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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

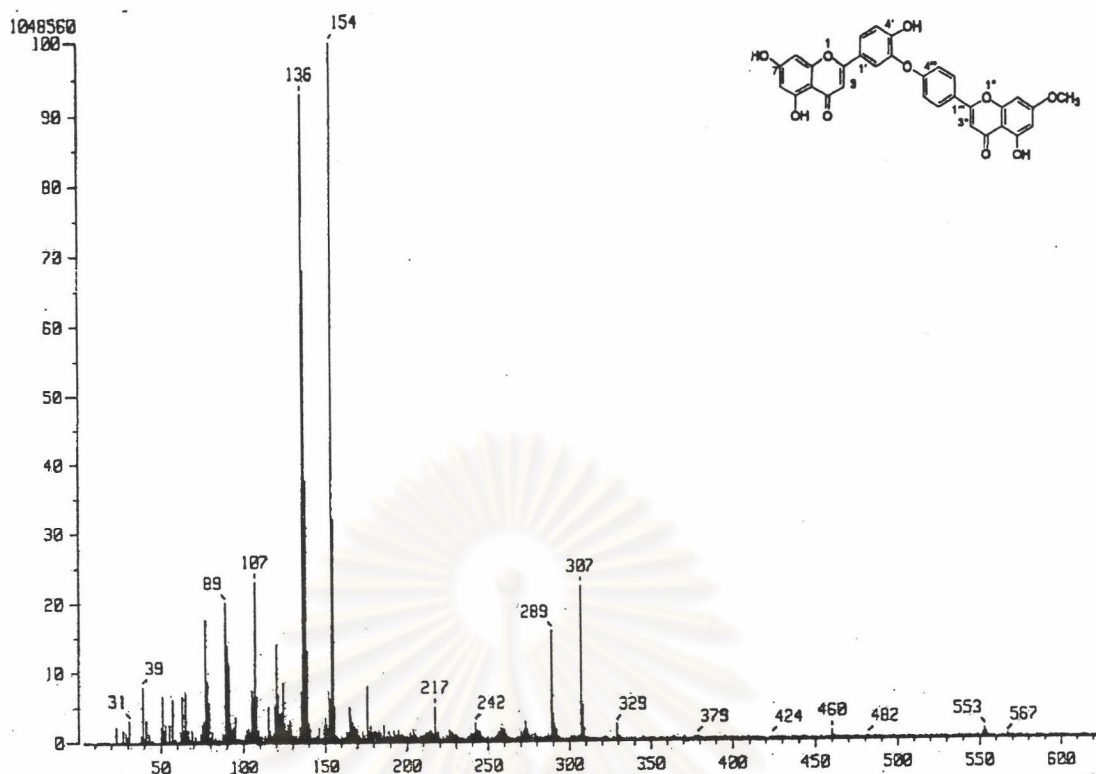


Figure 5 The FAB mass spectrum of compound 47

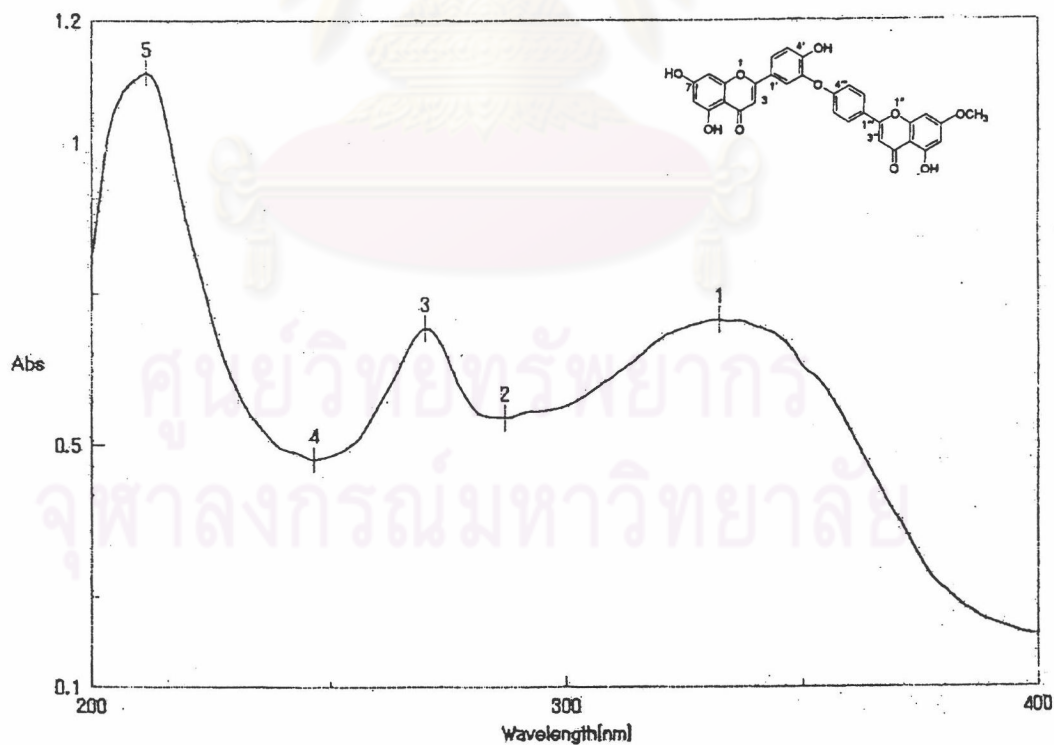


Figure 6 The UV spectrum of compound 47 (in methanol)

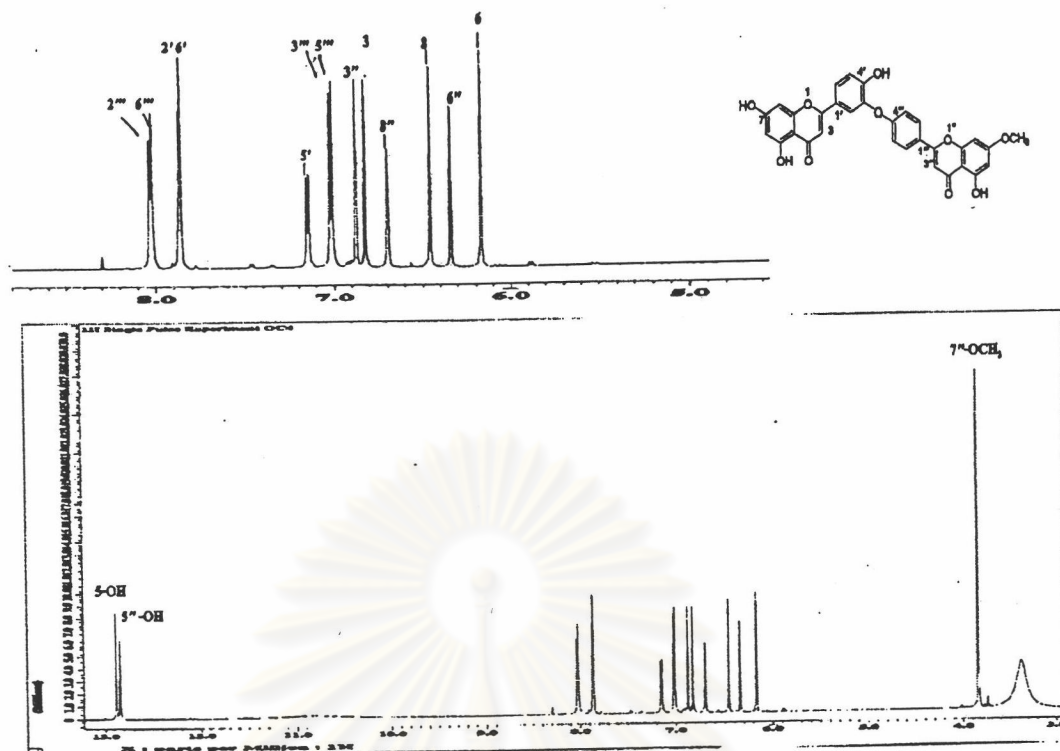


Figure 7 The ^1H NMR (600 MHz) spectrum of compound 47 (in $\text{DMSO}-d_6$)

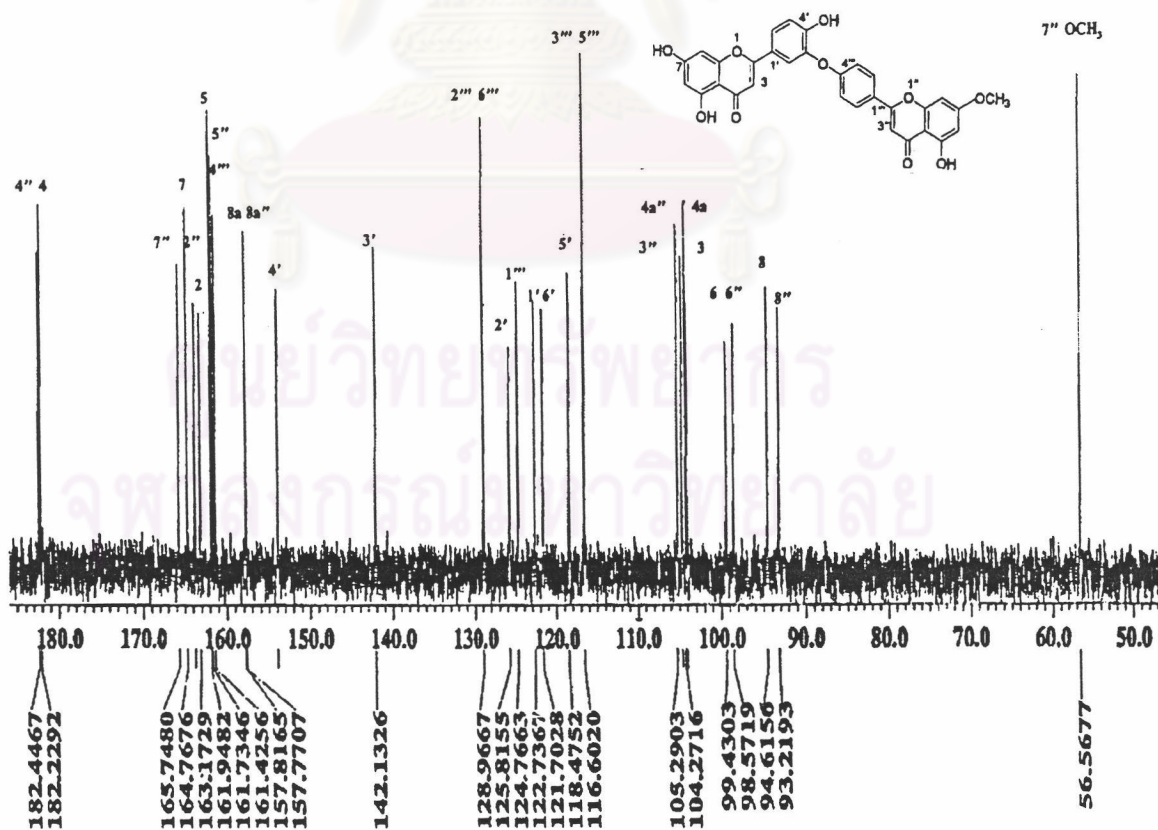


Figure 8 The ^{13}C NMR (150 MHz) spectrum of compound 47 (in $\text{DMSO}-d_6$)

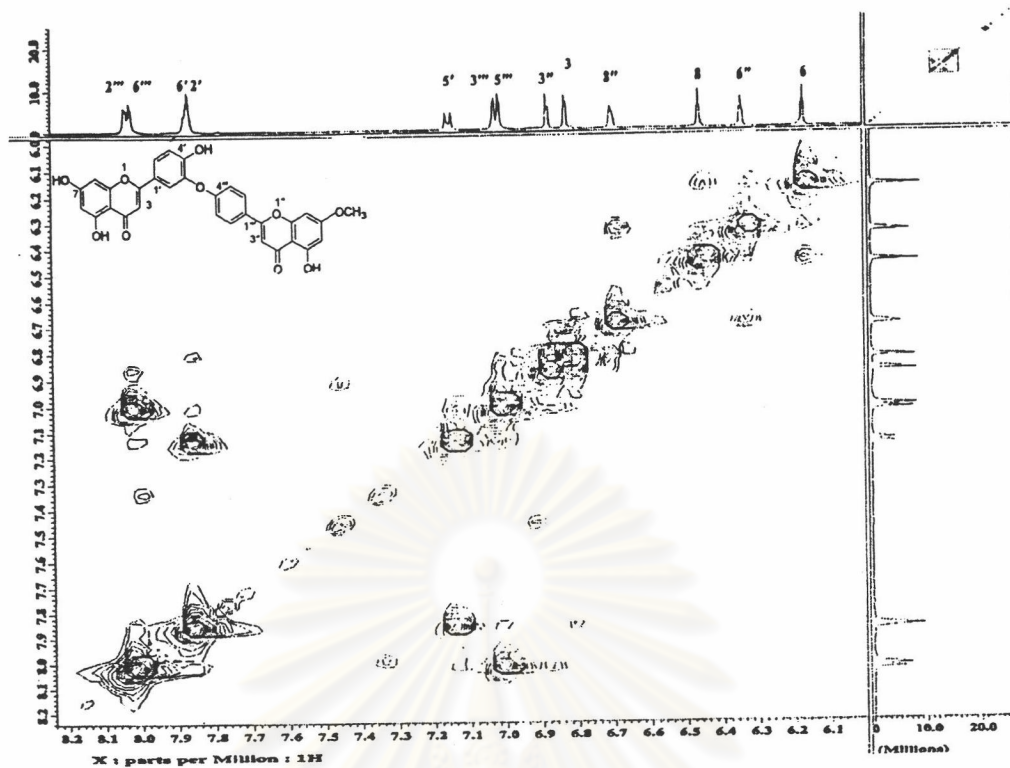


Figure 9 The ^1H - ^1H COSY spectrum of compound 47 (in $\text{DMSO}-d_6$)

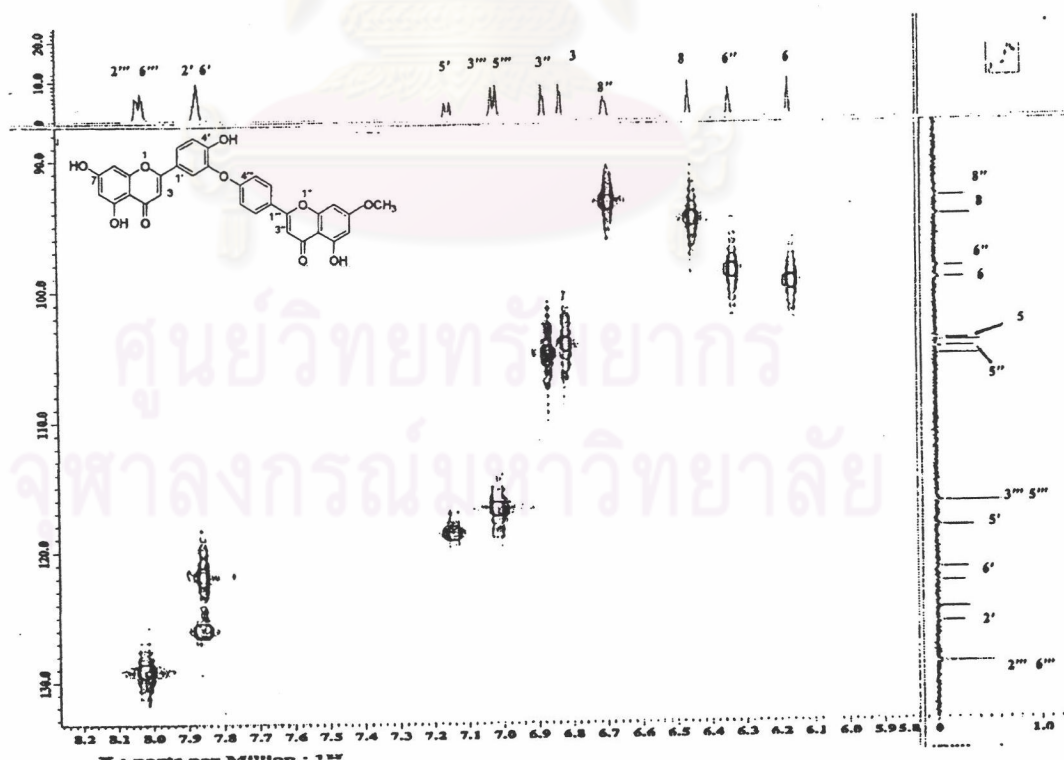


Figure 10 The HMQC spectrum of compound 47 (in $\text{DMSO}-d_6$)

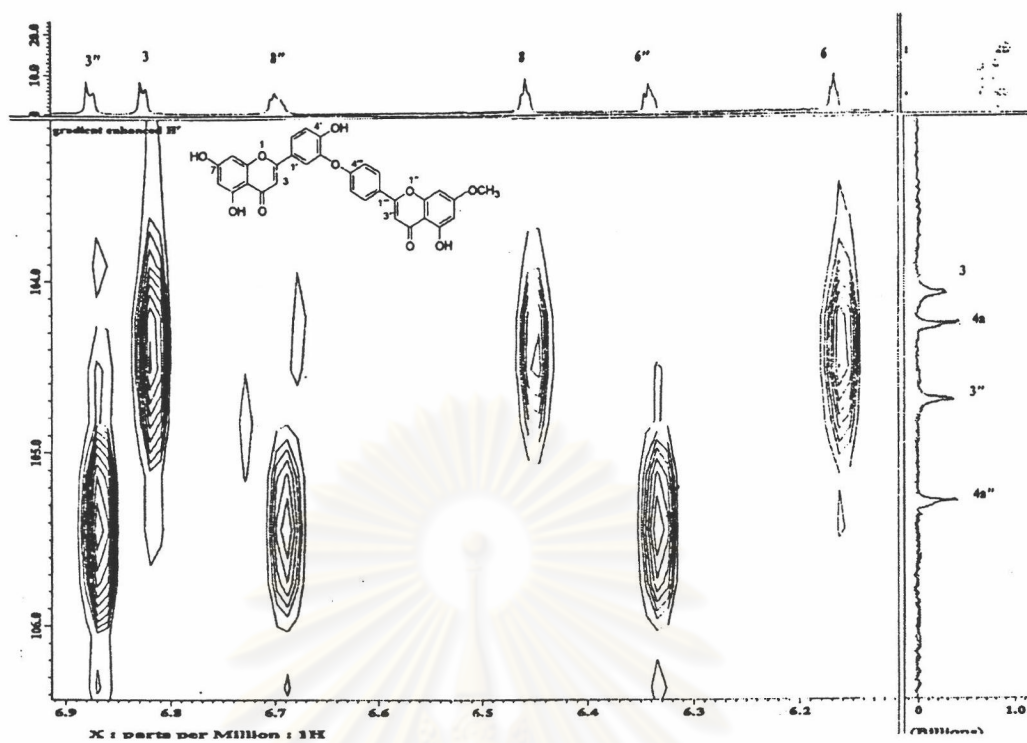


Figure 11 The HMBC spectrum of compound 47 (in DMSO- d_6)

$[\delta_H 6.2-6.9 \text{ ppm}, \delta_C 103.0-107.0 \text{ ppm}]$

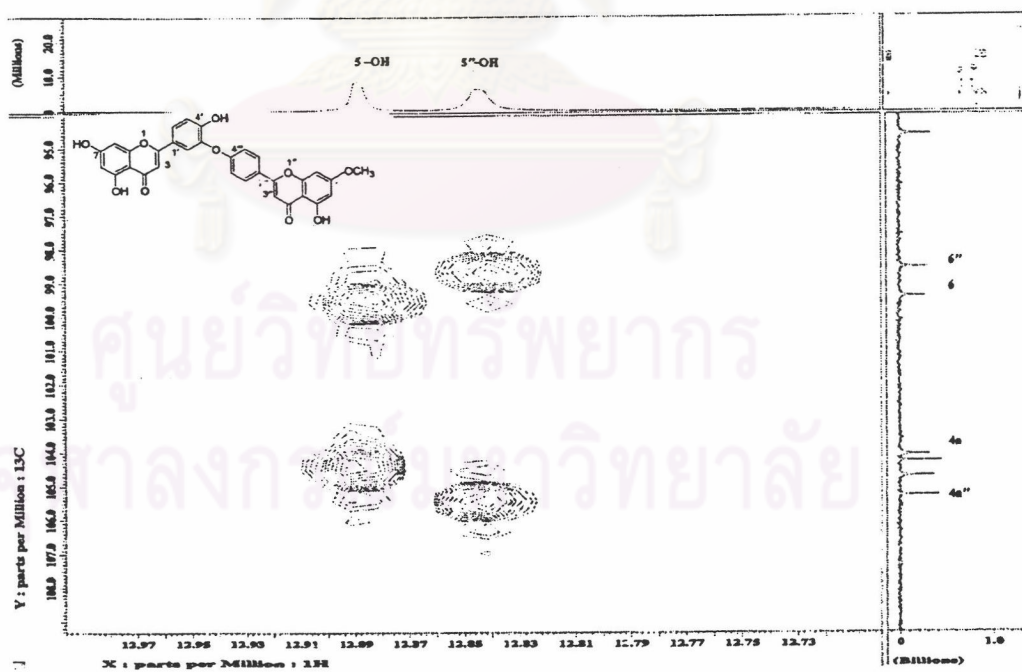


Figure 12 The HMBC spectrum of compound 47 (in DMSO- d_6)

$[\delta_H 12.73-12.97 \text{ ppm}, \delta_C 95.0-108.0 \text{ ppm}]$

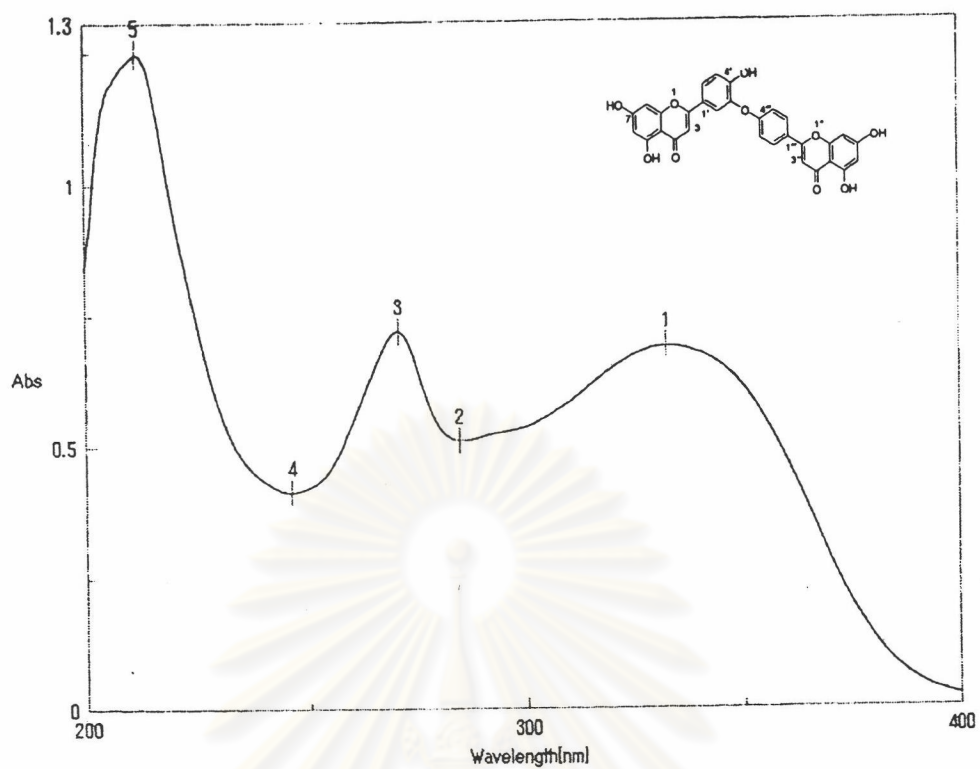


Figure 15 The UV spectrum of compound 4 (in methanol)

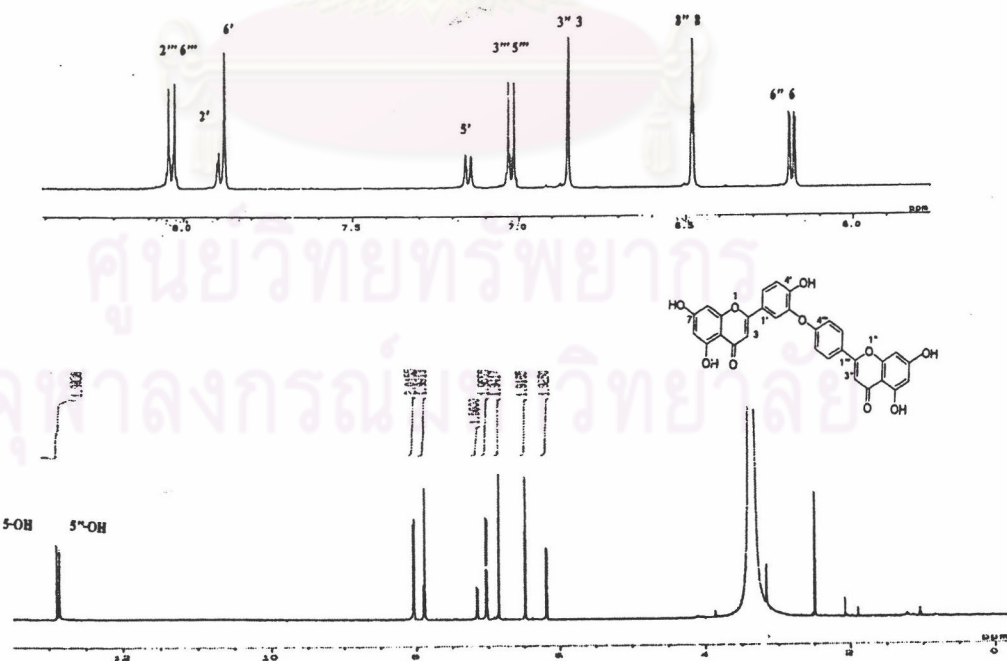


Figure 16 The ^1H NMR (600 MHz) spectrum of compound 4 (in $\text{DMSO}-d_6$)

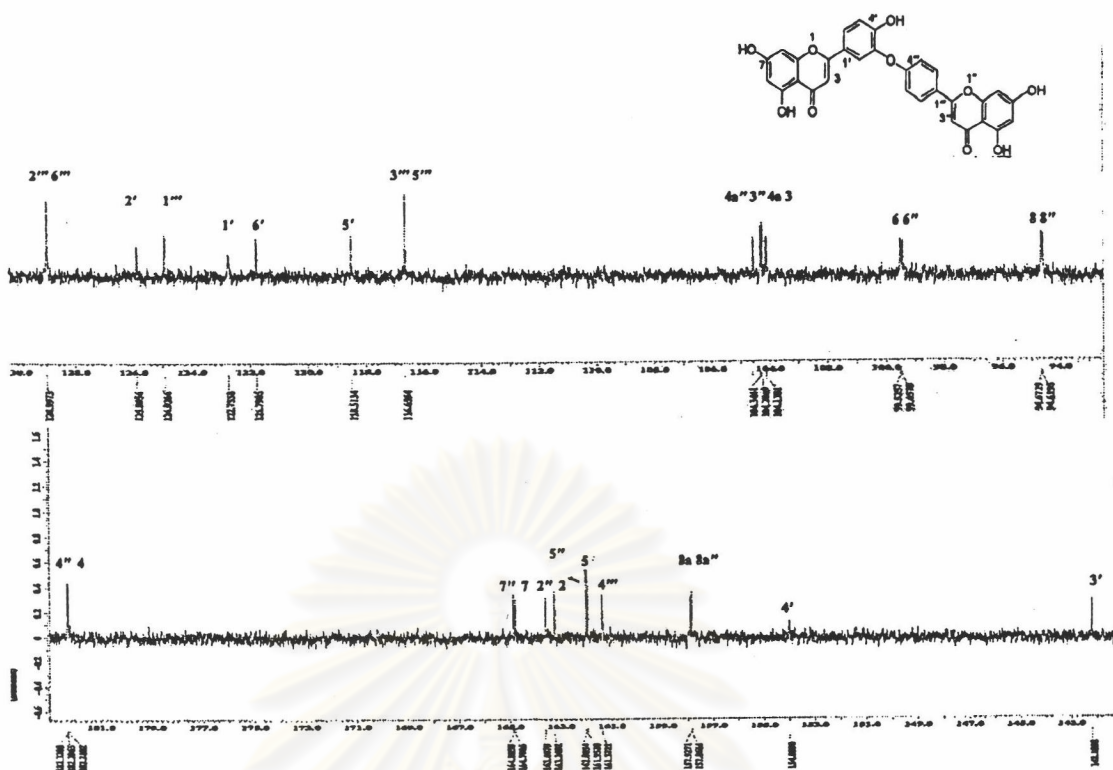


Figure 17 The ^{13}C NMR (150 MHz) spectrum of compound 4 (in $\text{DMSO}-d_6$)

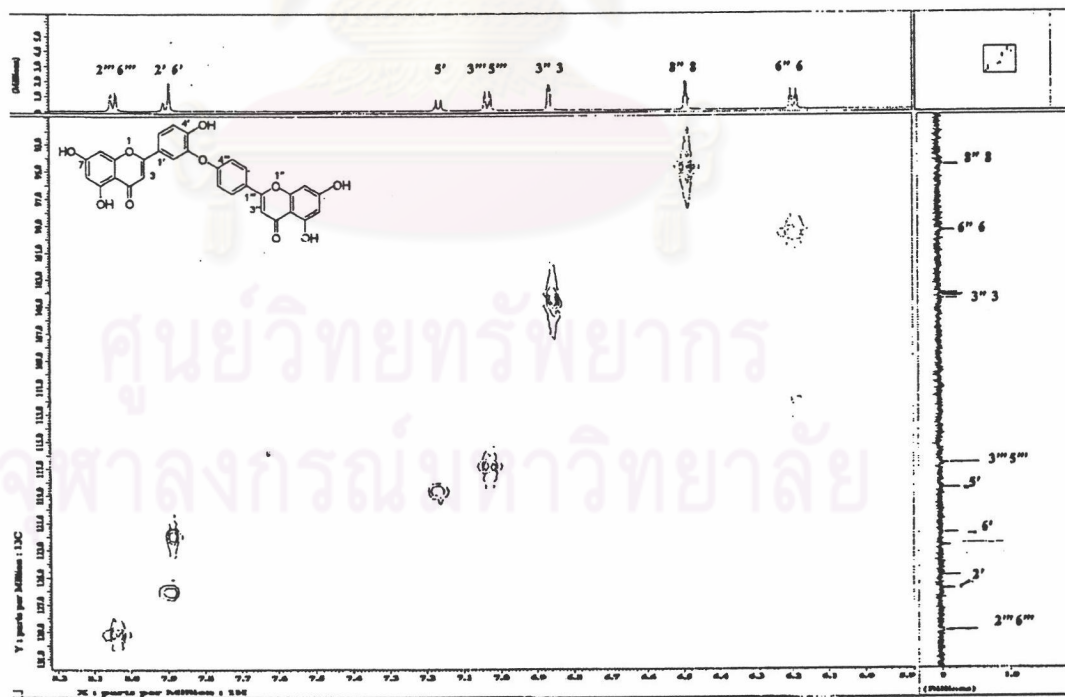


Figure 18 The HMQC spectrum of compound 4 (in $\text{DMSO}-d_6$)

$[\delta_{\text{H}} 5.9-8.2 \text{ ppm}, \delta_{\text{C}} 93.0-131.0 \text{ ppm}]$

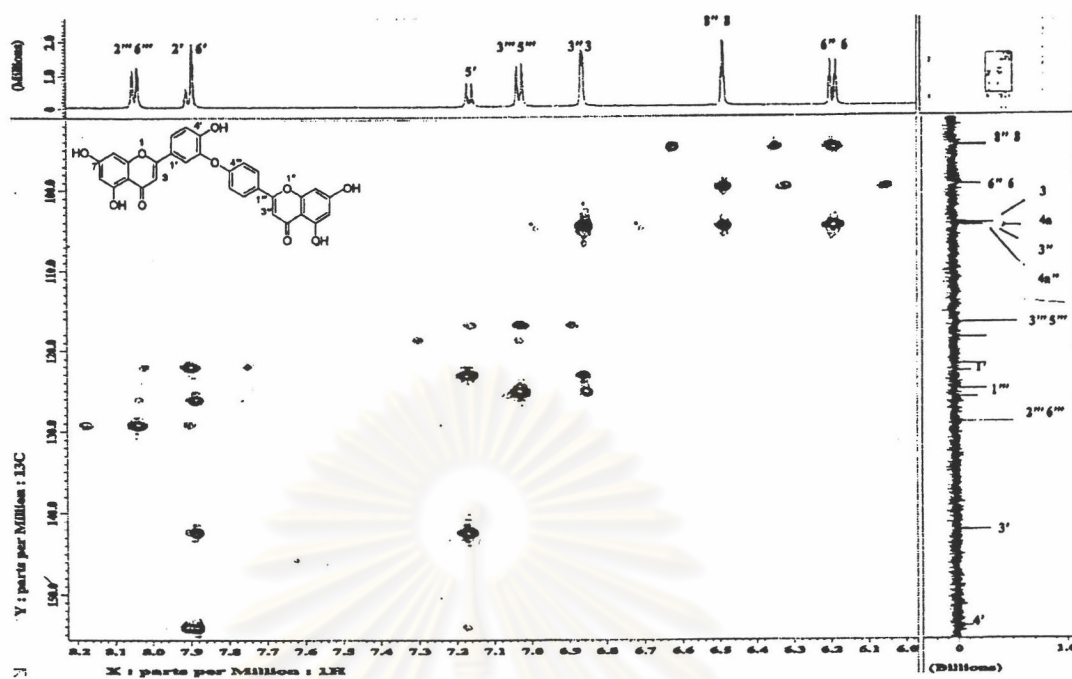


Figure 19 The HMBC spectrum of compound 4 (in DMSO- d_6)

$[\delta_H 6.0-8.2 \text{ ppm}, \delta_C 100.0-150.0 \text{ ppm}]$

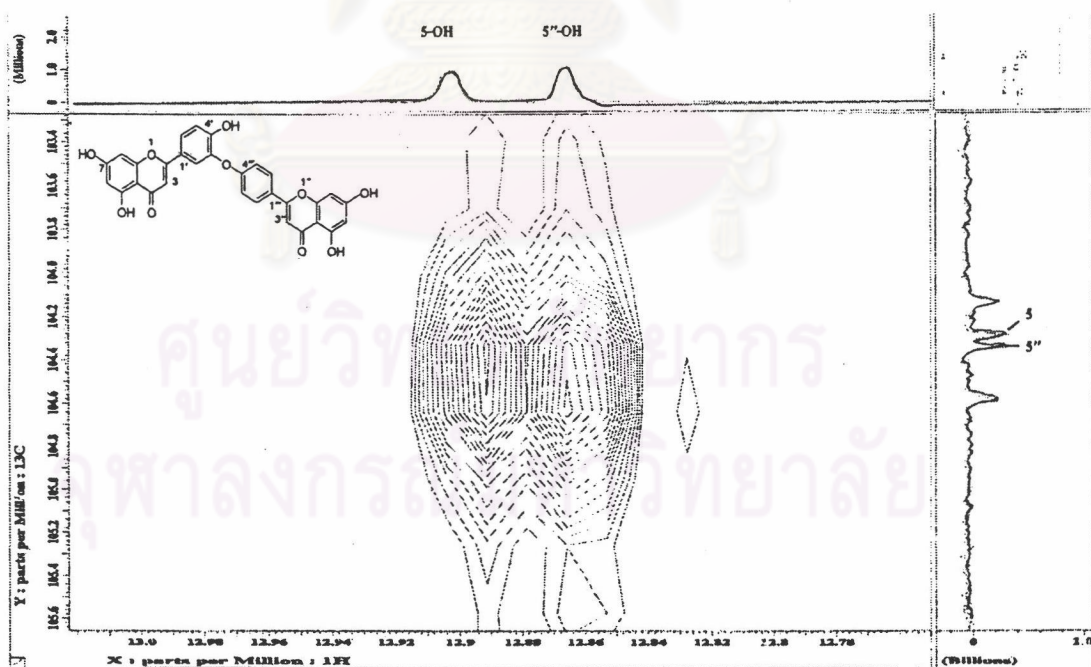


Figure 20 The HMBC spectrum of compound 4 (in DMSO- d_6)

$[\delta_H 12.7-13.0 \text{ ppm}, \delta_C 103.4-105.6 \text{ ppm}]$

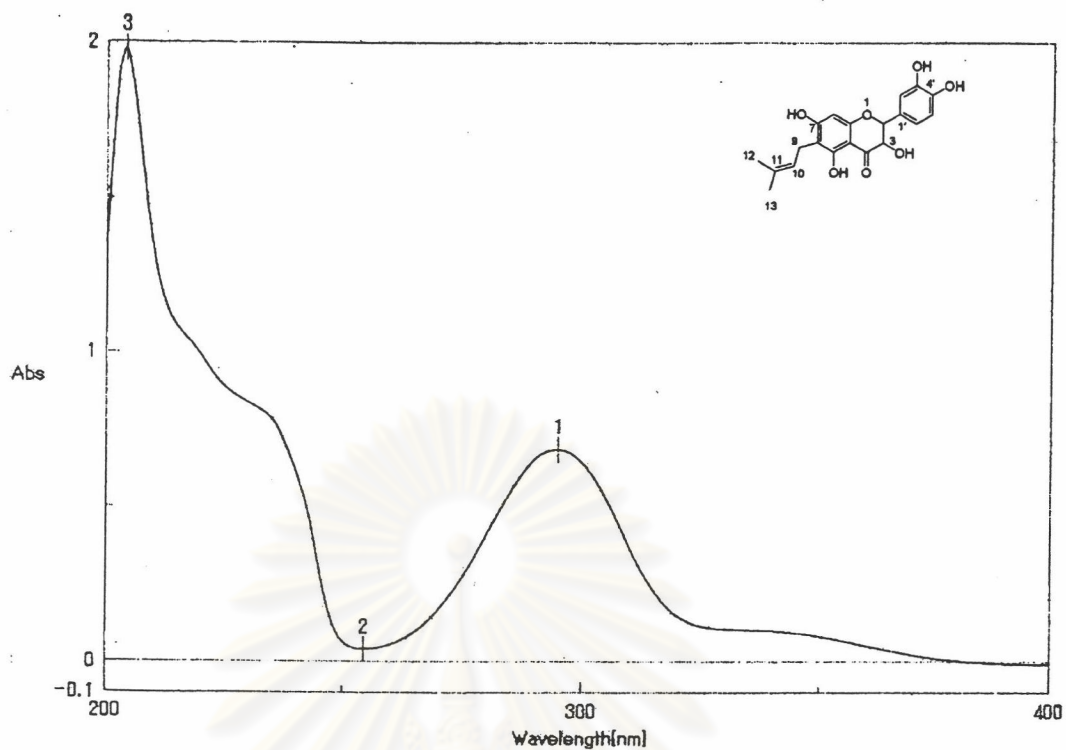


Figure 21 The UV spectrum of compound 170 (in methanol)

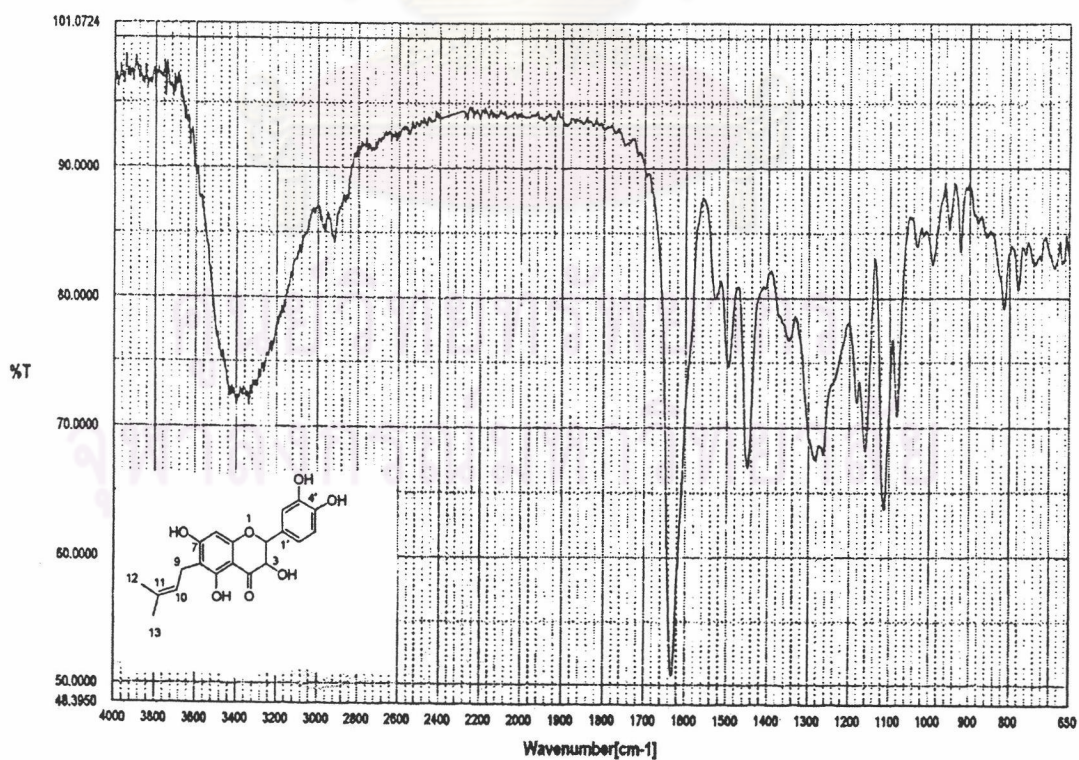


Figure 22 The IR spectrum of compound 170 (KBr disc)

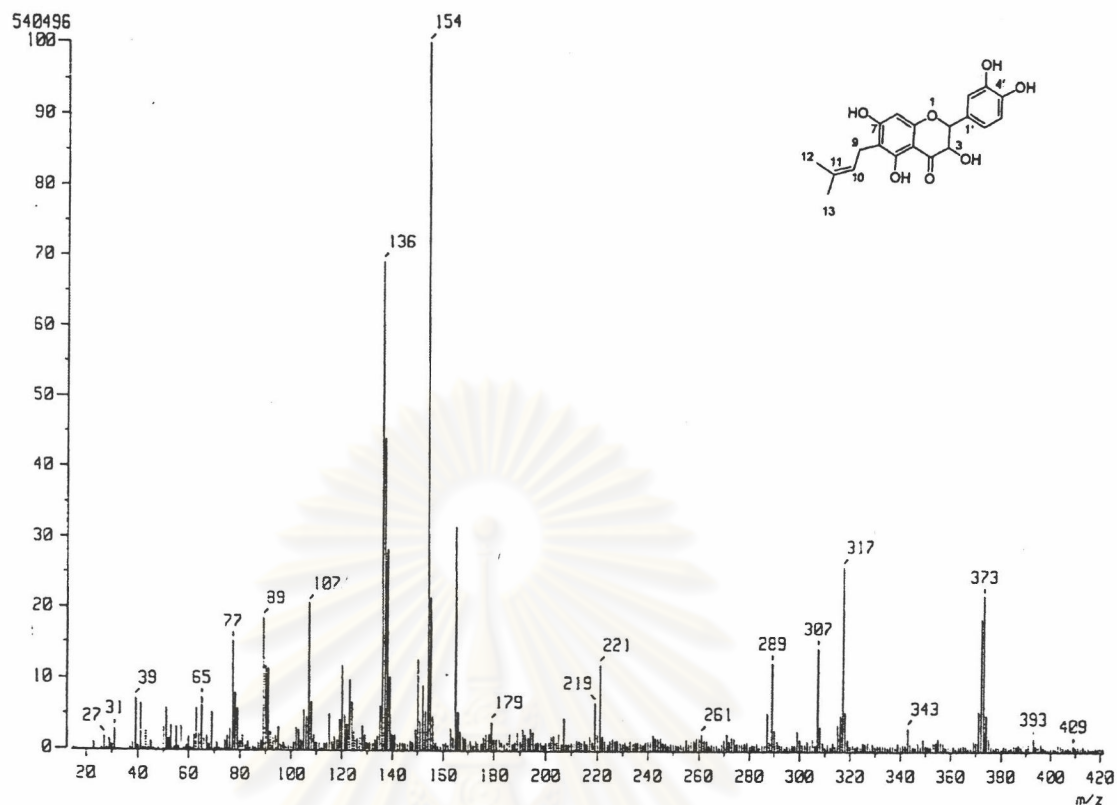


Figure 23 The FAB mass spectrum of compound 170

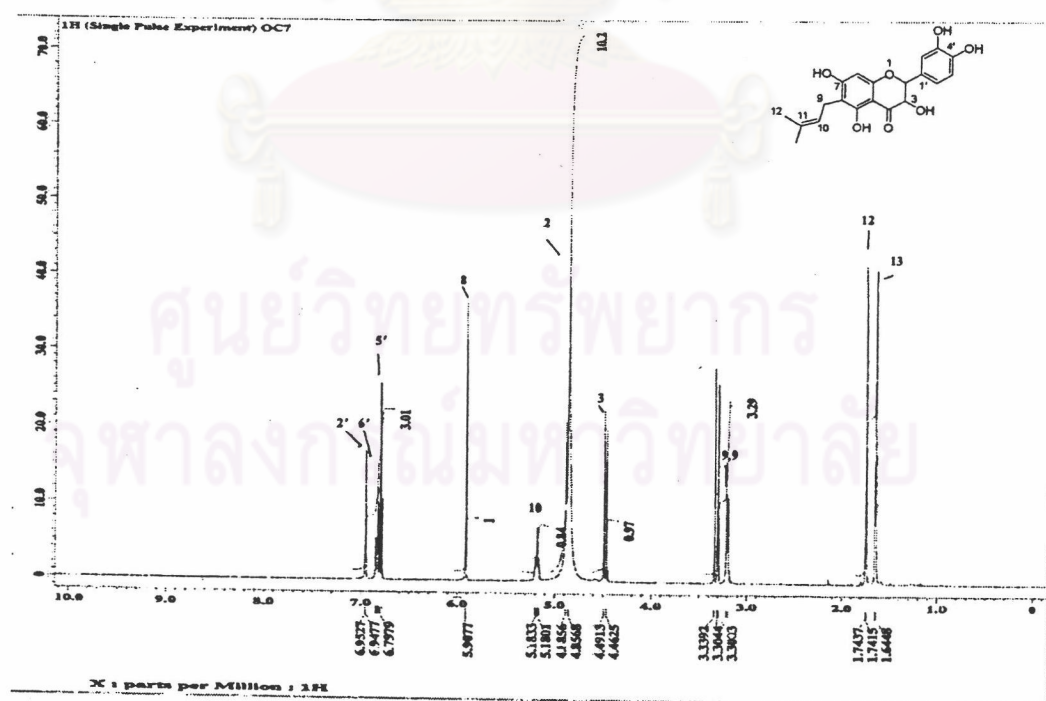


Figure 24 The ^1H NMR (600 MHz) spectrum of compound 170 (in $\text{MeOH}-d_4$)

