SUPPORTING INFORMATION

Title: **Total Synthesis of Natural and Unnatural Lamellarins with Saturated and Unsaturated D-rings**

Authors: **Poonsakdi Ploypradith, Thaninee Petchmanee, Poolsak Sahakitpichan, Nichole D. Litvinas, and Somsak Ruchirawat**

Table of Contents

Supporting Information

General Experimental Methods

Unless otherwise noted: Reactions were run in oven-dried round-bottomed flasks. Tetrahydrofuran (THF) was distilled from sodium benzophenone ketyl while dichloromethane (DCM) from calcium hydride prior to use. Acetonitrile (CH_3CN) was stored over calcium hydride. All other compounds were used as received from the suppliers. The crude reaction mixtures were concentrated under reduced pressure by removing organic solvents on rotary evaporator. Column chromatography was performed using silica gel 60 (particle size 0.06-0.2 mm; 70-230 mesh ASTM). Analytical thin-layer chromatography (TLC) was performed with silica gel 60 F_{254} aluminum sheets. Chemical shifts for ^1H nuclear magnetic resonance (NMR) spectra were reported in parts per million (ppm, δ) downfield from tetramethylsilane. Splitting patterns are described as singlet (s), doublet (d), triplet (t), quartet (q), multiplet (m), broad (br), and doublet of doublet (dd). Resonances for infrared (IR) spectra were reported in wavenumbers (cm^{-1}). Low resolution (LRMS) mass spectra were obtained either using electron ionization (EI) or time-of-flight (TOF) while high resolution (HRMS) mass spectra were obtained using either fast-atom-bombardment (FAB) or time-of-flight (TOF). Melting points were uncorrected.

Experimental Section

Ethyl 3-(3,4-Dimethoxyphenyl)-2-nitroacrylate (70). The material was obtained as a 1:1 mixture of *Z*- and *E*-isomers. IR (neat): ν_{max} 2967, 2940, 2841, 1719, 1683, 1633, 1596, 1514, 1464, 1423, 1381, 1260, 1233, 1197, 1146, 1072, 1018 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 1.34-1.40 (m, 6H), 3.84 (s, 3H), 3.86 (s, 3H), 3.91 (s, 3H), 3.93 (s, 3H), 4.30-4.49 (m, 2H), 6.89-6.93 (d, *J* = 8.0 Hz, 4H), 7.04 (s, 2H), 7.17 (d, *J* = 8.0 Hz, 2H), 7.44 (s, 1H), 8.02 (s, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.8, 14.0, 55.9, 56.0, 56.1, 62.8, 62.9, 111.4, 111.6, 112.3, 121.6, 125.3, 126.4, 132.8, 136.8, 149.5, 152.8, 153.1. LRMS (EI) *m/z* (rel intensity) 282 ($M + H^+$, 43), 281 (M^+, 100), 162 (34). TOF-HRMS calcd for $C_{13}H_{16}NO_6$ ($M + H^+$) 282.0972, found 282.0971.

A. Characterization of Mi-RC Products 74-76 and 80-92.

Ethyl 1,2-Bis(3,4-dimethoxyphenyl)-8,9-dimethoxypyrrolo[2,1-*a*]isoquinoline-3-carboxylate (74). IR (neat): ν_{max} 2935, 2835, 1674, 1609, 1582, 1531, 1497, 1464, 1378, 1351, 1258, 1222, 1184, 1161, 1133, 1103, 1068, 1027 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 1.02 (t, *J* = 7.6 Hz, 3H), 3.43 (s, 3H), 3.70 (s, 6H), 3.85 (s, 3H), 3.86 (s, 3H), 3.86 (s, 3H), 4.15 (q, *J* = 7.4 Hz, 2H), 6.73-6.78 (m, 4H), 6.86 (s, 2H), 6.96 (d, *J* = 7.2 Hz, 1H), 7.02 (s, 1H), 7.15 (s, 1H), 9.33 (d, *J* = 7.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.9, 55.2, 55.6, 55.7, 55.80, 55.82, 55.9, 105.2, 107.0, 109.8, 111.0, 112.0, 112.2, 114.1, 114.8, 118.3, 119.5, 123.2, 123.57, 123.62, 124.1, 128.0, 128.5, 130.2, 135.8, 147.4, 147.5, 147.9, 148.7, 149.2, 162.2. LRMS (EI) *m/z* (rel intensity) 572 ($M + H^+$, 33), 571 (M^+, 100), 499 (22). TOF-HRMS calcd for $C_{33}H_{34}NO_8$ ($M + H^+$) 572.2279, found 572.2287.

Ethyl 1,2-Bis(3,4-dimethoxyphenyl)-8,9-dimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (75). IR (neat): ν_{max} 2936, 2835, 1683, 1608, 1583, 1477, 1464, 1417, 1320, 1229, 1178, 1132, 1065, 1025 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 0.98 (t, *J* = 7.4 Hz, 3H), 3.03 (apparent t, *J* = 6.6 Hz, 2H), 3.31 (s, 3H), 3.60 (s, 3H), 3.65 (s, 3H),

3.80 (s, 3H), 3.81 (s, 3H), 3.85 (s, 3H), 4.07 (q, *J* = 7.4 Hz, 2H), 4.59 (apparent t, *J* = 6.6 Hz, 2H), 6.64-6.72 (m, 8H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.9, 29.1, 42.9, 55.2, 55.7, 55.9 (2 carbons), 55.91, 55.93, 59.7, 108.9, 110.3, 110.9, 111.3, 114.6, 114.7, 118.4, 121.0, 121.5, 123.2, 123.6, 126.0, 128.22, 128.24, 131.0, 132.7, 147.4, 147.6, 147.78, 147.82, 148.2, 148.8, 162.0. LRMS (EI) *m/z* (rel intensity) 574 ($M + H^+$, 33), 573 (M^+, 100), 558 (14). TOF-HRMS calcd for $C_{33}H_{36}NO_8$ ($M + H^+$) 574.2435, found 574.2436.

Ethyl 1-(3,4-Dimethoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7,8,9-trimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (80). IR (neat): ν_{max} 2935, 2835, 1685, 1605, 1582, 1531, 1464, 1421, 1404, 1316, 1333, 1255, 1174, 1131, 1107, 1026 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.84 (t, *J* = 7.4 Hz, 3H), 3.09 (apparent br t, *J* = 6.6 Hz, 2H), 3.32 (s, 3H), 3.54 (s, 3H), 3.65 (s, 3H), 3.84 (s, 3H), 3.86 (s, 3H), 3.90 (s, 3H), 4.01 (q, *J* = 7.4 Hz, 2H), 4.61 (br m, 2H), 4.76 (s, 2H), 5.03 (s, 2H), 6.43 (s, 1H), 6.55 (s, 1H), 6.58 (s, 1H), 6.67 (s, 1H), 6.75 (s, 2H), 7.07-7.11 (m, 2H), 7.21-7.33 (m, 8H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.8, 22.3, 42.6, 55.3, 55.8, 55.9, 56.6, 59.6, 61.0, 71.4, 71.8, 103.5, 105.2, 111.1, 114.4, 116.5, 118.9, 119.3, 119.5, 122.5, 123.3, 124.1, 126.8, 127.3, 127.4, 127.8, 128.3, 128.4, 130.4, 137.3, 137.9, 141.2, 143.8, 147.3, 147.8, 148.7, 150.4, 150.8, 151.6, 162.0. LRMS (EI) m/z (rel intensity) 786 ($M + H^+$, 50), 785 (M^+, 89), 695 (47), 694 (70), 648 (30), 604 (39), 603 (37), 558 (26), 530 (37), 526 (28), 484 (21), 91 (100), 65 (27), 55 (28). TOF-HRMS calcd for $C_{47}H_{48}NO_{10}$ ($M + H^+$) 786.3273, found 786.3264.

Ethyl 1-(4-Benzyloxy-3-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7,8,9-trimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (81). IR (neat): ν_{max} 2936, 2830, 1737, 1686, 1631, 1606, 1581, 1531, 1509, 1464, 1405, 1383, 1333, 1316, 1259, 1214, 1156, 1132, 1108, 1024 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.83 (t, *J* = 7.4 Hz, 3H), 3.07 (br apparent t, *J* = 6.6 Hz, 2H), 3.19 (s, 3H), 3.54 (s, 3H), 3.62 (s, 3H), 3.84 (s, 3H), 3.88 (s, 3H), 4.00 (q, *J* = 7.4 Hz, 2H), 4.59 (br m, 2H), 4.73 (s, 2H), 5.03 (s, 2H), 5.13 (s, 2H),

6.43 (s, 1H), 6.50 (s, 1H), 6.55-6.58 (m, 1H), 6.65-6.72 (m, 3H), 7.06-7.10 (m, 2H), 7.20-7.38 (m, 13H). ^{13}C NMR (50 MHz, $CDCl_3$) δ 13.8, 22.3, 42.6, 55.3, 55.9, 56.7, 59.6, 60.9, 61.0, 71.0, 71.5, 71.7, 103.5, 105.2, 114.0, 114.9, 116.6, 119.0, 119.3, 119.5, 122.5, 123.2, 124.1, 126.8, 127.1, 127.3, 127.4, 127.8, 128.3, 128.5, 128.6, 130.4, 137.3, 137.9, 141.2, 143.8, 146.7, 147.3, 149.4, 150.3, 150.7, 151.6, 162.0. TOF-LRMS m/z (rel intensity) 862 ($M + H^+$, 100). TOF-HRMS calcd for $C_{53}H_{52}NO_{10}$ ($M + H^+$) 862.3586, found 862.3579.

Ethyl 1-(3-Benzyloxy-4-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7,8,9-trimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (82). IR ($CHCl_3$): ν_{max} 2935, 2836, 1735, 1686, 1605, 1581, 1531, 1454, 1425, 1404, 1383, 1333, 1316, 1256, 1208, 1176, 1131, 1107, 1022 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.76 (t, *J* = 7.4 Hz, 3H), 3.01 (br apparent t, *J* = 7.6 Hz, 2H), 3.20 (s, 3H), 3.56 (s, 3H), 3.75 (s, 3H), 3.79 (s, 3H), 3.83 (s, 3H), 3.93 (q, *J* = 7.4 Hz, 2H), 4.51 (br m, 2H), 4.65 (s, 2H), 4.70 (s, 2H), 4.94 (s, 2H), 6.37 (s, 1H), 6.38 (s, 1H), 6.49 (s, 1H), 6.69 (s, 3H), 6.99-7.02 (m, 2H), 7.13-7.25 (m, 13H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.7, 22.2, 42.6, 55.1, 56.0, 56.4, 59.6, 60.9, 61.0, 70.9, 71.1, 71.7, 103.0, 105.0, 111.5, 116.0, 116.6, 118.6, 119.2, 119.4, 122.3, 123.8, 124.0, 126.7, 127.17, 127.21, 127.4, 127.70, 127.73, 128.2, 128.3, 128.4, 130.4, 136.9, 137.1, 137.8, 141.1, 143.5, 147.1, 147.8, 148.3, 150.2, 150.5, 151.4, 161.9. LRMS (EI) *m/z* (rel intensity) 862 ($M + H^+$, 7), 861 (M^+, 11), 91 (100), 65 (29). TOF-HRMS calcd for $C_{53}H_{52}NO_{10}$ ($M + H^+$) 862.3586, found 862.3574.

Ethyl 1-(3,4-Dimethoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7-benzyloxy-8,9-dimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (83). IR (neat): ν_{max} 2935, 2835, 1686, 1604, 1583, 1531, 1489, 1464, 1414, 1380, 1333, 1315, 1255, 1213, 1174, 1155, 1131, 1106, 1026 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.82 (t, *J* = 7.4 Hz, 3H), 2.93 (br apparent t, *J* = 6.6 Hz, 2H), 3.34 (s, 3H), 3.54 (s, 3H), 3.64 (s, 3H), 3.84 (s, 3H), 3.89 (s, 3H), 3.99 (q, *J* = 7.4 Hz, 2H), 4.42 (br m, 2H), 4.75 (s, 2H), 5.02 (s, 2H), 5.09 (s, 2H), 6.43

(s, 1H), 6.56 (s, 2H), 6.66 (s, 1H), 6.75 (s, 2H), 7.06-7.10 (m, 2H), 7.21-7.42 (m, 13H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.7, 22.6, 42.5, 55.3, 55.6, 55.8, 56.4, 59.6, 61.0, 71.1, 71.6, 75.3, 102.8, 105.2, 110.7, 114.0, 116.0, 118.6, 119.4, 119.9, 122.4, 123.1, 124.0, 126.7, 127.2, 127.4, 127.8, 128.1, 128.2, 128.5, 128.6, 130.3, 137.1, 137.3, 137.8, 141.2, 143.4, 147.0, 147.5, 148.4, 148.8, 150.5, 151.5, 161.9. LRMS (EI) *m/z* (rel intensity) 862 ($M + H^+$, 5), 861 (M^+, 7), 91 (100), 65 (35). TOF-HRMS calcd for $C_{53}H_{52}NO_{10}$ ($M + H^+$) 862.3586, found 862.3583.

Ethyl 1-(4-Benzyloxy-3-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7-benzyloxy-8,9-dimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (84). IR (neat): ν_{max} 2934, 1685, 1508, 1457, 1417, 1216, 1206 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.83 (t, *J* = 7.1 Hz, 3H), 2.91 (br s, 2H), 3.22 (s, 3H), 3.54 (s, 3H), 3.63 (s, 3H), 3.87 (s, 3H), 3.99 (br q, *J* = 7.1 Hz, 2H), 4.40 (br s, 2H), 4.73 (s, 2H), 5.03 (s, 2H), 5.08 (s, 2H), 5.13 (s, 2H), 6.43 (s, 1H), 6.53 (s, 1H), 6.56-6.76 (m, 4H), 7.07-7.44 (m, 20H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 13.7, 22.6, 29.7, 42.5, 55.2, 55.8, 56.5, 59.6, 61.0, 70.7, 71.2, 71.4, 75.4, 103.0, 105.2, 113.5, 114.5, 116.1, 118.6, 119.4, 119.9, 122.4, 123.1, 126.7, 127.0, 127.2, 127.4, 127.77, 127.79, 128.2, 128.47, 128.5, 128.6, 128.8, 130.3, 137.1, 137.2, 137.3, 137.8, 141.2, 143.5, 146.5, 147.1, 148.8, 149.1, 150.6, 151.5, 161.9. LRMS (EI) *m/z* (rel intensity) 938 ($M + H^+$, 4), 573 (92), 91 (100), 42 (90). HR-MS (FAB) calcd for $C_{59}H_{56}NO_{10}$ ($M + H^+$) 938.3904, found 938.3905. These spectroscopic data are identical to those reported previously.[1]

Ethyl 1-(3-Benzyloxy-4-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-7-benzyloxy-8,9-dimethoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (85). IR ($CHCl_3$): ν_{max} 2935, 2900, 2833, 1737, 1686, 1604, 1531, 1496, 1455, 1415, 1379, 1333, 1315, 1256, 1213, 1177, 1156, 1131, 1024 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.82 (t, *J* = 7.4 Hz, 3H), 2.92 (br m, 2H), 3.29 (s, 3H), 3.63 (s, 3H), 3.83 (s, 3H), 3.90 (s, 3H), 3.98 (q, *J*

= 7.4 Hz, 2H), 4.40 (br m, 2H), 4.72 (s, 2H), 4.77 (s, 2H), 5.01 (s, 2H), 5.09 (s, 2H), 6.43 (s, 1H), 6.48 (s, 1H), 6.54 (s, 1H), 6.75-6.77 (m, 3H), 7.04-7.09 (m, 2H), 7.20-7.48 (m, 18H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.7, 22.7, 42.6, 55.3, 56.2, 56.7, 59.6, 61.0, 71.1, 71.4, 71.8, 75.4, 103.5, 105.4, 111.9, 116.6, 117.1, 119.0, 119.5, 119.8, 122.4, 123.97, 124.04, 126.8, 127.25, 127.31, 127.4, 127.7, 128.3, 128.37, 128.43, 128.5, 128.6, 130.5, 137.1, 137.3, 137.5, 137.9, 141.4, 143.8, 147.4, 148.1, 148.6, 148.9, 150.8, 151.6, 161.9. LRMS (EI) *m/z* (rel intensity) 938 ($M + H^+$, 3), 937 (M^+, 2), 91 (100) 65 (15). TOF-HRMS calcd for $C_{59}H_{56}NO_{10}$ ($M + H^+$) 938.3899, found 938.3900.

Ethyl 1-(3,4-Dimethoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-8-benzyloxy-9-methoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (87). IR (neat): ν_{max} 2933, 2900, 2833, 1683, 1608, 1583, 1531, 1516, 1497, 1480, 1454, 1421, 1400, 1380, 1333, 1251, 1210, 1171, 1127, 1060, 1024 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.84 (t, *J* = 7.2 Hz, 3H), 3.01 (apparent t, *J* = 6.6 Hz, 2H), 3.37 (s, 3H), 3.54 (s, 3H), 3.66 (s, 3H), 3.84 (s, 3H), 3.98-4.03 (m, 2H), 4.61 (br m, 2H), 4.76 (s, 2H), 5.03 (s, 2H), 5.15 (s, 2H), 6.44 (s, 1H), 6.60 (s, 1H), 6.68 (s, 1H), 6.72-6.78 (m, 3H), 7.08-7.10 (m, 2H), 7.21-7.40 (m, 12H), 7.44-7.46 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 13.7, 29.0, 42.8, 55.3, 55.6, 55.8, 56.5, 59.6, 71.0, 71.1, 71.6, 103.0, 109.2, 110.8, 113.2, 114.0, 116.1, 118.8, 119.2, 121.6, 121.8, 123.1, 125.7, 126.7, 127.2, 127.4, 127.8, 127.9, 128.2, 128.4, 128.55, 128.62, 130.8, 137.1, 137.8, 143.5, 147.0, 147.8, 148.4, 150.5, 162.0. LRMS (EI) *m/z* (rel intensity) 831 (M^+, 5), 91 (100), 65 (29). TOF-HRMS calcd for $C_{52}H_{50}NO_9$ ($M + H^+$) 832.3480, found 832.3485.

Ethyl 1-(3-Benzyloxy-4-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-8-benzyloxy-9-methoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (89). IR (neat): ν_{max} 2933, 1685, 1498, 1381, 1254, 1212, 1174, 1106 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.82 (t, *J* = 7.1 Hz, 3H), 2.99 (br s, 2H), 3.31 (s, 3H), 3.64 (s, 3H), 3.82 (s, 3H), 3.99 (br q, *J* = 7.1 Hz, 2H), 4.59 (br s, 2H), 4.72 (s, 2H), 4.77 (s, 2H), 5.01 (s, 2H), 5.14 (s,

2H), 6.44 (s, 1H), 6.57 (s, 1H), 6.65 (s, 1H), 6.74 (s, 1H), 6.76 (s, 1H), 7.06-7.46 (m, 20H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 13.7, 29.6, 42.8, 55.2, 56.0, 56.5, 59.6, 70.8, 71.0, 71.2, 71.7, 103.1, 109.1, 111.5, 113.1, 116.1, 116.5, 118.8, 119.1, 121.5, 121.7, 123.7, 125.6, 126.8, 127.2, 127.3, 127.4, 127.7, 127.9, 128.2, 128.4, 128.5, 128.6, 130.9, 136.95, 137.01, 137.1, 137.9, 143.5, 147.1, 147.8, 147.9, 148.2, 150.6, 162.0. LRMS (EI) *m/z* (rel intensity) 908 (M + H^+, 6), 615 (100), 573 (84), 84 (38). HR-MS (FAB) calcd for $C_{59}H_{56}NO_{10}$ (M + H^+) 908.3799, found 908.3791. These spectroscopic data are identical to those reported previously.[1]

Ethyl 1-(3-Benzyloxy-4-methoxyphenyl)-2-(2,5-dibenzyloxy-4-methoxyphenyl)-8-benzyloxy-9-methoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (90). IR (neat): ν_{max} 3031, 2934, 2830, 1683, 1608, 1582, 1532, 1497, 1454, 1404, 1380, 1333, 1251, 1173, 1129, 1060, 1021 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.87 (t, *J* = 7.4 Hz, 3H), 2.98 (apparent t, *J* = 6.6 Hz, 2H), 3.30 (s, 3H), 3.75 (s, 3H), 3.81 (s, 3H), 3.97 (q, *J* = 7.4 Hz, 2H), 4.59 (apparent t, *J* = 6.6 Hz, 2H), 4.75 (s, 2H), 4.81 (s, 2H), 4.89 (s, 2H), 5.15 (s, 2H), 6.43 (s, 1H), 6.62 (s, 1H), 6.66 (s, 1H), 6.72-6.74 (m, 4H), 7.12-7.15 (m, 2H), 7.20-7.47 (m, 18H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.8, 29.0, 42.8, 55.2, 55.95, 56.04, 59.5, 70.8, 70.9, 71.8, 100.7, 103.2, 109.0, 111.4, 113.0, 116.4, 118.3, 118.7, 119.0, 121.5, 121.8, 123.7, 125.6, 126.8, 127.2, 127.4, 127.6, 127.7, 127.9, 128.3, 128.6, 134.2, 136.9, 137.0, 137.4, 137.9, 142.0, 147.1, 147.4, 147.7, 147.8, 148.1, 149.1, 151.3, 162.0. TOF-LRMS *m/z* (rel intensity) 908 (M + H^+, 100). TOF-HRMS calcd for $C_{58}H_{54}NO_9$ (M + H^+) 908.3793, found 908.3795.

Ethyl 1-(4-Benzyloxy-3-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-8-benzyloxy-9-methoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (91). IR (neat): ν_{max} 3032, 2932, 1733, 1683, 1607, 1584, 1497, 1480, 1454, 1400, 1381, 1334, 1250, 1210, 1173, 1128, 1060, 1024 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.83 (t, *J* = 7.4 Hz, 3H), 2.98 (apparent t, *J* = 6.6 Hz, 2H), 3.23 (s, 3H), 3.53 (s, 3H), 3.63 (s, 3H), 3.99 (q, *J* = 7.4 Hz,

2H), 4.60 (br m, 2H), 4.73 (s, 2H), 5.03 (s, 2H), 5.13 (s, 4H), 6.43 (s, 1H), 6.57 (s, 1H), 6.66 (s, 1H), 6.70-6.73 (m, 4H), 7.05-7.10 (m, 2H), 7.20-7.47 (m, 18H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.8, 29.1, 42.8, 55.3, 55.9, 56.6, 59.5, 71.0, 71.2, 71.5, 71.8, 103.5, 109.4, 113.5, 113.8, 114.0, 115.0, 116.7, 119.3, 121.8, 123.2, 125.7, 126.8, 127.1, 127.3, 127.8, 127.9, 128.2, 128.5, 130.8, 137.1, 137.4, 137.9, 143.9, 146.6, 147.3, 148.1, 149.4, 150.7, 162.0. TOF-LRMS m/z (rel intensity) 908 ($M + H^+$, 100). TOF-HRMS calcd for $C_{58}H_{54}NO_9$ ($M + H^+$) 908.3793, found 908.3790.

Ethyl 1-(3-Benzyloxy-4-methoxyphenyl)-2-(2,4-dibenzyloxy-5-methoxyphenyl)-9-benzyloxy-8-methoxy-5,6-dihydropyrrolo[2,1-*a*]isoquinoline-3-carboxylate (92). IR ($CHCl_3$): ν_{max} 2934, 2900, 1683, 1608, 1582, 1497, 1454, 1424, 1382, 1333, 1251, 1204, 1174, 1129, 1061, 1022 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 0.82 (t, *J* = 7.0 Hz, 3H), 3.04 (apparent t, *J* = 6.6 Hz, 2H), 3.63 (s, 3H), 3.84 (s, 3H), 3.90 (s, 3H), 3.98 (q, *J* = 7.0 Hz, 2H) 4.57 (br m, 2H), 4.57 (s, 2H), 4.69 (s, 2H), 4.74 (s, 2H), 5.01 (s, 2H), 6.42 (s, 1H), 6.55 (s, 1H), 6.69 (d, *J* = 3.6 Hz, 2H), 6.74 (s, 3H), 7.02-7.12 (m, 2H), 7.18-7.34 (m, 18H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 13.9, 29.4, 42.9, 56.3, 56.8, 59.7, 70.5, 71.2, 71.6, 72.0, 103.7, 107.7, 111.3, 111.5, 112.0, 115.0, 116.7, 116.8, 117.1, 119.3, 121.3, 121.8, 123.4, 123.9, 126.4, 126.9, 127.1, 127.2, 127.3, 127.4, 127.7, 127.8, 127.9, 128.4, 128.5, 128.6, 131.0, 137.1, 137.3, 137.4, 138.1, 143.9, 144.0, 145.0, 146.8, 147.5, 148.3, 148.6, 148.8, 150.9, 162.1. LRMS (EI) *m/z* (rel intensity) 908 ($M + H^+$, 5), 907 (M^+, 5), 532 (11), 531 (23), 440 (17), 412 (12), 295 (14), 181 (12), 91 (100), 65 (11). TOF-HRMS calcd for $C_{58}H_{54}NO_9$ ($M + H^+$) 908.3793, found 908.3793.

B. Characterization of Saturated Lamellarins 3, 79 and 93-104.

14-(4-Hydroxy-3-methoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (3; Lamellarin C). mp (MeOH) 234–238 °C (lit.[2] 225-230 °C) . IR (neat): ν_{max} 3410 (br), 3000, 2939, 2838, 1701, 1599,

1546, 1508, 1456, 1414, 1271, 1246, 1203, 1146, 1119, 1086, 1036 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.05 (apparent t, J = 6.0 Hz, 2H), 3.27 (s, 3H), 3.34 (s, 3H), 3.73 (s, 3H), 3.74 (s, 3H), 3.78 (s, 3H), 4.55-4.65 (m, 2H), 6.56 (s, 1H), 6.61 (s, 1H), 6.79 (s, 1H), 6.87 (d, J = 6.6 Hz, 1H), 6.99 (s, 1H), 7.03 (s, 1H), 9.31 (s, 1H), 9.71 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 21.9, 42.1, 55.3, 55.5, 56.5, 60.9, 61.2, 104.1, 105.6, 109.1, 113.2, 115.1, 116.1, 116.8, 120.4, 123.0, 123.8, 125.7, 128.1, 135.2, 142.4, 145.0, 146.1, 147.1, 147.4, 149.0, 150.7, 151.8, 154.7. LRMS (EI) m/z (rel intensity) 546 ($M + H^+$, 33), 545 (M^+, 100), 531 (10), 530 (26). TOF-HRMS calcd for $C_{30}H_{28}NO_9$ ($M + H^+$) 546.1759, found 546.1769. These spectroscopic data are identical to those reported previously.[2]

14-(3,4-Dimethoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (93; Lamellarin I). mp (MeOH) 243–247 °C (lit.[3] 218–220 °C). IR (neat): ν_{max} 3407 (br), 2993, 2936, 2837, 1705, 1598, 1544, 1507, 1455, 1414, 1336, 1315, 1280, 1242, 1170, 1085, 1028 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 3.13 (apparent t, J = 6.6 Hz, 2H), 3.34 (s, 3H), 3.47 (s, 3H), 3.86 (s, 3H), 3.87 (s, 3H), 3.89 (s, 3H), 3.96 (s, 3H), 4.75 (apparent t, J = 6.6 Hz, 2H), 5.77 (s, 1H), 6.56 (s, 1H), 6.58 (s, 1H), 6.96 (s, 1H), 7.05 (s, 1H), 7.08 (s, 2H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 21.9, 42.2, 55.2, 55.6, 56.2, 56.3, 60.9, 61.0, 103.5, 104.1, 105.2, 110.2, 112.1, 114.0, 114.3, 115.4, 120.1, 123.0, 123.6, 128.1, 128.3, 135.3, 142.4, 143.3, 145.6, 146.5, 149.0, 150.0, 150.7, 151.9, 155.6. LRMS (EI) m/z (rel intensity) 560 ($M + H^+$, 46), 559 (M^+, 65), 248 (100). TOF-HRMS calcd for $C_{31}H_{30}NO_9$ ($M + H^+$) 560.1915, found 560.1925. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (94; Lamellarin T). mp (MeOH) >250 °C (lit.[4] 214–218 °C). IR (neat): ν_{max} 3376 (br), 2937, 2839, 1681, 1598, 1547, 1507, 1454, 1413, 1273, 1242, 1201, 1145, 1086, 1037 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ

3.05 (apparent t, *J* = 6.6 Hz, 2H), 3.27 (s, 3H), 3.37 (s, 3H), 3.73 (s, 3H), 3.78 (s, 3H), 3.81 (s, 3H), 4.50-4.72 (m, 2H), 6.58 (s, 1H), 6.63 (s, 1H), 6.79 (s, 1H), 6.87 (s, 1H), 6.88 (d, *J* = 6.6 Hz, 1H), 7.15 (d, *J* = 8.8 Hz, 1H), 9.34 (s, 1H), 9.72 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 21.9, 42.1, 55.3, 55.6, 56.6, 60.9, 61.2, 104.1, 105.6, 109.0, 113.3, 114.1, 115.7, 118.3, 120.5, 122.0, 122.9, 127.7, 135.1, 142.4, 145.0, 146.1, 147.4, 148.1, 148.2, 150.7, 151.8, 154.7. LRMS (EI) m/z (rel intensity) 546 (M + H^+, 22), 545 (M^+, 45), 530 (39), 272 (58), 241 (100). TOF-HRMS calcd for $C_{30}H_{28}NO_9$ (M + H^+) 546.1759, found 546.1768. These spectroscopic data are identical to those reported previously.[4]

14-(3,4-Dimethoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (95; Lamellarin F). mp (MeOH) >250 °C (lit.[5] 273–276 °C). IR (neat): ν_{max} 3409 (br), 3001, 2938, 2837, 1698, 1596, 1547, 1511, 1479, 1456, 1408, 1340, 1260, 1242, 1170, 1143, 1121, 1084, 1035 cm^{-1}. ^{1}H NMR (200 MHz, DMSO-d_6): δ 3.00 (apparent br t, *J* = 6.6 Hz, 2H), 3.24 (s, 3H), 3.31 (s, 3H), 3.64 (s, 3H), 3.73 (s, 3H), 3.81 (s, 3H), 4.46-4.74 (m, 2H), 6.31 (s, 1H), 6.51 (s, 1H), 6.79 (s, 1H), 7.00 (d, *J* = 8.0 Hz, 1H), 7.08 (s, 1H), 7.18 (d, *J* = 8.0 Hz, 1H), 9.26 (s,1H), 9.71 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 21.7, 42.1, 55.1, 55.5, 56.4, 60.7, 101.5, 104.1, 105.5, 109.1, 113.1, 113.6, 114.8, 115.6, 122.8, 123.6, 127.8, 128.0, 135.7, 137.0, 145.0, 146.1, 147.4, 147.8, 149.3, 150.2, 150.3, 151.3, 154.7. LRMS (EI) m/z (rel intensity) 546 (M + H^+, 37), 545 (M^+, 100), 531 (18), 530 (44). TOF-HRMS calcd for $C_{30}H_{28}NO_9$ (M + H^+) 546.1759, found 546.1760. These spectroscopic data are identical to those reported previously.[5]

14-(4-Hydroxy-3-methoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (96; Lamellarin K). mp (MeOH) >250 °C. IR (KBr): ν_{max} 3404 (br), 2936, 1712, 1544, 1510, 1457, 1265, 1118 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.04 (m, 2H), 3.28 (s, 3H), 3.39 (s, 3H), 3.75 (s, 3H), 3.78 (s, 3H), 3.78 (s, 3H), 4.08 (br s, 3 H), 4.55 (m, 1H), 4.73 (m, 1H), 6.33 (s, 1H), 6.55 (s, 1H), 6.79

(s, 1H), 6.91 (dd, *J* = 8.0, 1.8 Hz, 1H), 6.94 (d, *J* = 1.8 Hz, 1H), 7.00 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 21.4, 42.0, 54.9, 55.3, 56.0, 60.7, 101.5, 103.5, 104.5, 109.8, 113.3, 113.75, 113.84, 115.6, 115.7, 123.1, 123.9, 126.8, 128.7, 135.9, 136.1, 144.4, 145.9, 146.0, 146.1, 146.7, 148.0, 150.7, 156.2. LRMS (EI) *m/z* (rel intensity) 532 ($M + H^+$, 38), 531 (M^+, 100), 516 (52), 484 (23). TOF-HRMS calcd for $C_{29}H_{26}NO_9$ ($M + H^+$) 532.1602, found 532.1607. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (97; Lamellarin E). mp (MeOH) >250 °C (lit.[5] 228–232 °C). IR (neat): ν_{max} 3377 (br), 3000, 2931, 2850, 1682, 1591, 1549, 1516, 1485, 1433, 1407, 1246, 1203, 1159, 1143, 1026 cm^{-1}. ^{1}H NMR (200 MHz, DMSO-d_6): δ 3.00 (apparent t, *J* = 6.0 Hz, 2H), 3.26 (s, 3H), 3.37 (s, 3H), 3.64 (s, 3H), 3.81 (s, 3H), 4.46-4.72 (m, 2H), 6.34 (s, 1H), 6.62 (s, 1H), 6.78 (s, 1H), 6.86 (s, 1H), 6.88 (d, *J* = 6.6 Hz, 1H), 7.14 (d, *J* = 8.8 Hz, 1H), 9.25 (s,1H), 9.32 (s, 1H), 9.71 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 21.7, 42.1, 55.1, 55.5, 56.6, 60.9, 101.5, 104.1, 105.6, 109.1, 113.1, 114.1, 114.8, 115.6, 118.3, 122.0, 122.8, 127.9, 135.6, 137.0, 144.9, 146.1, 147.3, 147.7, 148.0, 148.1, 151.2, 154.7. LRMS (EI) m/z (rel intensity) 532 ($M + H^+$, 58), 531 (M^+, 100), 516 (32), 221 (30). TOF-HRMS calcd for $C_{29}H_{26}NO_9$ ($M + H^+$) 532.1602 found 532.1616. These spectroscopic data are identical to those reported previously.[5]

14-(3,4-Dimethoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (99; Lamellarin J). mp (MeOH) >250 °C (lit.[3] 216–220 °C). IR (neat): ν_{max} 3406 (br), 2993, 2937, 2836, 1704, 1598, 1543, 1507, 1455, 1414, 1336, 1315, 1260, 1242, 1200, 1170, 1143, 1118, 1085, 1028, 1003 cm^{-1}. ^{1}H NMR (200 MHz, DMSO-d_6): δ 3.00 (apparent br t, *J* = 6.6 Hz, 2H), 3.23 (s, 3H), 3.32 (s, 3H), 3.73 (s, 3H), 3.82 (s, 3H), 4.50-4.66 (m, 2H), 6.55 (s, 1H), 6.62 (s, 1H), 6.74 (s, 1H), 6.78 (s, 1H), 7.01 (d, *J* = 8.0 Hz, 1H), 7.08 (s, 1H), 7.19 (d, *J* = 8.0 Hz, 1H), 9.46 (s,1H), 9.69

(s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 27.9, 42.4, 55.2, 55.5, 56.36, 56.42, 104.0, 105.6, 109.1, 109.8, 112.8, 113.6, 114.3, 115.0, 115.8, 118.5, 123.7, 127.6, 127.8, 136.3, 144.9, 146.1, 146.4, 147.3, 147.5, 149.3, 150.2, 154.7. LRMS (EI) m/z (rel intensity) 516 ($M + H^+$, 11), 515 (M^+, 16), 41 (100). TOF-HRMS calcd for $C_{29}H_{26}NO_8$ ($M + H^+$) 516.1653, found 516.1652. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (101; Lamellarin L). mp (MeOH) >250 °C (lit.[3] 285-287 °C). IR (KBr): ν_{max} 3629 (br), 3473 (br), 3266 (br), 2957, 1672, 1589, 1485, 1421, 1278 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.05 (apparent t, *J* = 6.5 Hz, 2H), 3.41 (s, 3H), 3.52 (s, 3 H), 3.96 (s, 3H), 4.64-4.80 (m, 2H), 6.72 (s, 1H), 6.77 (s, 1H), 6.89 (s, 1H), 6.98 (dd, *J* = 8.2, 2.0 Hz, 1H), 7.05 (d, *J* = 8.2 Hz, 1H), 7.08 (d, *J* = 2.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 28.3, 42.3, 55.1, 55.4, 56.2, 103.4, 104.5, 108.8, 109.9, 111.7, 113.2, 114.4, 117.6, 119.3, 122.8, 127.3, 128.5, 136.4, 143.9, 145.4, 145.8, 145.9, 146.1, 146.6, 146.8, 156.0. LRMS (EI) *m/z* (rel intensity) 501 (M^+, 1), 251 (51), 42 (100). TOF-HRMS calcd for $C_{28}H_{24}NO_8$ ($M + H^+$) 502.1496, found 502.1501. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-2,11-dihydroxy-3,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (102; Lamellarin G). mp (MeOH) >250 °C (lit.[5] 263–265°C). IR (neat): ν_{max} 3384 (br), 2923, 2851, 1686, 1586, 1509, 1486, 1424, 1273, 1206, 1160, 1100, 1027 cm^{-1}. ^{1}H NMR (200 MHz, DMSO-d_6): δ 2.98 (apparent br t, *J* = 6.6 Hz, 2H), 3.25 (s, 3H), 3.79 (s, 3H), 3.85 (s, 3H), 4.46-4.72 (m, 2H), 6.47 (s, 1H), 6.65 (s, 1H), 6.72 (s, 1H), 6.80 (s, 1H), 6.82 (d, *J* = 8.0 Hz, 1H), 7.00 (s, 1H), 7.12 (d, *J* = 8.0 Hz, 1H), 9.00 (s, 1H), 9.29 (s,1H), 9.43 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 27.9, 42.4, 55.1, 56.3 (2C), 101.2, 108.8, 109.7, 110.6, 113.0, 113.9, 114.8, 115.7, 118.2, 118.5, 121.9, 127.3, 127.6, 127.8, 136.4, 143.3, 145.1, 146.4, 147.4, 147.9, 148.1, 148.3, 154.7.

LRMS (EI) m/z (rel intensity) 502 ($M + H^+$, 64), 501 (M^+, 100). TOF-HRMS calcd for $C_{28}H_{24}NO_8$ ($M + H^+$) 502.1496, found 502.1500. These spectroscopic data are identical to those reported previously.[5]

14-(4-Hydroxy-3-methoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (103; Lamellarin χ). mp (MeOH) >250 °C. IR (neat): ν_{max} 3384 (br), 2935, 2850, 1682, 1596, 1554, 1515, 1485, 1427, 1337, 1280, 1250, 1208, 1163, 1045 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.00 (apparent br t, *J* = 6.6 Hz, 2H), 3.26 (s, 3H), 3.34 (s, 3H), 3.73 (s, 3H), 4.59 (apparent br t, *J* = 6.6 Hz, 2H), 6.59 (s, 1H), 6.67 (s, 1H), 6.73 (s, 1H), 6.78 (s, 1H), 6.88 (d, *J* = 8.0 Hz, 1H), 7.00 (d, *J* = 8.0 Hz, 1H), 7.02 (s, 1H), 9.28 (s, 1H), 9.46 (s, 1H), 9.69 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 28.0, 42.4, 55.2, 55.6, 56.5, 104.0, 105.8, 109.3, 109.9, 112.7, 114.7, 115.3, 115.8, 116.8, 118.6, 123.9, 126.0, 127.6, 128.1, 136.4, 144.9, 146.2, 146.5, 147.0, 147.3, 147.5, 149.0, 154.7. LRMS (EI) m/z (rel intensity) 502 ($M + H^+$, 15), 501 (M^+, 43), 368 (72), 41 (100). TOF-HRMS calcd for $C_{28}H_{24}NO_8$ ($M + H^+$) 502.1496, found 502.1501.

14-(3-Hydroxy-4-methoxyphenyl)-3,12-dihydroxy-2,11-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (104; Lamellarin Y). mp (MeOH) >250 °C. IR (neat): ν_{max} 3378 (br), 2925, 2851, 1682, 1587, 1552, 1513, 1488, 1462, 1422, 1359, 1340, 1320, 1274, 1248, 1207, 1161, 1044, 1017 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.04 (apparent br t, *J* = 6.0 Hz, 2H), 3.37 (s, 3H), 3.78 (s, 3H), 3.84 (s, 3H), 4.60 (apparent br t, *J* = 6.0 Hz, 2H), 6.47 (s, 1H), 6.64 (s, 1H), 6.77 (s, 1H), 6.81 (s, 1H), 6.82 (d, *J* = 6.6 Hz, 1H), 6.93 (s, 1H), 7.12 (d, *J* = 8.8 Hz, 1H), 8.84 (br s, 1H), 9.28 (br s, 1H), 9.66 (br s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 28.4, 42.5, 55.5, 56.1, 56.3, 104.0, 105.4, 109.1, 112.4, 112.9, 113.3, 113.7, 114.9, 118.2, 120.1, 121.9, 126.0, 127.6, 128.1, 135.7, 144.9, 145.2, 146.1, 147.2, 147.8, 148.1, 148.5, 154.7. LRMS (EI) m/z (rel intensity) 502 ($M + H^+$,

30), 501 (M^+, 100), 468 (31). TOF-HRMS calcd for $C_{28}H_{24}NO_8$ (M + H^+) 502.1496, found 502.1502.

C. Characterization of Saturated Lamellarin Acetates 106-118.

14-(3,4-Dimethoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (106; Lamellarin I acetate). mp (MeOH) 232–235 °C (lit.[3] 240–241 °C). IR (neat): ν_{max} 2933, 2851, 1765, 1713, 1607, 1582, 1541, 1505, 1462, 1413, 1369, 1315, 1259, 1195, 1177, 1136, 1083, 1022 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.31 (s, 3H), 3.15 (apparent t, *J* = 6.6 Hz, 2H), 3.34 (s, 3H), 3.40 (s, 3H), 3.87 (s, 3H), 3.88 (s, 3H), 3.90 (s, 3H), 3.96 (s, 3H), 4.78 (apparent t, *J* = 6.6 Hz, 2H), 6.56 (s, 1H), 6.72 (s, 1H), 7.04 (s, 1H), 7.09 (s, 3H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 21.9, 42.3, 55.2, 55.5, 56.2, 56.3, 60.9, 61.1, 105.3, 105.8, 111.9, 112.1, 114.0, 114.6, 116.1, 116.3, 120.1, 122.9, 123.6, 127.3, 127.9, 135.5, 139.0, 142.5, 145.1, 147.6, 149.1, 150.1, 150.7, 152.0, 155.1, 168.6, 168.7. LRMS (EI) m/z (rel intensity) 602 (M + H^+, 18), 601 (M^+, 20), 559 (19), 544 (12), 43 (100). TOF-HRMS calcd for $C_{33}H_{32}NO_{10}$ (M + H^+) 602.2021, found 602.2023. These spectroscopic data are identical to those reported previously.[3]

14-(4-Acetoxy-3-methoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (107; Lamellarin C diacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2925, 2853, 1765, 1710, 1595, 1542, 1507, 1475, 1414, 1273, 1257, 1194, 1138, 1117, 1084, 1033, 1007 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.29 (s, 3H), 2.34 (s, 3H), 3.14 (apparent t, *J* = 6.6 Hz, 2H), 3.37 (s, 3H), 3.42 (s, 3H), 3.81 (s, 3H), 3.86 (s, 3H), 3.89 (s, 3H), 4.64-4.89 (m, 2H), 6.53 (s, 1H), 6.68 (s, 1H), 7.07 (s, 1H), 7.10 (s, 1H), 7.14 (d, *J* = 1.6 Hz, 1H), 7.22 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 21.9, 42.3, 55.5, 55.7, 56.3, 60.9, 61.0, 105.2, 105.6, 111.9, 114.7, 115.0, 115.6, 116.1, 119.9, 122.6, 123.3, 123.9, 127.1, 134.3, 135.4, 139.0, 140.1, 142.5, 145.0, 147.7, 150.7, 152.2, 152.3, 155.1, 168.58, 168.63. LRMS (EI) m/z (rel intensity) 630 (M + H^+, 31),

629 (M^+, 29), 588 (26), 587 (25), 545 (14), 531 (15), 530 (30), 43 (100). TOF-HRMS calcd for $C_{34}H_{32}NO_{11}$ ($M + H^+$) 630.1970, found 630.1969.

14-(3-Acetoxy-4-methoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (108; Lamellarin T diacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2930, 2851, 1767, 1713, 1602, 1545, 1506, 1454, 1414, 1370, 1293, 1263, 1199, 1140, 1083, 1030, 1017 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.30 (s, 6H), 3.01-3.25 (m, 2H), 3.39 (s, 3H), 3.45 (s, 3H), 3.86 (s, 3H), 3.88 (s, 3H), 3.89 (s, 3H), 4.53-4.67 (m, 1H), 4.84-4.97 (m, 1H), 6.48 (s, 1H), 6.69 (s, 1H), 7.06 (s, 1H), 7.14 (d, *J* = 8.0 Hz, 1H), 7.23 (d, *J* = 2.2 Hz, 1H), 7.32 (dd, *J* = 8.0, 2.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 20.6, 21.8, 42.2, 55.2, 55.5, 56.2, 60.9, 61.0, 105.1, 105.4, 111.8, 113.0, 114.5, 114.8, 116.1, 119.9, 122.6, 125.4, 127.2, 127.7, 129.5, 135.6, 138.7, 140.7, 142.3, 144.8, 147.5, 150.5, 151.3, 151.9, 155.1, 168.5, 168.8. LRMS (EI) *m/z* (rel intensity) 630 ($M + H^+$, 15), 629 (M^+, 42), 588 (35), 587 (100), 546 (7), 545 (20). TOF-HRMS calcd for $C_{34}H_{32}NO_{11}$ ($M + H^+$) 630.1970, found 630.1966.

14-(3,4-Dimethoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (109; Lamellarin F diacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2993, 2934, 1765, 1711, 1542, 1510, 1478, 1420, 1370, 1290, 1233, 1193, 1137, 1077, 1024 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.30 (s, 3H), 2.40 (s, 3H), 2.97 (apparent t, *J* = 6.6 Hz, 2H), 3.34 (s, 3H), 3.38 (s, 3H), 3.81 (s, 3H), 3.89 (s, 3H), 3.96 (s, 3H), 4.72-4.81 (m, 2H), 6.70 (s, 2H), 7.03 (s, 1H), 7.08 (s, 3H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.4, 20.5, 22.3, 41.9, 55.3, 55.5, 56.26, 56.32, 60.8, 105.8, 107.8, 111.9, 112.3, 114.0, 114.8, 116.2, 116.3, 119.5, 122.9, 123.6, 127.3, 127.7, 135.0, 139.1, 141.3, 141.7, 145.1, 147.6, 149.2, 150.1, 151.7, 155.1, 168.7. LRMS (EI) *m/z* (rel intensity) 630 ($M + H^+$, 24), 629 (M^+, 64), 588 (35), 587 (100), 546 (17), 545 (50), 530 (28), 43 (19). TOF-HRMS calcd for $C_{34}H_{32}NO_{11}$ ($M + H^+$) 630.1970, found 630.1966.

14-(4-Acetoxy-3-methoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (110; Lamellarin K triacetate). mp (MeOH) >250 °C (lit.[3] 275–277 °C). IR (KBr): ν_{max} 2941, 2847, 1769, 1714, 1543, 1510, 1478, 1421, 1370, 1275, 1197, 1139, 1078, 1038, 1010 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.30 (s, 3H), 2.35 (s, 3H), 2.39 (s, 3H), 2.97 (br apparent t, *J* = 6.6 Hz, 2H), 3.38 (s, 3H), 3.42 (s, 3H), 3.80 (s, 3H), 3.83 (s, 3H), 4.60-4.74 (m, 1H), 4.80-4.93 (m, 1H), 6.67 (s, 2H), 7.10 (d, *J* = 8.0 Hz, 1H), 7.11 (s, 1H), 7.15 (s, 1H), 7.23 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 20.6, 22.2, 41.8, 55.4, 55.6, 56.2, 60.8, 105.4, 107.4, 111.9, 114.6, 114.7, 115.7, 116.0, 119.1, 122.6, 123.2, 123.9, 127.1, 134.0, 134.8, 138.8, 139.9, 141.1, 141.6, 144.8, 147.6, 151.8, 152.2, 155.1, 168.7, 168.8. LRMS (EI) *m/z* (rel intensity) 658 ($M + H^+$, 16), 657 (M^+, 25), 616 (47), 615 (100), 574 (22), 573 (52), 558 (23), 531 (28), 522 (15), 516 (18), 86 (10). TOF-HRMS calcd for $C_{35}H_{32}NO_{12}$ ($M + H^+$) 658.1919, found 658.1906. These spectroscopic data are identical to those reported previously.[3]

14-(3-Acetoxy-4-methoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (111; Lamellarin E triacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2926, 2853, 1766, 1715, 1617, 1546, 1510, 1476, 1446, 1421, 1370, 1292, 1265, 1194, 1139, 1114, 1077, 1038, 1017 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.31 (s, 6H), 2.40 (s, 3H), 2.97 (apparent t, *J* = 6.6 Hz, 2H), 3.40 (s, 3H), 3.46 (s, 3H), 3.81 (s, 3H), 3.90 (s, 3H), 4.55-4.69 (m, 1H), 4.84-4.98 (m, 1H), 6.63 (s, 1H), 6.71 (s, 1H), 7.08 (s, 1H), 7.16 (d, *J* = 8.0 Hz, 1H), 7.24 (d, *J* = 2.2 Hz, 1H), 7.34 (dd, *J* = 8.0, 2.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.57, 20.64, 22.5, 42.0, 55.5, 55.8, 56.5, 60.9, 105.8, 107.9, 112.0, 113.4, 114.9, 115.3, 116.3, 119.4, 122.8, 125.7, 127.5, 127.9, 129.8, 135.3, 139.2, 141.1, 141.4, 141.8, 145.2, 147.9, 151.7, 152.0, 155.2, 168.6, 168.7, 168.8. LRMS (EI) *m/z* (rel intensity) 657 (M^+, 2), 531 (6), 43 (100). TOF-HRMS calcd for $C_{35}H_{32}NO_{12}$ ($M + H^+$) 658.1919, found 658.1923. Only the ^1H NMR (DMSO-d_6) was previously reported.[5]

14-(3,4-Dimethoxyphenyl)-3-acetoxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (112; Dihydrolamellarin η acetate). mp (EtOAc/hexanes) >250 °C. IR (neat): ν_{max} 2993, 2930, 2850, 1764, 1706, 1610, 1582, 1543, 1515, 1484, 1463, 1438, 1413, 1343, 1319, 1259, 1197, 1164, 1136, 1100, 1025 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.30 (s, 3H), 3.12 (apparent t, *J* = 6.6 Hz, 2H), 3.35 (s, 3H), 3.39 (s, 3H), 3.86 (s, 3H), 3.89 (s, 3H), 3.95 (s, 3H), 4.72-4.85 (m, 2H), 6.69 (s, 1H), 6.75 (s, 2H), 7.03 (s, 1H),7.08 (s, 3H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 28.7, 42.5, 55.2, 55.6, 56.0, 56.2, 56.3, 105.8, 108.9, 111.2, 111.9, 112.2, 114.2, 114.4, 115.4, 116.4, 120.0, 123.7, 126.7, 127.4, 127.9, 136.0, 139.0, 145.2, 147.6, 147.7, 149.1, 149.2, 150.0, 155.2, 168.7. LRMS (EI) *m/z* (rel intensity) 572 ($M + H^+$, 11), 571 (M^+, 31), 530 (31), 529 (100). TOF-HRMS calcd for $C_{32}H_{30}NO_9$ ($M + H^+$) 572.1915, found 572.1916.

14-(3,4-Dimethoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (113; Lamellarin J diacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2923, 2853, 1763, 1713, 1546, 1513, 1463, 1371, 1256, 1196, 1025 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.31 (s, 6H), 3.11 (apparent t, *J* = 6.6 Hz, 2H), 3.31 (s, 3H), 3.40 (s, 3H), 3.88 (s, 3H), 3.96 (s, 3H), 4.82 (apparent t, *J* = 6.6 Hz, 2H), 6.73 (s, 1H), 6.81 (s, 1H), 6.95 (s, 1H), 7.04 (s, 1H), 7.09 (apparent d, *J* = 1.4 Hz, 3H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 28.1, 42.5, 55.3, 55.6, 56.2, 56.3, 105.8, 109.9, 111.9, 112.3, 114.0, 114.9, 116.2, 116.5, 122.6, 123.5, 125.9, 126.2, 127.3, 127.7, 135.2, 139.1, 139.5, 145.1, 147.6, 149.2, 149.8, 150.1, 155.1, 168.6, 168.8. LRMS (EI) *m/z* (rel intensity) 599 (M^+, 6), 516 (44), 515 (100). TOF-HRMS calcd for $C_{33}H_{30}NO_{10}$ ($M + H^+$) 600.1864, found 600.1858.

