Supporting Information

Isomerization of Allyl Ethers Initiated by Lithium Diisopropylamide (LDA)

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Materials and Methods. THF and DME were used from a dry solvent dispensing system. DMSO was distilled from calcium hydride under a reduced pressure. Diisopropylamine was distilled from sodium hydride. Solvents for extraction and chromatography were technical grade. Unless otherwise stated, purchased chemicals (Aldrich, Acros, Alfa Aesar) were used as received. The concentration of n-butyllithium in n-pentane was determined according to Kofron double titration method.[1] All reactions under anhydrous conditions were conducted using flame- or oven-dried glassware and standard syringe techniques under an atmosphere of argon.

NMR spectra were recorded at either 300 MHz or 400 MHz using $CDCl_3$ as the solvent. Chemical shifts are reported in ppm and were referenced to residual protonated solvent for ^{1}H-NMR (δ 7.27 ppm for $CHCl_3$) and ^{13}C-NMR (δ 77.00 ppm for $CDCl_3$). Data are represented as follows: chemical shift (multiplicity [br = broad, s = singlet, d = doublet, t = triplet, q = qartet, m = multiplet], integration, coupling constants in Hz). High-resolution mass spectra were obtained using electron impact or fast atom bombardment ionization methods.

General Procedures for the Synthesis of the Allyl Ethers. Allyl phenyl ether was bought from Aldrich directly. For the synthesis of other allyl ethers, it can be divided into three types.

Type I) (Table 1, entries 2-12 and compound **2a**) The starting alcohol (1 equiv) was dissolved in dry THF under an atmosphere of nitrogen at 0^{o}C. To this solution was added sodium hydride (1.3 equiv; 2.6 equiv for entry 12 and **2a**) and was allowed to stir for 10 minutes at 0^{o}C. After adding allyl bromide (1.3 equiv; 2.6 equiv for entry 12 and **2a**), the solution was then allowed to stir at room temperature for 30 minutes and reflux overnight.

The reaction was quenched by the addition of saturated ammonium chloride solution. The mixture was then extracted with diethyl ether three times and the organic phase was washed with water, brine and dried over $NaSO_4$. The solvent was removed by rotary evaporation and purification was performed by vacuum distillation except entries 2, 8 and entry 11 which were purified by flash column chromatography and simple distillation respectively.

Type II) (Table 1, entries 13, 15) To a solution of tert-butyldimethylsilyl chloride (1 equiv) in dry THF under an atmosphere of nitrogen was added imidazole (2.4 equiv). The solution was stirred for 5 minutes before allyl alcohol or 2-methylprop-2-en-1-ol (1.4 equiv) was added. The resulting mixture was allowed to stir for 2 days before being quenched by saturated ammonium chloride solution. The mixture was then extracted with diethyl ether three times and the organic phase was washed with water, brine and dried over $NaSO_4$. The solvent was removed by rotary evaporation and purification was performed by flash column chromatography.

Type III) (Table 1, entry 14) To a solution of 2-methylprop-2-en-1-ol (1 equiv) in dry THF under an atmosphere of nitrogen at 0^oC was added sodium hydride (1 equiv). The mixture was stirred at 0^oC for 10 minutes before adding 1-bromohexane (1 equiv). The reaction was stirred at room temperature for 30 minutes and was refluxed overnight. The reaction was quenched by the addition of saturated ammonium chloride solution. The mixture was then extracted with diethyl ether three times and the organic phase was washed with water, brine and dried over $NaSO_4$. The solvent was removed by rotary evaporation and purification was performed by flash column chromatography.

(Allyloxy)cyclopentane (Table 1, entry 2). (Allyloxy)cyclopentane was prepared as described above from cyclopentanol (0.50g, 5.8mmol). Purification (Hexanes : EtOAc = 25: 1) gave a light yellow oil (0.59g, 4.7mmol, 81%). ^1H NMR ($CDCl_3$, 300 MHz) δ 6.02-5.80

(m, 1H), 5.26 (d, 1H, *J* = 16.6 Hz), 5.14 (d, 1H, *J* = 10.0 Hz), 4.01-3.85 (m, 3H), 1.82-1.40 (m, 8H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 135.5, 116.3, 80.9, 69.8, 32.3, 23.6; HRMS-EI (M +) calcd for $C_8H_{14}O$ 126.1045, found 126.1042.

(Allyloxy)cyclohexane (Table 1, entry 3). (Allyloxy)cyclohexane was prepared as described above from cyclohexanol (9.62g, 96.0mmol). Purification (bp = 36-37^{o}C, 8 mmHg) gave a colorless oil (10.8g, 77.1mmol, 80%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.00-5.83 (m, 1H), 5.25 (d, 1H, *J* = 17.2Hz), 5.14 (d, 1H, *J* = 10.2Hz), 4.06-3.94 (m, 2H), 3.35-3.20 (m, 1H), 2.00-1.06 (m, 10H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 169.3, 155.1, 144.6, 129.7, 128.1, 126.9, 80.0, 67.0, 66.8, 66.7, 49.3, 46.0, 42.6, 35.0, 28.4; MS m/z 140 (M^+), 97, 83, 67, 58, 55.

(Allyloxy)cycloheptane (Table 1, entry 4). (Allyloxy)cycloheptane was prepared as described above from cycloheptanol (1.92g, 16.8mmol). Purification (bp = 54-56^{o}C, 8 mmHg) gave a colorless oil (2.07g, 13.4mmol, 80%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.99-5.85 (m, 1H), 5.26 (dd, 1H, *J* = 17.2, 1.2 Hz), 5.21-5.10 (d, 1H, *J* = 9.5 Hz), 3.99-3.93 (m, 2H), 3.47 (quintet, 1H, *J* = 4.0Hz), 1.95-1.83 (m, 2H), 1.71-1.49 (m, 8H) , 1.44-1.31 (m, 2H);^{13}C NMR ($CDCl_3$, 100 MHz) δ 135.7, 116.2, 79.5, 69.1, 33.9, 28.4, 23.0;HRMS-EI (M +) calcd for $C_{10}H_{18}O$ 154.1358, found 154.1355.

5-(allyloxy)-1,1,3,3-tetramethylcyclohexane (Table 1, entry 5). 5-(allyloxy)-1,1,3,3-tetramethylcyclohexane was prepared as described above from 3,3,5,5-tetramethyl-cyclohexanol (4.1g, 26.3mmol). Purification (bp = 78-80^{o}C, 8 mmHg) gave a colorless oil (3.6g, 18.4mmol, 70%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.00-5.87 (m, 1H), 5.27 (d, 1H, *J* = 16.2 Hz), 5.15 (d, 1H, *J* = 9.9 Hz), 4.02 (d, 2H, *J* = 4.92 Hz), 3.65-3.52 (m, 1H), 1.78 (d, 2H, *J* = 11.6Hz), 1.27-1.17 (m, 1H), 1.12-0.87 (m, 15H); ^{13}C NMR ($CDCl_3$, 100

MHz) δ 135.6, 116.3, 77.3, 69.0, 51.8, 45.3, 35.2, 32.3, 27.9; HRMS-EI (M +) calcd for $C_{13}H_{24}O$ 196.1827, found 196.1822.

(1S,2R,4R)-2-(allyloxy)-1-isopropyl-4-methylcyclohexane (Table 1, entry 6). (1S,2R,4R)-2-(allyloxy)-1-isopropyl-4-methylcyclohexane was prepared as described above from (-)-menthol (2.50g, 16.0mmol). Purification (bp = 78-79^{o}C, 8 mmHg) gave a colorless oil (2.56g, 13.1mmol, 82%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.04-5.85 (m, 1H), 5.26 (d, 1H, *J* = 17.2 Hz), 5.14 (d, 1H, *J* = 10.2 Hz), 4.21-4.06 (m, 1H), 3.99-3.82 (m, 1H), 3.08 (dt, 1H, *J* = 10.4, 4.1 Hz), 2.35-2.17 (m, 1H), 2.17-2.04 (m, 1H), 1.74-1.55 (m, 2H), 1.46-1.18 (m, 2H), 1.12-0.71 (m, 14H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 135.8, 116.3, 78.7, 69.5, 48.3, 40.5, 34.6, 31.5, 25.5, 23.4, 22.3, 21.0, 16.2; HRMS-EI (M +) calcd for $C_{13}H_{24}O$ 198.1827, found 198.1821.

1-(allyloxy)hexane (Table 1, entry 7). 1-(allyloxy)hexane was prepared as described above from 1-hexanol (3.25g, 31.9mmol). Purification (bp = 36-37^{o}C, 8 mmHg) gave a colorless oil (3.69g, 26.0mmol, 82%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.99-5.85 (m, 1H), 5.27 (dd, 1H, *J* = 17.2, 1.6 Hz), 5.16 (d, 1H, *J* = 10.3 Hz), 4.00-3.93 (m, 2H), 3.96 (t, 2H, *J* = 6.7 Hz), 1.66-1.52 (m, 2H), 1.41-1.24 (m, 6H), 0.89 (t, 3H, *J* = 6.64Hz); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 135.1, 116.6, 71.8, 70.5 31.7, 29.7, 25.9, 22.6, 14.0; HRMS-EI (M +) calcd for $C_9H_{18}O$ 142.1358, found 142.1360.

(1S,2S,4R)-2-(allyloxy)bicyclo[2.2.1]heptane (Table 1, entry 8). (1S,2S,4R)-2-(allyloxy)bicyclo[2.2.1]heptane was prepared as described above from (1S,2S,4R)-bicyclo[2.2.1]heptan-2-ol (0.50g, 4.5mmol). Purification (Hexanes: EtOAc = 30:1) gave a light yellow oil (0.62g, 4.1mmol, 91%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.02-5.35 (m, 1H), 5.26 (dd, 1H, *J* = 22.9, 2.2 Hz), 5.14 (dd, 1H, *J* = 13.2, 1.1 Hz), 4.02-3.86 (m, 2H), 3.45-3.35 (m, 1H), 2.37-2.29 (m, 1H), 2.29-2.20 (m, 1H), 1.65-1.33 (m, 5H), 1.16-0.91 (m,

2H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 135.5, 116.2, 82.1, 69.3, 40.4, 39.6, 35.2, 34.8, 28.5, 24.6; HRMS-EI (M +) calcd for $C_{10}H_{16}O$ 152.1201, found 152.1206.

(1S,2R,4S)-2-(allyloxy)-1,7,7-trimethylbicyclo[2.2.1]heptane (Table 1, entry 9). (1S,2R,4S)-2-(allyloxy)-1,7,7-trimethylbicyclo[2.2.1]heptane was prepared as described above from (1S,2R,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-ol (6.5g, 42.2mmol). Purification (bp = 68-70^{o}C, 8 mmHg) gave a colorless oil (6.8g, 35.1mmol, 83%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.03-5.82 (m, 1H), 5.28 (d, 1H, *J* = 17.1 Hz), 5.15 (d, 1H, *J* = 9.1 Hz), 4.11-3.99 (m, 1H), 3.99-3.82 (m, 1H), 3.73-3.55 (m, 1H), 2.21-1.93 (m, 2H), 1.83-1.55 (m, 2H) , 1.35-1.13 (m, 2H) , 1.12-0.96 (m, 1H) , 0.96-0.75 (m, 9H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 135.9, 115.7, 84.3, 70.8, 49.2, 47.8, 45.0, 36.3, 28.2, 26.7, 19.8, 18.8, 14.0; HRMS-EI (M +) calcd for $C_{13}H_{22}O$ 194.1671, found 194.1668.

(1S,2S,4S)-2-(allyloxy)-1,7,7-trimethylbicyclo[2.2.1]heptane (Table 1, entry 10). (1S,2S,4S)-2-(allyloxy)-1,7,7-trimethylbicyclo[2.2.1]heptane was prepared as described above from (1S,2S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-ol (3.0g, 19.5mmol). Purification (bp = 65-68^{o}C, 8 mmHg) gave a colorless oil (3.1g, 16.0mmol, 82%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.96-5.82 (m, 1H), 5.26 (dd, 1H, *J* = 17.2, 1.6 Hz), 5.11 (d, 1H, *J* = 10.5 Hz), 4.03-3.93 (m, 1H), 3.91-3.81 (m, 1H), 3.29-3.22 (m, 1H), 1.82-1.42 (m, 5H), 1.05-0.95 (m, 5H), 0.91 (s, 3H), 0.81 (s, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 135.9, 115.3, 107.6, 86.5, 83.8, 69.8, 49.2, 46.5, 45.1, 38.7, 34.5, 27.3, 20.24, 20.20, 11.9; HRMS-EI (M +) calcd for $C_{13}H_{22}O$ 194.1671, found 194.1662.

3-(allyloxy)-2,4-dimethylpentane (Table 1, entry 11). 3-(allyloxy)-2,4-dimethylpentane was prepared as described above from 2,4-dimethylpentan-3-ol (2.0g, 17.2mmol). Purification (bp = 125^{o}C, 760 mmHg) gave a colorless oil (2.2g, 14.1mmol, 82%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.04-5.86 (m, 1H), 5.26 (d, 1H, *J* = 17.2 Hz), 5.12

(d, 1H, J = 10.3 Hz), 4.12-4.04 (m, 2H), 2.70 (t, 1H, J = 5.6 Hz), 1.91-1.73 (m, 2H), 0.99-0.85 (m, 12H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 135.6, 115.9, 90.7, 74.8, 30.8, 20.3, 17.7; MS m/z 155 ($M-H^+$), 113, 71, 57, 55.

1,6-bis(allyloxy)hexane (Table 1, entry 12). 1,6-bis(allyloxy)hexane was prepared as described above from hexane-1,6-diol (3.5g, 29.7mmol). Purification (bp = 96-98^{o}C, 8 mmHg) gave a colorless oil (4.6g, 23.2mmol, 78%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.99-5.85 (m, 2H), 5.26 (d, 2H, J = 17.2 Hz), 5.16 (d, 2H, J = 10.0 Hz), 4.00-3.92 (m, 4H), 3.42 (t, 4H, J = 6.5 Hz), 1.66-1.54 (m, 4H), 1.44-1.33 (m, 4H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 135.0, 116.7, 71.8, 70.3, 29.7, 26.0; HRMS-FAB ($M + Na^+$) calcd for $C_{12}H_{22}O_2$ 221.1518, found 221.1522.

(Allyloxy)(tert-butyl)dimethylsilane (Table 1, entry 13). (Allyloxy)(tert-butyl)dimethylsilane was prepared as described above from tert-butylchloro-dimethylsilane (1.2g, 7.96mmol). Purification (Hexanes : EtOAc = 30: 1) gave a colorless oil (1.0g, 5.81mmol, 73%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.01-5.85 (d, 1H), 5.27 (d, 1H, J = 17.0 Hz), 5.08 (d, 1H, J = 9.0 Hz), 4.26-4.16 (m, 2H), 0.93 (s, 9H), 0.08 (s, 6H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 137.5, 113.9, 64.1, 25.9, 18.4, -5.3; MS m/z 172 (M^+), 115, 99, 85, 75, 73, 59, 57.

1-((2-methylallyl)oxy)hexane (Table 1, entry 14). 1-((2-methylallyl)oxy)hexane was prepared as described above from 2-methylprop-2-en-1-ol (0.77g, 10.7mmol). Purification (Hexanes : EtOAc = 20 : 1) gave a colorless oil (1.31g, 8.40mmol, 78%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.95 (s, 1H), 4.88 (s, 1H), 3.87 (s, 2H), 3.38 (t, 2H, J = 6.6 Hz), 1.99-1.21 (m, 11H), 0.89(t, 3H, J = 5.9 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 142.6, 111.7, 74.7, 70.2, 31.7, 29.7, 25.9, 22.6, 19.4, 14.0;HRMS-EI (M +) calcd for $C_{10}H_{20}O$

156.1514, found 156.1502.

tert-butyldimethyl((2-methylallyl)oxy)silane (Table 1, entry 15). tert-butyldimethyl((2-methylallyl)oxy)silane was prepared as described above from tert-butylchloro-dimethylsilane (0.6g, 3.98mmol). Purification (Hexanes : EtOAc = 30 : 1) gave a colorless oil (0.5g, 2.69mmol, 68%). ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.99 (s, 1H), 4.81 (s, 1H), 4.05 (s, 2H), 1.71 (s, 3H), 0.94 (s, 9H), 0.09 (s, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 145.0, 109.5, 67.2, 26.3, 19.3, 18.8, -5.0; HRMS-EI (M + Na) calcd for $C_{10}H_{22}OSi$ 186.1440, found 186.1431.

1,3-bis(allyloxy)-2,2,4-trimethylpentane (2a). 1,3-bis(allyloxy)-2,2,4-trimethyl-pentane was prepared as described above from 2,2,4-trimethylpentane-1,3-diol (4.0g, 27.4mmol). Purification (bp = 78-80 ^{o}C, 8 mmHg) gave a colorless oil (5.80g, 25.7mmol, 93%). ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.02-5.84 (m, 2H), 5.27 (d, 2H, J = 17.2 Hz), 5.14 (m, 2H), 4.18-3.92 (m, 4H), 3.31 (d, 1H, J = 8.6 Hz), 3.15-3.04 (m, 2H), 2.00-1.86 (m, 1H), 1.07-0.85 (m, 12H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 135.8, 135.3, 116.2, 115.3, 87.4, 77.9, 74.7, 72.1, 40.5, 28.9, 24.6, 22.3, 21.1, 17.9; MS m/z 227 ($M + H^+$), 183, 127, 113, 112, 85, 71, 57, 55.

General Procedures for the Isomerization of the Allyl Ethers (Table 1 and 2a) to Vinyl Ethers by LDA in THF. Under an argon atmosphere, a pentane solution of n-butyllithium (2 equiv) was added dropwise to a solution of diisopropylamine (2 equiv) in dry THF (4 mL) at -78^{o}C. After stirring for 5min, the solution was allowed to warm to 0^{o}C for 2 min and was then re-cooled to -78^{o}C. Allyl ether (1 equiv; except Table 1, entries 10-12) was added dropwise to the mixture at -78^{o}C and the mixture was allowed to stir for 5 min at -78^{o}C before warming up to room temperature. The reaction time of the

mixture varied between different kind of allyl ethers (Table 1). After being stirred for the corresponding time, the reaction mixture was quenched by saturated ammonium chloride solution. The mixture was then extracted with diethyl ether three times and the organic phase was washed with water, brine and dried over $NaSO_4$. The solvent was first removed by rotary evaporation and then by oil pump yielding a yellow liquid which was then characterized by NMR spectroscopy and HRMS.

(Z)-(prop-1-en-1-yloxy)benzene (Table 1, entry 1). (Z)-(prop-1-en-1-yloxy)benzene (187mg, 88%) was obtained from (allyloxy)benzene (165mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 7.28-7.30 (m, 2H), 7.10-7.00 (m, 3H), 6.41 (d, 1H, J = 4.4 Hz), 4.91 (m, 1H), 1.75 (d, 3H, J = 5.9 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 157.5, 140.8, 129.5, 122.3, 116.1, 107.5, 9.4; HRMS-EI (M +) calcd for $C_9H_{10}O$ 134.0732, found 134.0728.

(Z)-(prop-1-en-1-yloxy)cyclopentane (Table 1, entry 2). (Z)-(prop-1-en-1-yloxy)cyclopentane (151mg, 83%) was obtained from (allyloxy)cyclopentane (182mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.98-5.94 (dq, 1H, J = 6.2 Hz, 1.6 Hz), 4.41 (m, 1H), 4.23 (m, 1H), 1.75 (m, 6H), 1.57 (m, 5H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 144.3, 101.5, 82.9, 32.6, 23.5, 9.2; HRMS-EI (M +) calcd for $C_8H_{14}O$ 126.1045, found 126.1041.

(Z)-(prop-1-en-1-yloxy)cyclohexane (Table 1, entry 3). (Z)-(prop-1-en-1-yloxy)cyclohexane (182mg, 88%) was obtained from (allyloxy)cyclohexane (207mg) as described above. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.02-5.90 (d, 1H, J = 4.8 Hz), 4.45-4.30 (m, 1H), 3.64-3.45 (m, 1H), 1.90-1.10 (m, 13H), 2.49 (dd, 1H, J = 5.6, 12.4 Hz), 2.41 (dd, 1H, J = 7.5, 12.4), 1.42 (s, 9H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 114.2, 101.0, 78.9, 32.3, 25.6, 23.6, 9.3; HRMS-EI (M +) calcd for $C_9H_{16}O$ 140.1201, found 140.1205.

(Z)-(prop-1-en-1-yloxy)cycloheptane (Table 1, entry 4). (Z)-(prop-1-en-1-yl oxy)cycloheptane (202mg, 99%) was obtained from (allyloxy)cycloheptane (205mg) as described above. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.00-5.92 (d, 1H, J = 6.2 Hz), 4.44-4.32 (m, 1H), 3.84-3.72 (m, 1H), 1.96-1.32 (m, 15H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 144.5, 101.1, 81.8, 34.2, 28.3, 22.7, 9.3; HRMS-EI (M +) calcd for $C_{10}H_{18}O$ 154.1358, found 154.1356.

(Z)-1,1,3,3-tetramethyl-5-(prop-1-en-1-yloxy)cyclohexane (Table 1, entry 5). (Z)-1,1,3,3-tetramethyl-5-(prop-1-en-1-yloxy)cyclohexane (0.19g, 100%) was obtained from 5-(allyloxy)-1,1,3,3-tetramethylcyclohexane (0.19g) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.07-6.00 (d, 1H, J = 6.2 Hz), 4.44-4.34 (m, 1H), 3.90-3.78 (m, 1H), 1.83-1.73 (m, 2H), 1.62-1.54 (m, 3H), 1.31-0.89 (m, 16H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 144.3, 100.9, 75.9, 51.6, 45.4, 34.9, 32.3, 28.0, 9.3; HRMS-EI (M +) calcd for $C_{13}H_{24}O$ 196.1827, found 196.1824.

