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ศูนย์วิจัยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

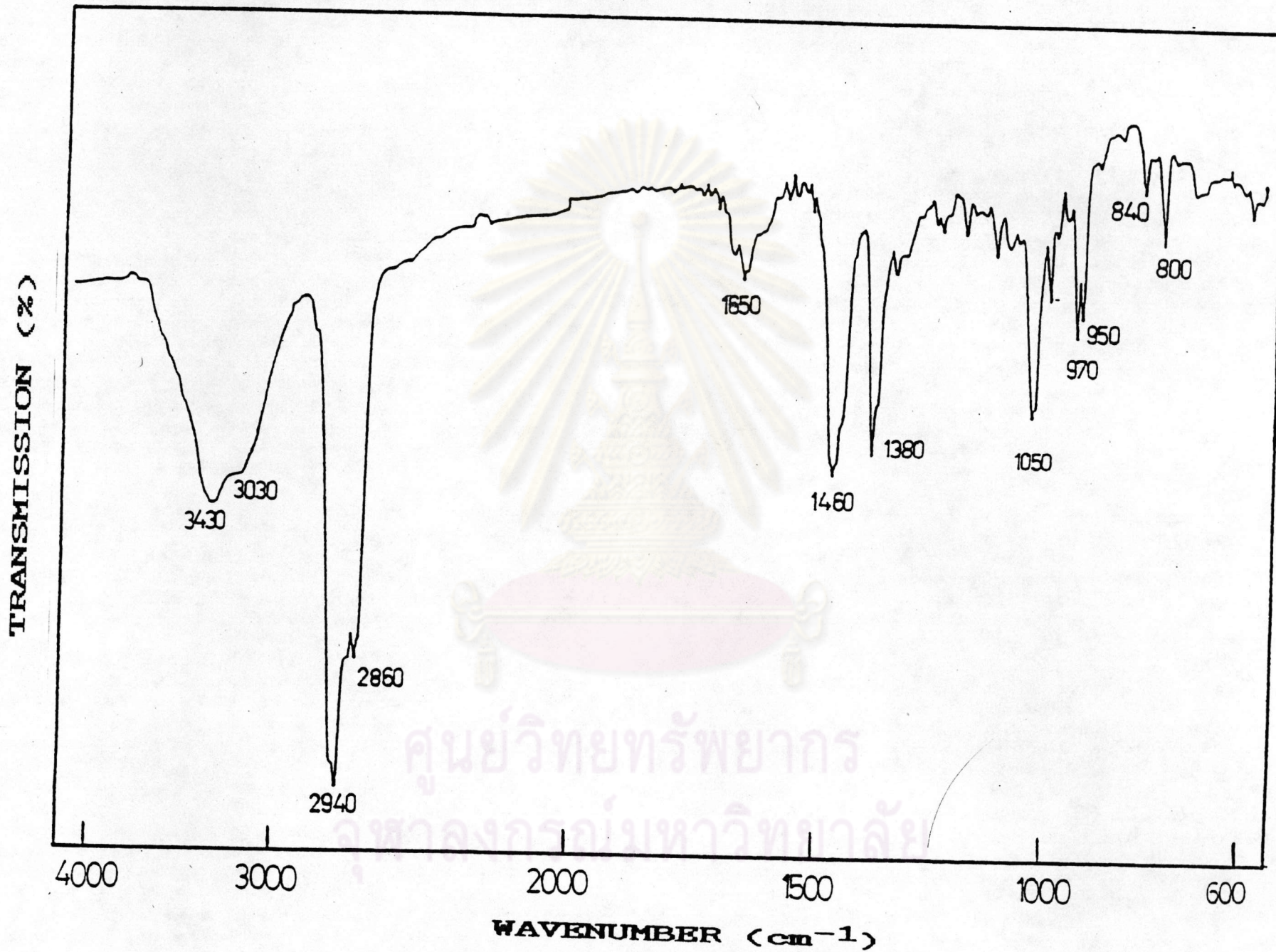


Figure 1 The IR spectrum of Compound(1)

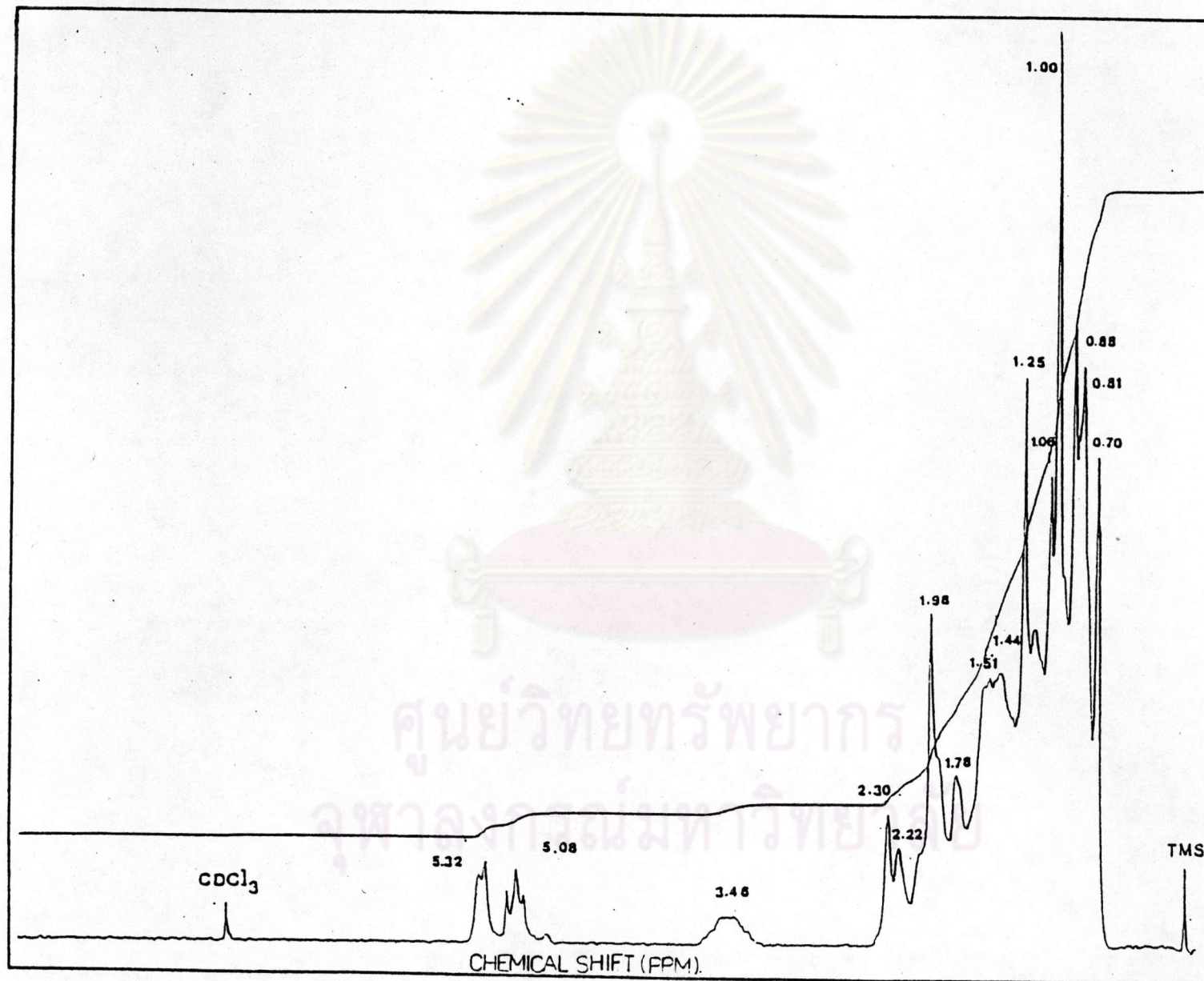


Figure 2 The ^1H NMR spectrum of Compound (1) (CDCl_3)

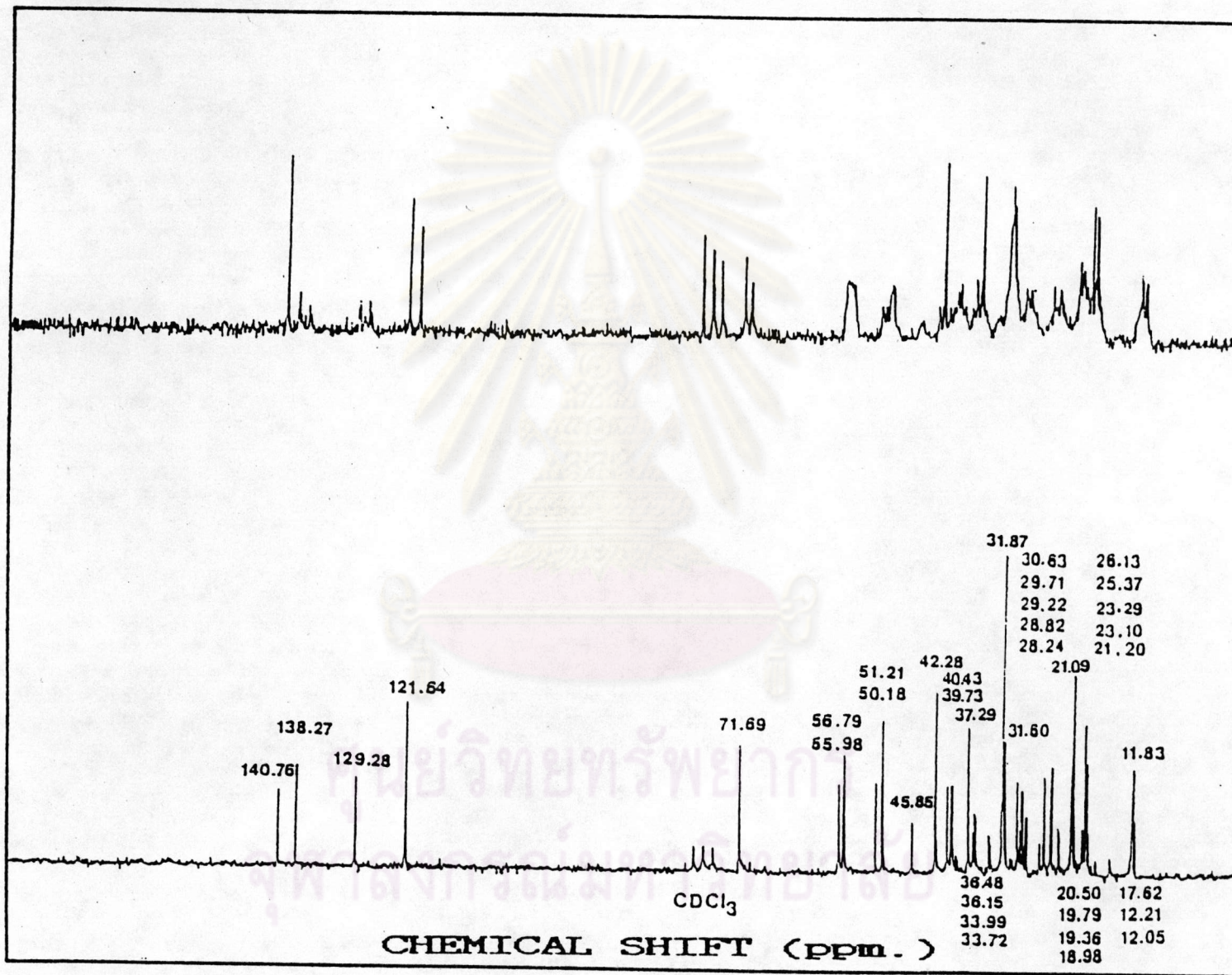


Figure 3 The ¹³C NMR spectrum of Compound (1) (CDCl₃)



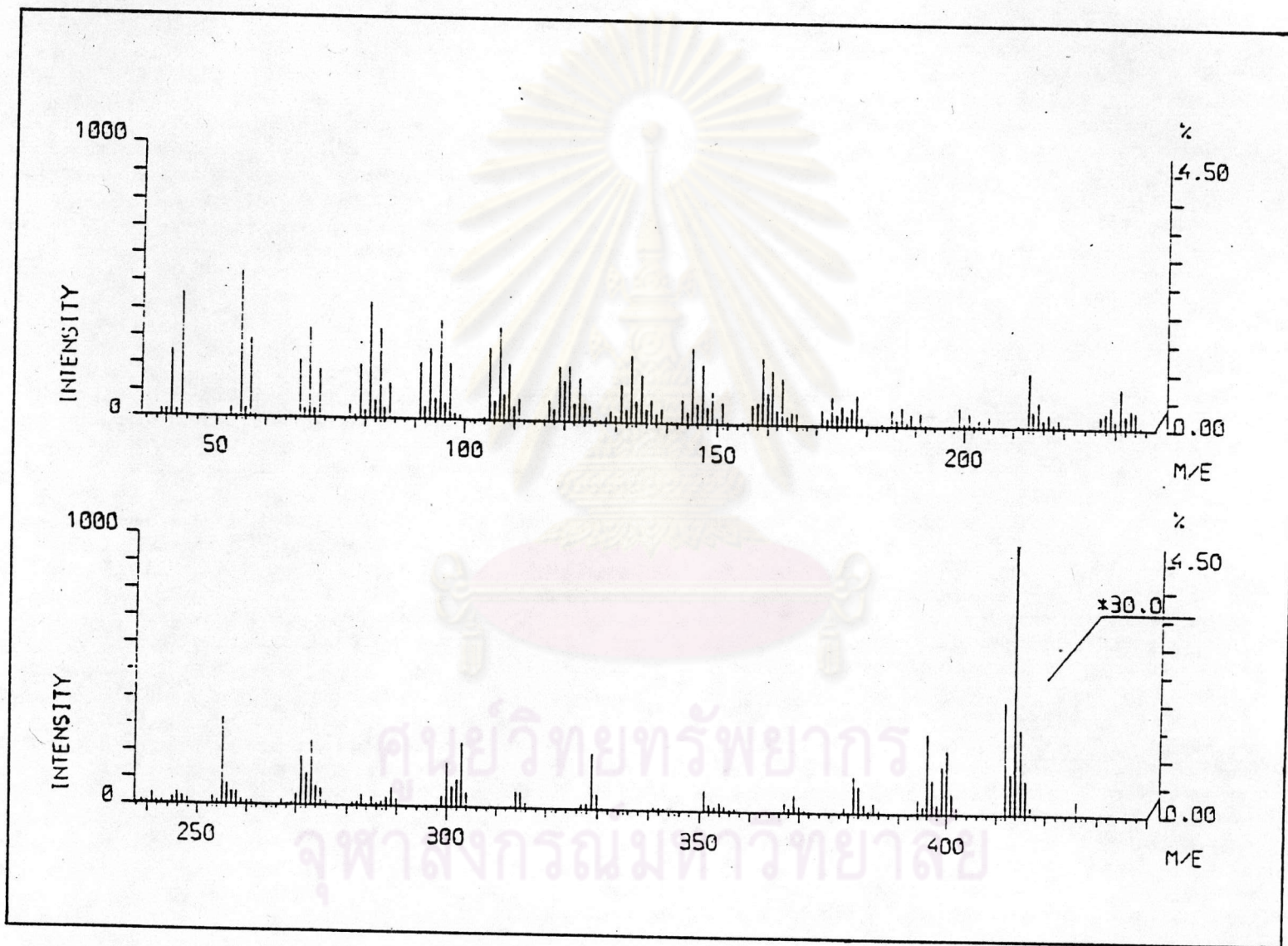


Figure 4 The mass spectrum of Compound (1)

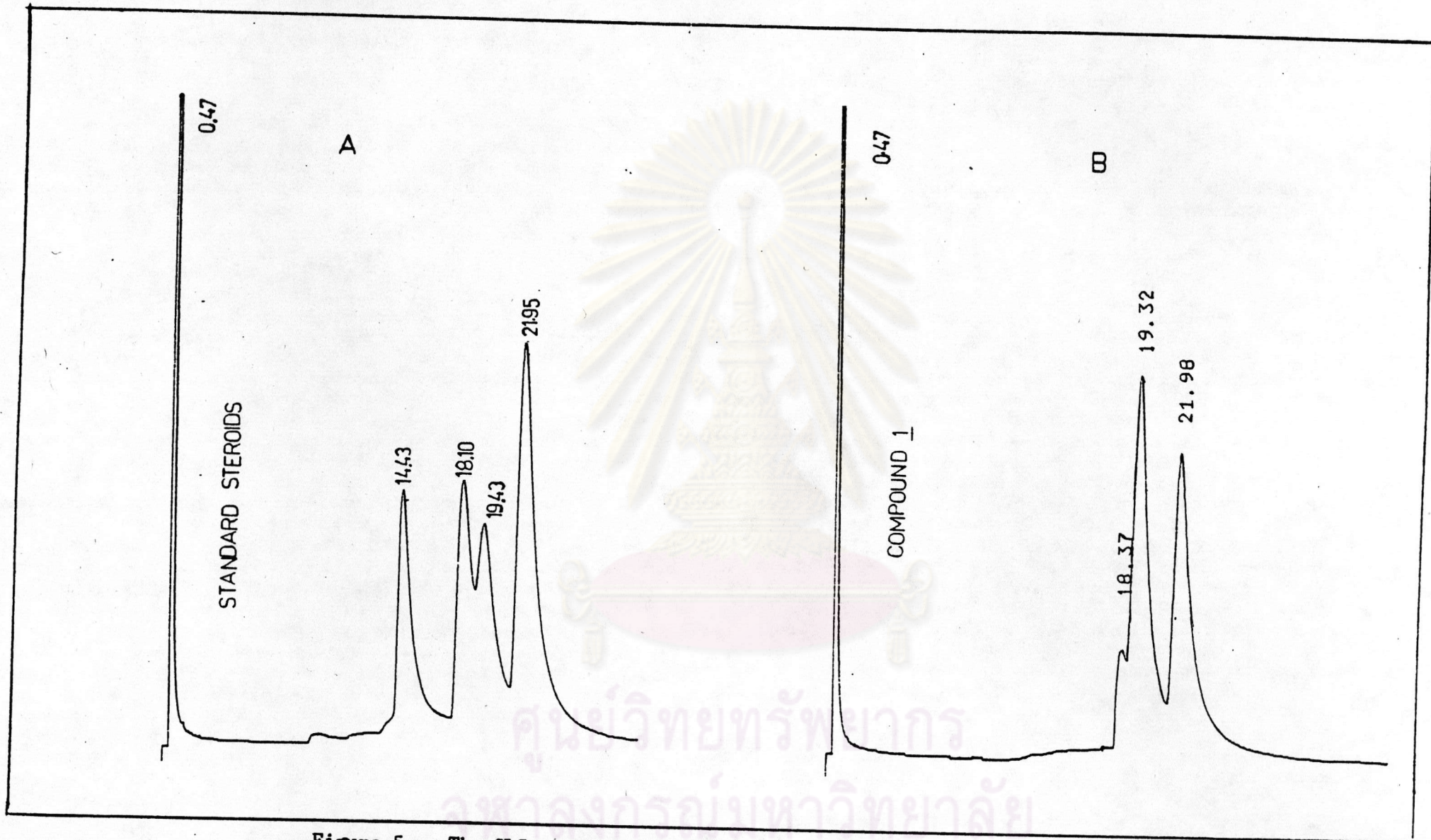


Figure 5 The GLC analysis results of
 A) standard cholesterol, campesterol, stigmasterol and β -sitosterol
 B) Compound (1)

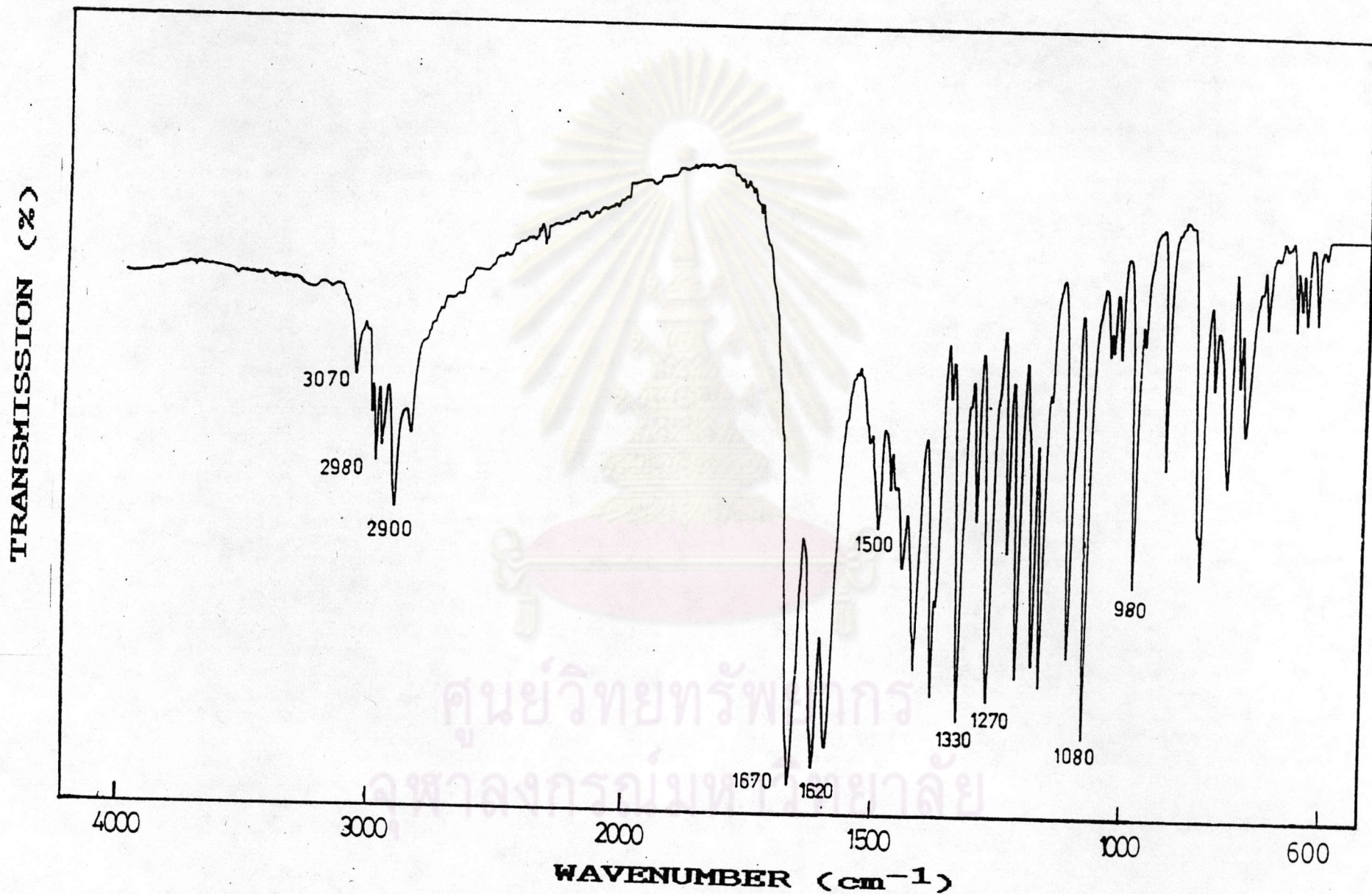


Figure 6 The IR spectrum of Compound (2)

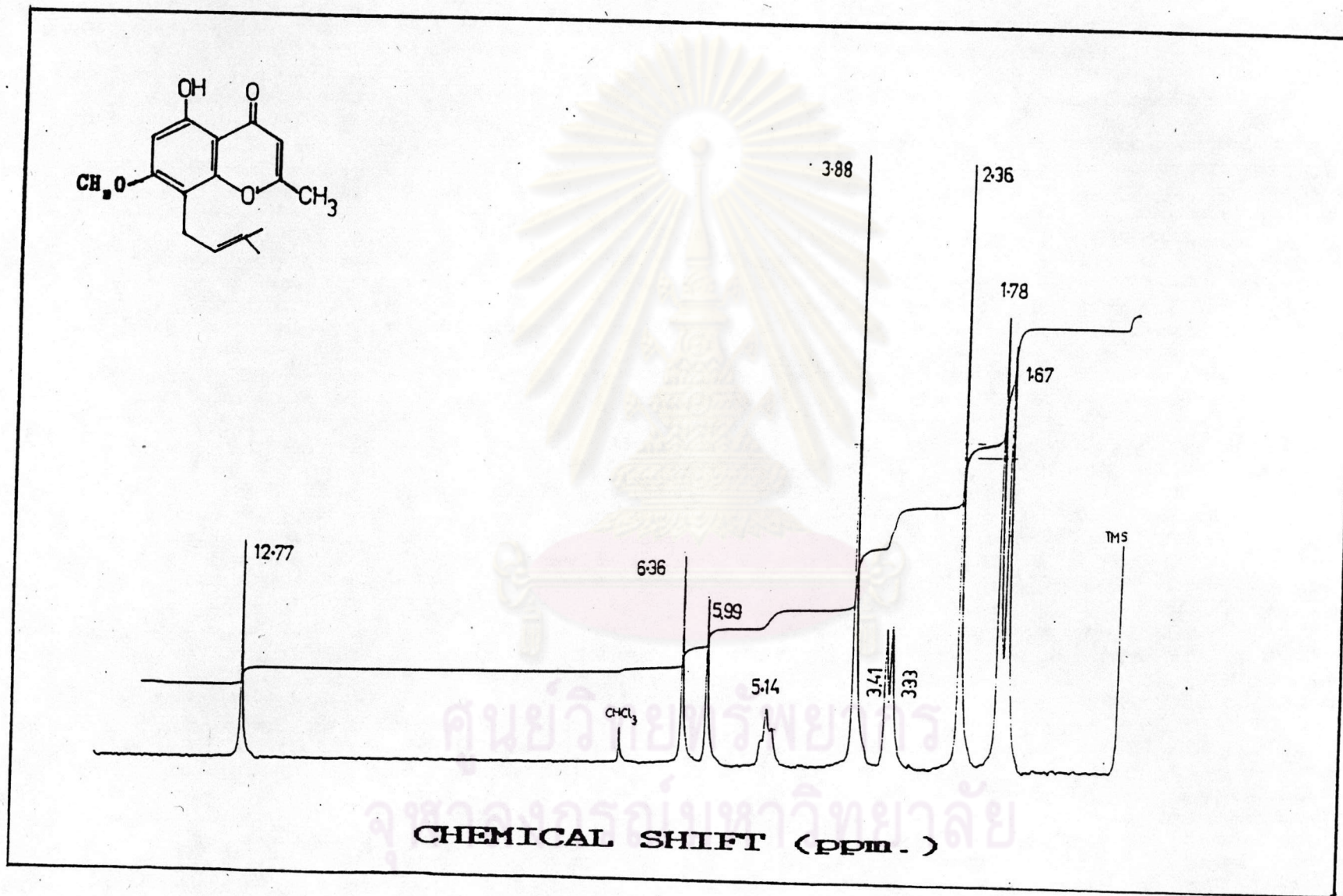


Figure 7 The ¹H NMR spectrum of Compound (2) (CDCl₃)