14-(3-Acetoxy-4-methoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (115; Lamellarin L triacetate). mp (MeOH) >250 °C (lit.[3] >300 °C). IR (neat): ν_{max} 3080, 2939, 2840, 1766, 1716, 1549, 1512,

1479, 1439, 1419, 1368, 1296, 1282, 1192, 1149, 1130, 1033, 1014 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.29 (s, 6H), 2.31 (s, 3H), 3.01-3.15 (m, 2H), 3.36 (s, 3H), 3.45 (s, 3H), 3.88 (s, 3H), 4.57-4.71 (m, 1H), 4.91-5.04 (m, 1H), 6.72 (s, 1H), 6.73 (s, 1H), 6.95 (s, 1H), 7.09 (s, 1H), 7.14 (d, *J* = 8.0 Hz, 1H), 7.24 (d, *J* = 2.2 Hz, 1H), 7.32 (dd, *J* = 8.0, 2.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 28.2, 42.5, 55.4, 55.7, 56.3, 105.6, 109.9, 111.9, 113.3, 115.3, 116.1, 122.6, 125.6, 125.7, 126.0, 127.3, 127.7, 129.6, 135.4, 139.0, 139.5, 140.9, 145.0, 147.7, 149.9, 151.5, 155.1, 168.4, 168.6, 168.7. LRMS (EI) *m/z* (rel intensity) 628 (M + H^+, 72), 586 (100), 544 (45), 529 (26) 501 (8). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ (M + H^+) 628.1813, found 628.1819. These spectroscopic data are identical to those reported previously.[3]

14-(3-Acetoxy-4-methoxyphenyl)-2,11-diacetoxy-3,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (116; Lamellarin G triacetate). mp (MeOH) 241–244 °C. IR (neat): ν_{max} 2957, 2854, 2924, 1766, 1719, 1647, 1602, 1465, 1410, 1377, 1260, 1183, 1131, 1037, 1012 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.27 (s, 3H), 2.30 (s, 3H), 2.31 (s, 3H), 2.98-3.20 (m, 2H), 3.36 (s, 3H), 3.84 (s, 3H), 3.91 (s, 3H), 4.47-4.61 (m, 1H), 4.95-5.05 (m, 1H), 6.66 (s, 1H), 6.93 (d, *J* = 3.6 Hz, 2H), 6.97 (s, 1H), 7.02-7.38 (m, 3H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 28.2, 42.5, 55.4, 56.15, 56.24, 101.4, 110.1, 110.8, 113.5, 114.2, 115.2, 116.9, 122.5, 125.6, 125.7, 126.1, 127.2, 127.3, 129.5, 135.6, 136.3, 139.5, 140.8, 149.9, 150.1, 150.9, 151.5, 155.1, 168.5, 168.9, 169.0. TOF-LRMS m/z (rel intensity) 628 (M + H^+, 100). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ (M + H^+) 628.1813, found 628.1808. Only the ^{1}H NMR (DMSO-d_6) was previously reported.[5]

14-(4-Acetoxy-3-methoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (117; Lamellarin χ triacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2938, 2847, 1765, 1713, 1617, 1593, 1546, 1513, 1482, 1439, 1418, 1401, 1275, 1196, 1150, 1120, 1035, 1016 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ

2.31 (s, 3H), 2.32 (s, 3H), 2.35 (s, 3H), 3.12 (apparent t, *J* = 6.6 Hz, 2H), 3.36 (s, 3H), 3.43 (s, 3H), 3.82 (s, 3H), 4.69-4.96 (m, 2H), 6.70 (s, 1H), 6.80 (s, 1H), 6.96 (s, 1H), 7.09 (s, 1H), 7.11 (s, 1H), 7.16 (d, *J* = 1.4 Hz, 1H), 7.23 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 28.1, 42.5, 55.5, 55.7, 56.2, 105.5, 109.8, 112.0, 114.8, 115.0, 115.9, 116.0, 122.6, 123.2, 123.9, 125.7, 125.9, 127.1, 134.0, 135.0, 139.0, 139.5, 140.1, 145.0, 147.8, 149.9, 152.3, 155.1, 168.6, 168.7, 168.9. LRMS (EI) m/z (rel intensity) 628 ($M + H^+$, 5), 627 (M^+, 10), 585 (24), 543 (36), 501 (7), 111 (100). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ ($M + H^+$) 628.1813, found 628.1824. Only the ^{1}H NMR ($CDCl_3$), IR, FABMS and HRFABMS were previously reported.[6]

14-(3-Acetoxy-4-methoxyphenyl)-3,12-diacetoxy-2,11-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (118; Lamellarin Y triacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 2939, 2843, 1764, 1710, 1616, 1548, 1515, 1457, 1415, 1370, 1266, 1199, 1138, 1039, 1010 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.24 (s, 3H), 2.31 (s, 6H), 3.10-3.20 (m, 2H), 3.47 (s, 3H), 3.84 (s, 3H), 3.92 (s, 3H), 4.60-4.74 (m, 1H), 4.89-5.02 (m, 1H), 6.72 (s, 1H), 6.74 (s, 1H), 6.87 (s, 1H), 7.09 (d, *J* = 8.2 Hz, 1H), 7.15 (s, 1H), 7.20 (d, *J* = 2.2 Hz, 1H), 7.28 (dd, *J* = 8.2, 2.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.7, 29.5, 42.3, 55.9, 56.1, 56.4, 105.9, 112.0, 112.4, 113.5, 114.7, 115.0, 116.3, 120.4, 125.6, 127.3, 127.5, 129.7, 133.0, 135.4, 138.7, 139.2, 140.9, 145.1, 147.9, 151.4, 151.7, 155.3, 168.4, 168.8, 169.0. LRMS (EI) *m/z* (rel intensity) 628 ($M + H^+$, 15), 627 (M^+, 47), 586 (30), 585 (95), 551 (15), 544 (31), 543 (100), 502 (11), 501 (41). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ ($M + H^+$) 628.1813, found 628.1803.

D. Characterization of the Unsaturated Lamellarin Acetates 119-132.

14-(3,4-Dimethoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (119; Lamellarin ζ acetate). mp (EtOAc/hexanes) 223–225 °C. IR (neat): ν_{max} 3087, 3000, 2937, 2836, 1771, 1706, 1605,

1538, 1479, 1415, 1393, 1332, 1282, 1257, 1198, 1157, 1137, 1120, 1097, 1075, 1043, 1023, 1003 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.32 (s, 3H), 3.41 (s, 3H), 3.43 (s, 3H), 3.89 (s, 3H), 3.94 (s, 3H), 3.99 (s, 3H), 4.03 (s, 3H), 6.82 (s, 1H), 6.97 (s, 1H), 7.12-7.18 (m, 3H), 7.43 (d, *J* = 7.6 Hz, 1H), 9.22 (d, *J* = 7.6 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.3, 55.6, 56.3, 56.4, 61.1, 61.6, 101.7, 106.5, 107.6, 112.2, 112.4, 112.5, 114.5, 116.0, 119.5, 121.4, 122.8, 124.0, 128.2, 128.4, 133.9, 139.8, 142.5, 145.7, 147.7, 148.6, 149.4, 150.3, 153.5, 155.1, 168.6. LRMS (EI) m/z (rel intensity) 600 ($M + H^+$, 27), 599 (M^+, 65), 558 (33), 557 (100). TOF-HRMS calcd for $C_{33}H_{30}NO_{10}$ ($M + H^+$) 600.1864, found 600.1865.

14-(4-Acetoxy-3-methoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (120; Lamellarin B diacetate). mp (EtOAc/hexanes) >250 °C. IR (neat): ν_{max} 3120, 3073, 1765, 1708, 1603, 1539, 1479, 1415, 1394, 1370, 1332, 1275, 1255, 1195, 1156, 1138, 1118, 1095, 1073, 1042, 1007 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.33 (s, 3H), 2.38 (s, 3H), 3.46 (s, 3H), 3.49 (s, 3H), 3.84 (s, 3H), 3.95 (s, 3H), 4.04 (s, 3H), 6.82 (s, 1H), 6.95 (s, 1H), 7.15 (s, 1H), 7.21 (s, 1H), 7.23 (d, *J* = 8.0 Hz, 1H), 7.31 (d, *J* = 8.0 Hz, 1H), 7.46 (d, *J* = 7.4 Hz, 1H), 9.22 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.6, 55.8, 56.3, 61.1, 61.6, 101.6, 106.3, 107.7, 108.9, 111.9, 112.2, 115.4, 115.8, 119.3, 121.2, 122.7, 123.8, 124.0, 128.2, 133.7, 134.6, 139.8, 140.4, 142.5, 145.6, 147.8, 148.6, 152.4, 153.7, 155.0, 168.6. LRMS (EI) *m/z* (rel intensity) 628 ($M + H^+$, 32), 627 (M^+, 42), 544 (20), 543 (66), 43 (100). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ ($M + H^+$) 628.1813, found 628.1799. Only the ^{1}H NMR ($CDCl_3$), MS, and HRMS were previously reported.[2]

14-(3-Acetoxy-4-methoxyphenyl)-3-acetoxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (121; Lamellarin W diacetate). mp (EtOAc/hexanes) 215–220 °C. IR (neat): ν_{max} 3120, 2938, 2849, 1769, 1712, 1605, 1540, 1479, 1418, 1395, 1370, 1333, 1284, 1266, 1205, 1156, 1140, 1123, 1073, 1043, 1020 cm^{-1}.

^{1}H NMR (200 MHz, $CDCl_3$): δ 2.32 (s, 6H), 3.48 (s, 3H), 3.52 (s, 3H), 3.94 (s, 6H), 4.03 (s, 3H), 6.78 (s, 1H), 6.94 (s, 1H), 7.14 (s, 1H), 7.24 (d, *J* = 8.0 Hz, 1H), 7.32 (d, *J* = 2.2 Hz, 1H), 7.41-7.48 (m, 2H), 9.20 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 20.6, 55.3, 55.6, 56.4, 61.1, 61.7, 101.5, 106.2, 107.6, 108.7, 111.3, 112.1, 113.1, 115.8, 119.3, 121.2, 122.6, 126.0, 128.0, 128.4, 130.1, 133.9, 139.6, 140.9, 142.3, 145.4, 147.6, 148.4, 151.6, 153.5, 155.1, 168.5, 168.7. LRMS (EI) *m/z* (rel intensity) 627 (M^+, 12), 369 (68), 368 (95), 43 (49), 41 (100). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ (M + H^+) 628.1813, found 628.1821.

14-(3,4-Dimethoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (122; Lamellarin ε diacetate). mp (EtOAc/hexanes) 238–241 °C. IR (neat): ν_{max} 3000, 2840, 2837, 1771, 1710, 1615, 1539, 1483, 1420, 1396, 1371, 1333, 1313, 1255, 1199, 1139, 1117, 1069, 1045, 1009 cm^{-1}. ^{1}H NMR (200 MHz, DMSO-d_6): δ 2.24 (s, 3H), 2.45 (s, 3H, superimposed with H_2O in DMSO), 3.32 (s, 6H, superimposed with H_2O in DMSO), 3.75 (s, 6H), 3.84 (s, 3H), 6.78 (s, 1H), 7.13 (s, 1H), 7.18 (s, 1H), 7.24-7.35 (m, 3H), 7.31 (d, *J* = 7.2 Hz, 1H), 9.05 (d, *J* = 7.2 Hz, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 20.2, 55.0, 55.2, 56.1, 60.5, 103.8, 106.0, 106.9, 108.1, 112.1, 113.1, 113.4, 114.4, 115.1, 117.8, 120.5, 122.7, 123.3, 126.4, 127.7, 132.6, 138.8, 139.5, 144.9, 147.4, 149.4, 150.2, 152.7, 153.9, 168.2, 168.6. LRMS (EI) *m/z* (rel intensity) 627 (M^+, 12), 544 (15), 543 (10), 255 (100). TOF-HRMS calcd for $C_{34}H_{30}NO_{11}$ (M + H^+) 628.1813, found 628.1802.

14-(4-Acetoxy-3-methoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (123; Lamellarin M triacetate). mp (EtOAc/hexanes) >250 °C (lit.[3] 265–267 °C). IR (neat): ν_{max} 3007, 2922, 2851, 1766, 1709, 1538, 1481, 1463, 1420, 1397, 1370, 1276, 1257, 1243, 1194, 1139, 1116, 1068, 1045, 1009 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.33 (s, 3H), 2.38 (s, 3H), 2.50 (s, 3H), 3.46 (s, 3H),

3.49 (s, 3H), 3.85 (s, 3H), 3.90 (s, 3H), 6.81 (s, 1H), 7.08 (d, *J* = 7.4 Hz, 1H), 7.10 (s, 1H), 7.15 (s, 1H), 7.21 (s, 1H), 7.23 (d, *J* = 8.0 Hz, 1H), 7.32 (d, *J* = 8.0 Hz, 1H), 9.22 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.6, 55.8, 56.3, 60.8, 104.2, 106.3, 106.6, 109.1, 112.2, 115.3, 115.7, 118.3, 121.0, 123.4, 123.7, 124.1, 128.4, 133.3, 134.3, 139.1, 140.0, 140.4, 142.0, 145.6, 147.9, 152.5, 153.3, 155.0, 168.6, 168.7, 168.8. LRMS (EI) *m/z* (rel intensity) 656 ($M + H^+$, 44), 655 (M^+, 90), 614 (32), 613 (81), 572 (34), 571 (100), 529 (44), 91 (56). TOF-HRMS calcd for $C_{35}H_{30}NO_{12}$ ($M + H^+$) 656.1763, found 656.1759. These spectroscopic data are those reported previously.[3]

14-(3-Acetoxy-4-methoxyphenyl)-3,10-diacetoxy-2,11,12-trimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (124; Lamellarin X triacetate). mp (EtOAc/hexanes) 232–234 °C. IR (neat): ν_{max} 2925, 2851, 1767, 1709, 1617, 1539, 1481, 1421, 1396, 1369, 1333, 1285, 1266, 1192, 1140, 1067, 1044, 1009 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.32 (s, 6H), 2.49 (s, 3H), 3.47 (s, 3H), 3.51 (s, 3H), 3.88 (s, 3H), 3.93 (s, 3H), 6.77 (s, 1H), 7.07 (d, *J* = 7.4 Hz, 1H), 7.09 (s, 1H), 7.15 (s, 1H), 7.23 (d, *J* = 8.0 Hz, 1H), 7.30 (d, *J* = 1.4 Hz, 1H), 7.43 (dd, *J* = 7.4, 1.4 Hz, 1H), 9.23 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.4, 55.7, 56.4, 60.8, 104.3, 106.4, 106.6, 109.1, 111.6, 112.2, 113.4, 115.8, 118.4, 121.1, 123.5, 126.1, 128.0, 128.7, 130.1, 133.6, 139.1, 140.0, 141.2, 142.0, 145.6, 147.8, 151.9, 153.2, 155.0, 168.48, 168.54, 168.6. TOF-LRMS *m/z* (rel intensity) 656 ($M + H^+$, 100). TOF-HRMS calcd for $C_{35}H_{30}NO_{12}$ ($M + H^+$) 656.1763, found 656.1760.

14-(3,4-Dimethoxyphenyl)-3-acetoxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (125; Lamellarin η acetate). mp (EtOAc/hexanes) >250 °C. IR (neat): ν_{max} 3073, 3001, 2937, 2836, 1766, 1704, 1615, 1582, 1539, 1511, 1479, 1416, 1370, 1317, 1260, 1223, 1185, 1166, 1136, 1103, 1087, 1041, 1007 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.32 (s, 3H), 3.42 (s, 3H), 3.46 (s, 3H), 3.89 (s, 3H),

3.99 (s, 6H), 6.86 (s, 1H), 7.08 (d, *J* = 7.2 Hz, 1H), 7.10 (s, 1H), 7.14 (s, 3H), 7.17 (s, 1H), 7.20 (d, *J* = 1.4 Hz, 1H), 9.25 (d, *J* = 7.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 55.3, 55.6, 56.0, 56.3, 56.4, 105.4, 106.6, 107.6, 108.4, 111.6, 112.2, 112.4, 112.8, 114.6, 116.1, 119.2, 123.3, 124.1, 124.9, 128.2, 128.5, 134.4, 139.8, 145.8, 147.6, 149.4, 149.5, 150.2, 150.4, 155.1, 168.6. LRMS (EI) *m/z* (rel intensity) 570 ($M + H^+$, 16), 569 (M^+, 33), 528 (31), 527 (100). TOF-HRMS calcd for $C_{32}H_{28}NO_9$ ($M + H^+$) 570.1759, found 570.1769.

14-(3,4-Dimethoxyphenyl)-2,3,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (126; Dehydrolamellarin G trimethyl ether). mp (CH_2Cl_2/MeOH) >250 °C. IR (neat): ν_{max} 3102, 2998, 2935, 2836, 1701, 1616, 1535, 1512, 1491, 1429, 1415, 1269, 1225, 1167, 1045, 1011 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 3.40 (s, 3H), 3.41 (s, 3H), 3.76 (s, 3H), 3.84 (s, 3H), 3.91 (s, 3H), 3.92 (s, 3H), 6.66 (s, 1H), 6.78 (s, 1H), 6.93 (d, *J* = 8.0 Hz, 1H), 6.99 (s, 1H), 7.06-7.19 (m, 4H), 9.09 (d, *J* = 8.0 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 55.2, 55.5, 55.95, 56.03, 56.2, 56.4, 100.6, 105.3, 105.4, 107.5, 107.9, 109.9, 110.9, 112.3, 114.8, 119.1, 123.3, 124.2, 124.8, 128.4, 129.3, 134.4, 145.6, 146.7, 149.3, 149.7, 150.1, 150.2, 155.4. LRMS (EI) *m/z* (rel intensity) 542 ($M + H^+$, 34), 541 (M^+, 100). TOF-HRMS calcd for $C_{31}H_{28}NO_8$ ($M + H^+$) 542.1809, found 542.1819.

14-(3,4-Dimethoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (127; Dehydrolamellarin J diacetate). mp (EtOAc/hexanes) >250 °C. IR (neat): ν_{max} 2921, 2851, 1759, 1706, 1623, 1582, 1541, 1508, 1487, 1465, 1431, 1396, 1332, 1314, 1278, 1255, 1225, 1152, 1123, 1090, 1045, 1027 cm^{-1}. ^{1}H NMR (200 MHz, $CDCl_3$): δ 2.31 (s, 3H), 2.33 (s, 3H), 3.41 (s, 6H), 3.90 (s, 3H), 3.98 (s, 3H), 6.82 (s, 1H), 7.03 (d, *J* = 7.4 Hz, 1H), 7.13-7.18 (m, 3H), 7.24 (s, 2H), 7.38 (s, 1H), 9.21 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.3, 55.6, 56.3, 56.4, 106.5, 106.6, 109.1, 112.2, 112.4, 112.7, 112.9, 114.3, 115.9, 120.7, 123.3, 123.9,

124.0, 127.9, 128.4, 133.7, 139.9, 140.9, 145.7, 147.7, 149.4, 150.3, 150.9, 155.1, 168.6, 168.7. LRMS (EI) m/z (rel intensity) 598 (11), 597 (53), 556 (17), 555 (46), 514 (31), 513 (100). TOF-HRMS calcd for $C_{33}H_{28}NO_{10}$ ($M + H^+$) 598.1708, found 598.1712.

14-(3-Acetoxy-4-methoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (129; Lamellarin N triacetate). mp (EtOAc/hexanes) >250 °C (lit.[3] 283–285 °C). IR (neat): ν_{max} 2922, 2852, 1759, 1709, 1542, 1486, 1462, 1433, 1369, 1297, 1277, 1257, 1187, 1149, 1125, 1035, 1017 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.31 (s, 6H), 2.34 (s, 3H), 3.48 (s, 6H), 3.93 (s, 3H), 6.78 (s, 1H), 7.05 (d, *J* = 7.4 Hz, 1H), 7.14 (s, 1H), 7.21 (s, 2H), 7.32 (s, 1H), 7.38-7.46 (m, 2H), 9.23 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 20.6, 55.4, 55.7, 56.4, 106.4, 106.5, 109.1, 111.7, 112.2, 112.8, 113.4, 115.8, 120.7, 123.2, 123.8, 123.9, 126.0, 127.9, 128.6, 130.1, 133.8, 139.9, 141.0, 141.2, 145.6, 147.8, 151.1, 151.9, 155.1, 168.5, 168.6, 168.8. LRMS (EI) *m/z* (rel intensity) 626 ($M + H^+$, 72), 585 (35), 584 (100), 542 (45), 527 (26). TOF-HRMS calcd for $C_{34}H_{28}NO_{11}$ ($M + H^+$) 626.1657, found 626.1655. These spectroscopic data are identical to those reported previously.[3]

14-(3-Acetoxy-4-methoxyphenyl)-2,11-diacetoxy-3,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (130; Dehydrolamellarin G triacetate). mp (MeOH) >250 °C. IR (neat): ν_{max} 3000, 2924, 2851, 1764, 1683, 1628, 1557, 1509, 1420, 1370, 1276, 1210, 1193, 1156, 1129, 1084, 1024 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.21 (s, 3H), 2.25 (s, 3H), 2.26 (s, 3H), 3.42 (s, 3H), 3.78 (s, 3H), 3.89 (s, 3H), 6.84 (s, 1H), 6.91 (s, 1H), 6.93 (d, *J* = 7.4 Hz, 1H), 7.08 (s, 1H), 7.15 (d, *J* = 8.0 Hz, 1H), 7.20 (s, 1H), 7.22 (d, *J* = 2.2 Hz, 1H), 7.33 (dd, *J* = 8.0, 2.2 Hz, 1H), 9.11 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 55.5, 56.2, 56.3, 101.5, 106.6, 108.4, 110.4, 111.6, 112.6, 113.5, 117.5, 120.6, 123.1, 123.7, 124.0, 126.0, 127.5, 128.7, 130.0, 134.0, 136.4, 141.0, 150.6, 151.0, 151.7, 151.8, 155.0, 168.4, 168.7, 168.9. LRMS (EI) m/z (rel intensity)

625 (M^+, 10), 500 (17), 499 (100). TOF-HRMS calcd for $C_{34}H_{28}NO_{11}$ (M + H^+) 626.1657, found 626.1657.

14-(4-Acetoxy-3-methoxyphenyl)-3,11-diacetoxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (131; Lamellarin D triacetate). mp (EtOAc/hexanes) >250 °C (lit.[3] 288–290 °C; lit.[7] >300 °C). IR (neat): ν_{max} 2919, 2850, 1762, 1709, 1623, 1593, 1542, 1509, 1485, 1465, 1431, 1370, 1277, 1257, 1196, 1151, 1042, 1012 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.33 (s, 3H), 2.35 (s, 3H), 2.37 (s, 3H), 3.46 (s, 6H), 3.84 (s, 3H), 6.82 (s, 1H), 7.08 (d, *J* = 7.6 Hz, 1H), 7.19 (d, *J* = 8.0 Hz, 1H), 7.22 (s, 1H), 7.25-7.33 (m, 3H), 7.41 (s, 1H), 9.25 (d, *J* = 7.6 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.6, 55.7, 55.8, 56.3, 106.3, 106.5, 109.2, 112.3, 112.8, 115.2, 115.7, 120.8, 123.2, 123.7, 123.9, 124.1, 128.2, 133.6, 134.3, 139.9, 140.5, 141.0, 145.6, 147.9, 151.2, 152.5, 155.1, 168.6. LRMS (EI) *m/z* (rel intensity) 626 (M + H^+, 11), 625 (M^+, 13), 555 (13), 255 (31), 254 (37), 213 (48), 212 (100), 55 (40). TOF-HRMS calcd for $C_{34}H_{28}NO_{11}$ (M + H^+) 626.1657, found 626.1653. These spectroscopic data are identical to those reported previously.[3]

14-(3-Acetoxy-4-methoxyphenyl)-3,12-diacetoxy-2,11-dimethoxy-8,9-dihydro-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (132; Dehydrolamellarin Y triacetate). mp (EtOAc/hexanes) >250 °C. IR (neat): ν_{max} 3080, 3007, 2940, 2843, 1764, 1709, 1639, 1617, 1542, 1505, 1476, 1438, 1417, 1395, 1369, 1336, 1293, 1270, 1183, 1159, 1139, 1099, 1082, 1040, 1010 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 2.28 (s, 3H), 2.31 (s, 6H), 3.48 (s, 3H), 3.93 (s, 3H), 3.95 (s, 3H), 6.75 (s, 1H), 7.08 (d, *J* = 7.2 Hz, 1H), 7.14 (s, 1H), 7.17-7.19 (m, 1H), 7.23-7.26 (m, 2H), 7.31 (s, 1H), 7.37 (dd, *J* = 8.0, 1.6 Hz, 1H), 9.30 (d, *J* = 7.2 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 20.5, 55.7, 56.0, 56.3, 106.4, 108.8, 111.3, 112.1, 112.7, 113.6, 115.8, 118.4, 118.7, 120.3, 124.7, 125.8, 127.3, 128.9, 129.4, 129.9, 134.0, 139.9, 140.3, 141.0, 145.6, 147.8, 151.9, 155.1, 168.4, 168.6, 168.8. LRMS

(EI) *m/z* (rel intensity) 626 ($M + H^+$, 19), 625 (M^+, 58), 583 (59), 541 (100), 500 (11), 499 (36). TOF-HRMS calcd for $C_{34}H_{28}NO_{11}$ ($M + H^+$) 626.1657, found 626.1654.

E. Characterization of Unsaturated Lamellarins 4, and 133-144.

14-(4-Hydroxy-3-methoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (4; Lamellarin D). mp (CH_2Cl_2/MeOH) >250 °C (lit.[7] >300 °C). IR (neat): ν_{max} 3388 (br), 2922, 2852, 1672, 1635, 1596, 1547, 1509, 1490, 1455, 1433, 1405, 1367, 1274, 1218, 1155, 1121, 1082, 1040, 1016 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.38 (s, 6H), 3.75 (s, 3H), 6.69 (s, 1H), 6.85 (s, 1H), 6.99 (d, *J* = 8.8 Hz, 1H), 7.06 (s, 1H), 7.12-7.21 (m, 4H), 8.98 (d, *J* = 7.4 Hz, 1H), 8.37 (br s, 1H), 9.81 (br s, 2H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.0, 55.6, 56.5, 104.2, 105.9, 106.4, 106.8, 108.8, 111.2, 112.0, 112.8, 115.7, 116.9, 118.0, 122.4, 124.3, 125.1, 125.9, 129.4, 134.5, 145.0, 146.8, 147.3, 148.3, 148.8, 149.0, 149.1, 154.8. LRMS (EI) *m/z* (rel intensity) 500 ($M + H^+$, 33), 499 (M^+, 100), 466 (14), 438 (16). TOF-HRMS calcd for $C_{28}H_{22}NO_8$ ($M + H^+$) 500.1340, found 500.1349. Only ^1H NMR (acetone-d_6 and DMSO-d_6), MS, and HRMS were reported previously.[2,7]

14-(3,4-Dimethoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (133; Lamellarin ζ). mp (CH_2Cl_2/hexanes) >250 °C (lit.[6] 268–272 °C). IR (neat): ν_{max} 2923, 2853, 1700, 1603, 1538, 1479, 1425, 1332, 1285, 1260, 1235, 1203, 1177, 1120, 1075, 1044 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 3.43 (s, 3H), 3.49 (s, 3H), 3.90 (s, 3H), 3.94 (s, 3H), 4.00 (s, 3H), 4.02 (s, 3H), 6.67 (s, 1H), 6.98 (d, *J* = 2.2 Hz, 2H), 7.15-7.20 (m, 3H), 7.38 (d, *J* = 7.6 Hz, 1H), 9.19 (d, *J* = 7.6 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 55.4, 55.8, 56.4, 56.5, 61.3, 61.8, 101.8, 103.8, 104.9, 107.1, 110.0, 111.8, 112.4, 114.7, 119.7, 121.5, 123.1, 124.3, 128.7, 129.5, 134.0, 142.5, 143.5, 146.6, 147.3, 148.7, 149.4, 150.3, 153.5. LRMS (EI) m/z (rel intensity) 558 ($M + H^+$, 39), 557 (M^+, 100), 542 (20). TOF-HRMS calcd for $C_{31}H_{28}NO_9$ ($M + H^+$)

558.1759, found 558.1770. These spectroscopic data are identical to those reported previously.[6]

14-(4-Hydroxy-3-methoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (134; Lamellarin B). mp (CH_2Cl_2/MeOH) >250 °C (lit.[2] 258-259 °C). IR (neat): ν_{max} 3311 (br), 2934, 2827, 1702, 1677, 1603, 1594, 1541, 1479, 1425, 1377, 1267, 1238, 1148, 1117, 1077, 1034, 1014 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.35 (s, 3H), 3.38 (s, 3H, superimposed with H_2O in DMSO), 3.74 (s, 3H), 3.79 (s, 3H), 3.91 (s, 3H), 6.64 (s, 1H), 6.81 (s, 1H), 6.93 (dd, *J* = 8.0, 2.2 Hz, 1H), 6.97 (s, 1H), 7.03 (d, *J* = 8.0 Hz, 1H), 7.12 (d, *J* = 2.2 Hz, 1H), 7.33 (d, *J* = 7.2 Hz, 1H), 8.96 (d, *J* = 7.2 Hz, 1H), 9.37 (s, 1H), 9.86 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 54.8, 55.1, 56.0, 60.7, 61.5, 101.5, 103.7, 105.8, 106.7, 107.0, 108.1, 112.2, 115.1, 116.4, 118.4, 120.6, 122.0, 123.7, 125.2, 128.9, 133.0, 141.8, 144.6, 146.3, 146.9, 147.9, 148.0, 148.7, 153.0, 154.3. LRMS (EI) *m/z* (rel intensity) 544 ($M + H^+$, 31), 543 (M^+, 100), 528 (15), 497 (11). TOF-HRMS calcd for $C_{30}H_{26}NO_9$ ($M + H^+$) 544.1602, found 544.1603. Only ^1H NMR (acetone-d_6), MS, and HRMS were reported previously.[2]

14-(3-Hydroxy-4-methoxyphenyl)-3-hydroxy-2,10,11,12-tetramethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (135; Lamellarin W). mp (CH_2Cl_2/MeOH) >250 °C (lit.[4] 224–228 °C). IR (neat): ν_{max} 3414, 3139 (br), 2980, 2940, 2840, 1667, 1607, 1481, 1421, 1334, 1274, 1241, 1207, 1155, 1114, 1075, 1046, 1021 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.36 (s, 6H), 3.81 (s, 3H), 3.85 (s, 3H), 3.93 (s, 3H), 6.72 (s, 1H), 6.86 (s, 1H), 6.99 (m, 2H), 7.03 (s, 1H), 7.21 (d, *J* = 8.0 Hz, 1H), 7.38 (d, *J* = 7.4 Hz, 1H), 9.02 (d, *J* = 7.4 Hz, 1H), 9.42 (s, 1H), 9.90 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.3, 55.5, 56.6, 61.2, 62.0, 101.9, 104.2, 106.2, 107.3, 107.6, 108.5, 112.4, 114.2, 118.6, 118.9, 121.0, 122.4, 122.6, 127.6, 129.2, 133.3, 142.3, 145.1, 146.7, 148.2, 148.4, 148.5, 153.5, 154.8. LRMS (EI) *m/z* (rel intensity) 544 ($M + H^+$, 36), 543 (M^+, 100), 528 (19).

TOF-HRMS calcd for $C_{30}H_{26}NO_9$ ($M + H^+$) 544.1602, found 544.1615. These spectroscopic data are identical to those reported previously.[4]

14-(3,4-Dimethoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (136; Lamellarin ε). mp (CH_2Cl_2/hexanes) >250 °C (lit.[8] 271–275 °C). IR (neat): ν_{max} 3400 (br), 3007, 2938, 2837, 1694, 1618, 1596, 1543, 1507, 1481, 1428, 1403, 1257, 1230, 1203, 1143, 1073, 1042 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.37 (s, 6H), 3.71 (s, 3H), 3.75 (s, 3H), 3.85 (s, 3H), 6.62 (s, 1H), 6.72 (s, 1H), 6.86 (s, 1H), 7.12 (d, *J* = 8.0 Hz, 1H), 7.20 (s, 1H), 7.25 (d, *J* = 8.0 Hz, 1H), 7.45 (d, *J* = 7.6 Hz, 1H), 8.99 (d, *J* = 7.6 Hz, 1H), 9.90 (br s, 1H), 9.94 (br s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.1, 55.5, 56.4, 56.5, 60.9, 97.8, 104.2, 106.2, 107.4, 107.9, 108.6, 112.2, 113.7, 115.3, 121.2, 121.4, 124.1, 127.8, 129.2, 133.7, 136.4, 145.1, 146.1, 146.7, 148.3, 149.6, 150.4, 153.3, 154.8. LRMS (EI) *m/z* (rel intensity) 544 ($M + H^+$, 33), 543 (M^+, 100), 528 (11), 499 (11), 497 (19), 496 (15). TOF-HRMS calcd for $C_{30}H_{26}NO_9$ ($M + H^+$) 544.1602, found 544.1593. Only ^1H NMR ($CDCl_3$), IR (KBr), FABMS, and HRFABMS were reported previously.[8]

14-(4-Hydroxy-3-methoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (137; Lamellarin M). mp (CH_2Cl_2/MeOH) >250 °C. IR (neat): ν_{max} 3314 (br), 3000, 2941, 2835, 1683, 1617, 1597, 1548, 1508, 1480, 1455, 1429, 1405, 1376, 1267, 1224, 1143, 1119, 1067, 1038 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.38 (s, 6H), 3.71 (s, 3H), 3.75 (s, 3H), 6.66 (s, 1H), 6.77 (s, 1H), 6.86 (s, 1H), 6.97 (d, *J* = 8.0 Hz, 1H), 7.05 (s, 1H), 7.11 (d, *J* = 8.0 Hz, 1H), 7.44 (d, *J* = 7.4 Hz, 1H), 8.98 (d, *J* = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.1, 55.5, 56.5, 60.9, 97.9, 104.2, 106.3, 107.3, 107.9, 108.7, 112.5, 115.2, 115.6, 116.9, 121.3, 121.4, 124.2, 125.8, 129.3, 133.8, 136.3, 145.1, 146.0, 146.7, 147.3, 148.3, 149.1, 153.2, 154.8. LRMS (EI) *m/z* (rel intensity) 530 ($M + H^+$, 33), 529 (M^+, 100), 514 (11), 483 (15), 482 (23), 290

(10), 92 (25), 91 (83), 65 (17). TOF-HRMS calcd for $C_{29}H_{24}NO_9$ ($M + H^+$) 530.1446, found 530.1451. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-3,10-dihydroxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (138; Lamellarin X). mp (CH_2Cl_2/MeOH) >250 °C. IR (neat): ν_{max} 3400 (br), 2956, 2844, 1707, 1623, 1593, 1583, 1546, 1508, 1482, 1454, 1431, 1407, 1377, 1358, 1334, 1276, 1213, 1233, 1144, 1130, 1068, 1034, 1013 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.40 (s, 6H), 3.71 (s, 3H), 3.85 (s, 3H), 6.71 (s, 1H), 6.79 (s, 1H), 6.86 (s, 1H), 6.98 (br m, 2H), 7.20 (d, J = 8.0 Hz, 1H), 7.44 (d, J = 7.4 Hz, 1H), 8.98 (d, J = 7.4 Hz, 1H), 9.44 (br s, 1H), 9.88 (br s, 2H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.2, 55.6, 56.7, 61.0, 97.9, 104.2, 106.3, 107.4, 107.9, 108.6, 112.2, 114.2, 115.2, 118.7, 121.2, 121.4, 122.5, 127.9, 129.1, 133.6, 136.4, 145.1, 146.1, 146.7, 148.2, 148.3, 148.5, 153.3, 154.8. TOF-LRMS *m/z* (rel intensity) 530 ($M + H^+$, 100). TOF-HRMS calcd for $C_{29}H_{24}NO_9$ ($M + H^+$) 530.1446, found 530.1445. Only ^1H NMR (DMSO-d_6), FABMS, and HRFABMS were reported previously.[4]

14-(3,4-Dimethoxyphenyl)-3-hydroxy-2,11,12-trimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (139; Lamellarin η). mp (CH_2Cl_2/MeOH) >250 °C (lit.[6] 265-269 °C). IR (neat): ν_{max} 3281 (br), 3100, 2999, 2933, 2834, 1690, 1595, 1536, 1513, 1491, 1461, 1431, 1364, 1263, 1243, 1226, 1165, 1140, 1046, 1023 cm^{-1}. ^1H NMR (200 MHz, $CDCl_3$): δ 3.46 (s, 3H), 3.50 (s, 3H), 3.88 (s, 3H), 3.98 (s, 3H), 3.99 (s, 3H), 5.83 (br s, 1H), 6.70 (s, 1H), 7.00 (s, 1H), 7.04 (d, J = 7.4 Hz, 1H), 7.08 (s, 1H), 7.13-7.20 (m, 4H), 9.22 (d, J = 7.4 Hz, 1H). ^{13}C NMR (50 MHz, $CDCl_3$): δ 55.2, 55.7, 56.0, 56.3, 56.4, 103.7, 104.8, 105.5, 107.6, 108.0, 109.9, 110.8, 112.3, 114.7, 119.2, 123.4, 124.2, 124.9, 128.6, 129.5, 134.4, 143.4, 146.5, 147.2, 149.4, 149.5, 150.1, 150.3, 155.5. LRMS (EI) *m/z* (rel intensity) 528 ($M + H^+$, 36), 527 (M^+, 100). TOF-HRMS calcd for

$C_{30}H_{26}NO_8$ (M + H^+) 528.1653, found 528.1662. These spectroscopic data are identical to those reported previously.[6]

14-(3,4-Dimethoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (140; Dehydrolamellarin J). mp (CH_2Cl_2/MeOH) >250 °C. IR (neat): ν_{max} 3451, 3278 (br), 2995, 2951, 2835, 1679, 1491, 1426, 1387, 1277, 1241, 1222, 1202, 1164, 1142, 1051, 1032, 1018 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.34 (s, 6H, superimposed with H_2O in DMSO), 3.74 (s, 3H), 3.84 (s, 3H), 6.65 (s, 1H), 6.85 (s, 1H), 7.07 (s, 1H), 7.12-7.29 (m, 4H), 7.23 (d, *J* = 5.0 Hz, 1H), 8.99 (d, *J* = 5.0 Hz, 1H), 9.84 (s, 1H), 9.94 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 53.1, 53.7, 54.5, 54.6, 102.3, 103.9, 104.3, 105.0, 106.8, 109.0, 110.1, 111.0, 111.8, 111.9, 113.3, 113.4, 143.2, 144.9, 146.4, 146.9, 147.1, 147.7, 148.5, 152.9. TOF-LRMS *m/z* (rel intensity) 514 (M^+, 100). TOF-HRMS calcd for $C_{29}H_{24}NO_8$ (M + H^+) 514.1496, found 514.1494.

14-(3-Hydroxy-4-methoxyphenyl)-3,11-dihydroxy-2,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (142; Lamellarin N). mp (CH_2Cl_2/MeOH) >250 °C (lit.[3] 271–275 °C). IR (neat): ν_{max} 3361 (br), 2922, 2852, 1660, 1633, 1466, 1378, 1277, 1135, 1041, 1010 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.41 (s, 6H, superimposed with H_2O in DMSO), 3.86 (s, 3H), 6.75 (s, 1H), 6.86 (s, 1H), 7.01 (m, 2H), 7.16-7.25 (m, 4H), 8.99 (d, *J* = 7.2 Hz, 1H), 9.44 (s, 1H), 9.89 (s, 1H), 10.0 (s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 54.7, 55.2, 56.3, 103.9, 105.5, 106.0, 106.6, 108.4, 110.6, 111.7, 112.5, 114.0, 117.6, 118.4, 122.1, 122.2, 124.8, 127.6, 128.9, 134.0, 144.7, 146.4, 148.0, 148.1, 148.4, 148.7, 154.4. LRMS (EI) *m/z* (rel intensity) 499 (M^+, 8), 91 (100), 65 (20). TOF-HRMS calcd for $C_{28}H_{22}NO_8$ (M + H^+) 500.1340, found 500.1344. These spectroscopic data are identical to those reported previously.[3]

14-(3-Hydroxy-4-methoxyphenyl)-2,11-dihydroxy-3,12-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (143; Dehydrolamellarin G). mp

(CH_2Cl_2/hexanes) >250 °C. IR (neat): ν_{max} 3250 (br), 2924, 2847, 1717, 1463, 1417, 1377, 1276, 1261, 1030 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.34 (s, 3H), 3.81 (s, 3H), 3.86 (s, 3H), 6.74 (s, 1H), 6.92-6.95 (m, 3H), 7.06 (s, 1H), 7.17-7.21 (m, 3H), 9.00 (d, *J* = 7.4 Hz, 1H), 9.12 (s, 1H), 9.54 (s, 1H), 10.1 (br s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.0, 56.4 (2 carbons), 101.4, 105.9, 107.1, 109.5, 110.2, 111.5, 112.1, 113.0, 114.2, 117.9, 118.6, 122.3, 122.4, 125.1, 127.8, 128.7, 134.7, 143.5, 145.7, 148.3, 148.5, 148.8, 149.0, 149.3, 154.9. LRMS (EI) *m/z* (rel intensity) 500 ($M + H^+$, 30), 499 (M^+, 100). TOF-HRMS calcd for $C_{28}H_{22}NO_8$ ($M + H^+$) 500.1340, found 500.1349.

14-(3-Hydroxy-4-methoxyphenyl)-3,12-dihydroxy-2,11-dimethoxy-6*H*-chromeno[4',3':4,5]pyrrolo[2,1-*a*]isoquinolin-6-one (144; Dehydrolamellarin Y). mp (CH_2Cl_2/MeOH) >250 °C. IR (neat): ν_{max} 3479, 3420 (br), 2999, 2922, 2844, 1714, 1682, 1553, 1514, 1491, 1479, 1434, 1421, 1271, 1219, 1163, 1177, 1082, 1041, 1020 cm^{-1}. ^1H NMR (200 MHz, DMSO-d_6): δ 3.36 (s, 3H), 3.89 (s, 6H), 6.49 (s, 1H), 6.84 (s, 1H), 6.91-6.95 (m, 2H), 7.17 (s, 1H), 7.18-7.24 (m, 1H), 7.26 (d, *J* = 7.4 Hz, 1H), 7.38 (s, 1H), 9.01 (d, *J* = 7.4 Hz, 1H), 9.37 (s, 1H), 9.66 (br s, 1H), 9.82 (br s, 1H). ^{13}C NMR (50 MHz, DMSO-d_6): δ 55.4, 56.1, 56.3, 104.1, 106.1, 107.0, 108.7, 108.9, 109.5, 111.5, 113.3, 114.0, 118.4, 119.3, 121.8, 122.2, 124.0, 127.6, 129.4, 133.7, 145.0, 146.7, 147.6, 148.1, 148.4, 150.0, 154.7. TOF-LRMS *m/z* (rel intensity) 500 ($M + H^+$, 100). TOF-HRMS calcd for $C_{28}H_{22}NO_8$ ($M + H^+$) 500.1340, found 500.1357.

References for Supporting Information

(1) Ploypradith, P.; Mahidol, C.; Sahakitpichan, P.; Wongbundit, S.; Ruchirawat, S. *Angew. Chem., Int. Ed. Engl.* **2004**, *43*, 866-868.

(2) Andersen, R. J.; Faulkner, D. J.; He, C.-H.; Van Duyne, G. D.; Clardy, J. *J. Am. Chem. Soc.* **1985**, *107*, 5492-5495.

(3) Carroll, A. R.; Bowden, B. F.; Coll, J. C. *Aust. J. Chem.* **1993**, *46*, 489-501.

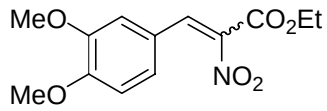
(4) Reddy, M. V. R.; Faulkner, D. J.; Venkateswarlu, Y.; Rao, M. R. *Tetrahedron* **1997**, *53*, 3457-3466.

(5) Lindquist, N.; Fenical, W.; Van Duyne, G. D.; Clardy, J. *J. Org. Chem.* **1988**, *53*, 4570-4574.

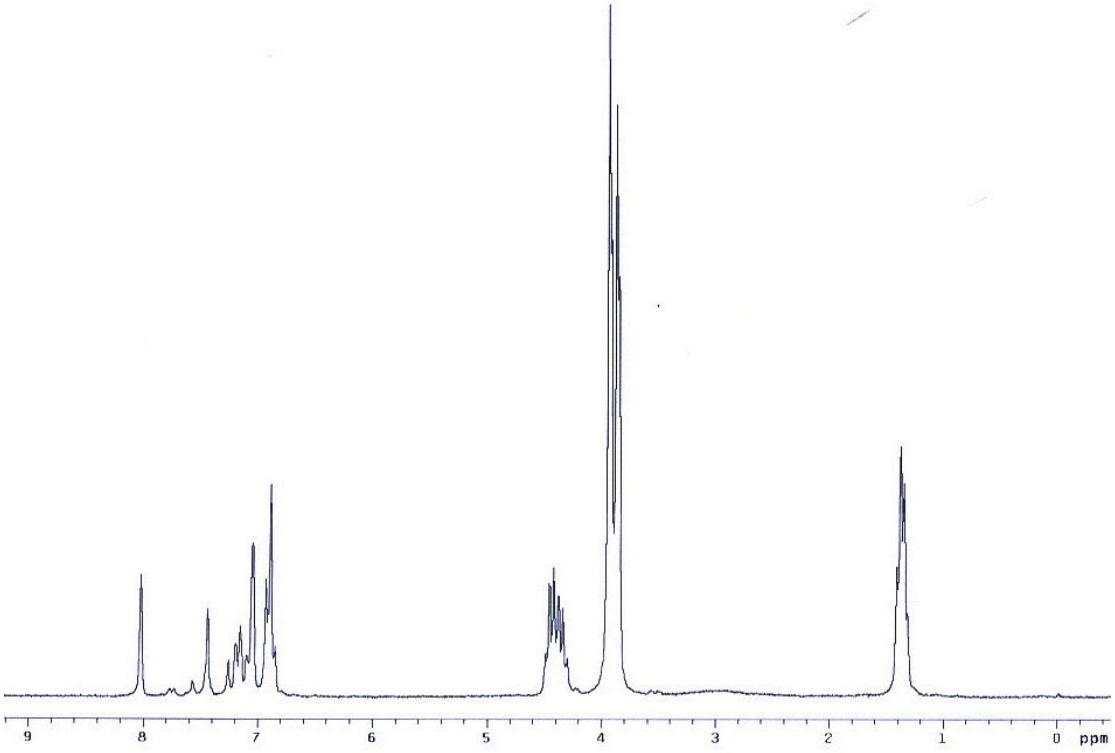
(6) Reddy, S. M.; Srinivasulu, M.; Satyanarayana, N.; Kondapi, A. K.; Venkateswarlu, Y. *Tetrahedron* **2005**, *61*, 9242-9247.

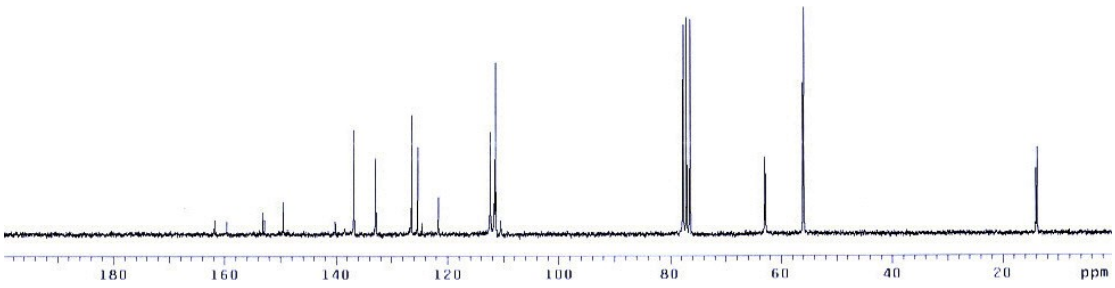
(7) Ishibashi, F.; Miyazaki, Y.; Iwao, M. *Tetrahedron* **1997**, *53*, 5951-5962.

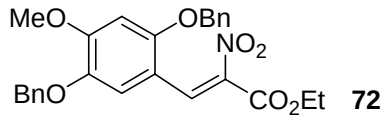
(8) Krishnaiah, P.; Reddy, V. L. N.; Venkataramana, G.; Ravinder, K.; Srinivasulu. M.; Raju, T. V.; Ravikumar, K.; Chandrasekar, D.; Ramakrishna, S.; Venkateswarlu, Y. *J. Nat. Prod.* **2004**, *67*, 1168-1171.


MeO
MeO
CO2Et
NO2

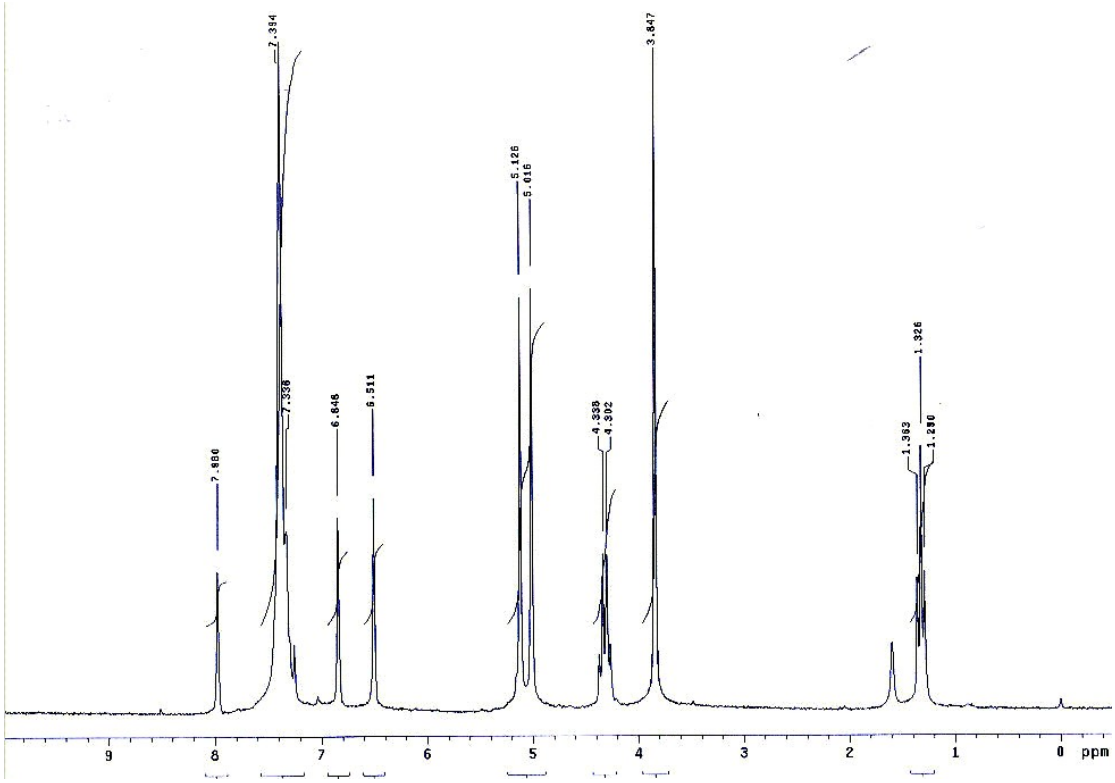
70

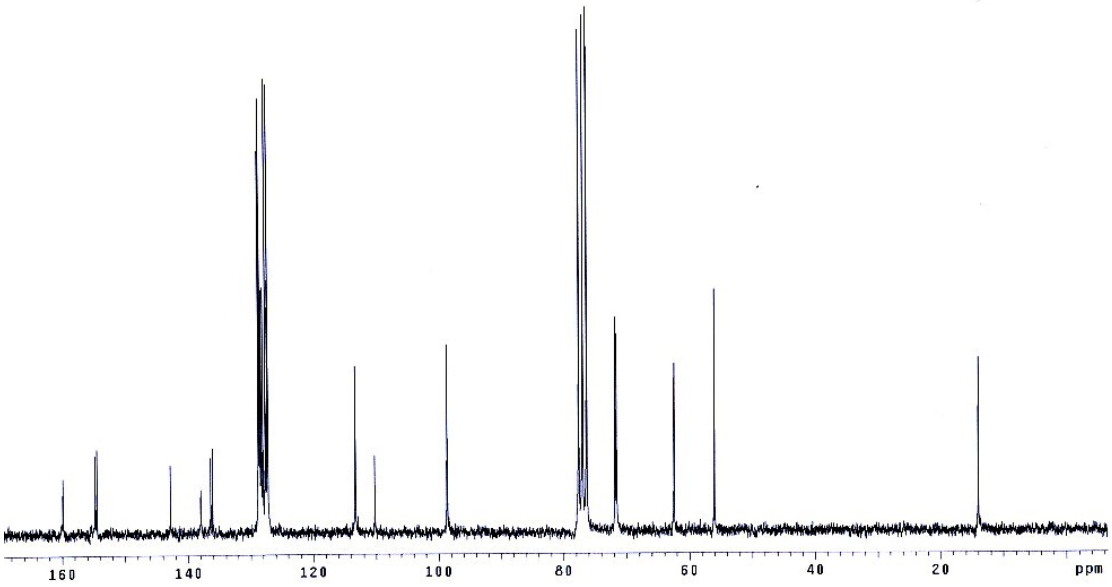

9
8
7
6
5
4
3
2
1
0
ppm

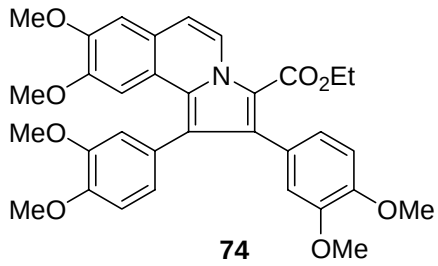

180
160
140
120
100
80
60
40
20
ppm


MeO
OBn
NO2
BnO
CO2Et

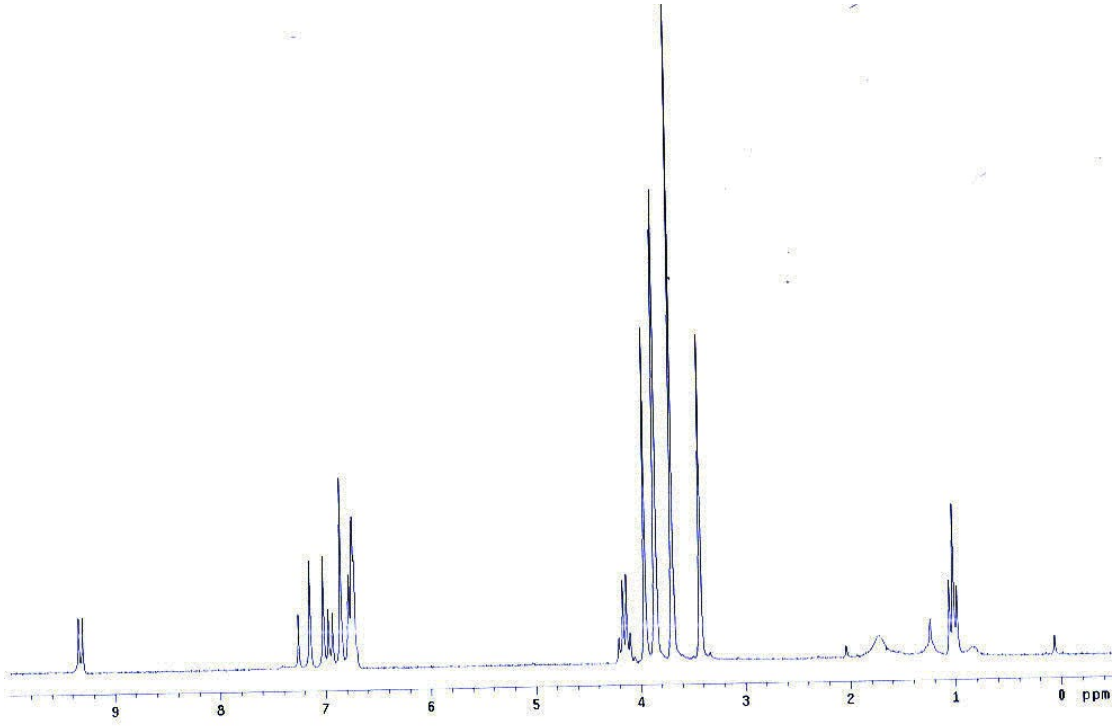
72

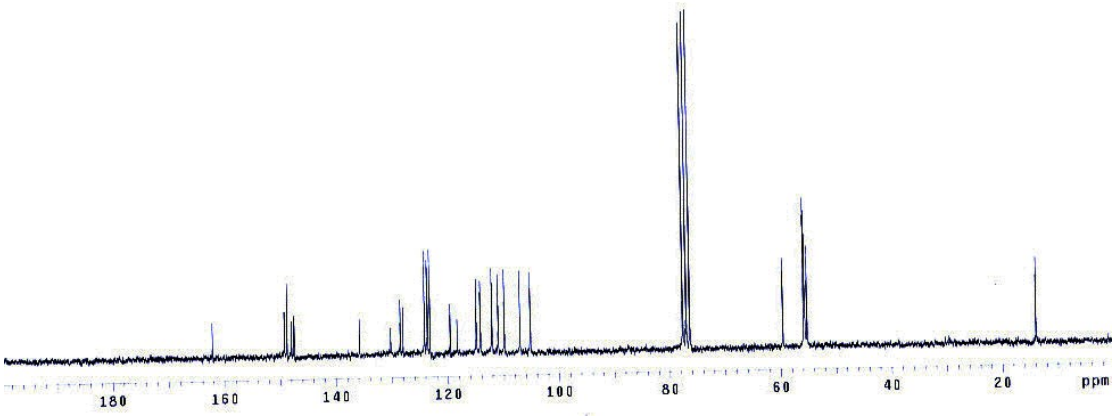

7.680
7.384
7.338
6.646
6.511
5.126
5.016
4.339
4.302
3.847
1.393
1.326
1.260
9
8
7
6
5
4
3
2
1
0 ppm

