Supporting Information

Total Synthesis of the Proposed Structure of Maltepolide C

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General information and abbreviations:

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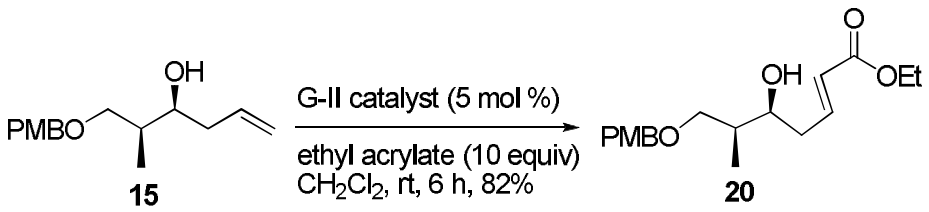
All the air and moisture sensitive reactions were carried out under inert atmosphere (nitrogen or argon). Oven-dried glass apparatus were used to perform all the reactions. Freshly distilled anhydrous solvents were used for air and moisture sensitive reactions. Commercially available reagents were used as such. Purification of compounds was carried out via column chromatography by using silica gel (100-200 mesh) packed in glass columns. ^{1}H NMR and ^{13}C NMR were recorded in $CDCl_3$, C_6D_6 and CD_3OD solvents on 300 MHz, 400 MHz, 500 MHz, 600 MHz, 700 MHz and 75 MHz, 100 MHz, 125 MHz, 150 MHz, 175 MHz spectrometer respectively, using TMS as an internal standard. Chemical shifts are measured as ppm values relative to internal $CHCl_3$ δ 7.26 or TMS δ 0.0 or C_6D_6 δ 7.16, CD_3OD 3.31 for ^{1}H NMR and $CHCl_3$ δ 77, C_6D_6 δ 128.02, CD_3OD δ 49.15 for ^{13}C NMR. In ^{1}H NMR multiplicity defined as: s = singlet; d = doublet; t = triplet; q = quartet; quin= quintet, dd = doublet of doublet; ddd = doublet of doublet of doublet; dddd = doublet of doublet of doublet of doublet; dt = doublet of triplet; td = triplet of doublet; qd = quartet of doublet; ddt = doublet of doublet of triplet; dtd = doublet of triplet of doublet; tdd = triplet of doublet of doublet; dtd = doublet of triplet of doublet; m = multiplet; brs = broad singlet. Optical rotation values were recorded on Horiba sepa 300 polarimeter using a 2 mL cell with a 10 mm path length. FTIR spectra were recorded on Alpha (Bruker) infrared Spectrophotometer. High resolution mass spectra (HRMS) [ESI+] were obtained using either a TOF or a double focusing spectrometer.

Abbreviations:

KHMDS = Potassium bis(trimethylsilyl)amide; Ipc = Isopinocampheyl; DDQ = 2,3-Dichloro-5,6-dicyano-1,4-benzoquinone; DMP = Dess-Martin periodinane; CSA = Camphorsulfonic acid; THF = Tetrahydrofuran; DMAP = 4-(Dimethylamino) pyridine; DMF = Dimethylformamide.

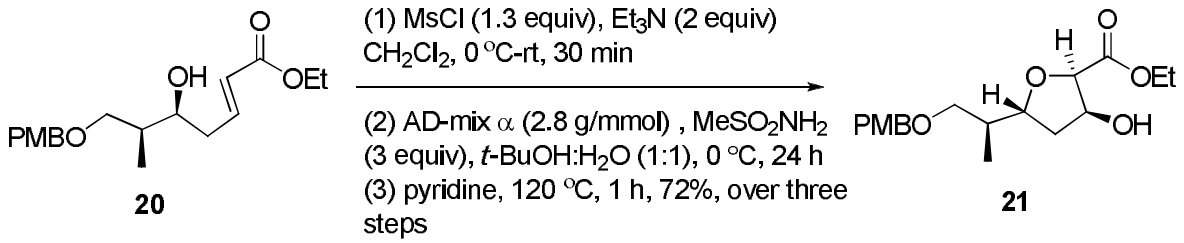
Experimental procedures and analytical data:

(5*S*,6*S*,*E*)-Ethyl 5-hydroxy-7-(4-methoxybenzyloxy)-6-methylhept-2-enoate (20):



A solution of alcohol **15** (1.65 g, 6.59 mmol) and ethyl acrylate (7.16 ml, 65.9 mmol) in anhydrous CH_2Cl_2 (76 ml) was degassed by purging argon for 15 min and then treated with G-II catalyst (280 mg, 0.33mmol, 5 mol %). The resulting solution was stirred at room temperature under argon atmosphere for 6 h. Then the catalyst was allowed to oxidize by opening the reaction to air and stirred for 1 h. The dark brown solution was concentrated under reduced pressure to give crude material, which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 20% EtOAc/hexane) to afford enoate **20** (1.75 g, 5.43 mmol, 82%) as a pale yellow oil. R_f = 0.3 (SiO_2, 30% EtOAc/hexane); $[\alpha]_D^{25}$ = –15.8 (*c* 1.23, $CHCl_3$); IR (Neat): ν_{max} 3493, 2967, 2910, 2858, 1712, 1653, 1612, 1513, 1461, 1367, 1303, 1248, 1212, 1173, 1091, 1037, 982, 821, 709, 580 cm^{-1}; ^1H NMR (500 MHz, $CDCl_3$): δ 7.23 (m, 2H), 6.98 (td, *J* = 15.7, 7.3 Hz, 1H), 6.88 (m, 2H), 5.89 (td, *J* = 15.7, 1.4 Hz, 1H), 4.44 (d, *J* = 17.2 Hz, 1H), 4.43 (d, *J*= 17.2 Hz, 1H), 4.18 (q, *J* = 7.1Hz, 2H), 3.94-3.89 (m, 1H), 3.81 (s, 3H), 3.53 (dd, *J* = 9.2, 4.2 Hz, 1H), 3.47 (dd, *J* = 9.2, 6.3 Hz, 1H), 2.81 (d, *J* = 4.0 Hz, 1H), 2.37 (dddd, *J* = 18.5, 14.5, 7.5, 1.5 Hz, 1H), 2.29 (dddd, *J* = 14.5,6.4, 4.8, 1.5 Hz, 1H), 1.92-1.86 (m, 1H), 1.28 (t, *J* = 7.2 Hz, 3H), 0.94 (d, *J* = 7.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 166.36, 159.25, 145.91, 129.84, 129.25, 123.26, 113.82, 74.08, 73.09, 72.87, 60.18, 55.22, 37.53, 36.95, 14.22, 10.69. HRMS (ESI): $[M + Na]^+$calcd. for $C_{18}H_{26}O_5Na$ 345.1673, found 345.1681.

(2*R*,3S,5*R*)-Ethyl-3-hydroxy-5-((*S*)-1-(4-methoxybenzyloxy) propan-2-yl)tetrahydrofuran-2-carboxylate (21):

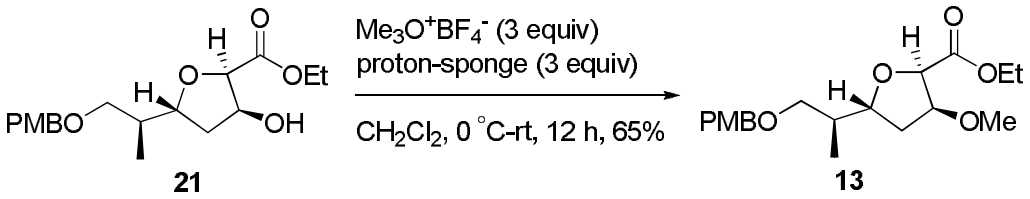


A solution of enoate **20** (1.72 g, 5.33 mmol) in anhydrous CH_2Cl_2 (16 ml) were added Et_3N (1.48 ml, 10.66 mmol) followed by MsCl (0.54 ml, 6.93 mmol) at 0 ˚C. The resulting solution was warmed to room temperature and stirred for 30 min. After which time, TLC (20% EtOAc/hexane) indicated the complete consumption of enoate **20**. The reaction was quenched with saturated aqueous $NaHCO_3$ (10 ml) at 0 ˚C and diluted with water (20 ml) and CH_2Cl_2 (30 ml) and the aqueous layer was extracted with CH_2Cl_2 (3 x 30 ml). The combined organic extracts were washed with water (30 ml) and brine (30 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (30% EtOAc/hexane) to afford mesyl compound (2.1 g, quantitative) as yellow oil, which was used directly for the next reaction without any further characterization. To a stirred solution of mesyl compound in *t*-BuOH:H_2O (1:1, 160 ml) were added AD-mix α (14.89 g) and $MeSO_2NH_2$ (1.01 g, 10.66 mmol) at 0 ˚C. After stirring at 0 ˚C for 24 h the reaction was quenched with saturated aqueous $Na_2S_2O_5$ (15.19 g, 79.95 mmol) at 0 ˚C and the reaction mixture was warmed to room temperature and stirred for 30 min. The reaction mixture was diluted with water (50 ml) and extracted with ethyl acetate (3 x 50 ml). The combined organic extracts were washed with water (50 ml) and brine (50 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was used in the next step without further purification.

The crude product obtained in the previous reaction was dissolved in anhydrous pyridine (16 ml) and stirred at 120 ˚C for 1 h under nitrogen atmosphere. Then the reaction mixture was cooled to room temperature and diluted with ethyl acetate (90 ml). It was then washed with saturated aqueous $CuSO_4$ (2 x 25 ml), water (30 ml) and brine (30 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was purified by silica gel column chromatography

(SiO_2, 100-200 mesh, 40% EtOAc/hexane) to afford **21** (1.31 g, 3.87 mmol, 72%) as a colorless oil. R_f = 0.4 (SiO_2, 50% EtOAc/hexane); $[\alpha]_D^{25}$ = +14.3 (*c* 1.3 $CHCl_3$); IR (Neat): ν_{max} 3465, 2966, 2926, 1744, 1611, 1513, 1461, 1373, 1298, 1247, 1207, 1087, 1032, 981, 823 cm^{-1}; ^1H NMR (500 MHz, $CDCl_3$): δ 7.25 (m, 2H), 6.87 (m, 2H), 4.64 (m,1H), 4.52 (d, *J* = 4.4 Hz, 1H), 4.44 (s, 2H), 4.36-4.22 (m, 3H), 3.80 (s, 3H), 3.58 (dd, *J* = 9.2, 5.0 Hz, 1H), 3.35 (dd, *J* = 9.2, 7.0 Hz, 1H), 2.37 (brs, 1H), 2.06-1.98 (m, 2H), 1.84 (ddd, *J* = 13.2, 10.2, 5.2 Hz, 1H), 1.30 (t, *J* = 7.2 Hz, 3H), 0.93 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 170.49, 159.01, 130.67, 129.10, 113.68, 81.91, 80.95, 73.53, 72.73, 72.46, 61.21, 55.23, 38.29, 38.09, 14.23, 12.89. HRMS (ESI): $[M + Na]^+$calcd. for $C_{18}H_{26}O_5Na$ 361.1622, found 361.1629.

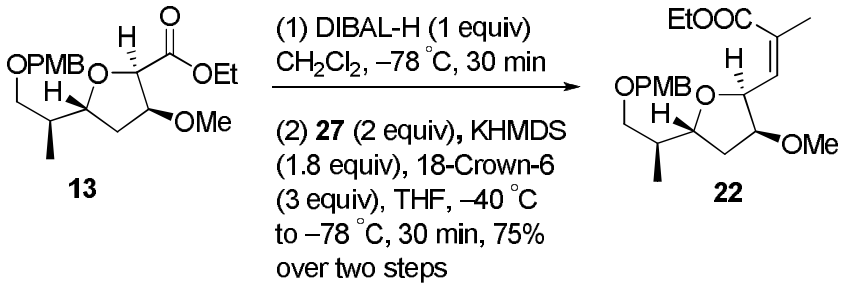
(2*R*,3*S*,5*R*)-Ethyl 3-methoxy-5-((*S*)-1-(4-methoxybenzyloxy)propan-2-yl)tetrahydrofuran-2-carboxylate (13):



To a stirred solution of **21** (1.29 g, 3.81 mmol) in anhydrous CH_2Cl_2 (20 ml) were added proton-sponge (2.45 g, 11.43 mmol) and trimethyloxoniumtetrafluoroborate (1.69 g, 11.43 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred for 12 h. The reaction was quenched with saturated aqueous ammonium chloride (20 ml) and diluted with water (20 ml) and CH_2Cl_2 (20 ml). The aqueous layer was extracted with CH_2Cl_2 (3 x 30 ml). The combined organic extracts were washed with water (30 ml) and brine (30 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 20% EtOAc/hexane) to afford **13** (873 mg, 2.48 mmol, 65%) as a colorless oil. R_f = 0.5 (SiO_2, 30% EtOAc/hexane); $[\alpha]_D^{25}$ = +22.6 (*c* 0.89, $CHCl_3$); IR (Neat): ν_{max} 3746, 2927, 2849, 2310, 1756, 1612, 1513, 1460, 1369, 1296, 1247, 1198, 1092, 1033, 820 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.25 (m, 2H), 6.87 (m, 2H), 4.58 (d, *J* = 5.1 Hz, 1H), 4.44 (s, 2H), 4.31-4.14 (m, 4H), 3.80 (s, 3H), 3.60 (dd, *J* = 9.3, 5.0 Hz, 1H), 3.34-3.31 (m, 4H), 2.10 (ddd, *J* = 13.0, 5.7, 2.0 Hz, 1H), 2.01 (dtd, *J* = 13.9, 7.0, 5.0 Hz, 1H), 1.7-1.63 (m, 1H), 1.28 (t, *J* = 7.1 Hz, 3H), 0.93 (d, *J* = 7.0 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 170.01,

159.00, 130.77, 129.08, 113.66, 82.58, 81.19, 80.87, 72.68, 72.53, 60.62, 57.77, 55.23, 38.26, 34.18, 14.26, 13.04. HRMS (ESI): $[M + Na]^+$calcd. for $C_{19}H_{28}O_6Na$ 375.1778, found 375.1790.

(*Z*)-Ethyl-3-((2*S*,3*S*,5*R*)-3-methoxy-5-((*S*)-1-(4-methoxybenzyloxy)propan-2-yl)tetrahy drofuran-2-yl)-2-methylacrylate (22):

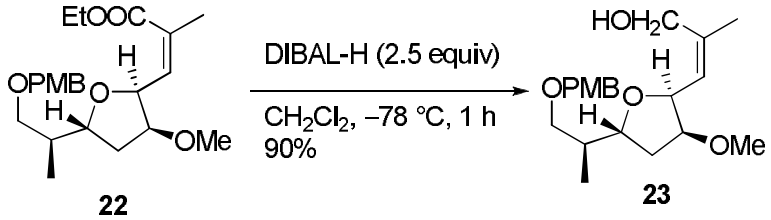


A stirred solution of **13** (850 mg, 2.41 mmol) in anhydrous CH_2Cl_2 (7.2 ml) was treated with DIBAL-H (1.6 M toluene solution, 1.51 ml, 2.41 mmol) drop wise over a period of 10 min at –78 ˚C and stirred for 30 min. After which time TLC (hexane:ethyl acetate = 1:1) indicated the complete consumption of **13**. The reaction was quenched with methanol (1.2 ml) and allowed to warm to 0 ˚C. A saturated solution of sodium potassium tartrate (4.8 ml) was added and the mixture was stirred for 2 h at room temperature. The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 20 ml) three times. The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (50% EtOAc/hexane) to afford an aldehyde as colorless oil, which was immediately used for the next step.

A solution of 18-Crown-6 (1.91 g, 7.23 mmol) and ethyl 2-[bis (2,2,2-trifluoroethyl) phosphono] propionate **27** (1.67 g, 4.82 mmol) in anhydrous THF (15 ml) was treated with KHMDS (0.5 M toluene solution, 8.68 ml, 4.34 mmol) at –40 ˚C and the resulting brown solution was stirred for 30 min. Then the solution was further cooled down to –78 ˚C and treated with a solution of aldehyde in anhydrous THF (15 ml) and stirred for 30 min. The reaction mixture was warmed to 0 ˚C and quenched with saturated aqueous ammonium chloride (30 ml). The reaction mixture was extracted with ethyl acetate (3 x 30 ml). The combined organic extracts were washed with water (30 ml) and brine (30 ml). The organic layer was dried over anhydrous

sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 14% EtOAc/hexane) to afford **22** (710 mg, 1.81 mmol, 75%) as a colorless oil. R_f = 0.6 (SiO_2, 40% EtOAc/hexane); $[\alpha]_D^{25}$ = +47.3 (*c* 0.83, $CHCl_3$); IR (Neat): ν_{max} 2970, 2928, 2311, 1710, 1652, 1611, 1513, 1458, 1369, 1304, 1243, 1151, 1102, 1057, 1034, 945, 822, 760 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.25 (m, 2H), 6.86 (m, 2H), 6.06 (qd, *J* = 7.7, 1.5 Hz, 1H), 5.13 (dd, *J* = 7.5, 4.0 Hz, 1H), 4.42 (s, 2H), 4.18 (q, *J* = 7.1 Hz, 2H), 4.11-4.06 (m, 2H), 3.80 (s, 3H), 3.58 (dd, *J* = 9.2, 5.0 Hz, 1H), 3.32 (dd, *J* = 9.1, 7.3 Hz, 1H), 3.28 (s, 3H), 2.12 (dd, 13.1, 6.2 Hz, 1H), 1.95 (s, 3H), 1.94-1.89 (m, 1H), 1.75-1.65 (m, 2H), 1.29 (t, *J* = 7.2 Hz, 3H), 0.92 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 167.40, 158.97, 140.59, 130.85, 129.05, 128.75, 113.65, 83.76, 79.60, 79.48, 72.76, 72.65, 60.36, 57.45, 55.22, 38.83, 35.40, 20.27, 14.22, 13.20. HRMS (ESI): $[M + Na]^+$calcd. for $C_{22}H_{32}O_6Na$ 415.2091, found 415.2096.

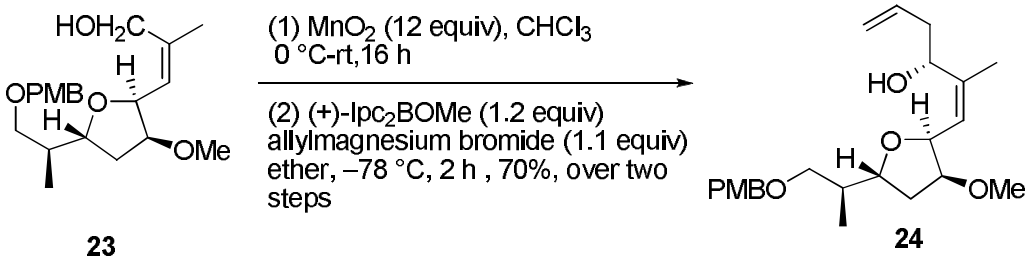
((2*S*,3*S*,5*R*)-3-Methoxy-5-((*S*)-1-(4-methoxybenzyloxy)propan-2-yl)tetrahydrofuran-2-yl)-2-methylprop-2-en-1-ol (23):



A stirred solution of compound **22** (500 mg, 1.27 mmol) in an hydrous CH_2Cl_2 (4 ml) was treated with DIBAL-H (1.6 M toluene solution, 1.98 ml, 3.18 mmol) at –78 ˚C and stirred for 30 min. After which the reaction was quenched with methanol (1 ml) and allowed to warm to 0 ˚C. A saturated aqueous solution of sodium potassium tartrate (4 ml) was added and the mixture was stirred at room temperature until the white suspension becomes clear solution. The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 25 ml). The combined organic extracts were washed with water (25 ml) and brine (25 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was purified by silica gel column chromatography (40% EtOAc/hexane) to afford alcohol **23** (402 mg, 1.15 mmol, 90%) as a colorless oil. R_f = 0.25 (SiO_2, 60% EtOAc/hexane); $[\alpha]_D^{25}$ = +9.6 (*c* 0.38 $CHCl_3$); IR (Neat): ν_{max}

3433, 2924, 1612, 1512, 1458, 1365, 1300, 1246, 1176, 1097, 1037, 947, 820 cm^{-1}; ^1H NMR (500 MHz, $CDCl_3$): δ 7.25 (m, 2H), 6.87 (m, 2H), 5.60 (d, J = 7.5 Hz, 1H), 4.67 (dd, J = 7.3, 3.9 Hz, 1H), 4.42 (d, J = 1.2 Hz, 2H), 4.18 (d, J = 12.4 Hz, 1H), 4.10-4.00 (m, 2H), 3.83-3.81 (m, 1H), 3.80 (s, 3H), 3.55 (dd, J = 9.2, 4.9 Hz, 1H), 3.33 (s, 3H), 3.31 (dd, J = 12.5, 6.5 Hz, 1H), 2.44 (brs, 1H), 2.13 (ddd, J = 8.4, 6.4, 2.0 Hz, 1H), 1.96-1.89 (m, 1H), 1.86 (s, 3H), 1.76 (ddd, J = 12.8, 9.3, 5.0 Hz, 1H), 0.92 (d, J = 6.9 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 159.00, 140.94, 130.73, 129.11, 123.05, 113.65, 82.51, 79.10, 77.32, 72.69, 72.59, 62.53, 57.24, 55.22, 38.87, 34.67, 22.31, 13.30. HRMS (ESI): $[M + Na]^+$calcd. for $C_{20}H_{30}O_5Na$ 373.1986, found 373.1992.

(*R*,*Z*)-1-((2*S*,3*S*,5*R*)-3-Ethoxy-5-((*S*)-1-(4-methoxybenzyloxy)propan-2-l)tetrahydrofuran-2-yl)-2-methylhexa-1,5-dien-3-ol (24):



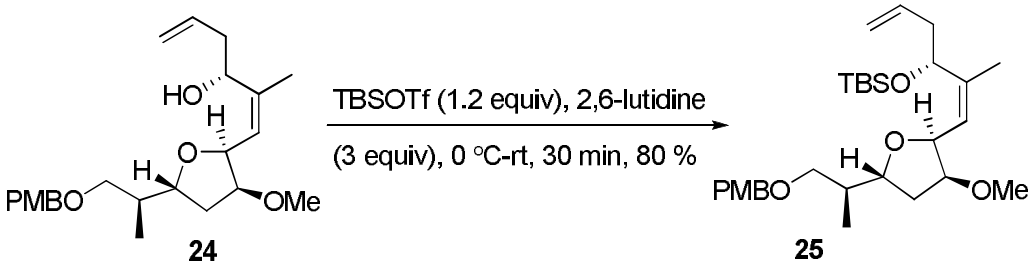
23 **24**

A solution of alcohol **23** (370 mg, 1.06 mmol) in anhydrous $CHCl_3$ (6 ml) was treated with freshly activated MnO_2 (1.11 g, 12.72 mmol) at 0 ˚C and the solution was stirred at room temperature for 16 h under dark. Then the reaction mixture was filtered through small Celite plug and washed with $CHCl_3$ (30 ml). The filtrate was concentrated under reduced pressure to afford aldehyde, which was immediately used in next step without further purification.

A stirred solution of (+)-Ipc_2BOMe (402 mg, 1.27 mmol) in dry ether (3.8 ml) was treated with a solution of allylmagnesium bromide (1.0 M ether solution, 1.17 ml, 1.17 mmol) at 0 ˚C. The resulting solution was allowed to warm to room temperature and stirred for additional 1 h to obtain a white suspension. The suspension was then cooled to 0 ˚C and allowed to settle for 30 min. The supernatant was cannulated to a cooled solution of aldehyde in dry ether (2 ml) at –78 ˚C. The resulting mixture was stirred at –78 ˚C for 2 h then allowed to warm to 0 ˚C. The reaction was quenched with ethanol (0.17 ml), 3N aqueous NaOH (0.45 ml) and 30% H_2O_2 (0.89 ml). The reaction mixture was warmed to room temperature and stirred for 16 h. The reaction

mixture was diluted with water (20 ml) and extracted with ether (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 20% EtOAc/hexane) to afford alcohol **24** (289 mg, 0.83mmol, 70%) as a colorless oil. R_f = 0.35 (SiO_2, 40% EtOAc/hexane); $[\alpha]_D^{25}$ = +7.7 (*c* 1.18, $CHCl_3$); IR (Neat): ν_{max} 3747, 3464, 2925, 2855, 2311, 1701, 1610, 1513, 1458, 1248, 1173, 1094, 1035, 823 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.24 (m, 2H), 6.86 (m, 2H), 5.81(ddt, *J* = 17.2, 10.1, 7.4 Hz, 1H), 5.57 (dd, *J* = 8.0, 1.0 Hz, 1H), 5.18-5.08 (m, 2H), 4.70 (dd, *J* = 8.0, 4.0 Hz, 1H), 4.50 (t, *J* = 6.8 Hz, 1H), 4.42 (s, 2H), 4.03 (td, *J* = 9.0, 7.0 Hz, 1H), 3.84-3.81 (m, 1H), 3.80 (s, 3H), 3.58 (dd, *J* = 9.1,4.8 Hz, 1H), 3.34 (s, 3H), 3.31 (dd, *J* = 10.1, 3.0 Hz, 1H), 2.39-2.33 (m, 2H), 2.12 (ddd, *J* = 8.8, 6.6, 2.2 Hz, 1H), 1.95-1.87 (m, 1H), 1.79 (d, *J* = 1.0 Hz, 3H), 1.74 (dd, *J* = 9.1, 4.8 Hz, 1H), 0.92 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 159.00, 142.21, 134.84, 130.78, 129.07, 123.06, 117.67, 113.66, 82.51, 78.80, 76.54, 72.70, 72.68, 69.95, 57.23, 55.23, 39.80, 38.98, 34.66, 18.65, 13.37. HRMS (ESI): $[M + Na]^+$calcd. for $C_{23}H_{34}O_5Na$ 413.2299, found 413.2312.

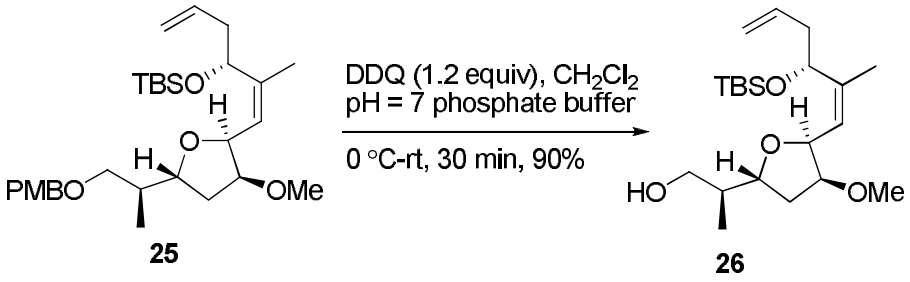
***tert*-Butyl((*R*,*Z*)-1-((2*S*,3*S*,5*R*)-3-methoxy-5-((*S*)-1-(4-methoxybenzyloxy)propan-2-yl) tetrahydrofuran-2-yl)-2-methylhexa-1,5-dien-3-yloxy)dimethylsilane (25):**



A stirred solution of alcohol **24** (260 mg, 0.67 mmol) in dry CH_2Cl_2 (2 ml) was treated with 2,6-lutidine (0.23 ml, 2.01 mmol) followed by TBSOTf (0.19 ml, 0.80 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred for 30 min. After which the reaction was quenched with saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and diluted with water (20 ml). The reaction mixture was extracted with CH_2Cl_2 (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude

material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 5% EtOAc/hexane) to afford **25** (269 mg, 0.53 mmol, 80%) as a colorless oil. R_f = 0.5 (SiO_2, 15% EtOAc/hexane); $[\alpha]_D^{25}$ = –4.5 (*c* 1.4, $CHCl_3$); IR (Neat): ν_{max} 3072, 2930, 2894, 2856, 1613, 1513, 1463, 1364, 1299, 1248, 1176, 1070, 1006, 943, 914, 833, 776, 670 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.24 (m, 2H), 6.86 (m, 2H), 5.81 (ddt, *J* = 17.2, 10.1, 7.4 Hz, 1H), 5.47 (qd, *J* = 8.4, 0.6 Hz, 1H), 5.08-4.97 (m, 2H), 4.56 (td, *J* = 9.3, 4.2 Hz, 2H), 4.42 (s, 2H), 4.03-3.96 (dd, *J* = 14.0,7.6 Hz, 1H), 3.80 (s, 3H), 3.76 (td , *J* = 5.0, 1.5 Hz, 1H), 3.63 (dd, *J* = 9.0, 4.6 Hz, 1H), 3.32 (s, 3H), 3.31-3.26 (m, 1H), 2.39-2.20 (m, 2H), 2.15 (ddd, *J* = 13.2, 6.2, 1.2 Hz, 1H), 1.95-1.87 (m, 1H), 1.75 (d, *J* = 1.2 Hz, 3H), 1.70 (dd, *J* = 9.5, 4.8 Hz, 1H), 0.92 (d, *J* = 6.6 Hz, 3H), 0.88 (s, 9H), 0.03 (s, 3H); 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 159.00, 143.74, 135.72, 130.86, 129.04, 120.52, 116.45, 113.67, 82.77, 78.76, 76.53, 72.91, 72.71, 71.24, 57.24, 55.24, 41.41, 39.13, 35.19, 25.77, 18.25, 18.19, 13.32, -4.76, -4.79. HRMS (ESI): $[M + Na]^+$calcd. for $C_{29}H_{48}O_5NaSi$ 527.3163, found 527.3177.

(*S*)-2-((2*R*,4*S*,5*S*)-5-((*R*,*Z*)-3-(*tert*-Butyldimethylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)propan-1-ol (26):

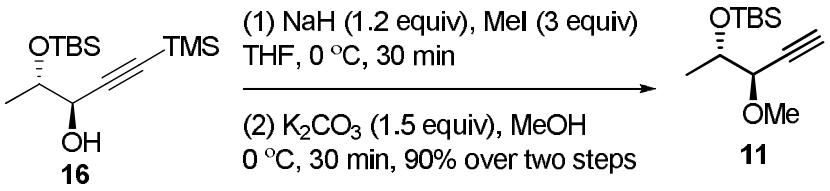


25 **26**

A stirred solution of **25** (250 mg, 0.5 mmol) in a mixture of solvents CH_2Cl_2 and pH = 7 phosphate buffer (3 ml, 20:1) was treated with DDQ (136 mg, 0.6 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred for 30 min. After which the reaction was quenched with saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and diluted with water (20 ml), CH_2Cl_2 (20 ml). The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 20 ml) three times. The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (17% EtOAc/hexane) to afford alcohol **26** (172 mg, 0.45 mmol, 90%) as a

colorless oil. R_f = 0.4 (SiO_2, 30% EtOAc/hexane); $[\alpha]_D^{25}$ = +12.2 (*c* 0.5, $CHCl_3$); IR (Neat): ν_{max} 3744, 3470, 2926, 2856, 1723, 1646, 1463, 1369, 1252, 1076, 1040, 1005, 941, 915, 836, 776, 668 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 5.74 (ddt, *J* = 17.2, 10.2, 7.2 Hz, 1H), 5.46 (d, *J* = 9.0 Hz, 1H), 5.09-5.00 (m, 2H), 4.69 (dd, 13.7, 9.0 Hz, 1H), 4.52 (t, *J* = 6.8 Hz, 1H), 3.97 (dt, *J* = 9.4, 5.9 Hz, 1H), 3.75 (td, *J* = 4.6, 1.5 Hz, 1H), 3.61 (dd, *J* = 11.0, 8.3 Hz, 1H), 3.56 (dd, *J* = 11.0, 3.7 Hz, 1H), 3.34 (s, 3H), 2.38-2.16 (m, 3H), 1.75 (d, *J* = 1.2 Hz, 3H), 1.73-1.65 (m, 2H), 0.87 (s, 9H), 0.79 (d, *J* = 6.8 Hz, 3H), 0.03 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 143.54, 134.89, 120.38, 117.00, 83.41, 82.01, 76.83, 70.94, 68.48, 57.50, 41.28, 41.19, 37.50, 25.74, 18.27, 18.17, 13.18, -4.75, -4.79. HRMS (ESI): $[M + Na]^+$calcd. for $C_{21}H_{40}O_4NaSi$ 407.2588, found 407.2596.

***tert*-Butyl-((2*S*,3*R*)-3-methoxypent-4-yn-2-yloxy)-dimethylsilane (11):**

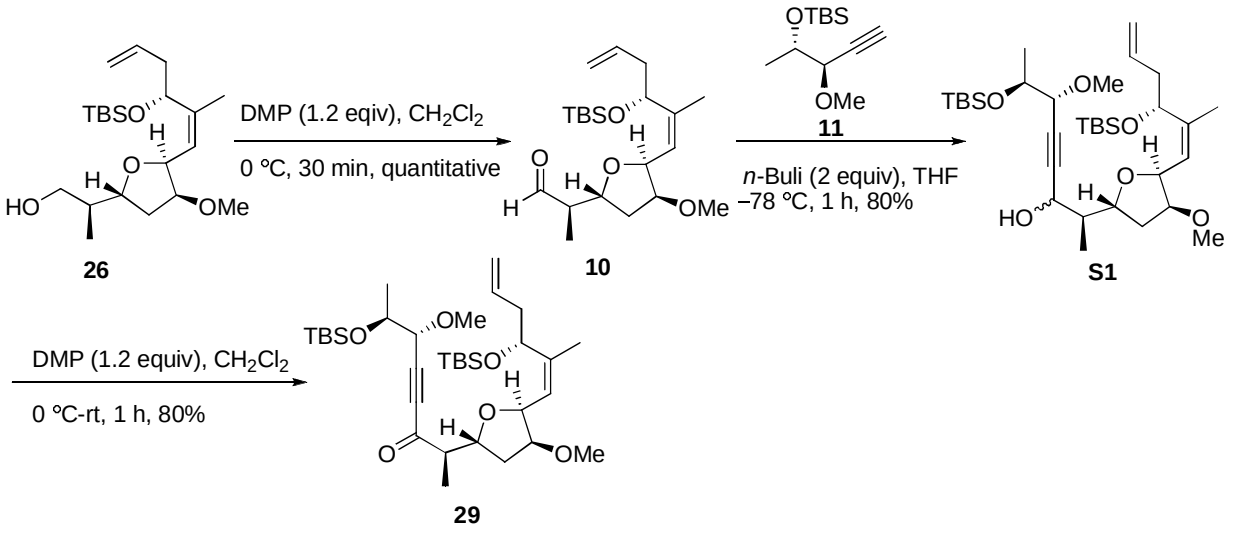


A stirred solution of **16** (580 mg, 2.02 mmol) in anhydrous THF (6 ml) was treated with NaH (97 mg, 2.42 mmol) followed by freshly distilled MeI (0.38 ml, 6.06 mmol) at 0 ˚C and stirred for 30 min. After which the reaction was quenched with saturated aqueous ammonium chloride (10 ml) and extracted with ether (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material, which was used in the next step without further purification.

A solution of above crude compound in anhydrous MeOH (3 ml) was treated with anhydrous K_2CO_3 (418 mg, 3.03 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred for 30 min. The reaction mixture was filtered through small Celite plug and washed with ether. The filtrate and washings were concentrated under reduced pressure to give brown residue. The brown residue was diluted with ether (20 ml) and saturated aqueous ammonium chloride (20 ml) and stirred for 10 min. The layers were separated and the aqueous layer was extracted with ether (3 x 20 ml). The combined organic extracts were washed with water (20 ml)

and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 2% EtOAc/hexane) to afford alkyne **11** (416 mg, 1.83 mmol, 90%) as a pale brown oil. R_f = 0.7 (SiO_2, 5% EtOAc/hexane); $[\alpha]_D^{25}$ = –20.1 (*c* 0.8 $CHCl_3$); IR (Neat): ν_{max} 3309, 2928, 2856, 1736, 1716, 1464, 1371, 1253, 1194, 1117, 1029, 1003, 945, 834, 777, 661, 631 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 3.89 (m, 1H), 3.76 (dd, *J* = 5.3, 2.1 Hz, 1H), 3.44 (s, 3H), 2.41 (d, *J* = 2.1 Hz, 1H), 1.23 (d, *J* = 6.1 Hz, 3H), 0.89 (s, 9H), 0.09 (s, 3H); 0.08 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 81.25, 76.58, 74.50, 70.60, 57.16, 25.83, 19.51, 18.15, -4.56, -4.66. HRMS (EI-MS):$[M]^{+\cdot}$ calcd. for $C_{12}H_{24}O_2Si$ 228.1545, found 228.1545.

