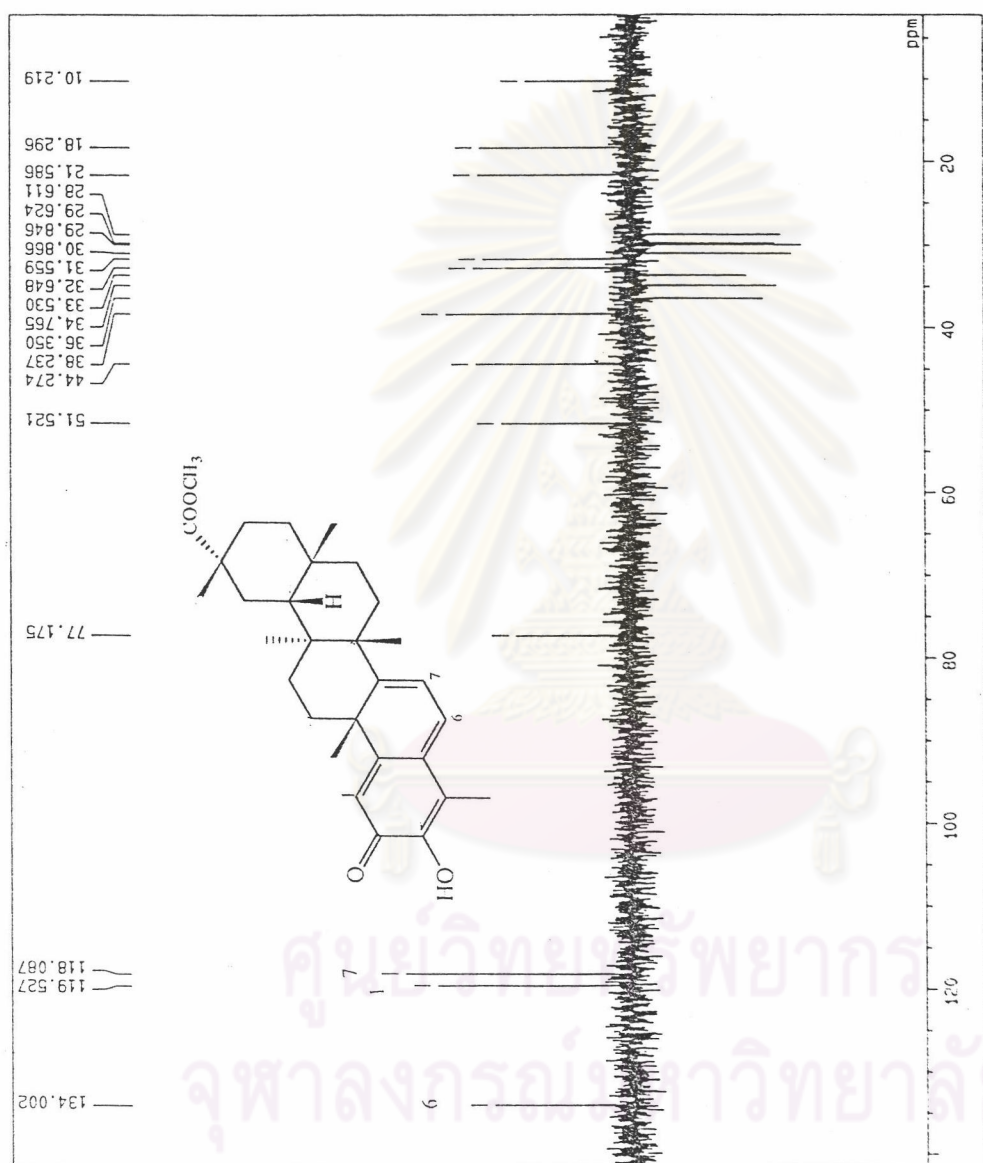


Figure 25. (b) Expanded ^{13}C - NMR spectrum (125 MHz) of SC3 (16) (in CDCl_3) in the range of δ 180 -116 ppm.

(c) Expanded ^{13}C - NMR spectrum (125 MHz) of SC3 (16) (in CDCl_3) in the range of δ 60 -10 ppm.



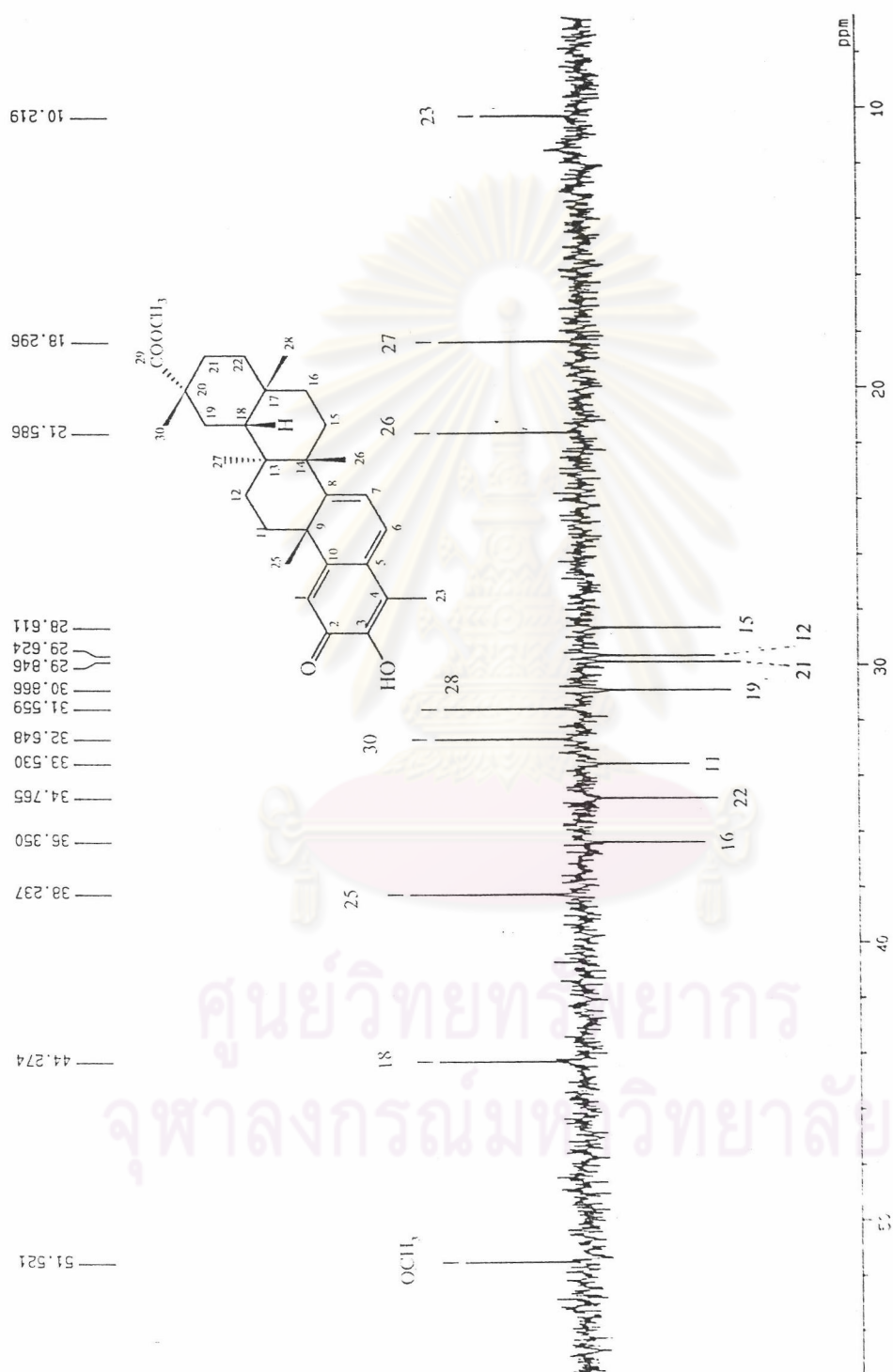


Figure 26. (b) Expanded DEPT 135 spectrum of SC3 (16) (in CDCl_3) in the range of δ 60 - 10 ppm.