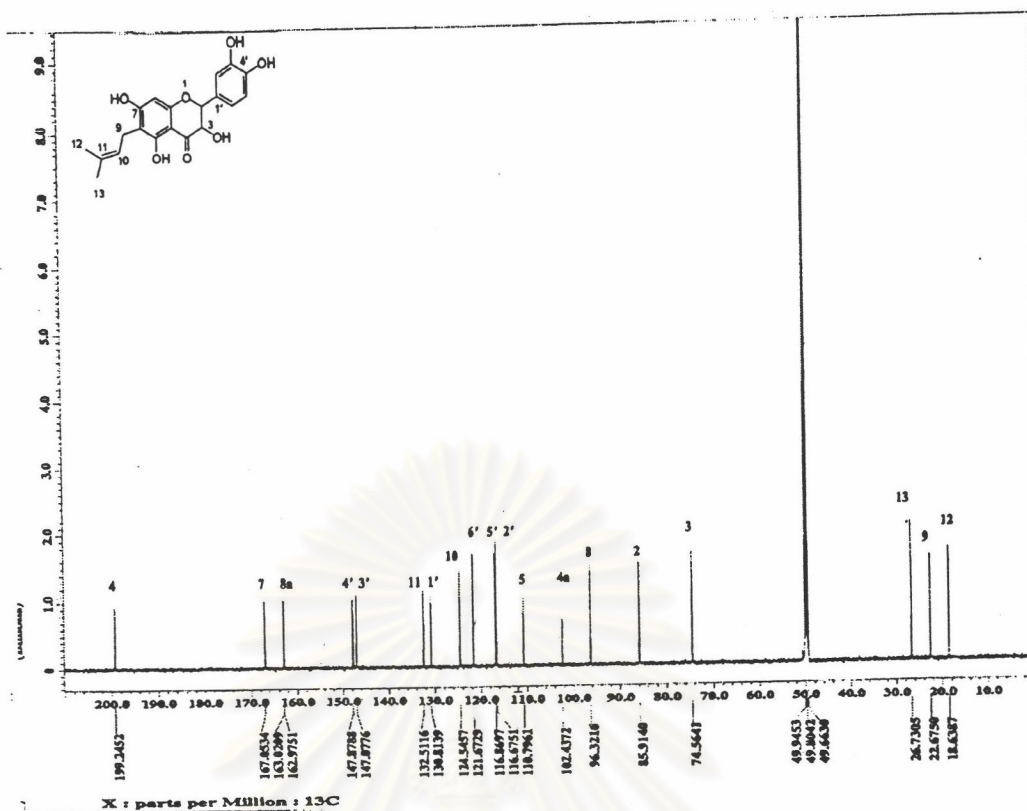


Figure 25 The ^{13}C NMR (150 MHz) spectrum of compound 170 (in MeOH-d_4)

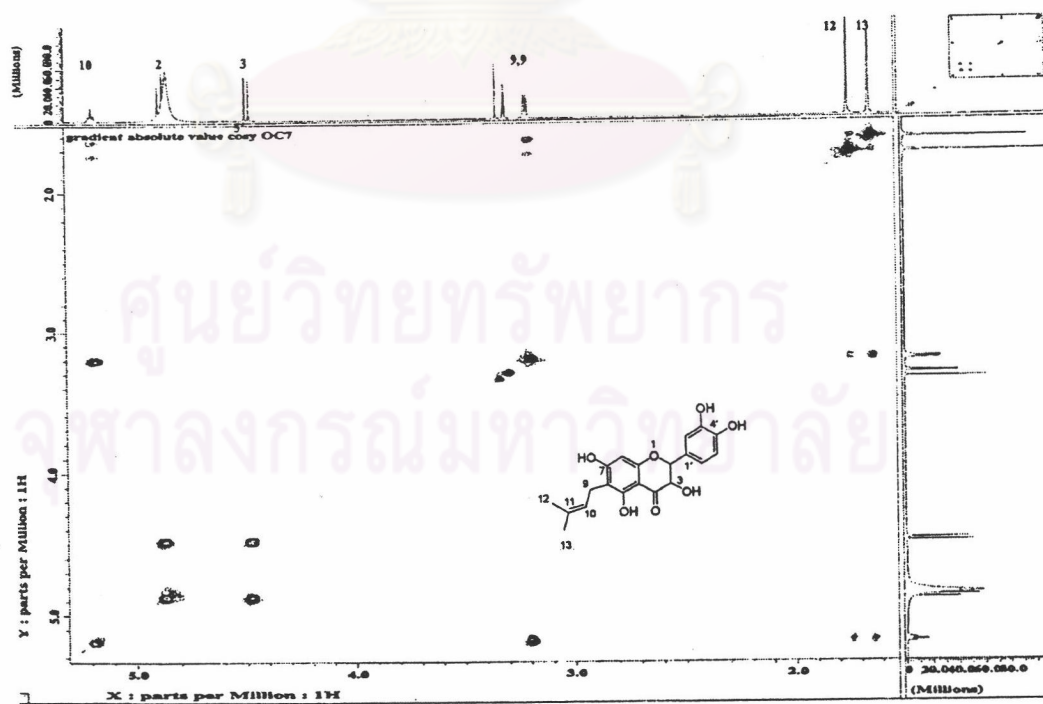


Figure 26 The ^1H - ^1H COSY spectrum of compound 170 (in MeOH-d_4)

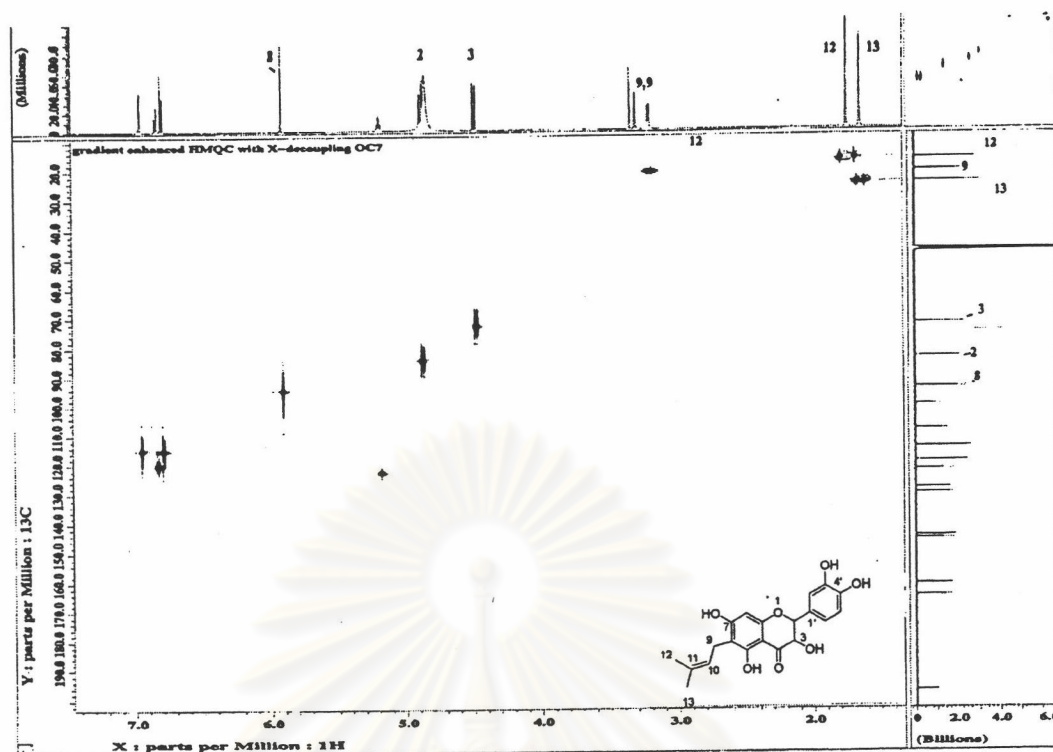


Figure 27 The HMQC spectrum of compound 170 (in MeOH- d_4)

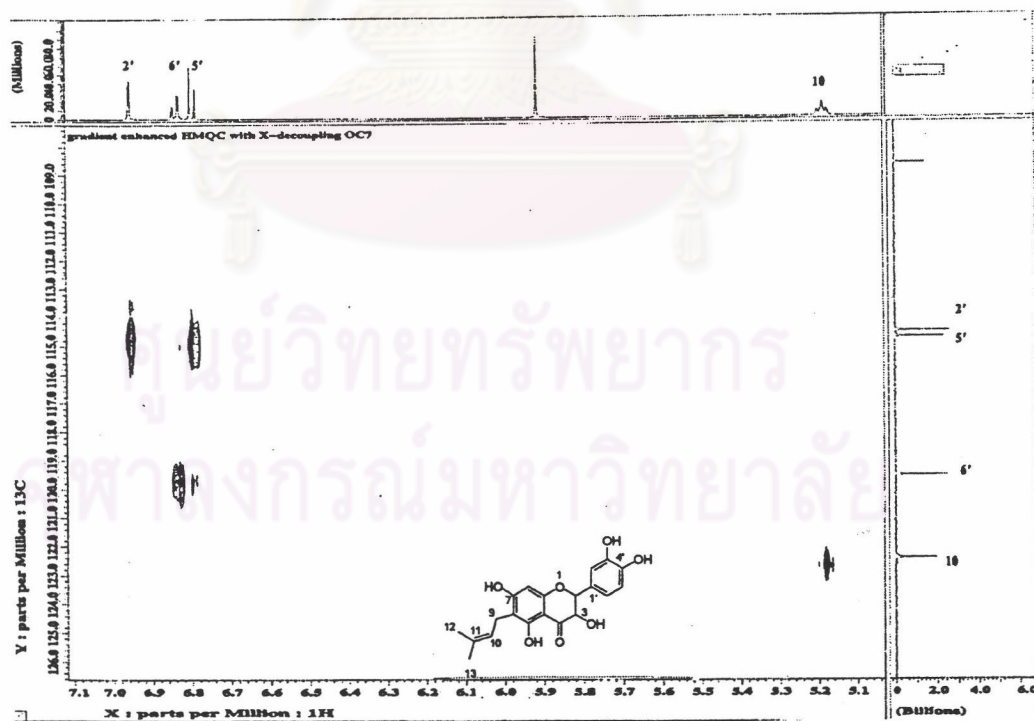


Figure 28 The HMQC spectrum of compound 170 (in MeOH- d_4)

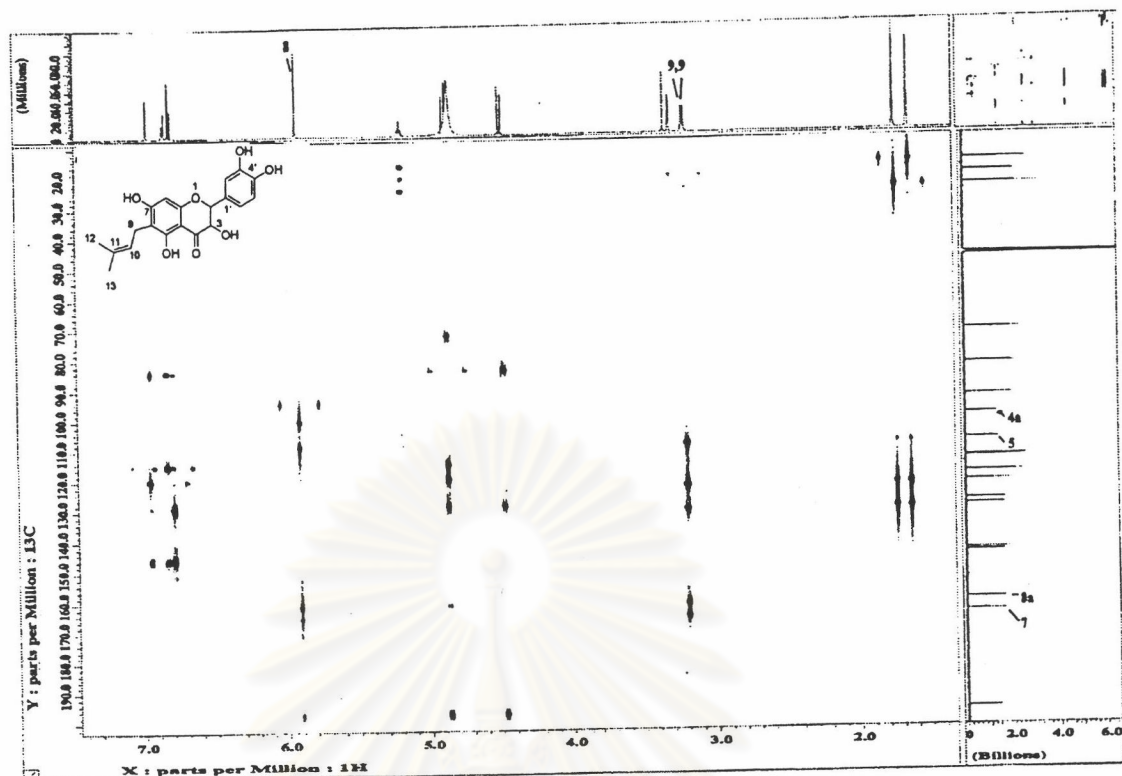


Figure 29 The HMBC spectrum of compound 170 (in MeOH- d_4)

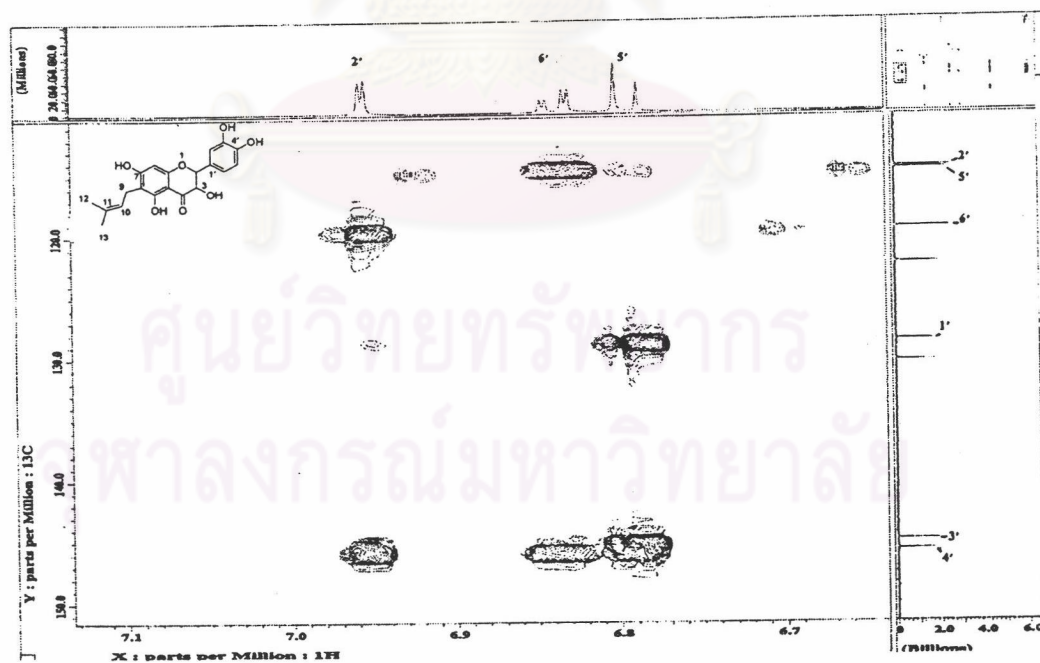


Figure 30 The HMBC spectrum of compound 170 (in MeOH- d_4)

$[\delta_H 6.7-7.1 \text{ ppm}, \delta_C 120.0-150.0 \text{ ppm}]$

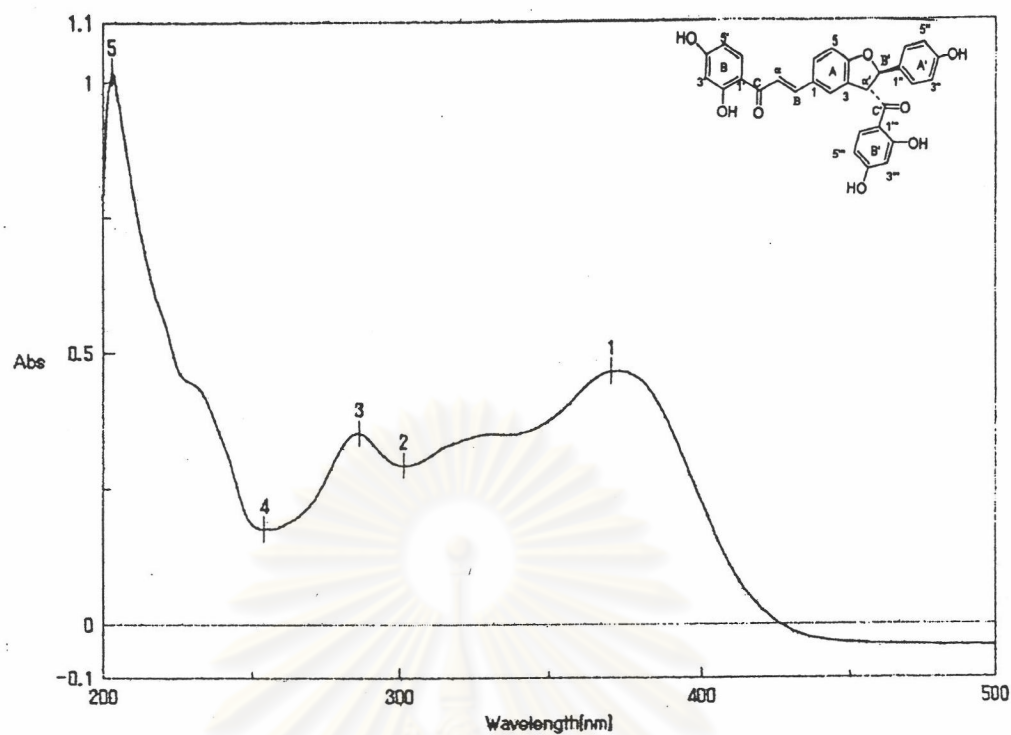


Figure 31 The UV spectrum of compound 1 (in methanol)

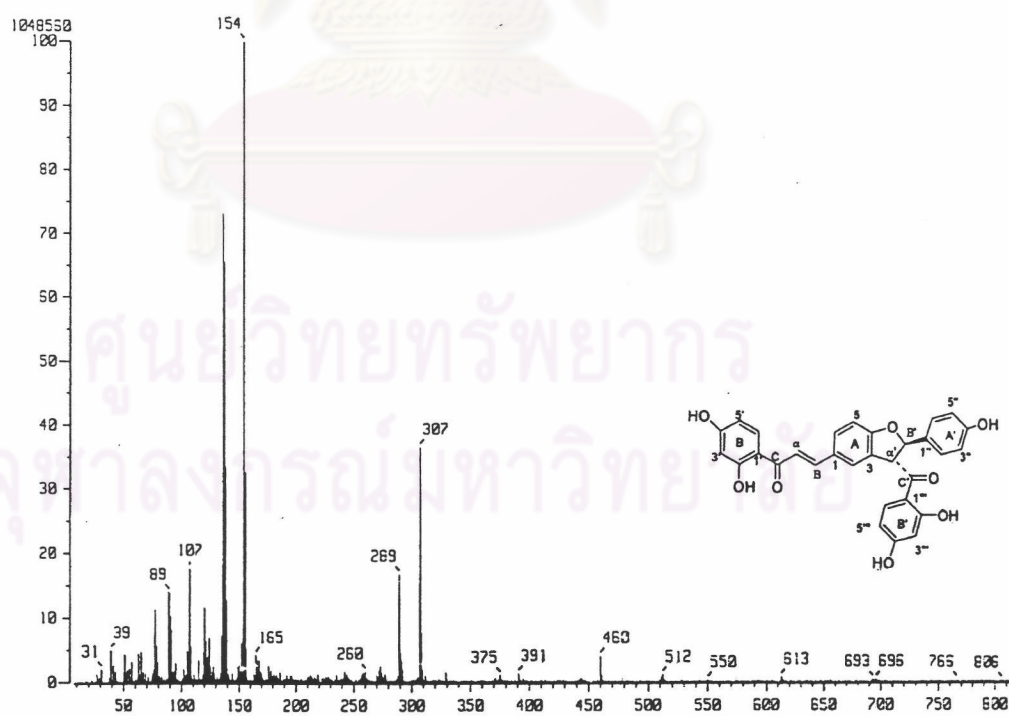


Figure 32 The FAB mass spectrum of compound 1

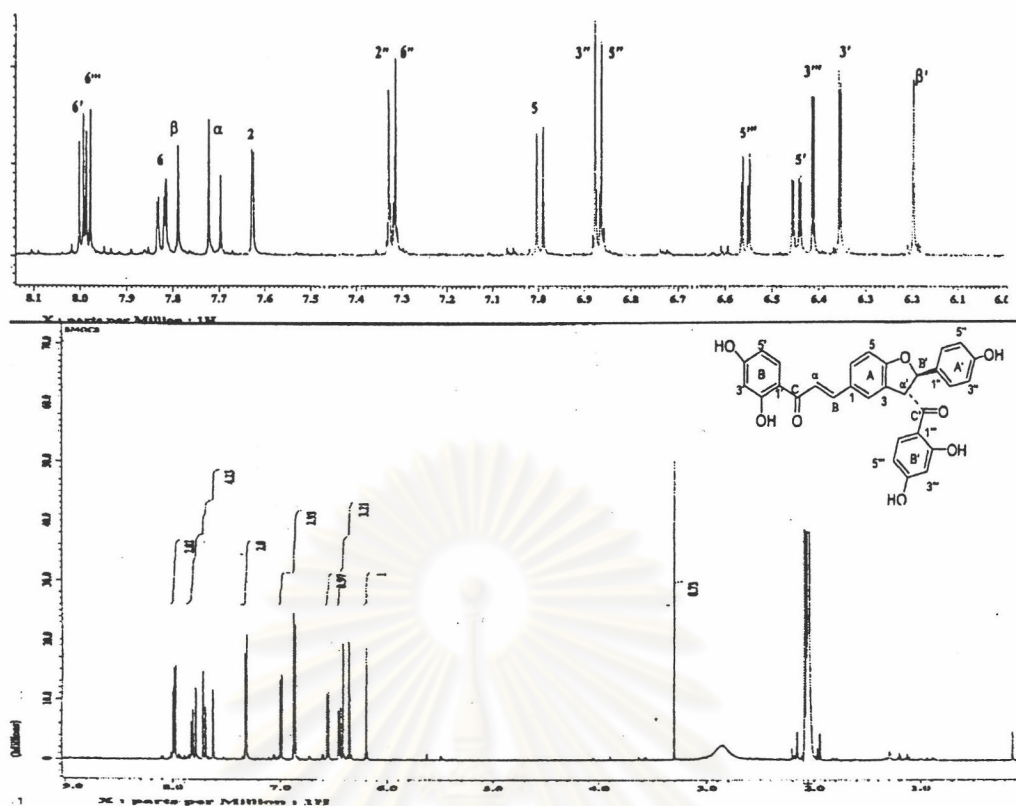


Figure 33 The ^1H NMR (600 MHz) spectrum of compound 1 (in acetone- d_6)

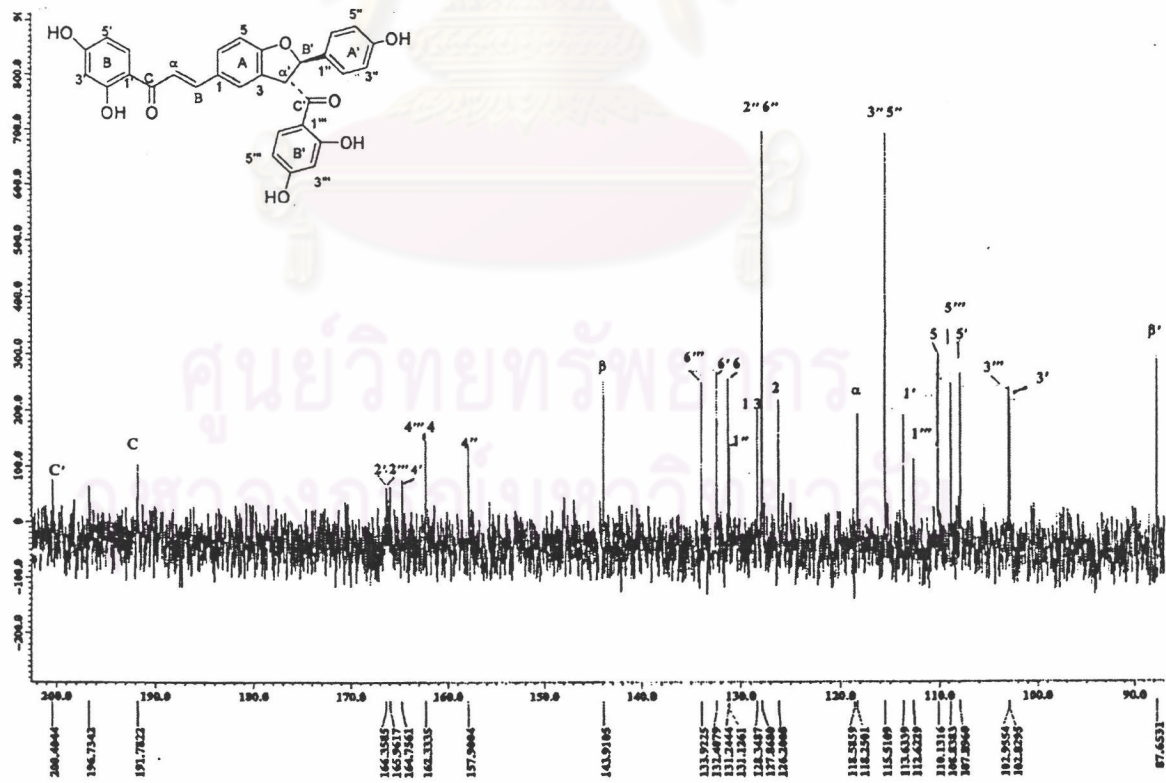


Figure 34 The ^{13}C NMR (150 MHz) spectrum of compound 1 (in acetone- d_6)

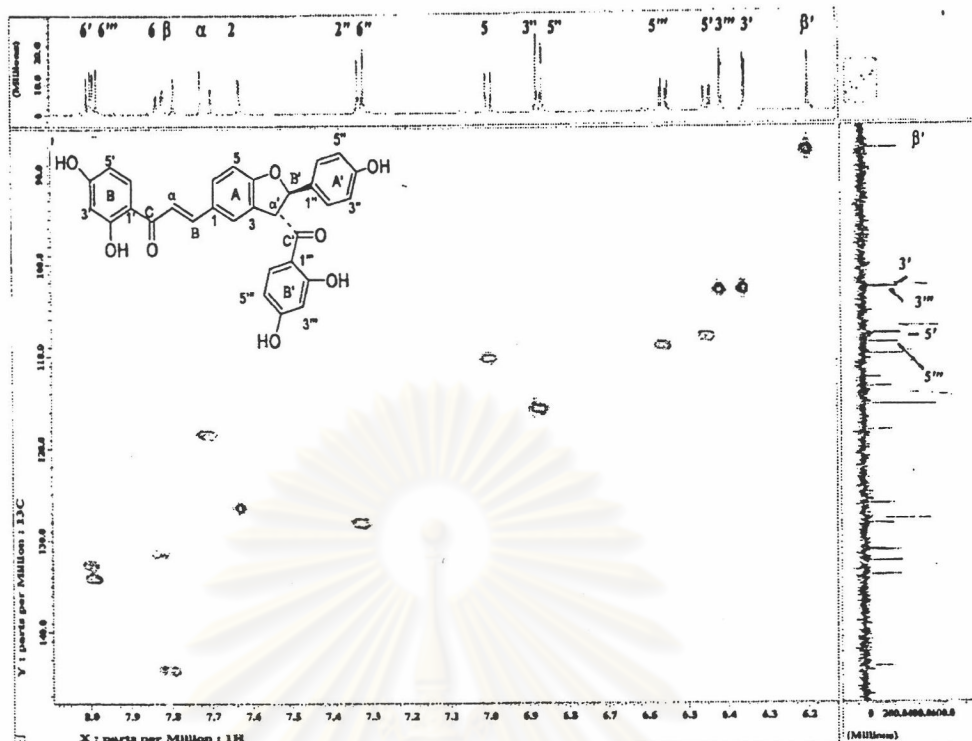


Figure 37 The HMQC spectrum of compound 1 (in acetone- d_6)

$[\delta_H 6.2-8.0 \text{ ppm}, \delta_C 90.0-140.0 \text{ ppm}]$

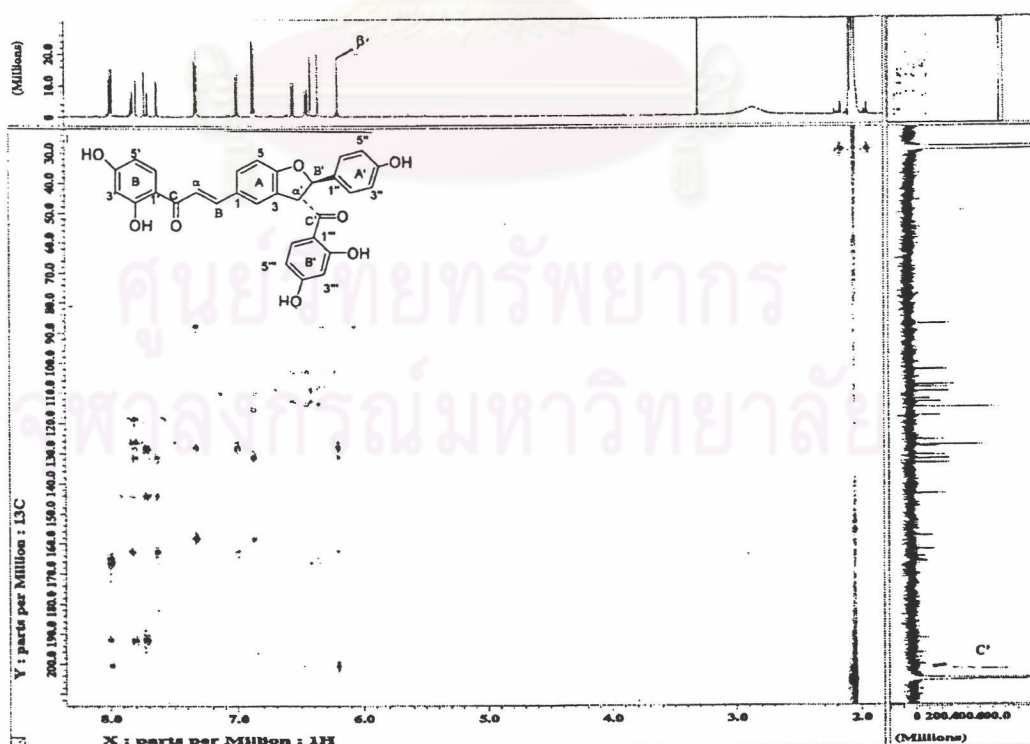


Figure 38 The HMBC spectrum of compound 1 (in acetone- d_6)

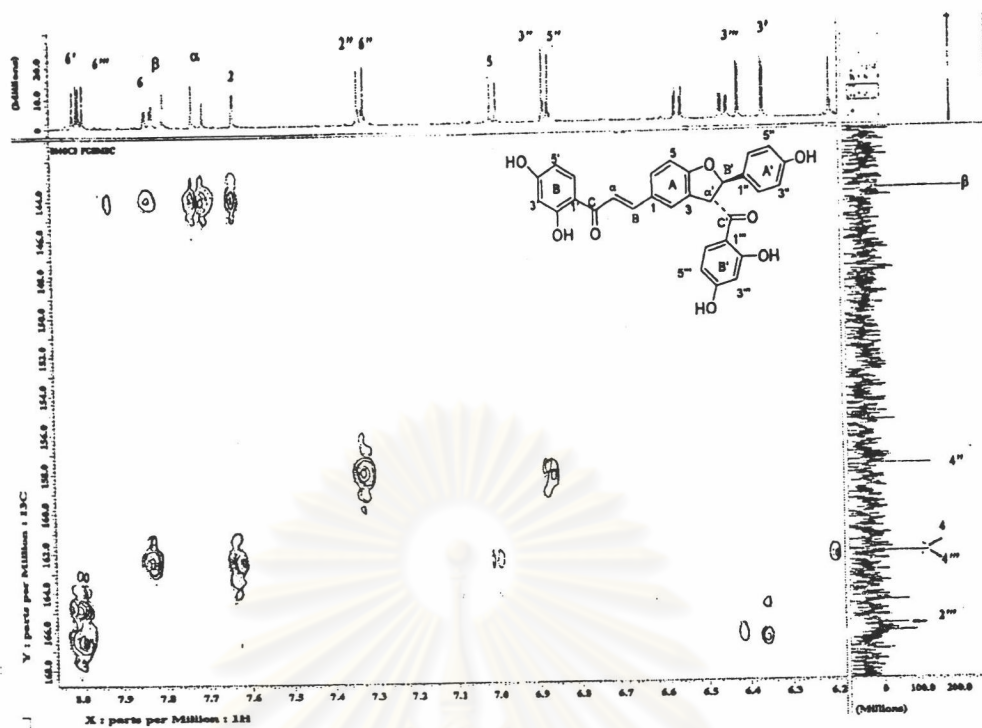


Figure 39 The HMBC spectrum of compound 1 (in acetone- d_6)

$[\delta_H 6.2-8.0 \text{ ppm}, \delta_C 144.0-168.0 \text{ ppm}]$

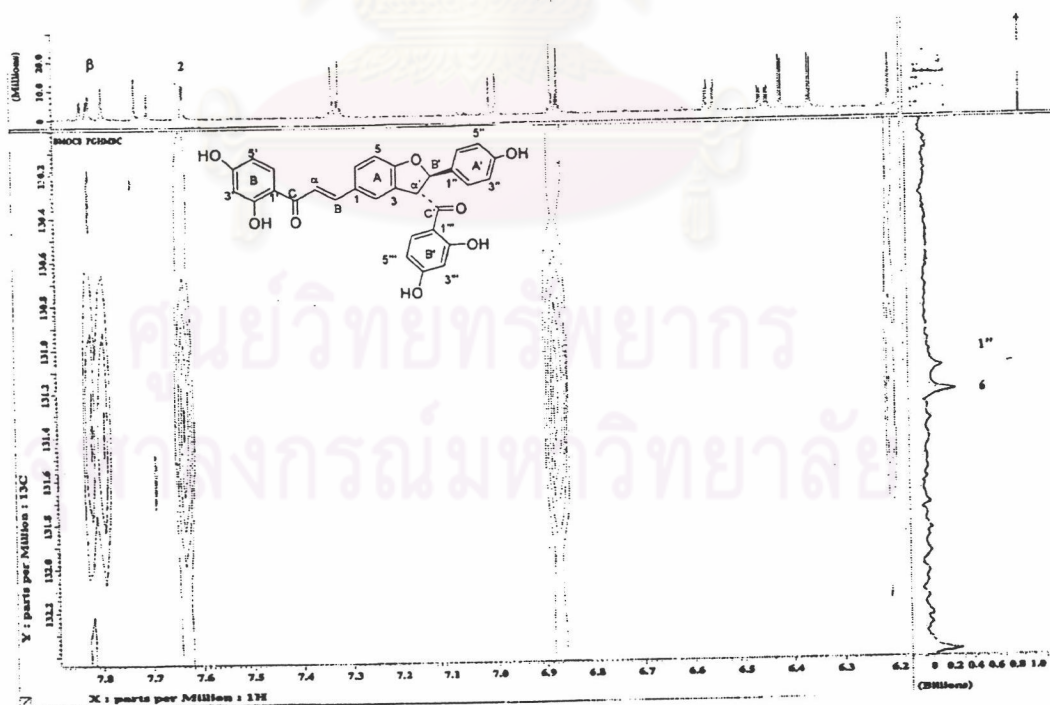


Figure 40 The HMBC spectrum of compound 1 (in acetone- d_6)

$[\delta_H 6.2-7.8 \text{ ppm}, \delta_C 130.2-132.2 \text{ ppm}]$

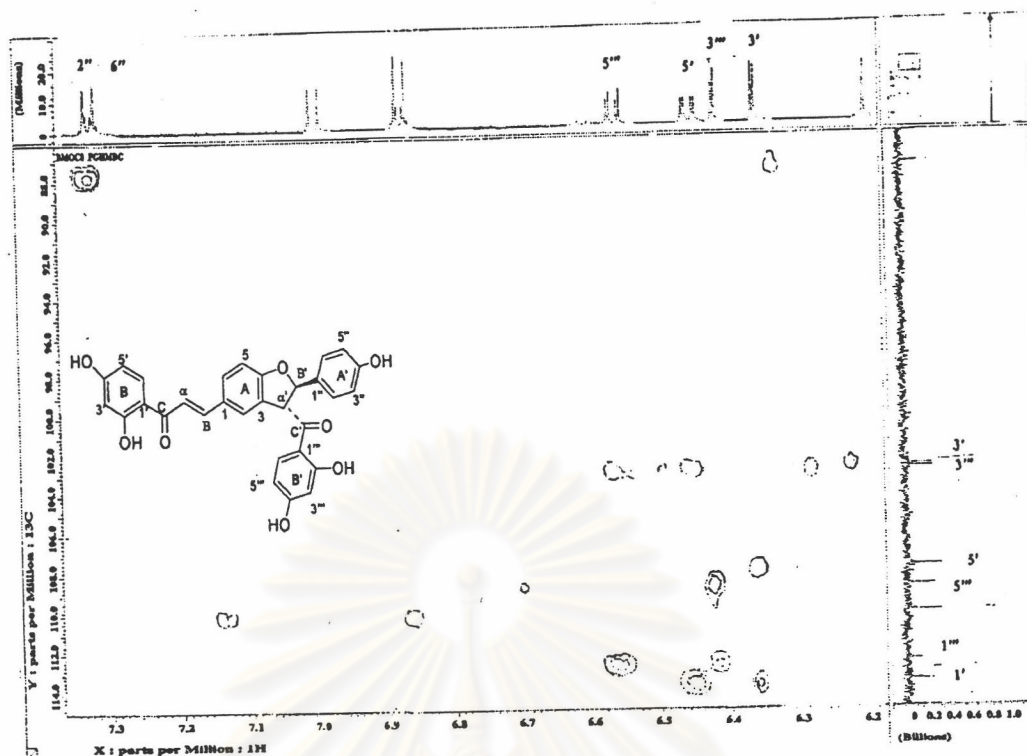


Figure 41 The HMBC spectrum of compound 1 (in acetone- d_6)

$[\delta_H 6.2-7.3 \text{ ppm}, \delta_C 88.0-114.0 \text{ ppm}]$

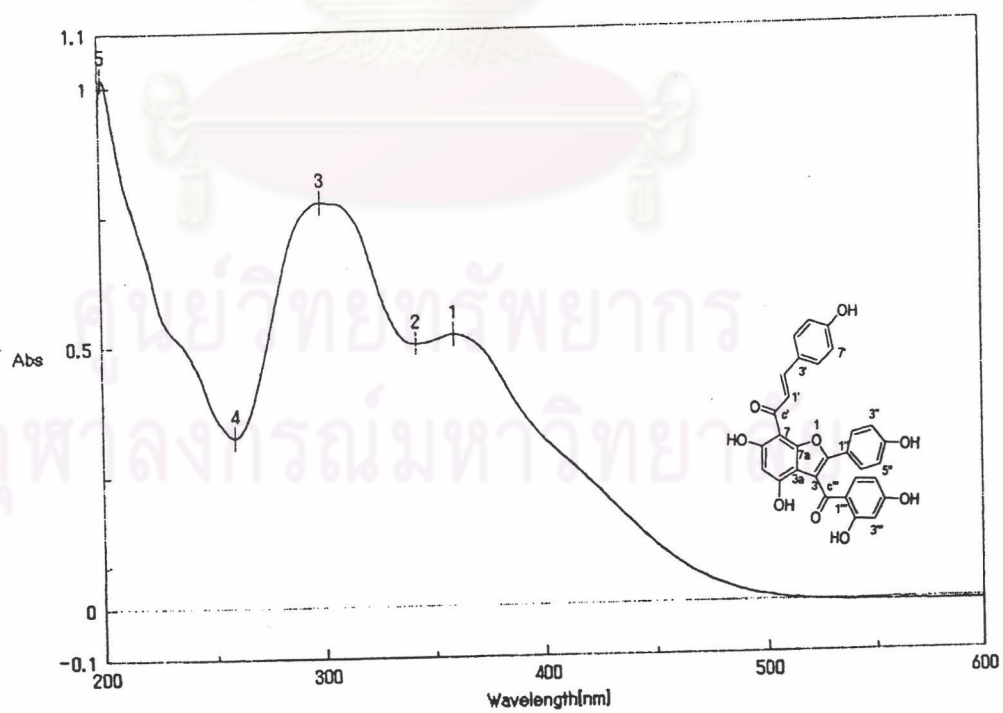


Figure 42 The UV spectrum of compound 171 (in methanol)

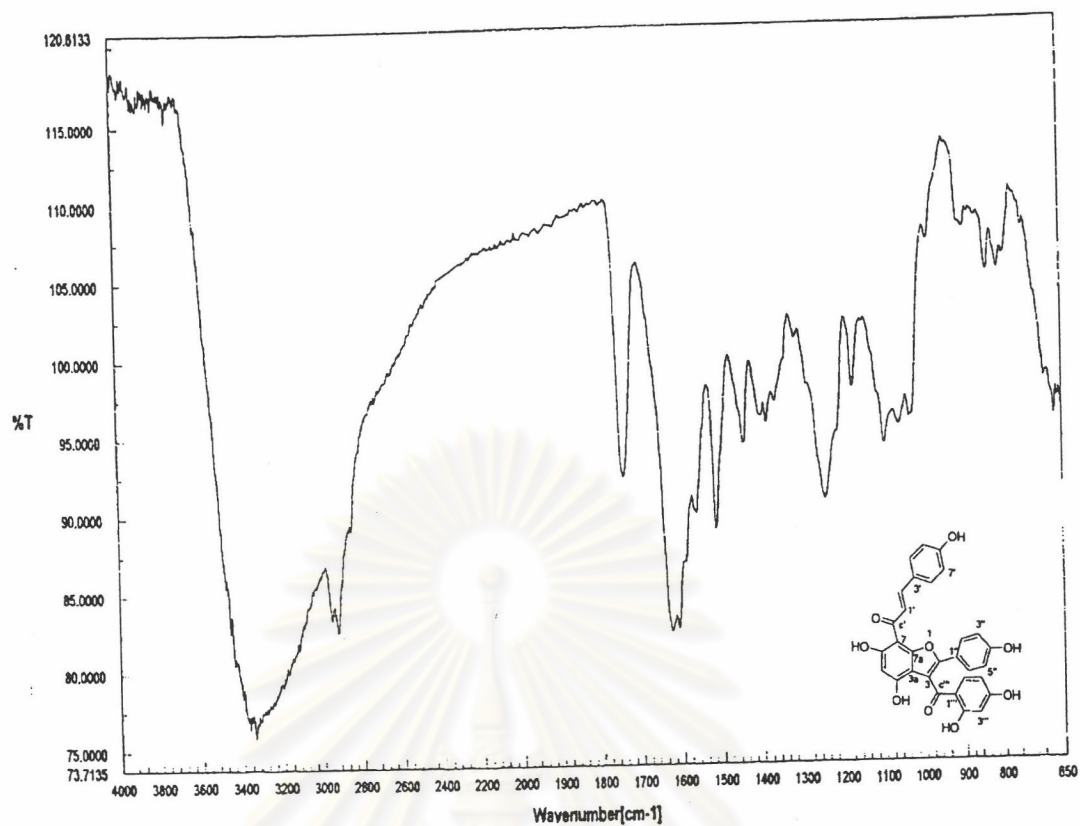


Figure 43 The IR spectrum of compound 171 (KBr disc)

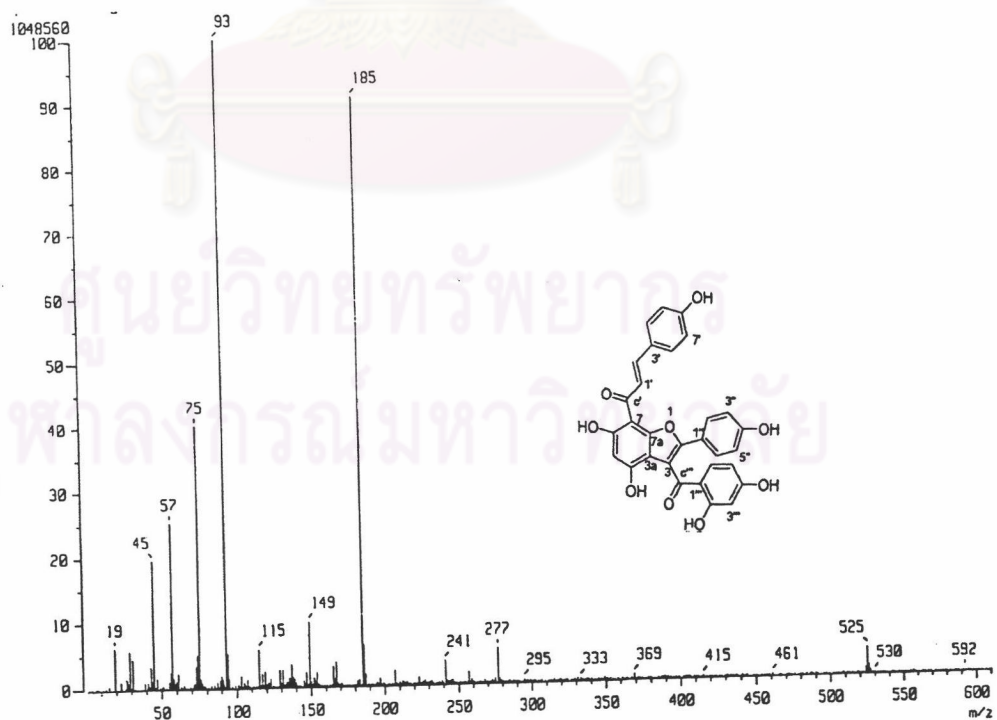


Figure 44 The FAB mass spectrum of compound 171

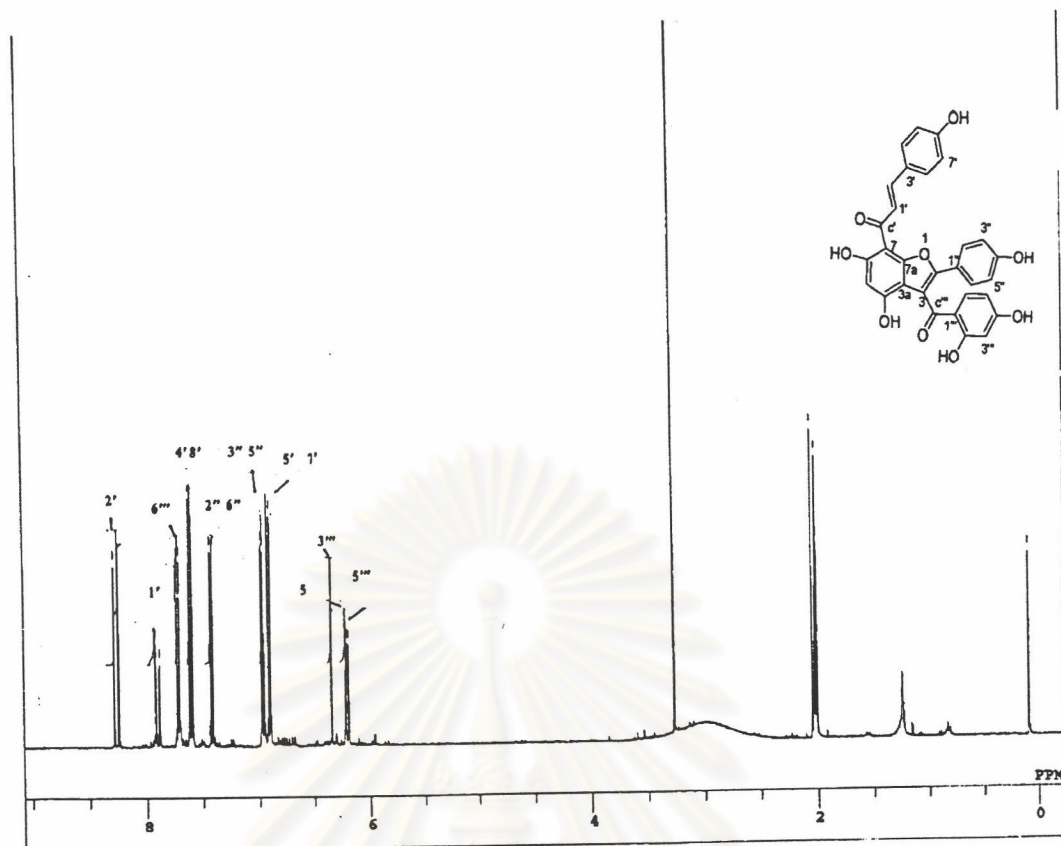


Figure 45 The ^1H NMR (400 MHz) spectrum of compound 171 (in acetone- d_6)