(2*R*,6*R*,7*S*)-7-(*tert*-Butyldimethylsilyloxy)-2-((2*R*,4*S*,5*S*)-5-((*R*,*Z*)-3-(*tert*-Butyldime thylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)-6-methoxyoct -4-yn-3-one (29):



A stirred solution of alcohol **26** (125 mg, 0.33 mmol) in CH_2Cl_2 (2 ml) was treated with DMP (168 mg, 0.41 mmol) at 0 ˚C and stirred at room temperature for 30 min. The reaction was quenched with (1:1) mixture of saturated aqueous hypo and saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and diluted with water (5 ml), CH_2Cl_2 (10 ml). The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 20 ml). The organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered.

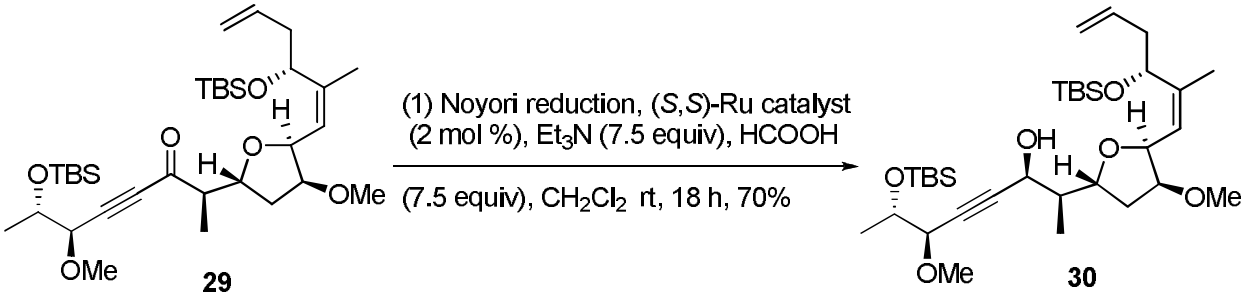
The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 50% EtOAc/hexane) to afford aldehyde **10** (120 mg, 0.31 mmol, quantitative) as a colorless oil. R_f = 0.5 (SiO_2, 20% EtOAc/hexane) which was used immediately in the next step.

A stirred solution of alkyne **11** (151 mg, 0.66 mmol) in dry THF (1.5 ml) was treated with *n*-Buli (1.6 M hexane solution, 0.39 ml, 0.62 mmol) at – 78 ˚C and the solution was warmed slowly (over a period of 45 min.) to – 10 ˚C. The reaction mixture was again cooled to – 78 ˚C and aldehyde **10** (120 mg, 0.31 mmol) in dry THF (3 ml) was cannulated to the reaction mixture and stirred for 1h. The solution was warmed to 0 ˚C and quenched with saturated aqueous NH_4Cl (5 ml) and diluted with water (5 ml) and ethyl acetate (5 ml). The layers were separated and the aqueous layer was extracted with ethyl acetate (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (8% EtOAc/hexane) to afford diastereomeric mixture of alcohols **S1** (153 mg, 0.25mmol, 80%) as a brown oil.

Diastereomeric mixture of alcohols **S1** (120 mg, 0.20 mmol) obtained above were dissolved in anhydrous CH_2Cl_2 (4 ml) and treated with DMP (102 mg, 0.24 mmol) at 0 ˚C. The reaction mixture was warmed to room temperature and stirred for 1 h. The reaction was quenched with (1:1) mixture of saturated aqueous hypo and saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and stirred at room temperature for 30 min. It was then diluted with water (5 ml), CH_2Cl_2 (5 ml) and the layers were separated. The aqueous layer was extracted with CH_2Cl_2 (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (7% EtOAc/hexane) to afford alkynone **29** (95 mg, 0.16 mmol, 80%) as a colorless oil. R_f = 0.6 (SiO_2, 20% EtOAc/hexane); $[\alpha]_D^{25}$ = –20.2 (*c* 0.7, $CHCl_3$); IR (Neat): ν_{max} 2930, 2857, 2210, 1677, 1463, 1369, 1253, 1114, 1076, 1002, 940, 835, 777, 669 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 5.79 (ddt, *J* = 17.4, 10.1, 7.2 Hz, 1H), 5.44 (d, *J* = 7.9 Hz, 1H), 5.08-4.98 (m, 2H), 4.60 (dd, *J* = 8.4, 3.7 Hz, 1H), 4.51 (dd, *J* = 8.4, 5.5 Hz, 1H), 3.99 -3.90 (m, 2H), 3.80 (dt, *J* = 5.2, 1.5 Hz, 1H) , 3.43 (s, 3H), 3.32 (s, 3H), 2.81 (quin, *J* = 7.1 Hz, 1H), 2.37-2.14 (m,

4H), 1.74 (d, *J* = 1.2 Hz, 3H), 1.71 (dd, *J* = 9.0, 5.0 Hz, 1H), 1.22 (d, *J* = 6.0 Hz, 3H), 1.16 (d, *J* = 7.1 Hz, 3H), 0.88 (s, 9H), 0.87 (s, 9H), 0.08 (s, 3H), 0.07 (s, 3H), 0.03 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 188.64, 144.21, 135.57, 119.91, 116.56, 90.37, 84.41, 82.39, 77.20, 76.85, 71.18, 70.23, 57.50, 57.32, 53.69, 41.41, 34.31, 25.77, 19.84, 18.22, 18.07, 11.50, -4.67, -4.74, -4.81. HRMS (ESI): $[M + NH_4]^+$calcd. for $C_{33}H_{64}O_6NSi_2$ 626.4267, found 626.4287.

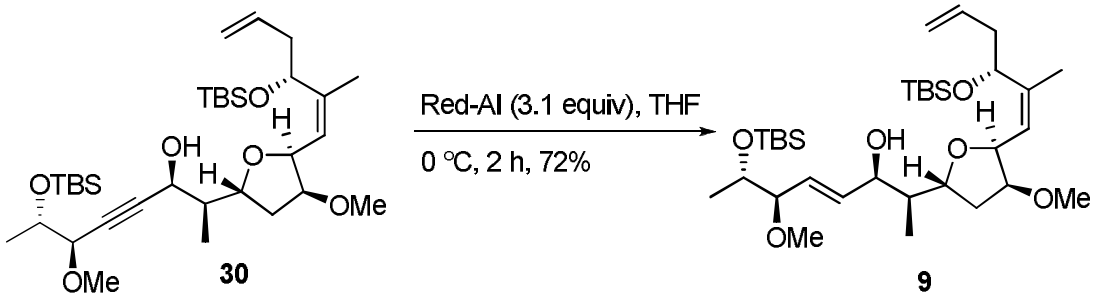
(2*S*,3*S*,6*R*,7*S*)-7-(*tert*-Butyldimethylsilyloxy)-2-((2*R*,4*S*,5*S*)-5-((*R*,*Z*)-3-(*tert*-butyldimethylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)-6-methoxyoct-4-yn-3-ol (30):



To a solution of alkynone 2**9** (80 mg, 0.13 mmol) in anhydrous CH_2Cl_2 (4 ml), Et_3N (0.14 ml, 0.98 mmol) and HCOOH (37 µl, 0.98 mmol) were added at 0 ˚C under argon and stirred for 5 min. To the above solution was added in situ generated (*S*,*S*)-Ru catalyst (0.01 M CH_2Cl_2 solution, 0.26 ml, 0.0026 mmol, 2 mol %) at 0 ˚C. The solution was warmed to room temperature and stirred for 18 h. The reaction was quenched with saturated aqueous NH_4Cl (5 ml) and diluted with water (5 ml). The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 15 ml). The combined organic extracts were washed with water (15 ml) and brine (15 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 8% EtOAc/hexane) to afford alcohol **30** (56 mg, 0.092 mmol, 70%) as a brown oil. R_f = 0.45 (SiO_2, 20% EtOAc/hexane); $[\alpha]_D^{25}$ = –30.2 (*c* 0.5, $CHCl_3$); IR (Neat): ν_{max} 3434, 2930, 2857, 1720, 1642, 1371, 1253, 1198, 1099, 1004, 836, 779 cm^{-1}; ^{1}H NMR (700 MHz, $CDCl_3$): δ 5.73 (ddt, *J* = 17.2, 10.4, 7.3 Hz, 1H), 5.44 (dd, *J* = 9.2, 1.5 Hz, 1H), 5.07 (dd, *J* = 10.4, 2.0 Hz, 1H), 5.04 (dd, *J* = 17.2, 2.0 Hz, 1H), 4.71 (dd, *J* = 9.2, 4.0 Hz, 1H), 4.51 (dd, *J* = 7.3, 6.5 Hz, 1H), 4.45 (m, 1H), 4.34 (td, *J* = 9.5, 5.8, Hz, 1H), 3.93 (qd, *J* = 6.4, 4.0

Hz, 1H), 3.87 (dd, *J* = 4.0, 1.5 Hz, 1H), 3.76 (t, *J* = 4.0 Hz, 1H), 3.41 (s, 3H), 3.31 (s, 3H), 2.28 (ddd, *J* = 13.2, 6.5, 1.5 Hz, 1H), 2.32 (m, 13.5, 7.5 Hz, 1H), 2.22 (m, *J* = 13.5, 7.3, 6.5 Hz, 1H), 1.87 (ddd, *J* = 9.8, 6.7, 2.9 Hz, 2H), 1.75 (d, *J* = 1.5 Hz, 3H), 1.70 (ddd, *J* = 13.2, 9.6, 5.0 Hz, 1H), 1.21 (d, *J* = 6.4 Hz, 3H), 0.91 (d, *J* = 7.0 Hz, 3H), 0.88 (s, 9H), 0.87 (s, 9H), 0.08 (s, 3H), 0.07 (s, 3H), 0.03 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 143.12, 134.90, 120.55, 117.05, 85.73, 82.74, 81.88, 79.86, 76.84, 77.20, 71.01, 70.77, 67.05, 57.45, 57.03, 43.99, 41.28, 37.33, 25.86, 25.75, 19.30, 18.29, 18.17, 13.04, -4.58, -4.68, -4.75, -4.79. HRMS (ESI): $[M + NH_4]^+$ calcd. for $C_{33}H_{66}O_6NSi_2$ 628.4423, found 628.4445.

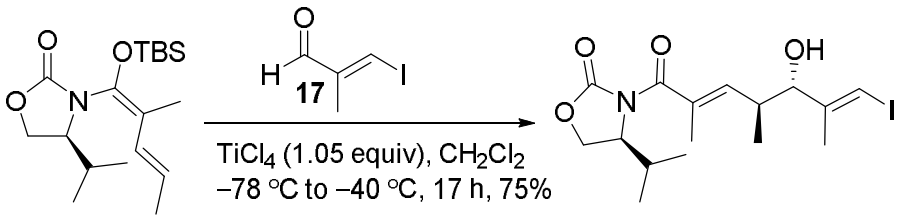
(2*S*,3*R*,6*R*,7*S*,*E*)-7-(*tert*-Butyldimethylsilyloxy)-2-((2*R*,4*S*,5S)-5-((*R*,*Z*)-3-(*tert*-butyldimethylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)-6-methoxyoct-4-en-3-ol (9):



A stirred solution of alcohol **30** (40 mg, 0.065 mmol) in anhydrous THF (2 ml) was treated with Red-Al (0.06 ml, 0.2 mmol, 65% in toluene) at 0 ˚C under argon and stirred for 2 h. The reaction mixture was quenched at 0 ˚C with saturated Rochelle salt (3 ml) and diluted with ethyl acetate (3 ml). The reaction mixture was warmed to room temperature and stirred until two clear layers formed. The reaction mixture was diluted with water (10 ml) and the aqueous layer was extracted with ethyl acetate (3 x 15 ml). The combined organic extracts were washed with water (10 ml) and brine (10 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 8% EtOAc/hexane) to afford **9** (29 mg, 0.047 mmol, 72%) as a colorless oil. R_f = 0.4 (SiO_2, 20% EtOAc/hexane); $[\alpha]_D^{25}$ = –10.3 (*c* 0.35, $CHCl_3$); IR (Neat): ν_{max} 3478, 2928, 2856, 1724, 1643, 1463, 172, 1253, 1113, 1078, 1040, 1002, 942, 915, 835, 776, 672 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$): δ 5.79-5.69 (m, 2H), 5.57 (ddd, *J* = 15.7, 7.6, 0.9 Hz, 1H), 5.43 (d, *J* = 8.8 Hz, 1H), 5.09-5.01 (m, 2H), 4.70 (dd,

J = 9.0, 3.7 Hz, 1H), 4.52 (t, *J* = 6.7 Hz, 1H), 4.22 (d, *J* = 4.0 Hz, 1H), 4.09 (dt, *J* = 9.5, 5.7 Hz, 1H), 3.80 (dd, *J* = 6.1, 4.3 Hz, 1H), 3.76 (t, *J* = 4.0 Hz, 1H), 3.41 (dd, *J* = 7.6, 4.3 Hz, 1H), 3.32 (s, 3H), 3.29 (s, 3H), 2.38-2.18 (m, 3H), 1.82 (ddd, *J* = 9.1, 7.0, 2.7 Hz, 1H),1.75 (d, *J* = 1.1 Hz, 3H), 1.69 (ddd, *J* = 13.0, 9.7, 4.8 Hz, 1H), 1.11 (d, *J* = 6.2 Hz, 3H), 0.87 (s, 9H), 0.87 (s, 9H), 0.83 (d, *J* = 7.0 Hz, 3H), 0.04 (s, 6H), 0.03 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 143.31, 134.94, 134.20, 129.00, 120.50, 116.99, 86.74, 82.12, 79.97, 76.82, 74.94, 71.00, 70.95, 57.49, 56.66, 43.90, 41.30, 37.35, 25.86, 25.75, 19.74, 18.29, 18.17, 18.13, 12.35, -4.58, -4.63, -4.74, -4.79. HRMS (ESI):$[M + Na]^+$ calcd. for $C_{33}H_{64}O_6NaSi_2$ 635.4134, found 635.4125.

(*S*)-3-((2*E*,4*S*,5*S*,6*E*)-5-Hydroxy-7-iodo-2,4,6-trimethylhepta-2,6-dienoyl)-4-isopropyloxazolidin-2-one (31):

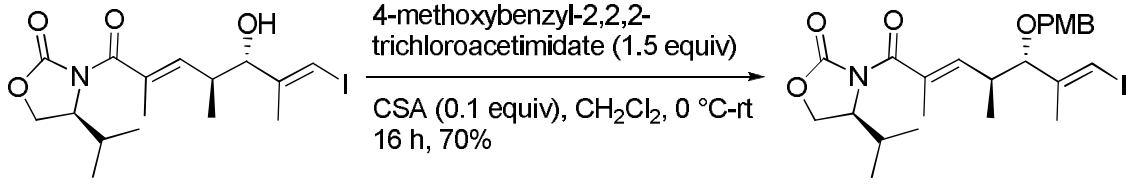


18 **31**

A stirred solution of aldehyde **17** (866 mg, 4.42 mmol) in anhydrous CH_2Cl_2 (12 ml) was treated with a solution of $TiCl_4$ (1.0 M toluene solution, 2.32 ml, 2.32 mmol) at –78 ˚C under argon atmosphere. The resulting orange solution was stirred for 5 min and then a solution of compound **18** (750 mg, 2.21 mmol) in anhydrous CH_2Cl_2 (10 ml) was added to the reaction mixture and stirred for 1 h at the same temperature. The reaction temperature was then warmed to – 40 ˚C and stirred for 16 h. The reaction mixture was quenched with (1:1) mixture of saturated Rochelle salt and saturated $NaHCO_3$ (20 ml) and the mixture was warmed to room temperature and stirred until two clear layers formed. The reaction mixture was diluted with water (20 ml) and CH_2Cl_2 (20 ml) and the aqueous layer was extracted with CH_2Cl_2 (3 x 30 ml). The combined organic extracts were washed with water (30 ml) and brine (30 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 15% EtOAc/hexane) to afford aldol adduct **31** (698 mg, 1.41 mmol, 75%) as a pale yellow solid. R_f = 0.4 (SiO_2, 40% EtOAc/hexane); $[\alpha]_D^{25}$ = –15.7 (*c*

1.2, $CHCl_3$); IR (Neat): ν_{max} 3496, 2965, 2926, 2874, 1767, 1686, 1457, 1389, 1369, 1303, 1207, 1012, 777, 690 cm^{-1}; ^1H NMR (500 MHz, $CDCl_3$): δ 6.25 (s, 1H), 5.71 (qd, *J* = 10.2, 1.5 Hz, 1H), 4.57 (td, *J* = 9.2, 5.3 Hz, 1H), 4.35 (t, *J* = 9.0 Hz, 1H), 4.19 (dd, *J* = 9.2, 5.6 Hz, 1H), 3.87 (d, *J* = 9.2 Hz, 1H), 2.78-2.69 (m, 1H), 2.38-2.30 (m, 1H), 1.97 (d, *J* = 1.1Hz, 3H), 1.87 (d, *J* = 0.6 Hz, 3H), 0.93 (d, *J* = 6.7 Hz, 3H), 0.91 (d, *J* =6.7 Hz, 3H), 0.85 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 171.22, 154.52, 147.21, 140.20, 132.39, 80.84, 80.24, 63.52, 58.08, 38.00, 28.39, 18.81, 17.82, 15.98, 15.17, 14.09. HRMS (ESI):$[M + Na]^+$calcd. for $C_{16}H_{24}O_4NINa$ 444.0642, found 444.0632.

(*S*)-3-((2*E*,4*S*,5*S*,6*E*)-7-Iodo-5-(4-methoxybenzyloxy)-2,4,6-trimethylhepta-2,6-dienoyl)-4-isopropyloxazolidin-2-one (32):

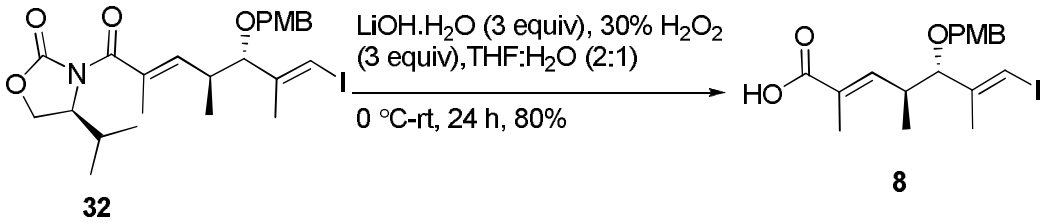


31 **32**

A solution of compound **31** (570 mg, 1.35 mmol) in anhydrous CH_2Cl_2 (6 ml) was treated with 4-methoxybenzyl-2,2,2-trichloroacetimidate (572 mg, 2.03 mmol) and CSA (31.4 mg, 0.14 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred for 16 h. The reaction was quenched with saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and diluted with water (10 ml). The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 20 ml) three times. The organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 10% EtOAc/hexane) to afford **32** (513 mg, 0.95 mmol, 70 %) as a brown liquid. R_f = 0.45 (SiO_2, 40% EtOAc/hexane); $[\alpha]_D^{25}$ = –7.0 (*c* 1.14, $CHCl_3$); IR (Neat): ν_{max} 2963, 2926, 2868, 1783, 1731, 1681, 1612, 1511, 1459, 1369, 1301, 1274, 1245, 1206, 1064, 1033, 823, 755, 690 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.22 (m, 2H), 6.85 (m, 2H), 6.18 (d, *J* = 1.2 Hz, 1H), 5.81 (qd, *J* = 9.5, 1.5 Hz, 1H), 4.50 (td, *J* = 9.0, 4.5 Hz, 1H), 4.40 (d, *J* = 11.5 Hz, 1H), 4.31 (t, *J* = 8.9 Hz, 1H), 4.2-4.14 (m, 2H), 3.80 (s, 3H), 3.62 (d, *J* = 8.1 Hz, 1H), 2.79-2.69 (m, 1H), 2.43-2.34 (m, 1H), 1.91 (d, *J* = 1.3 Hz, 3H), 1.81 (d, *J* = 1.0 Hz, 3H),

0.92 (d, *J* = 7.0 Hz, 3H), 0.90 (d, *J* = 6.8 Hz, 3H), 0.84 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 171.66, 159.02, 153.41, 146.64, 140.67, 131.58, 130.19, 129.49, 113.61, 86.79, 80.29, 70.04, 63.36, 58.30, 55.21, 35.89, 28.26, 17.85, 16.07, 14.95, 14.15. HRMS (ESI): [M + Na]$^+$calcd. for $C_{24}H_{32}O_5NINa$ 564.1217, found 564.1207.

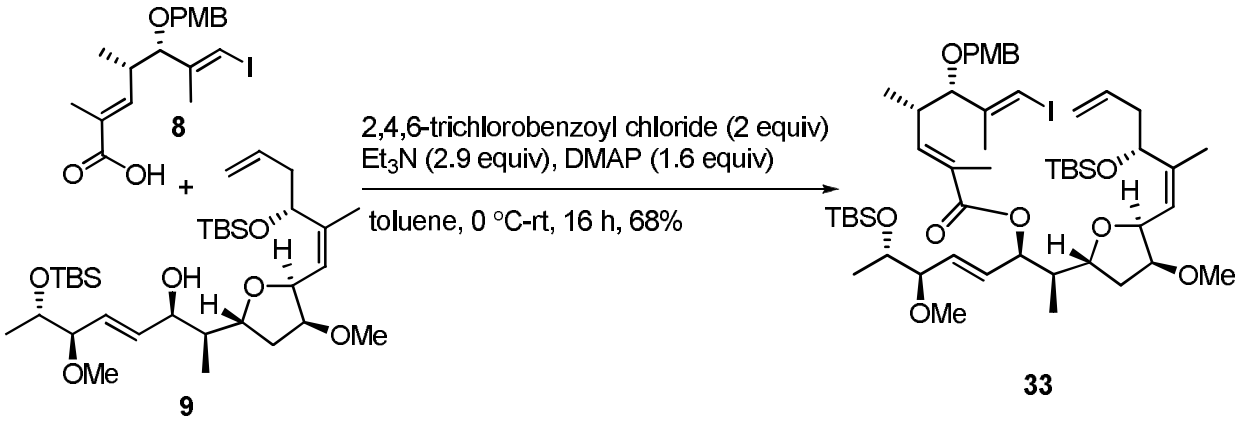
(2*E*,4*S*,5*S*,6*E*)-7-Iodo-5-(4-methoxybenzyloxy)-2,4,6-trimethylhepta-2,6-dienoic acid (8):



32 **8**

A stirred solution of **32** (480 mg, 0.89 mmol) in THF:H_2O (12 ml, 2:1) was treated with 30% H_2O_2 in H_2O (0.3 ml, 2.67 mmol) and LiOH.H_2O (37.3 mg, 2.67 mmol)) at 0 ˚C. The resulting reaction mixture was warmed to room temperature and stirred for 24 h. The reaction mixture was acidified with 1N HCl (until pH = 3) and diluted with water (10 ml) and ethyl acetate (10 ml). The layers were separated and the aqueous layer was extracted with ethyl acetate (3 x 20 ml). The combined organic extracts were washed with water (20 ml) and brine (20 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 15% EtOAc/hexane) to afford dienoic acid **8** (305 mg, 0.72 mmol, 80%) as a colorless oil. R_f = 0.3 (SiO_2, 40% EtOAc/hexane); $[\alpha]_D^{25}$ = –41.8 (*c* 0.85, $CHCl_3$); IR (Neat): ν_{max} 3745, 2960, 2858, 2310, 1685, 1647, 1612, 1511, 1455, 1421, 1382, 1246, 1172, 1067, 1034, 999, 820, 676 cm^{-1}; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.17 (m, 2H), 6.86 (m, 2H), 6.72 (qd, *J* = 9.8, 1.6 Hz, 1H), 6.20 (d, *J* = 0.8 Hz, 1H), 4.42 (d, *J* = 11.7 Hz, 1H), 4.12 (d, *J* = 11.7 Hz, 1H), 3.80 (s, 3H), 3.63 (d, *J* = 8.5 Hz, 1H), 2.78-2.72 (m, 1H), 1.86 (d, *J* = 1.2 H, 3H), 1.81 (d, *J* = 1.1 Hz, 3H), 0.84 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 173.00, 159.14, 147.26, 146.36, 129.85, 129.30, 127.35, 113.76, 86.83, 80.58, 69.97, 55.24, 36.42, 19.02, 16.07, 12.41. HRMS (ESI): [M + NH_4]$^+$calcd. for $C_{18}H_{27}O_4NI$ 448.0979, found 448.0992.

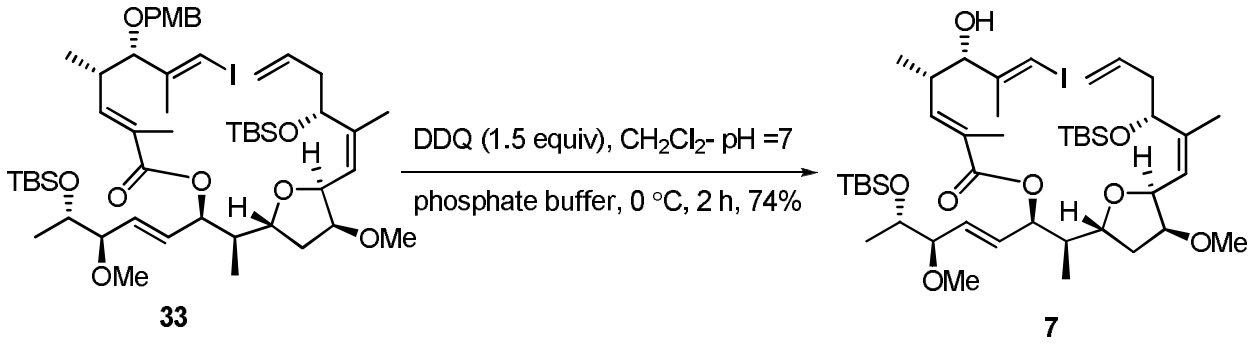
(2*E*,4*S*,5*S*,6*E*)-((2*R*,3*R*,6*R*,7*S*,*E*)-7-(*tert*-Butyldimethylsilyloxy)-2-((2*R*,4*S*,5*S*)-5-((*R*,*Z*)-3-(*tert*-butyldimethylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)-6-methoxyoct-4-en-3-yl) 7-iodo-5-(4-methoxybenzyloxy)-2,4,6-trimethylhepta-2,6-dienoate (33)



A stirred solution of alcohol **9** (23 mg, 0.038 mmol) and dienoicacid **8** (24.2 mg, 0.056 mmol) in anhydrous toluene (1.5 ml) was treated with Et_3N (16 µl, 0.11mmol), DMAP (7 mg, 0.06 mmol) and 2,4,6-tricholobenzoyl chloride (12 µl, 0.076 mmol) at 0 ˚C. The resulting white suspension was stirred at room temperature for 16 h. The reaction was quenched with saturated aqueous $NaHCO_3$ (2 ml) at 0 ˚C and diluted with water (2 ml). The reaction mixture was extracted with ethyl acetate (3 x 15 ml) and the combined organic extracts were washed with water (15 ml) and brine (15 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (5% EtOAc/hexane) to afford ester **33** (26 mg, 0.025 mmol, 68%) as a colorless oil. R_f = 0.7 (SiO_2, 20% EtOAc/hexane); $[\alpha]_D^{25}$ = –22.1 (*c* 0.7, $CHCl_3$); IR (Neat): ν_{max} 2925, 2854, 1715, 1614, 1462, 1374, 1253, 1112, 1077, 834, 777 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$): δ 7.15 (m, 2H), 6.85 (m, 2H), 6.58 (dd, *J* = 9.5, 1.3 Hz, 1H), 6.16 (d, *J* = 0.6 Hz, 1H), 5.83 (ddt, *J* = 17.2, 10.1, 7.1 Hz, 1H), 5.63 (dd, *J* = 15.8, 5.5 Hz, 1H), 5.57-5.43 (m, 3H), 5.13-5.01 (m, 2H), 4.58-4.51 (m, 2H), 4.41 (d, *J* = 11.7 Hz, 1H), 4.12 (d, *J* = 11.9 Hz, 2H), 3.79 (s, 3H), 3.78-3.75 (m, 2H), 3.62 (d, *J* = 8.3 Hz, 1H), 3.40 (dd, *J* = 7.0, 4.2 Hz, 1H), 3.3 (s, 3H), 3.28 (s, 3H), 2.78-2.67 (m, 1H), 2.39-2.21 (m, 2H), 2.12 (dd, *J* = 13.0, 6.7 Hz, 1H), 1.94 (dt, *J* = 7.2, 3.8 Hz, 1H), 1.83 (d, *J* = 1.2 Hz, 3H), 1.79 (d, *J* = 0.9 Hz, 3H), 1.73 (d, *J* = 1.2 Hz, 3H), 1.71-1.64 (m, 1H), 1.08 (d, *J* = 6.4 Hz, 3H), 0.94 (d, *J* = 7.0 Hz, 3H), 0.88 (s, 9H), 0.86

(s, 9H), 0.82 (d, J = 6.8 Hz, 3H), 0.03 (s, 3H), 0.02 (s, 6H), 0.001 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 166.76, 159.09, 146.53, 144.32, 143.81, 135.58, 131.66, 129.89, 129.66, 129.23, 128.36, 120.34, 116.64, 113.73, 86.74, 86.37, 82.90, 80.42, 77.67, 76.43, 74.04, 71.30, 70.90, 69.91, 57.29, 56.94, 55.21, 42.67, 41.34, 36.19, 34.39, 25.86, 25.77, 19.52, 19.09, 18.18, 18.09, 16.25, 12.88, 9.04, -4.65, -4.74, -4.77. HRMS (ESI): $[M + NH_4]^+$calcd. for $C_{51}H_{89}O_9NISi_2$ 1042.5115, found 1042.5117.

(2*E*,4*S*,5*S*,6*E*)-((2*R*,3*R*,6*R*,7*S*,*E*)-7-(*tert*-Butyldimethylsilyloxy)-2-((2*R*,4*S*,5*S*)-5-((*R*,*Z*)-3-(*tert*-butyldimethylsilyloxy)-2-methylhexa-1,5-dienyl)-4-methoxytetrahydrofuran-2-yl)-6-methoxyoct-4-en-3-yl)5-hydroxy-7-iodo-2,4,6-rimethylhepta-2,6-dienoate (7):

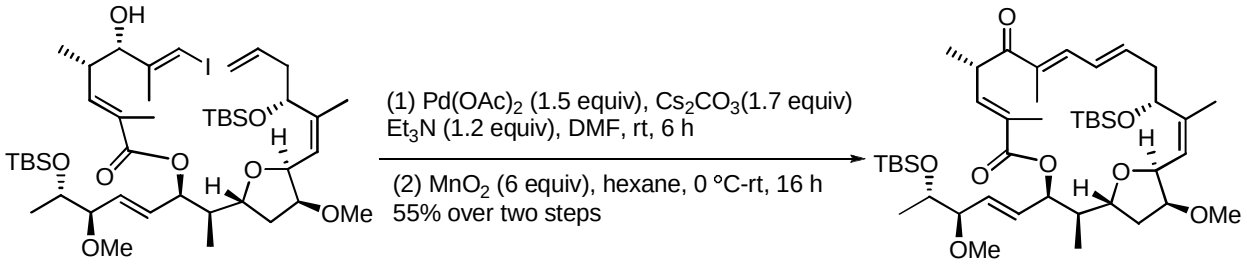


33 **7**

To a stirred solution of compound **33** (23 mg, 0.022 mmol) in CH_2Cl_2 and pH =7 phosphate buffer (12 ml, 5:1) was added DDQ (7.5 mg, 0.033 mmol) at 0 ˚C and stirred for 2 h. The reaction was quenched with saturated aqueous $NaHCO_3$ (5 ml) at 0 ˚C and diluted with water (5 ml). The layers were separated and the aqueous layer was extracted with CH_2Cl_2 (3 x 15 ml). The combined organic extracts were washed with water (15 ml) and brine (15 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 10% EtOAc/hexane) to afford alcohol **7** (15 mg, 0.017 mmol, 74%) as a brown oil. R_f = 0.45 (SiO_2, 20% EtOAc/hexane); $[\alpha]_D^{25}$ = –14.9 (c 0.38, $CHCl_3$); IR (Neat): ν_{max} 3450, 2926, 2855, 1713, 1647,1462, 1378, 1255, 1222, 1114, 1077, 1005, 835, 777, 672 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$): δ 6.59 (dd, J = 10.0, 1.5 Hz, 1H), 6.29 (s, 1H), 5.82 (ddt, J = 17.2, 10.1, 7.1 Hz, 1H), 5.65-5.43 (m, 4H), 5.13-5.01 (m, 2H), 4.58-4.50 (m, 2H), 4.09-3.98 (m, 2H), 3.82-3.75 (m, 2H), 3.39 (dd, J = 7.2, 4.4 Hz, 1H), 3.32 (s, 3H), 3.28 (s, 3H), 2.76-2.67 (m, 1H),

2.38-2.21 (m, 2H), 2.15 (dd, *J* = 12.0, 7.0 Hz, 1H), 1.94-1.90 (m, 1H), 1.88 (d, *J* = 1.3 Hz, 3H), 1.84 (d, *J* = 0.9 Hz, 3H), 1.74 (d, *J* = 1.1 Hz, 3H), 1.72-1.64 (m, 1H), 1.08 (d, *J* = 6.2 Hz, 3H), 0.92 (d, *J* = 7.0 Hz, 3H), 0.91 (d, *J* = 6.1 Hz, 3H), 0.88 (s, 9H), 0.86 (s, 9H), 0.03 (s, 6H), 0.02 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 166.53, 147.96, 143.98, 142.95, 135.61, 131.42, 129.88, 129.60, 120.22, 116.62, 86.37, 82.90, 80.73, 80.15, 77.61, 76.40, 74.18, 71.31, 70.90, 57.33, 56.96, 42.82, 41.33, 37.43, 34.75, 25.86, 25.78, 19.63, 19.27, 18.20, 18.09 16.41, 12.97, 9.17, -4.63, -4.74, -4.76. HRMS (ESI): $[M + Na]^+$calcd. for $C_{43}H_{77}O_8INaSi_2$ 927.4094, found 927.4094.