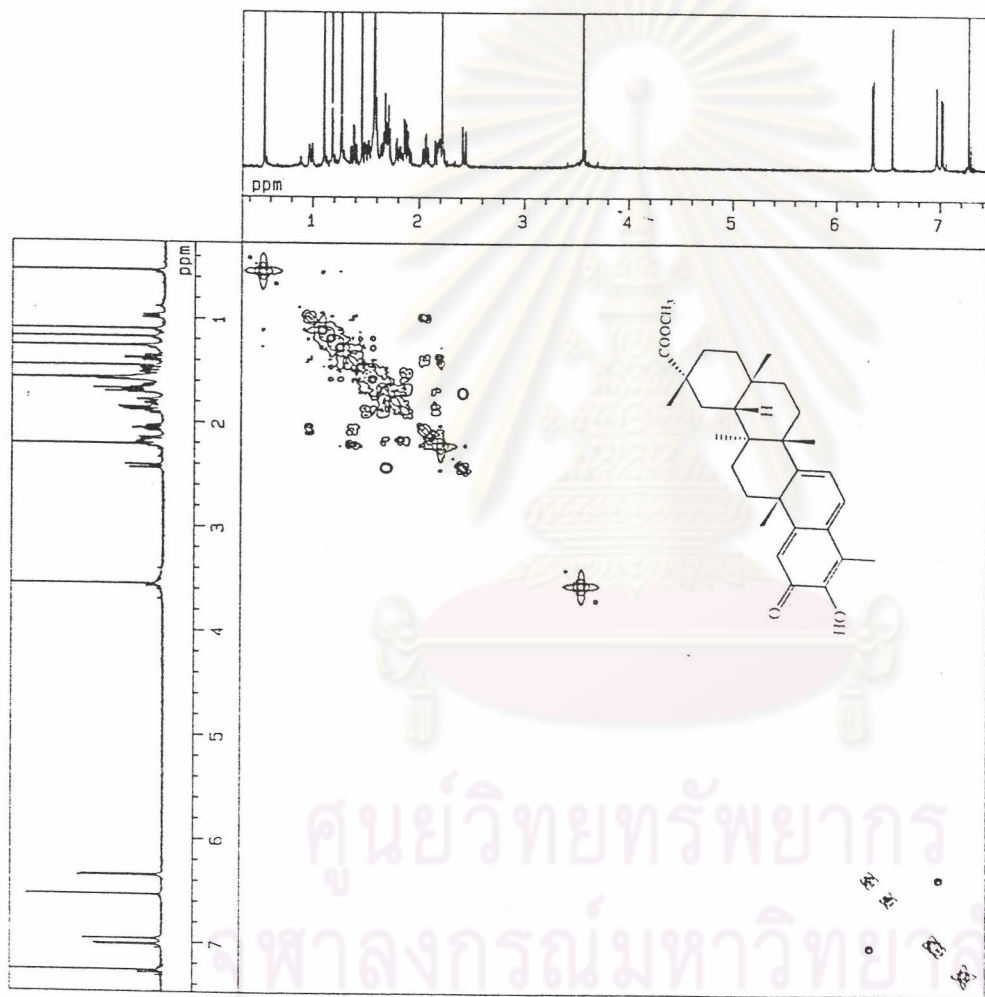
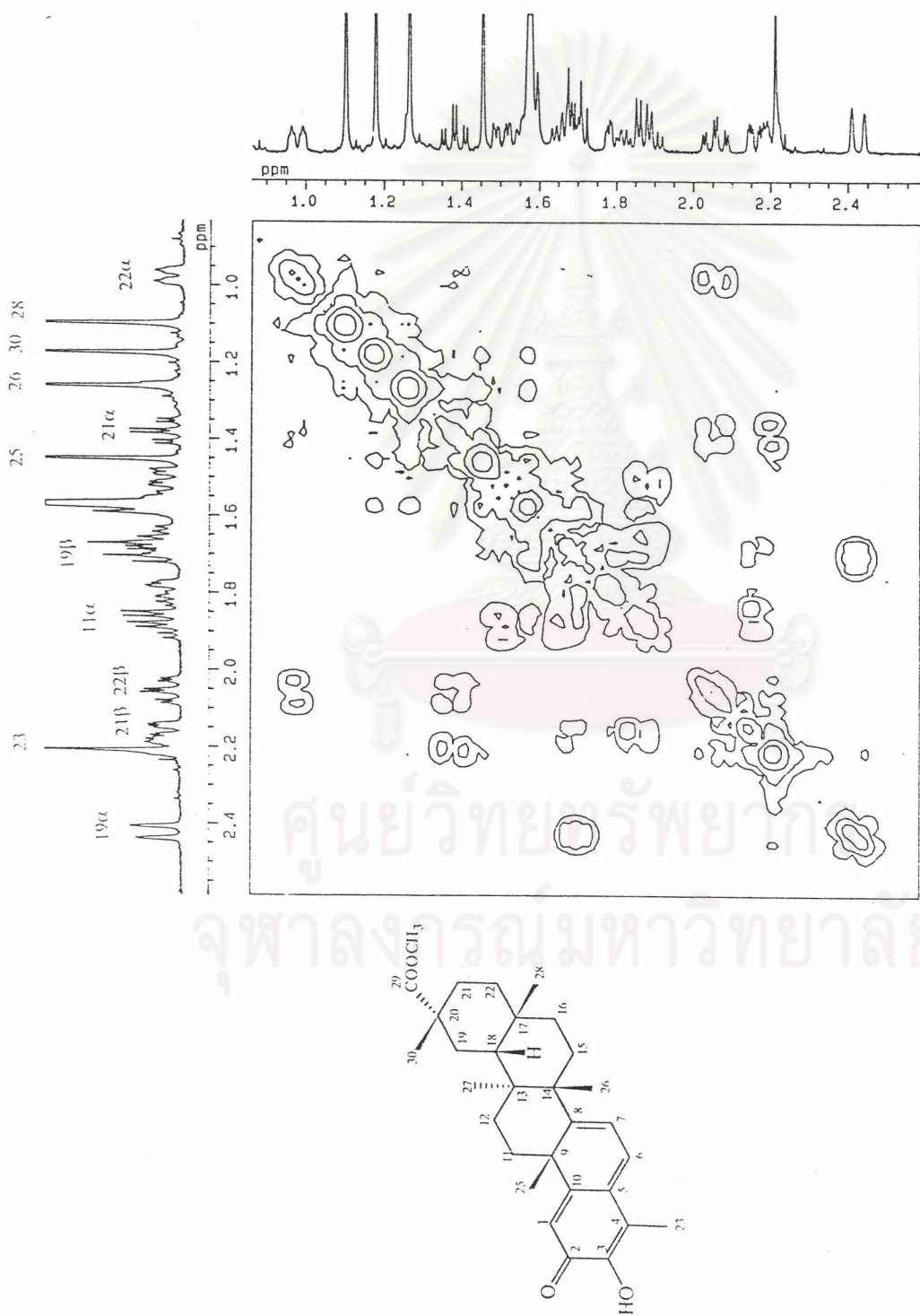
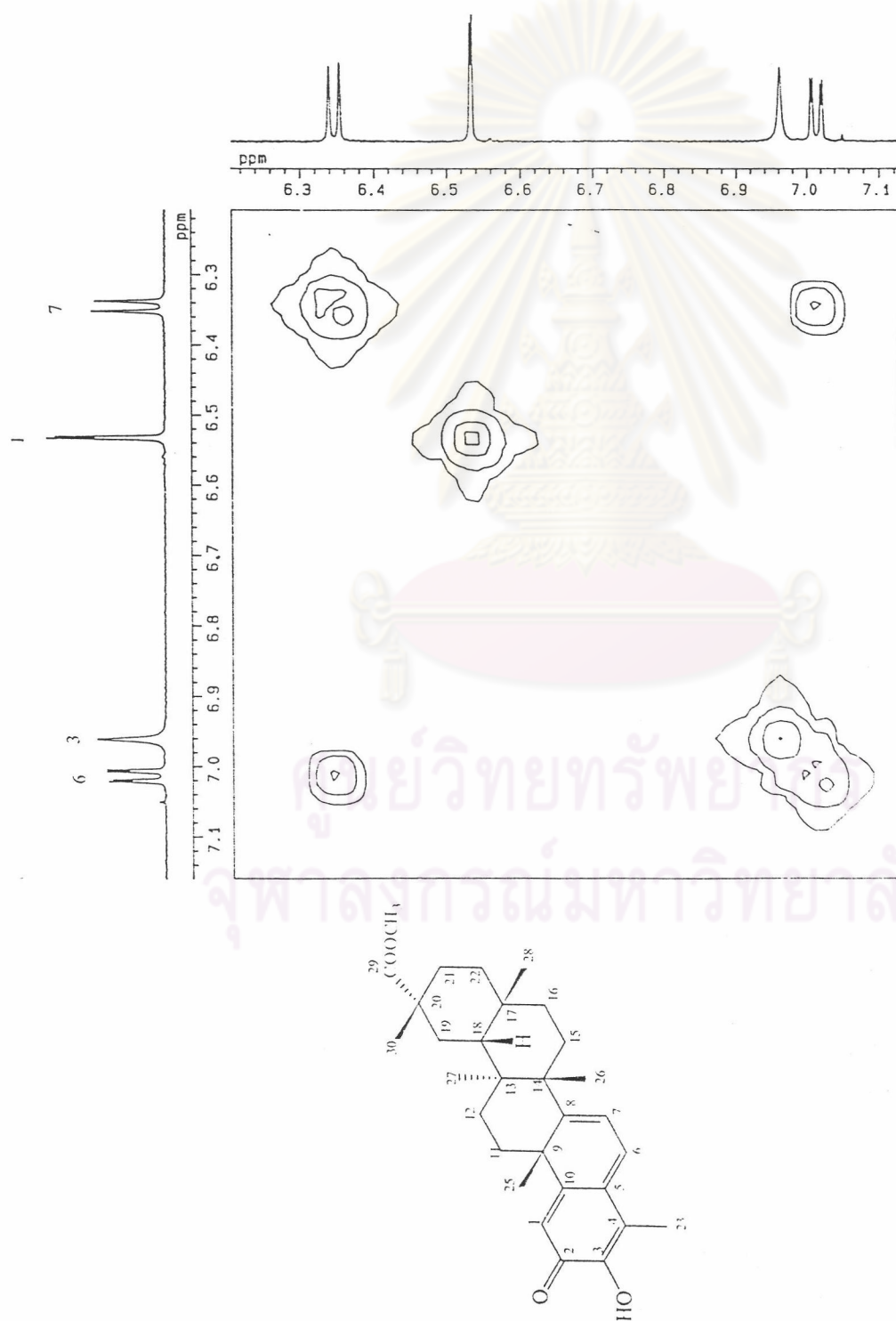