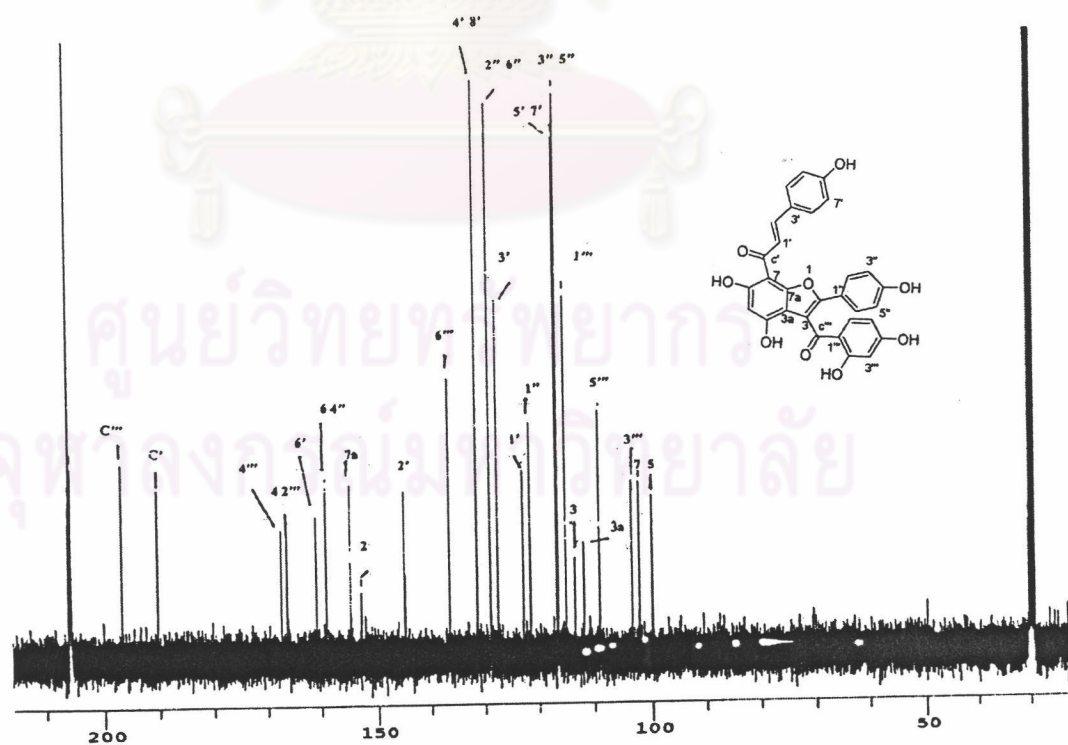


Figure 46 The ^{13}C NMR (100 MHz) spectrum of compound 171 (in acetone- d_6)

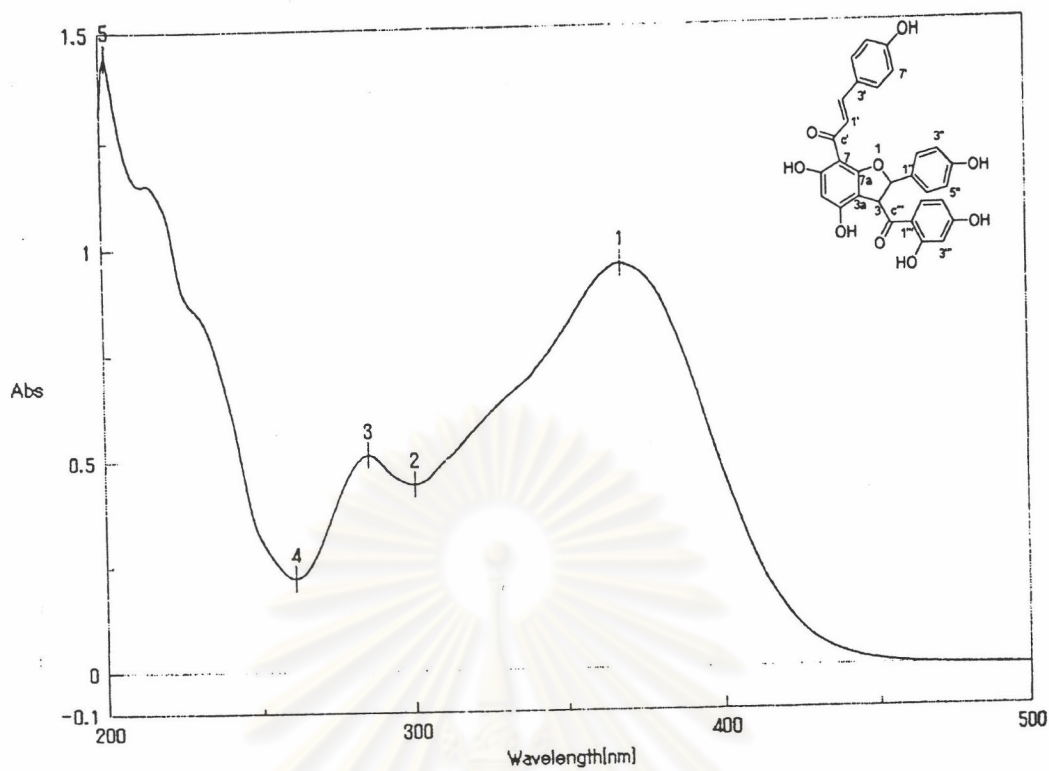


Figure 47 The UV spectrum of compound 172 (in methanol)

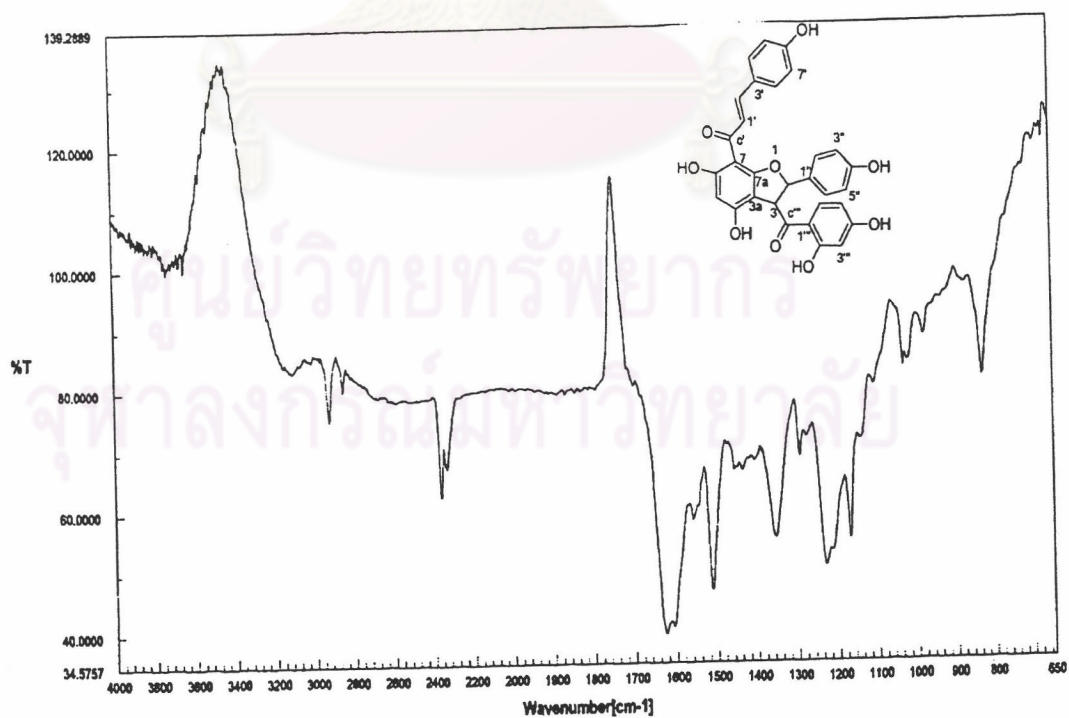


Figure 48 The IR spectrum of compound 172 (KBr disc)

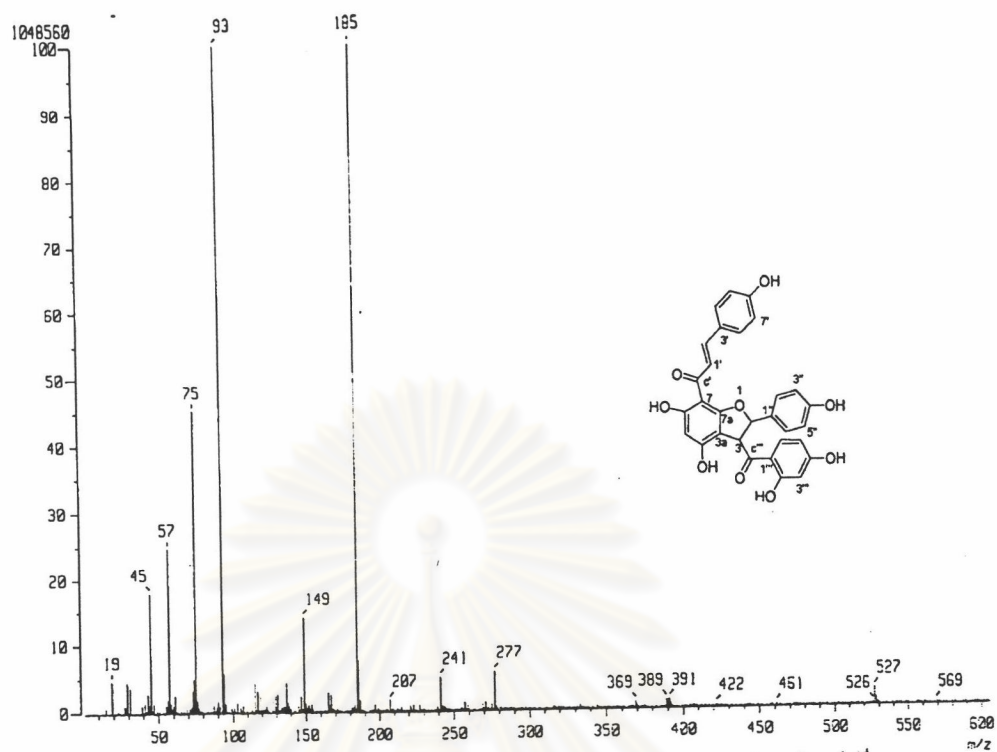


Figure 49 The FAB mass spectrum of compound 172

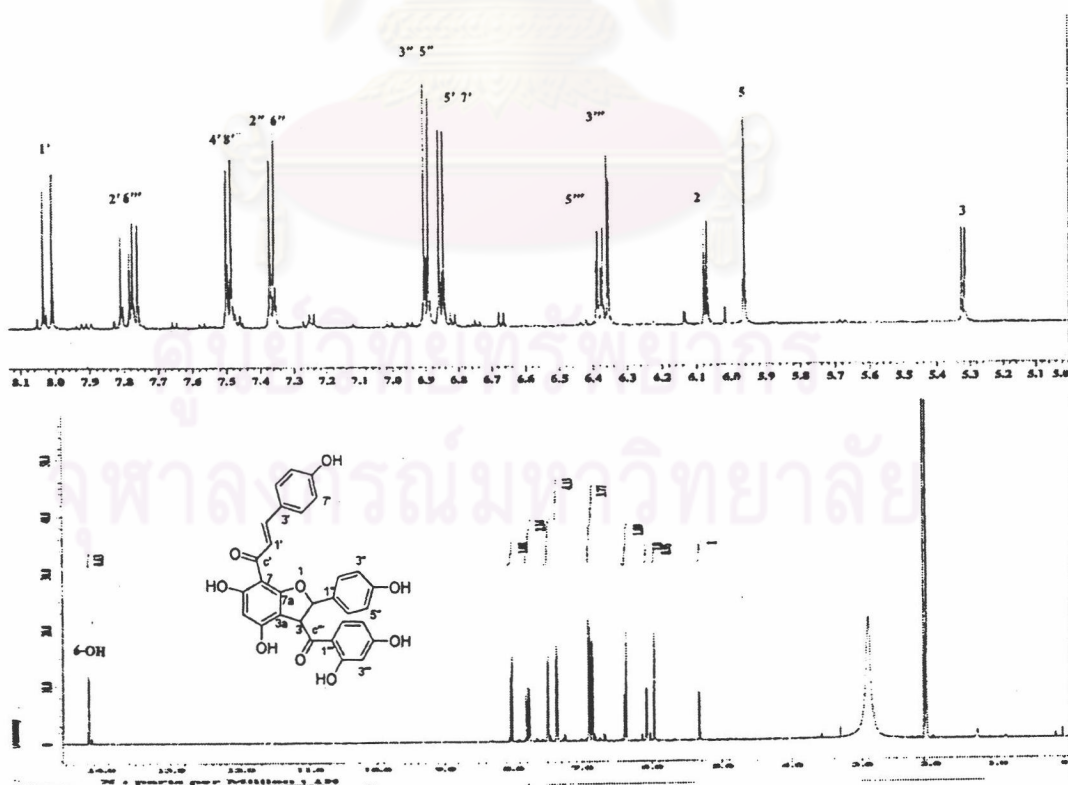


Figure 50 The ^1H NMR (600 MHz) spectrum of compound 172 (in acetone- d_6)

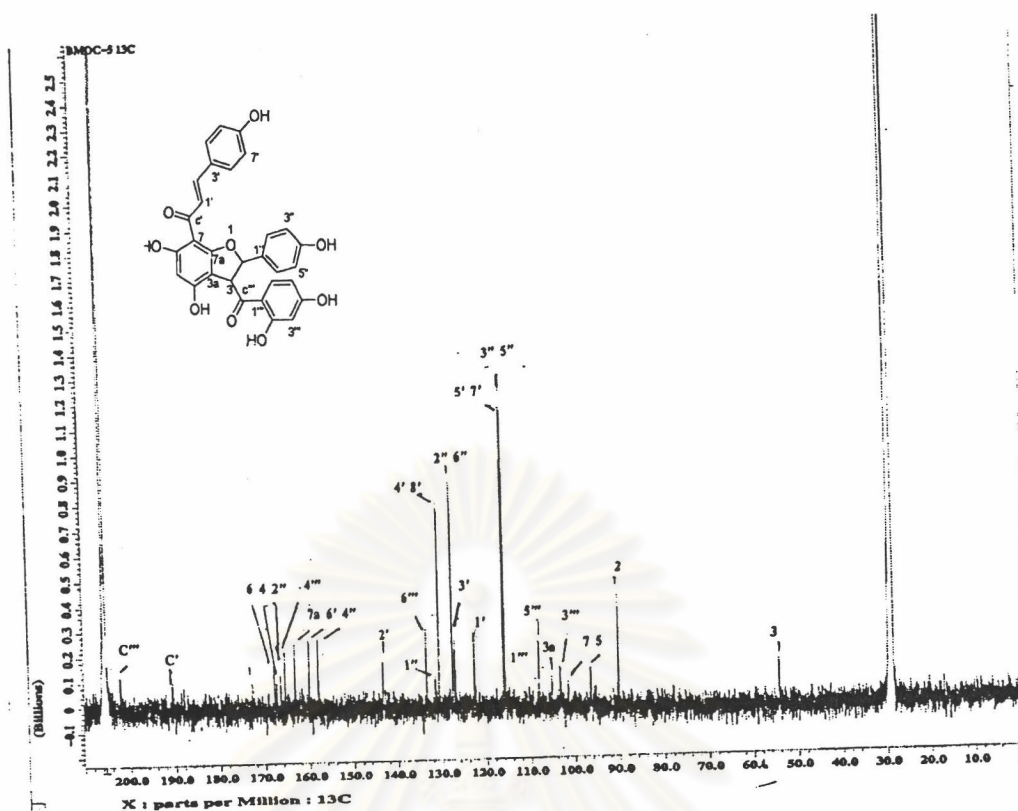


Figure 51 The ^{13}C NMR (150 MHz) spectrum of compound 172 (in acetone- d_6)

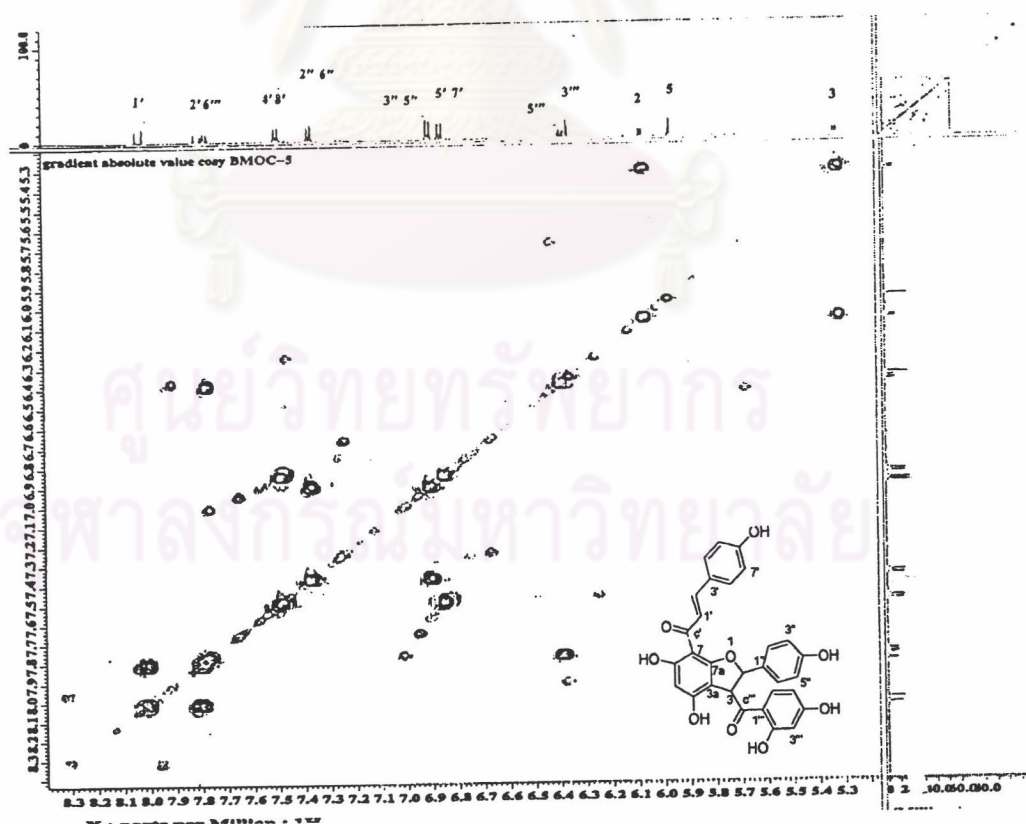


Figure 52 The ^1H - ^1H COSY spectrum of compound 172 (in acetone- d_6)

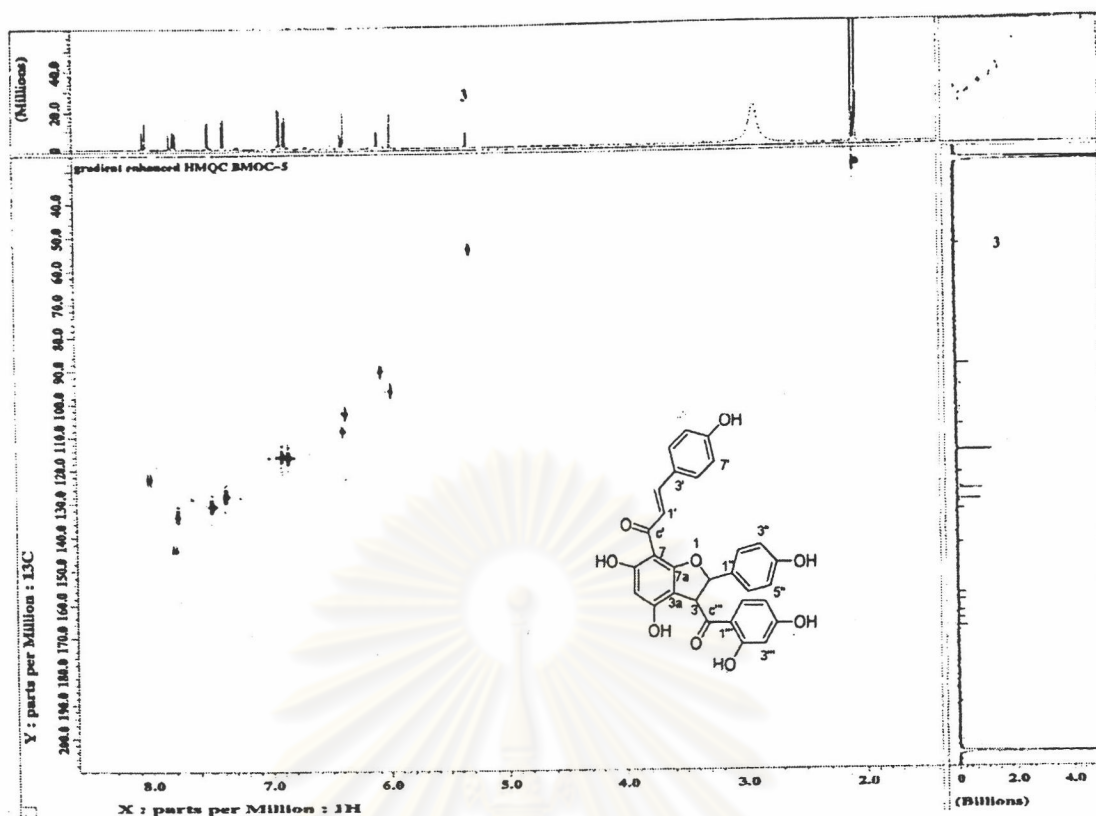


Figure 53 The HMQC spectrum of compound 172 (in acetone- d_6)

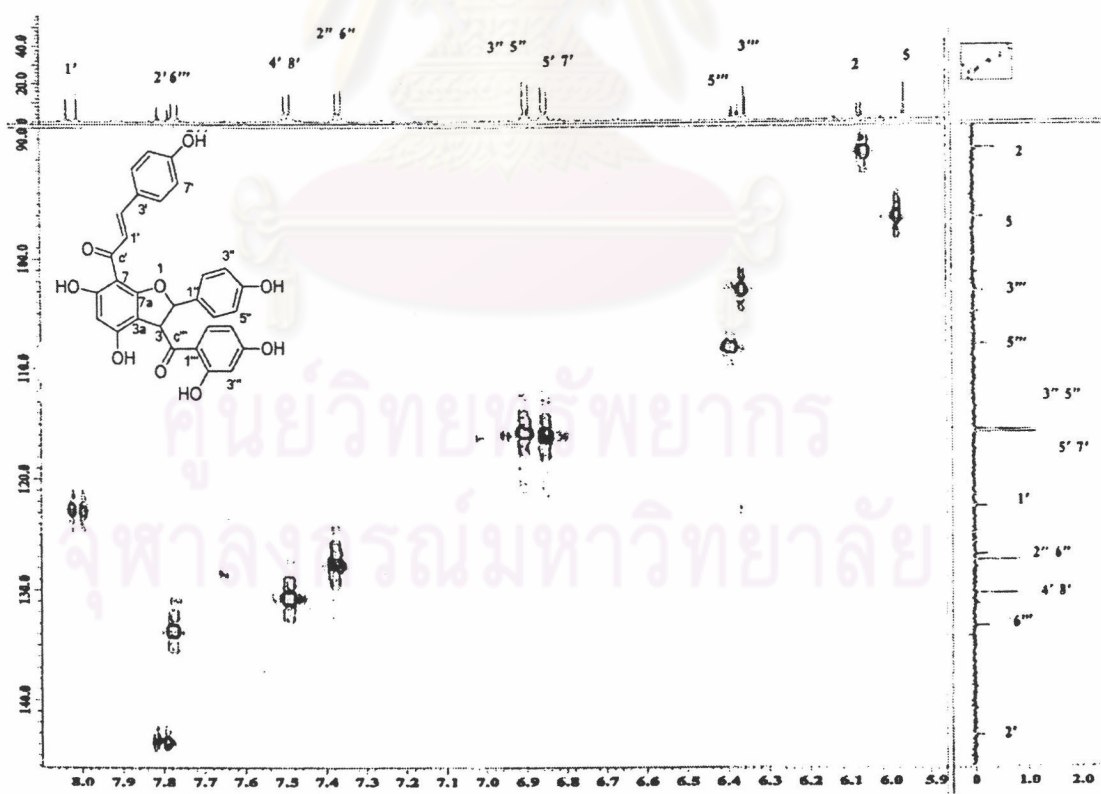


Figure 54 The HMQC spectrum of compound 172 (in acetone- d_6)

$[\delta_{\text{H}} 5.9\text{-}8.0 \text{ ppm}, \delta_{\text{C}} 90.0\text{-}140.0 \text{ ppm}]$

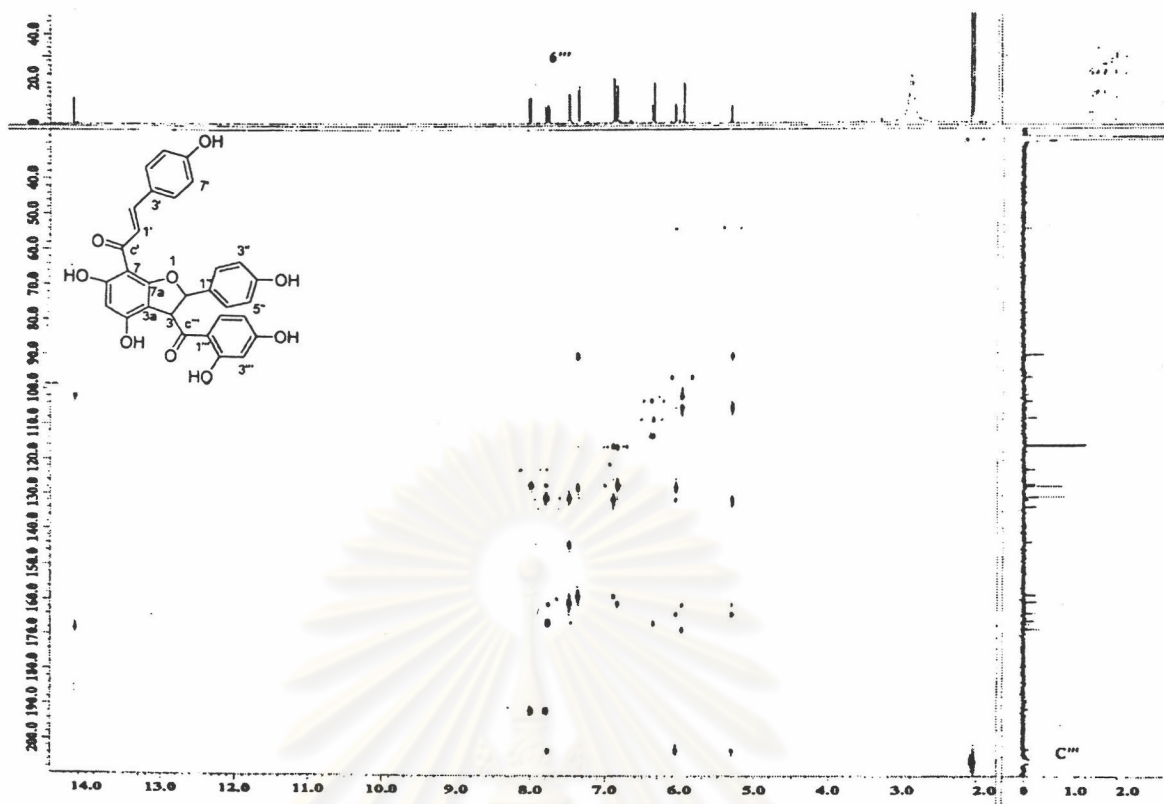


Figure 55 The HMBC spectrum of compound 172 (in acetone- d_6)

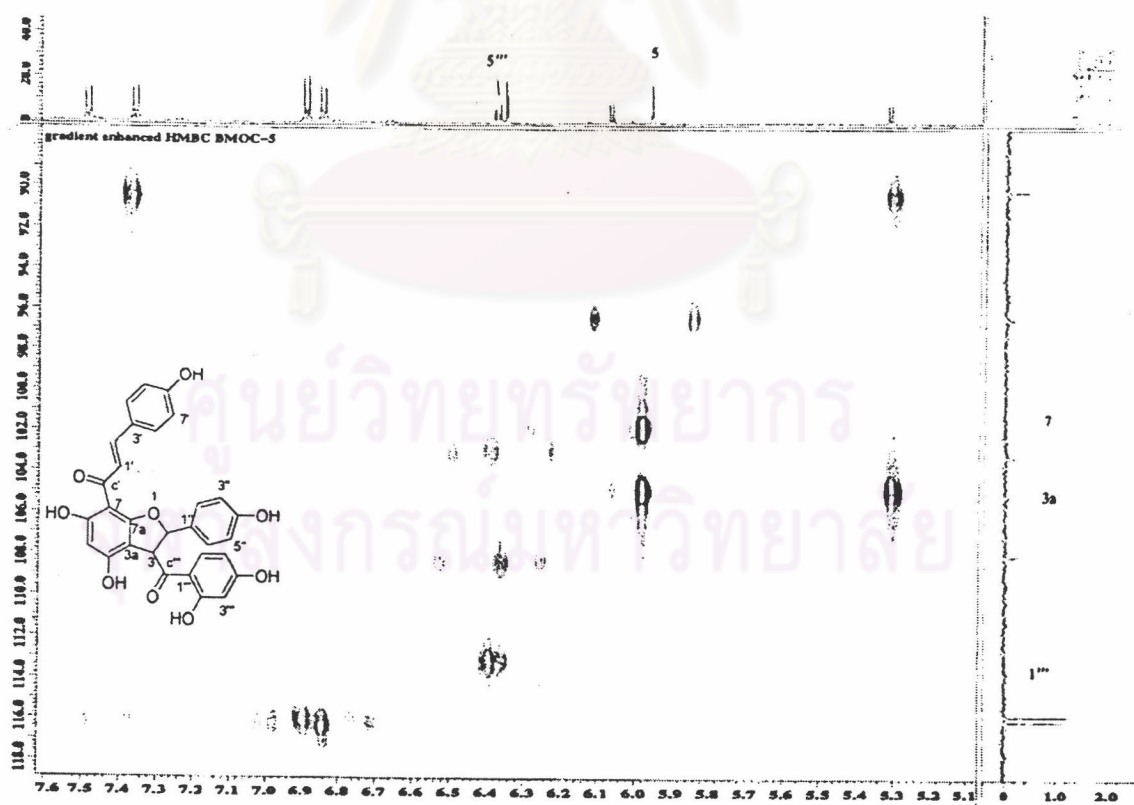


Figure 56 The HMBC spectrum of compound 172 (in acetone- d_6)

$[\delta_H 5.1-7.3 \text{ ppm}, \delta_C 90.0-118.0 \text{ ppm}]$

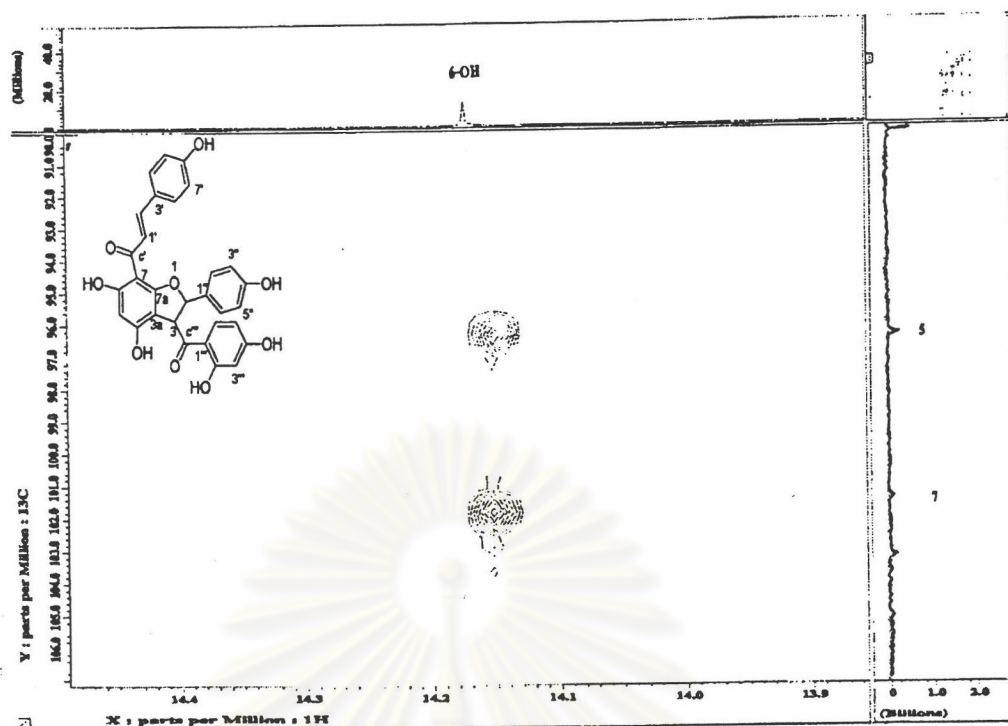


Figure 57 The HMBC spectrum of compound 172 (in acetone- d_6)

$[\delta_{\text{H}} 13.9\text{-}14.4 \text{ ppm}, \delta_{\text{C}} 90.0\text{-}106.0 \text{ ppm}]$

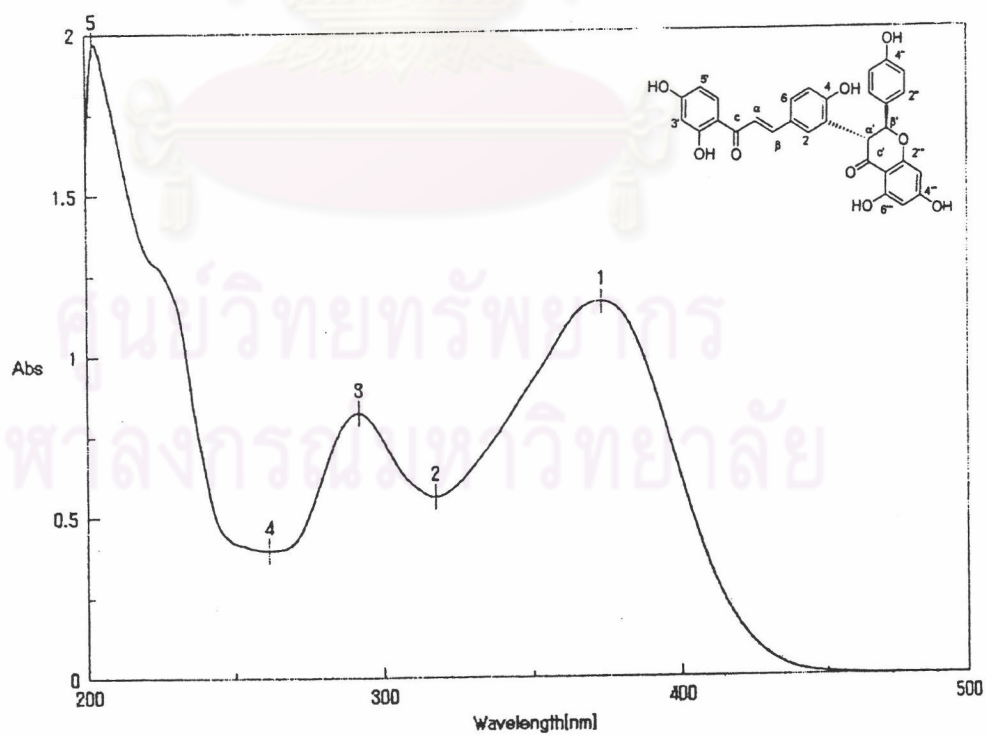


Figure 58 The UV spectrum of compound 173 (in methanol)

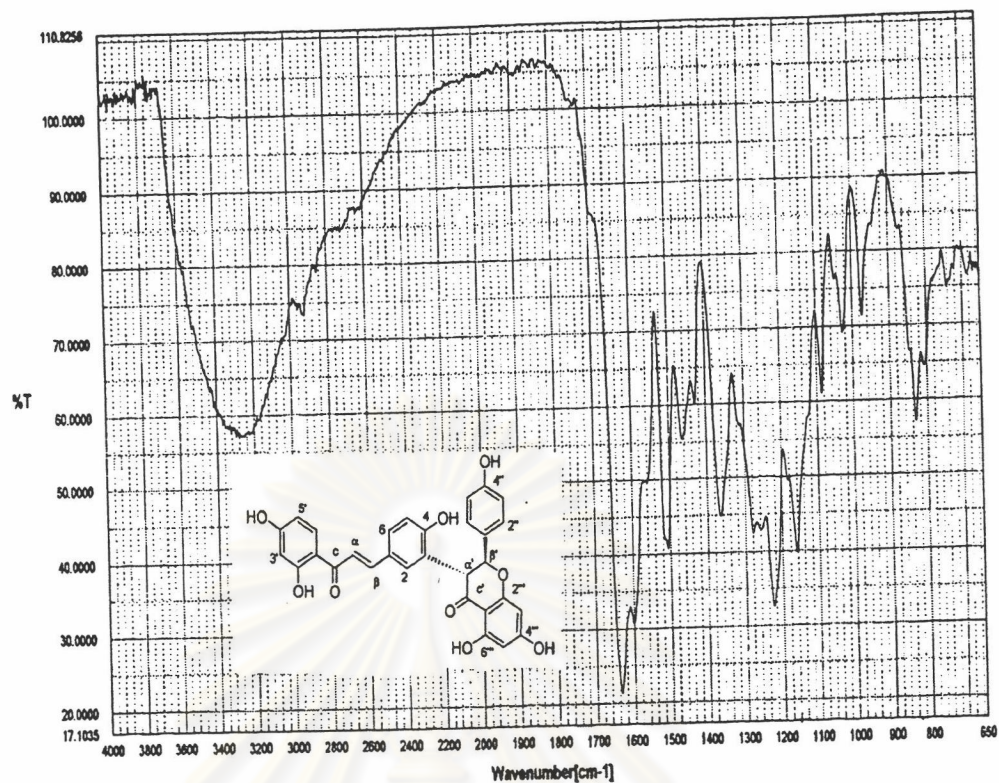


Figure 59 The IR spectrum of compound 173 (KBr disc)

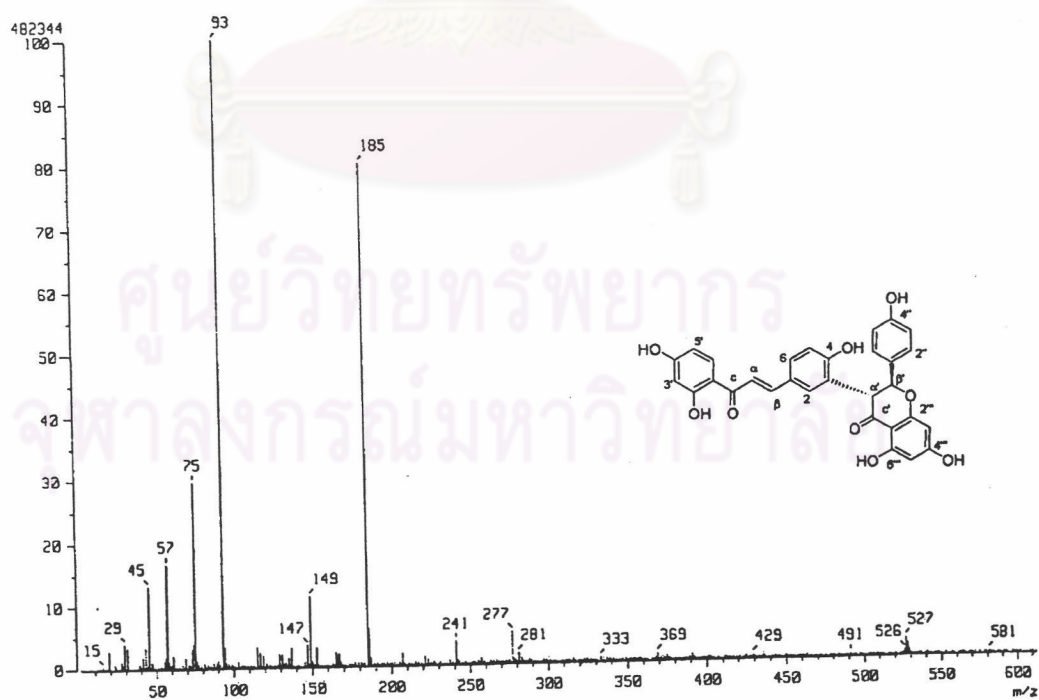


Figure 60 The FAB mass spectrum of compound 173

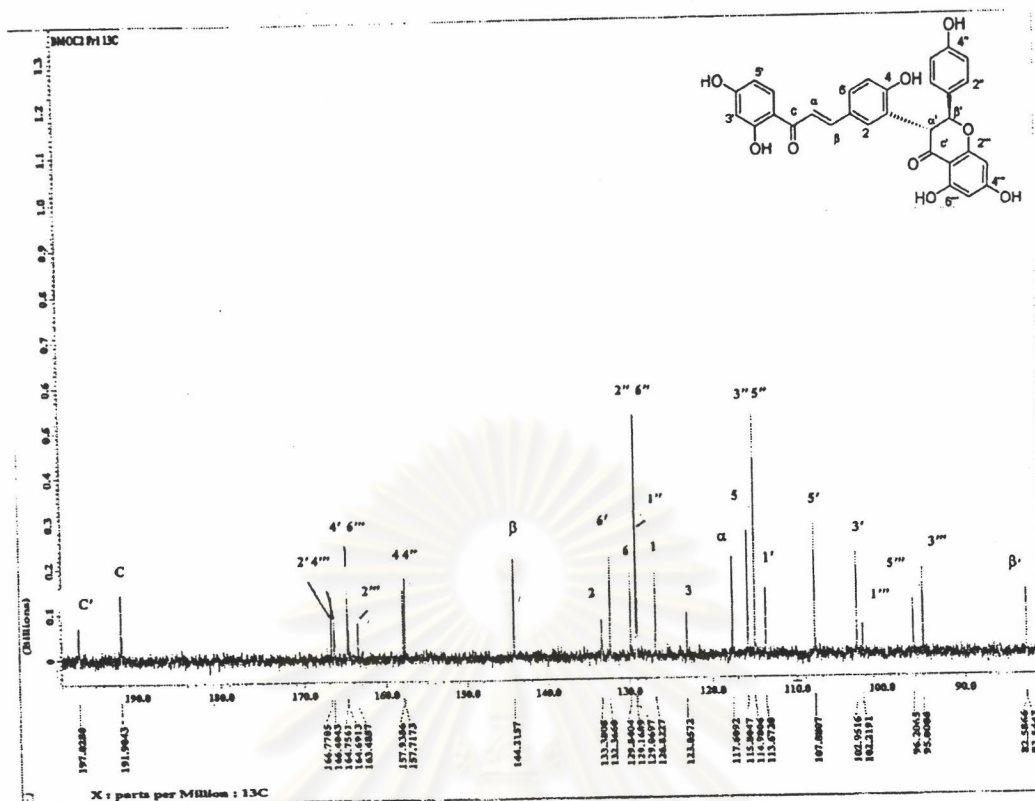


Figure 61 The ^{13}C NMR (150 MHz) spectrum of compound 173 (in acetone- d_6)

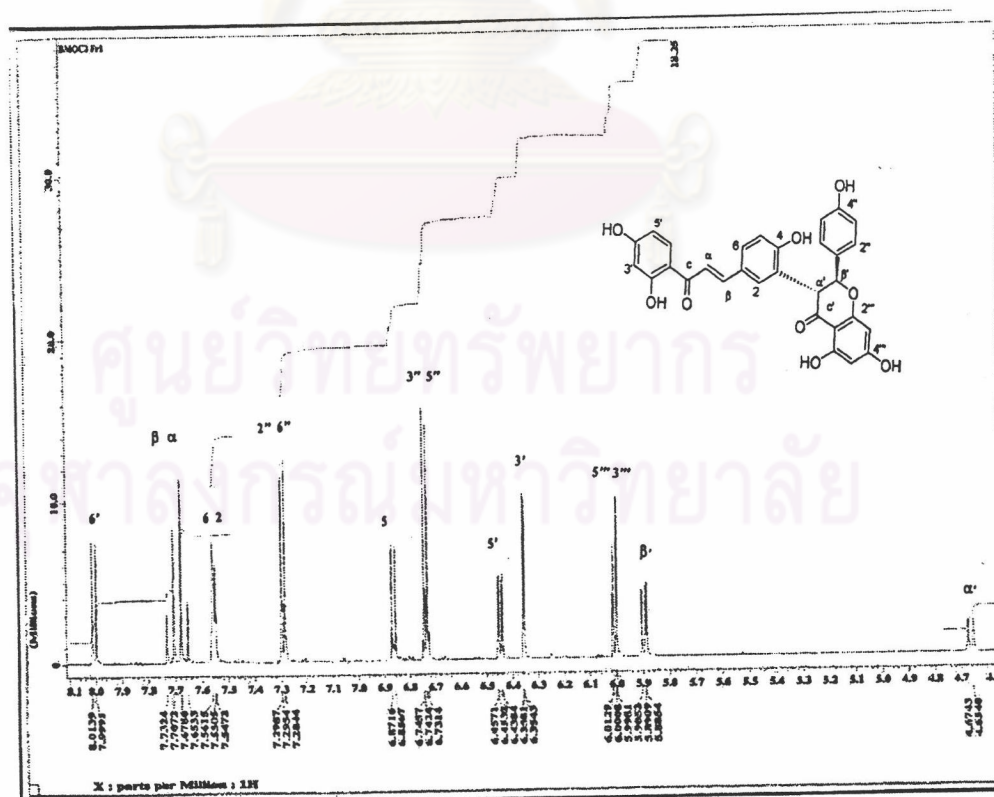


Figure 62 The ^1H NMR (600 MHz) spectrum of compound 173 (in acetone- d_6)

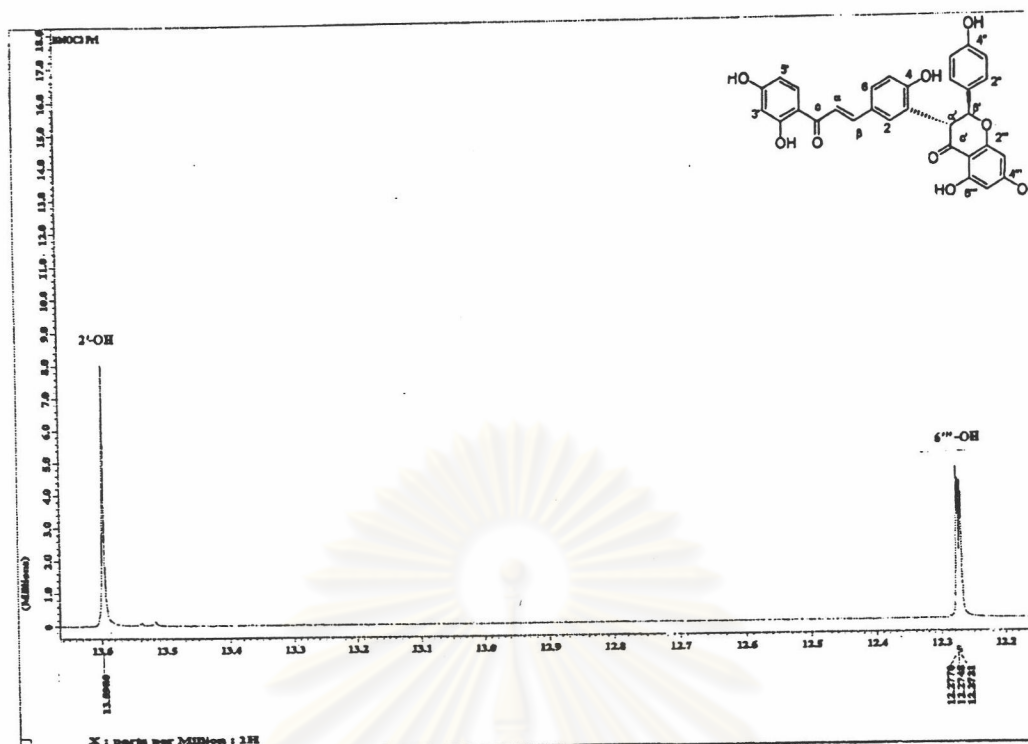


Figure 63 The ^1H NMR (600 MHz) spectrum of compound 173 (in acetone- d_6)