(1S,2R,4R)-1-isopropyl-4-methyl-2-((Z)-prop-1-en-1-yloxy)cyclohexane (Table 1, entry 6). (1S,2R,4R)-1-isopropyl-4-methyl-2-((Z)-prop-1-en-1-yloxy)cyclohexane (0.20g, 100%) was obtained from (1S,2R,4R)-2-(allyloxy)-1-isopropyl-4-methylcyclohexane (0.20g) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.04-5.99 (dq, 1H, J = 6.2 Hz, 1.6 Hz), 4.38-4.30 (m, 1H), 3.35 (dt, 1H, J = 10.7, 4.3 Hz), 2.21-2.10 (m, 1H), 2.05-1.96 (m, 1H), 1.69-1.59 (m, 5H), 1.45-1.32 (m, 2H), 1.06-0.76 (m, 11H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ114.8, 100.2, 81.3, 47.8, 41.6, 34.4, 31.6, 25.9, 23.6, 22.2, 20.8, 16.4, 9.3; HRMS-EI (M +) calcd for $C_{13}H_{24}O$ 196.1827, found 196.1819.

(Z)-1-(prop-1-en-1-yloxy)hexane (Table 1, entry 7). (Z)-1-(prop-1-en-1-yloxy)hexane (180mg, 92%) was obtained from 1-(allyloxy)hexane (195mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.98-5.91 (d, 1H, J = 4.2 Hz), 4.43-4.32 (m, 1H),

3.76-3.68 (t, 2H, J = 6.6 Hz), 1.67-1.54 (m, 5H), 1.42-1.24 (m, 6H), 0.94-0.85 (t, 3H, J = 6.5 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 145.6, 100.7, 72.1, 31.6, 29.7, 25.5, 22.6, 14.0, 9.2; HRMS-EI (M +) calcd for $C_9H_{18}O$ 142.1358, found 142.1360.

(1S,2S,4R)-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (Table 1, entry 8). (1S,2S,4R)-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (125mg, 89%) was obtained from (1S,2S,4R)-2-(allyloxy)bicyclo[2.2.1]heptane (140mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.98-5.93 (dq, 1H, J = 6.2 Hz, 1.6 Hz), 4.45-4.37 (m, 1H), 3.70-3.65 (m, 1H), 2.34-2.24 (m, 2H), 1.64-1.40 (m, 8H), 1.15-0.59 (m, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 144.1, 101.5, 83.8, 41.3, 39.3, 35.2, 34.7, 28.5, 24.2, 9.3; HRMS-EI (M +) calcd for $C_{10}H_{16}O$ 152.1201, found 152.1206.

(1S,2R,4S)-1,7,7-trimethyl-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (Table 1, entry 9). (1S,2R,4S)-1,7,7-trimethyl-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (185mg, 95%) was obtained from (1S,2R,4S)-2-(allyloxy)-1,7,7-trimethyl-bicyclo[2.2.1]heptane (195mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.99-5.94 (dq, 1H, J = 6.1 Hz, 1.6Hz), 4.39-4.31 (m, 1H), 3.94-3.88 (m, 1H), 2.25-2.14 (m, 1H), 2.10-2.01 (m, 1H), 1.79-1.58 (m, 5H), 1.33-1.21 (m, 2H), 1.15-1.07 (m, 1H), 0.94-0.84 (m, 9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 145.8, 100.4, 86.6, 49.5, 48.0, 45.0, 36.4, 28.1, 26.7, 19.8, 18.8, 13.8, 9.4; HRMS-EI (M +) calcd for $C_{13}H_{22}O$ 194.1671, found 194.1668.

(1S,2S,4S)-1,7,7-trimethyl-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (Table 1, entry 10). (1S,2S,4S)-1,7,7-trimethyl-2-((Z)-prop-1-en-1-yloxy)bicyclo[2.2.1]heptane (0.20g, 100%) was obtained from (1S,2S,4S)-2-(allyloxy)-1,7,7-trimethyl-bicyclo[2.2.1]heptane (0.20g) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.95-5.88 (dq, 1H, J = 6.2Hz Hz, 1.6 Hz), 4.35-4.26 (m, 1H), 3.59-3.52 (m, 1H), 1.90-1.47 (m,

8H), 1.08-0.80 (m, 11H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ145.7, 99.7, 88.9, 49.5, 46.6, 45.0, 38.7, 33.9, 27.2, 20.2, 20.0, 11.8, 9.3; HRMS-EI (M +) calcd for $C_{13}H_{22}O$ 194.1671, found 194.1665.

(Z)-2,4-dimethyl-3-(prop-1-en-1-yloxy)pentane (Table 1, entry 11). (Z)-2,4-dimethyl-3-(prop-1-en-1-yloxy)pentane (180mg, 87%) was obtained from 3-(allyloxy)-2,4-dimethylpentane (207mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.02-5.93 (d, 1H, *J* = 6.2 Hz), 4.22-4.11 (m, 1H), 3.00-2.90 (m, 1H), 1.95-1.80 (m, 2H), 1.64-1.55 (m, 3H), 0.98-0.83 (m, 12H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 149.3, 97.7, 93.5, 30.9, 20.4, 17.9, 9.6; HRMS-EI (M +) calcd for $C_{10}H_{20}O$ 156.1514, found 156.1510.

1,6-bis((Z)-prop-1-en-1-yloxy)hexane (Table 1, entry 12). 1,6-bis((Z)-prop-1-en-1-yloxy)hexane (192mg, 100%) was obtained from 1,6-bis(allyloxy)hexane (192mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.02-5.91 (dq, 2H, *J* = 8.2 Hz, 2.2 Hz), 4.44-4.33 (m, 2H), 3.85-3.68 (m, 4H), 1.82-1.36 (m, 14H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 145.6, 100.8, 71.9, 29.7, 25.6, 9.2; HRMS-EI (M +) calcd for $C_{12}H_{22}O_2$ 198.1620, found 198.1612.

(Z)-tert-butyldimethyl(prop-1-en-1-yloxy)silane (Table 1, entry 13). (Z)-tert-butyldimethyl(prop-1-en-1-yloxy)silane (160g, 81%) was obtained from (allyloxy)(tert-butyl)dimethylsilane (198mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.25-6.17 (dq, 1H, *J* = 4.1 Hz, 1.6 Hz), 4.57-4.46 (m, 1H), 1.63-1.55 (dd, 3H, *J* = 6.7, 1.6 Hz), 0.94 (s, 9H), 0.14 (s, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 139.3, 104.8, 25.7, 18.3, 8.9, -5.4; HRMS-EI (M +) calcd for $C_9H_{20}OSi$ 172.1283, found 172.1288.

1-((2-methylprop-1-en-1-yl)oxy)hexane (Table 1, entry 14). 1-((2-methylprop-1-en-1-yl)oxy)hexane (140mg, 100%) was obtained from 1-((2-methylallyl)oxy)hexane

(140mg) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 5.79 (s, 1H), 3.65 (t, 2H, *J* = 6.6 Hz), 1.68-1.47 (m, 8H), 1.42-1.23 (m, 6H), 0.89 (t, 3H, J =6.6 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 140.1, 110.1, 71.8, 31.6, 29.7, 25.56, 25.59, 19.5, 14.9, 14.0; HRMS-EI (M +) calcd for $C_{10}H_{20}O$ 156.1514, found 156.1518.

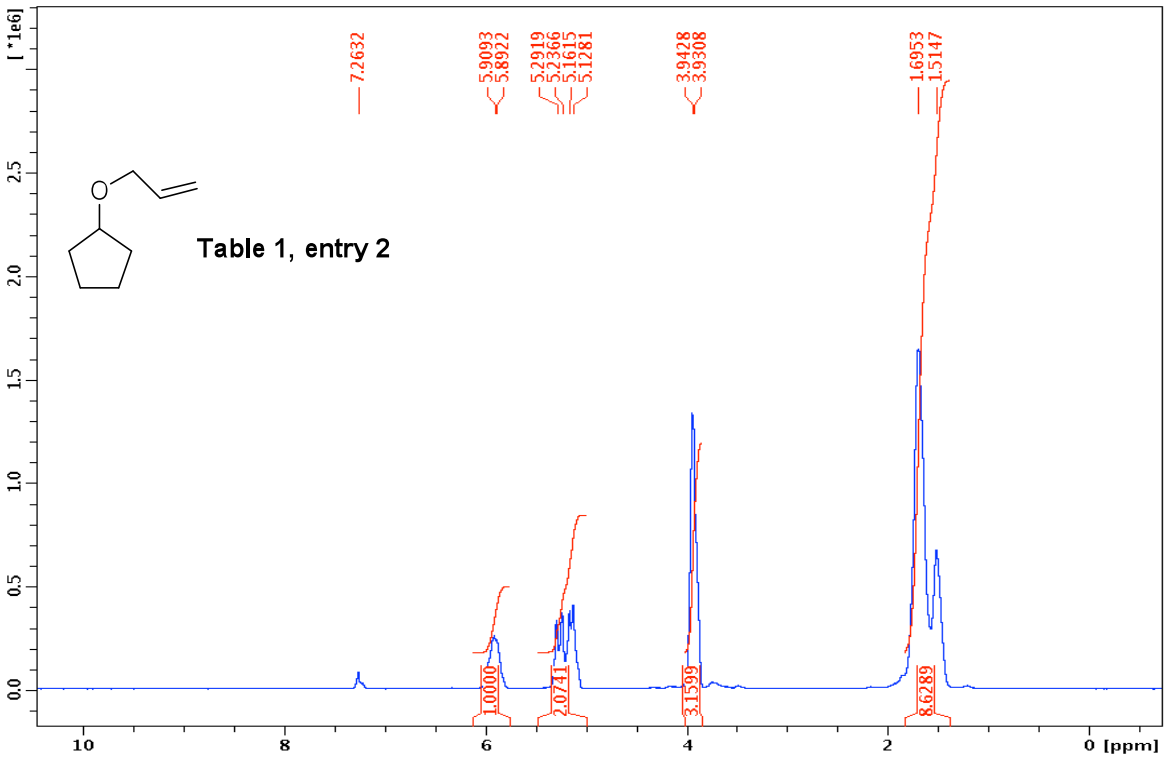
tert-butyldimethyl((2-methylprop-1-en-1-yl)oxy)silane (Table 1, entry 15). tert-butyldimethyl((2-methylprop-1-en-1-yl)oxy)silane (0.17g, 85%) was obtained from tert-butyldimethyl((2-methylallyl)oxy)silane (0.20g) as described above. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 6.04 (s, 1H), 1.61 (s, 3H), 1.54 (s, 3H), 0.93 (s, 9H), 0.12 (s, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 133.5, 113.3, 25.7, 19.3, 18.2, 14.7, -5.3; HRMS-EI (M +) calcd for $C_{10}H_{22}OSi$ 186.1440, found 186.1431.

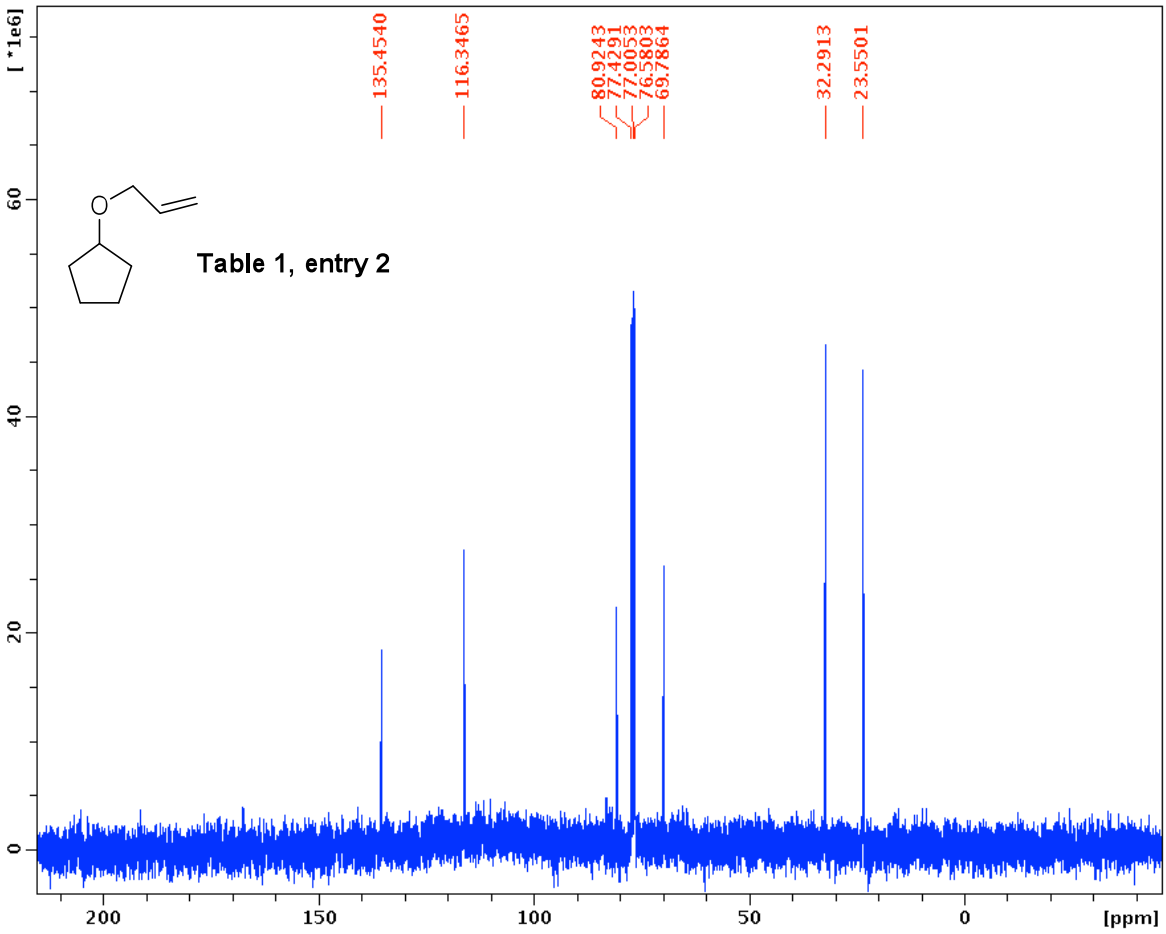
(Z)-3-(allyloxy)-2,2,4-trimethyl-1-(prop-1-en-1-yloxy)pentane (Isomerization of 2a). (Z)-3-(allyloxy)-2,2,4-trimethyl-1-(prop-1-en-1-yloxy)pentane (0.194g, 0.86mmol, 100%) was obtained from 1,3-bis(allyloxy)-2,2,4-trimethyl-pentane (0.194g, 0.86mmol) as described above. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 6.01-5.83 (m, 2H), 5.26 (d, 1H, *J* = 17.1 Hz), 5.10 (d, 1H, *J* = 10.4 Hz), 4.40-4.26 (m, 1H), 4.19-3.90 (m, 2H), 3.63 (d, 1H, *J* = 9.3 Hz), 3.36 (d, 1H, *J* = 9.4 Hz), 3.12 (s, 1H), 2.03-1.85 (m, 1H), 1.63-1.51 (m, 3H), 1.08-0.82 (m, 12H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 146.4, 135.6, 115.4, 100.0, 87.3, 79.4, 74.7, 40.9, 28.8, 24.7, 22.2, 20.5, 17.9, 9.2; MS m/z 226 (M^+), 183, 157, 127, 125, 113, 111, 85, 71, 69, 57, 55.

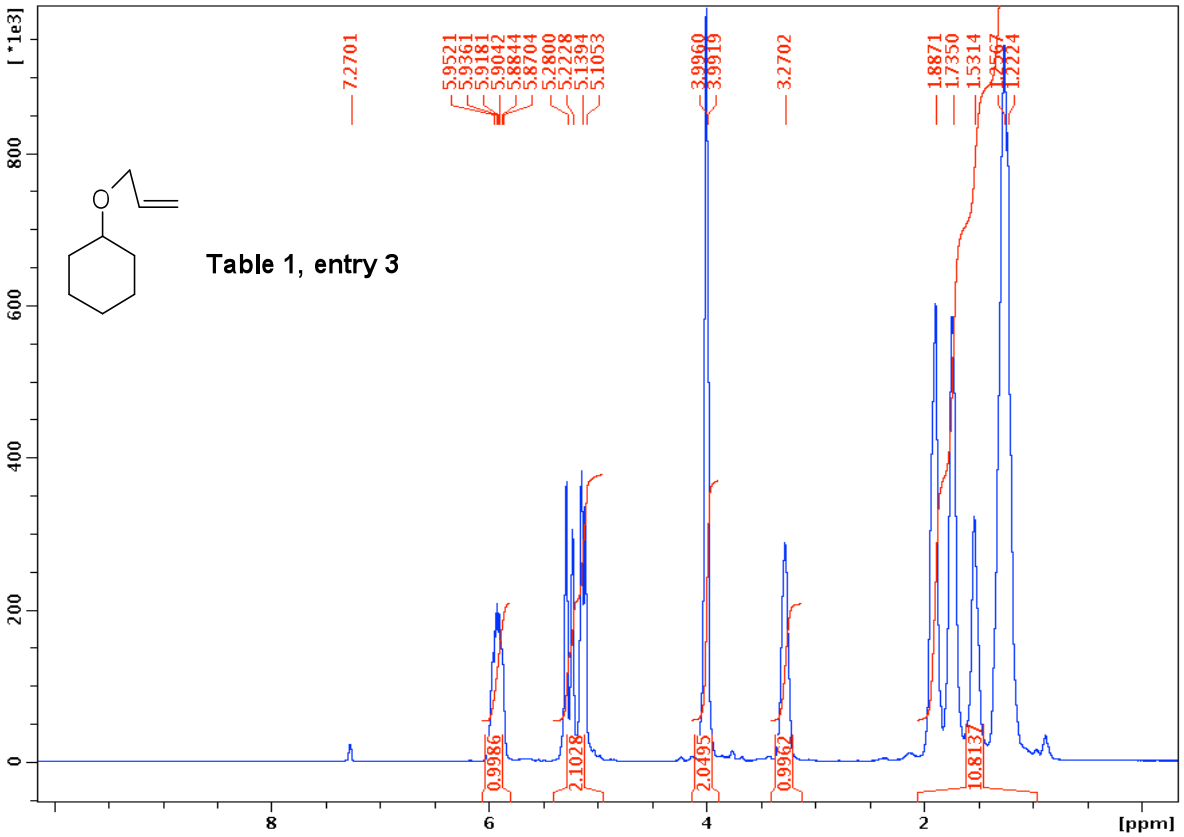
General Procedures for the Isomerization of the Allyl Ethers (Table 4) to Vinyl Ethers by tBuOK in DMSO. Under an argon atmosphere, potassium t-butoxide (2 equiv) purchased directly from Aldrich was dissolved in 3mL dry DMSO at room temperature. To this solution was added allyl ether (1 equiv) and the reaction mix

ture was stirred at room temperature, 60^{o}C or 120^{o}C for the amount of time shown in Table 3. The reaction mixture was quenched by saturated ammonium chloride solution. The mixture was then extracted with diethyl ether three times and the organic phase was washed with water, brine and dried over $NaSO_4$. The solvent was first removed by rotary evaporation and then by oil pump yielding a light yellow liquid which was then characterized by NMR spectroscopy to determine the ratio between the starting allyl ether and vinyl ether product.