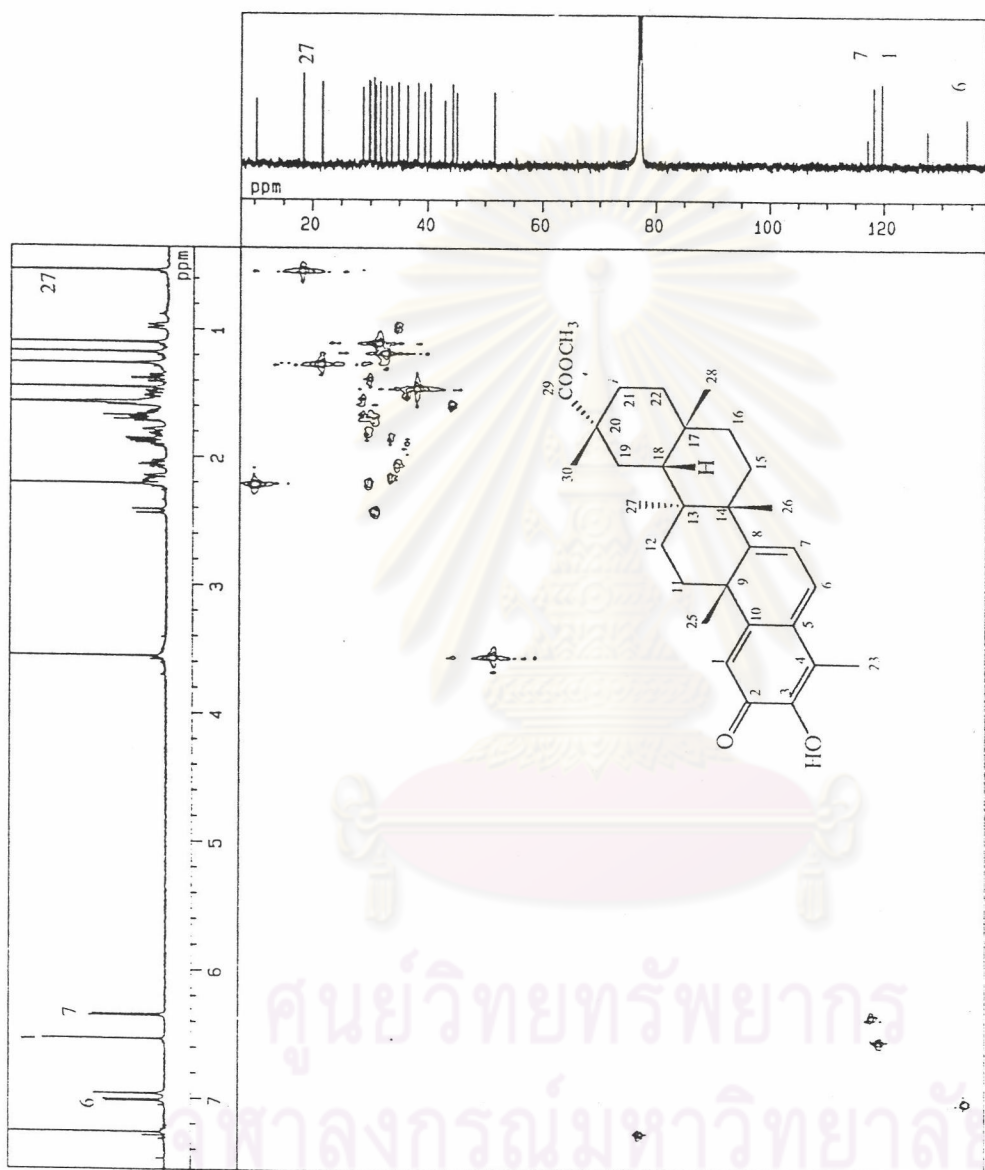
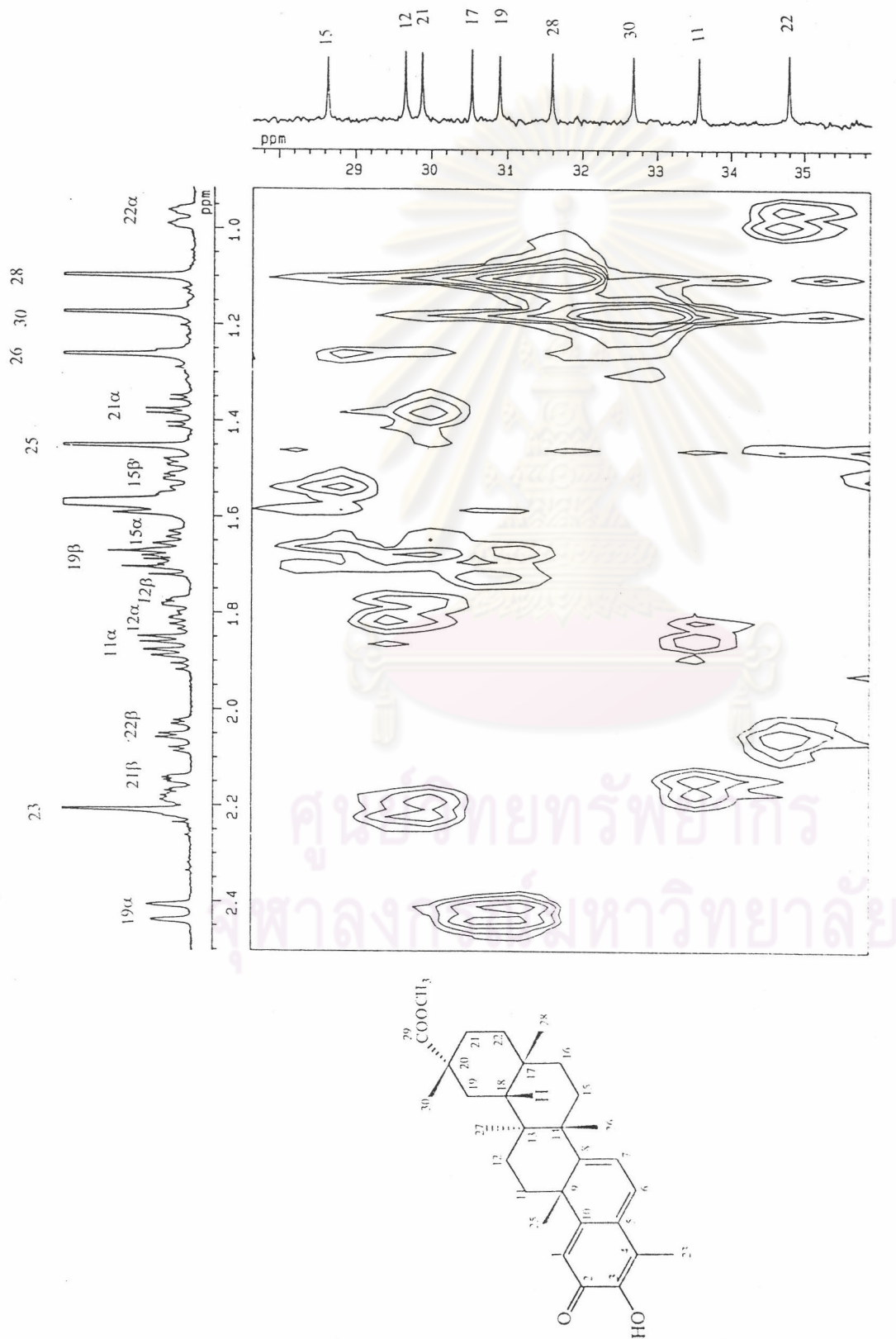