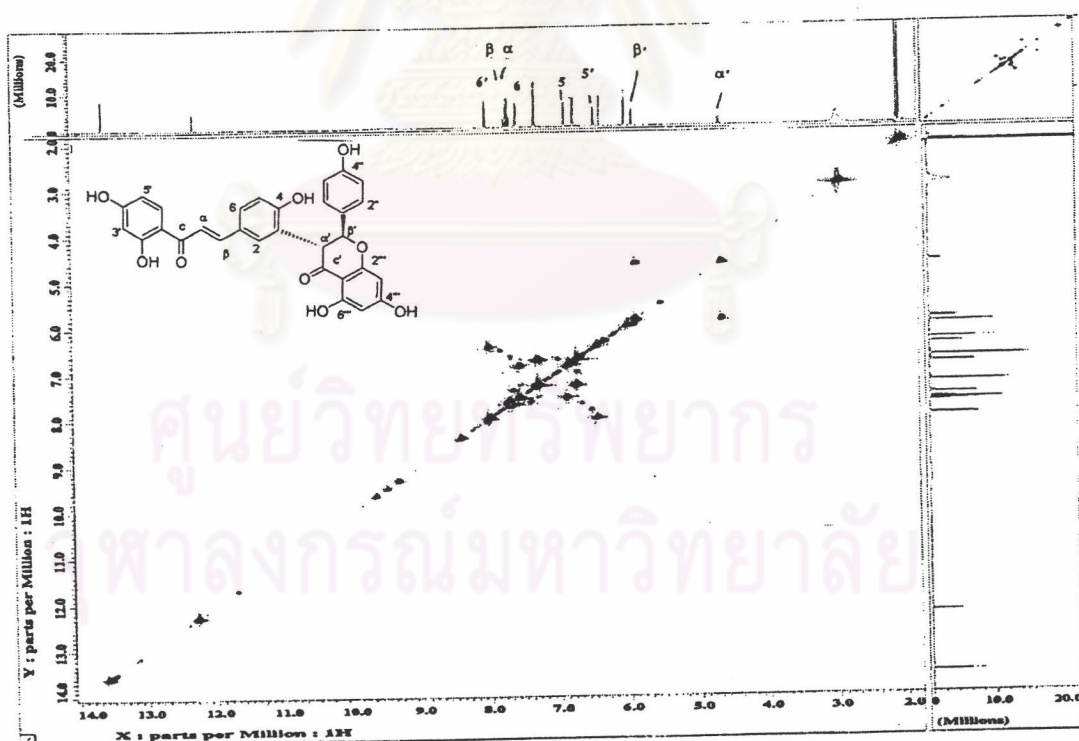


Figure 64 The ^1H - ^1H COSY spectrum of compound 173 (in acetone- d_6)

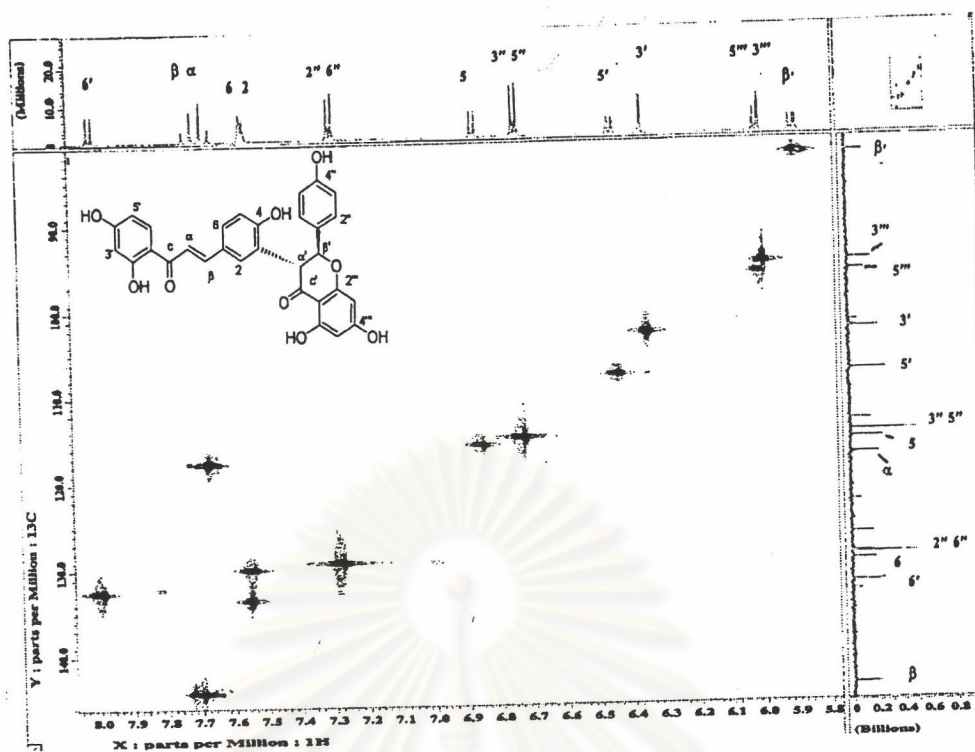


Figure 65 The HMQC spectrum of compound 173 (in acetone- d_6)
 $[\delta_H 5.8-8.0 \text{ ppm}, \delta_C 80.0-150.0 \text{ ppm},]$

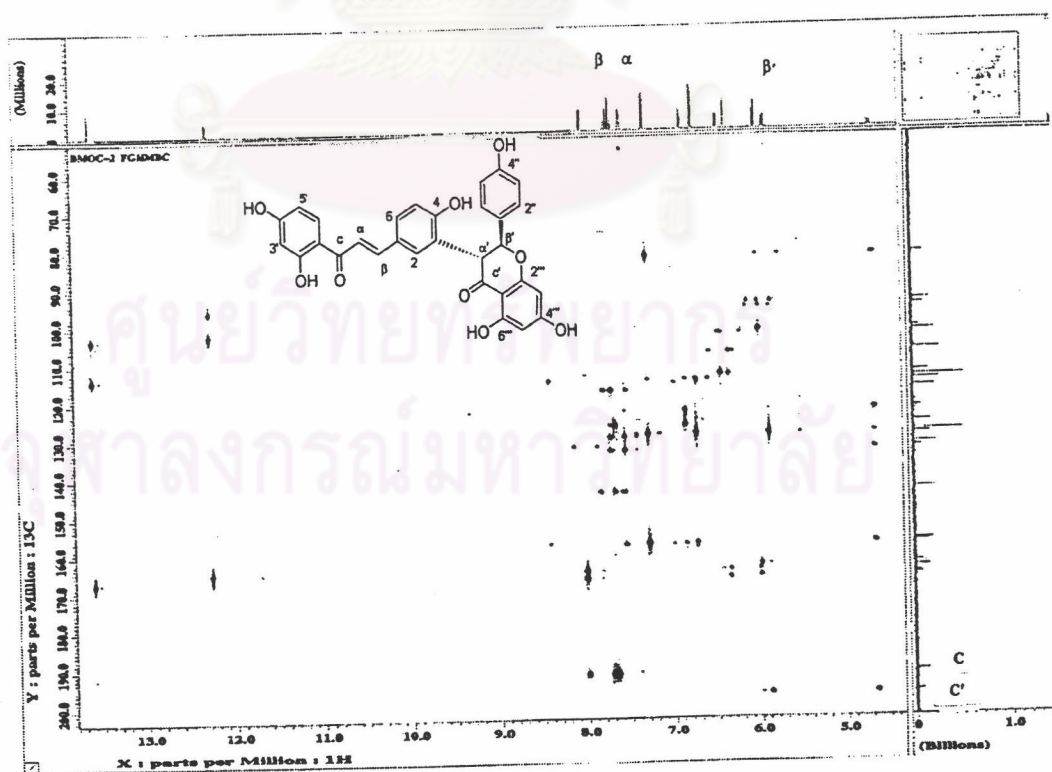


Figure 66 The HMBC spectrum of compound 173 (in acetone- d_6)

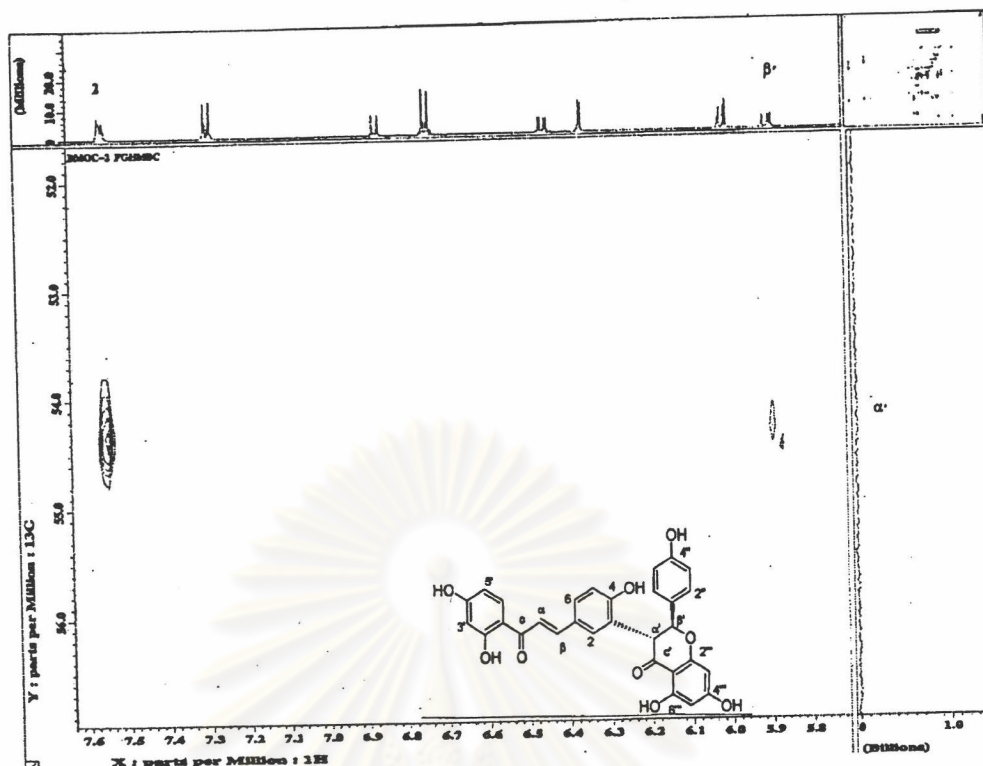


Figure 67 The HMBC spectrum of compound 173 (in acetone- d_6)

[δ_H 5.8-7.6 ppm, δ_C 52.0-60.0 ppm]

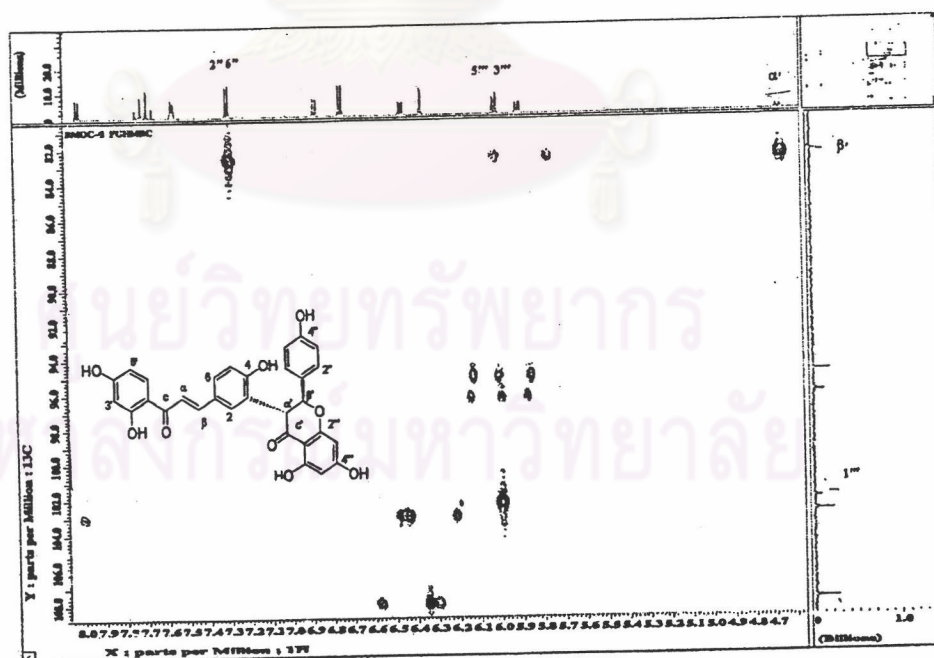


Figure 68 The HMBC spectrum of compound 173 (in acetone- d_6)

[δ_H 4.7-8.0 ppm, δ_C 82.0-108.0 ppm]

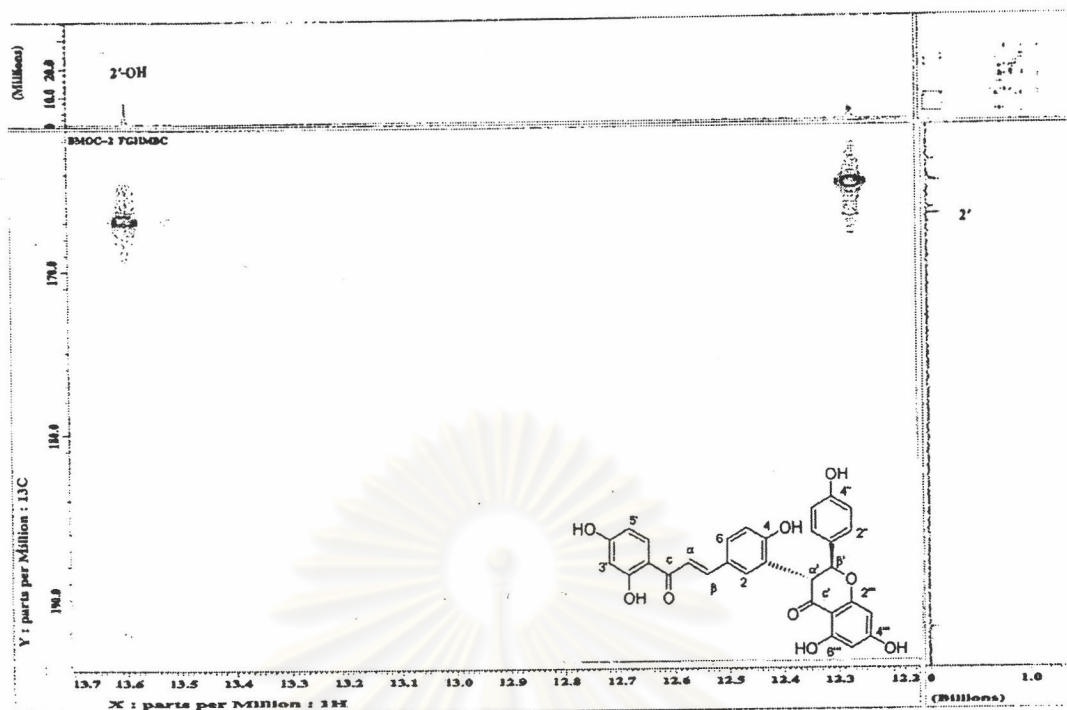


Figure 69 The HMBC spectrum of compound 173 (in acetone- d_6)

$[\delta_{\text{H}} 12.2\text{-}13.7 \text{ ppm}, \delta_{\text{C}} 160.0\text{-}195.0 \text{ ppm}]$

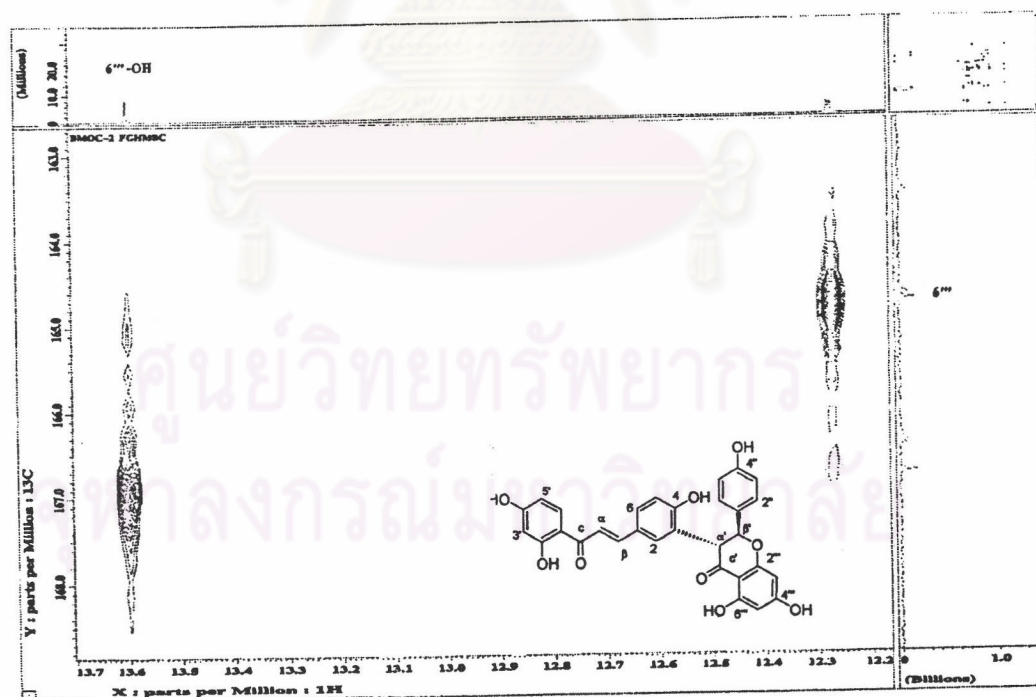


Figure 70 The HMBC spectrum of compound 173 (in acetone- d_6)

$[\delta_{\text{H}} 12.2\text{-}13.7 \text{ ppm}, \delta_{\text{C}} 163.0\text{-}168.0 \text{ ppm}]$

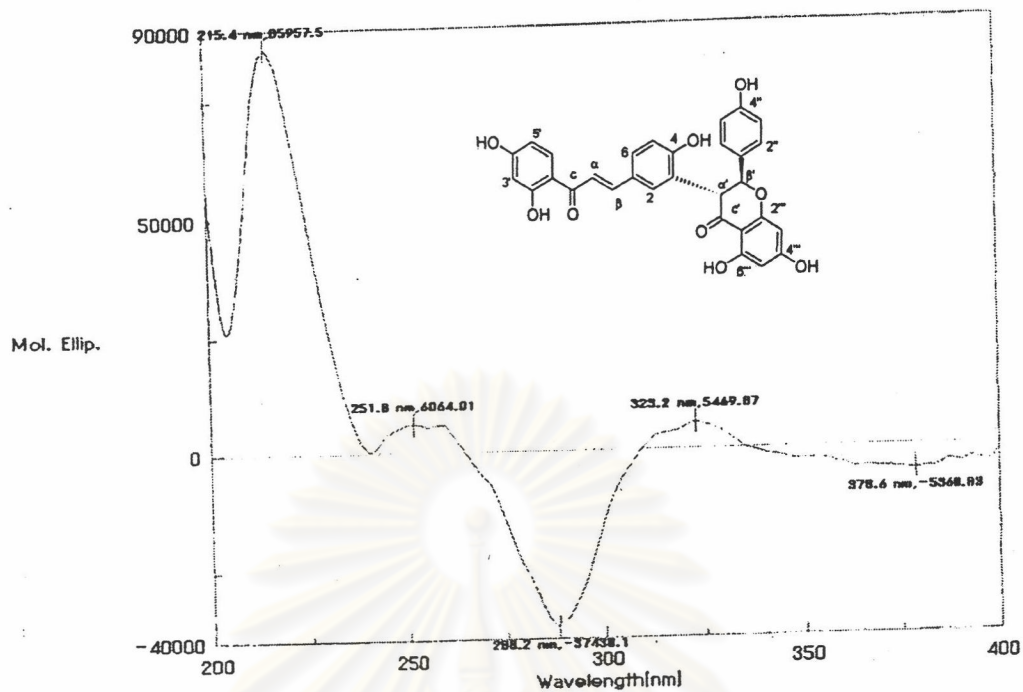


Figure 71 The CD spectrum of compound 173

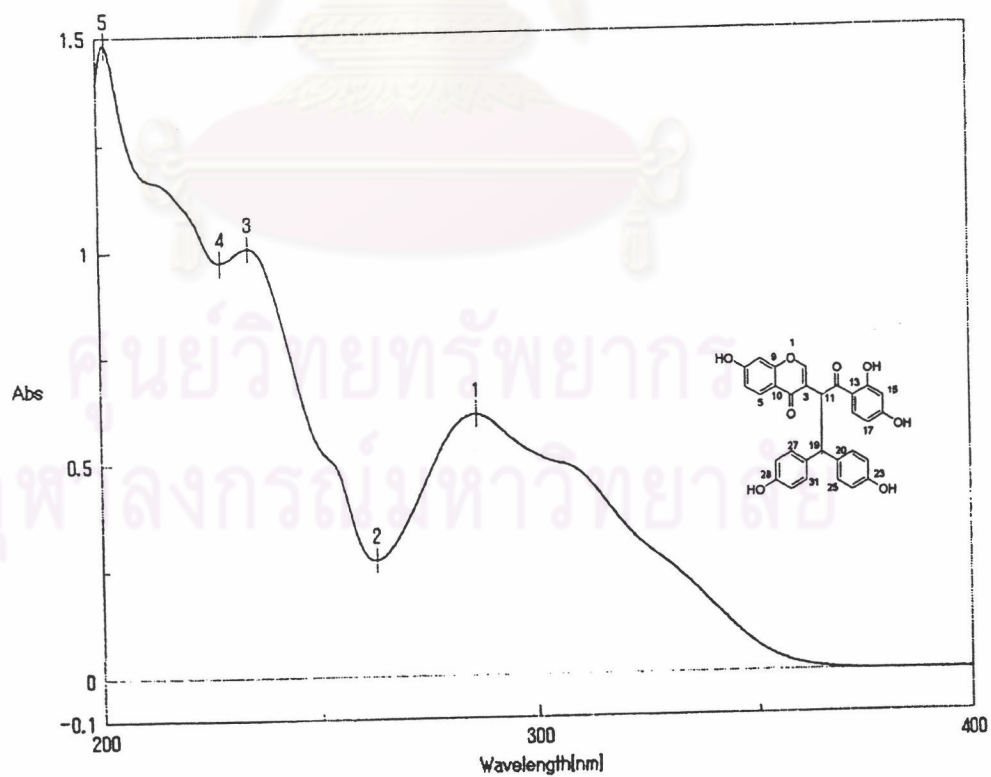


Figure 72 The UV spectrum of compound 27 (in methanol)

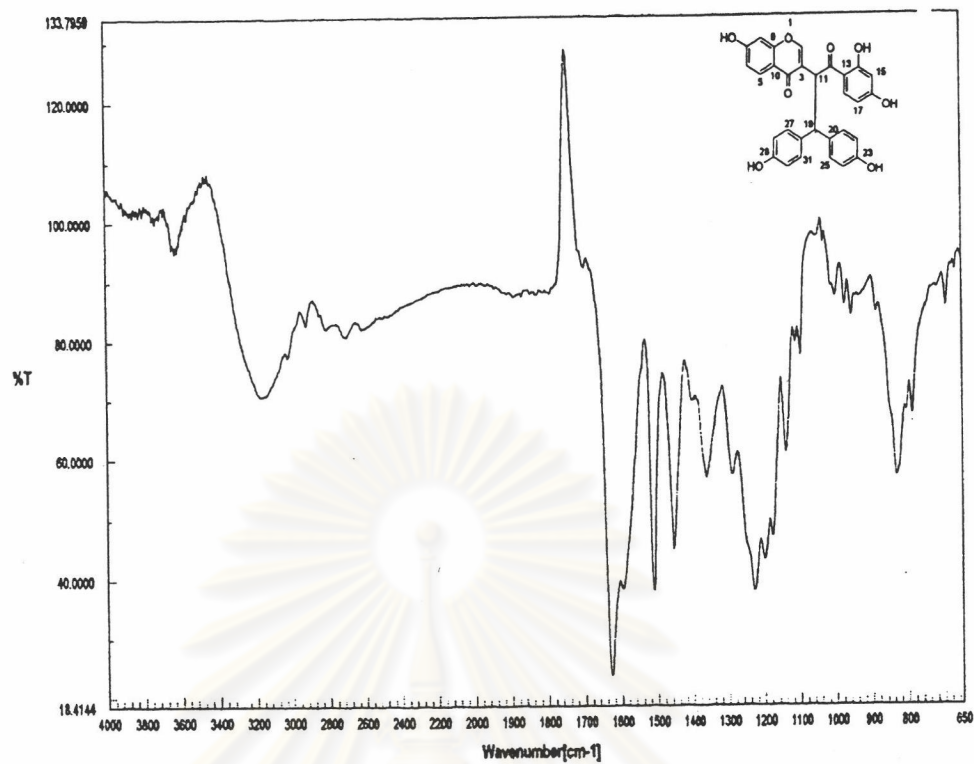


Figure 73 The IR spectrum of compound 27 (KBr disc)

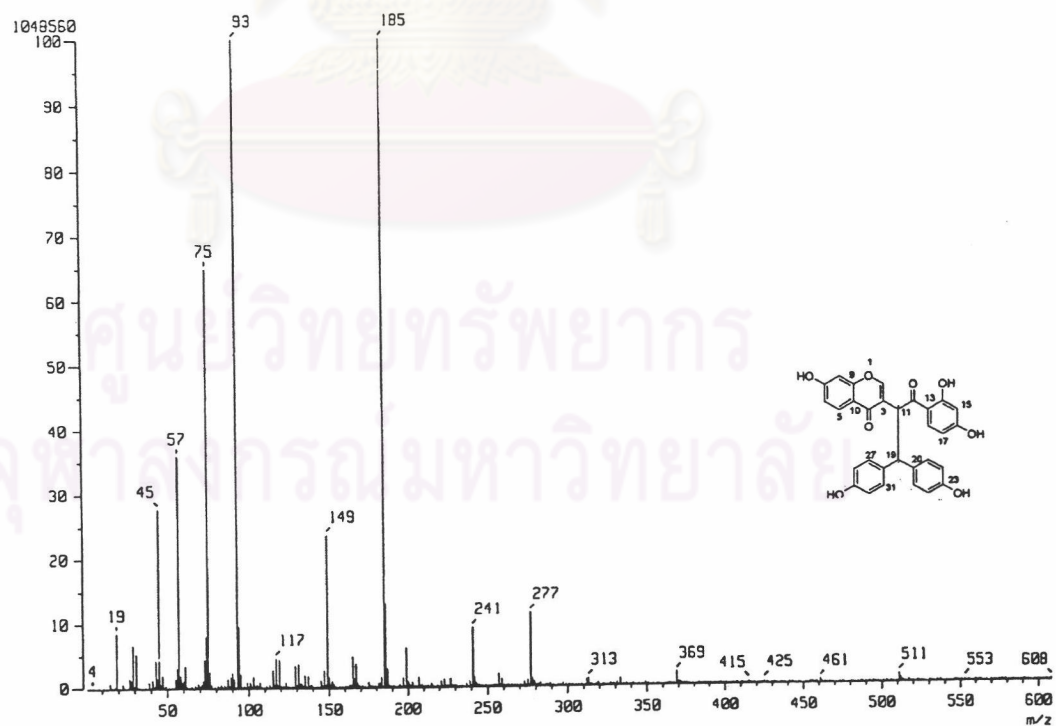


Figure 74 The FAB mass spectrum of compound 27

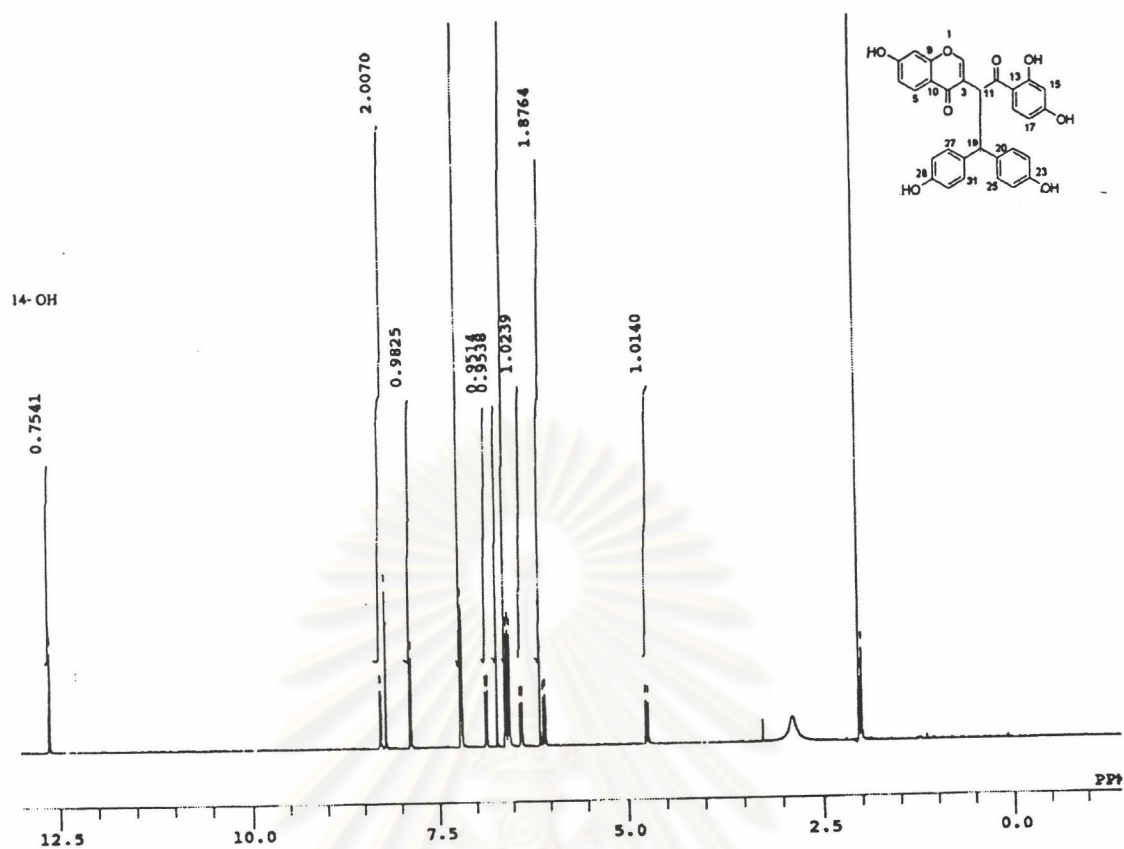


Figure 75 The ^1H NMR (400 MHz) spectrum of compound 27 (in acetone- d_6)

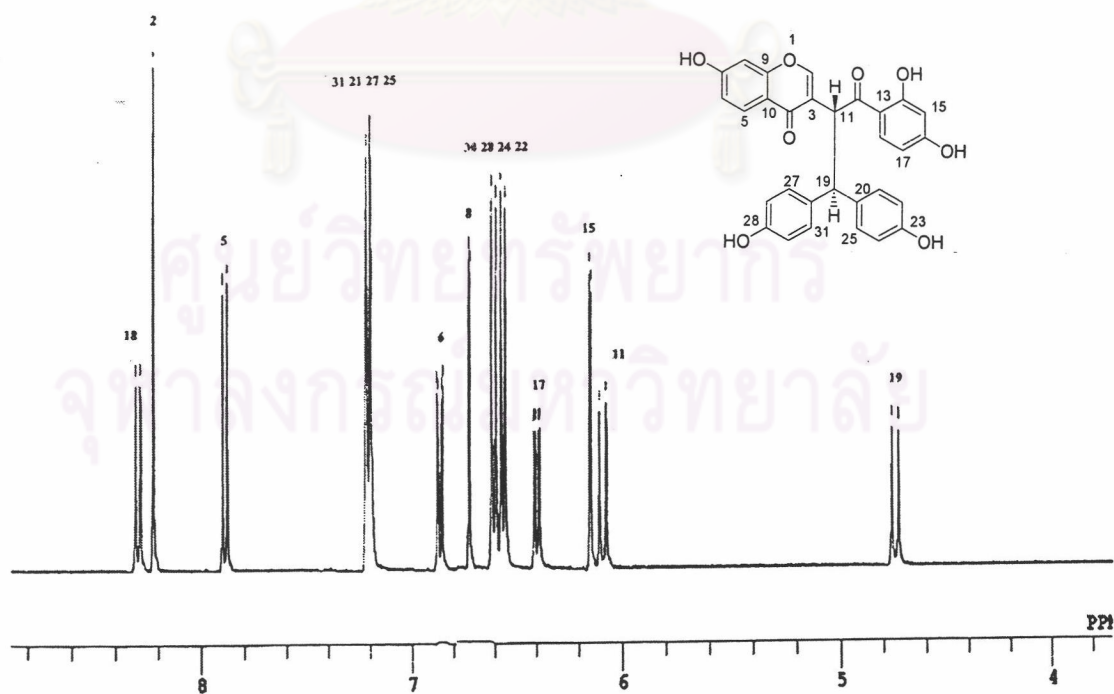


Figure 76 The ^1H NMR (400 MHz) spectrum of compound 27 (in acetone- d_6)

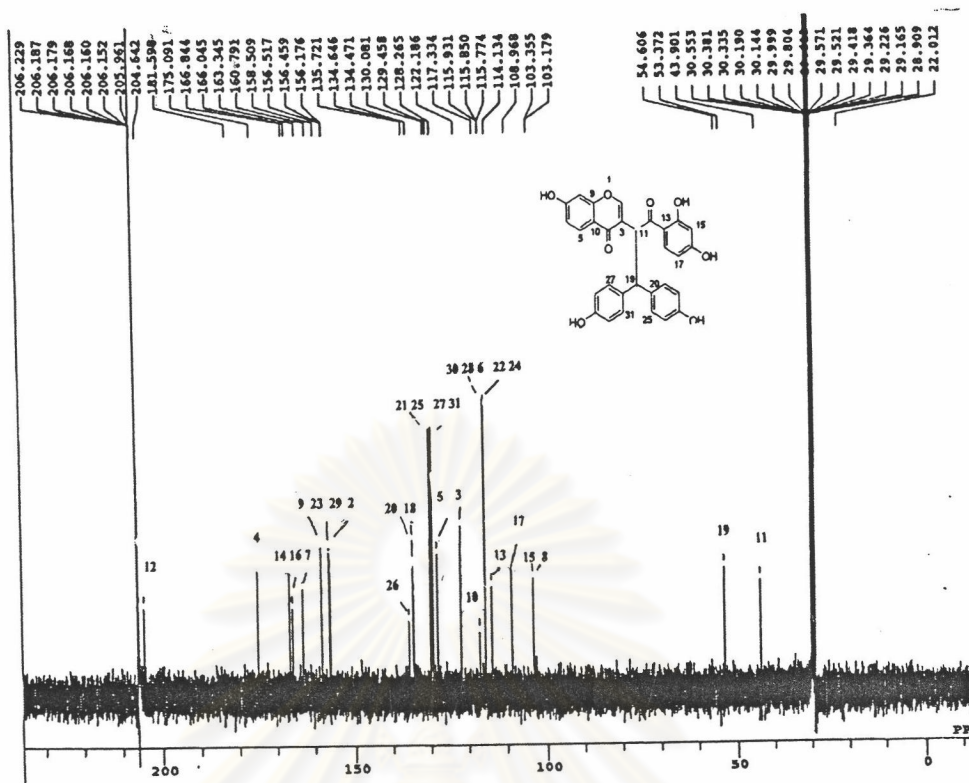


Figure 77 The ^{13}C NMR (100 MHz) spectrum of compound 27 (in acetone- d_6)

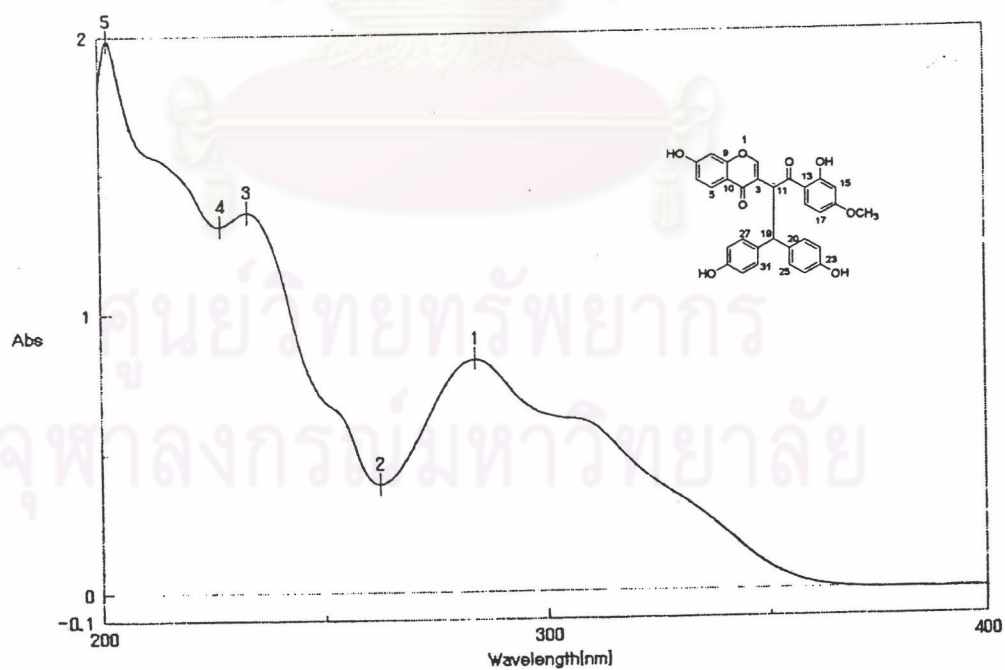


Figure 78 The UV spectrum of compound 21 (in methanol)

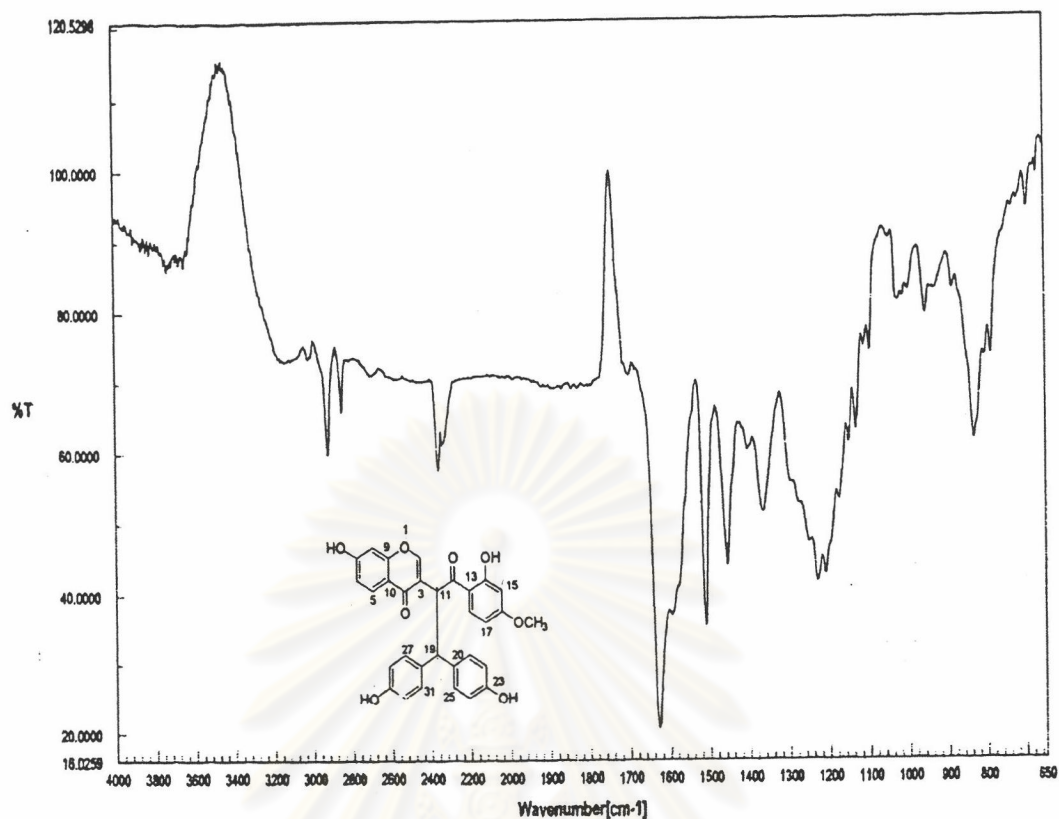


Figure 79 The IR spectrum of compound 21 (KBr disc)

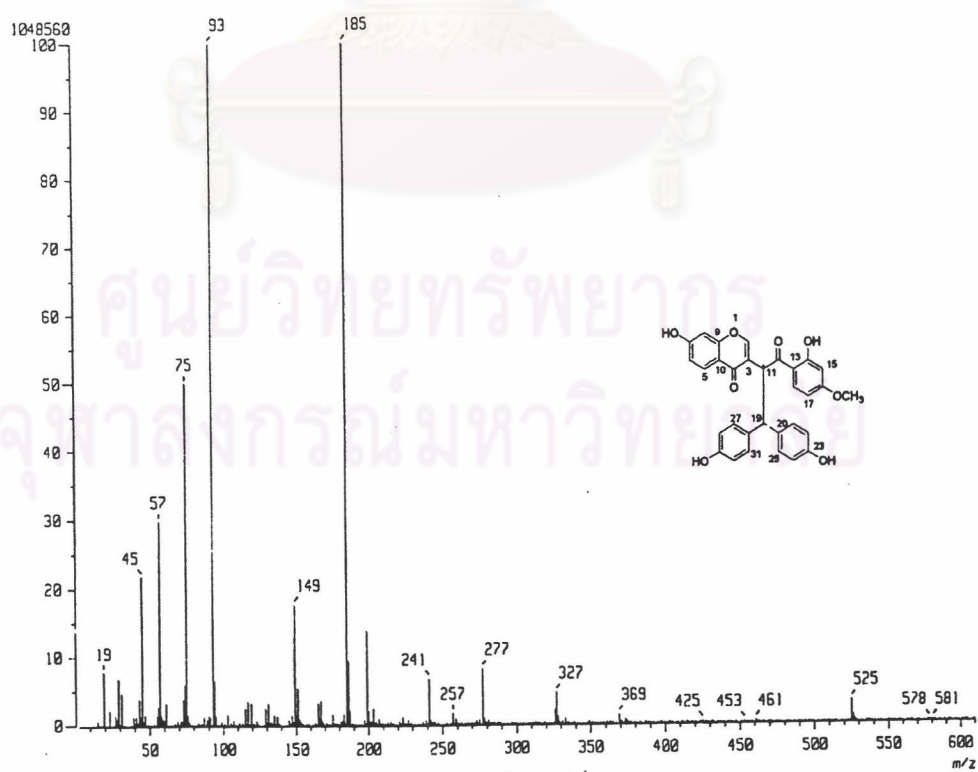


Figure 80 The FAB mass spectrum of compound 21

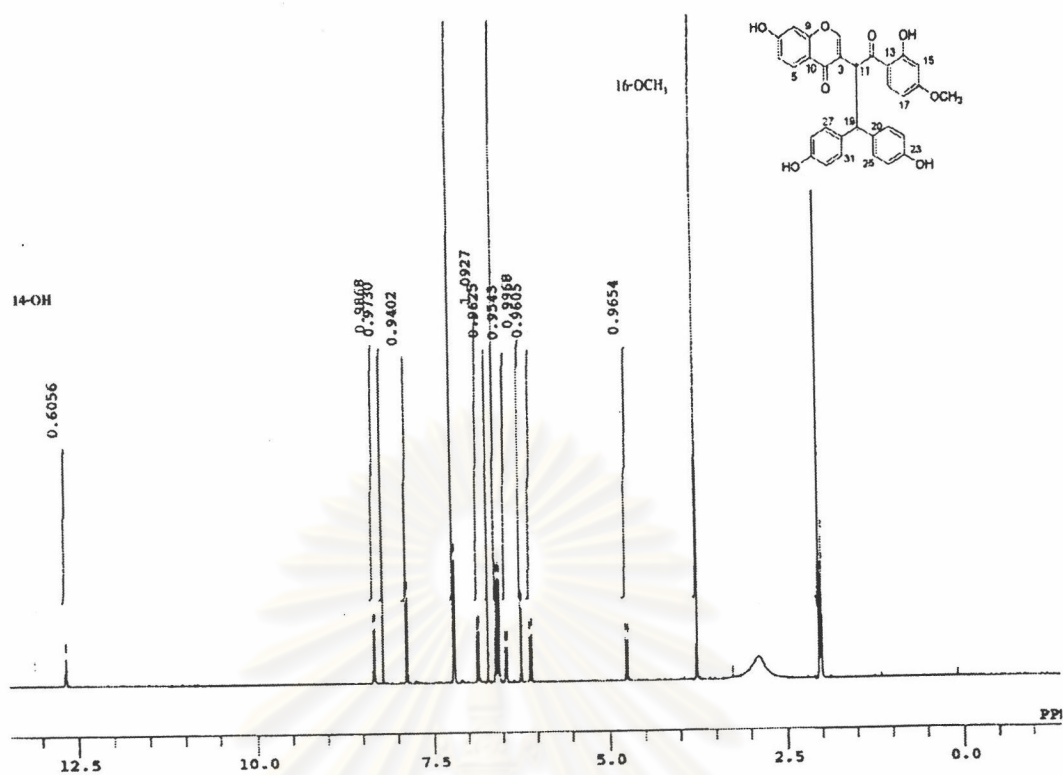


Figure 81 The ^1H NMR (400 MHz) spectrum of compound 21 (in acetone- d_6)

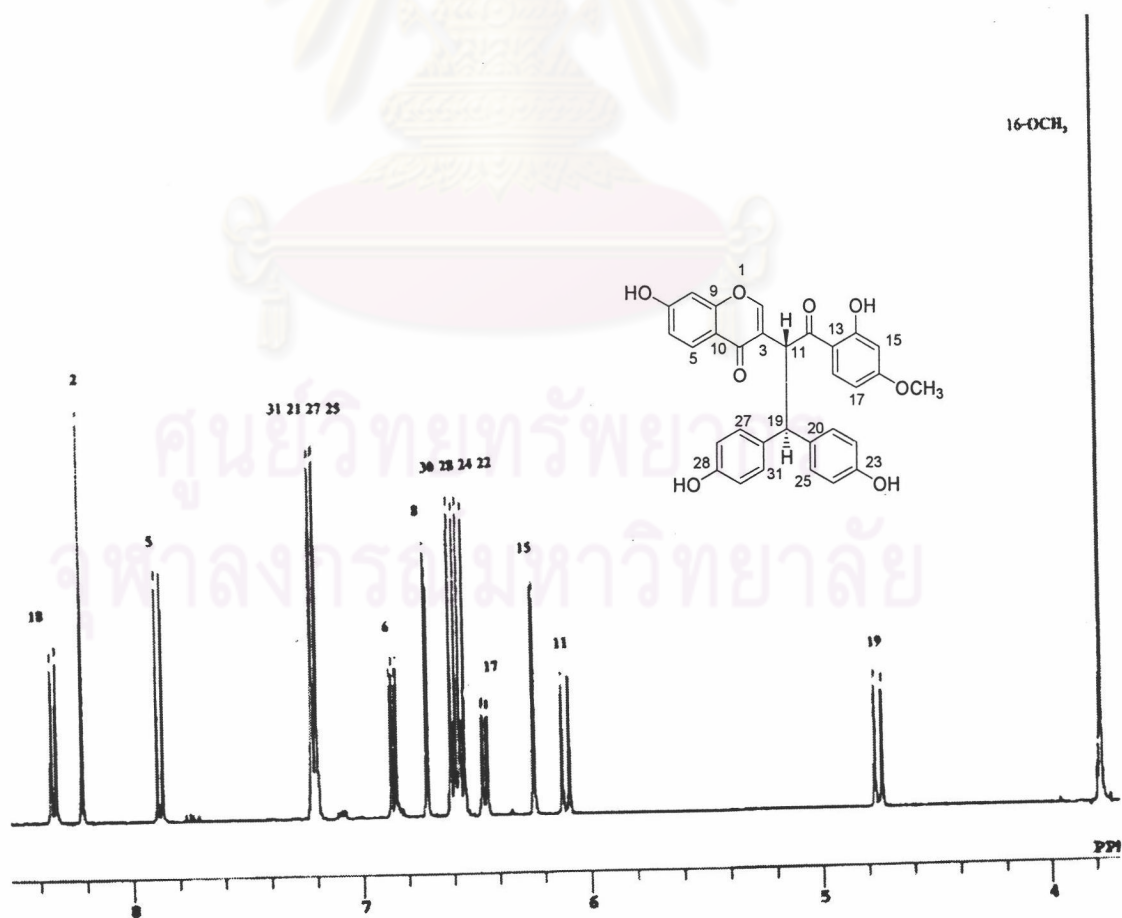


Figure 82 The ^1H NMR (400 MHz) spectrum of compound 21 (in acetone- d_6)