^{1}H and ^{13}C NMR Spectra for Allyl Ethers



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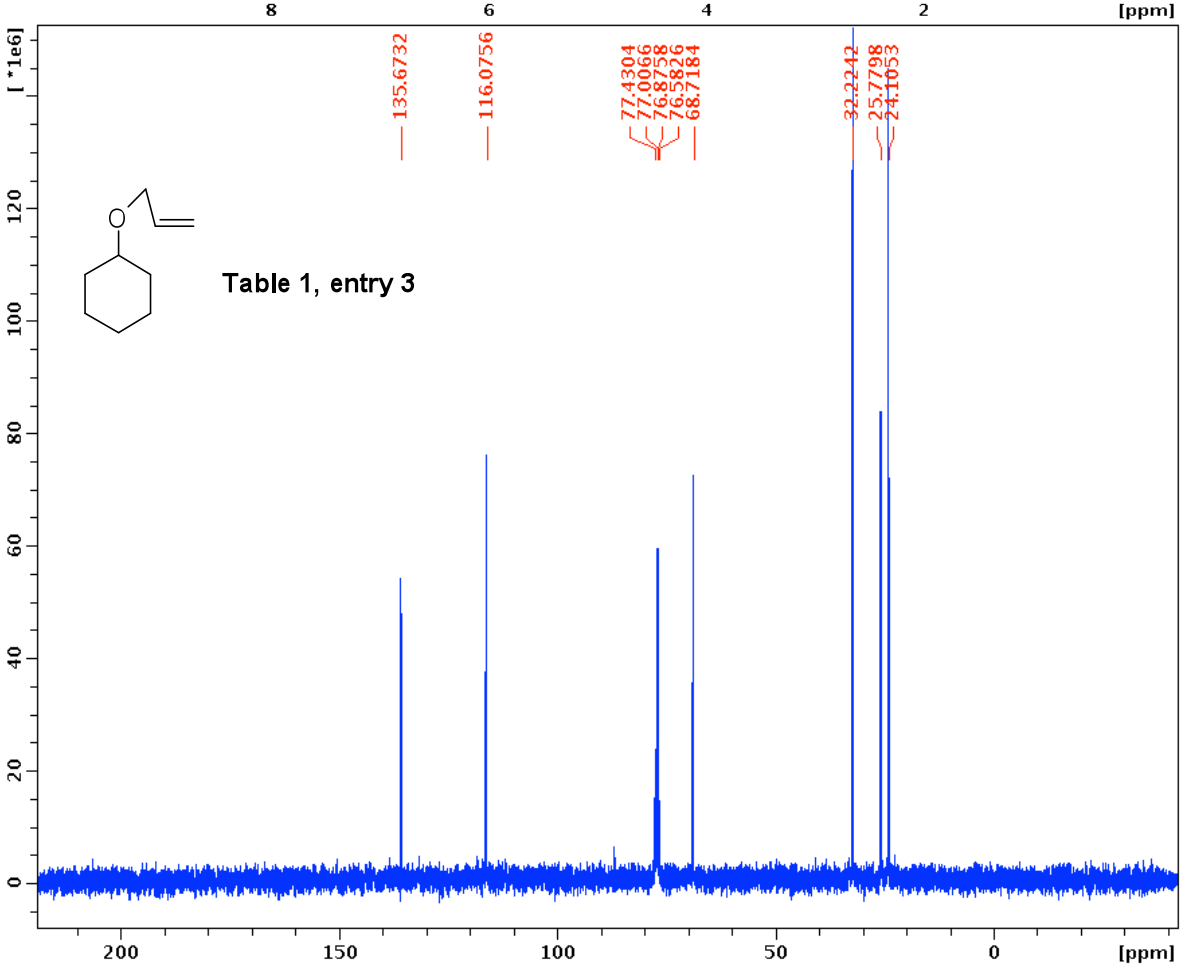
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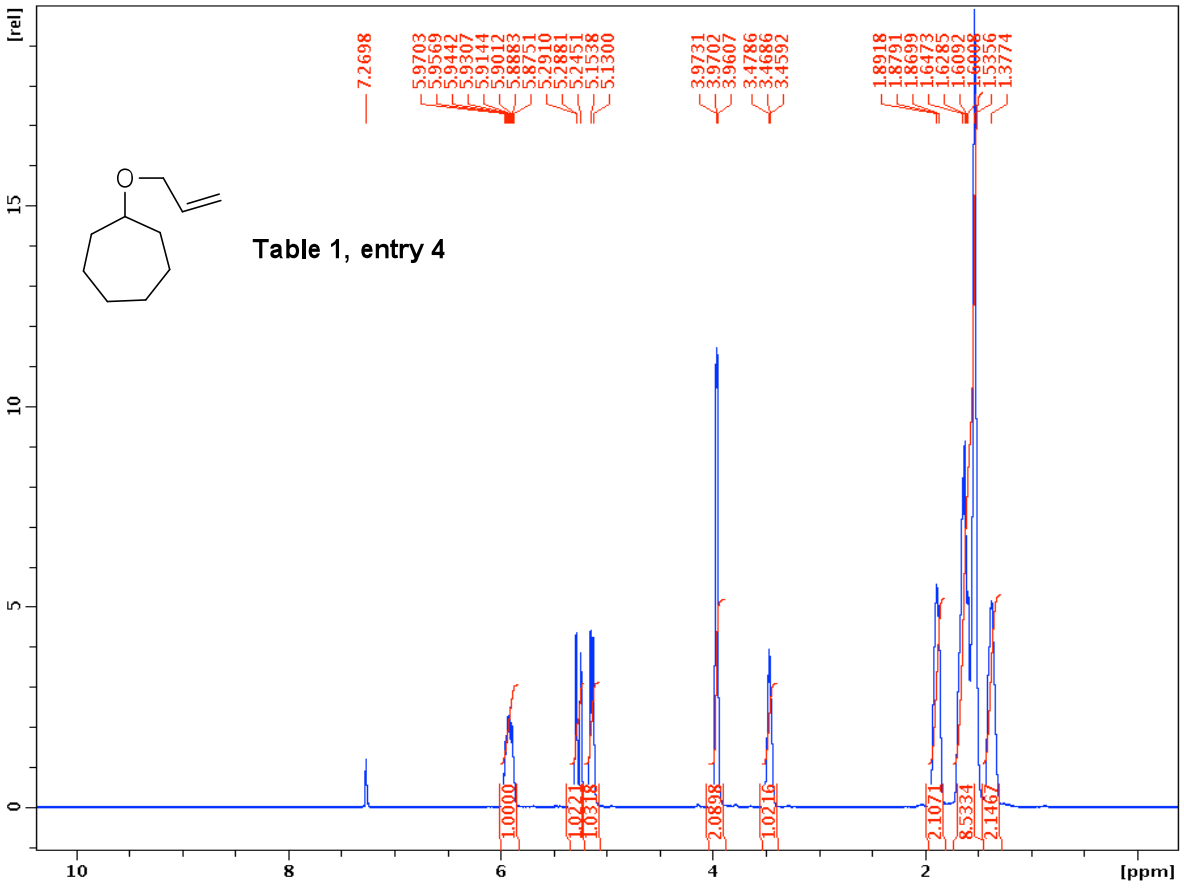
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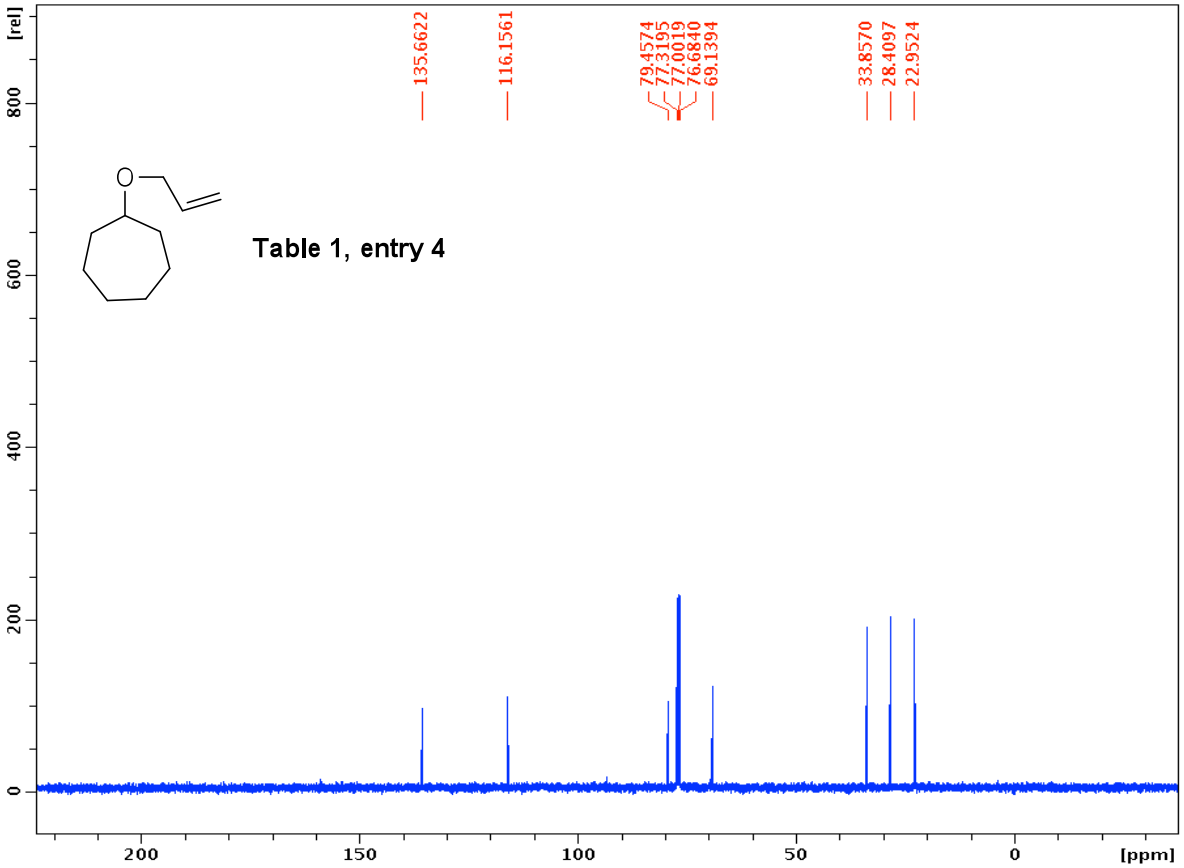
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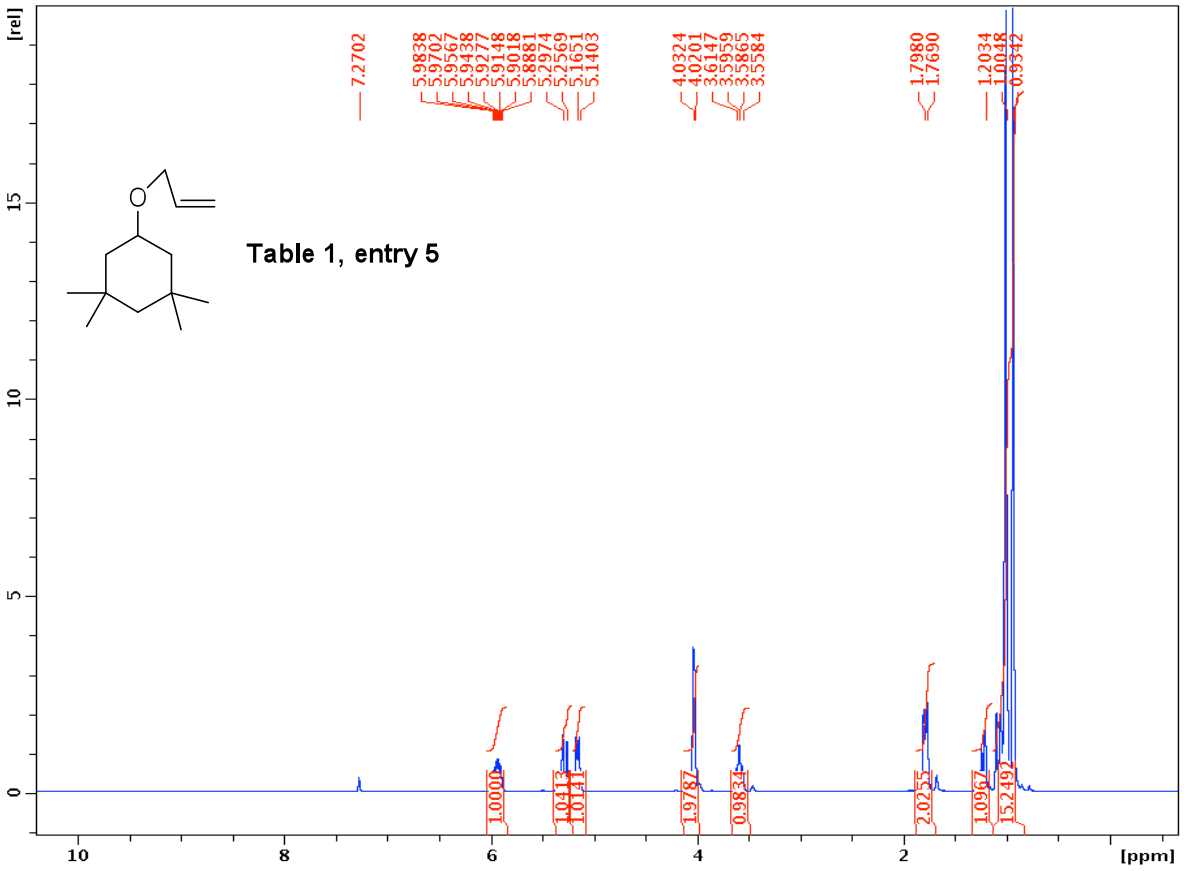
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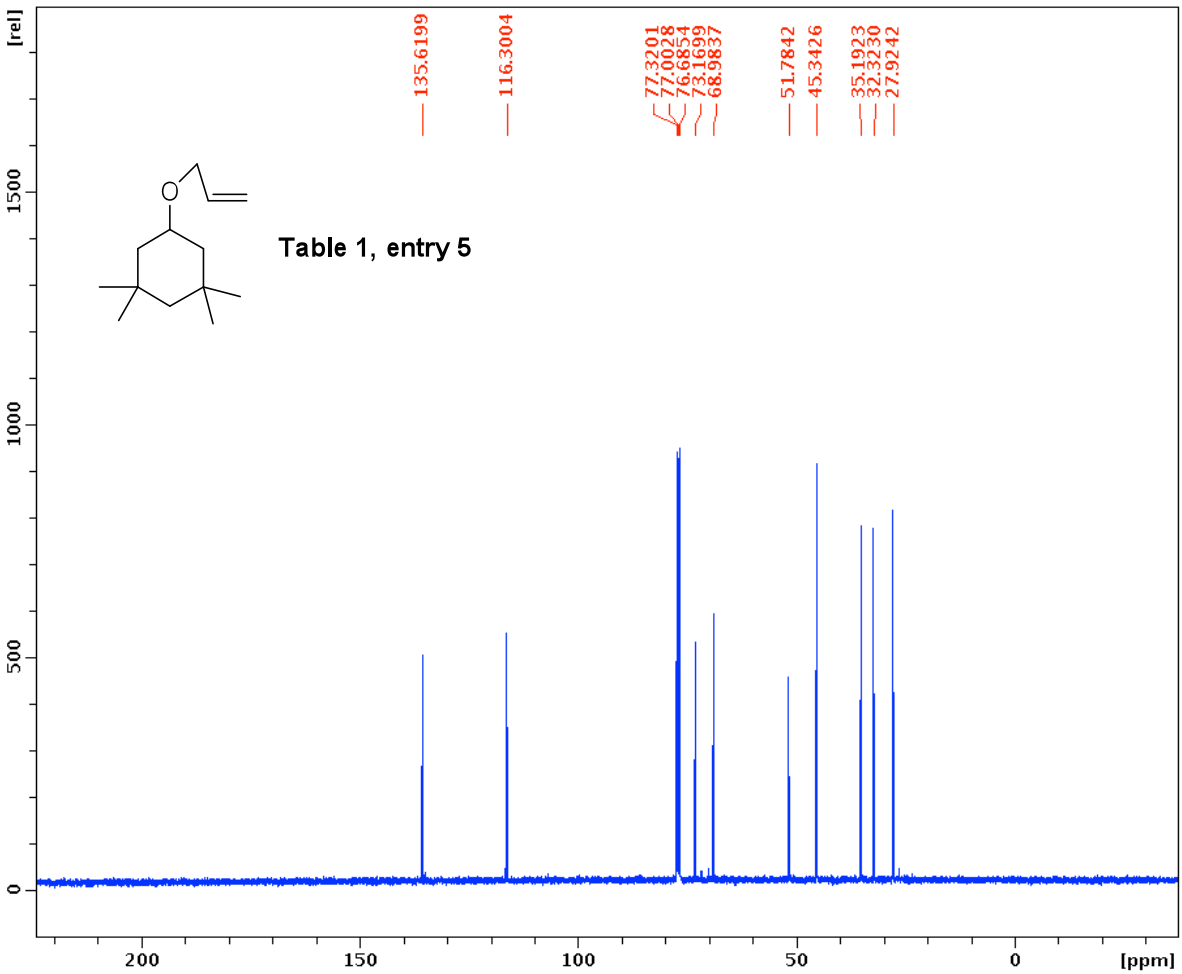
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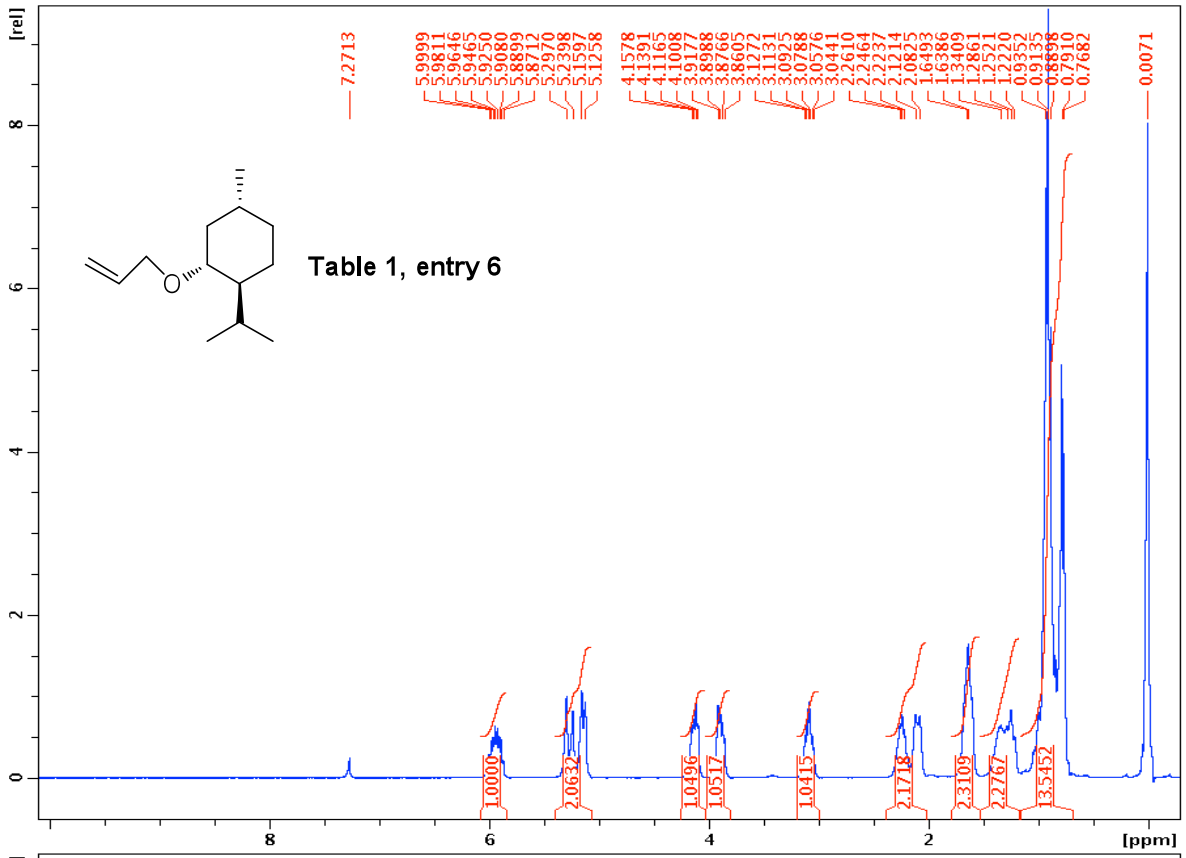
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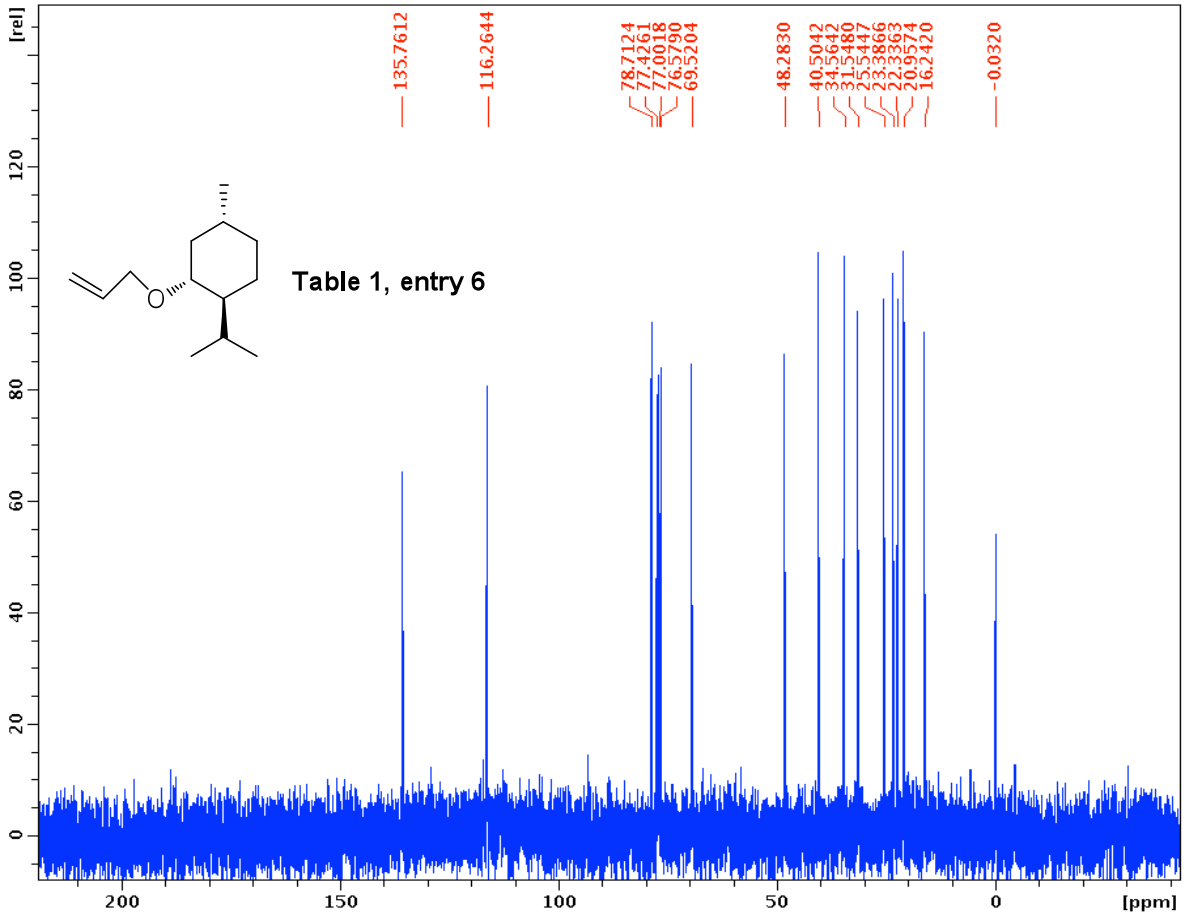
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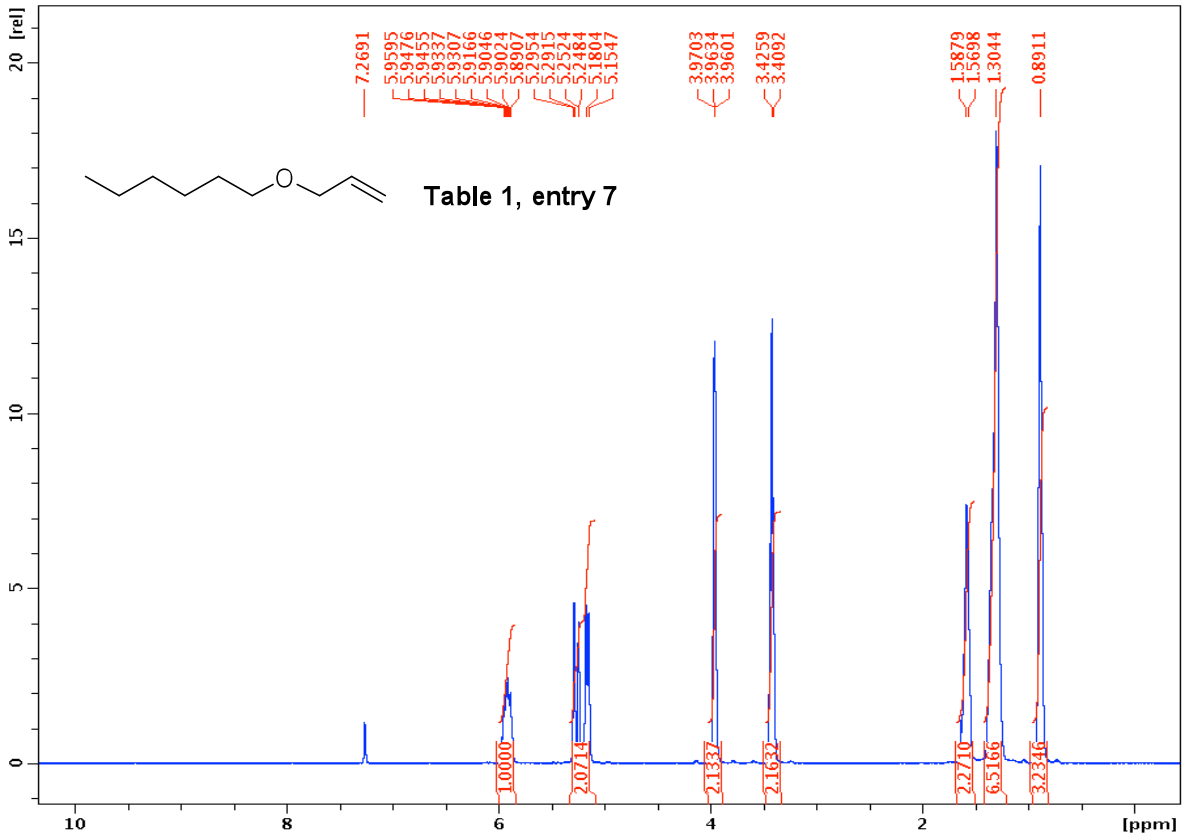