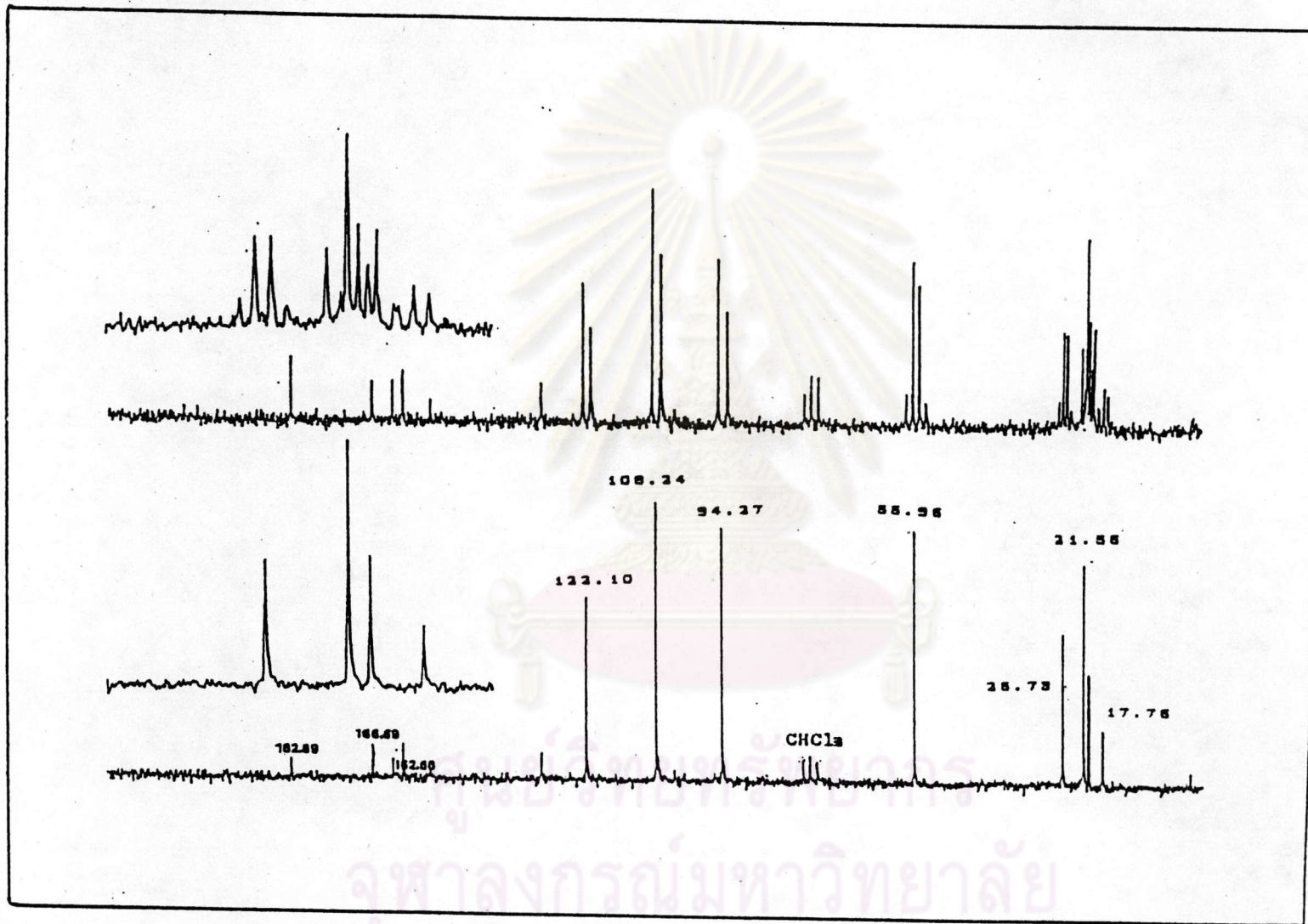


Figure 8 The ^{13}C NMR spectrum of Compound (2) (CDCl_3)

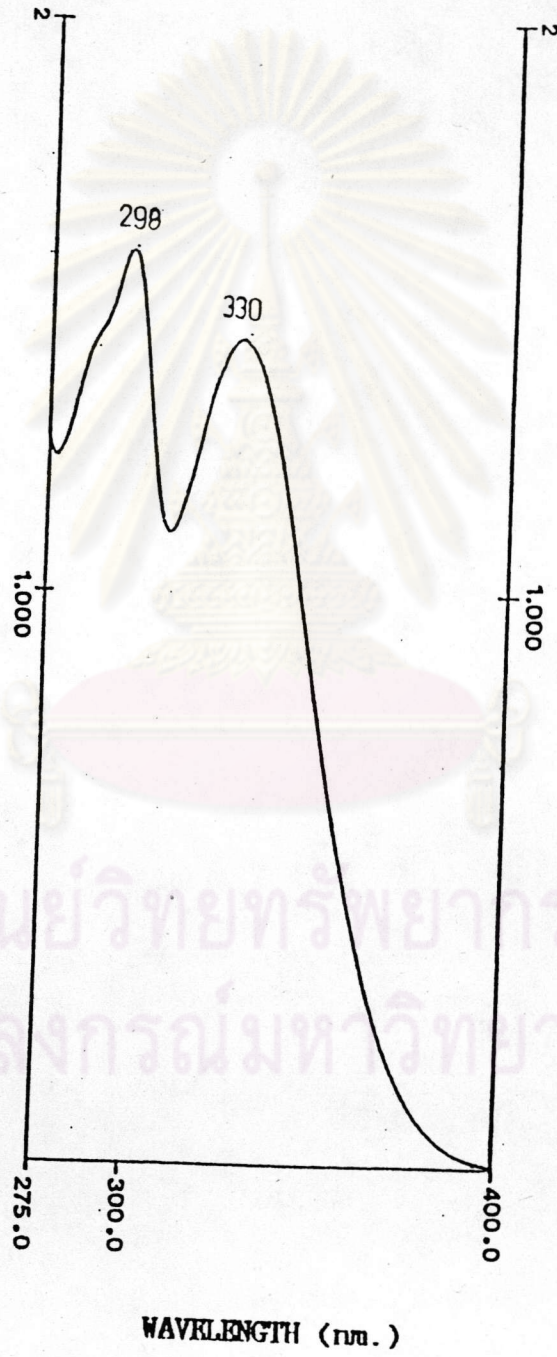


Figure 9 The UV spectrum of Compound (2)

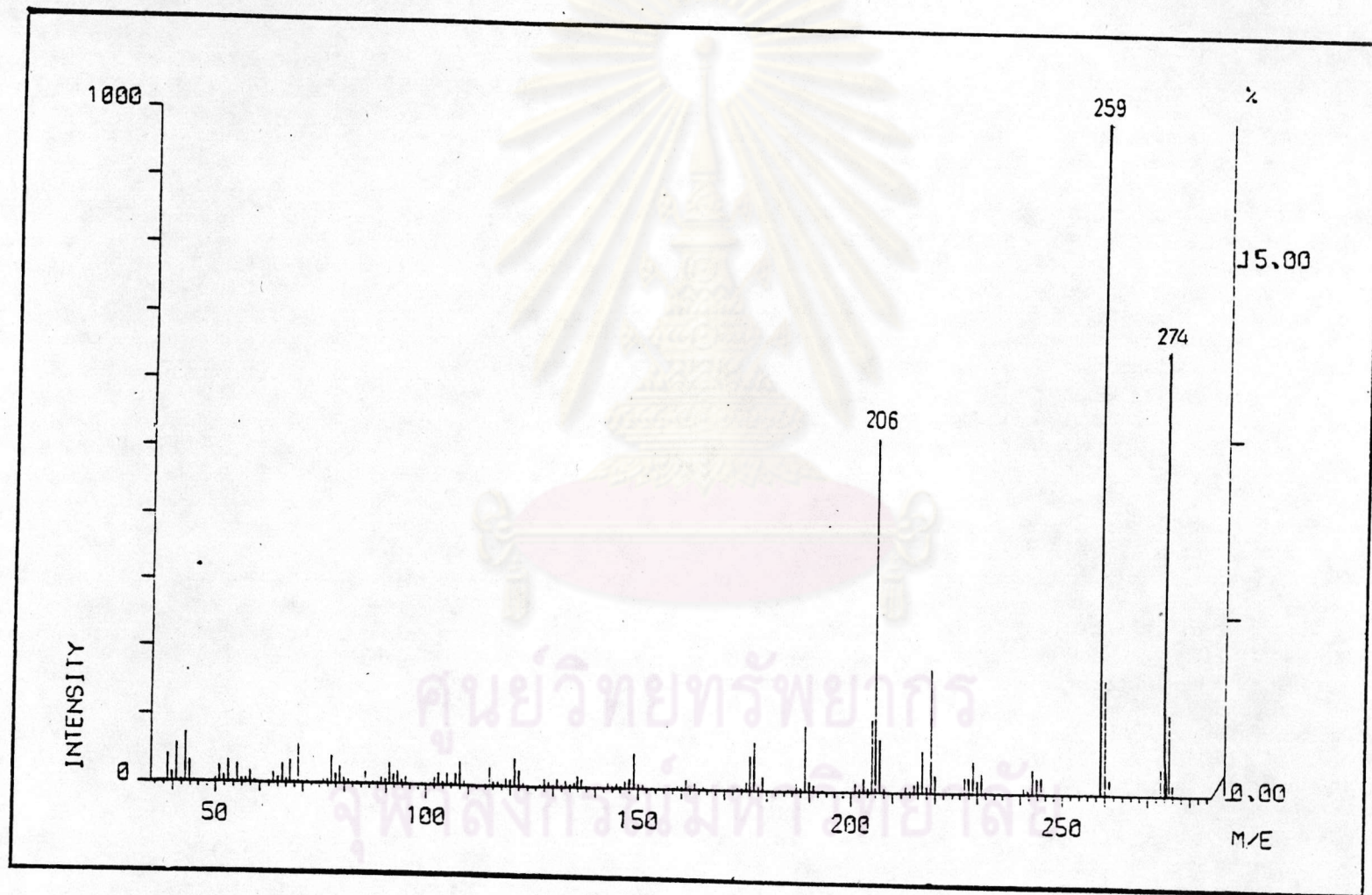


Figure 10 The mass spectrum of Compound (2)

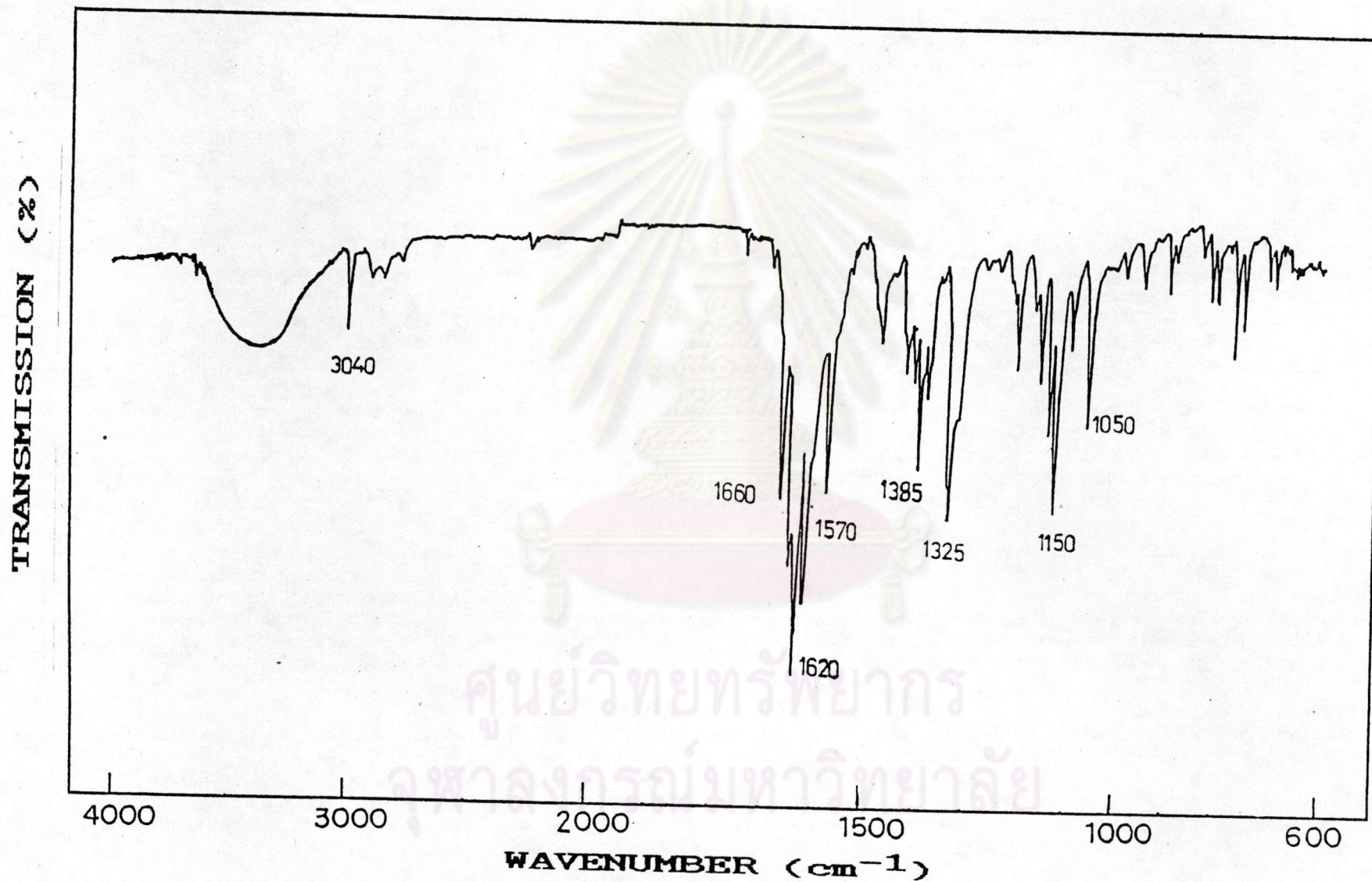


Figure 11 The IR spectrum of Compound(3)

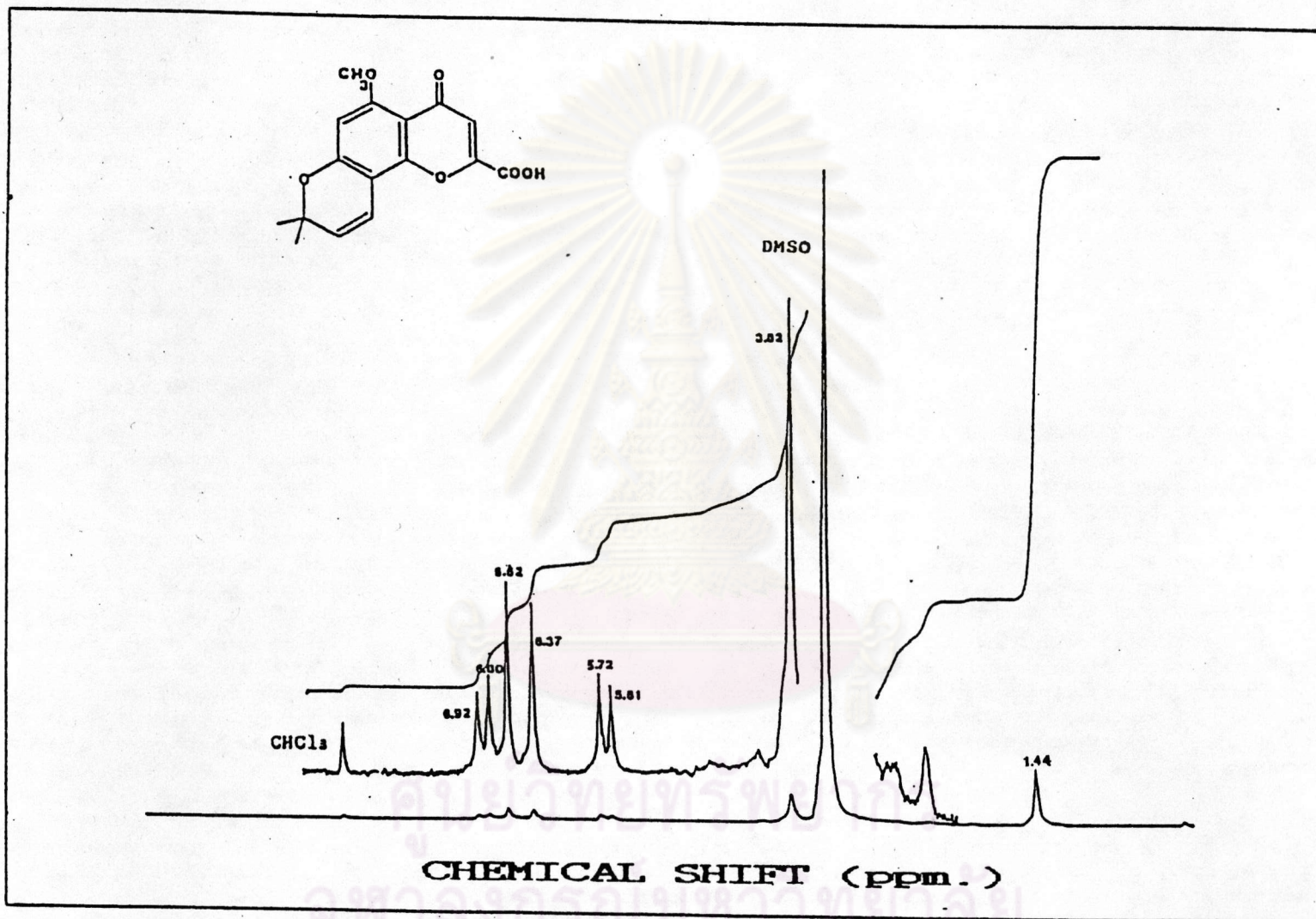


Figure 12 The ¹H NMR spectrum of Compound (3) (CDCl₃ + DMSO)

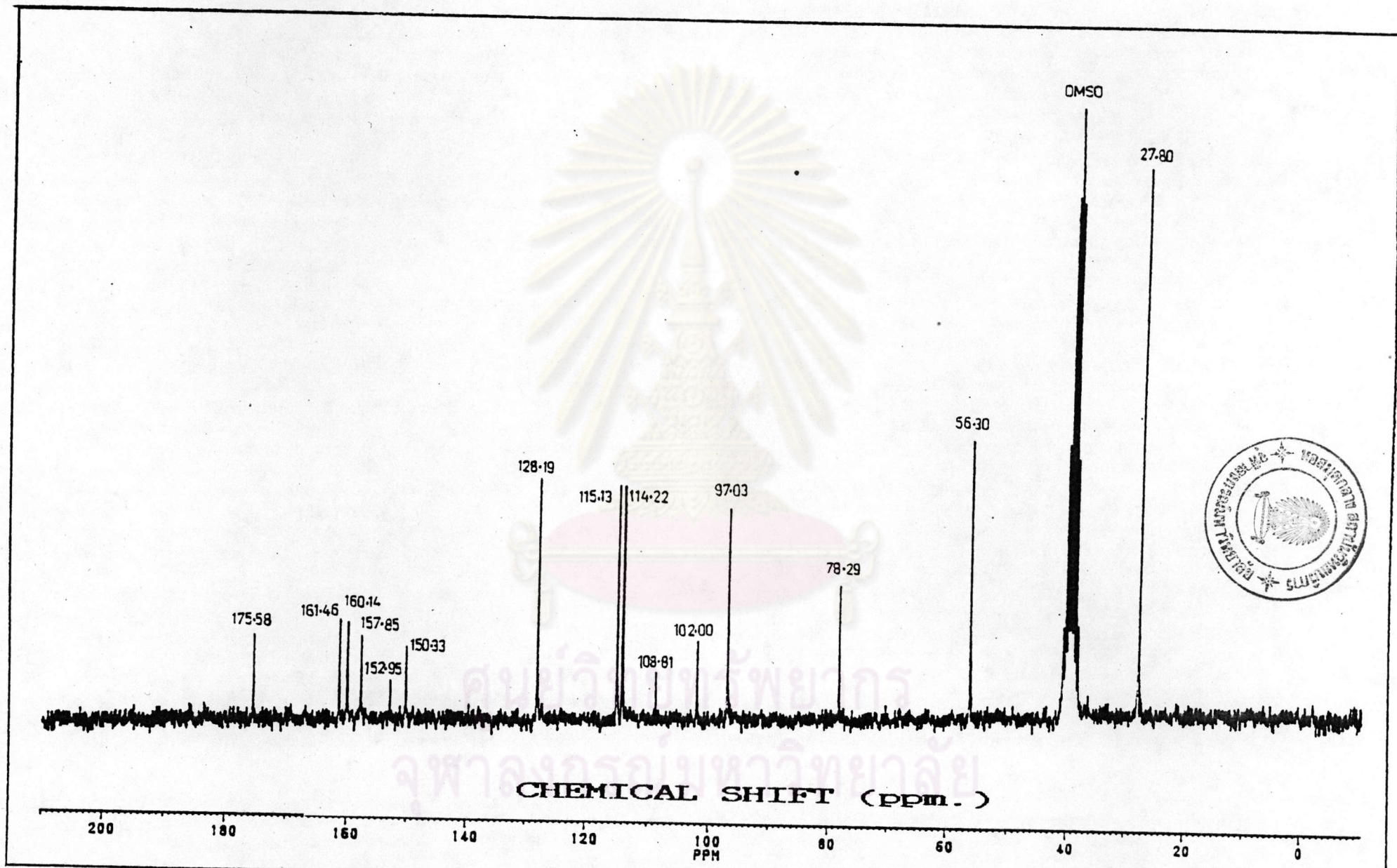


Figure 13 The ^{13}C NMR spectrum of Compound (3) (DMSO)

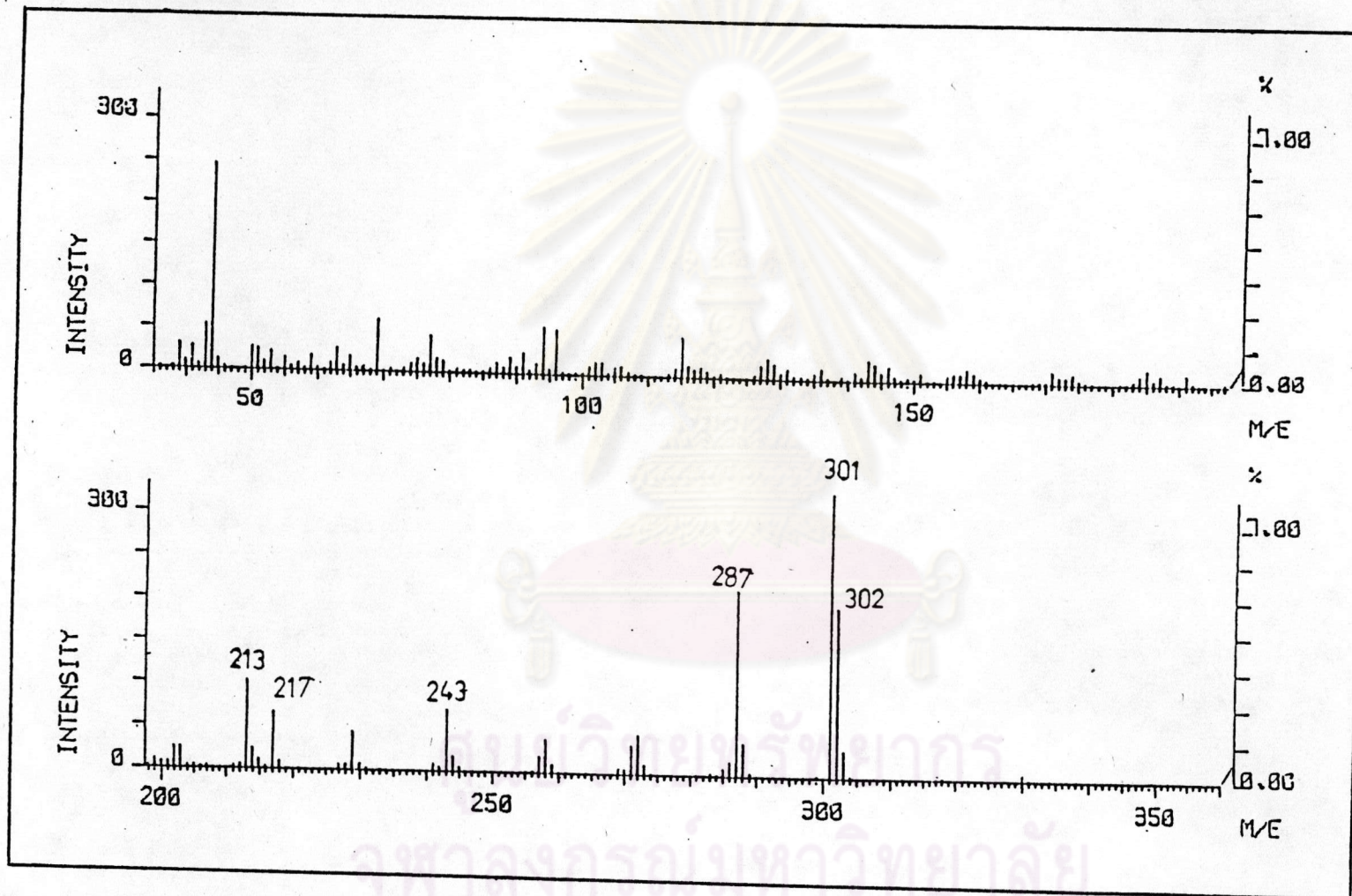


Figure 14 The mass spectrum of Compound (3)

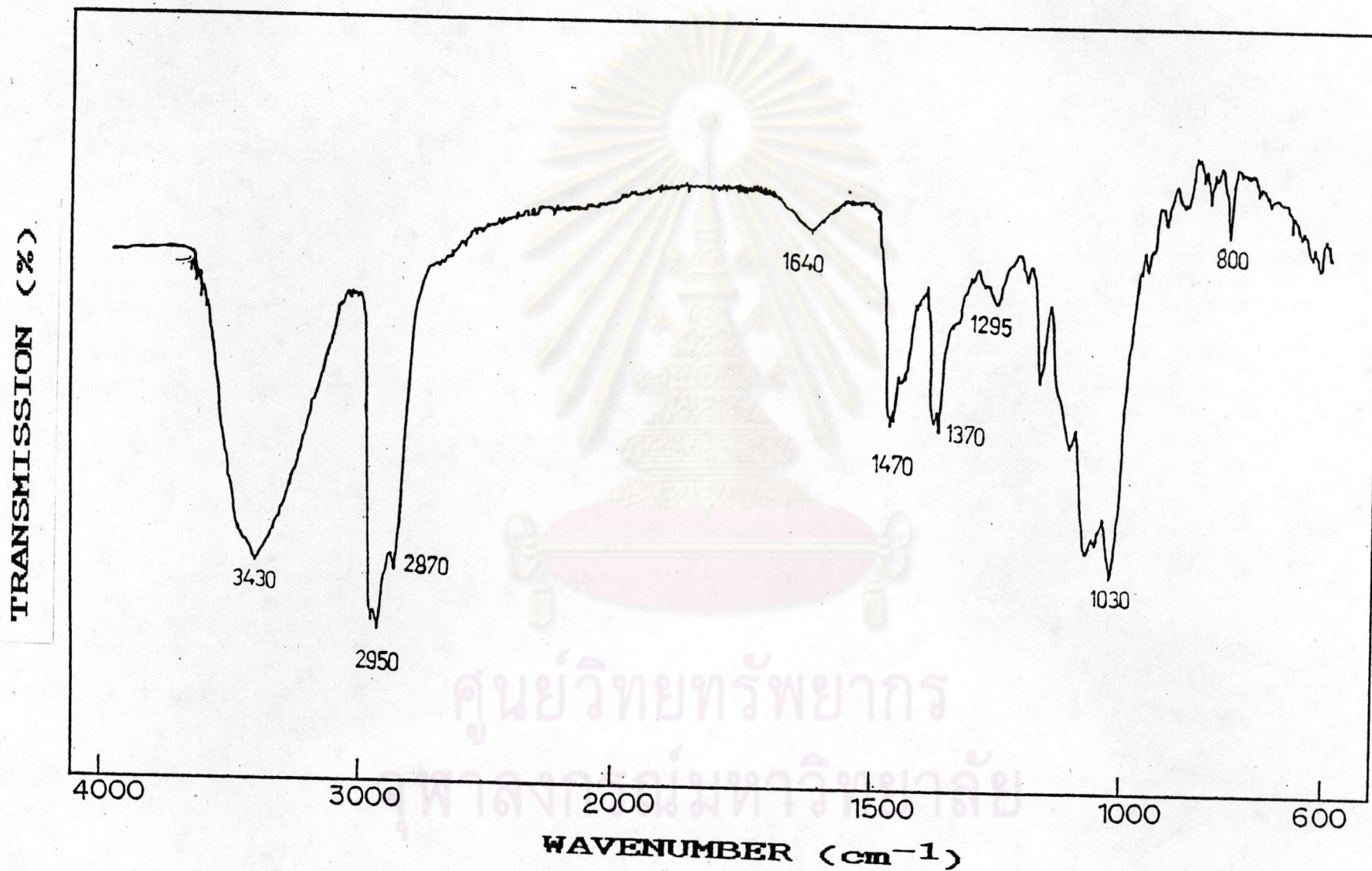


Figure 15 The IR spectrum of Compound(4)