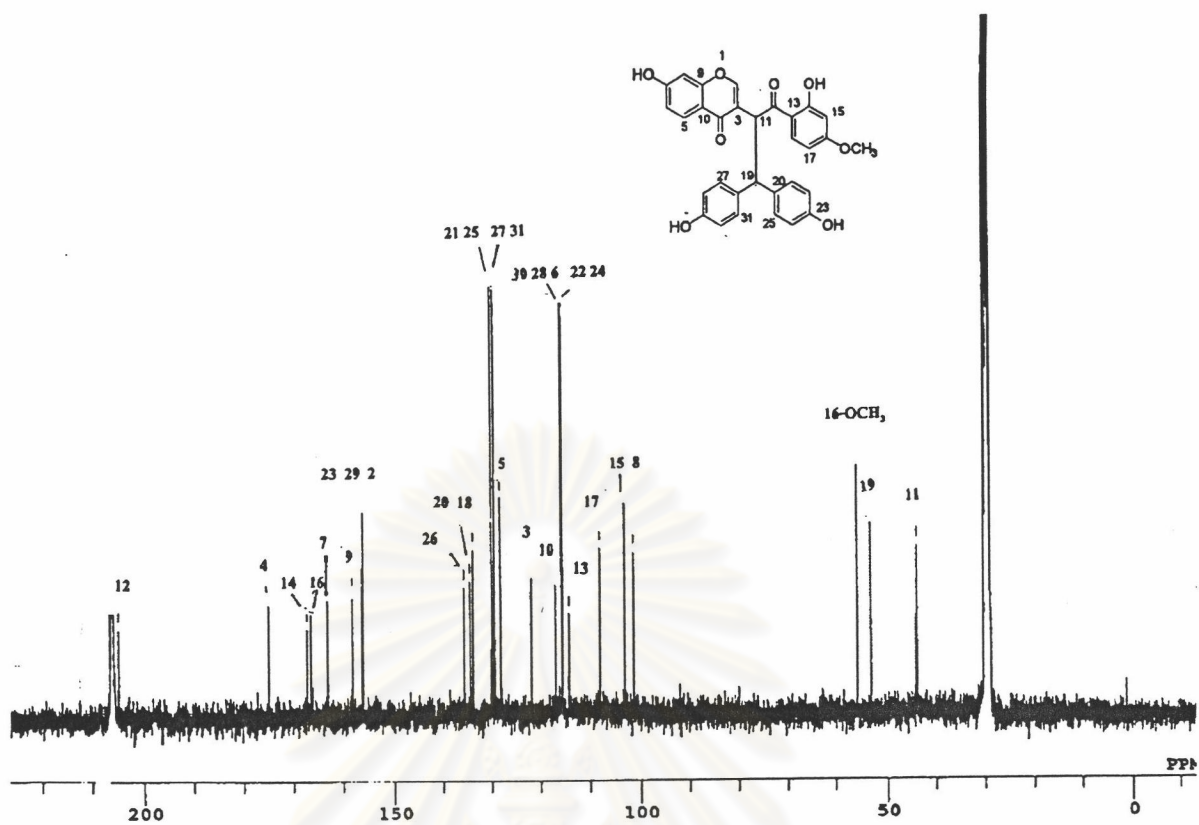


Figure 83 The ^{13}C NMR (100 MHz) spectrum of compound 21 (in acetone- d_6)

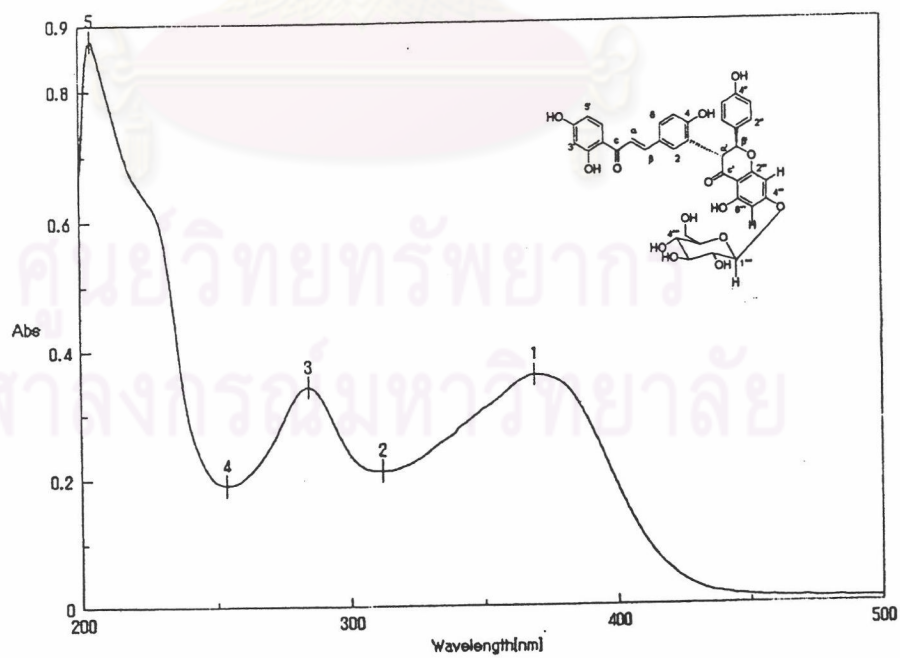


Figure 84 The UV spectrum of compound 174 (in methanol)

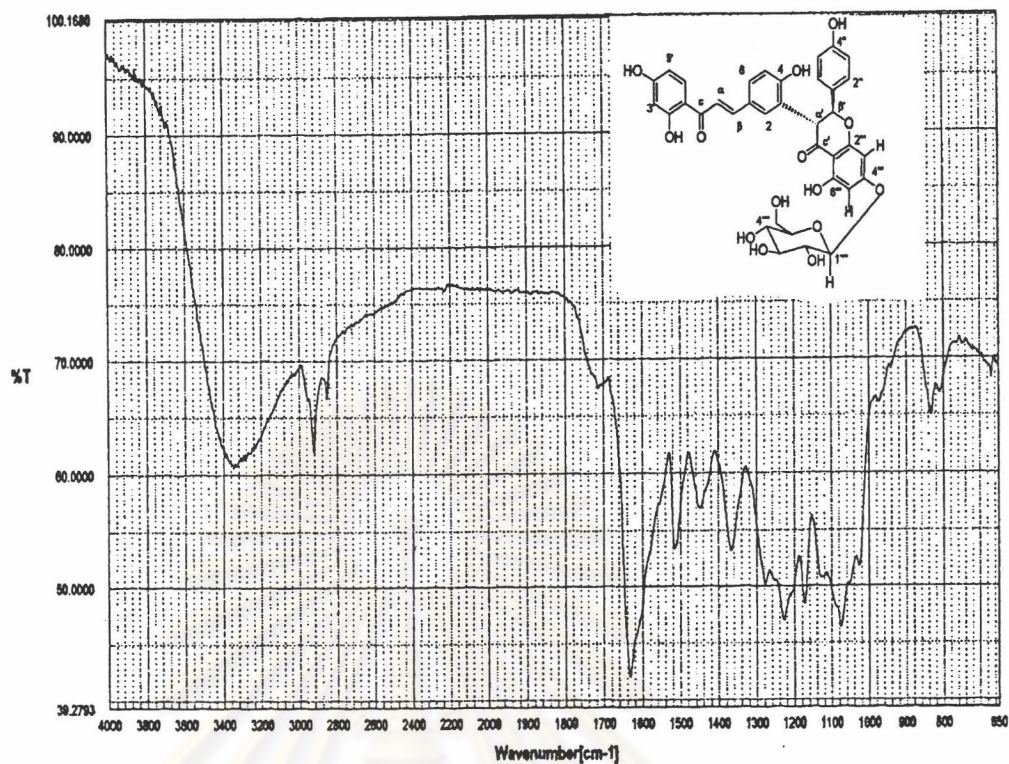


Figure 85 The IR spectrum of compound 174 (KBr disc)

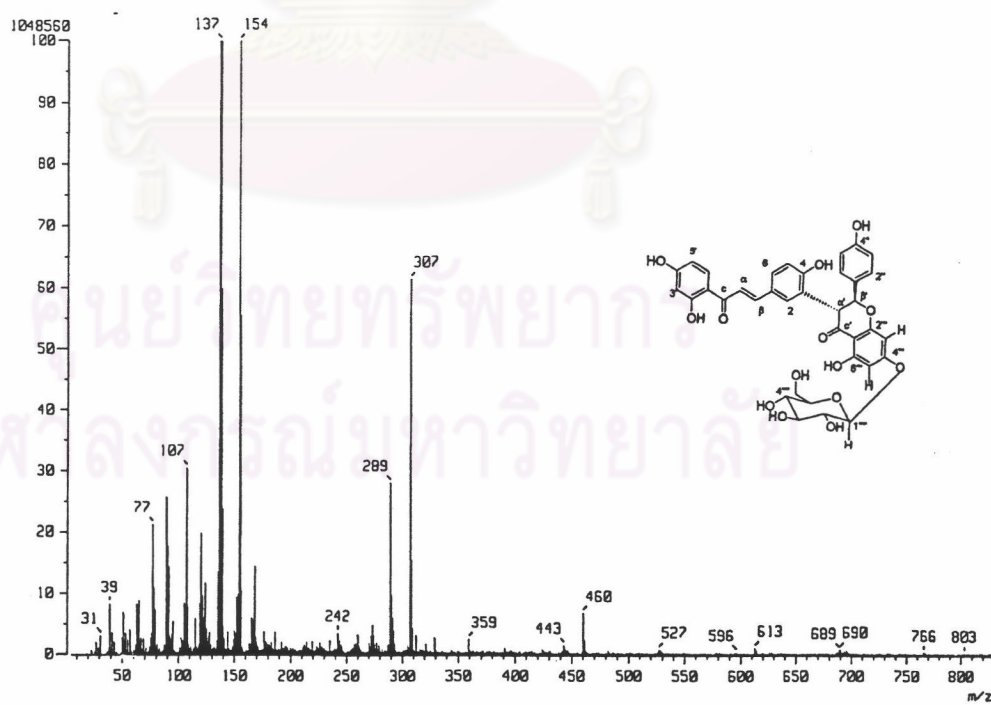


Figure 86 The FAB mass spectrum of compound 174

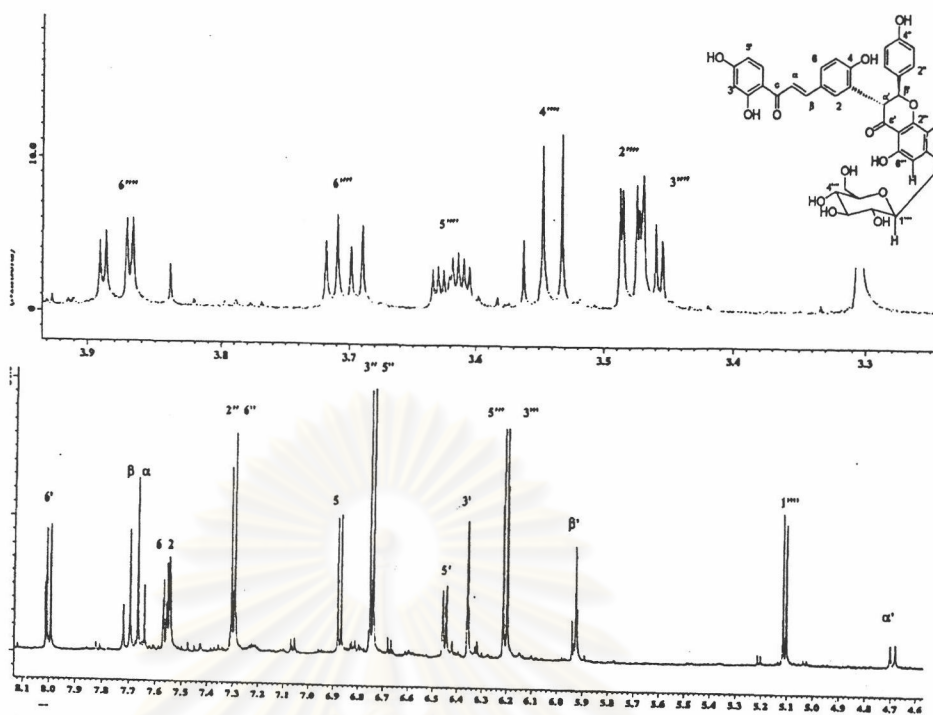


Figure 87 The ^1H NMR (600 MHz) spectrum of compound 174 (in acetone- d_6)

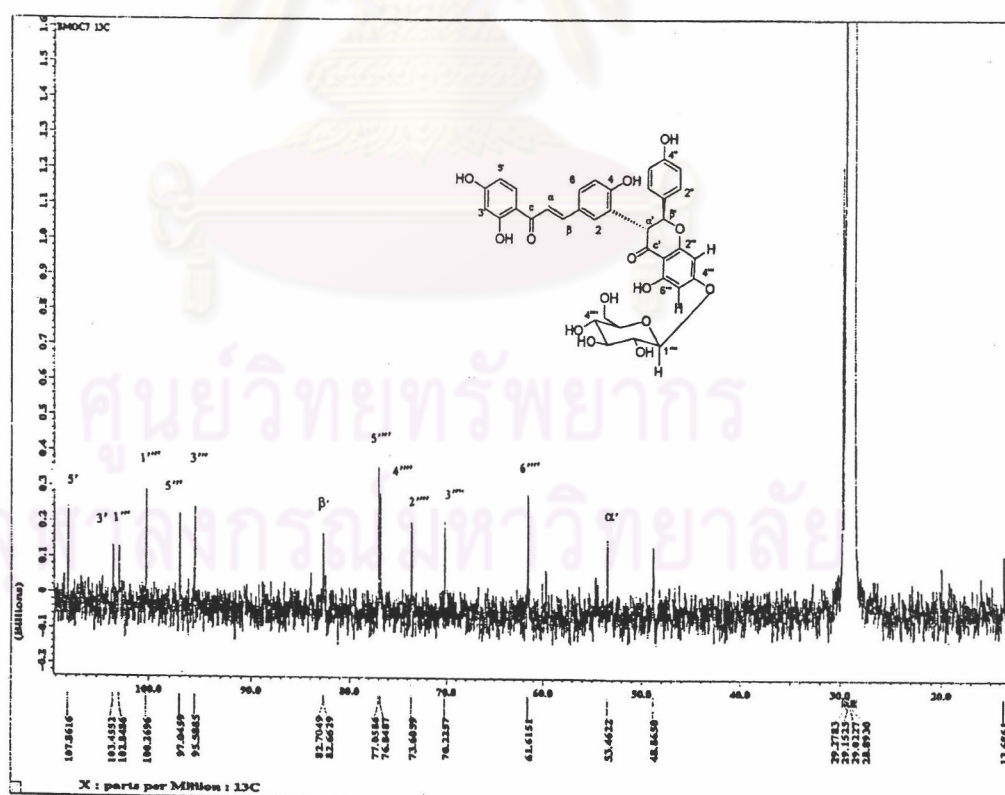


Figure 88 The ^{13}C NMR (150 MHz) spectrum of compound 174 (in acetone- d_6)

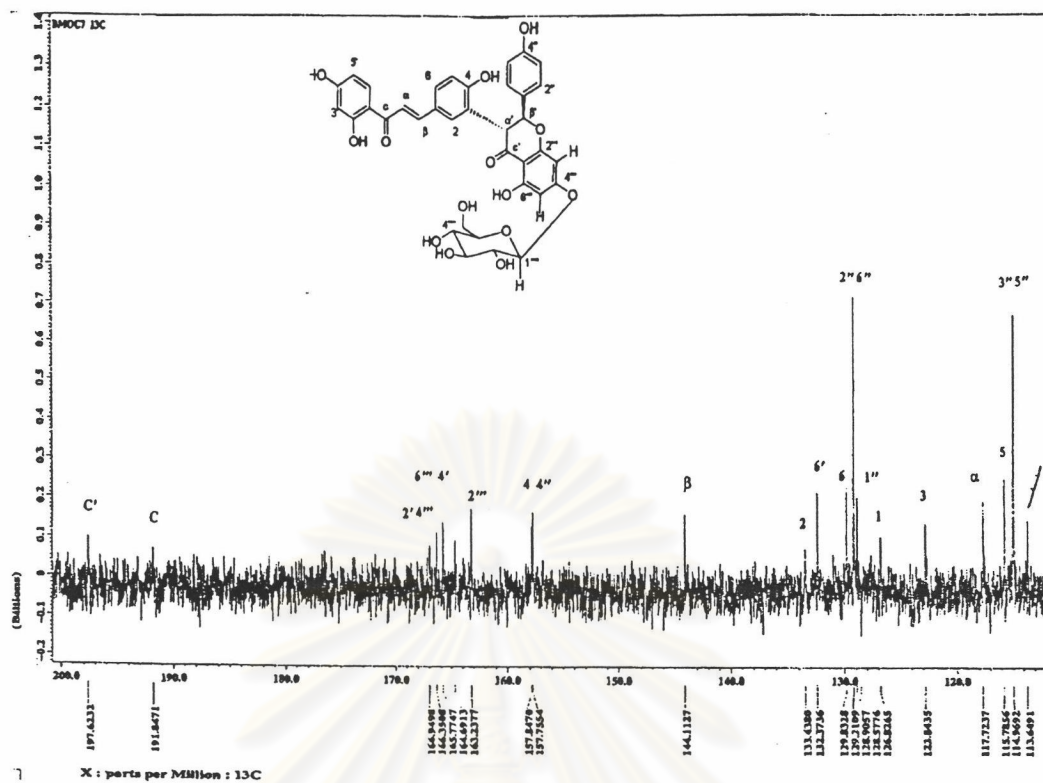


Figure 89 The ^{13}C NMR (150 MHz) spectrum of compound 174 (in acetone- d_6)

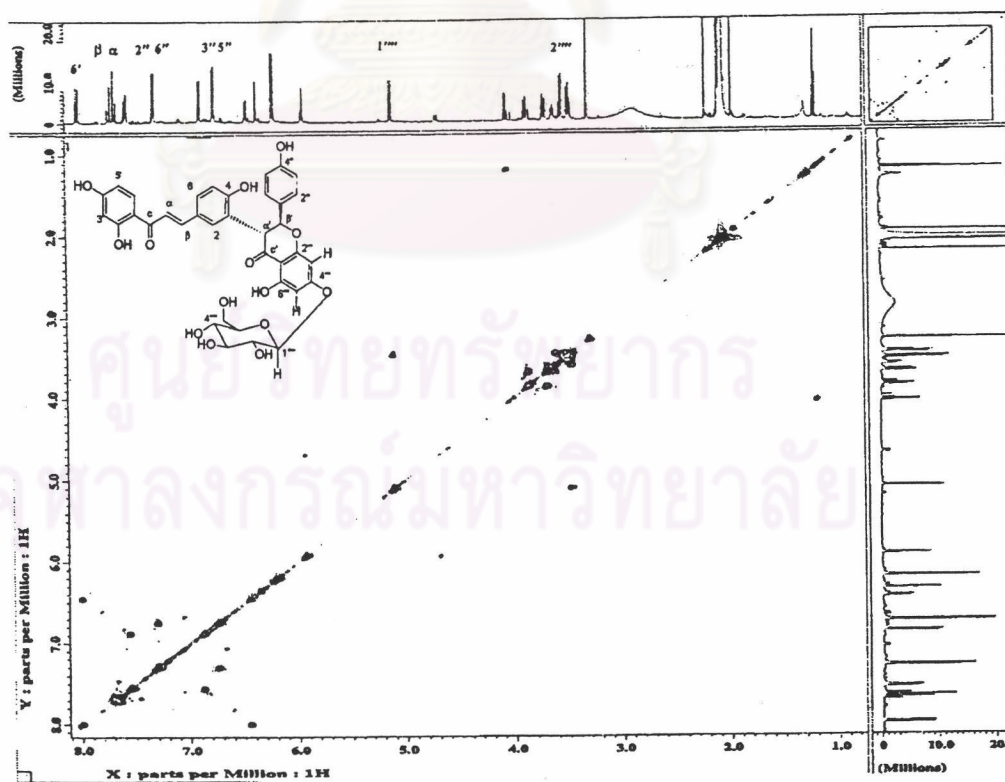


Figure 90 The ^1H - ^1H COSY spectrum of compound 174 (in acetone- d_6)

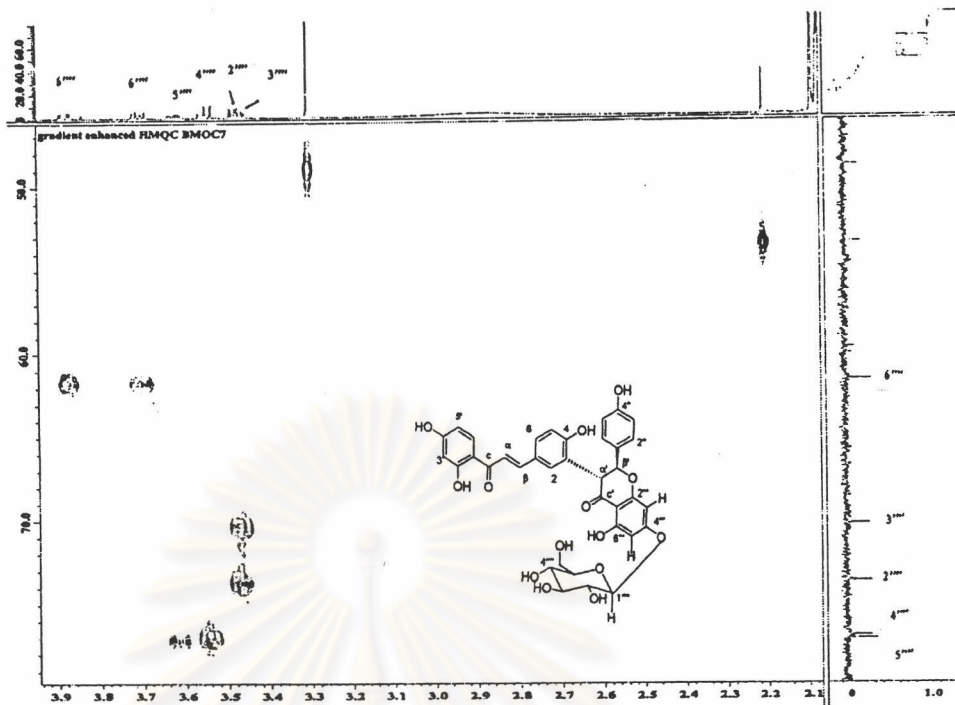


Figure 91 The HMQC spectrum of compound 174 (in acetone- d_6)

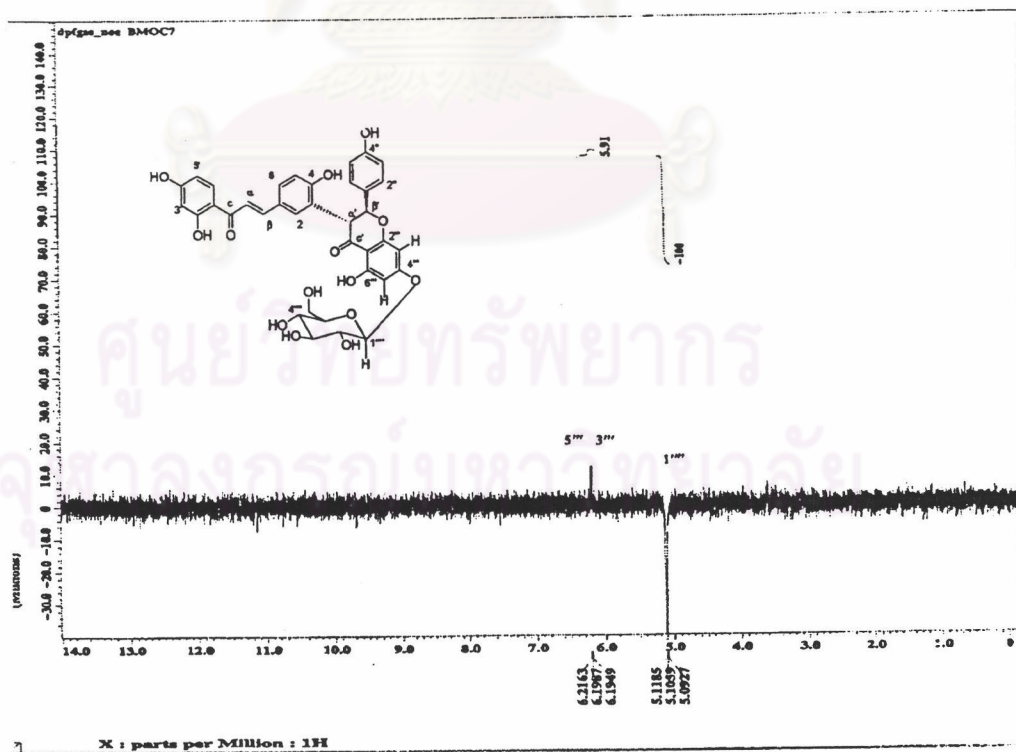


Figure 92 The NOE difference spectrum of compound 174 (in acetone- d_6)

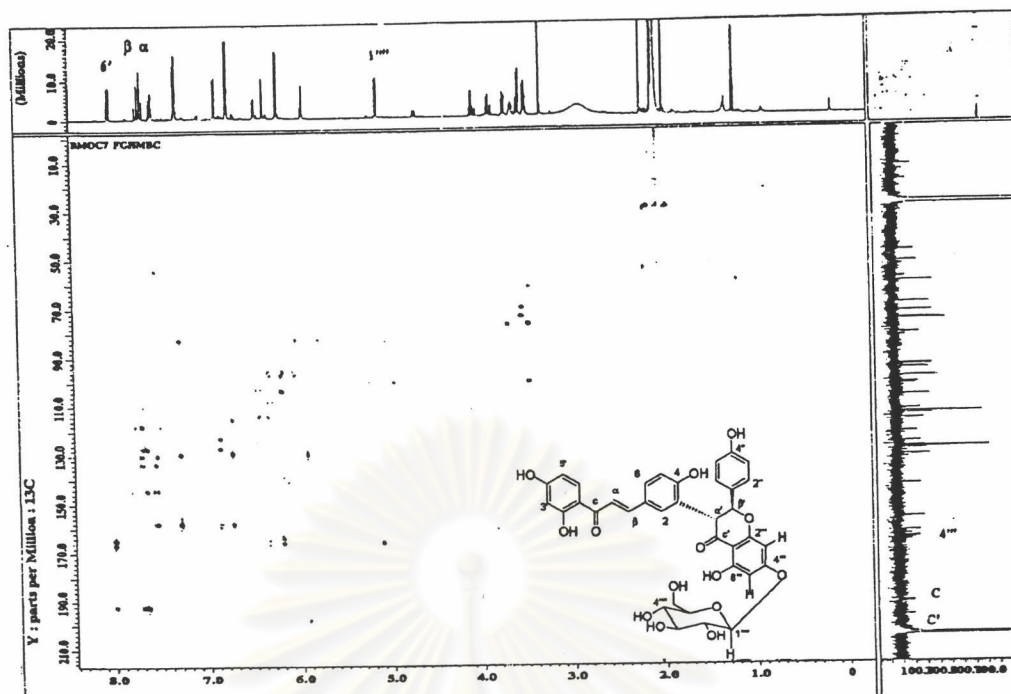


Figure 93 The HMBC spectrum of compound 174 (in acetone- d_6)

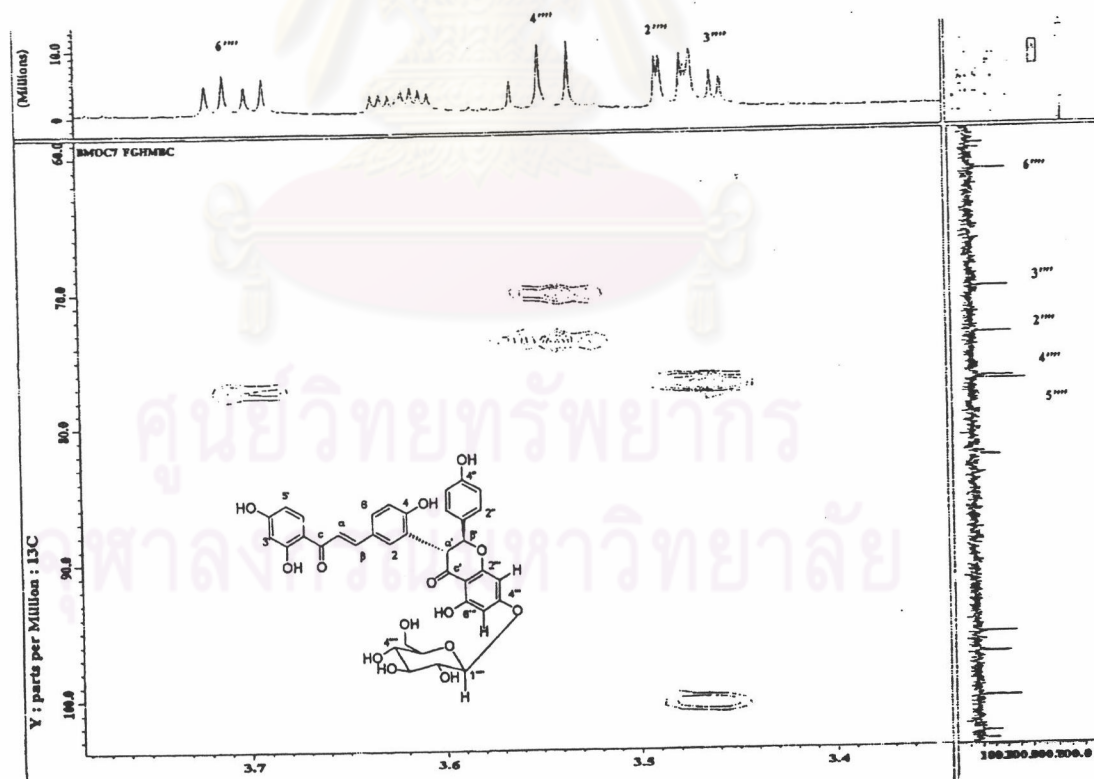


Figure 94 The HMBC spectrum of compound 174 (in acetone- d_6)

$[\delta_H 3.4-3.7 \text{ ppm}, \delta_C 60.0-100.0 \text{ ppm}]$

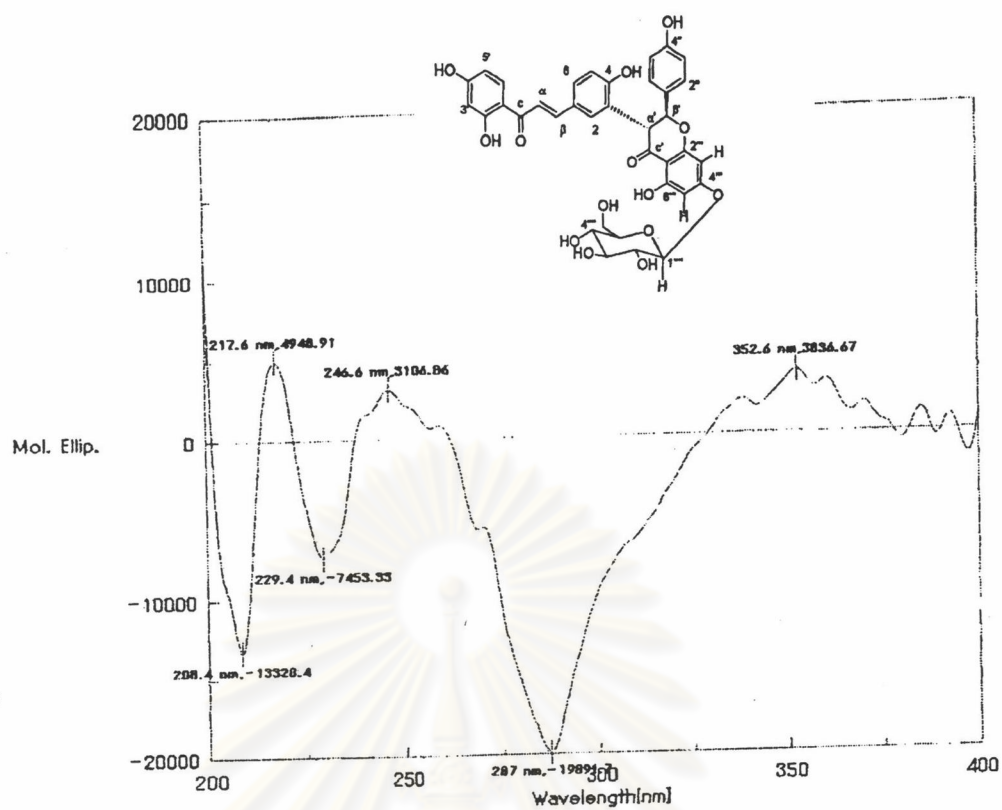


Figure 95 The CD spectrum of compound 174

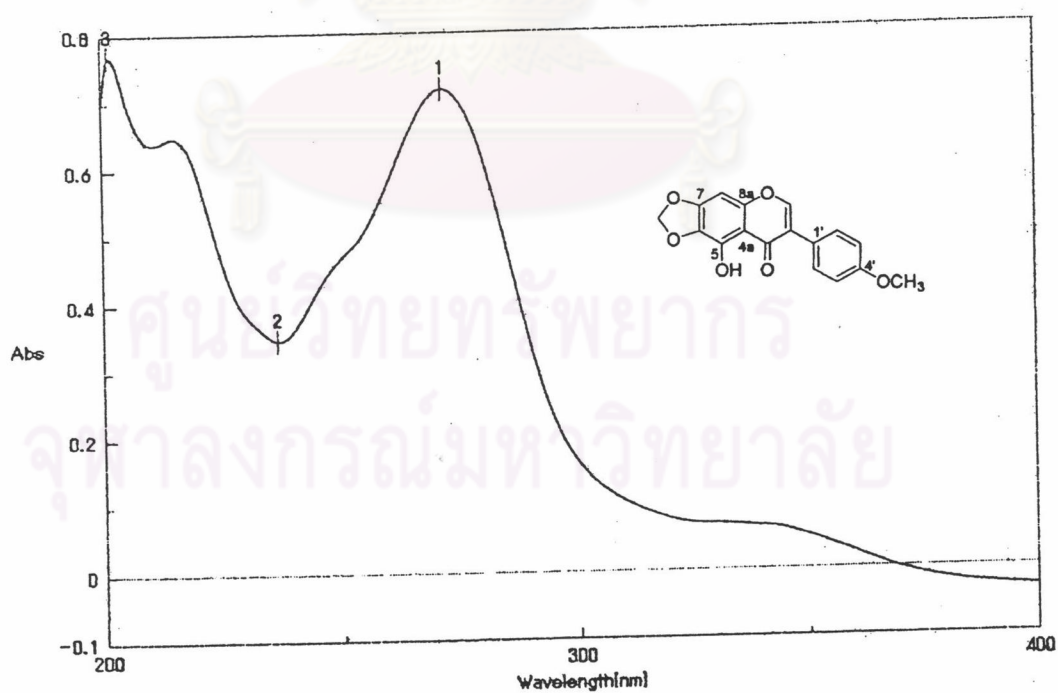


Figure 96 The UV spectrum of compound 26 (in methanol)

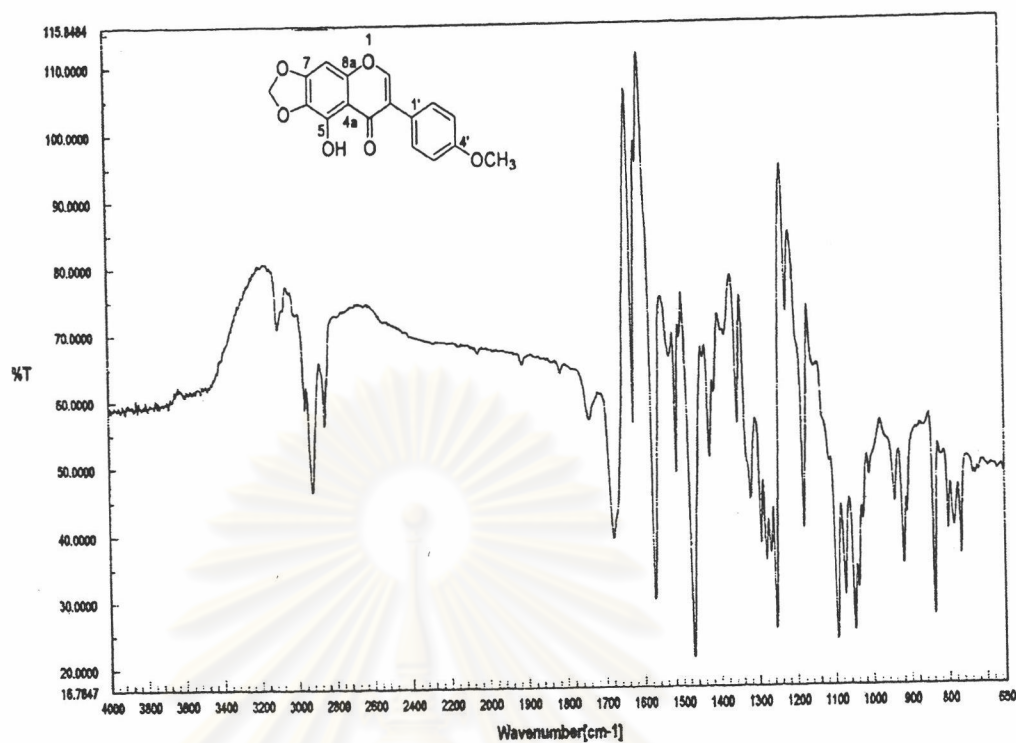


Figure 97 The IR spectrum of compound 26 (KBr disc)

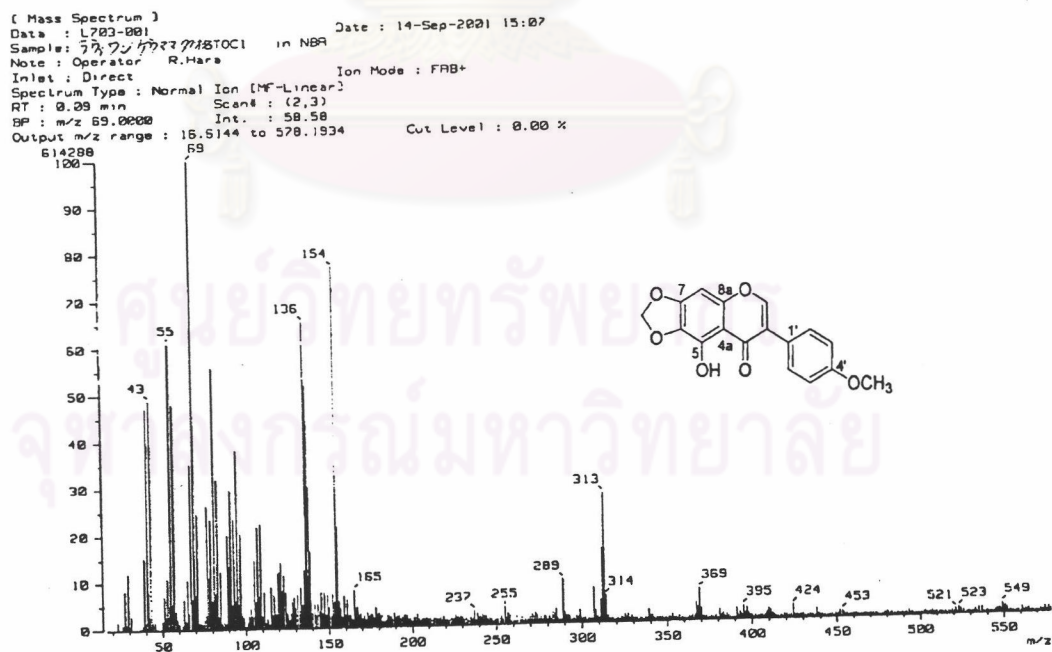


Figure 98 The FAB mass spectrum of compound 26

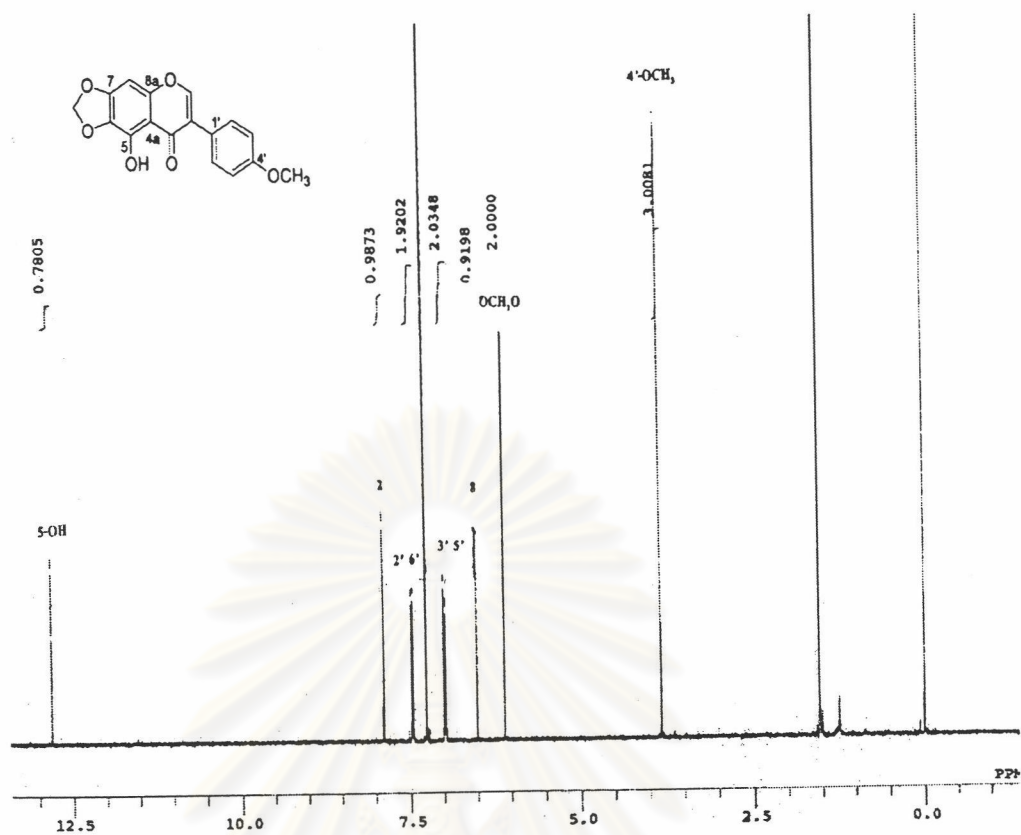


Figure 99 The $^1\text{H NMR}$ (400 MHz) spectrum of compound 26 (in acetone- d_6)

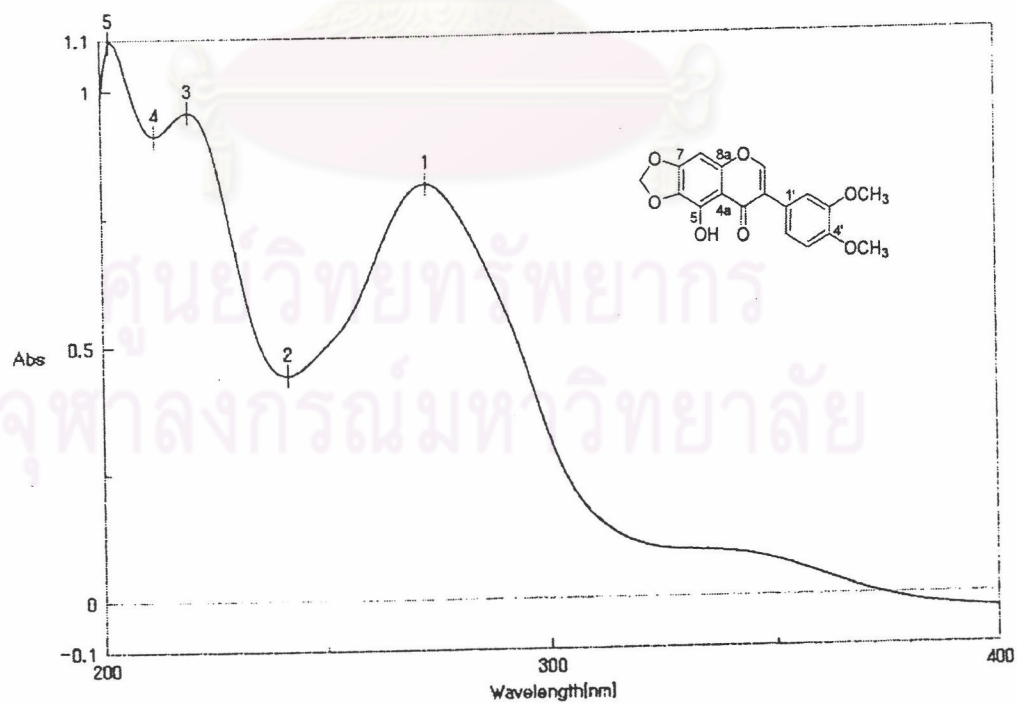


Figure 100 The UV spectrum of compound 58 (in methanol)

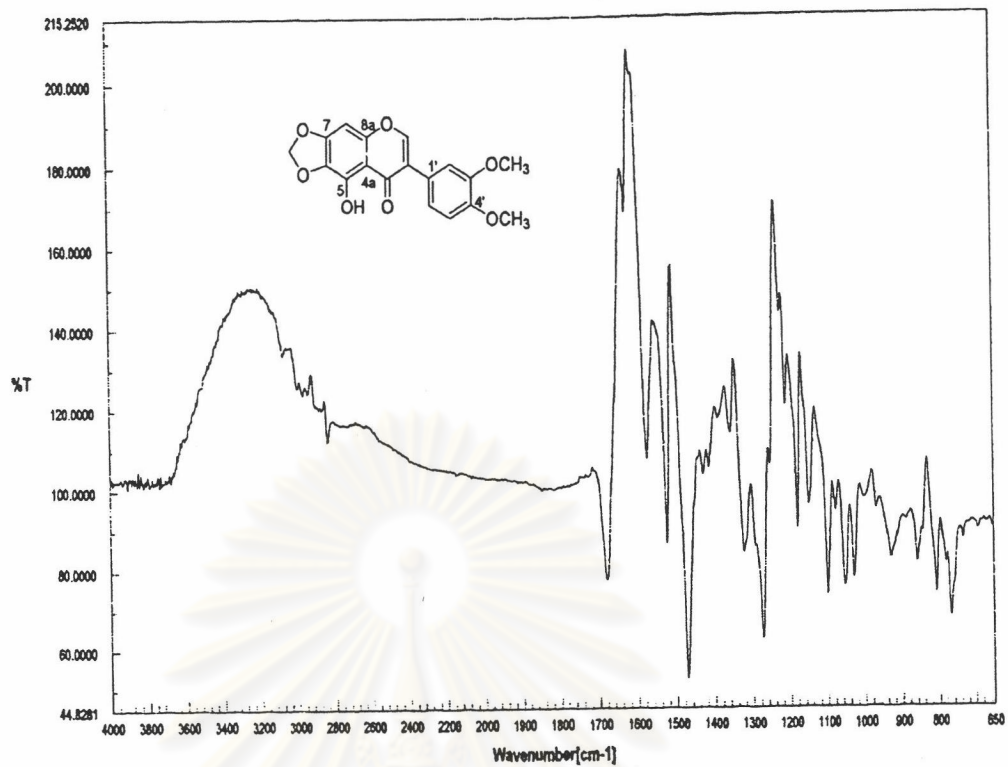


Figure 101 The IR spectrum of compound 58 (KBr disc)