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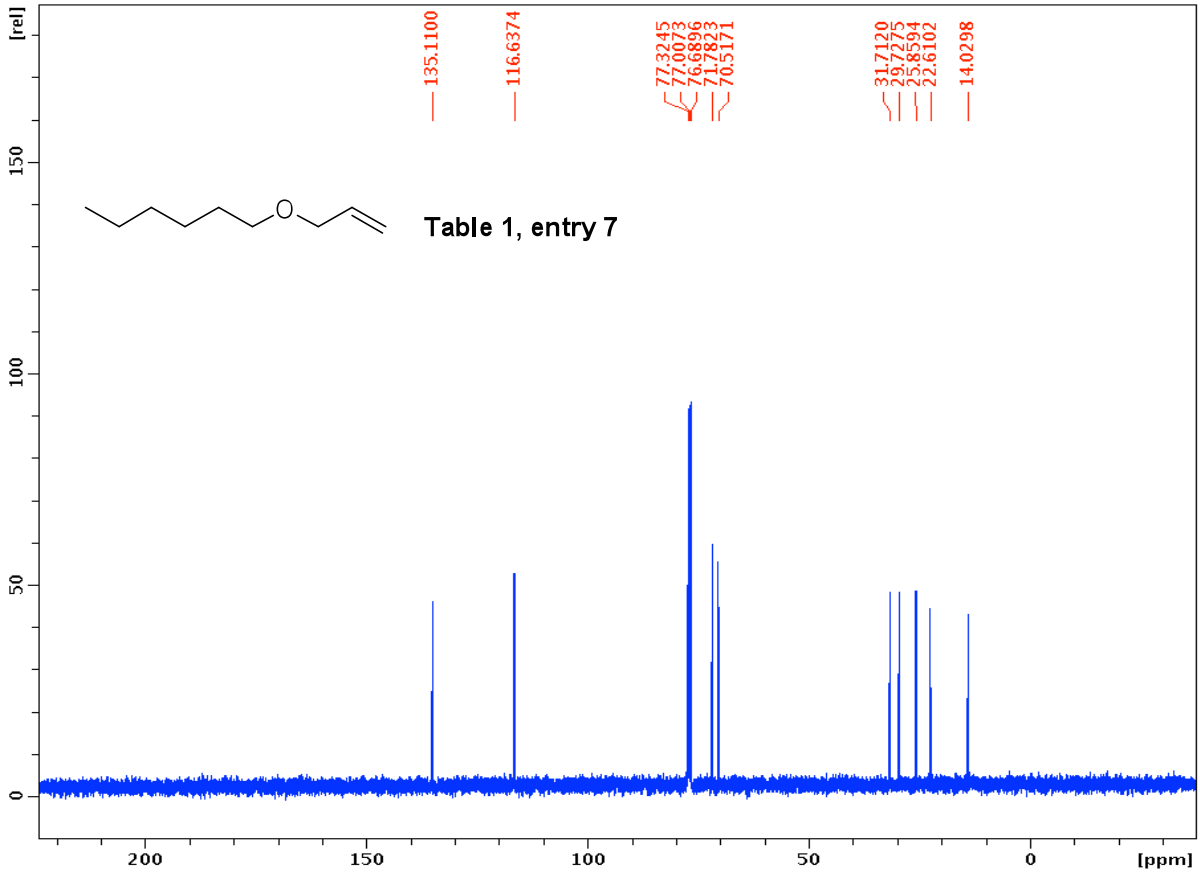
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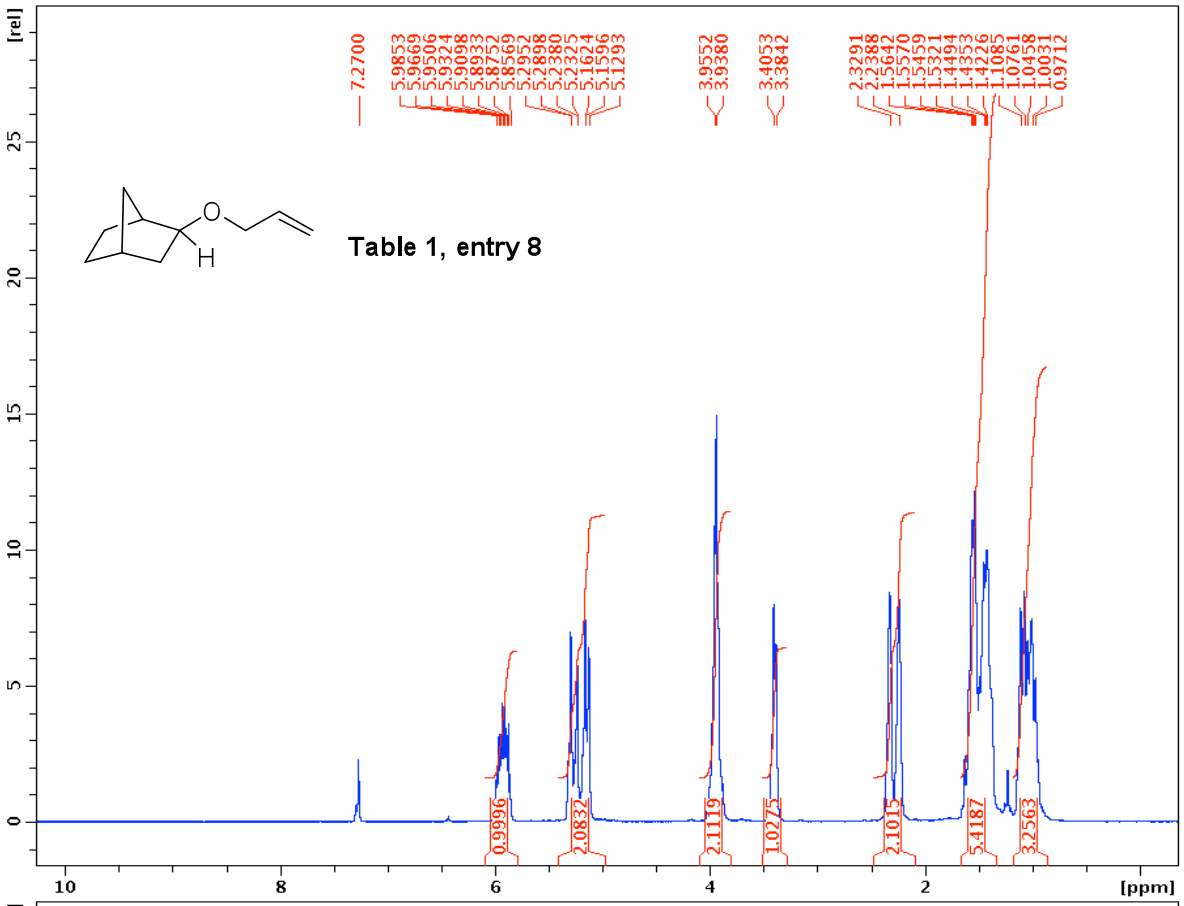
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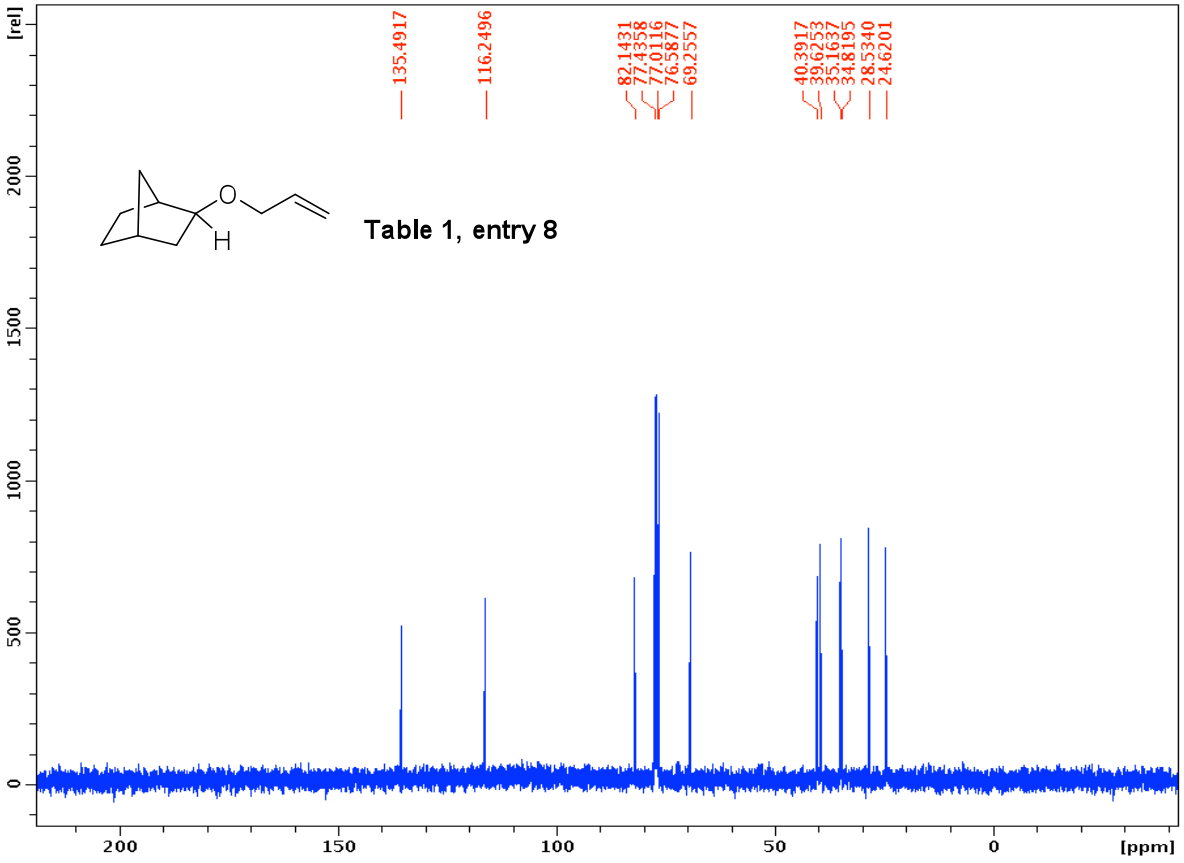
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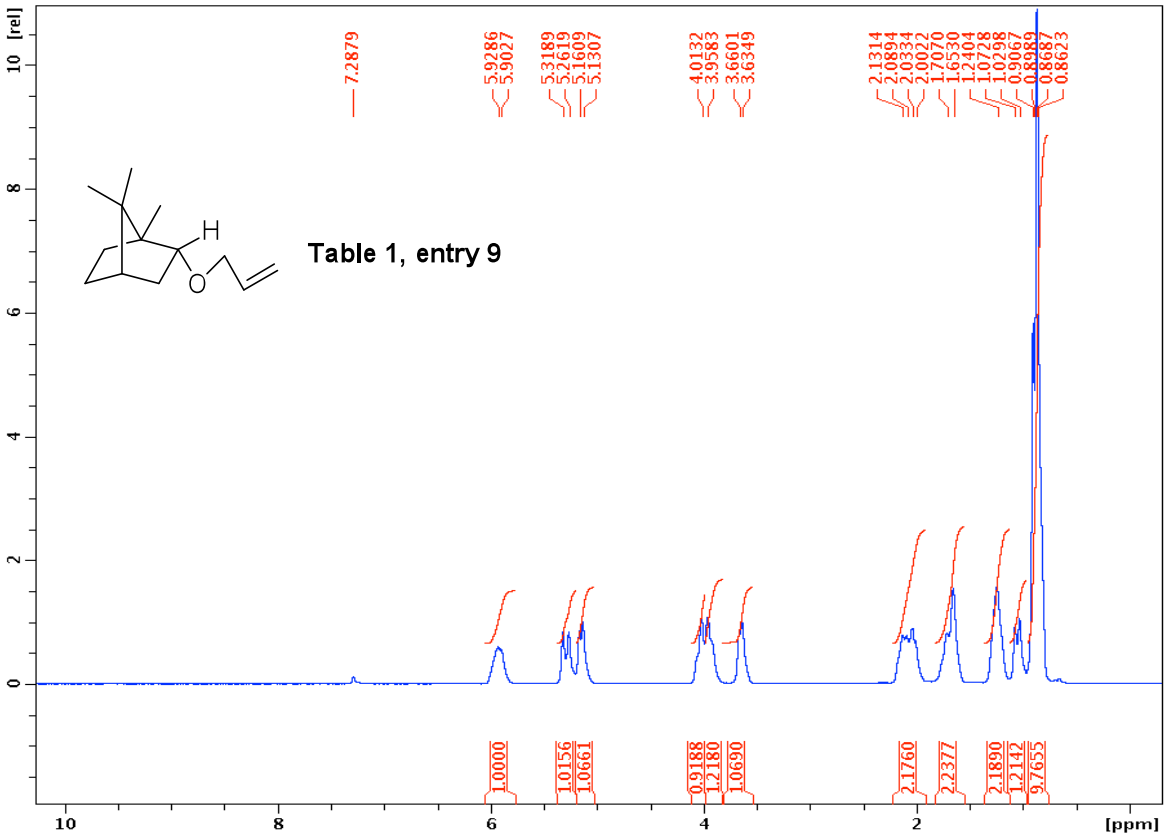
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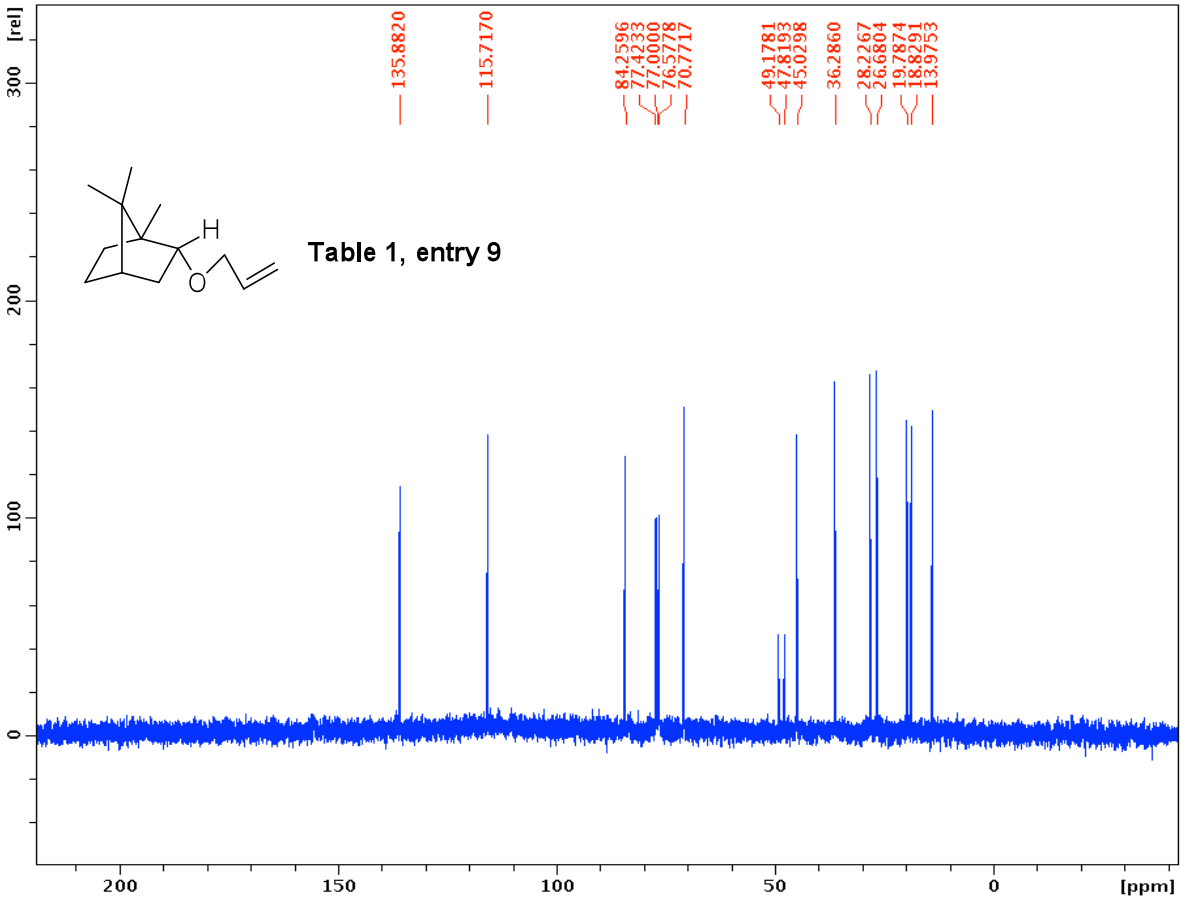
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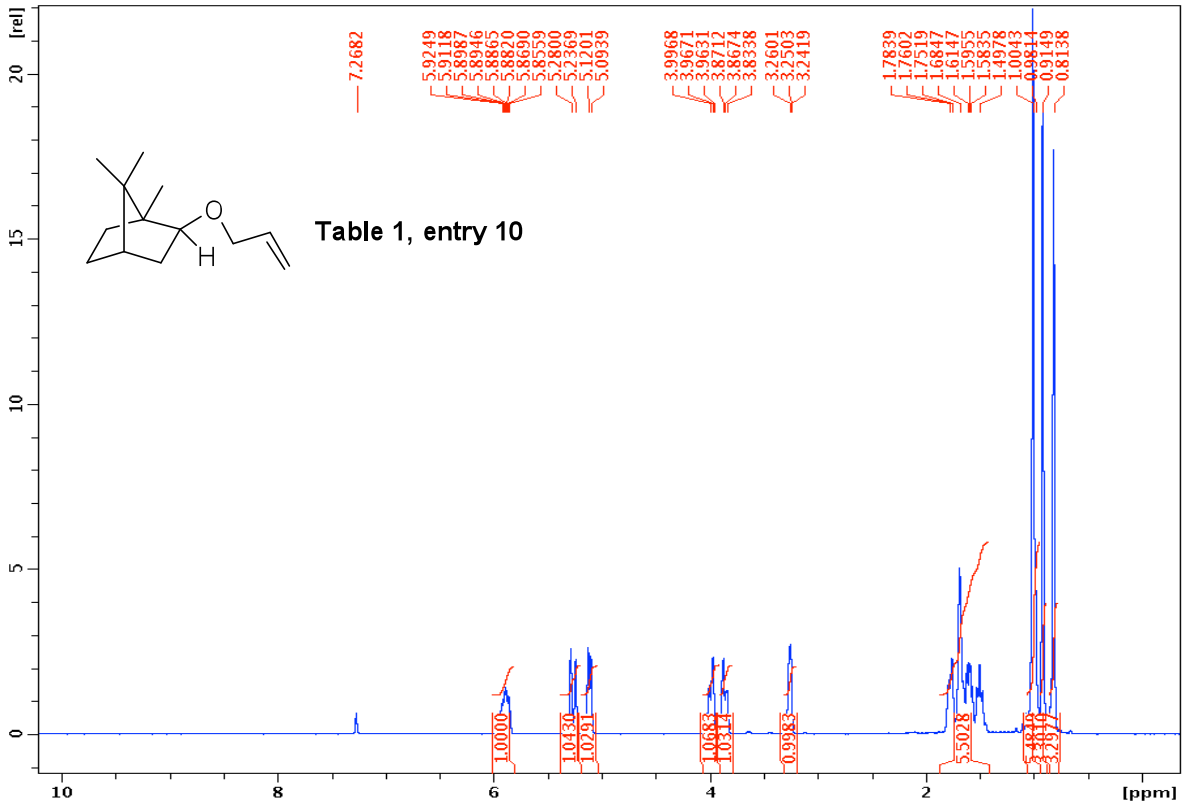
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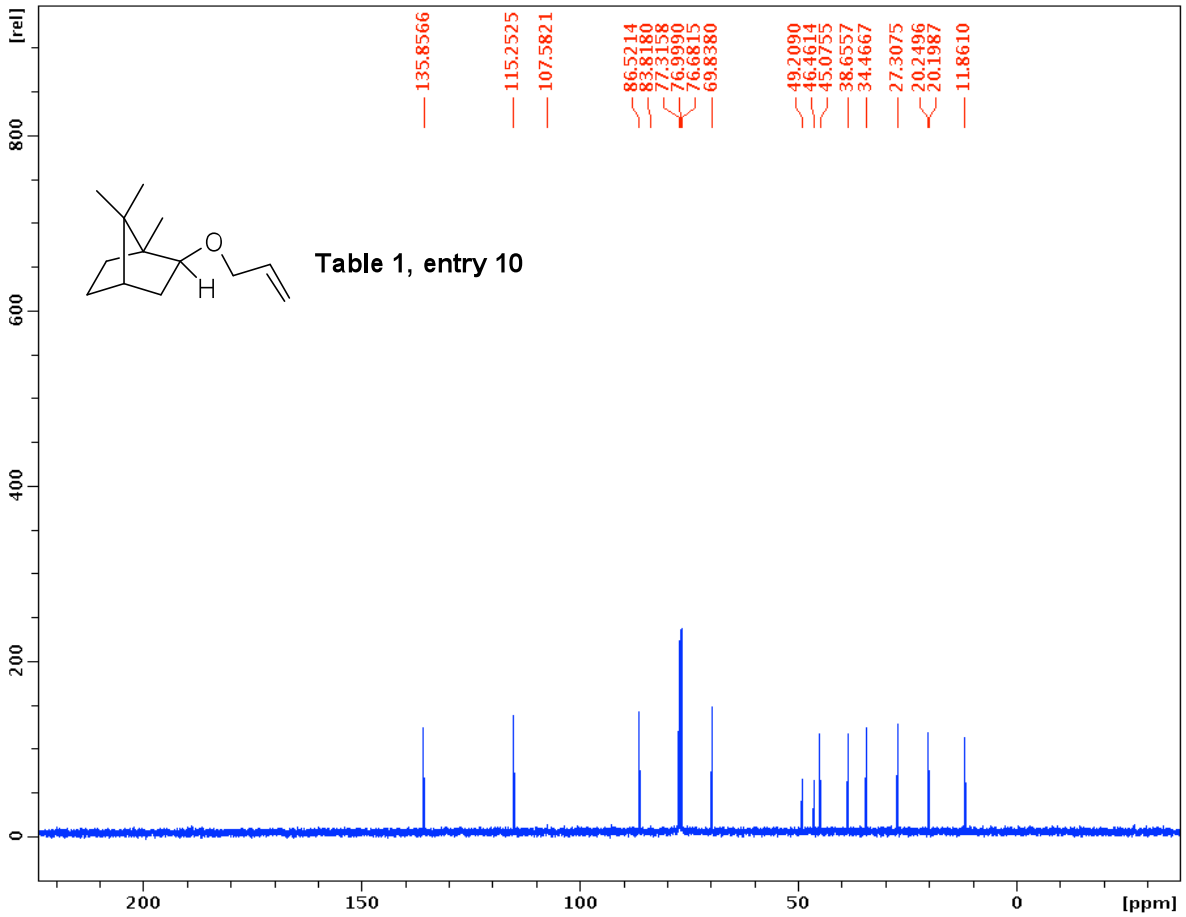
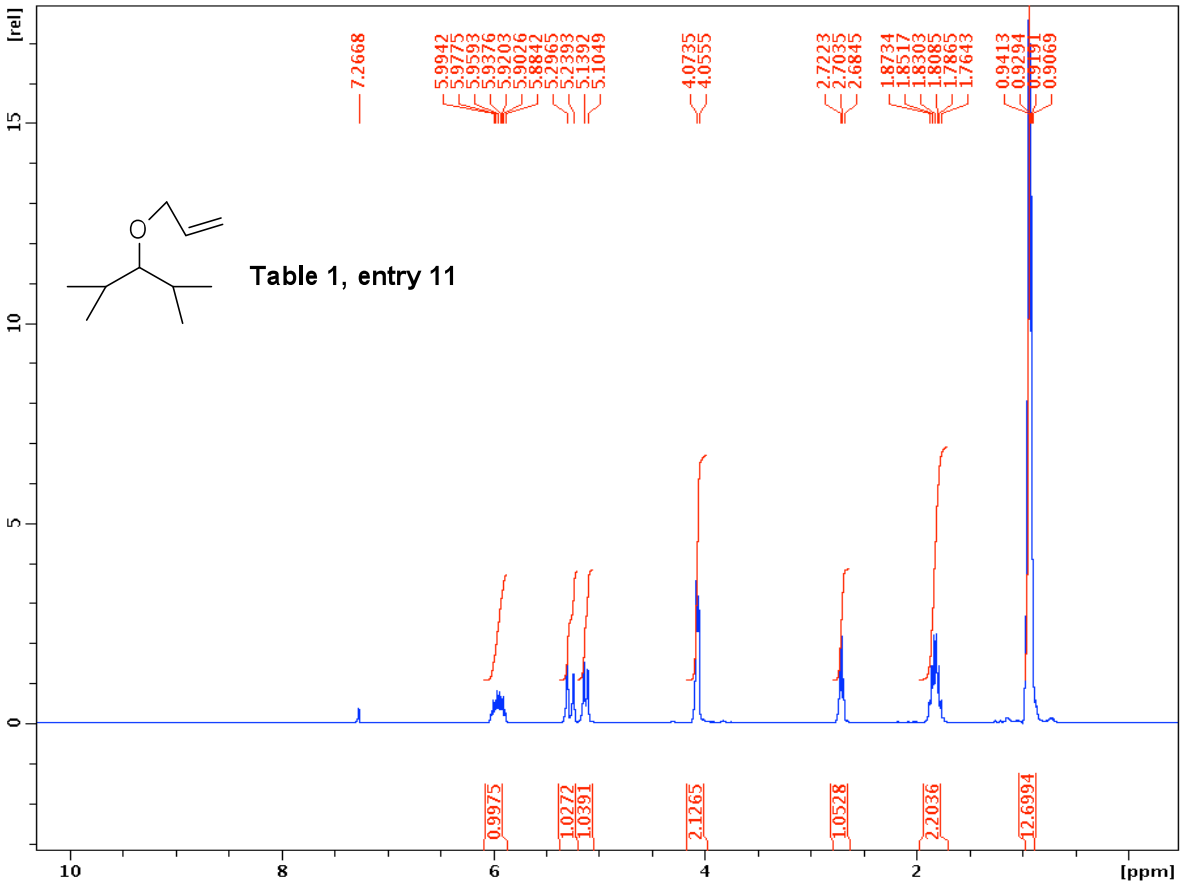
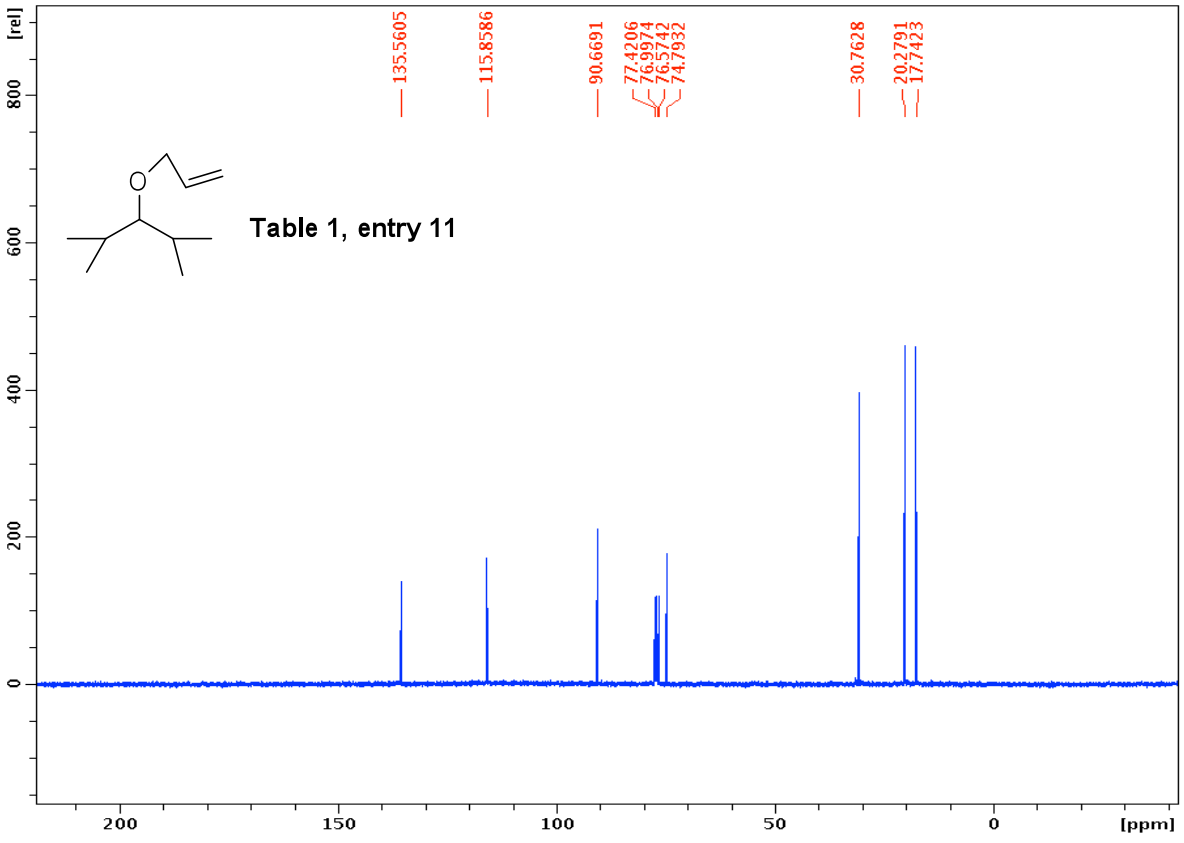
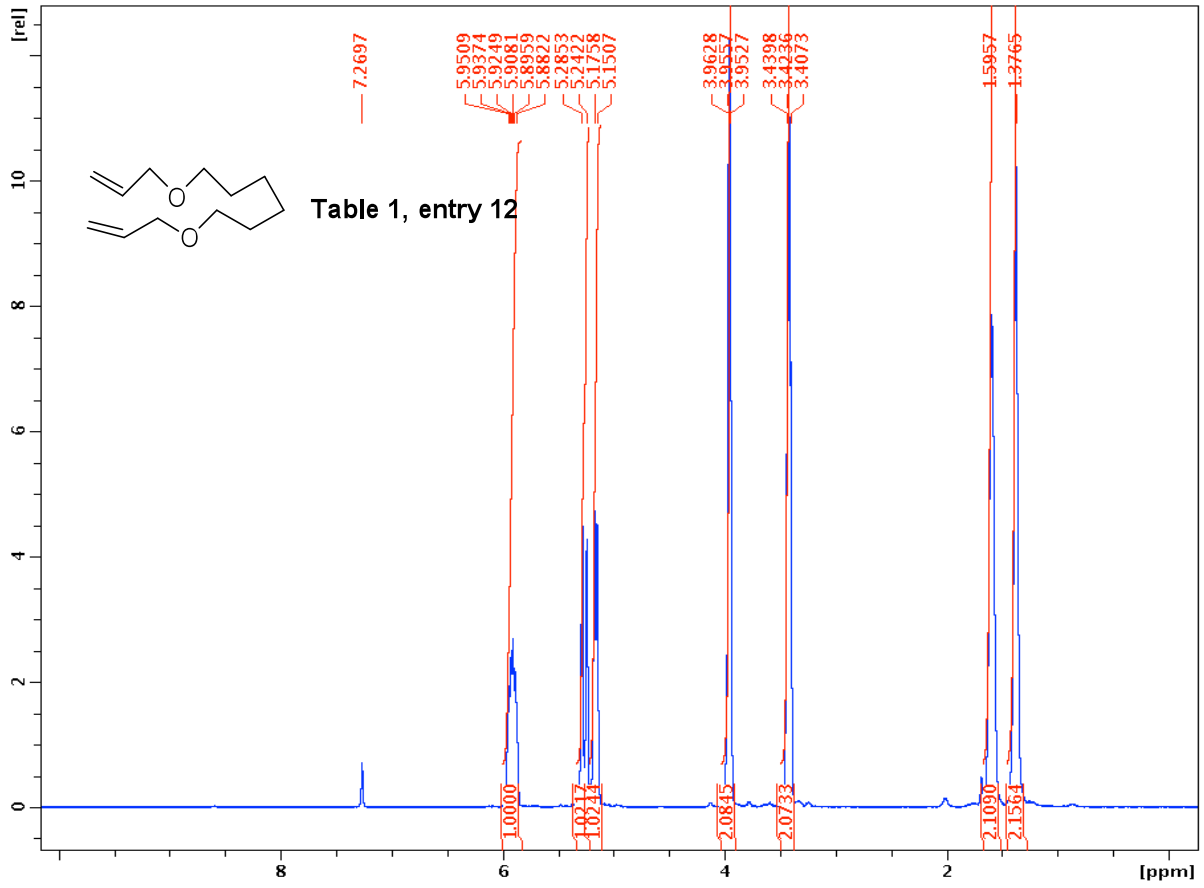
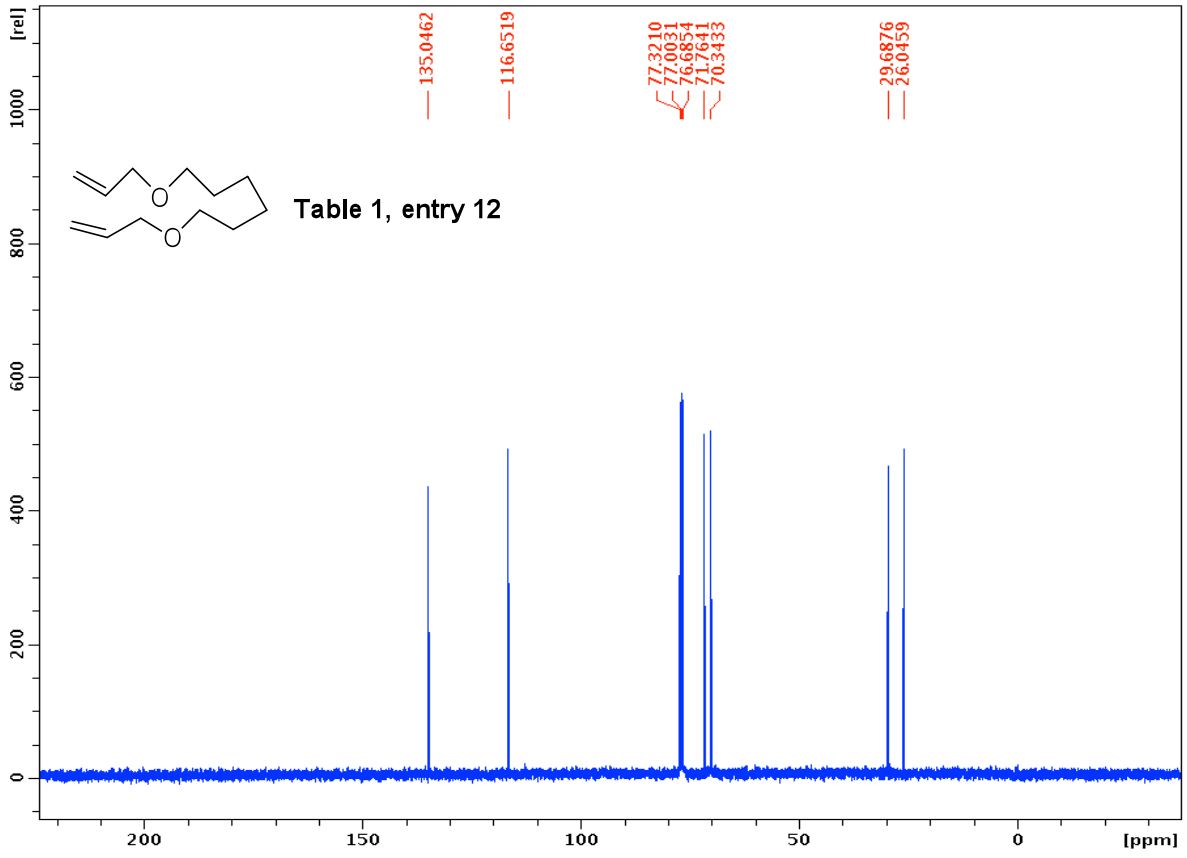
Table 1, entry 10