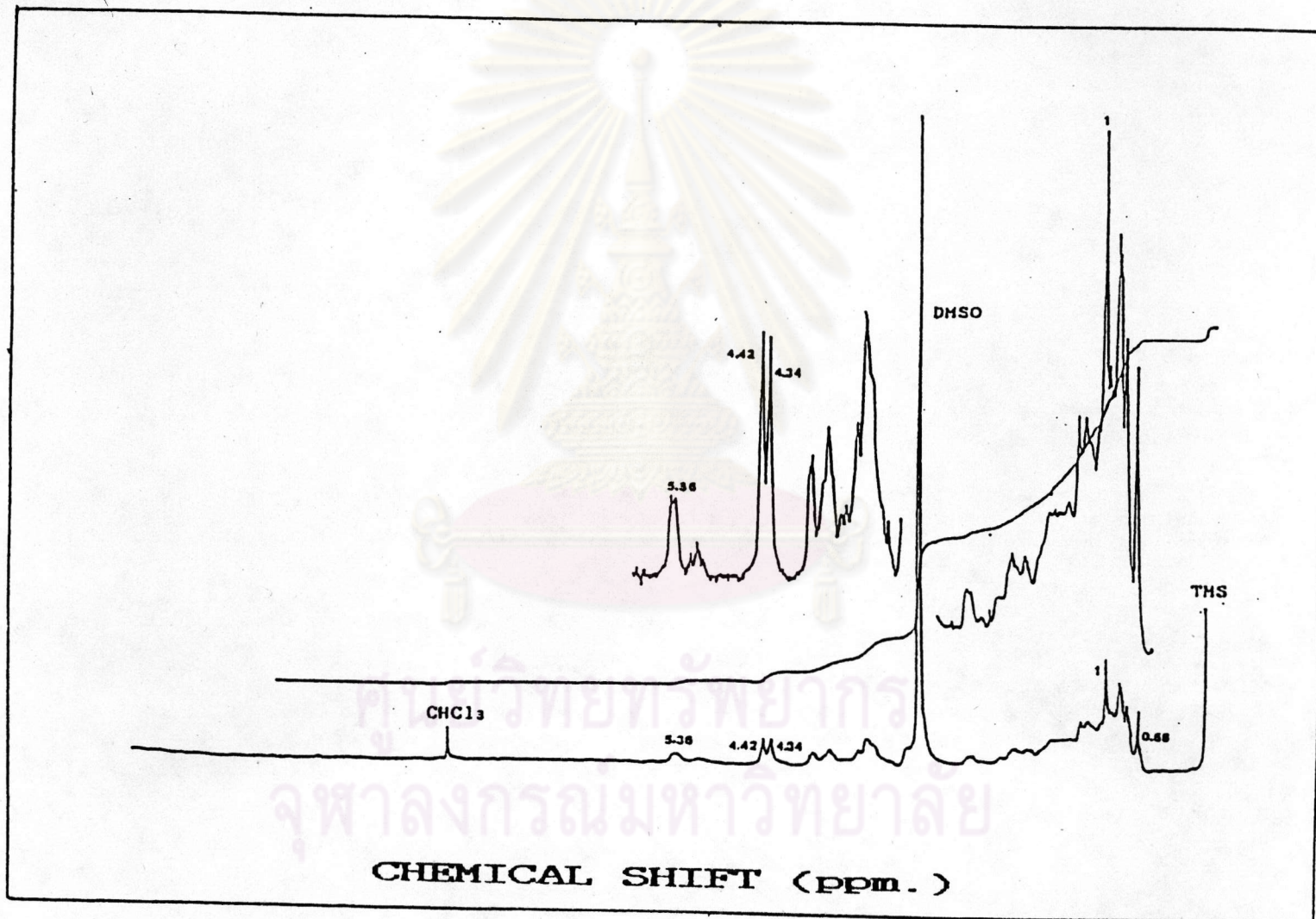


Figure 16 The ^1H NMR spectrum of Compound (4) ($\text{CDCl}_3 + \text{DMSO}$)

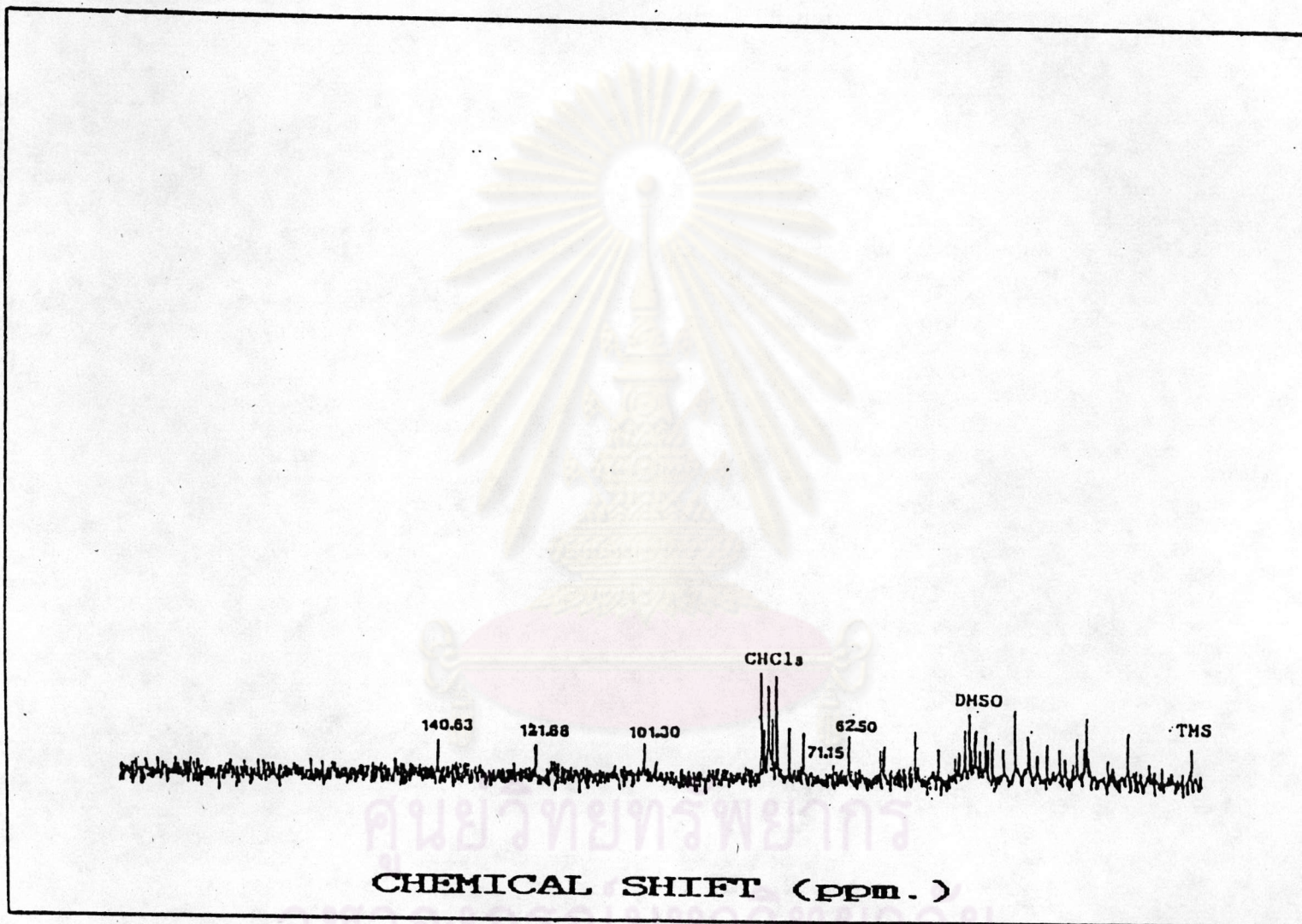


Figure 17 The ^{13}C NMR spectrum of Compound (4) ($\text{CDCl}_3 + \text{DMSO}$)

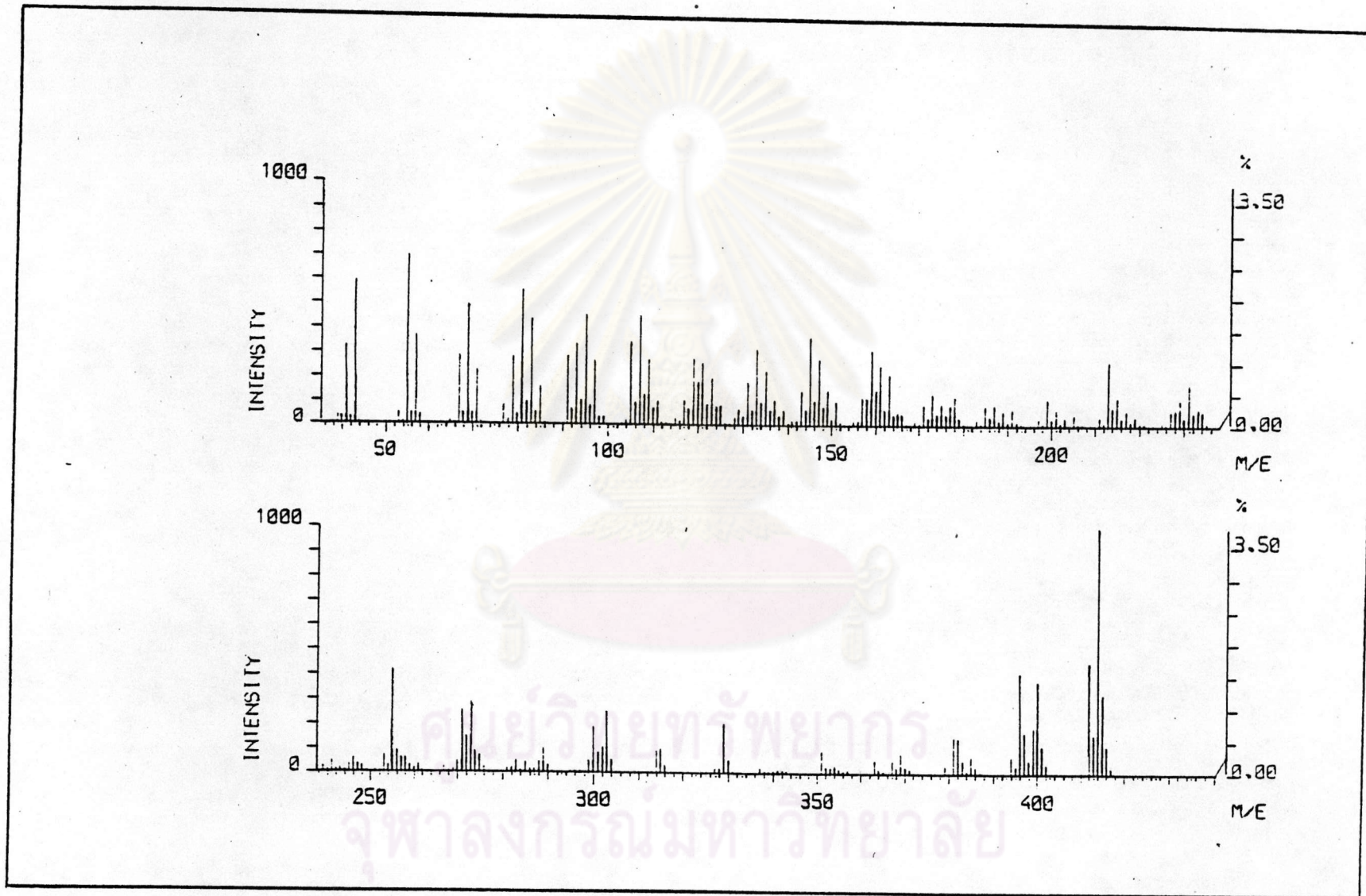


Figure 18 The mass spectrum of Compound (4)

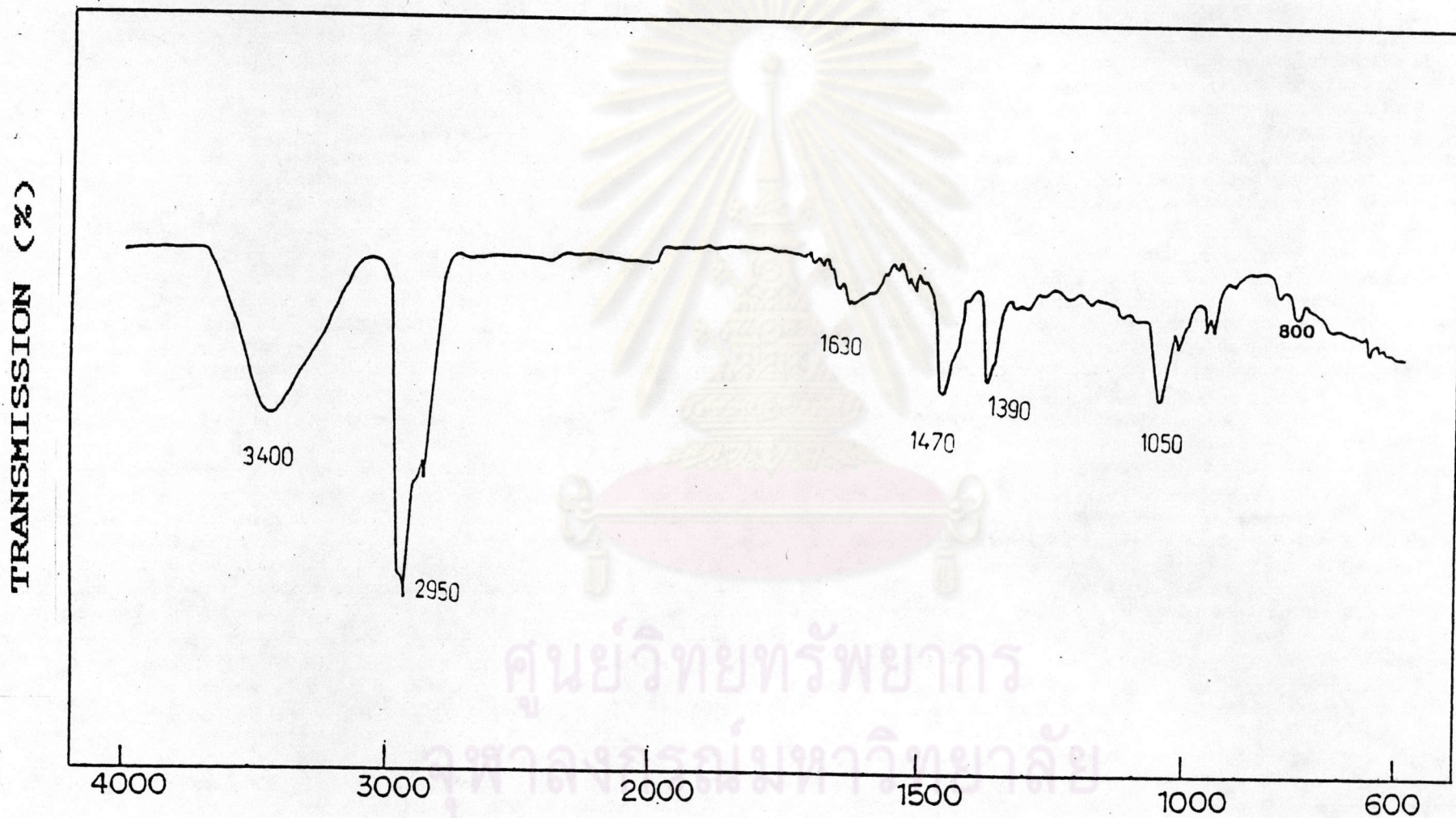


Figure 19 The IR spectrum of Compound (4a)

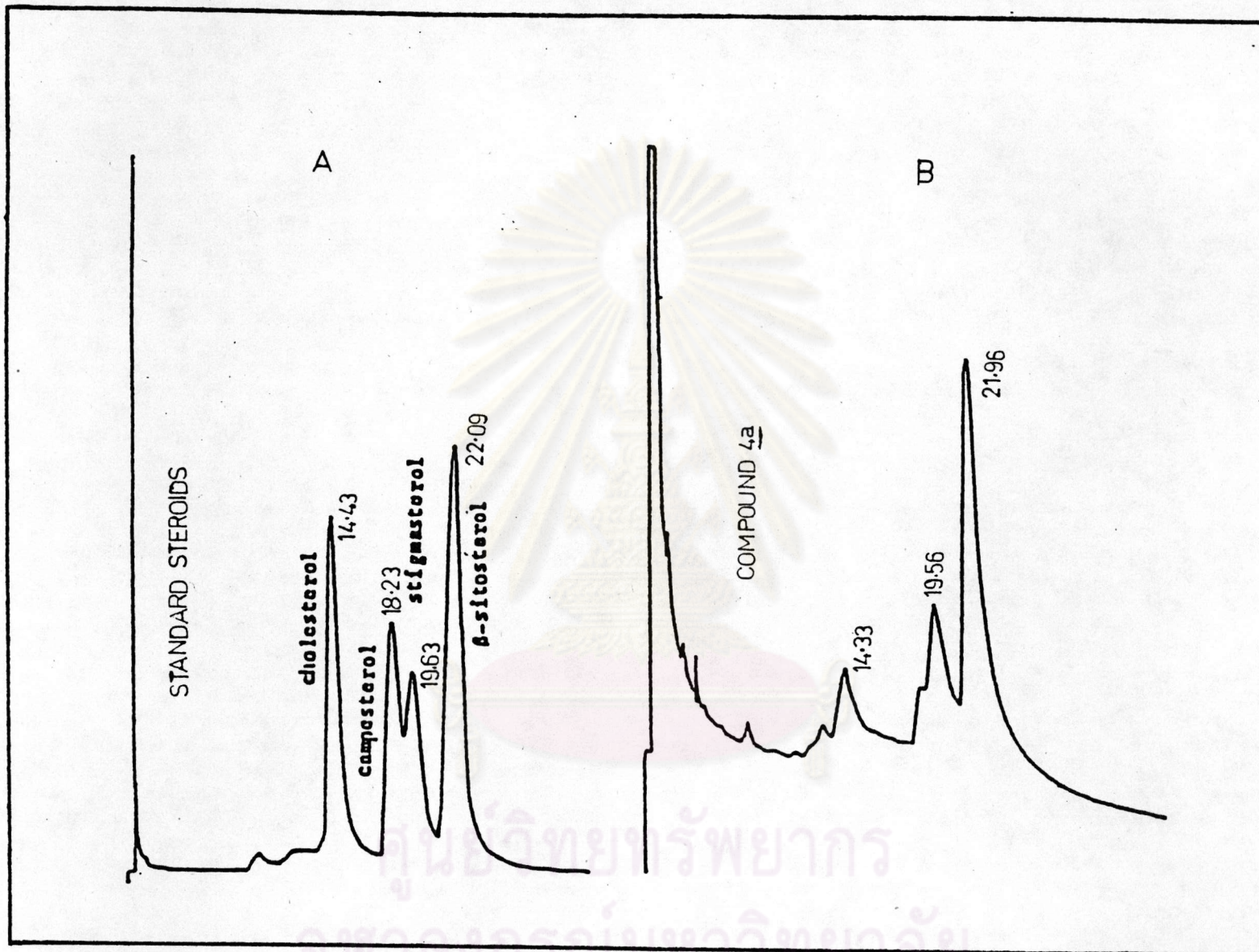


Figure 20 The GLC analysis results of

A) standard cholesterol, campesterol, stigmasterol and

β -sitosterol

B) Compound (4B)

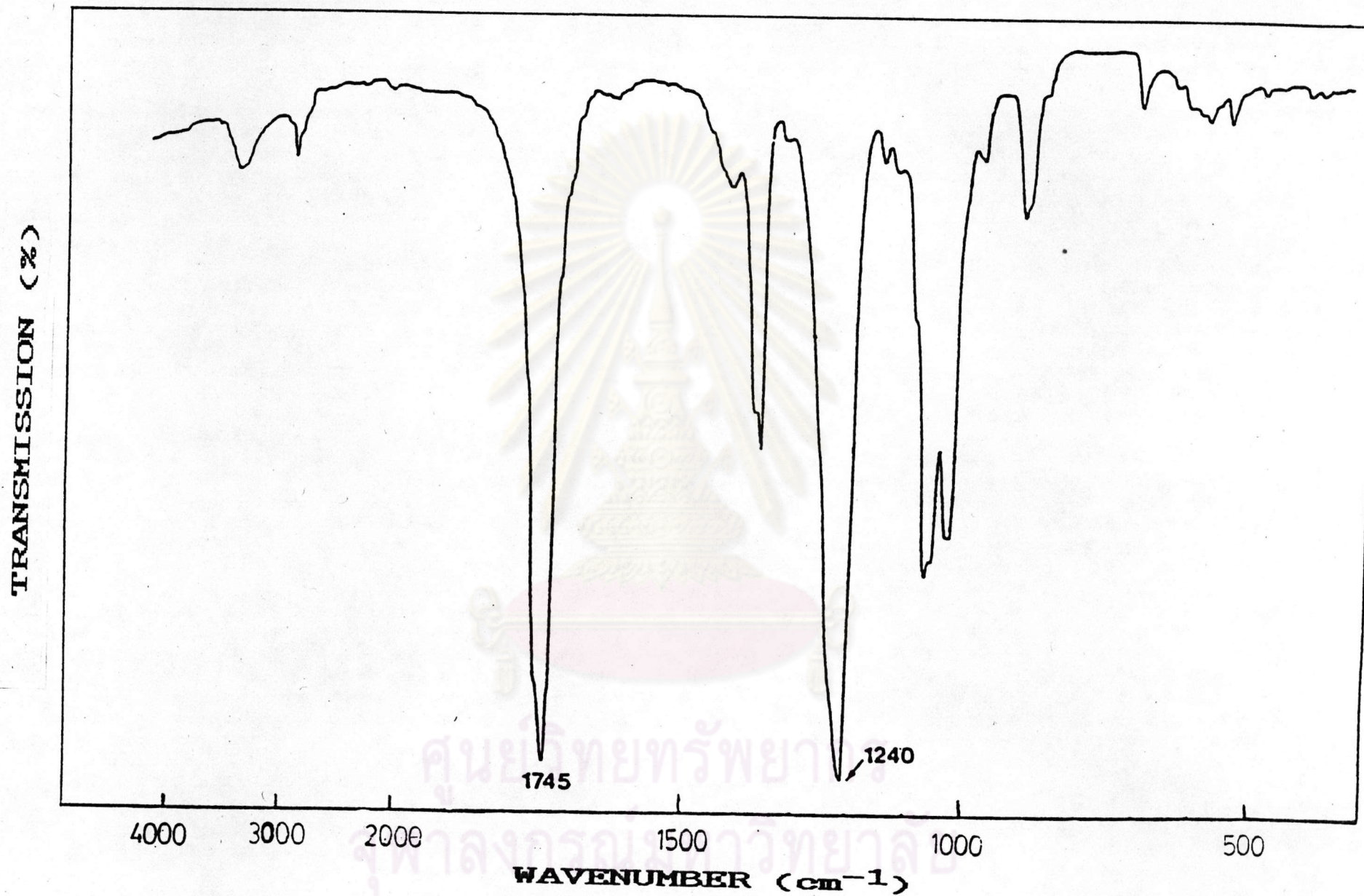


Figure 21 The IR spectrum of Compound (4b) acetate

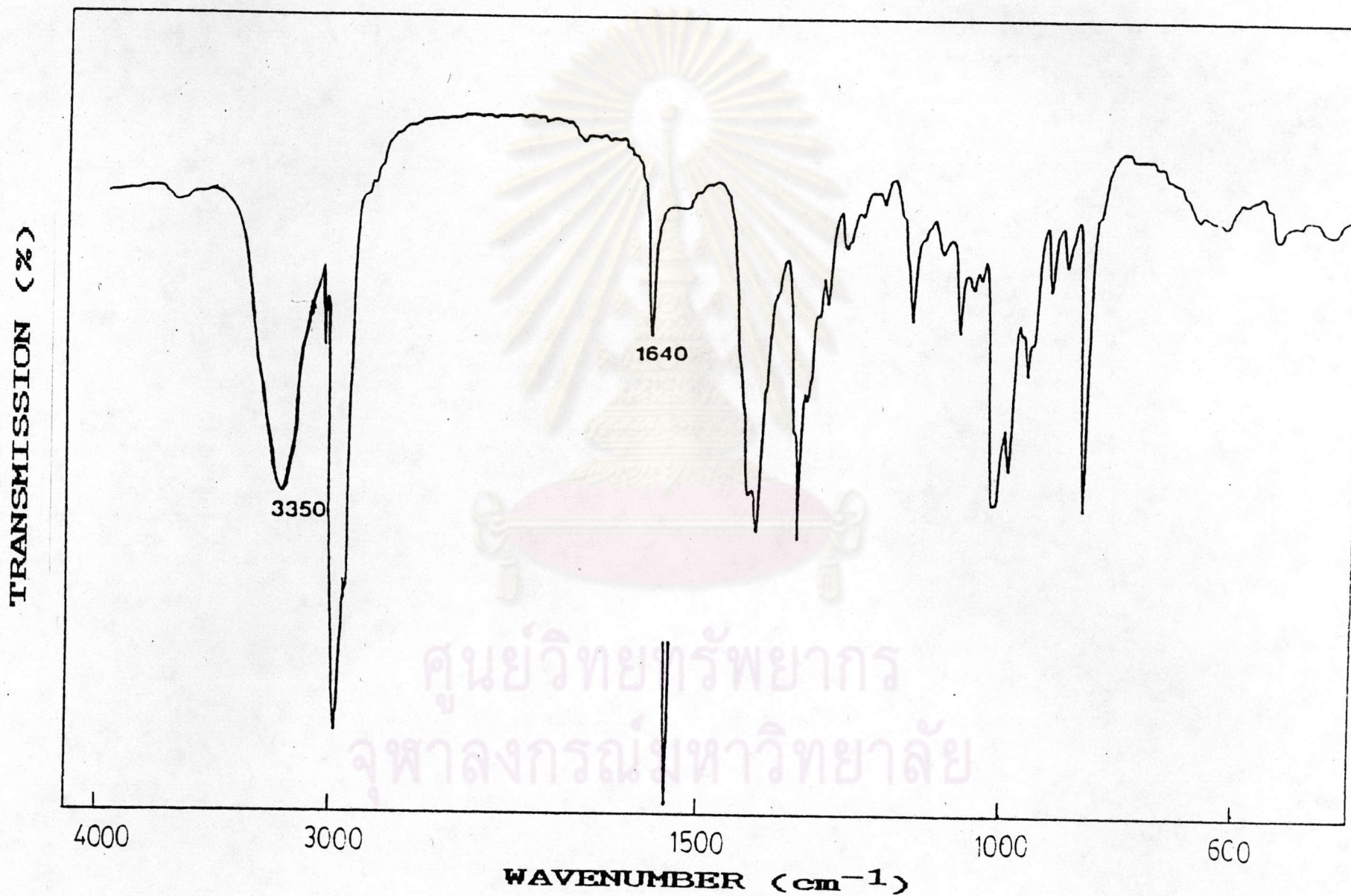


Figure 22 The IR spectrum of Compound (5)