Figure 27. (a) ^1H - ^1H COSY spectrum of SC3 (16) (in CDCl_3).









25

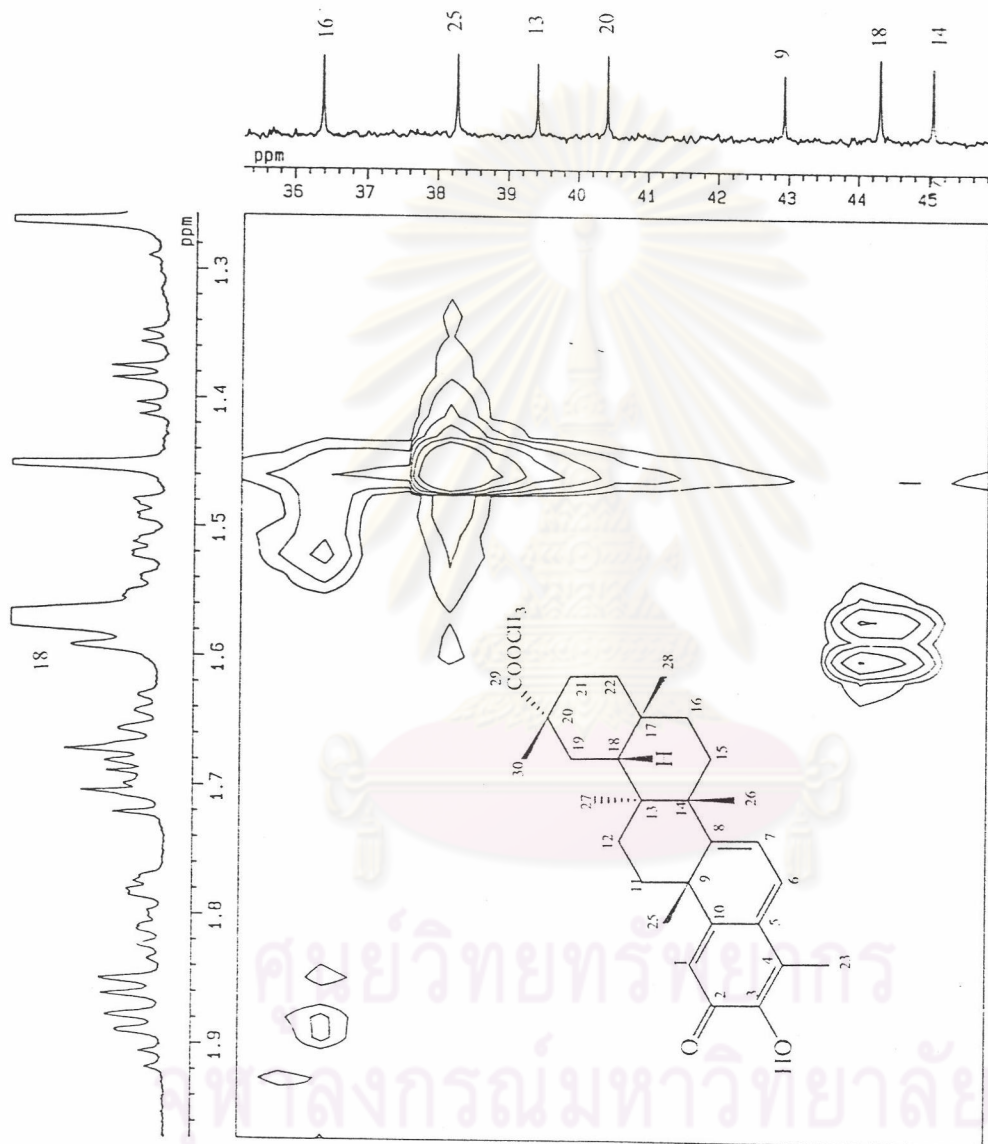


Figure 28. (c) Expanded 1HMQC spectrum of SC3 (16) (in CDCl₃) in the range of δ H 2.0 - 1.3 ppm and δ C 46 - 36 ppm.