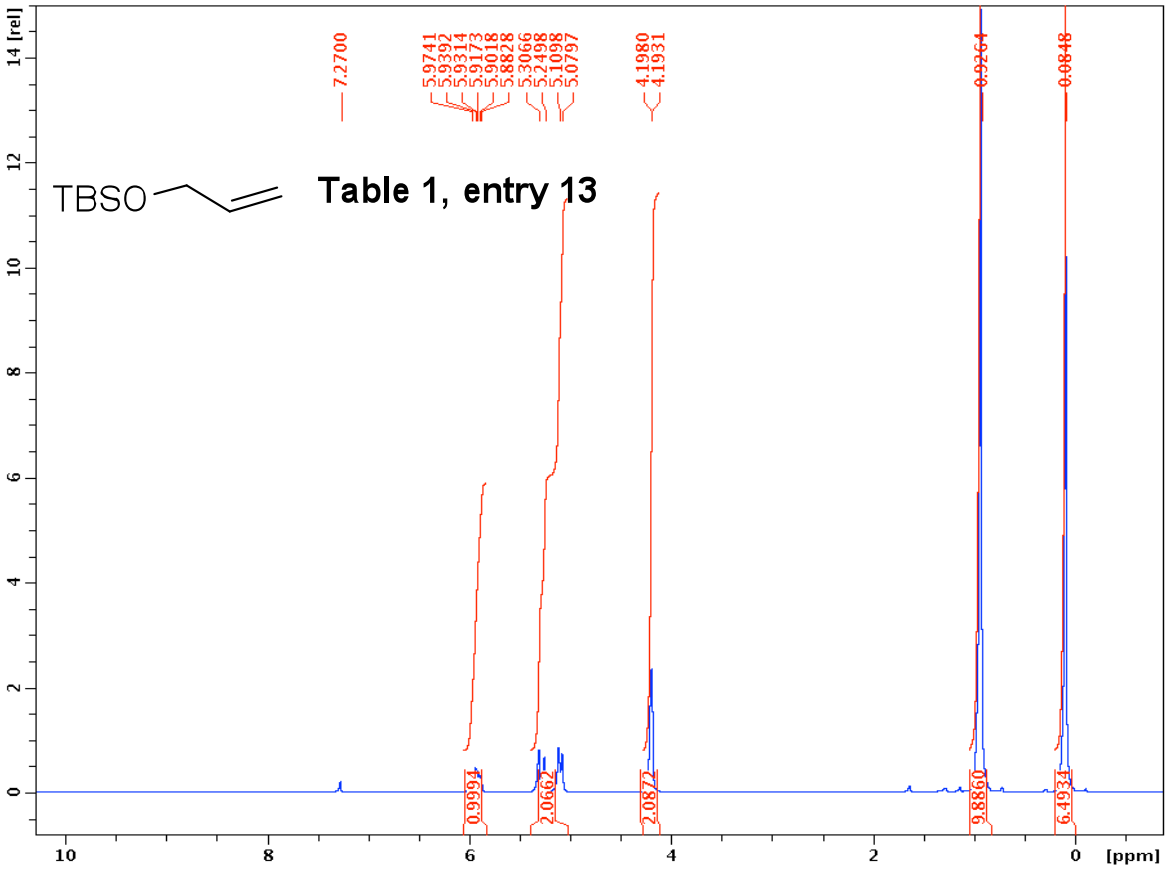

135.8566
115.2525
107.5821
86.5214
83.8180
77.3158
76.9990
76.6815
69.8380
49.2090
46.4914
45.0755
38.6557
34.4667
27.3075
20.2496
20.1987
11.8610
[rel]
[ppm]
Table 1, entry 10

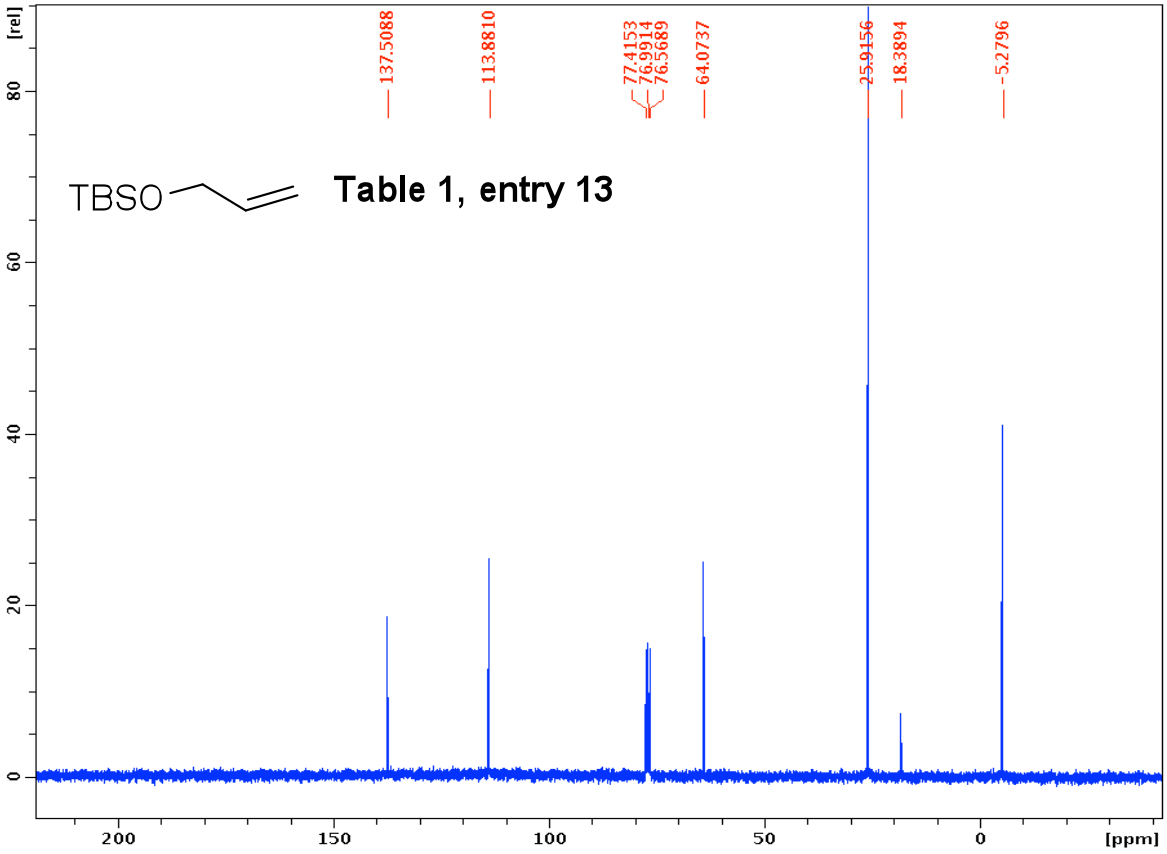

[rel]
15
10
5
0
7.2668
5.9942
5.9775
5.9593
5.9376
5.9203
5.9026
5.8842
5.2965
5.2393
5.1392
5.1049
4.0735
4.0555
2.7223
2.7035
2.6845
1.8734
1.8517
1.8303
1.8085
1.7865
1.7643
0.9413
0.9294
0.9191
0.9069
0.9975
1.0272
1.0391
2.1265
1.0528
2.2036
12.6994
10
8
6
4
2
[ppm]
Table 1, entry 11

