Supporting Information

Convergent total synthesis of corallocin A

Tomoya Mashiko, Yuta Nakazato, Yuta Katsumura, Akihiko Kasamatsu, Shinya Adachi, Shogo Kamo, Akinobu Matsuzawa and Kazuyuki Sugita*

Department of Synthetic Medicinal Chemistry, Faculty of Pharmaceutical Sciences, Hoshi University

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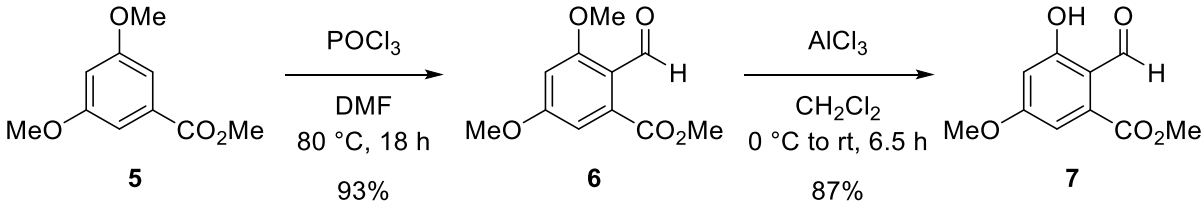
1. General

All reactions were carried out in a round-bottom flask or a test tube fitted with a 3-way glass stopcock under Ar atmosphere unless otherwise stated. Flash chromatography was performed using silica gel 60N (particle size: 40-50 μm) purchased from Kanto Chemical unless otherwise stated. All work-up and purification procedures were carried out with reagent-grade solvents under ambient atmosphere. Reagents were purchased from commercial suppliers and used as received unless otherwise stated. Melting point (Mp) data were determined using a Yanaco MP apparatus and were uncorrected. IR spectra were recorded on a JASCO FT/IR 4100 spectrometer. ^{1}H and ^{13}C NMR spectra were recorded on JEOL ECA-600 or Bruker AVIII 400 spectrometers, using $CDCl_3$ or acetone-d_6 as solvent. Chemical shift values are reported in δ (ppm) relative to residual solvent signals ($CDCl_3$: 7.26 ppm for ^{1}H and 77.0 ppm for ^{13}C, acetone-d_6: 2.04 ppm for ^{1}H and 29.8 ppm for ^{13}C). NMR data are reported as follows: chemical shifts, multiplicity (s: singlet, d: doublet, t: triplet, q: quartet, m: multiplet, br: broad signal), coupling constant, and integration. High-resolution mass spectra (ESI-TOF) were measured on JEOL JMS-T100LP.

2. Experimental Procedures

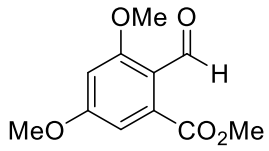
Methyl 2-formyl-3-hydroxy-5-methoxybenzoate (7)[S1]



The title compound **7** was prepared by following the literature procedure with slightly modification in 81% overall yield.

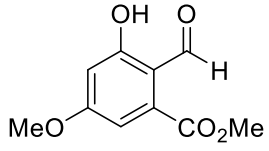
Phosphoryl chloride ($POCl_3$, 2.84 mL, 30.6 mmol) was added portion-wise to DMF (4.0 mL) at 0 °C. To the resultant mixture was added methyl 3,5-dimethoxybenzoate **5** (1.00 g, 5.10 mmol) at 0 °C, the reaction mixture was stirred for 18 h at 80 °C. The reaction was cooled to 0 °C, and quenched by the addition of sat. NaOAc aq. (50.0 mL) to give a precipitate. Filtration and washing with H_2O gave aldehyde **6** (1.07 g, 4.77 mmol, 93%) as a gray solid.

A solution of aldehyde **6** (104 mg, 464 μmol) in CH_2Cl_2 (3.0 mL) was added portion-wise to a solution of $AlCl_3$ (314 mg, 2.35 mmol) in CH_2Cl_2 (3.0 mL) at 0 °C. The resultant mixture was stirred for 6.5 h at room temperature. The reaction mixture was poured into ice water and diluted with CH_2Cl_2. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 3/2) to give **7** (81.3 mg, 387 μmol, 87%) as a white solid. The structure of **7** was confirmed by comparison of its ^{1}H NMR spectrum with that reported[S1]



6

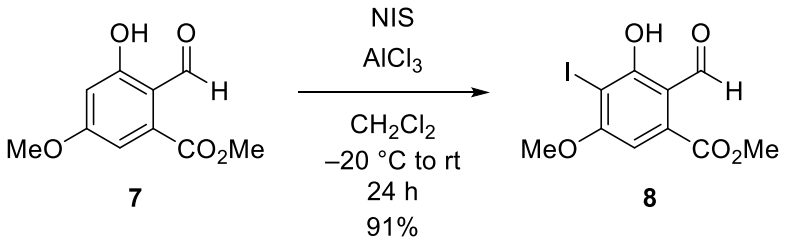
Mp = 104–106 °C; IR (neat) ν_{max} = 2952, 2893, 1732, 1671, 1600, 1339, 1221, 1137, 1065 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 10.29 (s, 1H), 6.56 (d, *J* = 1.8 Hz, 1H), 6.51 (d, *J* = 1.8 Hz, 1H), 3.91 (s, 3H), 3.90 (s, 3H), 3.87 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 187.7, 169.5, 165.0, 163.2, 136.6, 116.6, 105.1, 99.5, 56.0, 55.8, 52.9.; HRMS (ESI) *m/z* calcd. for $C_{11}H_{12}O_5Na$ ($[M+Na]^+$) 247.0577, found 247.0573.



7

Mp = 71–72 °C; IR (neat) ν_{max} = 2953, 2842, 1769, 1717, 1635, 1623, 1378, 1147 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ 12.72 (s, 1H), 10.41 (s, 1H), 7.00 (d, *J* = 2.4 Hz, 1H), 6.53, (d, *J* = 2.4 Hz, 1H), 3.93 (s, 3H), 3.86 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 195.5, 166.4, 166.1, 165.3, 135.1, 112.7, 111.9, 103.9, 55.9, 52.8.; HRMS (ESI) *m/z* calcd. for $C_{10}H_{11}O_5$ ($[M+H]^+$) 211.0601, found 211.0598.

Methyl 2-formyl-3-hydroxy-4-iodo-5-methoxybenzoate (8)

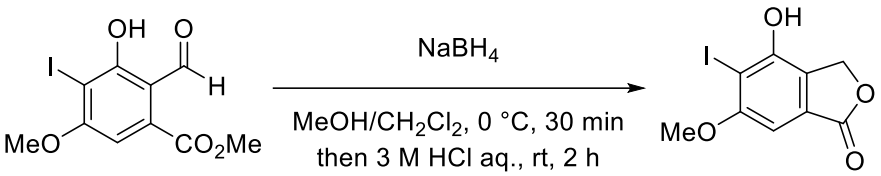


7 **8**

To a solution of **7** (3.6 mg, 17 μmol) in CH_2Cl_2 (1.0 mL) was added $AlCl_3$ (2.3 mg, 14 μmol) at −20 °C. After stirring for 15 min at same temperature, *N*-iodosuccinimide (NIS, 4.6 mg, 20 μmol) was added. The reaction was allowed to warm to room temperature and stirred for 24 h in the dark. The reaction was quenched by the addition of 1 M HCl aq. and diluted with CH_2Cl_2. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 5/1 to 1/1) to give **8** (5.2 mg, 16 μmol, 91%) as a white solid.

Mp = 170.1–172.0 °C; IR (KBr) ν_{max} = 2958, 2924, 2855, 1708, 1629, 1488, 1254, 1177, 803, 786 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ13.47 (s, 1H), 10.40 (s, 1H), 7.02 (s, 1H), 4.04 (s, 3H), 3.98 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 195.4, 165.8, 164.2, 164.0, 135.6, 113.3, 105.7, 81.6, 57.1, 53.1; HRMS (ESI) *m/z* calcd. for $C_{10}H_8IO_5$ ($[M-H]^-$) 334.9422, found 334.9427.

4-Hydroxy-5-iodo-6-methoxyisobenzofuran-1(3*H*)-one (9)[S2]

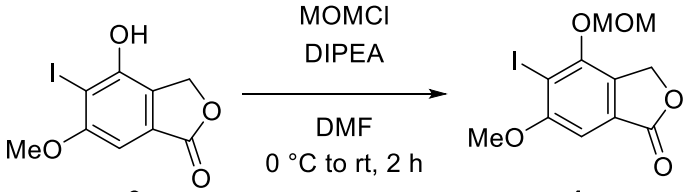


8 88% **9**

To a solution of **8** (5.0 mg, 15 μmol) in MeOH (400 μL) and CH_2Cl_2 (400 μL) was added $NaBH_4$ (3.4 mg, 89 μmol) at 0 °C. After the reaction mixture was stirred for 30 min at same temperature, 3 M HCl aq. (250 μL) was added and stirred for 2 h at room temperature. The reaction mixture was quenched by the addition of water and diluted with CH_2Cl_2. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 2/1 to 1/1) to give **9** (4.0 mg, 13 μmol, 88%) as a white solid. The structure of **9** was confirmed by comparison of its ^{1}H NMR spectrum with that reported[S2].

Mp = 185–187 °C; IR (neat) ν_{max} = 3114, 2948, 1749, 1716, 1471, 1350, 1117 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 6.89 (s, 1H), 5.85 (s, 1H), 5.27 (s, 2H), 3.96 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 170.6, 160.0, 150.6, 128.4, 125.1, 98.2, 85.8, 67.8, 57.1.; HRMS (ESI) *m/z* calcd. for $C_9H_8IO_4$ ([M+H]$^+$) 306.9462, found 306.9458.

5-Iodo-6-methoxy-4-(methoxymethoxy)isobenzofuran-1(3*H*)-one (4) [S2]

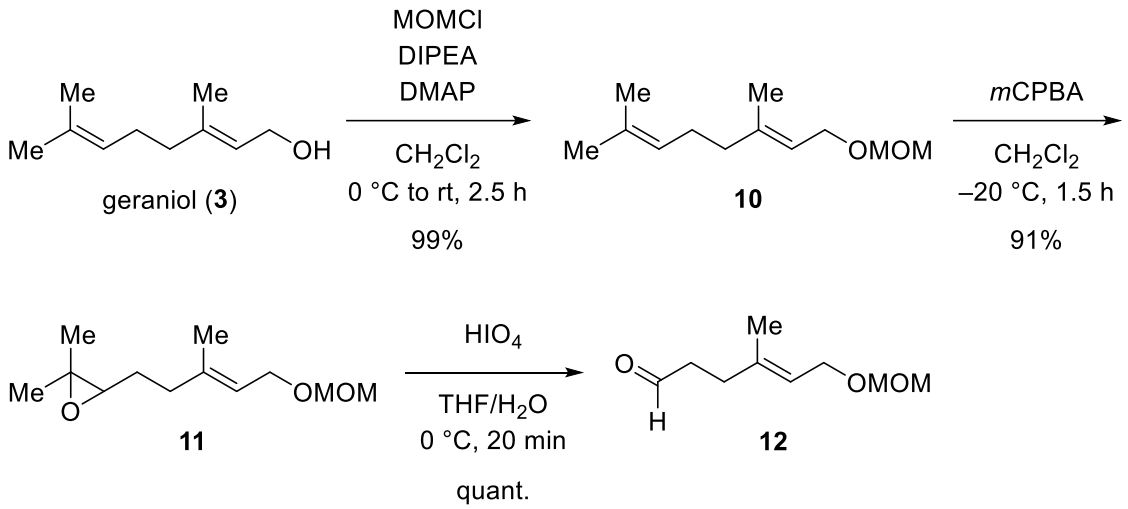


9 quant. **4**

To a solution of **9** (70.0 mg, 229 μmol) in DMF (2.3 mL) was added DIPEA (155 μL, 890 μmol) and MOMCl (33.5 μL, 444 μmol) at 0 °C. The reaction mixture was stirred for 2 h at room temperature. The reaction was quenched by the addition of sat. NH_4Cl aq. and diluted with EtOAc. After the layers were separated, the aqueous layer was extracted with EtOAc. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 5/1 to 2/1) to give **4** (80.0 mg, 228 μmol, quant.) as a white solid. The structure of **4** was confirmed by comparison of its ^{1}H NMR spectrum with that reported[S2].

Mp = 127–129 °C; IR (neat) ν_{max} = 2947, 1771, 1753, 1470, 1389, 1152, 1102 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.07 (s, 1H), 5.39 (s, 2H), 5.17 (s, 2H), 3.97 (s, 3H), 3.57 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 170.4, 160.7, 152.6, 128.6 (2C), 101.3, 97.5, 91.5, 68.5, 57.3, 57.1; ^{13}C NMR (150 MHz, acetone-d_6) δ 171.1, 162.5, 154.2, 130.3, 130.0, 102.3, 98.6, 91.9, 69.8, 58.3, 58.2; HRMS (ESI) *m/z* calcd. for $C_{11}H_{12}IO_5$ ([M+H]$^+$) 350.9724, found 350.9711.

(*E*)-6-(Methoxymethoxy)-4-methylhex-4-enal (12)[S3]

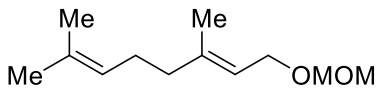


The title compound **12** was prepared by following the procedure reported by Hernández-Galán R. et al with slightly modification in 90% overall yield.

To a solution of geraniol (**3**) (2.00 g, 13.0 mmol), DIPEA (4.80 mL, 27.6 mmol), and DMAP (159 mg, 1.30 mmol) in CH_2Cl_2 (65.0 mL) was added MOMCl (1.96 mL, 26.0 mmol) at 0 °C. The resultant mixture was stirred for 2.5 h at room temperature. The reaction was quenched by the addition of sat. NH_4Cl aq. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 29/1 to 19/1) to give MOM ether **10** (2.55 g, 12.9 mmol, 99%) as a colorless oil.

A solution of **10** (1.20 g, 6.06 mmol) in CH_2Cl_2 (12.0 mL) was added to a stirred solution of *m*CPBA (1.77 g, 6.66 mmol) in CH_2Cl_2 (30.0 mL) at −20 °C. The resultant mixture was stirred for 1.5h at same temperature. The reaction was quenched by the addition of 1 M NaOH aq. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 9/1 to 4/1) to give epoxide **11** (1.18 g, 5.51 mmol, 91%) as a colorless oil.

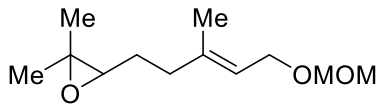
A solution of **11** (1.18 g, 5.51 mmol) in THF (11.0 mL) was added to a solution of HIO_4 (1.51 g, 6.61 mmol) in H_2O (5.5 mL) at 0 °C. The resultant mixture was stirred for 20 min at same temperature. The reaction was quenched by the addition of Brine and diluted with EtOAc. After the layers were separated, the aqueous layer was extracted with EtOAc. The combined organic solution was washed with sat. $NaHCO_3$ aq., dried over Na_2SO_4, filtered, and concentrated to give aldehyde **12** (948 mg, 5.50 mmol, quant.) as a colorless oil. The structure of **12** was confirmed by comparison of its ^1H NMR spectrum with that reported[S3].



10

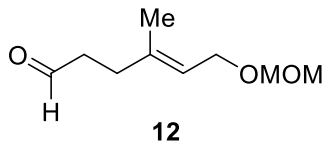
IR (neat) ν_{max} = 2927, 2882, 1448, 1379, 1149, 1104, 1050 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 5.34–5.36 (m, 1H), 5.09 (tt, *J* = 6.6, 1.2 Hz, 1H), 4.63 (s, 2H), 4.07 (d, *J* = 6.6 Hz, 2H), 3.37 (s, 3H), 2.12–2.03 (m, 4H), 1.68 (s, 3H), 1.67 (s, 3H), 1.60 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 140.9, 131.7, 123.9, 120.1, 95.4, 63.6, 55.1, 39.6,

26.3, 25.7, 17.6, 16.3. ; HRMS (ESI) *m/z* calcd. for $C_{12}H_{22}O_2Na$ ([M+Na]$^+$) 221.1512, found 221.1520.



11

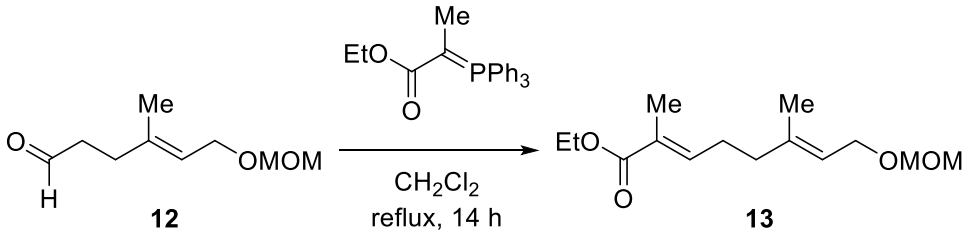
IR (neat) ν_{max} = 2958, 2927, 2883, 1457, 1379, 1149, 1103, 1044 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 5.38 (brt, *J* = 6.6 Hz, 1H), 4.61 (s, 2H), 4.06 (d, *J* = 6.6 Hz, 2H), 3.36 (s, 3H), 2.68–2.70 (m, 1H), 2.23–2.18 (m, 1H), 2.15–2.10 (m, 1H), 1.69 (s, 3H), 1.66–1.62 (m, 2H), 1.28 (s, 3H), 1.24 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 139.8, 120.7, 95.5, 63.9, 63.5, 58.3, 55.1, 36.1, 27.1, 24.8, 18.7, 16.4.; HRMS (ESI) *m/z* calcd. for $C_{12}H_{22}O_3Na$ ([M+Na]$^+$) 237.1461, found 237.1470.



12

IR (neat) ν_{max} = 3423, 2947, 2886, 1724, 1447, 1149, 1105, 1043, 921 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.78 (t, *J* = 1.2 Hz, 1H), 5.38 (tq, *J* = 6.6, 1.2 Hz, 1H), 4.62 (s, 2H), 4.07 (d, *J* = 6.6 Hz, 2H), 3.37 (s, 3H), 2.58 (dt, *J* = 7.8, 1.2 Hz, 2H), 2.38 (t, *J* = 7.8 Hz, 2H), 1.70 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 201.9, 138.6, 121.2, 95.6, 63.4, 55.2, 41.7, 31.4, 16.5.; HRMS (ESI) *m/z* calcd. for $C_9H_{16}O_3Na$ ([M+Na]$^+$) 195.0992, found 195.0996.

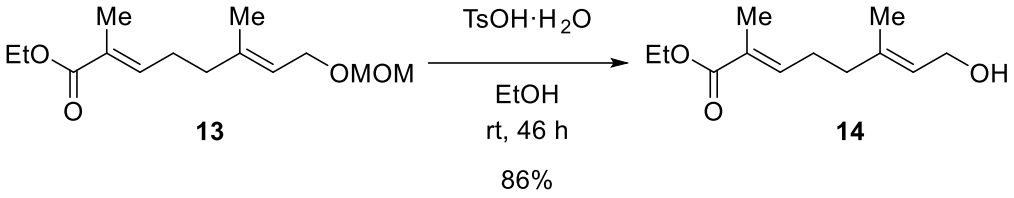
Ethyl (2*E*,6*E*)-8-(methoxymethoxy)-2,6-dimethylocta-2,6-dienoate (13)



To a solution of aldehyde **12** (948 mg, 5.52 mmol) in CH_2Cl_2 (18.4 mL) was added (Carbethoxyethylidene)triphenylphosphorane (4.00 g, 11.0 mmol) at room temperature. The resultant mixture was refluxed for 14 h. The reaction was cooled to room temperature and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 9/1 to 4/1) to give ethyl ester **13** (1.30 g, 5.07 mmol, 92%) as a pale yellow oil.