(1*R*,2*R*,3*R*,6*E*,8*S*,10*E*,12*E*,15*R*,16*Z*,18*S*,19*S*)-15-(*tert*-Butyldimethylsilyloxy)-3-((3*R*,4*S*,*E*)-4-(*tert*-butyldimethylsilyloxy)-3-methoxypent-1-enyl)-19-methoxy-2,6,8,10,16-pentamethyl-4,21-dioxabicyclo[16.2.1]henicosa-6,10,12,16-tetraene-5,9-dione (34):

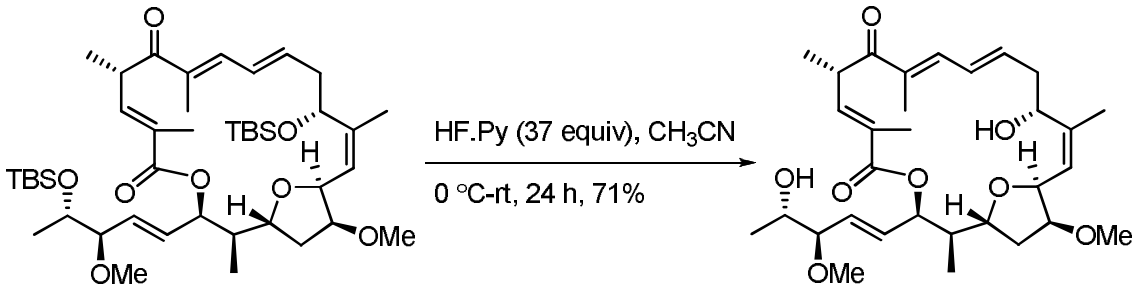


7 **34**

A stirred solution of alcohol **7** (5.0 mg, 0.0055 mmol) in anhydrous DMF (3 ml) was degassed by purging argon for 45 min. To the solution was added Cs_2CO_3 (3.06 mg, 0.0094 mmol), Et_3N (0.92 µl, 0.0066 mmol) followed by $Pd(OAc)_2$ (1.86 mg, 0.0083 mmol) at room temperature and stirred for 6 h. The reaction was quenched with water (5 ml) at 0 ˚C and diluted with ethyl acetate (5 ml). The layers were separated and the aqueous layer was extracted with ethyl acetate (3 x 15 ml) three times. The combined organic extracts were washed with water (15 ml) and brine (15 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was passed through a silica gel column (SiO_2, 100-200 mesh, 15% EtOAc/hexane) and concentrated. The cyclized product thus obtained was dissolved in hexane and treated with freshly prepared activated MnO_2 (2.9 mg, 0.033 mmol) at 0 ˚C. The solution was warmed to room temperature and stirred in the dark for 16 h. The reaction mixture was filtered through small Celite plug and

washed with ethyl acetate (3 x 10 ml). Combined filtrate and washings was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 6% EtOAc/hexane) to afford ketone **34** (2.35 mg, 0.0030 mmol, 55%) as a colorless oil. R_f = 0.5 (SiO_2, 15% EtOAc/hexane); $[\alpha]_D^{25}$ = –22.0 (*c* 0.05, C_6H_6); IR (Neat): ν_{max} 2925, 2855, 1734, 1715, 1670, 1638, 1461, 1378, 1284, 1251, 1160, 1111, 1075, 837, 749 cm^{-1}; ^1H NMR (500 MHz, $CDCl_3$): δ 6.88 (d, *J* = 10.8 Hz, 1H), 6.39 (ddd, *J* = 14.5, 11.0, 4.5 Hz, 1H), 5.92-5.84 (m, 3H), 5.66 (d, *J* = 8.2 Hz, 1H), 5.53 (dd, *J* = 5.0, 2.3 Hz, 1H), 4.57 (dt, *J* = 11.1, 4.6 Hz, 2H), 4.15 (ddd, *J* = 10.8, 8.7, 4.6 Hz, 1H), 3.91 (dt, *J* = 6.3, 4.1 Hz, 1H), 3.79 (dt, *J* = 13.0, 6.5 Hz, 1H), 3.52 (t, *J* = 4.1 Hz, 1H), 3.28 (dd, *J* = 6.3, 4.1 Hz, 1H), 3.22 (s, 3H), 2.98 (s, 3H), 2.61 (t, *J* = 13.0 Hz, 1H), 2.41 (ddd, *J* = 14, 11.5, 4.4 Hz, 1H), 2.24-2.07 (m, 2H), 2.06 (d, *J* = 1.4 Hz, 3H), 1.79 (s, 3H), 1.78 (s, 3H), 1.63-1.55 (m, 1H), 1.54-1.46 (m, 1H), 1.19 (d, *J* = 6.6 Hz, 3H), 1.16 (d, *J* = 6.3 Hz, 3H), 1.02 (s, 9H), 1.00 (s, 9H), 0.78 (d, *J* = 7.2 Hz, 3H), 0.16 (s, 3H), 0.15 (s, 3H), 0.12 (s, 3H), 0.09 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 199.35, 166.73, 142.46, 139.31, 138.13, 136.25, 134.47, 131.55, 129.59, 129.35, 129.16, 127.32, 86.92, 82.74, 78.93, 78.80, 71.30, 70.70, 56.72, 56.49, 41.66, 41.27, 40.37, 36.90, 32.32, 26.12, 25.92, 23.10, 20.56, 18.37, 18.23, 15.36, 14.35, 14.03, -4.29, -4.40, -4.48, -4.64. HRMS (ESI): $[M + NH_4]^+$calcd. for $C_{43}H_{74}O_8NaSi_2$ 797.4814, found 797.4809.

Maltepolide C (3):



34 maltepolide **C (3)**

A stirred solution of ketone **34** (2.0 mg, 0.0026 mmol) in dry acetonitrile (2 ml) was treated with HF.Py complex (2.7 µl, 0.096 mmol) at 0 ˚C and the solution was warmed to room temperature and stirred for 24 h. The reaction was quenched with saturated aqueous $NaHCO_3$ (2 ml) at 0 ˚C and stirred for 30 min. and diluted with water (3 ml). The aqueous layer was extracted with ethyl acetate (3 x 15 ml). The organic extracts were washed with water (10 ml)

and brine (10 ml). The organic layer was dried over anhydrous sodium sulfate and filtered. The filtrate was concentrated under reduced pressure to give a crude material which was purified by silica gel column chromatography (SiO_2, 100-200 mesh, 10% MeOH/$CHCl_3$) to afford maltepolide C (**3**) (1.0 mg, 0.00183 mmol, 71%) as colorless oil. R_f = 0.4 (SiO_2, 3% MeOH/$CHCl_3$).

$[\alpha]_D^{25}$ = +40.0 (*c* 0.05, CH_3CN); ν_{max} 3395, 2924, 1702, 1668, 1635, 1546, 1520, 1458, 1387, 1280, 1242, 1105, 974, 750, 692, 7 cm^{-1}; For ^1H and ^{13}C chemical shifts (δ) and coupling constants (J_{H-H}) see table 7(S30-S31)

NMR and molecular dynamics (MD) studies of synthetic maltepolide C (3)

The structure of synthetic maltepolide **(3)** is confirmed by extensive NMR experiments including 2-D Double Quantum Filtered Correlation Spectroscopy (DQF-COSY), Nuclear Overhauser Effect Spectroscopy (NOESY), Hetero-nuclear Single Quantum Correlations (HSQC) and Hetero-nuclear Multiple Bond Correlation (HMBC) experiments. The ^1H and ^{13}C one dimensional experiments were carried out on a ~ 2 mM solution, where as the 2-D experiments were undertaken in a ~ 4 mM solution in CD_3OD at 298 K.

As discussed in the main text, we observed chemical shift differences in the ^{13}C and ^1H spectra of **3** in the methoxy region (^{13}C chemical shifts (δ) listed in Table 1 and ^1H chemical shifts (δ) listed in Table 2) Therefore detailed NMR studies were carried out to find out possible structural differences in the synthesized molecule **3** and isolated maltepolide C.

Table 1: Comparison of ^{13}C chemical shifts* (listed in order of decreasing δ values) of isolated (125 Mz) and synthetic maltepolide C (**3**) (~ 2 mM, 293 K, 175 MHz) in MeOH-d_4

S.No	Maltepolide C (isolated) (ppm)	Maltepolide C (**3**) (synthetic) (ppm)	S.No	Maltepolide C (isolated) (ppm)	Maltepolide C (**3**) (synthetic) (ppm)
1	202.8	202.70	17	79.6	79.46
2	168.7	168.66	18	70.5	70.50
3	143.4	143.27	19	70.3	70.28
4	142.3	142.14	20	57.9	57.78
5	141.0	140.90	21	57.9	57.06
6	137.7	137.66	22	42.9	42.76
7	134.5	134.35	23	42.3	42.17
8	132.2	132.04	24	39.2	39.13
9	131.0	130.86	25	38.7	38.55
10	129.7	129.59	26	19.0	18.92
11	129.7	129.55	27	17.1	16.90
12	129.0	128.85	28	15.6	15.39

13	87.5	87.54	29	14.4	14.20
14	84.5	84.40	30	13.4	13.23
15	80.0	79.85	31	11.8	11.69
16	79.9	79.73			

*Reference value for ^{13}C chemical shift for MeOH-d_4 at δ = 49.15 ppm (Cambridge Isotope Laboratories, NMR solvent data chart).

Table 2: Comparison of ^{1}H chemical shifts* (listed in order of decreasing δ values), couplings and multiplicities of isolated[1] (300 Mz) and synthetic maltepolide C (**3)** (~ 2 mM, 293 K, 700 MHz) in MeOH-d_4

S.No	Maltepolide C (isolated) ppm (multiplicity and *J* in Hz)	Maltepolide C (**3**) (synthetic) ppm (multiplicity and *J* in Hz)
1	6.99 (d, 10.9 Hz, 1H)	6.99 (d, 11.5 Hz, 1H)
2#	6.60 (dd, 15.0, 11.0 Hz, 1H)	6.60 (ddd, 14.8, 11.5, 1.5 Hz, 1H)
3	6.38 (dd, 11.5, 1.5 Hz, 1H)	6.36 (dd, 11.5, 1.5 Hz, 1H)
4	5.96 (dd, 15.5, 6.8 Hz, 1H)	5.96 (dd, 15.6, 6.5 Hz, 1H)
5	5.85 (m, 1H)	5.85 (ddd,14.8, 11.5, 4.4 Hz, 1H)
6	5.69 (ddd, 15.8, 8.1, 1.1 Hz , 1H)	5.71 (ddd, 15.6, 8.1, 1.2 Hz, 1H)
7	5.45 (dd, 8.1, 1.3 Hz, 1H)	5.44 (dd, 8.2, 1.5 Hz, 1H)
8	5.24 (ddd, 6.6, 2.7, 1.1 Hz, 1H)	5.23 (ddd, 6.5, 2.5, 1.2 Hz, 1H)
9	4.56 (dd, 7.9, 3.8 Hz, 1H)	4.56 (dd, 8.2, 4.0 Hz, 1H)
10	4.40 (dd, 10.6, 5.2 Hz, 1H)	4.39 (dd, 11.0, 4.8 Hz, 1H)
11	4.27 (m, 1H)	4.27 (dq, 11.5, 6.5 Hz, 1H)
12	4.07 (m, 1H)	4.06 (ddd,10.5, 9.5, 5.0 Hz, 1H)
13	3.82 (t, 4.0 Hz, 1H)	3.82 (t, 4.0 Hz, 1H)
14	3.78 (dd, 6.4, 4.3 Hz, 1H)	3.77 (qd, 6.5, 4.2 Hz, 1H)
15	3.55 (dd, 8.1, 4.3 Hz, 1H)	3.54 (dd, 8.1, 4.2 Hz, 1H)
16	3.35 (s, 3H)	3.33 (s, 3H)
17	3.34 (s, 3H)	3.29 (s, 3H)
18	2.45-2.60 (m, 2H)	2.55 (ddd, 13.5, 11.0, 4.4 Hz, 1H) 2.48 (ddd, 13.5, 11.0, 4.4 Hz, 1H)
19	2.16 (dd, 13.0, 5.1 Hz, 1H)	2.15 (ddd, 12.8, 5.0, 1.5 Hz, 1H)
20	2.08 (d, 1.5 Hz, 3H)	2.07 (d, 1.5 Hz, 3H)
21	1.95-2.00 (m, 1H)	1.97 (dqd, 9.5, 7.0, 2.5 Hz, 1H)
22	1.82 (s, 3H)	1.81 (s, 3H)
23	1.80 (d, 0.7 Hz, 3H)	1.79 (d, 1.5 Hz, 3H)
24	1.58 (ddd, 13.0, 10.5, 4.4 Hz, 1H)	1.58 (ddd, 12.8, 10.5, 4.0 Hz ,1H)
25	1.11 (d, 6.6 Hz, 3H)	1.12 (d, 6.5 Hz, 3H)
26	1.11 (d, 6.6 Hz, 3H)	1.11 (d, 6.5 Hz, 3H)
27	0.89 (d, 6.9 Hz, 3H)	0.88 (d, 7.2 Hz, 3H)

*Reference value for ^{1}H chemical shift for MeOH-d_4 at δ = 3.31 ppm (Cambridge Isotope laboratories, NMR solvent data chart).
#Typographical error in the reported value of 6.54 ppm (we have measured the chemical shift again, with a value of 6.60 ppm).

The published information on the chemical shifts and coupling constants of maltelopide A, maltelopide B and maltelopide E served as guideline in making the chemical shift

assignments in the present case of maltepolide C (**3**). Due to the discrepancies observed in the chemical shifts it was felt appropriate to first have a closer look at the methoxy region of the NMR spectra. Thus one way to initiate the assignments was through the use of HSQC/HMBC spectrum and concentrating at the methoxy protons/carbon (~3.3 ppm/ ~57 ppm) region. In the

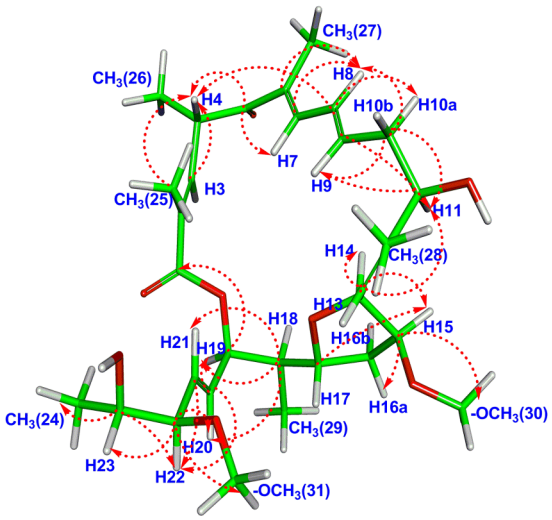


Figure 1A: HMBC correlations of ^{13}C with the neighboring protons in **3**.

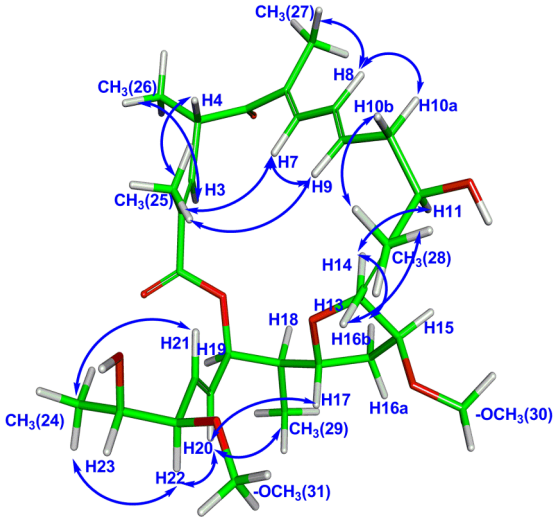


Figure 1B: Characteristic NOE correlations shown on one of the structures of **3** obtained from MD calculations discussed later.

HMBC spectrum (Figure 1A gives the details of ^{1}H-^{13}C HMBC correlations in the spectrum) the two methoxy carbons correlate with H22 and H15 at 3.54 and 3.82 ppm respectively. Among these protons only one, H22 displays correlation with an olefinic proton (H21 at 5.71 ppm), thus enabling us to assign the chemical shifts (δ) of H22, H21 and H14 at 3.54, 5.71 and 4.56 ppm respectively. Initiating the assignment process with methoxy protons (instead of the carbons as done above) and their correlations with C22 and C15 further validate these assignments. Thus the assignments of the methoxy proton/carbon were achieved (-OCH_3(30) at 3.29/57.78 ppm and -OCH_3(31) at 3.33/57.06 ppm). After making these assignments, one can proceed to assign all the protons/carbons from in C13-C24 fragment, including the methyls and the methoxy protons. CH_3(28) could be assigned with correlations with C13(128.85 ppm) and H14(4.56 ppm) at 1.79/16.90 ppm. Further, CH_3(28) correlations with C12(137.66 ppm) and C11(77.28 ppm) in the HMBC spectrum facilitate the assignments in the C6-C12 fragment including CH_3(27). For

fragments C1-C5, C5(202.70 ppm)/H7(6.99ppm) correlation was crucial, which along with several HMBC correlations, completes the ^{1}H and ^{13}C chemical shift assignments for **3**.

Having made the assignments of all the protons and carbons, the coupling constants were deduced mainly from the ^{1}H spectrum, which if necessary was facilitated by decoupling experiments. The coupling constants $^{3}J_{H8/H9}$ = 14.8 Hz and $^{3}J_{H20/H21}$ = 15.6 Hz confirm the *trans*-double bonds at C8-C9 and C20-C21 respectively. Values of $^{3}J_{H8/H9}$ = 14.8 Hz and $^{3}J_{H3/H4}$ = 11.5

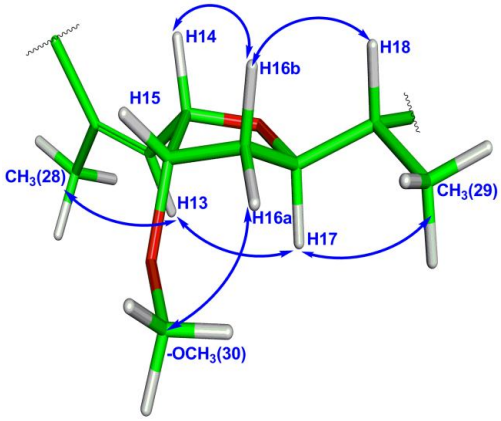


Figure 2: The envelop conformation of the tetrahydrofuran moiety along with the NOE correlations supporting the structure.

Hz and the NOE correlations H3/CH_3(26) and H4/CH_3(25) (Figure 1B shows the correlations obtained from NOESY experiments) support a C2-C3 *trans*-double bond. A strong NOE correlation, H13/CH_3(28), justifies close proximity of these protons, consistent with C12-C13 *cis*-double bond. The five membered sugar ring takes an envelop conformation, which is confirmed through the coupling constants: $^{3}J_{H14/H15}$ = 4.0, $^{3}J_{H15/H16b}$ = 4.0, $^{3}J_{H15/H16a}$ = 1.5, $^{3}J_{H16a/H17}$ = 5.0 and $^{3}J_{H16b/H17}$ = 10.5 Hz and the NOE correlations shown in Fig. 2. One very interesting observation was the fact that the 20 membered macrocycle appears quite rigid with most of the ^{3}J involving the ring protons < 4.2 Hz or > 9.5 Hz. In fact even the side chain C19-C24, containing C21-C22 olefinic bond, with small value of $^{3}J_{H22/H23}$ (4.2 Hz) along with several characteristic NOE correlations, appears to be fairly rigid. In view of above, and the need to draw more definite conclusions on the structure and configurations in the side chain, predominance of a single conformation was invoked. Thus $^{3}J_{H19/H20}$ = 6.5 Hz, $^{3}J_{H21/H22}$ = 8.1 Hz and $^{3}J_{H22/H23}$ = 4.2 Hz were assumed to arise mainly from staggered conformations about the C-C single bonds, with H19-C19-C20-H20 (θ_3) ~ 60°, H21-C21-C22-H22 (θ_2) ~ 180° and H22-C22-

C23-H23 (θ_1) ~ 60° respectively (Figure 3 for the definition of dihedral angles), which along with the observed NOE correlations H20/H22, H22/CH_3(24), H21/CH_3(24), H17/H20 and H20/CH_3(29) emphatically support a *R*-configuration at C22.

In the discussion above, presence of a single predominant conformation with staggered geometries about the C-C bonds in the side chains was invoked to arrive at the *R*-configuration at C22. However, it is evident that the Karplus equations provide multiple values of dihedral angles, which satisfy the experimentally observed couplings (*J*). Thus having attributed an *R*-

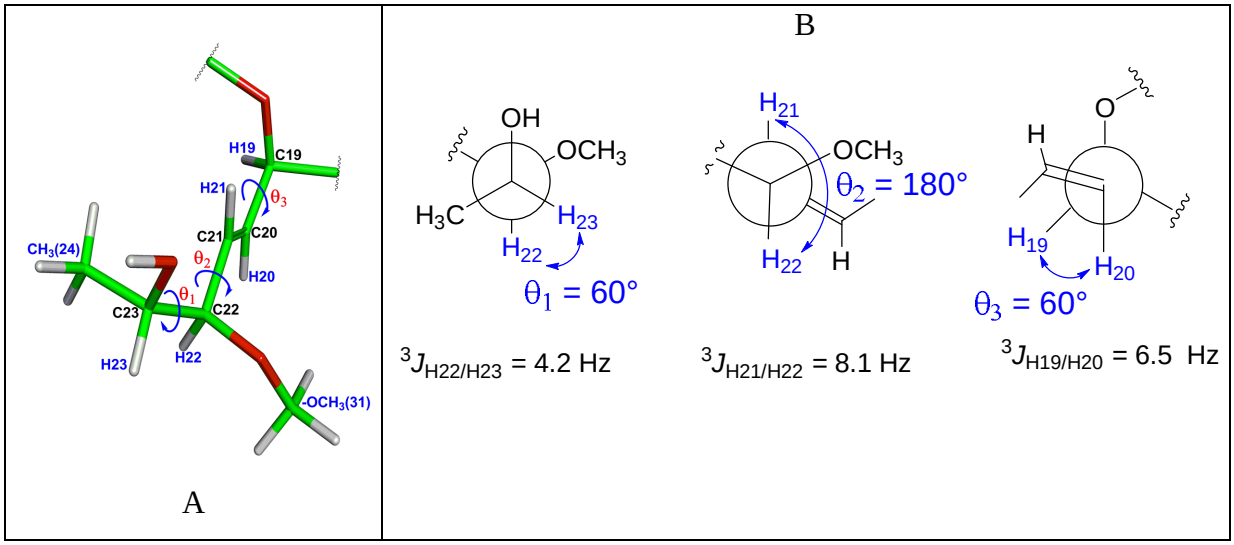


Figure 3: A) Definition of various dihedral angles in the side chain; B) Newman projections for single predominant conformers about C22-C23, C21-C22 and C19-C20 in the side chain (C19 – C23 fragment) with the observed ^3J.

configuration at C22, it was imperative that we also explore and scan other conformations, which are consistent with the other options of the dihedral angles for these couplings and verify/rule out their presence through the NOE correlations. Avoiding a somewhat stringent condition of staggered conformations about C-C bonds, and using the couplings to calculate the dihedral angles exactly using the Karplus equations (to about a degree), we looked at these combinations of the side chain conformation involving C-C bonds in the C19-C24 carbon chain in more detail. A $^3J_{H19/H20}$ = 6.5 Hz (if arising from a single conformation), would yield θ_3 values of about 40°, -30°, 145° and -130°. It was observed that only θ_3 ~ 40° is adequately supported by NOE correlations H17/H20 and H20/CH_3(29). On the other hand at the other end of the side chain, $^3J_{H21/H22}$ = 8.1 Hz could arise from θ_2 ~ 140°, -130° and ± 10° and $^3J_{H22/H23}$ = 4.2 Hz could have

θ_1 ~ ±45° and ± 125°. Thus we have tabulated (Table 3) all the structures that would satisfy $^3J_{H19/H20}$ = 6.5 Hz and $^3J_{H21/H22}$ = 8.1 Hz, with θ_1 ~ ± 45°/± 125° and θ_2 ~ ± 135°/ 0° (we have approximated the value of 140/-130° as ± 135° and value of ~ ±10° as 0°). Interestingly, only one set of values obtained by us is consistent with the derived structure having an *R*-configuration at C22. In addition, since the significant change in the chemical shifts were observed for O-Me(31), attached to C22, we also explored a likely *S*-configuration at C22. For this configuration the observe couplings were found to be inconsistent with the NOEs (Table 4). The Table 5 lists the HMBC correlations and Table 6 lists the chemical shifts and couplings in **3**.

Table 3: Possible dihedral angles (θ_1 and θ_2) derived from the couplings, which are consistent (Y)/ inconsistent (N) with the observed NOE correlations for *R*-configuration at C22 in **3**.

Dihedral Angles		NOE correlations		
θ_1(°)	θ_2(°)*	H20/H22	H21/CH_3(24)	H22/CH_3(24)
45	±135	Y	Y	Y
-45	±135	Y	Y	N
45	0	N	Y	Y
-45	0	N	N	Y
125	±135	Y	N	Y
-125	±135	Y	N	Y
125	0	N	N	Y
-125	0	N	N	Y

*±135° is an approximation for 140°/-130° and 0° is an approximation for ±10°.

Table 4: Possible dihedral angles (θ_1 and θ_2) derived from the couplings, which are consistent (Y)/ inconsistent (N) with the observed NOE correlations for *S*-configuration at C22 in **3**.

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Dihedral Angles		NOE correlations		
θ_1(°)	θ_2(°)*	H20/H22	C24-Me /H21	C24-Me/H22
45	±135	Y	N	Y
-45	±135	Y	Y	N
45	0	N	N	Y
-45	0	N	N	N
125	±135	Y	N	Y
-125	±135	Y	N	Y
125	0	N	Y	Y
-125	0	N	N	N

*±135° is an approximation for 140°/-130° and 0° is an approximation for ±10°

<u>Stereochemistry at C15 :</u>

In the above discussions, we have concentrated on confirming the configuration at C22. However, the methoxy group at C15 also displays variation in the ^{1}H chemical shift. Thus we have also checked the configuration at C15. The coupling constants, $^{3}J_{H14/H15}$ = 4.0, $^{3}J_{H15/H16b}$ = 4.0 and $^{3}J_{H15/H16a}$ = 1.5 Hz, in the tetrahydrofuran ring along with the NOE correlations, H16a/-OCH_3(30), H14/H16b, H13/H17, H16b/H18, H17/CH_3(29) and H13/CH_3(28) (Fig. 2), confirm a *S*-configuration at C15. This has been further elaborated in Table 5, where the values of the dihedral angles (H-C-C-H) in the tetrahydrofuran ring obtained from the Karplus equation and are compared with those obtained by MD calculations for one of the minimum energy structures (shown in Figure 2 in main text)

Table 5: Comparison of the dihedral angles in the tetrahydrofuran ring of **3** obtained from the ^{3}J (Karplus equation) with that obtained from the MD calculations

^{3}J (Hz)	Dihedral angles	Dihedral angles (°) (MD)[a]	Dihedral angles (°) (Karplus equation)[b]
$^{3}J_{H13/H14}$ = 8.2	H13-C13-C14-H14	153	146
$^{3}J_{H14/H15}$ = 4.0	H14-C14-C15-H15	30	30
$^{3}J_{15\text{-}H/H16a}$ = 1.5	H15-C15-C16-H16a	84	76
$^{3}J_{H15/H16b}$ = 4.0	H15-C15-C16-H16b	-36	-44
$^{3}J_{H16a/H17}$ = 5.0	H16a-C16-C17-H17	43	38
$^{3}J_{H16b/H17}$ = 10.5	H16b-C16-C17-H17	163	161

[a] from the minimum energy structure shown in Figure 2 from the MD calculations.

[b] Calculated from Karplus equation (Haasnoot, C. A. G.; DeLeeuw, F. A. A. M.; Altona, C. *Tetrahedron* **1980**, *36*, 2783-2792).

Table 6: HMBC-correlations (^{1}H-^{13}C) in **3**

Carbon δ (ppm)	Carbon	HMBC correlations with protons
168.66	C1	H4, H19, CH_3(25), H18
129.55	C2	H4, CH_3(25)
143.27	C3	H4, CH_3(25), CH_3(26)
42.17	C4	CH_3(26)
202.70	C5	H7, H4, CH_3(25), CH_3(26), CH_3(27)
134.35	C6	H8, CH_3
142.14	C7	H8, H9, CH_3
129.59	C8	H4, H10b, CH_3(25), CH_3(27)
140.90	C9	H7, H11, H10b, CH_3(27)
39.13	C10	H8, H9, H11

70.28	C11	H9, H10b, CH_3(28)
137.66	C12	H14, Hb, CH_3(28), H11
128.85	C13	H14,H11, CH_3(28)
79.73	C14	H14, H15, H16b
84.40	C15	H14, -OCH3(30), H16b, CH_3(28)
38.55	C16	H17, H14
79.85	C17	H15, H16a, CH_3(29)
42.76	C18	H19, H16a, CH_3(29)
79.46	C19	H21, H20, H19, CH_3(29)
132.04	C20	H19, H23, H22
130.86	C21	H19, H22
87.54	C22	H21, H20, H23, -OCH3(31), CH_3(24)
70.50	C23	H22, CH_3(24)
18.92	CH_3(24)	H22, H23,
13.23	CH_3(25)	H3
15.39	CH_3(26)	H4, CH_3(25)
11.69	CH_3(27)	H7
16.90	CH_3(28)	H11
14.20	CH_3(29)	H19
57.78	-OCH_3(30)	H15
57.06	-OCH_3(31)	H22

Table 7: ^{1}H and ^{13}C chemical shifts and coupling constants ($J_{H\text{-}H}$) for **3**

Carbon	^{13}C Chemical shift (δ) (ppm)	Proton	^{1}H Chemical shift (δ) (ppm)	multiplicity	$J_{H\text{-}H}$(Hz)
C1	168.66				
C2	129.55				
C3	143.27	H3	6.36	dd	$^{3}J_{H3/H4}$ = 11.5 $^{3}J_{H3/CH3(25)}$ = 1.5
C4	42.17	H4	4.27	dq	$^{3}J_{H3/H4}$ = 11.5 $^{3}J_{H4/CH3(26)}$ = 6.5
C5	202.70				
C6	134.35				
C7	142.14	H7	6.99	d	$^{3}J_{H7/H8}$ = 11.5
C8	129.59	H8	6.60	ddd	$^{3}J_{H8/H9}$ = 14.8 $^{3}J_{H7/H8}$ = 11.5 $^{3}J_{H8/CH3(27)}$ = 1.5
C9	140.90	H9	5.85	ddd	$^{3}J_{H8/H9}$ = 14.8 $^{3}J_{H9/H10b}$ = 11.5 $^{3}J_{H9/H10a}$ = 4.4
C10	39.13	H10a	2.55	ddd	$^{2}J_{H10a/H10b}$ = 13.5

					$^{3}J_{H10a/H11}$ = 11.0 $^{3}J_{H9/H10a}$ = 4.4
		H10b	2.48	ddd	$^{2}J_{H10a/H10b}$ = 13.5 $^{3}J_{H9/10b}$ = 11.5 $^{3}J_{H10b/H11}$ = 4.8
C11	70.28	H11	4.39	dd	$^{3}J_{H10a/H11}$ = 11.0 $^{3}J_{H10b/H11}$ = 4.8
C12	137.66				
C13	128.85	H13	5.44	dd	$^{3}J_{H13/H14}$ = 8.2 $^{3}J_{H13/CH3(28)}$ = 1.5
C14	79.73	H14	4.56	dd	$^{3}J_{H13/H14}$ = 8.2 $^{3}J_{H14/H15}$ = 4.0
C15	84.40	H15	3.82	t	$^{3}J_{H14/H15}$ = 4.0 $^{3}J_{H15/H16b}$ = 4.0
C16	38.55	H16a	2.15	ddd	$^{2}J_{H16a/H16b}$ = 12.8 $^{3}J_{H16a/H17}$ = 5.0 $^{3}J_{H15/H16a}$ = 1.5
		H16b	1.58	ddd	$^{2}J_{H16a/H16b}$ = 12.8 $^{3}J_{H16b/H17}$ = 10.5 $^{3}J_{H15/H16b}$ = 4.0
C17	79.85	H17	4.06	ddd	$^{3}J_{H16b/H17}$ = 10.5 $^{3}J_{H17/H18}$ = 9.5 $^{3}J_{H16a/H17}$ = 5.0
C18	42.76	H18	1.97	dqd	$^{3}J_{H17/H18}$ = 9.5 $^{3}J_{H18/CH3(29)}$ = 7.0 $^{3}J_{H18/H19}$ = 2.5
C19	79.46	H19	5.23	ddd	$^{3}J_{H19/H20}$ = 6.5 $^{3}J_{H18/H19}$ = 2.5 $^{4}J_{H19/H21}$ = 1.2
C20	132.04	H20	5.96	dd	$^{3}J_{20\text{-}H/21\text{-}H}$ = 15.6 $^{3}J_{19\text{-}H/20\text{-}H}$ = 6.5
C21	130.86	H21	5.71	ddd	$^{3}J_{20\text{-}H/H21}$ = 15.6 $^{3}J_{H21/H22}$ = 8.1 $^{4}J_{H19/H21}$ = 1.2
C22	87.54	H22	3.54	dd	$^{3}J_{H21/H22}$ = 8.1 $^{3}J_{H22/H23}$ = 4.2
C23	70.50	H23	3.77	qd	$^{3}J_{H23/CH3(24)}$ = 6.5 $^{3}J_{H22/H23}$ = 4.2
CH_3(24)	18.92	CH_3(24)	1.12	d	$^{3}J_{H23/CH3(24)}$ = 6.5
CH_3(25)	13.23	CH_3(25)	2.07	d	$^{3}J_{H3/CH3(25)}$ = 1.5
CH_3(26)	15.39	CH_3(26)	1.11	d	$^{3}J_{H4/CH3(26)}$ = 6.5
CH_3(27)	11.69	CH_3(27)	1.81	s	---
CH_3(28)	16.90	CH_3(28)	1.79	d	$^{3}J_{H13/CH3(28)}$ = 1.5
CH_3(29)	14.20	CH_3(29)	0.88	d	$^{3}J_{H18/CH3(29)}$ = 7.2
-OCH_3(30)	57.78	-OCH_3(30)	3.29	s	---
-OCH_3(31)	57.06	-OCH_3(31)	3.33	s	---

Variable temperature and concentration ^{1}H and ^{13}C NMR studies of compound 3:

In addition we have also studied the variations of the ^{1}H and the ^{13}C chemical shift as a function of temperature and concentration to rule out the influences arising from molecular association and other interactions. The results are tabulated in Tables 8 and 9.

Table 8: ^{1}H and ^{13}C Chemical shifts with temperature of synthetic maltepolide C (3) in MeOH-d_4 (4 mM)

Temperature	^{1}H δppm*		^{13}C δppm	
	OMe(30)	OMe(31)	OMe(30)	OMe(31)
10°C	3.296	3.338	57.82	57.15
20°C	3.299	3.340		
25°C	3.299	3.340	57.88	57.18
30°C	3.301	3.342		
40°C	3.302	3.343	57.94	57.21
50°C	3.303	3.343		

*for comparison ^{1}H chemical shift have been reported up to third decimal.

Table 9: ^{1}H and ^{13}C Chemical shifts with concentration of synthetic maltepolide C (3) in MeOH-d_4 (25°C)

concentration	^{1}H δppm*		^{13}C δppm	
	OMe(30)	OMe(31)	OMe(30)	OMe(31)
2 mM	3.294	3.335	57.78	57.06
4 mM	3.299	3.340	57.88	57.18

*for comparison ^{1}H chemical shift have been reported up to third decimal.

Molecular dynamics study:

Molecular dynamics simulations (MD) is one of the principal tools in the theoretical study of natural products and biological molecules. The molecular modeling calculations and energy minimization were carried out using Builder module in Insight-II (97.0)/)/Discover program on a Silicon Graphics Workstation. The CVFF (Consistent Valence Force Field) force field with default parameters was employed for all the calculations using a distance dependent dielectric constant with ε = 32.7 (dielectric constant of CD_3OD), which allows the inclusion of the solvent implicitly. A large number of restraints were used qualitatively in the restraint MD calculations. Thus strong intensity NOE correlations (s) were used to restrain the inter-atomic distance between 1.8- 2.5 Å, medium intensity (m) cross peak intensities between 1.8-3.5 Å and weak intensity (w) cross peak restrained distance between 1.8-4.5 Å. The inter-atomic distances used for restrained MD calculation are given in Table 7. These constraints with a force constant of 15 kcal mol^{-1} $Å^{-2}$ were applied in the form of a flat-bottom potential. These restraints were used throughout the MD simulations as well as the minimization. For the initiation of the dynamics the molecular model was built using the values of the dihedral angles deduced from the coupling constants as well as the NOEs. As a first step, the steric contacts were removed by a

mild minimization with the constraints. Subsequently energy minimizations were performed using steepest descent methods, followed by conjugate gradient methods for a maximum of 1000 iterations each or RMS deviation of 0.001 kcal mol^{-1}, whichever was achieved earlier. The energy-minimized structures were usually subjected to constrained MD simulations for duration of 2ns at 300 K with the time step of 1fs and with NVT ensemble. The 100 structures generated were energy minimized with the above protocol. Stereoview of the superposition of 10 best structures with the heavy atom and the backbone root-mean square deviation (RMSD) of 0.14±0.07Å and 0.16±0.13Å respectively is shown in Fig. 3. The average values of θ_2 = 151±1° and θ_3 = 51±1° agree with those for metapolide-F (θ_2 = -174° and θ_3 ~ 56°). On the other hand θ_1 = 61±1° differs from the X-ray value of -68°, possibly because of a heavy OTBS substituent, instead of OH in **3**.