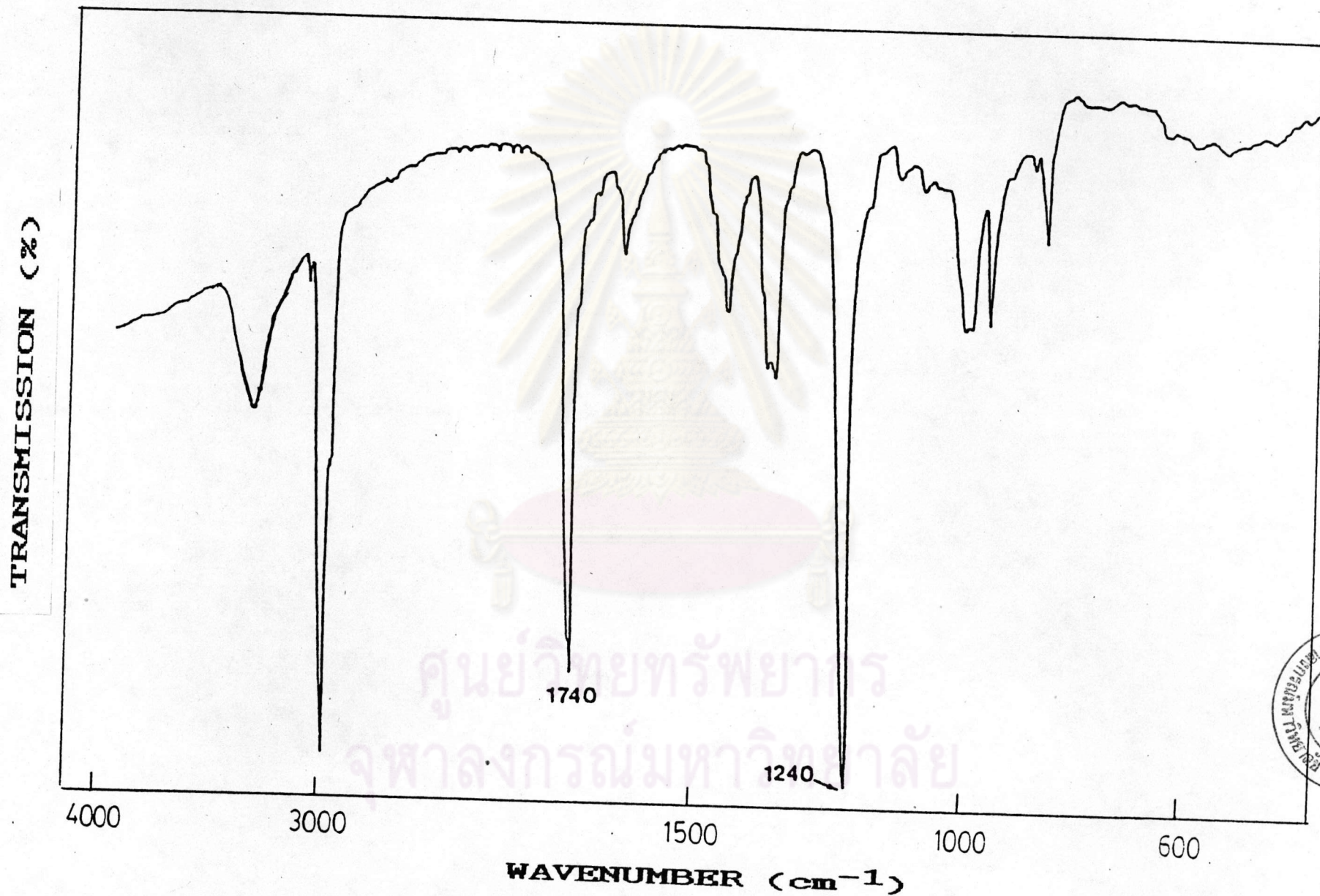


Figure 23 The IR spectrum of Compound (5) acetate

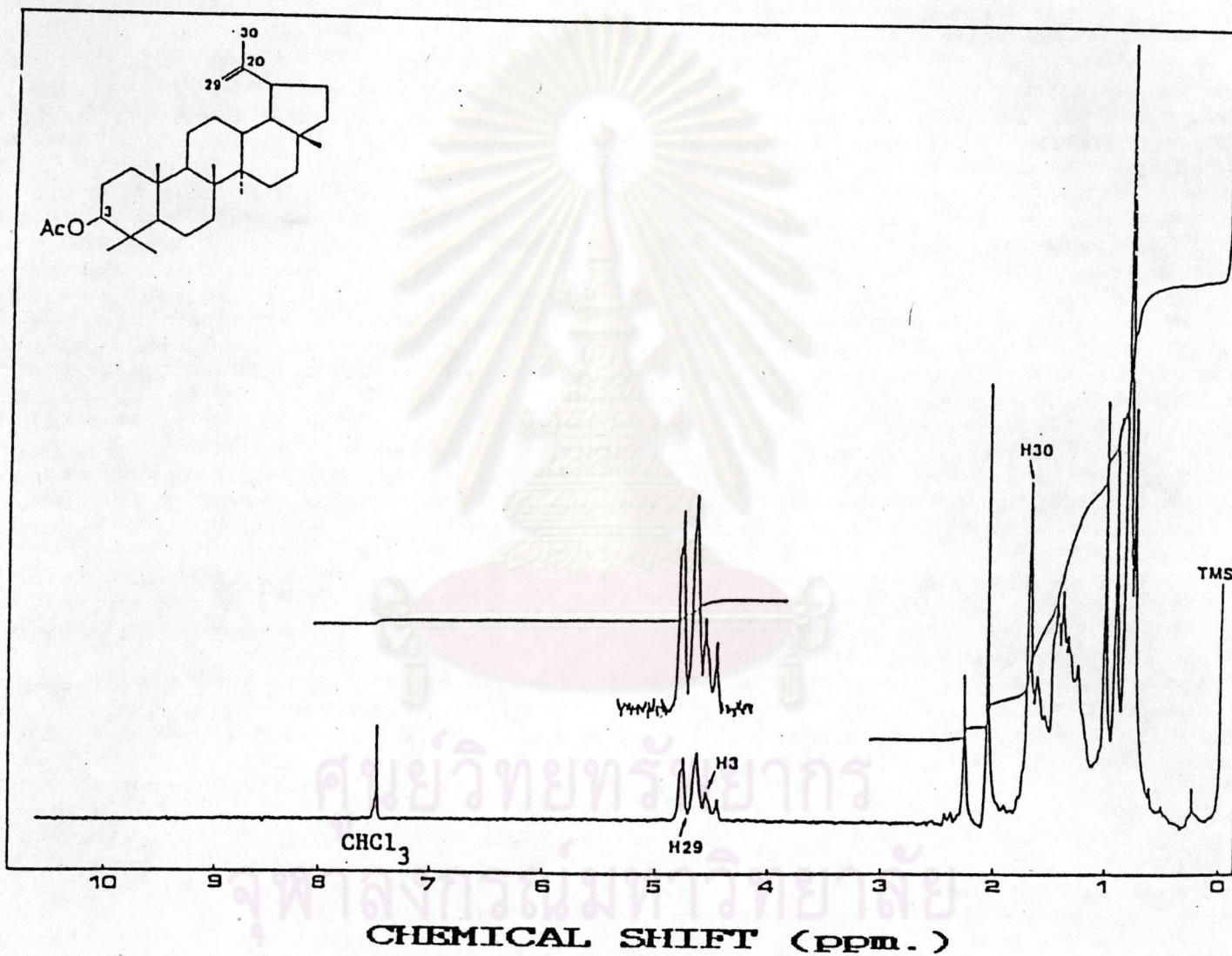


Figure 24 The ^1H NMR spectrum of Compound (5) acetate (CDCl_3)

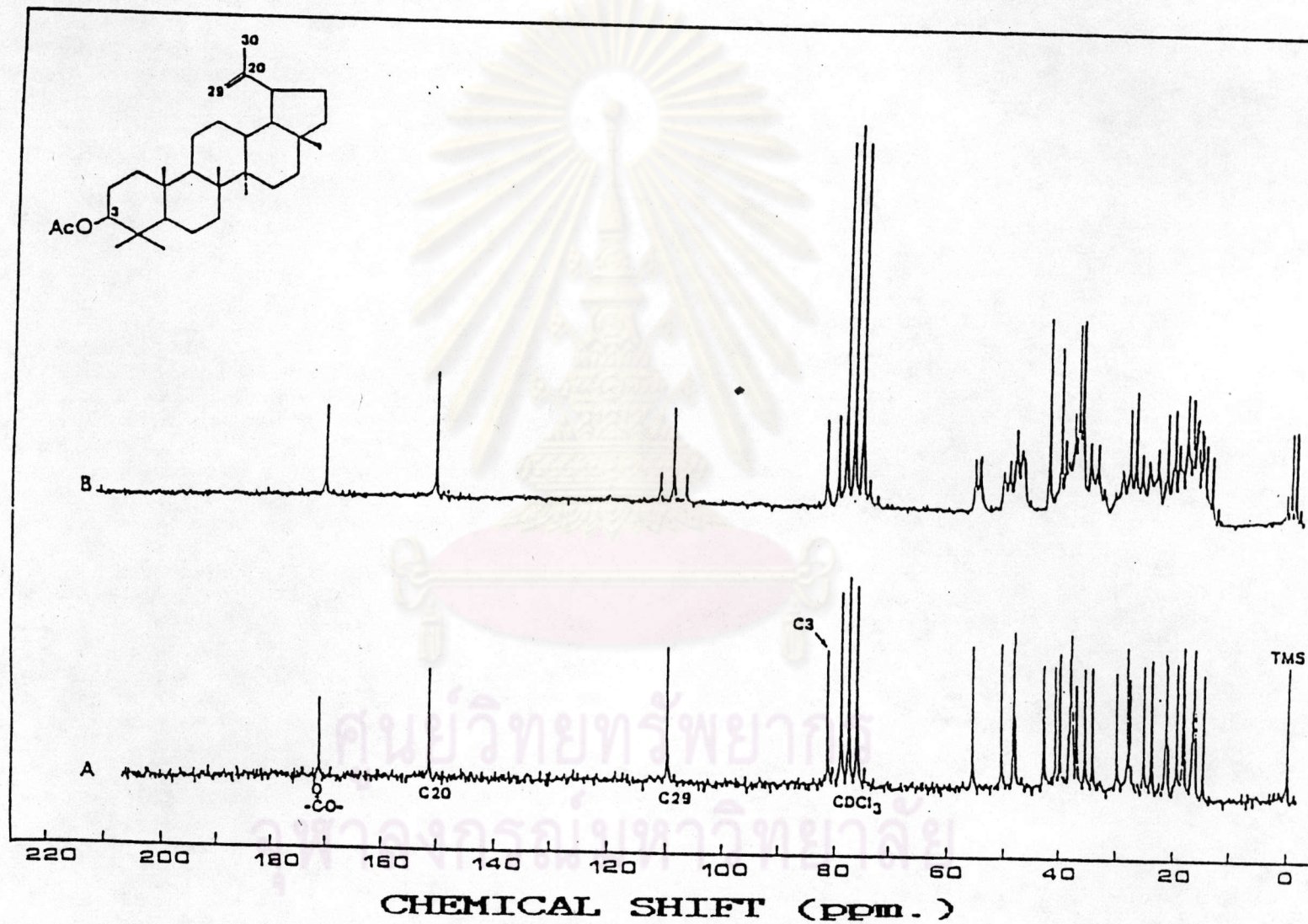


Figure 25 The ^{13}C NMR spectrum of Compound (5) acetate (CDCl_3)

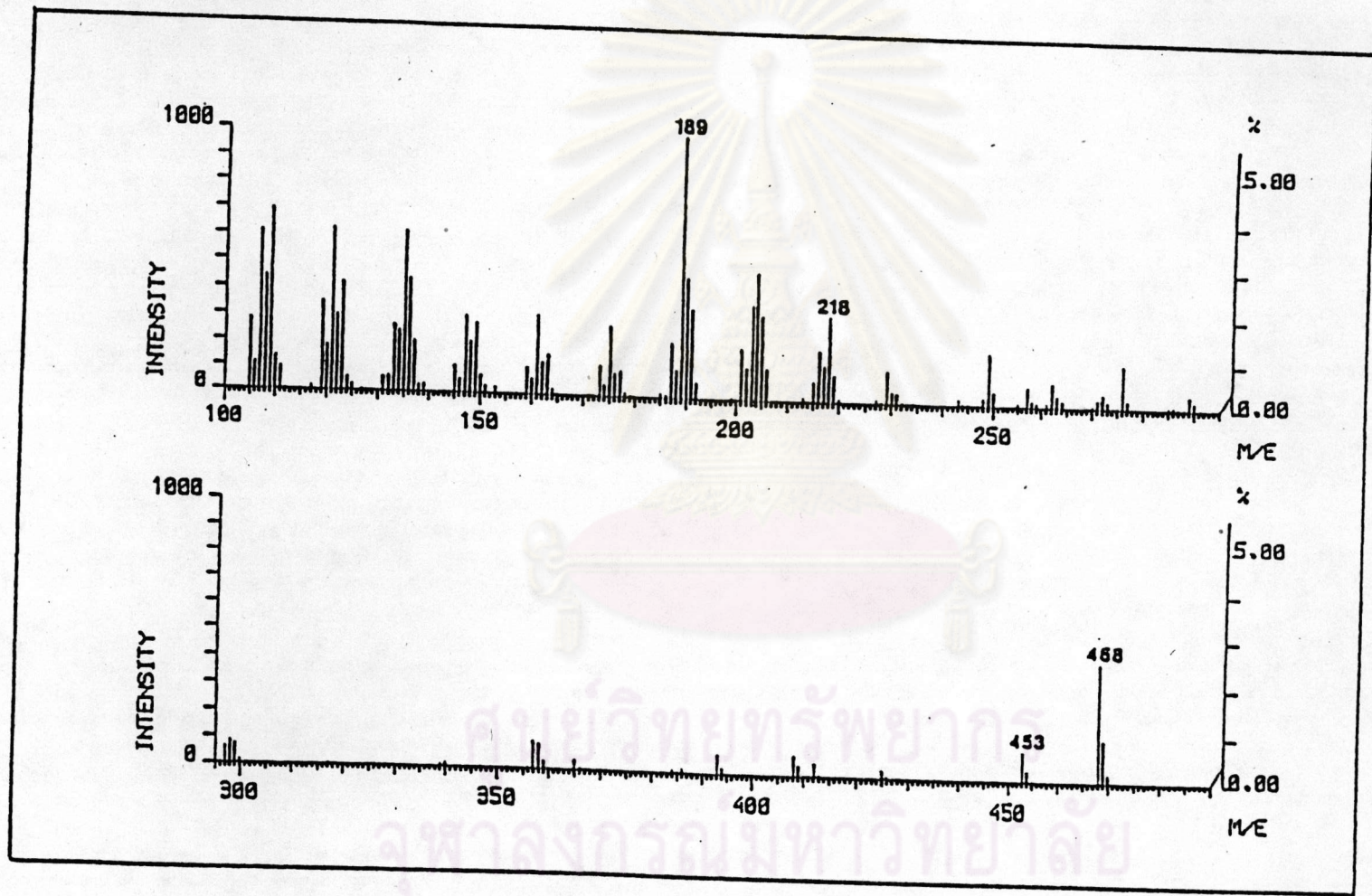


Figure 26 The mass spectrum of Compound (5) acetate

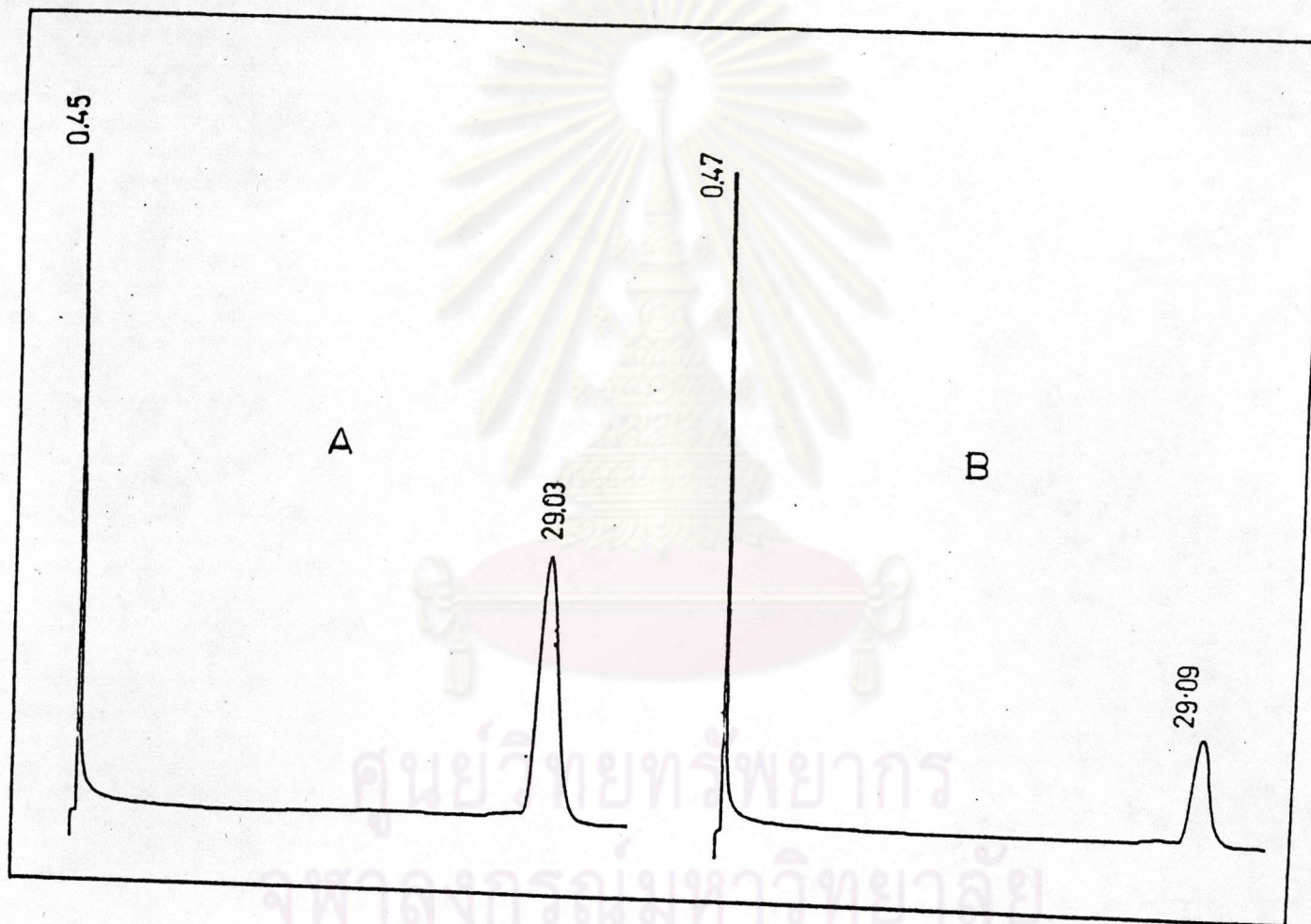


Figure 27 The GLC analysis results of
A) the authentic lupeolacetate
B) Compound (5) acetate

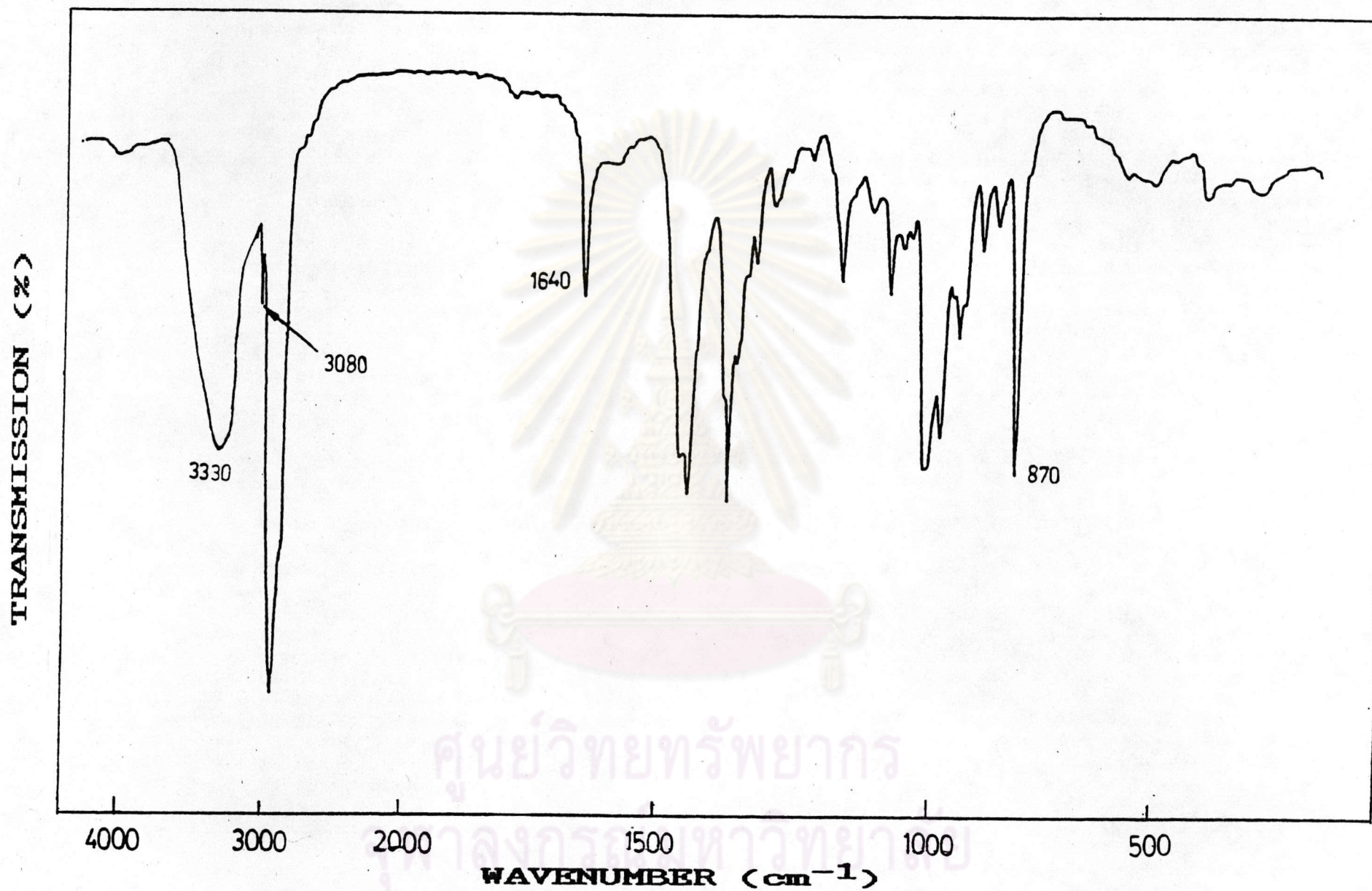


Figure 28 The IR spectrum of hydrolysis product of Compound (5) acetate
(an alcoholic part)

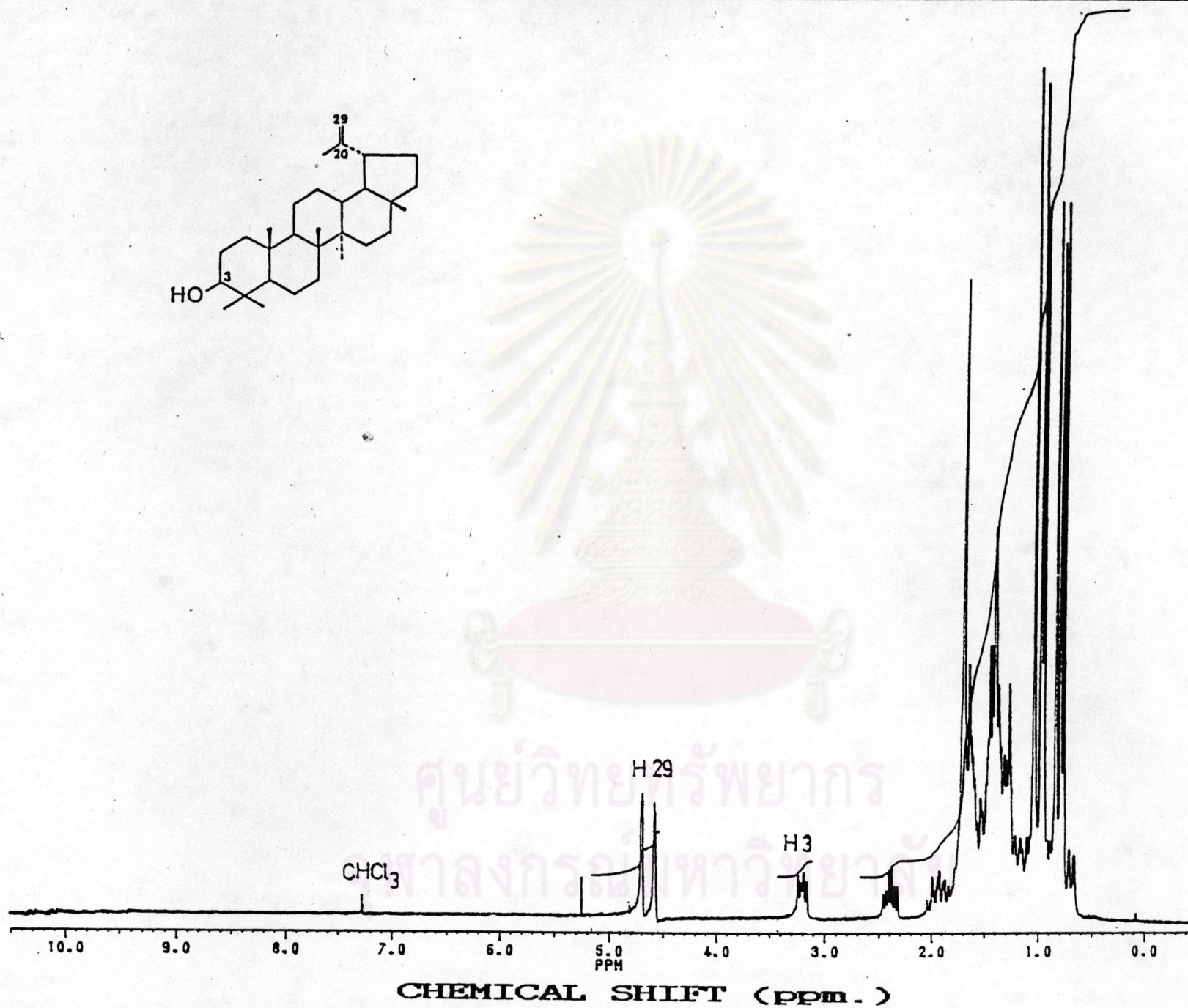
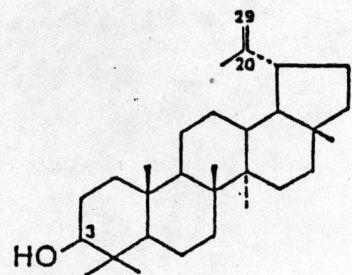
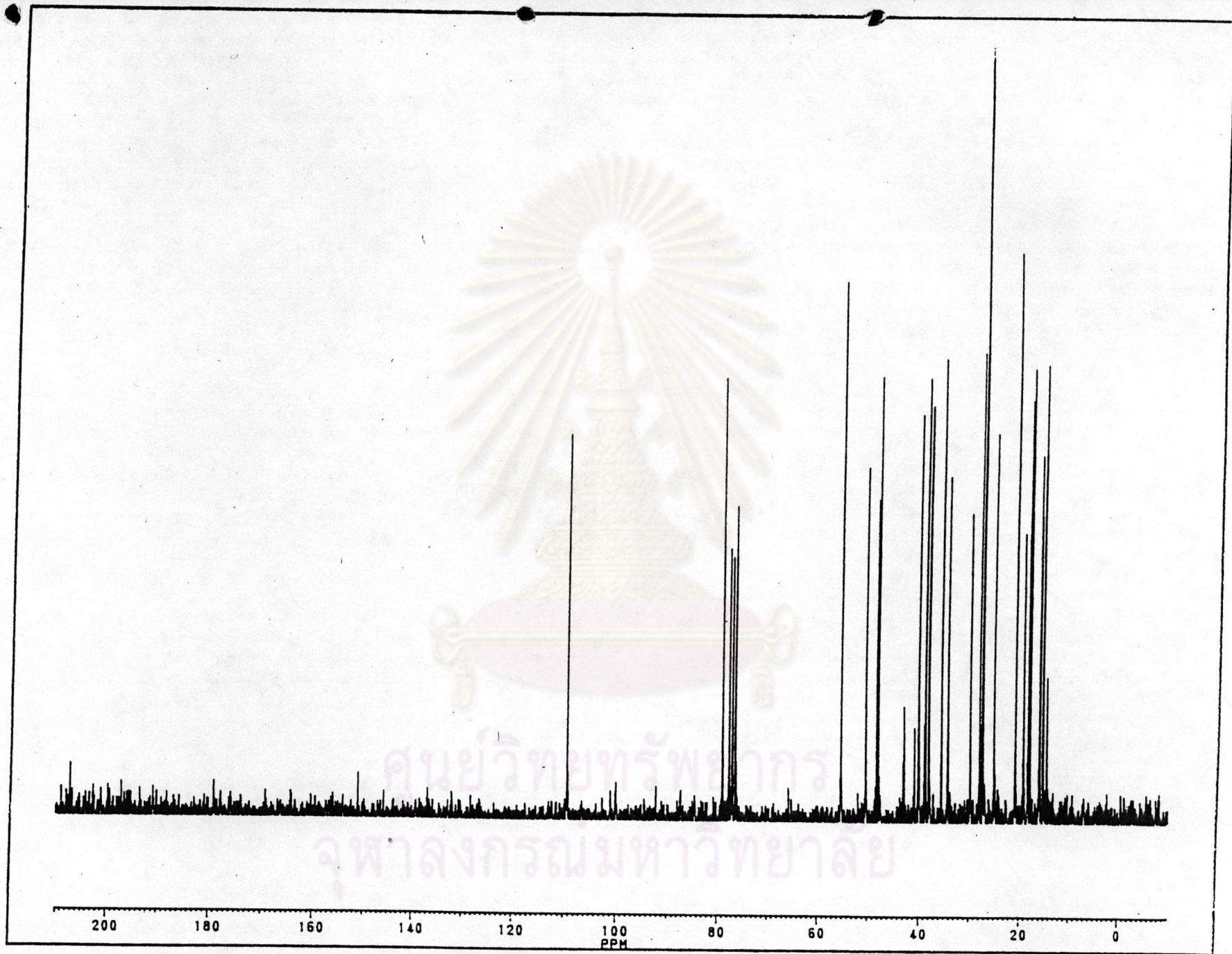


Figure 29 The ^1H NMR spectrum of hydrolysis product of Compound(5)



CHEMICAL SHIFT (ppm.)