IR (neat) ν_{max} = 2982, 2931, 2884, 1710, 1270, 1148, 1046 cm^{-1} ; ^{1}H NMR (600 MHz, $CDCl_3$) δ 6.72 (tq, *J* = 7.8 Hz, 1H), 5.38 (brt, *J* = 7.2 Hz, 1H), 4.63 (s, 2H), 4.18 (q, *J* = 7.8 Hz, 2H), 4.08 (d, *J* = 7.2 Hz, 2H), 3.37 (s, 3H), 2.31 (dt, *J* = 7.8, 7.2 Hz, 2H), 2.16 (t, *J* = 7.2 Hz, 2H), 1.83 (s, 3H), 1.70 (s, 3H), 1.28 (t, *J* = 7.8 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 168.2, 141.4, 139.9, 128.2, 121.0, 95.6, 63.6, 60.5, 55.3, 38.2, 27.0, 16.5, 14.4, 12.5; HRMS (ESI) *m/z* calcd. for $C_{14}H_{24}O_4Na$ ([M+Na]$^+$) 279.1567, found 279.1573.

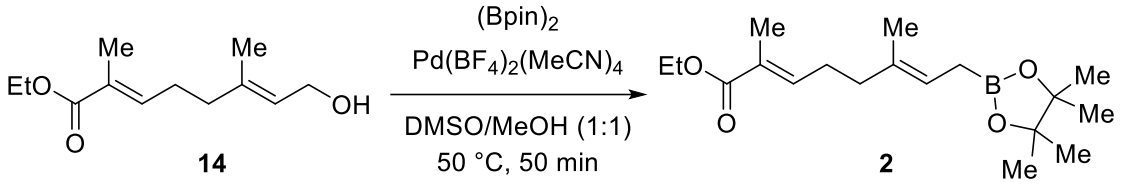
Ethyl (2*E*,6*E*)-8-hydroxy-2,6-dimethylocta-2,6-dienoate (14)



To a solution of aldehyde **13** (1.20 g, 4.68 mmol) in EtOH (25.0 mL) was added *p*-TsOH·H_2O (1.81 g, 9.52 mmol) at 0 °C. The resultant mixture was stirred for 46 h at room temperature. The reaction was quenched by the addition of H_2O and diluted with EtOAc. After the layers were separated, the aqueous layer was extracted with EtOAc. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 4/1 to 2/1) to give alcohol **14** (851 mg, 4.01 mmol, 86%) as a colorless oil.

IR (neat) ν_{max} = 3422, 2981, 2931, 1709, 1446, 1368, 1272, 1024 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 6.72 (tq, *J* = 7.2, 1.2 Hz, 1H), 5.43 (m, 1H), 4.18 (q, *J* = 7.8 Hz, 2H), 4.15 (d, *J* = 7.2 Hz, 2H), 2.30 (dt, *J* = 7.8, 7.2 Hz, 2H), 2.14 (t, *J* = 7.8 Hz, 2H), 1.83 (d, *J* = 1.2 Hz, 3H), 1.69 (s, 3H), 1.52–1.32 (brs, 1H), 1.28 (t, *J* = 7.8 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 168.2, 141.3, 138.5, 128.1, 124.1, 60.4, 59.3, 38.0, 26.9, 16.2, 14.3, 12.4; HRMS (ESI) *m*/*z* calcd. for $C_{12}H_{20}O_3Na$ ($[M+Na]^+$) 235.1305, found 235.1312.

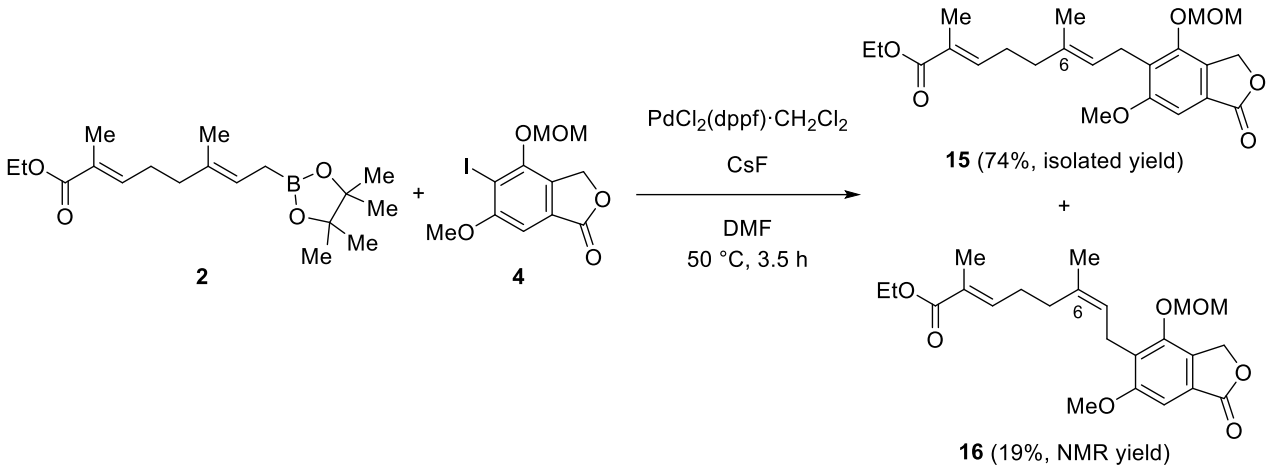
Ethyl (2*E*,6*E*)-2,6-dimethyl-8-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)octa-2,6-dienoate (2)



A mixture of alcohol **14** (100 mg, 471 μmol) and bis(pinacolato)diboron [$(Bpin)_2$, 180 mg, 710 μmol] in DMSO (2.5 mL) and MeOH (2.5 mL) was degassed with sonication under an argon atmosphere. To the resultant mixture was added tetrakis(acetonitrile)palladium (II) tetrafluoroborate [$Pd(BF_4)_2(MeCN)_4$], (20.9 mg, 47.1 μmol) at room temperature. The resultant mixture was stirred for 50 min at 50 °C. The reaction was cooled to room temperature, and then concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 19/1 to 9/1) to give **2** (142 mg, 441 μmol, 93%) as a colorless oil.

IR (neat) ν_{max} = 2979, 2931, 1711, 1370, 1343, 1326, 1273, 1124 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 6.73 (tq, *J* = 7.8, 1.2 Hz, 1H), 5.28 (tq, *J* = 7.8, 1.2 Hz, 1H), 4.17 (q, *J* = 7.2 Hz, 2H) 2.26 (dt, *J* = 7.8, 7.2 Hz, 2H), 2.10 (t, *J* = 7.2 Hz, 2H), 1.82 (d, *J* = 1.2 Hz, 3H), 1.60 (s, 3H), 1.29 (d, *J* = 7.8 Hz, 2H), 1.27 (t, *J* = 7.2 Hz, 3H), 1.24 (s, 12H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 168.3, 142.1, 134.1, 127.6, 119.3, 83.1 (2C), 60.3, 38.3, 27.6, 25.0, 24.7 (4C), 15.9, 14.3, 12.4; HRMS (ESI) *m*/*z* calcd. for $C_{18}H_{31}O_4Na$ ($[M+Na]^+$) 345.2208, found 345.2212.

Ethyl (2*E*,6*E*)-8-[6-methoxy-4-(methoxymethoxy)-1-oxo-1,3-dihydroisobenzofuran-5-yl]-2,6-dimethylocta-2,6-dienoate (15) and Ethyl (2*E*,6*Z*)-8-[6-methoxy-4-(methoxymethoxy)-1-oxo-1,3-dihydroisobenzofuran-5-yl]-2,6-dimethylocta-2,6-dienoate (16)

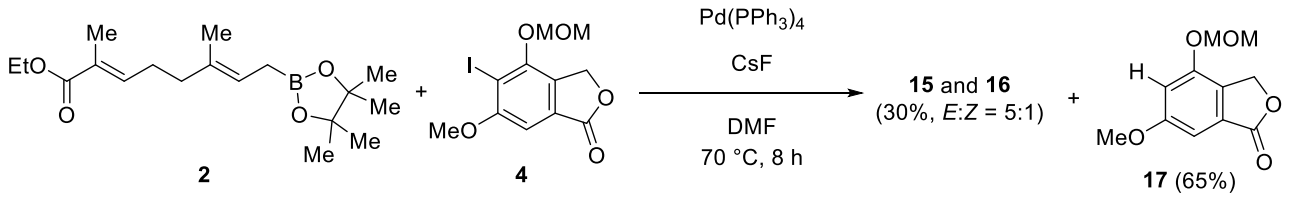


A solution of **4** (27.6 mg, 85.7 μmol) and **2** (20.0 mg, 57.2 μmol) in DMF (1.1 mL) was degassed with sonication under an argon atmosphere. To the resultant mixture was added [1,1′-bis(diphenylphosphino)ferrocene]dichloropalladium (II) ($PdCl_2(dppf)\cdot CH_2Cl_2$, 9.3 mg, 11 μmol) and CsF (12.1 mg, 79.7 μmol) at room temperature. The reaction mixture was stirred for 3.5 h at 50 °C. The reaction was cooled to room temperature, and then quenched by the addition of water and EtOAc. After the layers were separated, the aqueous layer was extracted with EtOAc. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 8/1 to 2/1) to give a mixture of **15** and **16**. (The yield of **16** was determined based on ^{1}H NMR spectrum to be 19%.) The resulting mixture was further purified by using preparative HPLC [CHIRALART Cellulose-SB (20 × 250 mm), hexane/2-propanol = 9/1, 25.0 mL/min, 254 nm, RT, t_R = 5.3 min for **15** and 7.1 min for **16**] to give (2*E*/6*E*)-**15** (15.4 mg, 36.8 μmol, 74%) as a colorless oil.

15: IR (neat) ν_{max} = 2979, 2932, 2846, 1767, 1707, 1468, 1331, 1270, 1154, 1113, 1070 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.13 (s, 1H), 6.67 (tq, *J* = 7.2, 1.2 Hz, 1H), 5.37 (s, 2H), 5.14 (tq, *J* = 7.8, 1.2 Hz, 1H), 5.06 (s, 2H), 4.14 (q, *J* = 6.6 Hz, 2H), 3.88 (s, 3H), 3.52 (s, 3H), 3.44 (d, *J* = 7.8 Hz, 2H), 2.25 (dt, *J* = 7.8, 7.2 Hz, 2H), 2.08 (t, *J* = 7.8 Hz, 2H), 1.78 (s, 6H), 1.25 (t, *J* = 6.6 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 168.1, 159.5, 150.2, 141.6, 134.9, 128.9, 128.7, 127.8, 125.4, 122.0, 101.6, 97.0, 69.1, 60.4, 56.7, 56.1, 38.2, 27.2, 23.5, 16.1, 14.2, 12.3; HRMS (ESI) *m*/*z* calcd. for $C_{23}H_{30}O_7Na$ ([M+Na]$^+$) 441.1884, found 441.1895.

16: IR (neat) ν_{max} = 2925, 2852, 1770, 1747, 1715, 1457, 1333, 1262, 1155, 1112, 1072 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.14 (s, 1H), 6.83–6.80 (m, 1H), 5.37 (s, 2H), 5.18 (t, *J* = 6.6 Hz, 1H), 5.07 (s, 2H), 4.20 (q, *J* = 7.2 Hz, 2H), 3.88 (s, 3H), 3.52 (s, 3H), 3.45 (d, *J* = 6.6 Hz, 2H), 2.36–2.30 (m, 4H), 1.87 (s, 3H), 1.69 (s, 3H), 1.30 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 168.2, 159.4, 150.1, 141.7, 135.2, 128.7, 128.5, 128.0, 125.4, 122.7, 101.7, 96.9, 69.1, 60.5, 56.8, 56.1, 30.7, 29.7, 27.2, 23.3, 14.3, 12.3; HRMS (ESI) *m*/*z* calcd. for $C_{23}H_{31}O_7$ ([M+H]$^+$) 419.2064, found 419.2054.

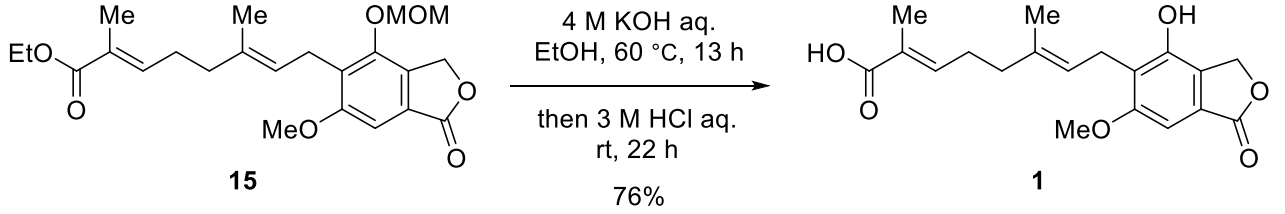
6-Methoxy-4-(methoxymethoxy)isobenzofuran-1(3*H*)-one (17) (Table 1, entry 3)



A solution of **4** (4.0 mg, 11 μmol) and **2** (5.5 mg, 17 μmol) in DMF (460 μL) was degassed with sonication under an argon atmosphere. To the resultant mixture was added tetrakis(triphenylphosphine)palladium(0) [$Pd(PPh_3)_4$, 2.0 mg, 1.7 μmol] and CsF (2.6 mg, 17.1 μmol) at room temperature. The reaction mixture was stirred for 8 h at 70 °C. The reaction was cooled to room temperature, and then quenched by the addition of water and EtOAc. After the layers were separated, the aqueous layer was extracted with EtOAc. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 8/1 to 2/1 and Cyclohexane/EtOAc = 8/1 to 2/1) to give a mixture of **15** and **16** (1.4 mg, 3.4 μmol, 30%, *E*:*Z* = 5:1) and **17** (1.7 mg, 7.6 μmol, 65%).

IR (neat) ν_{max} = 2918, 2849, 1762, 1505, 1457, 1338, 1151, 1073, 993 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 7.01 (d, *J* = 1.2 Hz, 1H), 6.95 (d, *J* = 1.2 Hz, 1H), 5.24 (s, 2H), 5.22 (s, 2H), 3.85; ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.1, 162.3, 152.4, 128.4, 128.3, 108.1, 100.4, 94.6, 68.1, 56.4, 56.0; HRMS (ESI) *m*/*z* calcd. for $C_{11}H_{13}O_5$ ($[M+H]^+$) 225.0757, found 225.0757.

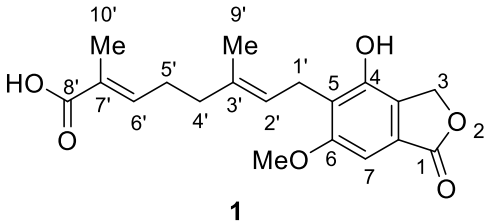
Corallocin A (1)



To a solution of **15** (4.0 mg, 9.6 μmol) in EtOH (200 μL) was added 4 M KOH aq. (25.0 μL, 100 μmol) at room temperature. The reaction mixture was stirred for 13 h at 60 °C. After the reaction mixture was cooled to room temperature, 3 M HCl aq. (200 μL, 600 μmol) was added and stirred for further 22 h. The reaction mixture was quenched by the addition of sat. NH_4Cl aq. and diluted with CH_2Cl_2. After the layers were separated, the aqueous layer was extracted with CH_2Cl_2. The combined organic solution was washed with brine, dried over Na_2SO_4, filtered, and concentrated to give a residue. The residue was purified by flash column chromatography (Hexane/EtOAc = 2/1 to 1/2) to give **1** (2.5 mg, 7.2 μmol, 76%) as a white solid.

Mp = 151.1–152.5 °C; IR (KBr) ν_{max} = 3243, 2927, 2851, 1732, 1684, 1472, 1349, 1100 cm^{-1}; ^1H NMR (600 MHz, acetone-d_6) δ 6.89 (s, 1H), 6.69 (tq, *J* = 7.2, 1.2 Hz, 1H), 5.24 (m, 1H), 5.23 (s, 2H), 3.90 (s, 3H), 3.46 (d, *J* = 7.2 Hz, 2H), 2.28 (dt, *J* = 7.8, 7.2 Hz, 2H), 2.09 (t, *J* = 7.8 Hz, 2H), 1.80 (brs, 3H), 1.75 (brs, 3H); ^{13}C NMR (150 MHz, acetone-d_6) δ 171.5, 169.3, 160.5, 150.4, 142.2, 135.0, 128.6, 127.7, 125.4, 124.0, 123.4, 98.5, 68.6, 56.4, 38.9, 27.6, 23.3, 16.1, 12.5; HRMS (ESI) *m*/*z* calcd. for $C_{19}H_{22}O_6Na$ ($[M+Na]^+$) 369.1309, found 369.1313.

Table S1. NMR spectroscopic data (acetone-d_6) for natural and synthetic corallocin A (1).[S4]



1

	Natural corallocin A (**1**)		Synthetic corallocin A (**1**)	
position	δ_C	δ_H (J in Hz)	δ_C	δ_H (J in Hz)
1	171.7		171.5	
2				
3	68.7	5.25, s	68.6	5.23, s
3a	125.6		125.4	
4	150.5		150.4	
5	124.1		124.0	
6	160.7		160.5	
7	98.7	6.89, s	98.5	6.89, s
7a	127.7		127.7	
OMe	56.5	3.91, s	56.4	3.90, s
1′	23.5	3.47 (d, 7.2)	23.3	3.46 (d, 7.2)
2′	123.5	5.26, m	123.4	5.24, m
3′	135.2		135.0	
4′	39.0	2.1, (t, 7.4)	38.9	2.09 (t, 7.8)
5′	27.8	2.28, m	27.6	2.28, m
6′	142.6	6.71 (tq, 7.4, 1.4)	142.2	6.69 (tq, 7.2, 1.2)
7′	128.4		128.6	
8′	169.1		169.3	
9′	16.2	1.81 (d, 1.2)	16.1	1.80, brs
10′	12.5	1.75, m	12.5	1.75, brs

3. ^{1}H and ^{13}C NMR charts

Figure S1. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 6.

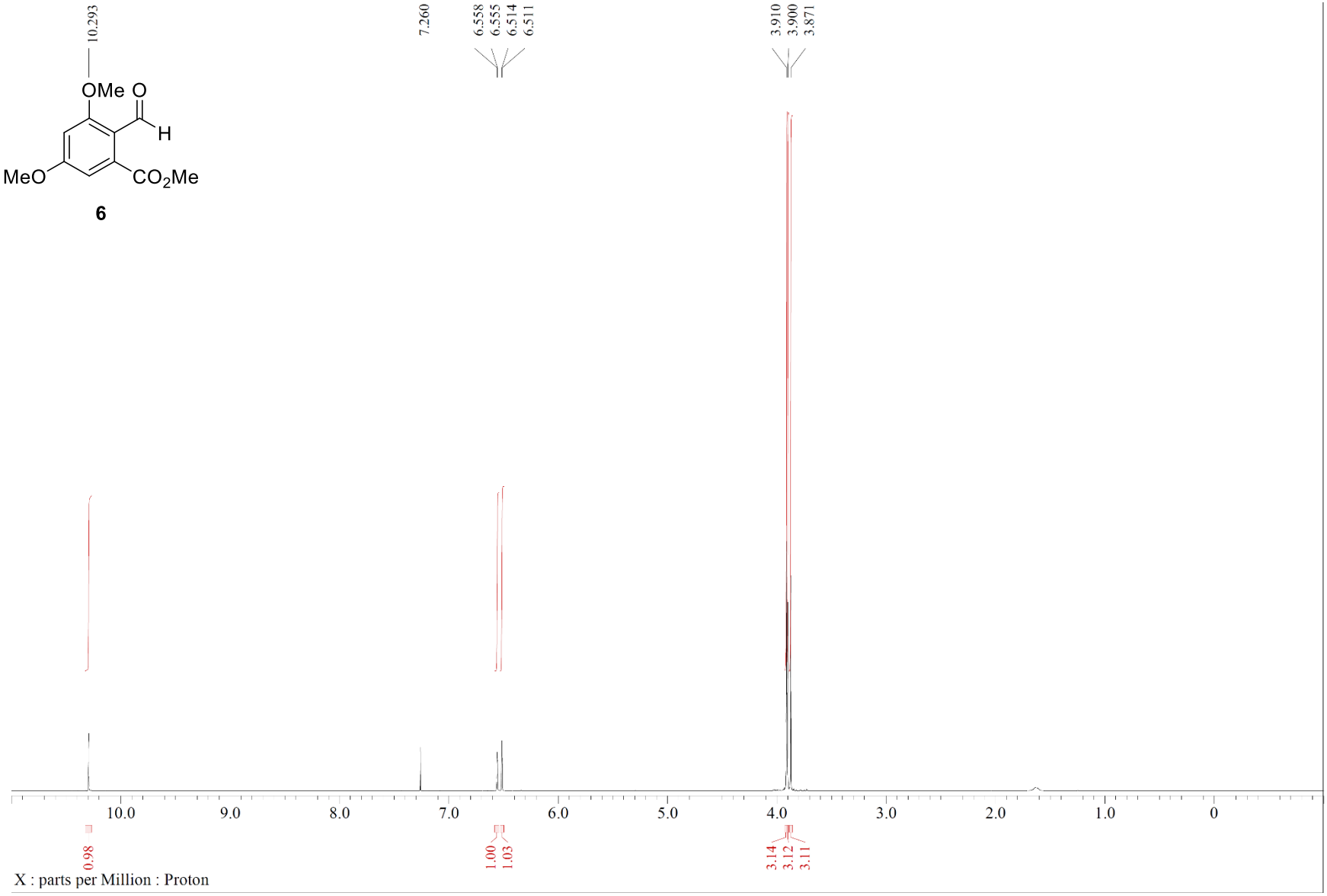


Figure S2. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 6.