Table 10: Distance constraints used in MD calculations* for **3**

NOE cross peak intensities							
Sl.No	From	To	Intensity	Sl. No	From	To	Intensity
1.	H3	CH_3(26)	m	9.	H11	H14	m
2.	H4	CH_3(25)	s	10.	H13	CH_3(28)	s
3.	H7	CH_3(25)	m	11.	H14	H16b	s
4.	H9	CH_3(25)	w	12.	H17	H20	s
5.	H7	H9	s	13.	H20	CH_3(29)	m
6.	H8	H10a	s	14.	H21	CH_3(24)	m
7.	H8	CH_3(27)	s	15.	H22	CH_3(24)	m
8.	H10b	CH_3(28)	w	16.	H20	H22	s

* Strong cross peak intensities (s) correspond to inter-atomic distances between 1.8- 2.5 Å, medium cross peak intensities (m) corresponds to inter-atomic distances between 1.8- 3.5 Å and weak cross peak intensities (w) corresponds to inter-atomic distances between 1.8-4.5 Å.

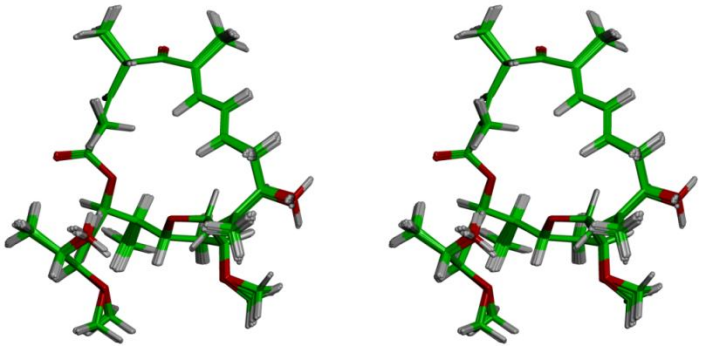
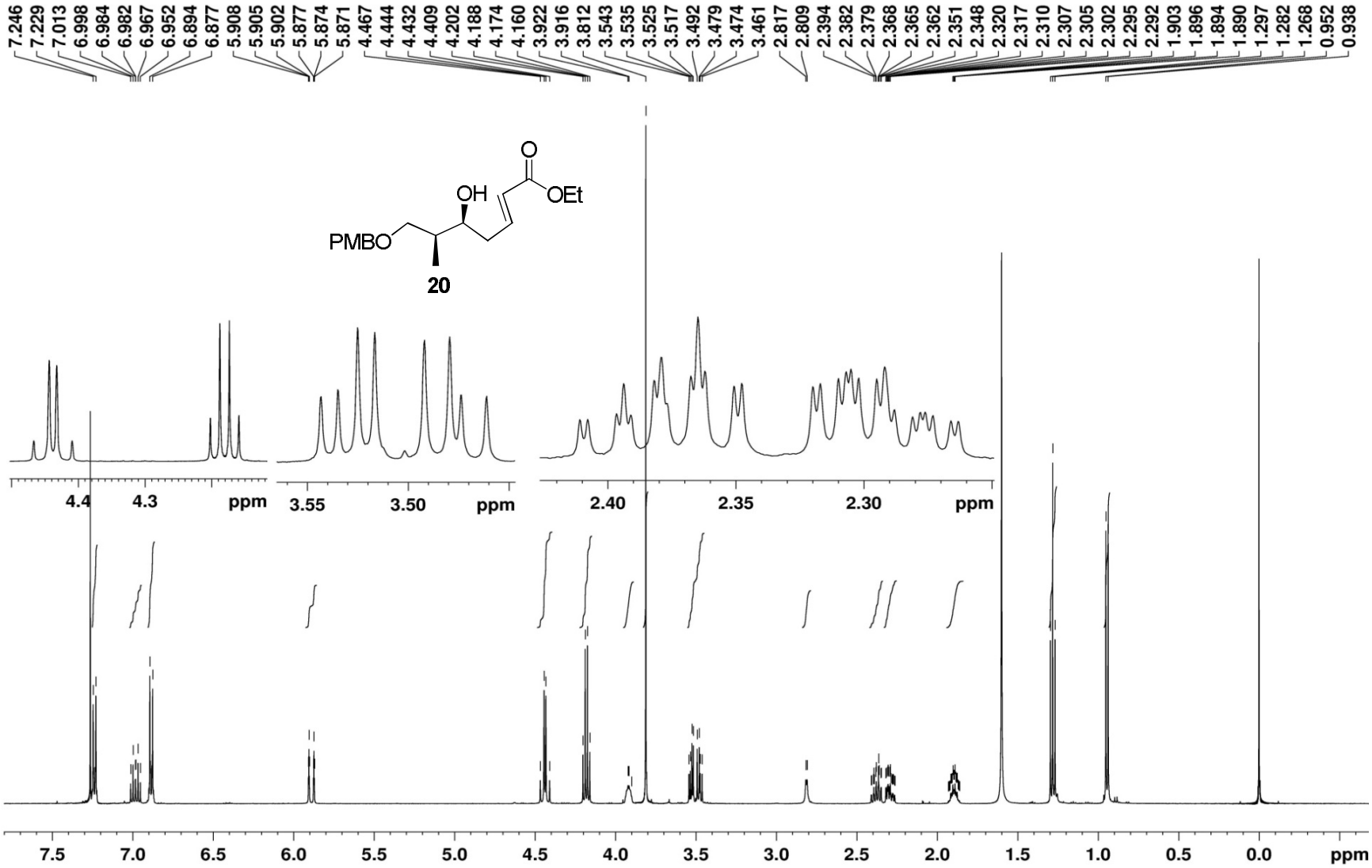
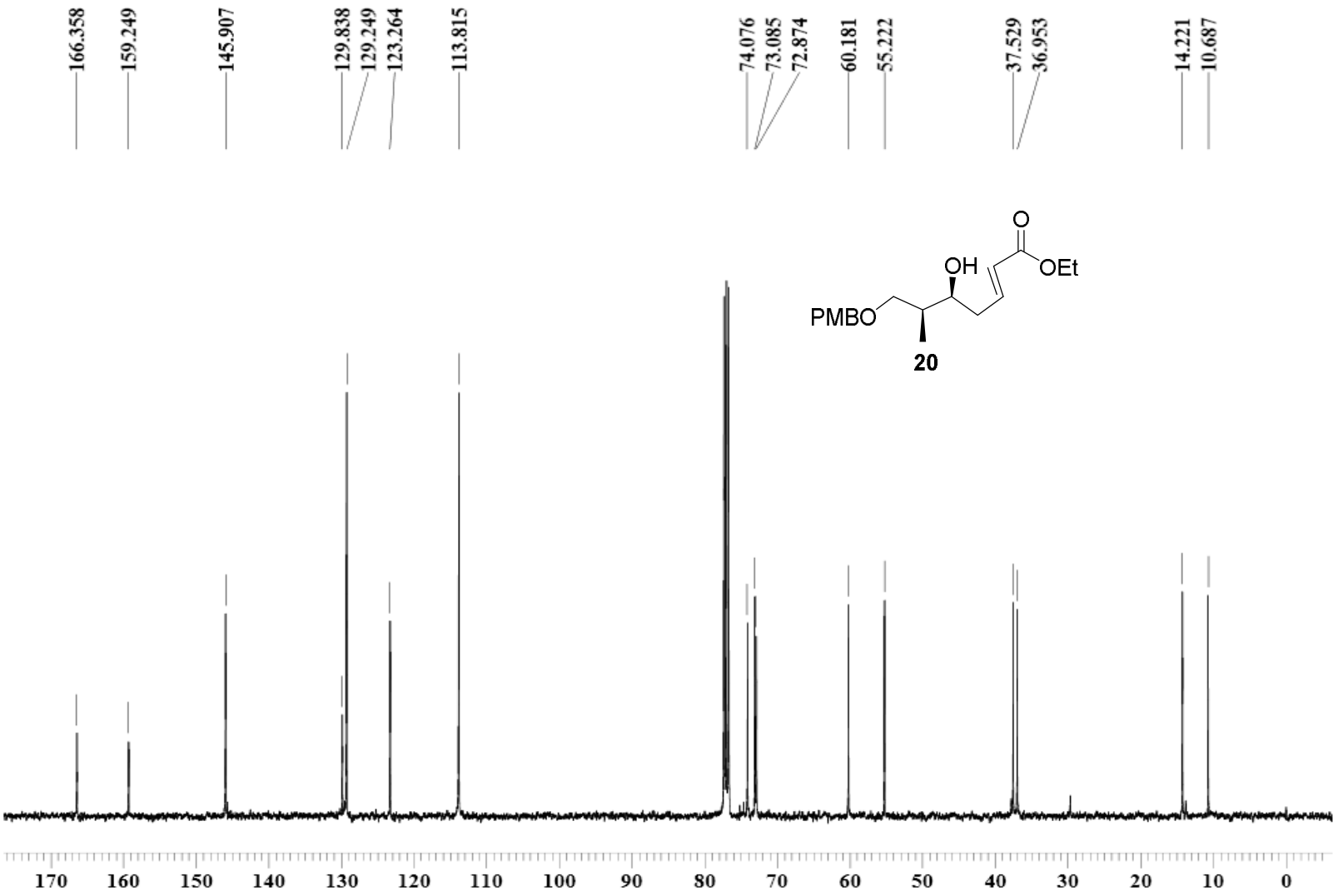


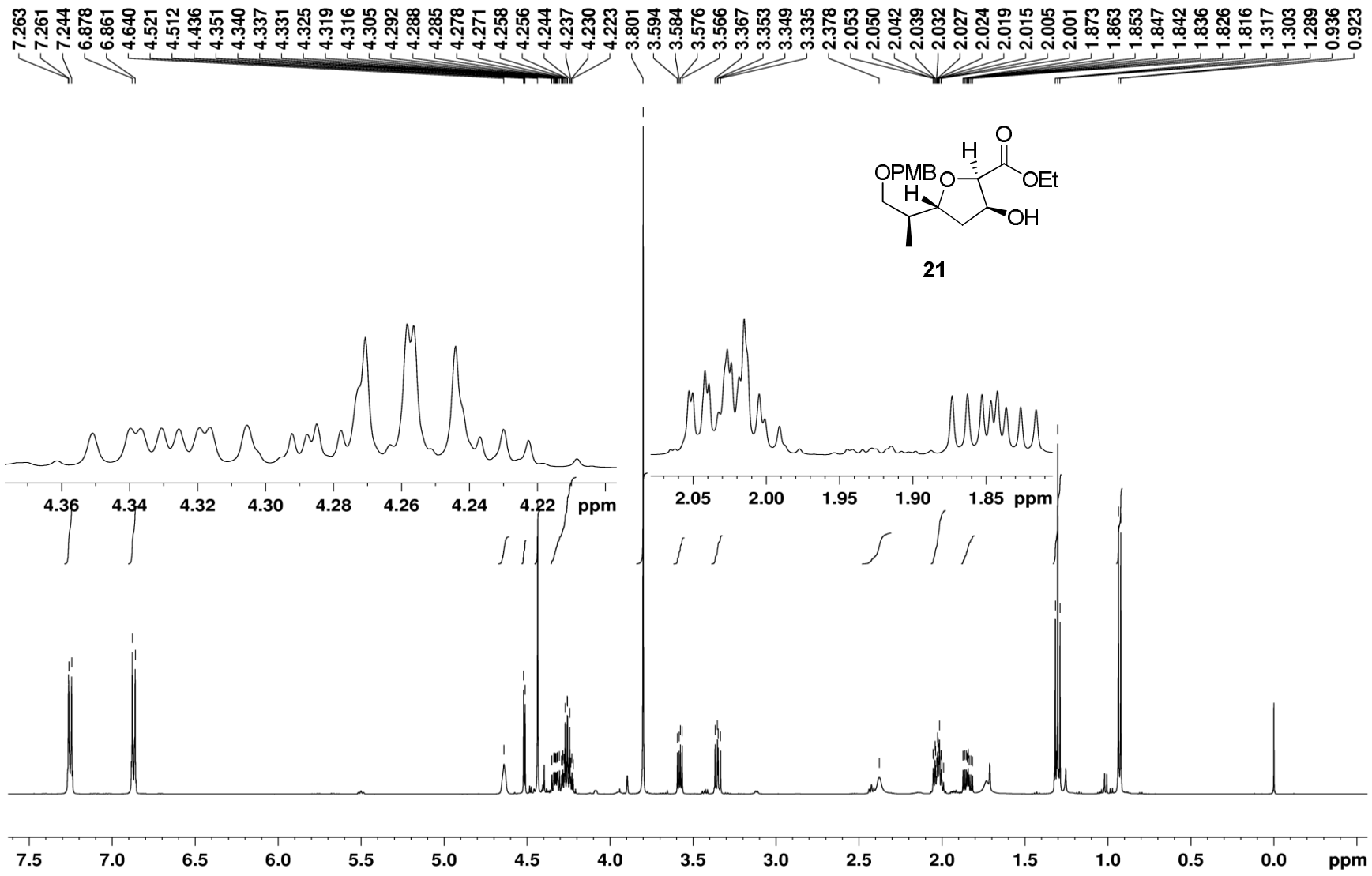
Figure 4: Stereoview of the superimposition of ten best structures for **3** from MD calculations.



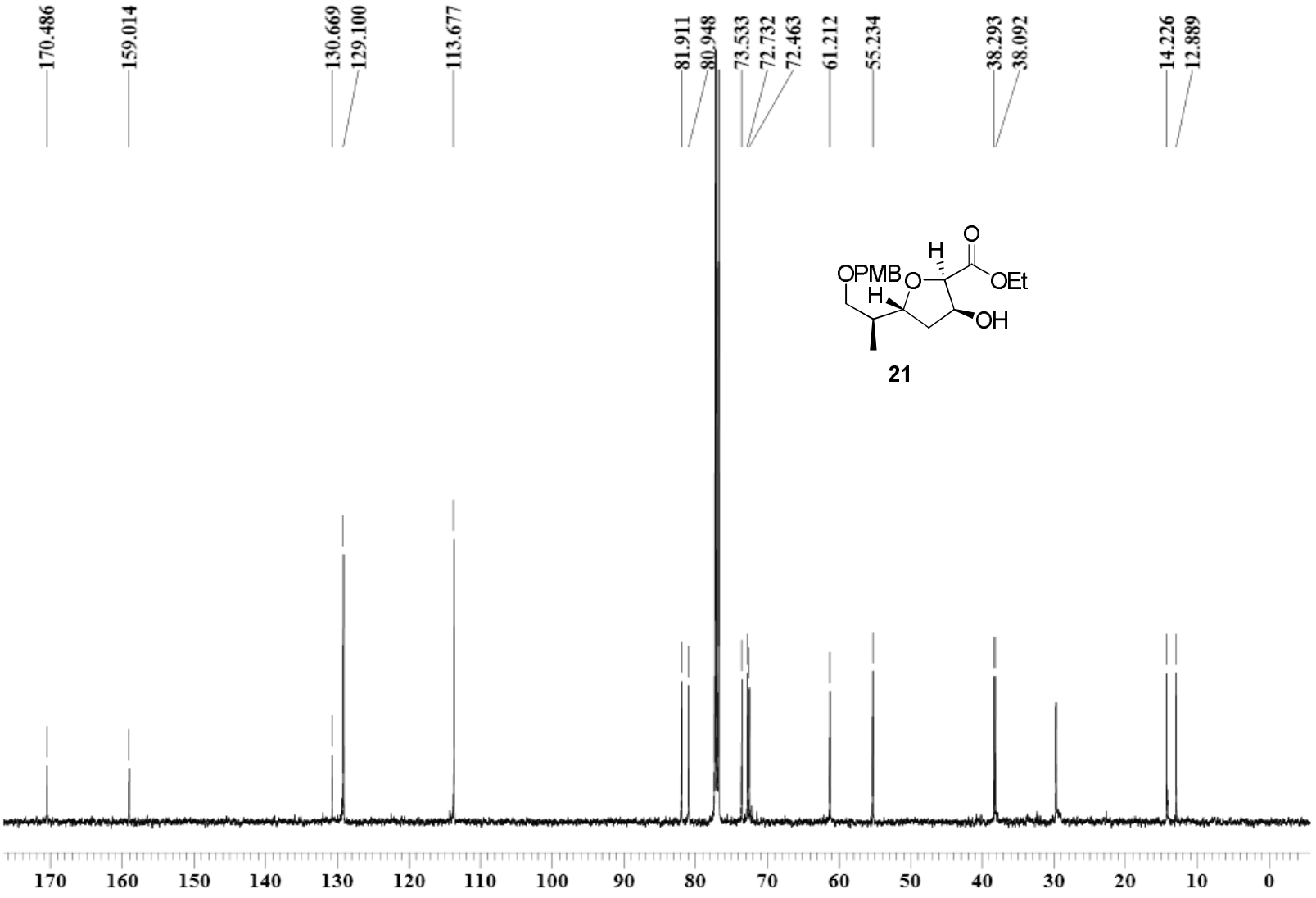
^{1}H NMR spectrum of 20 ($CDCl_3$, 500 MHz)



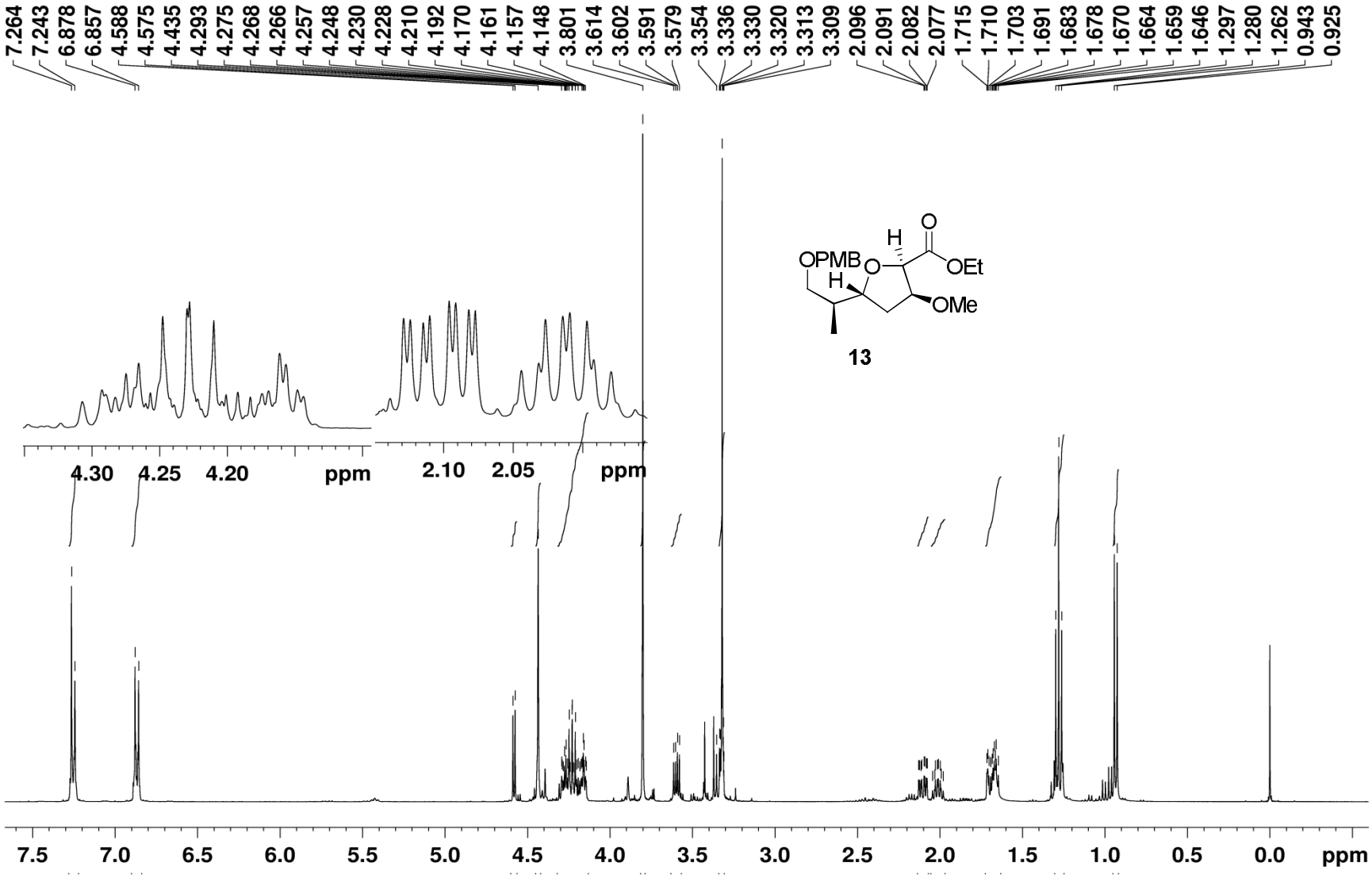
^{13}C NMR spectrum of 20 ($CDCl_3$, 100 MHz)



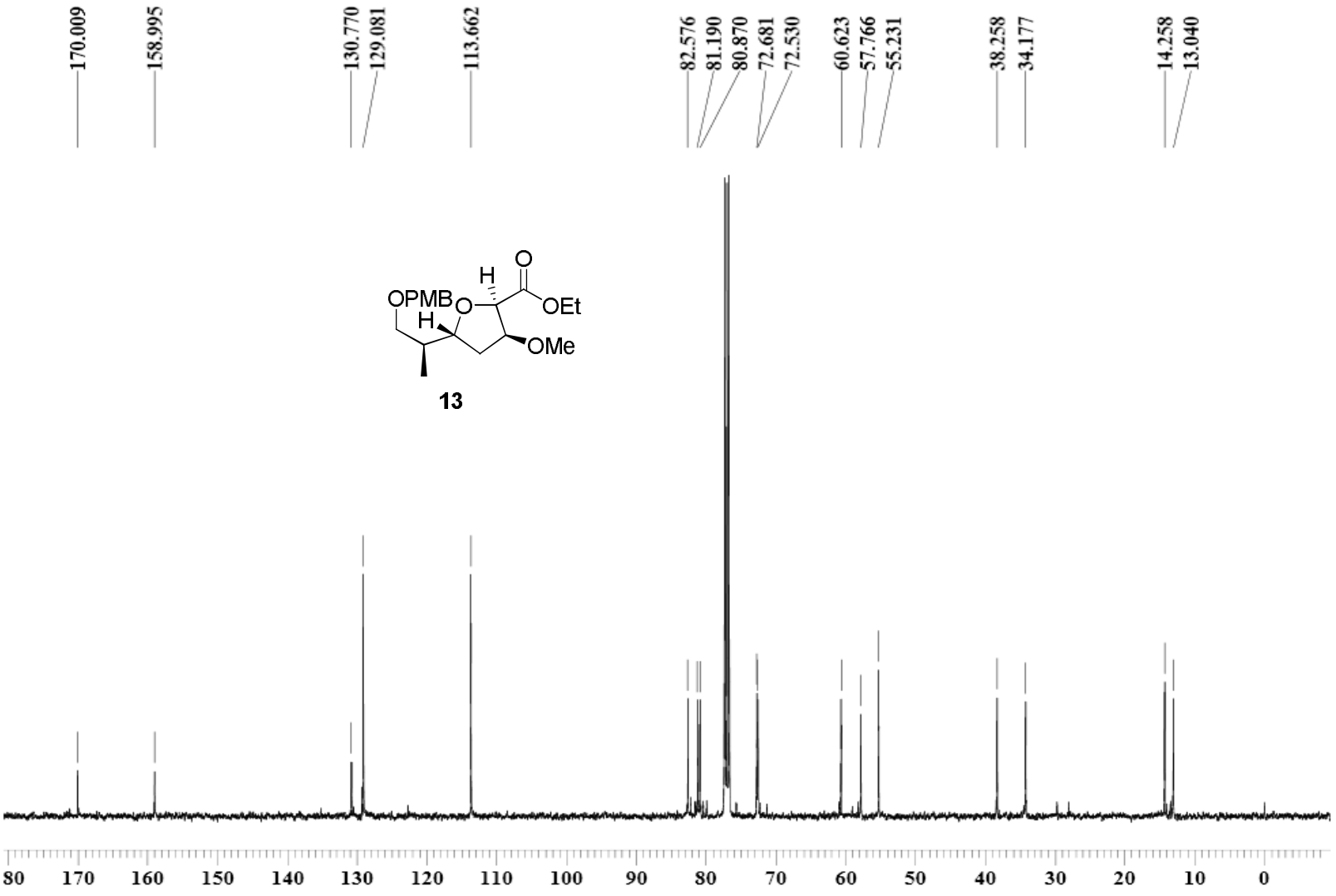
^{1}H NMR spectrum of 21 ($CDCl_3$, 500 MHz)



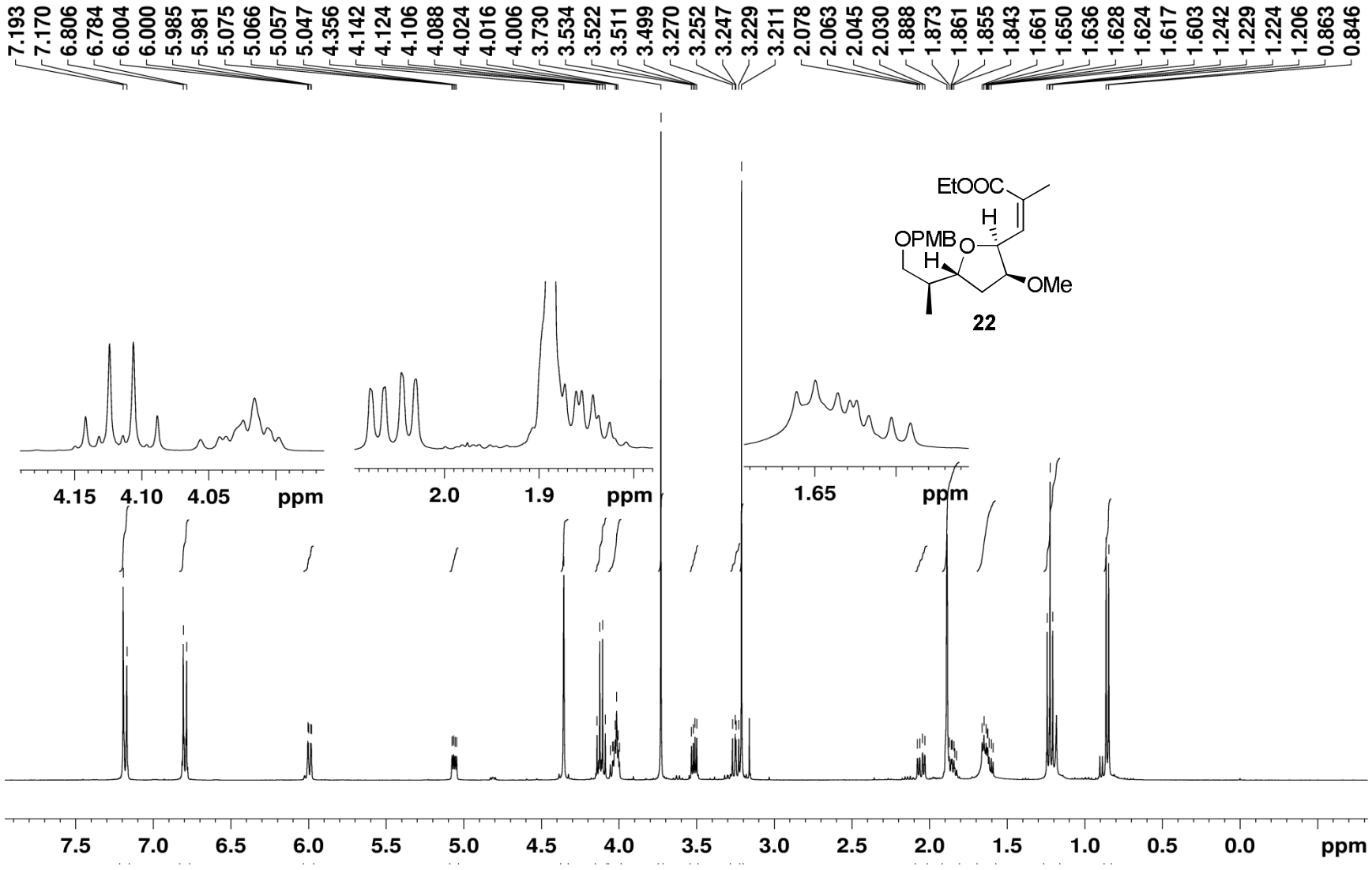
^{13}C NMR spectrum of 21 ($CDCl_3$, 500 MHz)



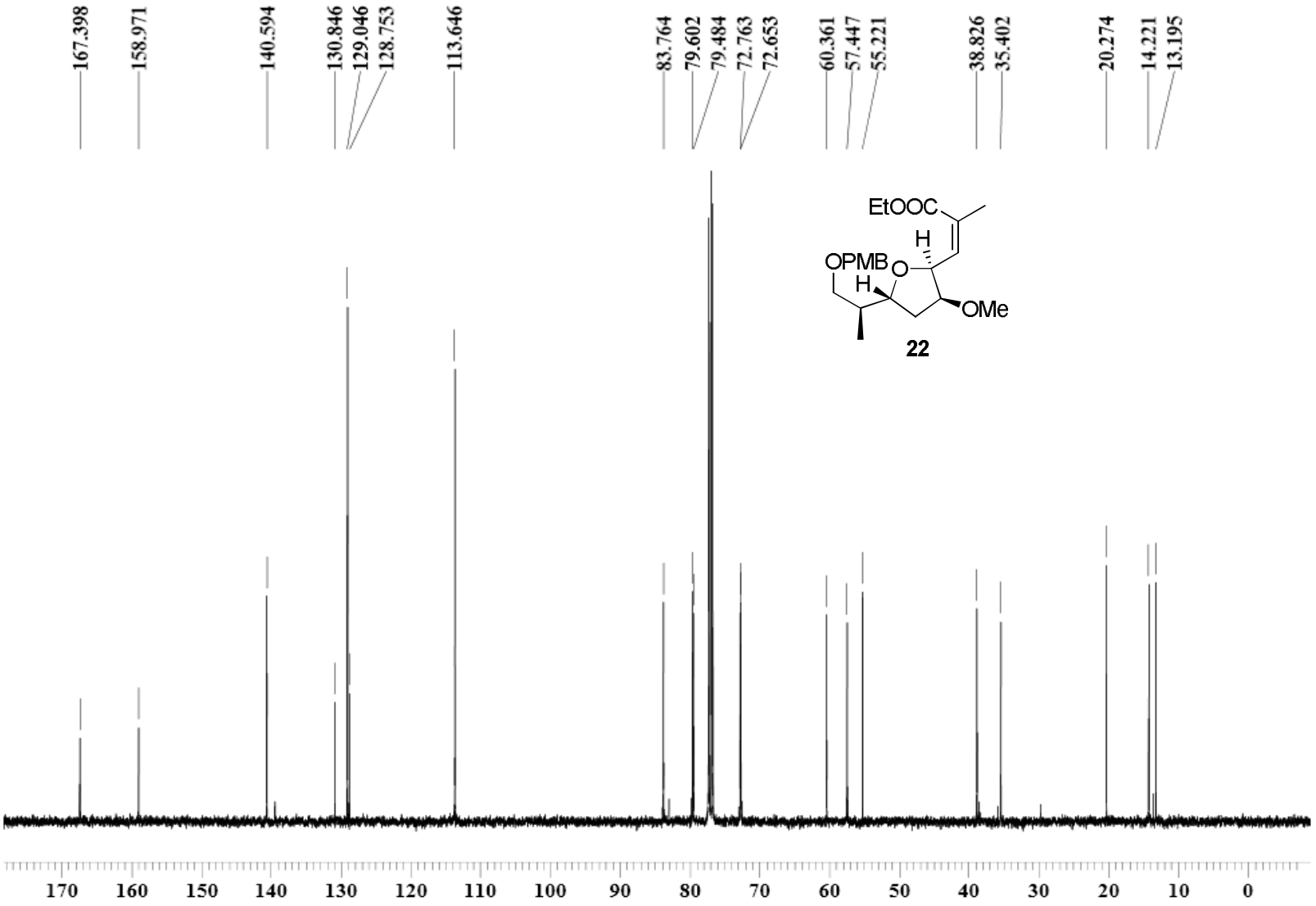
^{1}H NMR spectrum of 13 ($CDCl_3$, 400 MHz)



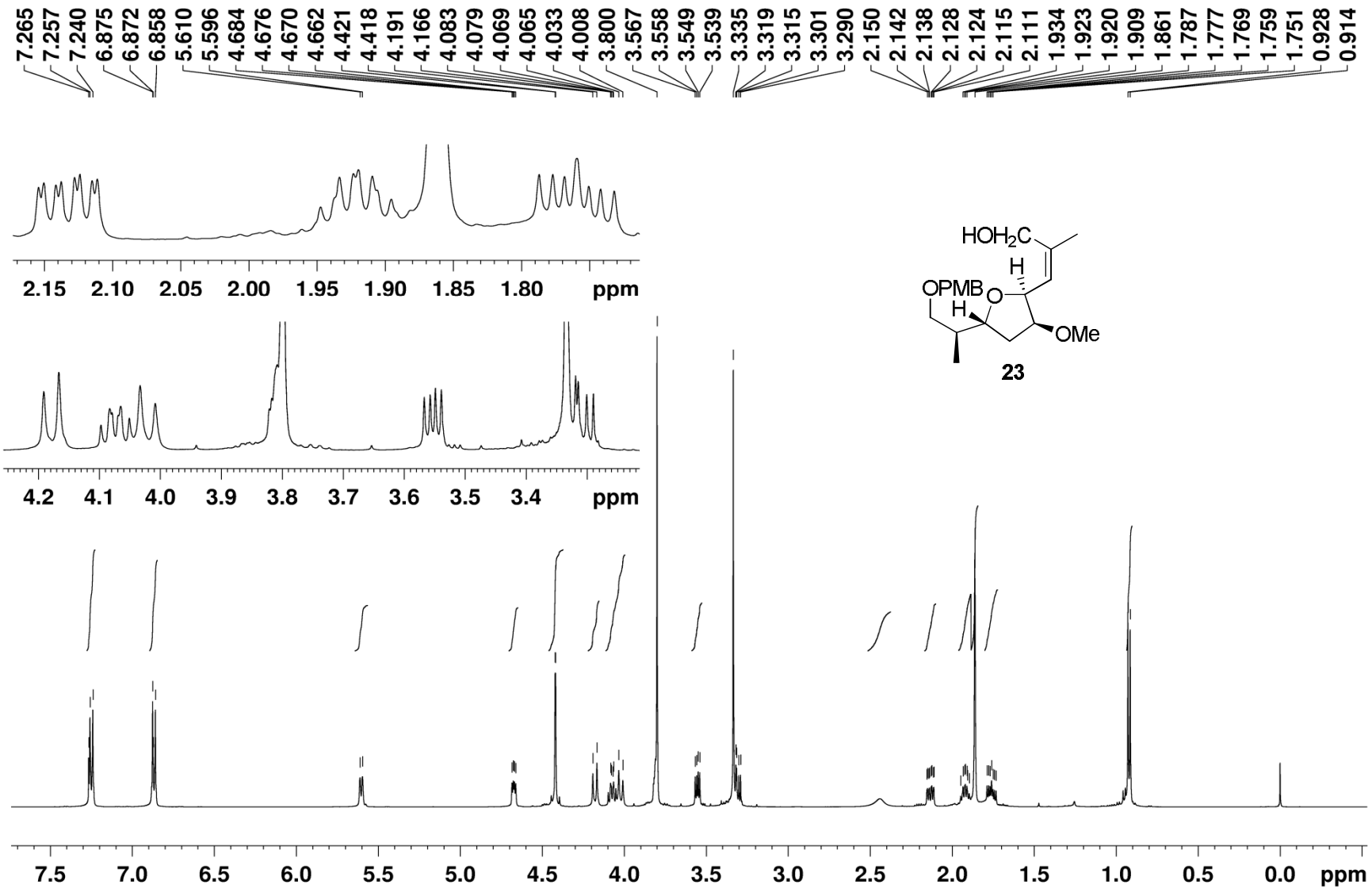
^{13}C NMR spectrum of 13 ($CDCl_3$, 100 MHz)