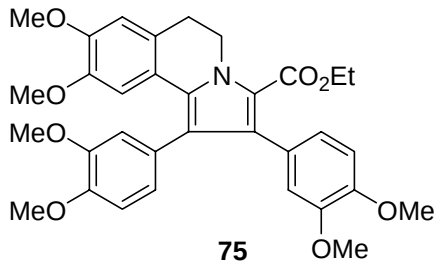

160
140
120
100
80
60
40
20
ppm


MeO
MeO
MeO
MeO
N
CO2Et
OMe
OMe

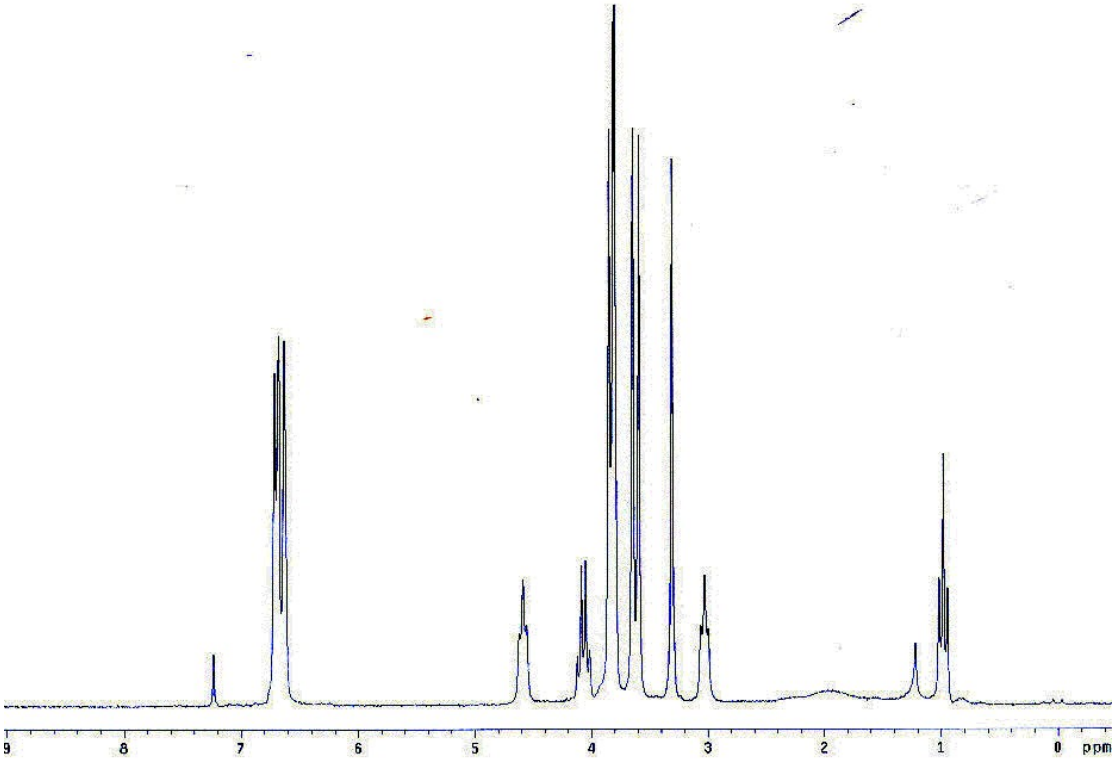
74

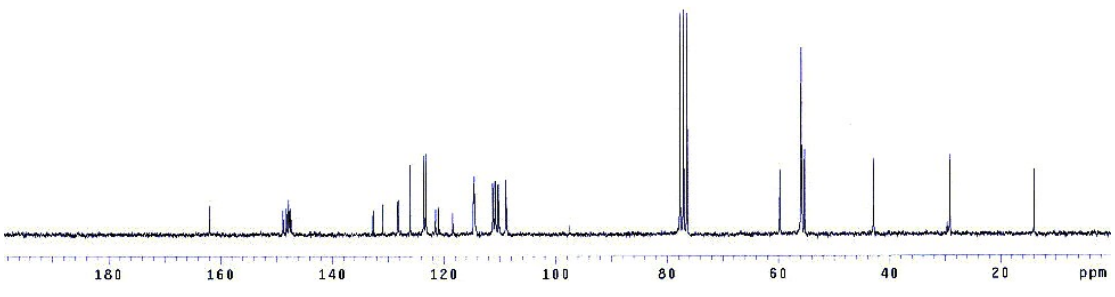

9
8
7
6
5
4
3
2
1
0 ppm

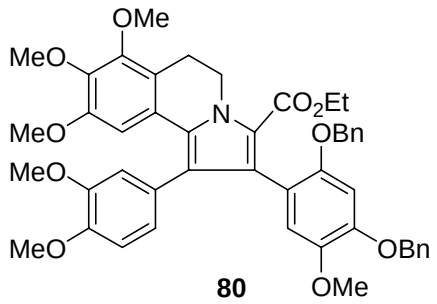

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
MeO
MeO
N
CO2Et
OMe
OMe

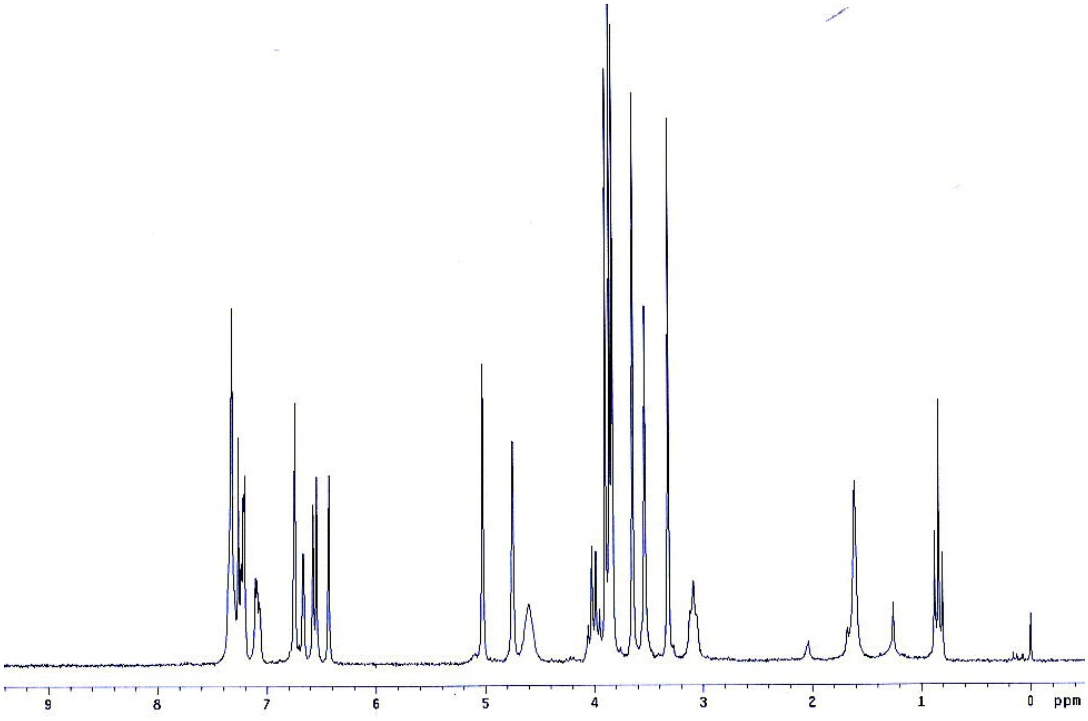
75

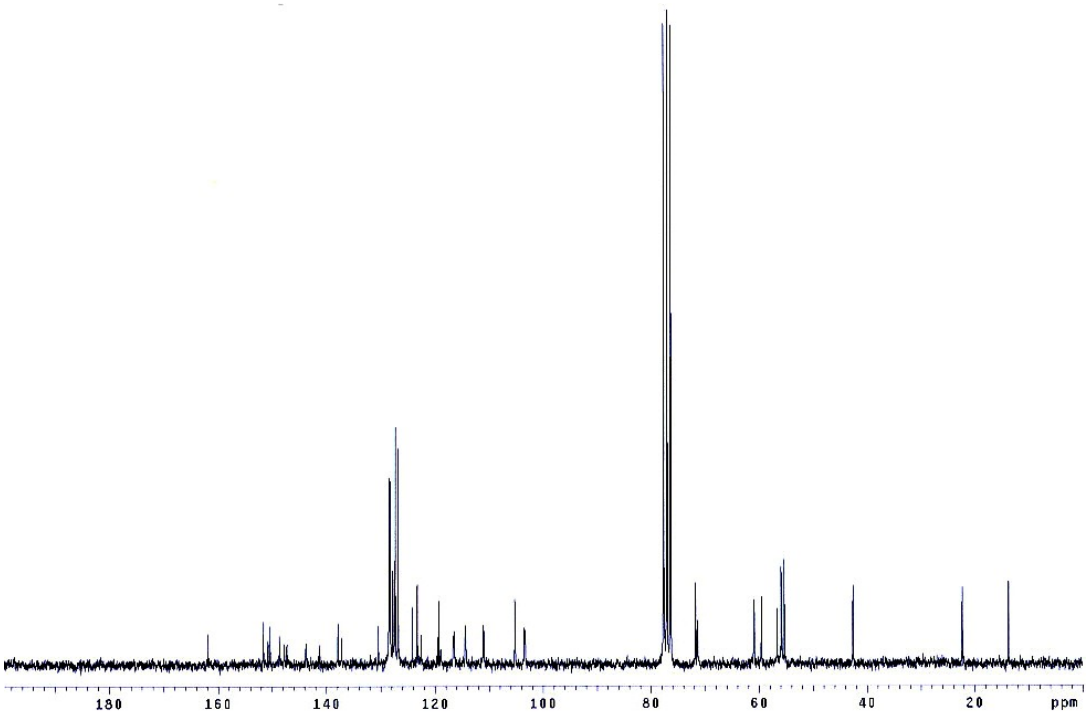

9
8
7
6
5
4
3
2
1
0
ppm

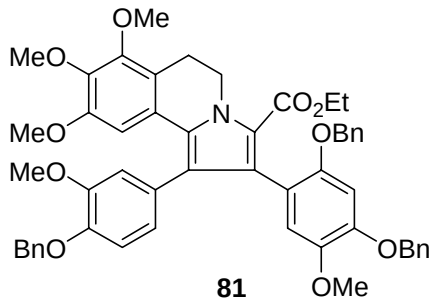

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
MeO
N
CO2Et
OBn
OBn
OMe

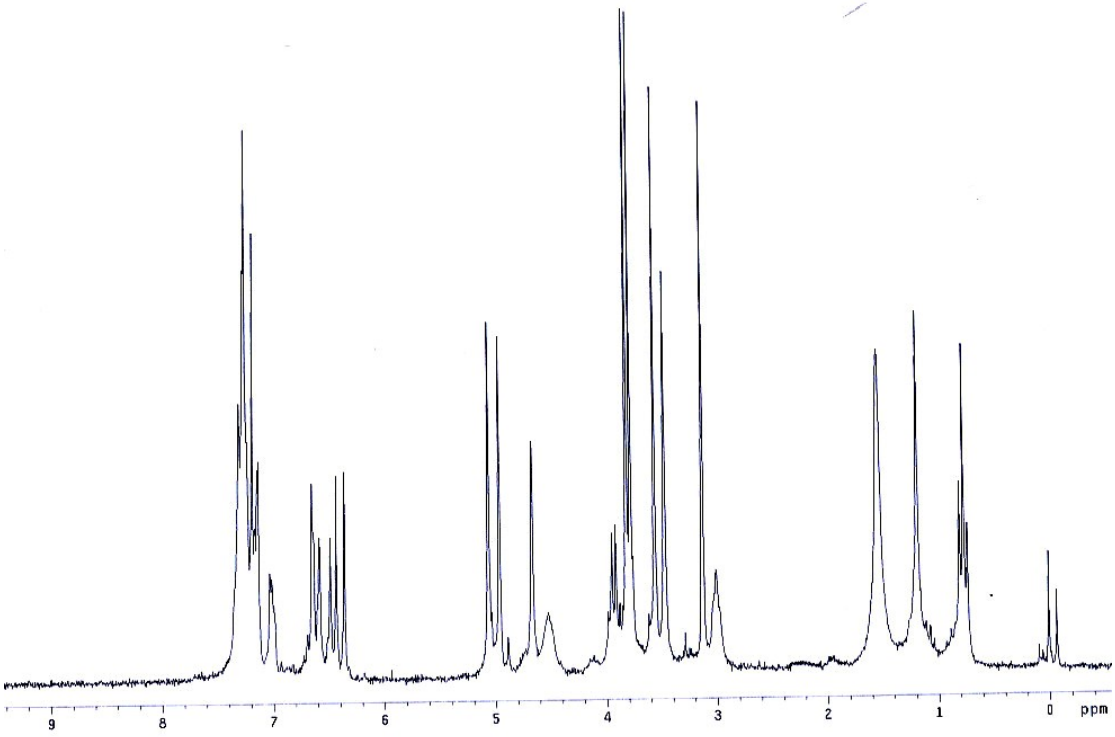
80

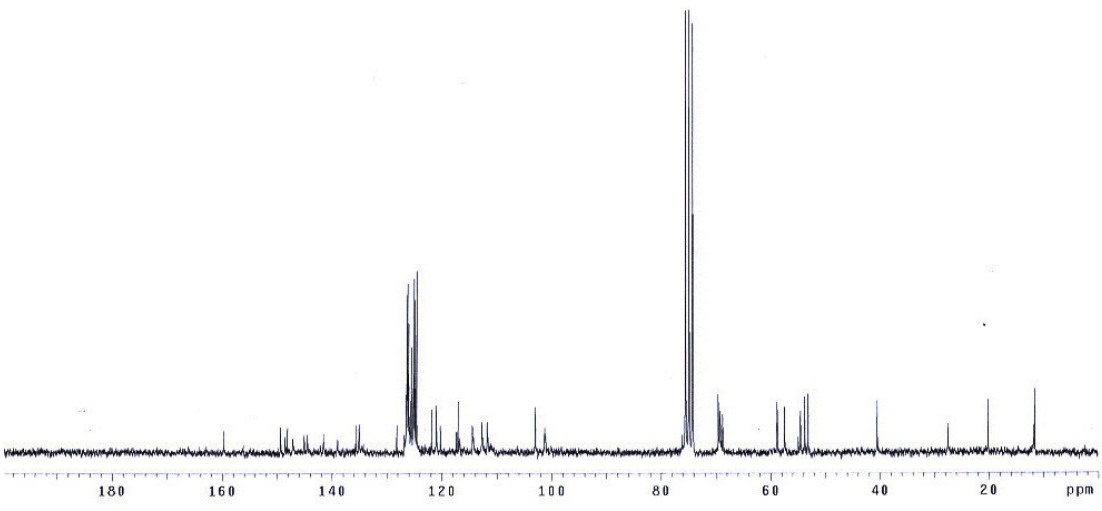

9
8
7
6
5
4
3
2
1
0
ppm

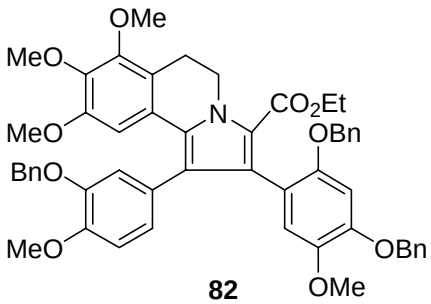

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
N
CO2Et
OBn
MeO
BnO
OBn
OMe

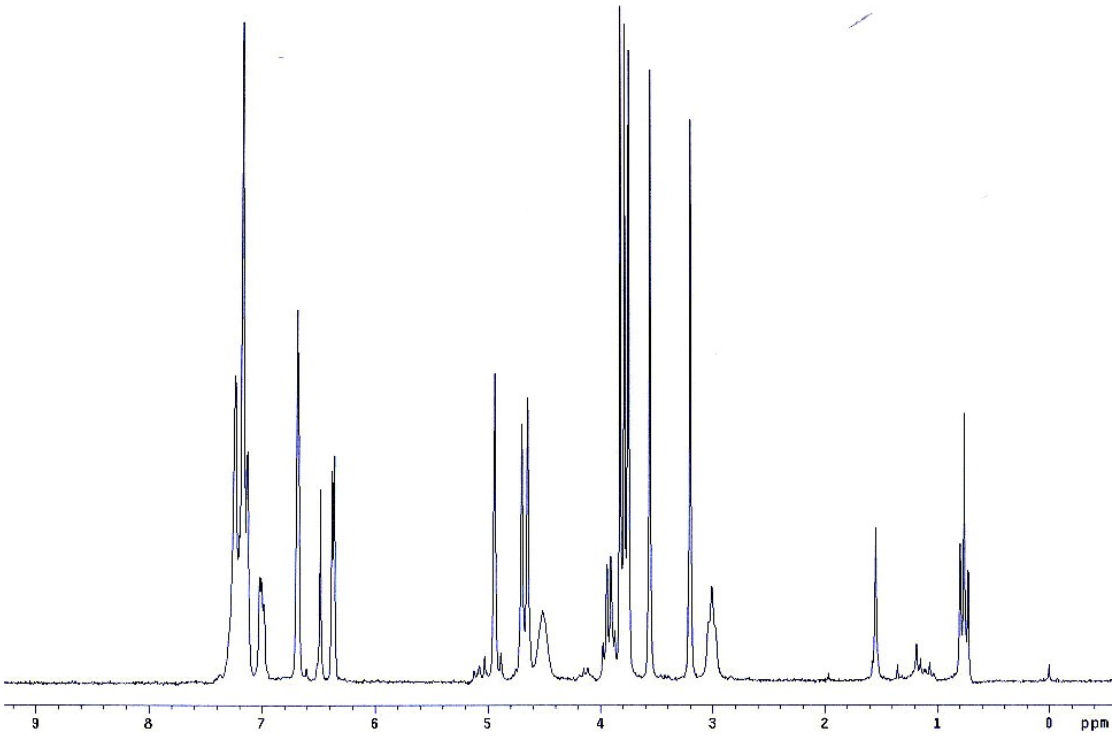
81

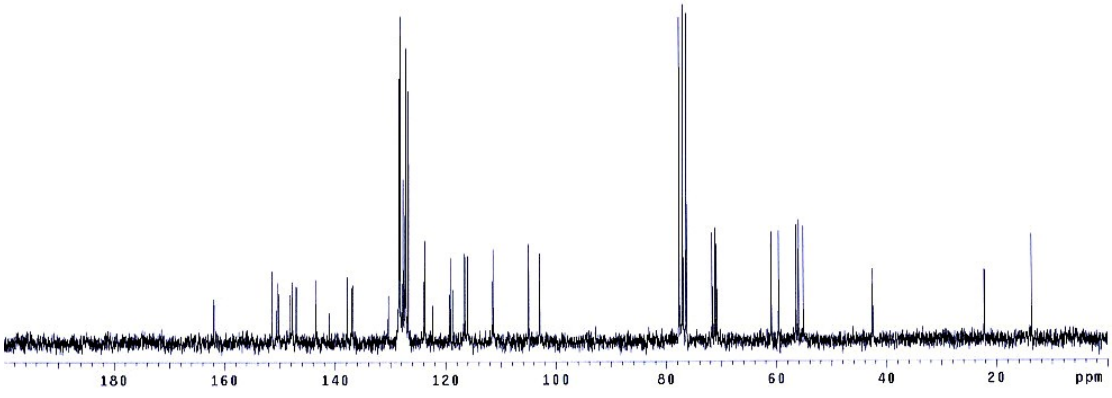

9
8
7
6
5
4
3
2
1
0
ppm

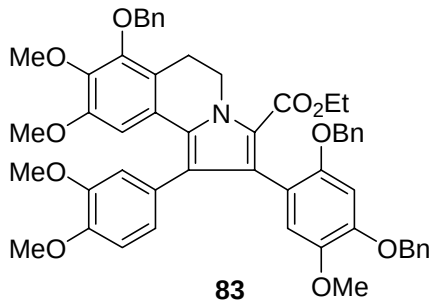

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
N
CO2Et
OBn
BnO
MeO
OBn
OMe