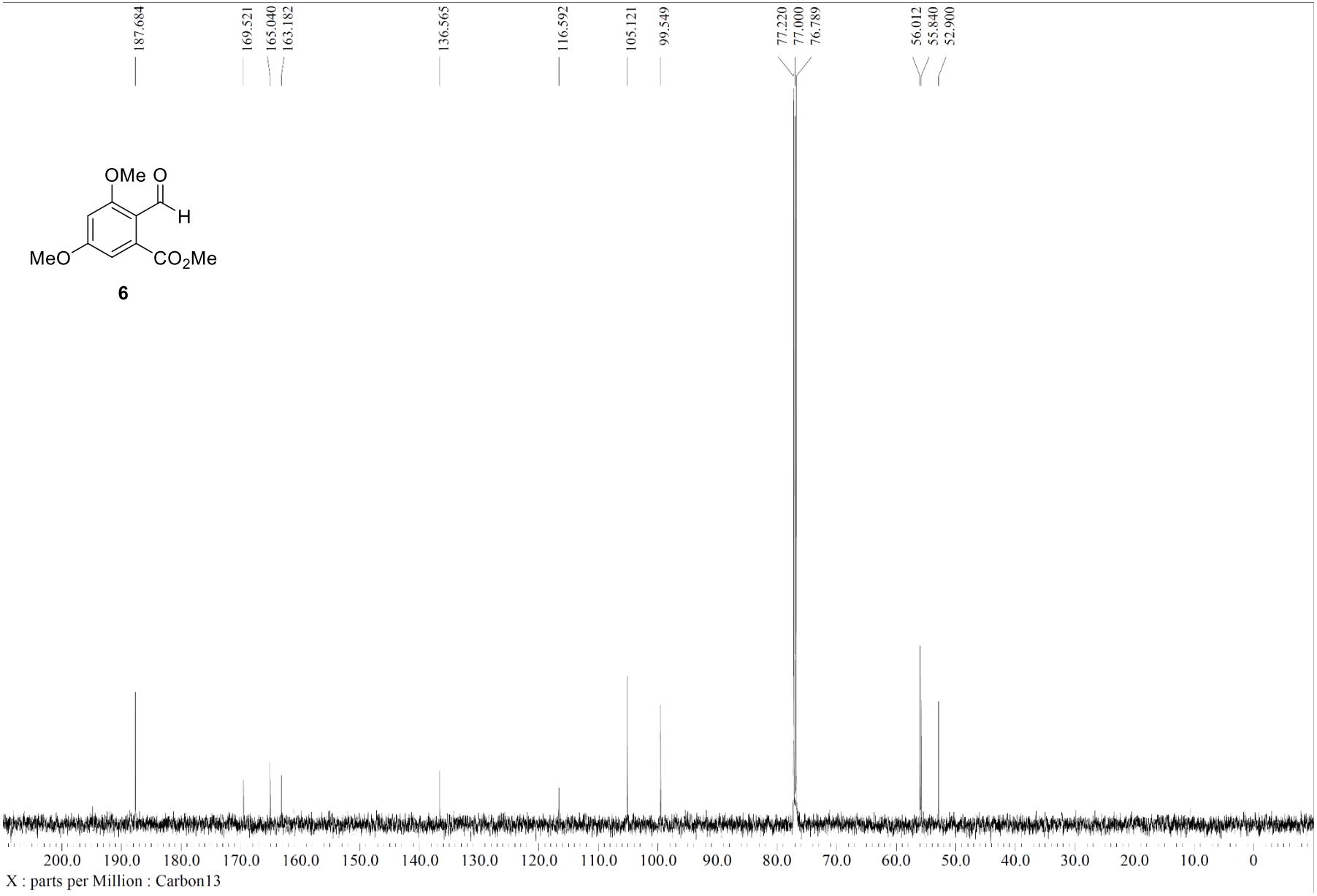


Figure S3. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 7.

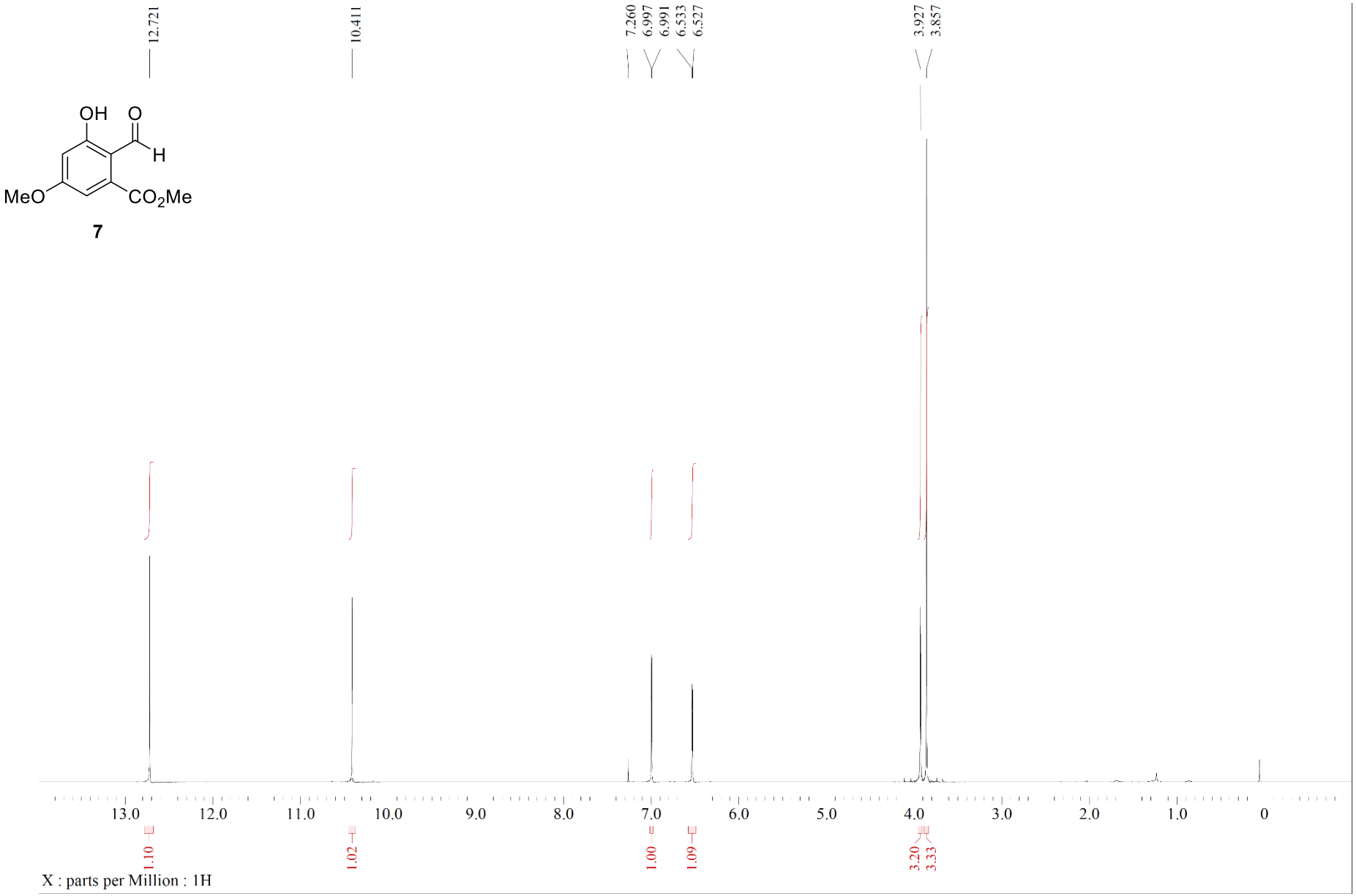


Figure S4. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 7.

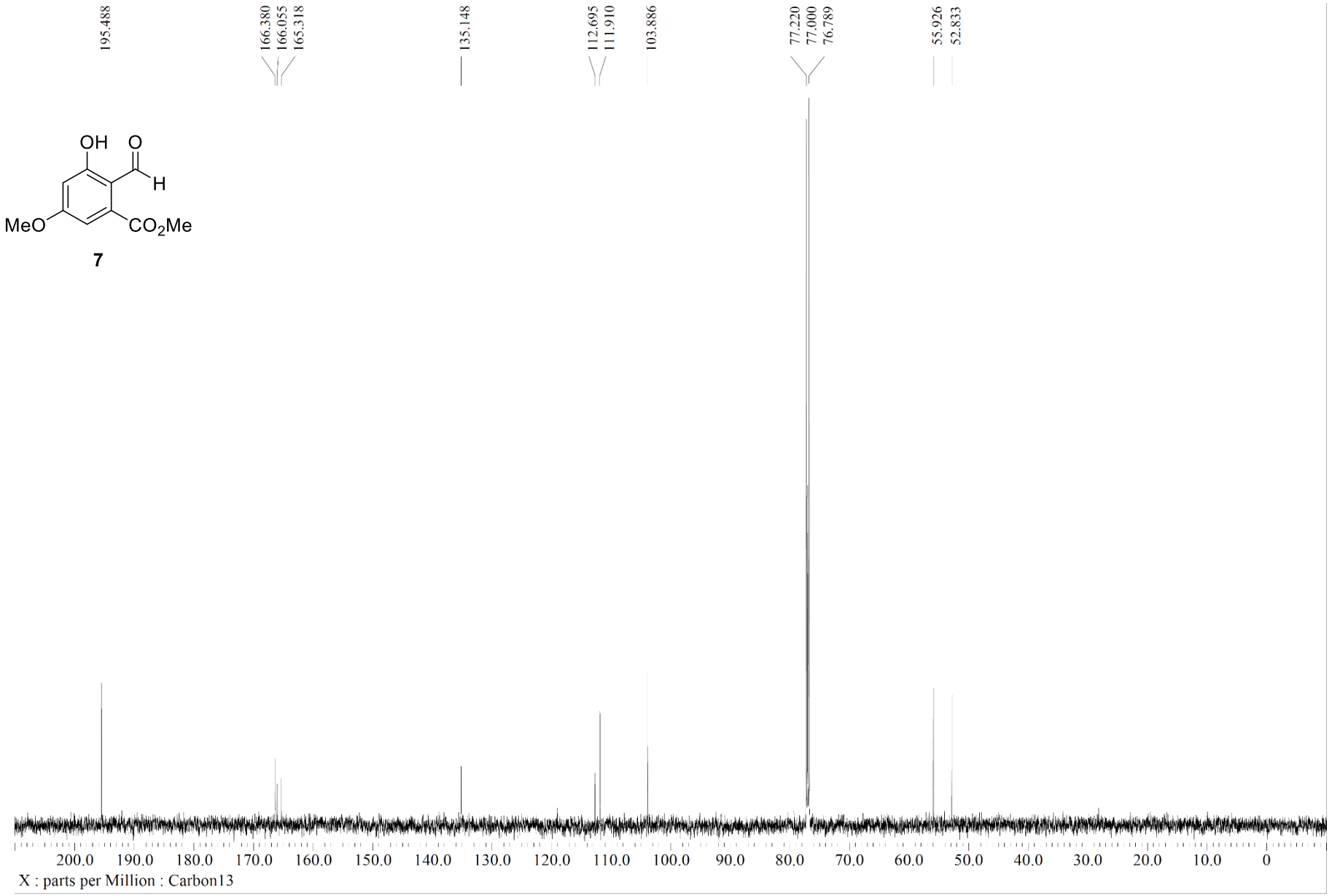


Figure S5. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 8.

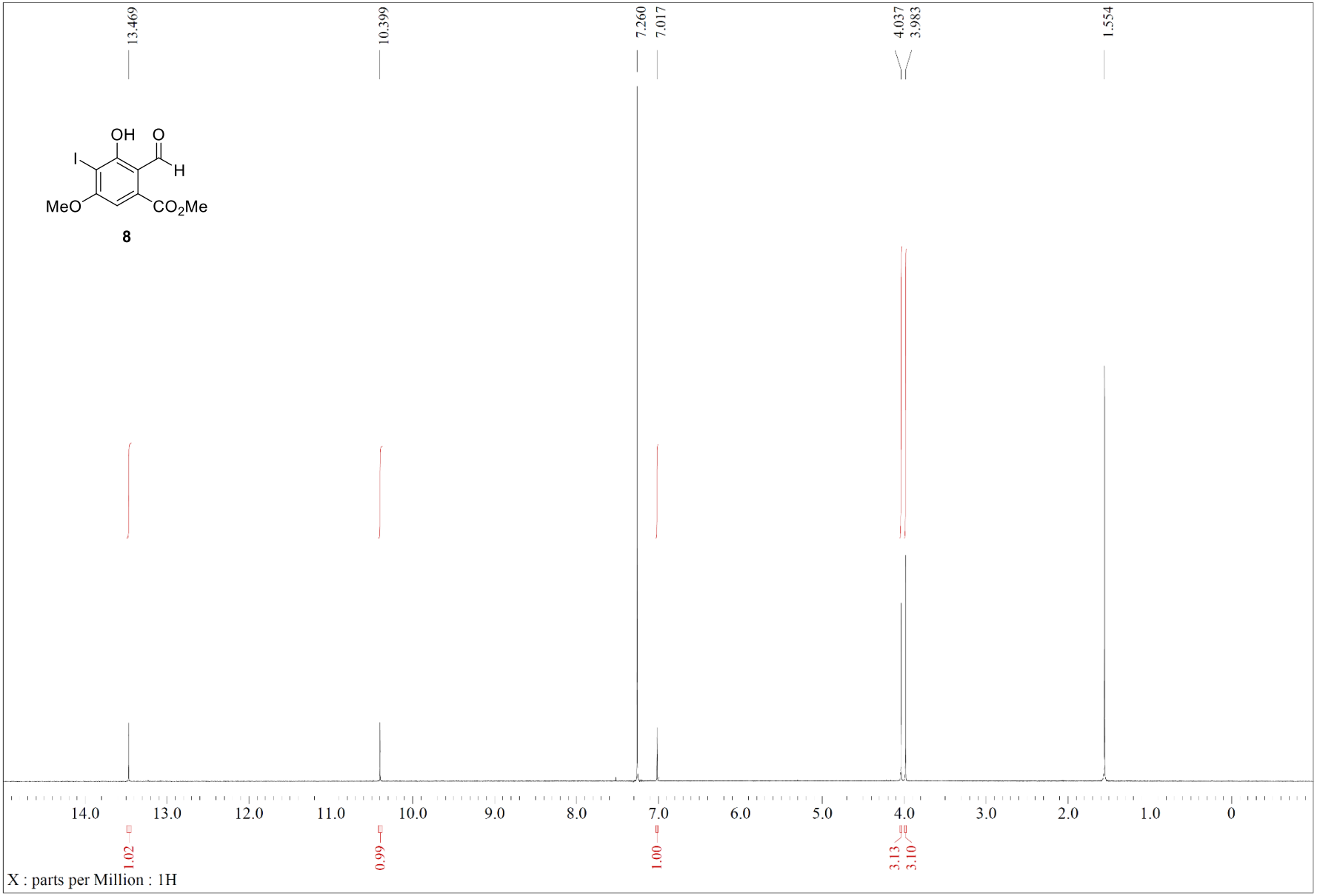


Figure S6. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 8.

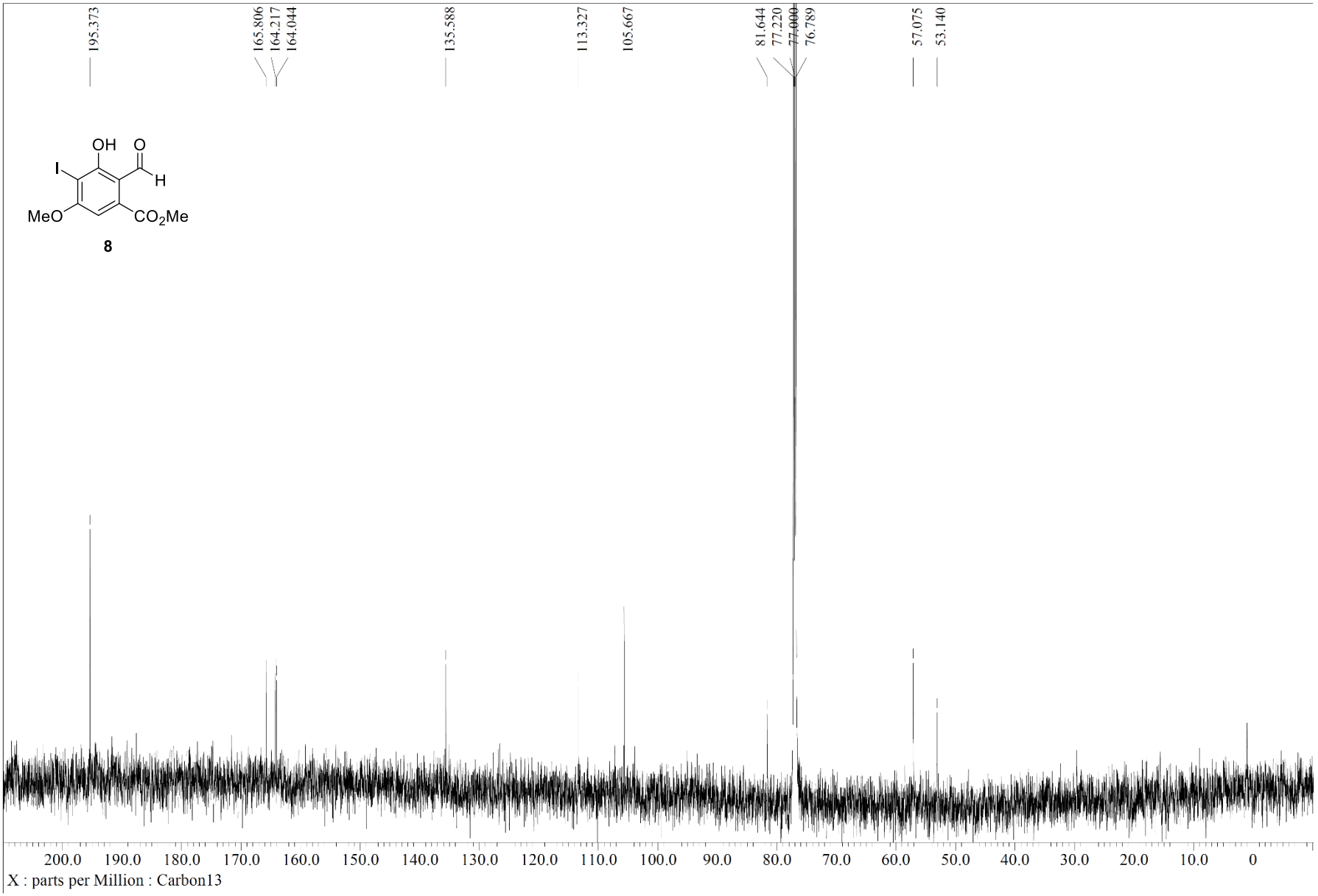


Figure S7. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 9.