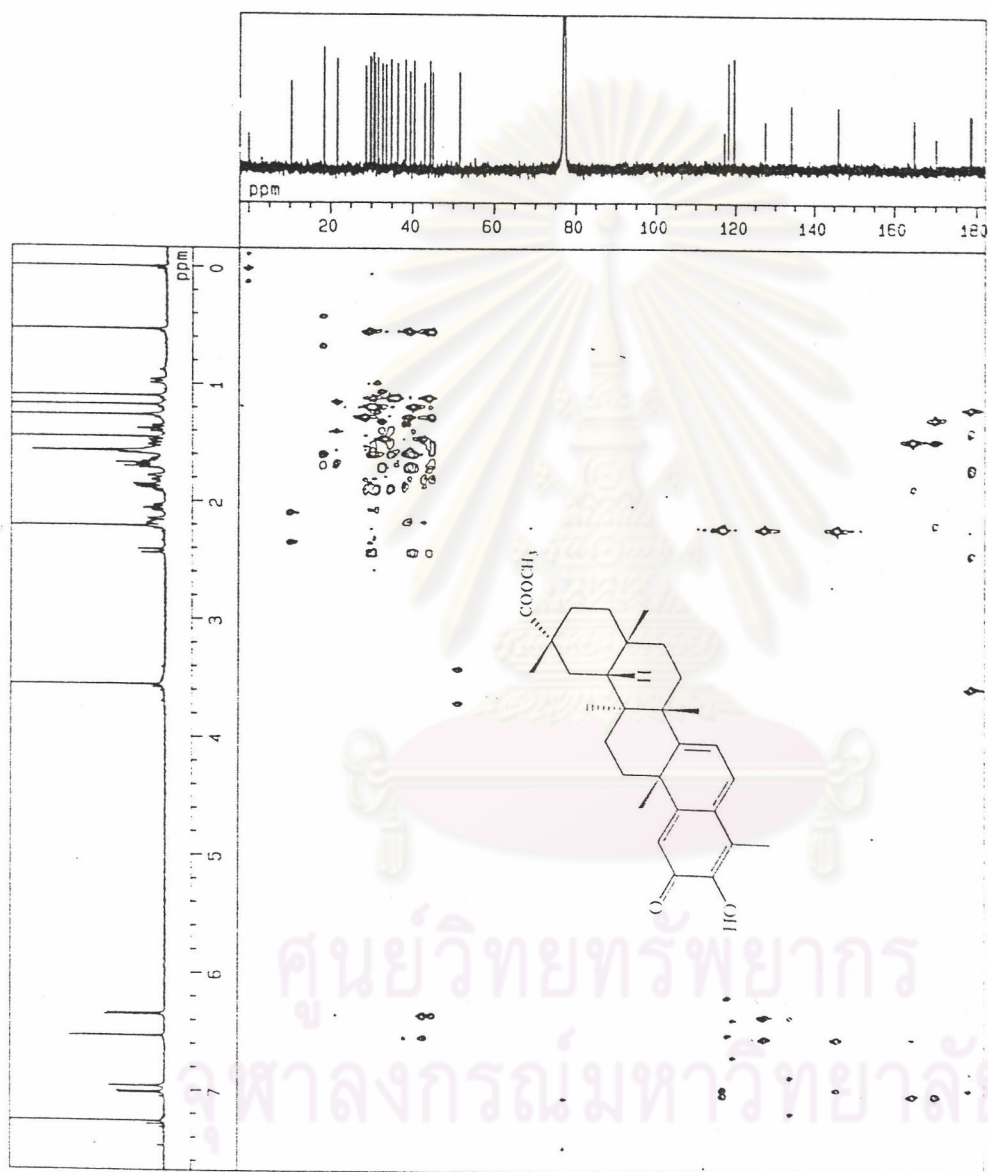


Figure 29. (a) HIMBC spectrum of SC3 (16) (in CDCl₃).