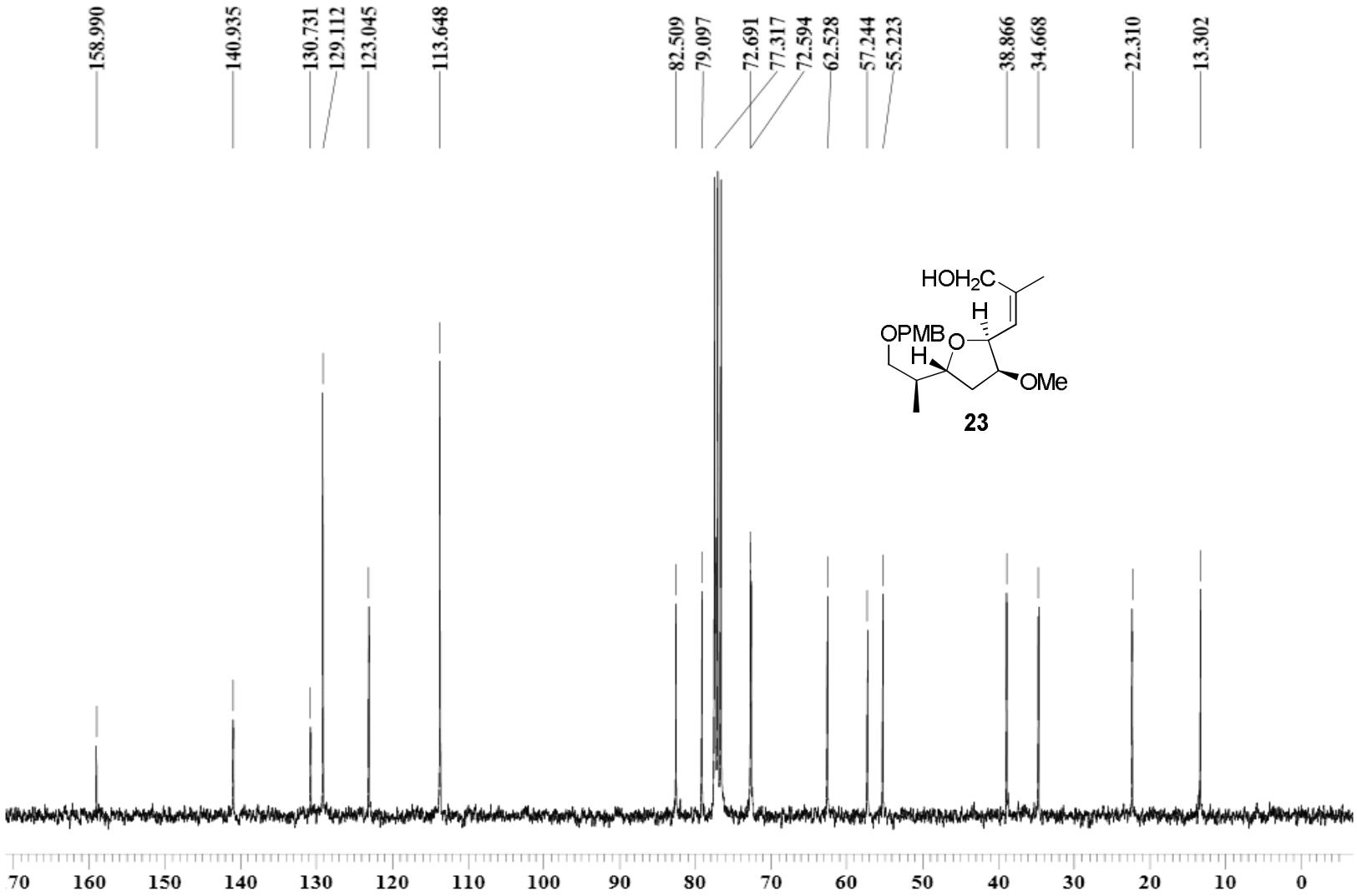
^{1}H NMR spectrum of 22 ($CDCl_3$, 400 MHz)



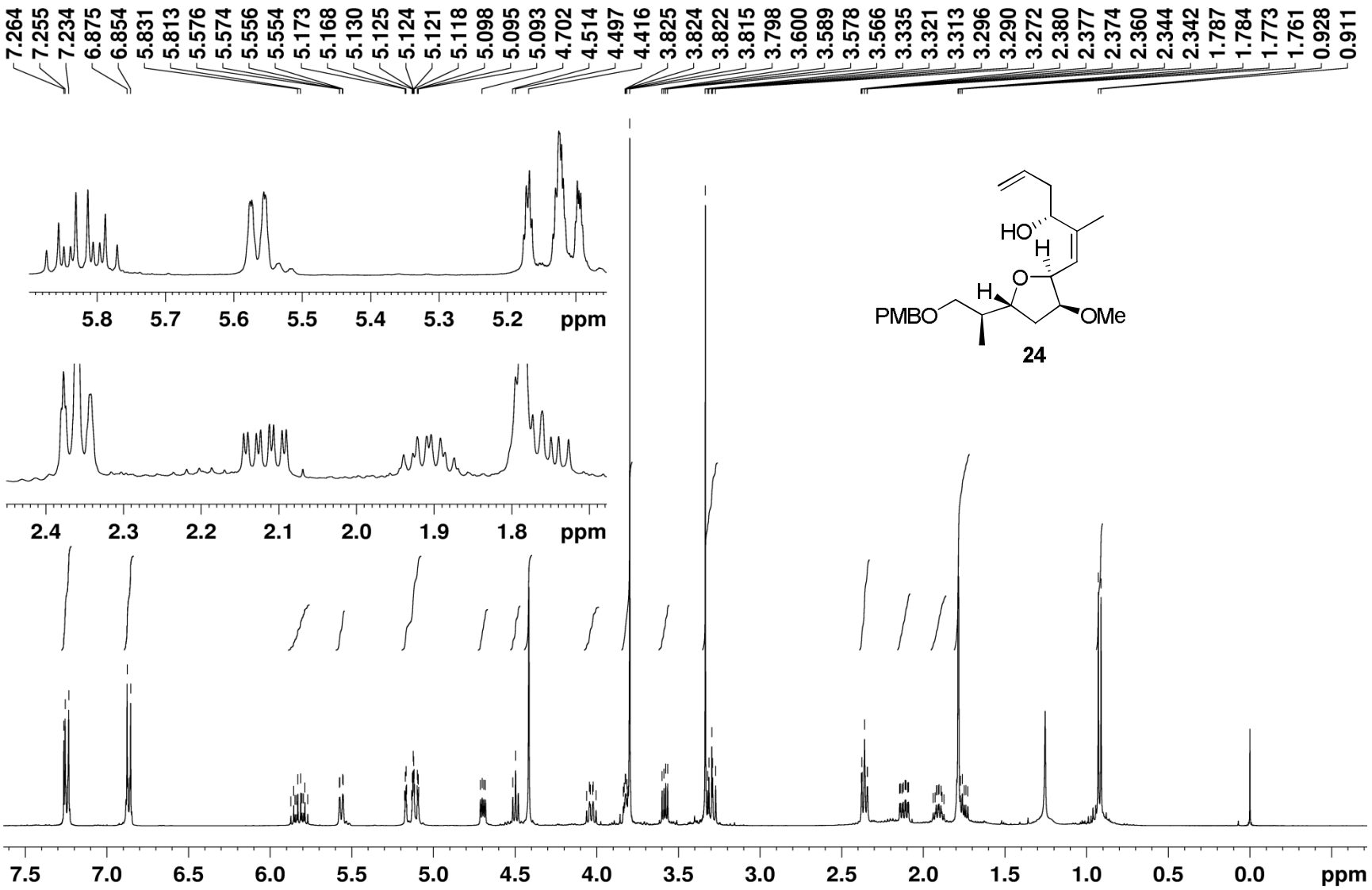
^{13}C NMR spectrum of 22 ($CDCl_3$, 100 MHz)



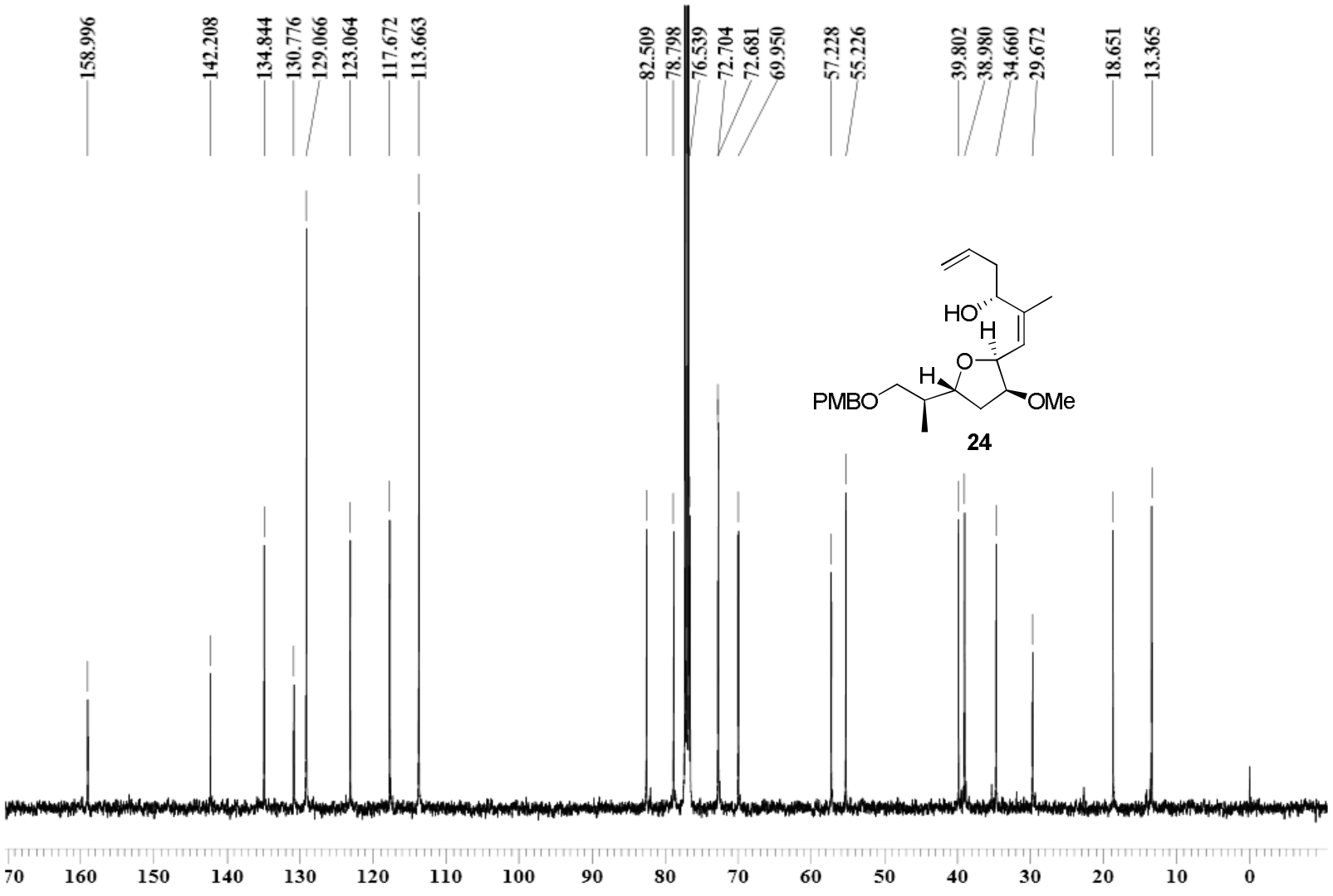
^{1}H NMR spectrum of 23 ($CDCl_3$, 500 MHz)



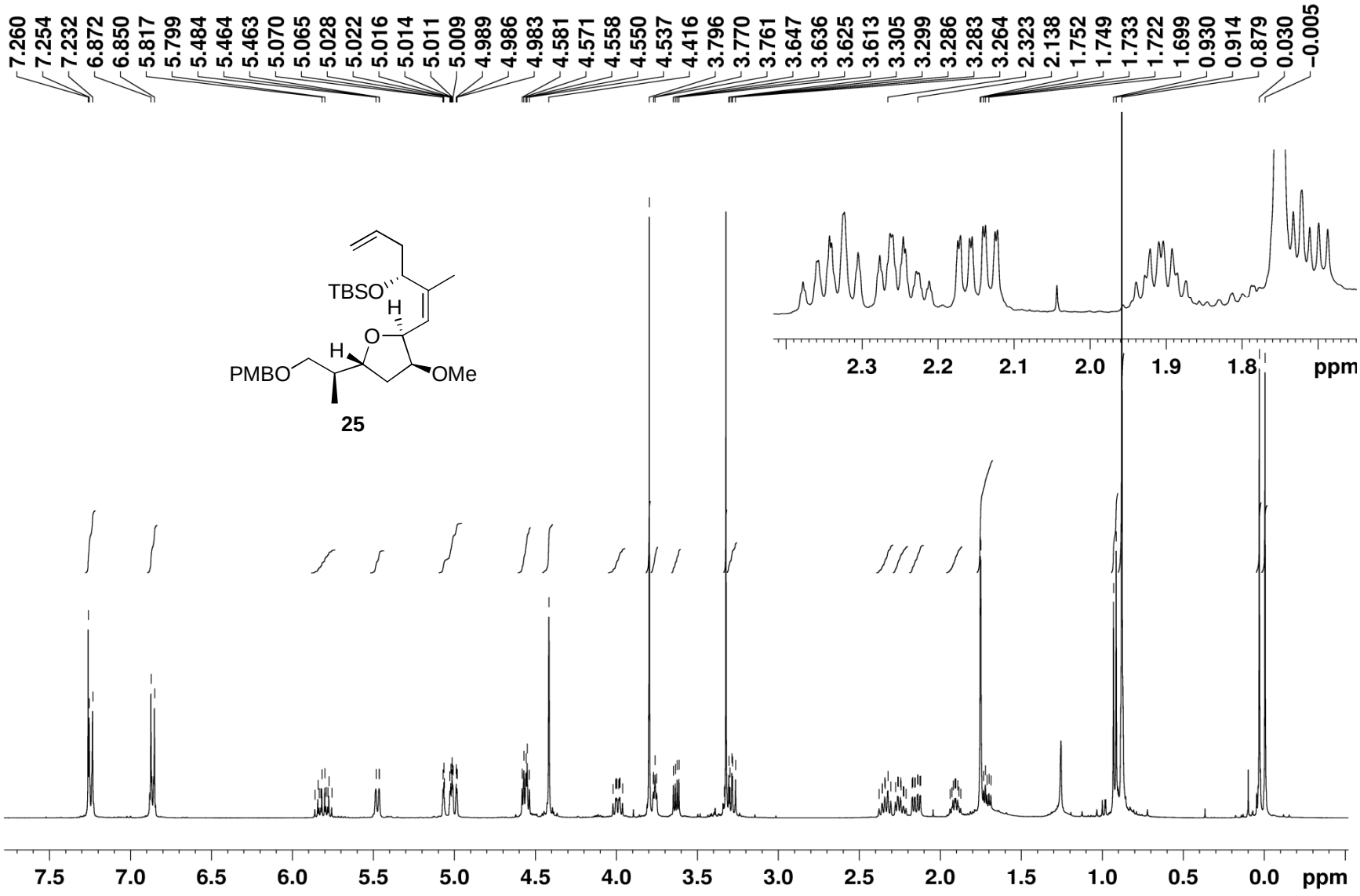
^{13}C NMR spectrum of 23 ($CDCl_3$, 100 MHz)



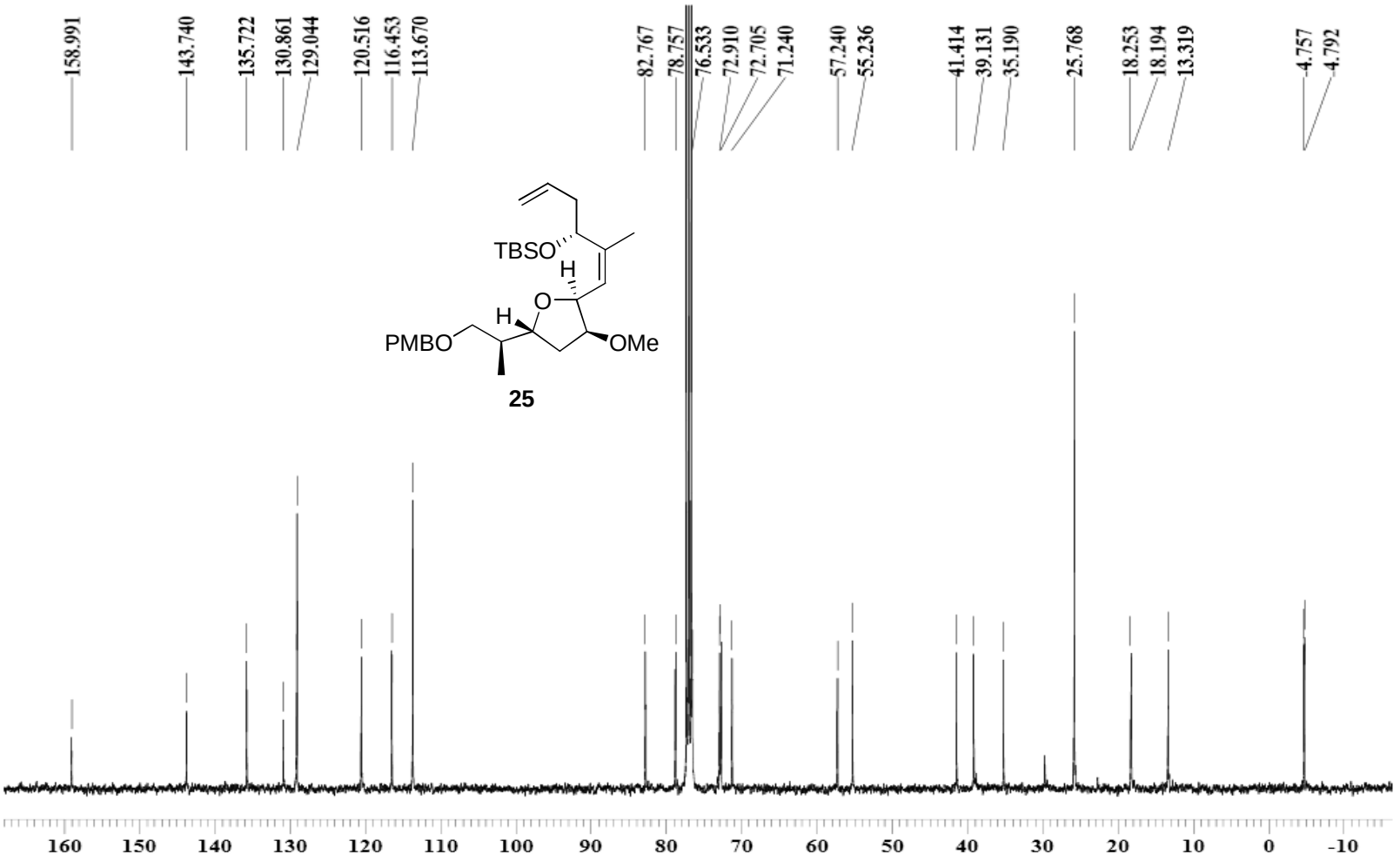
^{1}H NMR spectrum of 24 ($CDCl_3$, 400 MHz)



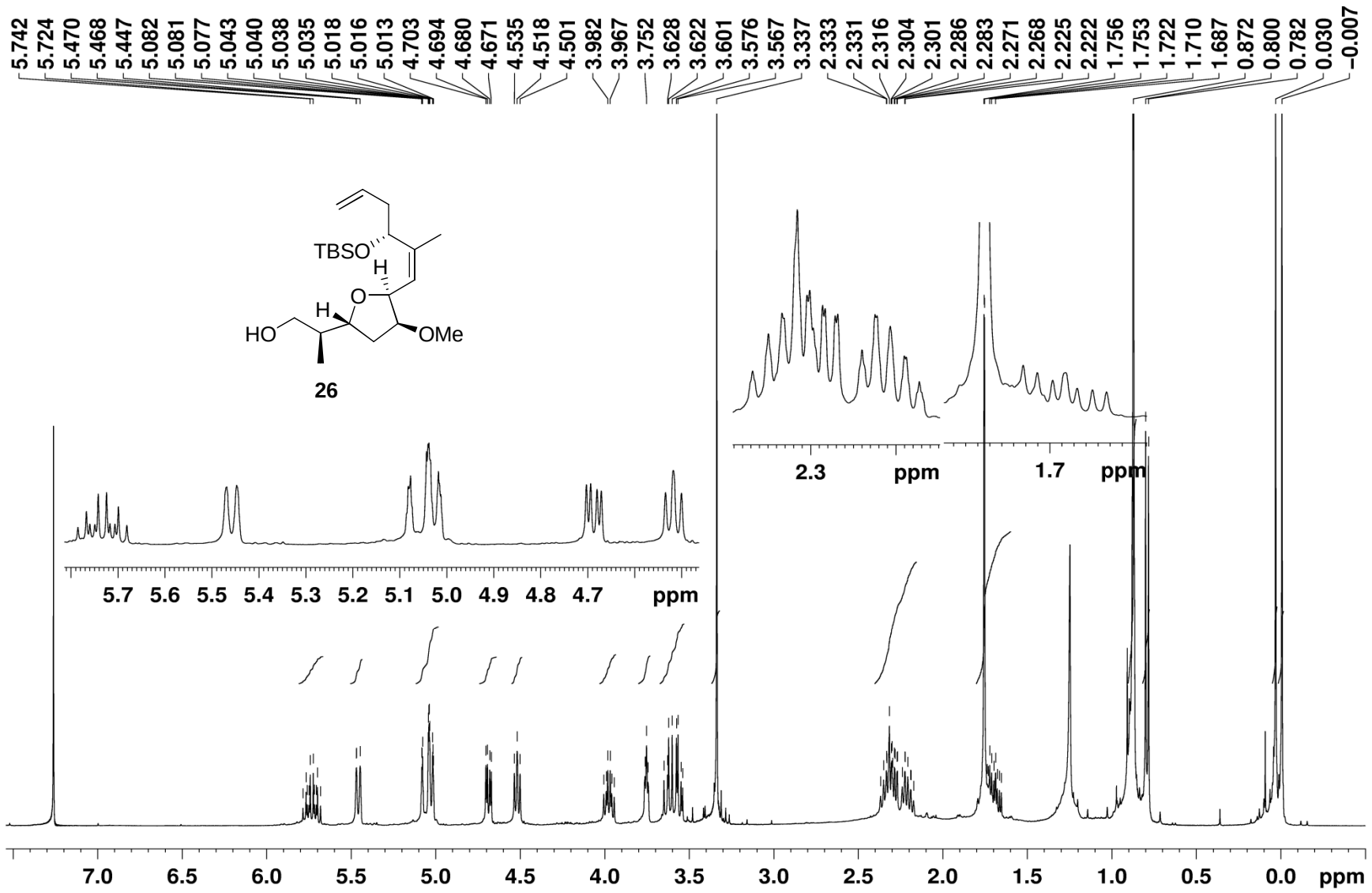
^{13}C NMR spectrum of 24 ($CDCl_3$, 125 MHz)



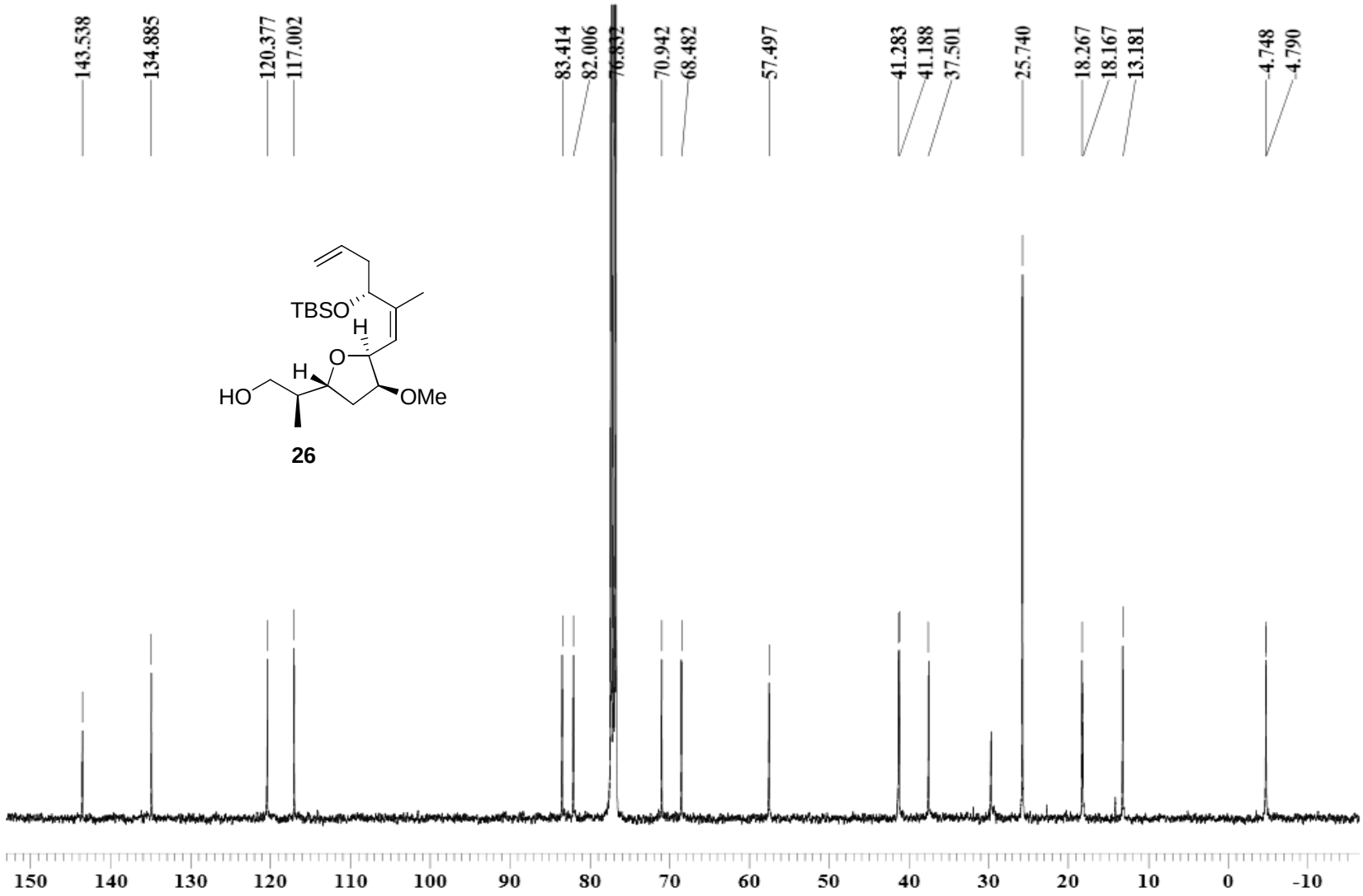
^{1}H NMR spectrum of 25 ($CDCl_3$, 400 MHz)



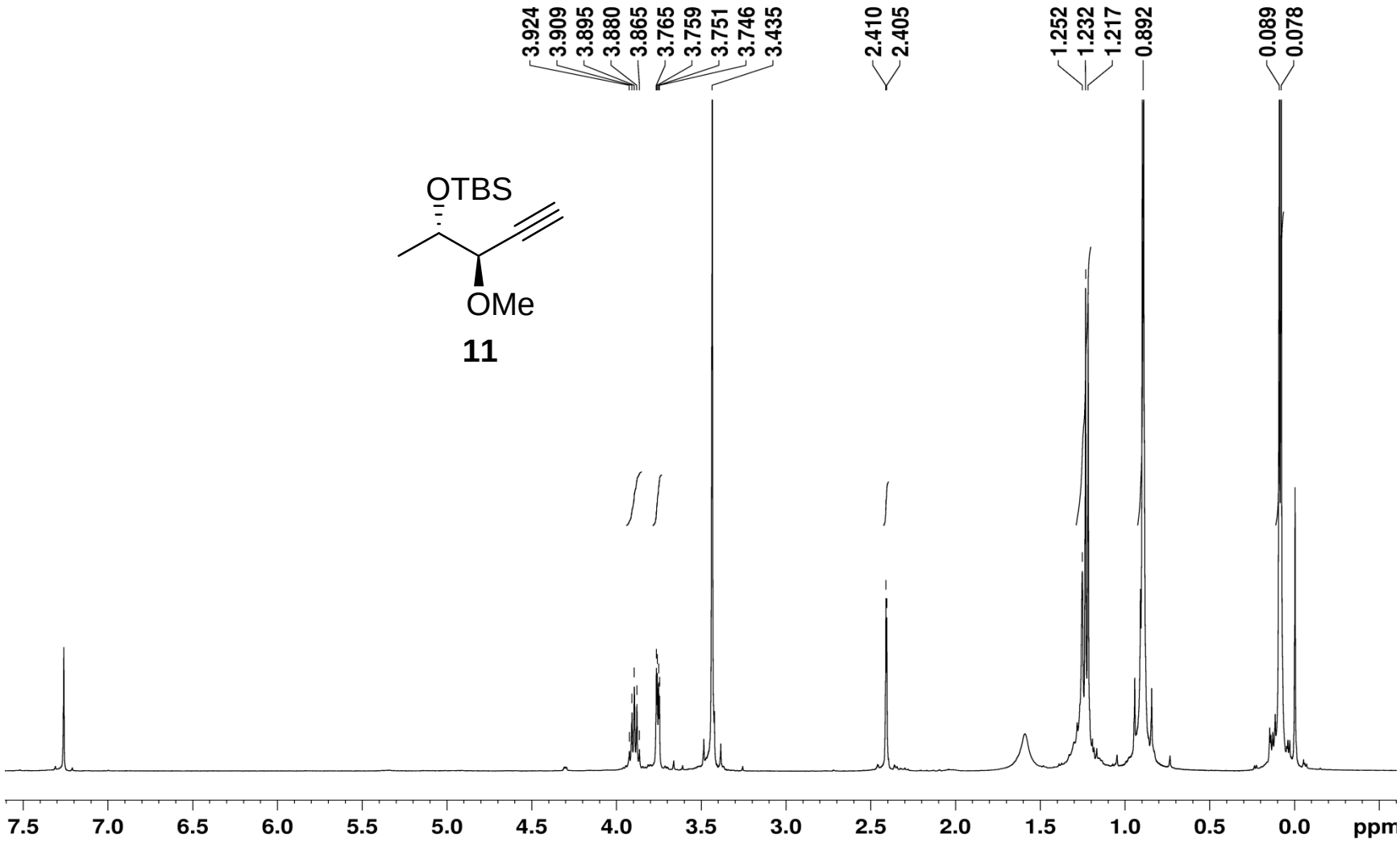
^{13}C NMR spectrum of 25 ($CDCl_3$, 100MHz)



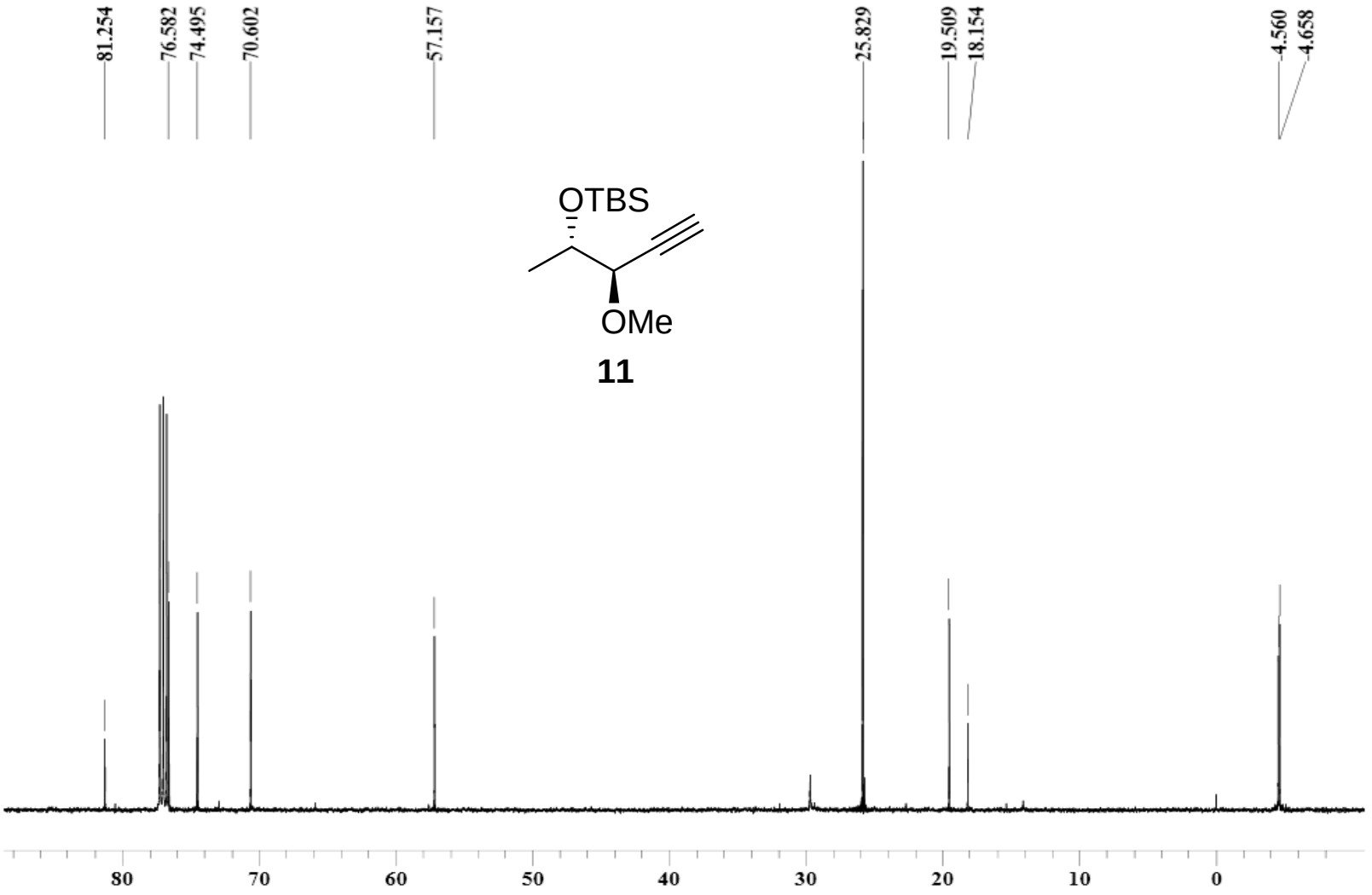
^{1}H NMR spectrum of 26 ($CDCl_3$, 400 MHz)