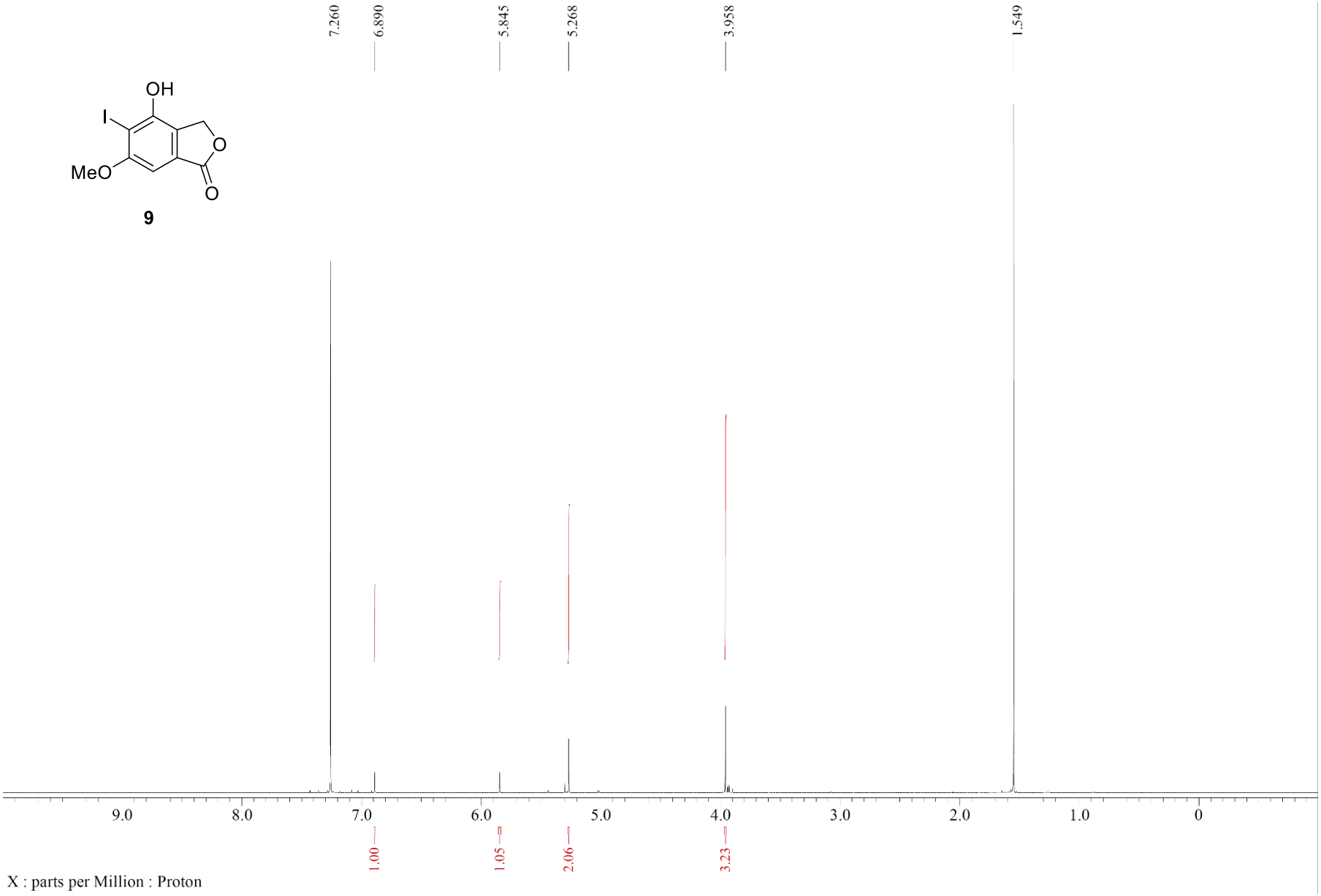


Figure S8. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 9.

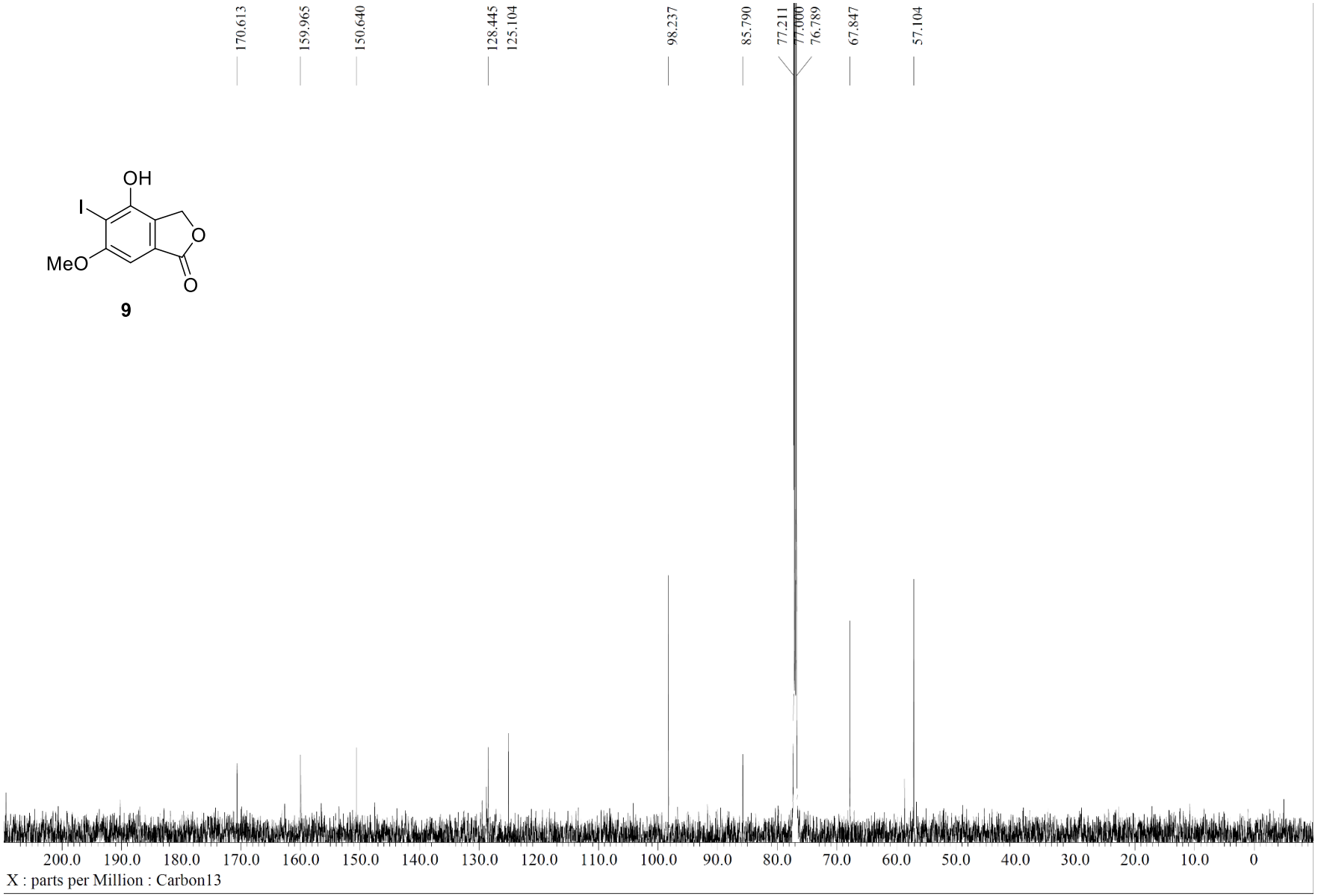


Figure S9. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 4.

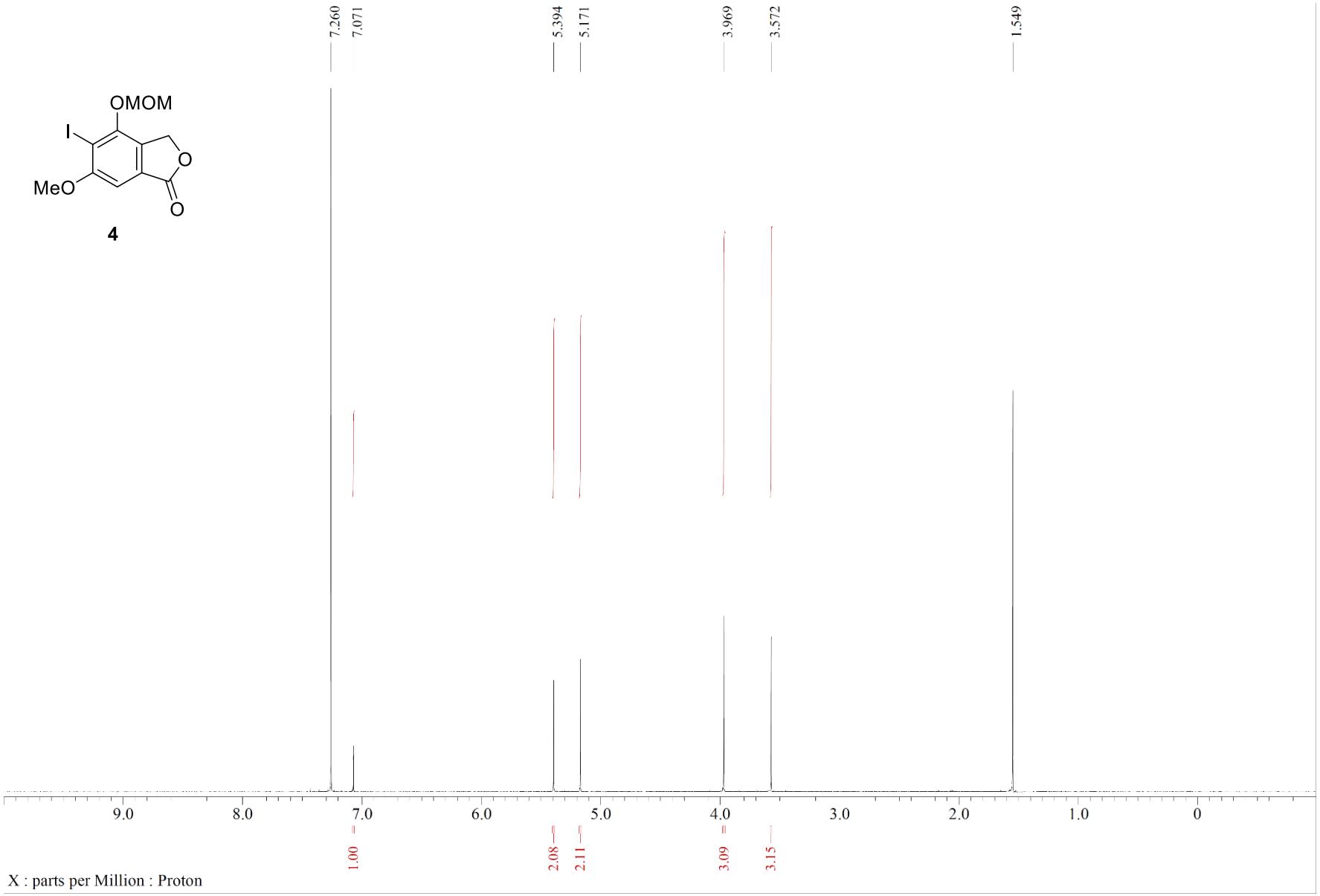


Figure S10. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 4.

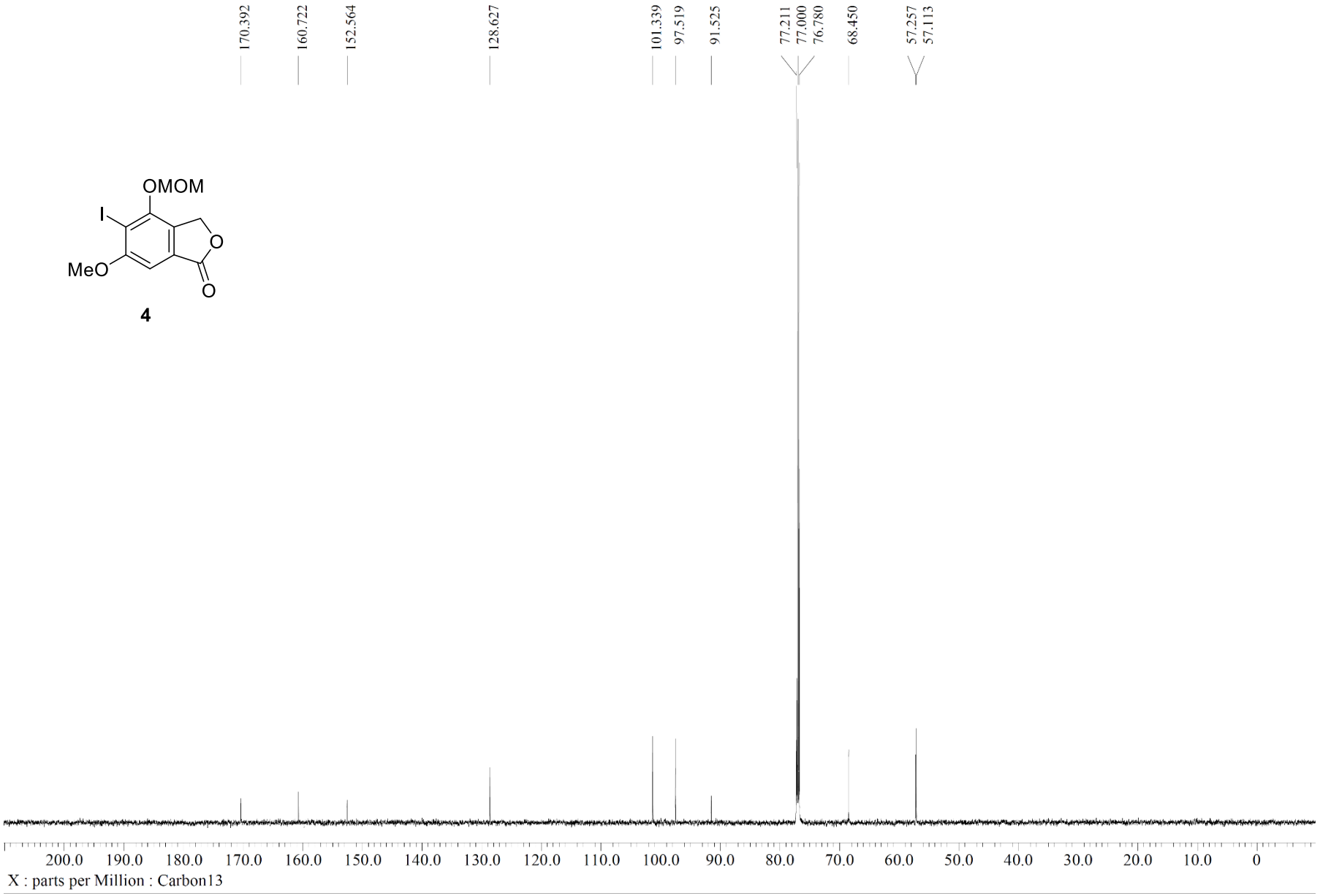


Figure S11. ^{13}C NMR spectrum (150 MHz, acetone-d_6) of compound 4.

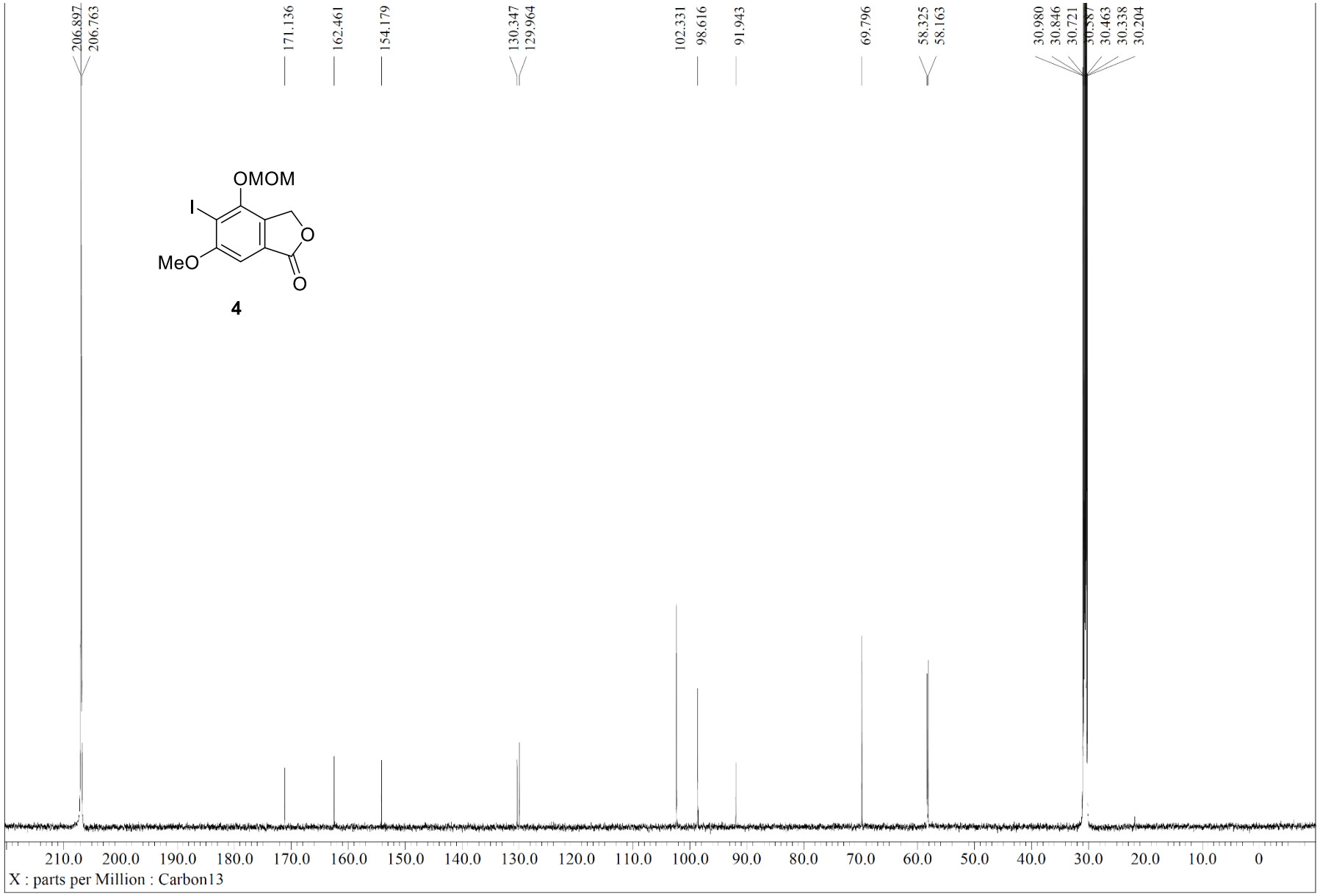


Figure S12. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 10.