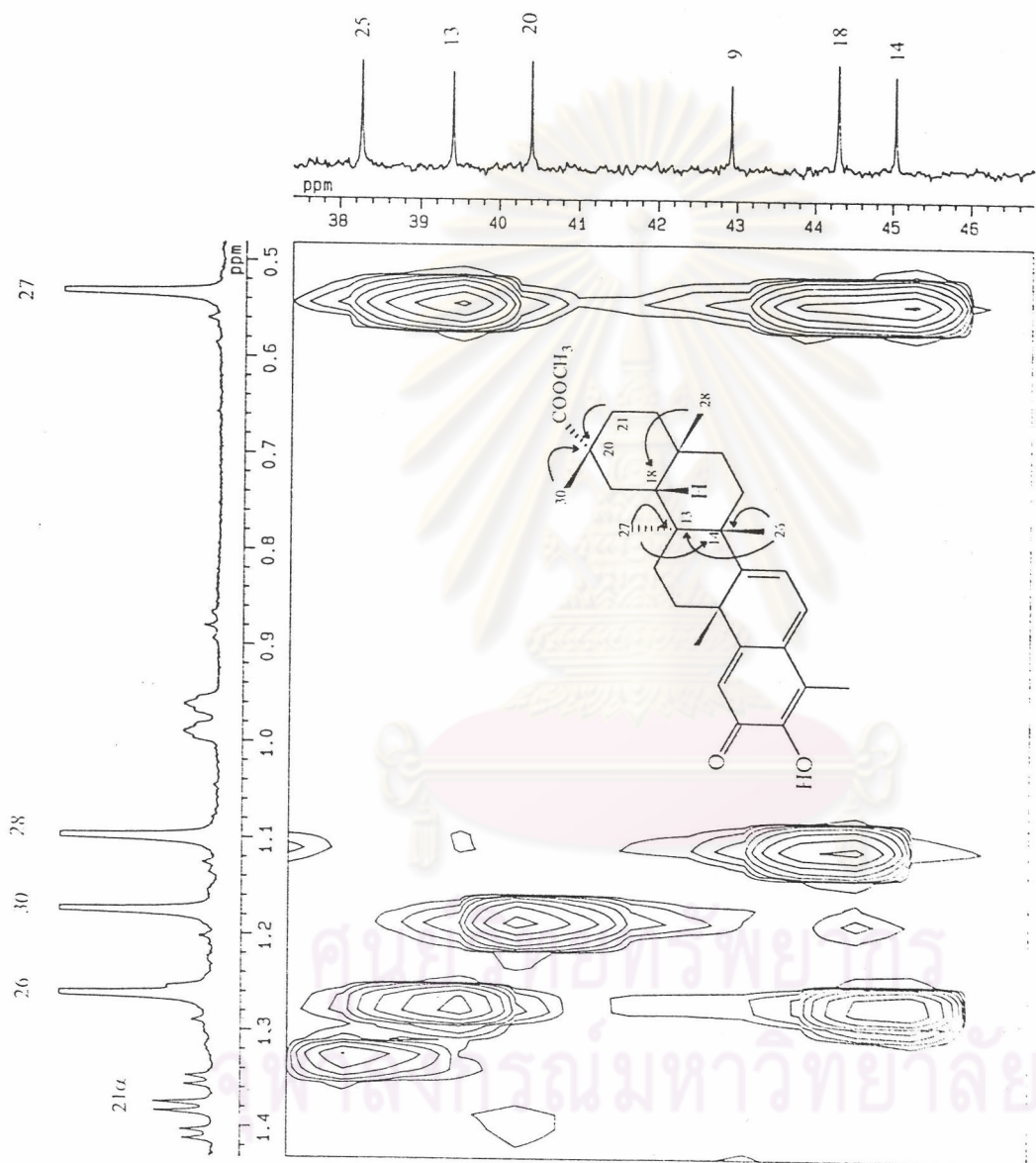


Figure 29. (b) Expanded H¹MBC spectrum of SC3 (**16**) (in CDCl₃) in the range of δ ¹H 1.4 - 0.5 ppm and δ ¹³C 46 - 38 ppm.

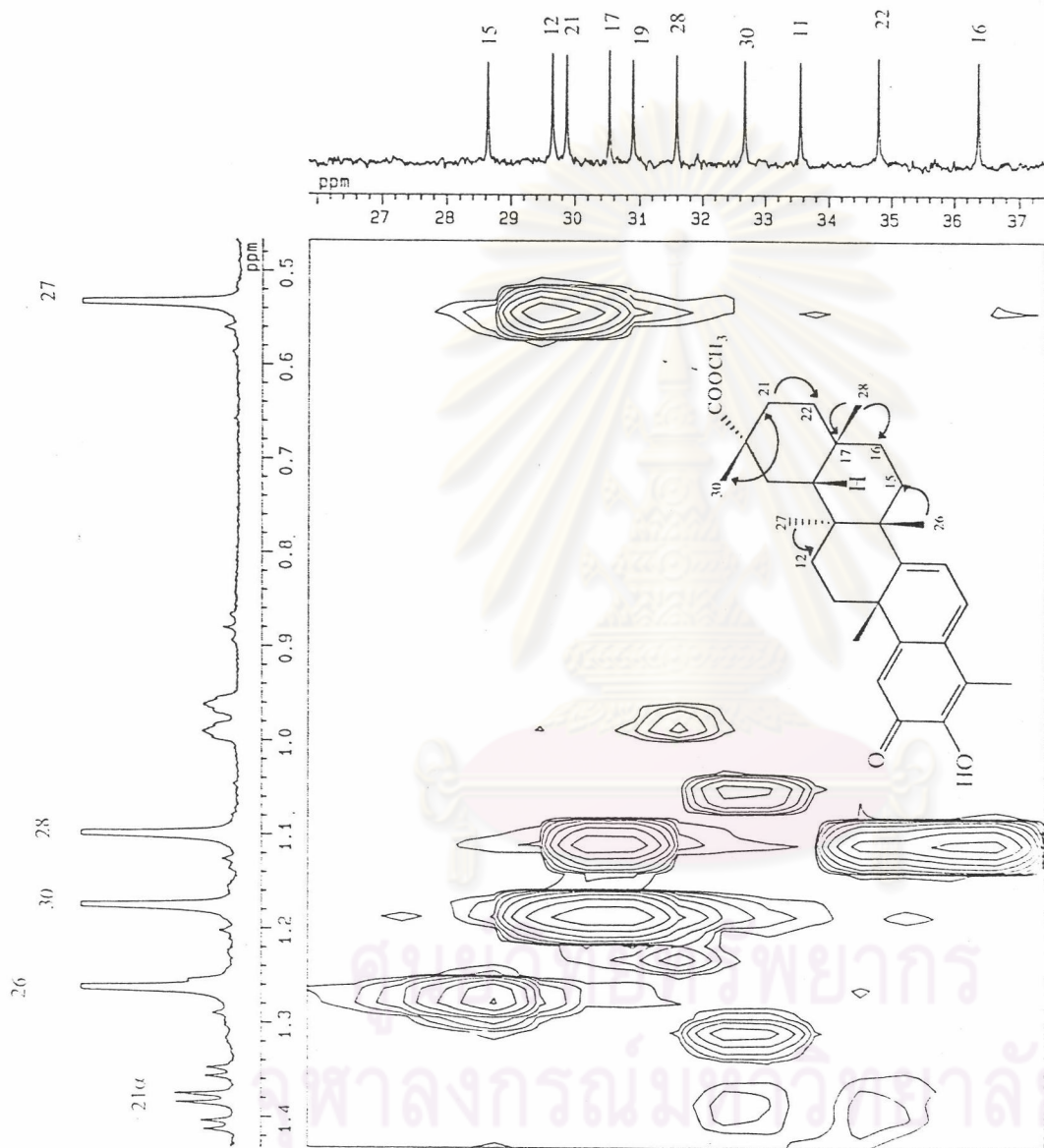
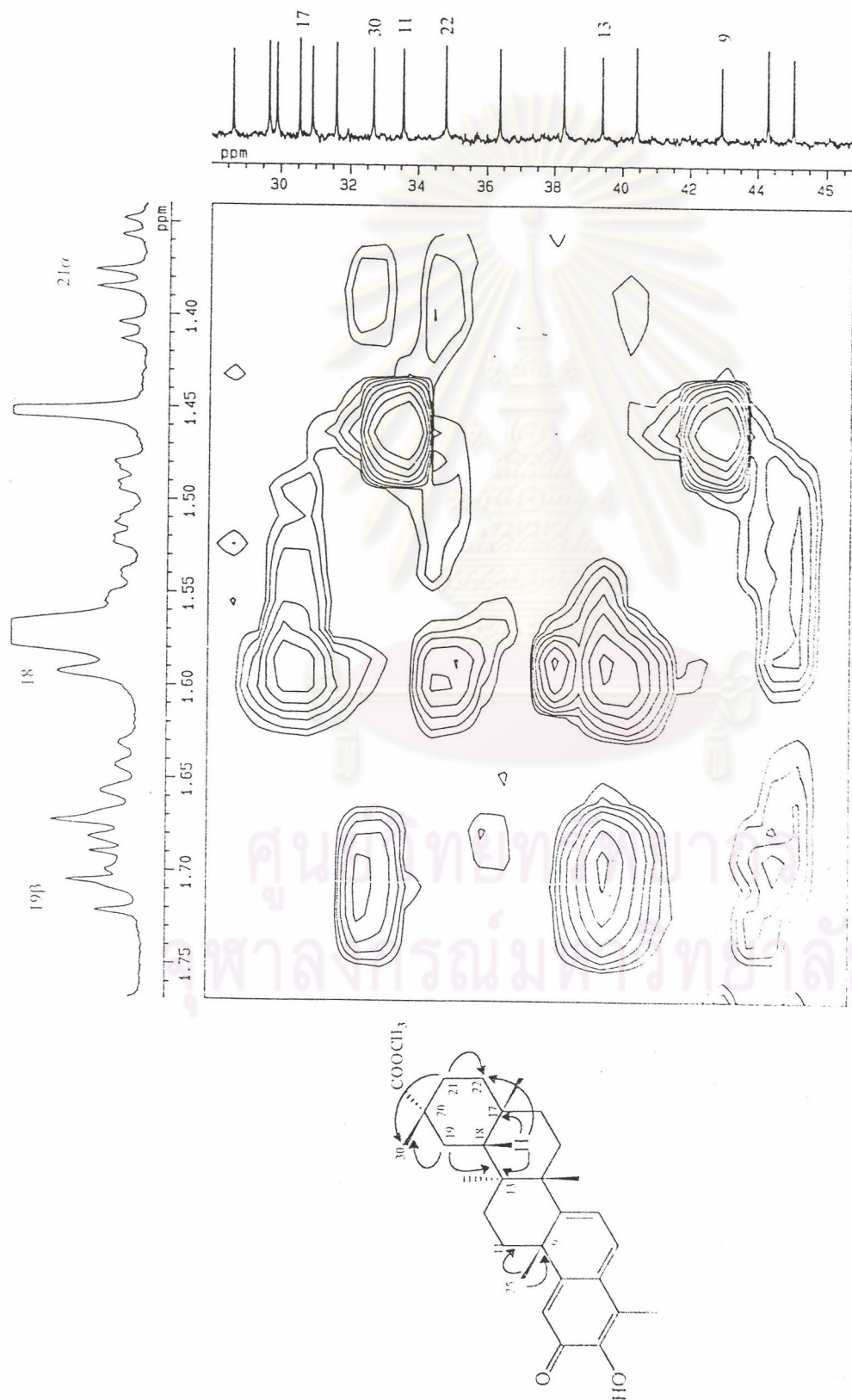