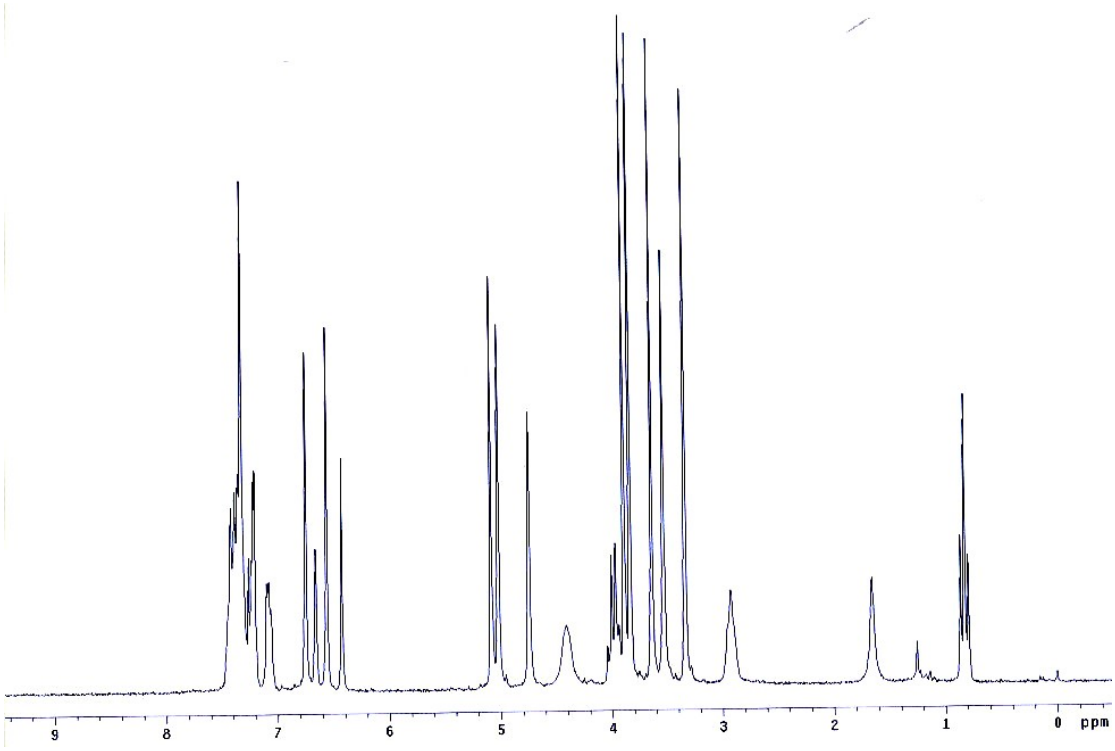
82

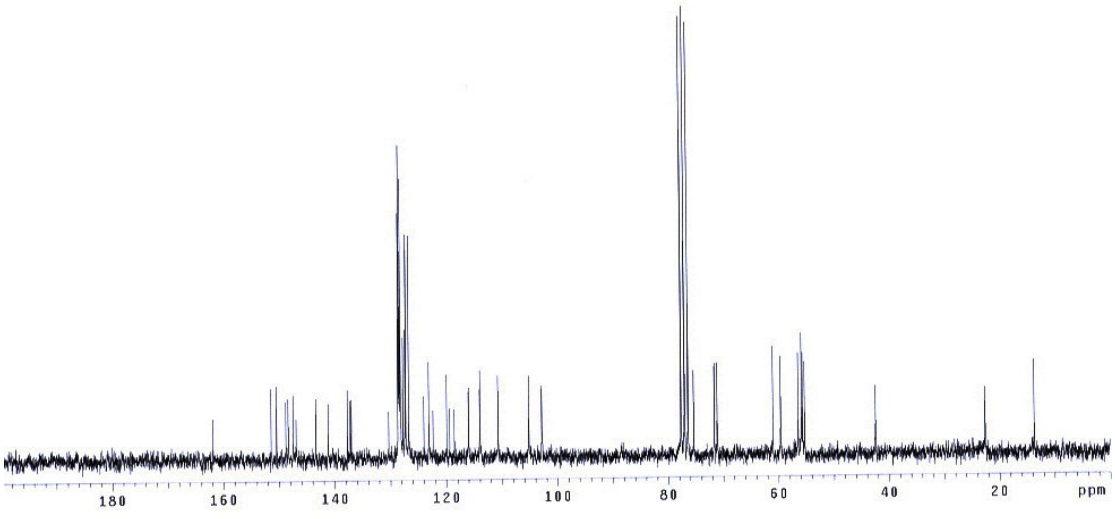

9
8
7
6
5
4
3
2
1
0
ppm

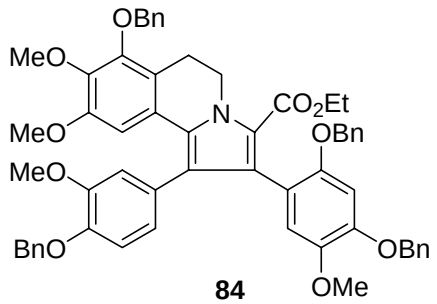

180
160
140
120
100
80
60
40
20
ppm


OBn
MeO
MeO
N
CO2Et
OBn
MeO
MeO
OBn
OMe

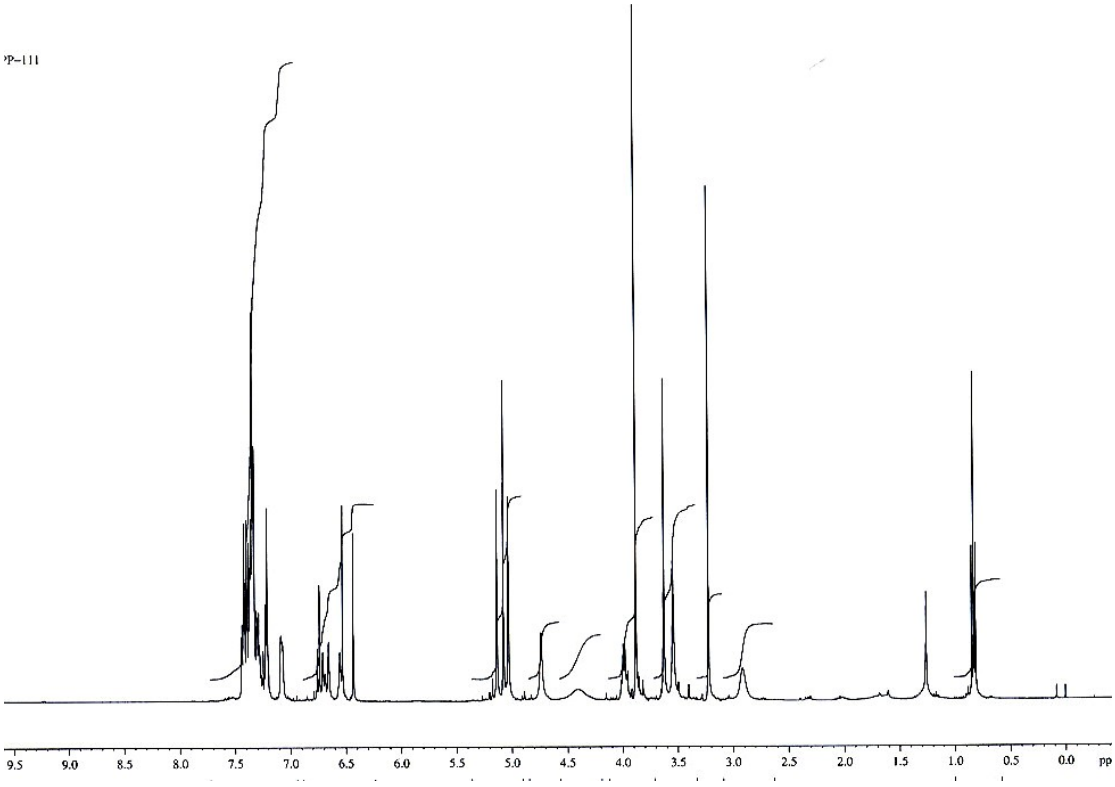
83

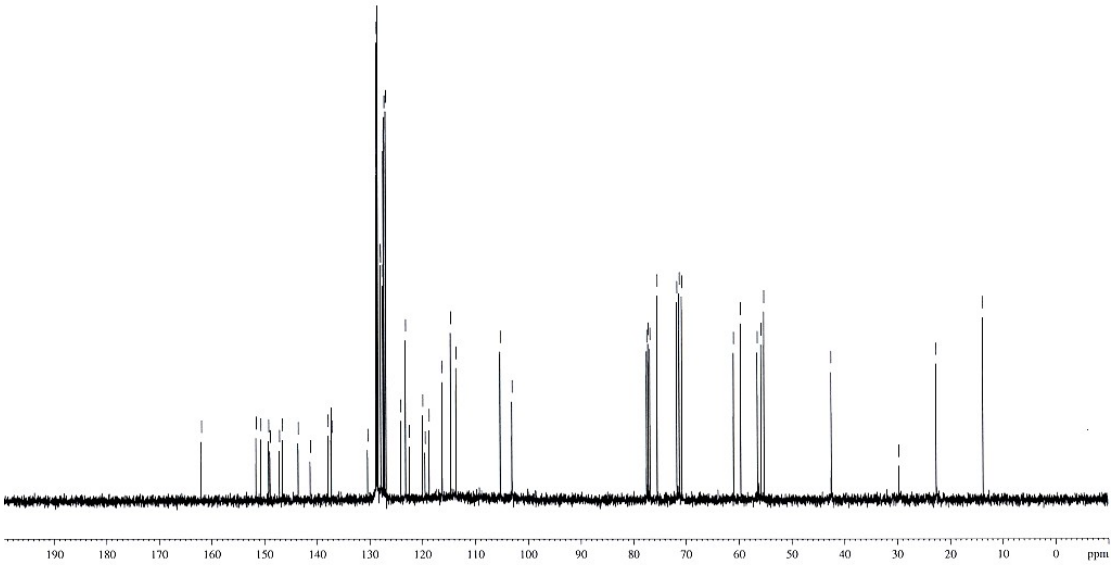

9
8
7
6
5
4
3
2
1
0
ppm

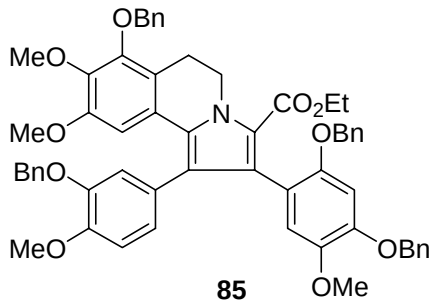

180
160
140
120
100
80
60
40
20
ppm


OBn
MeO
MeO
N
CO2Et
OBn
MeO
BnO
OBn
OMe

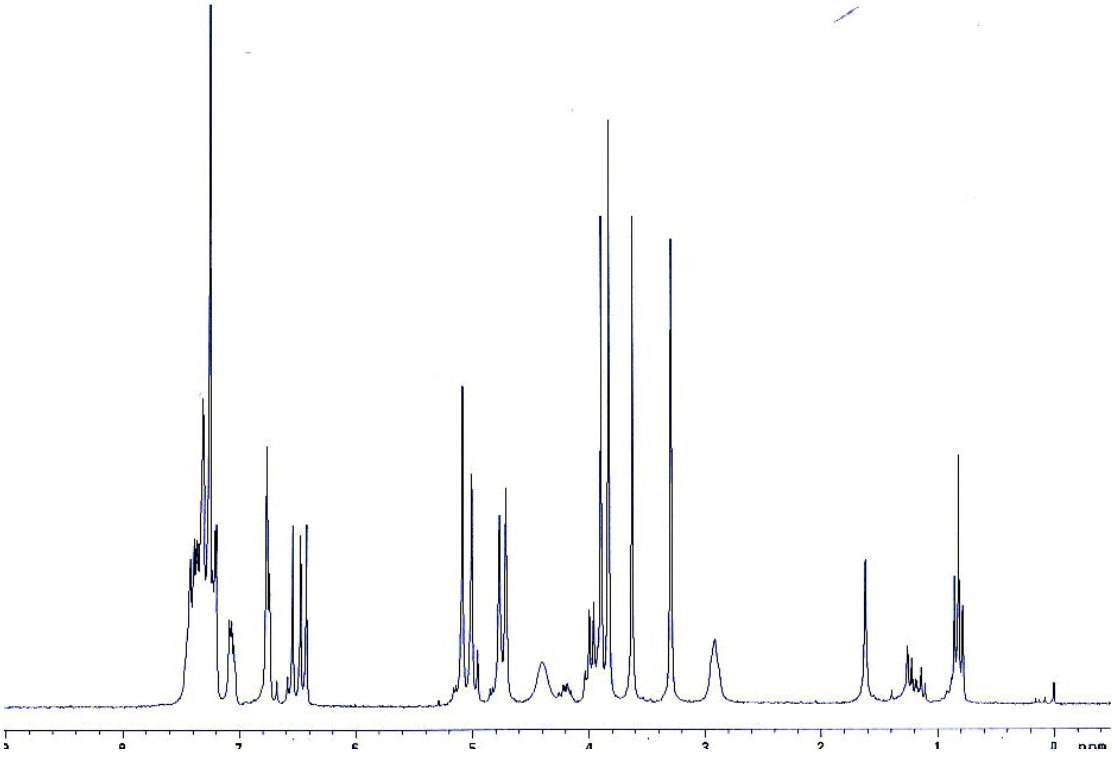
84

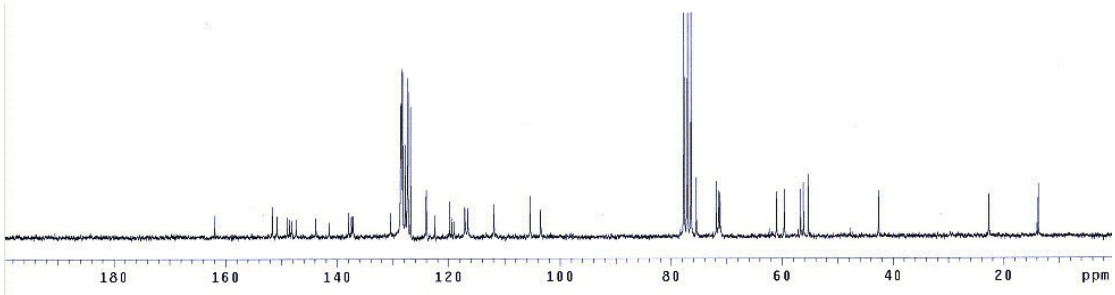

9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0

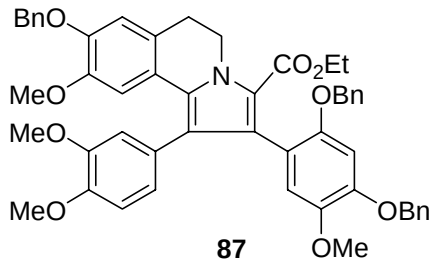

190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
ppm


OBn
MeO
MeO
N
CO2Et
OBn
BnO
MeO
OBn
OMe

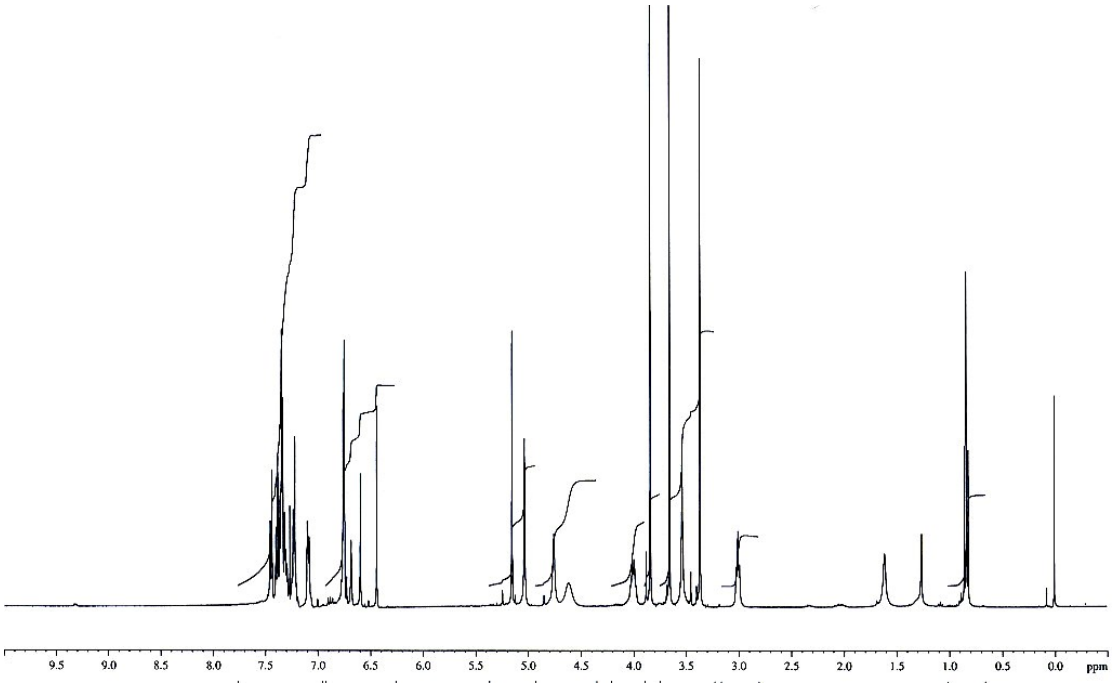
85

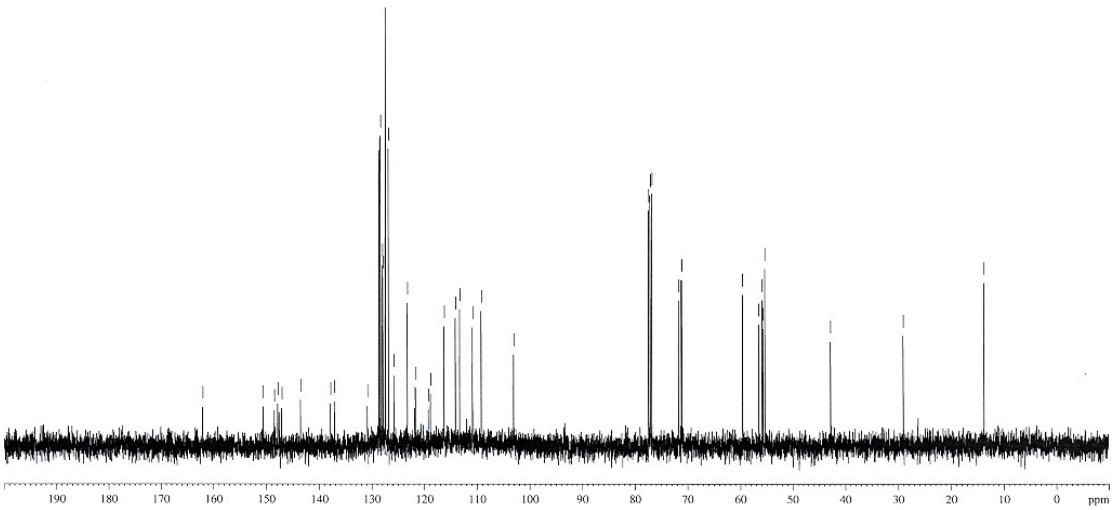


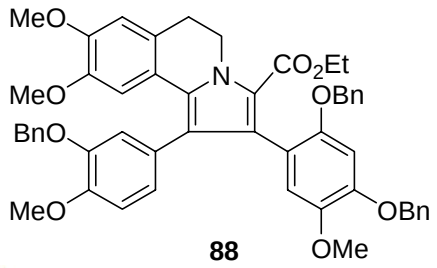

180
160
140
120
100
80
60
40
20
ppm


BnO
MeO
MeO
MeO
N
CO2Et
OBn
OBn
OMe

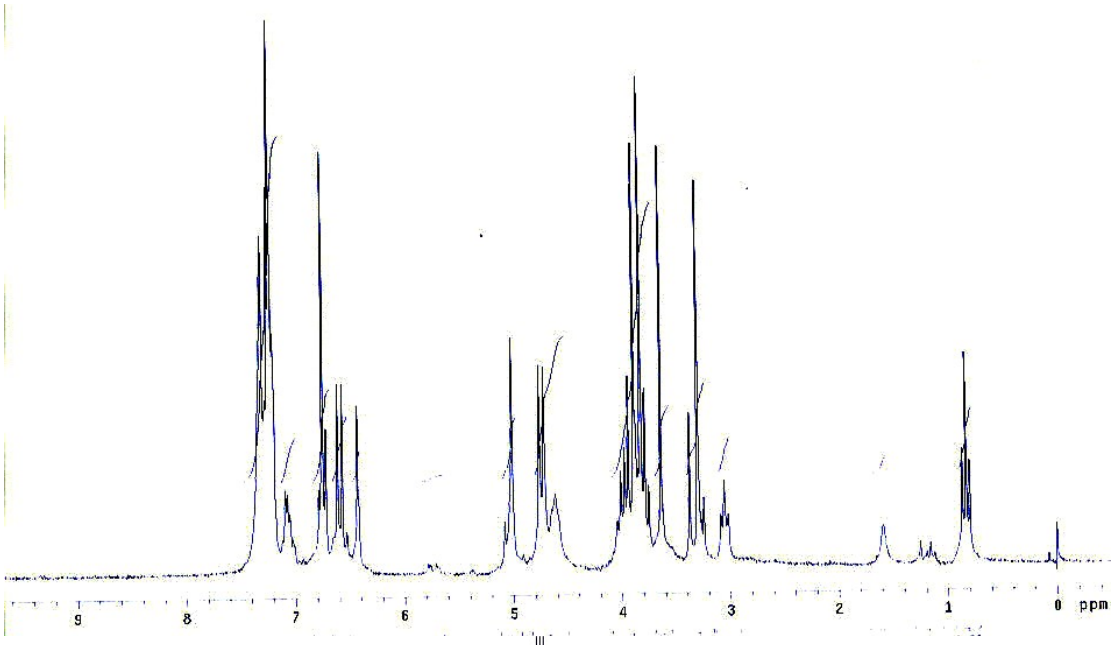
87

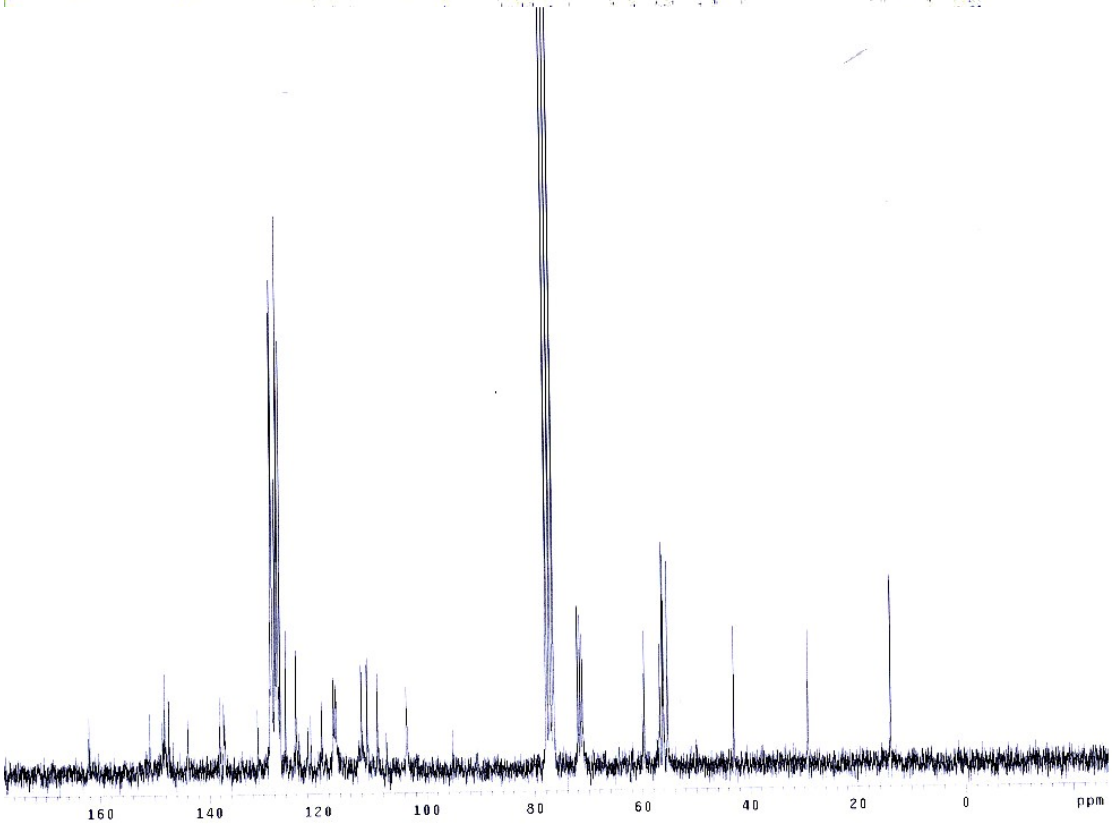

9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

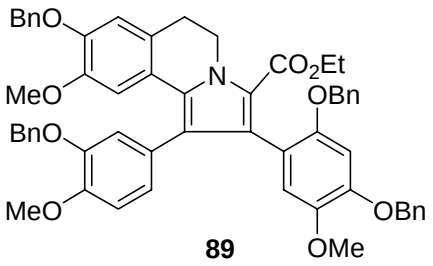

190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm


MeO
MeO
BnO
MeO
N
CO2Et
OBn
OBn
OMe

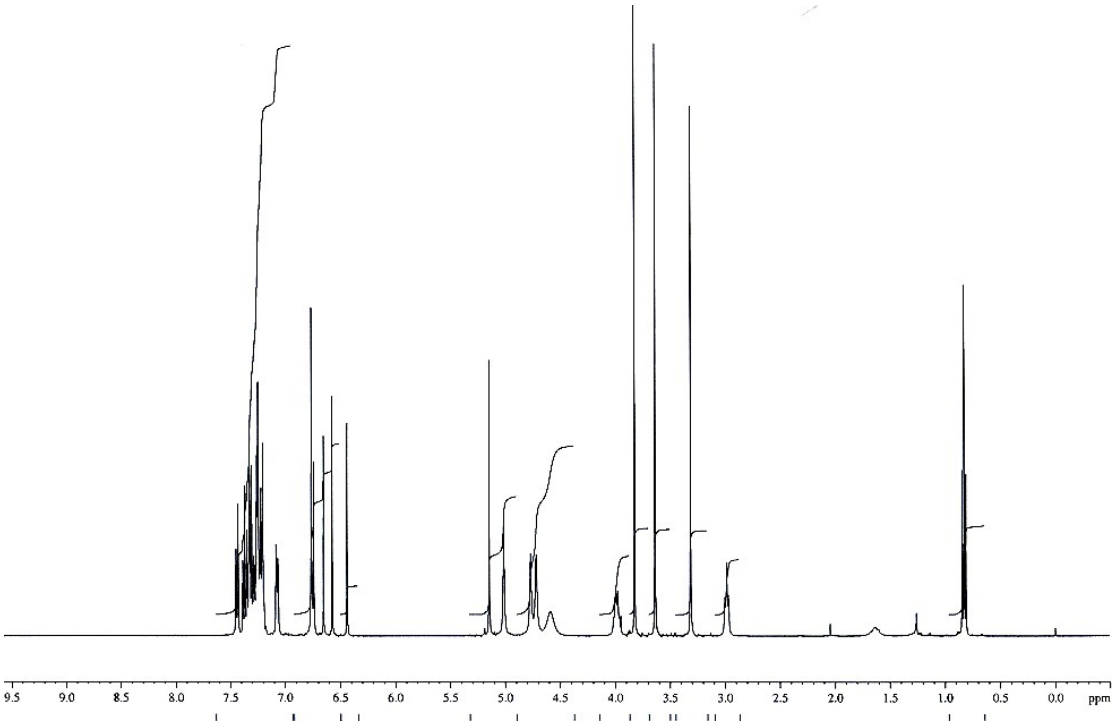
88

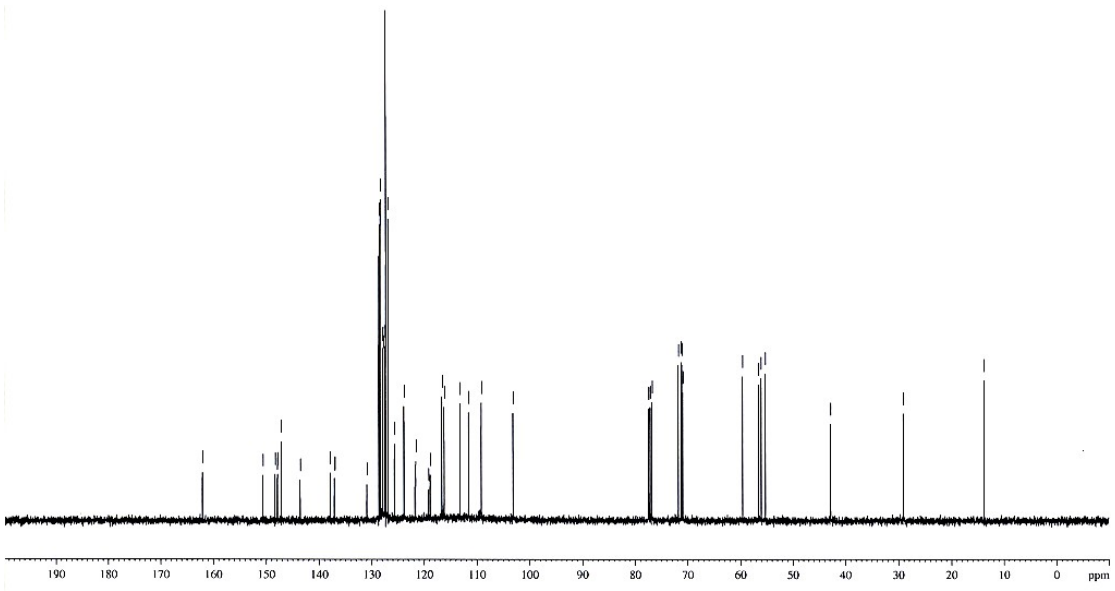

9
8
7
6
5
4
3
2
1
0
ppm

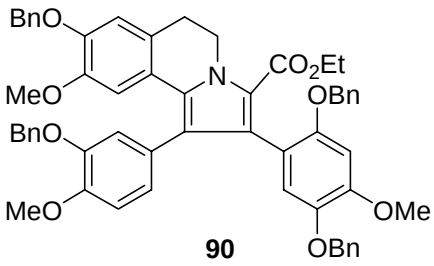

160
140
120
100
80
60
40
20
0
ppm


BnO
MeO
BnO
MeO
N
CO2Et
OBn
OBn
OMe

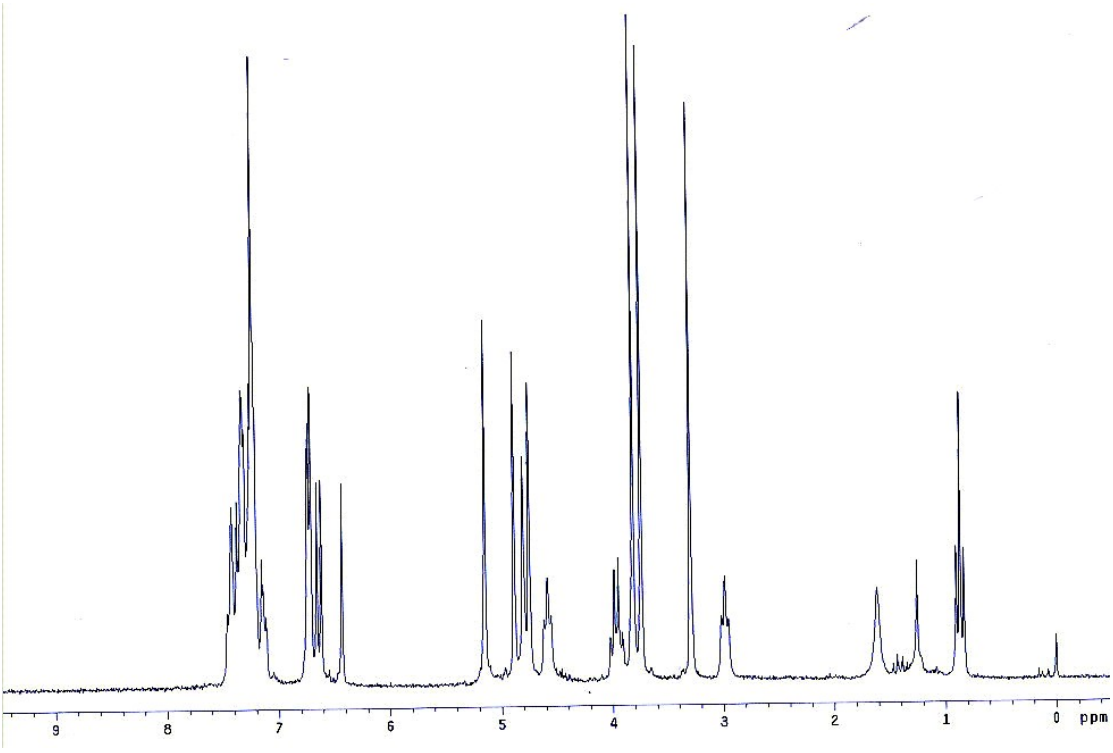
89

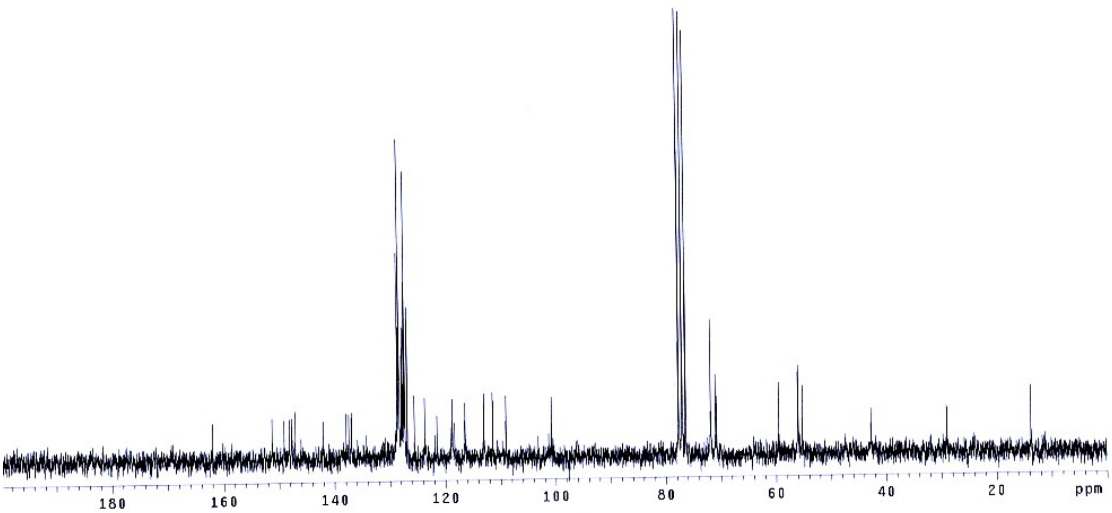

9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

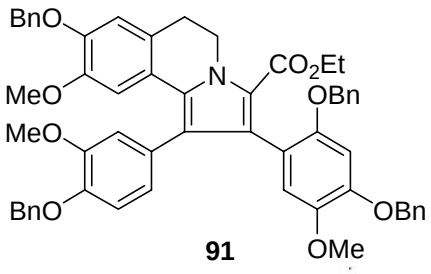

190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm


BnO
MeO
N
CO2Et
OBn
BnO
MeO
OMe
OBn

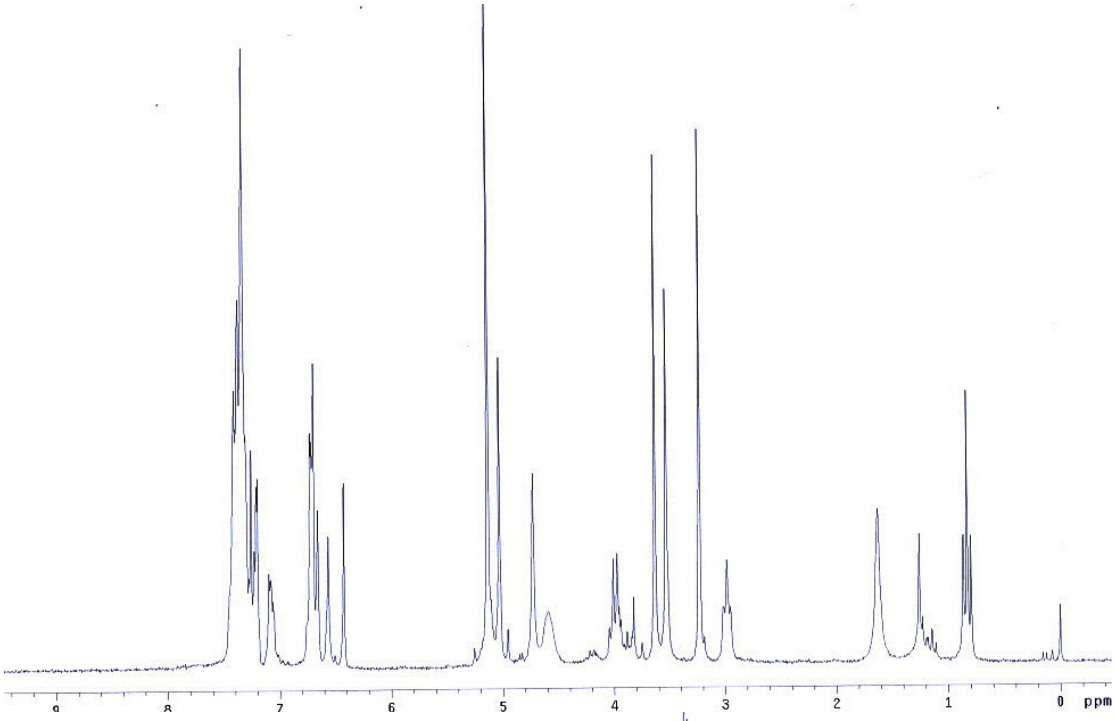
90

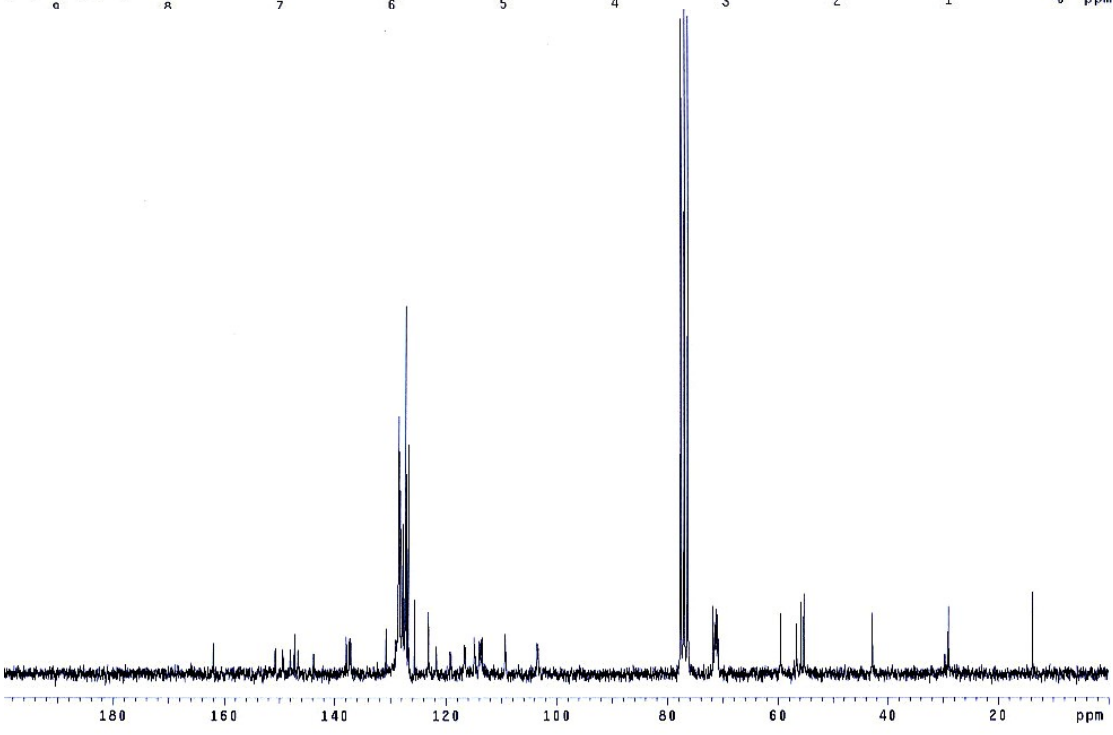

9
8
7
6
5
4
3
2
1
0
ppm

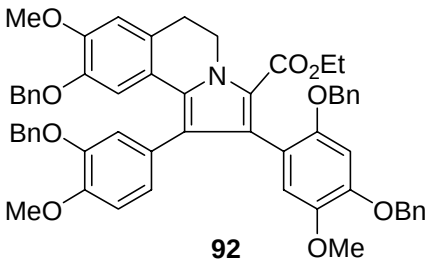

180
160
140
120
100
80
60
40
20
ppm


BnO
MeO
MeO
BnO
N
CO2Et
OBn
OBn
OMe

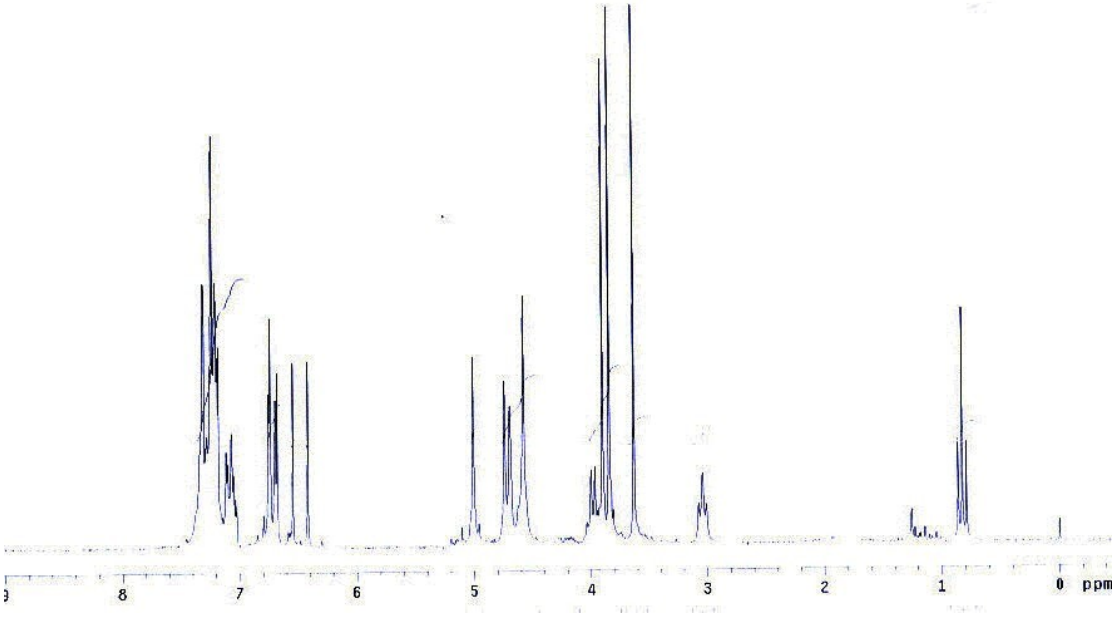
91

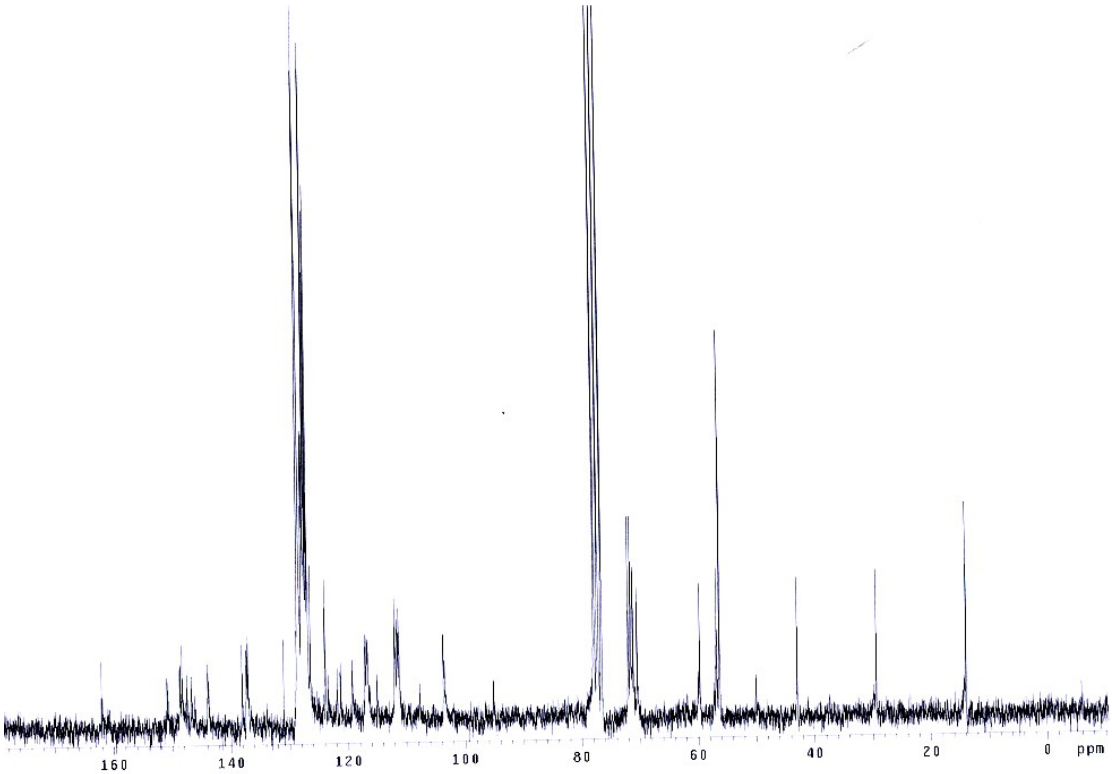

8
7
6
5
4
3
2
1
0 ppm

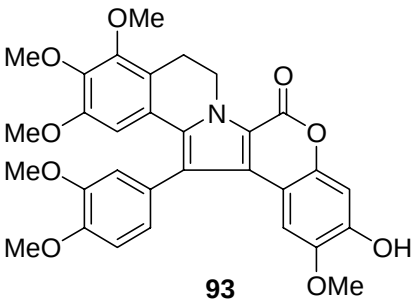

180
160
140
120
100
80
60
40
20
ppm


MeO
BnO
BnO
MeO
N
CO2Et
OBn
OBn
OMe

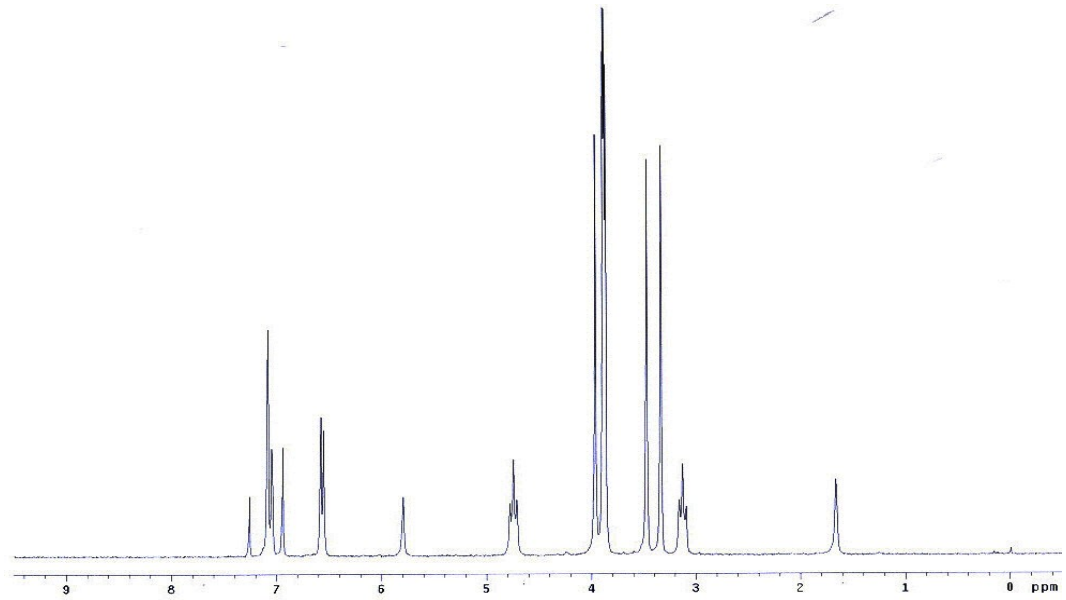
92

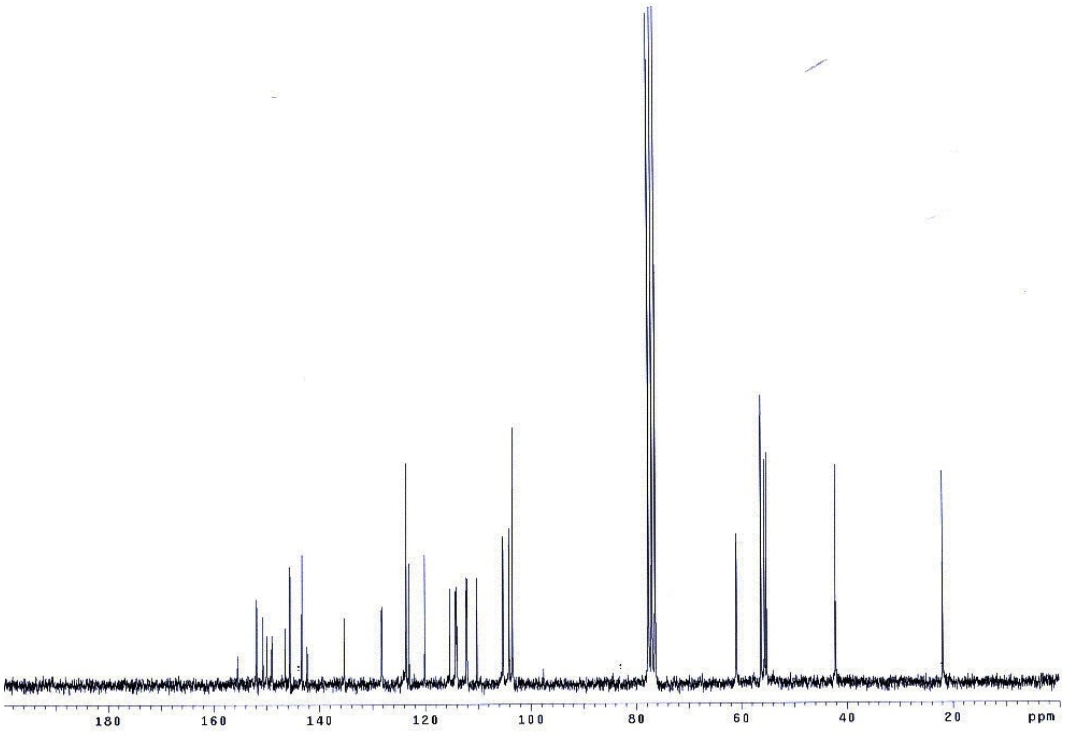

8
7
6
5
4
3
2
1
0 ppm

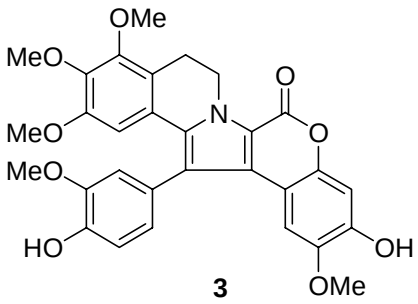

160
140
120
100
80
60
40
20
0 ppm


OMe
MeO
MeO
MeO
MeO
N
O
O
OH
OMe

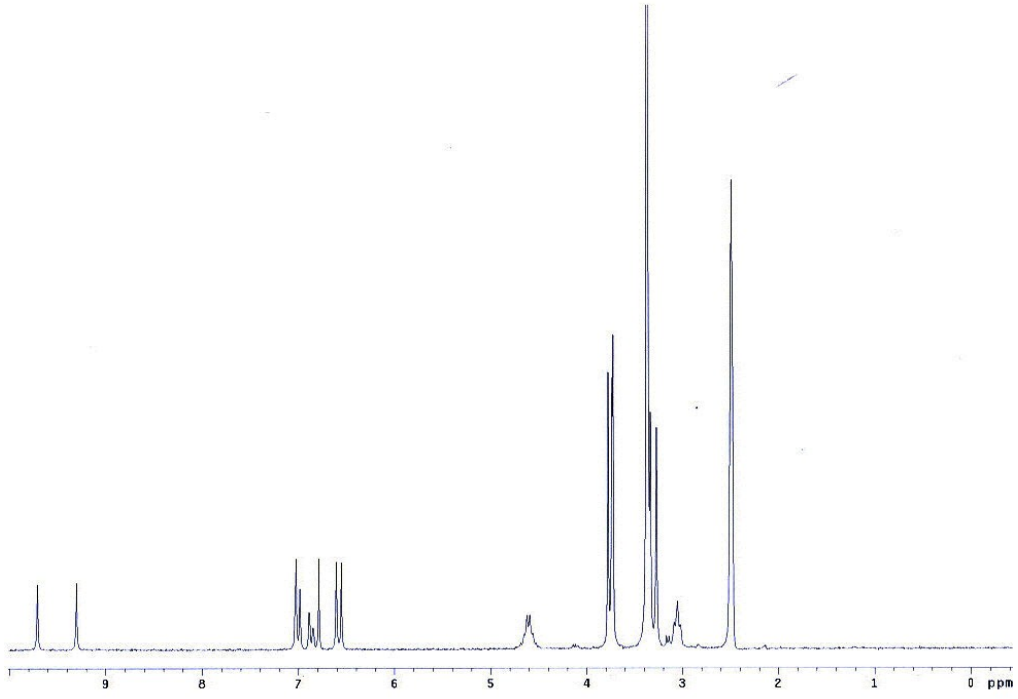
93

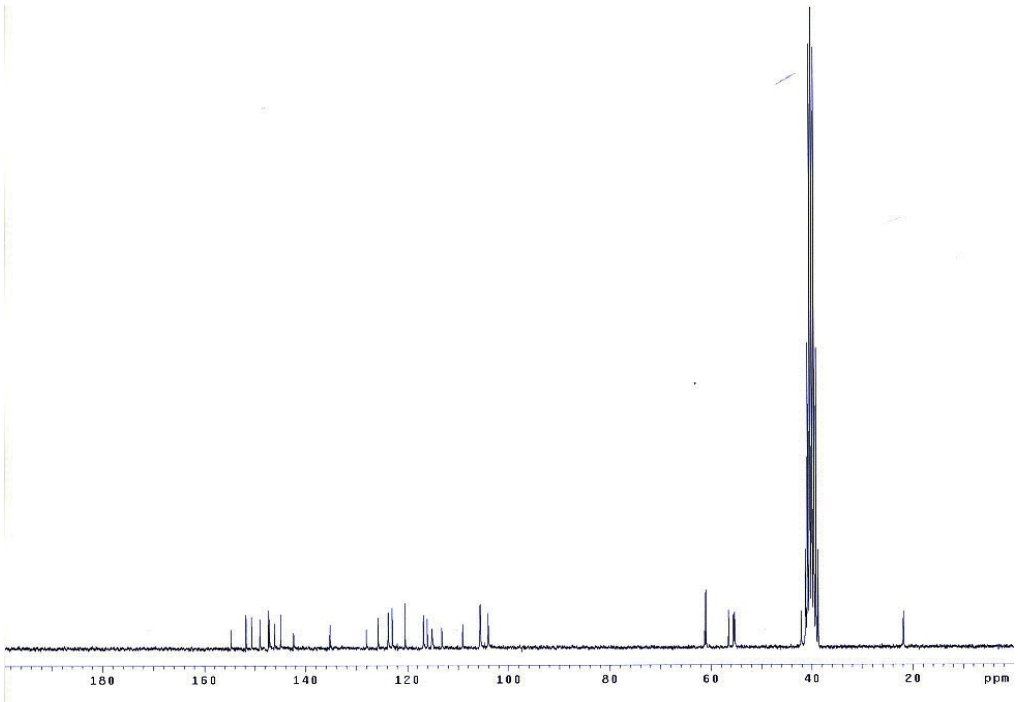

9
8
7
6
5
4
3
2
1
0
ppm

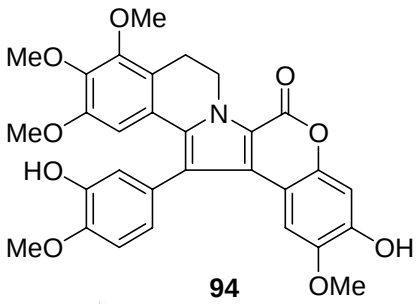

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
HO
N
O
O
OH
OMe

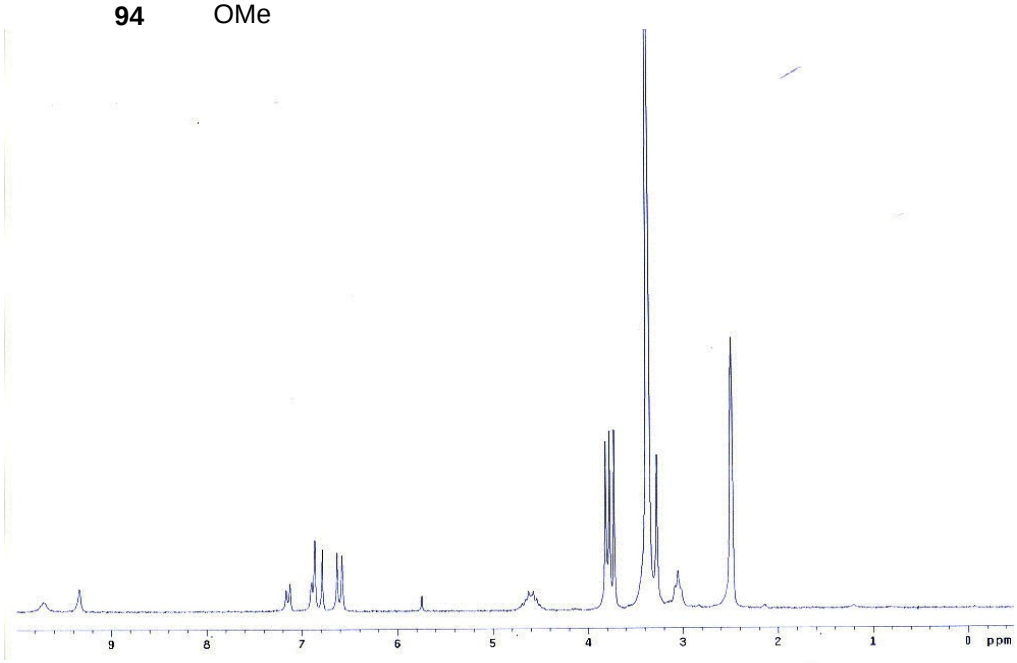
3

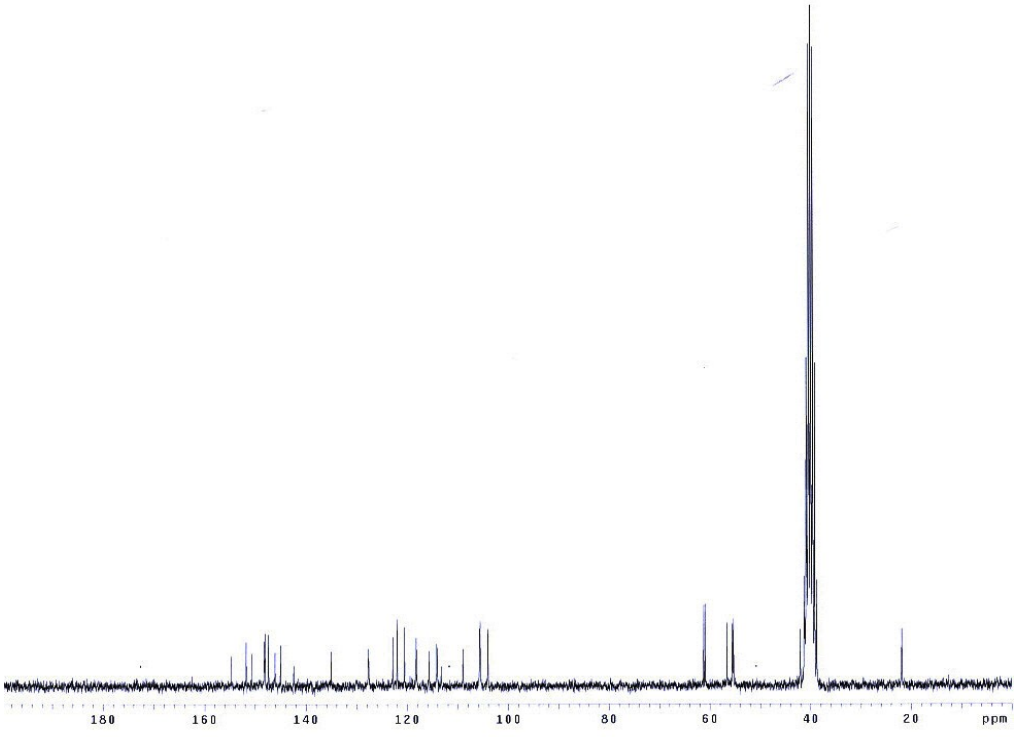

9
8
7
6
5
4
3
2
1
0 ppm