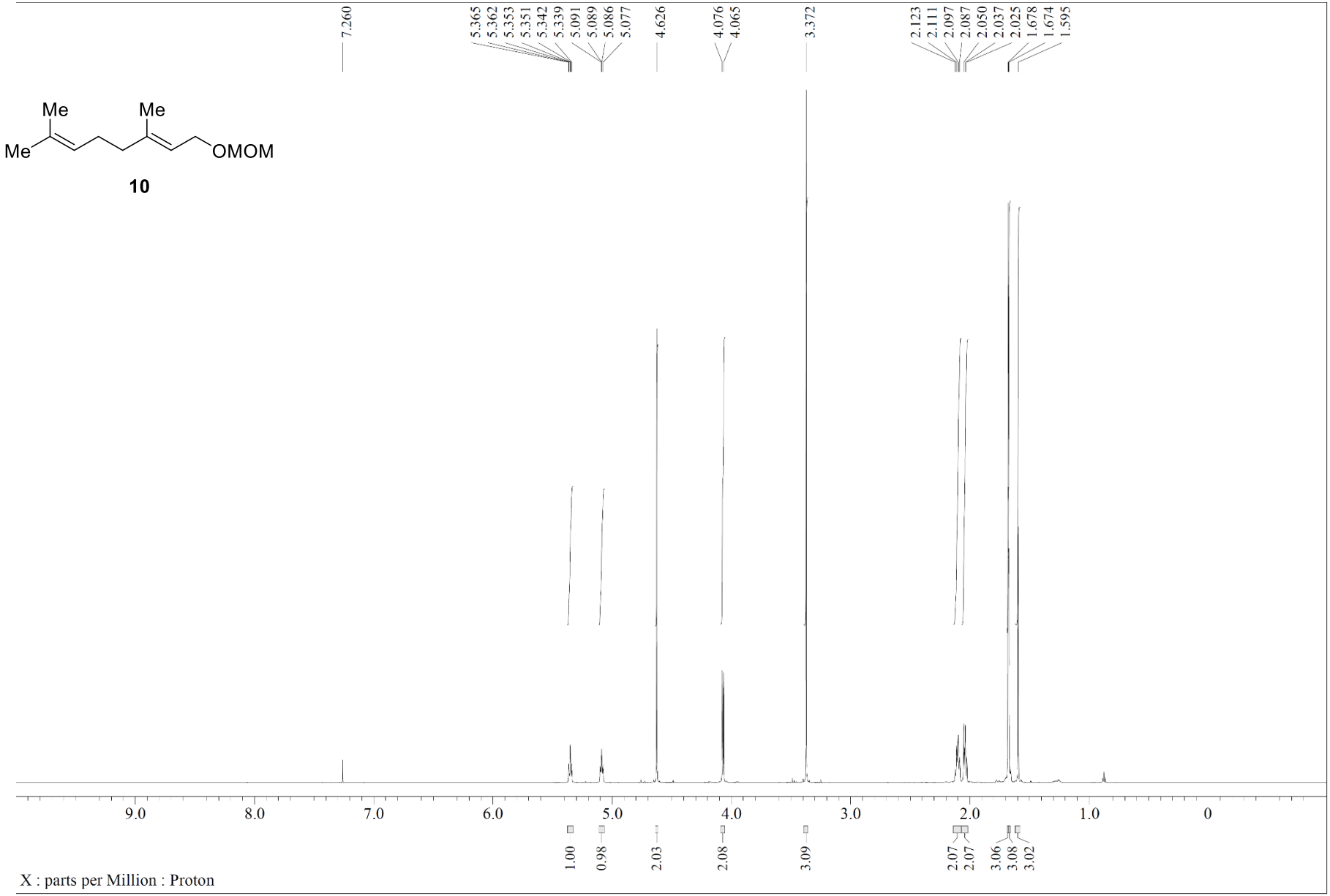


Figure S13. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 10.

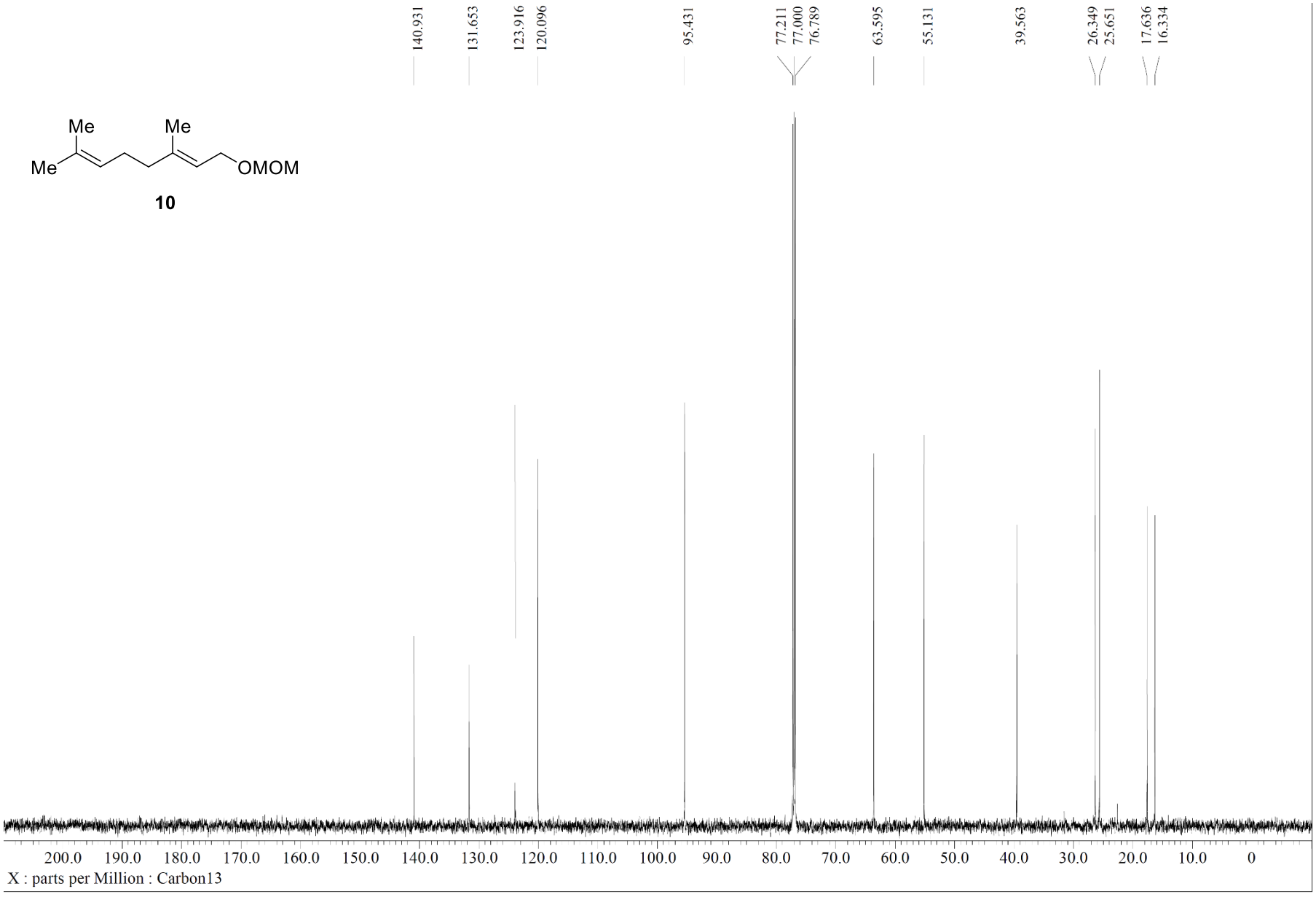


Figure S14. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 11.

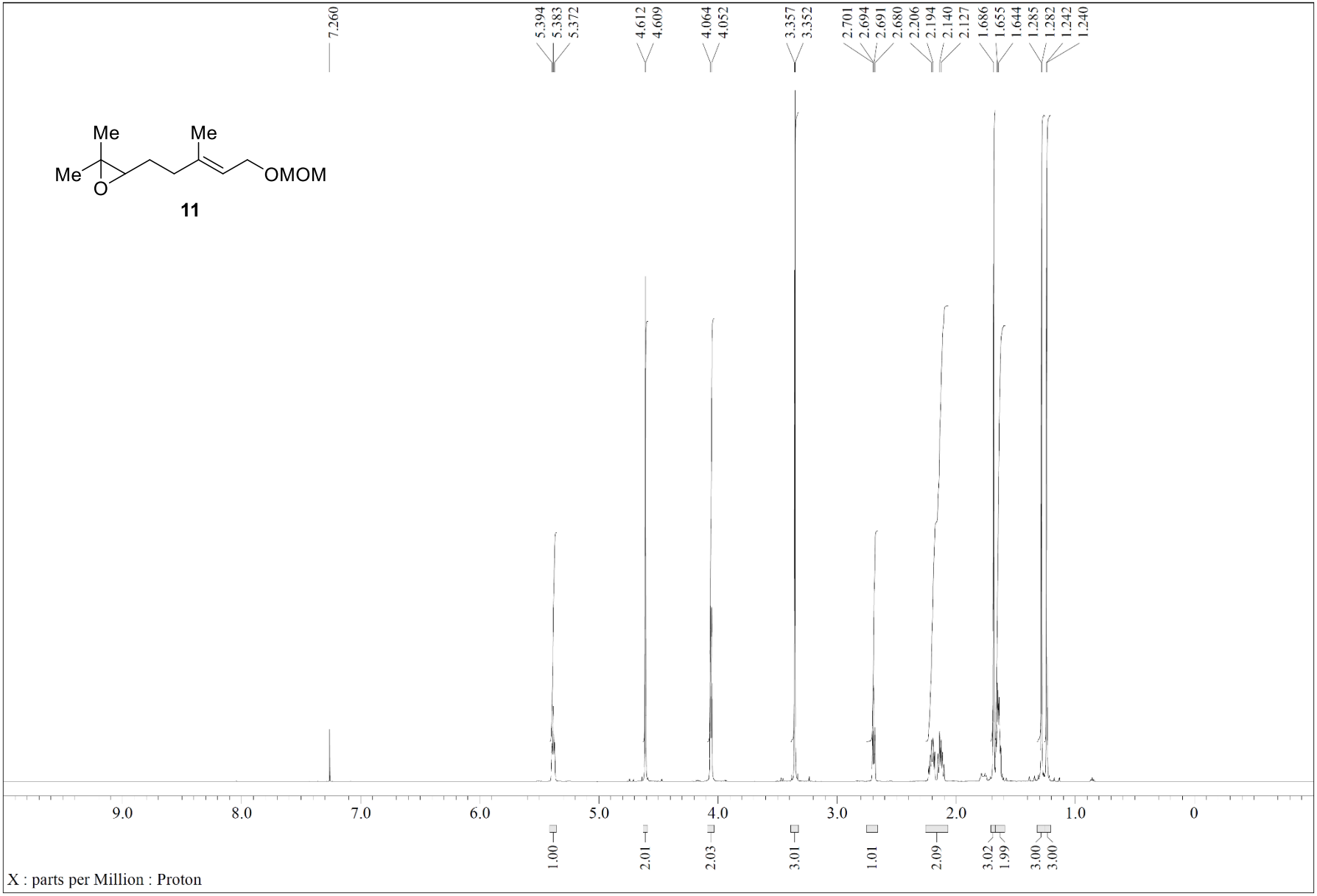


Figure S15. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 11.

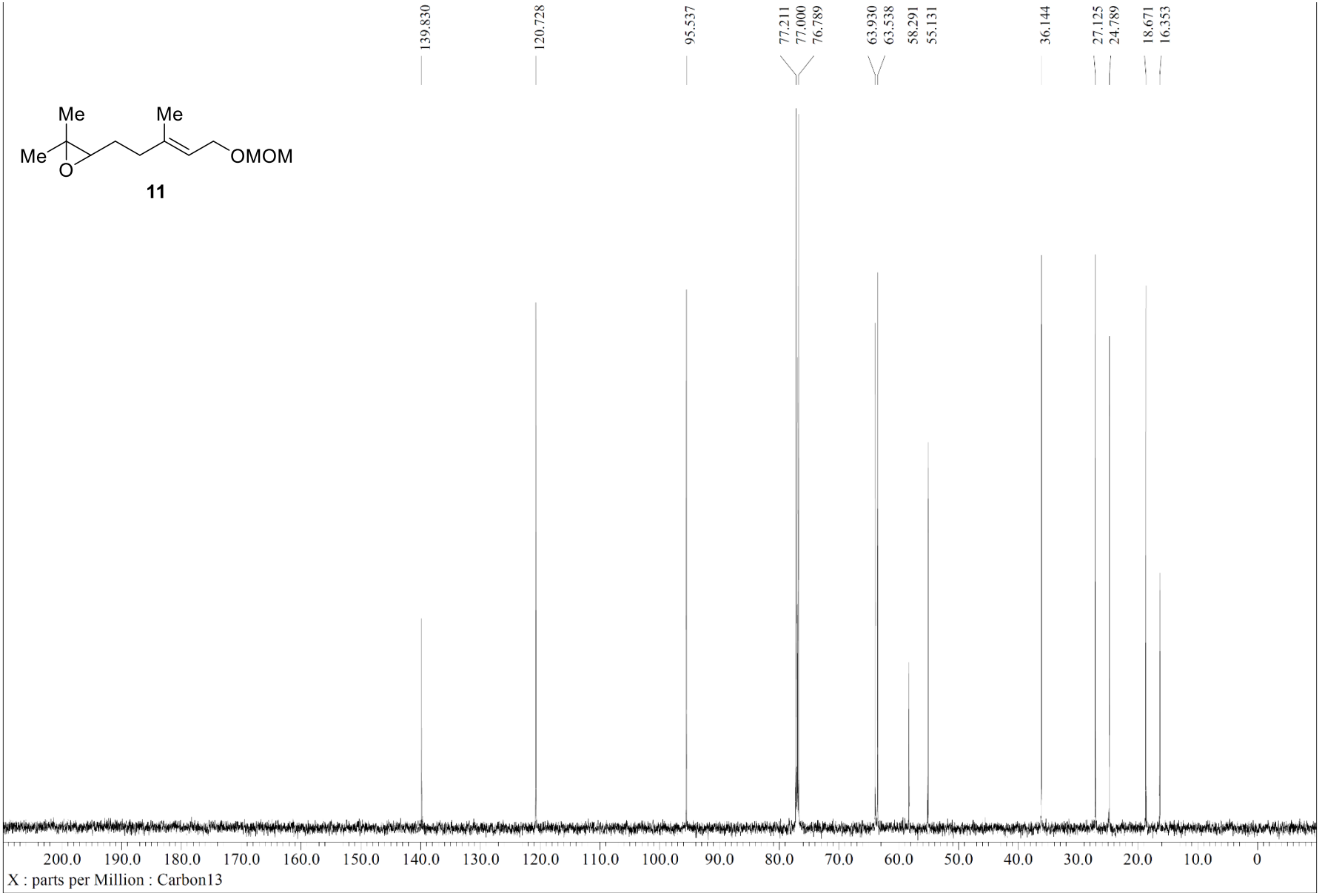


Figure S16. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 12.

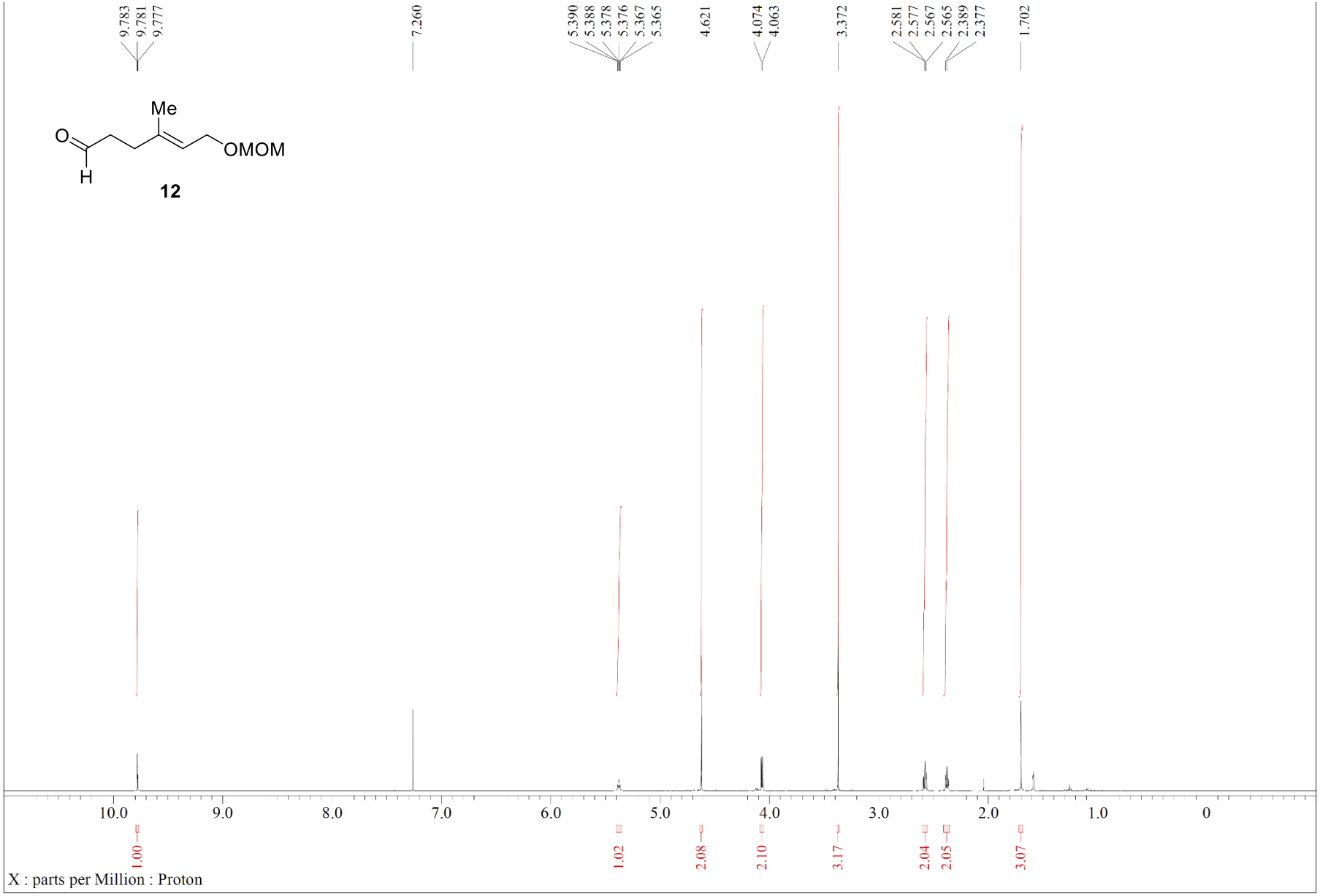


Figure S17. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 12.

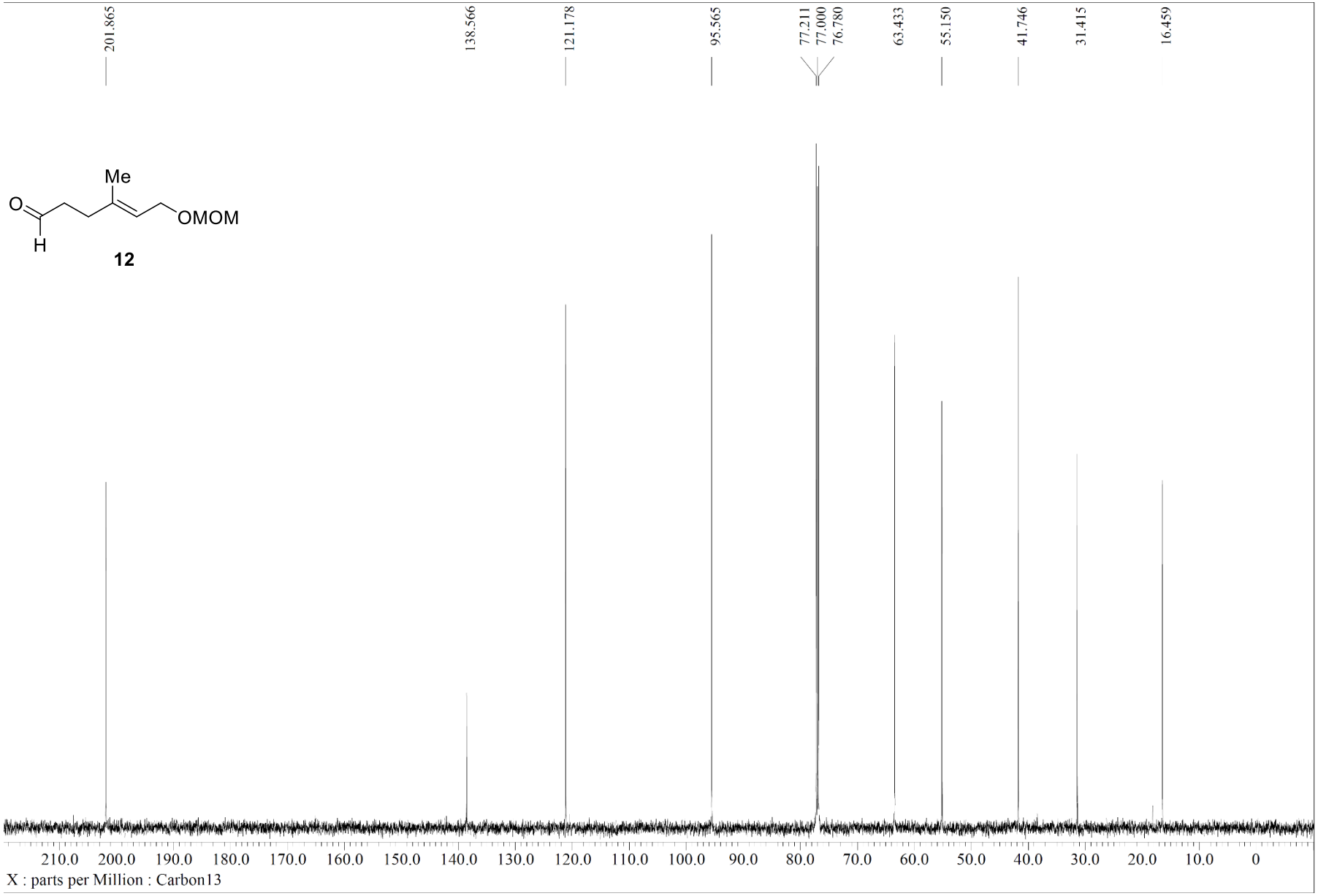


Figure S18. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 13.