Figure 29. (c) Expanded HMBC spectrum of **SC3 (16)** (in CDCl_3) in the range of $\delta^1\text{H}$ 1.4 - 0.5 ppm and $\delta^{13}\text{C}$ 37 - 27 ppm.

25

Figure 29. (d) Expanded HMBC spectrum of SC3 (**16**) (in CDCl_3)

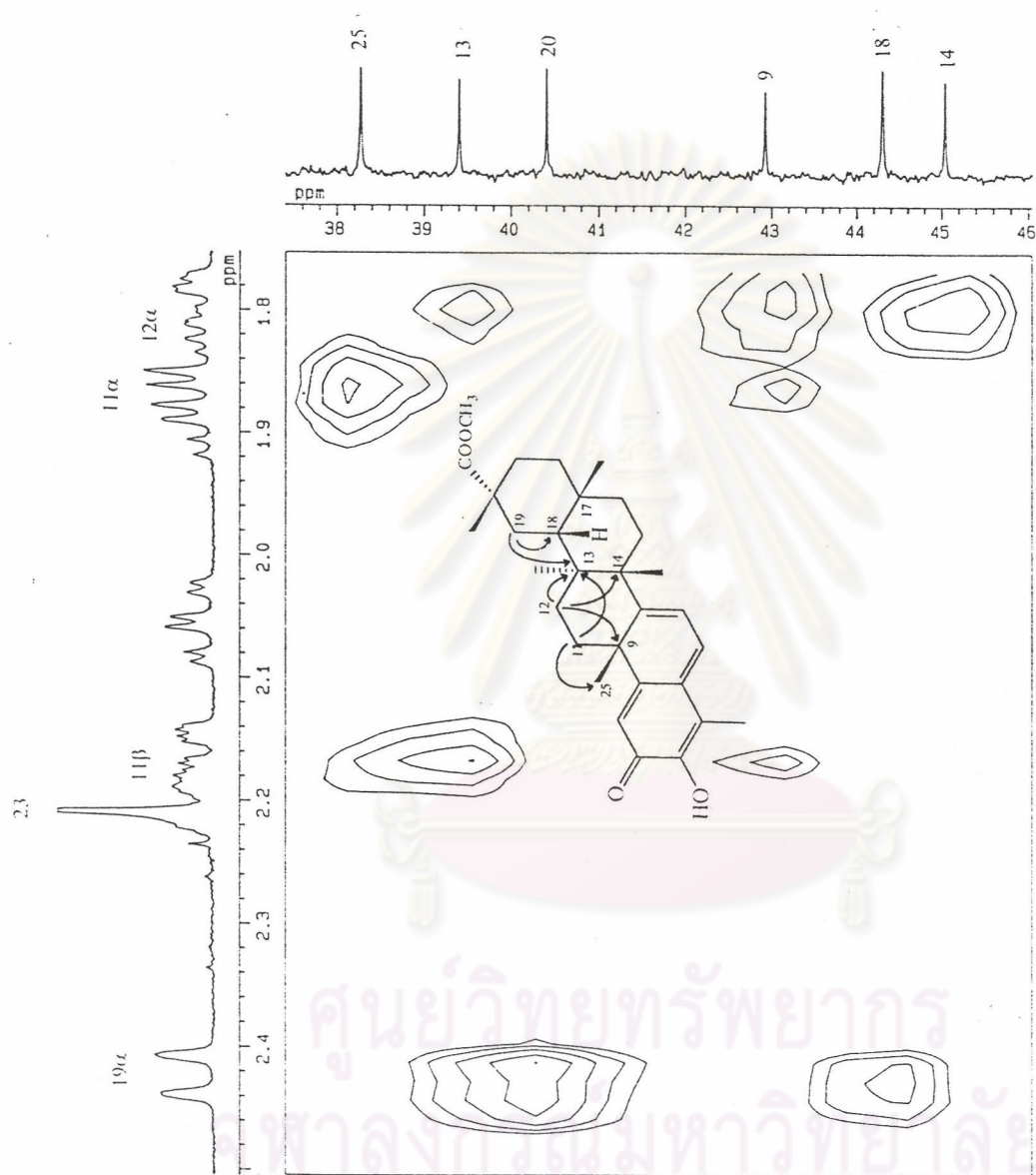


Figure 29. (c) Expanded HMBBC spectrum of SC3 (16) (in CDCl_3) in the range of δ ^1H 2.5 – 1.8 ppm and δ ^{13}C 46 – 38 ppm.