Figure 30 A) The ^{13}C NMR spectrum of hydrolysis product of Compound(5) acetate (an alcoholic part) (CDCl_3)

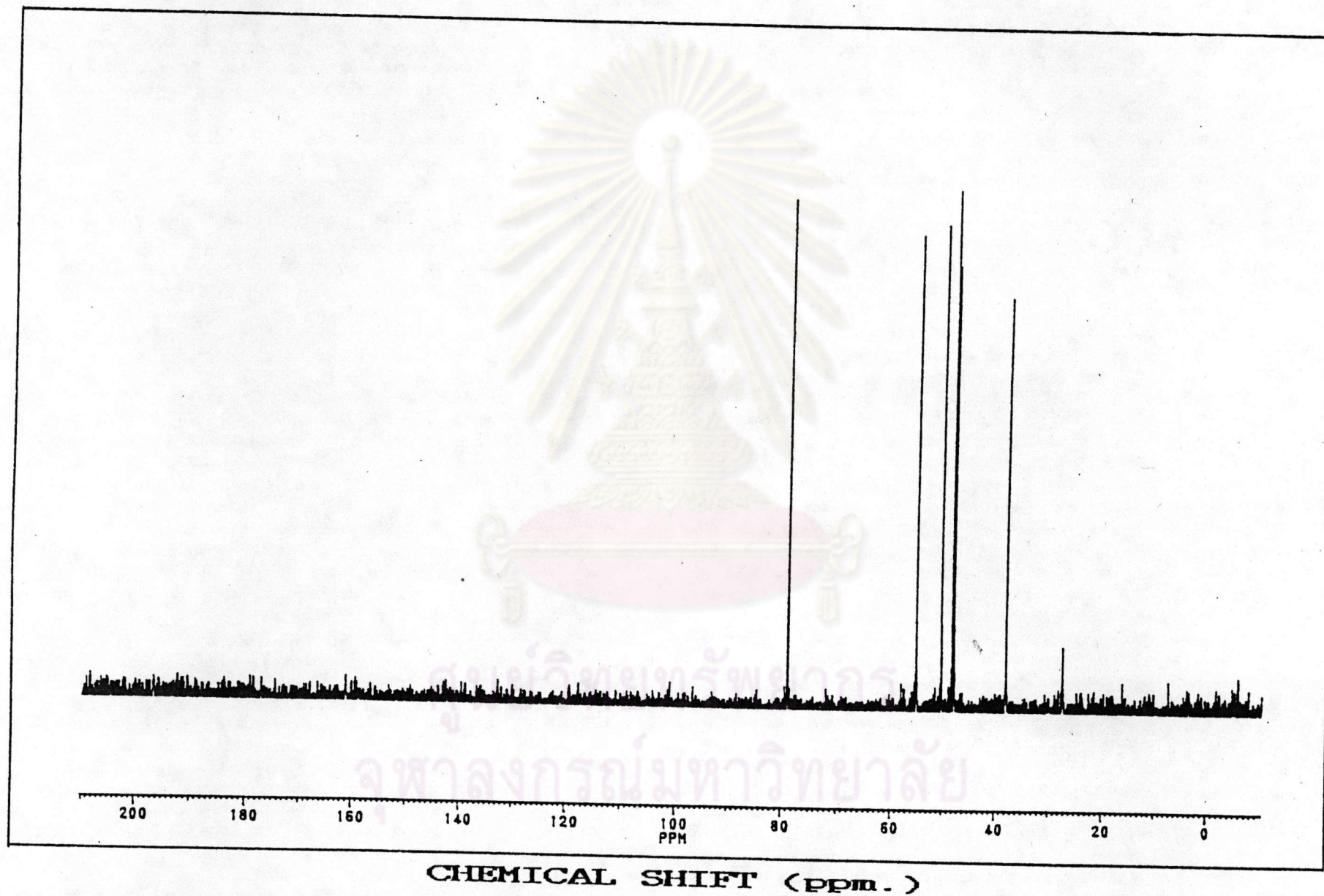


Figure 30 B) The ^{13}C NMR DEPT 90 spectrum of hydrolysis product of Compound(5)acetate (an alcoholic part) (CDCl_3)

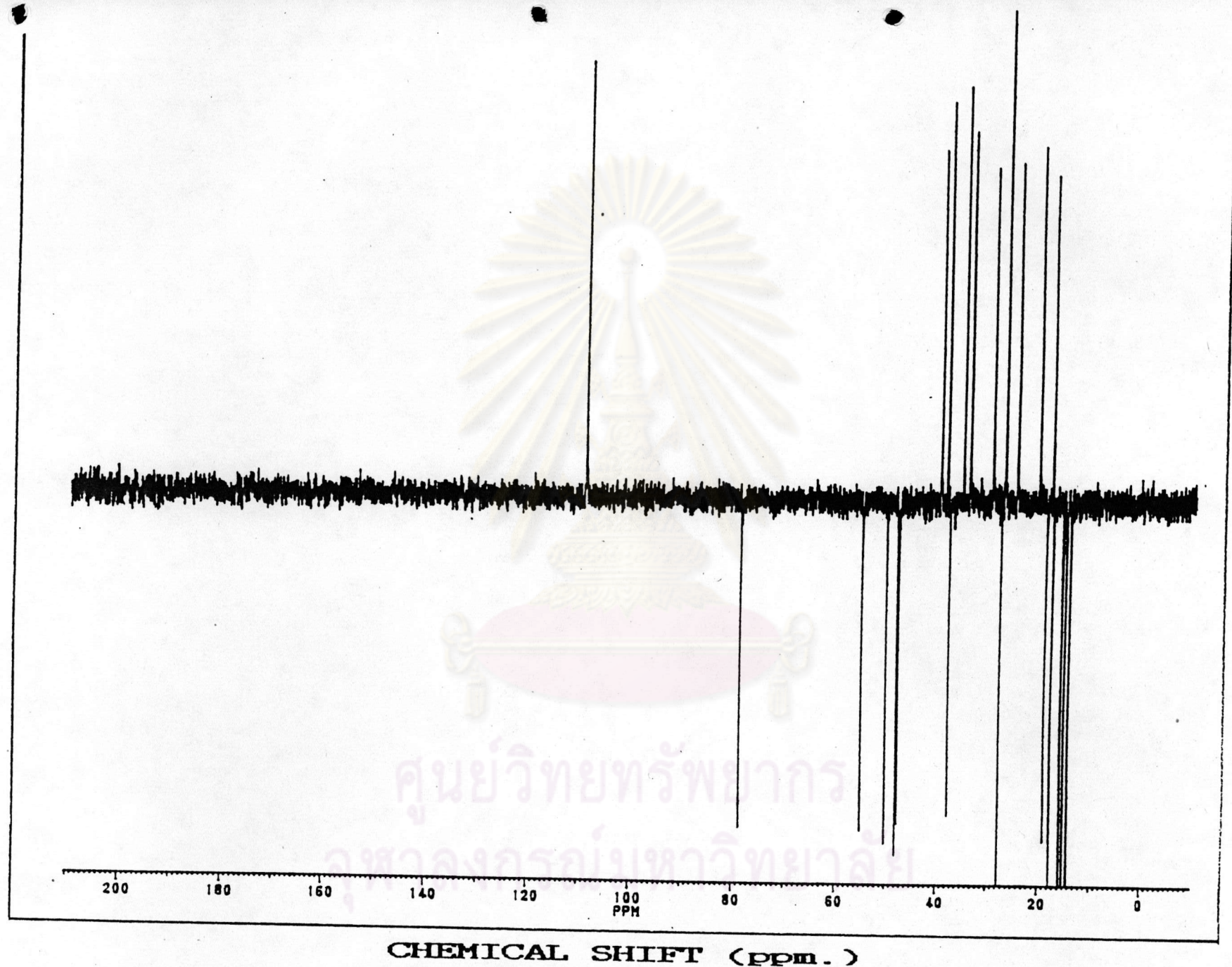


Figure 30 C) The ^{13}C NMR DEPT 135 spectrum of hydrolysis product of

Compound(5)acetate (an alcoholic part) (CDCl_3)

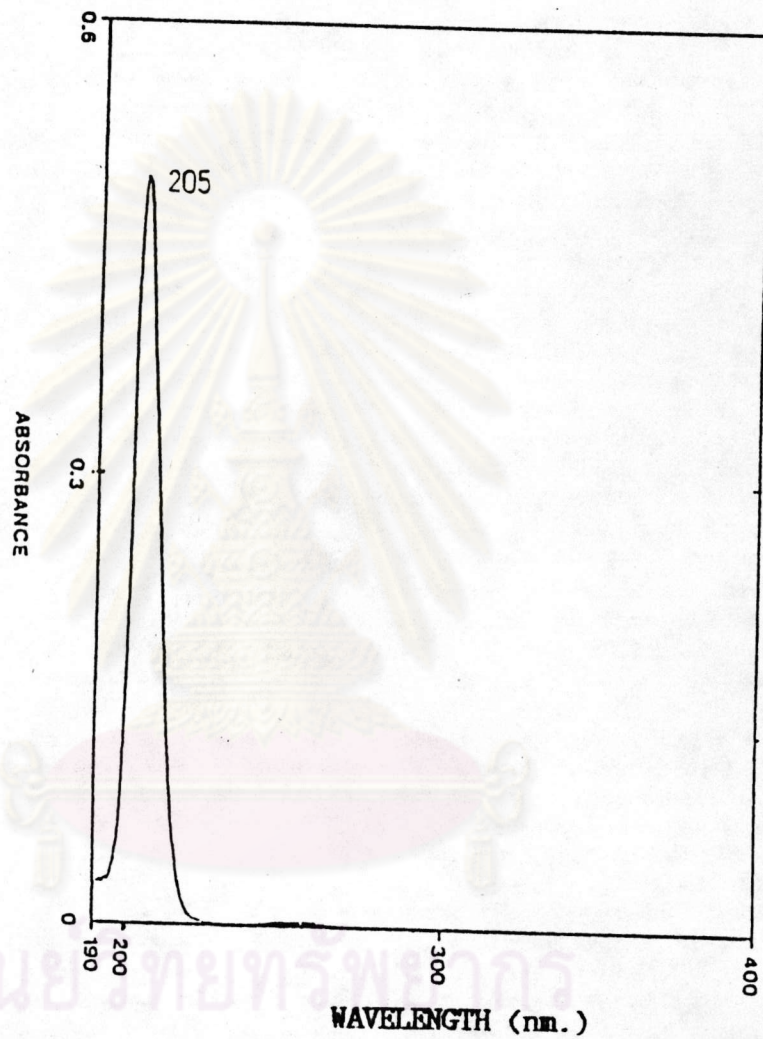


Figure 31 The UV spectrum of hydrolysis product of Compound(5) acetate
(an alcoholic part)

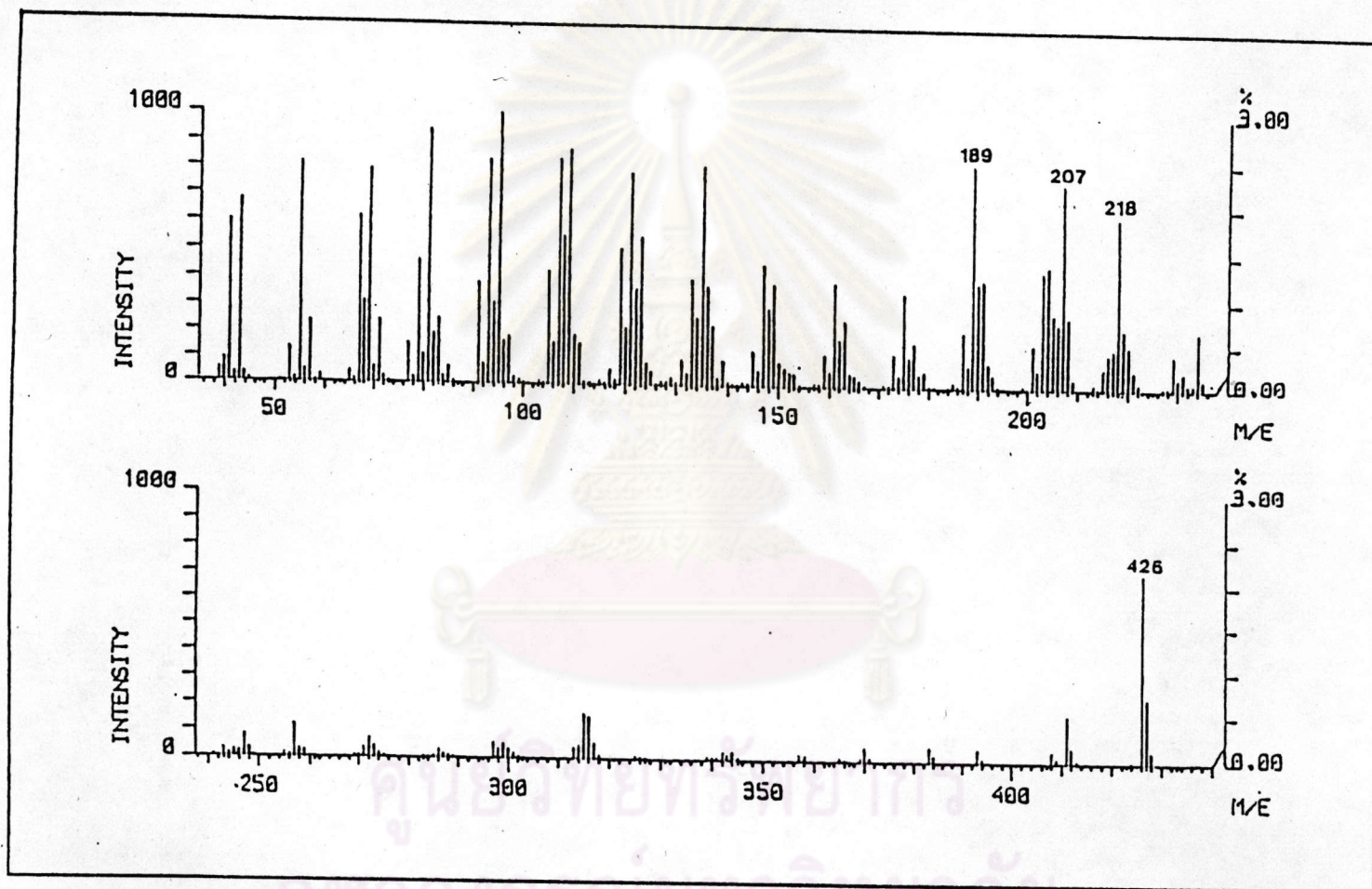


Figure 32 The mass spectrum of hydrolysis product of Compound(5) acetate (an alcoholic part)

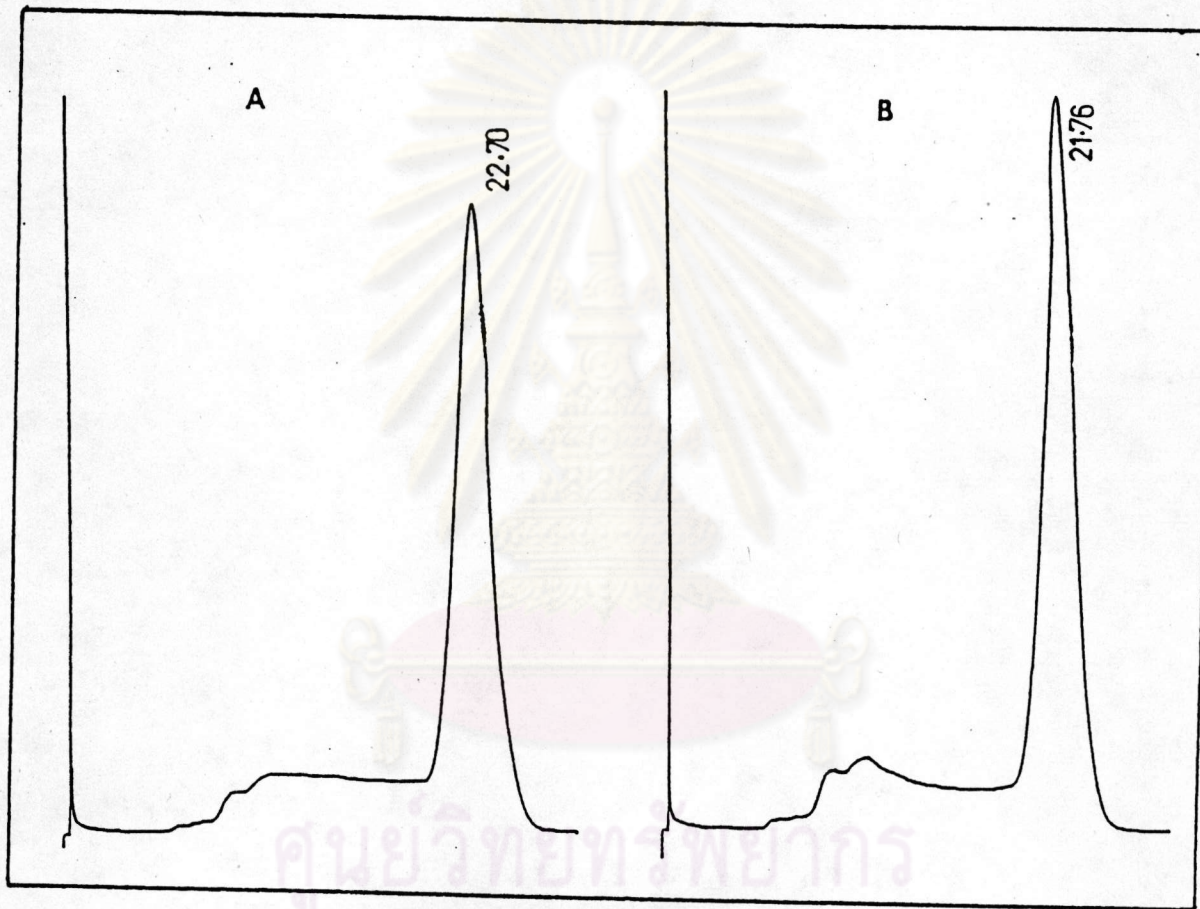


Figure 33 The GLC analysis results of

A) the authentic lupeol

B) the hydrolysis product of Compound(5)acetate

(an alcoholic part)

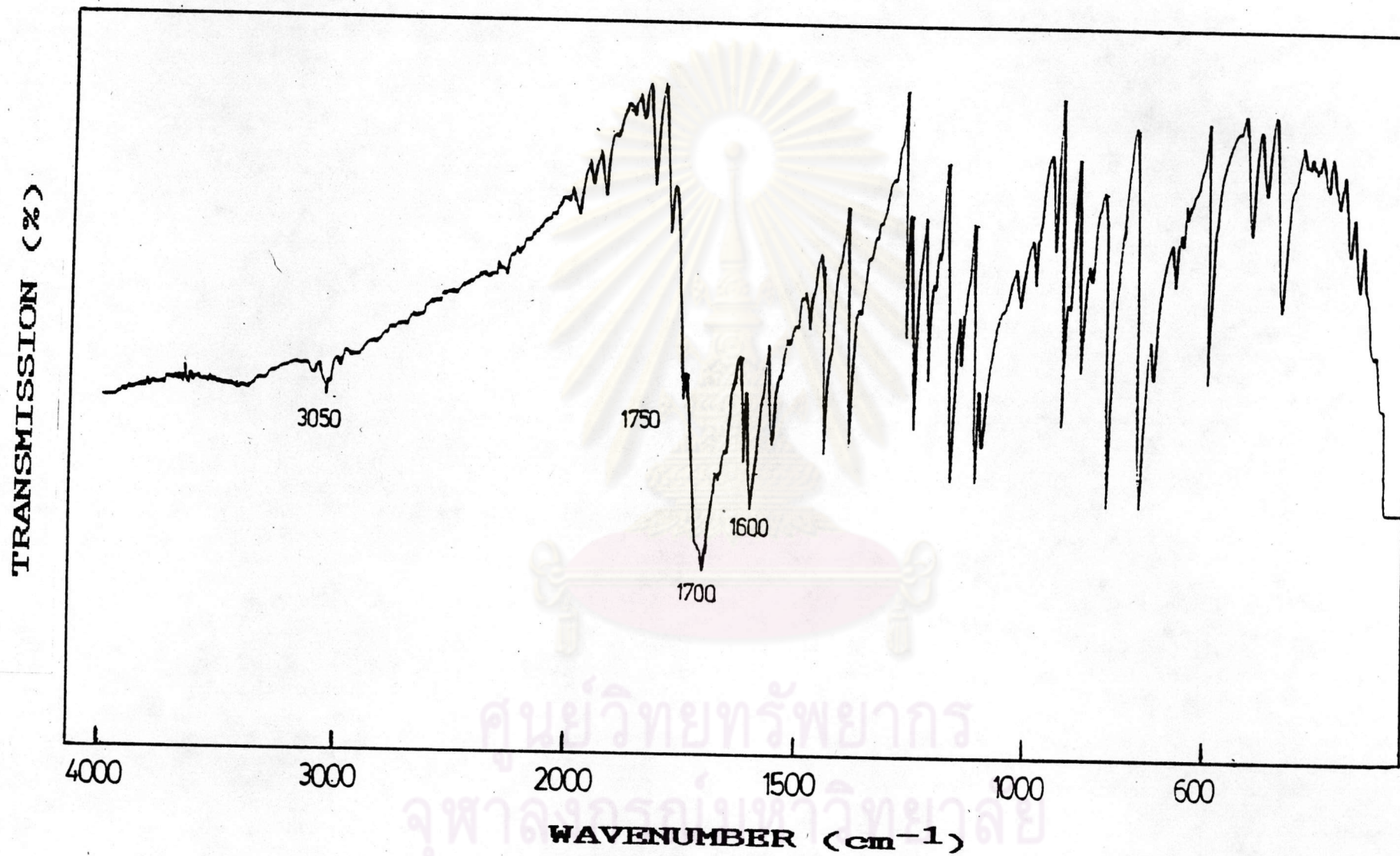


Figure 34 The IR spectrum of Compound (G)

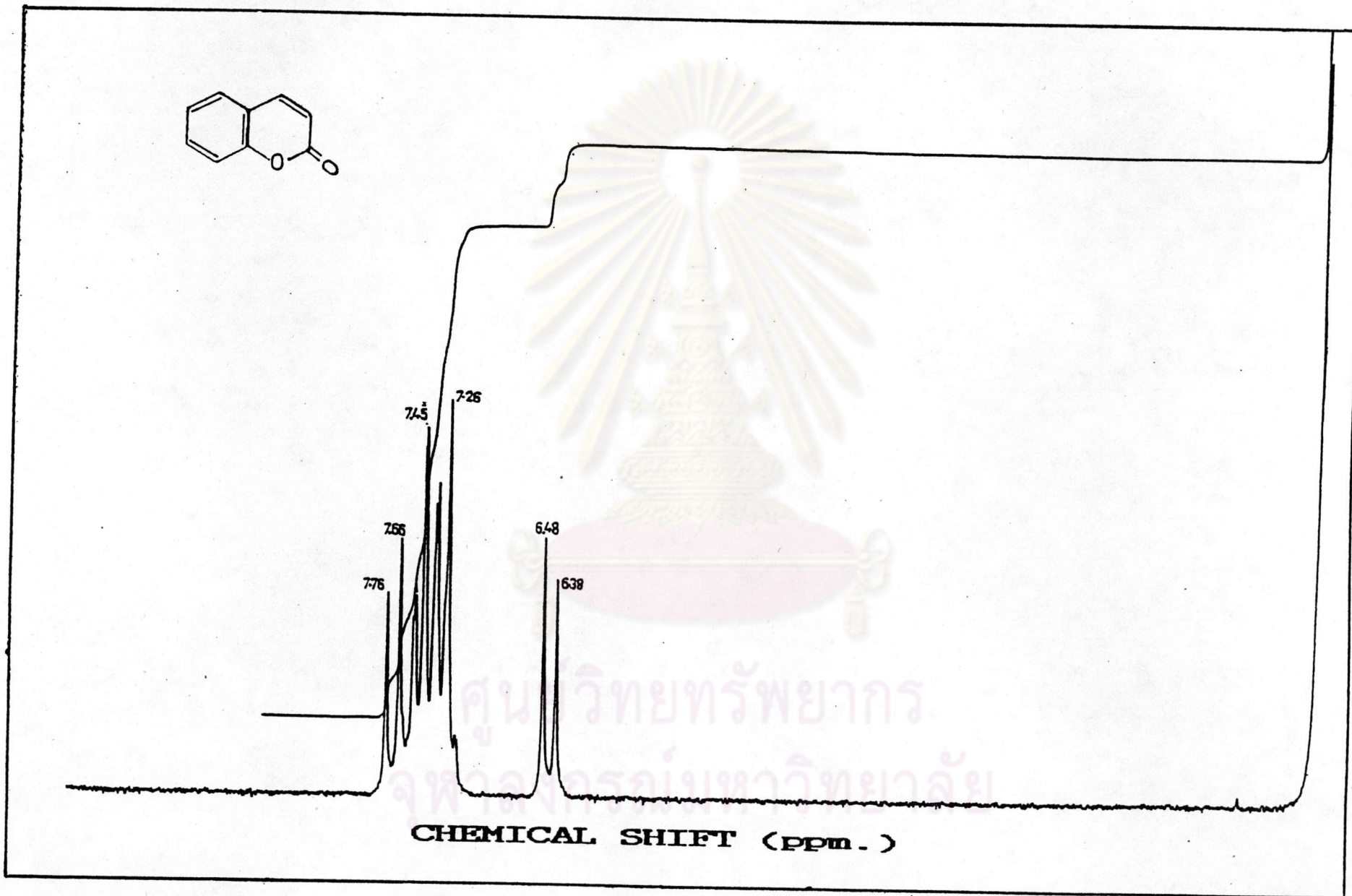


Figure 35 The ^1H NMR spectrum of Compound (5) (CDCl_3)

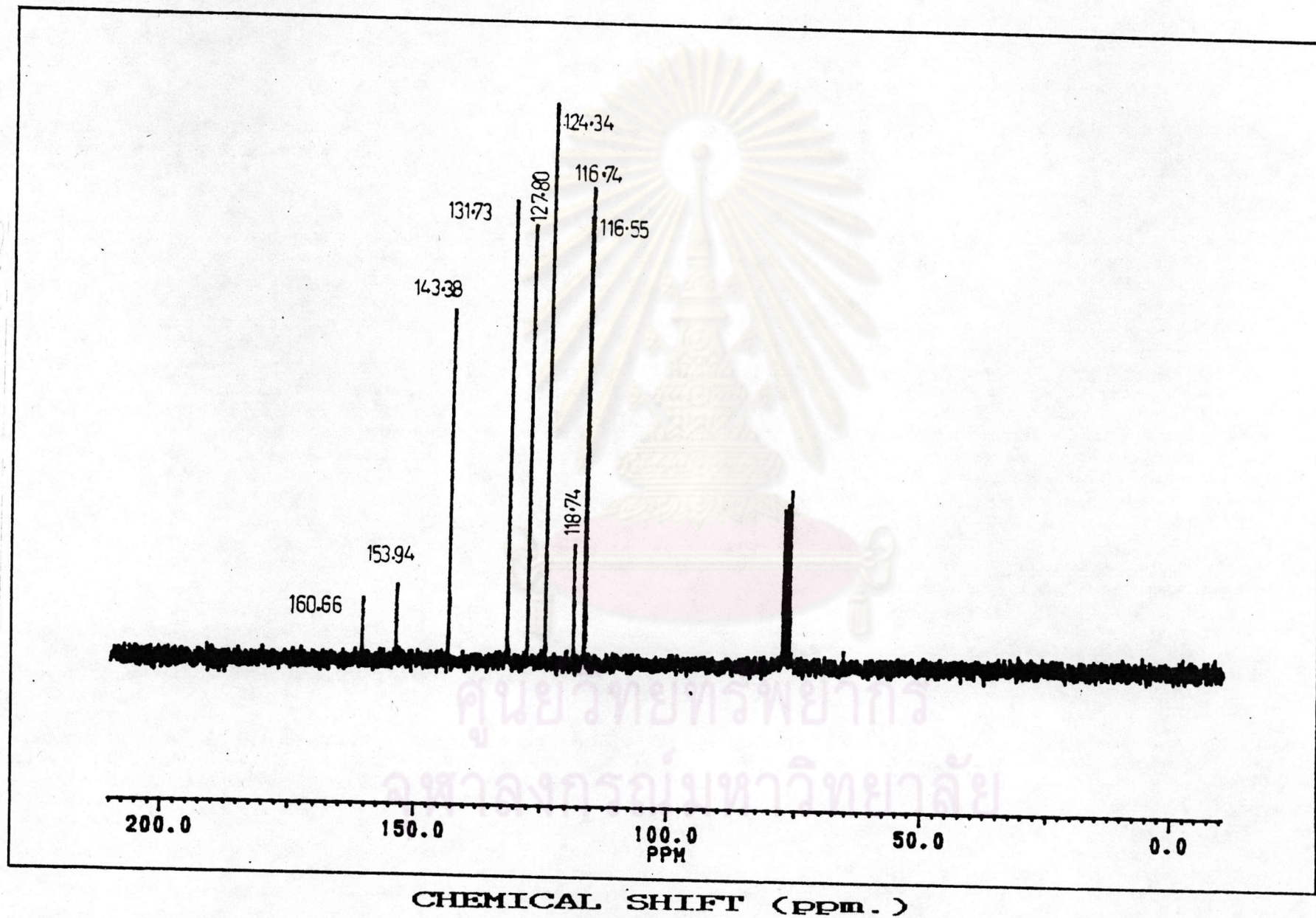


Figure 36 A) The ^{13}C NMR spectrum of Compound(6) (CDCl_3)