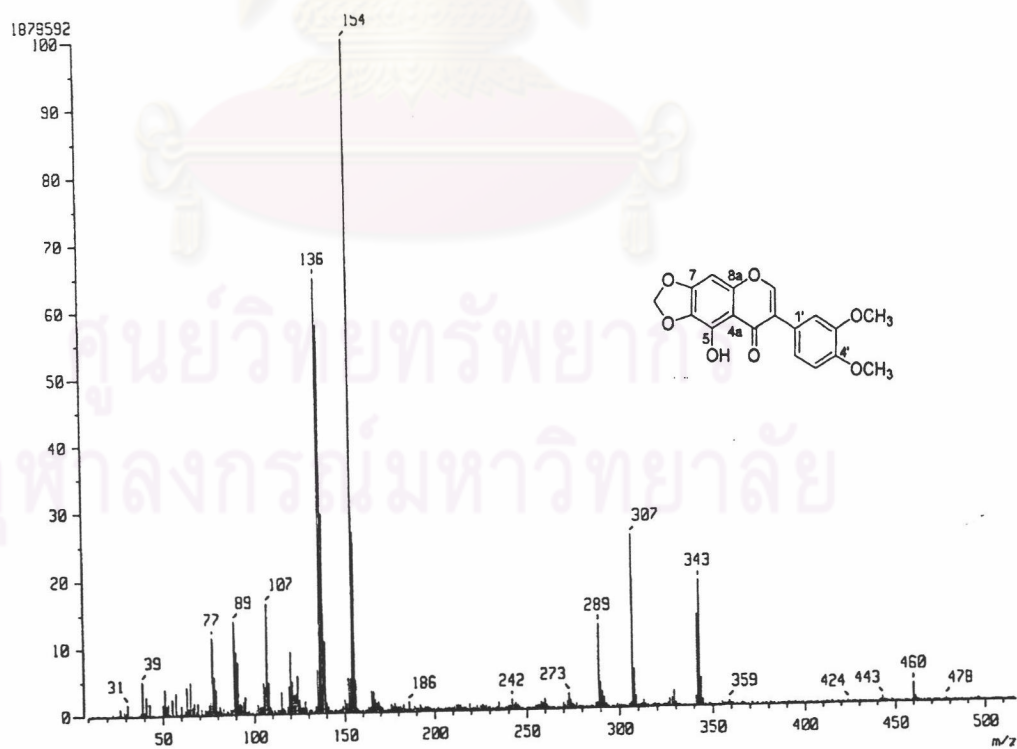


Figure 102 The FAB mass spectrum of compound 58

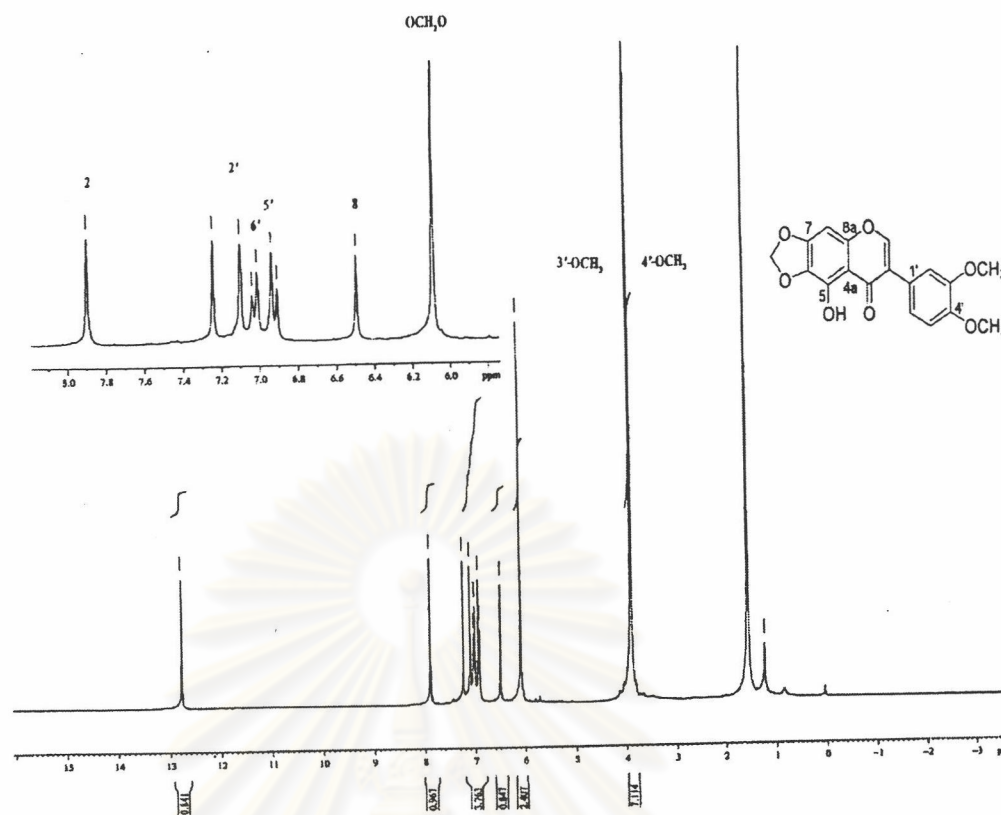


Figure 103 The ^1H NMR (300 MHz) spectrum of compound 58 (in CDCl_3)

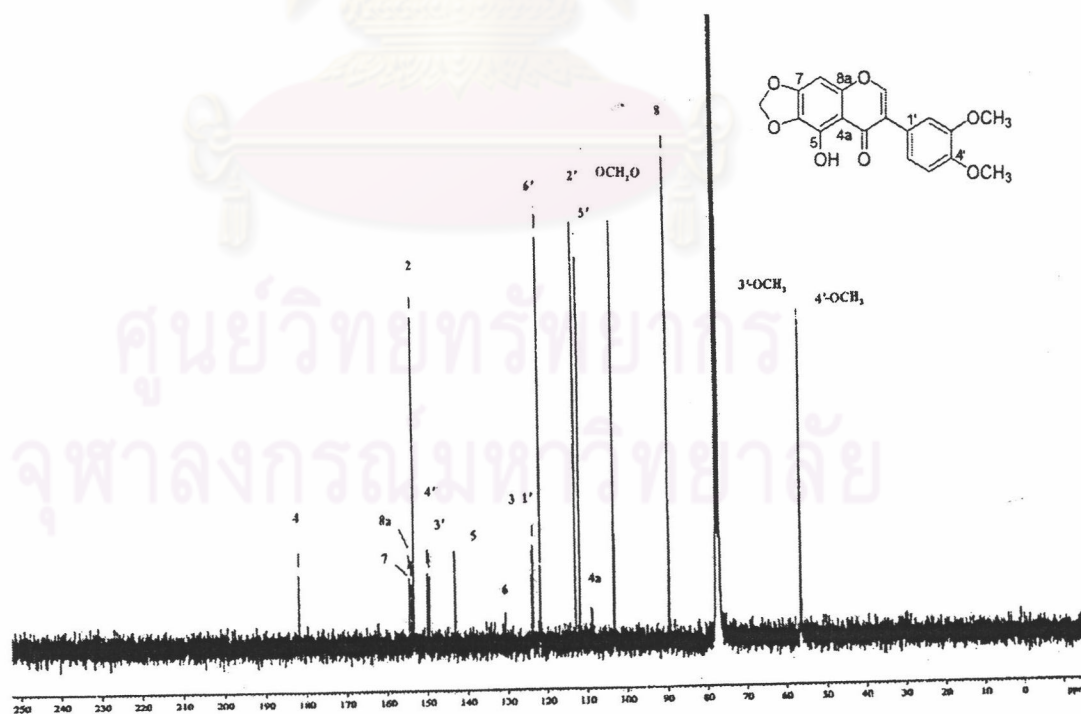


Figure 104 The ^{13}C NMR (75 MHz) spectrum of compound 58 (in CDCl_3)

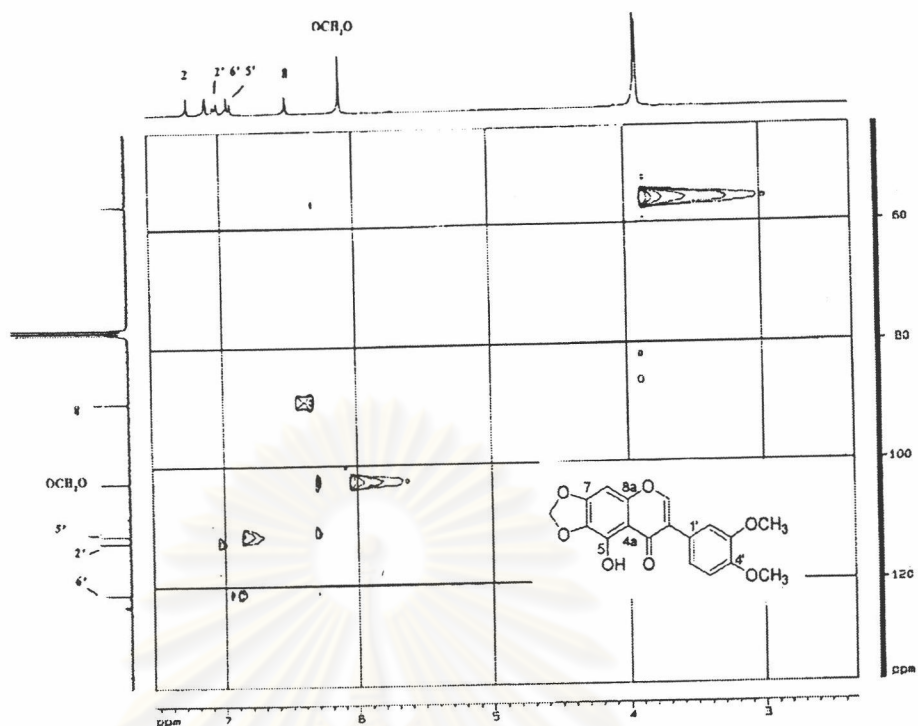


Figure 105 The HMQC spectrum of compound 58 (in CDCl_3)

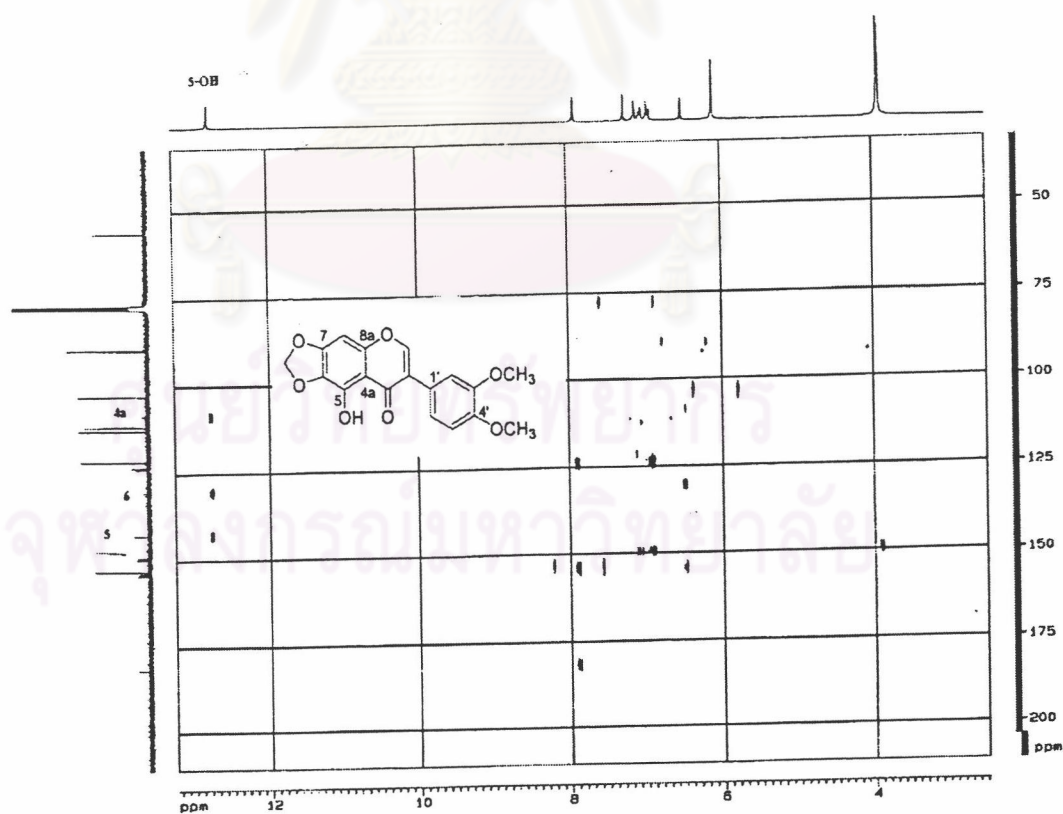


Figure 106 The HMBC spectrum of compound 58 (in CDCl_3)

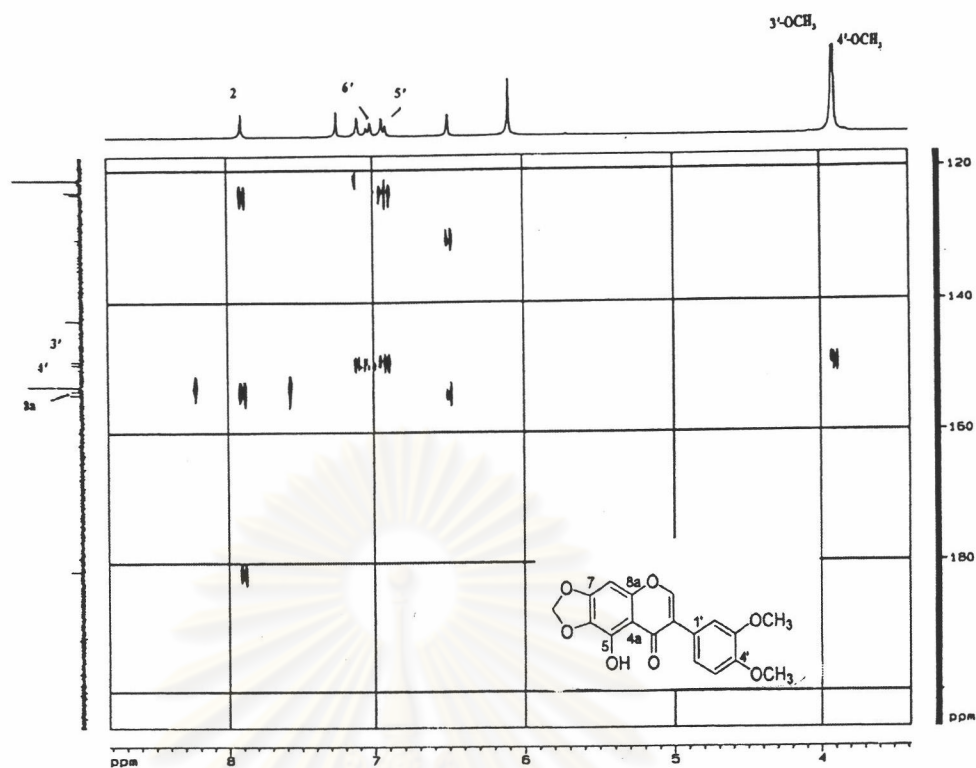


Figure 107 The HMBC spectrum of compound 58 (in CDCl_3)

$[\delta_{\text{H}} 4.0\text{-}8.0 \text{ ppm}, \delta_{\text{C}} 120.0\text{-}190.0 \text{ ppm}]$

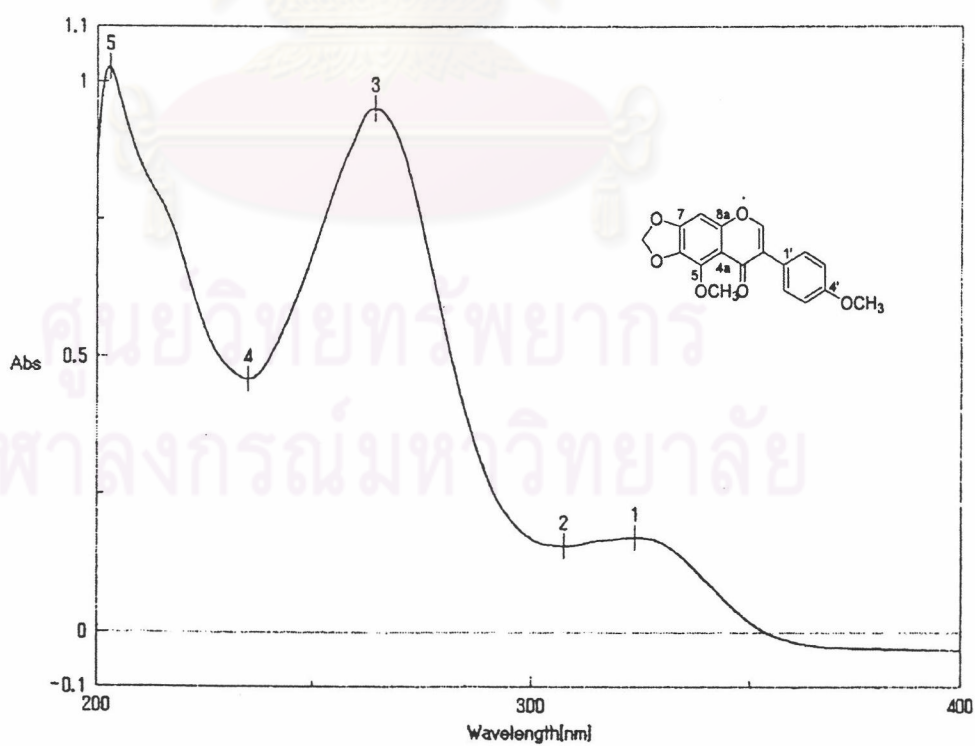


Figure 108 The UV spectrum of compound 175 (in methanol)

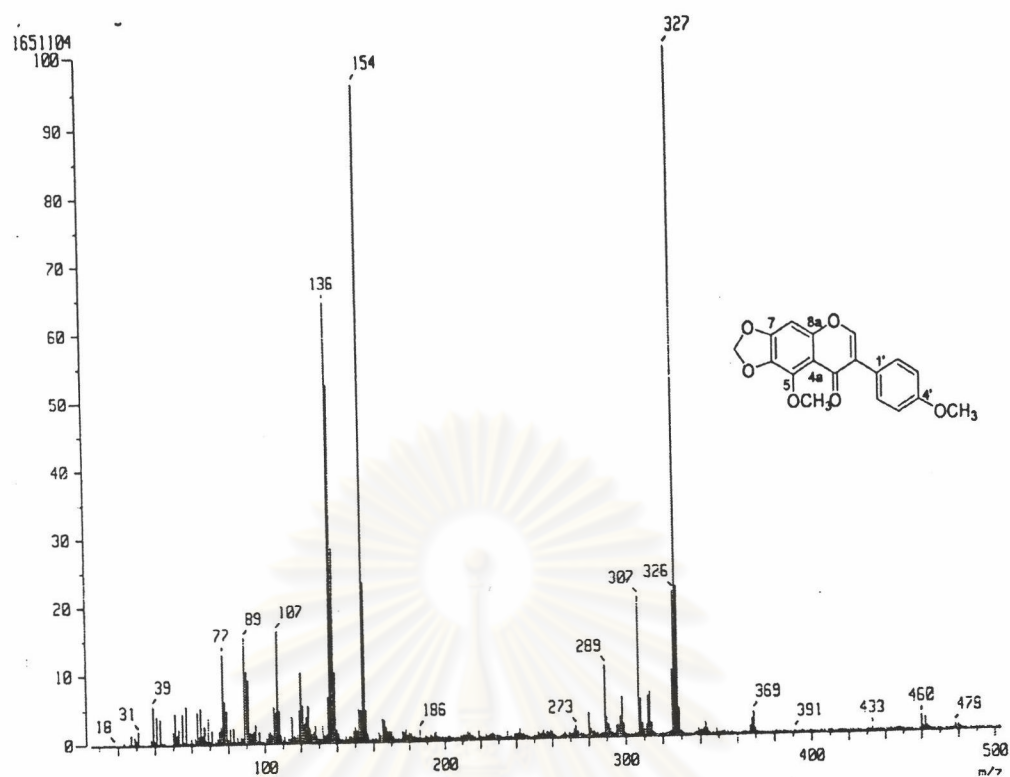


Figure 109 The FAB mass spectrum of compound 175

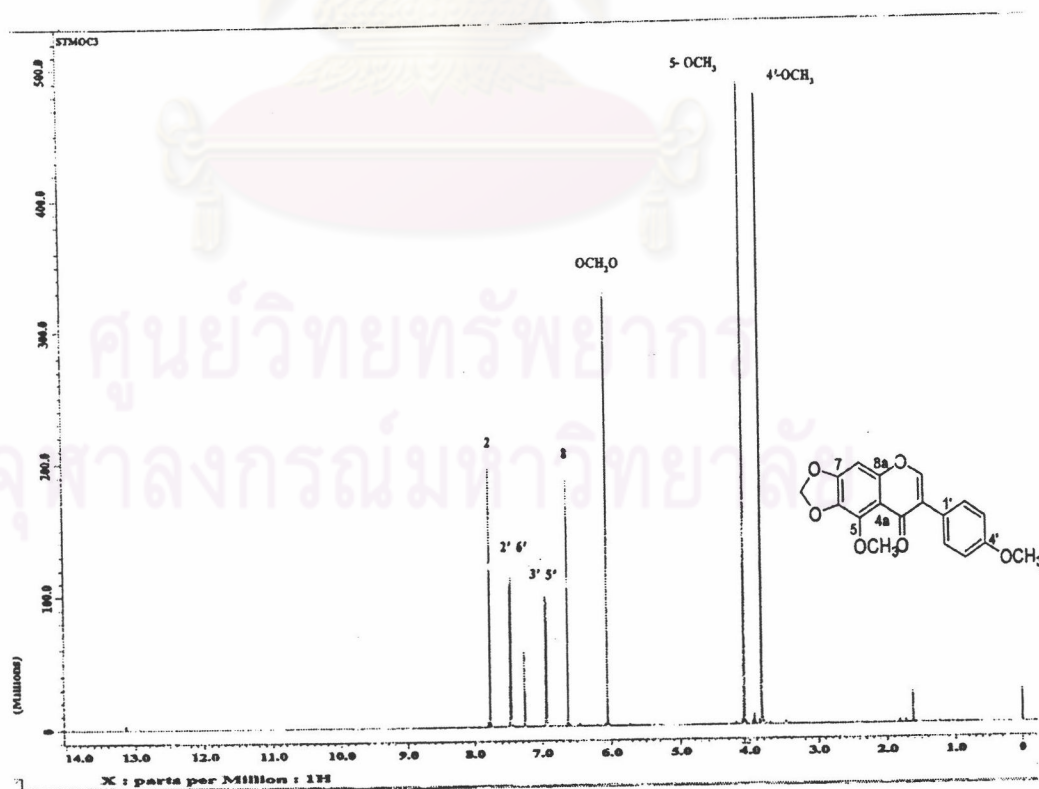


Figure 110 The ^1H NMR (600 MHz) spectrum of compound 175 (in CDCl_3)

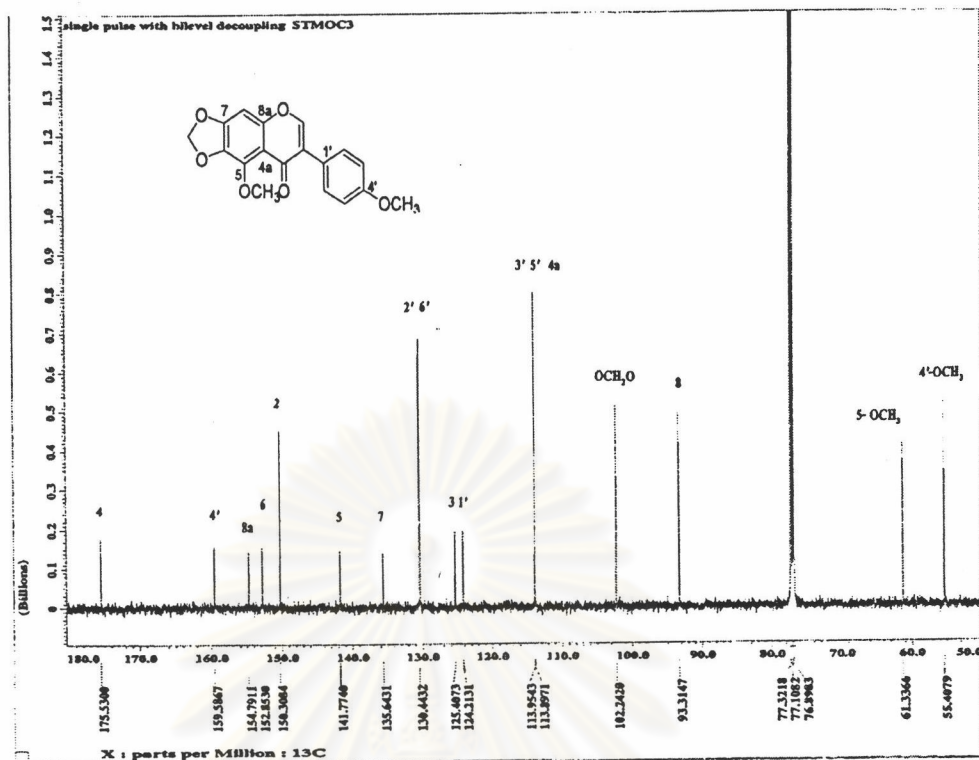


Figure 111 The ^{13}C NMR (150 MHz) spectrum of compound 175 (in CDCl_3)

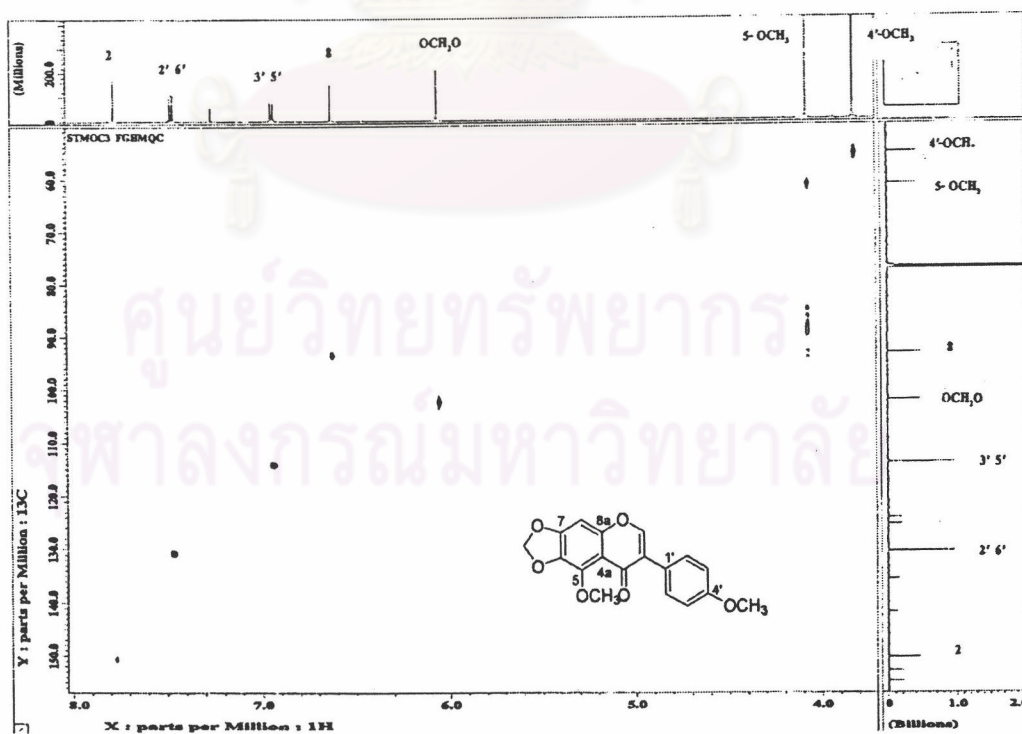


Figure 112 The HMQC spectrum of compound 175 (in CDCl_3)

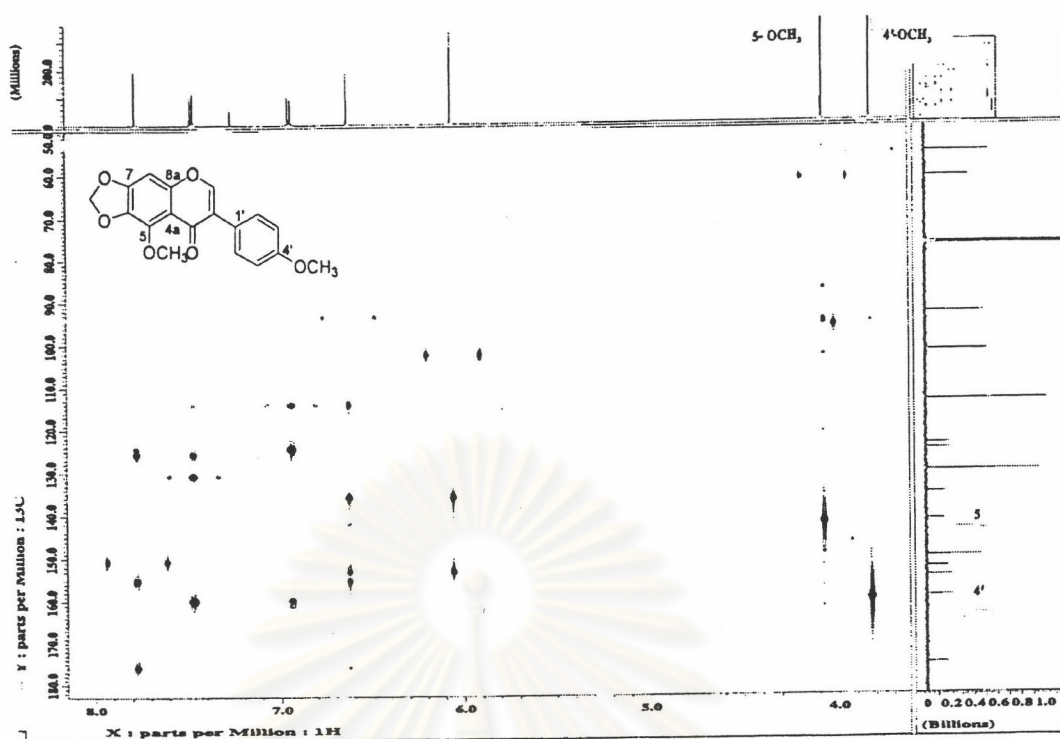


Figure 113 The HMBC spectrum of compound 175 (in CDCl_3)

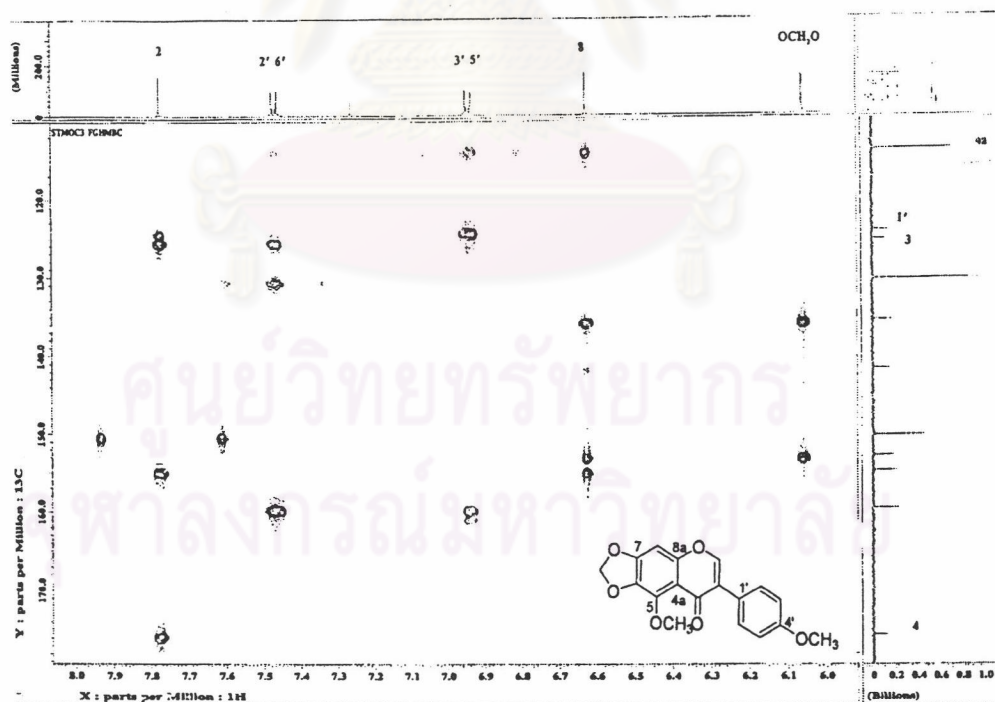


Figure 114 The HMBC spectrum of compound 175 (in CDCl_3)

$[\delta_{\text{H}} 6.0\text{-}8.0 \text{ ppm}, \delta_{\text{C}} 120.0\text{-}170.0 \text{ ppm}]$

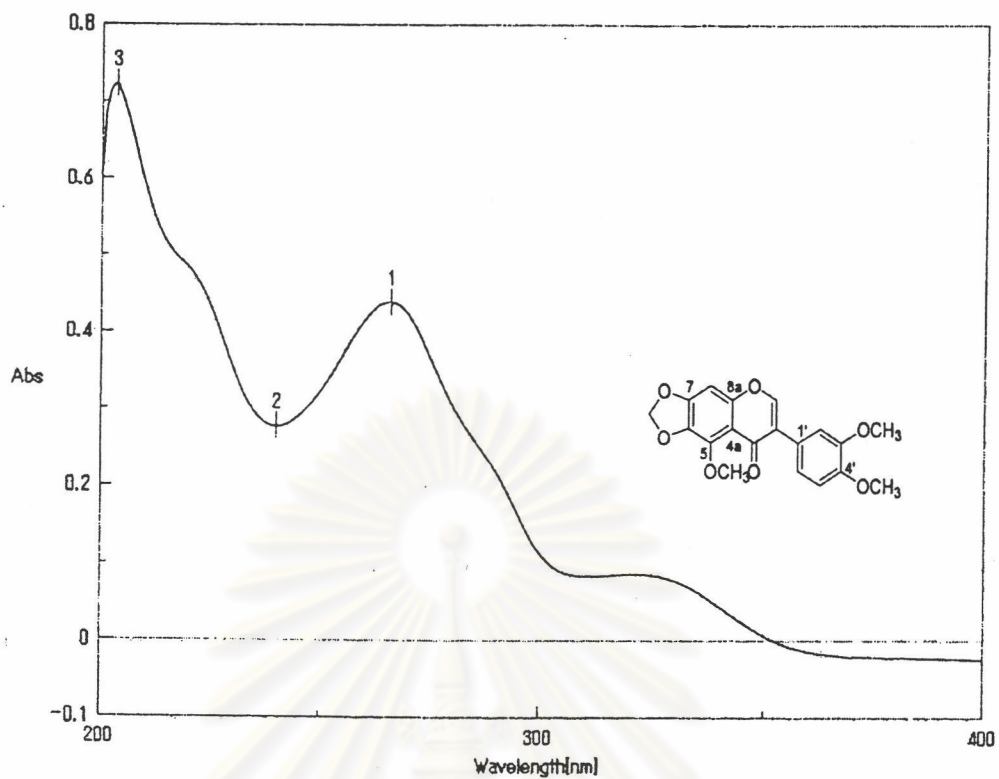


Figure 115 The UV spectrum of compound 60 (in methanol)

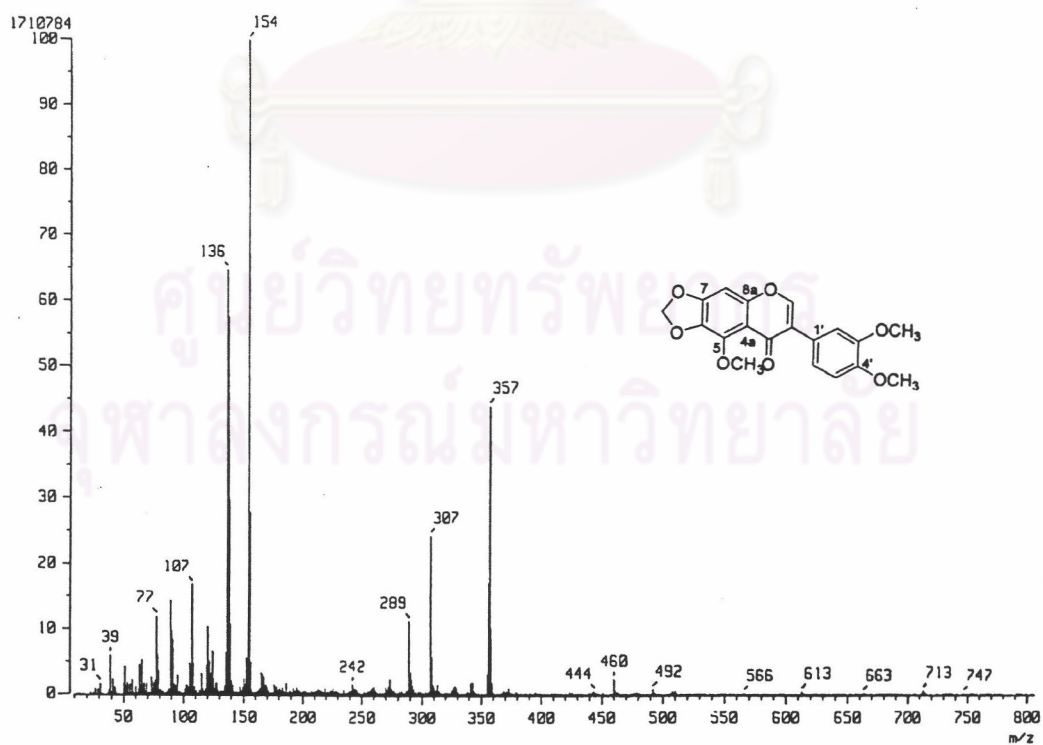


Figure 116 The FAB mass spectrum of compound 60

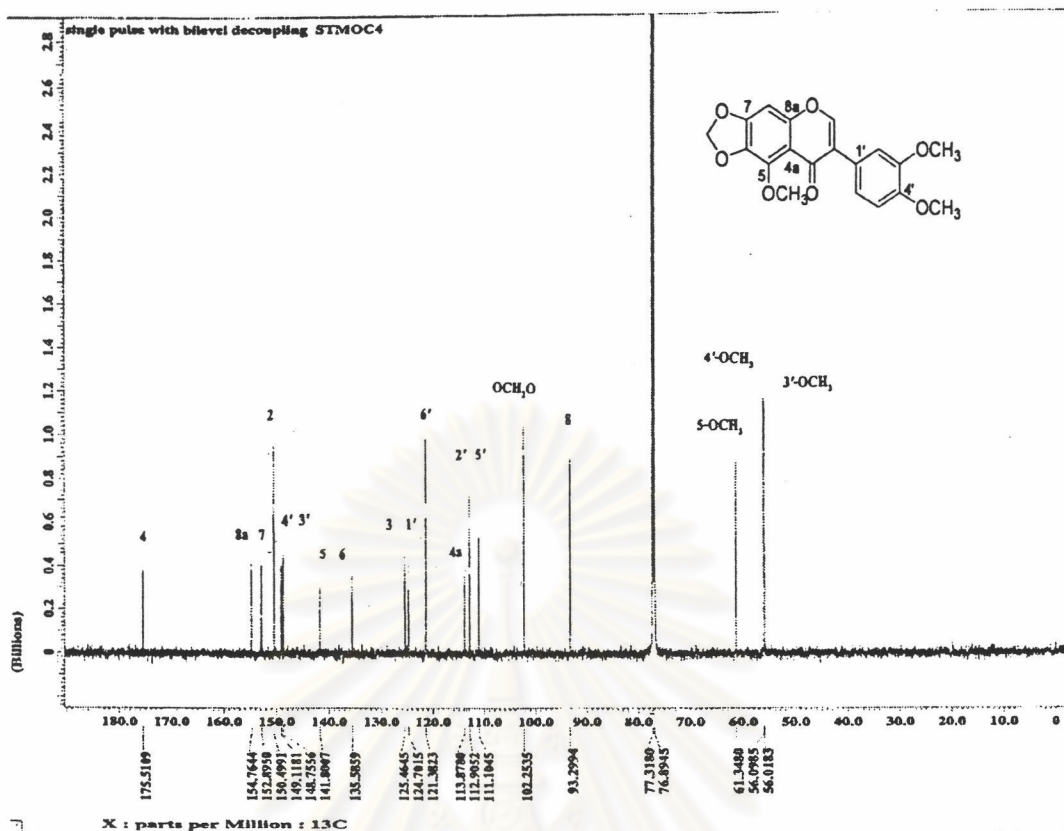


Figure 117 The ^{13}C NMR (150 MHz) spectrum of compound 60 (in CDCl_3)

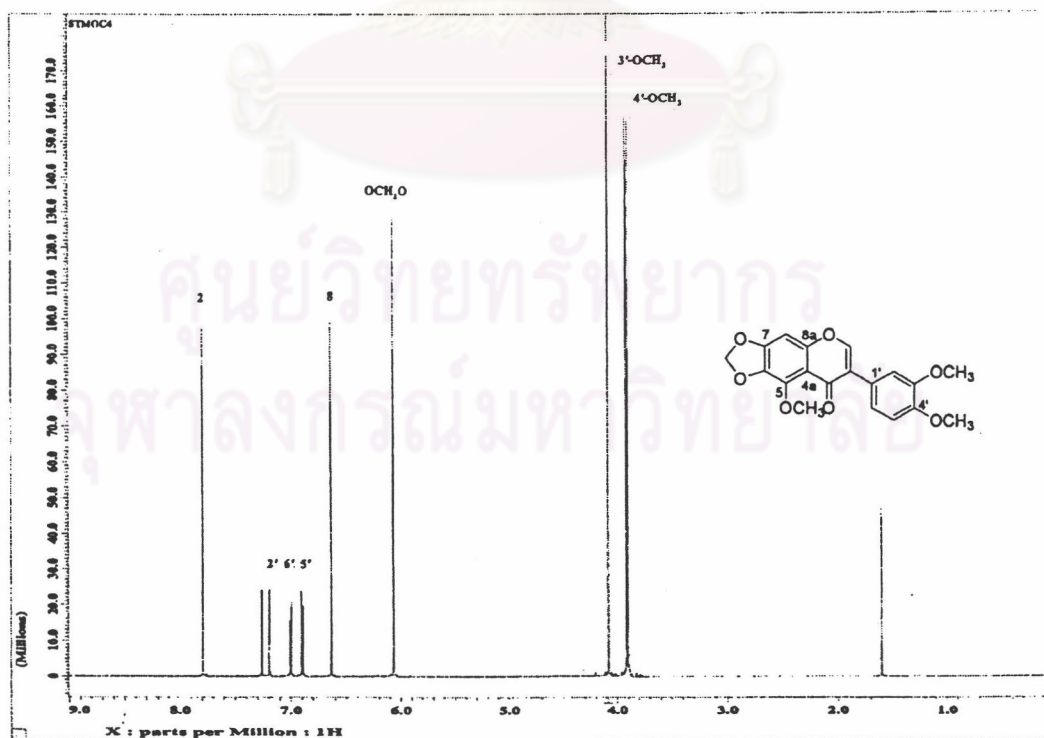


Figure 118 The ^1H NMR (600 MHz) spectrum of compound 60 (in CDCl_3)

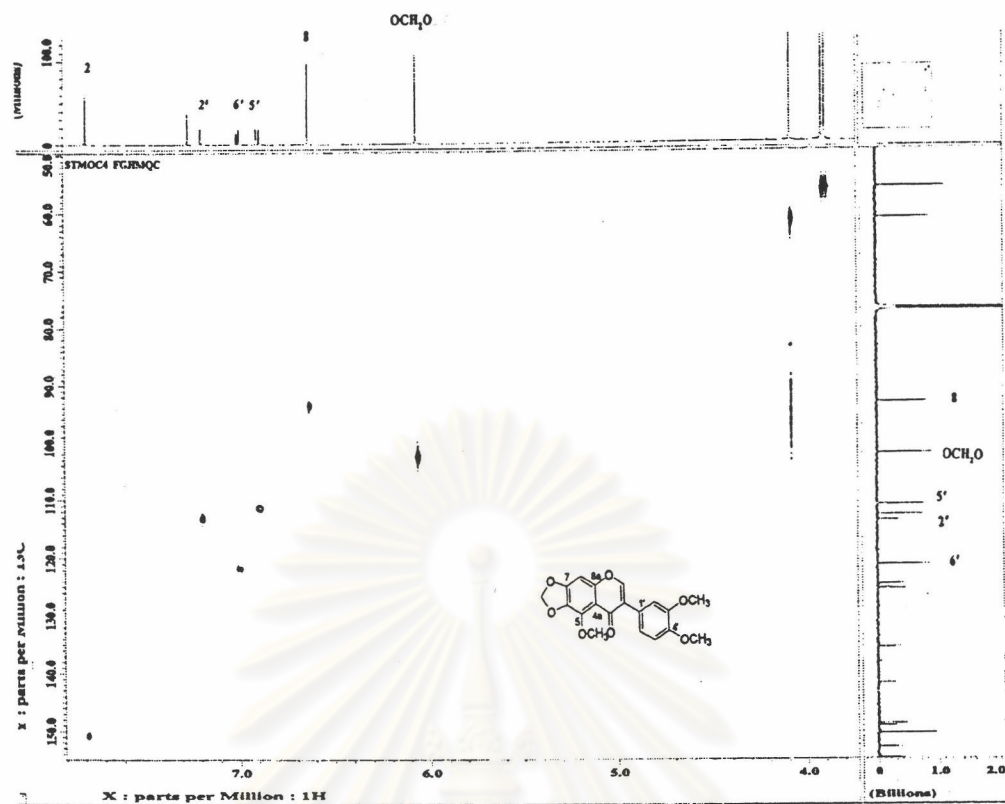


Figure 119 The HMQC spectrum of compound 60 (in CDCl_3)

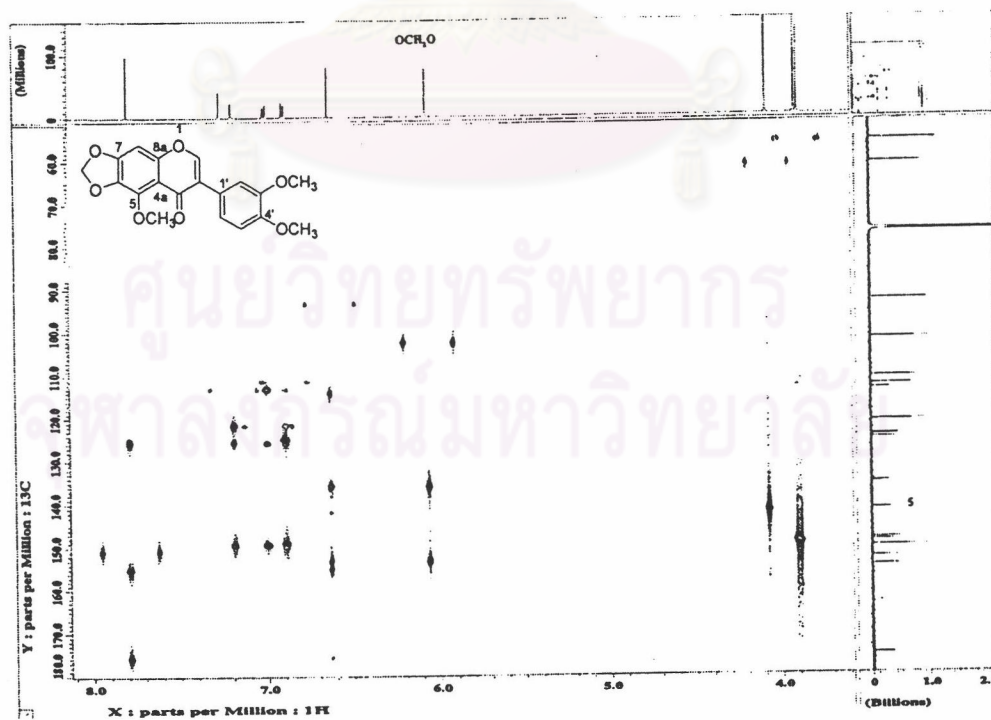


Figure 120 The HMBC spectrum of compound 60 (in CDCl_3)