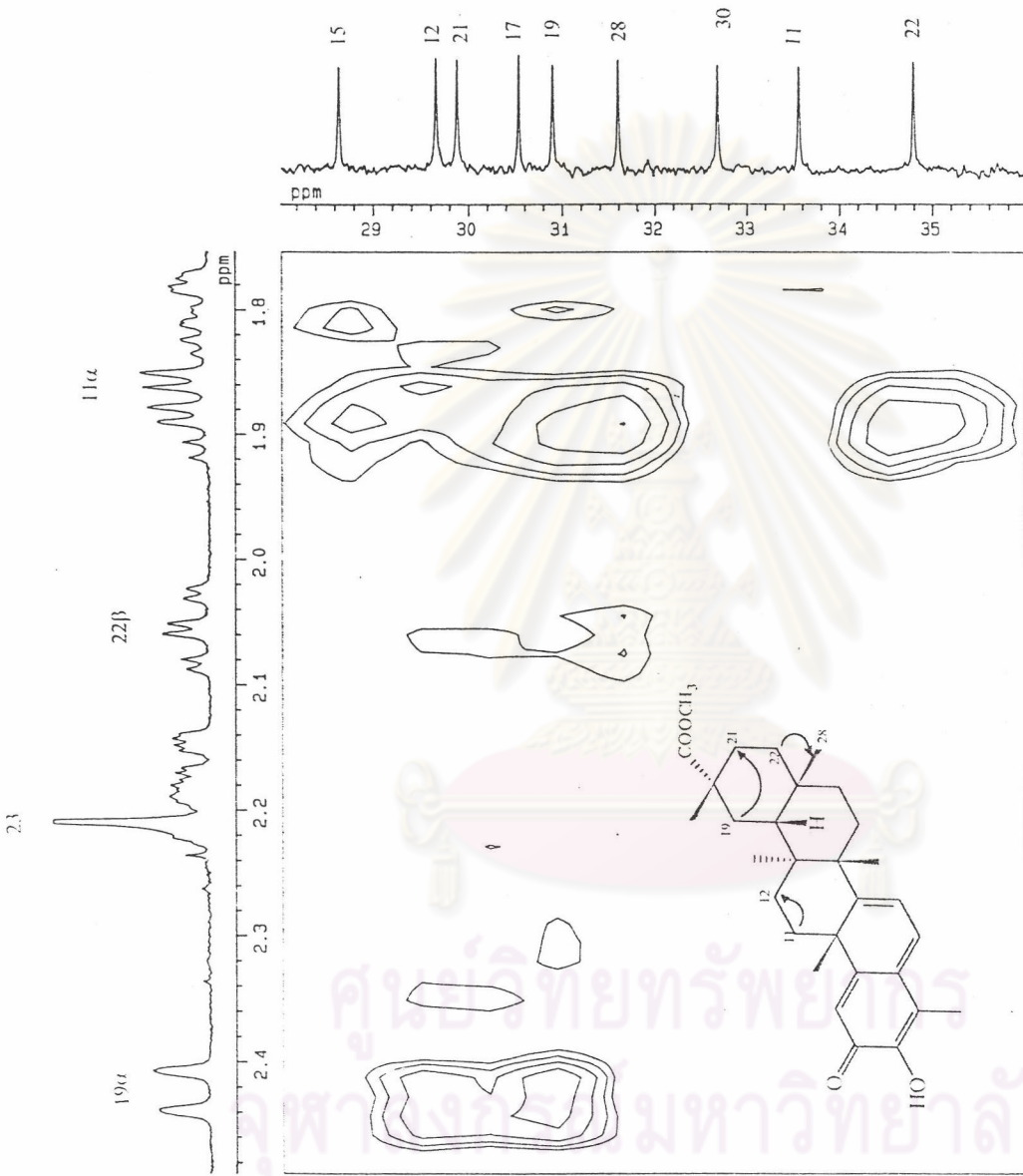


Figure 29. (f) Expanded HMBBC spectrum of SC3 (16) (in CDCl₃) in the range of δ ^1H 2.5 - 1.8 ppm and δ ^{13}C 35 - 28 ppm.

[Mass Spectrum]
Date : 12-Jul-95 10:51
Data : NBR-950712-001
Sample: NBR
Note : Operator R.HARR
Inlet : Direct
Ion Mode : FAB+
Spectrum Type : Normal Ion [MF-Linear]
RT : 0.09 min Scan# : (1,4)
BP : m/z 154.0000 Int. : 159.71
Output m/z range : 19.9208 to 477.4749
Cut Level : 0.00 %
Temp : 53.6 deg.C

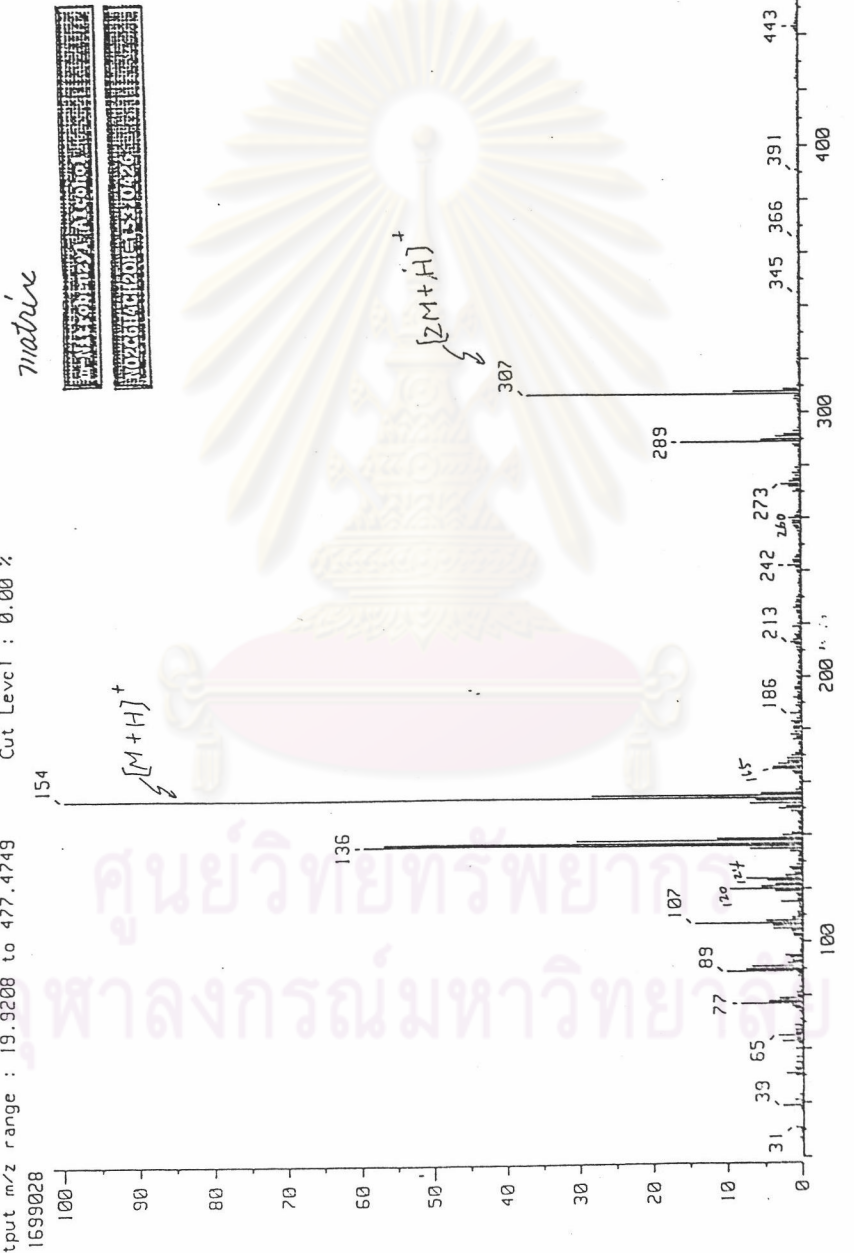


Figure 30. FAB - MS of NBA.

VITA

Mr. Chokchai Niampoka was born on May 1st, 1974 in Bangkok , Thailand. He obtained a B.Sc. in Pharmacy in 1998 , from the Faculty of Pharmacy , Silpakorn University. During his master degree study , he received the Chiba - Chulalongkorn University Pharmaceutical Exchange Student Scholarship for a one - month study (October , 2001) at Chiba University , Japan . He is now working as a hospital pharmacist at Chachoengsao hospital , Chachoengsao, Thailand.



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