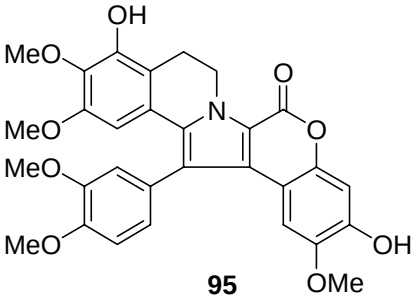

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
HO
MeO
O
N
O
OH
OMe

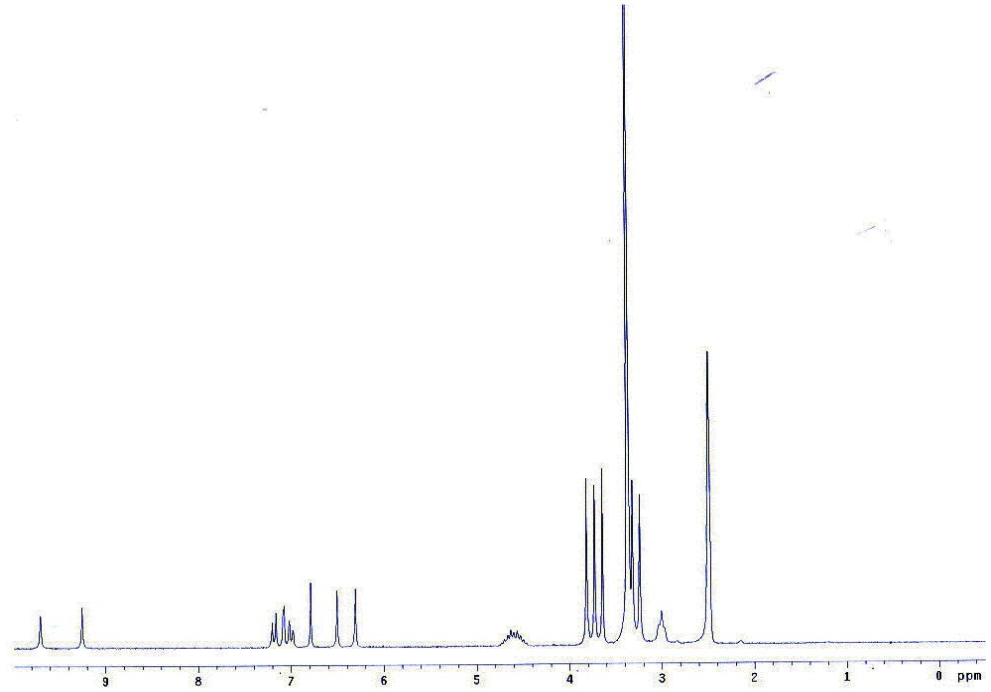
94

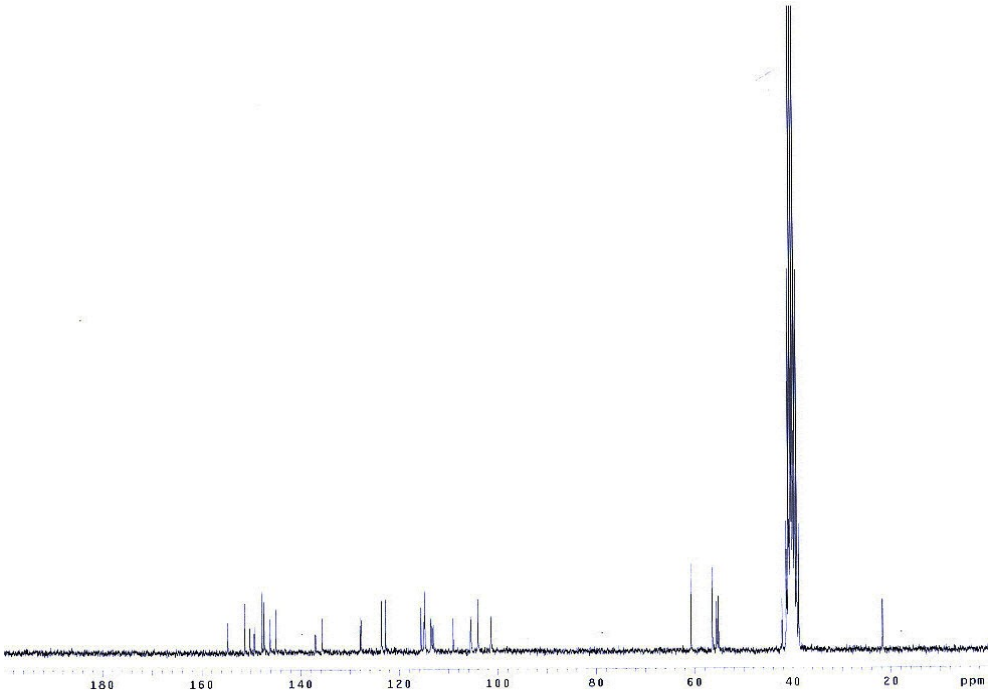

9
8
7
6
5
4
3
2
1
0
ppm

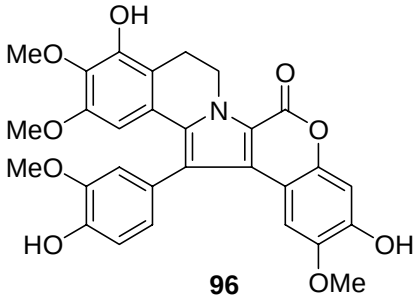

180
160
140
120
100
80
60
40
20
ppm


OH
MeO
MeO
MeO
MeO
N
O
O
OH
OMe

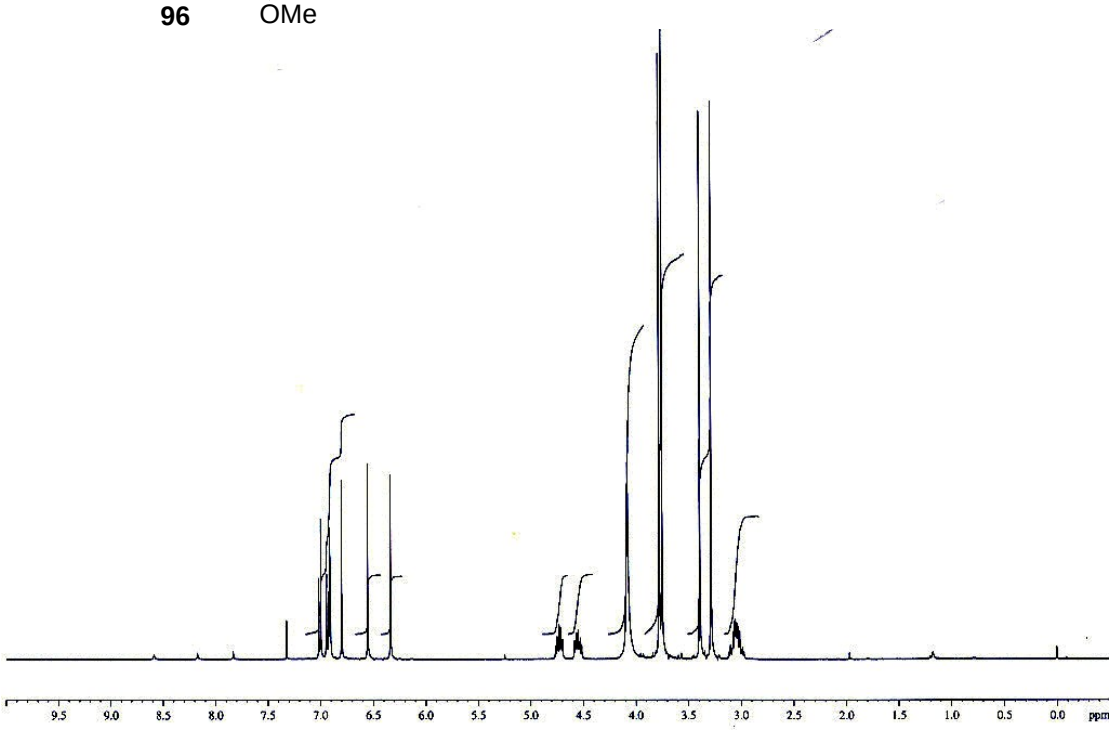
95

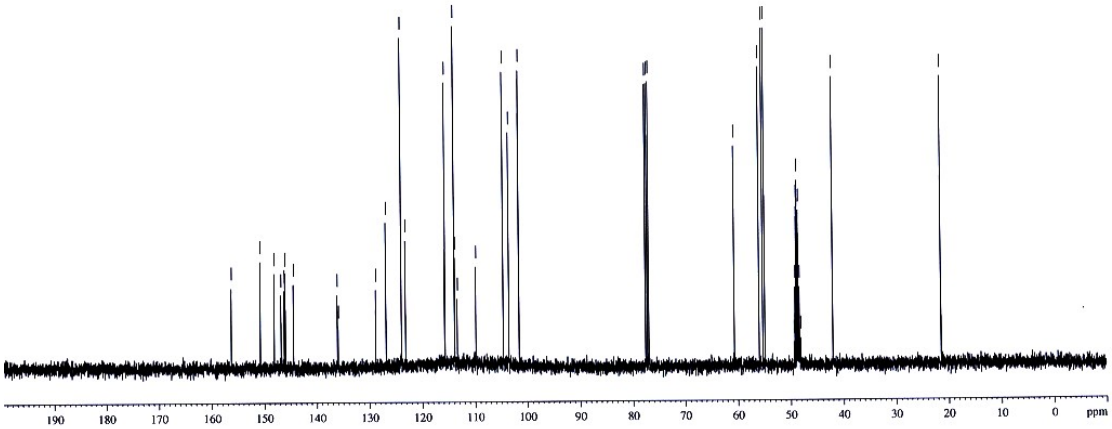

9
8
7
6
5
4
3
2
1
0 ppm

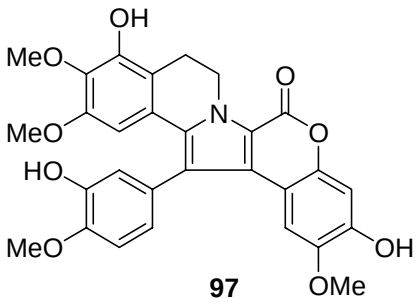

180
160
140
120
100
80
60
40
20
ppm


OH
MeO
MeO
MeO
HO
N
O
O
OH
OMe

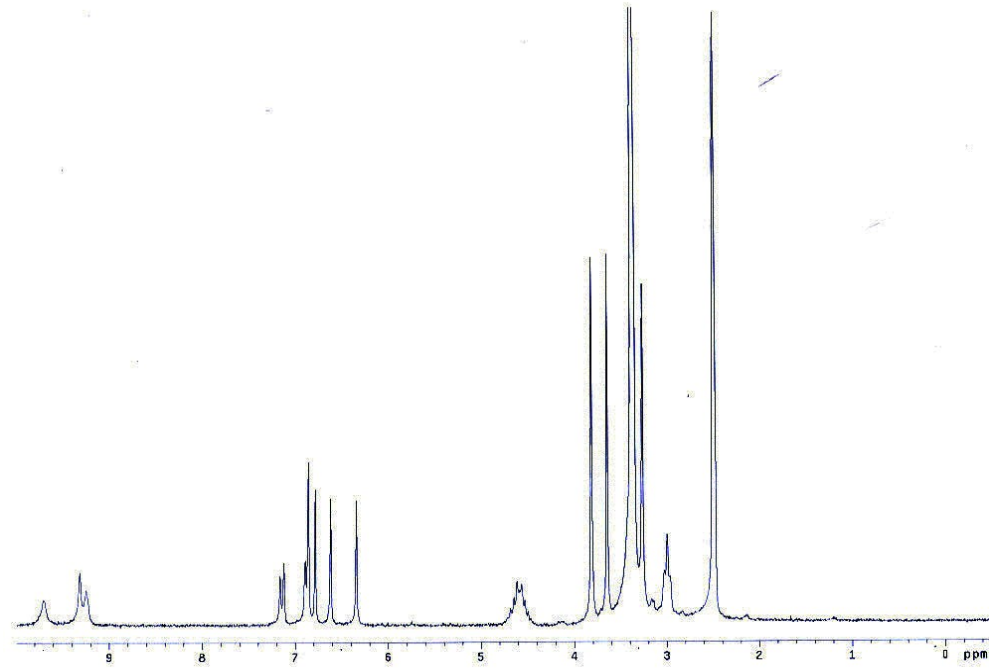
96

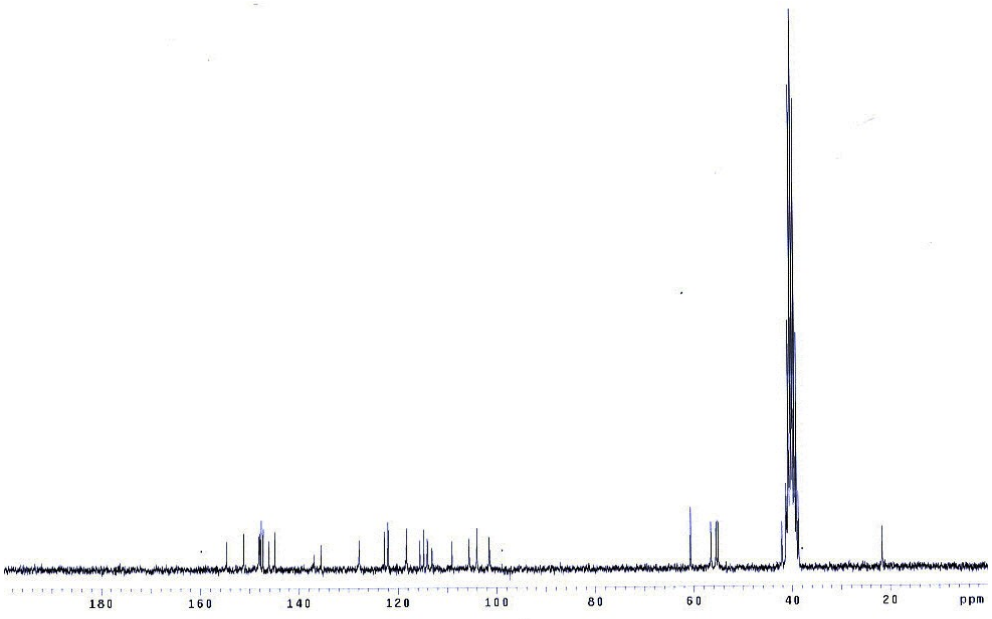

9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
ppm

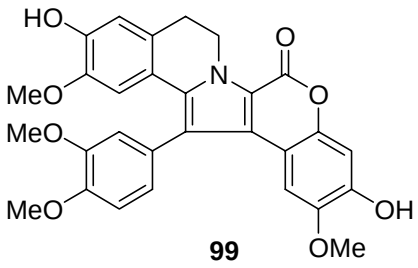

190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
ppm


OH
MeO
MeO
HO
MeO
O
N
O
OH
OMe

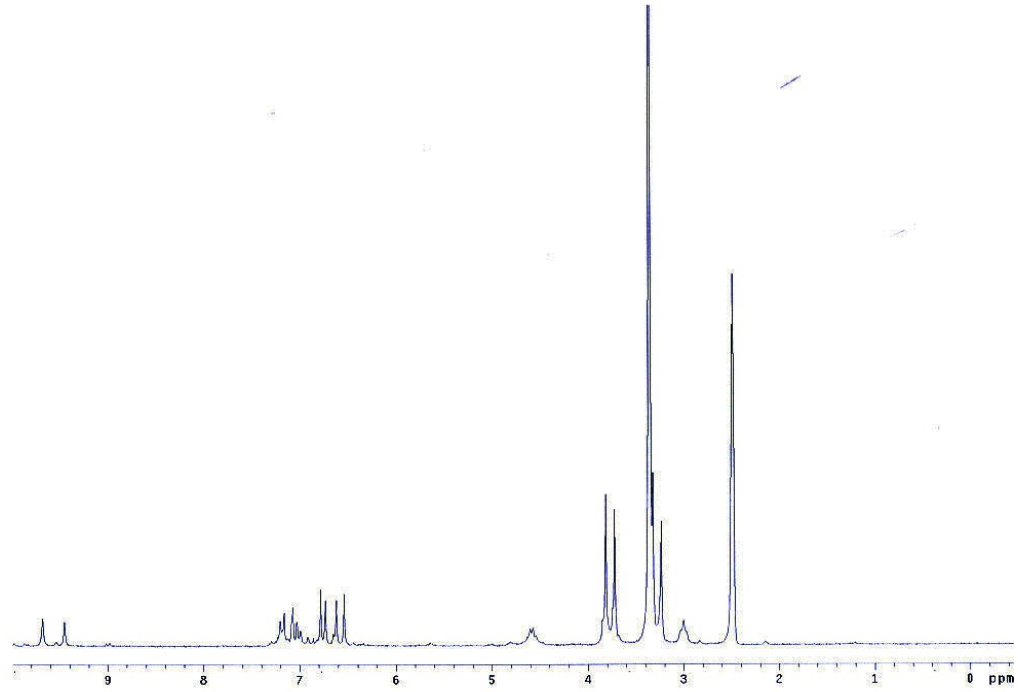
97

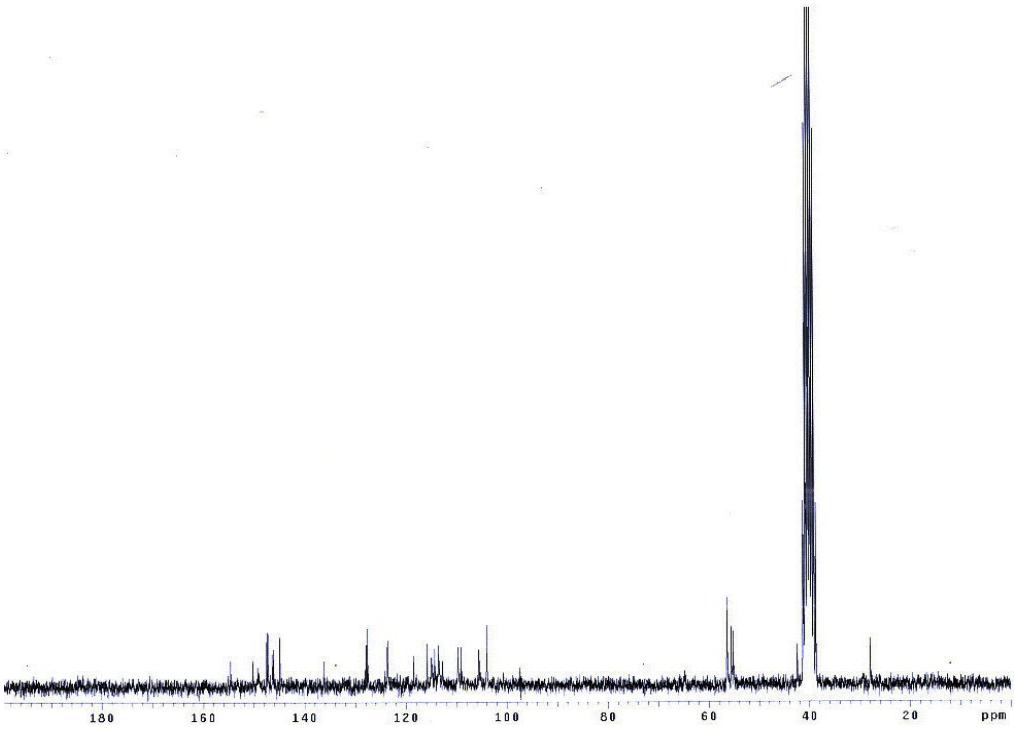

9
8
7
6
5
4
3
2
1
0
ppm

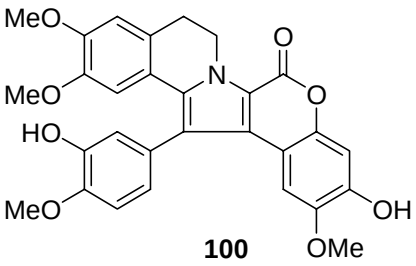

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
MeO
MeO
N
O
O
OH
OMe

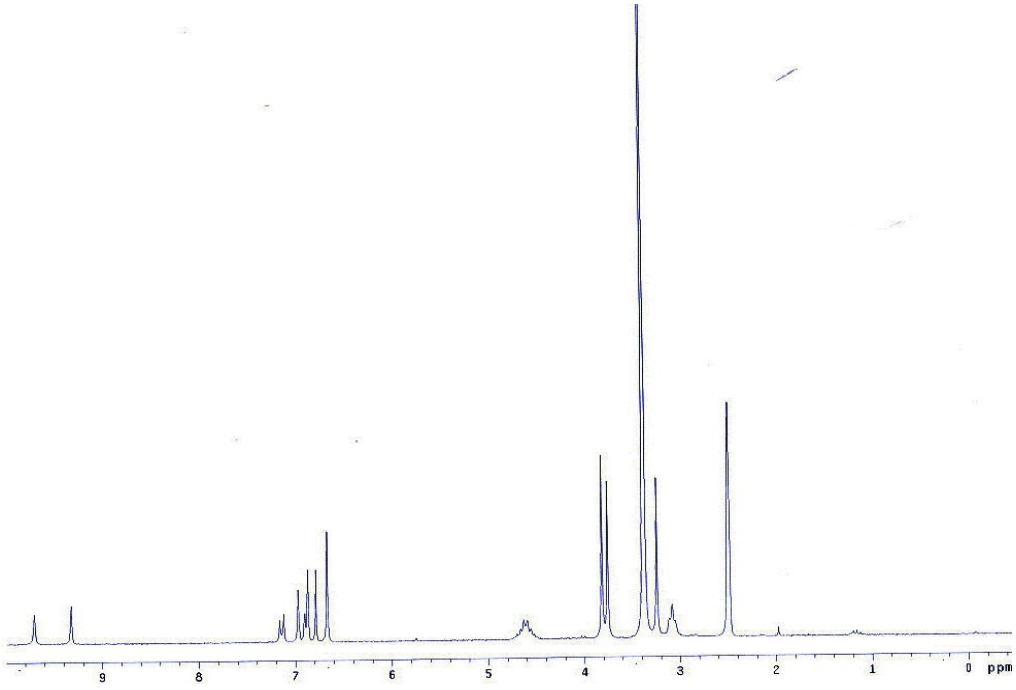
99

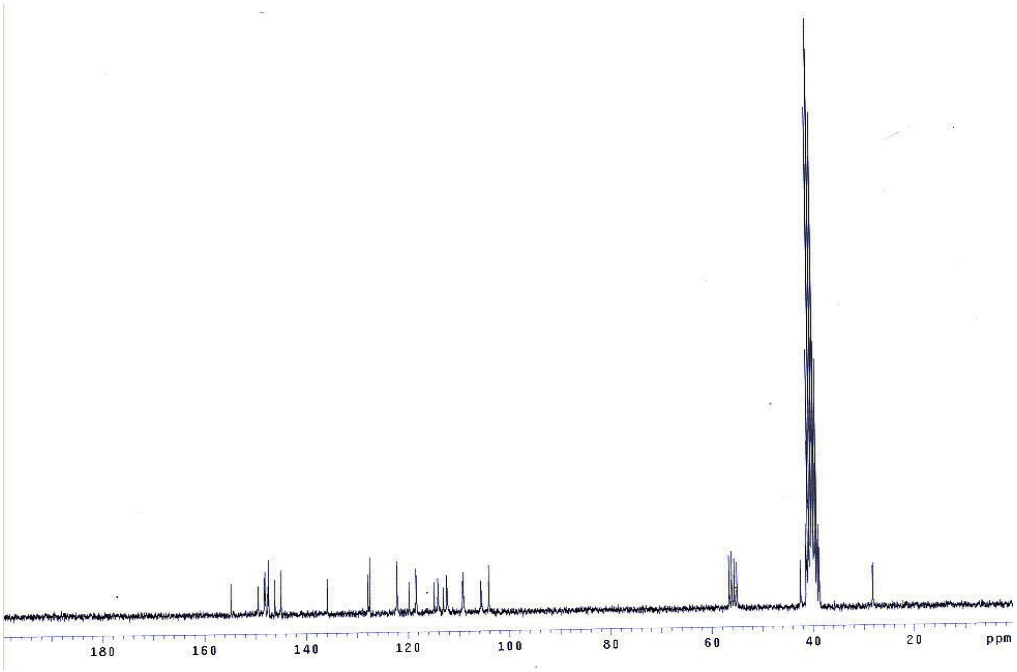

9
8
7
6
5
4
3
2
1
0 ppm

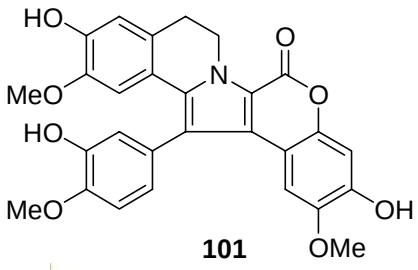

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
HO
MeO
N
O
O
OH
OMe

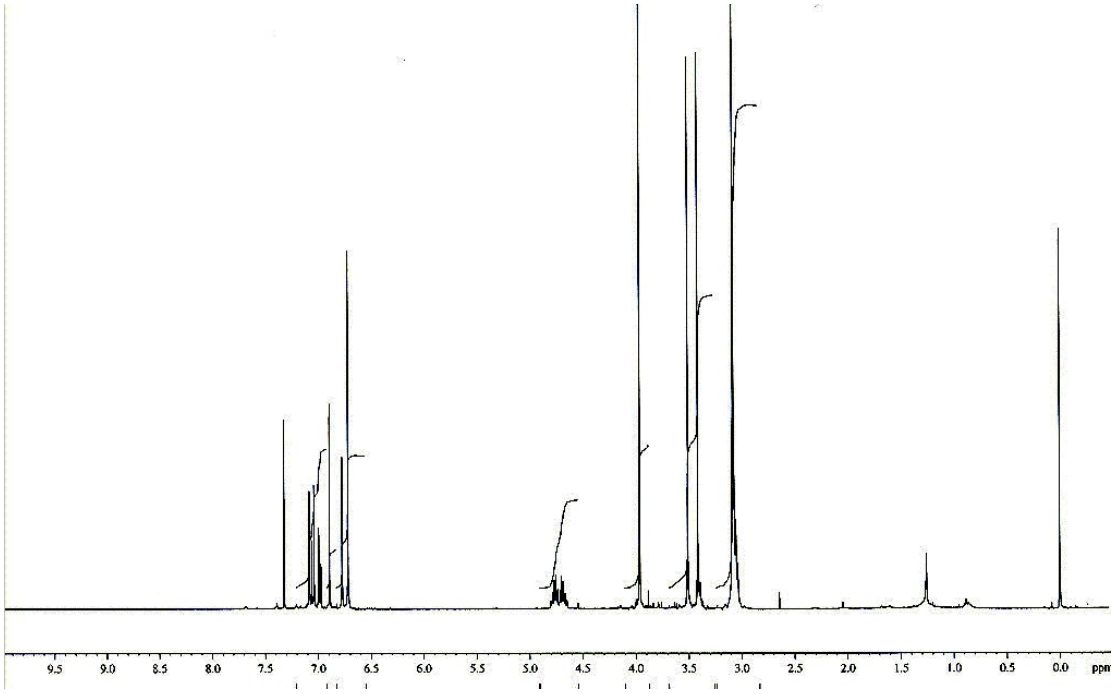
100

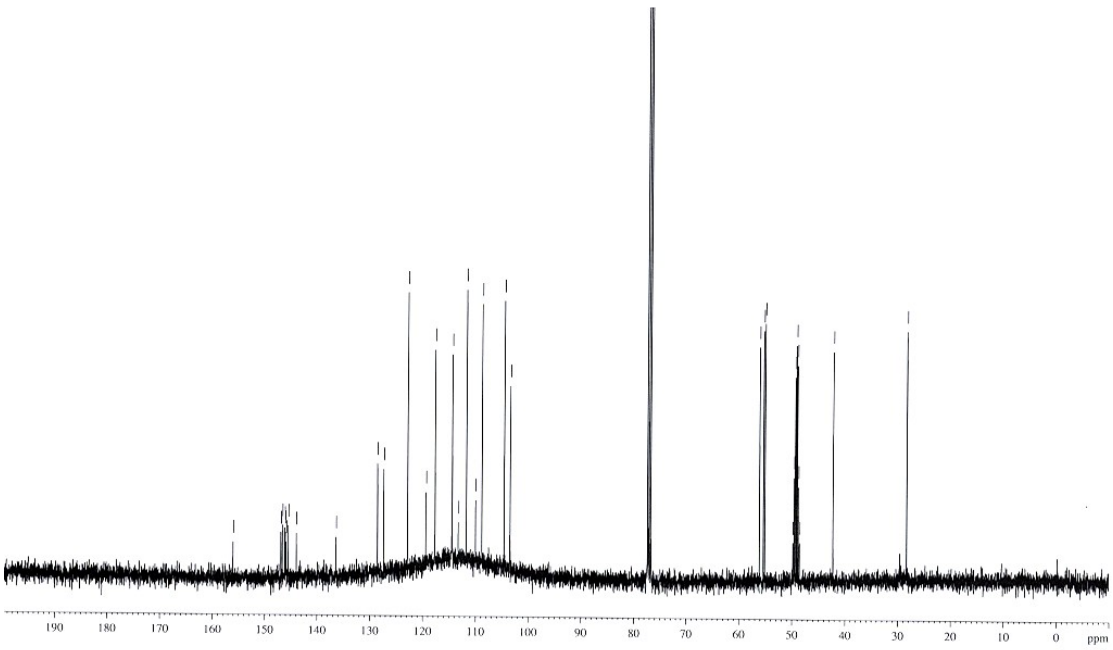

9
8
7
6
5
4
3
2
1
0
ppm

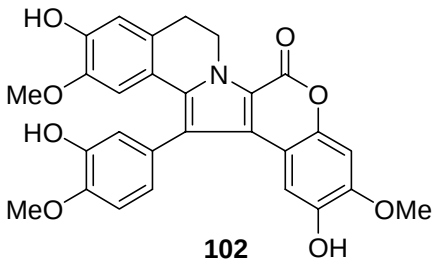

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
HO
MeO
N
O
O
OH
OMe

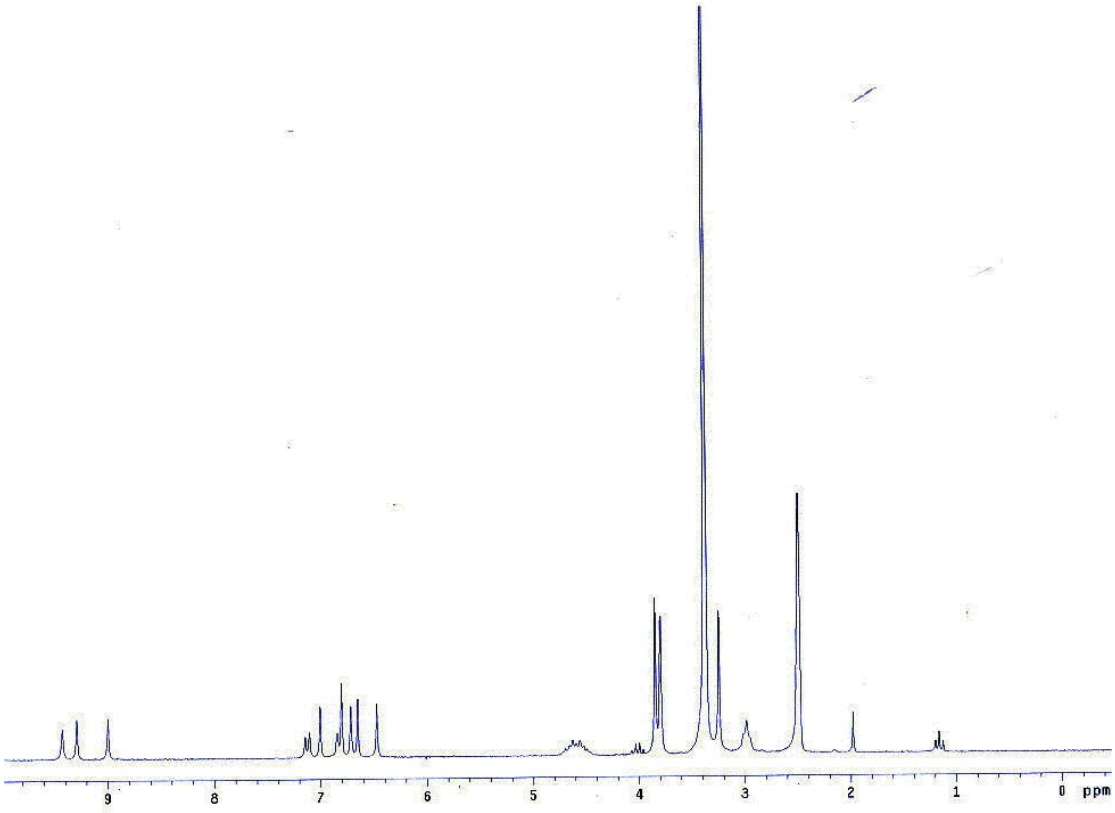
101

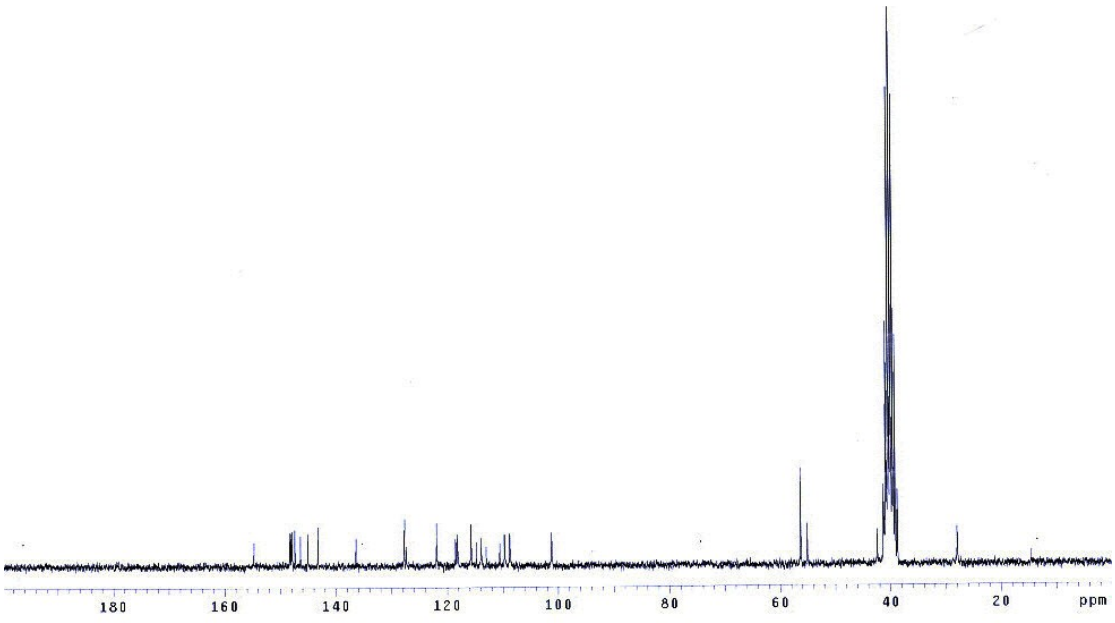

9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

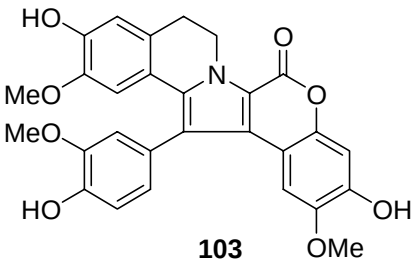

190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm


HO
MeO
HO
MeO
N
O
O
OMe
OH

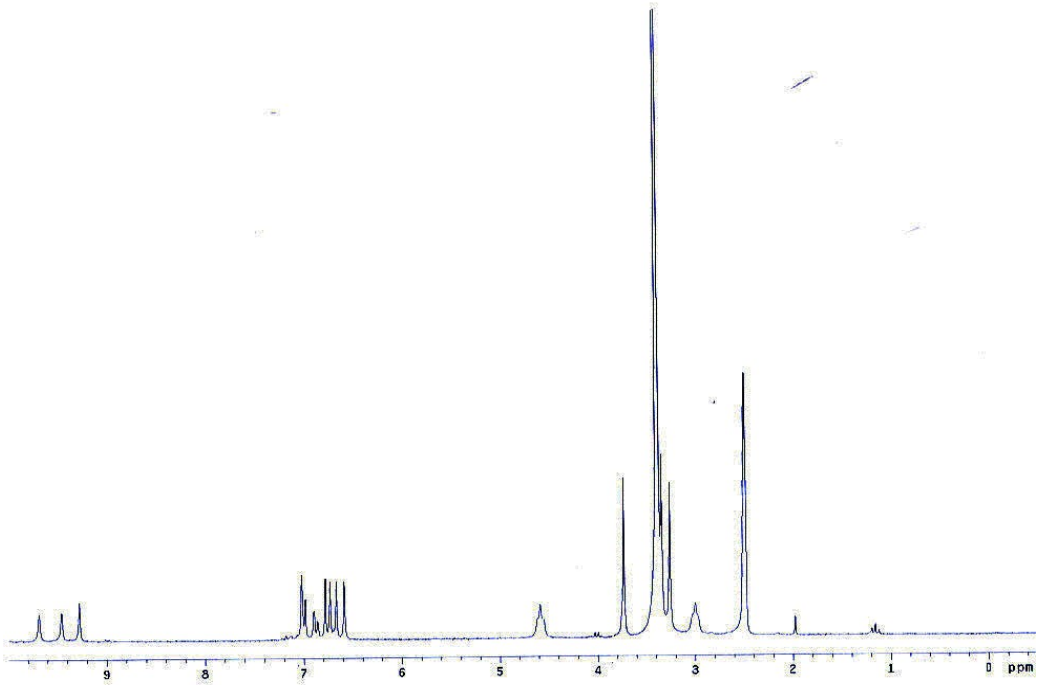
102

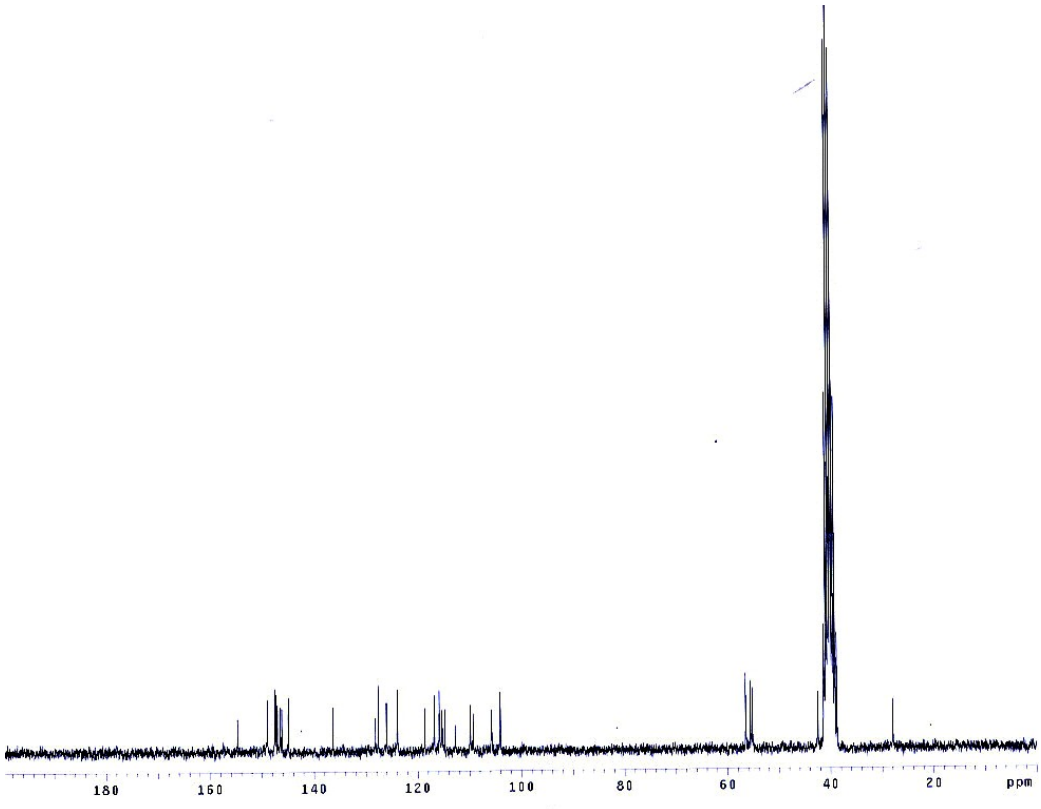

9
8
7
6
5
4
3
2
1
0 ppm

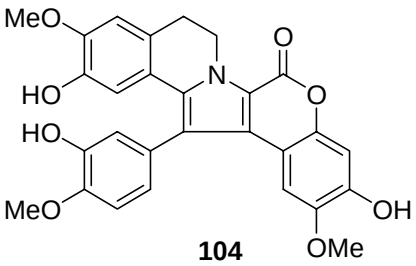

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
MeO
HO
N
O
O
OH
OMe

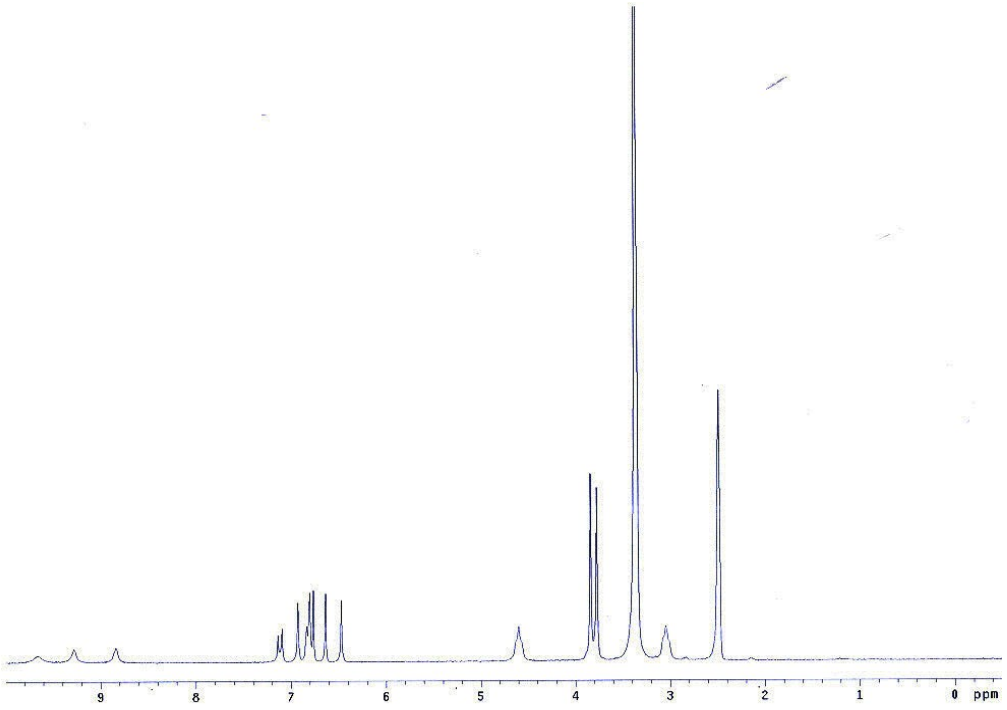
103

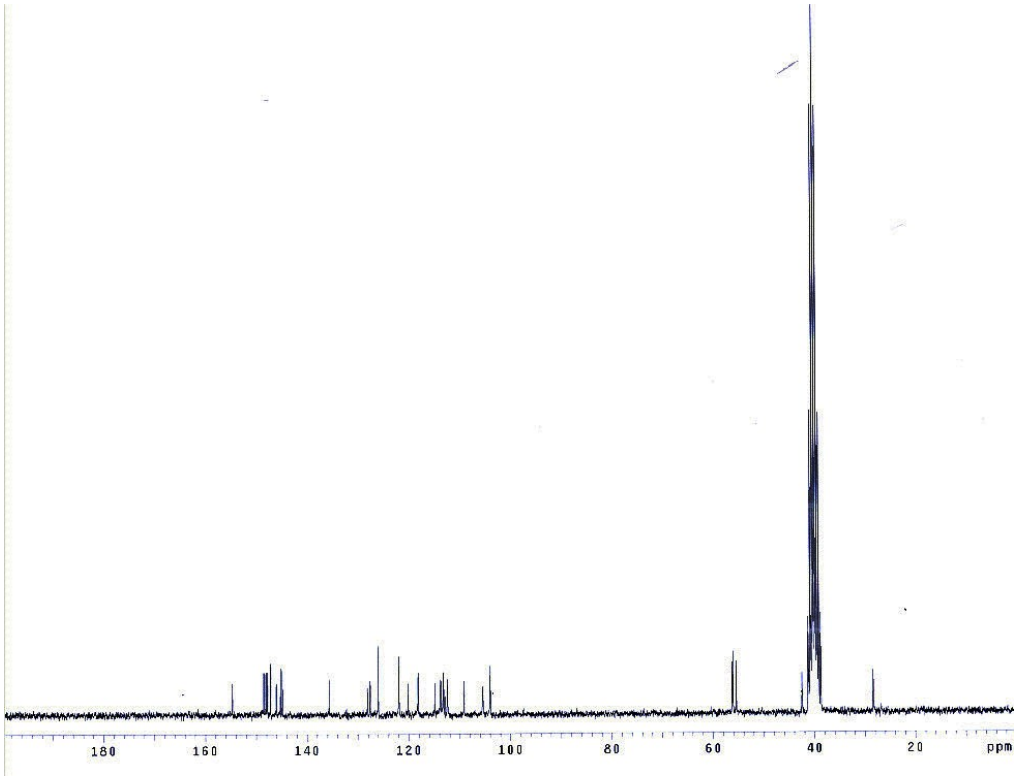

9
8
7
6
5
4
3
2
1
0
ppm

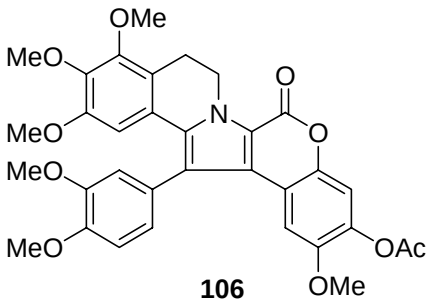

180
160
140
120
100
80
60
40
20
ppm


MeO
HO
HO
MeO
N
O
O
OH
OMe

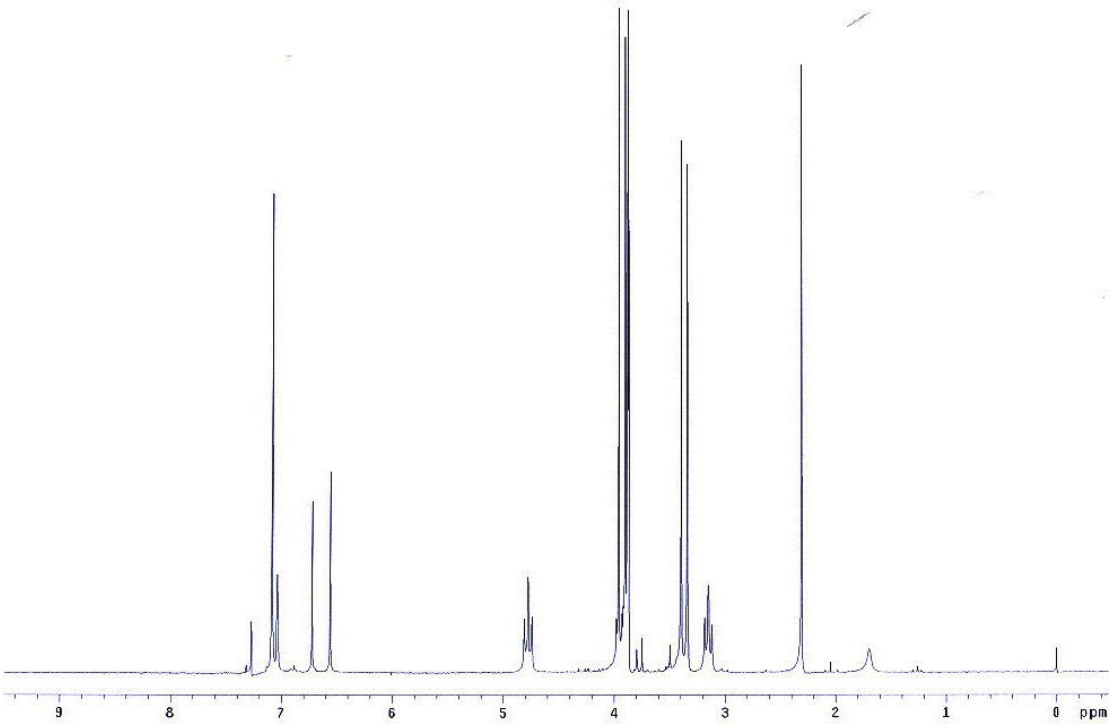
104

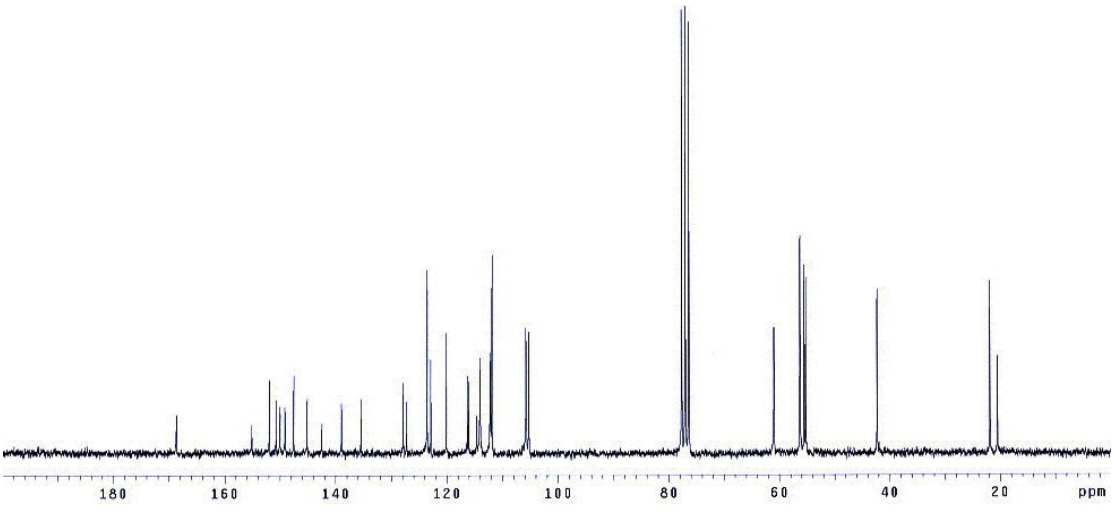

9
8
7
6
5
4
3
2
1
0
ppm

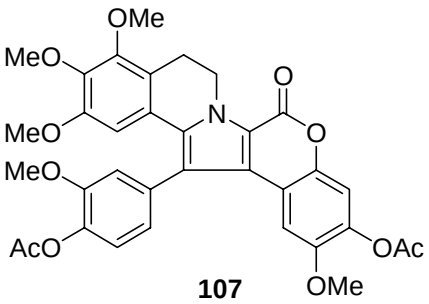

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
MeO
N
O
O
OAc
OMe

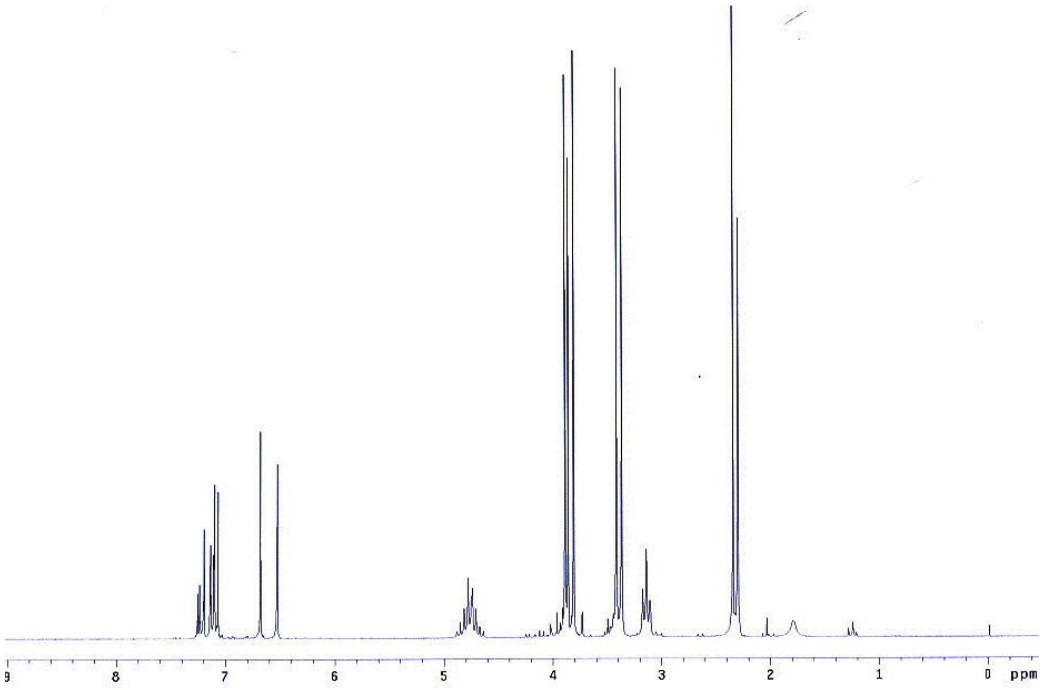
106

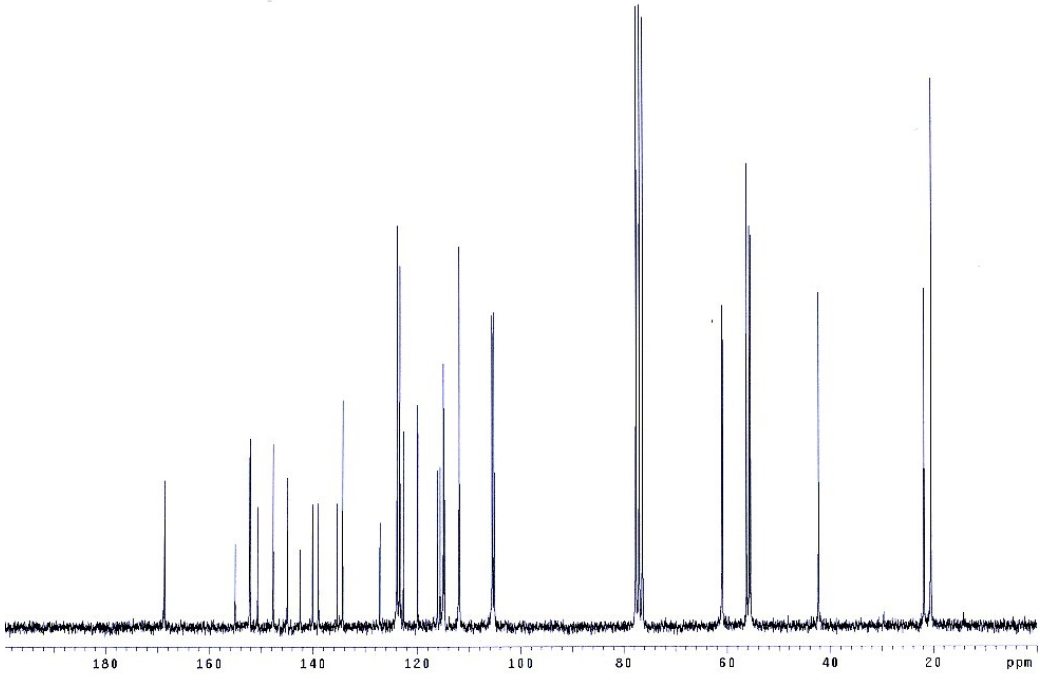

9
8
7
6
5
4
3
2
1
0
ppm

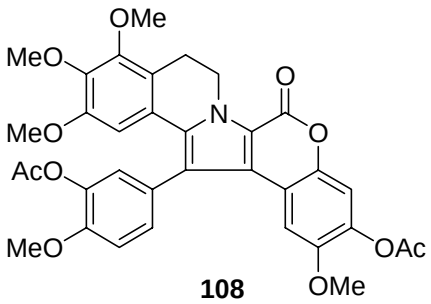

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
AcO
N
O
O
OAc
OMe

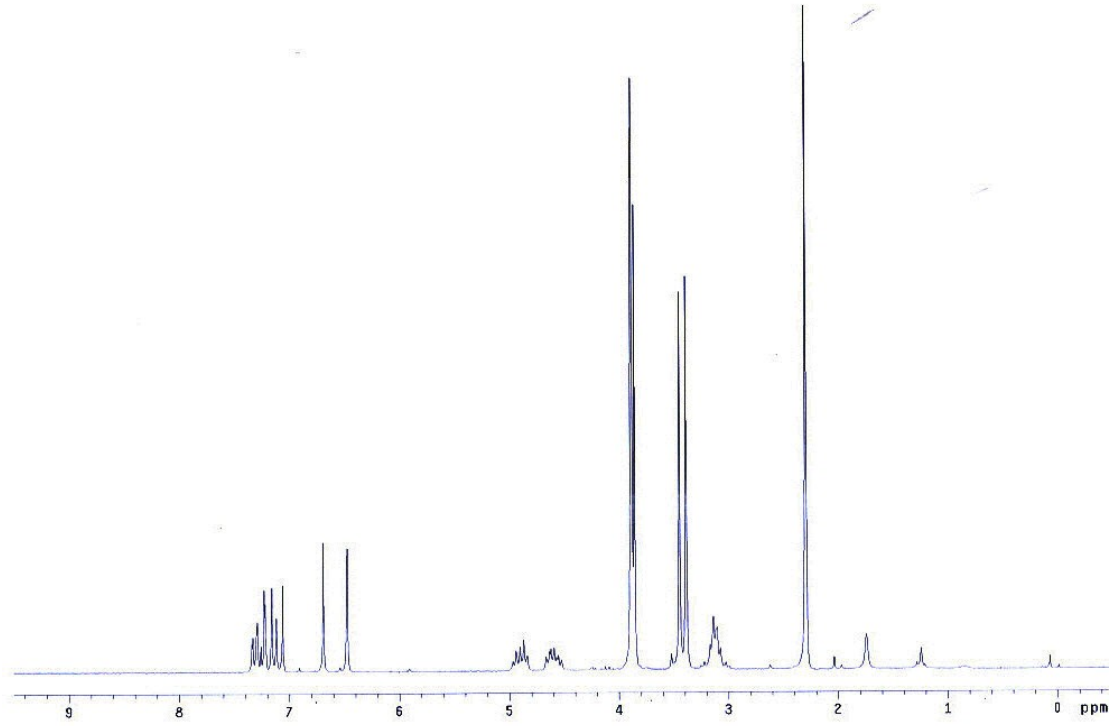
107