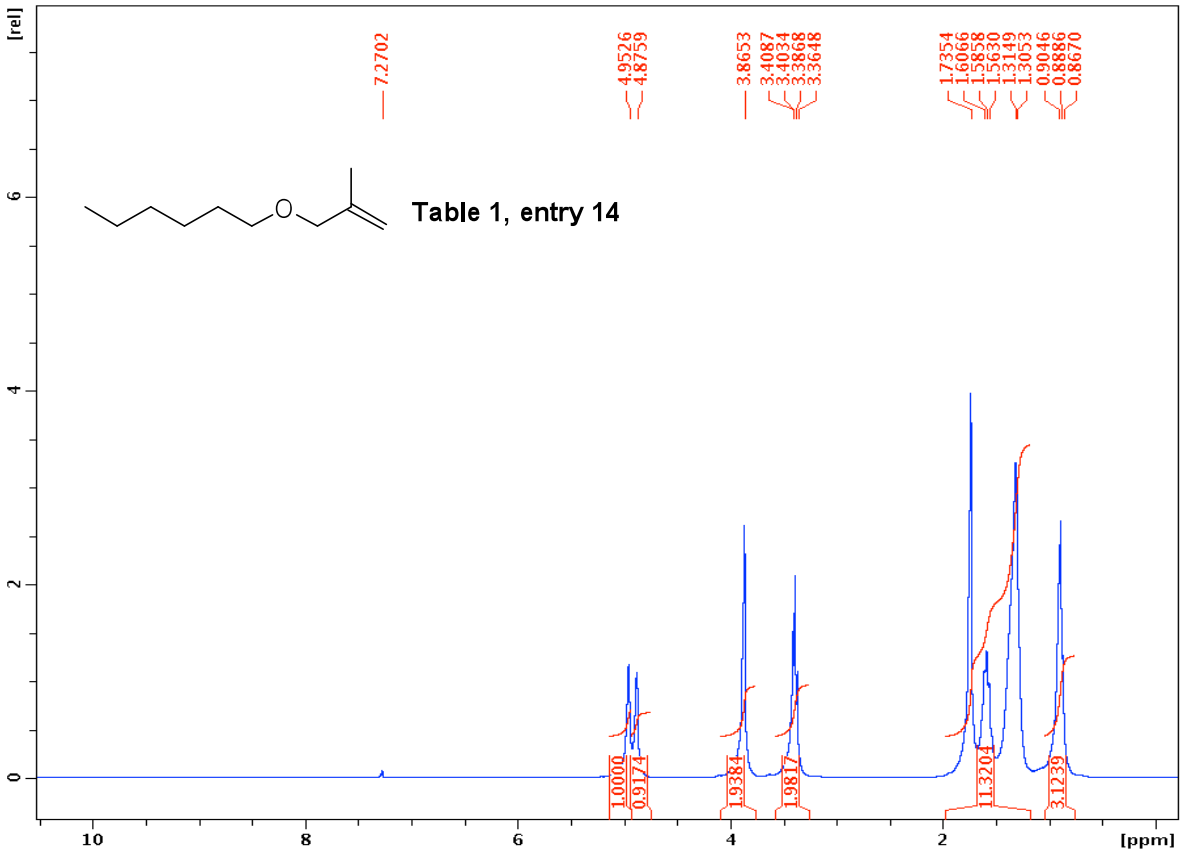

[rel]
800
600
400
200
0
135.5605
115.8586
90.6691
77.4206
76.9974
76.5742
74.7932
30.7628
20.2791
17.7423
200
150
100
50
0
[ppm]
Table 1, entry 11

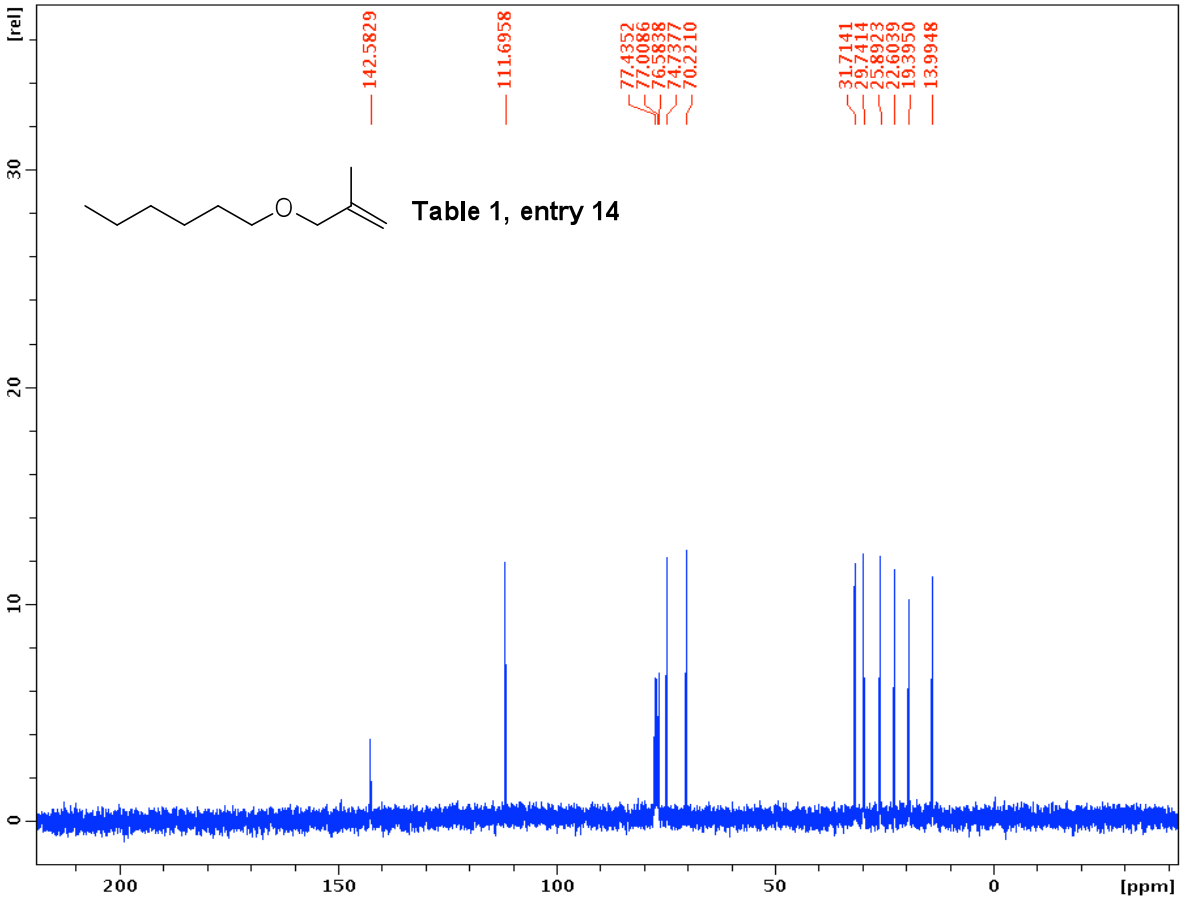

[rel]
7.2697
5.9509
5.9374
5.9249
5.9081
5.8959
5.8822
5.2853
5.2422
5.1758
5.1507
3.9628
3.9557
3.9527
3.4398
3.4236
3.4073
1.5957
1.3765
Table 1, entry 12
1.0000
1.0317
1.0244
2.0845
2.0733
2.1090
2.1564
[ppm]

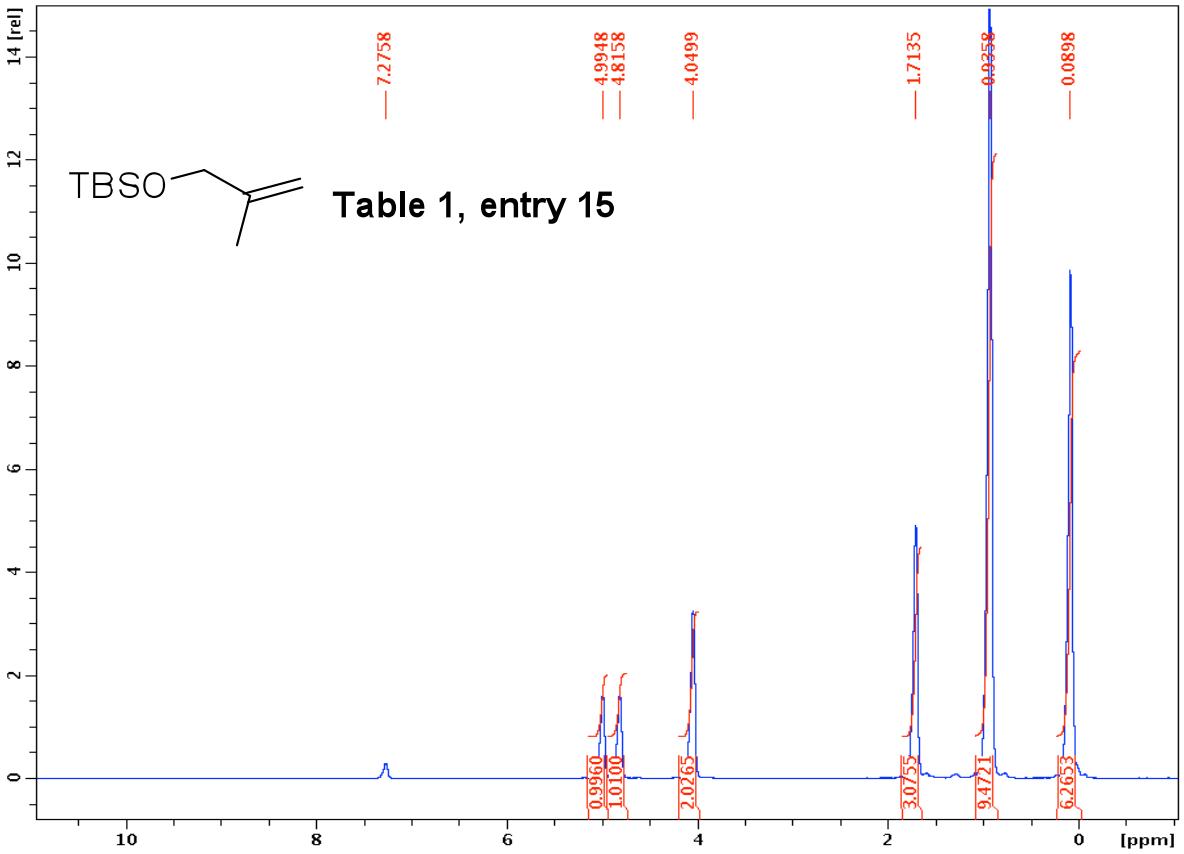

[rel]
135.0462
116.6519
77.3210
77.0031
76.6854
71.7641
70.3433
29.6876
26.0459
Table 1, entry 12
[ppm]

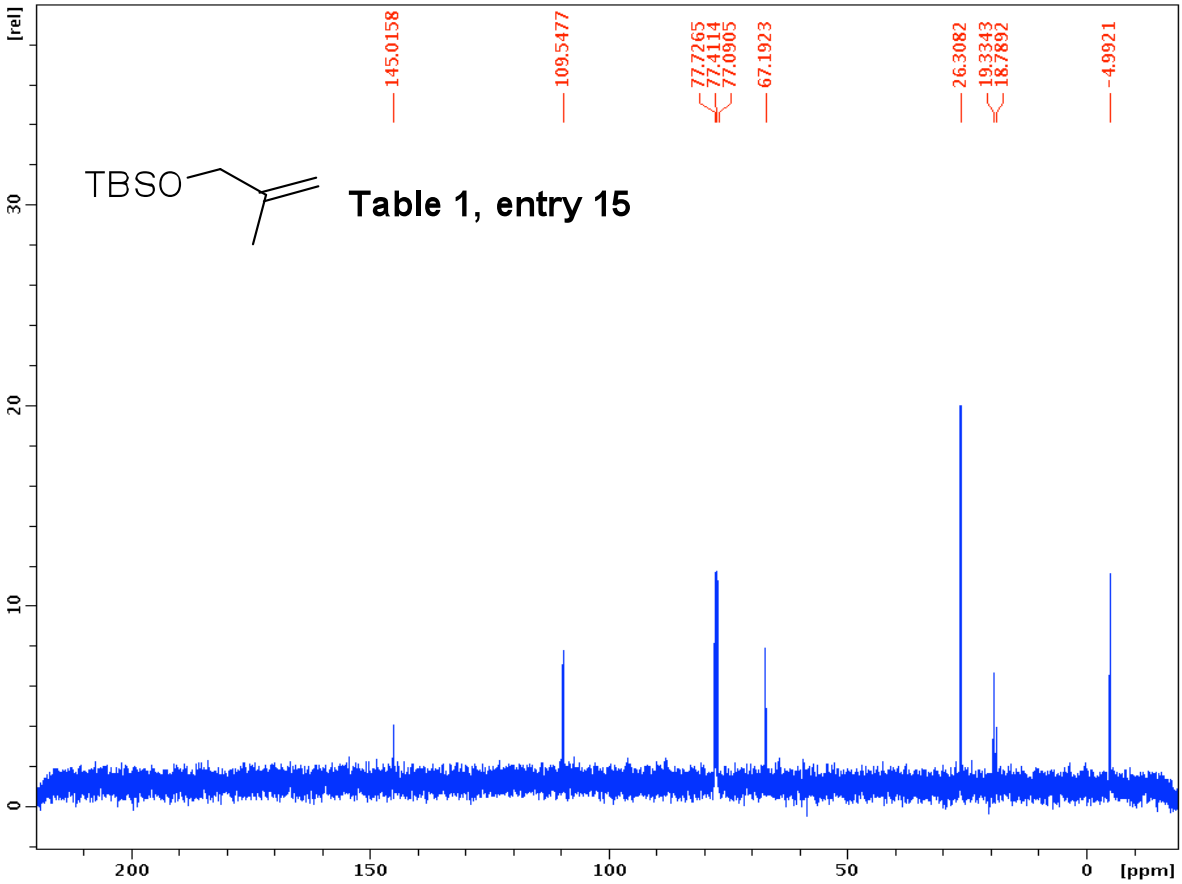

TBSO
Table 1, entry 13
7.2700
5.9741
5.9392
5.9314
5.9173
5.9018
5.8828
5.3066
5.2498
5.1098
5.0797
4.1980
4.1931
0.9264
0.0848
0.9994
2.0662
2.0872
9.8860
6.4934
14 [rel]
12
10
8
6
4
2
0
10
8
6
4
2
0
[ppm]

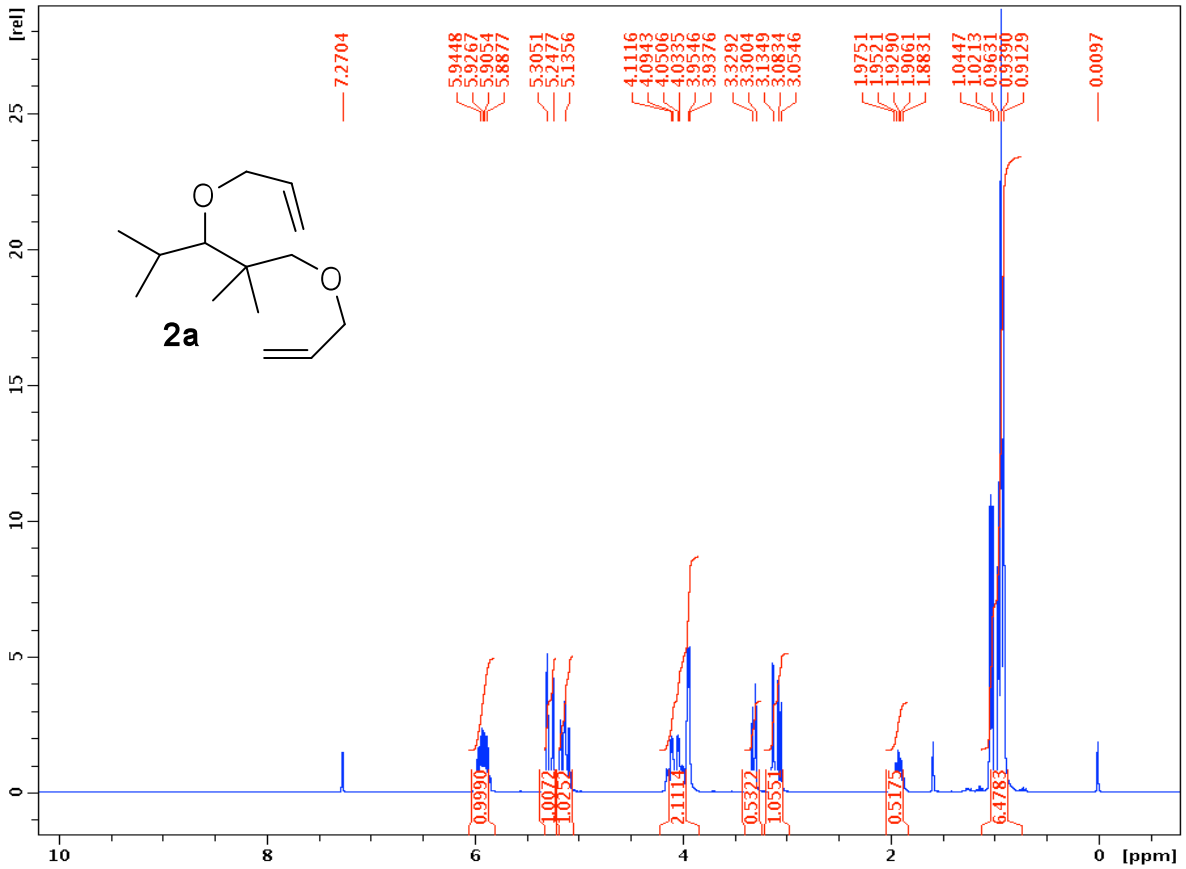

TBSO
Table 1, entry 13
137.5088
113.8810
77.4153
76.9914
76.5689
64.0737
25.9156
18.3894
-5.2796
[rel]
80
60
40
20
0
200
150
100
50
0
[ppm]

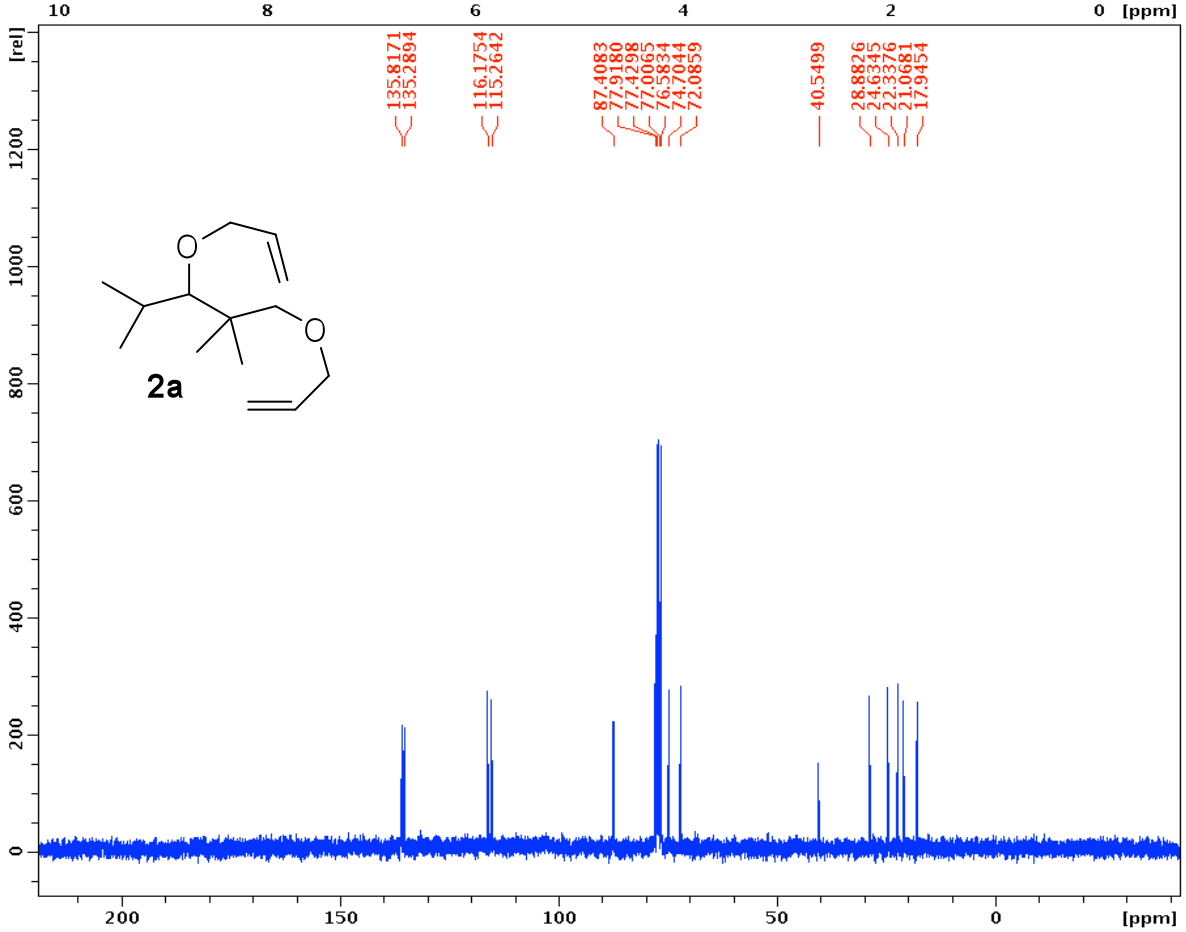

[rel]
7.2702
4.9526
4.8759
3.8653
3.4087
3.4034
3.3868
3.3648
1.7354
1.6066
1.5858
1.5630
1.3149
1.3053
0.9046
0.8886
0.8670
1.0000
0.9174
1.9384
1.9817
11.3204
3.1239
[ppm]
Table 1, entry 14


[rel]
142.5829
111.6958
77.4352
77.0086
76.5838
74.7377
70.2210
31.7141
29.7414
25.8923
22.6039
19.3950
13.9948
[ppm]
Table 1, entry 14