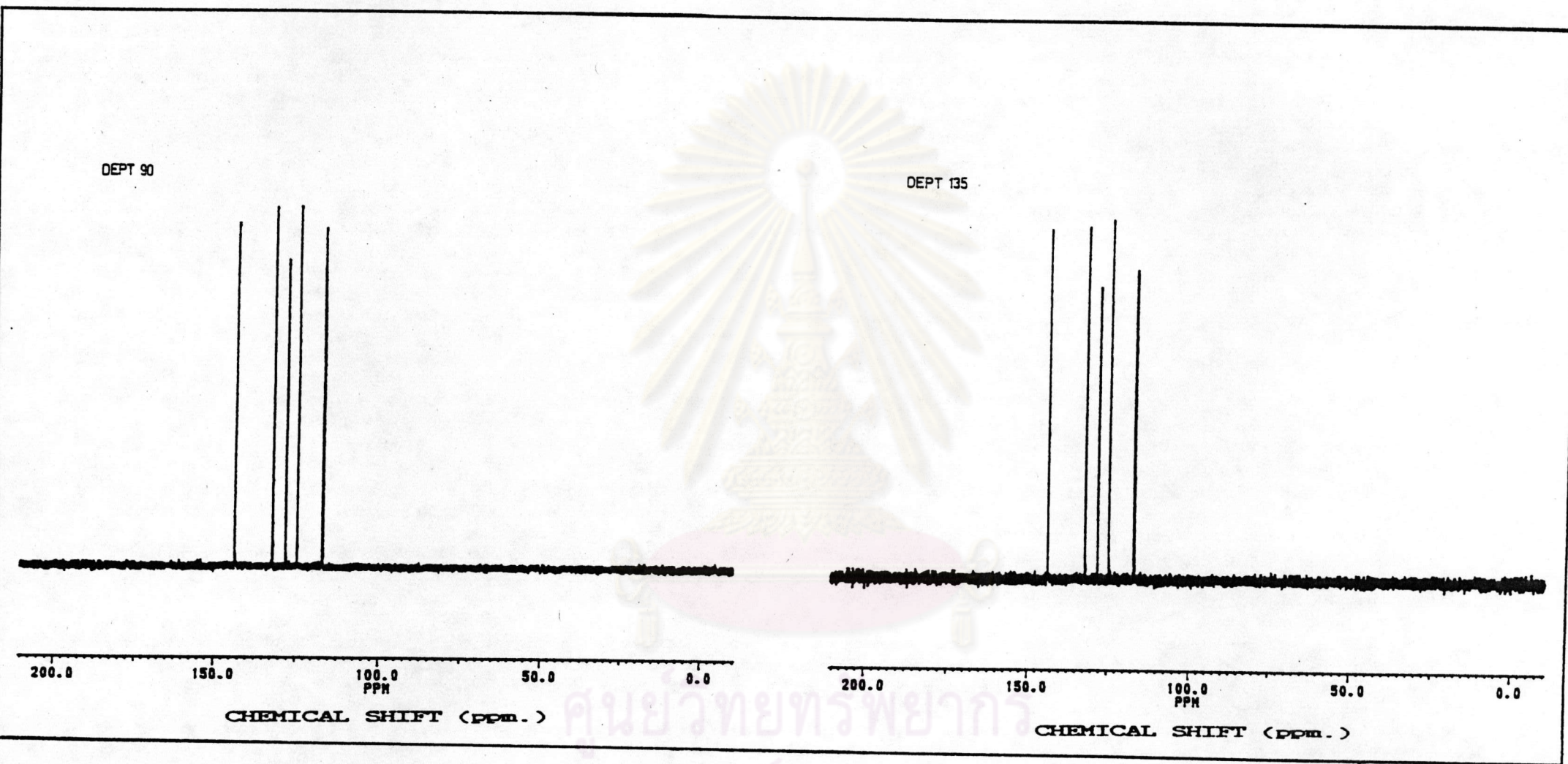


Figure 36 B) The ^{13}C NMR DEPT 90 spectrum of Compound (6)
(CDCl_3)

Figure 36 C) The ^{13}C NMR DEPT 135 spectrum of Compound (6)
(CDCl_3)

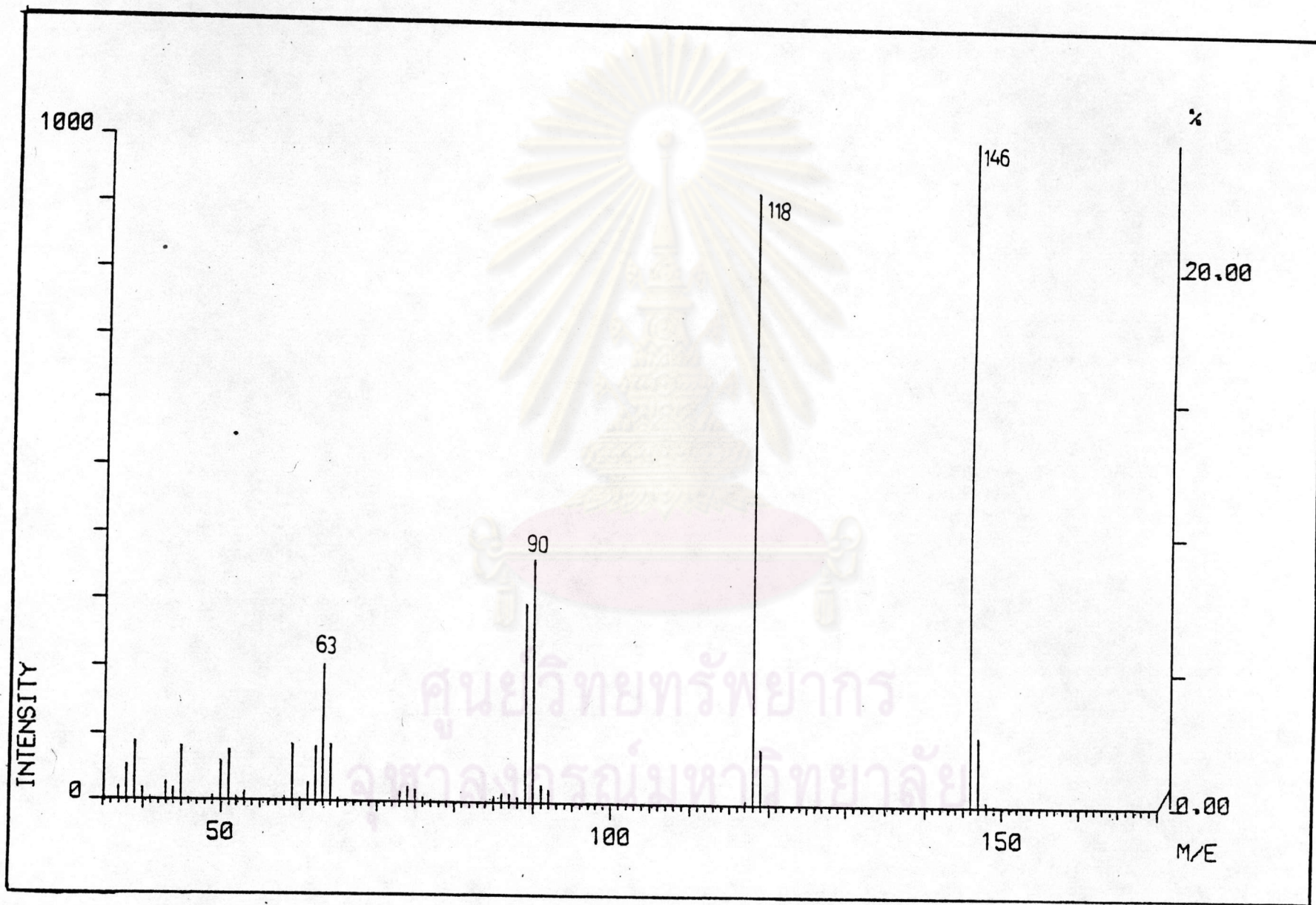


Figure 37 The mass spectrum of Compound (6)

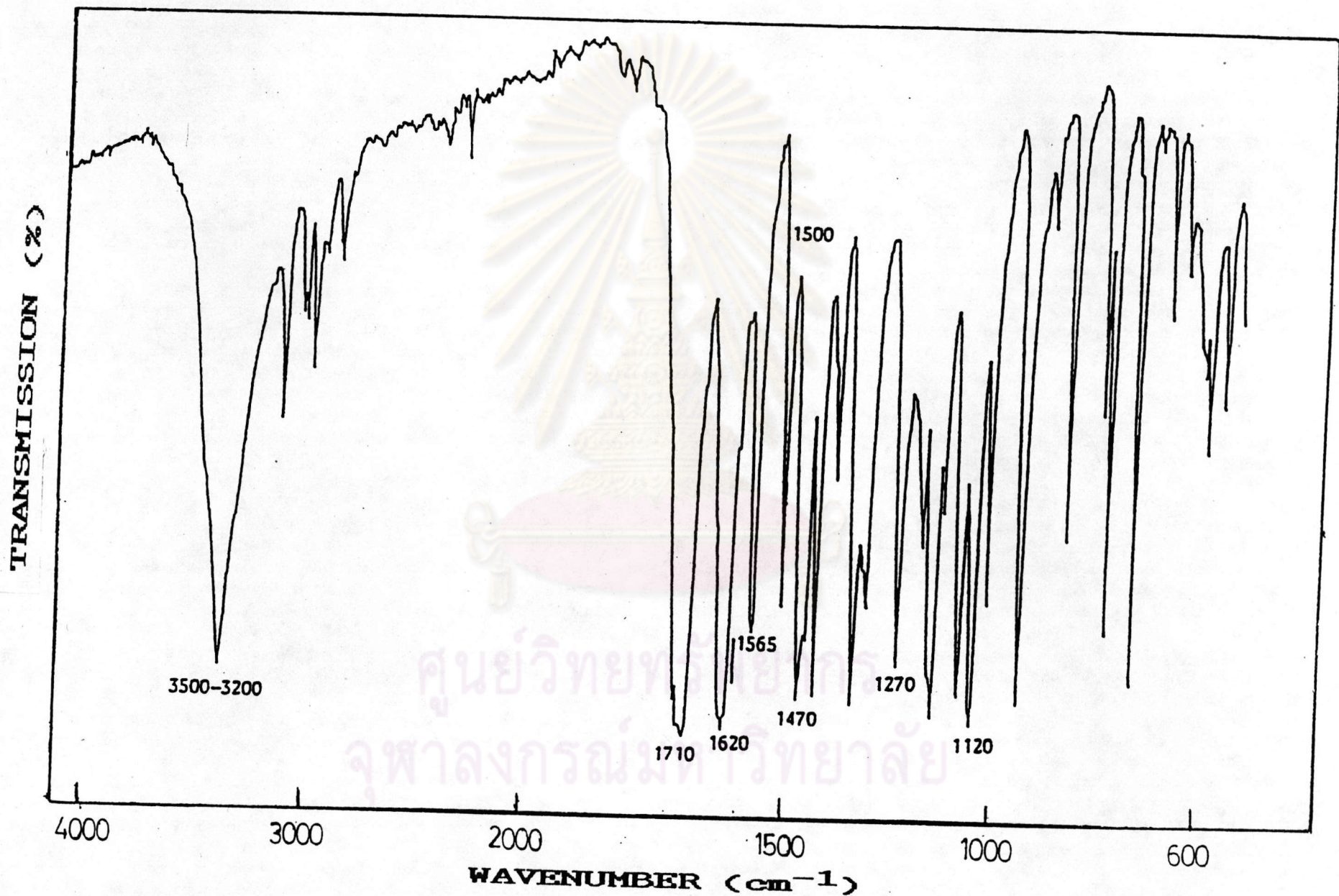


Figure 38 The IR spectrum of Compound (Z)

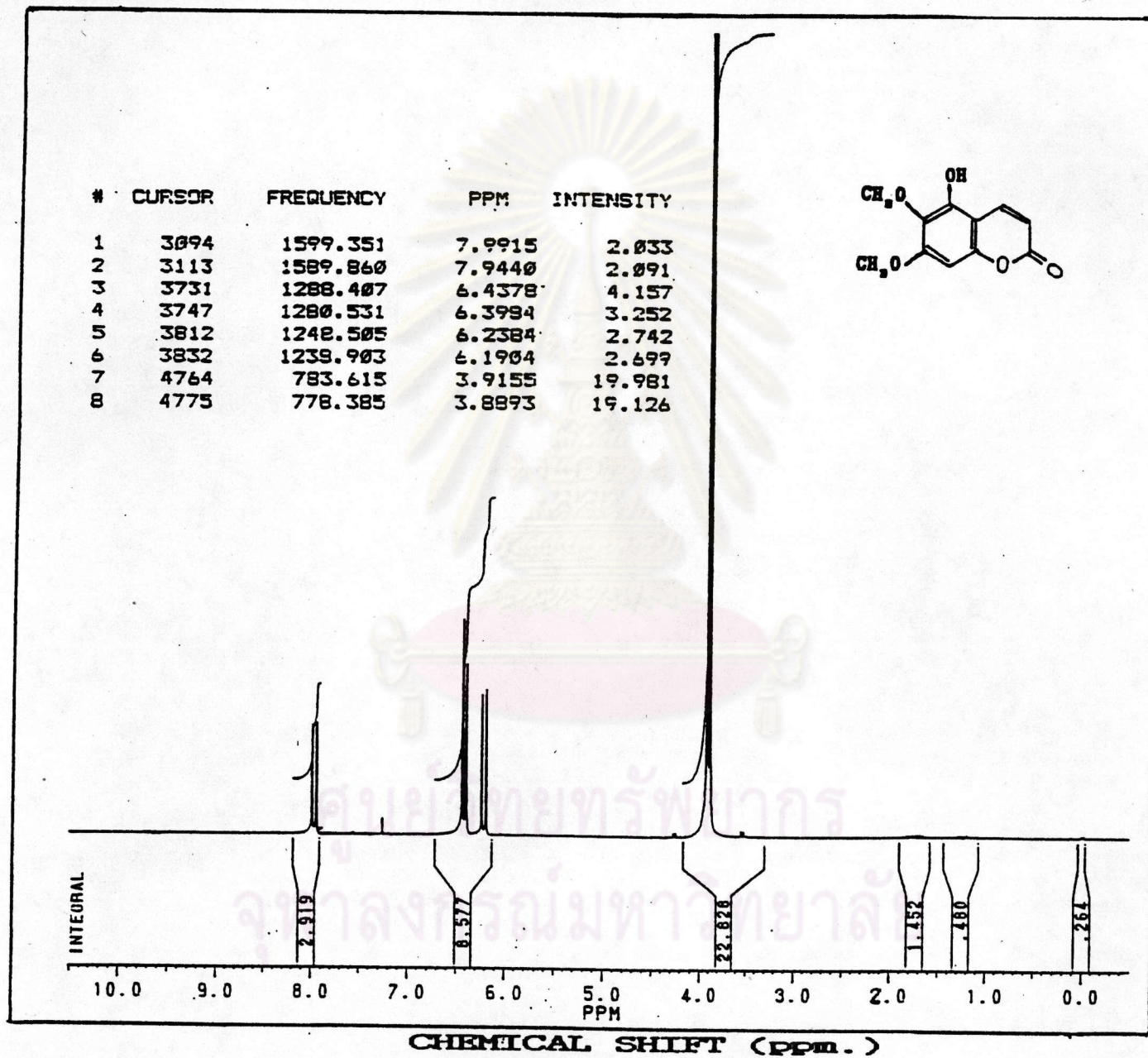


Figure 39 The ^1H NMR spectrum of Compound (7) (CDCl_3)

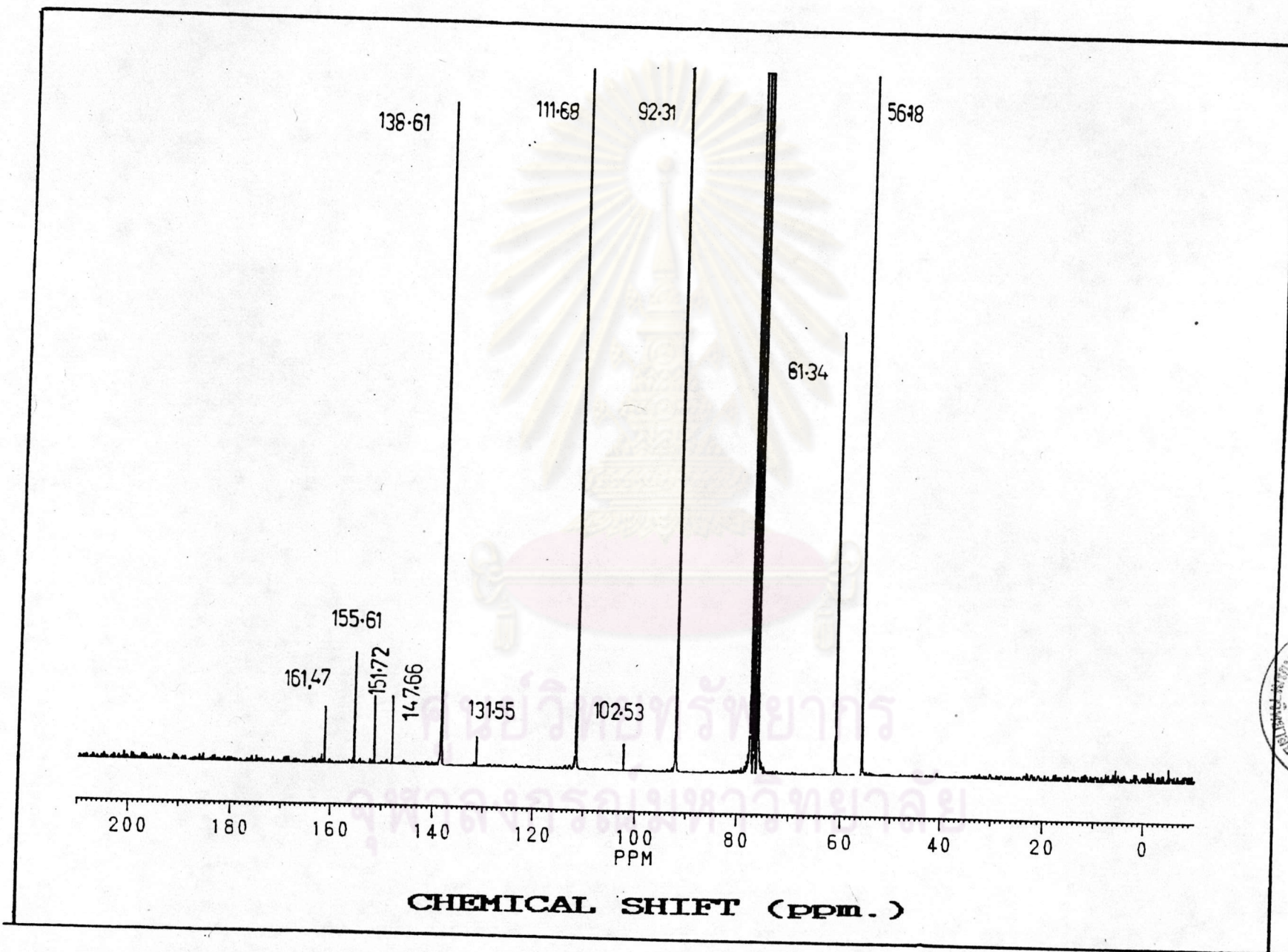


Figure 40 A) The ^{13}C NMR spectrum of Compound (Z) (CDCl_3)

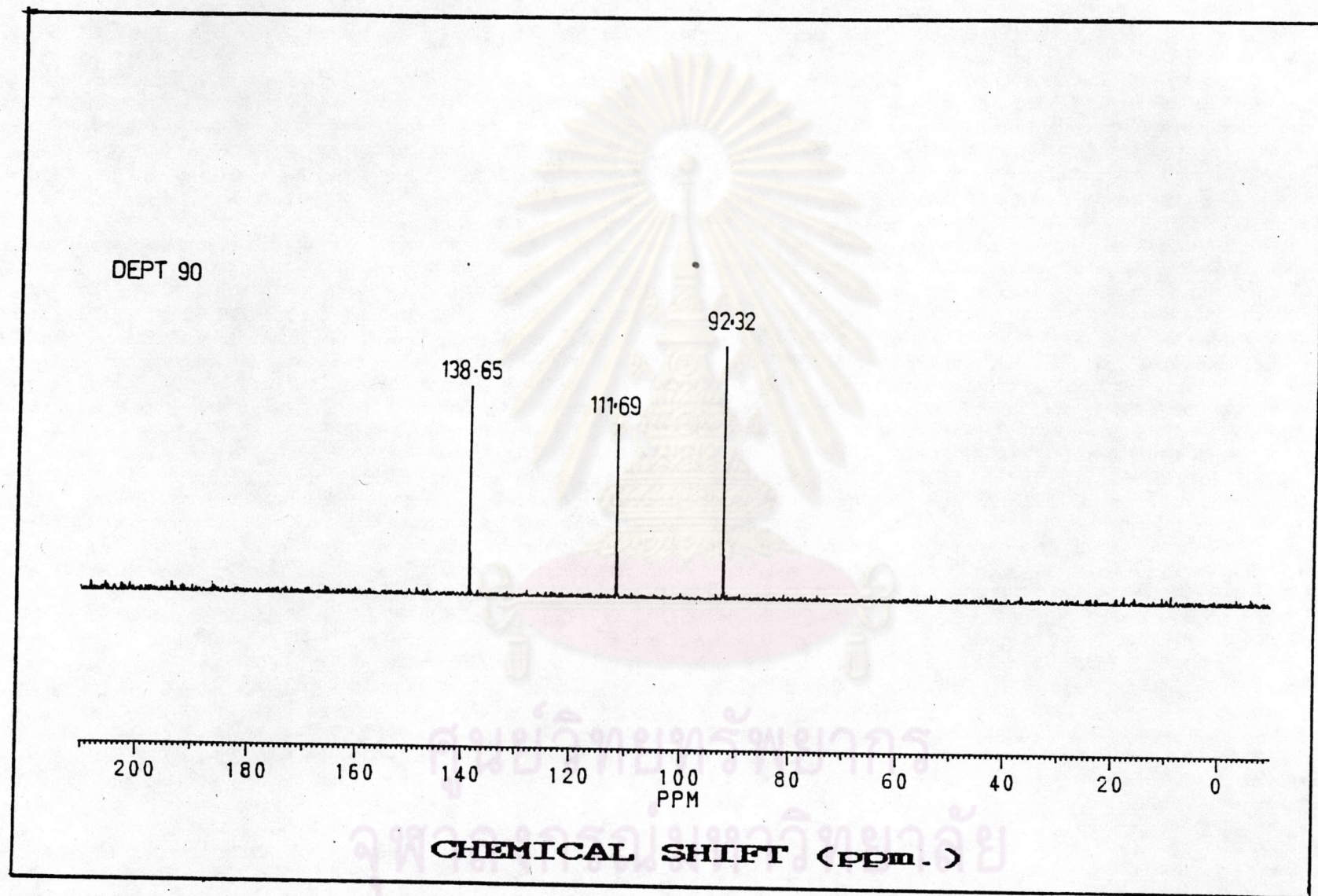


Figure 40 B) The ^{13}C NMR spectrum of Compound(Z) [DEPT 90] (CDCl_3)

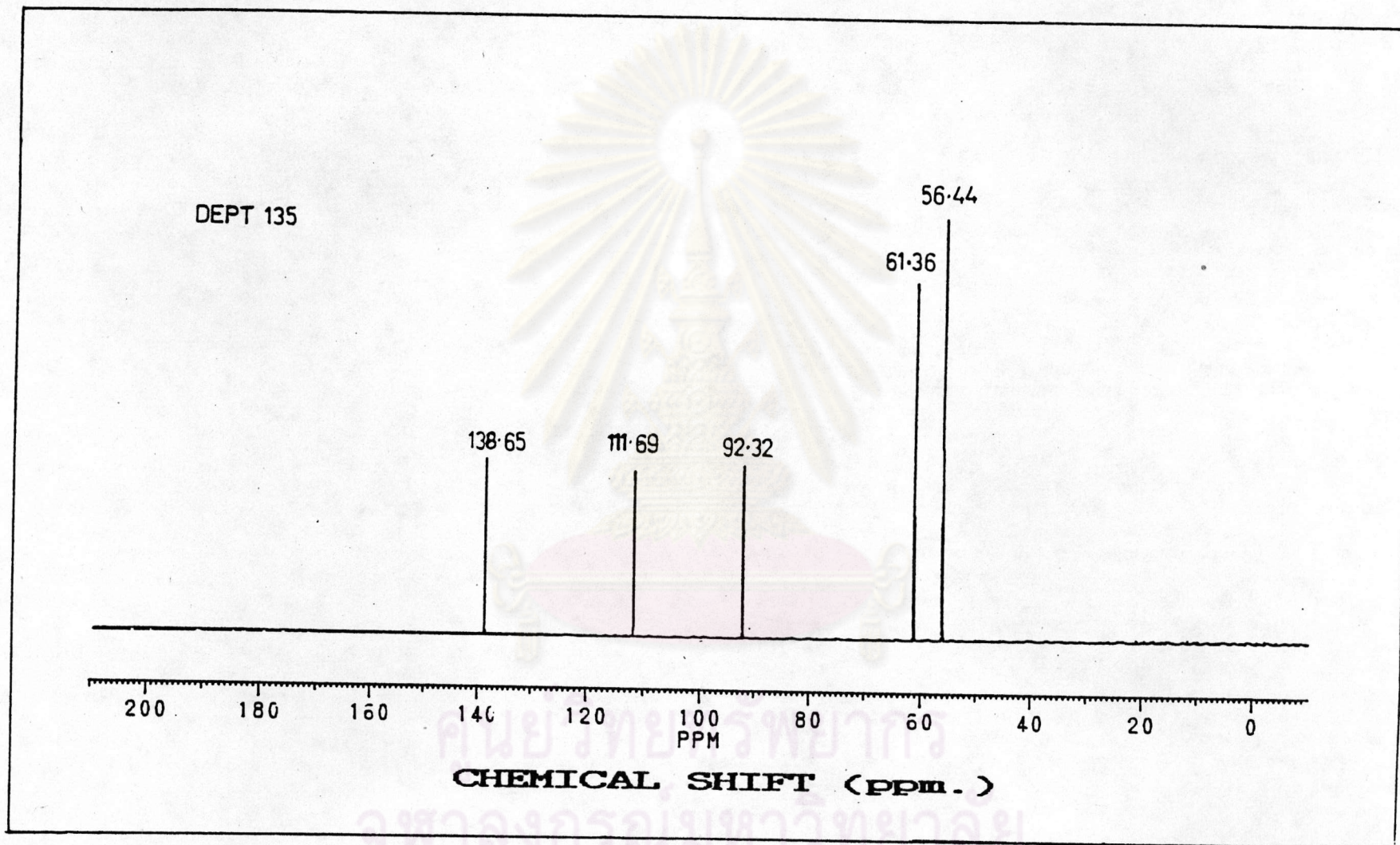


Figure 40 C) The ¹³C NMR spectrum of Compound(Z) [DEPT 135] (CDCl₃)