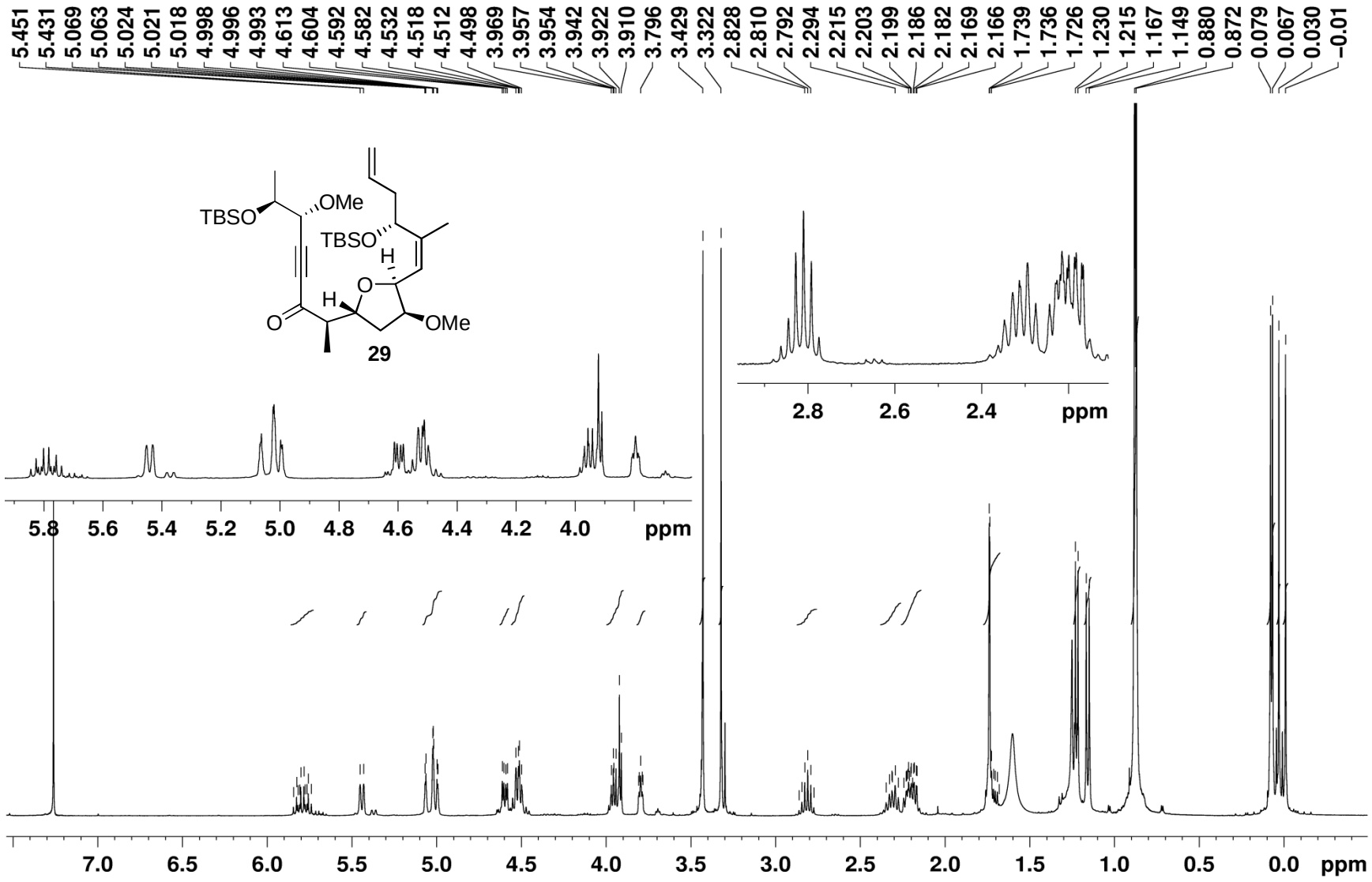
^{13}C NMR spectrum of 26 ($CDCl_3$, 100 MHz)



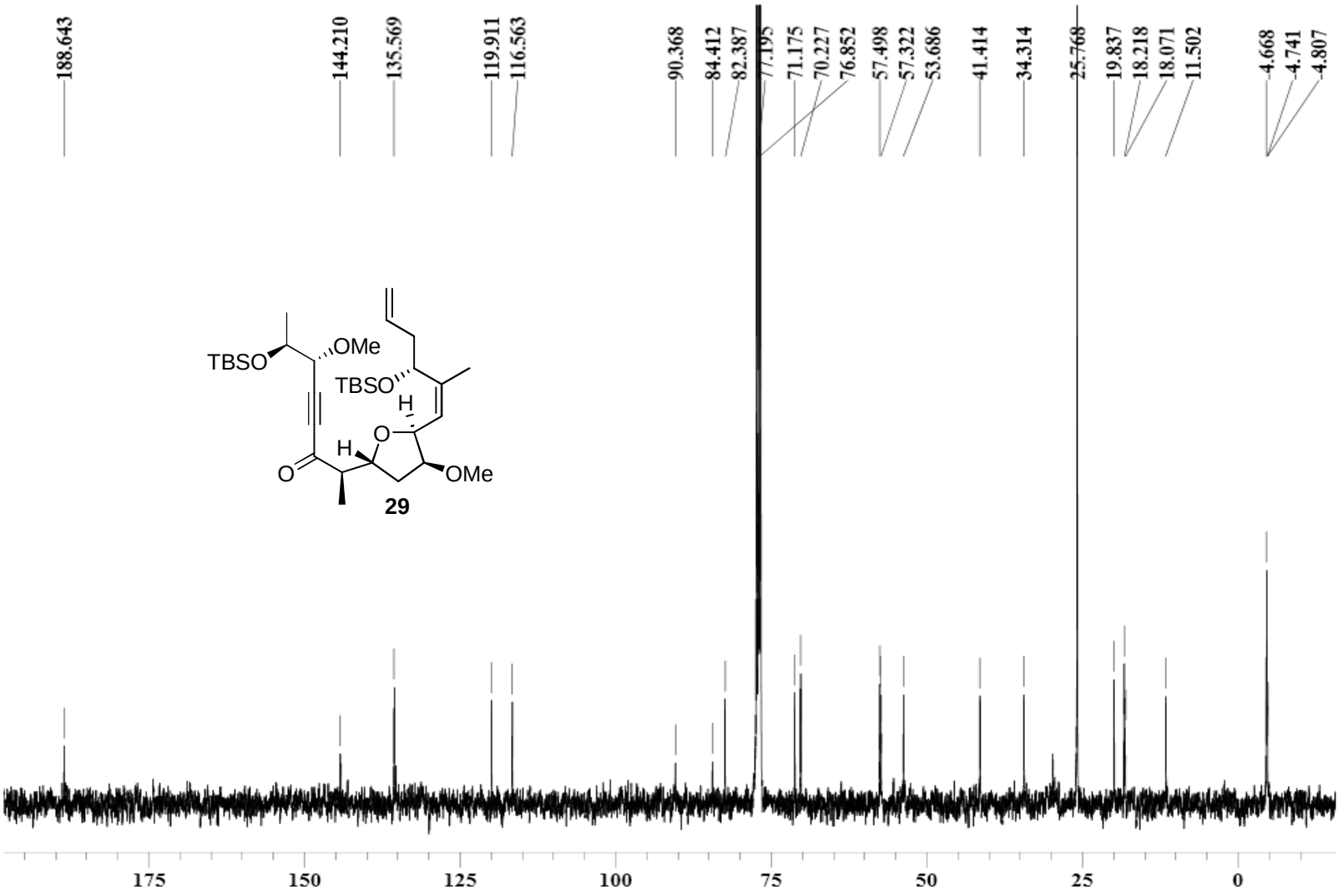
^{1}H NMR spectrum of 11 ($CDCl_3$, 400 MHz)



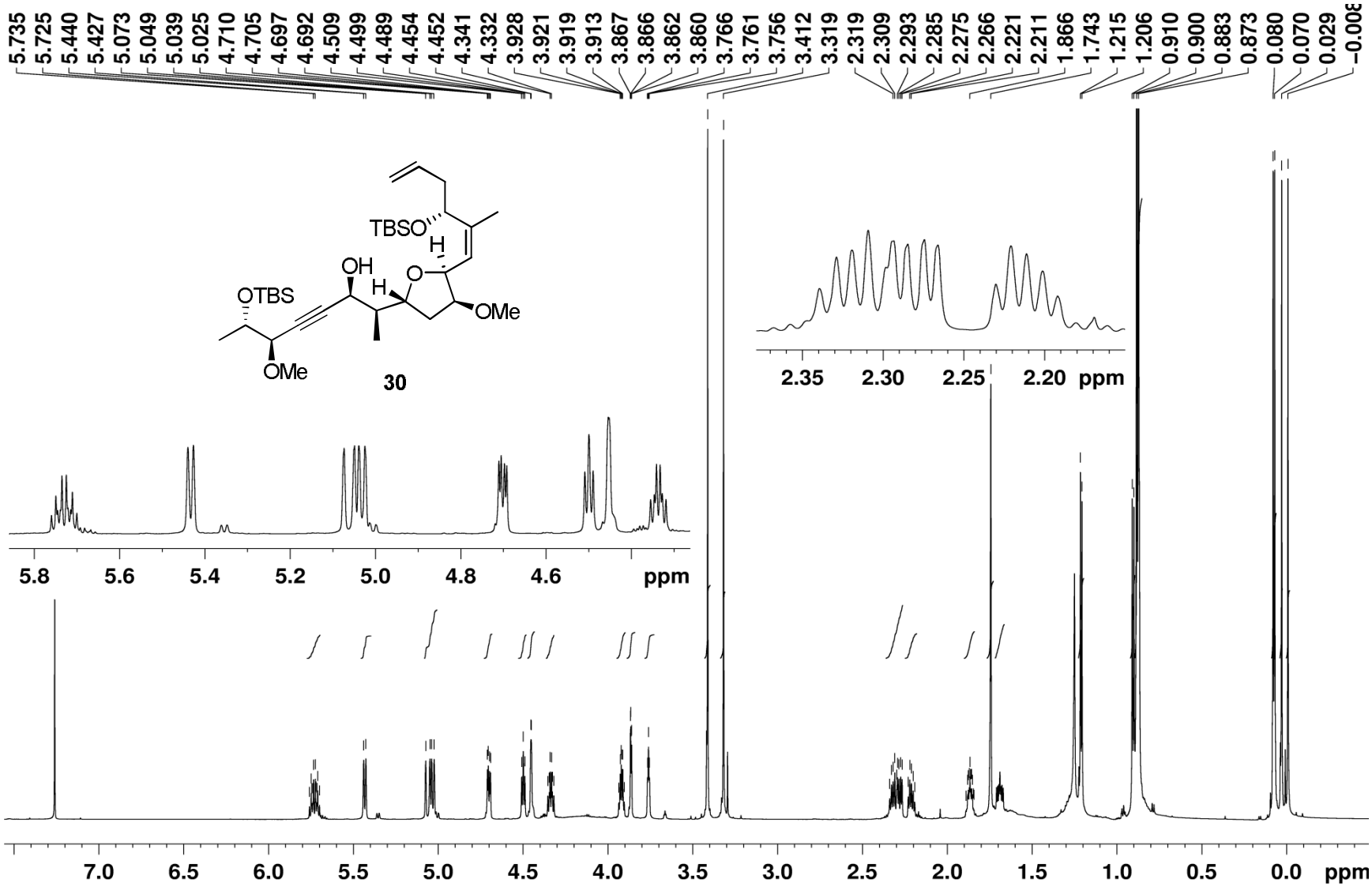
^{13}C NMR spectrum of 11 ($CDCl_3$, 100 MHz)



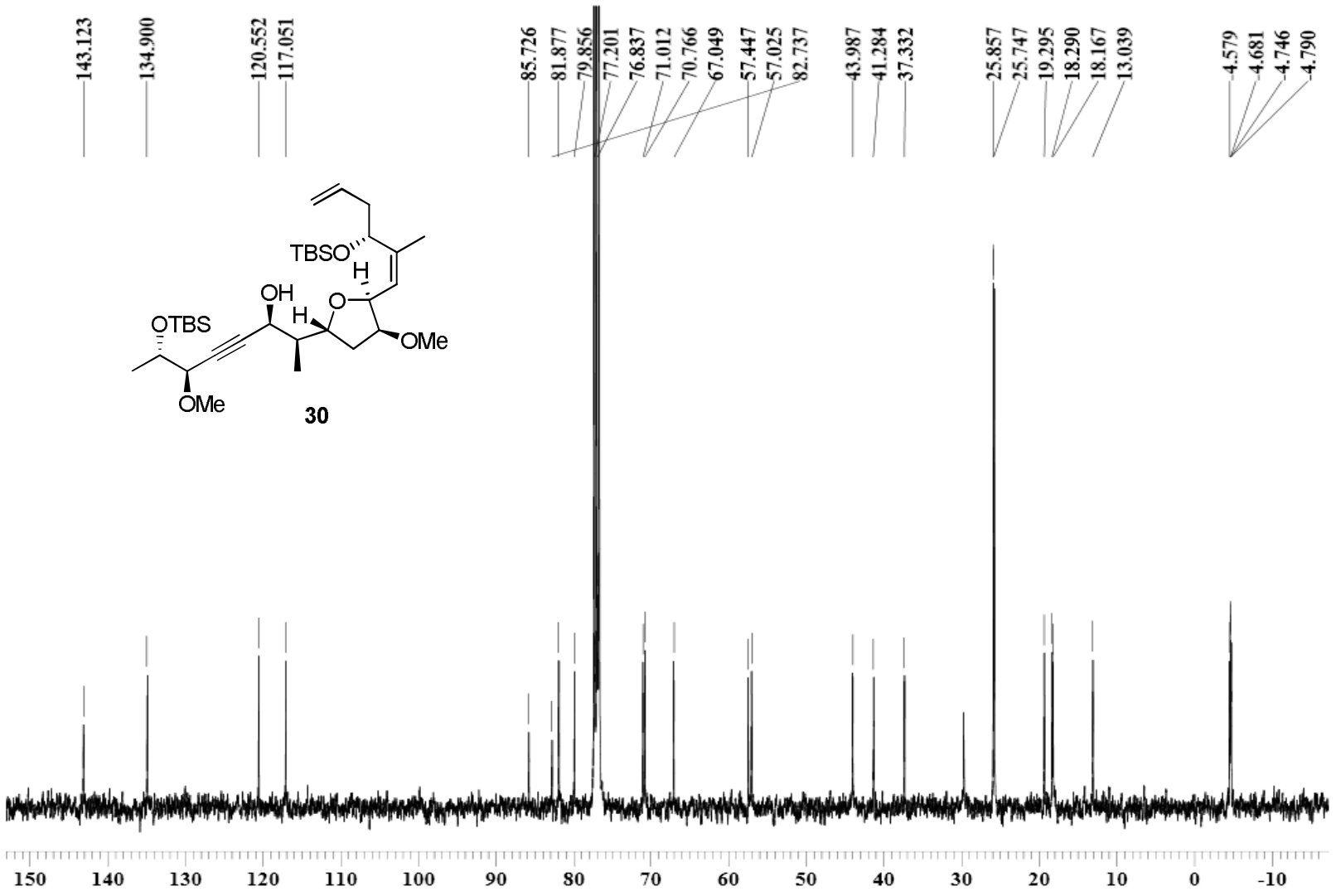
^{1}H NMR spectrum of 29 ($CDCl_3$, 400 MHz)



^{13}C NMR spectrum of 29 ($CDCl_3$, 100 MHz)

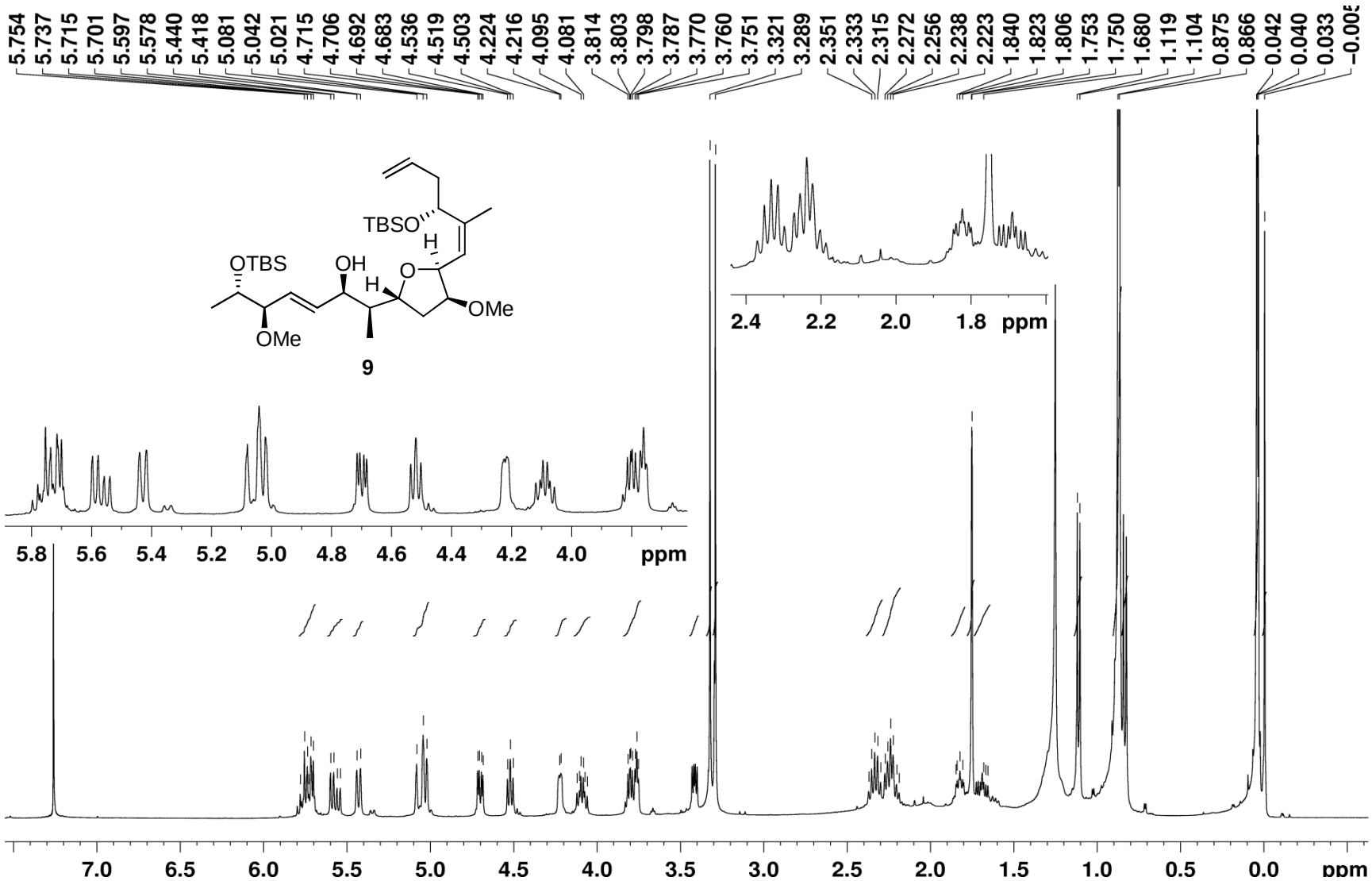


^{1}H NMR spectrum of 30 ($CDCl_3$, 700 MHz)

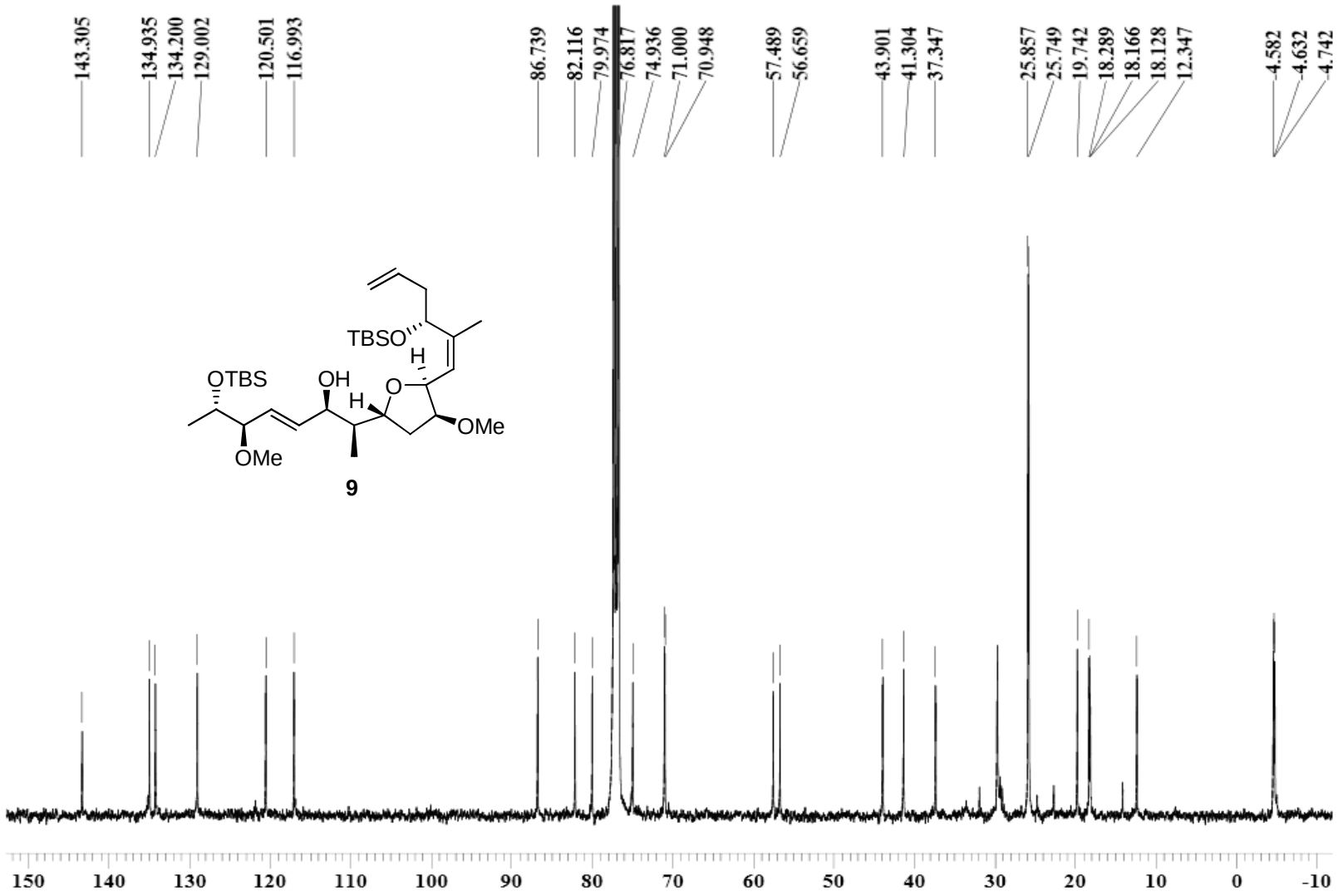


30

^{13}C NMR spectrum of 30 ($CDCl_3$, 100 MHz)

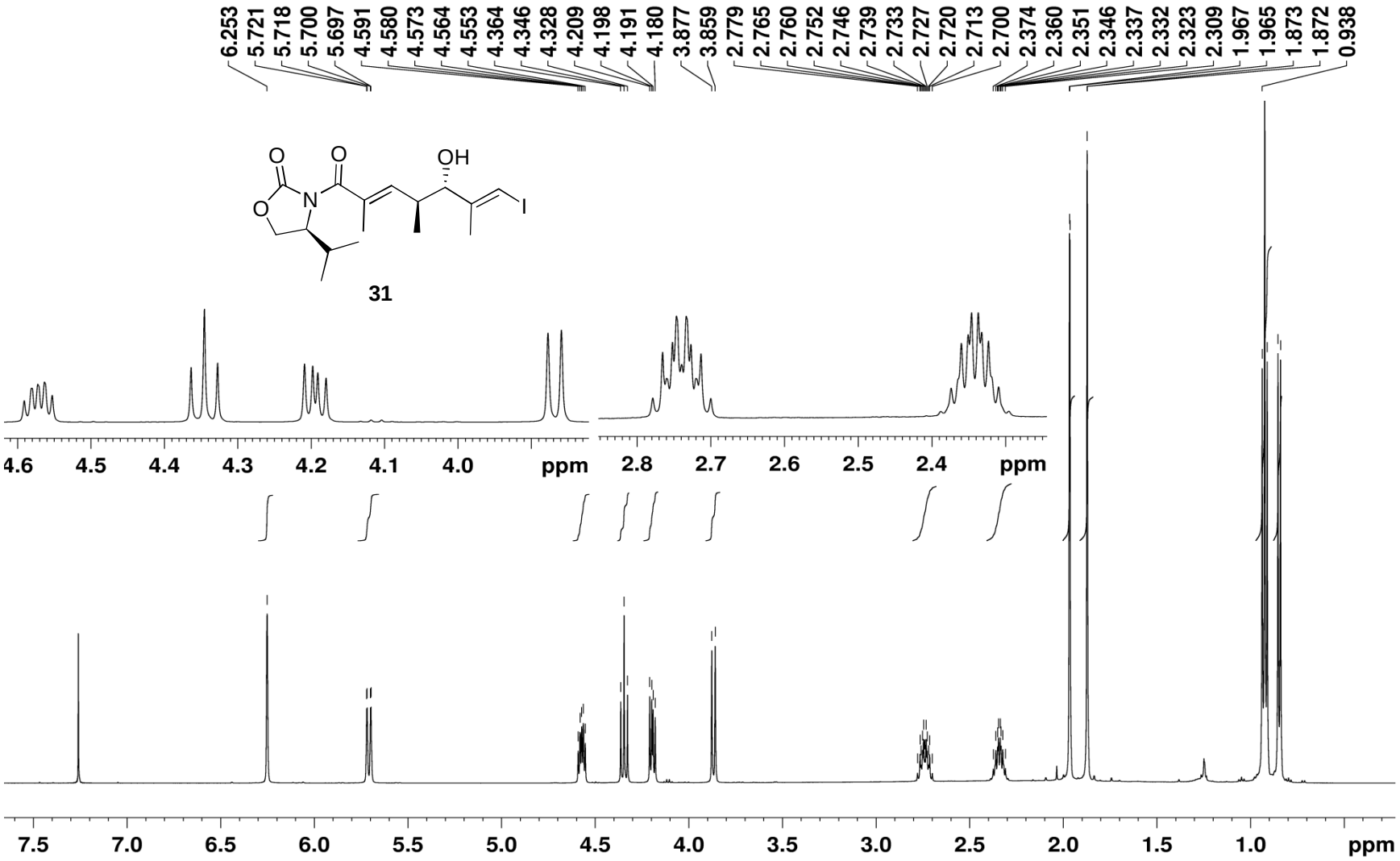


^{1}H NMR spectrum of 9 ($CDCl_3$, 400 MHz)

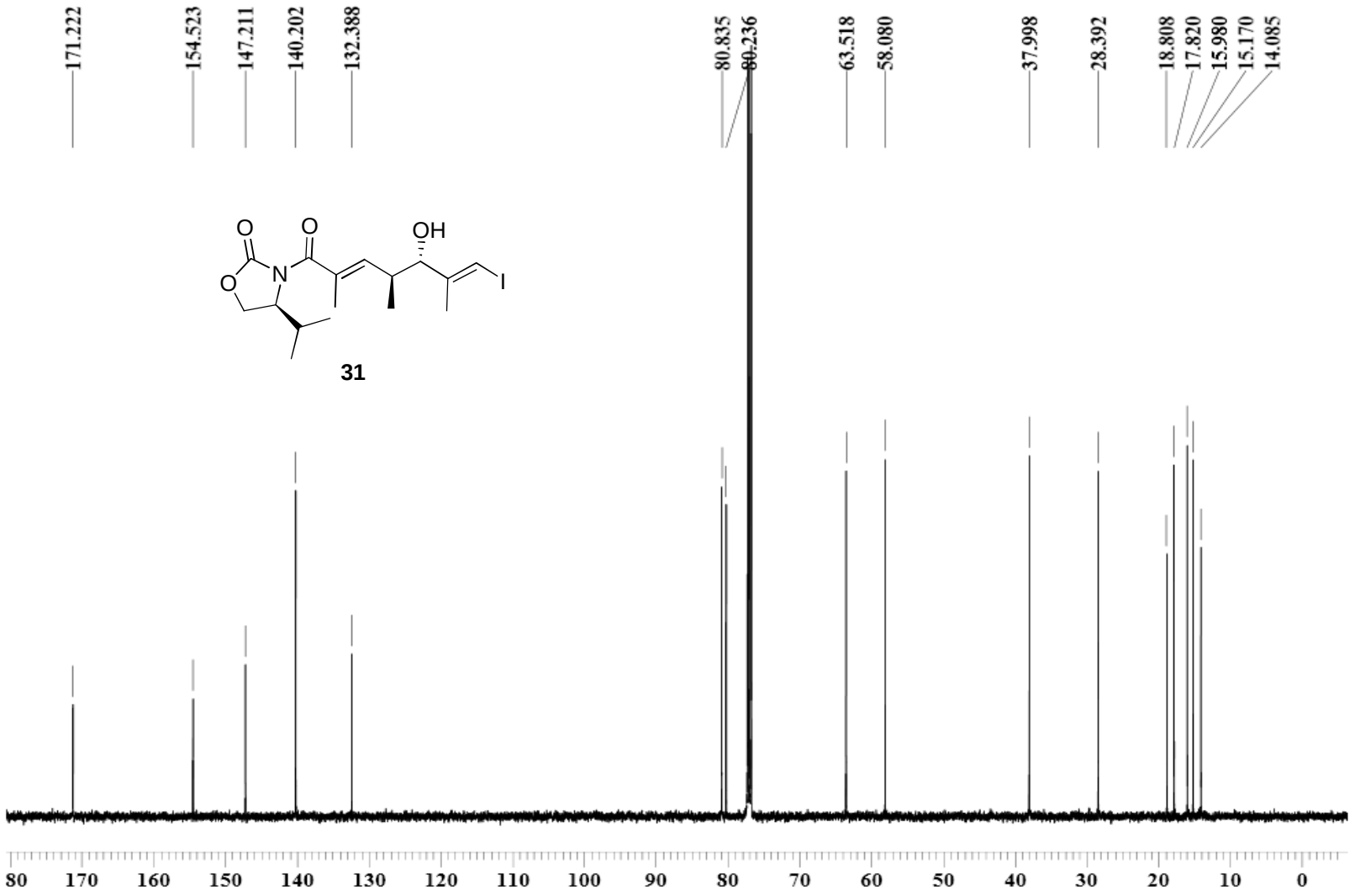


9

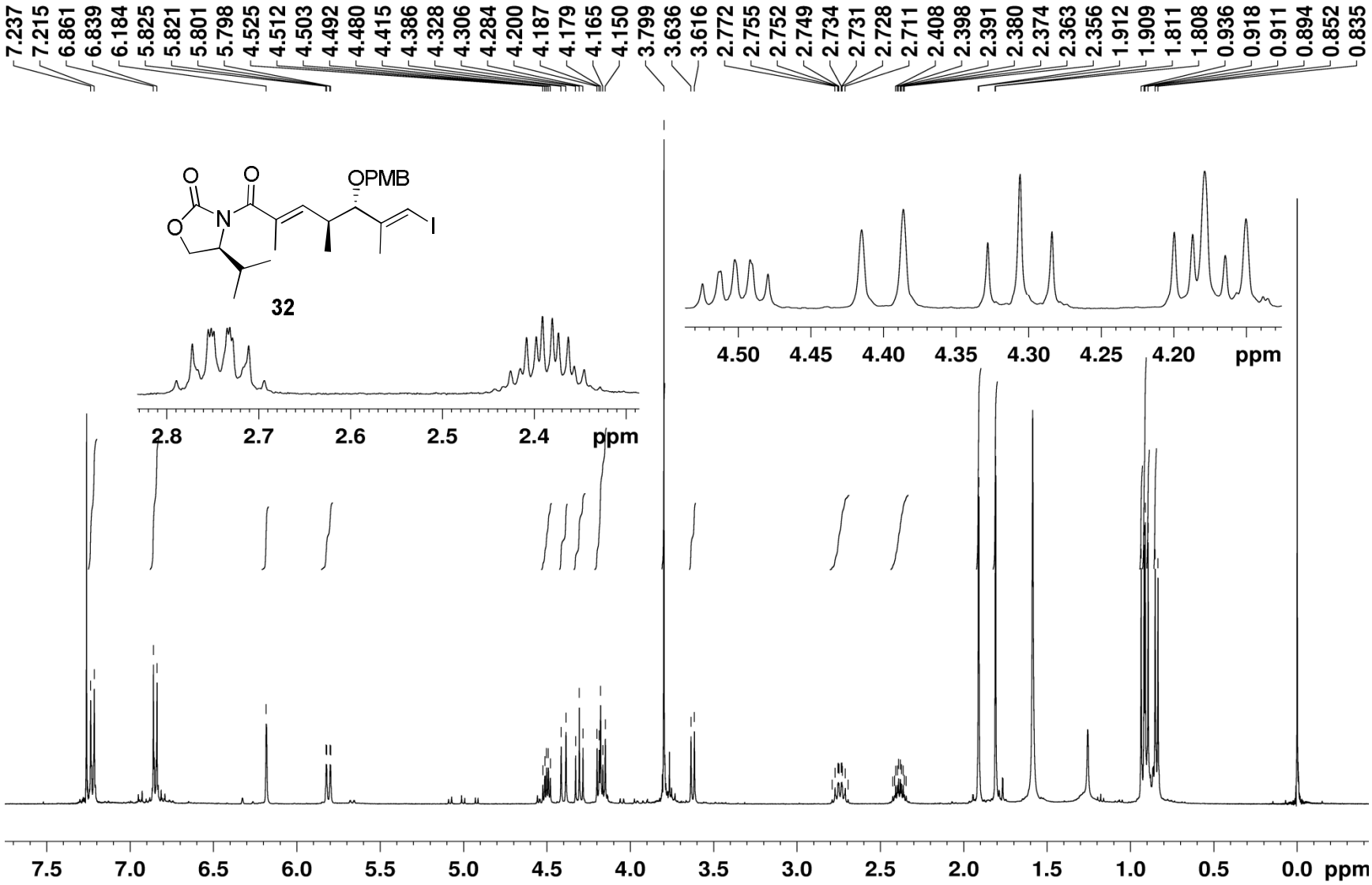
^{13}C NMR spectrum of 9 ($CDCl_3$, 100 MHz)