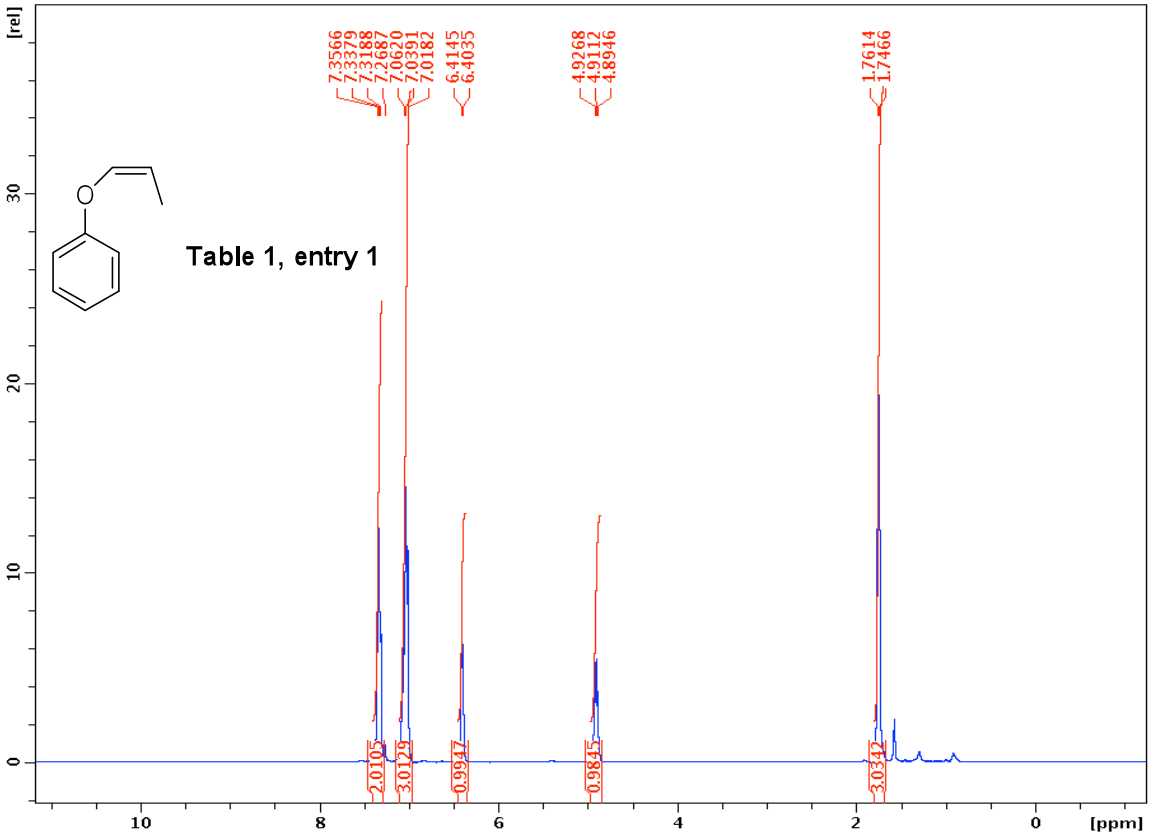

14 [rel]
12
10
8
6
4
2
0
7.2758
4.9948
4.8158
4.0499
1.7135
0.9358
0.0898
TBSO
Table 1, entry 15
0.9960
1.0100
2.0265
3.0755
9.4721
6.2653
10
8
6
4
2
0
[ppm]

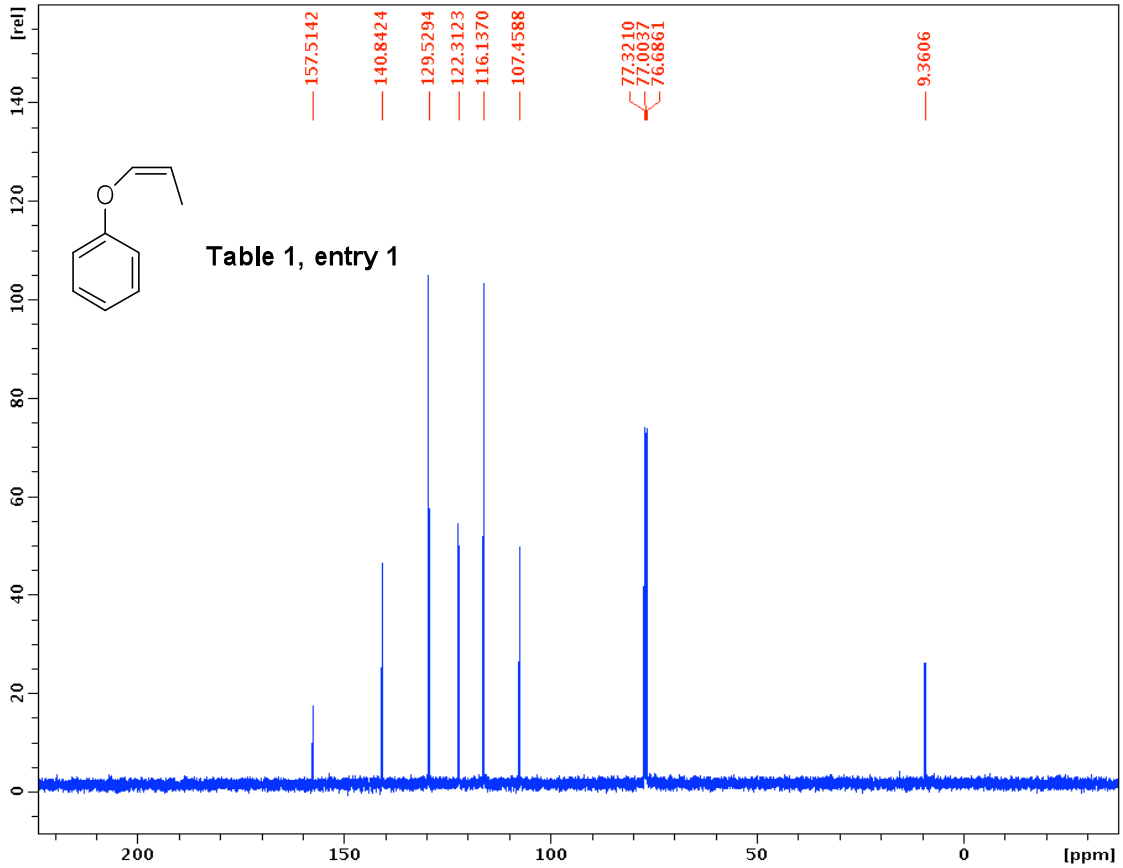

[rel]
30
20
10
0
145.0158
109.5477
77.7265
77.4114
77.0905
67.1923
26.3082
19.3343
18.7892
-4.9921
TBSO
Table 1, entry 15
200
150
100
50
0
[ppm]

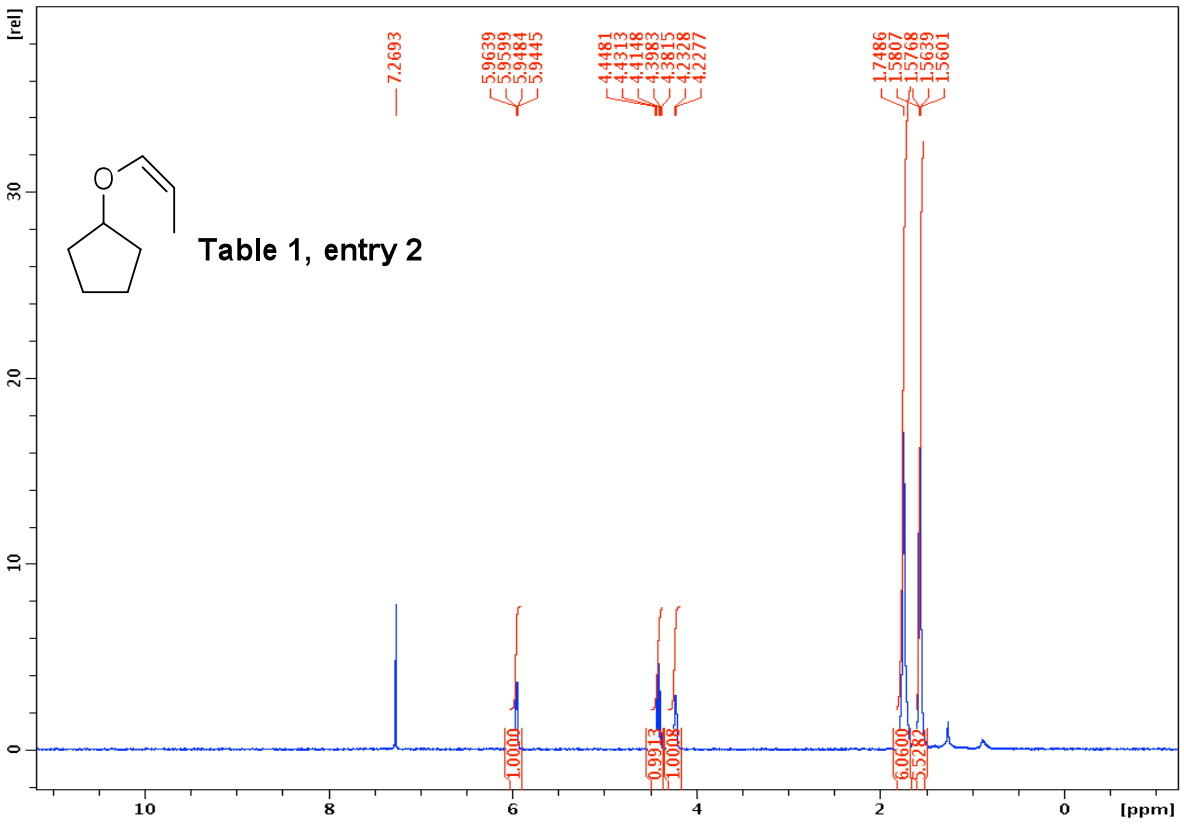

[rel]
7.2704
5.9448
5.9267
5.9054
5.8877
5.3051
5.2477
5.1356
4.1116
4.0943
4.0506
4.0335
3.9546
3.9376
3.3292
3.3004
3.1349
3.0834
3.0546
1.9751
1.9521
1.9290
1.9061
1.8831
1.0447
1.0213
0.9631
0.9390
0.9129
0.0097
0.9990
1.0072
1.0252
2.1114
0.5322
1.0551
0.5175
6.4783
[ppm]
2a


[rel]
135.8171
135.2894
116.1754
115.2642
87.4083
77.9180
77.4298
77.0065
76.5834
74.7044
72.0859
40.5499
28.8826
24.6345
22.3376
21.0681
17.9454
[ppm]
2a

^{1}H and ^{13}C NMR Spectra for Vinyl Ethers






[rel]
7.2693
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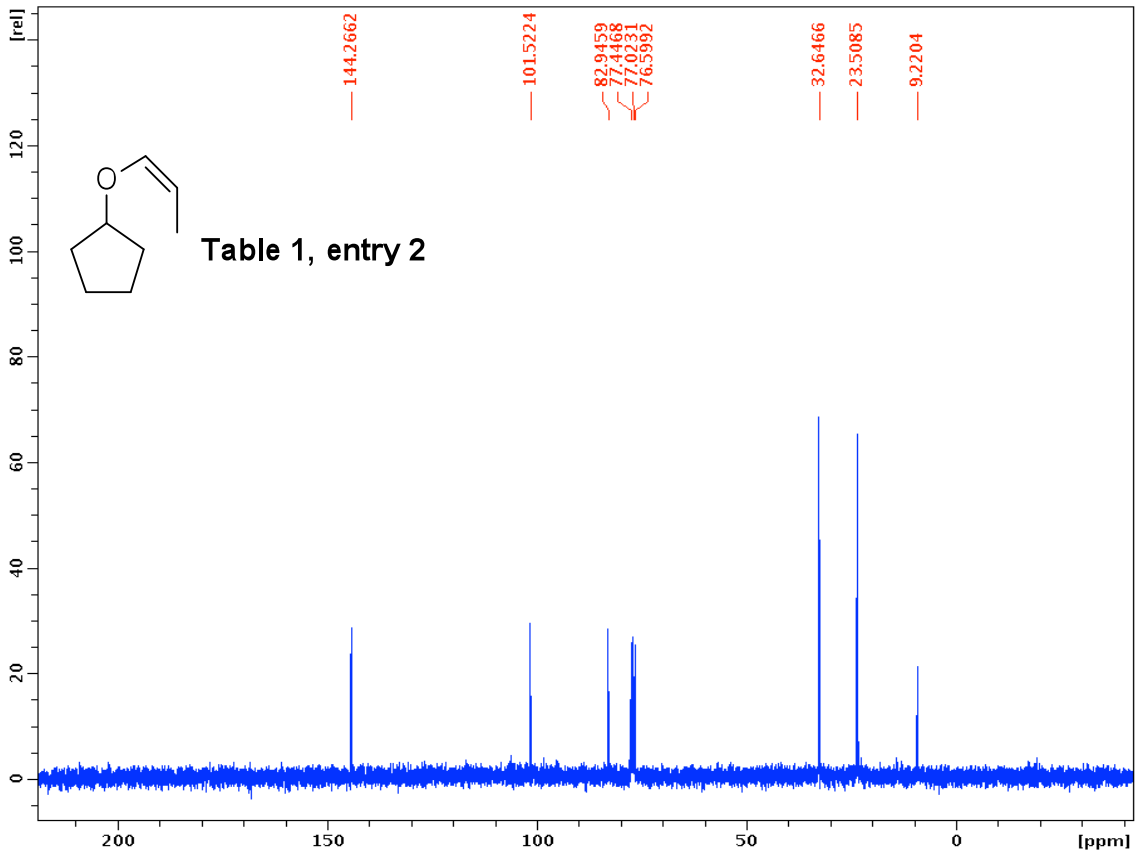
5.9599
5.9484
5.9445
4.4481
4.4313
4.4148
4.3983
4.3815
4.3328
4.2277
1.7486
1.5807
1.5768
1.5639
1.5601
1.0000
0.9913
1.0008
6.0600
5.5282
Table 1, entry 2
[ppm]


[rel]
144.2662
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82.9459
77.4468
77.0231
76.5992
32.6466
23.5085
9.2204
Table 1, entry 2
[ppm]

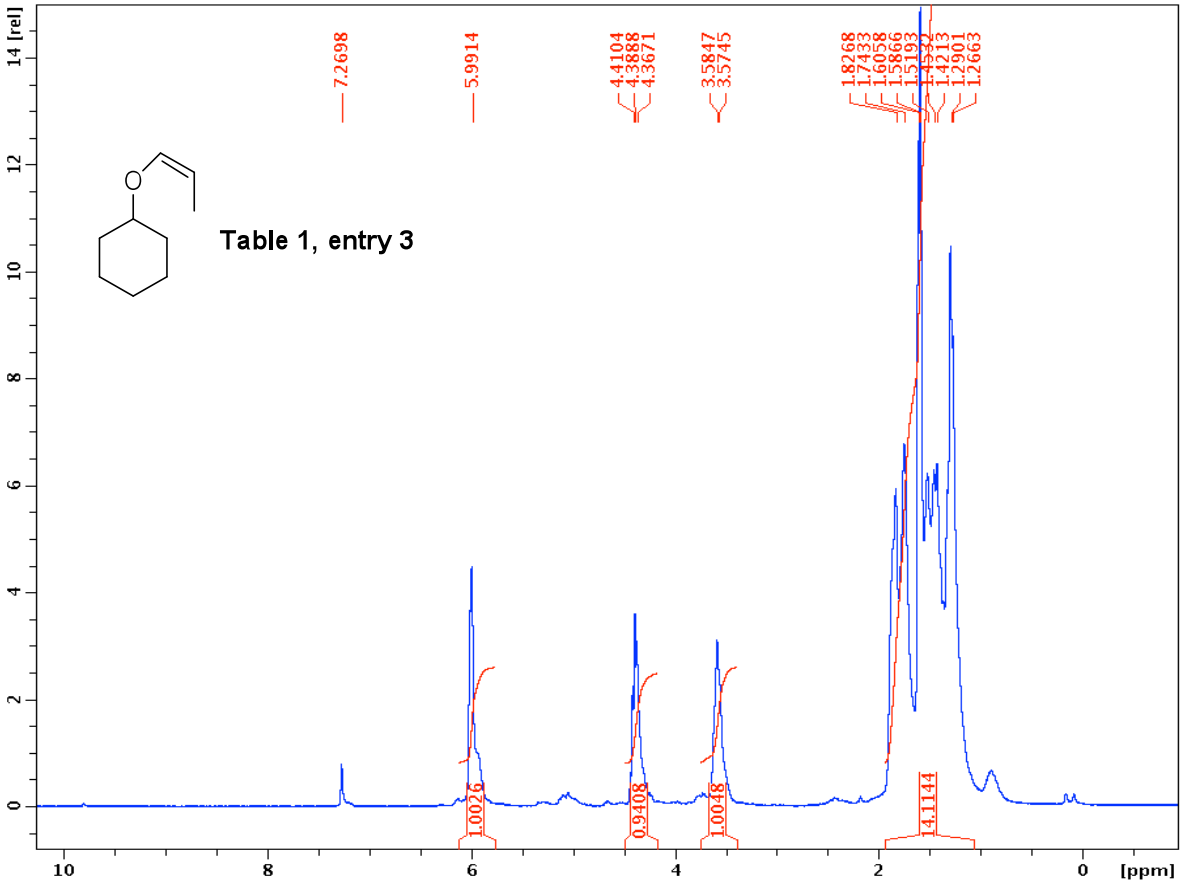
Table 1, entry 3
7.2698
5.9914
4.4104
4.3888
4.3671
3.5847
3.5745
1.8268
1.7433
1.6058
1.5866
1.5193
1.4332
1.4213
1.2901
1.2663
1.0026
0.9408
1.0048
14.1144
14 [rel]
[ppm]