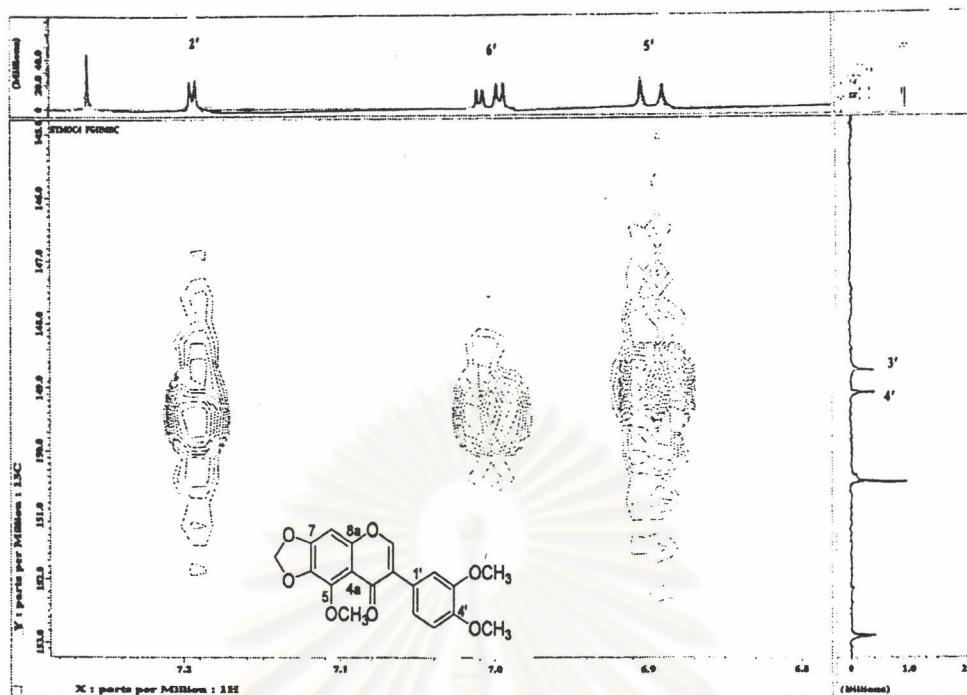


Figure 121 The HMBC spectrum of compound 60 (in CDCl_3)

$[\delta_H 6.8-8.0 \text{ ppm}, \delta_C 145.0-153.0 \text{ ppm}]$

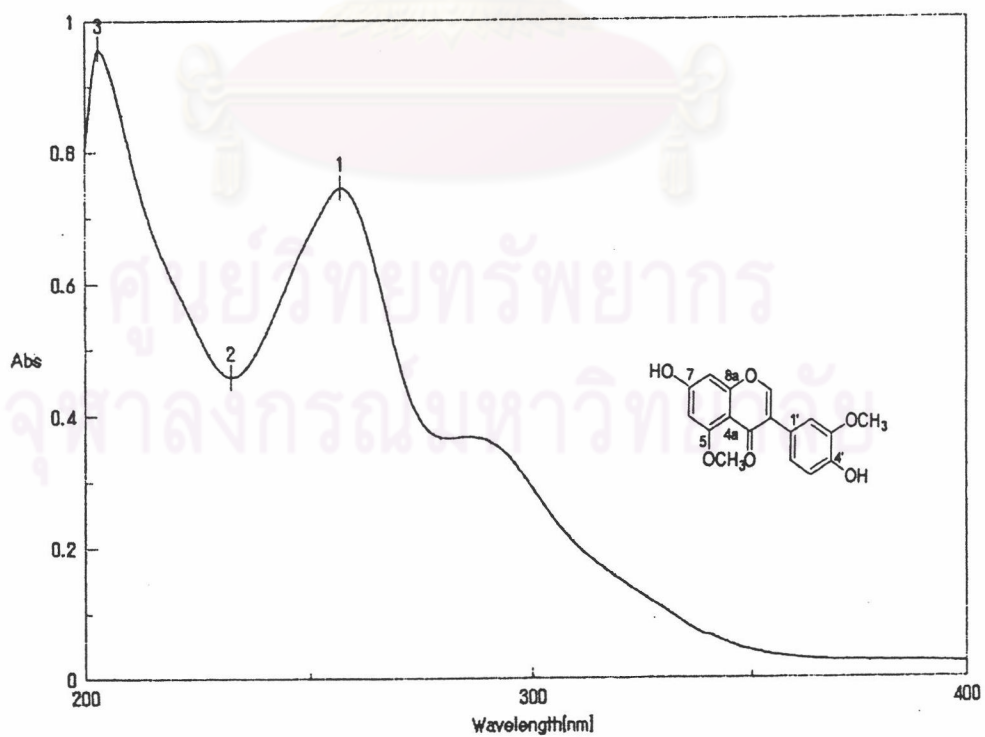


Figure 122 The UV spectrum of compound 176 (in methanol)

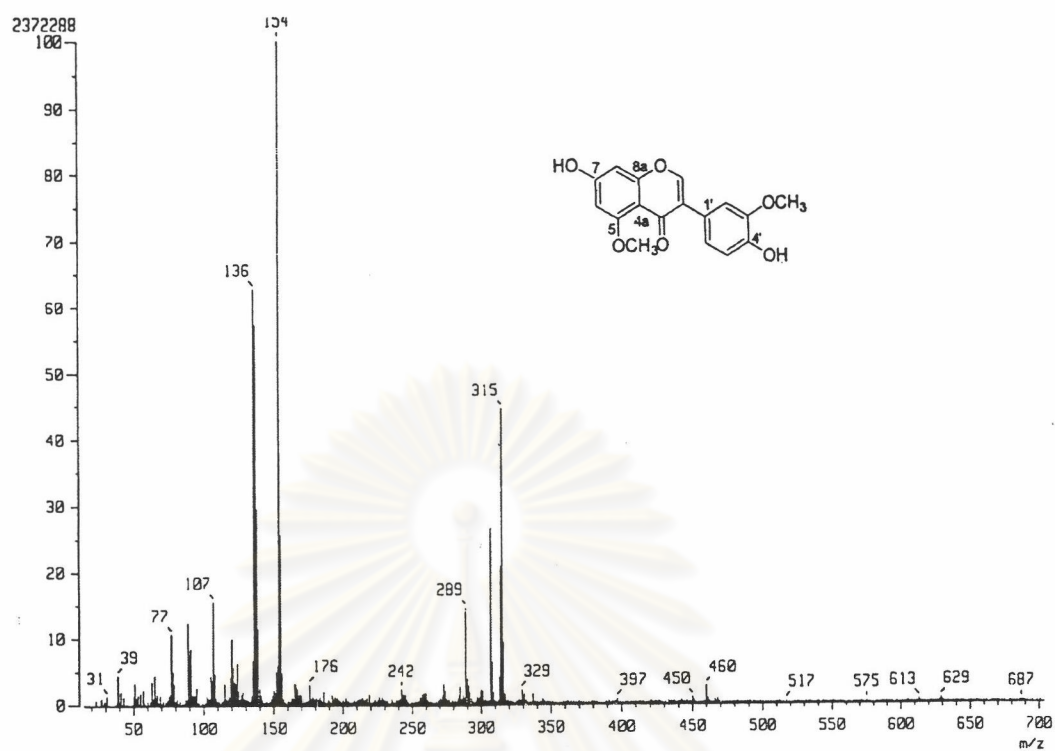


Figure 123 The FAB mass spectrum of compound 176

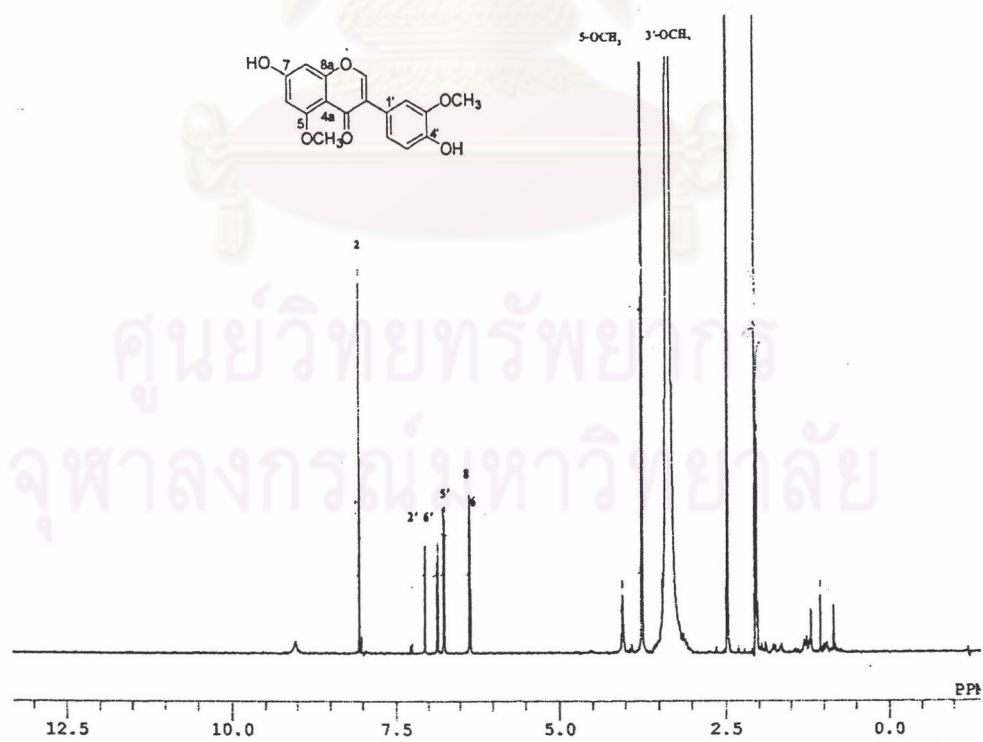


Figure 124 The ^1H NMR (500 MHz) spectrum of compound 176 (in $\text{DMSO}-d_6$)

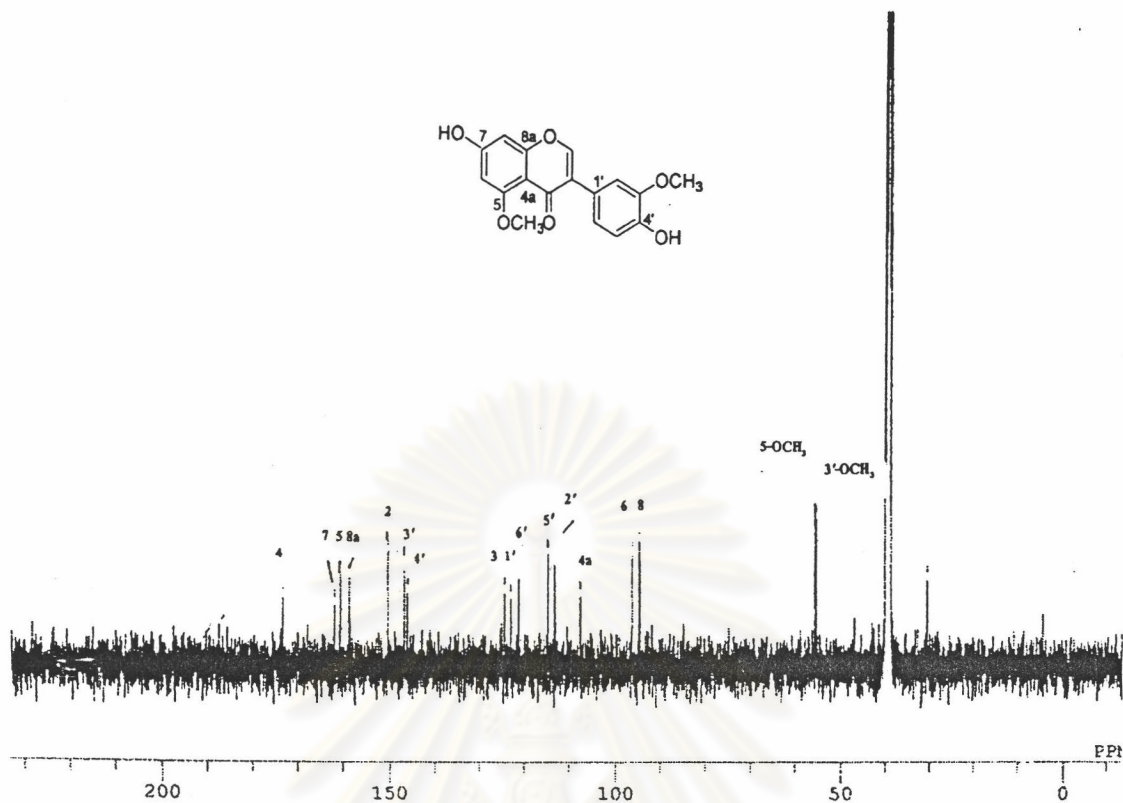


Figure 125 The ^{13}C NMR (125 MHz) spectrum of compound 176 (in $\text{DMSO-}d_6$)

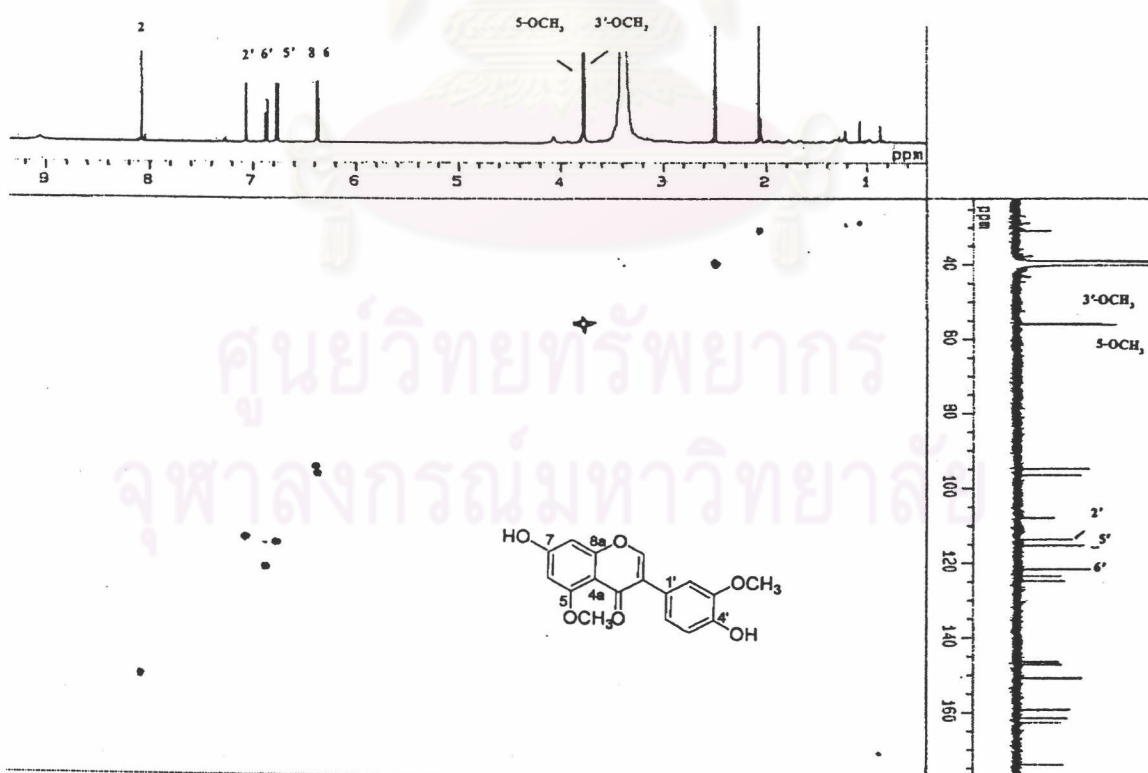


Figure 126 The HMQC spectrum of compound 176 (in $\text{DMSO-}d_6$)

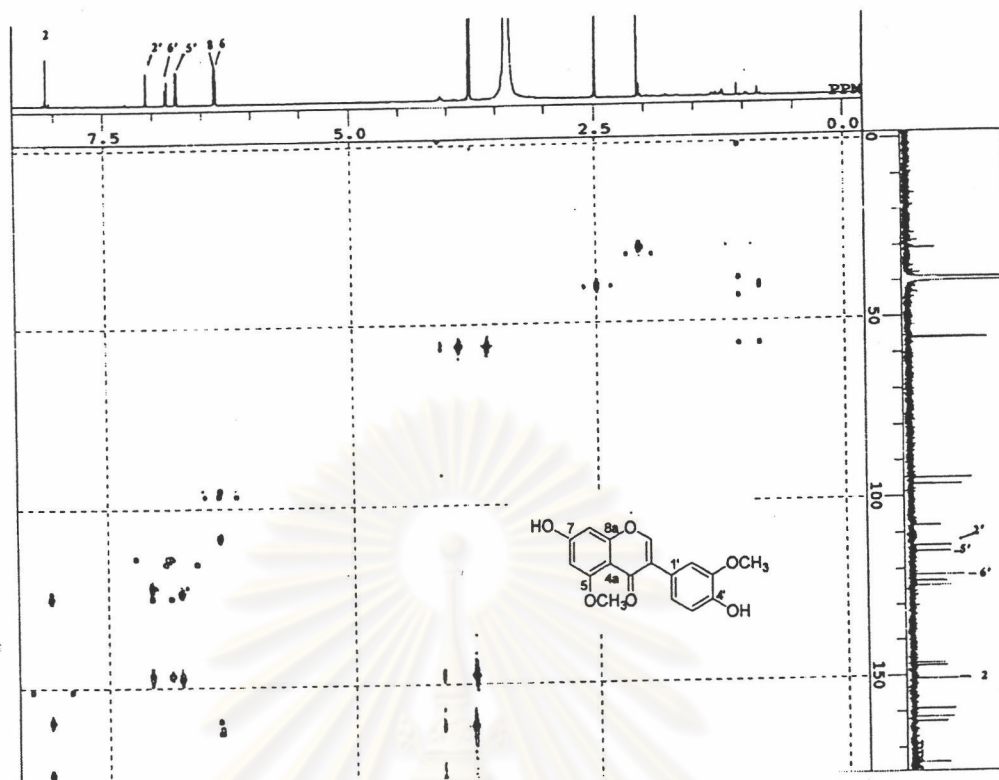


Figure 127 The HMBC spectrum of compound 176 (in DMSO- d_6)

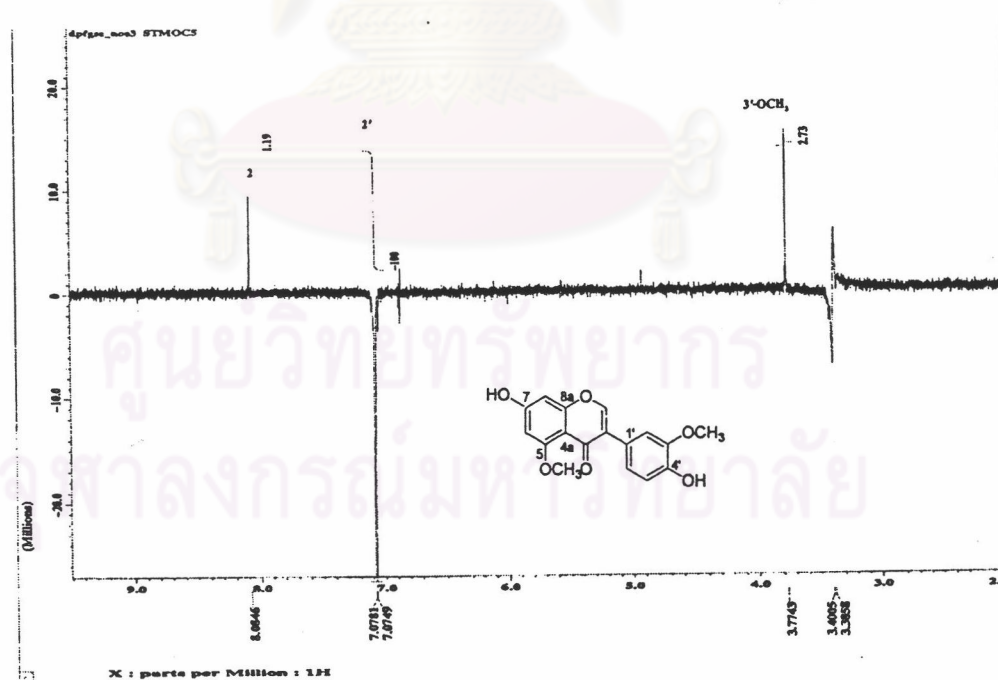


Figure 128 The NOE difference spectrum of compound 176 (in DMSO- d_6)
with irradiation at δ 7.07 ppm

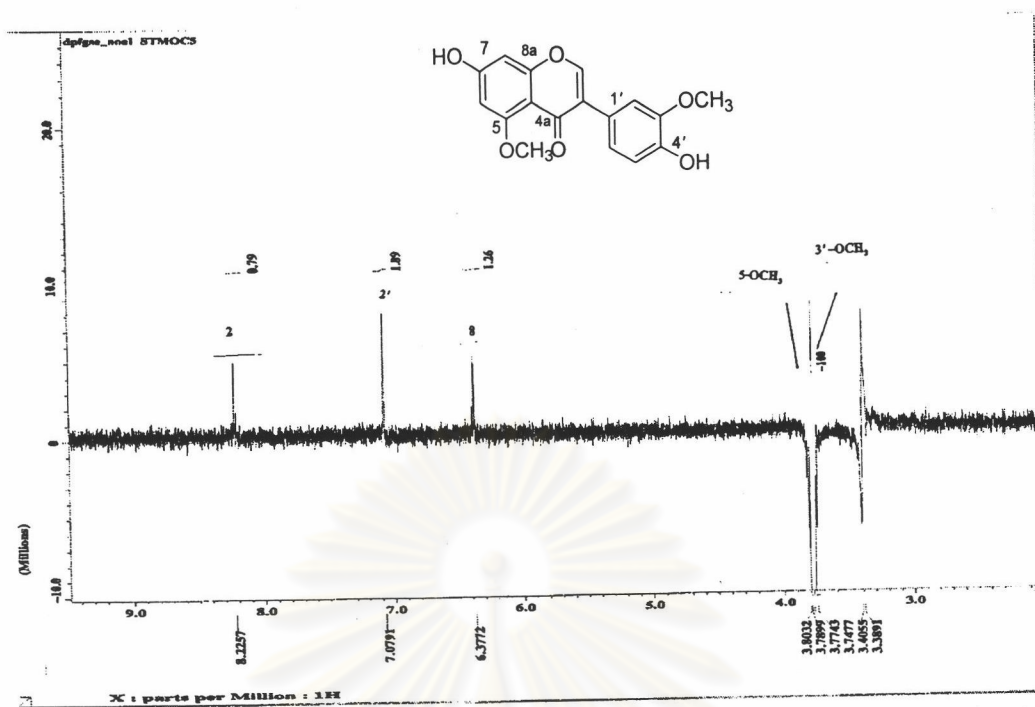


Figure 129 The NOE difference spectrum of compound 176 (in $\text{DMSO}-d_6$) with irradiation at δ 3.77 ppm

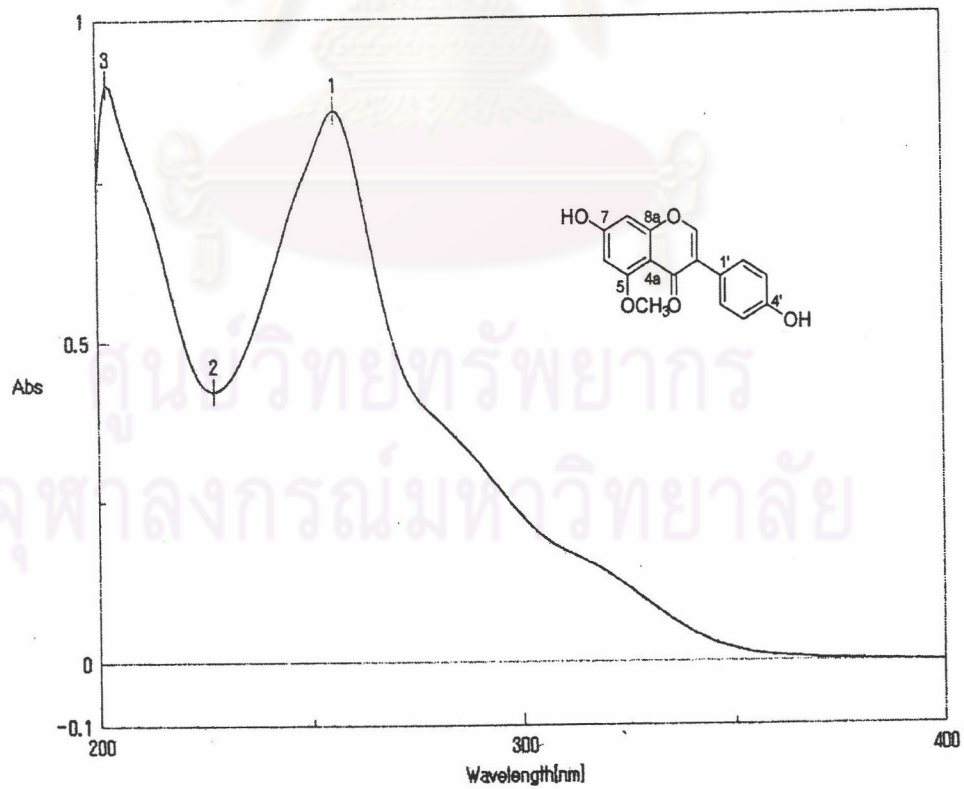


Figure 130 The UV spectrum of compound 177 (in methanol)

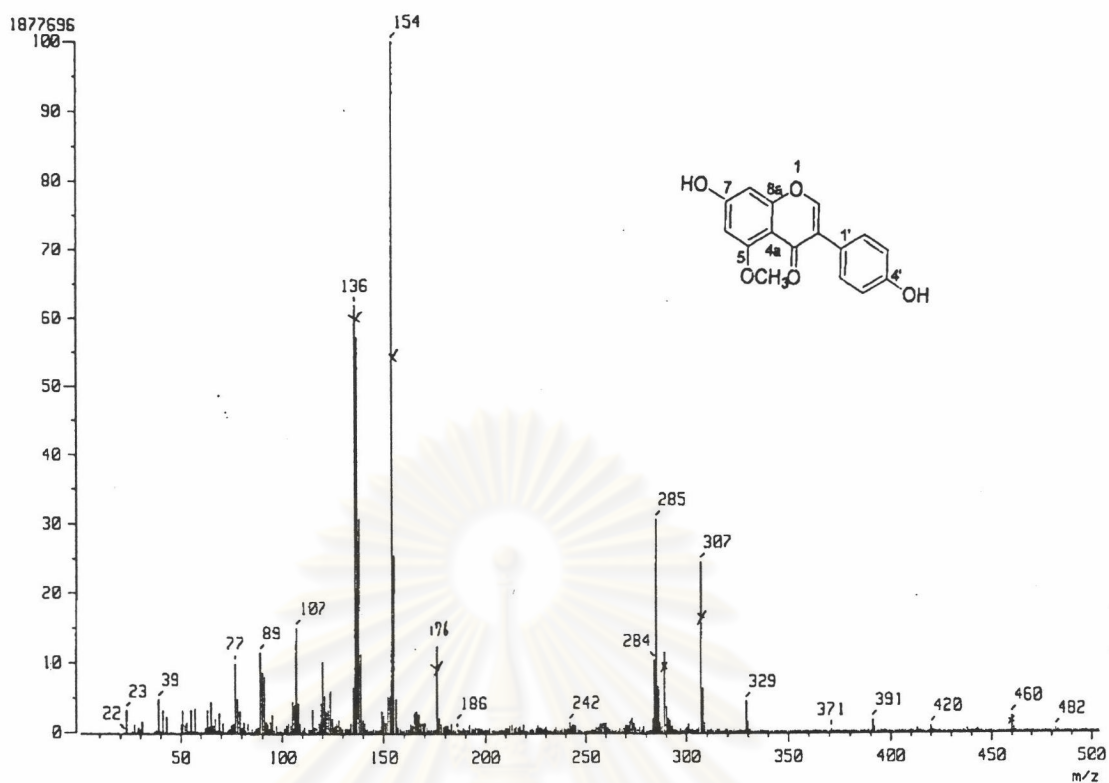


Figure 131 The FAB mass spectrum of compound 177

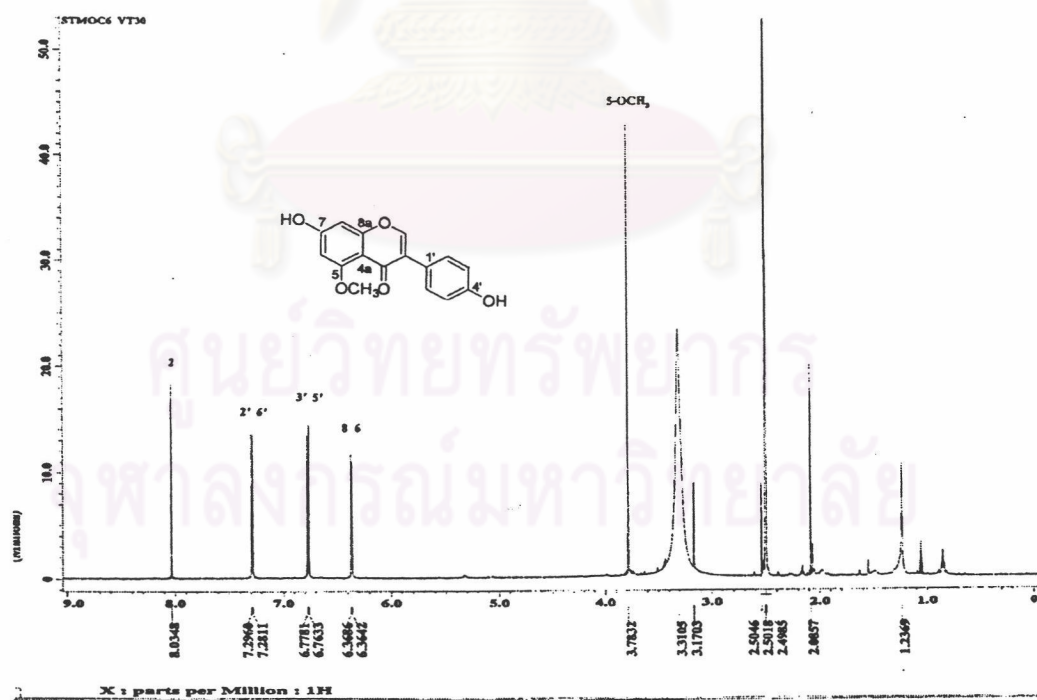


Figure 132 The ^1H NMR (600 MHz) spectrum of compound 177 (in $\text{DMSO}-d_6$)

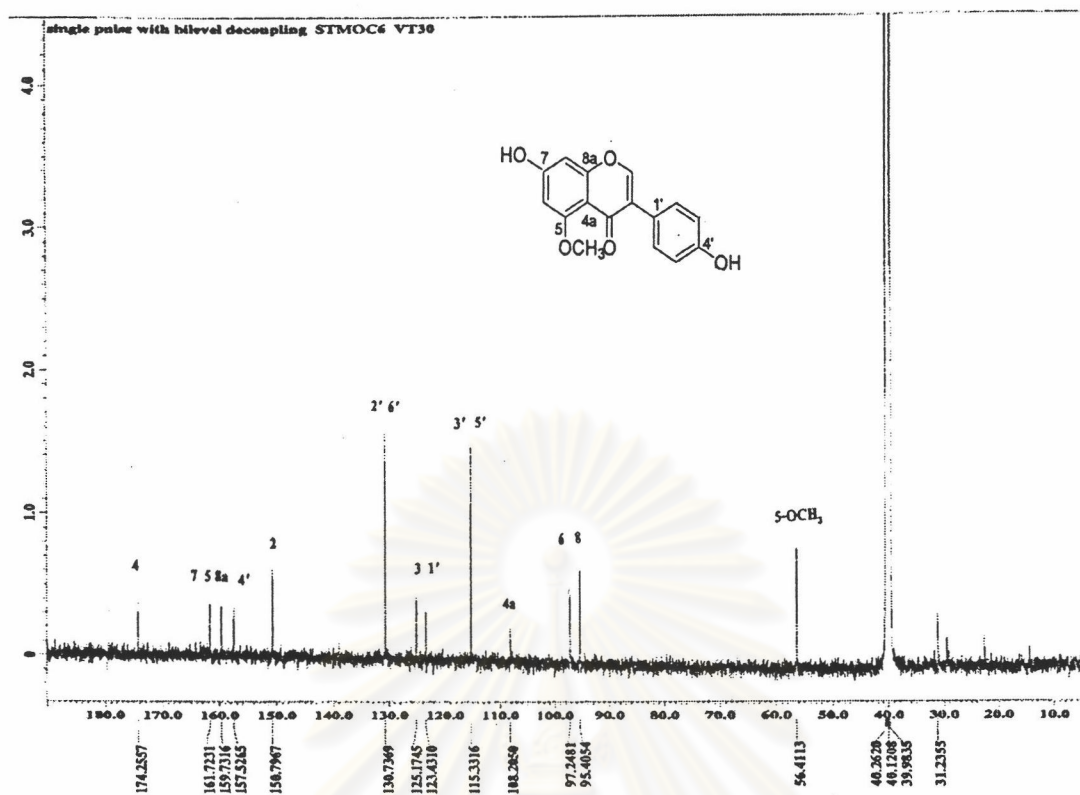


Figure 133 The ^{13}C NMR (150 MHz) spectrum of compound 177 (in $\text{DMSO}-d_6$)

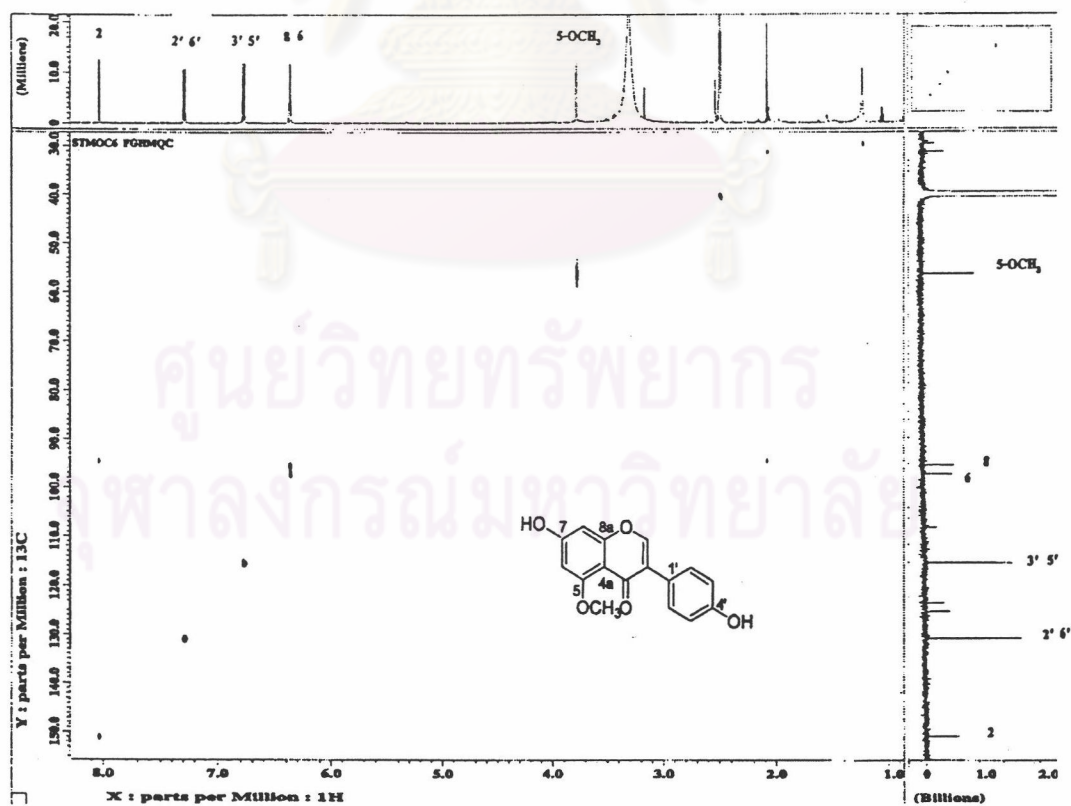


Figure 134 The HMBC spectrum of compound 177 (in $\text{DMSO}-d_6$)

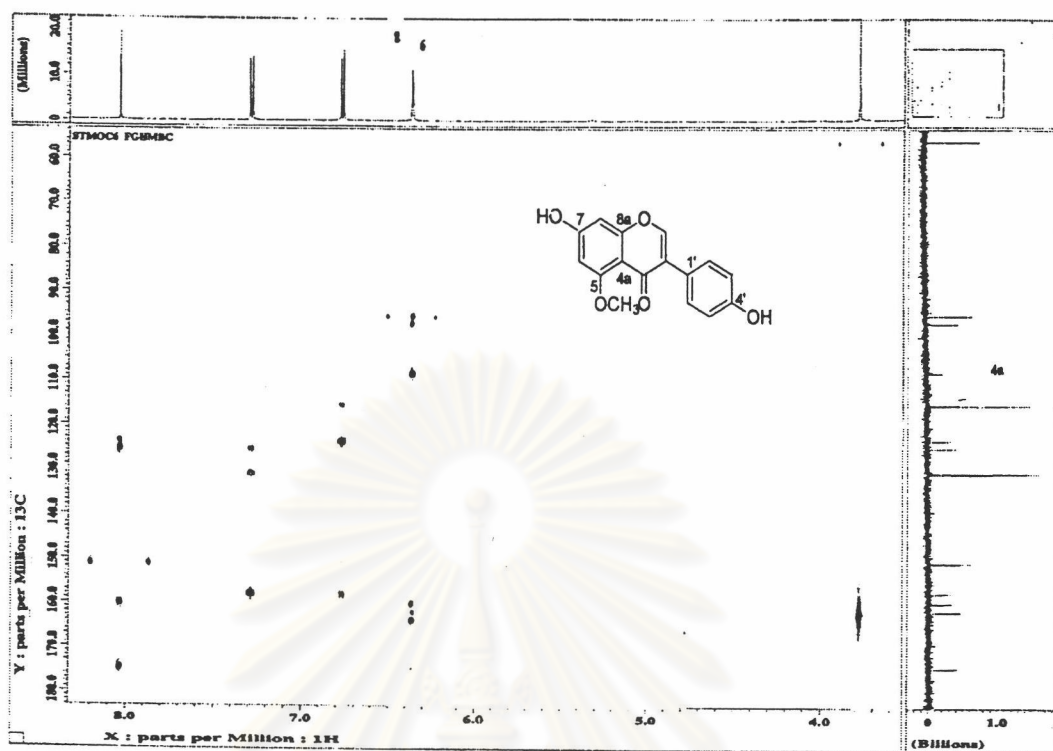


Figure 135 The HMBC spectrum of compound 177 (in DMSO- d_6)

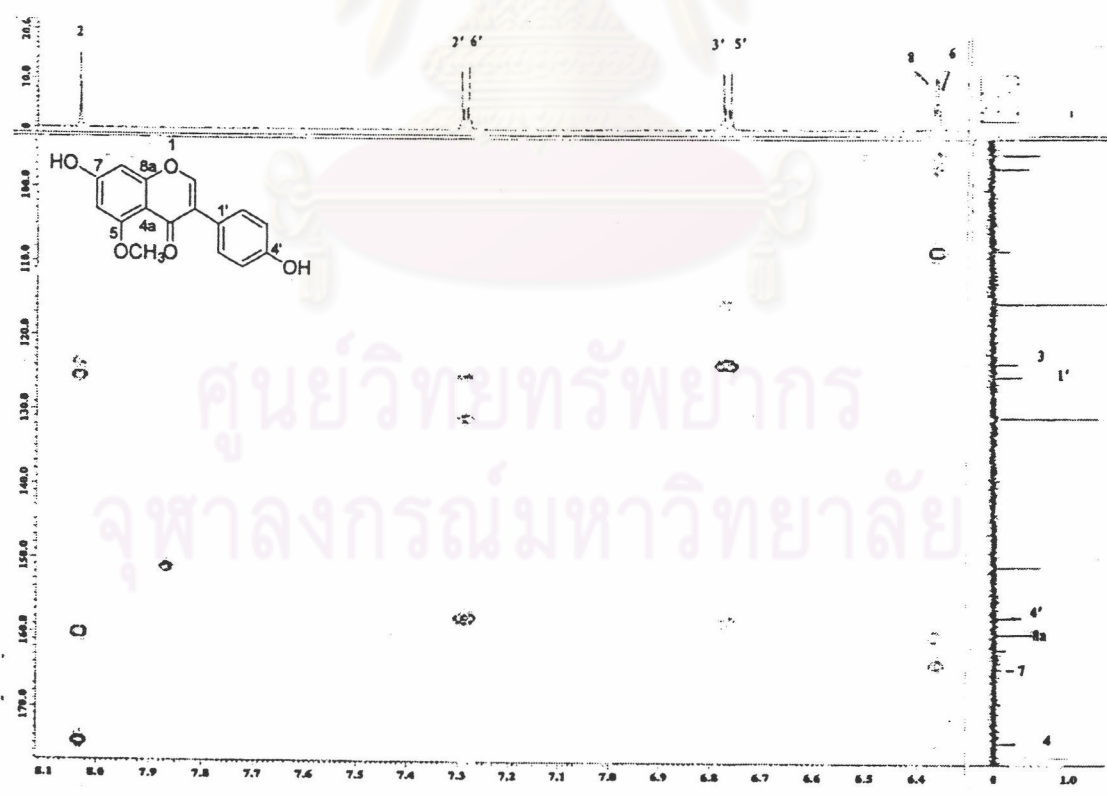


Figure 136 The HMBC spectrum of compound 177 (in DMSO- d_6)

$[\delta_H 6.4-8.0 \text{ ppm}, \delta_C 100.0-170.0 \text{ ppm}]$

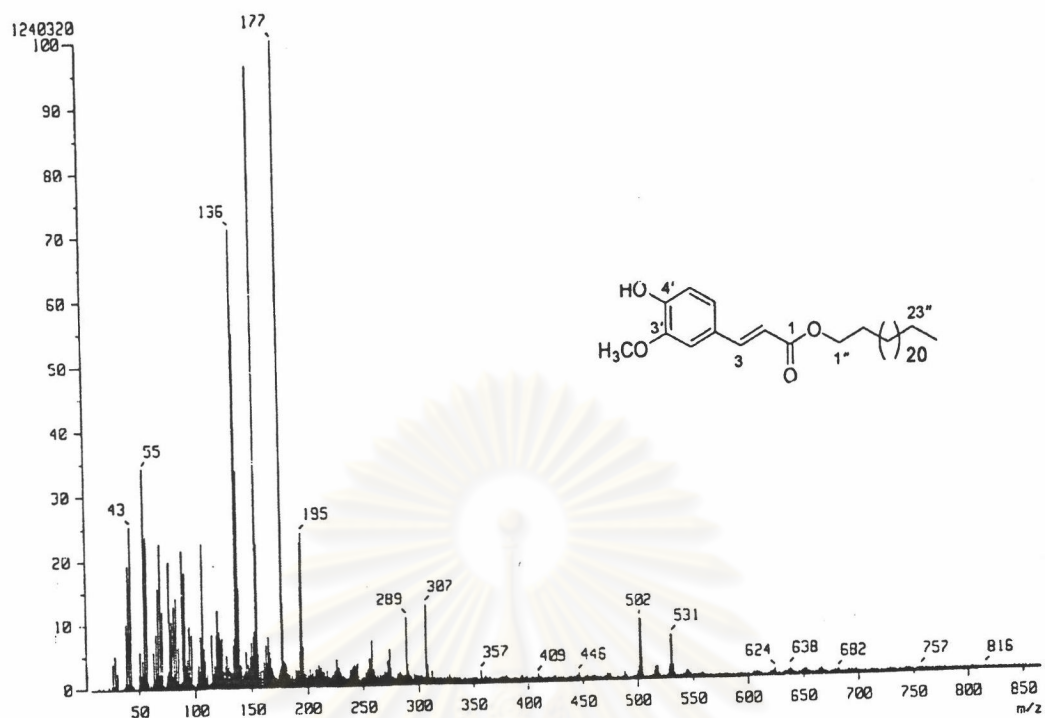


Figure 137 The FAB mass spectrum of compound 178

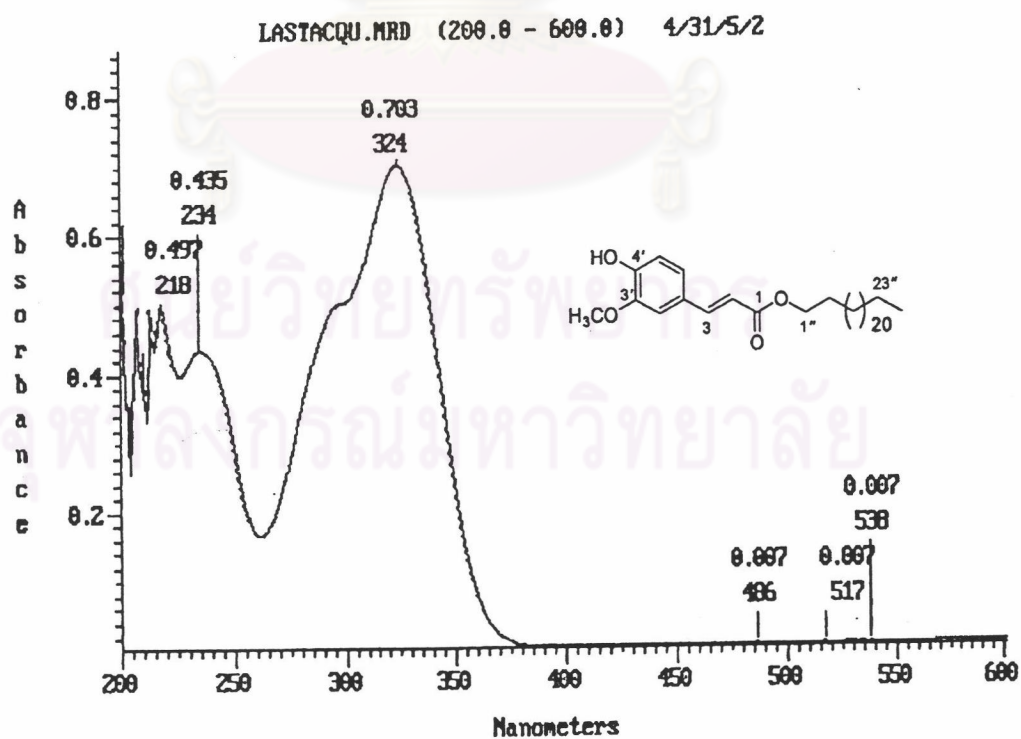


Figure 138 The UV spectrum of compound 178 (in methanol)

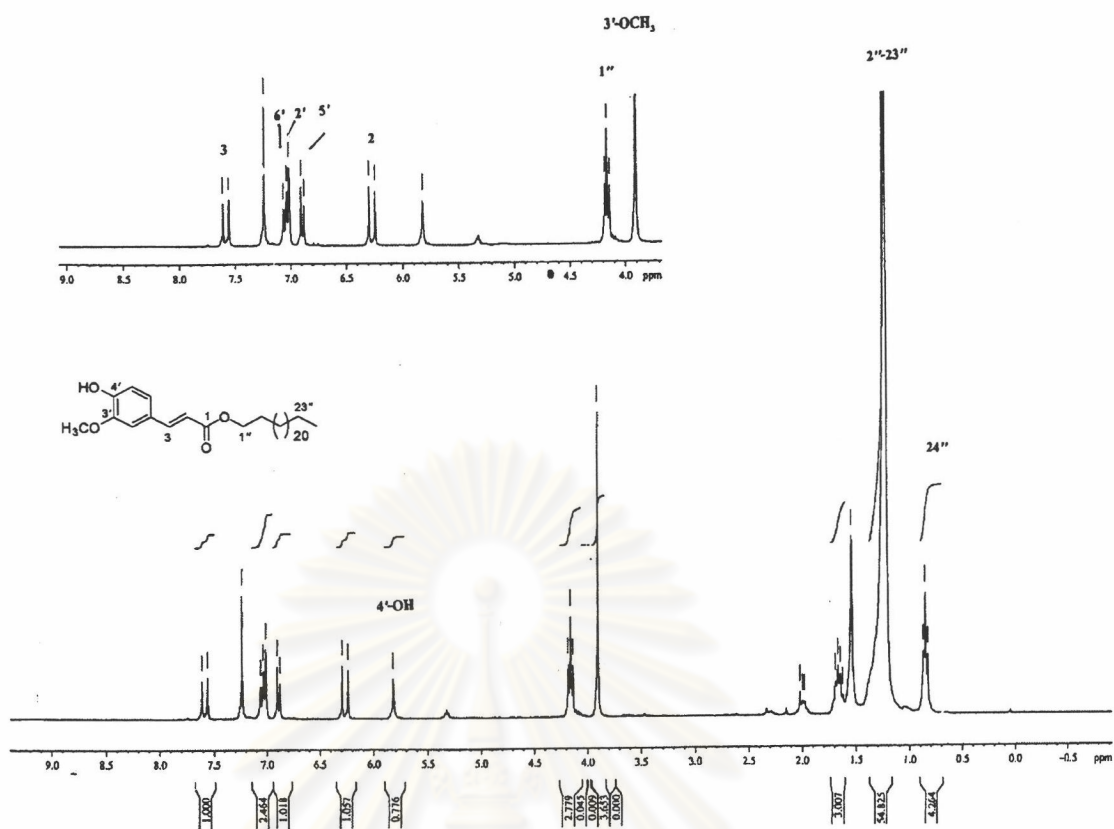


Figure 139 The ^1H NMR (300 MHz) spectrum of compound 178 (in CDCl_3)