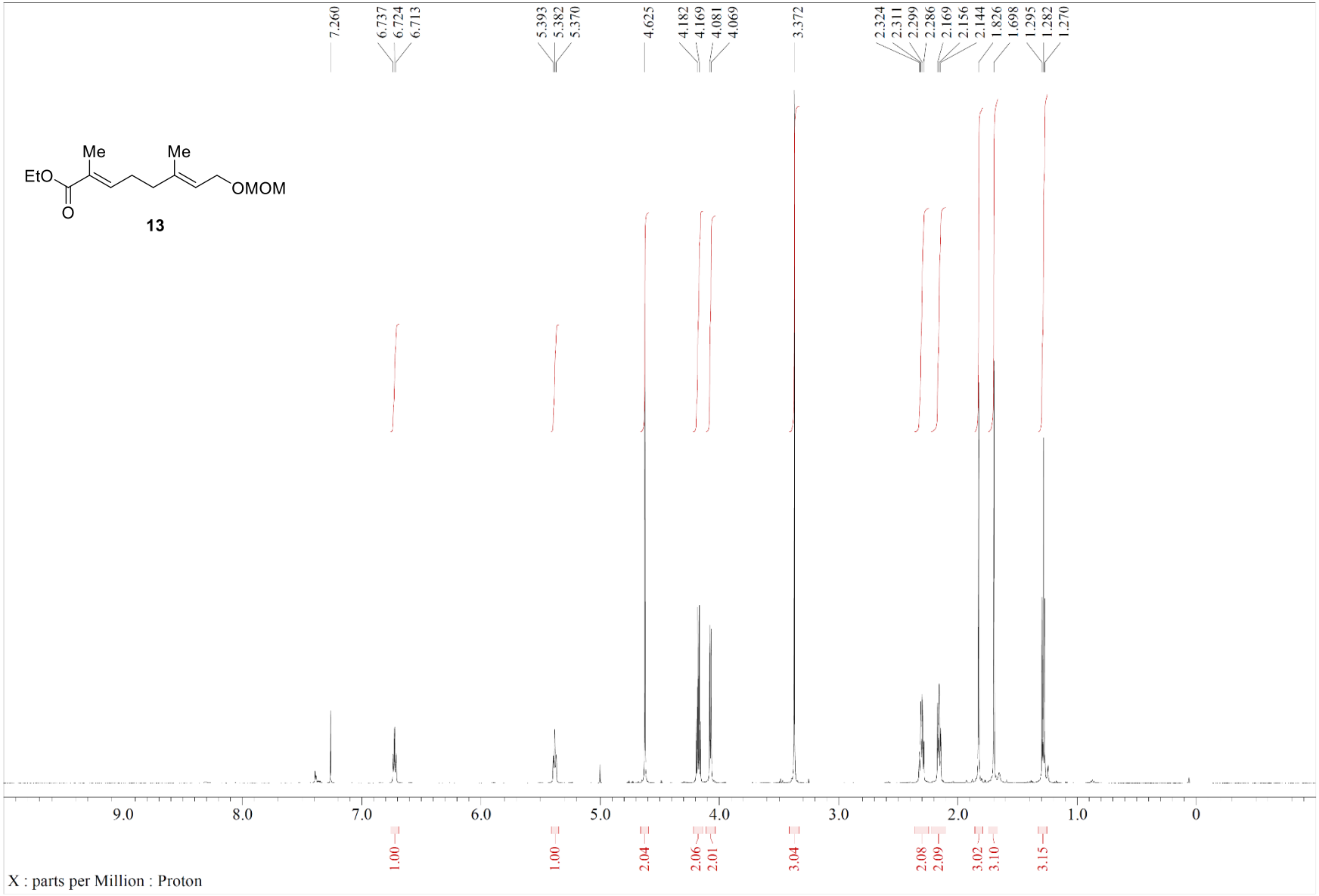


Figure S19. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 13.

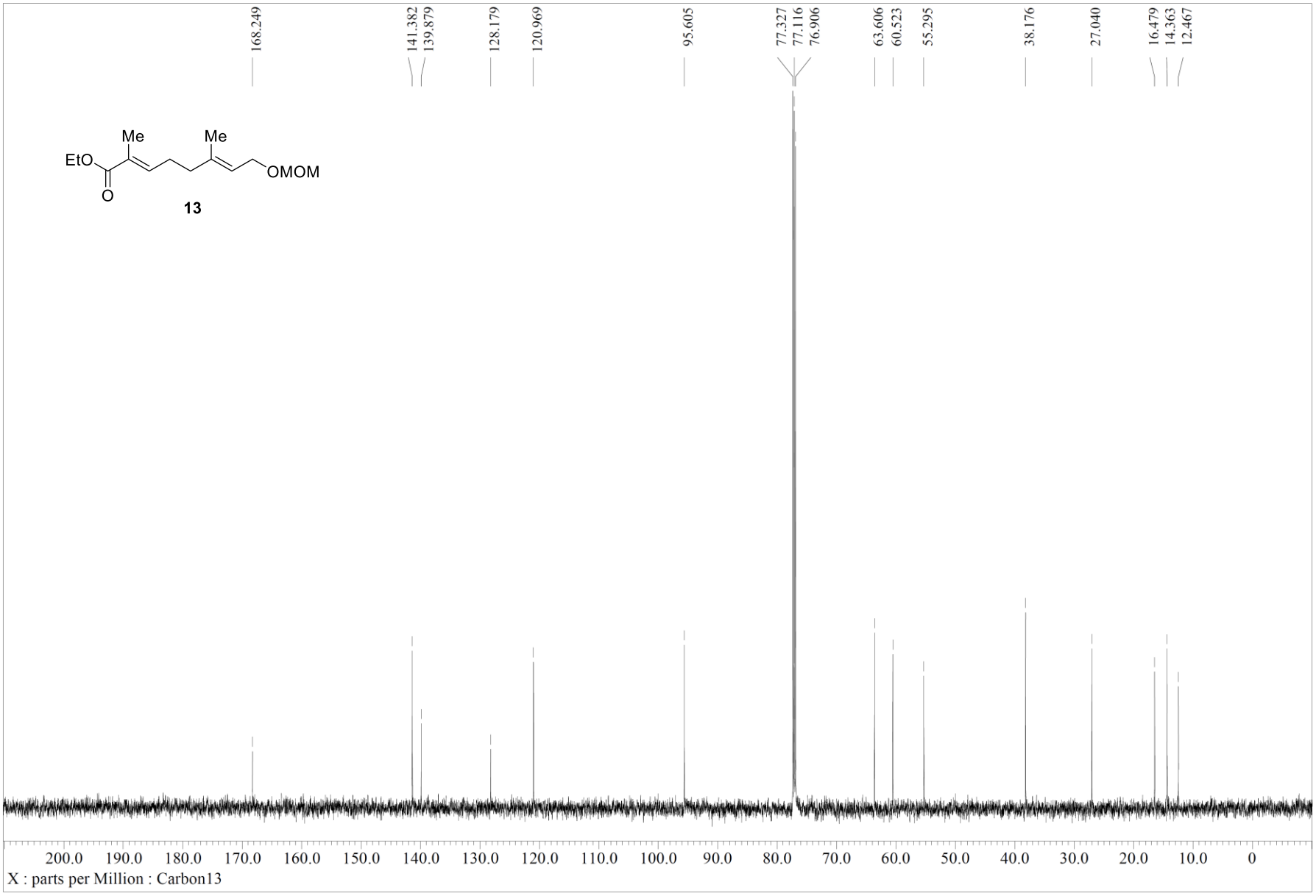


Figure S20. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 14.

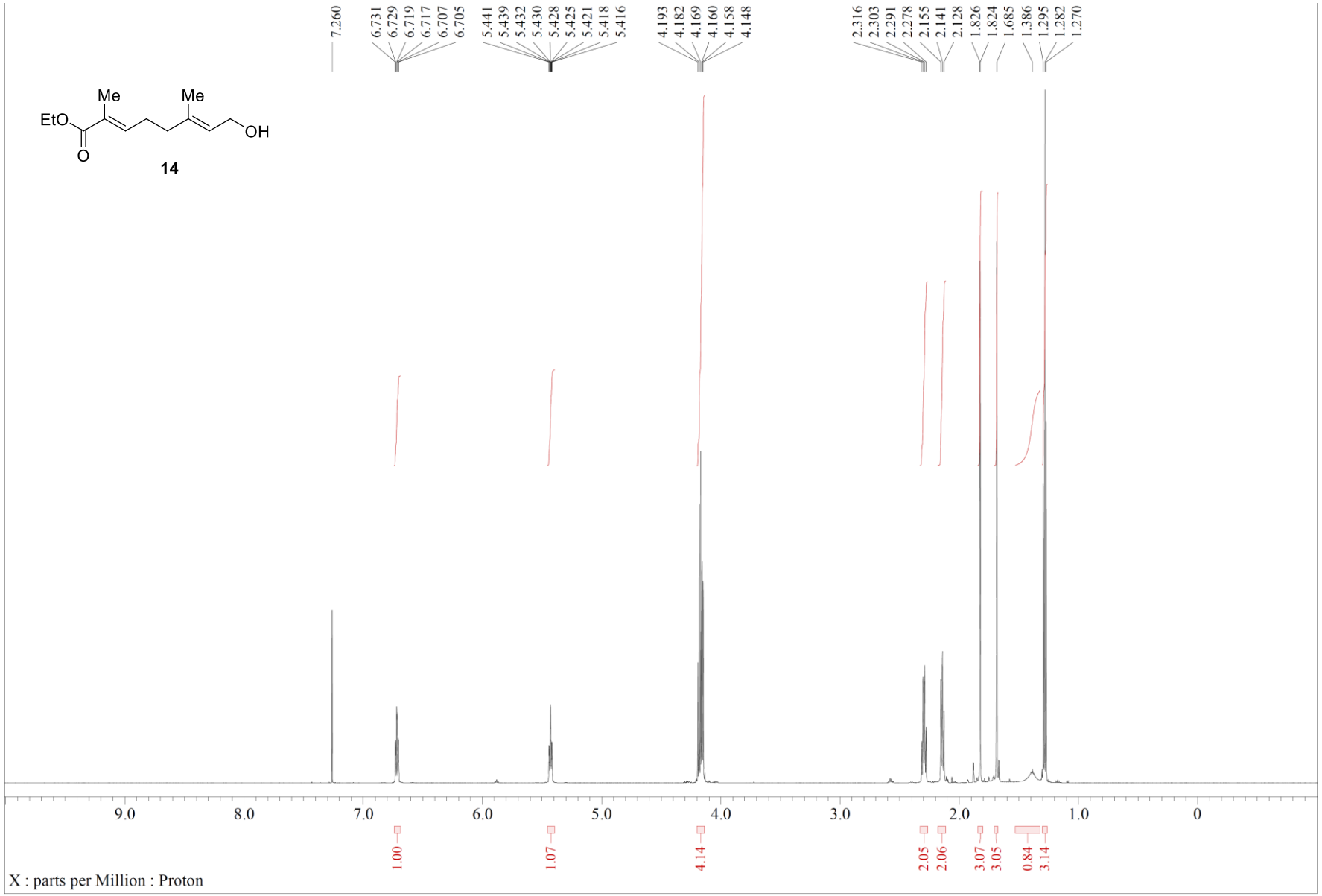


Figure S21. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 14.

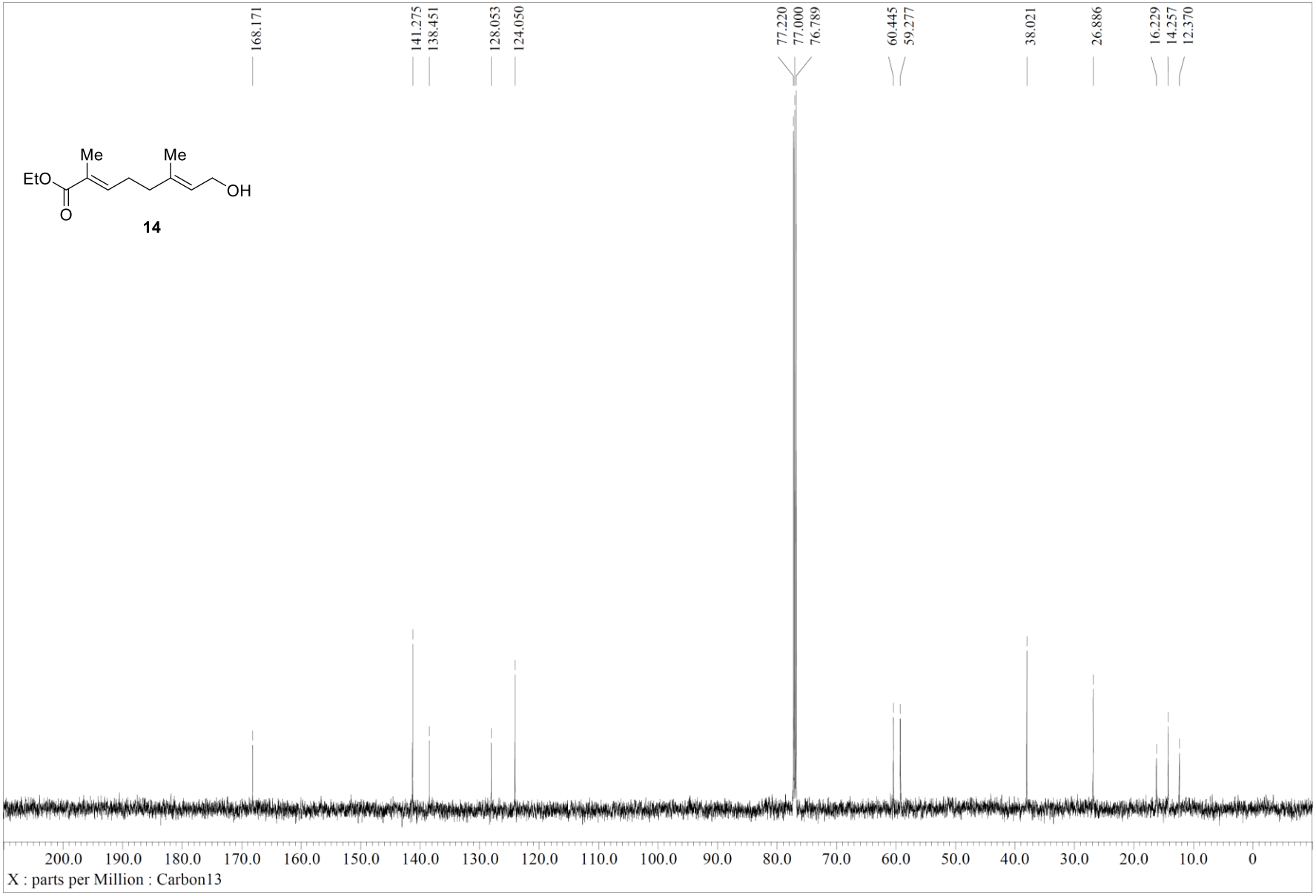


Figure S22. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 2.

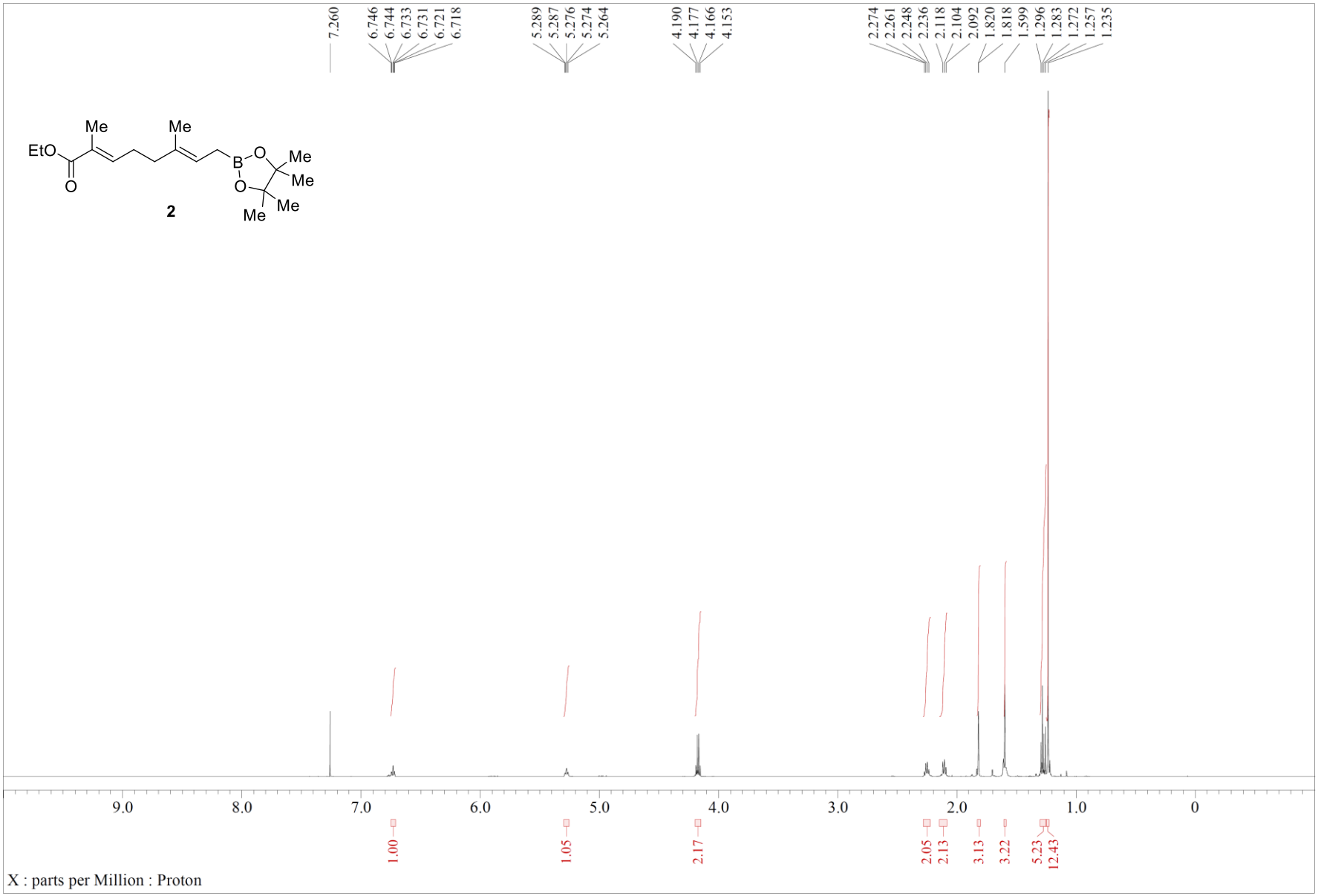


Figure S23. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 2.