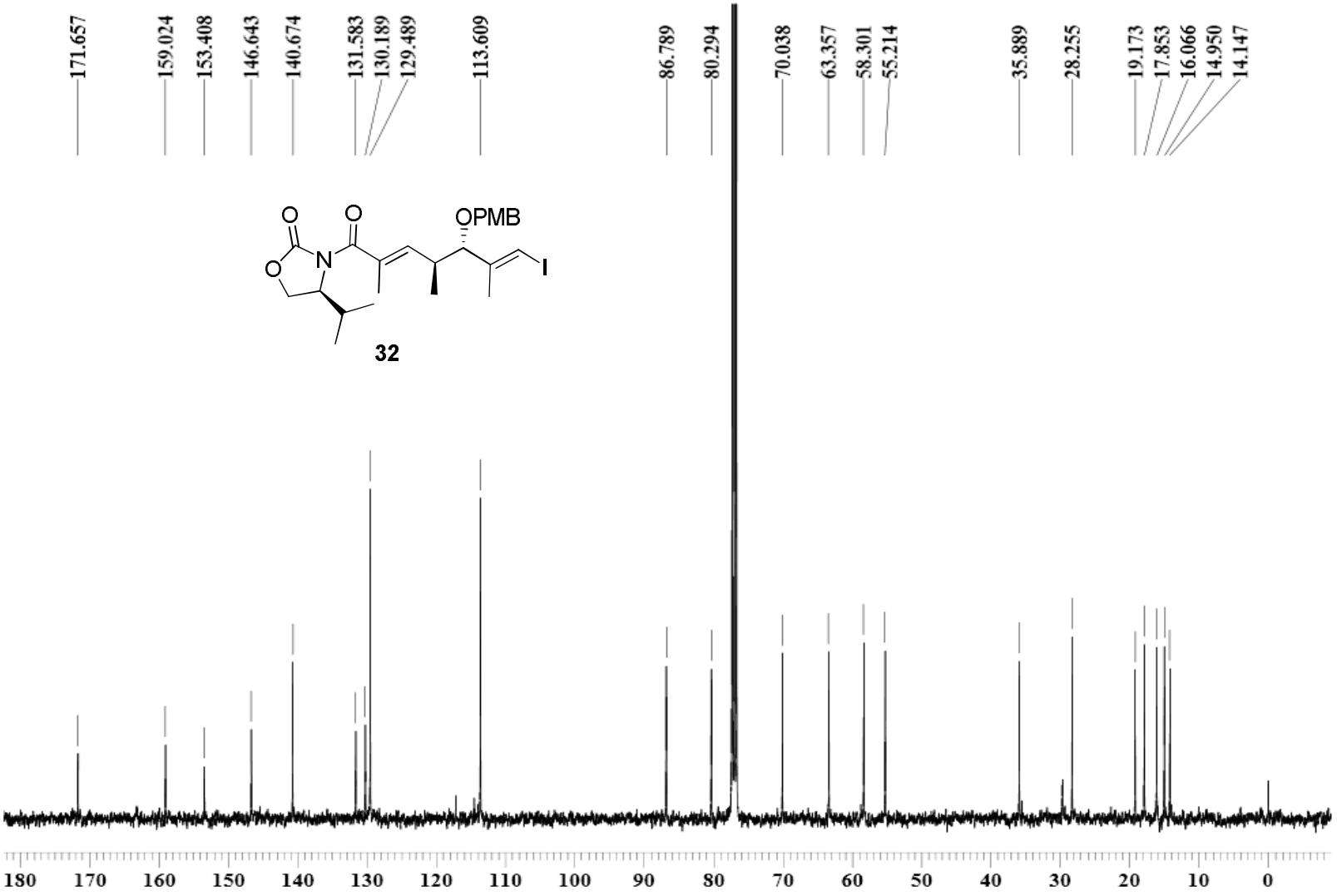
^{1}H NMR spectrum of 31 ($CDCl_3$, 500 MHz)



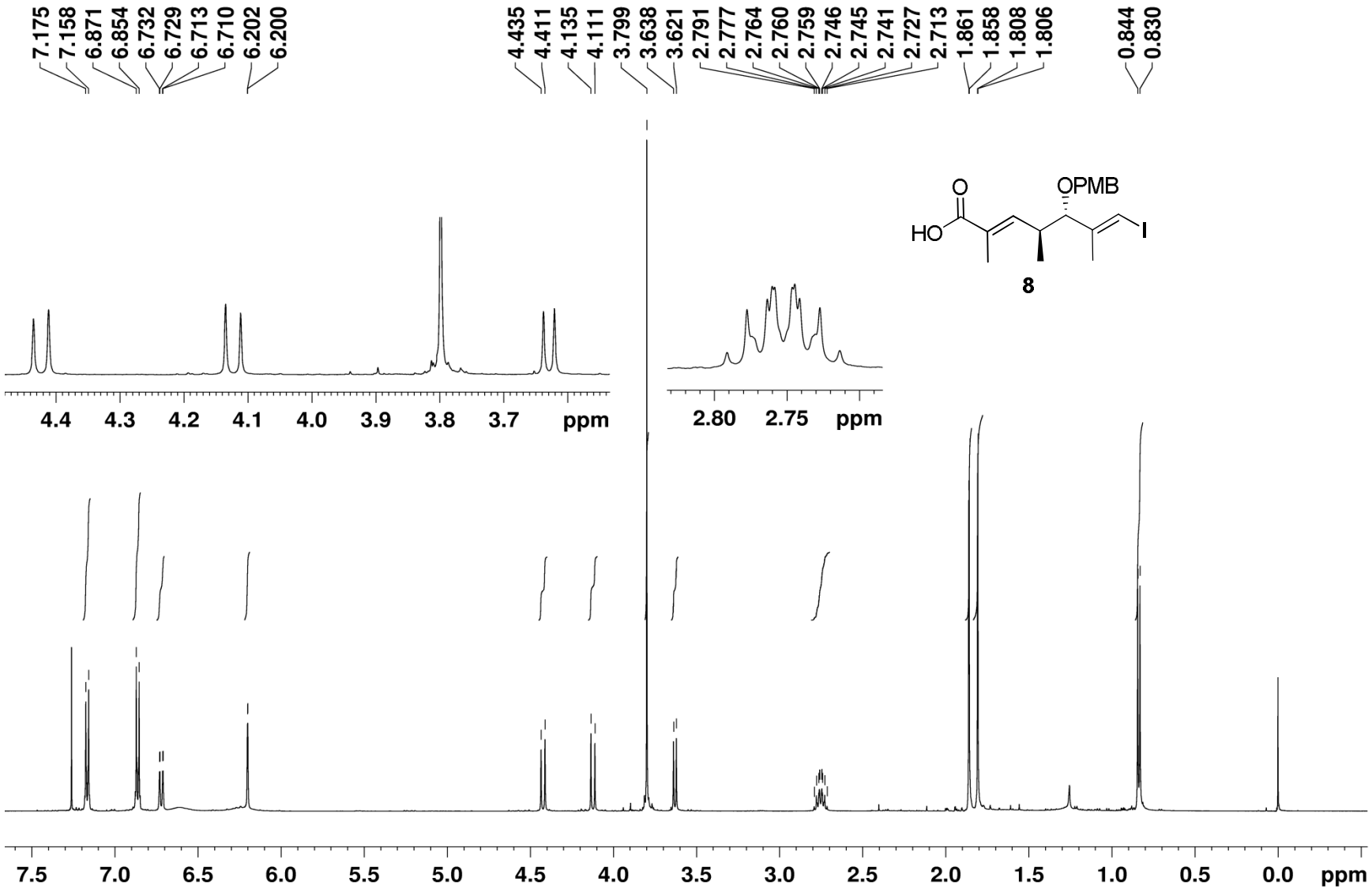
^{13}C NMR spectrum of 31 ($CDCl_3$, 125MHz)



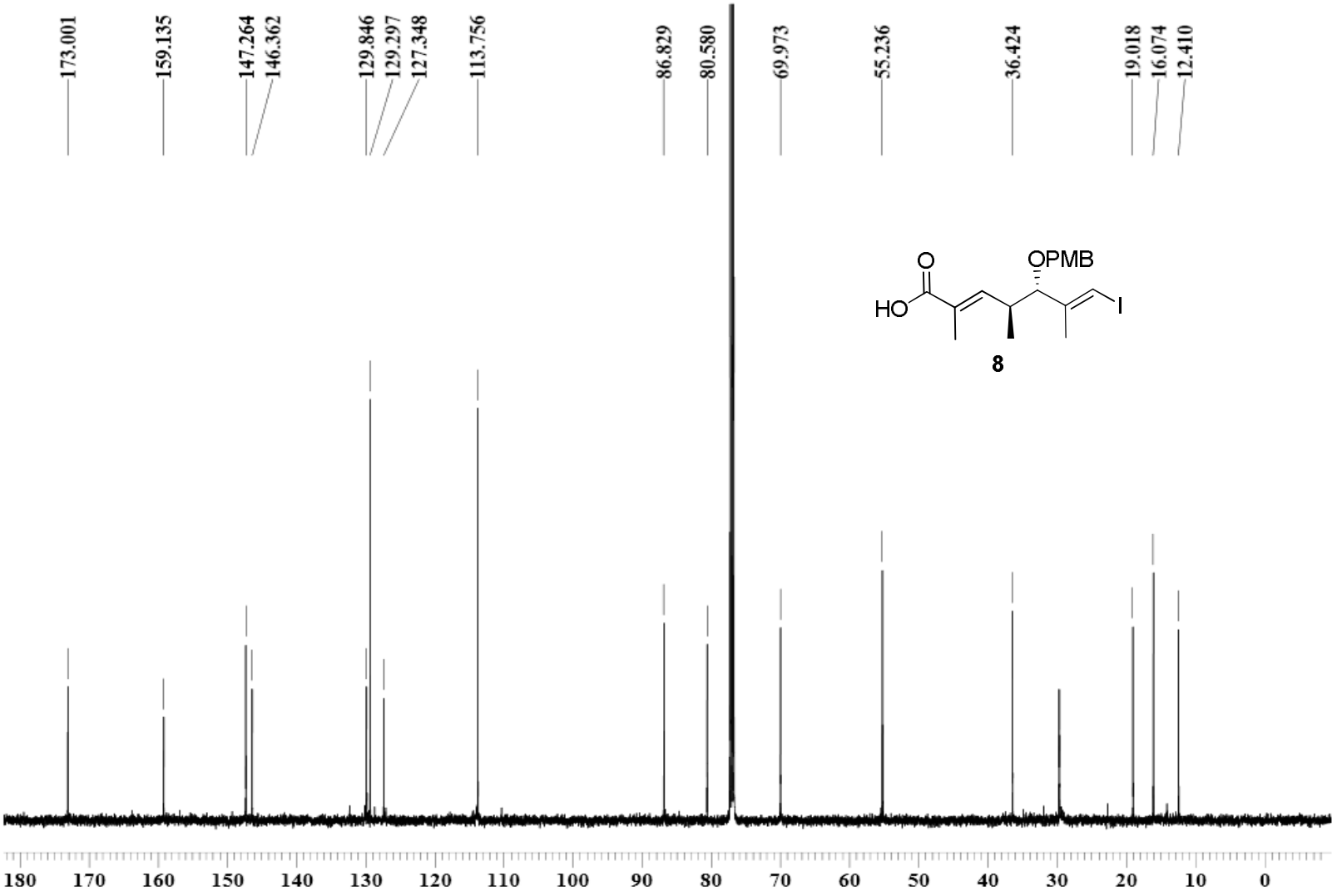
^{1}H NMR spectrum of 32 ($CDCl_3$, 400 MHz)



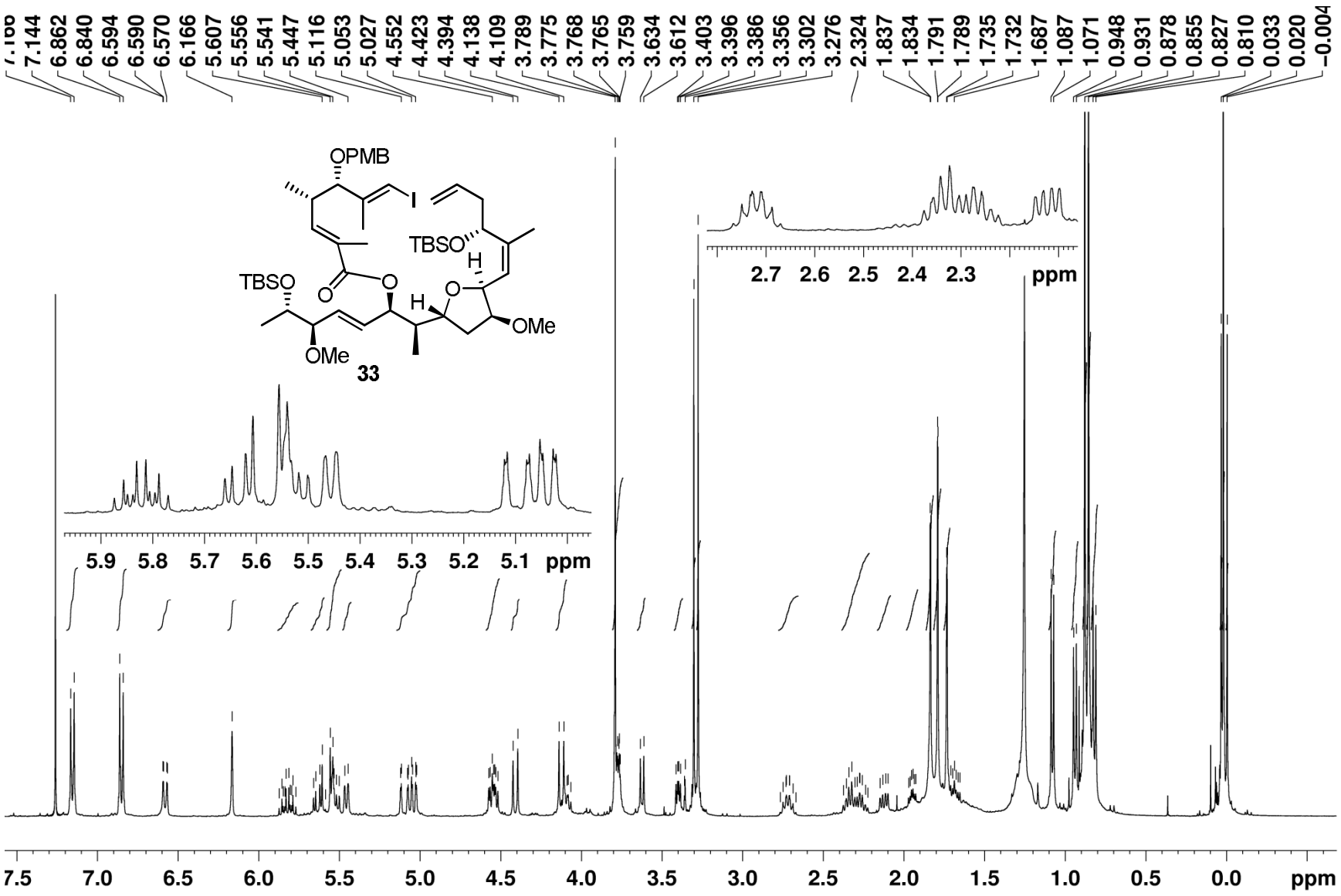
^{13}C NMR spectrum of 32 ($CDCl_3$, 100MHz)



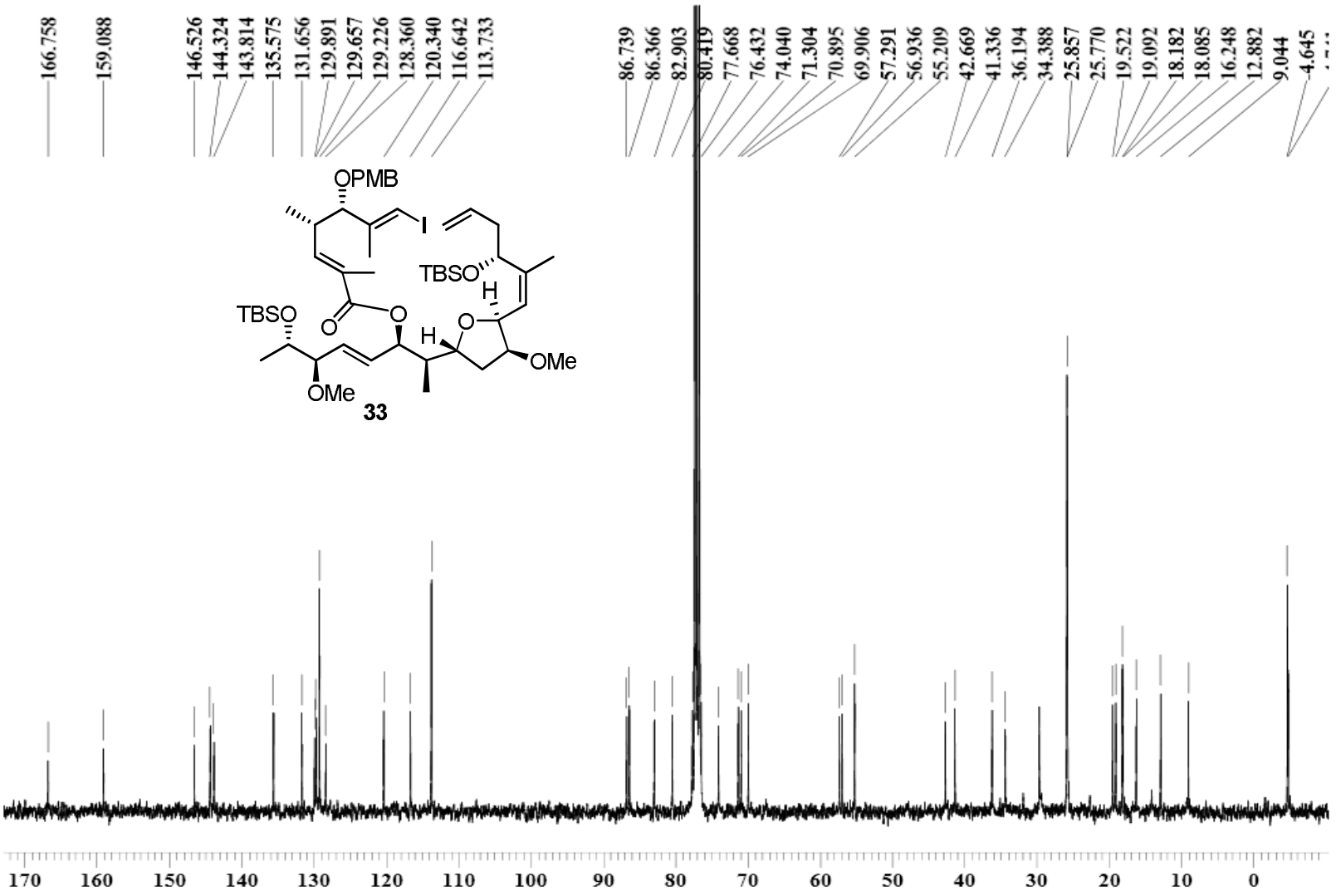
^{1}H NMR spectrum of 8 ($CDCl_3$, 500 MHz)



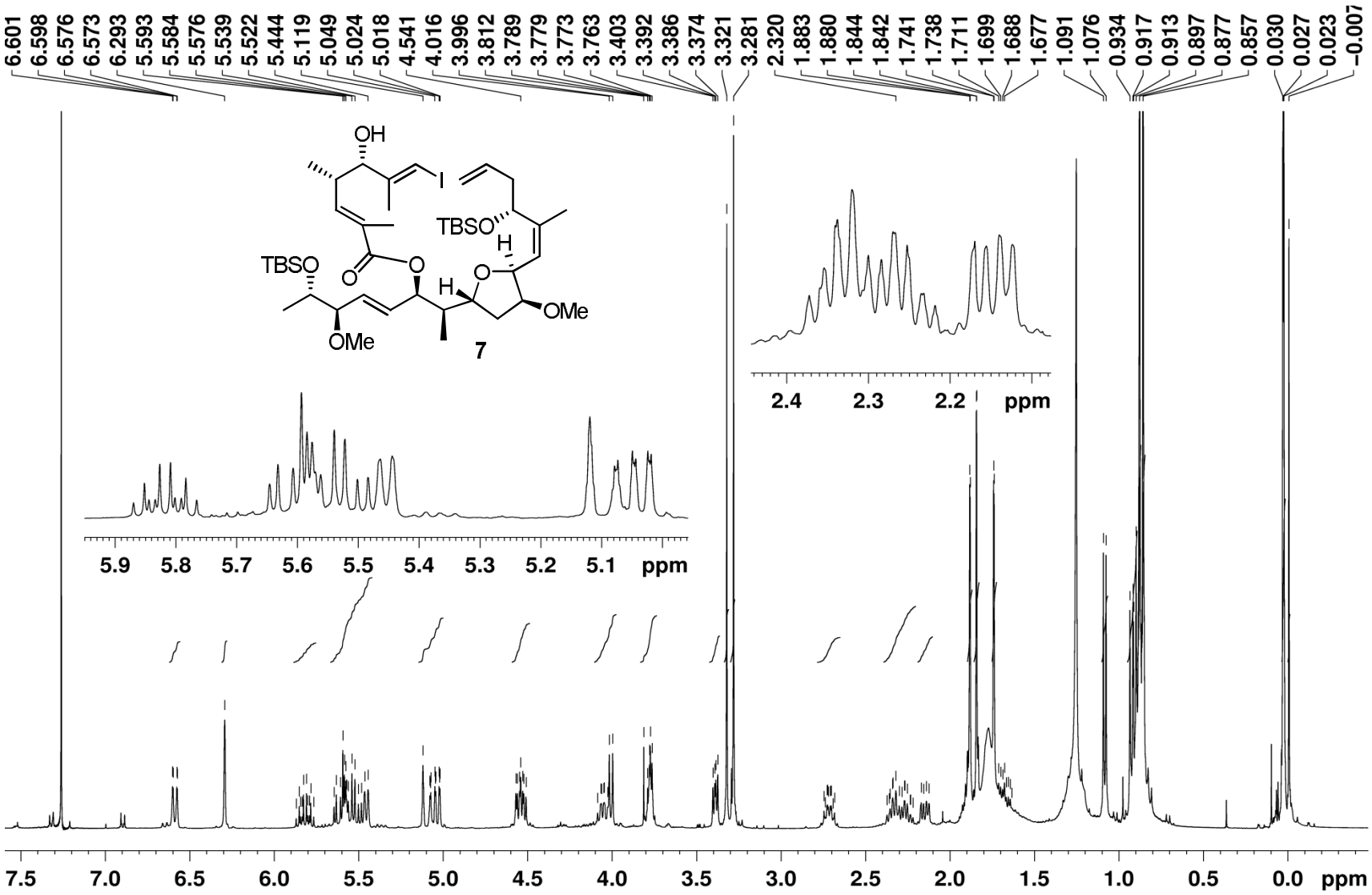
^{13}C NMR spectrum of 8 ($CDCl_3$, 125 MHz)



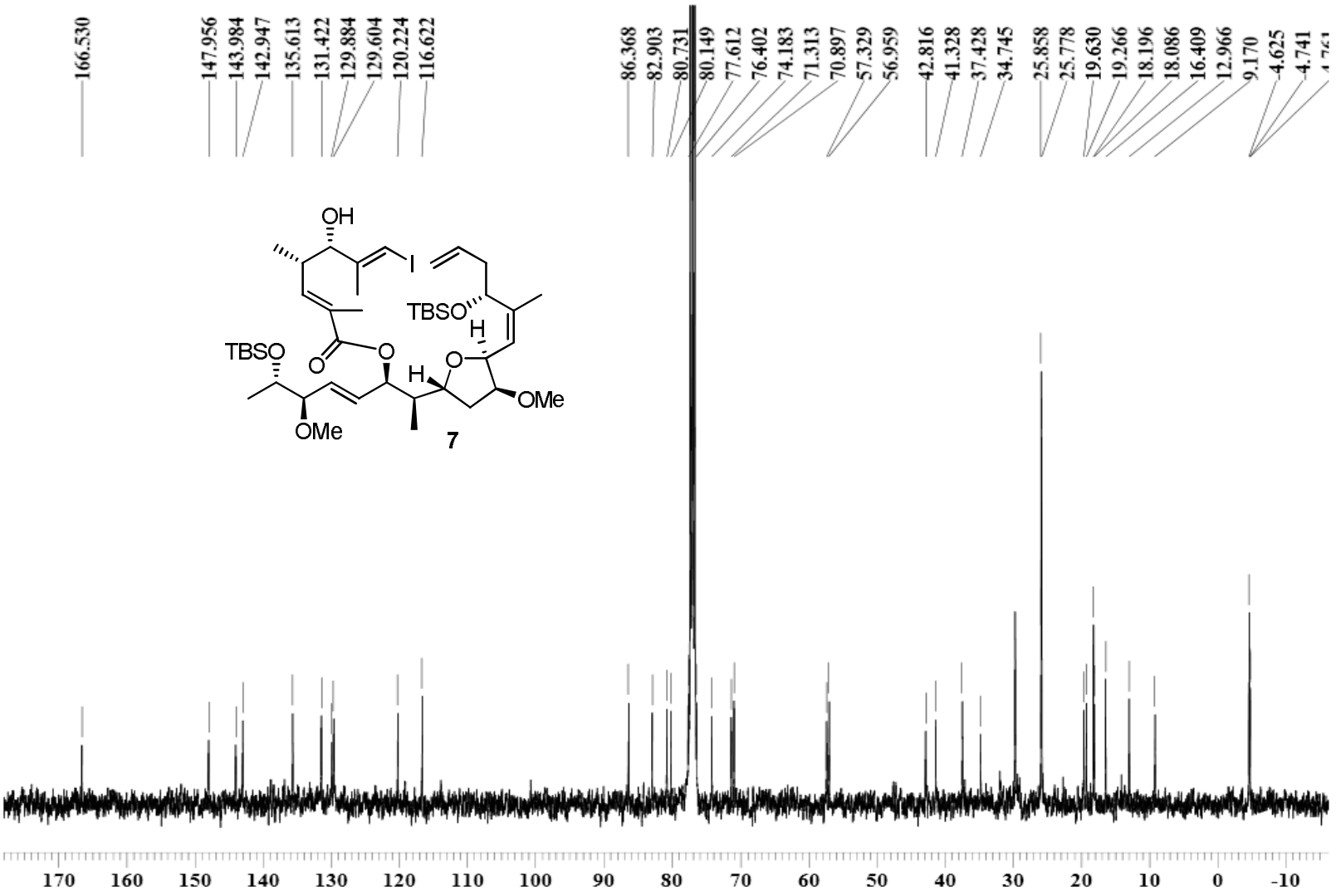
^{1}H NMR spectrum of 33 ($CDCl_3$, 400 MHz)



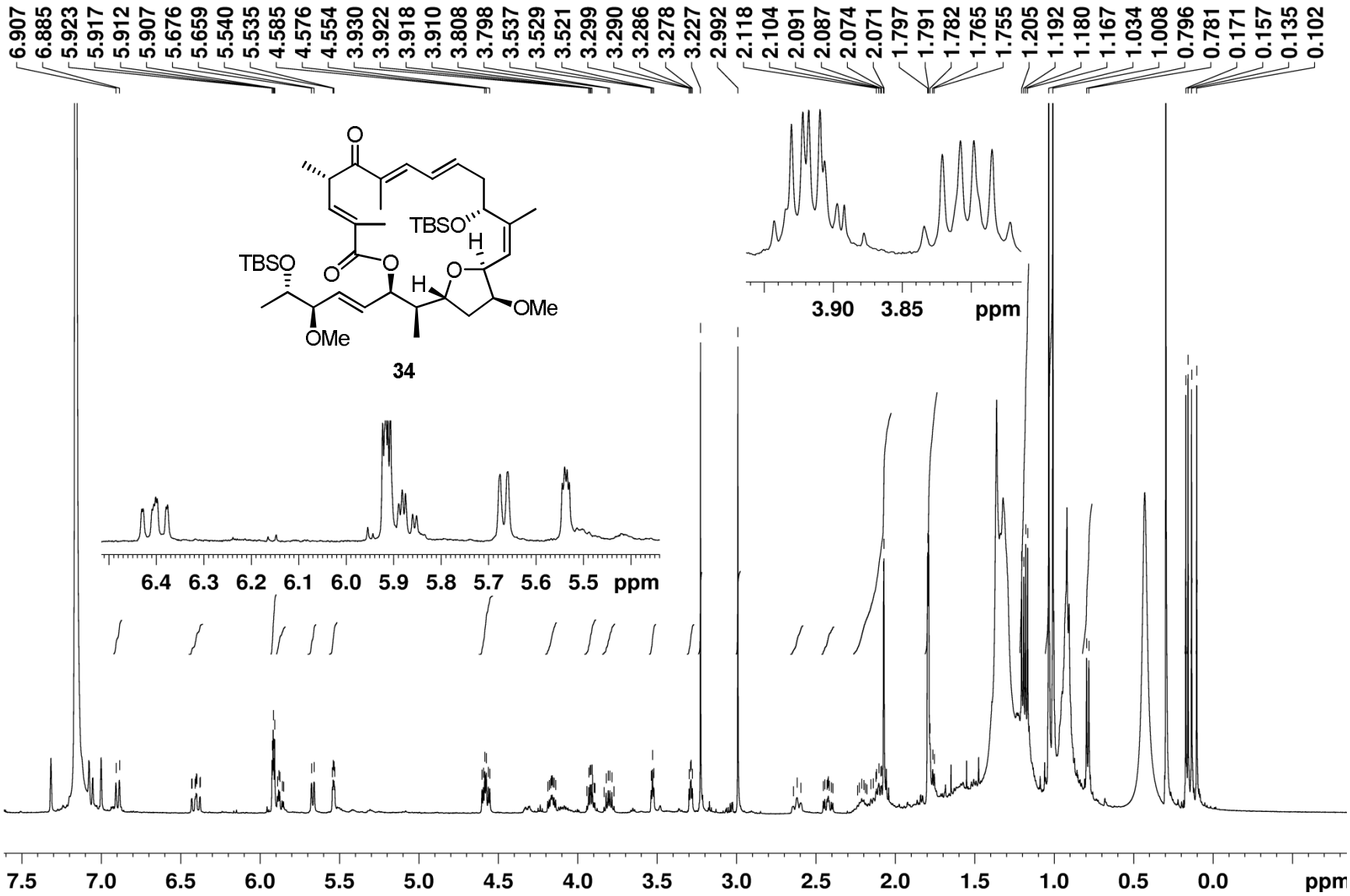
^{13}C NMR spectrum of 33 ($CDCl_3$, 100 MHz)



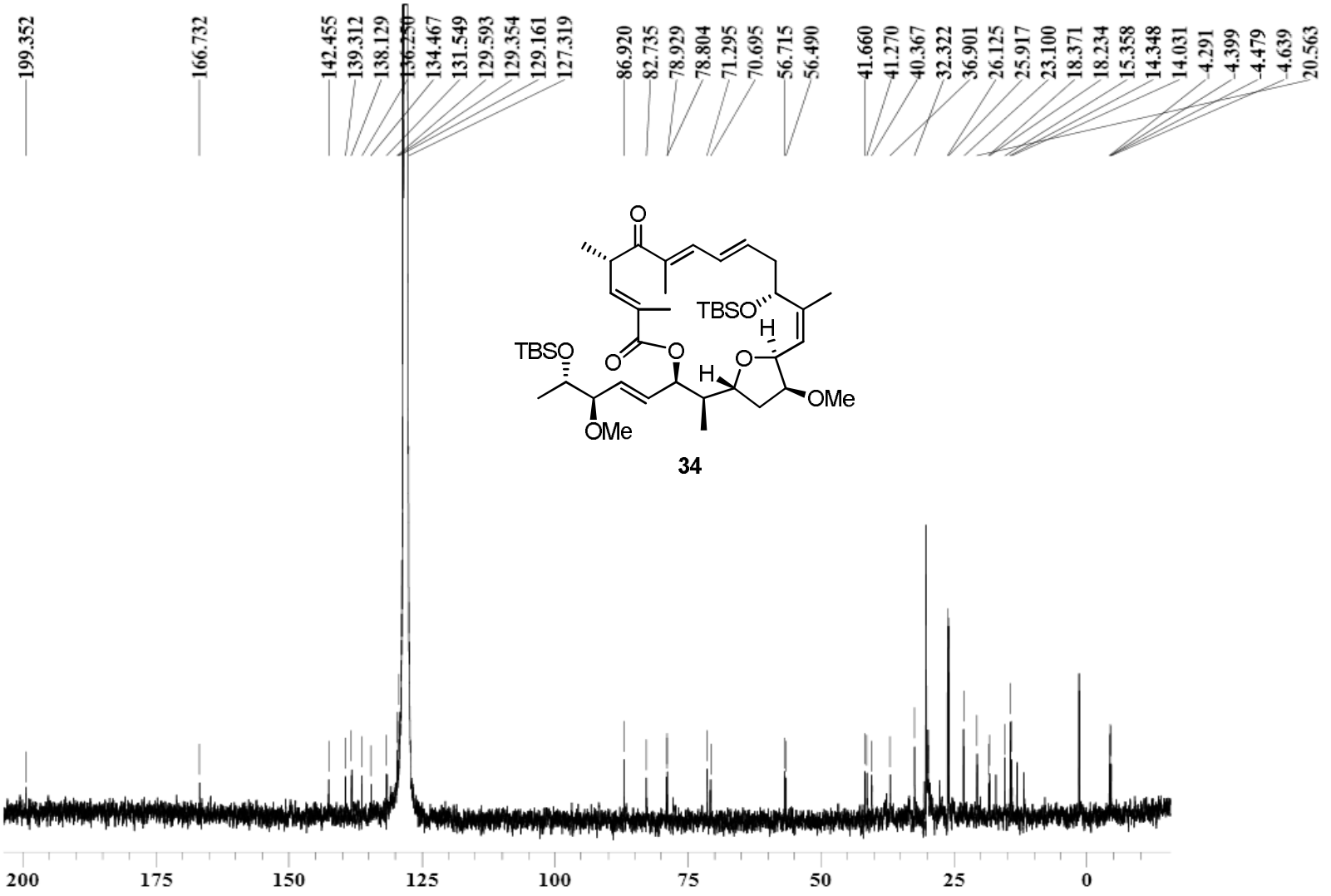
^{1}H NMR spectrum of 7 ($CDCl_3$, 400 MHz)



^{13}C NMR spectrum of 7 ($CDCl_3$, 100 MHz)

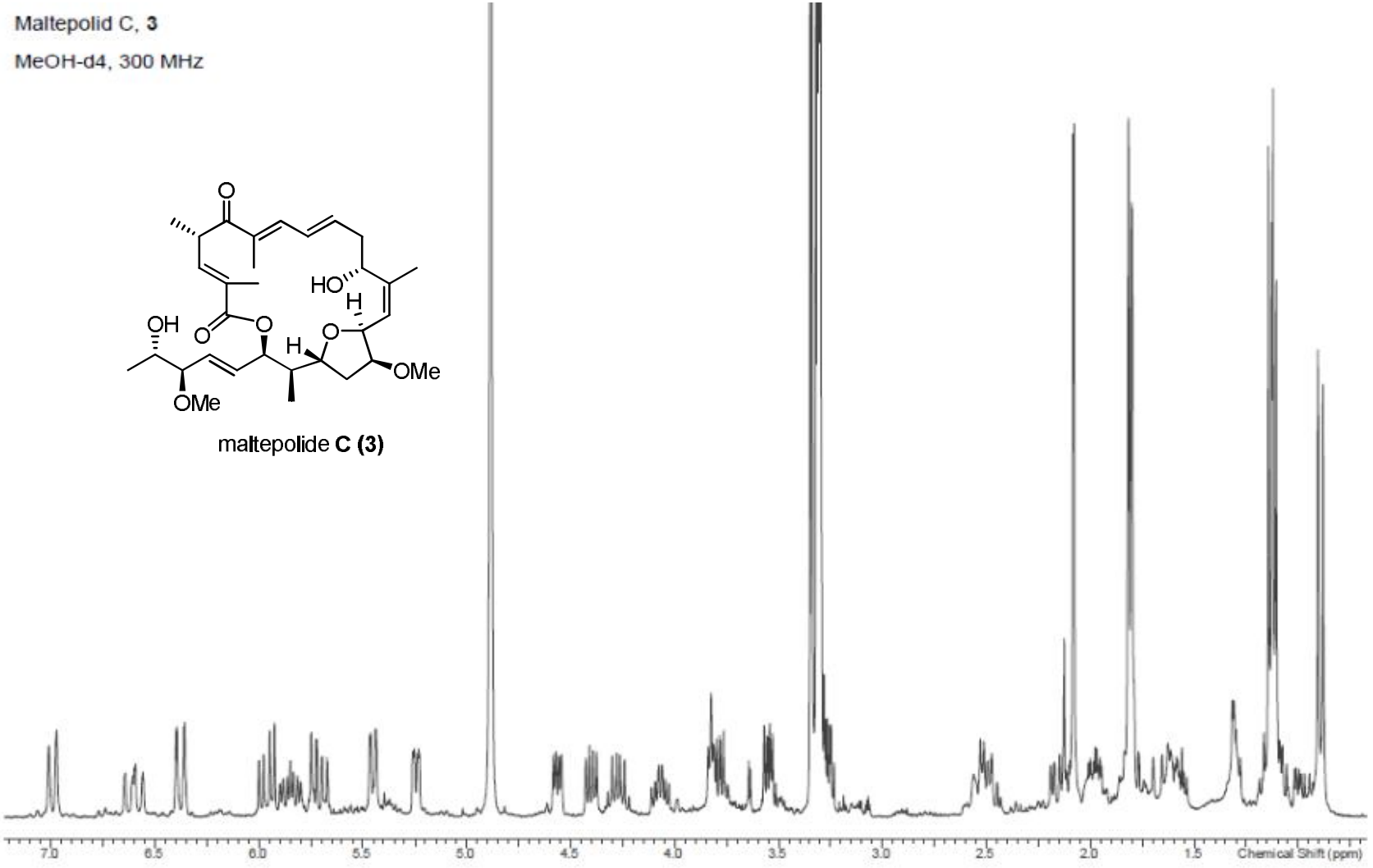


^{1}H NMR spectrum of 34 (Benzene-d_6, 500 MHz)