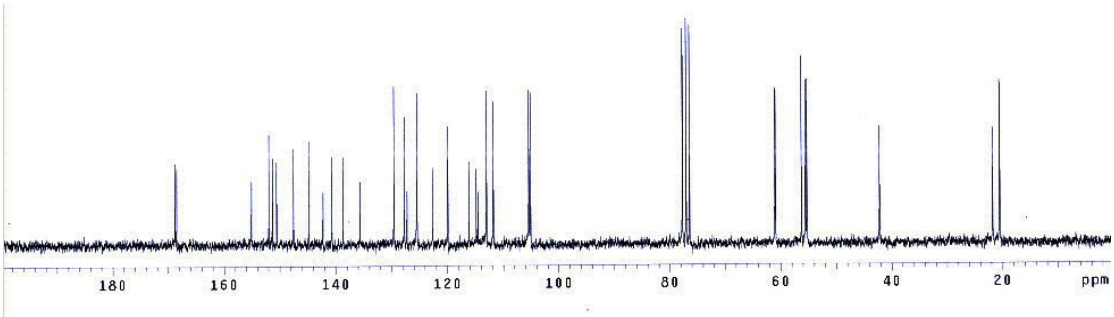

8
7
6
5
4
3
2
1
0
ppm

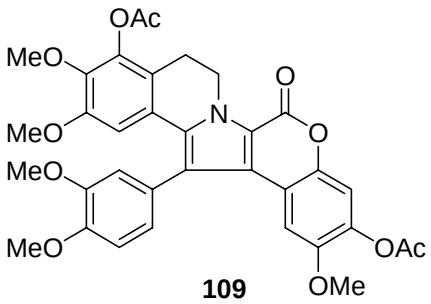

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
O
N
MeO
O
AcO
MeO
OAc
OMe

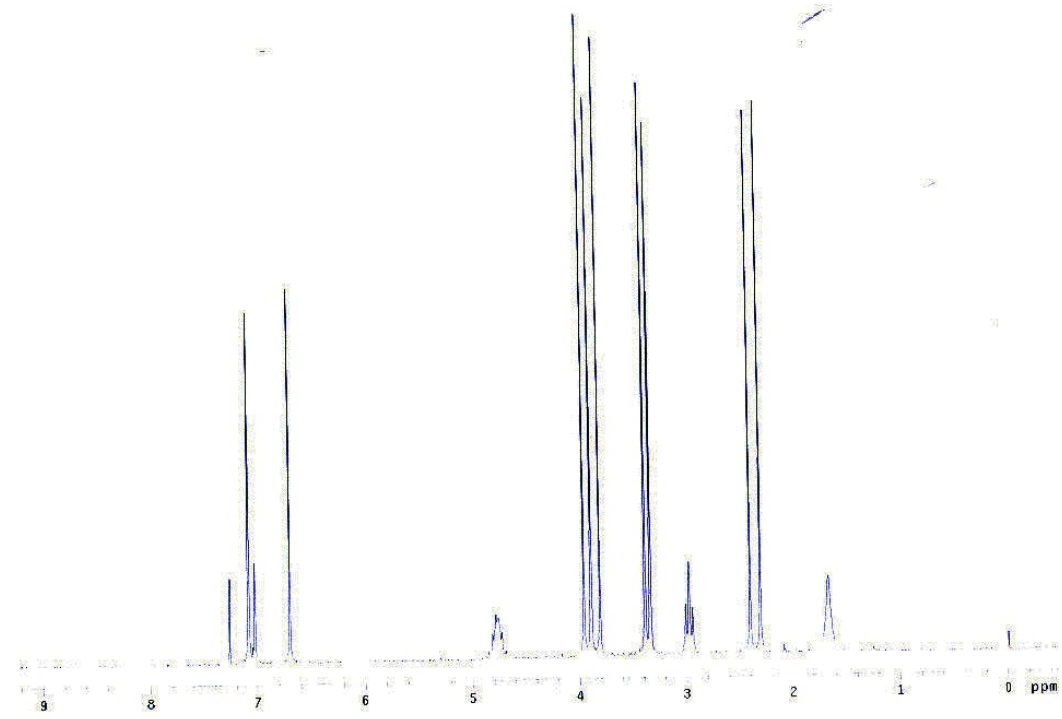
108

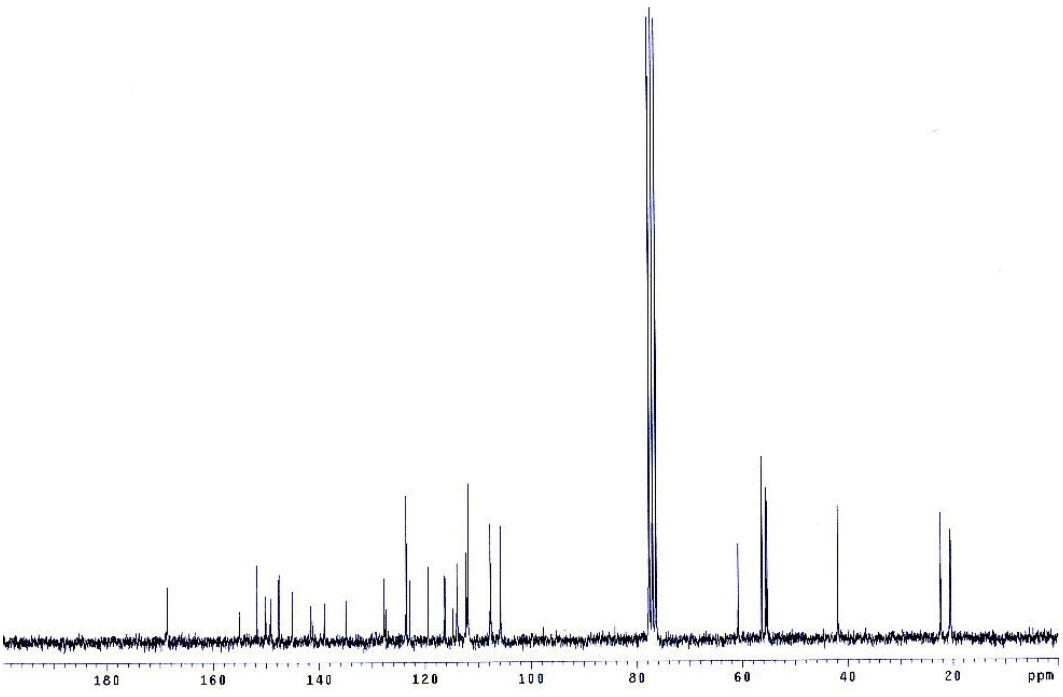

9
8
7
6
5
4
3
2
1
0
ppm

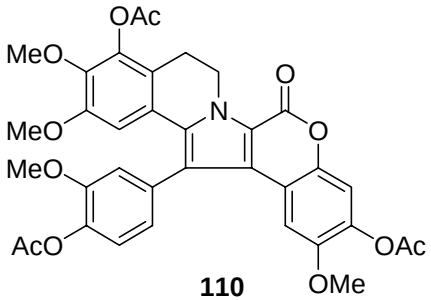

180
160
140
120
100
80
60
40
20
ppm


OAc
MeO
MeO
MeO
MeO
N
O
O
OAc
OMe

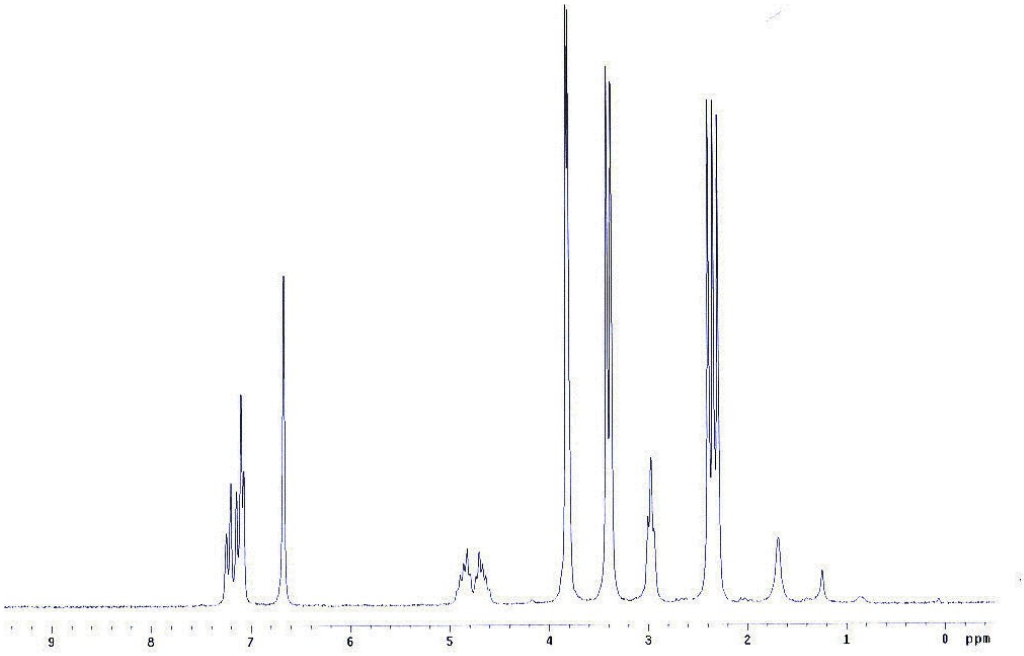
109

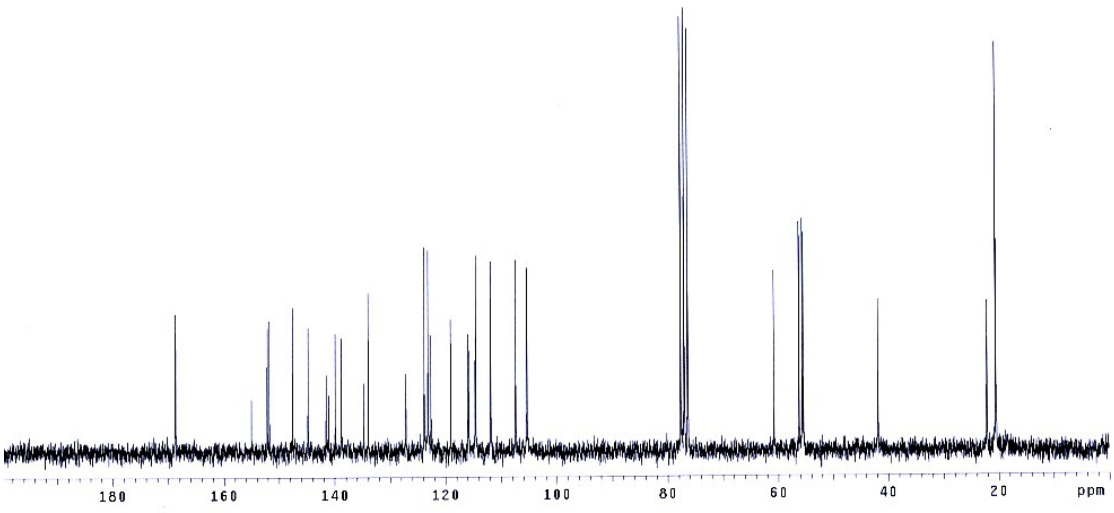

9
8
7
6
5
4
3
2
1
0
ppm

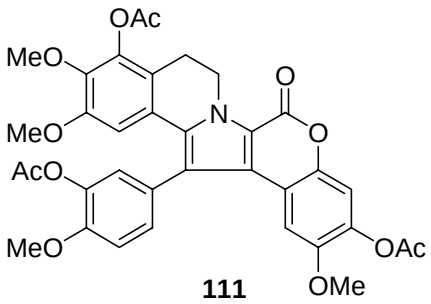

180
160
140
120
100
80
60
40
20
ppm


OAc
MeO
MeO
MeO
AcO
N
O
O
OAc
OMe

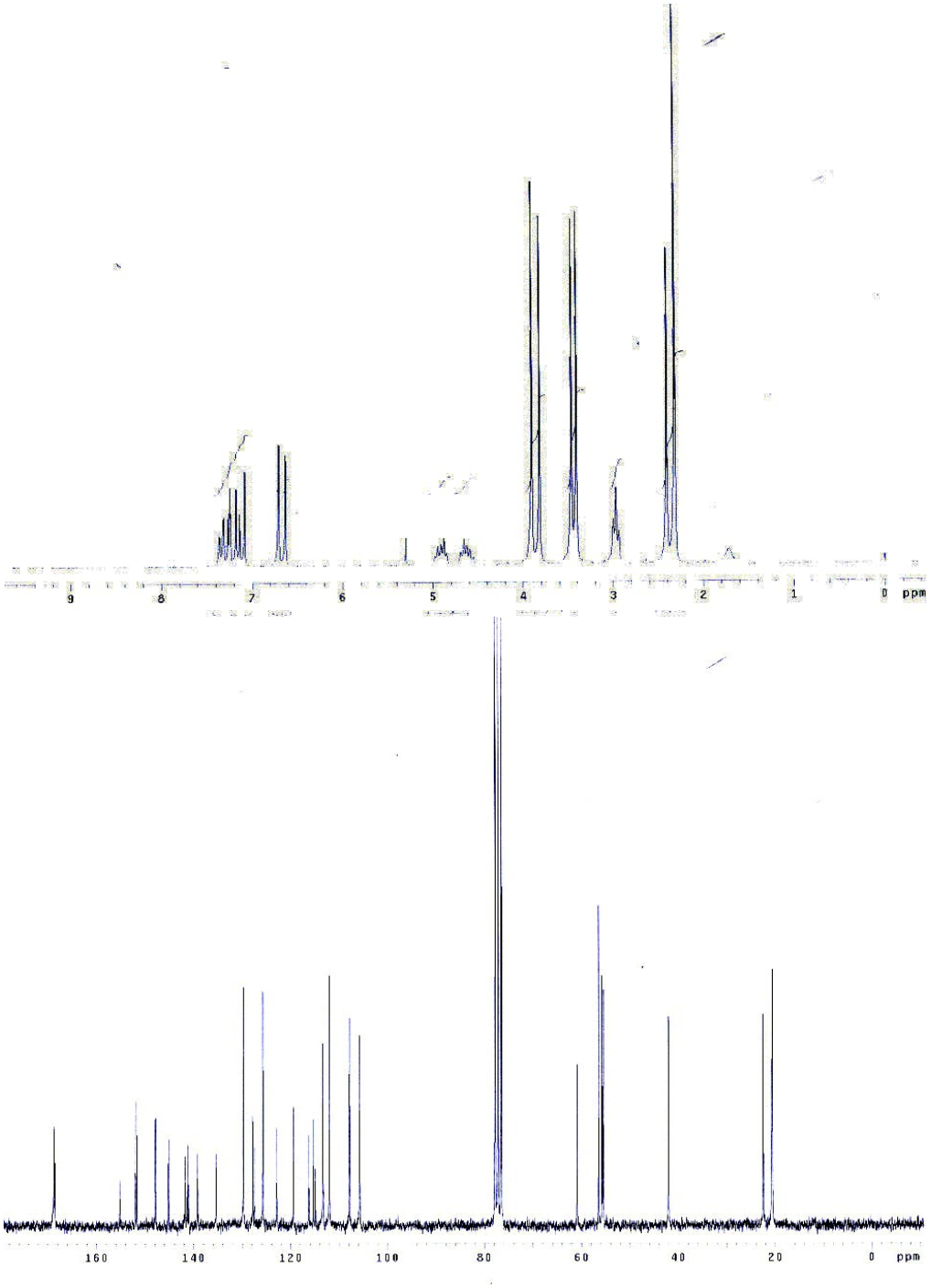
110

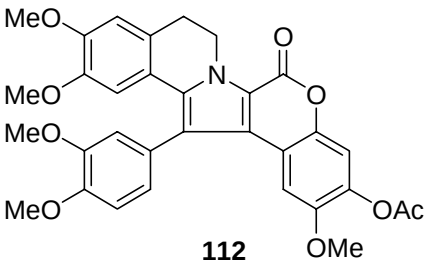

9
8
7
6
5
4
3
2
1
0
ppm


180
160
140
120
100
80
60
40
20
ppm

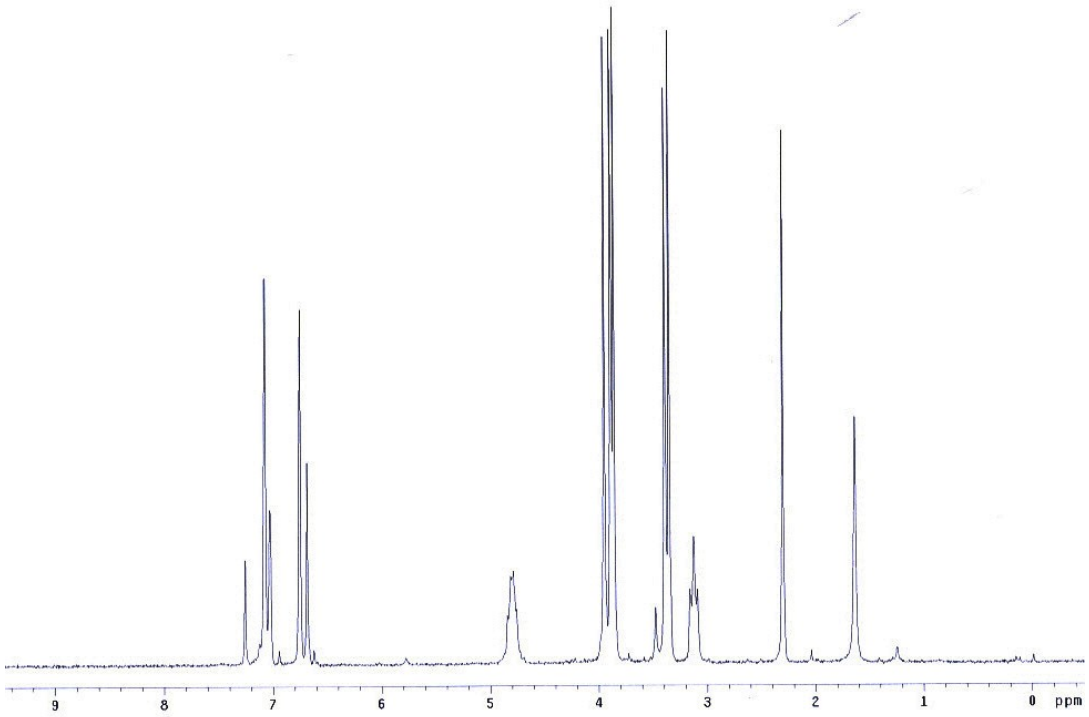

OAc
MeO
MeO
AcO
MeO
O
N
O
OAc
OMe

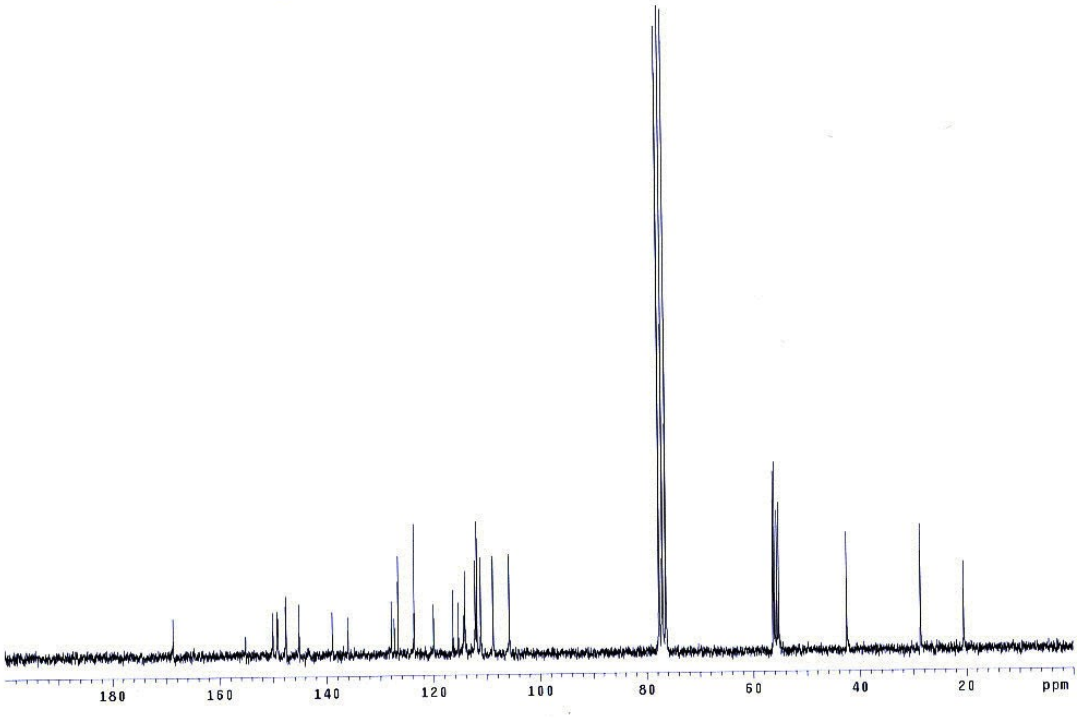
111

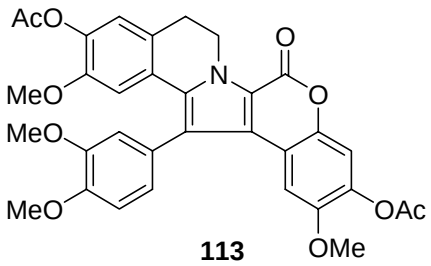

9
8
7
6
5
4
3
2
1
0 ppm
160
140
120
100
80
60
40
20
0 ppm


MeO
MeO
MeO
MeO
N
O
O
OAc
OMe

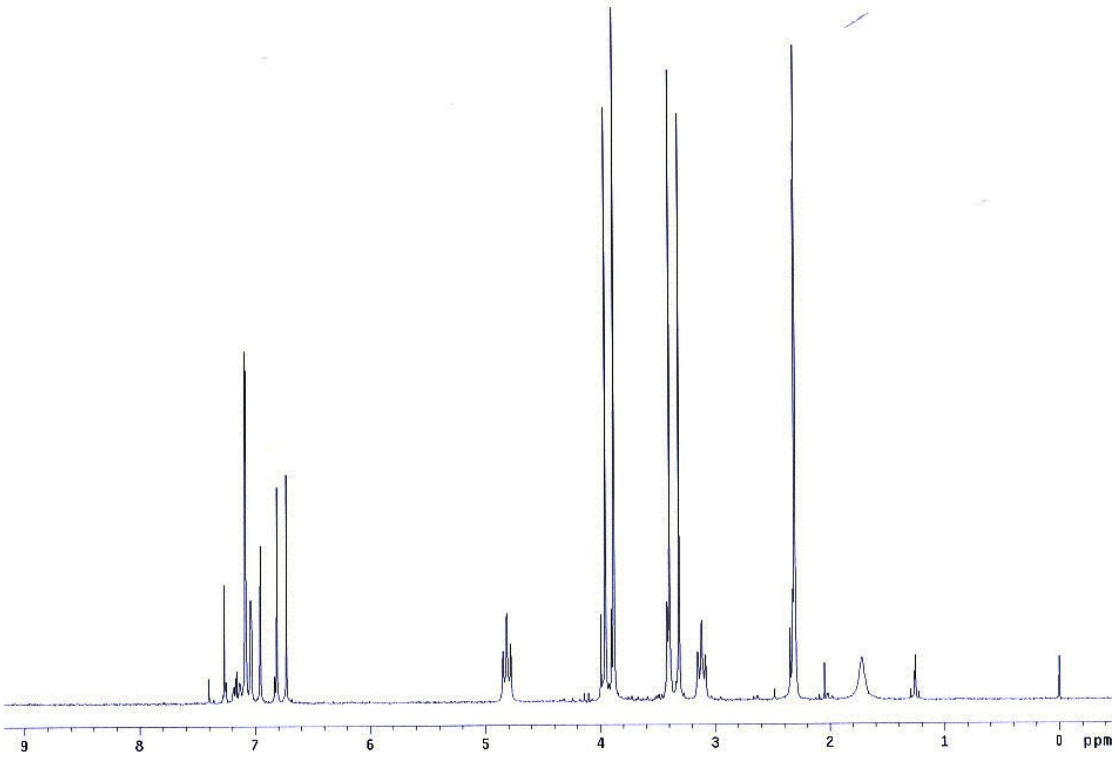
112

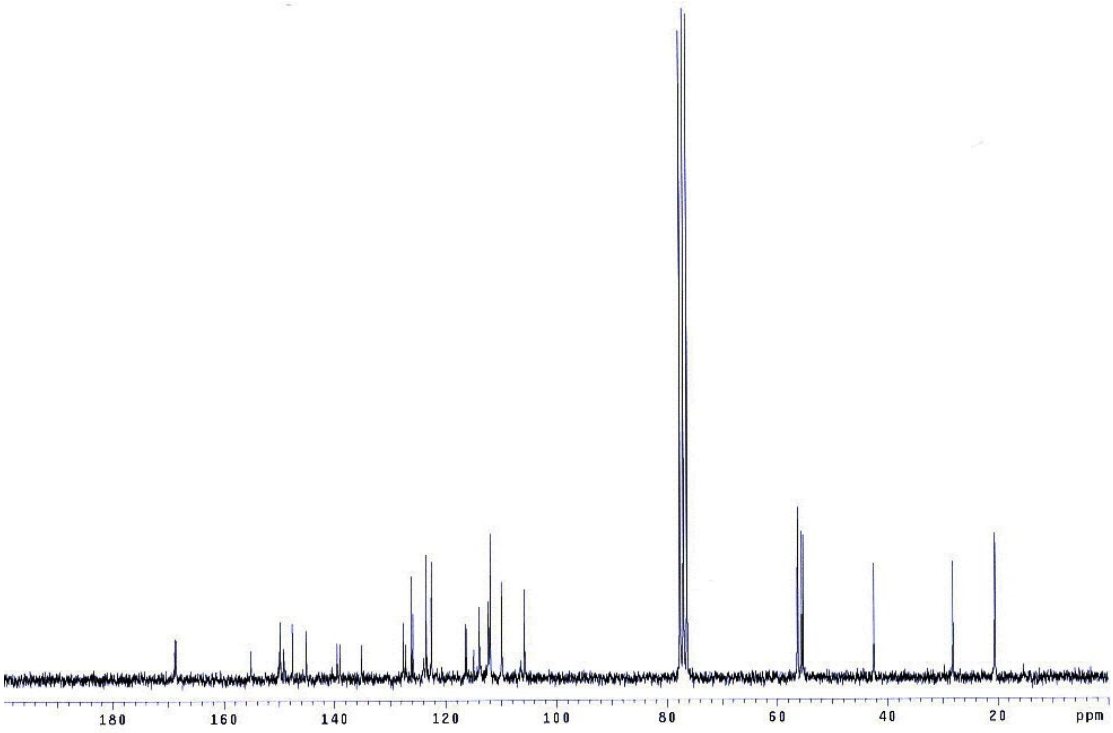

9
8
7
6
5
4
3
2
1
0
ppm

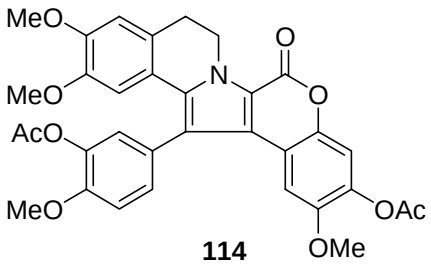

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
MeO
MeO
N
O
O
OAc
OMe

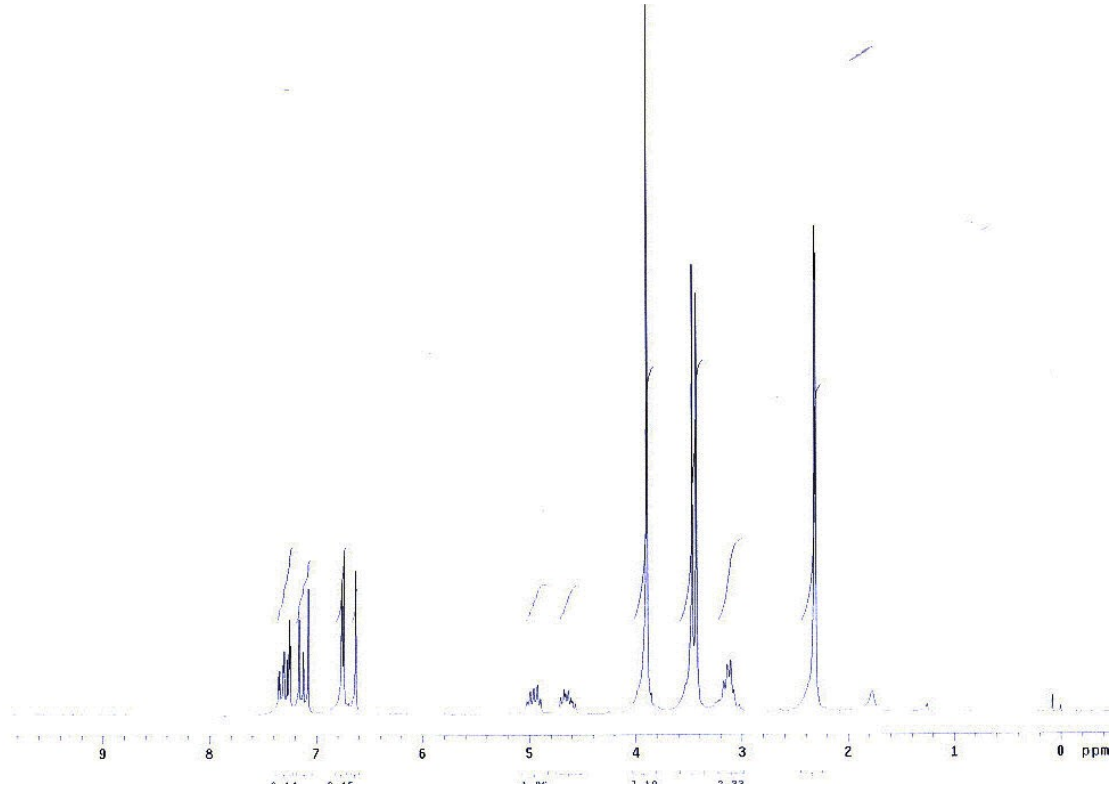
113

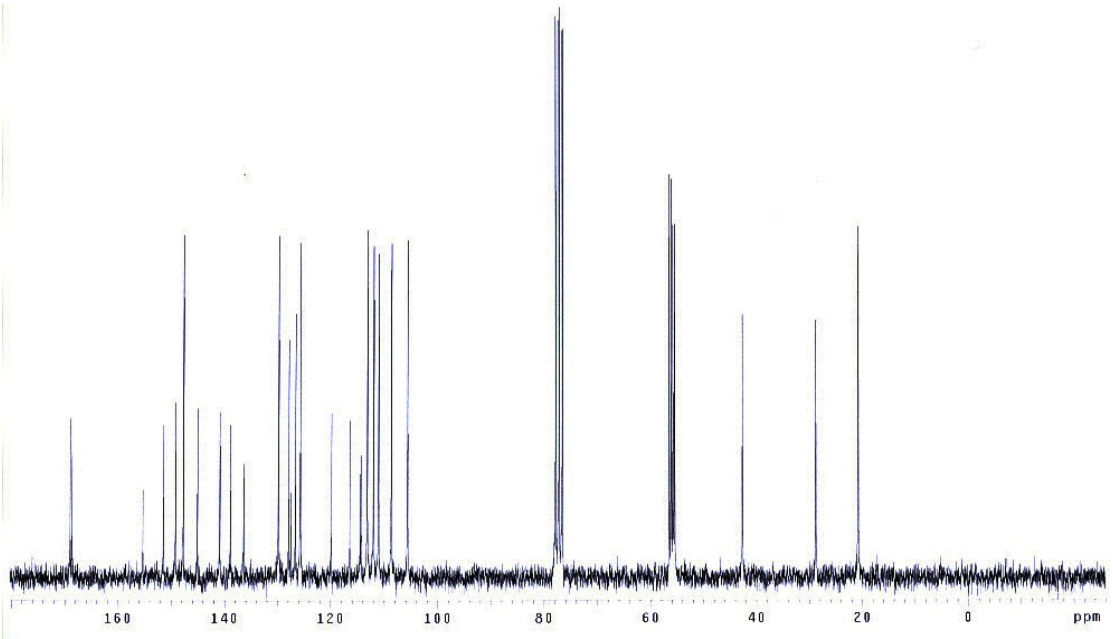

9
8
7
6
5
4
3
2
1
0
ppm

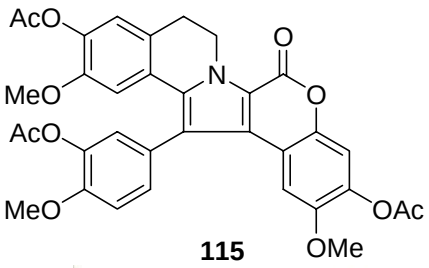

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
AcO
MeO
N
O
O
OAc
OMe

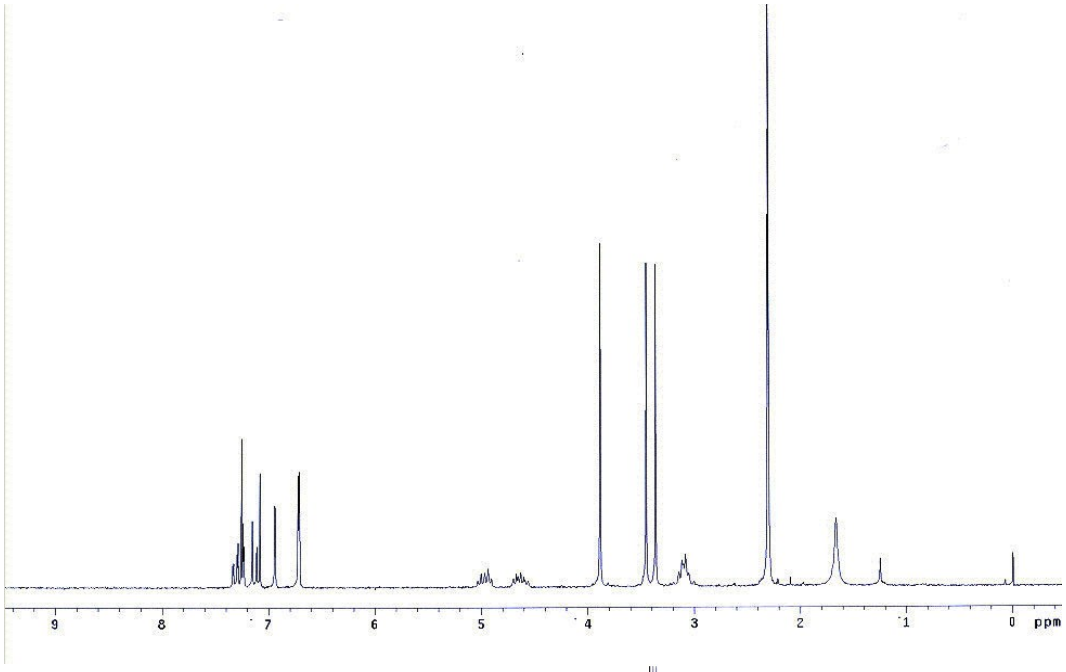
114

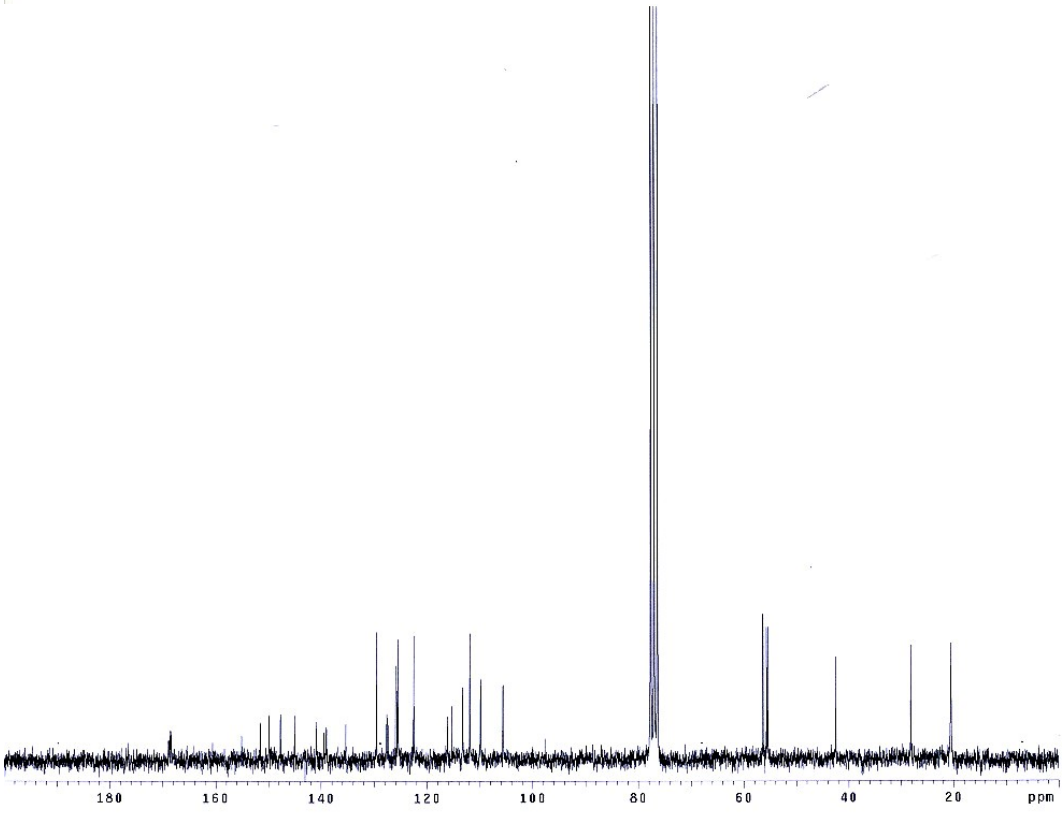

9
8
7
6
5
4
3
2
1
0 ppm

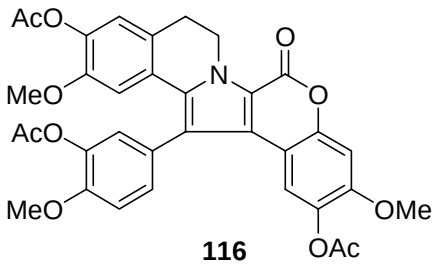

160
140
120
100
80
60
40
20
0
ppm


AcO
MeO
AcO
MeO
N
O
O
OAc
OMe

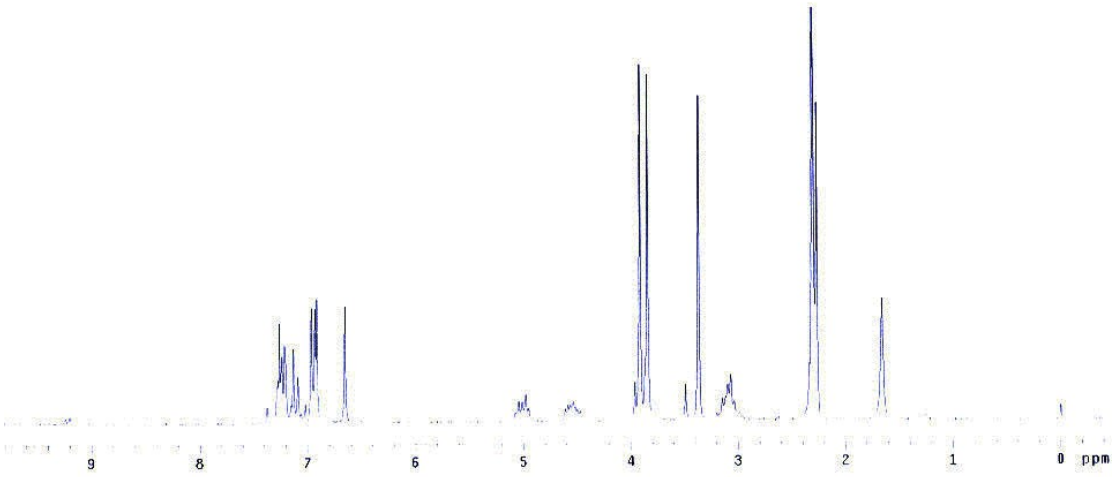
115

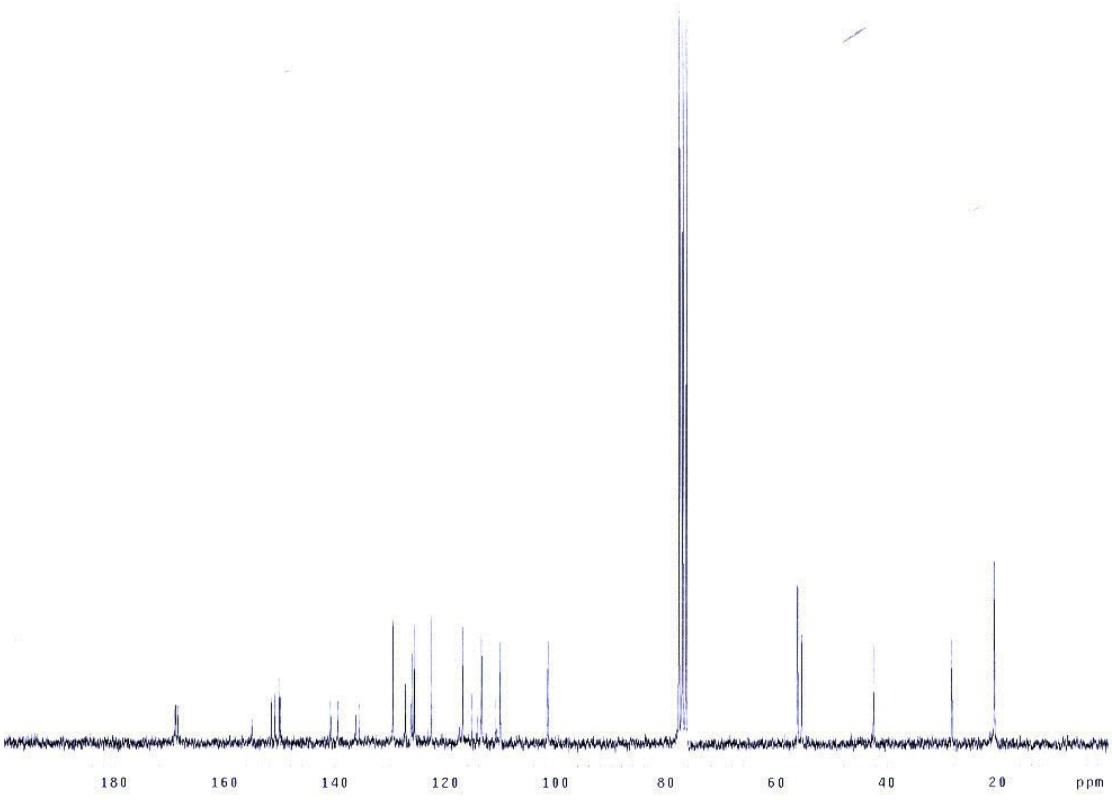

9
8
7
6
5
4
3
2
1
0
ppm

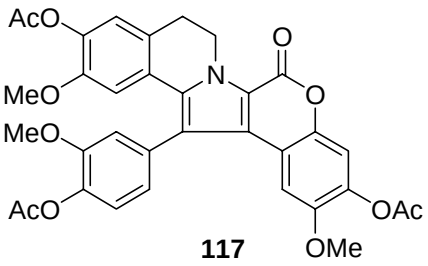

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
AcO
MeO
N
O
O
OMe
OAc

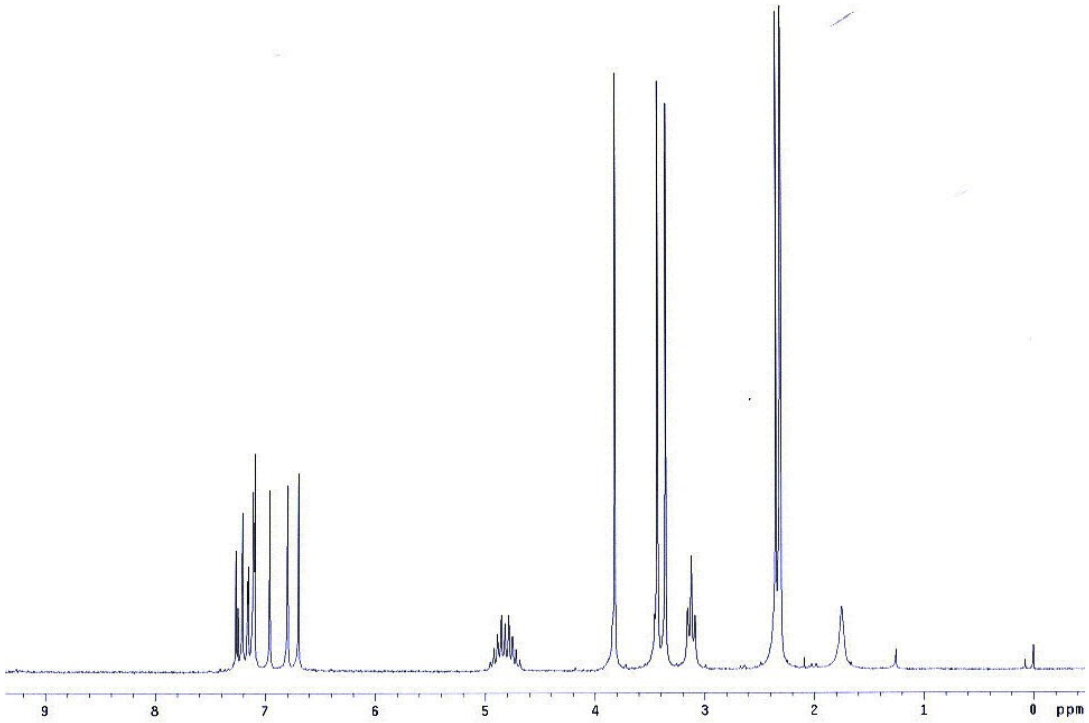
116

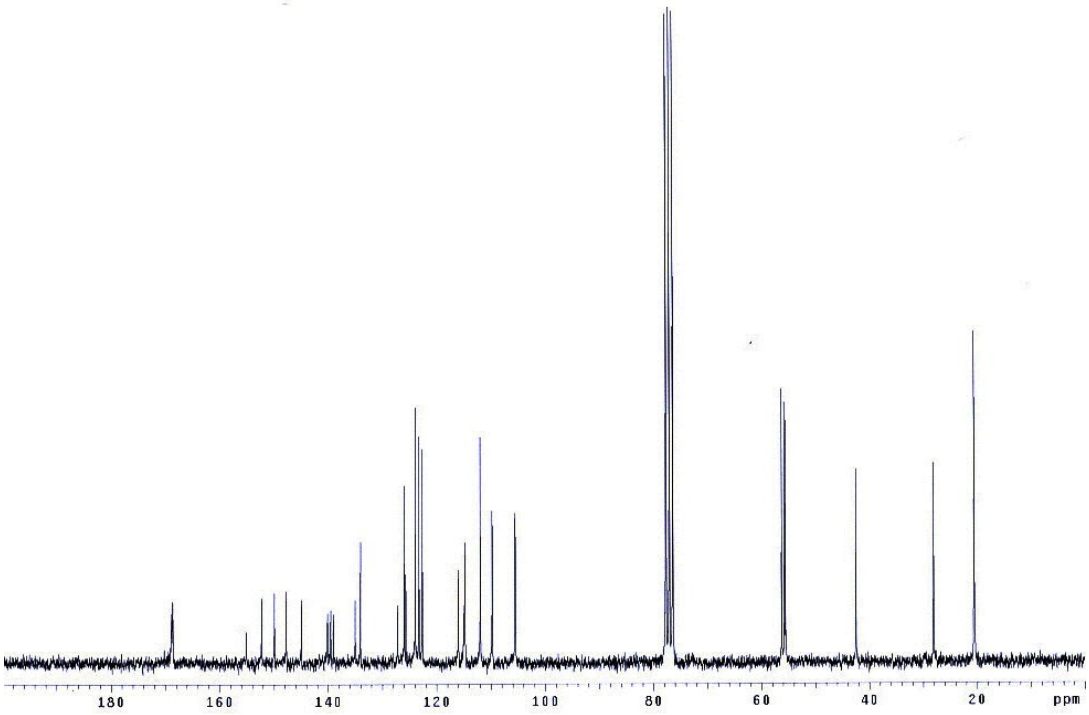

9
8
7
6
5
4
3
2
1
0 ppm

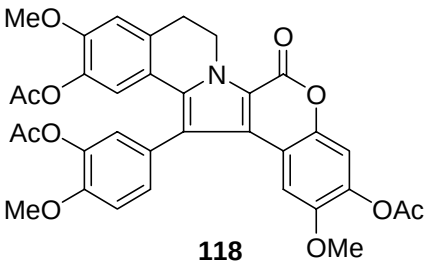

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
MeO
AcO
N
O
O
OAc
OMe

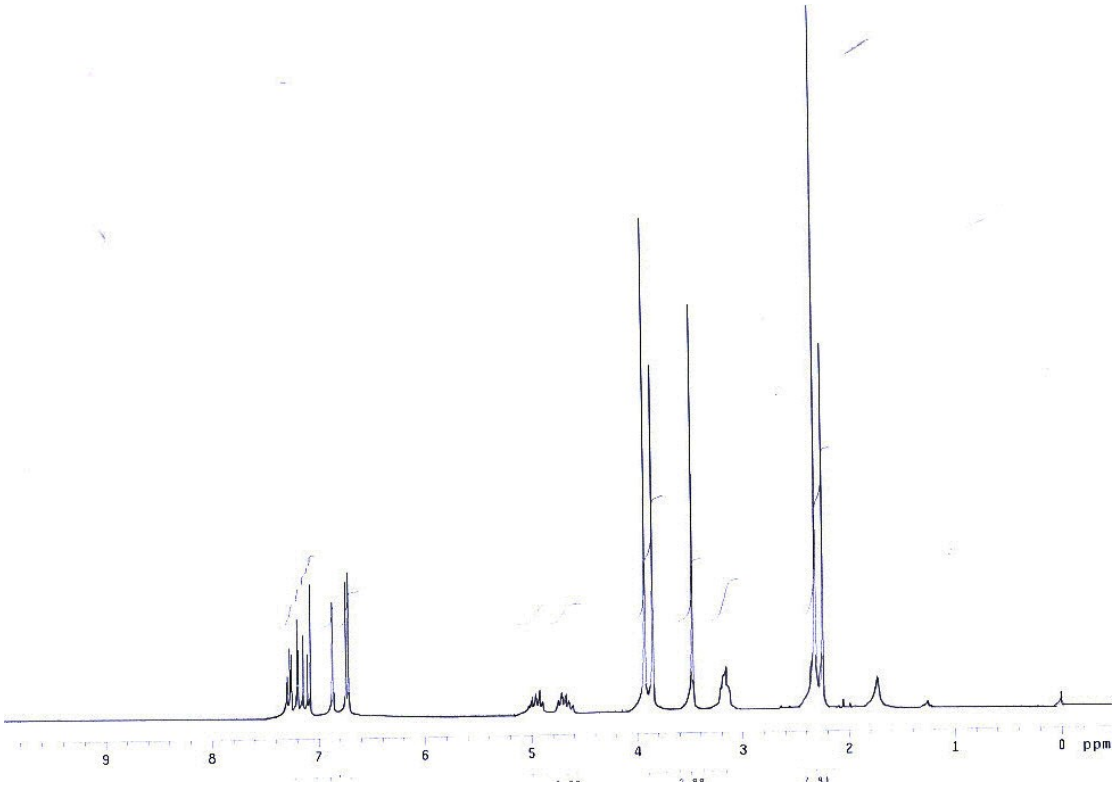
117

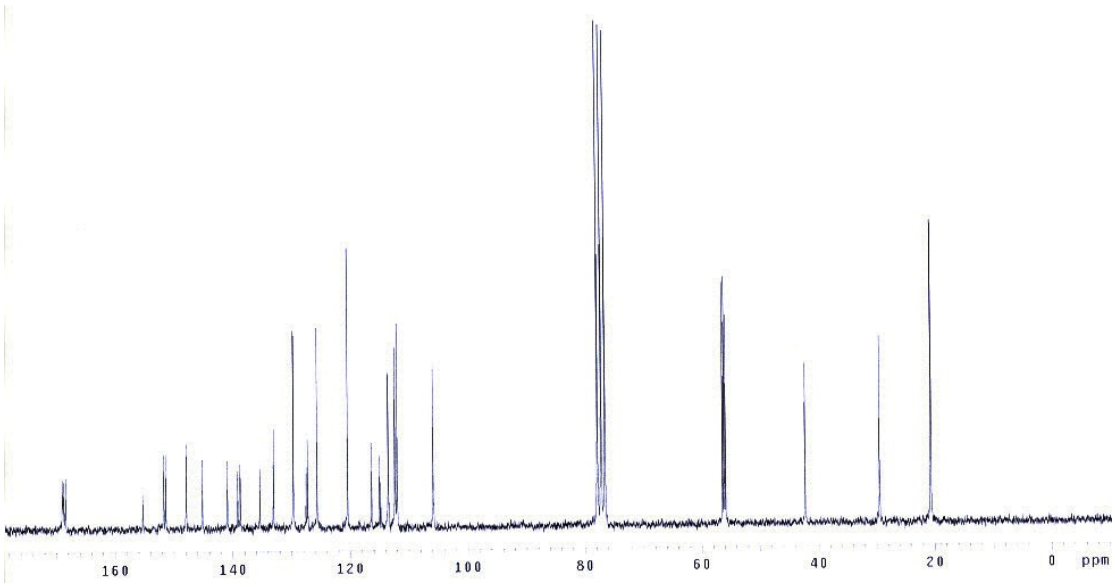

9
8
7
6
5
4
3
2
1
0
ppm

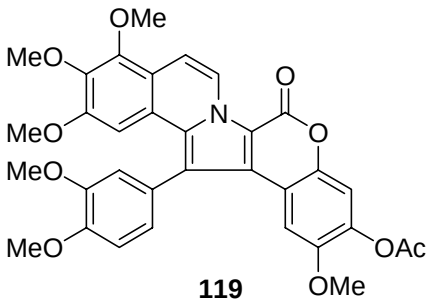

180
160
140
120
100
80
60
40
20
ppm


MeO
AcO
AcO
MeO
N
O
O
OAc
OMe

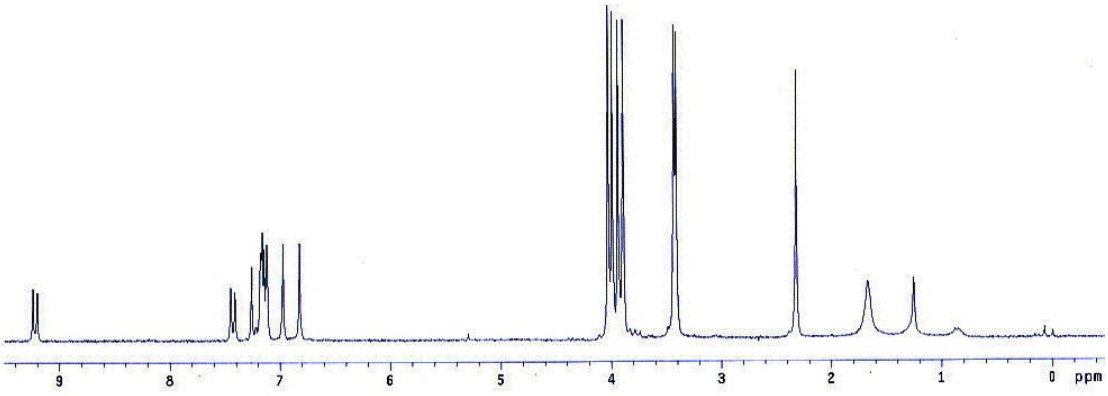
118

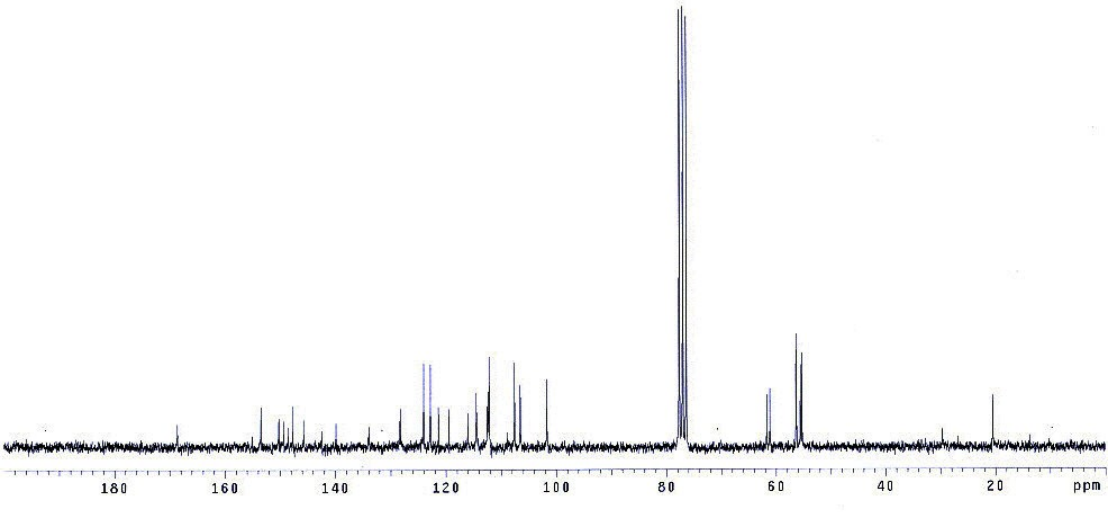

9
8
7
6
5
4
3
2
1
0 ppm

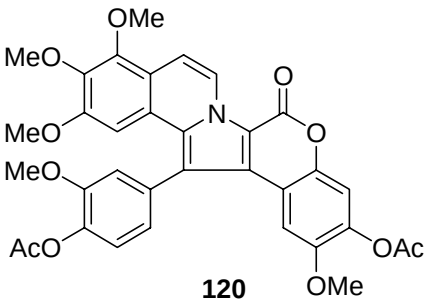

160
140
120
100
80
60
40
20
0 ppm


OMe
MeO
MeO
MeO
MeO
N
O
O
OAc
OMe

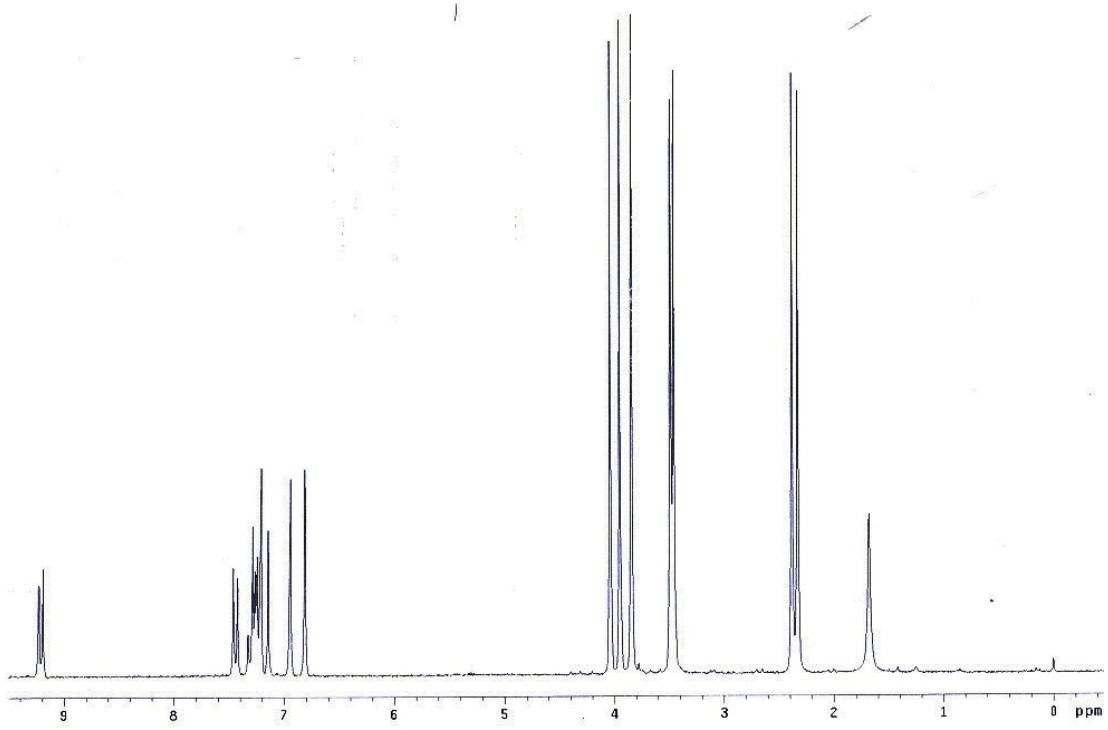
119

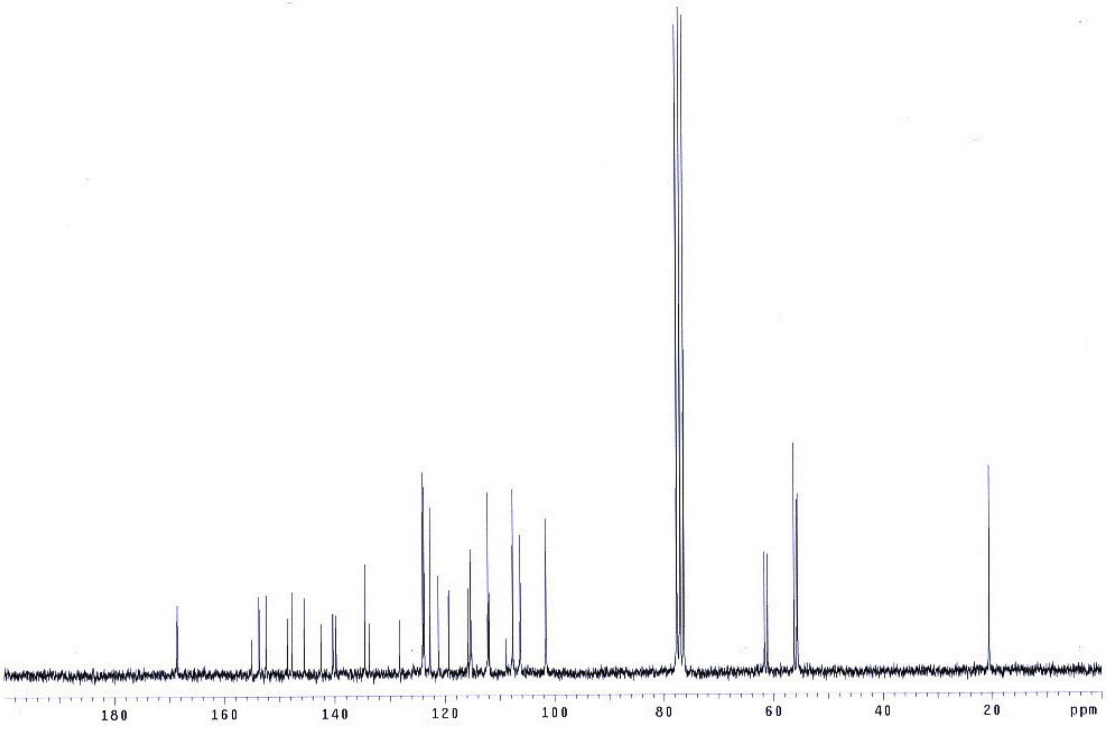

9
8
7
6
5
4
3
2
1
0
ppm