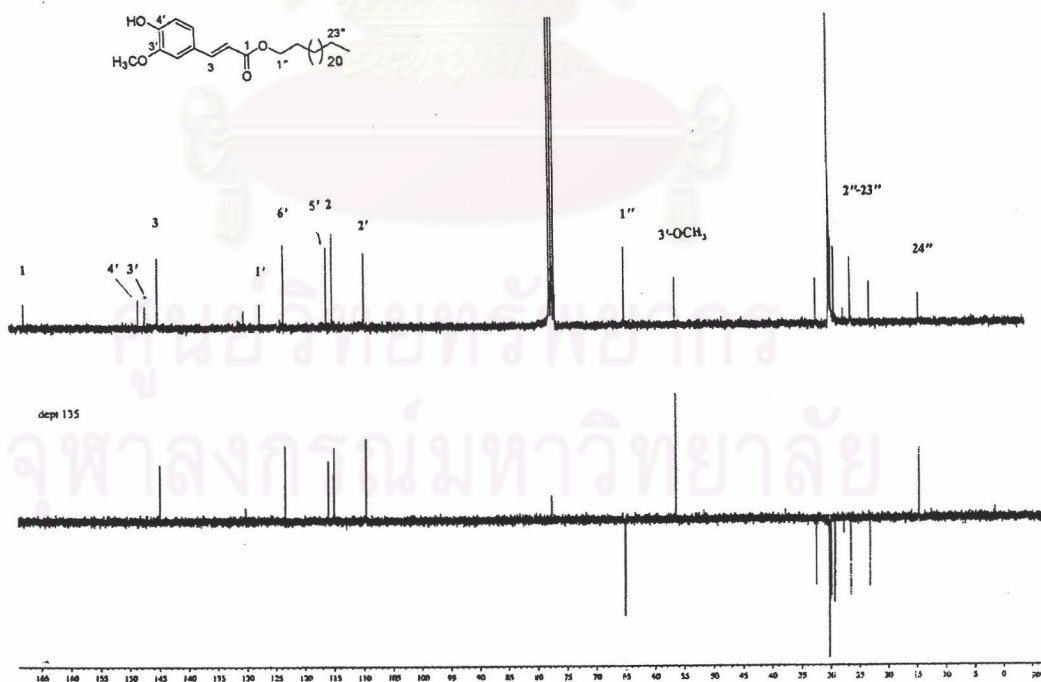


Figure 140 The ^{13}C NMR (75 MHz) and DEPT 135 spectra of compound 178 (in CDCl_3)

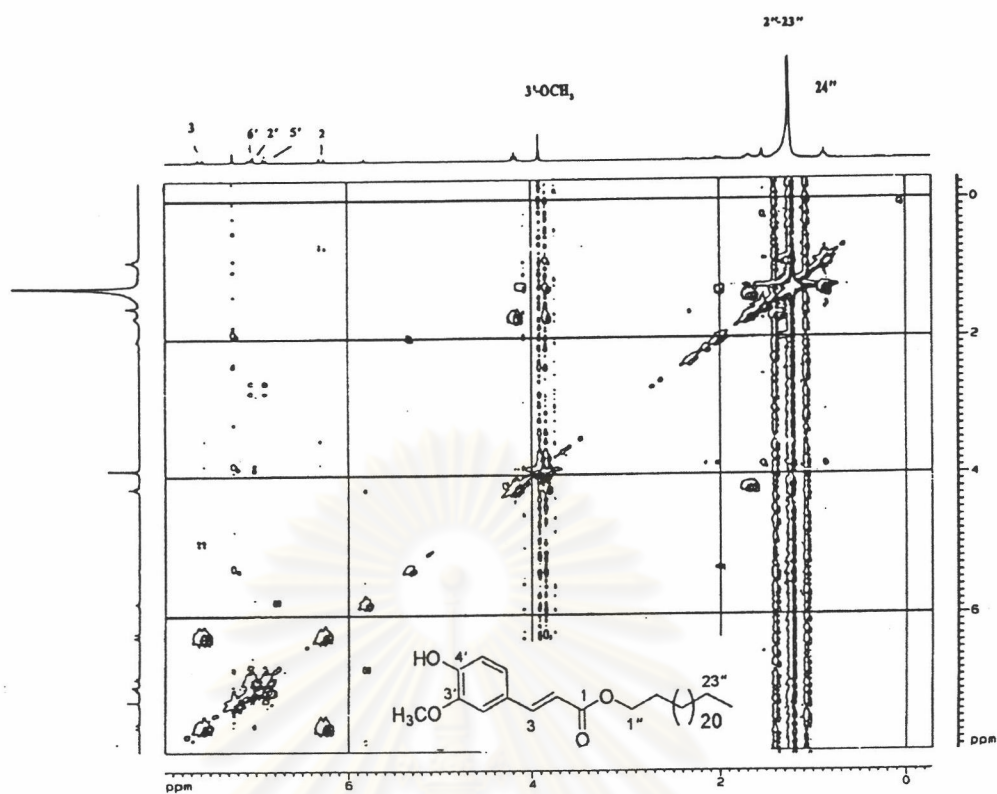


Figure 141 The ^1H - ^1H COSY spectrum of compound 178 (in CDCl_3)

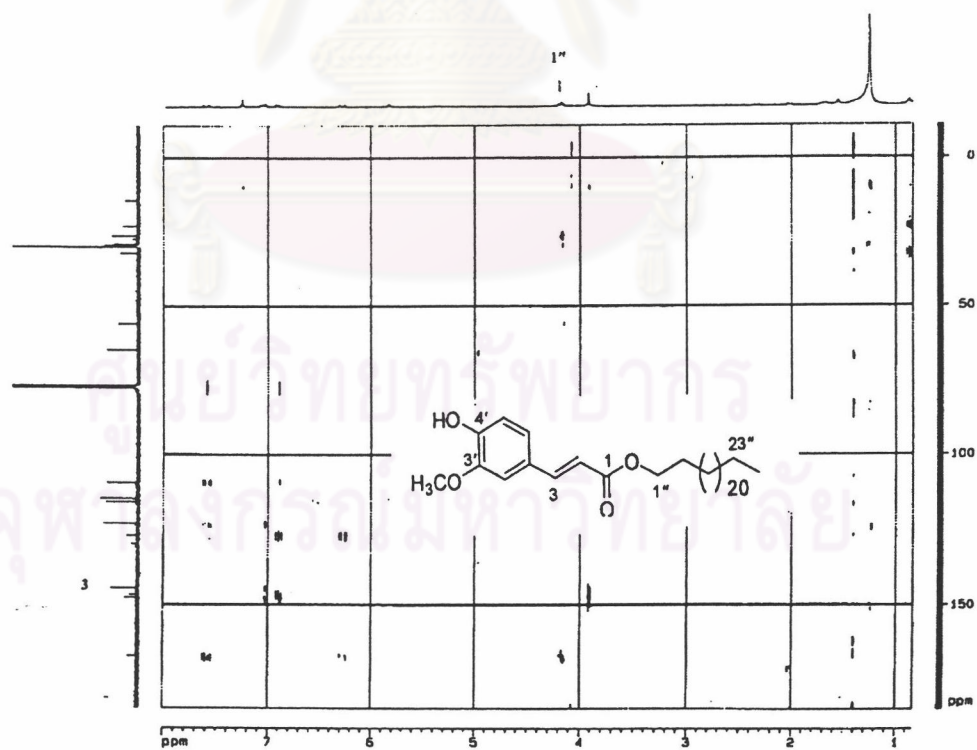


Figure 142 The HMBC spectrum of compound 178 (in CDCl_3)

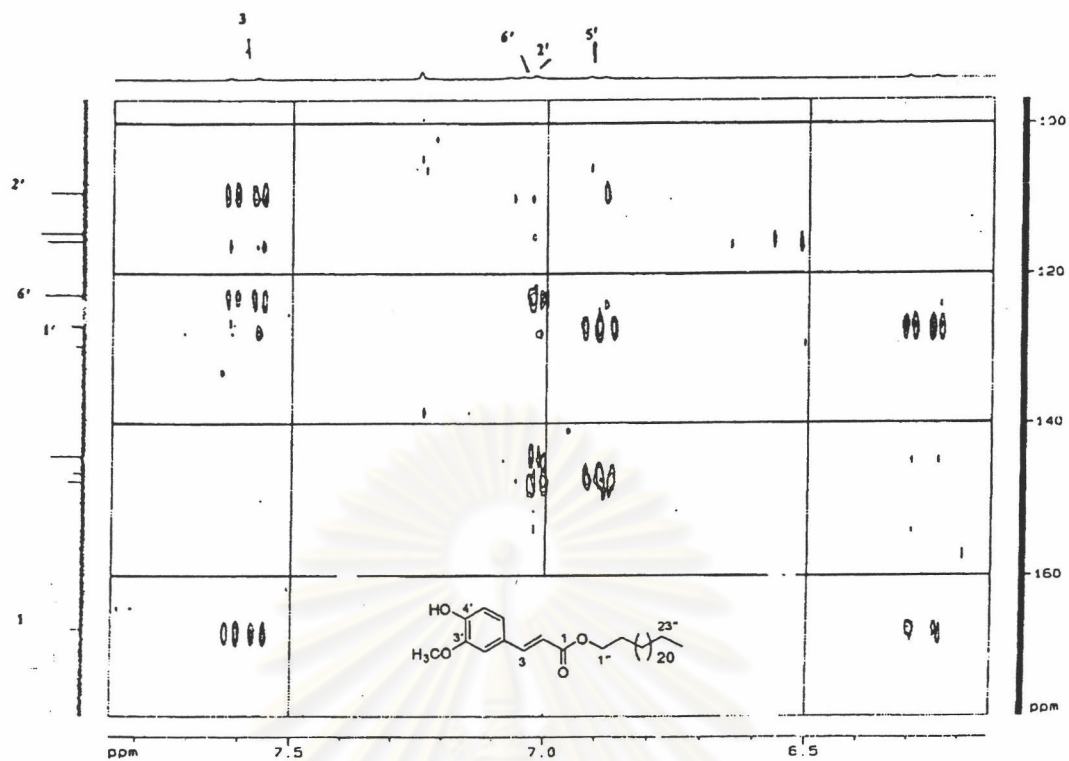


Figure 143 The HMBC spectrum of compound 178 (in CDCl_3)

$[\delta_H 6.5\text{-}7.5 \text{ ppm}, \delta_C 100.0\text{-}170.0 \text{ ppm}]$



Figure 144 The HMBC spectrum of compound 178 (in CDCl_3)

$[\delta_H 3.6\text{-}4.4 \text{ ppm}, \delta_C 20.0\text{-}70.0 \text{ ppm}]$

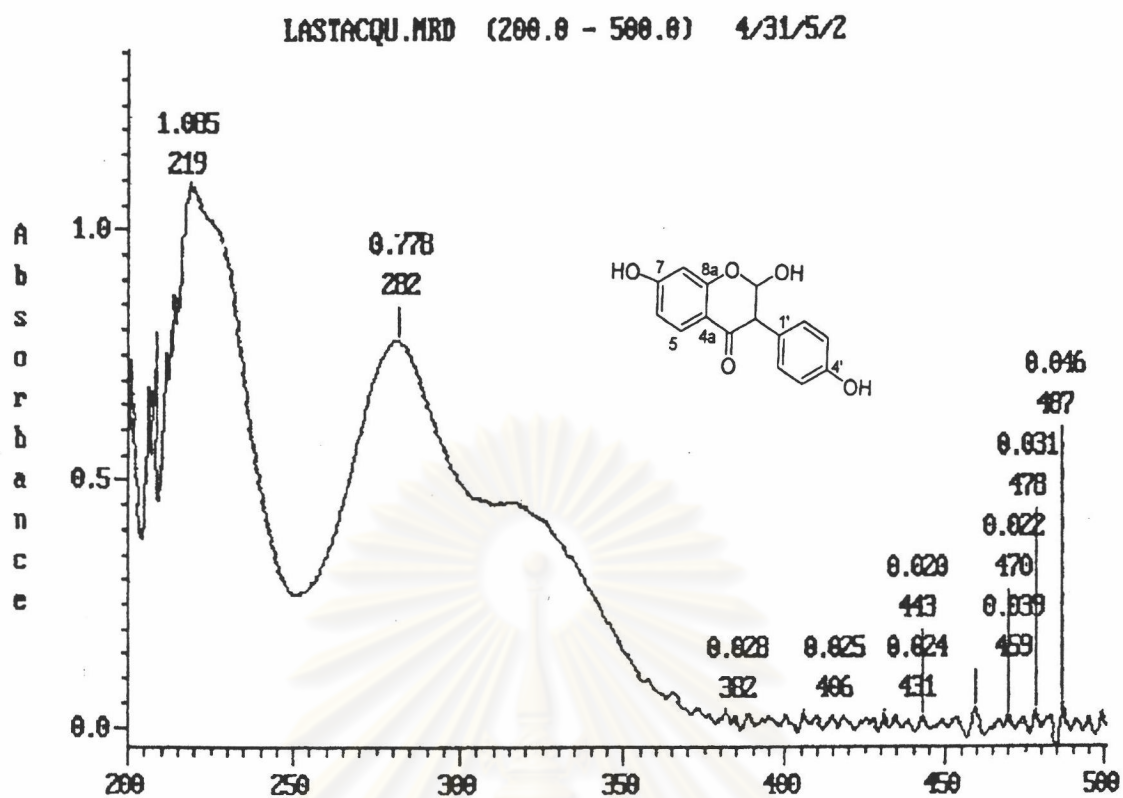


Figure 145 The UV spectrum of compound 179 (in methanol)

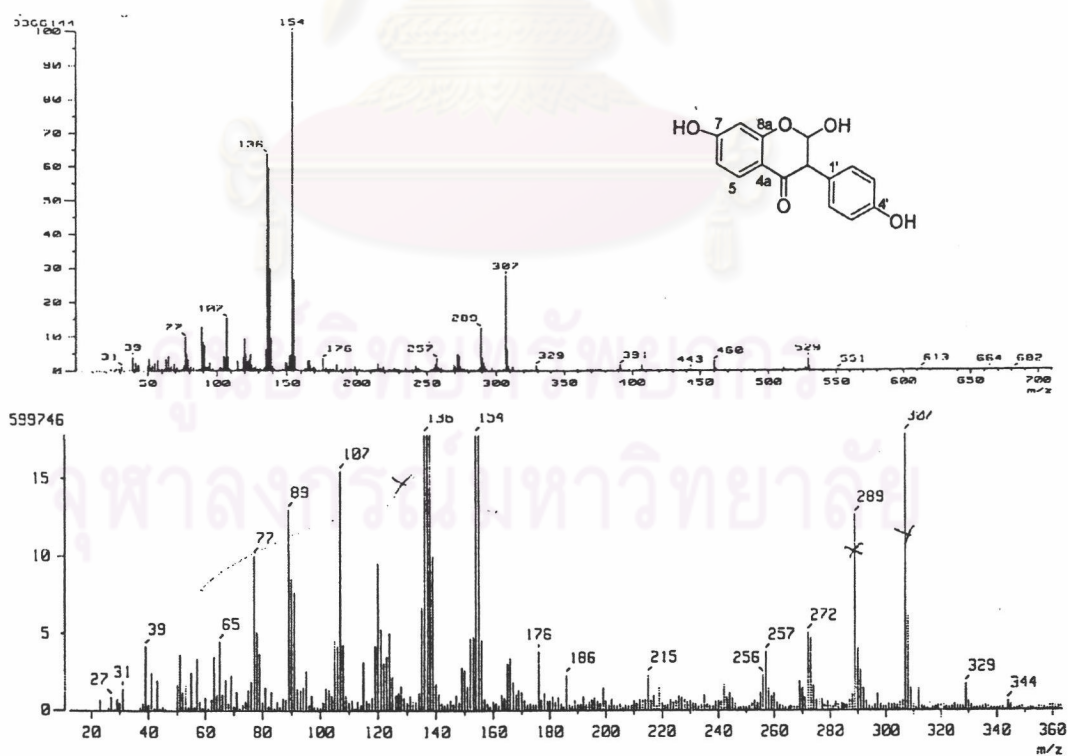


Figure 146 The FAB mass spectrum of compound 179

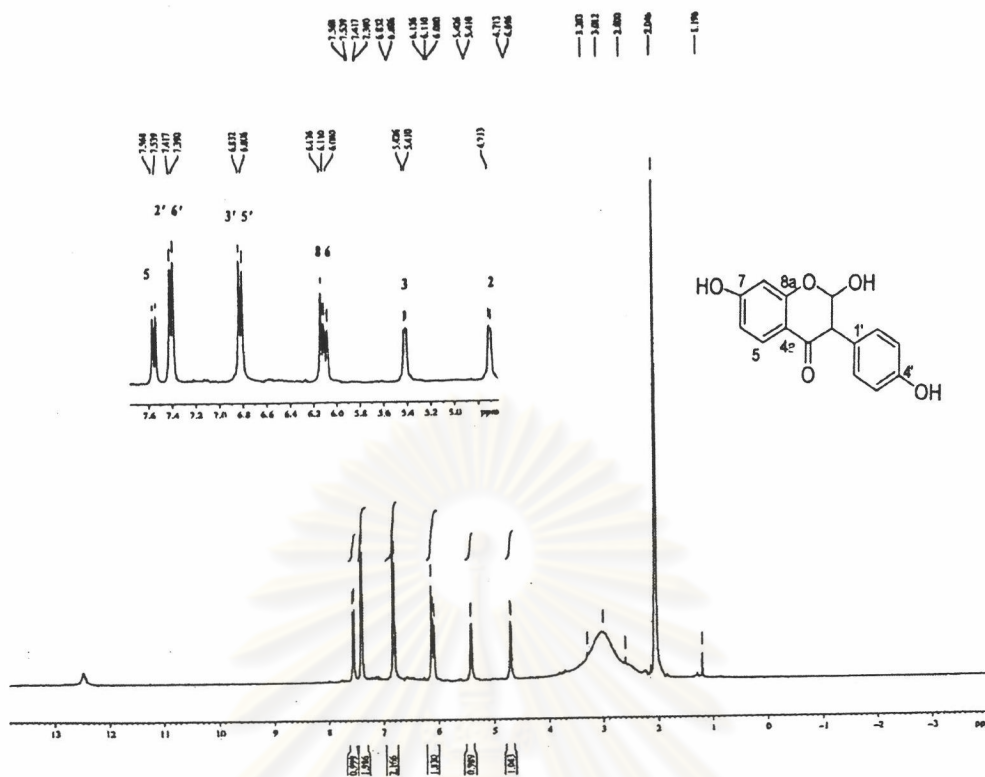


Figure 147 The ^1H NMR (300 MHz) spectrum of compound 179 (in acetone- d_6)

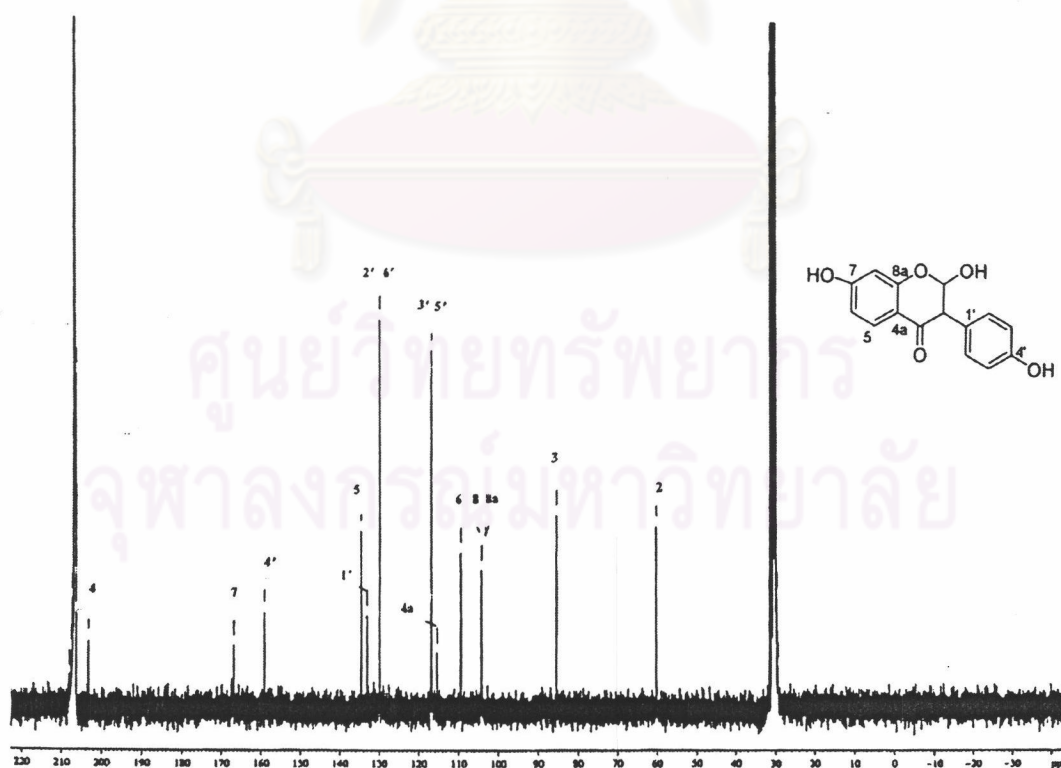


Figure 148 The ^{13}C NMR (75 MHz) spectrum of compound 179 (in acetone- d_6)

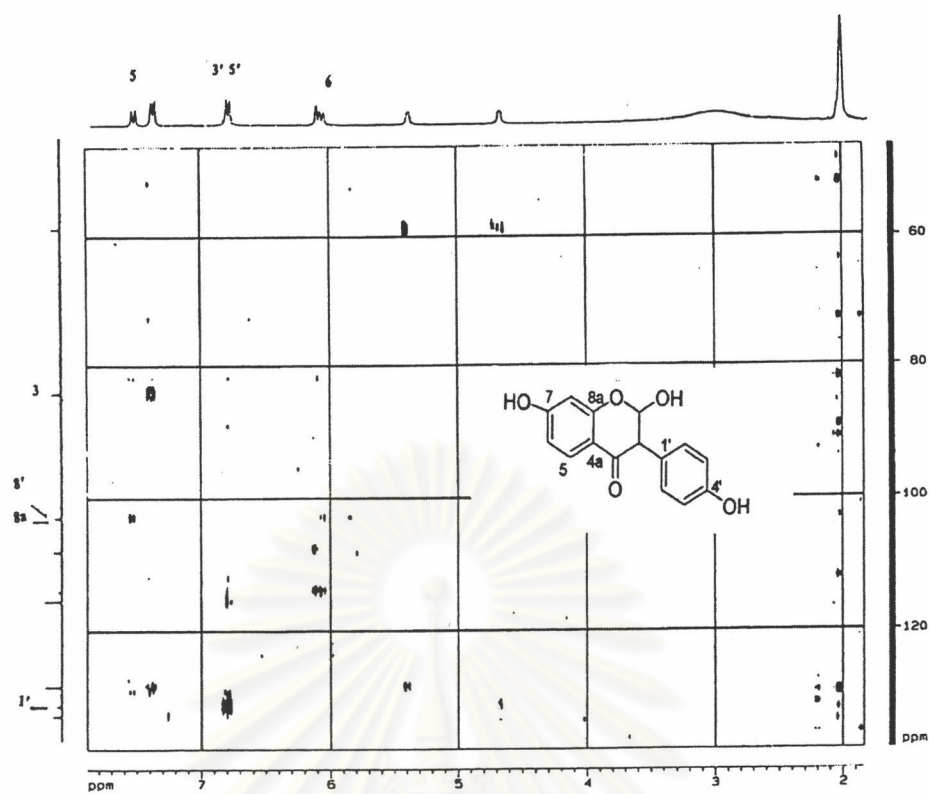


Figure 149 The HMQC spectrum of compound 179 (in acetone- d_6)

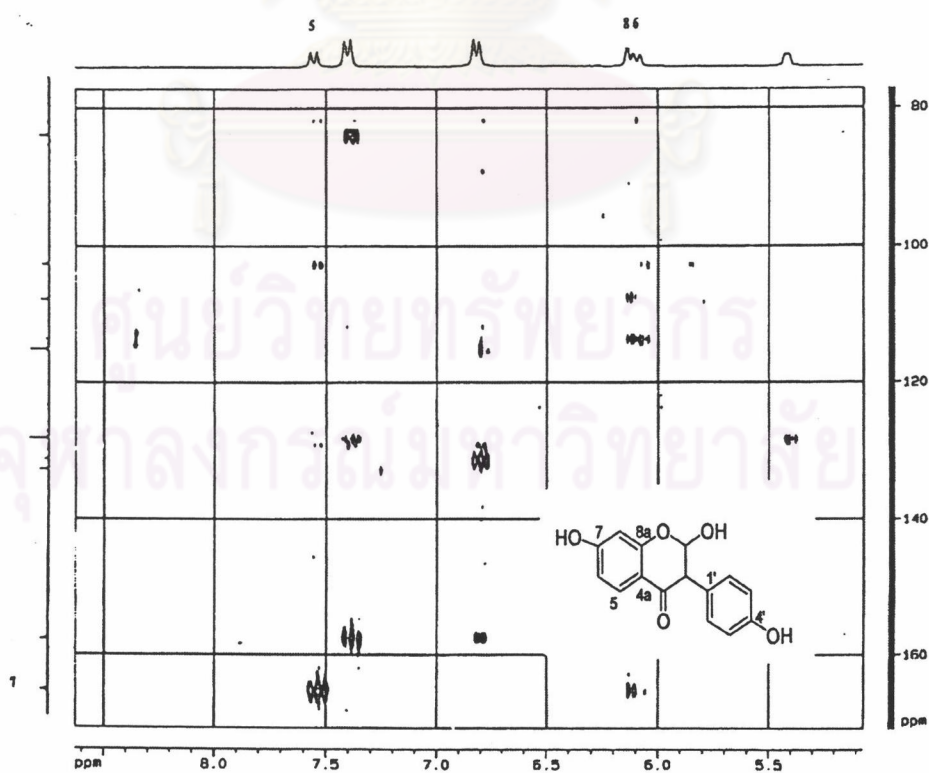


Figure 150 The HMBC spectrum of compound 179 (in acetone- d_6)

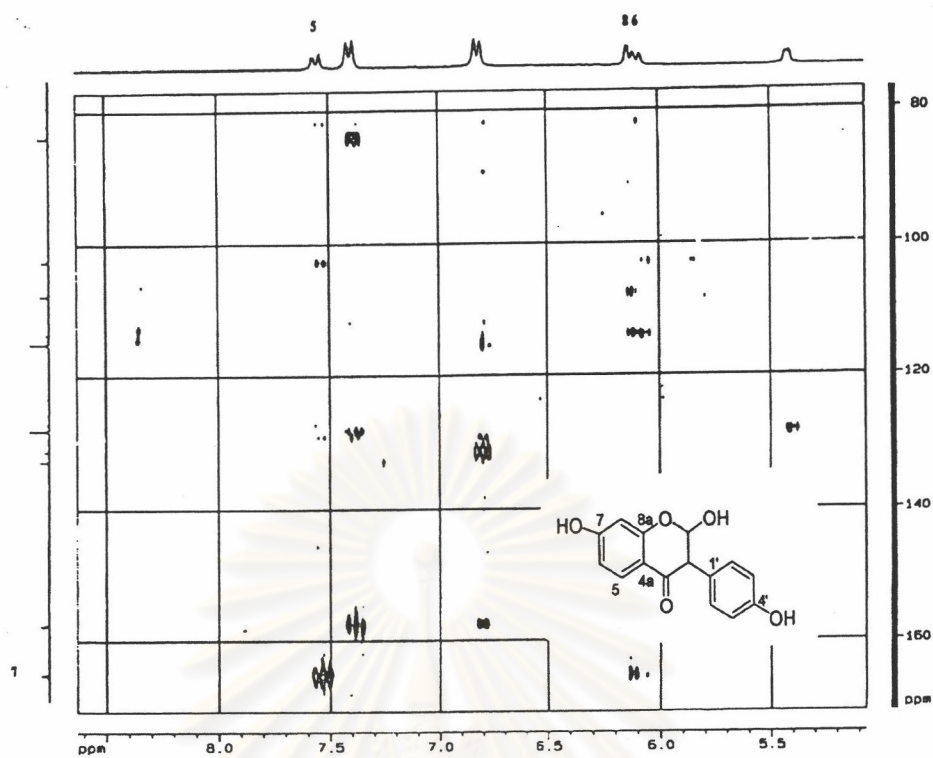


Figure 151 The HMBC spectrum of compound 179 (in acetone- d_6)

$[\delta_H 5.5-8.5 \text{ ppm}, \delta_C 80.0-160.0 \text{ ppm}]$

Scan: 50 (160-176)

R.T.: 2:28.7

Base: m/z 154; 12%FS TIC: 502790 (Max Inten: 126067)

#Ions: 110

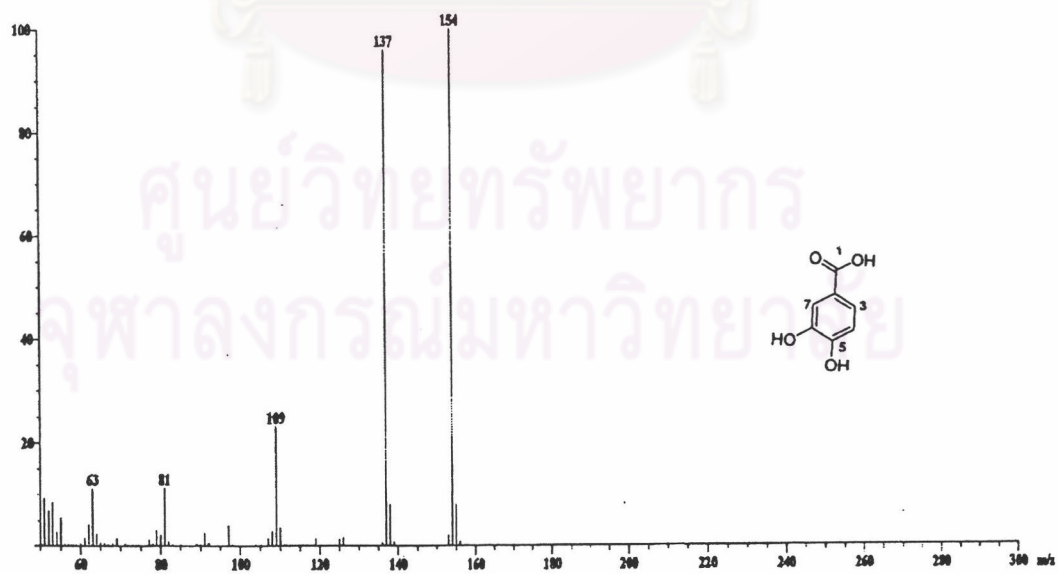


Figure 152 The EI mass spectrum of compound 180

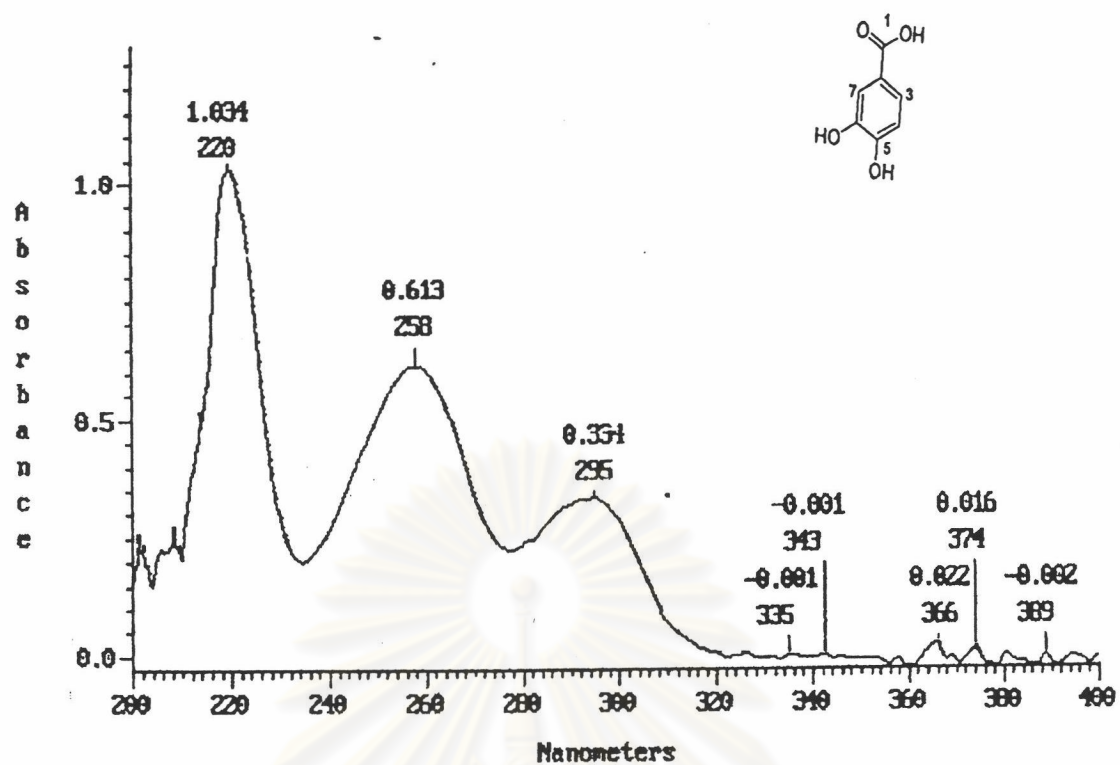


Figure 153 The UV spectrum of compound 180 (in methanol)

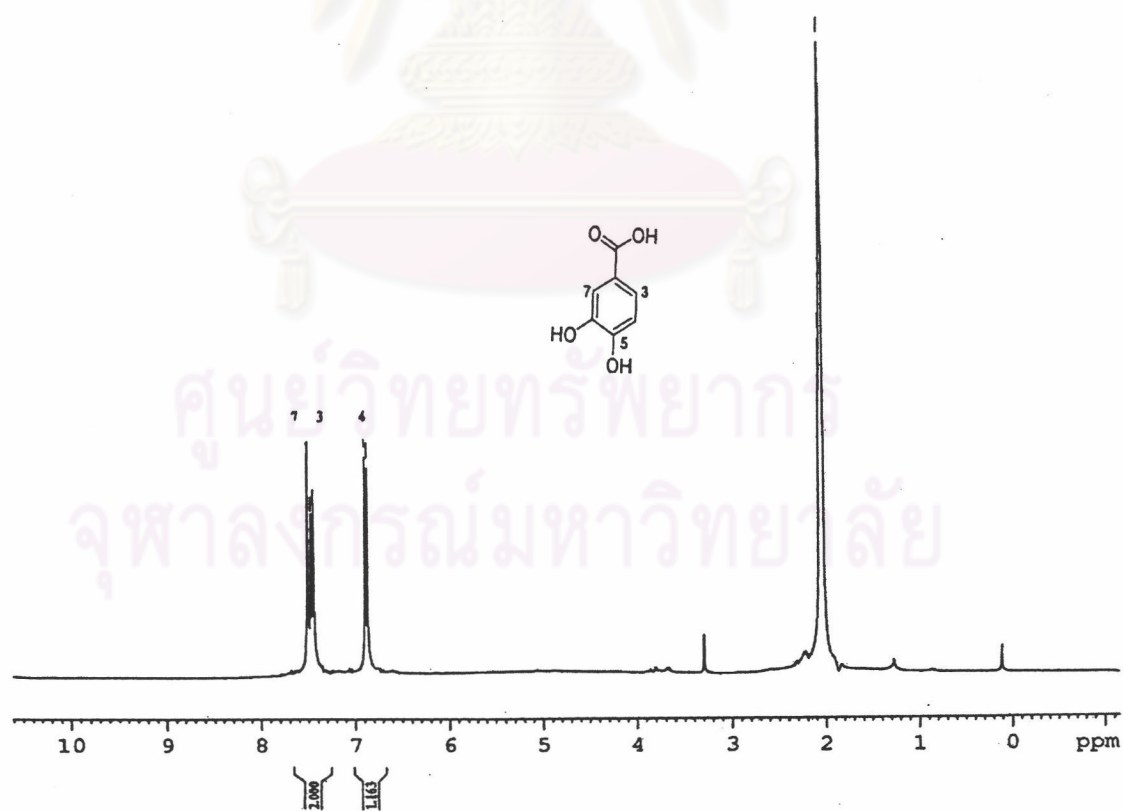


Figure 154 The ^1H NMR (300 MHz) spectrum of compound 180 (in acetone- d_6)

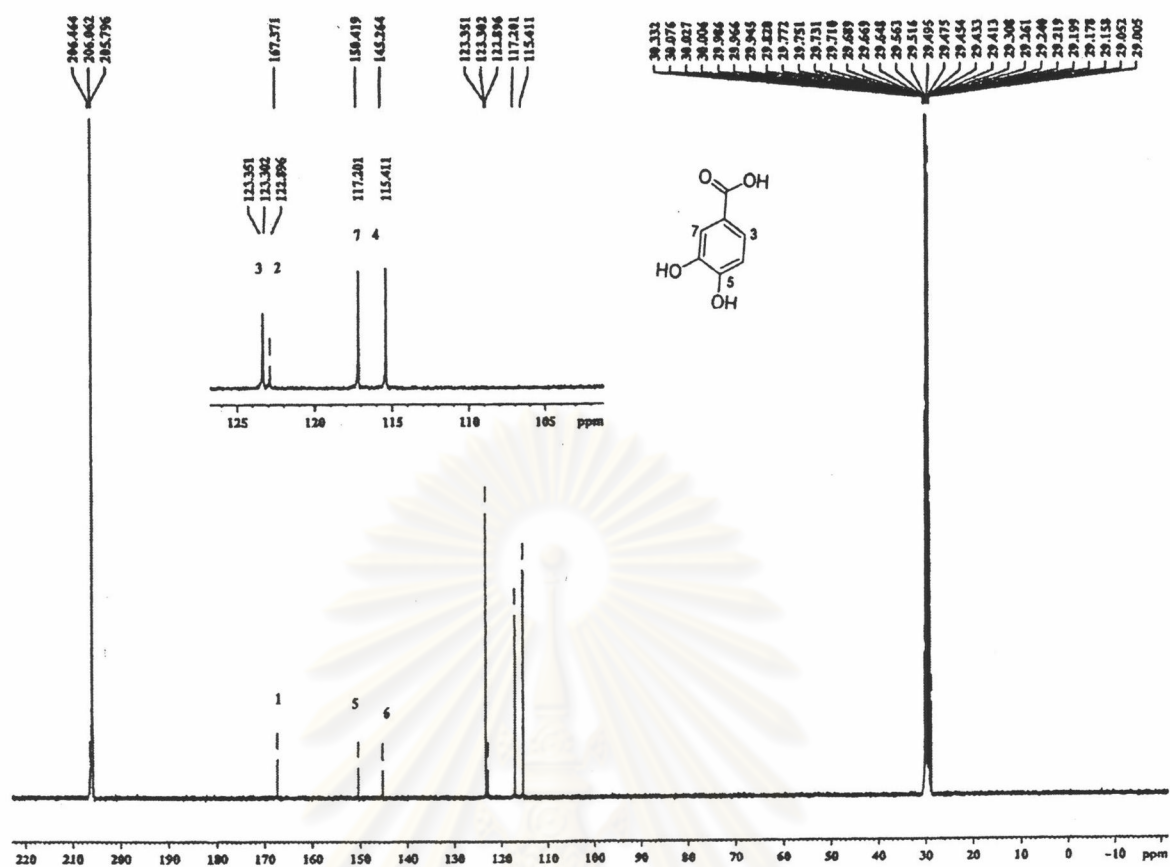


Figure 155 The ^{13}C NMR (75 MHz) spectrum of compound 180 (in acetone- d_6)

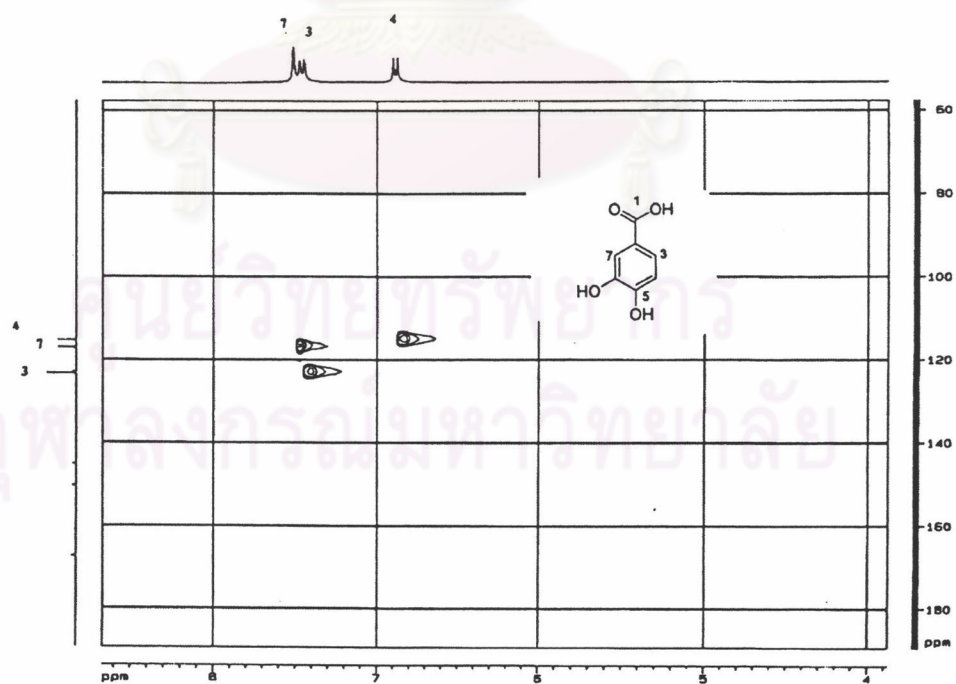


Figure 156 The HMBC spectrum of compound 180 (in acetone- d_6)

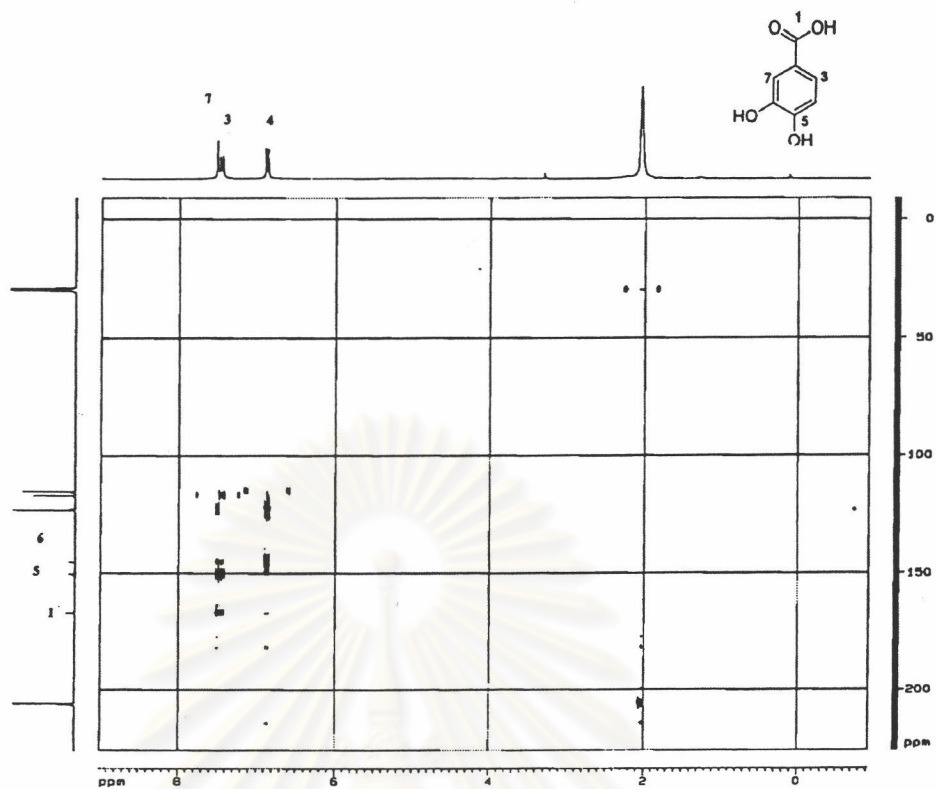


Figure 157 The HMBC spectrum of compound 180 (in acetone- d_6)

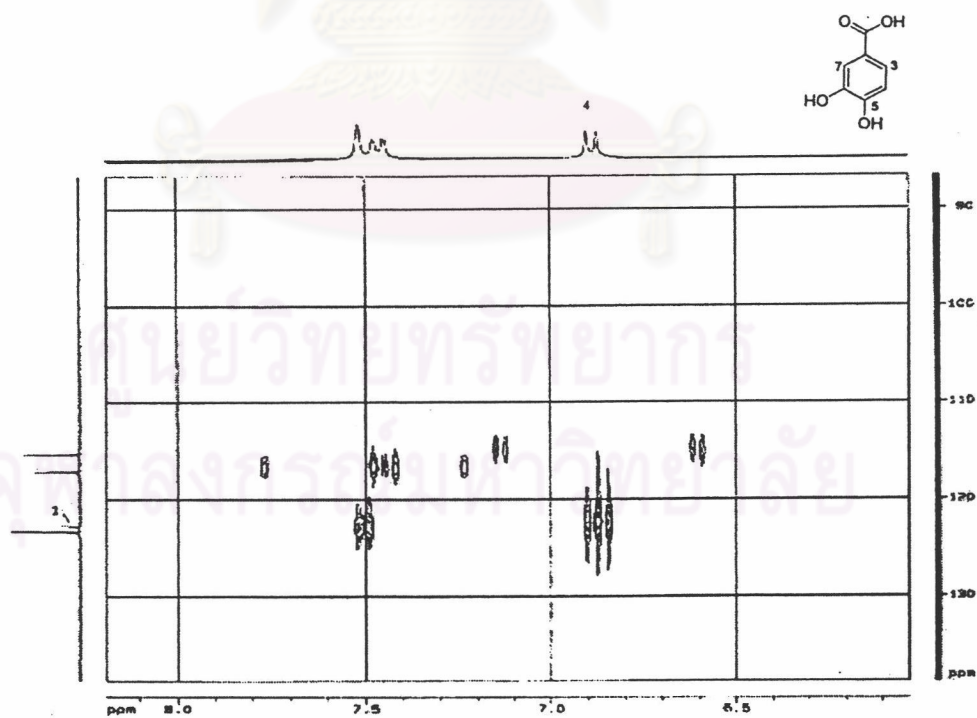


Figure 158 The HMBC spectrum of compound 180 (in acetone- d_6)

$[\delta_{\text{H}} 6.5\text{-}8.0 \text{ ppm}, \delta_{\text{C}} 90.0\text{-}130.0 \text{ ppm}]$

VITA

Miss Rawiwun Kaewamatawong was born on May 20, 1970 in Ubon Ratchathani. She received her Bachelor's degree of Science in Pharmacy from the Faculty of Pharmacy, Rangsit University in 1993 and Master's degree of Pharmaceutical Science from the Faculty of Pharmaceutical Sciences, Chulalongkorn University in 1997. She is currently a member of Faculty of Pharmaceutical Sciences, Ubon Ratchathani University.

Publication

Kaewamatawong, R., Likhitwitayawuid, K., Ruangrunsi, N., Takayama, H., Kitajima, M. and Aimi, N. 2002. Novel biflavonoids from the stem bark of *Ochna integerrima*. J. Nat. Prod. 65: 1027-1029.

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