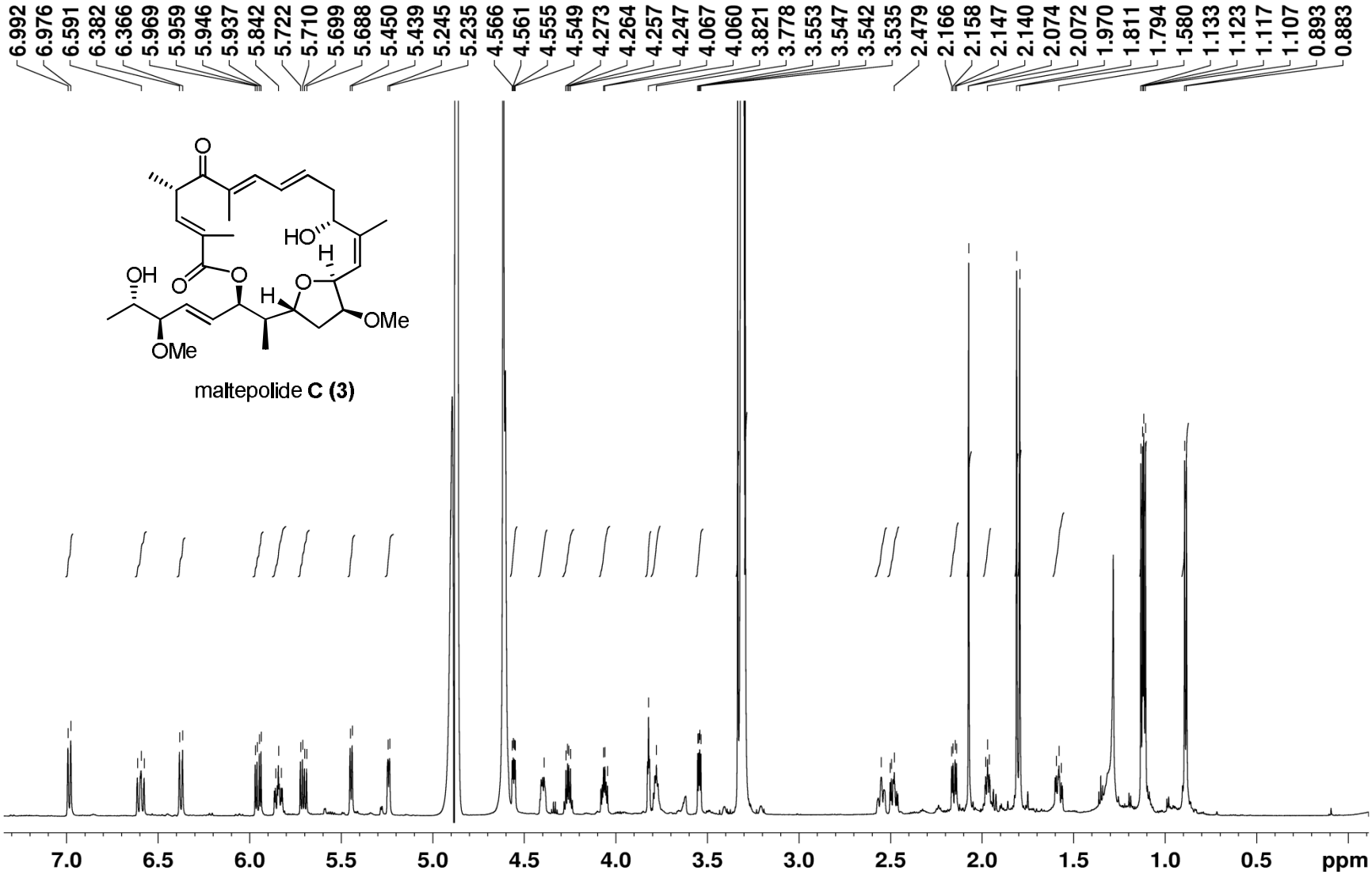


34

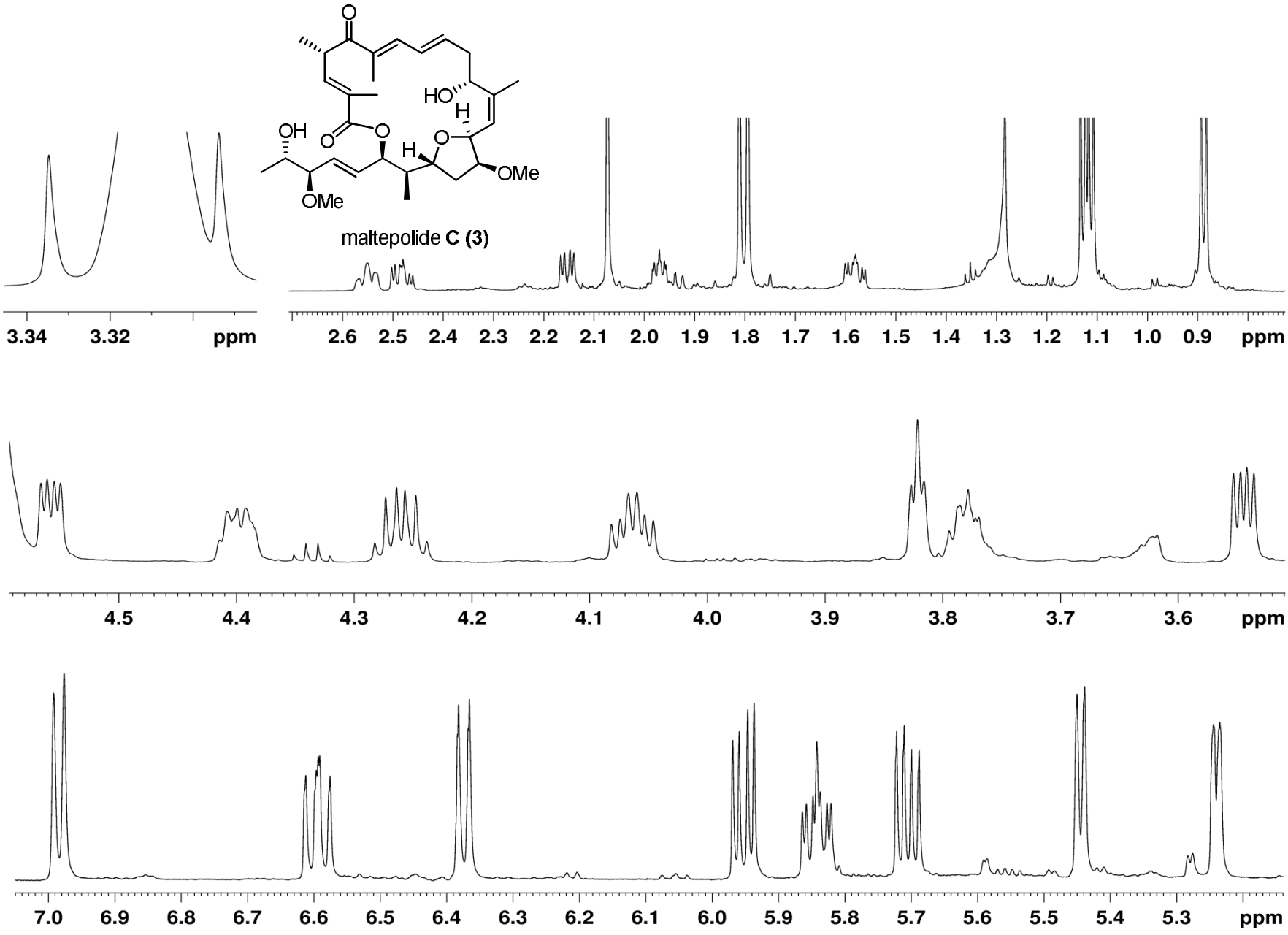
^{13}C NMR spectrum of 34 (Benzene-d_6, 125 MHz)



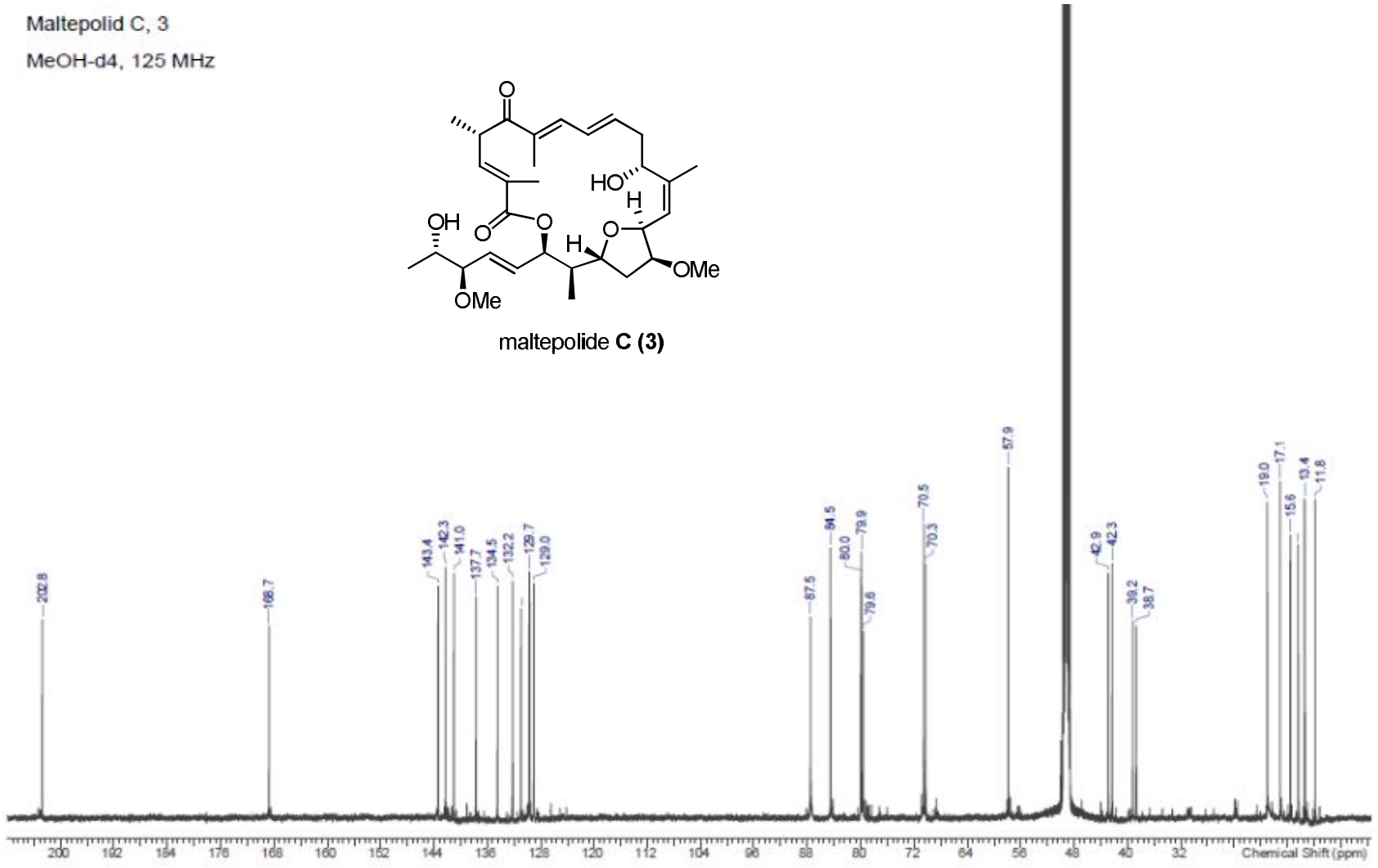
^{1}H NMR spectrum of maltepolide C (Isolation) (MeOH-d_4, 300 MHz)



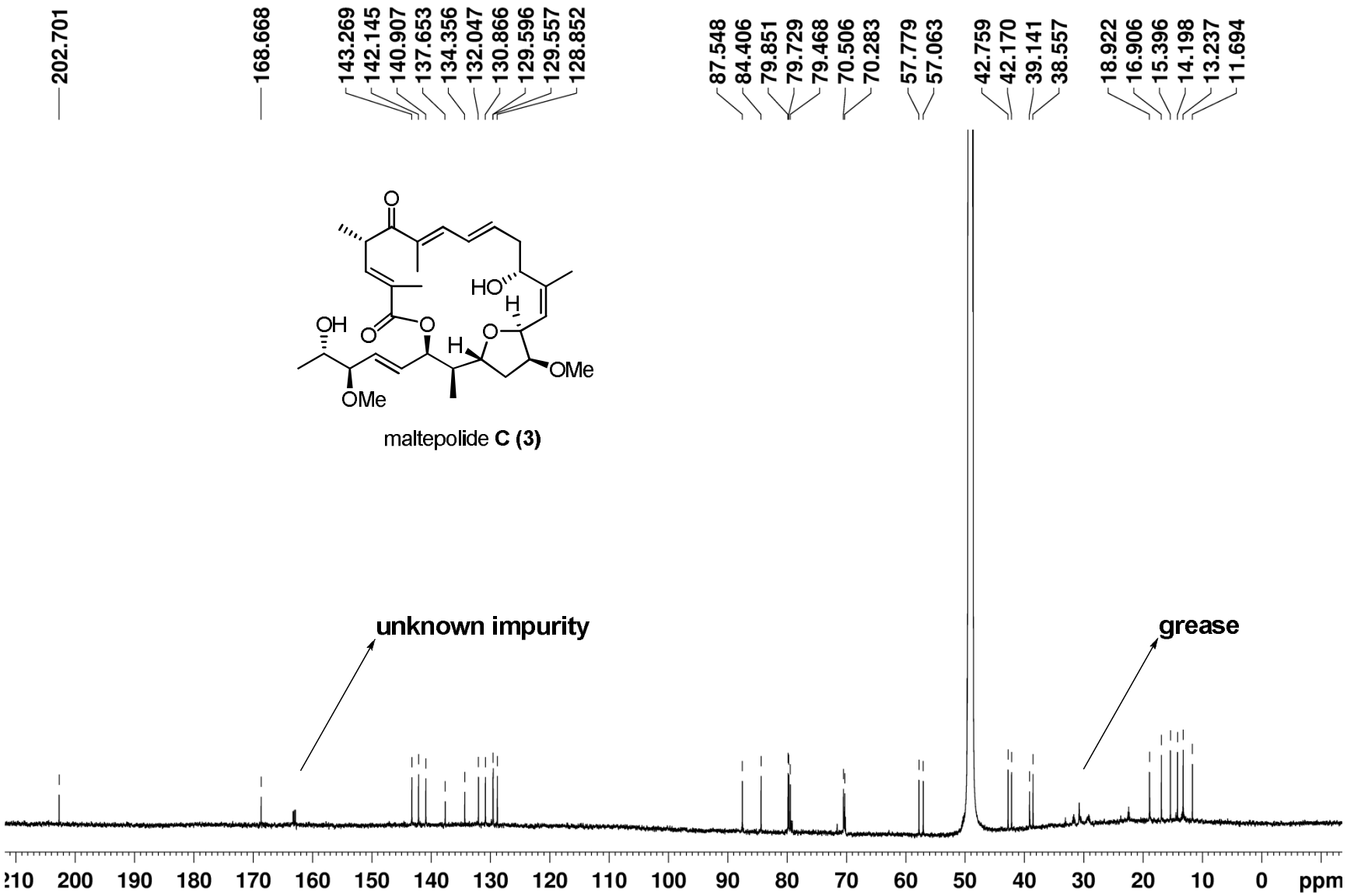
^{1}H NMR spectrum of maltepolide C (Synthetic) (MeOH-d_4, 700 MHz)



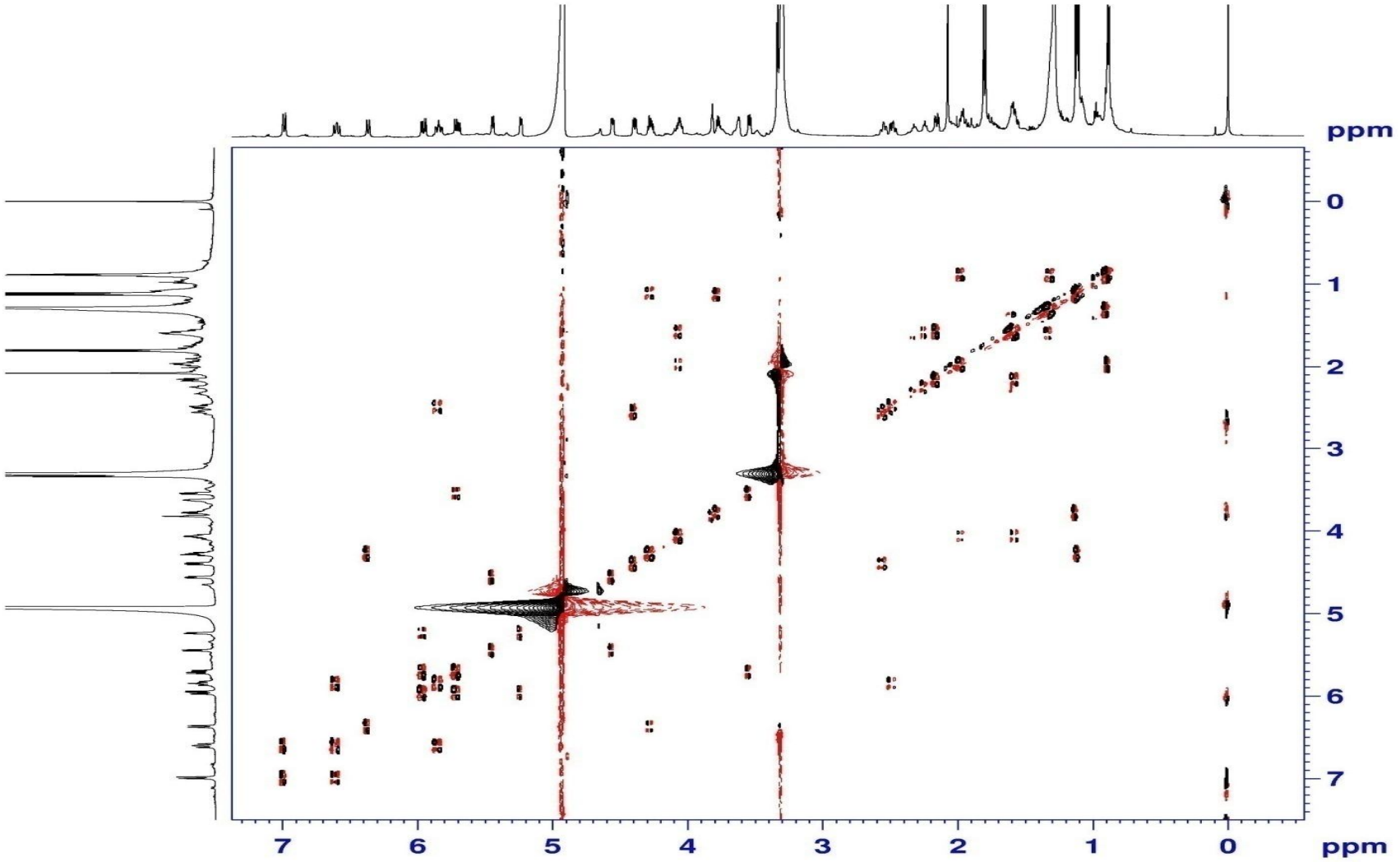
Expantion of ^{1}H NMR spectrum of maltepolide C (Synthetic) (MeOH-d_4, 700 MHz)



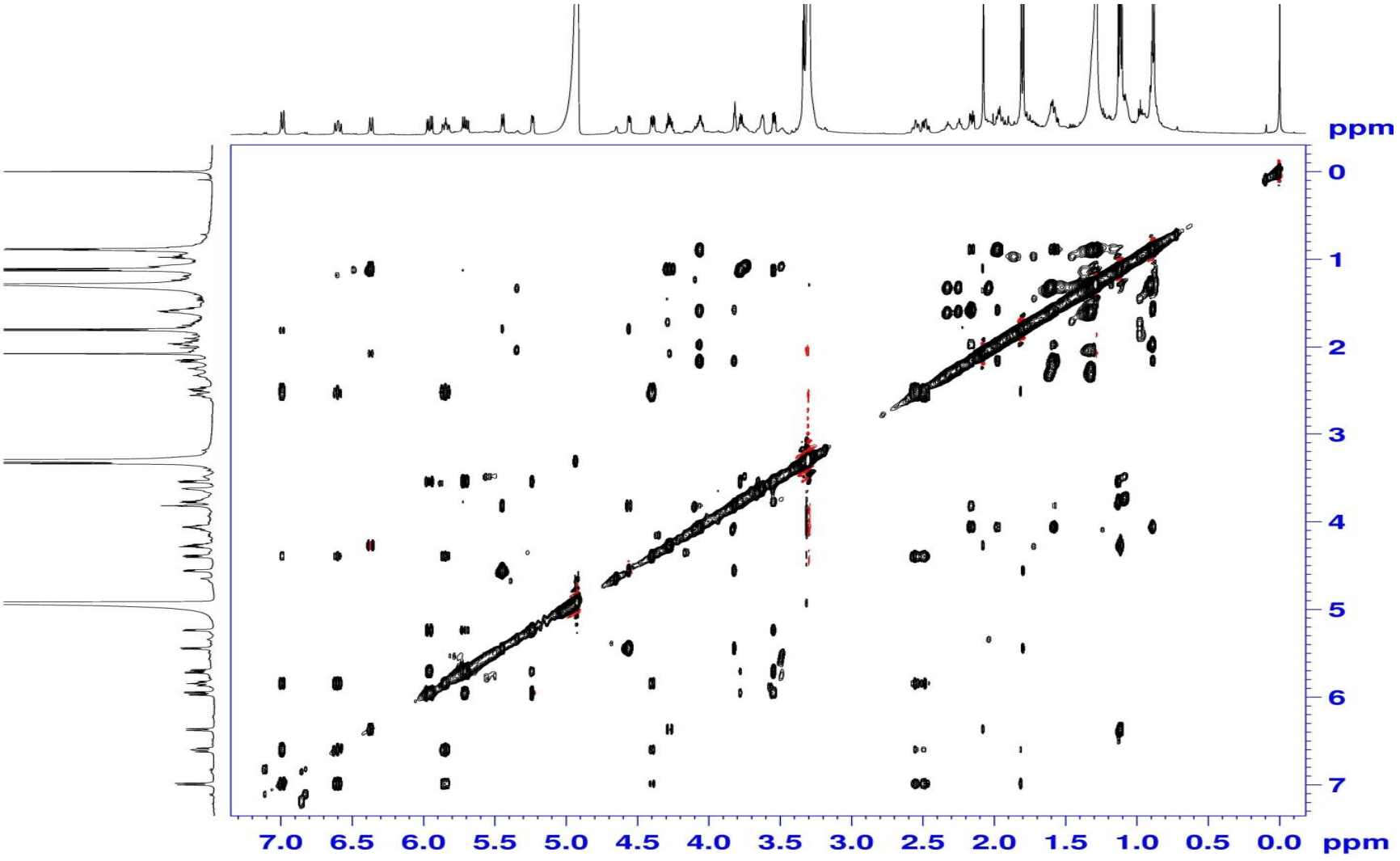
^{13}C NMR spectrum of maltepolide C (Isolation) (MeOH-d_4, 125 MHz)



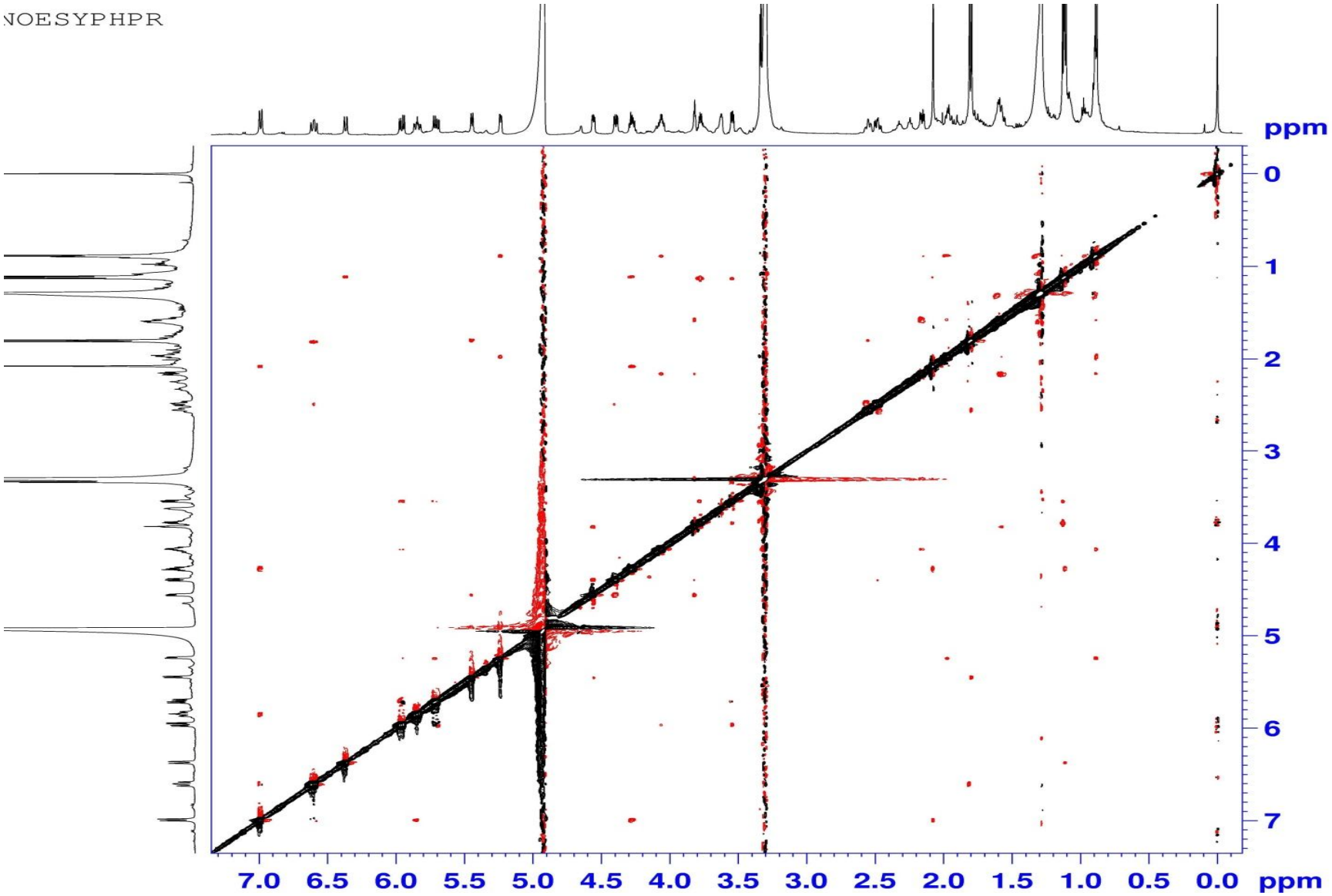
^{13}C NMR spectrum of maltepolide C (Synthetic) (MeOH-d_4, 175 MHz)



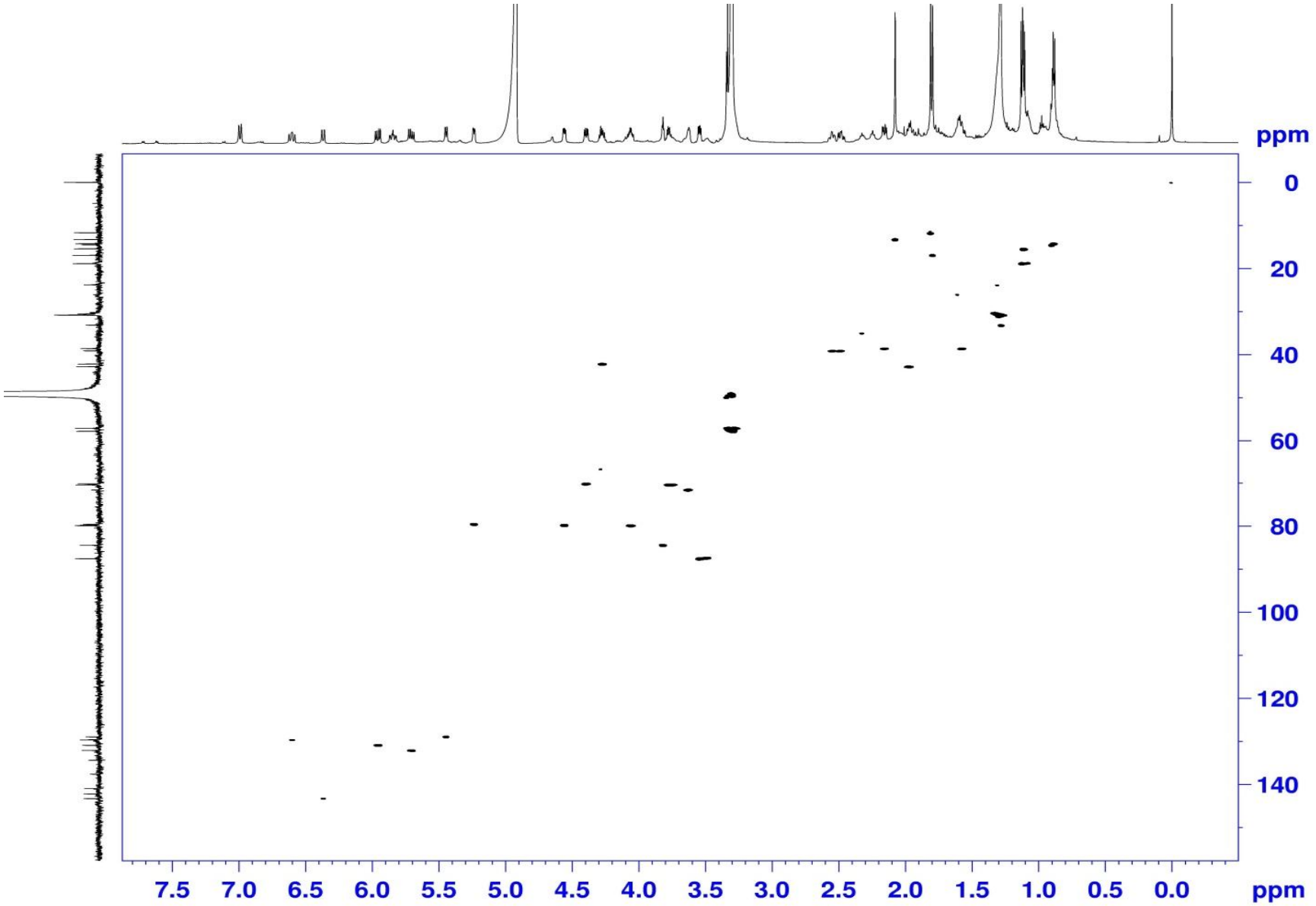
2D DQF-COSY (2D Double Quantum Filtered Correlation Spectroscopy) spectrum of compound 3 recorded on 600 MHz at 25 °C in MeOH-d_4



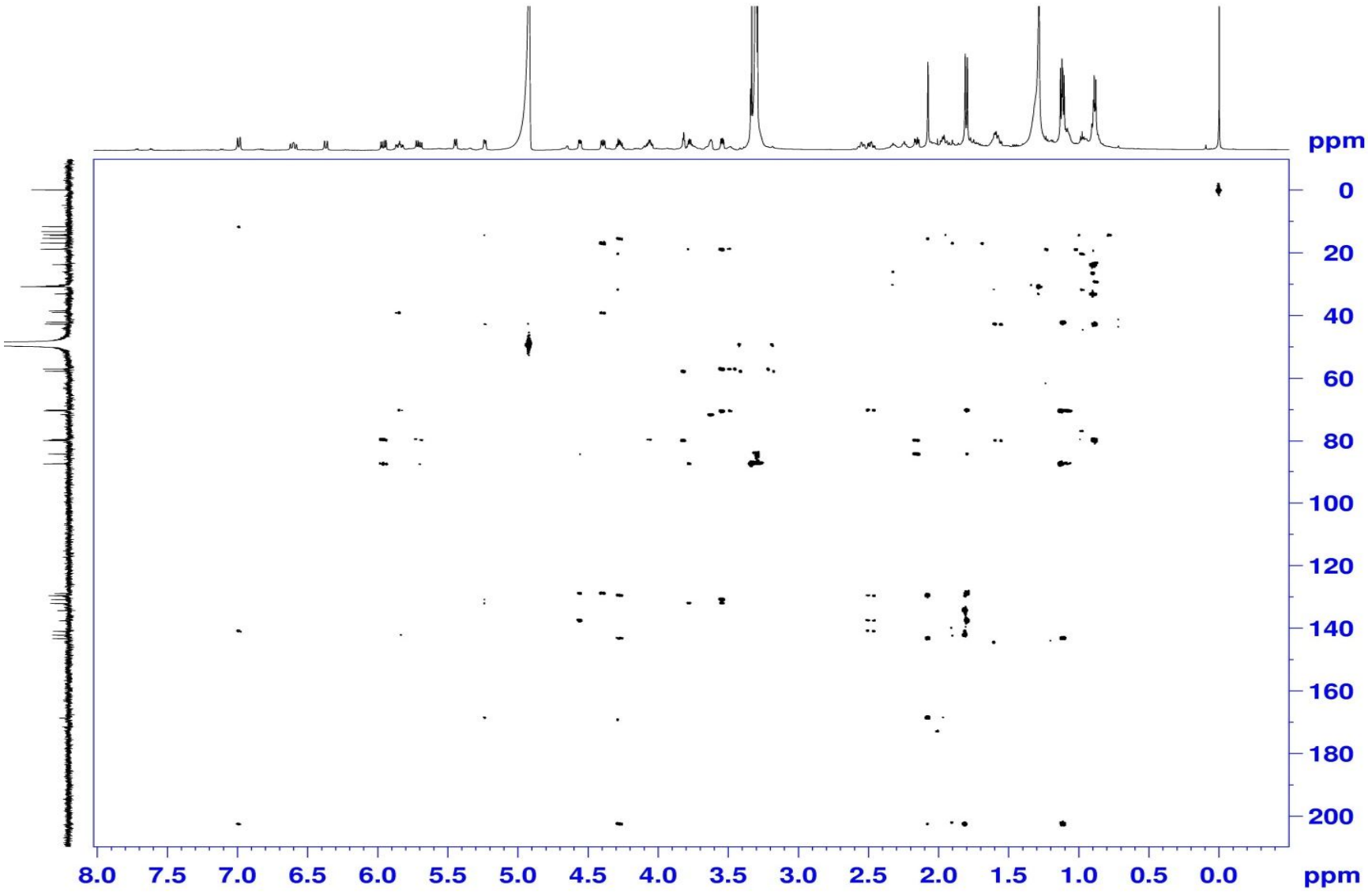
TOCSY (Total Correlation Spectroscopy) spectrum of compound 3 recorded on 600 MHz at 25 °C in MeOH-d_4



2D NOESY (Nuclear Overhauser Effect Spectroscopy) spectrum of compound 3 recorded on 600 MHz at 25 °C in MeOH-d_4



2D HSQC (Hetero-nuclear Single Quantum Correlation) spectrum of compound 3 recorded on 600 MHz at 25 °C in MeOH-d_4



2D HMBC (Hetero-nuclear Multiple Bond Correlation) spectrum of compound 3 recorded on 600 MHz at 25 °C in MeOH-d_4