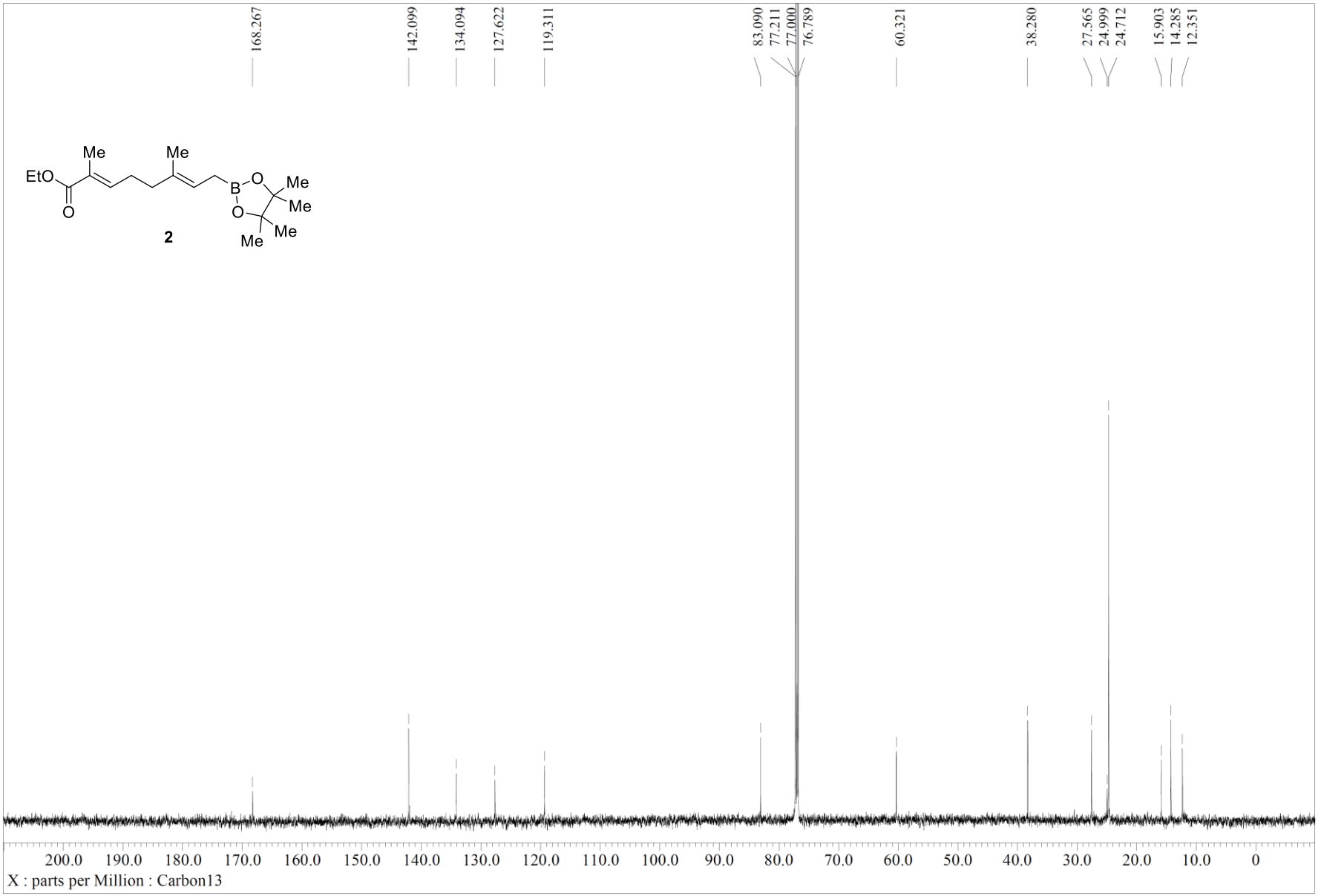


Figure S24. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 15.

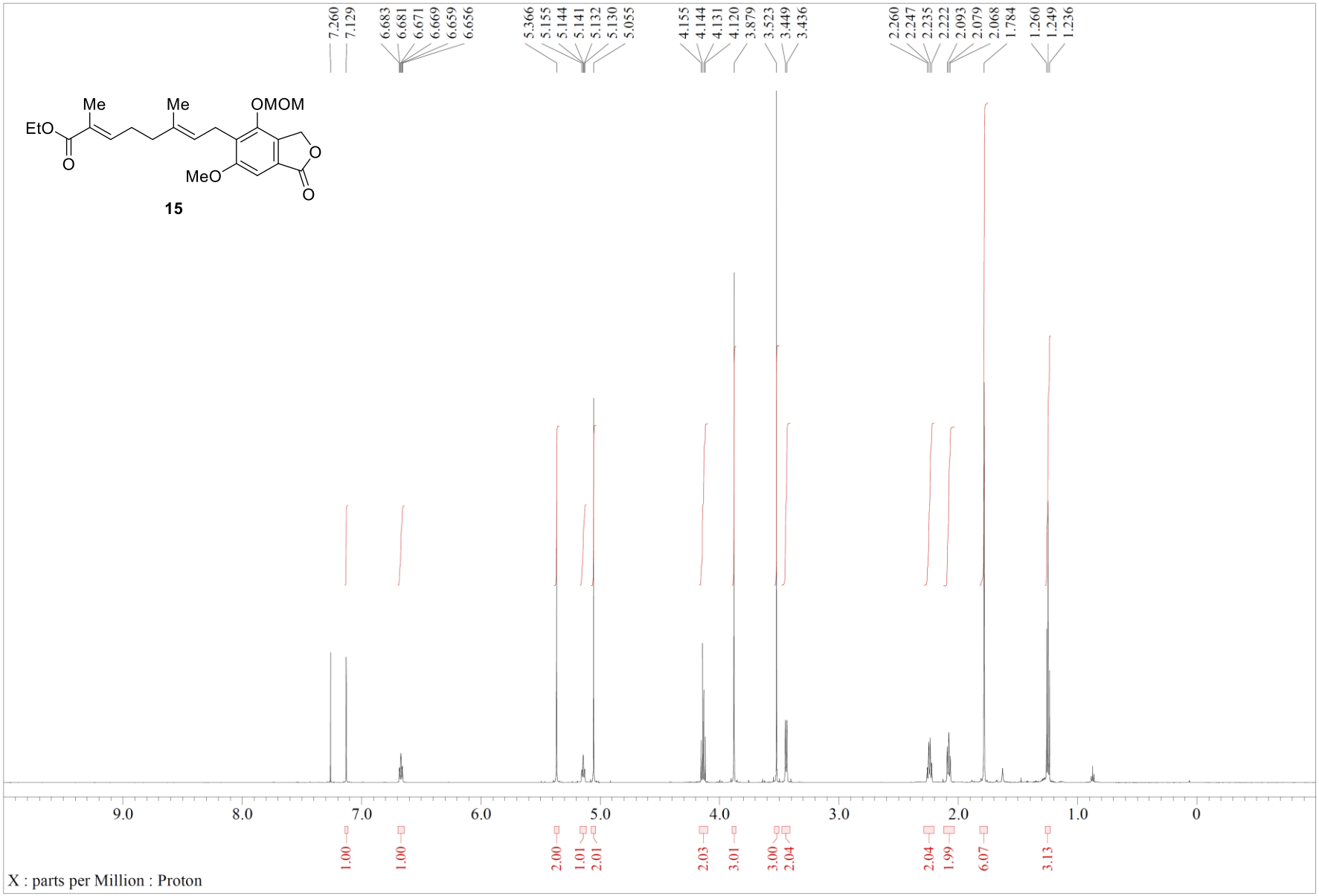


Figure S25. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 15.

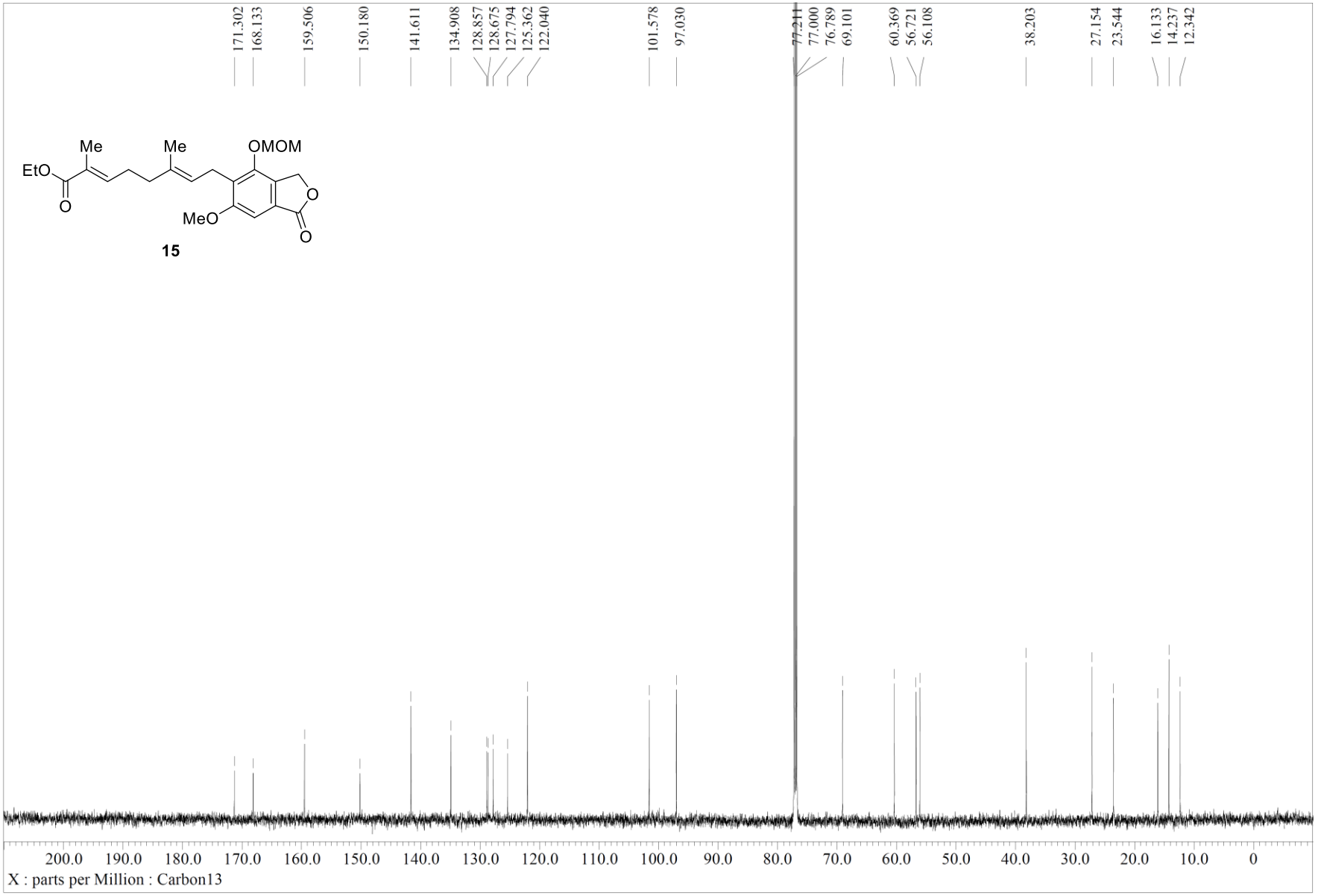


Figure S26. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 16.

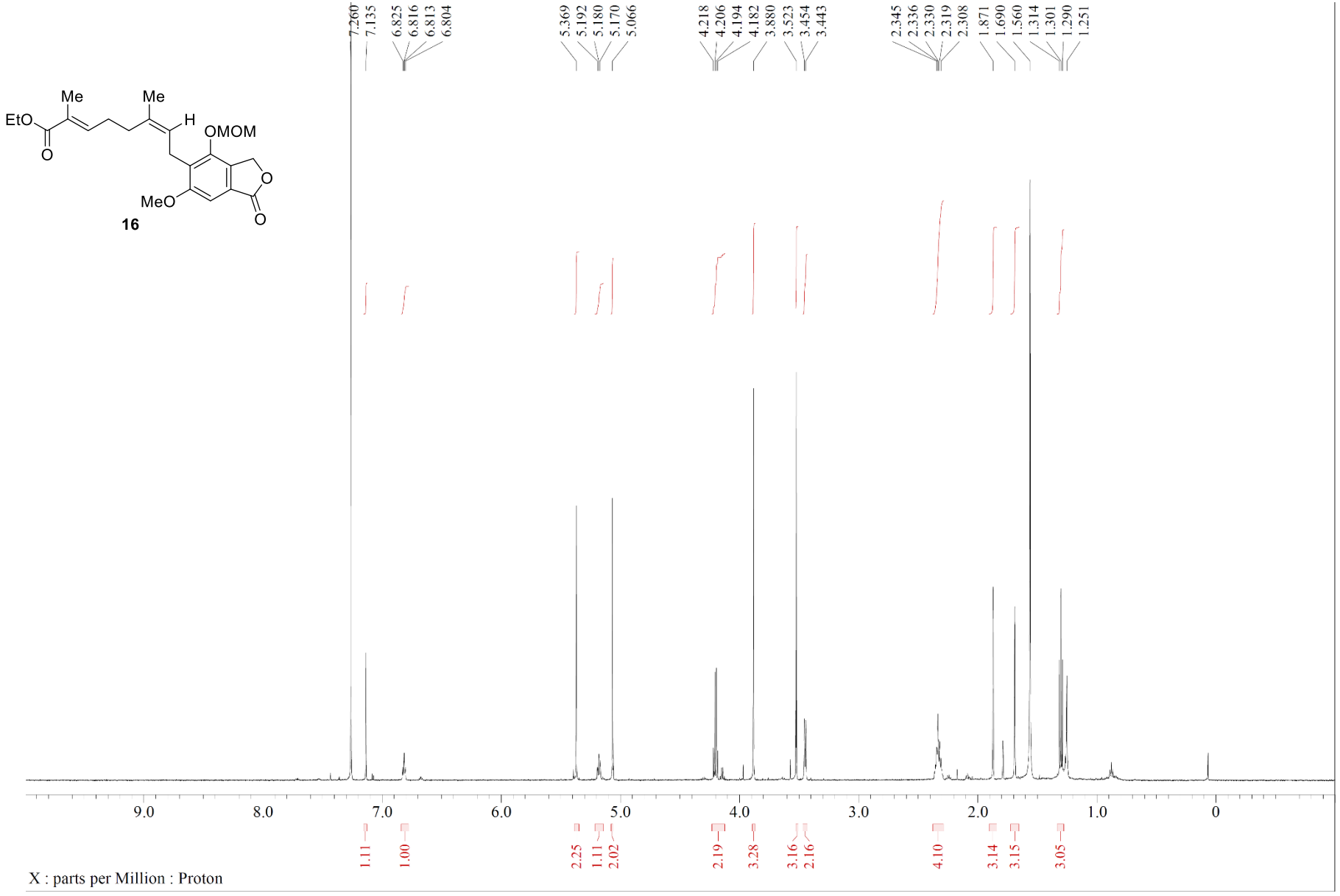


Figure S27. ^{13}C NMR spectrum (150 MHz, $CDCl_3$) of compound 16.

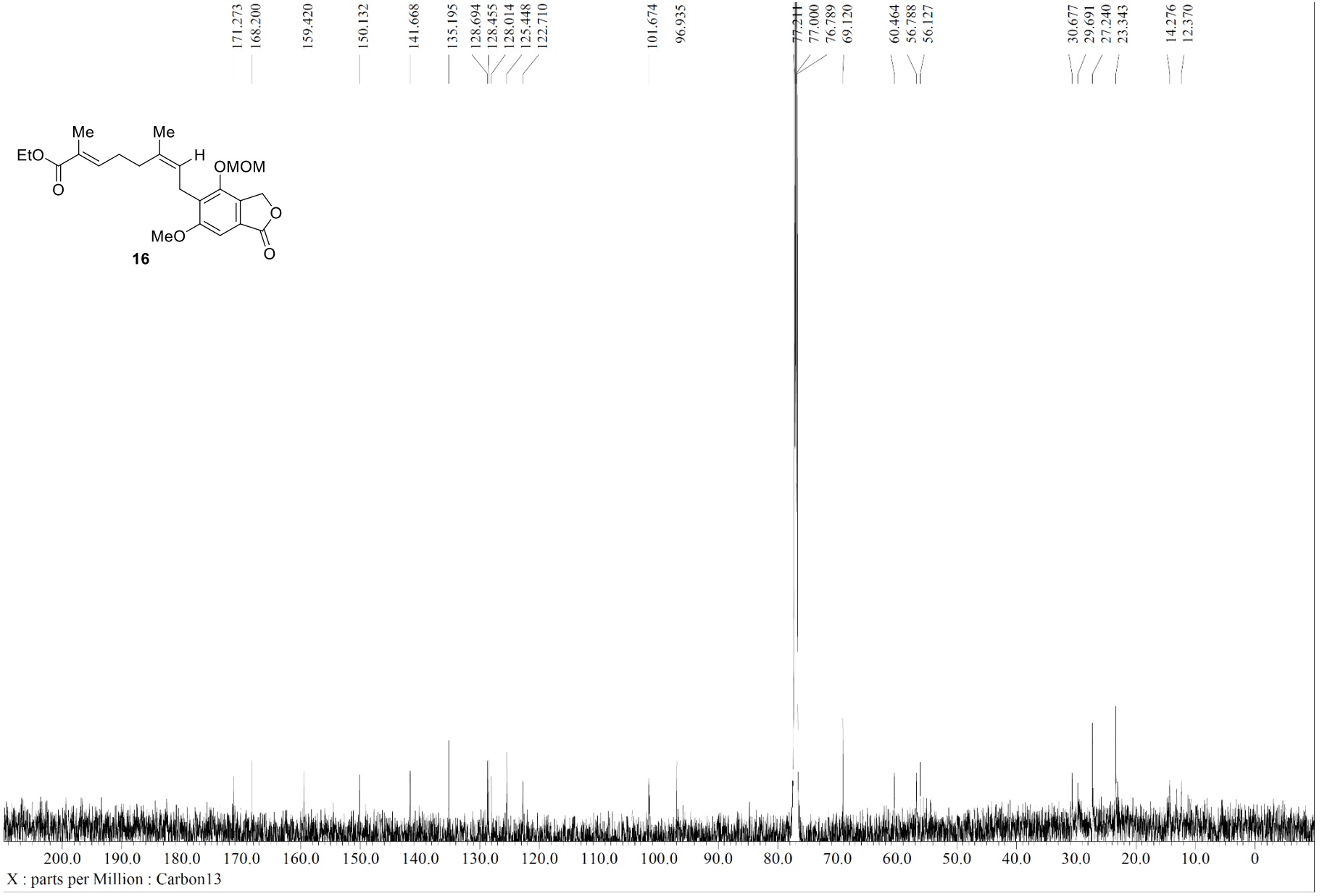


Figure S28. Difference NOE spectrum of 15.

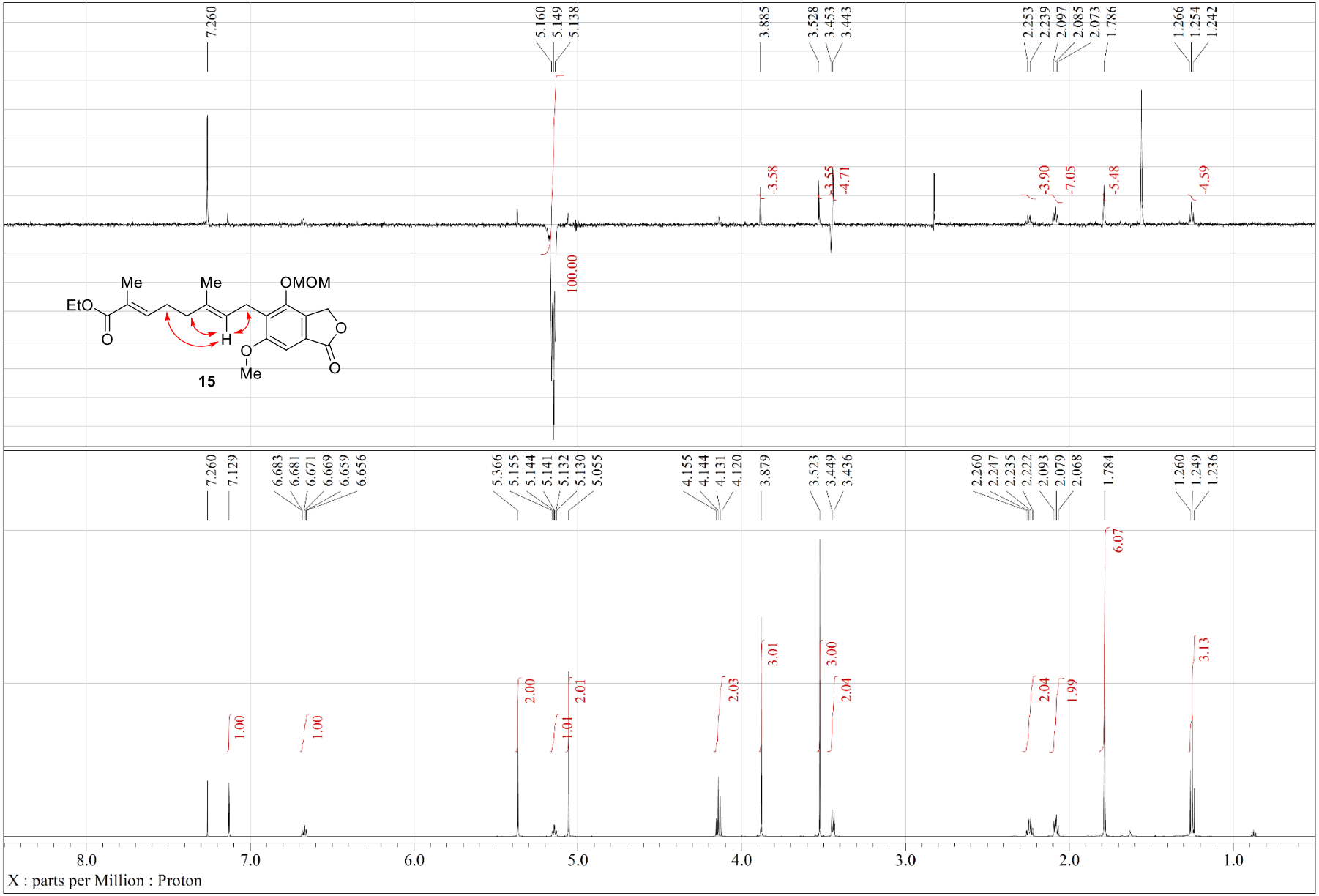


Figure S29. Difference NOE spectrum of 16.