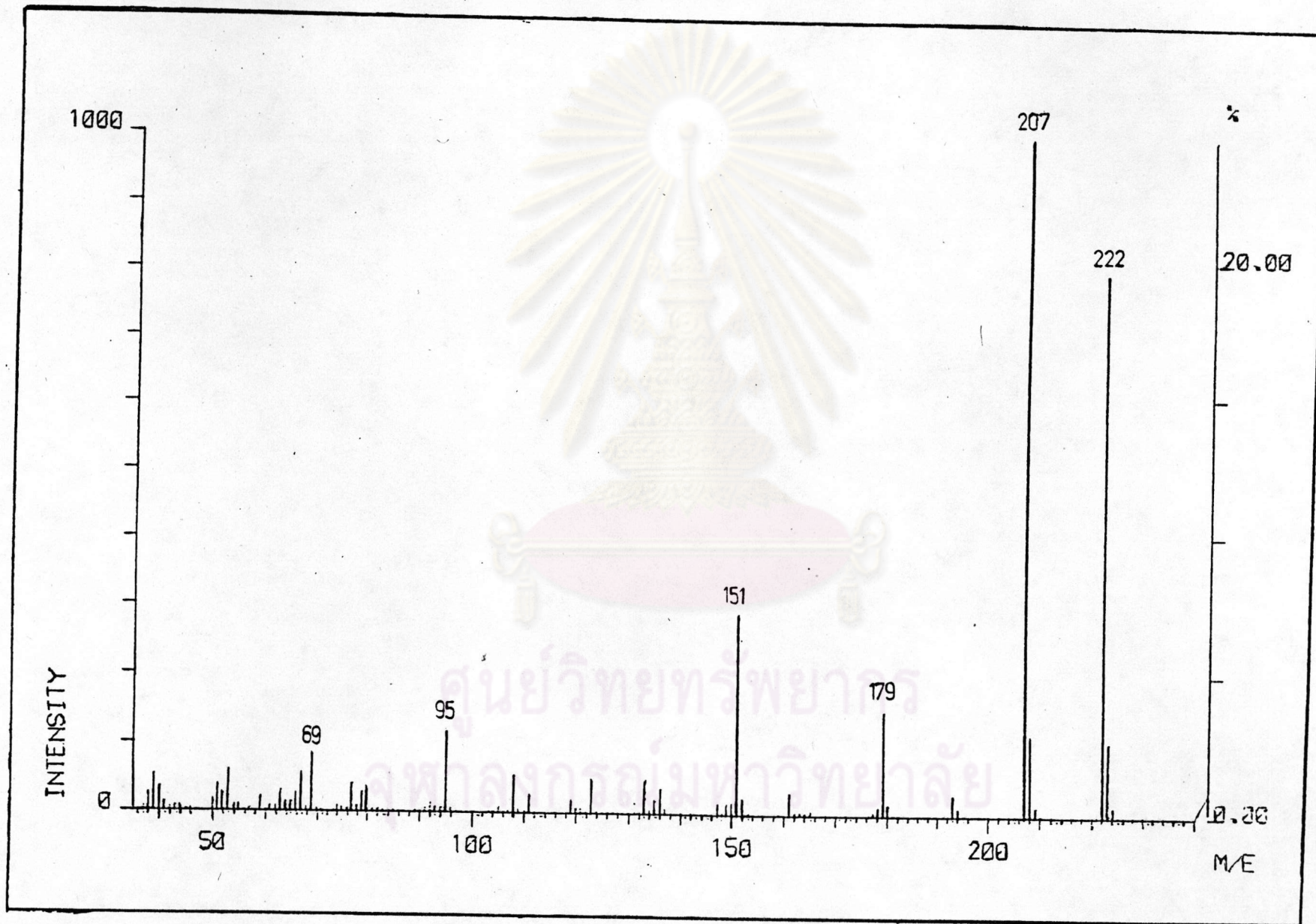


Figure 41 The mass spectrum of Compound(7)

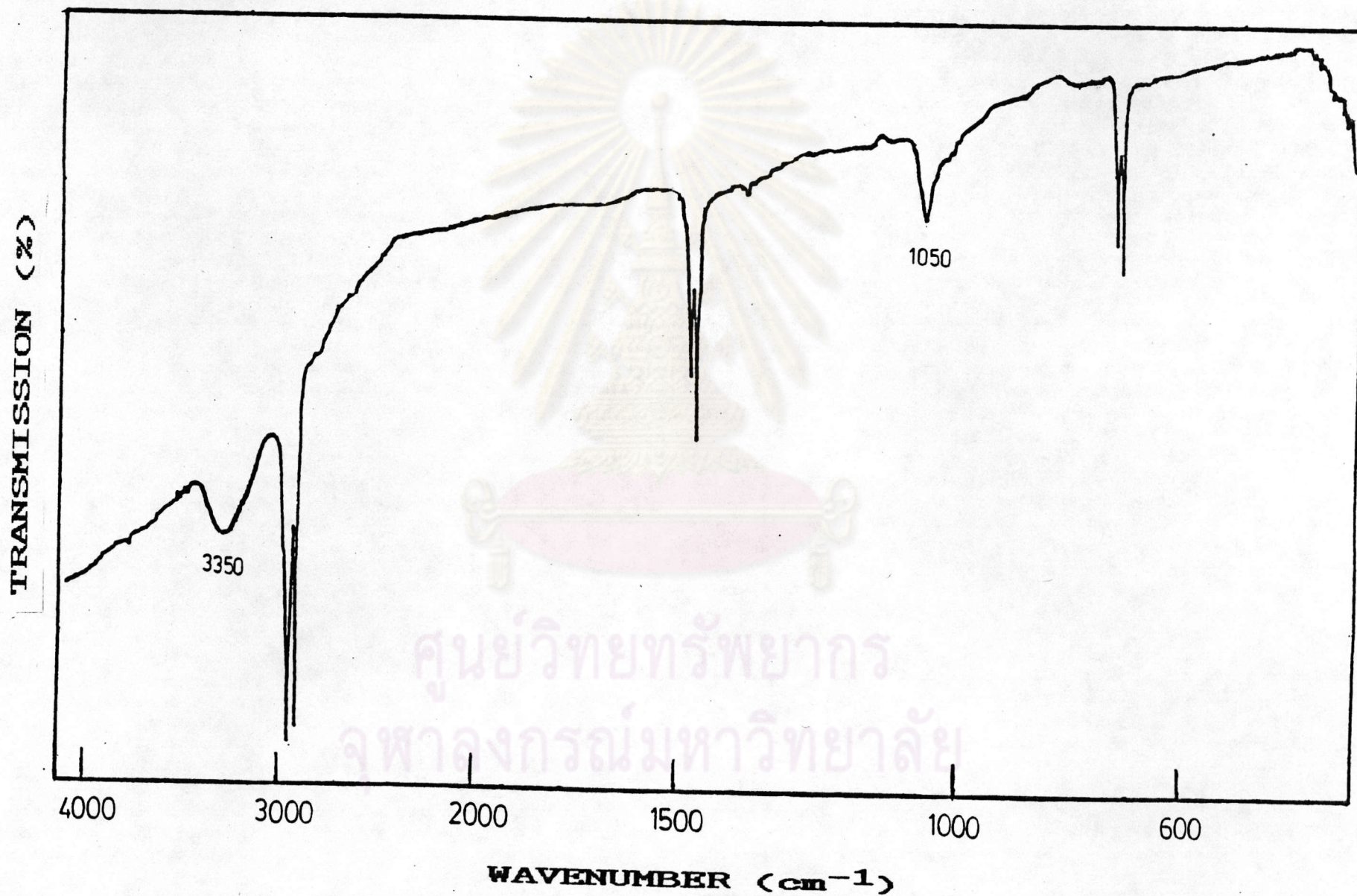


Figure 42 The IR spectrum of Compound (8)

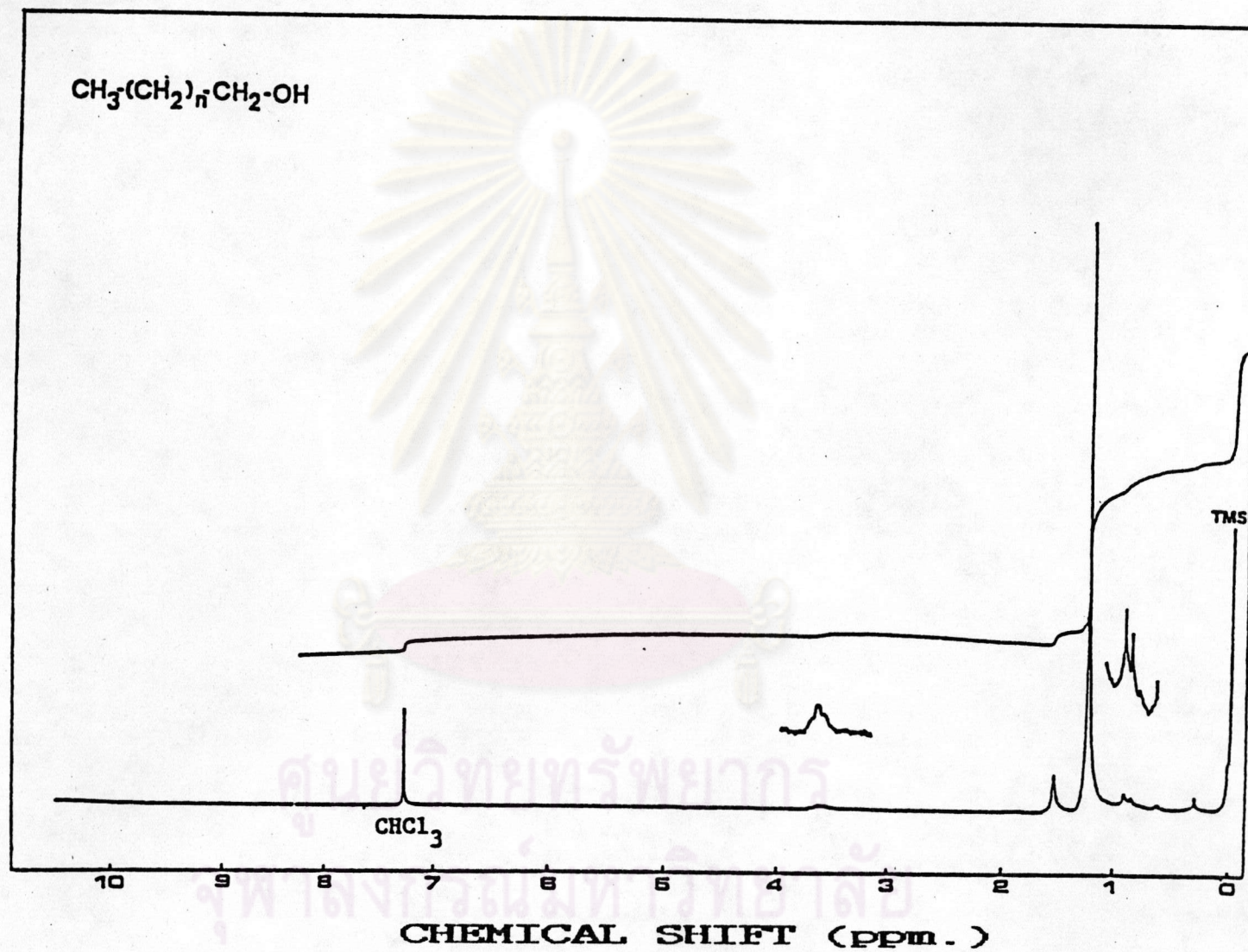


Figure 43 The ^1H NMR spectrum of Compound(8) (CDCl_3)

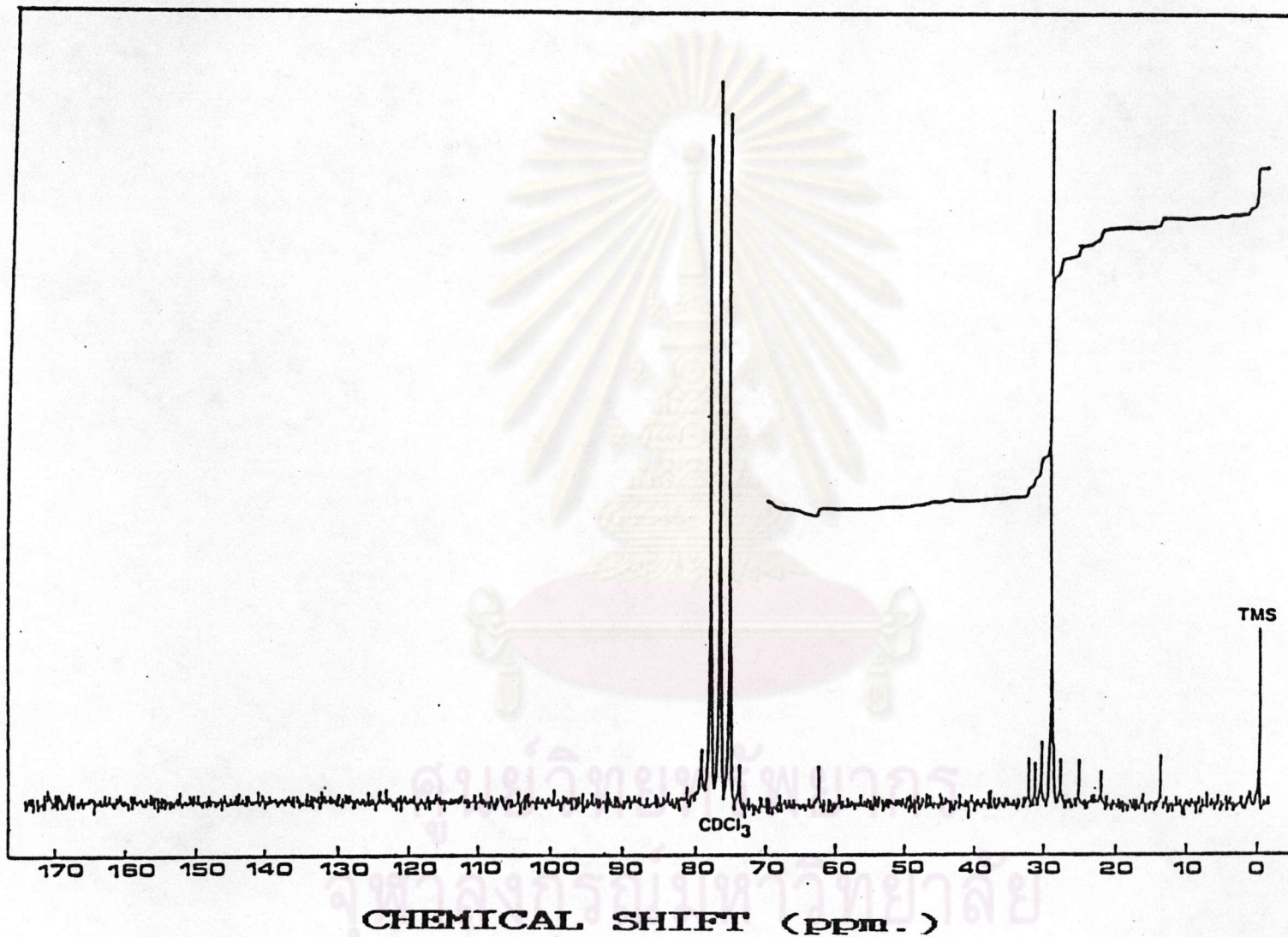


Figure 44 The ^{13}C NMR spectrum of Compound(8) (CDCl_3)

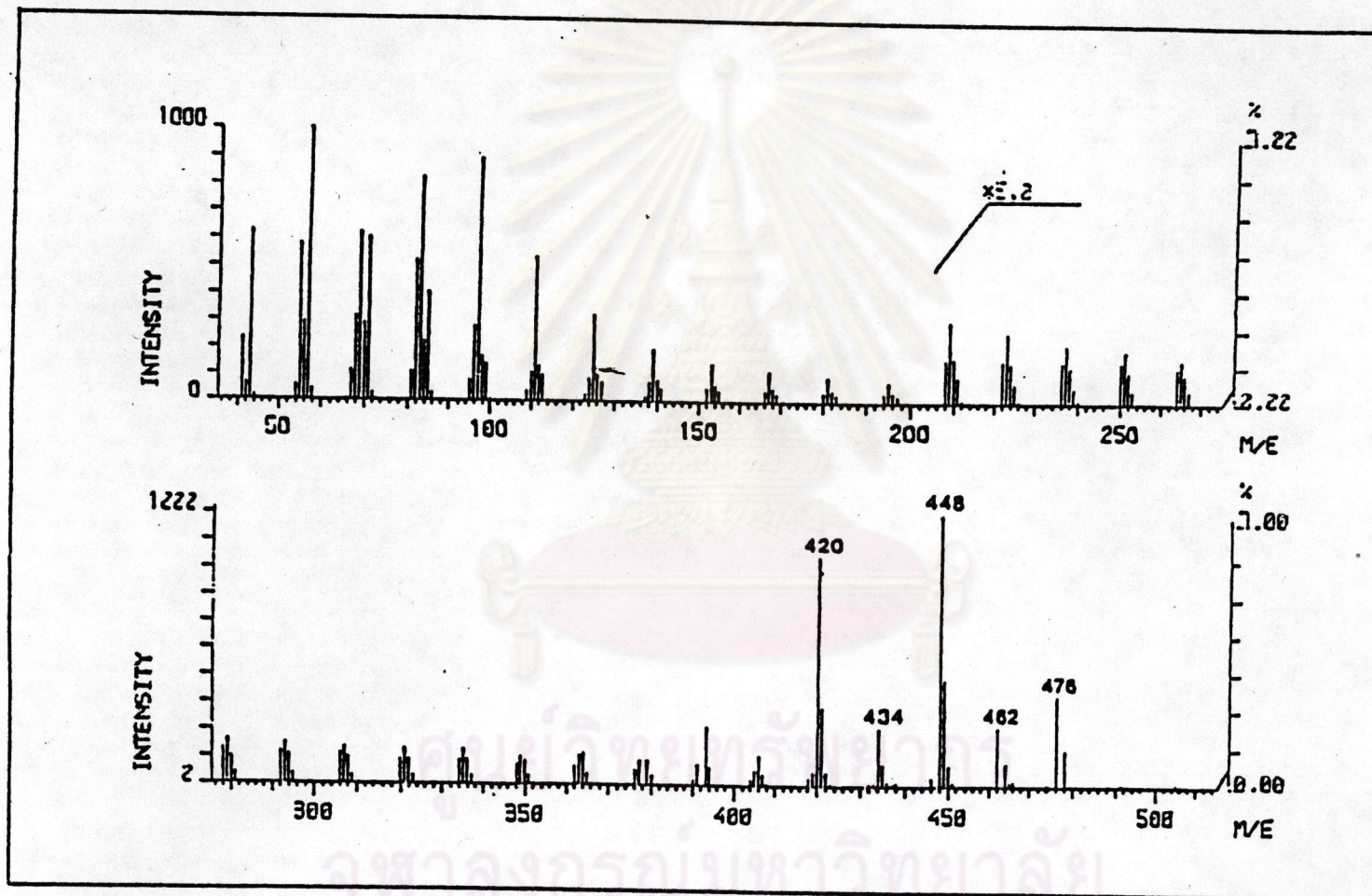


Figure 45 The mass spectrum of Compound (8)

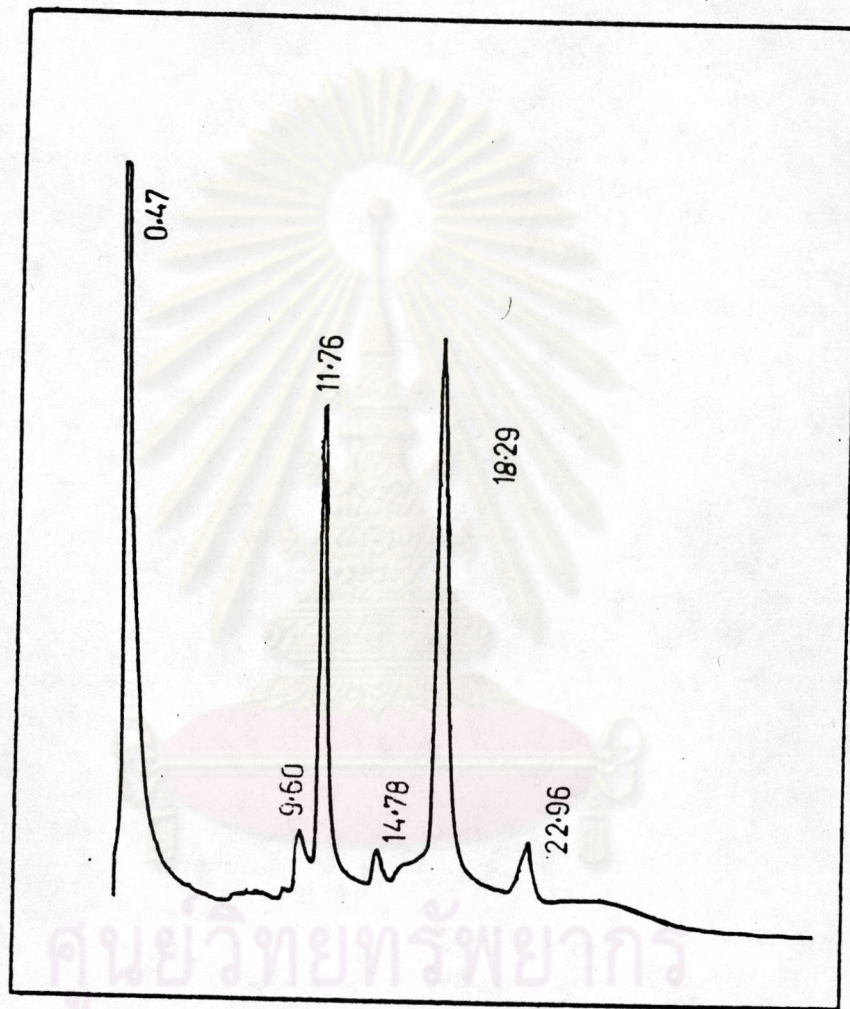


Figure 46 The GLC analysis results of Compound (8)

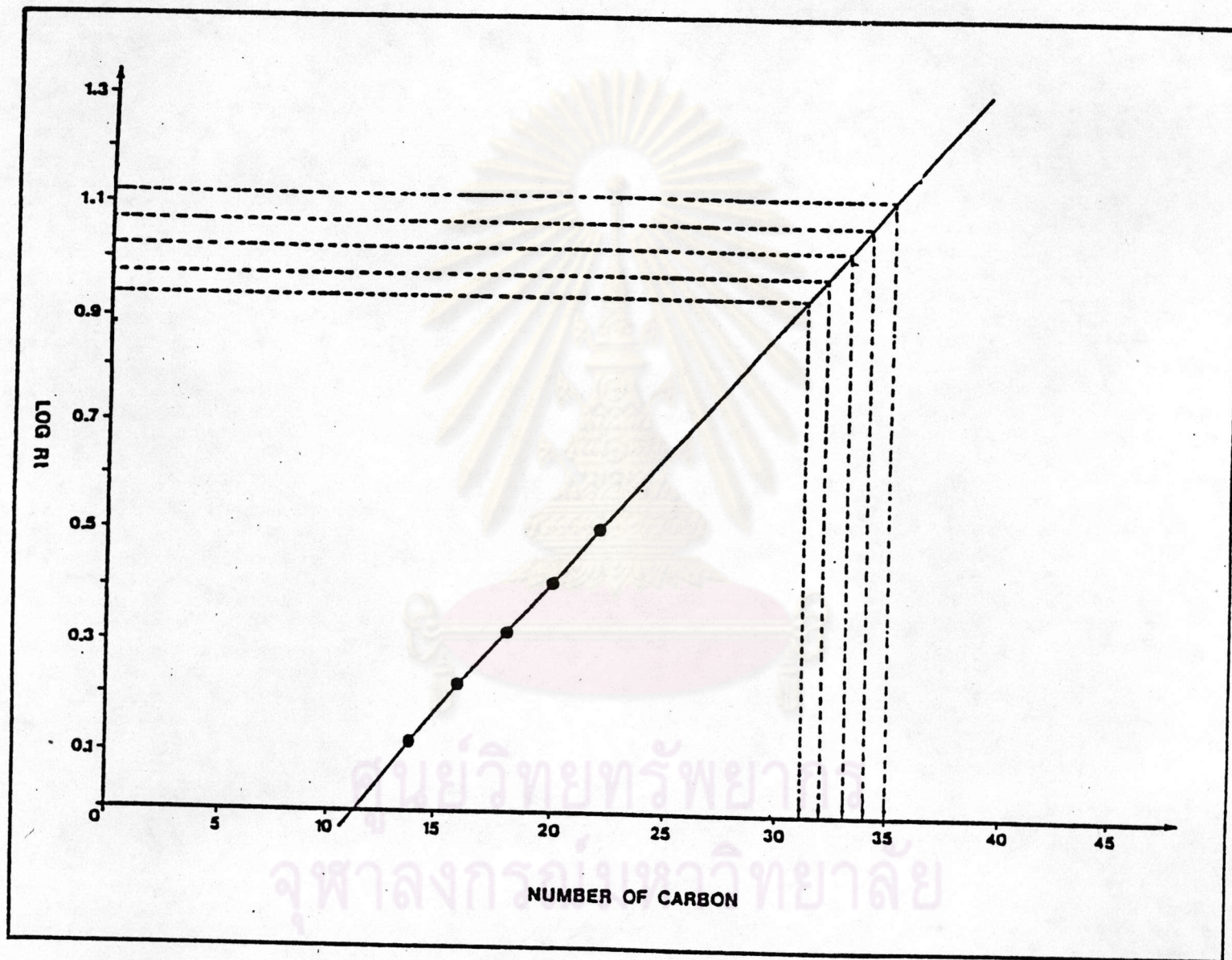


Figure 47 The standard correlation curve of Compound (g)