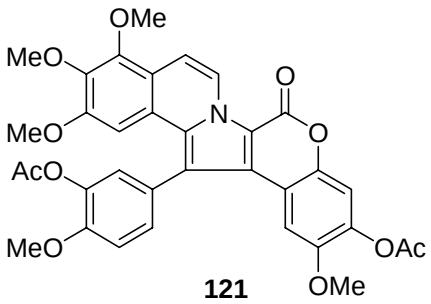

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
AcO
N
O
O
OAc
OMe

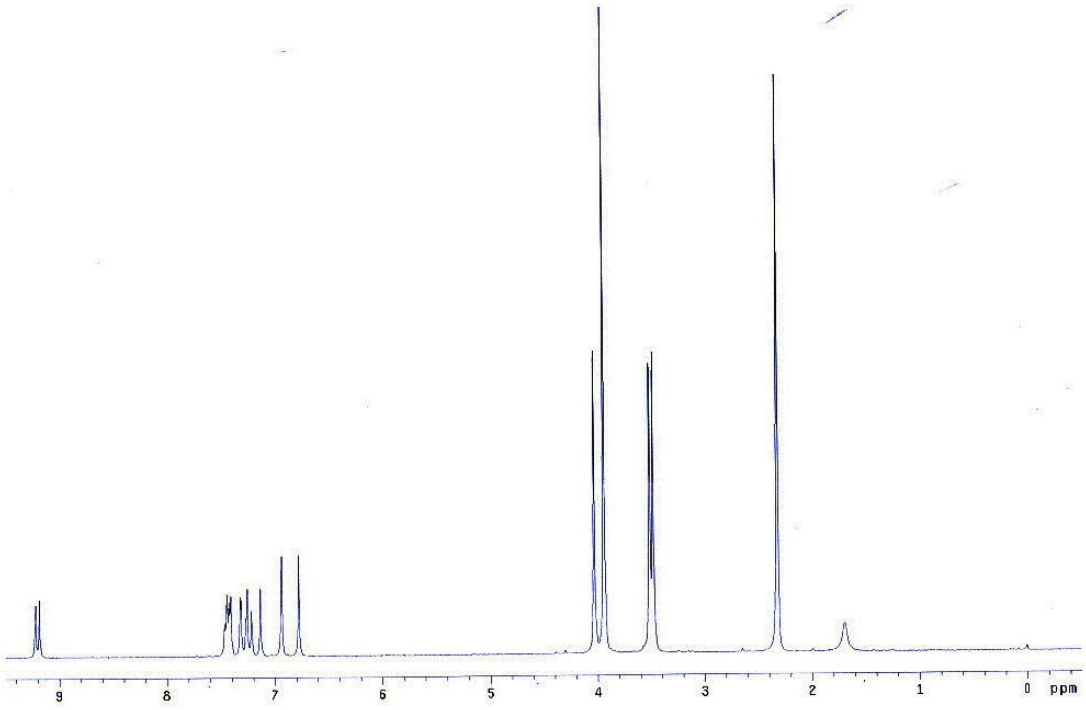
120

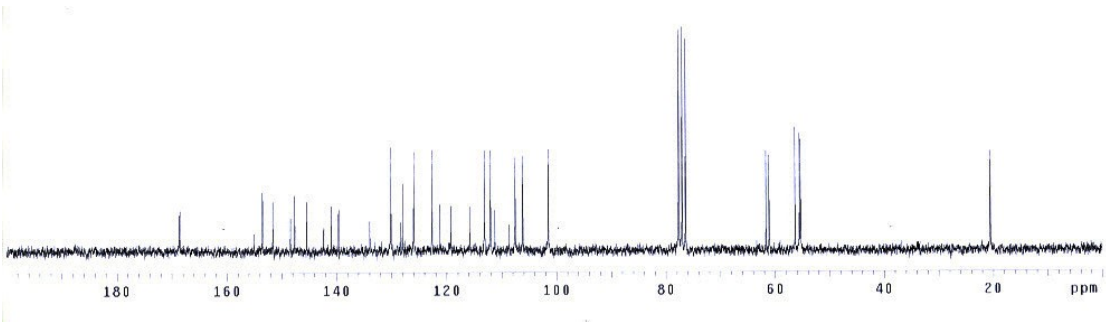

9
8
7
6
5
4
3
2
1
0
ppm

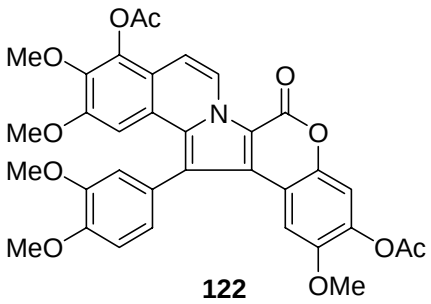

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
AcO
MeO
O
N
O
OAc
OMe

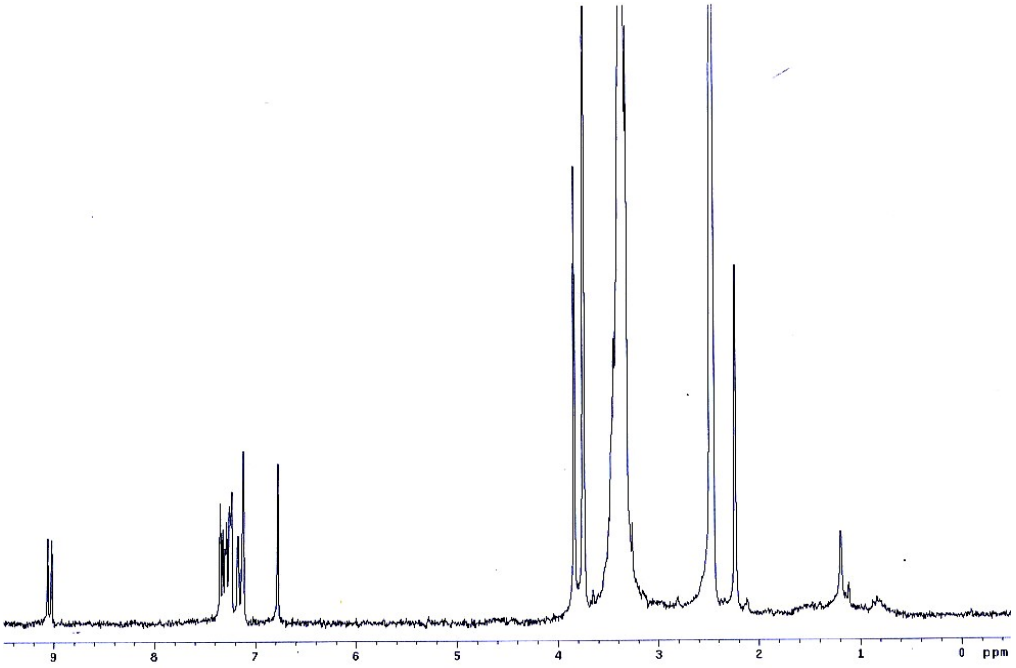
121

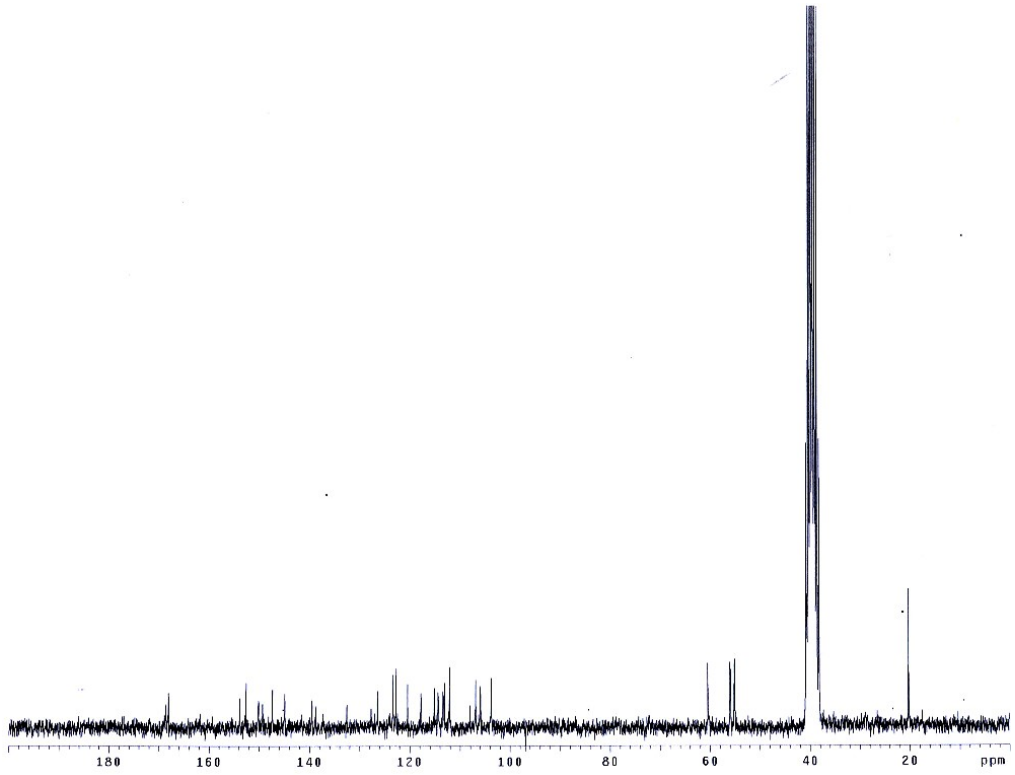

9
8
7
6
5
4
3
2
1
0
ppm

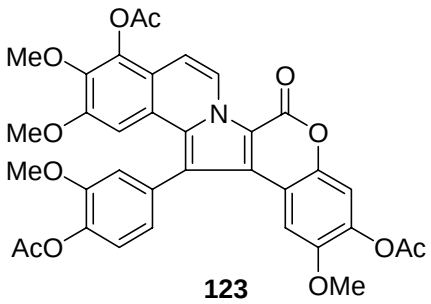

180
160
140
120
100
80
60
40
20
ppm


OAc
MeO
MeO
MeO
MeO
O
N
O
OAc
OMe

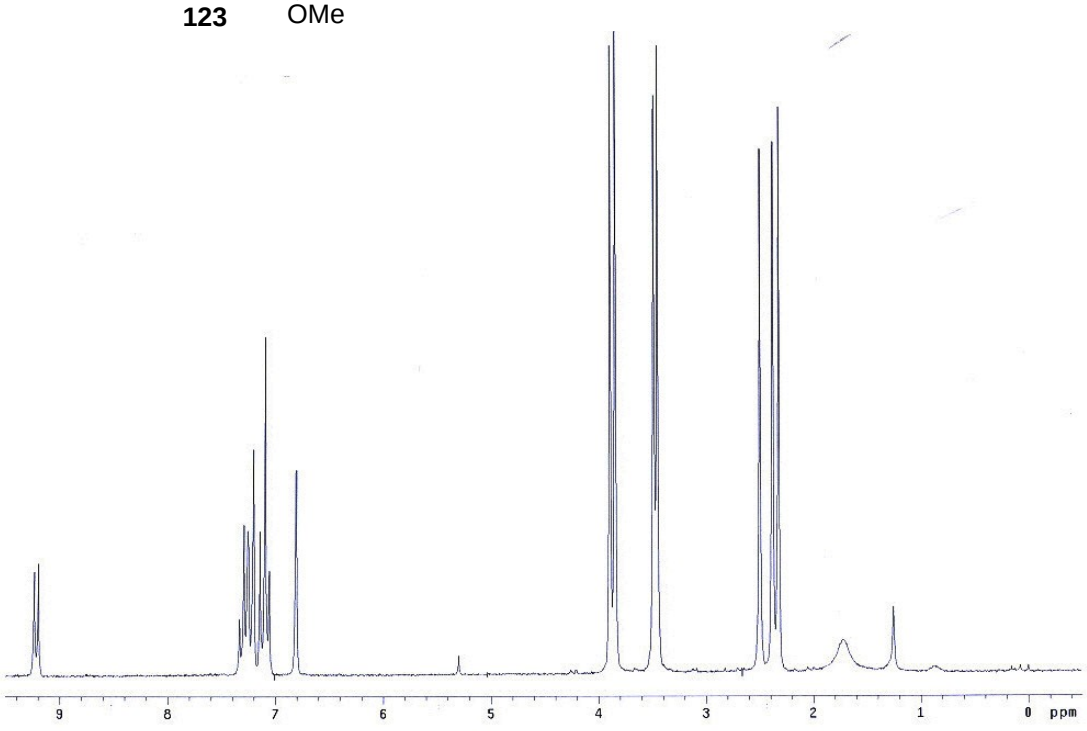
122

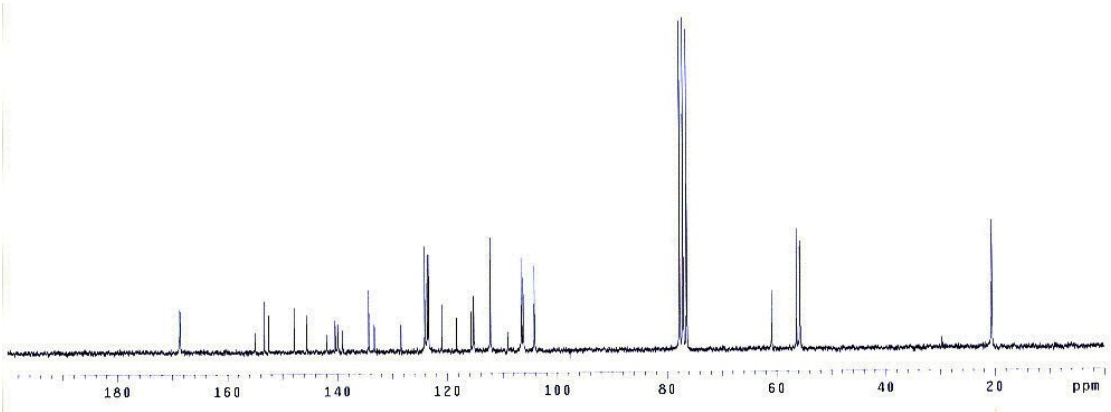

9
8
7
6
5
4
3
2
1
0
ppm

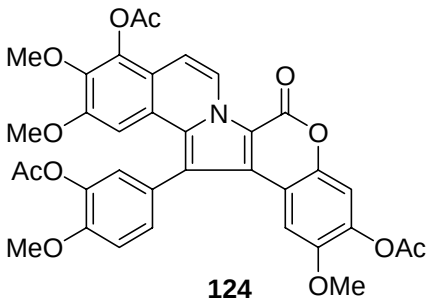

180
160
140
120
100
80
60
40
20
ppm


OAc
MeO
MeO
MeO
AcO
N
O
O
OAc
OMe

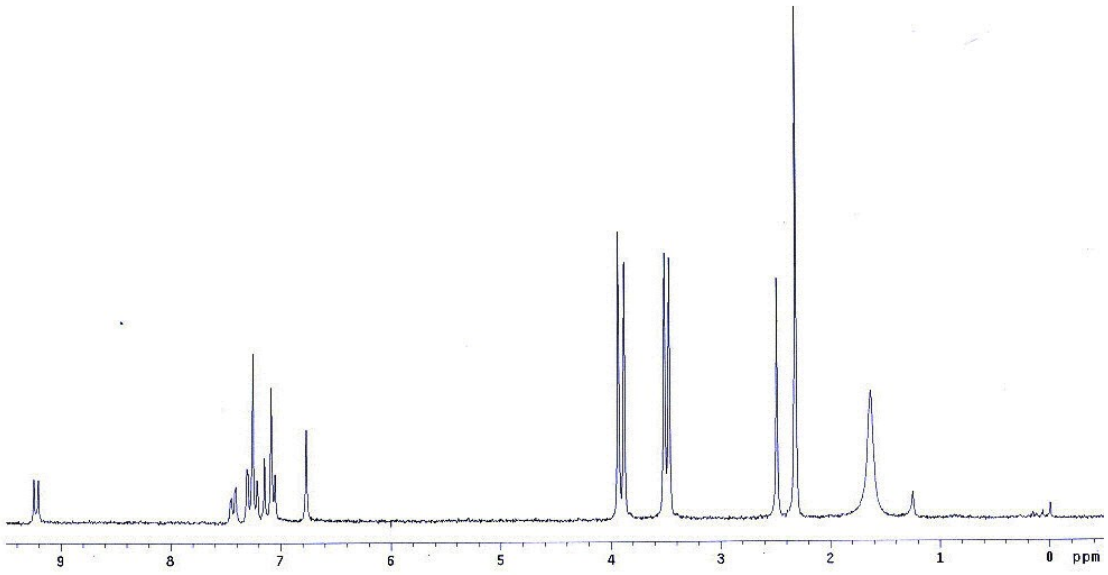
123

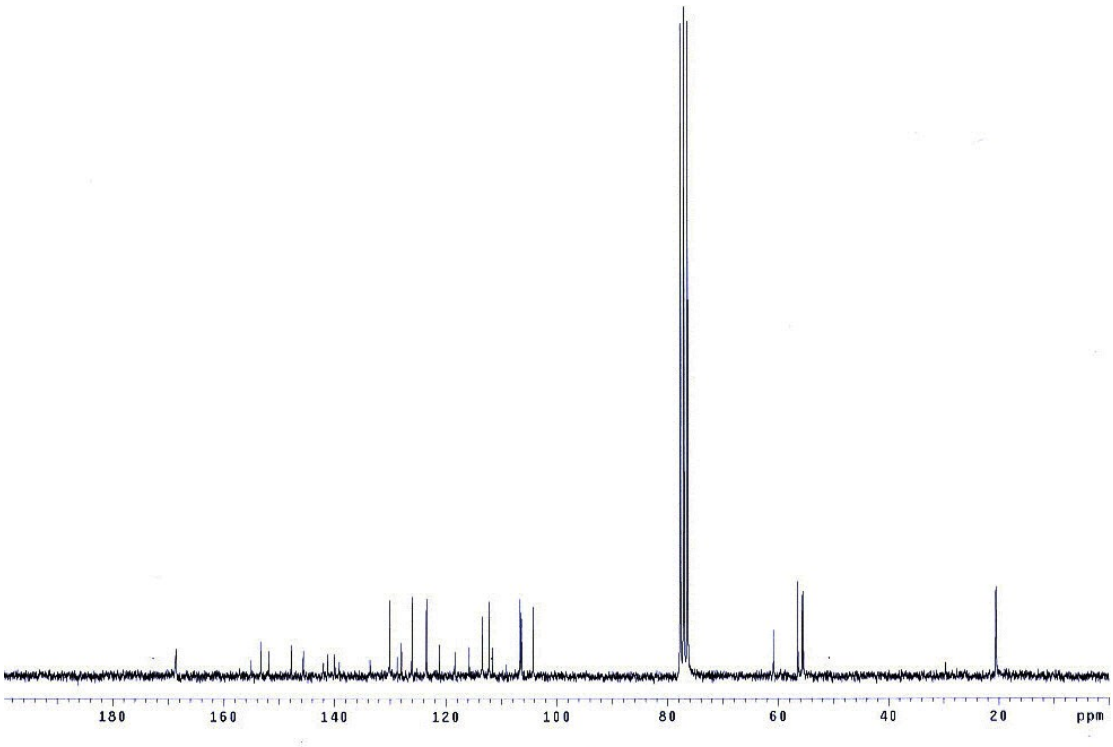

9
8
7
6
5
4
3
2
1
0 ppm

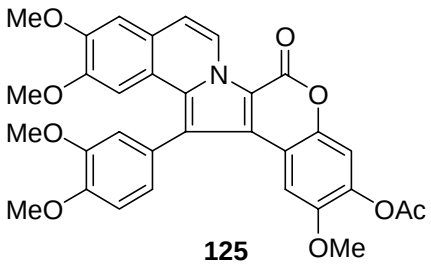

180
160
140
120
100
80
60
40
20
ppm


OAc
MeO
MeO
AcO
MeO
O
N
O
OAc
OMe

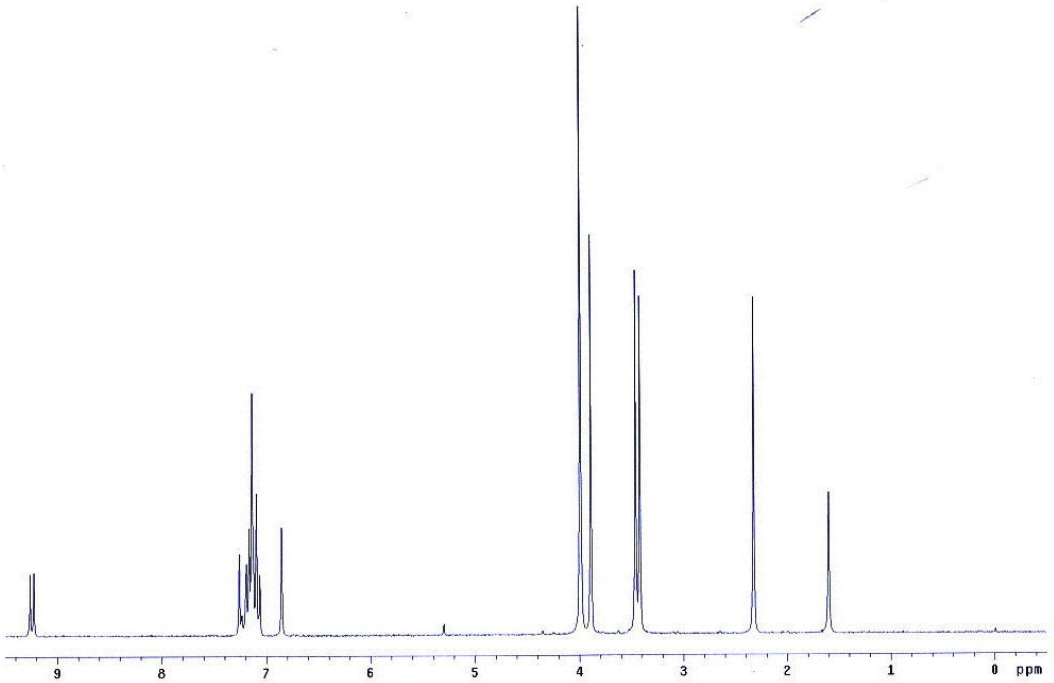
124

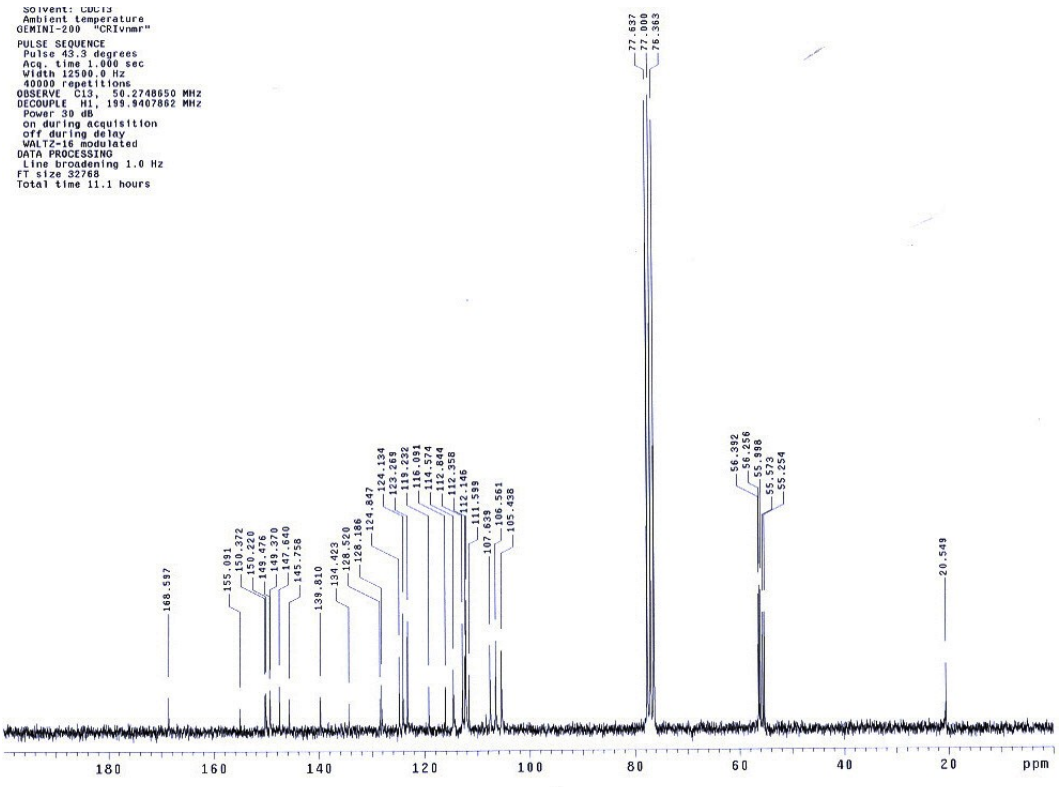

9
8
7
6
5
4
3
2
1
0
ppm

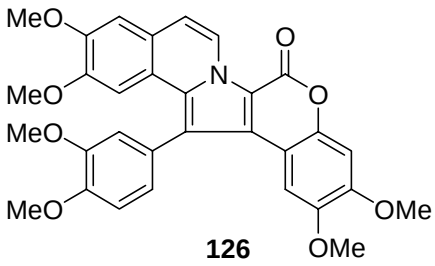

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
MeO
MeO
N
O
O
OAc
OMe

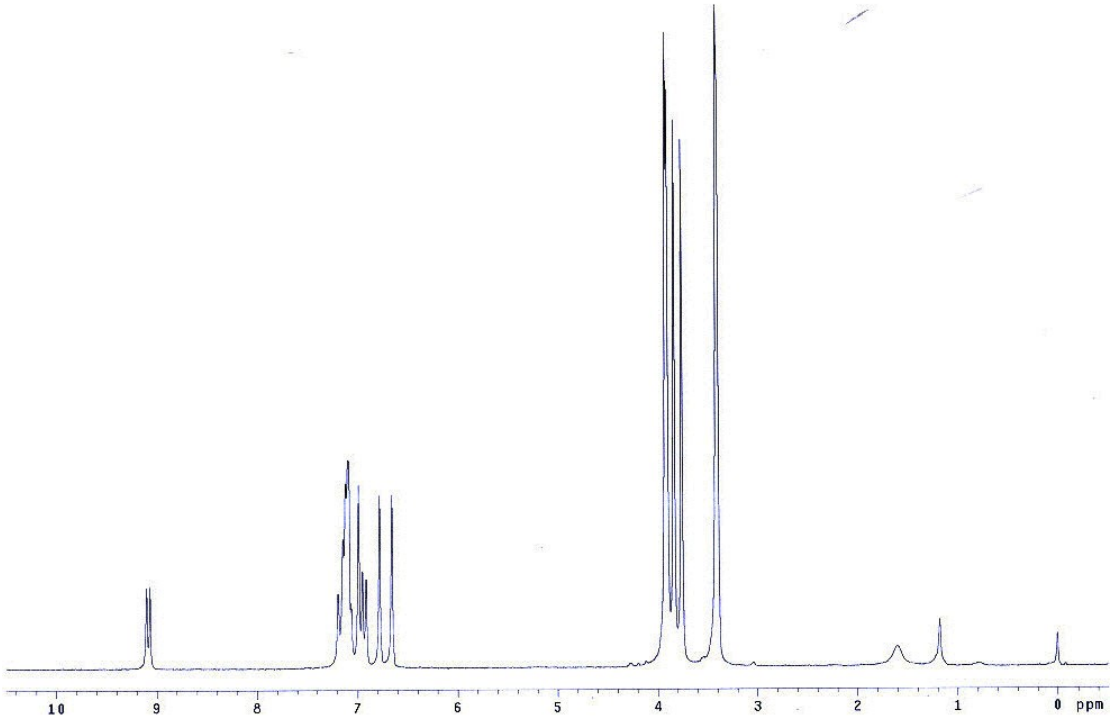
125

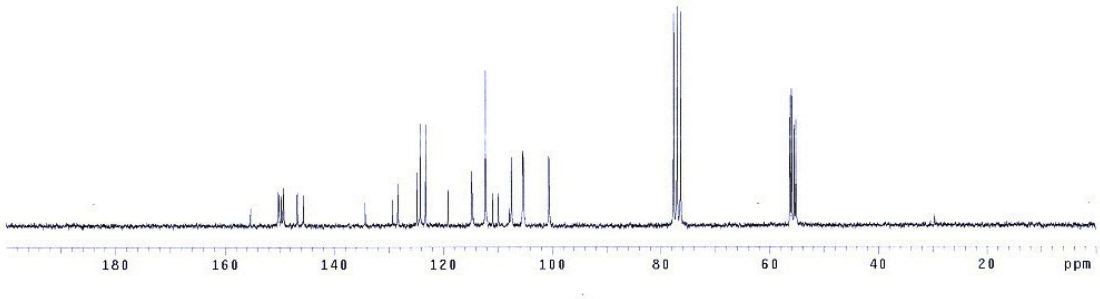

9
8
7
6
5
4
3
2
1
0 ppm

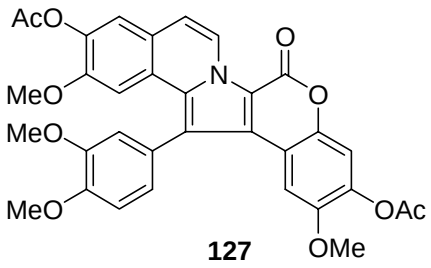

Solvent: CDCl3
Ambient temperature
GEMINI-200 "CRIvnmr"
PULSE SEQUENCE
Pulse 43.3 degrees
Acq. time 1.000 sec
Width 12500.0 Hz
40000 repetitions
OBSERVE C13, 50.2748650 MHz
DECOUPLE H1, 199.9407862 MHz
Power 30 dB
on during acquisition
off during delay
WALTZ-16 modulated
DATA PROCESSING
Line broadening 1.0 Hz
FT size 32768
Total time 11.1 hours
77.637
77.000
76.363
168.597
155.091
150.372
150.220
149.476
149.370
147.640
145.758
139.810
134.423
128.520
128.186
124.847
124.134
123.269
119.232
116.091
114.574
113.464
112.358
112.146
111.599
107.639
106.561
105.438
56.092
56.256
55.988
55.573
55.254
20.549
180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
MeO
MeO
N
O
O
OMe
OMe

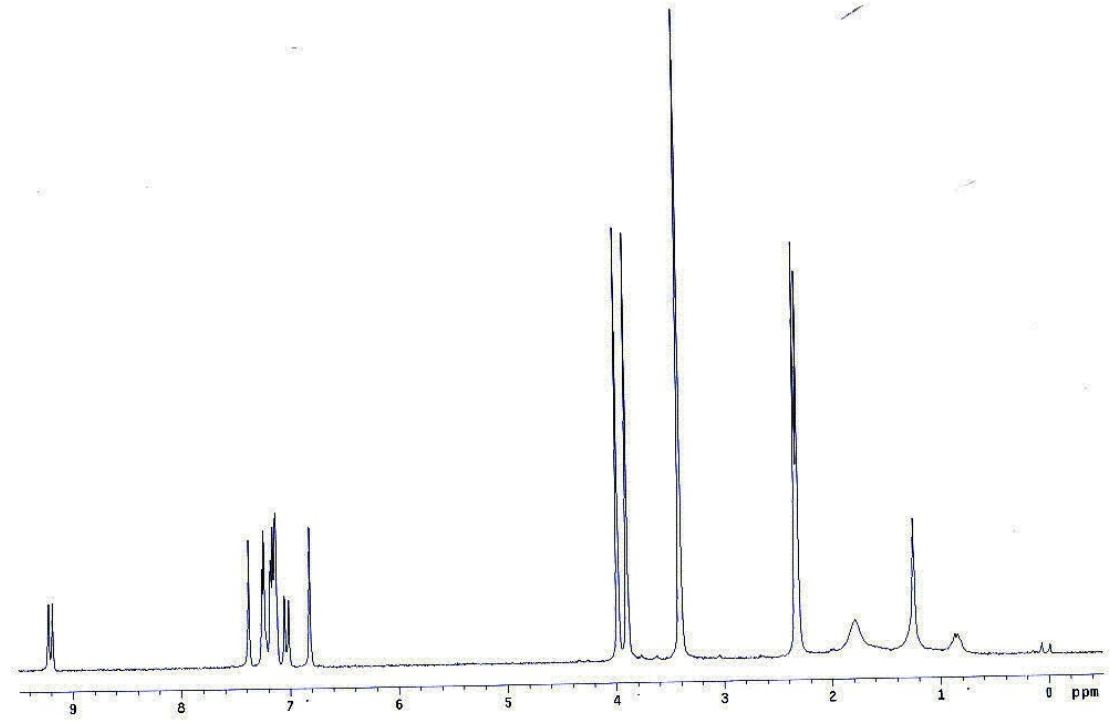
126

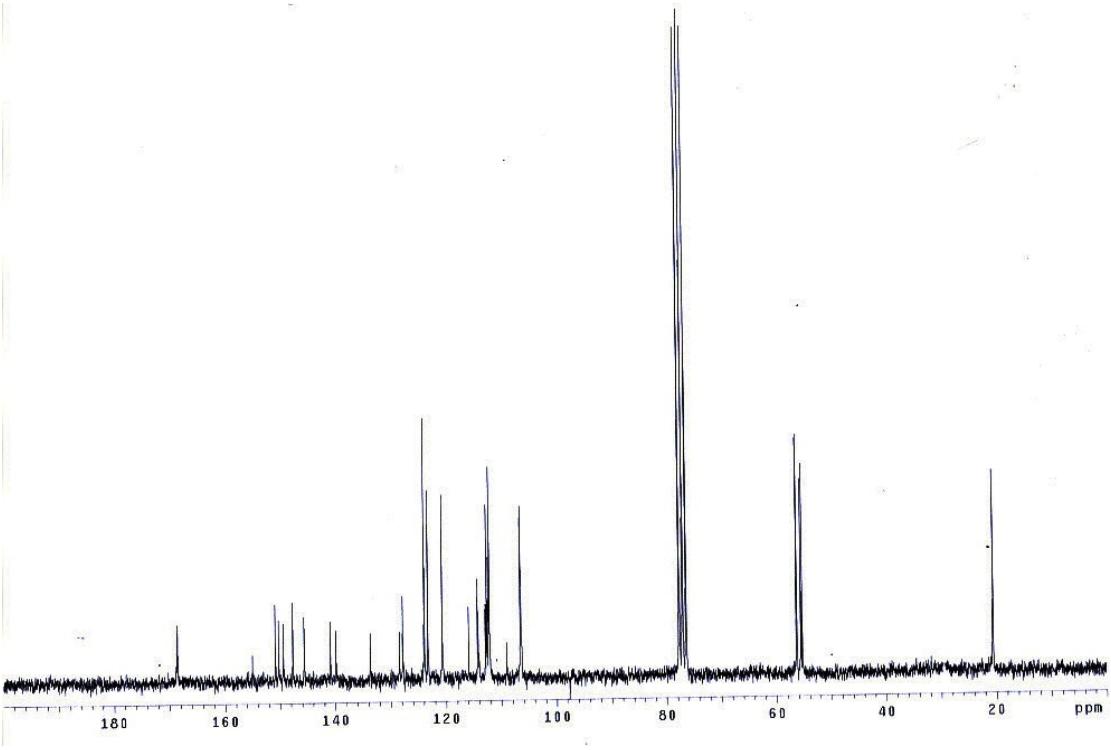

10
9
8
7
6
5
4
3
2
1
0 ppm

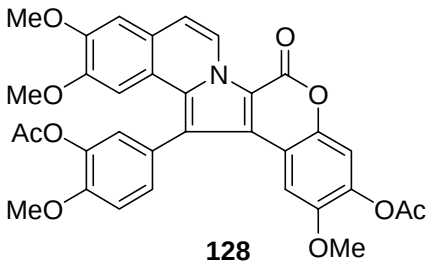

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
MeO
MeO
N
O
O
OAc
OMe

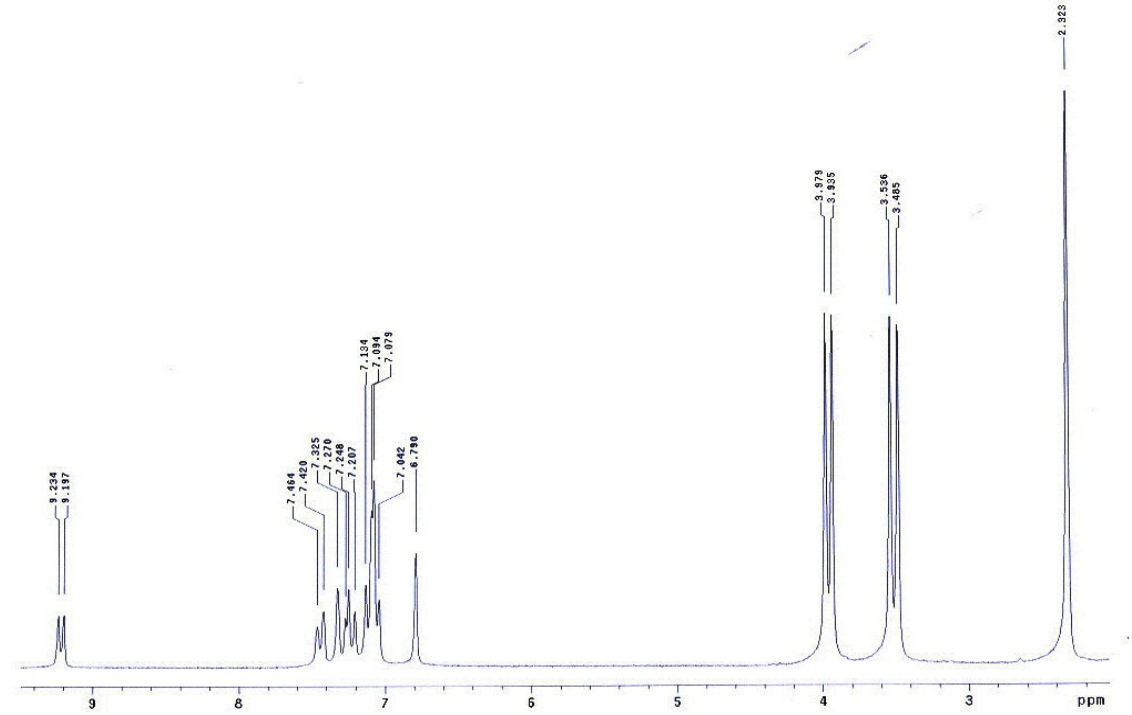
127

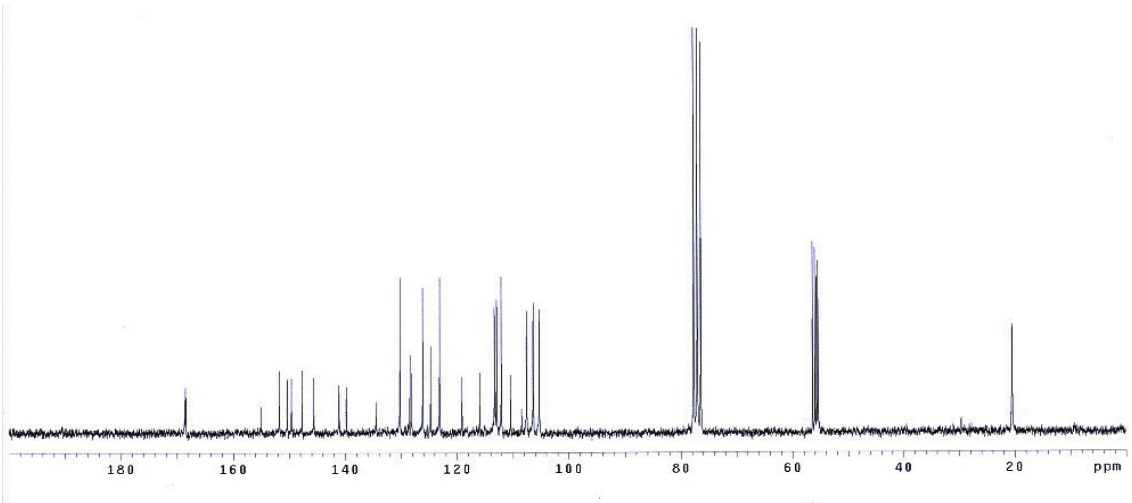

9
8
7
6
5
4
3
2
1
0 ppm

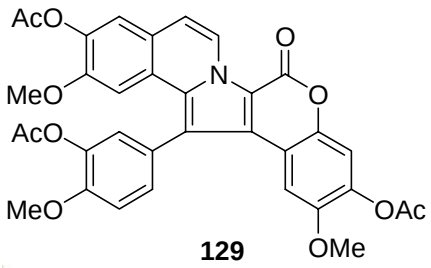

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
AcO
MeO
N
O
O
OAc
OMe

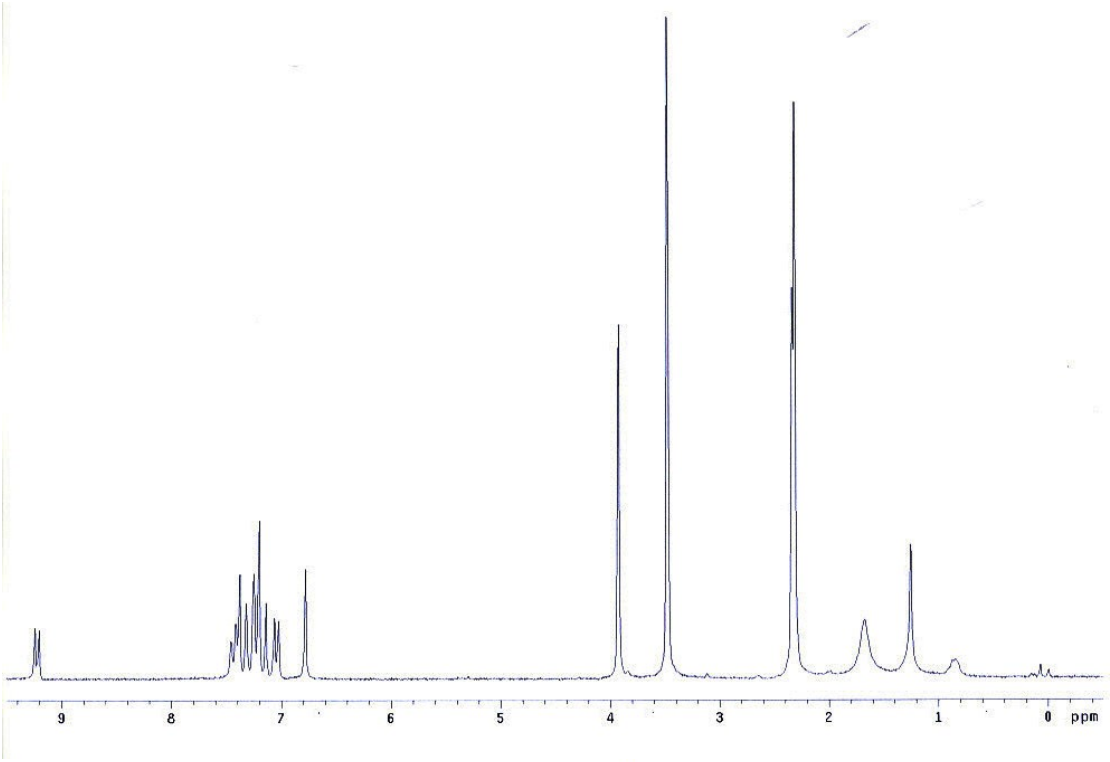
128

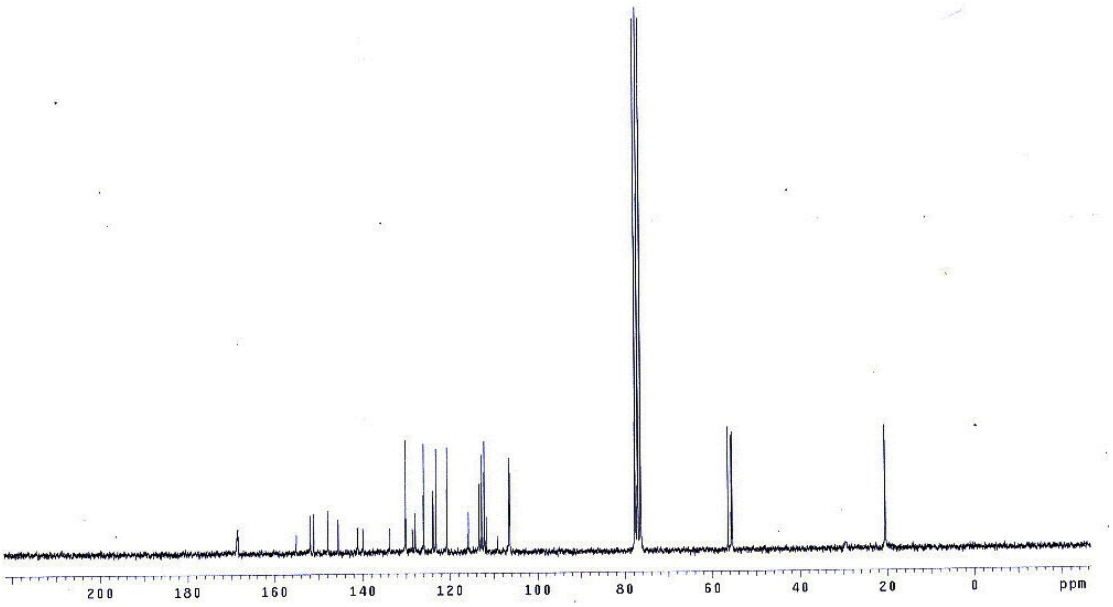

9.234
9.197
7.464
7.420
7.325
7.270
7.248
7.207
7.134
7.094
7.079
7.042
6.790
3.979
3.935
3.536
3.485
2.323
9
8
7
6
5
4
3
ppm