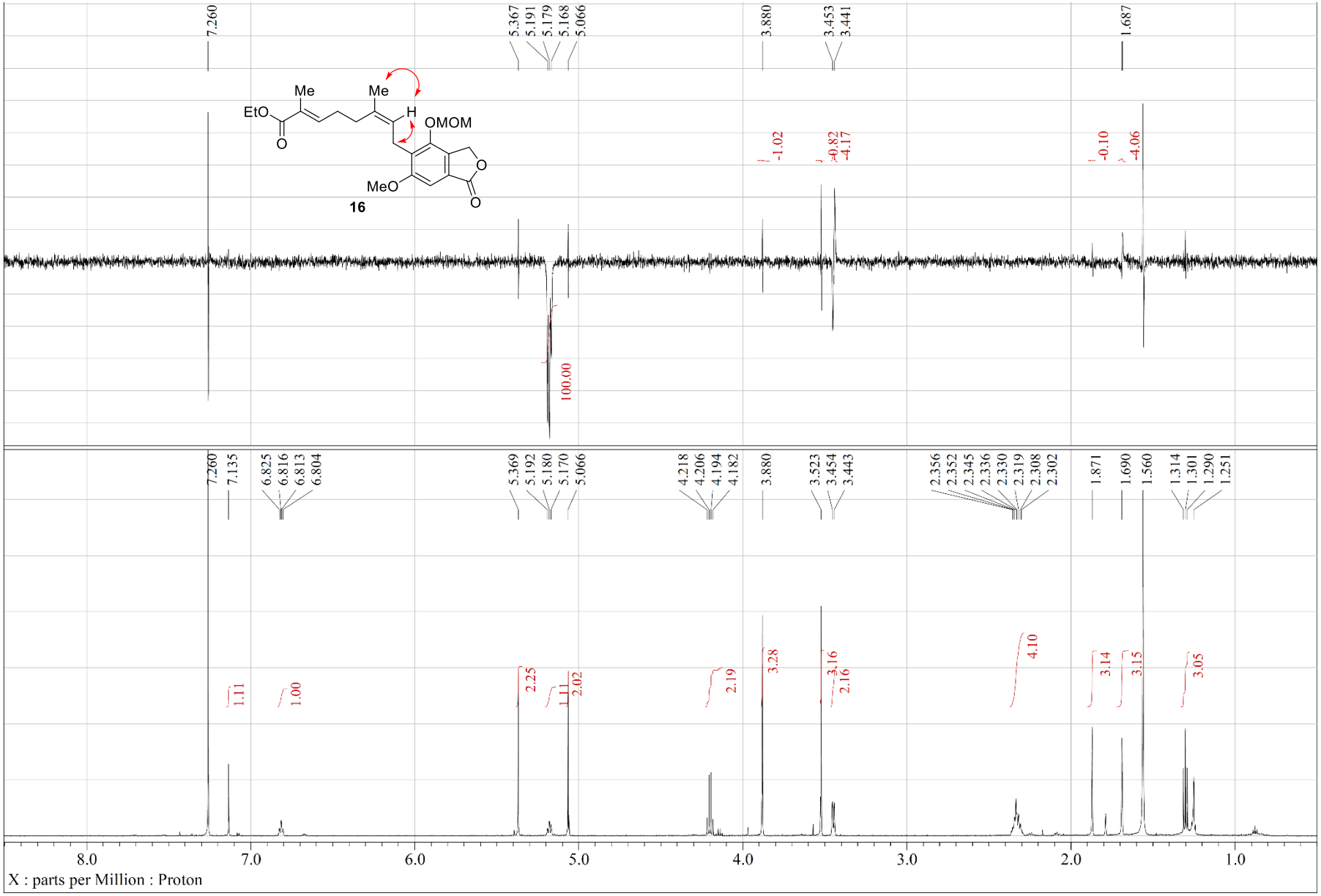


Figure S30. ^{1}H NMR spectrum (600 MHz, $CDCl_3$) of compound 17.

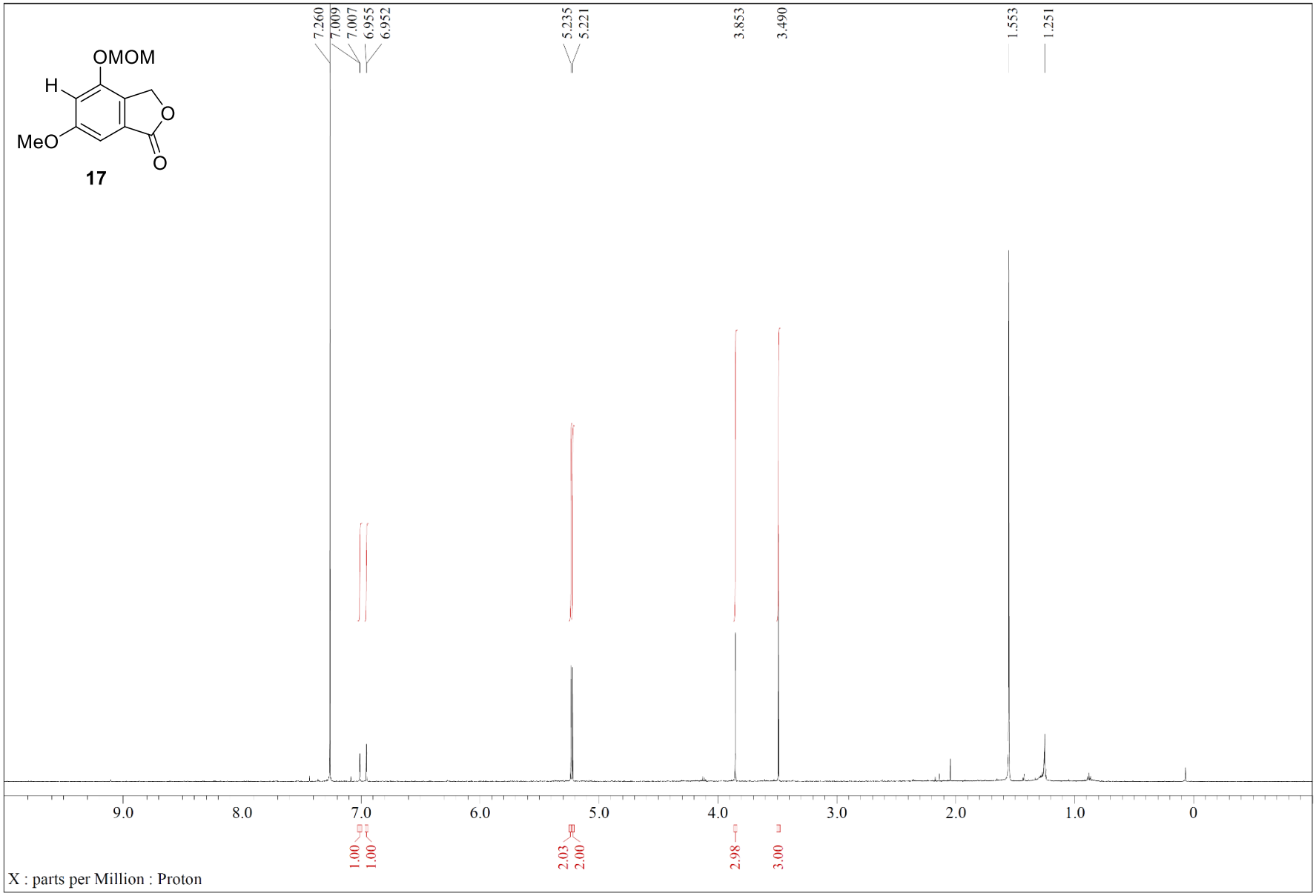


Figure S31. ^{1}H NMR spectrum (150 MHz, $CDCl_3$) of compound 17.

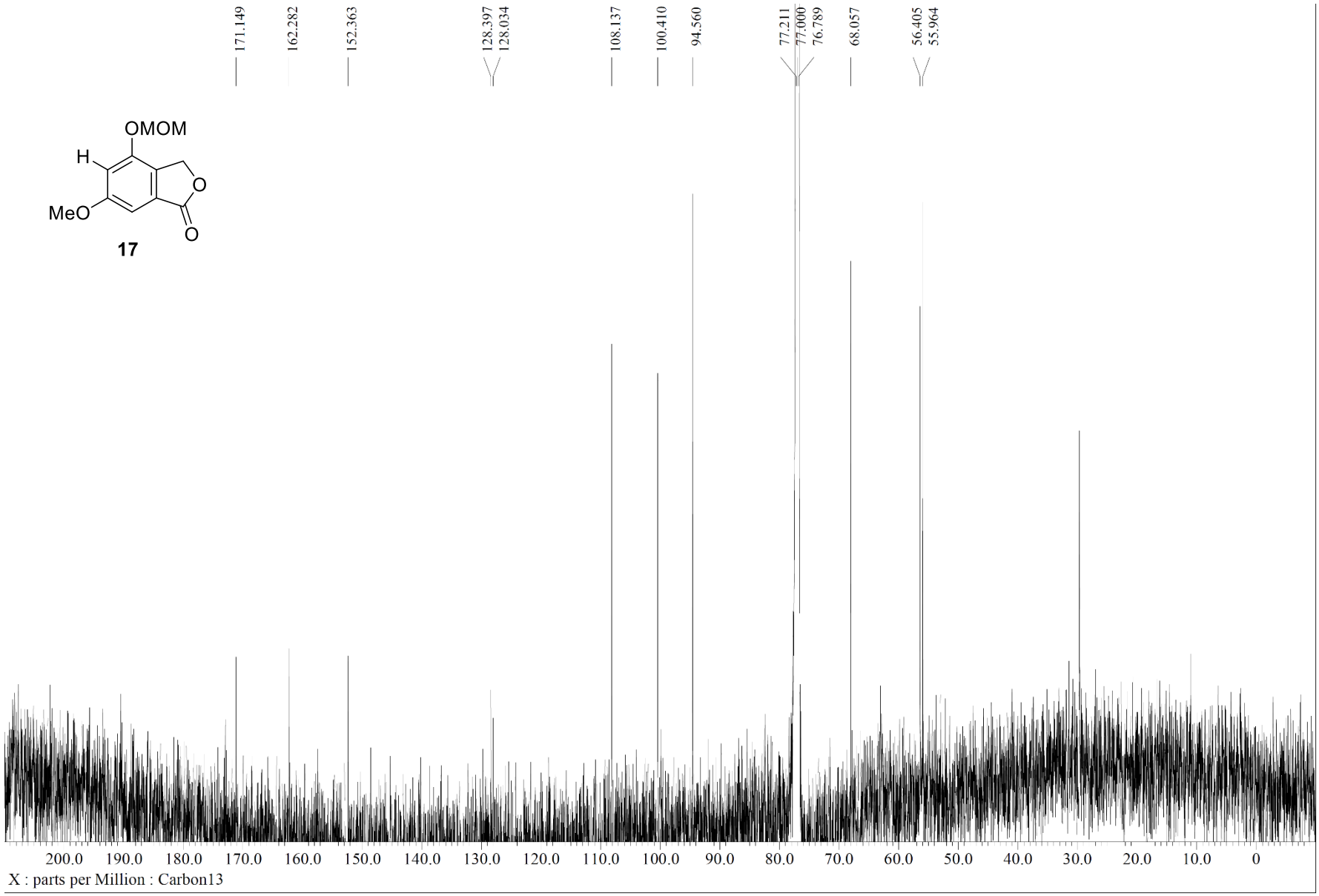


Figure S32. ^{1}H NMR spectrum (600 MHz, acetone-d_6) of compound 1.

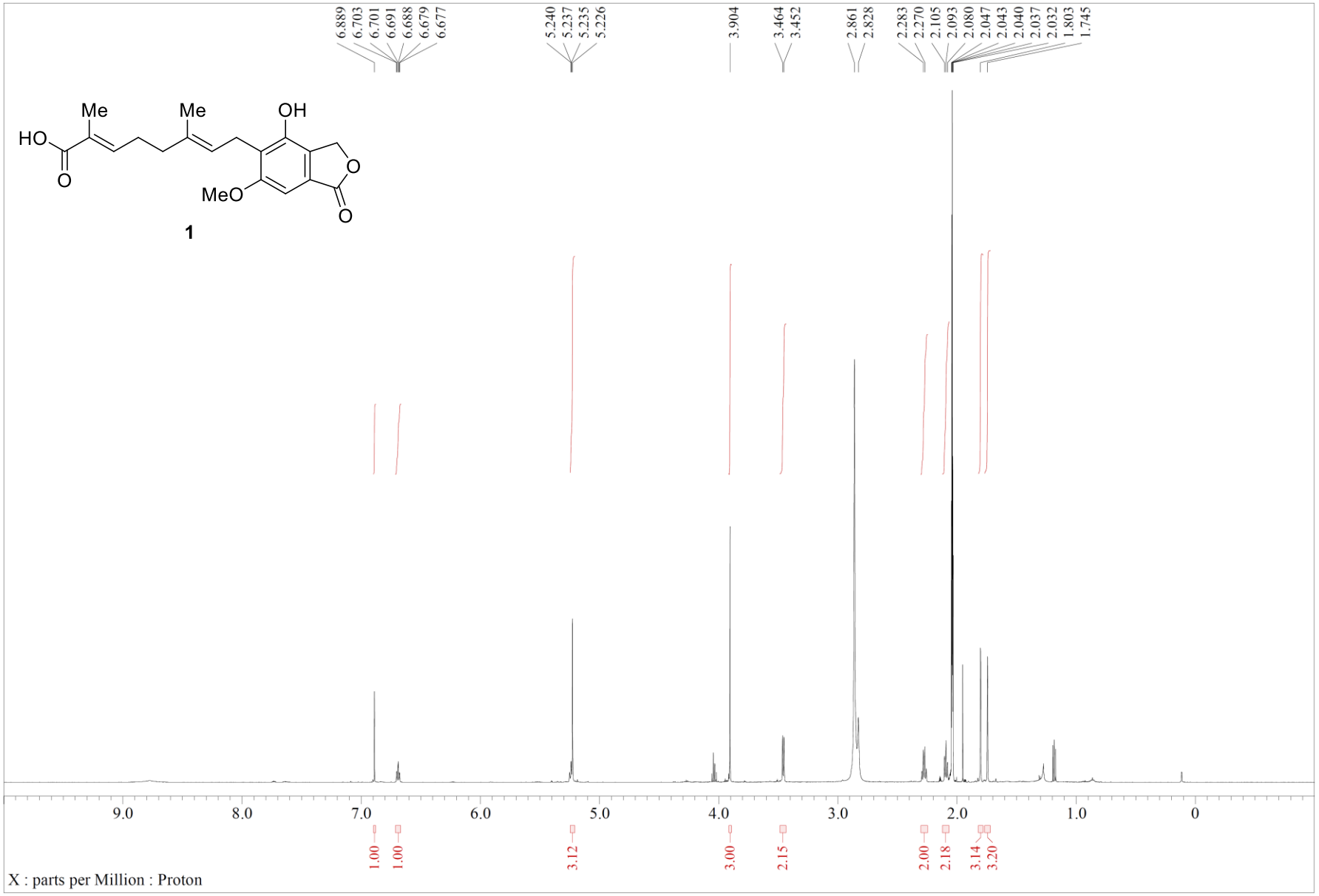
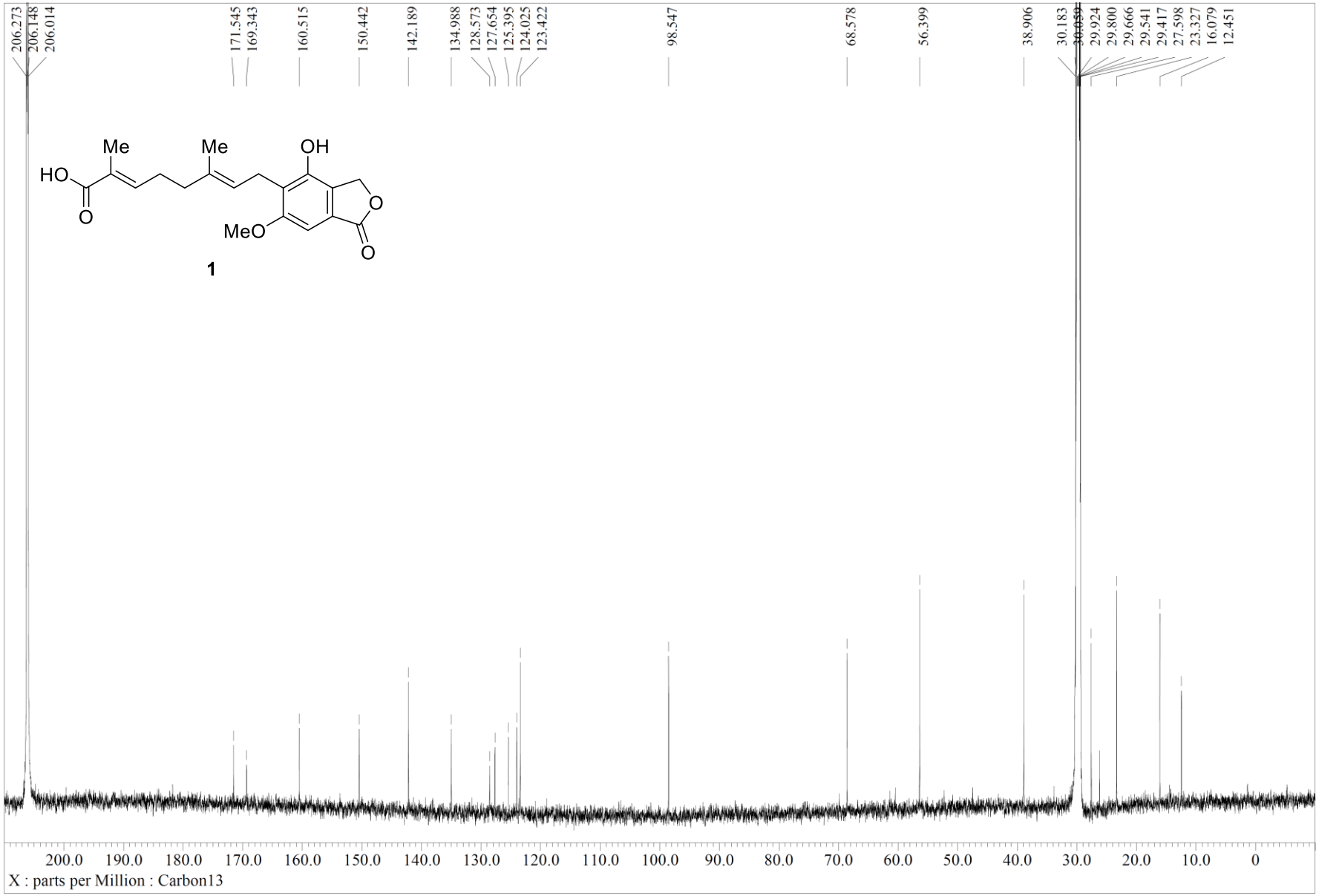


Figure S33. ^{13}C NMR spectrum (150 MHz, acetone-d_6) of compound 1.



4. References

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