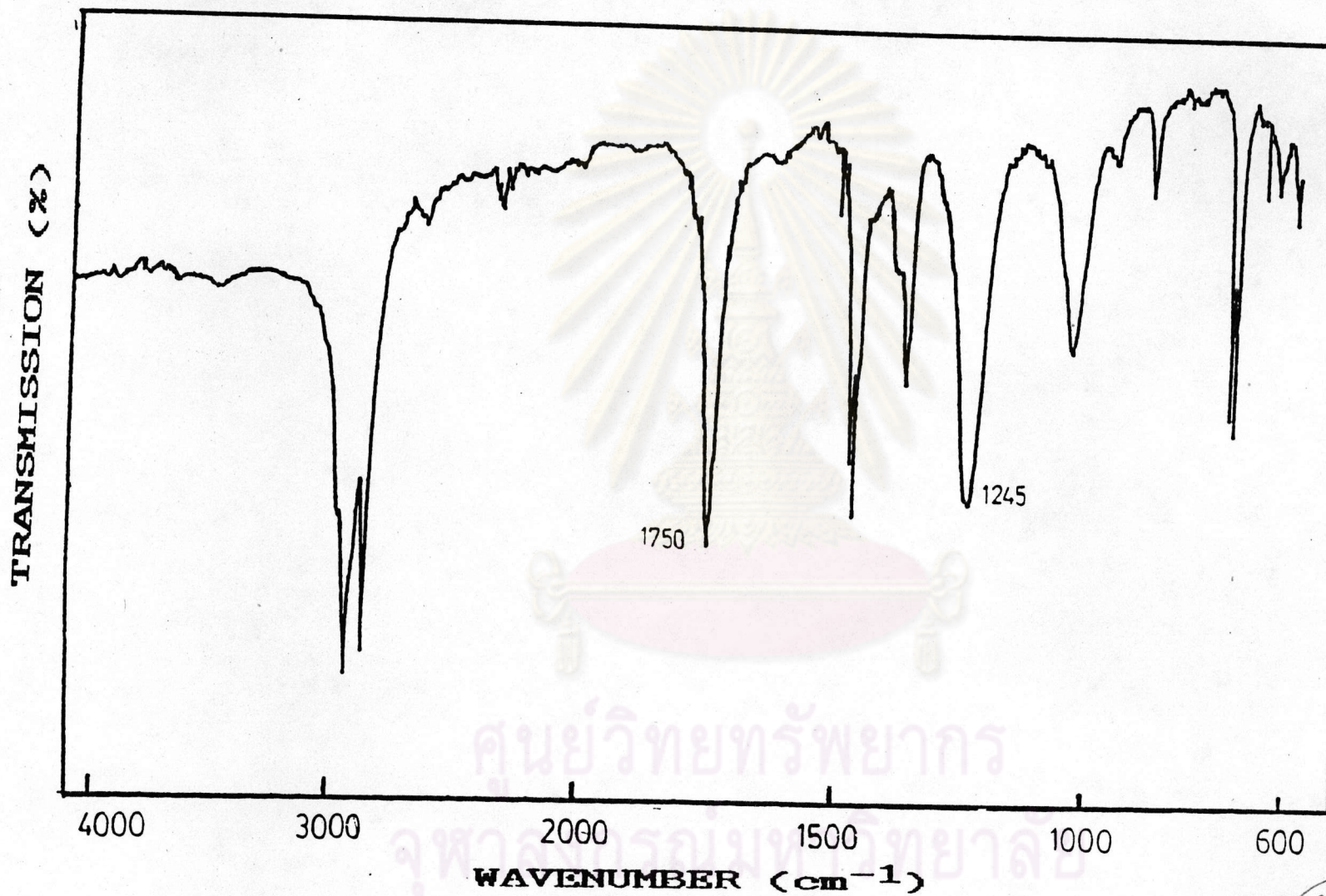


Figure 48 The IR spectrum of Compound(8) acetate



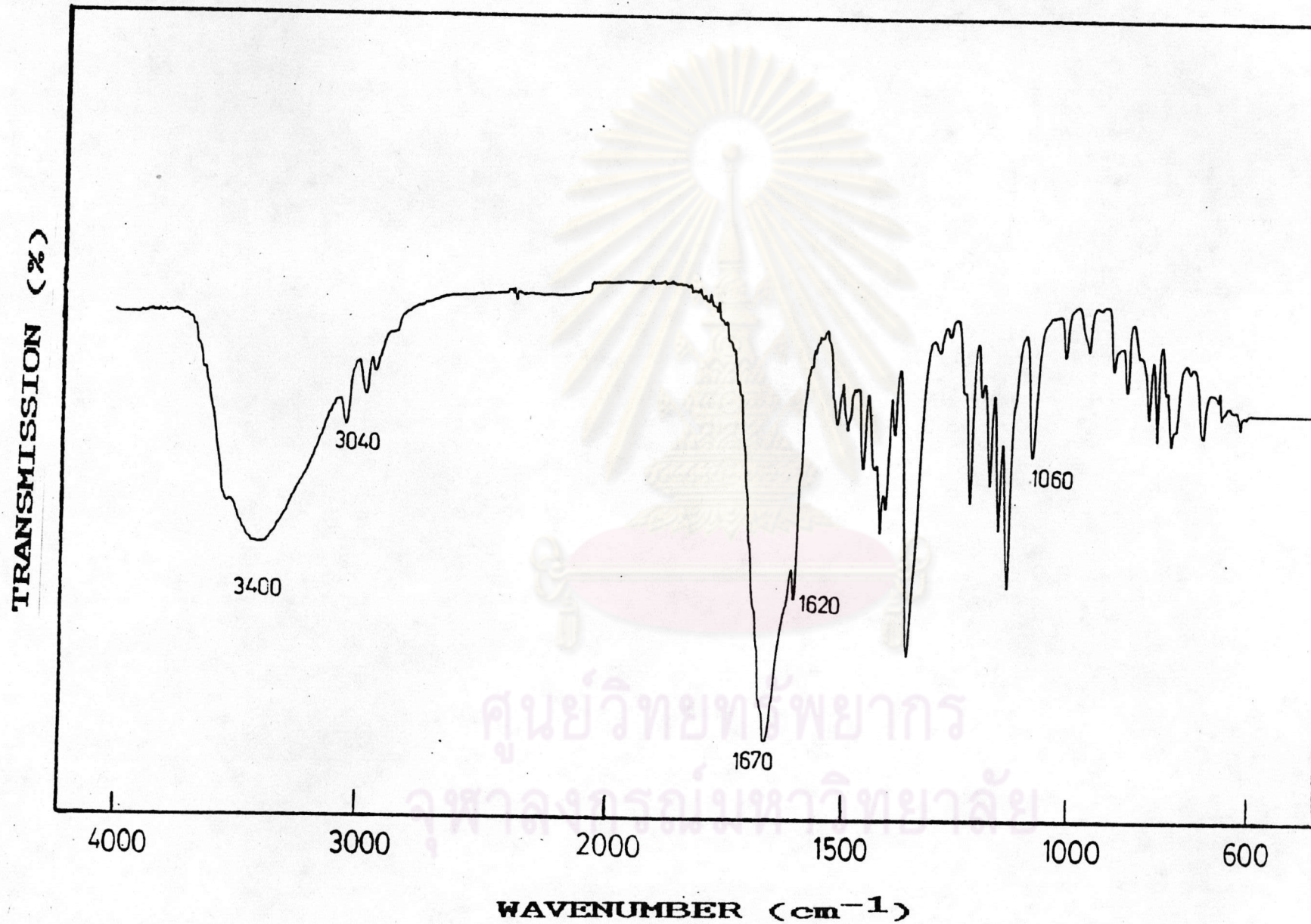


Figure 49 The IR spectrum of Compound(9)

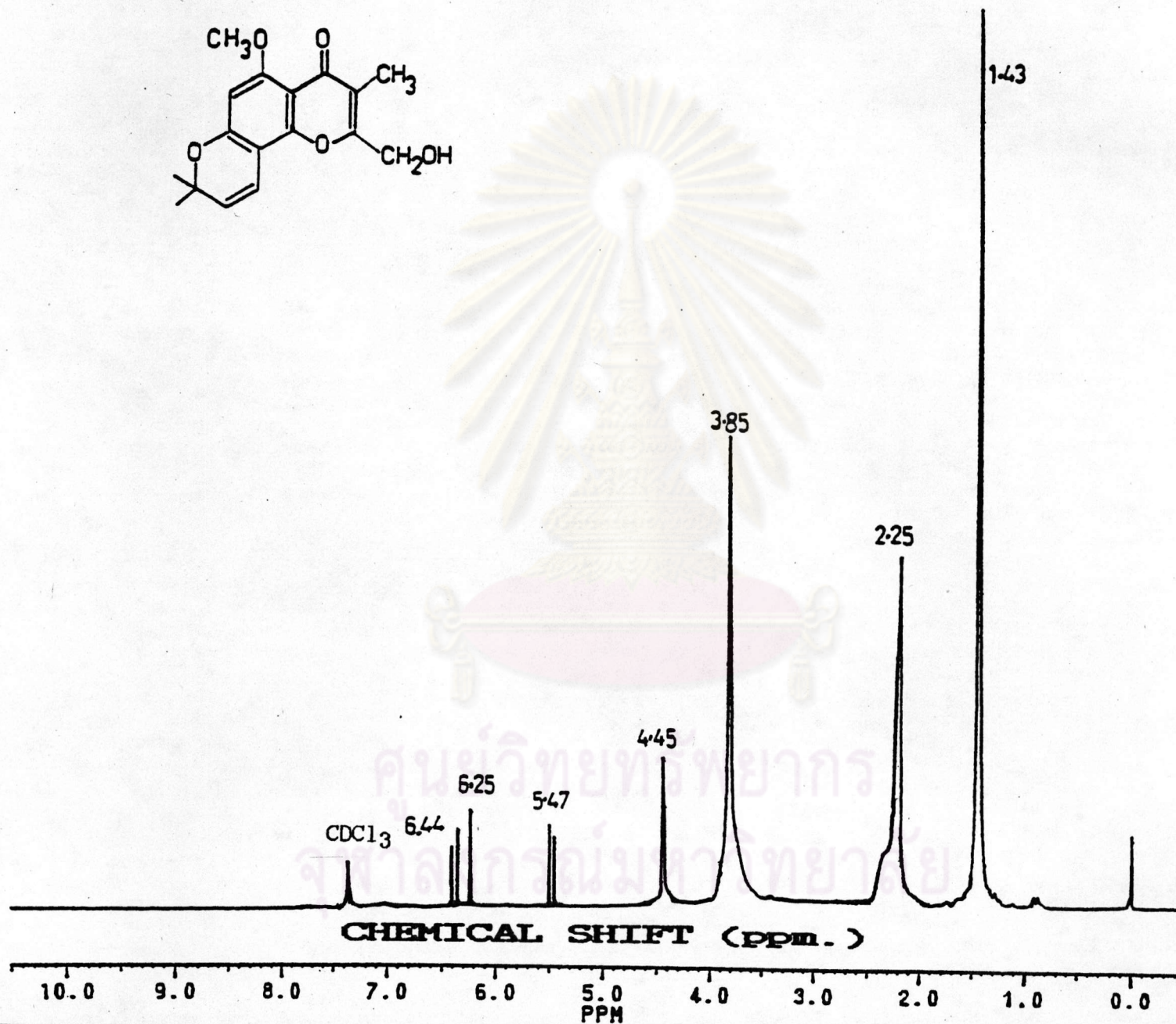
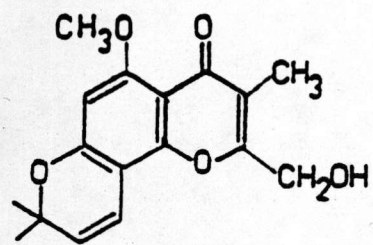


Figure 50 The ¹H NMR spectrum of Compound (9) (CDCl₃)

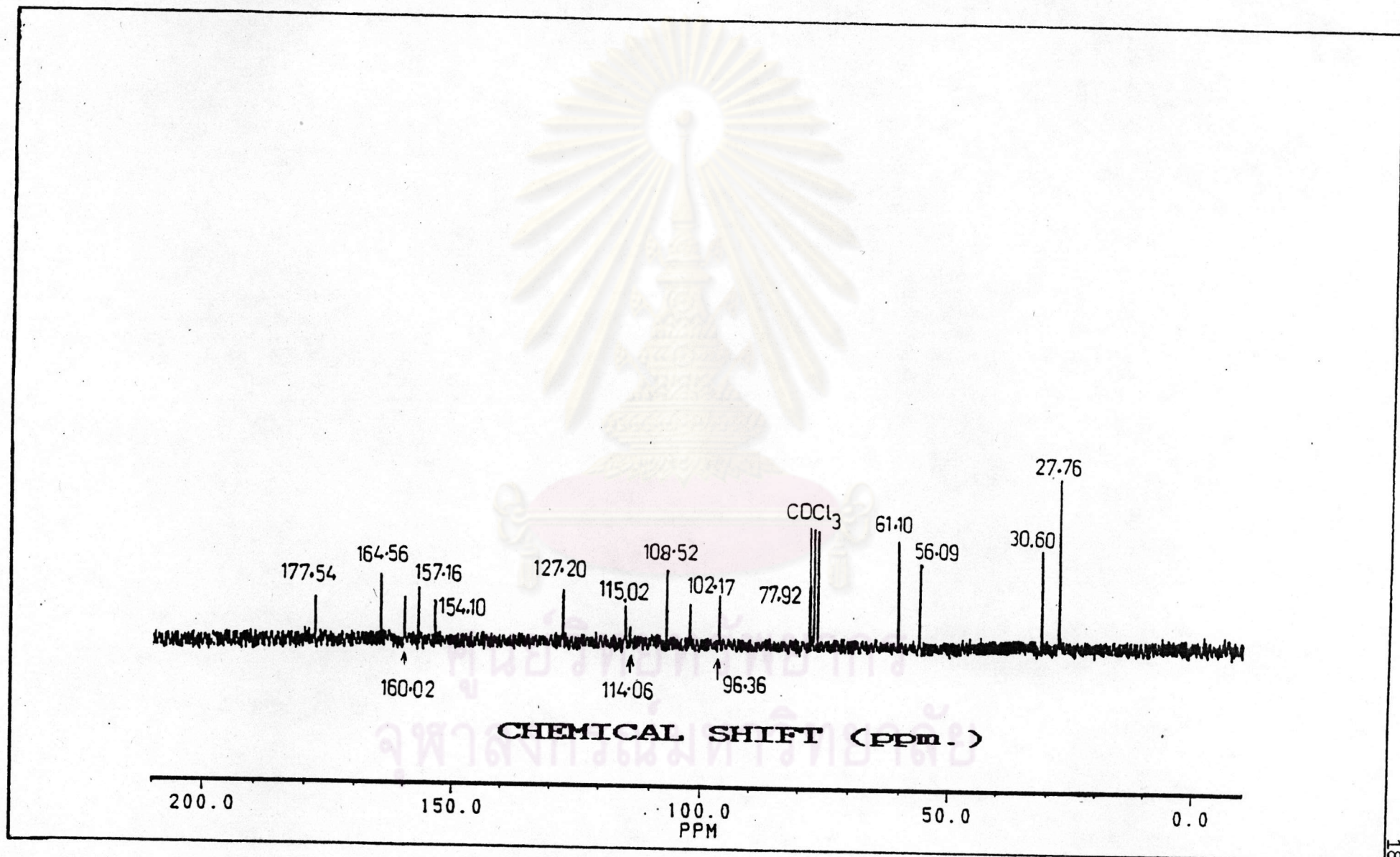


Figure 51 A) The ^{13}C NMR spectrum of Compound (9) (CDCl_3)

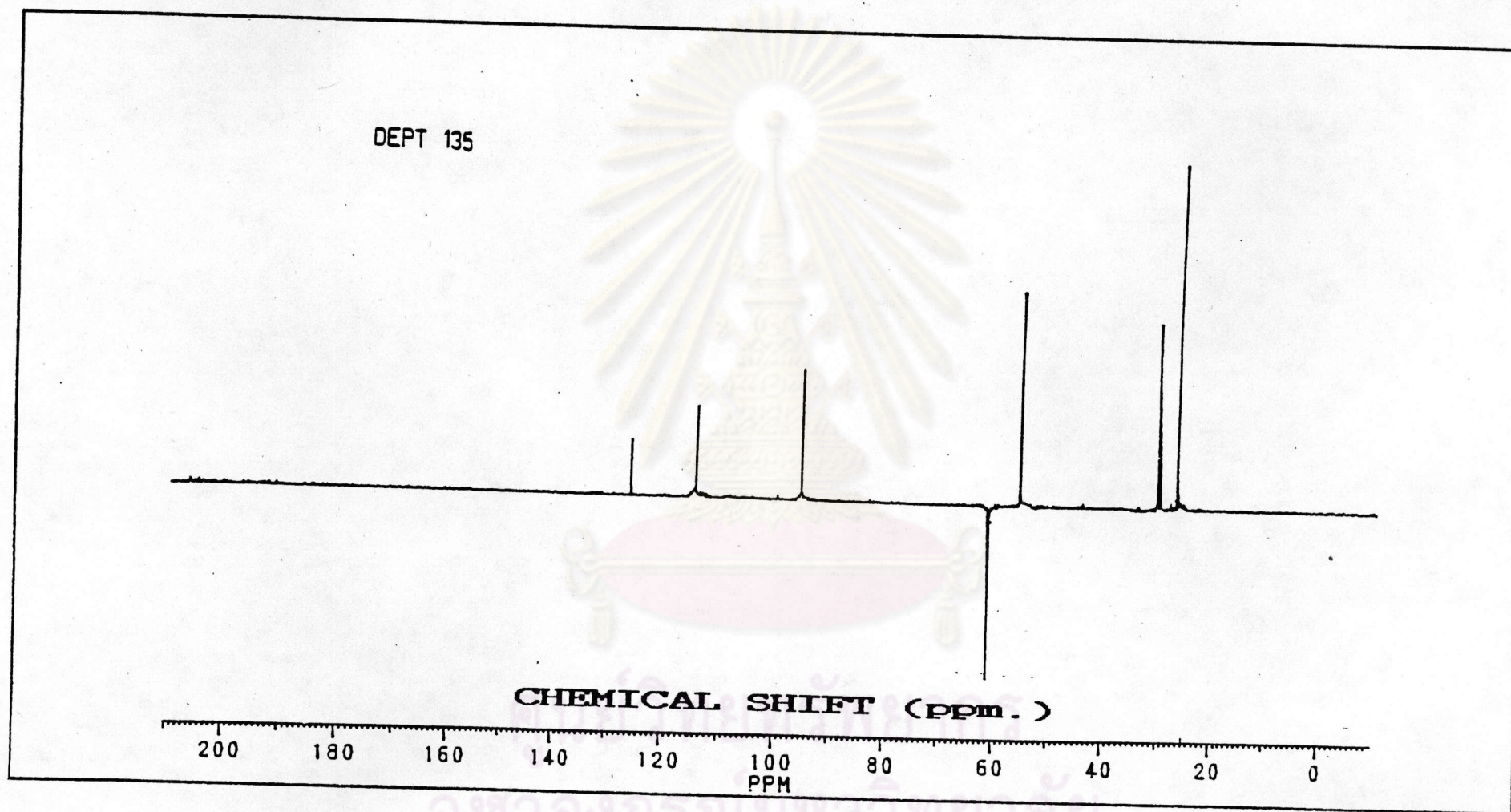


Figure 51 B) The ^{13}C NMR DEPT 135 spectrum of Compound(9) (CDCl_3)

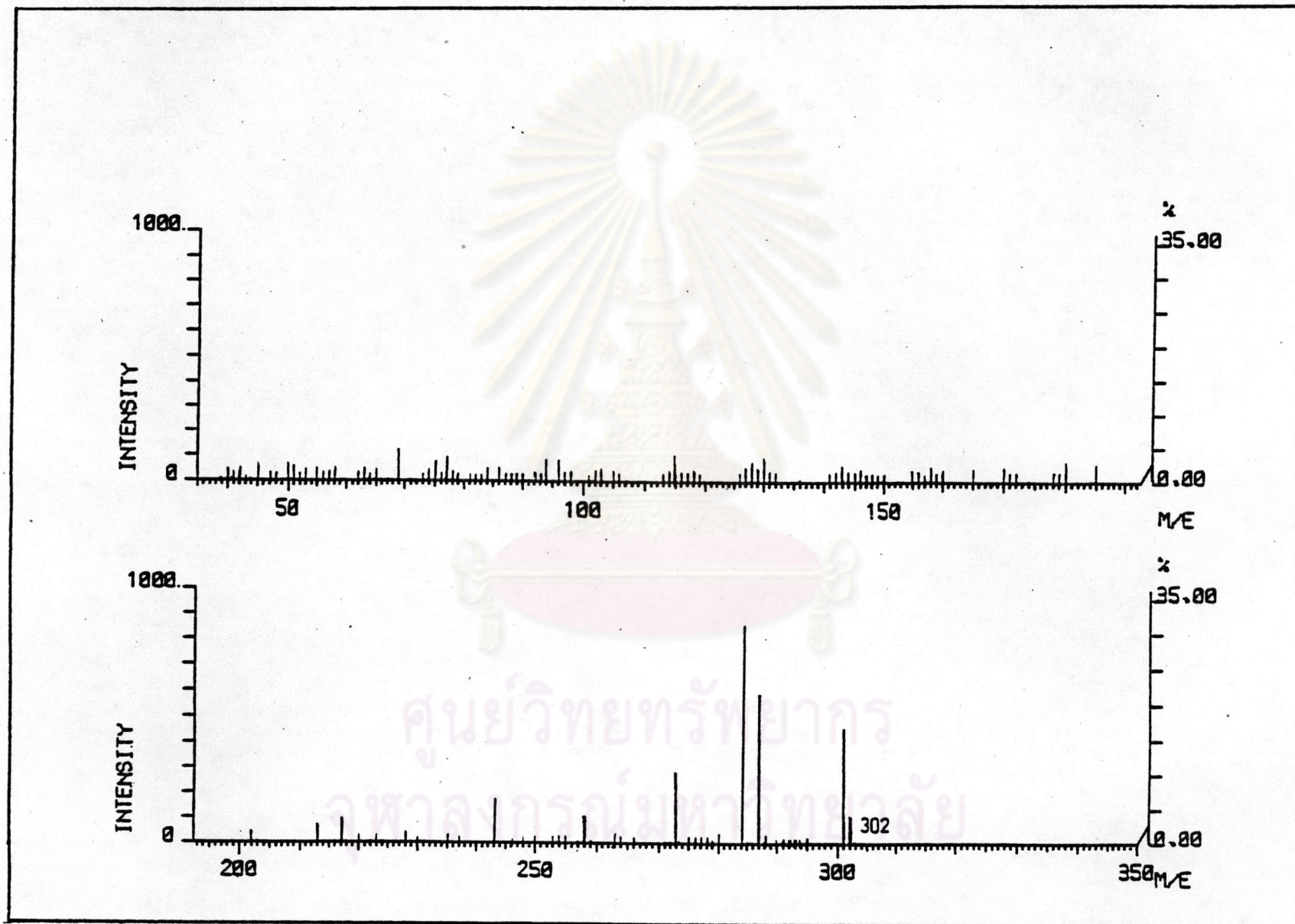


Figure 52 The mass spectrum of Compound(9)



Figure 53 The inorganic element analysis of water crude extract by Energy Dispersive X-Ray Fluorescence Spectrometer

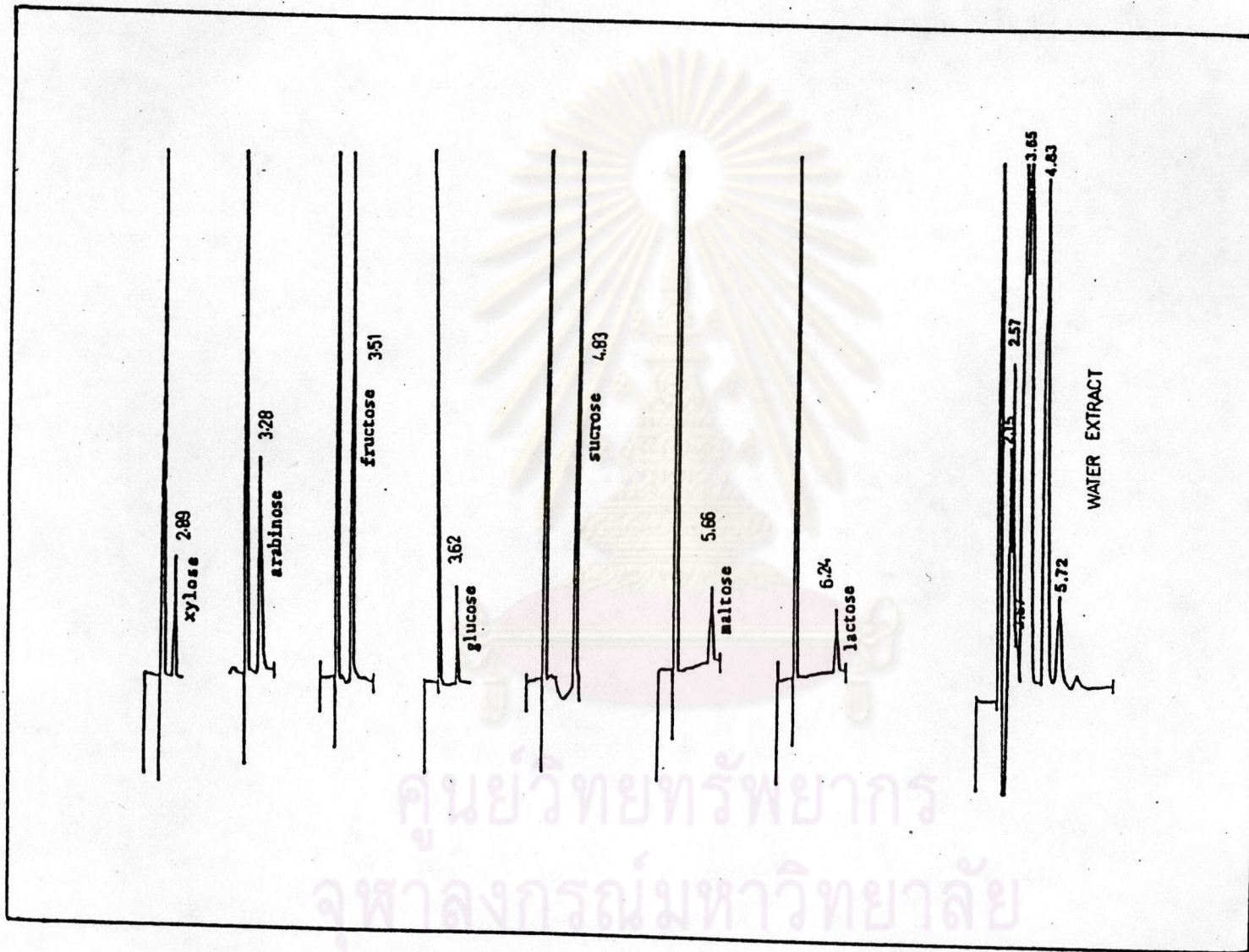


Figure 54 The carbohydrate analysis of water extract by High Performance Liquid Chromatography

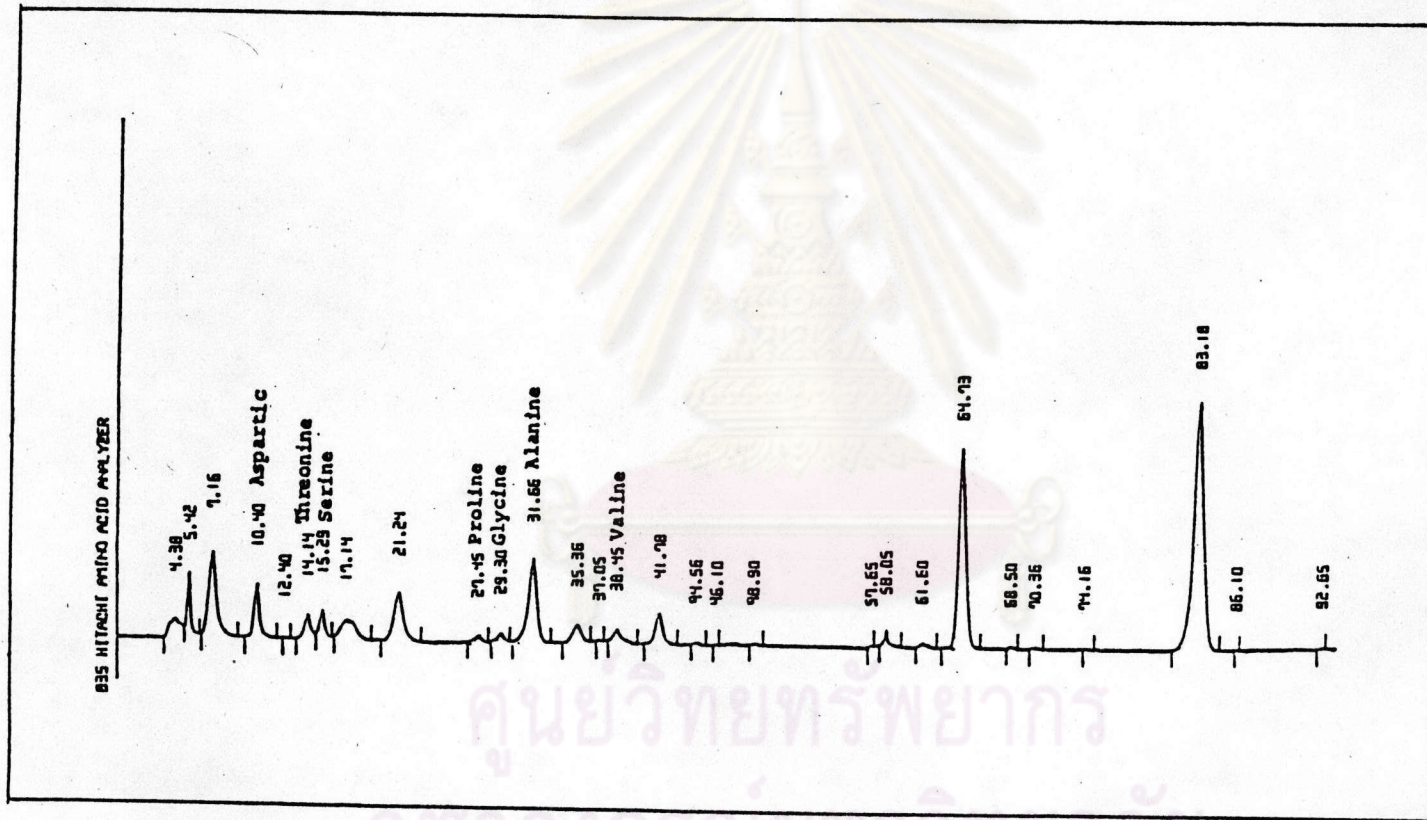


Figure 55 Amino acid analysis of water crude extract by Amino Acid Analyzer

VITA

Miss Manida Stitmannaitam was born on October 21, 1967 in Bangkok, Thailand. She received her Bachelor Degree of Science (Chemistry) from Kasetsart University in 1989. Since 1989, she has been a graduate student studying Organic Chemistry at Chulalongkorn University. During her study towards the Master's degree, she was awarded a Rhône-Poulenc Professor Lehn Scholarship during 1989-1991 and a research grant for her Master degree's thesis from the Graduate School, Chulalongkorn University.



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