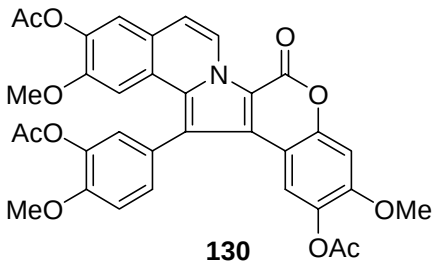

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
AcO
MeO
N
O
O
OAc
OMe

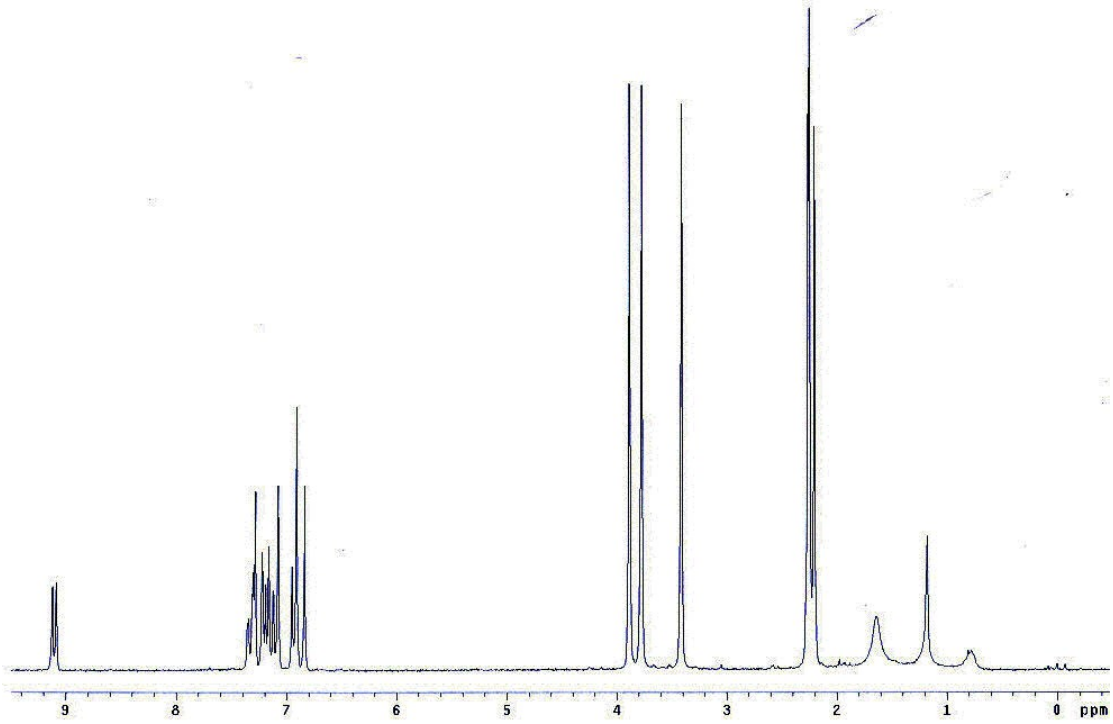
129

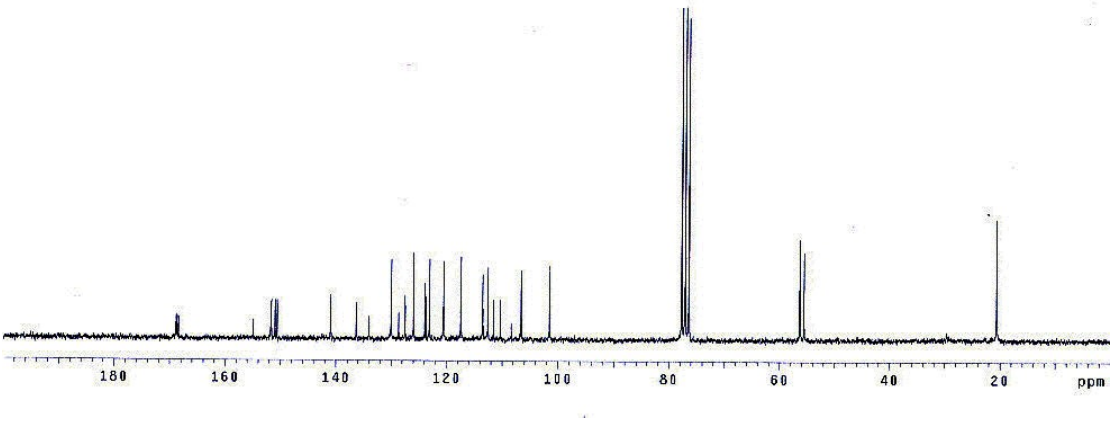

9
8
7
6
5
4
3
2
1
0
ppm

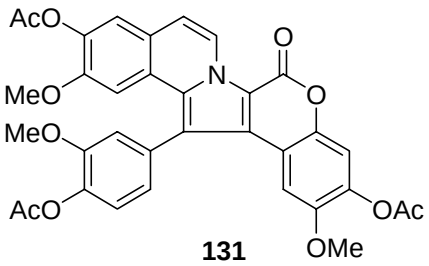

200
180
160
140
120
100
80
60
40
20
0
ppm


AcO
MeO
AcO
MeO
N
O
O
OMe
OAc

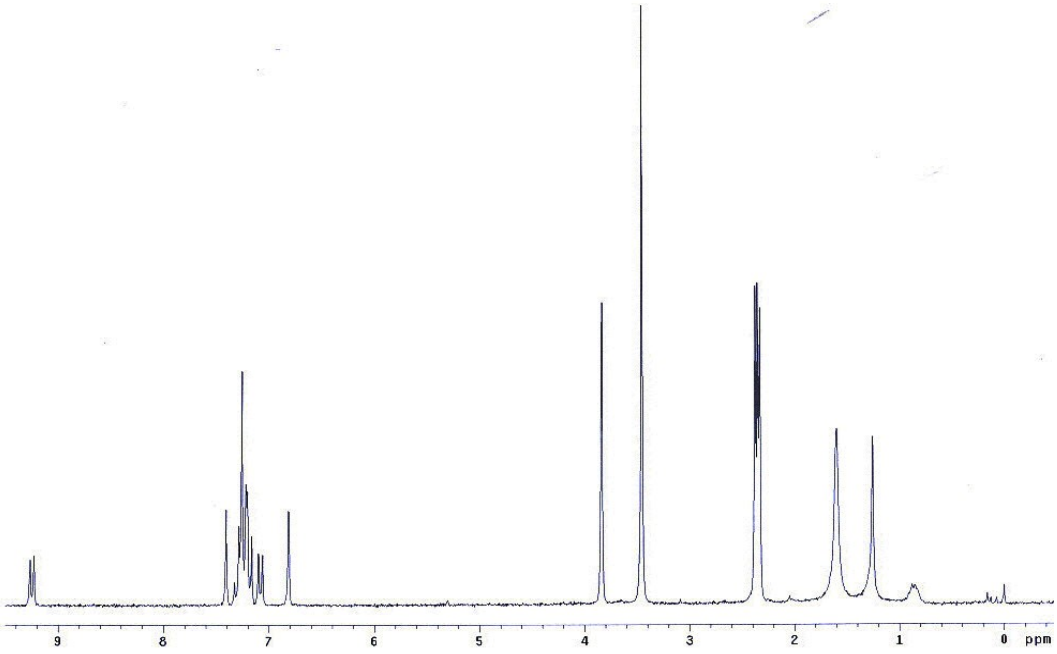
130

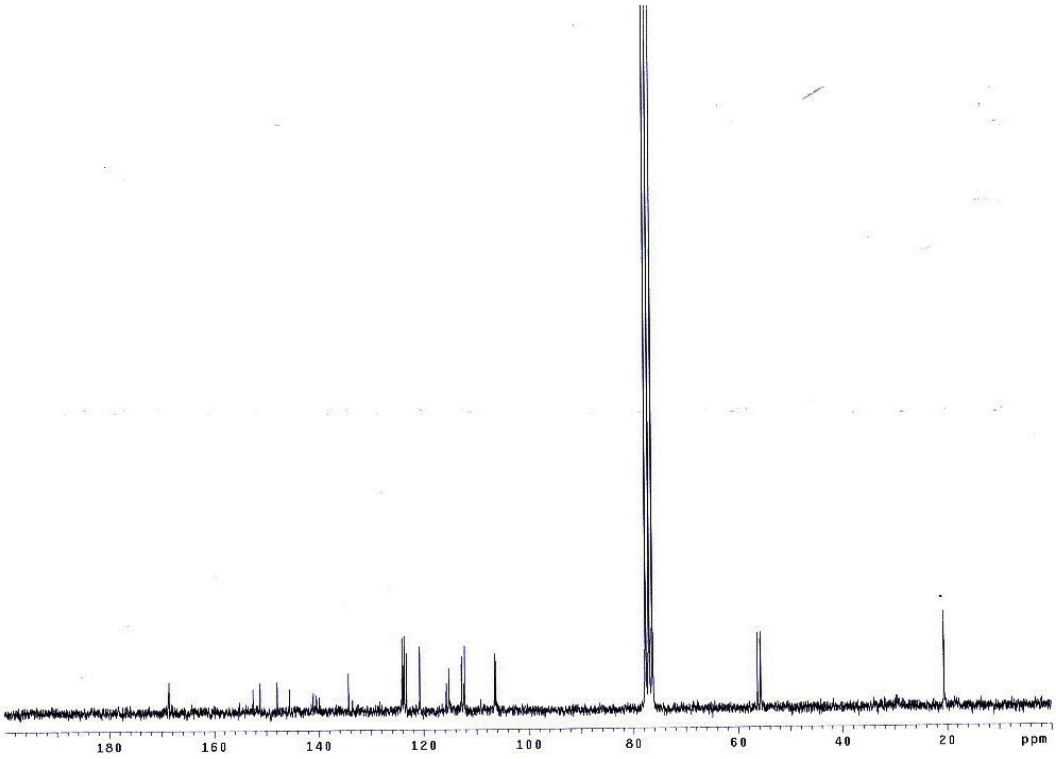

9
8
7
6
5
4
3
2
1
0
ppm

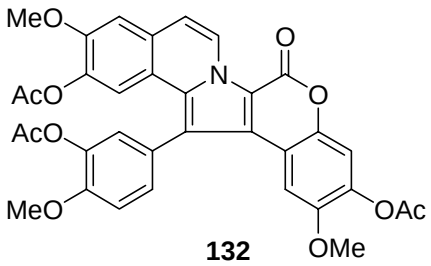

180
160
140
120
100
80
60
40
20
ppm


AcO
MeO
MeO
AcO
N
O
O
OAc
OMe

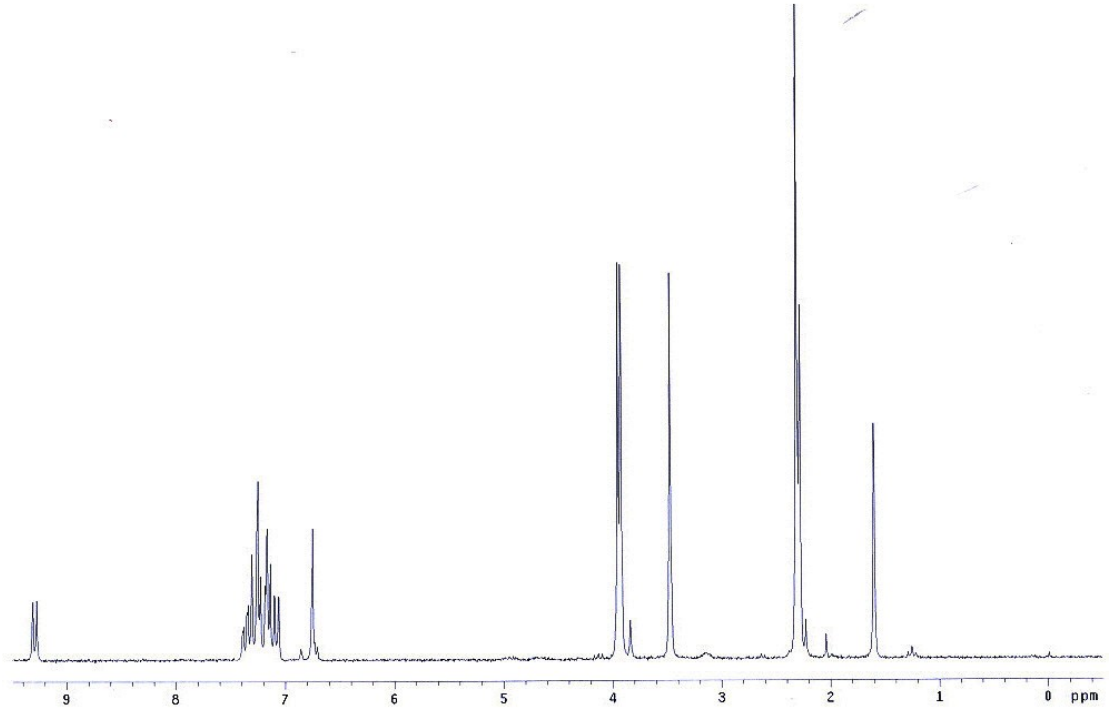
131

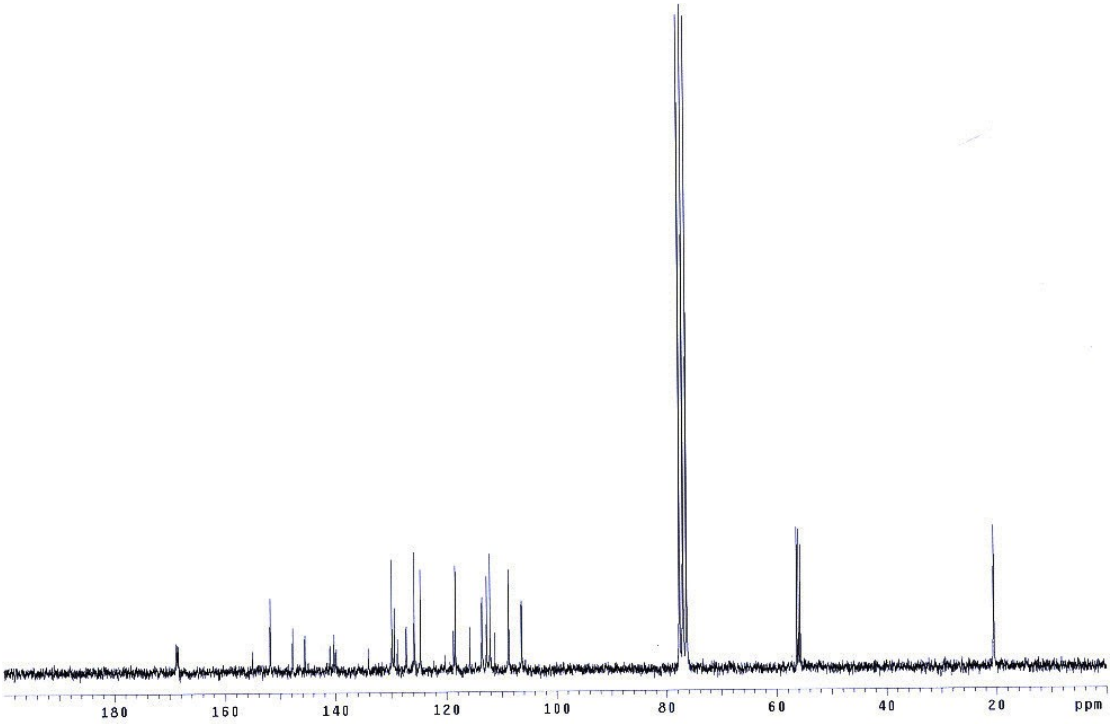

9
8
7
6
5
4
3
2
1
0
ppm

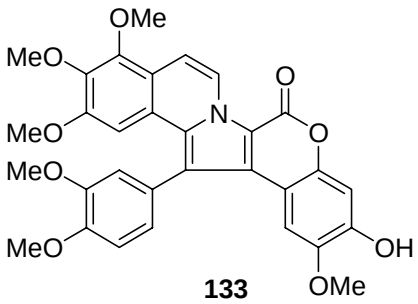

180
160
140
120
100
80
60
40
20
ppm


MeO
AcO
AcO
MeO
N
O
O
OAc
OMe

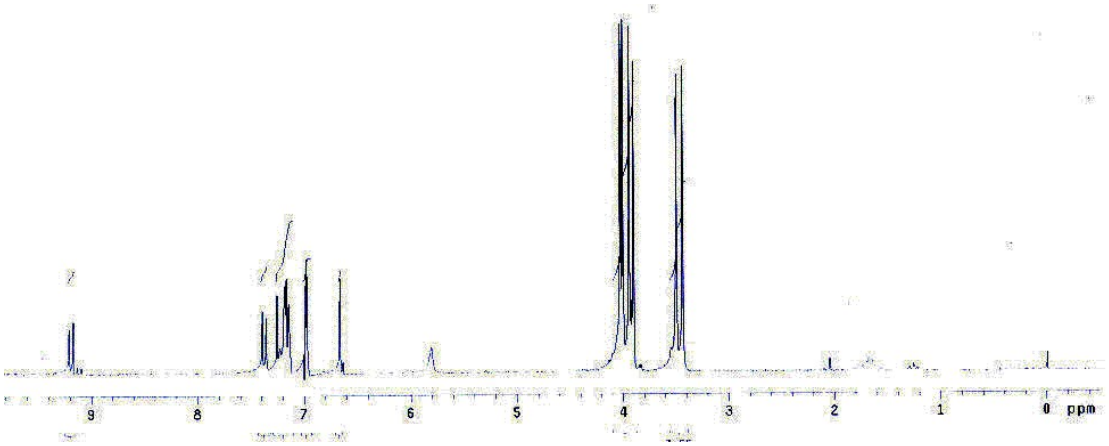
132

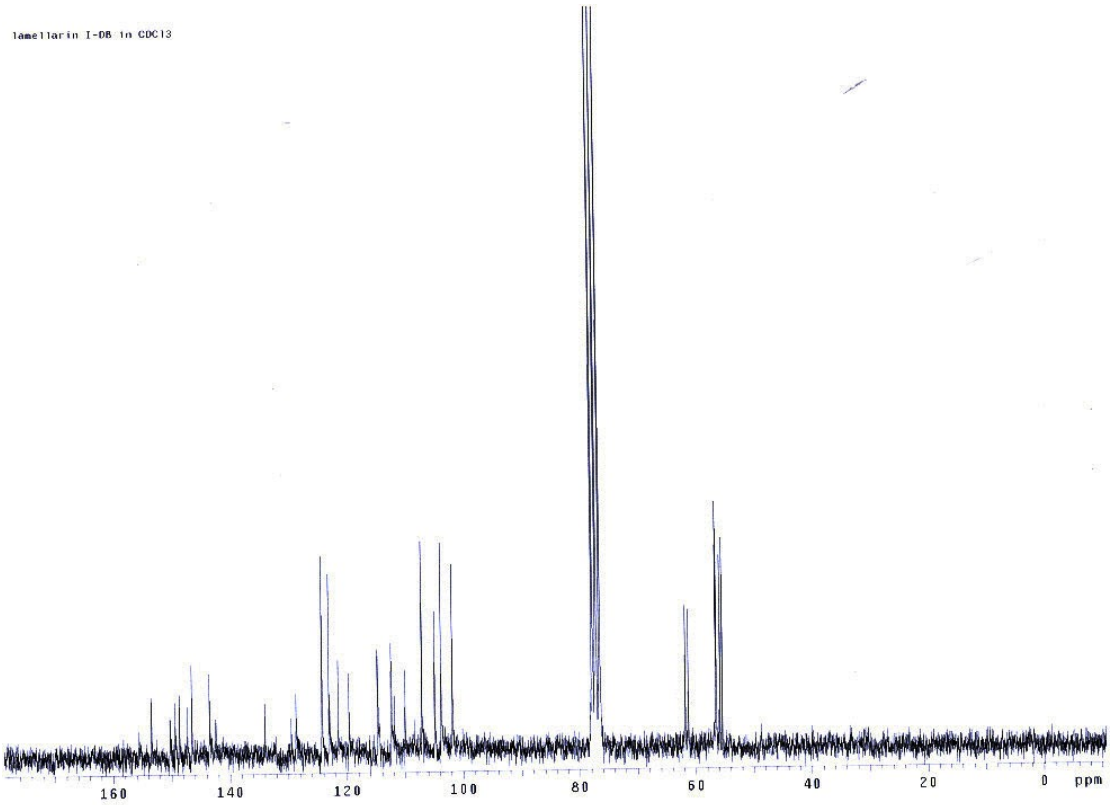

9
8
7
6
5
4
3
2
1
0
ppm

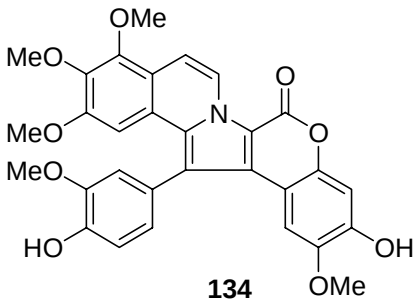

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
MeO
MeO
N
O
O
OH
OMe

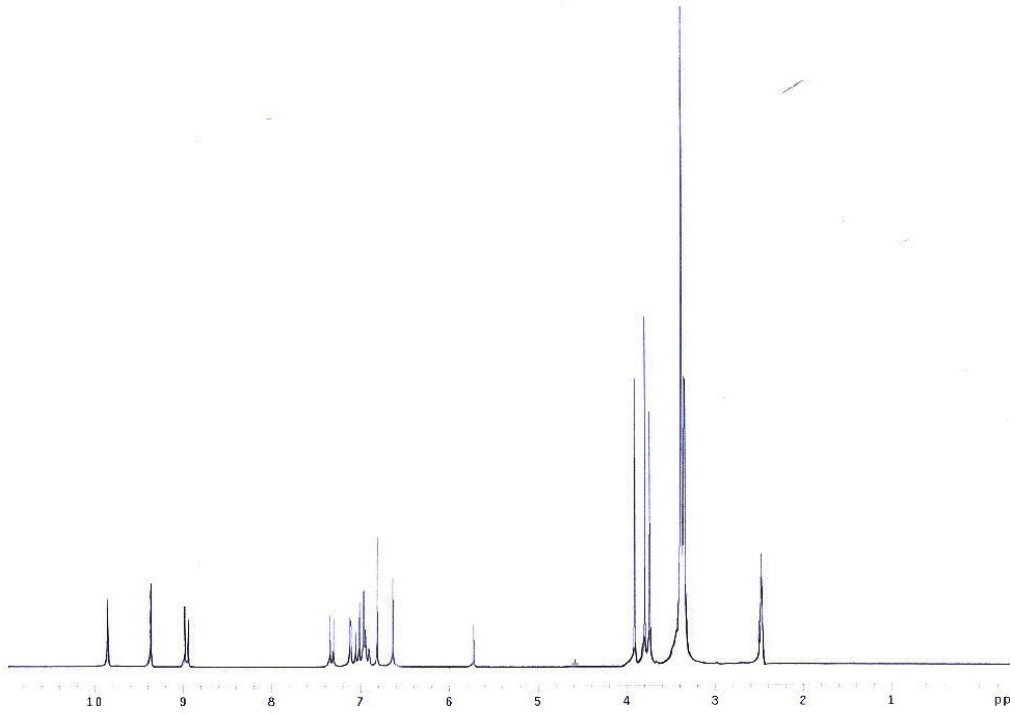
133

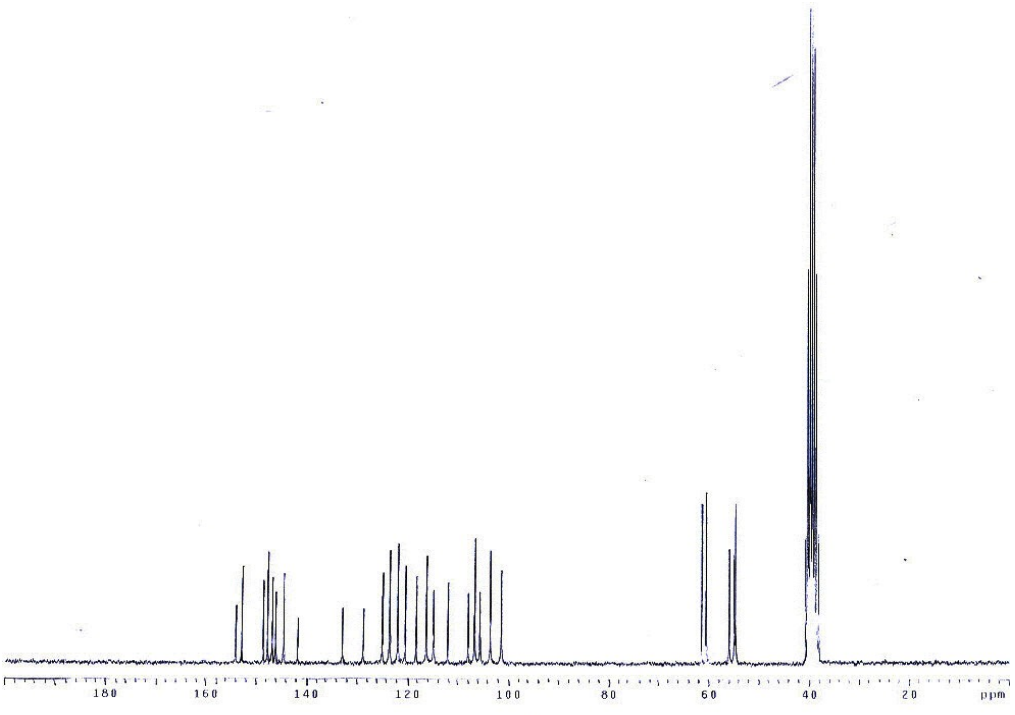

9
8
7
6
5
4
3
2
1
0 ppm

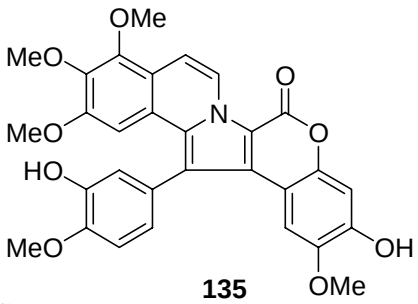

lamellarin I-DB in CDCl3
160
140
120
100
80
60
40
20
0 ppm


OMe
MeO
MeO
MeO
HO
N
O
O
OH
OMe

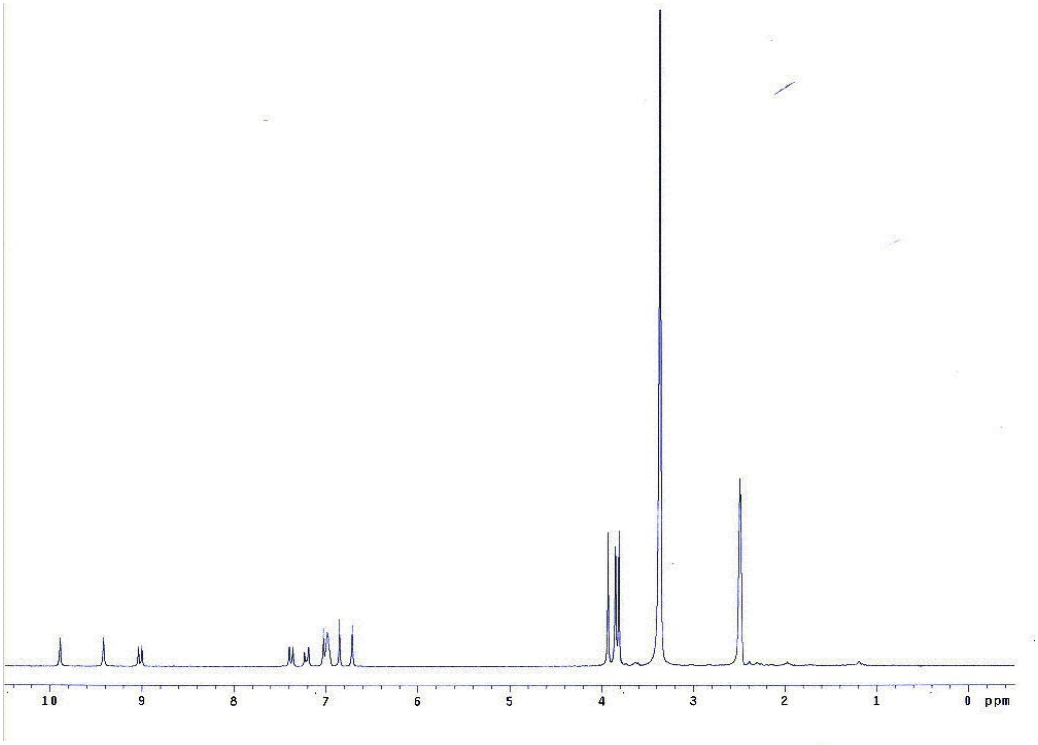
134

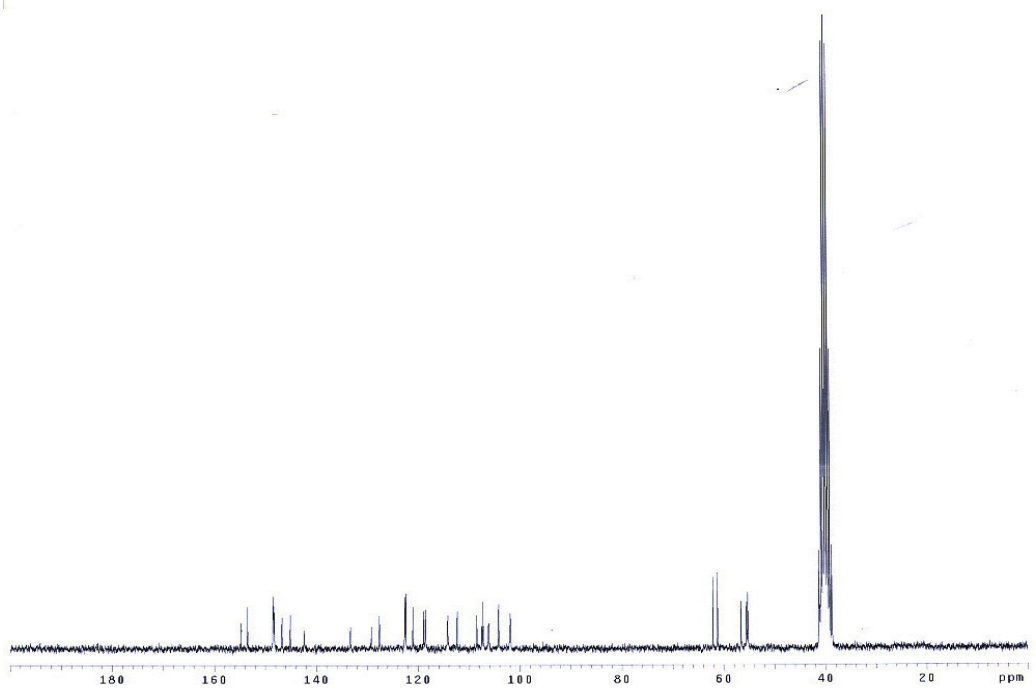

10
9
8
7
6
5
4
3
2
1
pp

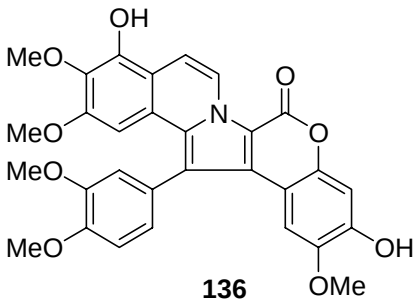

180
160
140
120
100
80
60
40
20
ppm


OMe
MeO
MeO
HO
MeO
O
N
O
OH
OMe

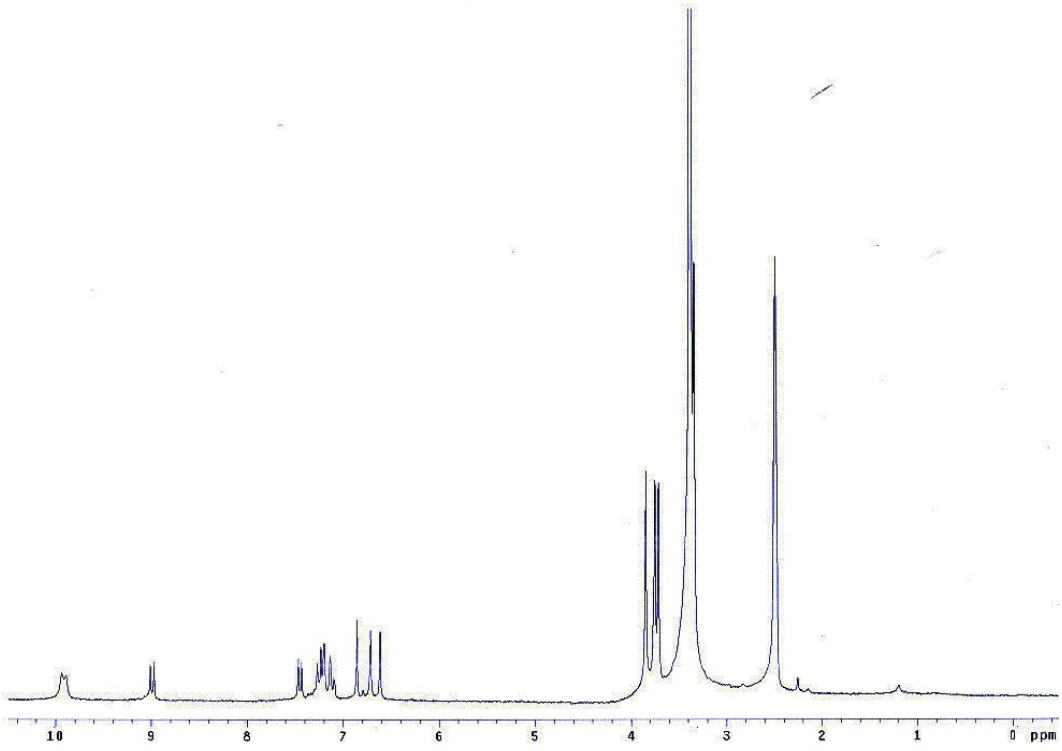
135

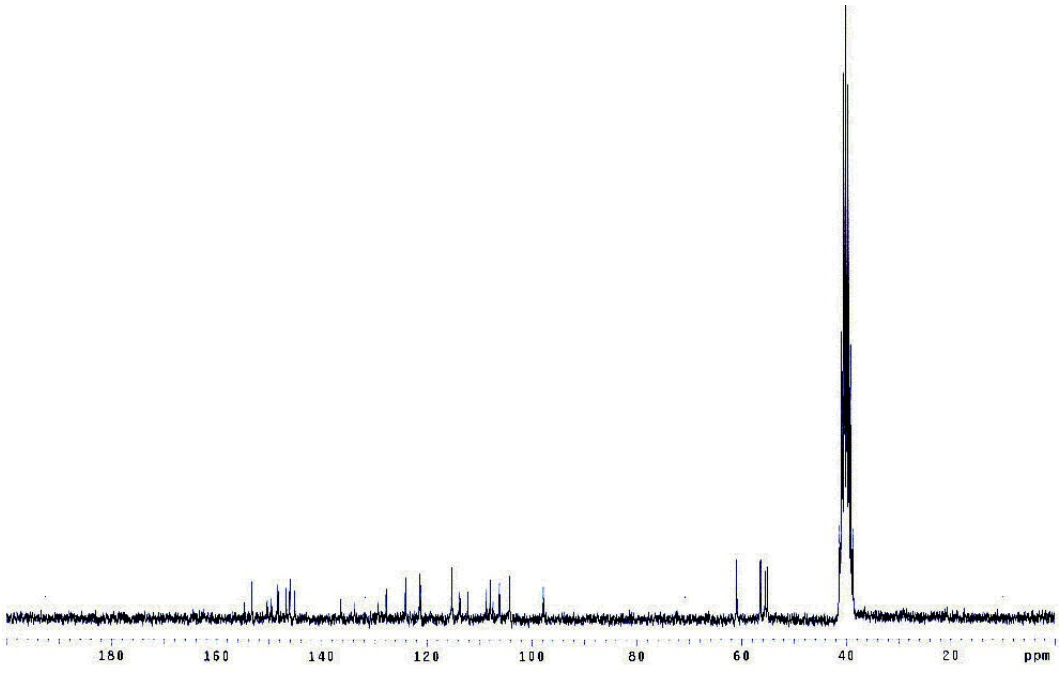

10
9
8
7
6
5
4
3
2
1
0 ppm

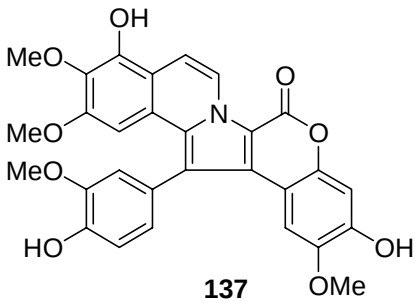

180
160
140
120
100
80
60
40
20
ppm


OH
MeO
MeO
MeO
MeO
N
O
O
OH
OMe

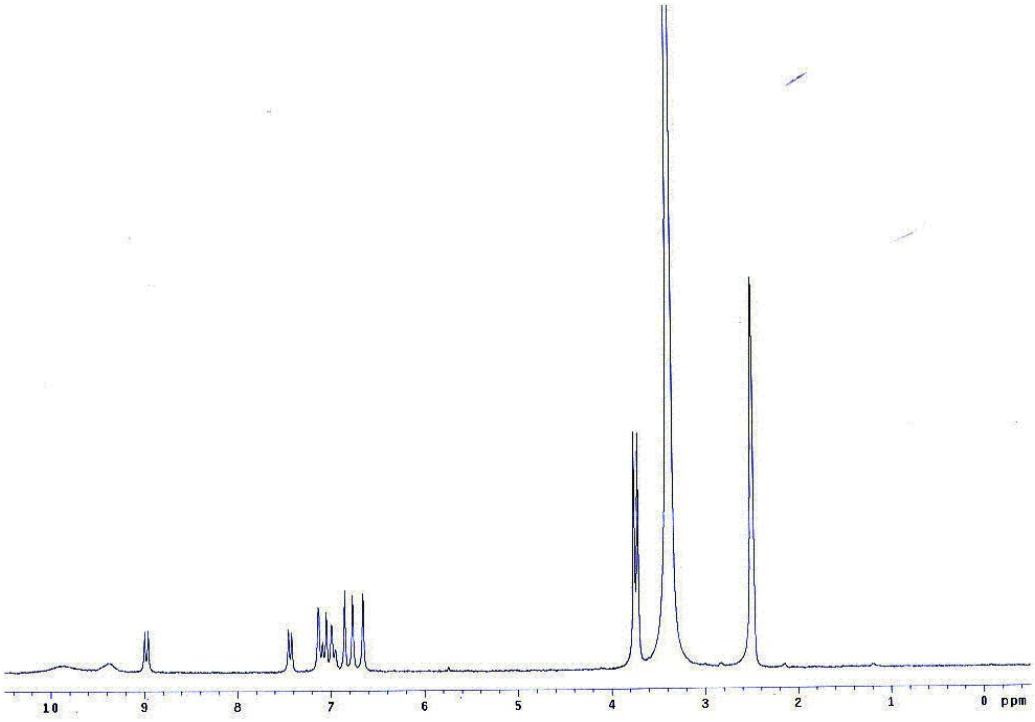
136

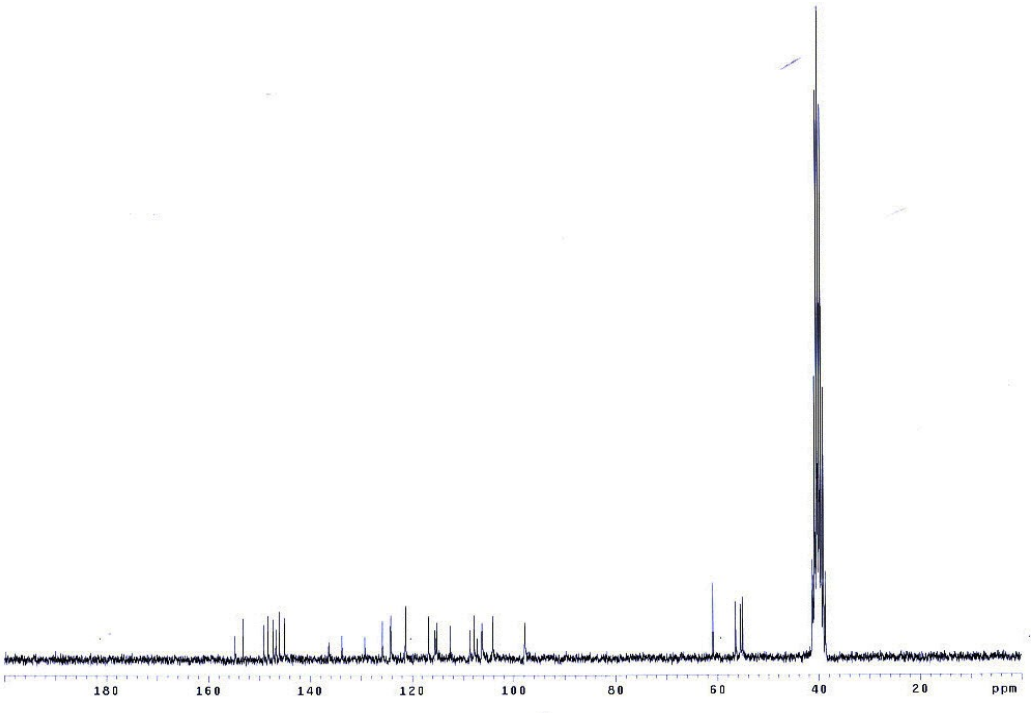

10
9
8
7
6
5
4
3
2
1
0
ppm

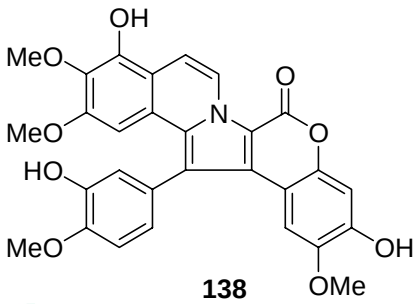

180
160
140
120
100
80
60
40
20
ppm


OH
MeO
MeO
MeO
HO
N
O
O
OH
OMe

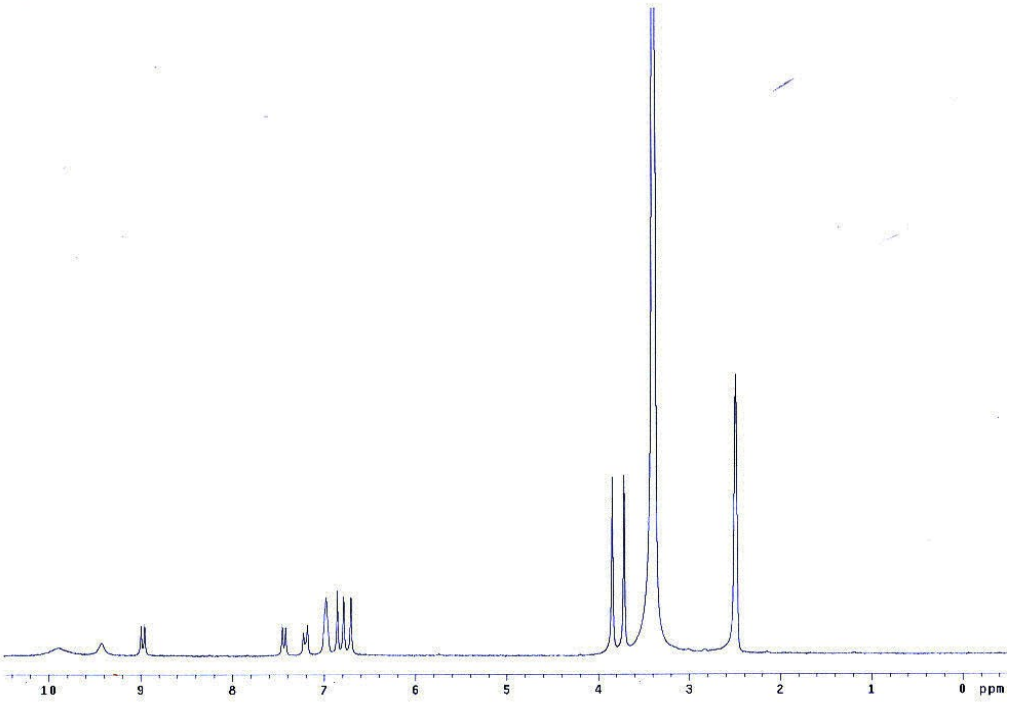
137

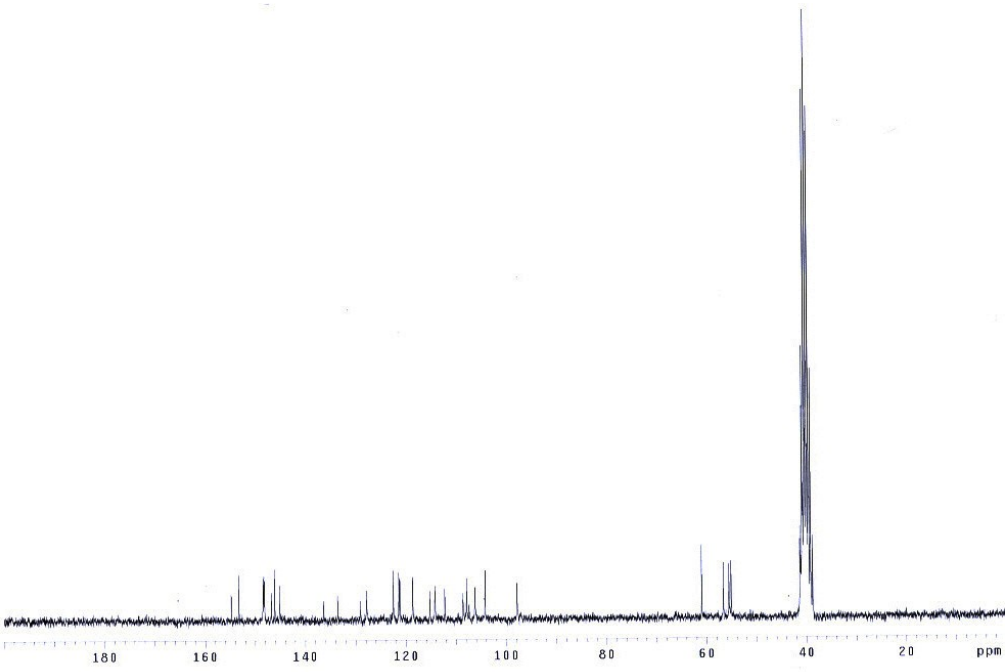

10
9
8
7
6
5
4
3
2
1
0 ppm

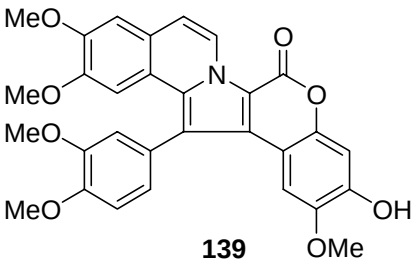

180
160
140
120
100
80
60
40
20
ppm


OH
MeO
MeO
HO
MeO
O
N
O
OH
OMe

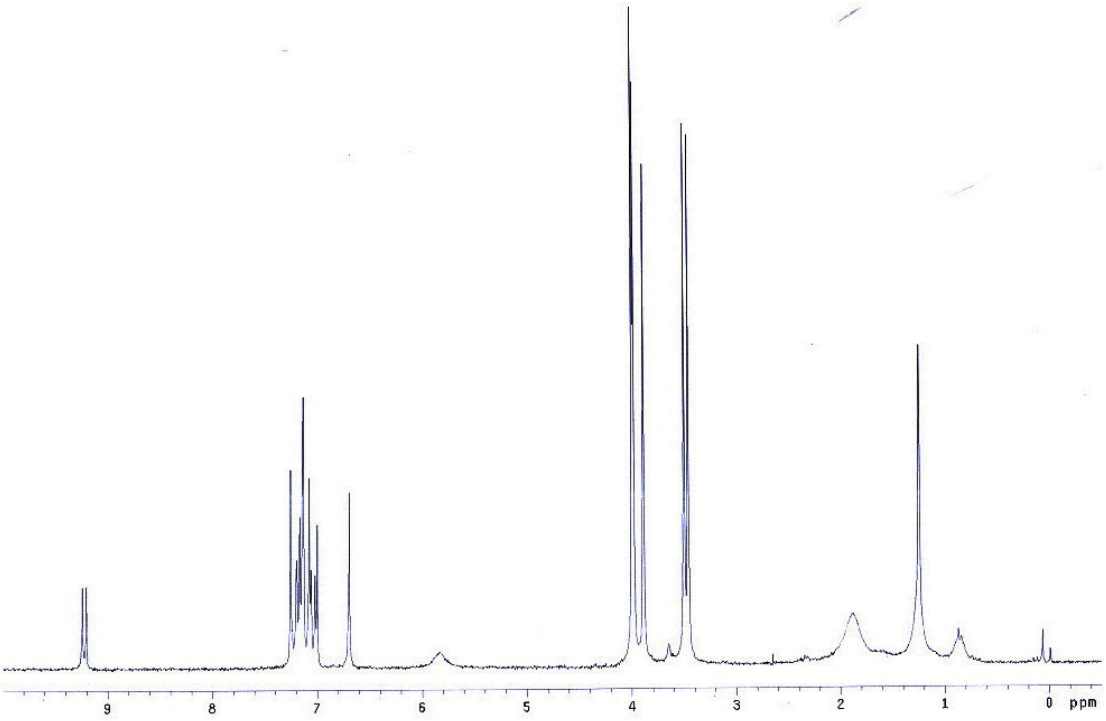
138

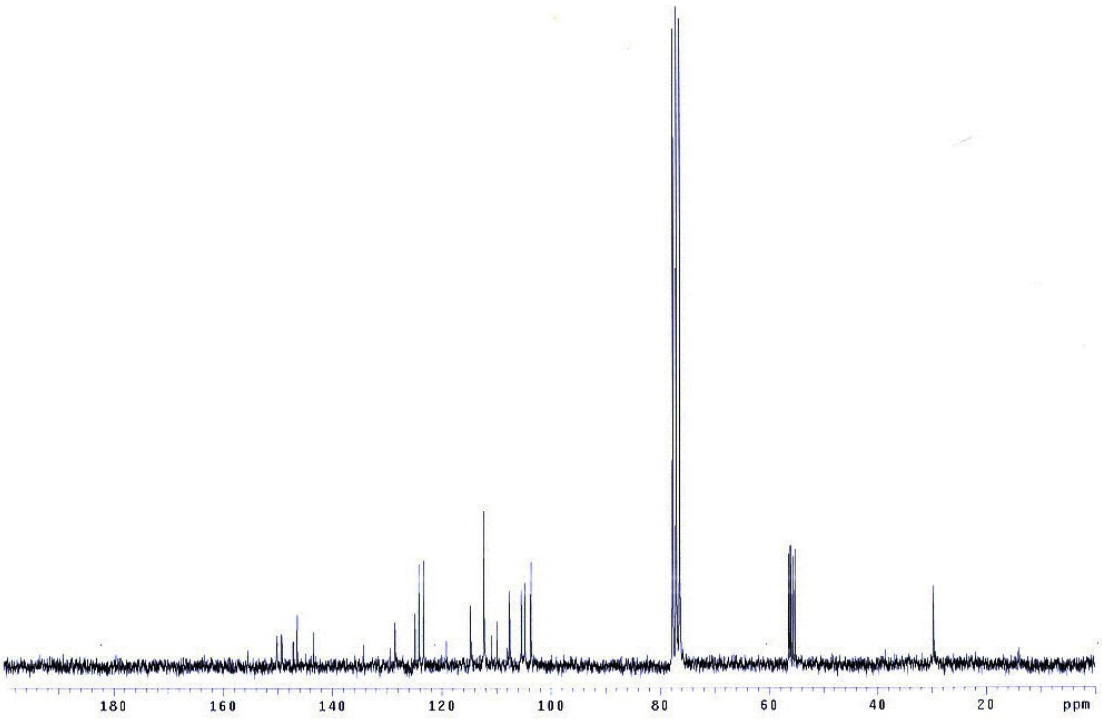

10
9
8
7
6
5
4
3
2
1
0
ppm

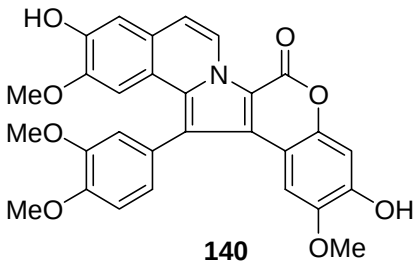

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
MeO
MeO
N
O
O
OH
OMe

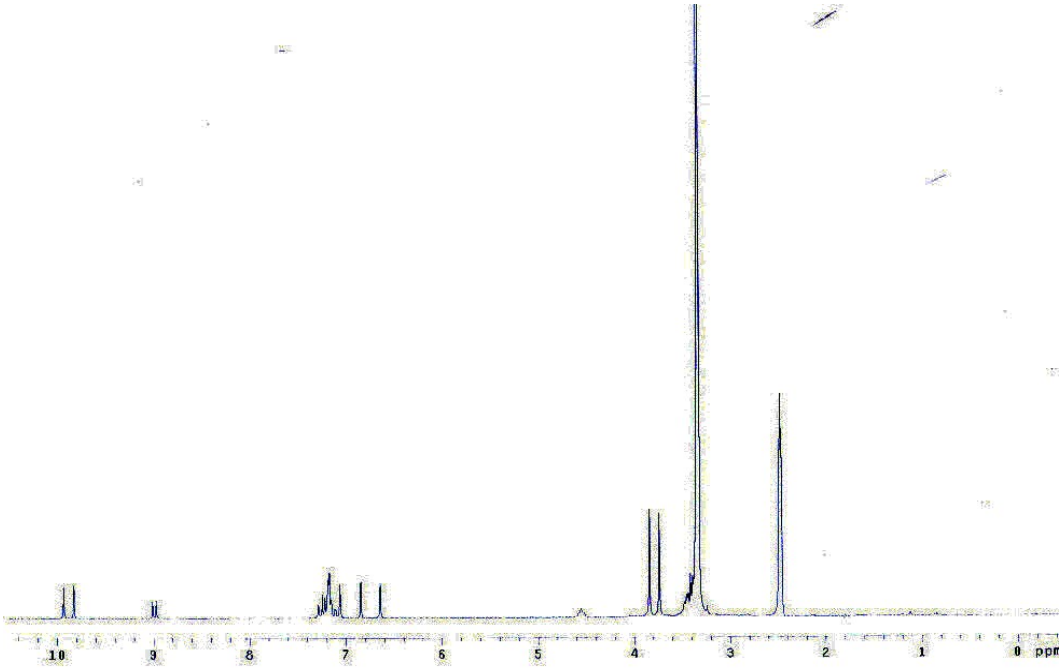
139

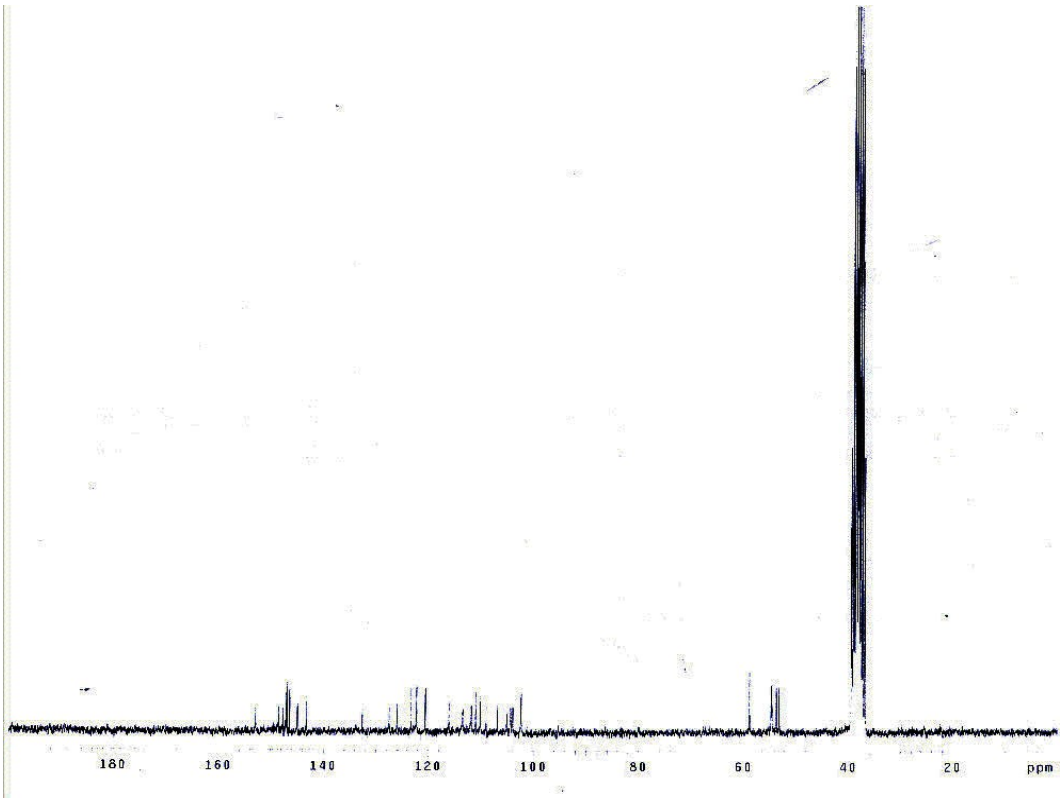

9
8
7
6
5
4
3
2
1
0 ppm

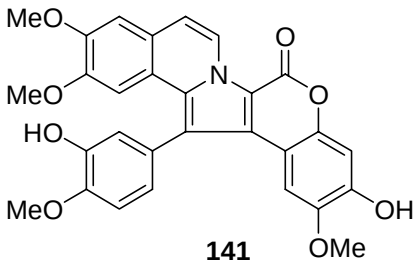

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
MeO
MeO
N
O
O
OH
OMe

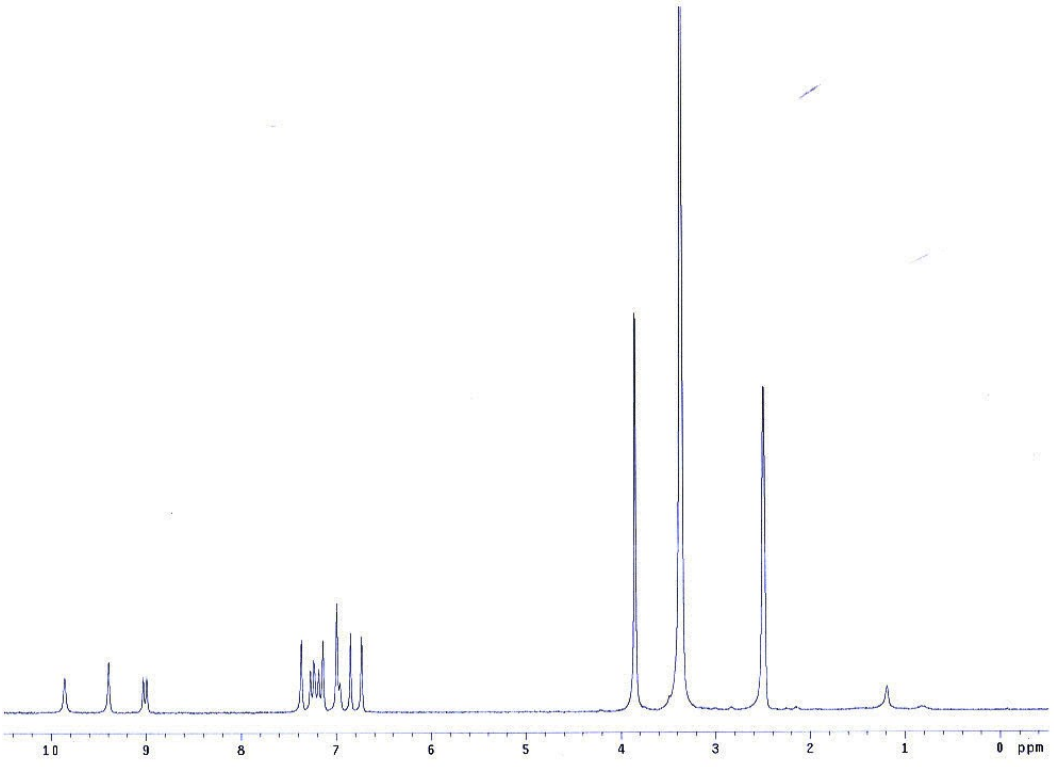
140

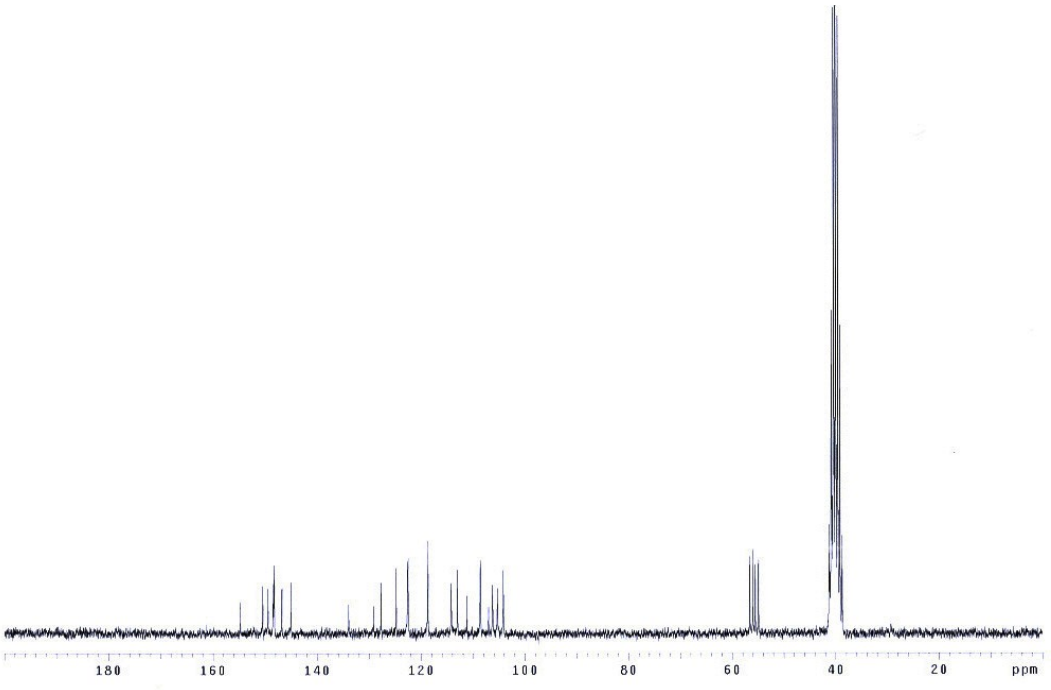

10
9
8
7
6
5
4
3
2
1
0
ppm

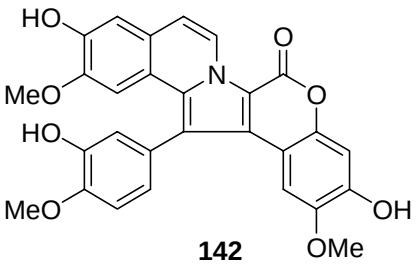

180
160
140
120
100
80
60
40
20
ppm


MeO
MeO
HO
MeO
N
O
O
OH
OMe

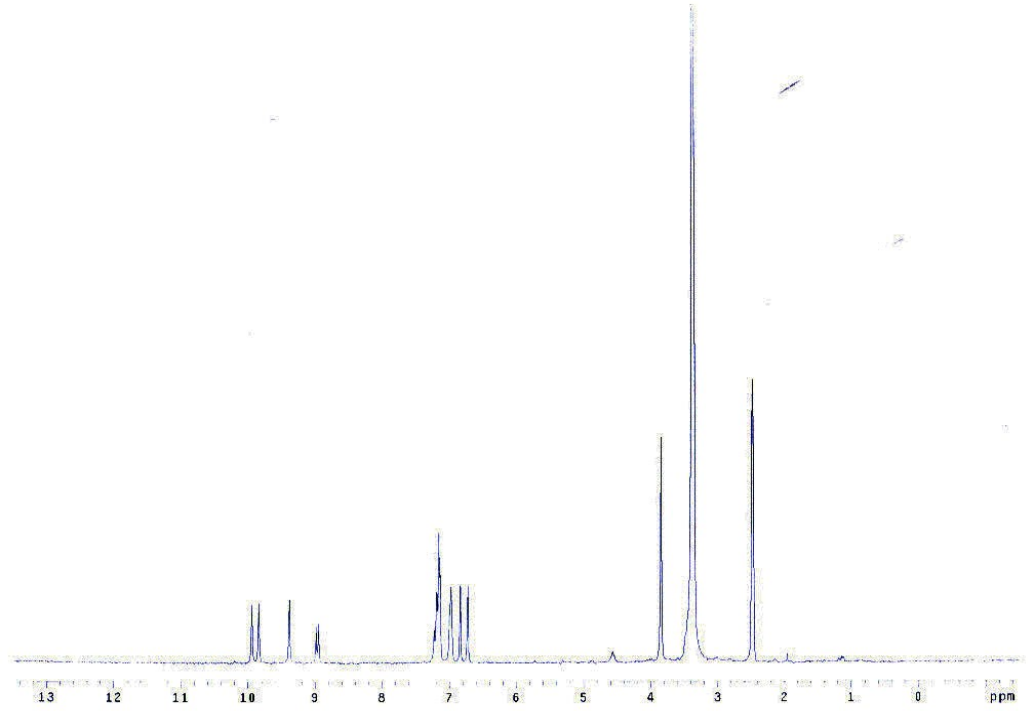
141

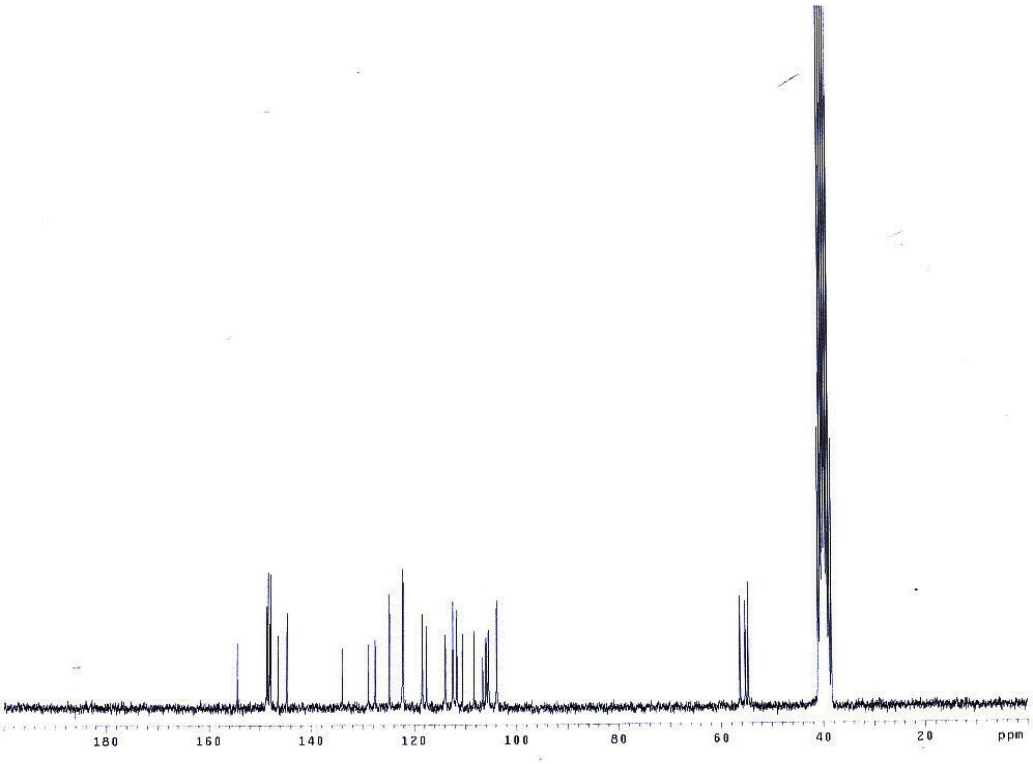

10
9
8
7
6
5
4
3
2
1
0
ppm

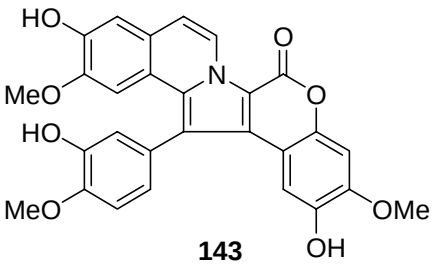

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
HO
MeO
N
O
O
OH
OMe

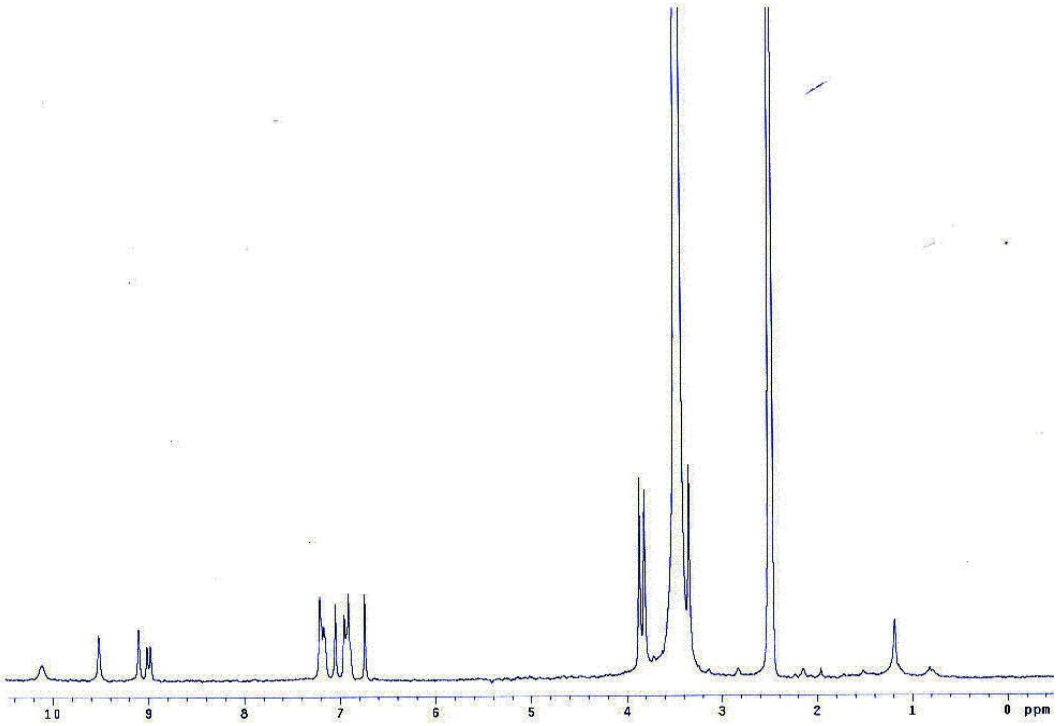
142

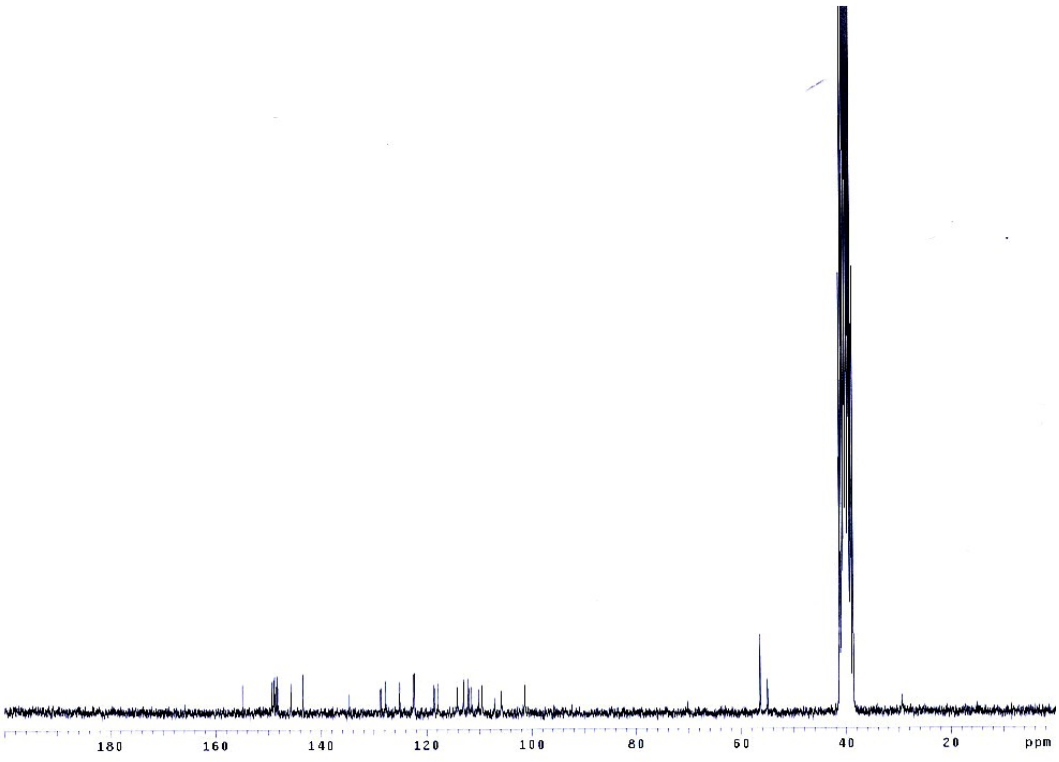

13
12
11
10
9
8
7
6
5
4
3
2
1
0
ppm

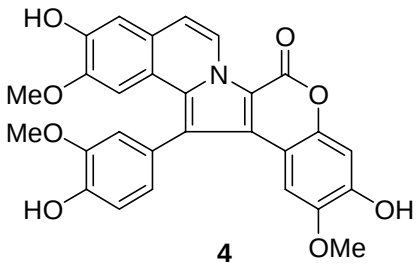

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
HO
MeO
N
O
O
OMe
OH

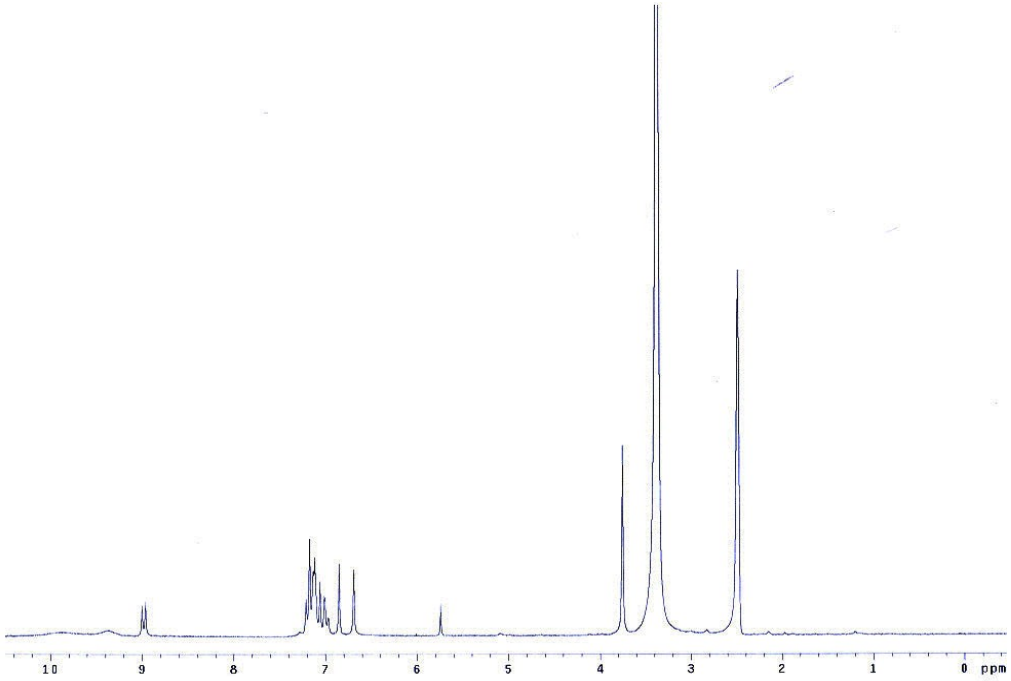
143

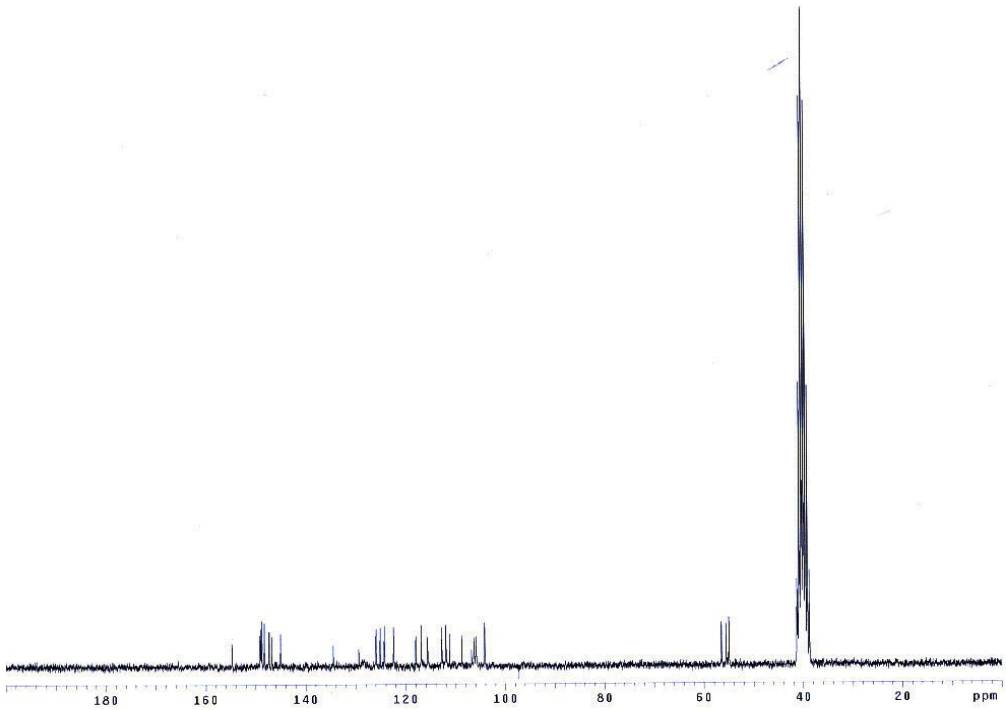

10
9
8
7
6
5
4
3
2
1
0 ppm

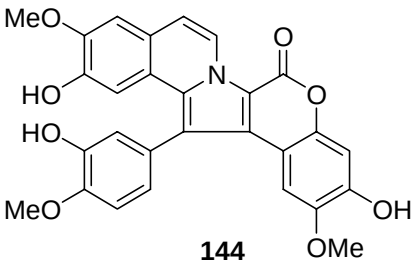

180
160
140
120
100
80
60
40
20
ppm


HO
MeO
MeO
HO
N
O
O
OH
OMe

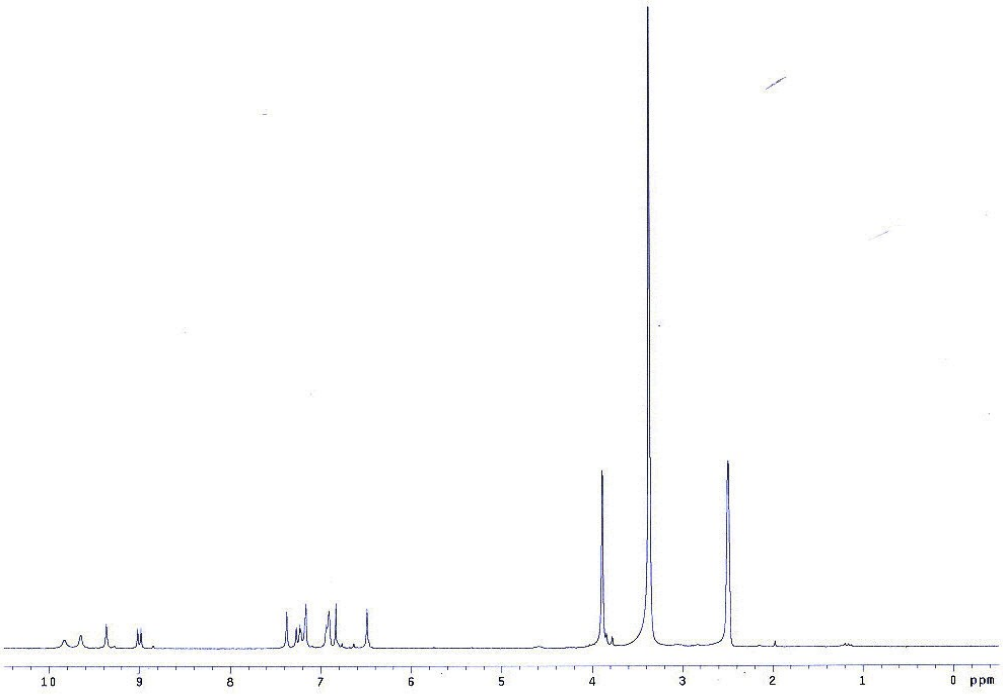
4

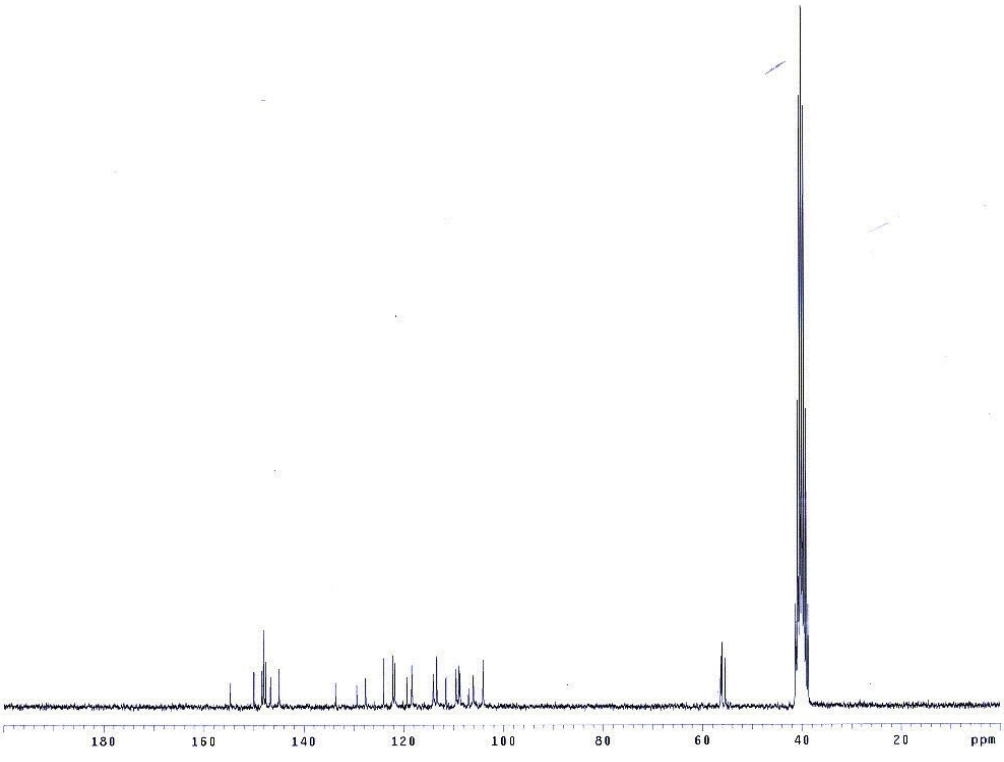

10
9
8
7
6
5
4
3
2
1
0 ppm


180
160
140
120
100
80
60
40
20
ppm


MeO
HO
HO
MeO
N
O
O
OH
OMe

144


10
9
8
7
6
5
4
3
2
1
0 ppm


180
160
140
120
100
80
60
40
20
ppm