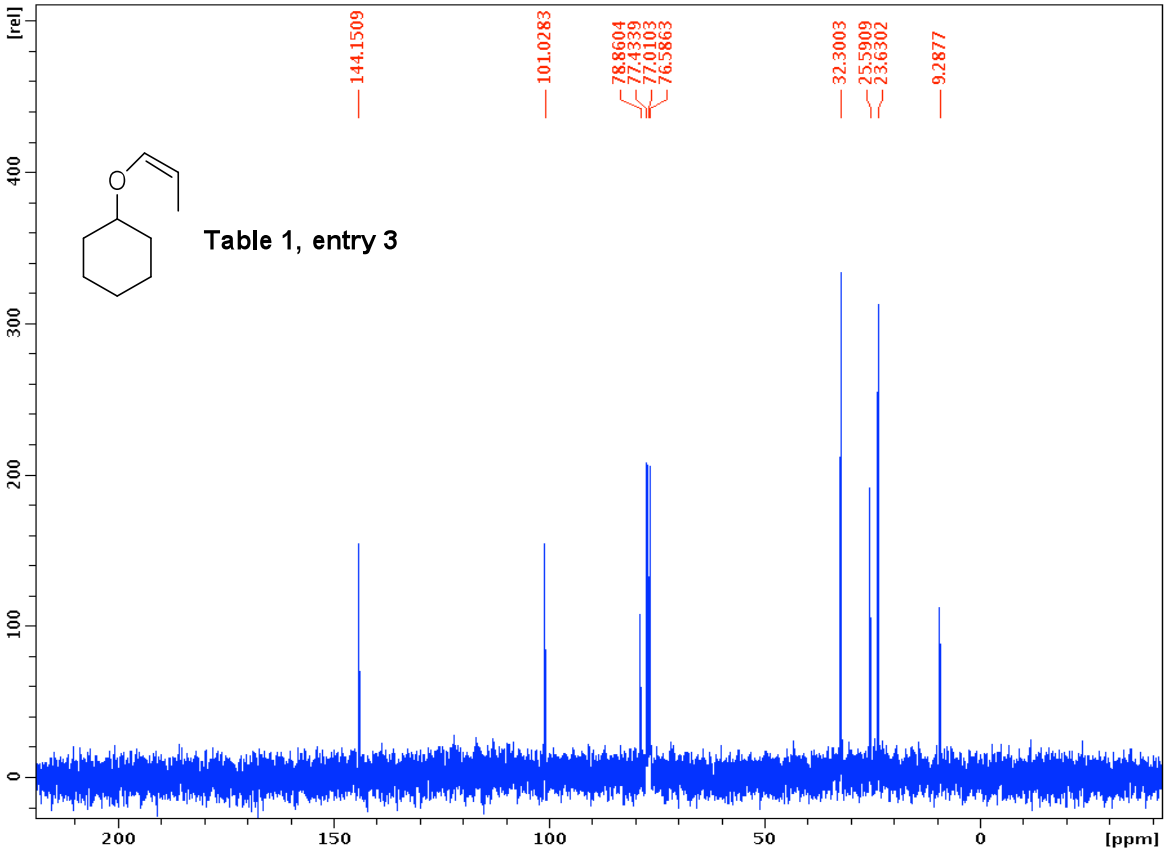
Table 1, entry 3
144.1509
101.0283
78.8604
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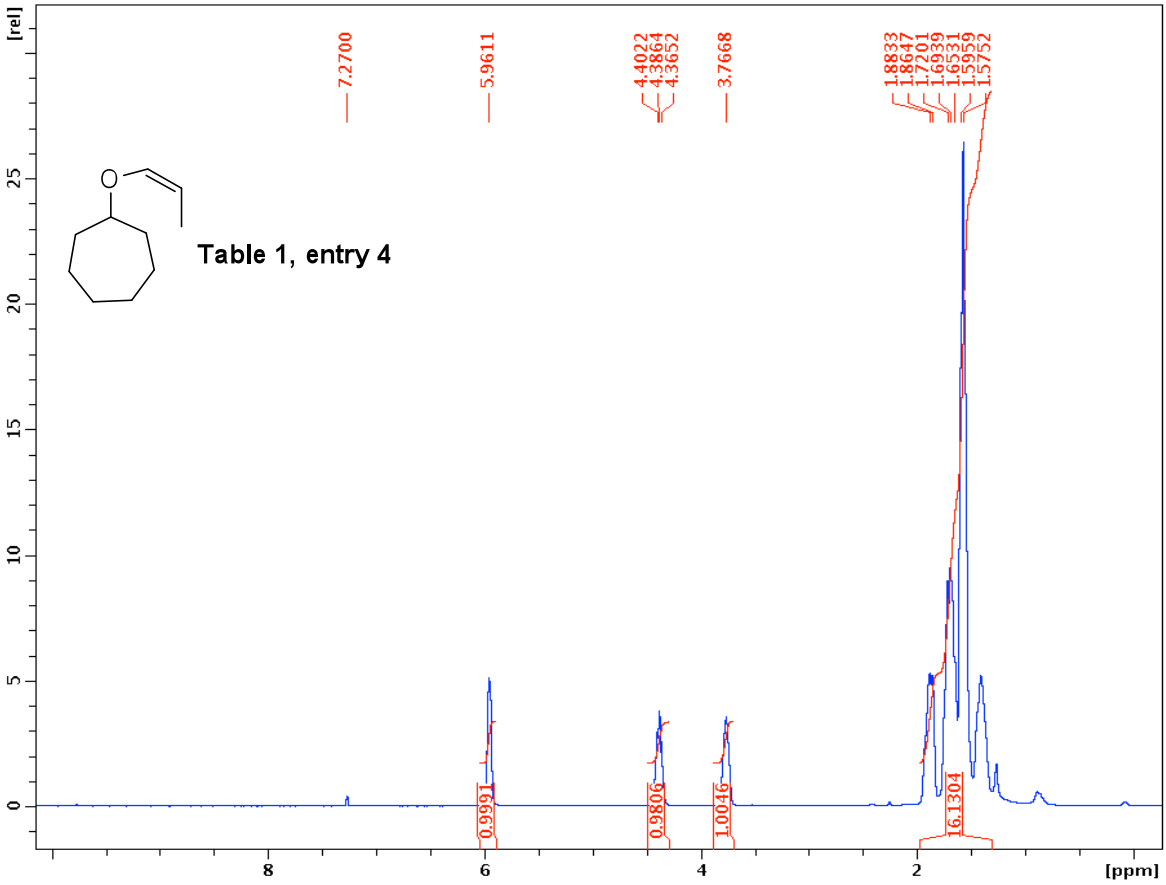
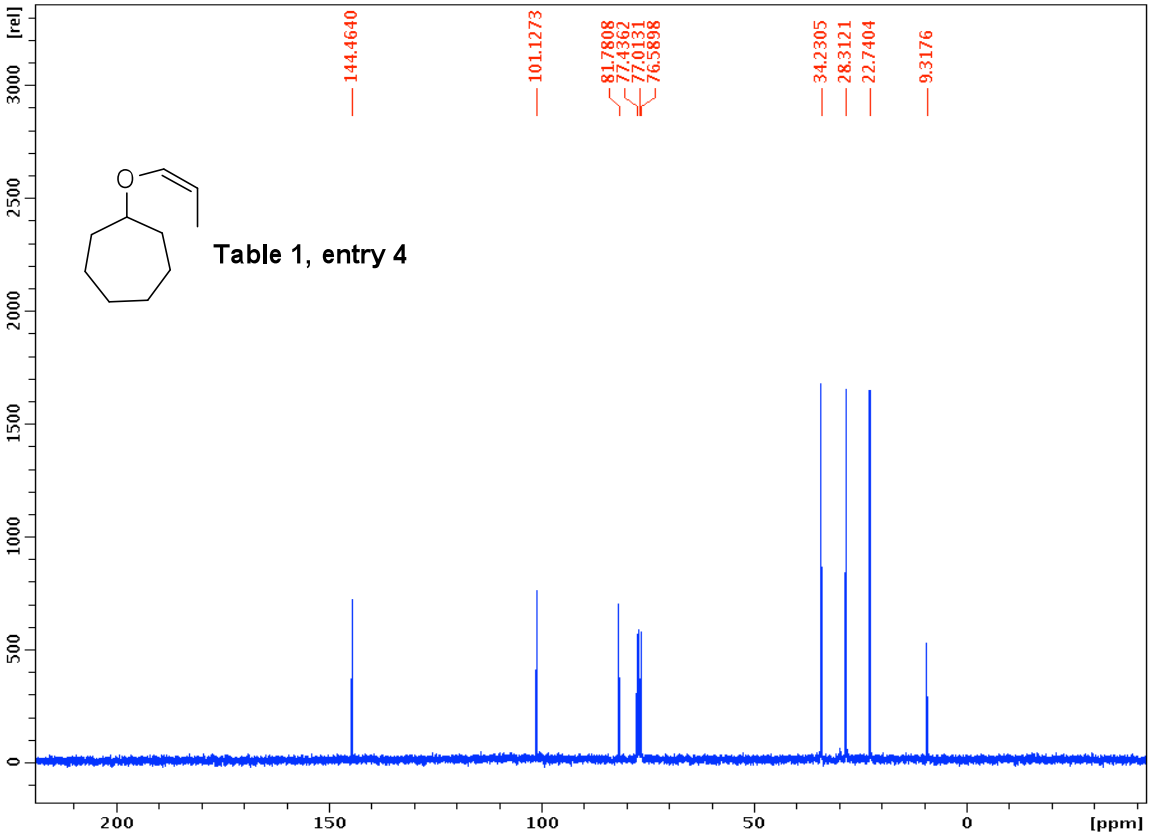
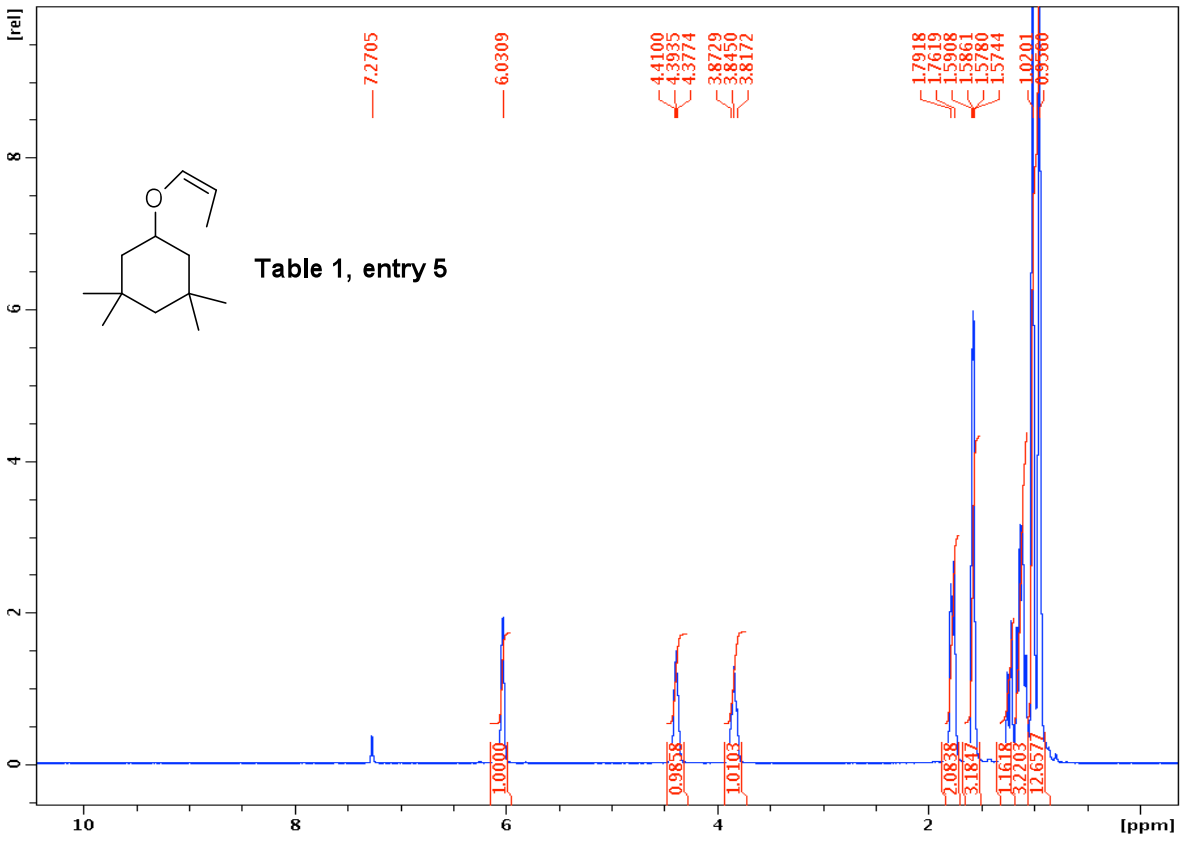
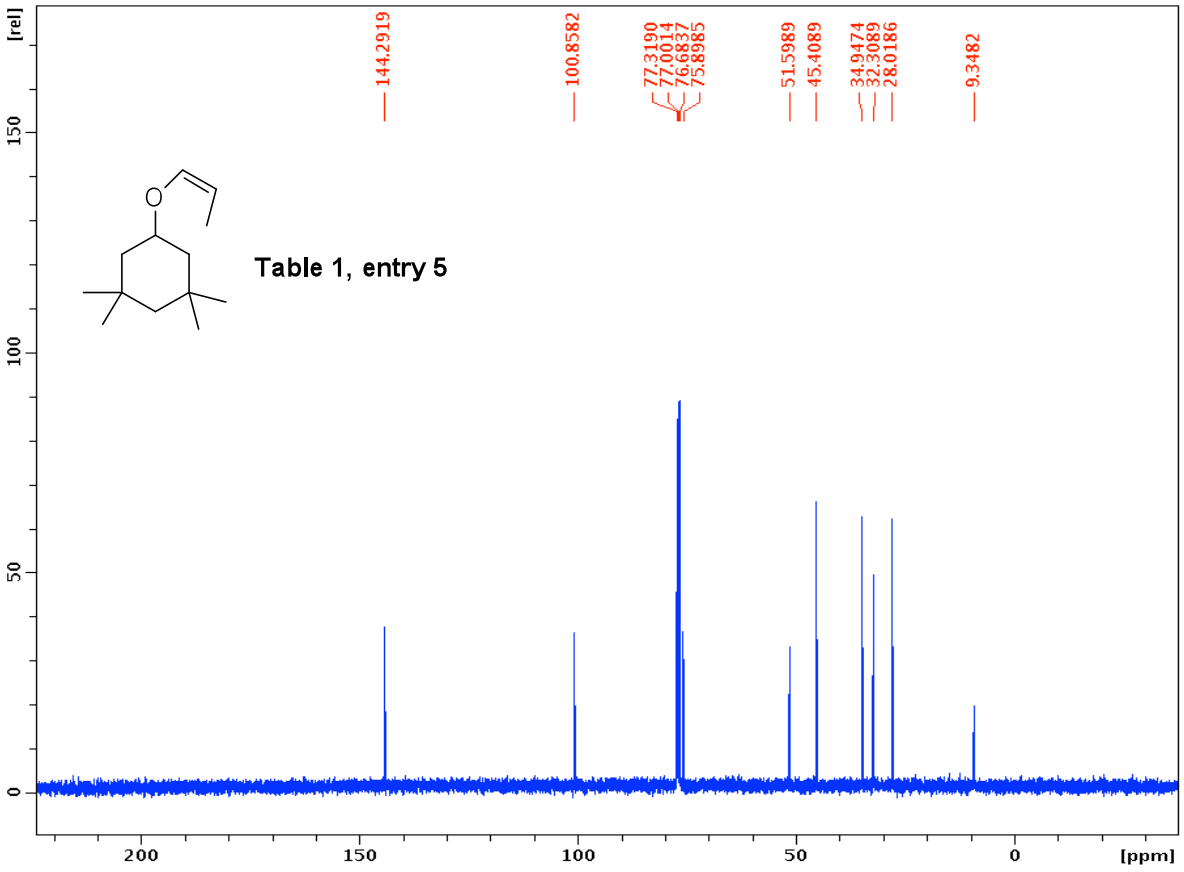
77.0103
76.5863
32.3003
25.5909
23.6302
9.2877
[rel]
[ppm]


[rel]
7.2700
5.9611
4.4022
4.3864
4.3652
3.7668
1.8833
1.8647
1.7201
1.6939
1.6531
1.5959
1.5752
0.9991
0.9806
1.0046
16.1304
[ppm]
Table 1, entry 4


[rel]
144.4640
101.1273
81.7808
77.4362
77.0131
76.5898
34.2305
28.3121
22.7404
9.3176
[ppm]
Table 1, entry 4


[rel]
7.2705
6.0309
4.4100
4.3935
4.3774
3.8729
3.8450
3.8172
1.7918
1.7619
1.5908
1.5861
1.5780
1.5744
1.0201
0.9560
1.0000
0.9858
1.0103
2.0838
3.1847
1.1618
3.2203
12.6577
Table 1, entry 5
[ppm]


[rel]
144.2919
100.8582
77.3190
77.0014
76.6837
75.8985
51.5989
45.4089
34.9474
32.3089
28.0186
9.3482
Table 1, entry 5
[ppm]

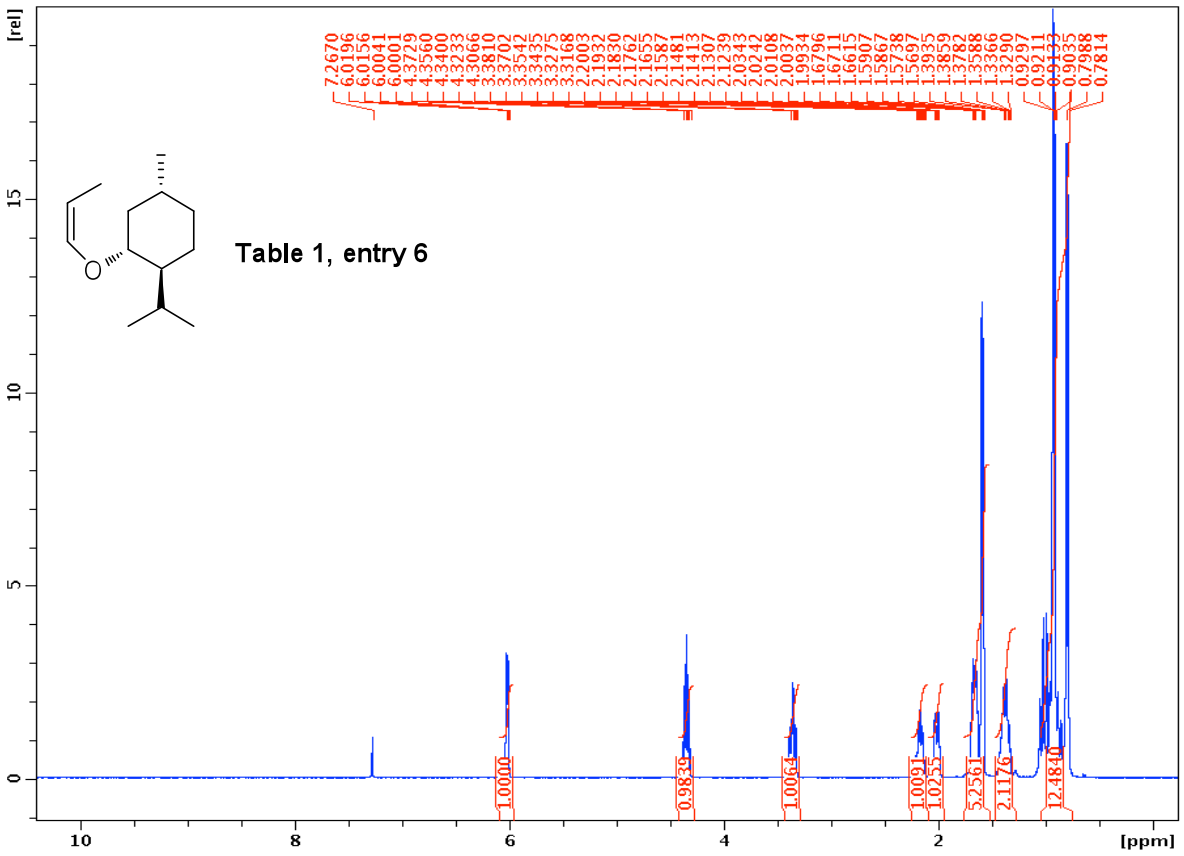


Table 1, entry 6
[rel]
[ppm]

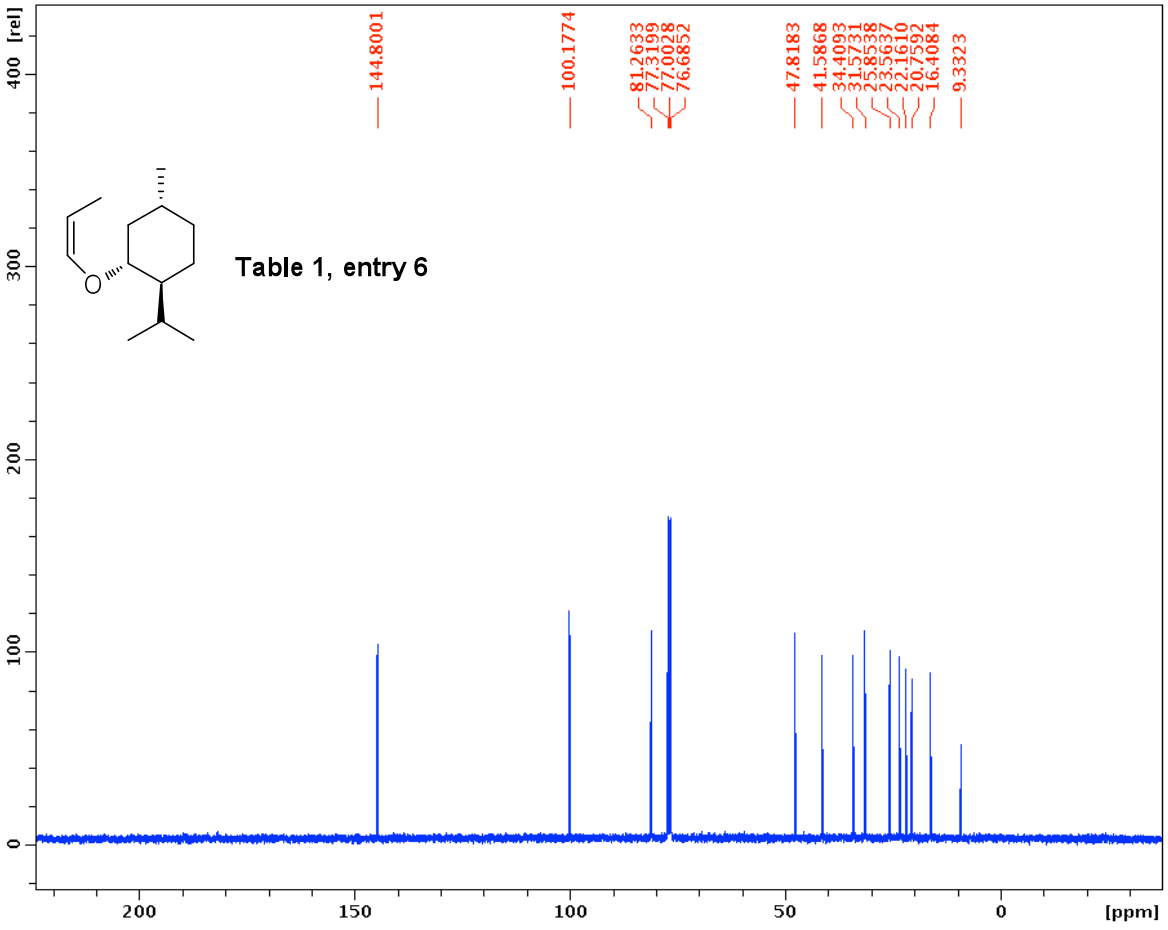
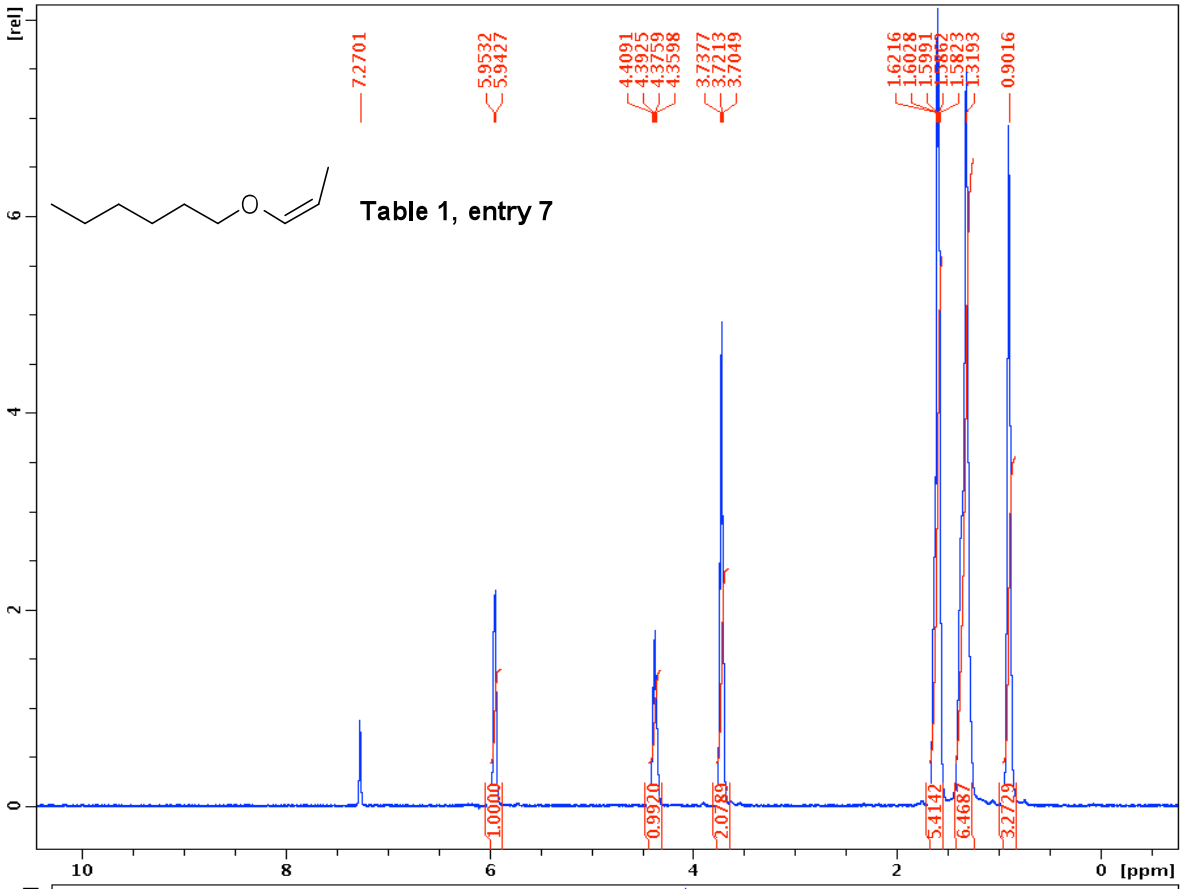
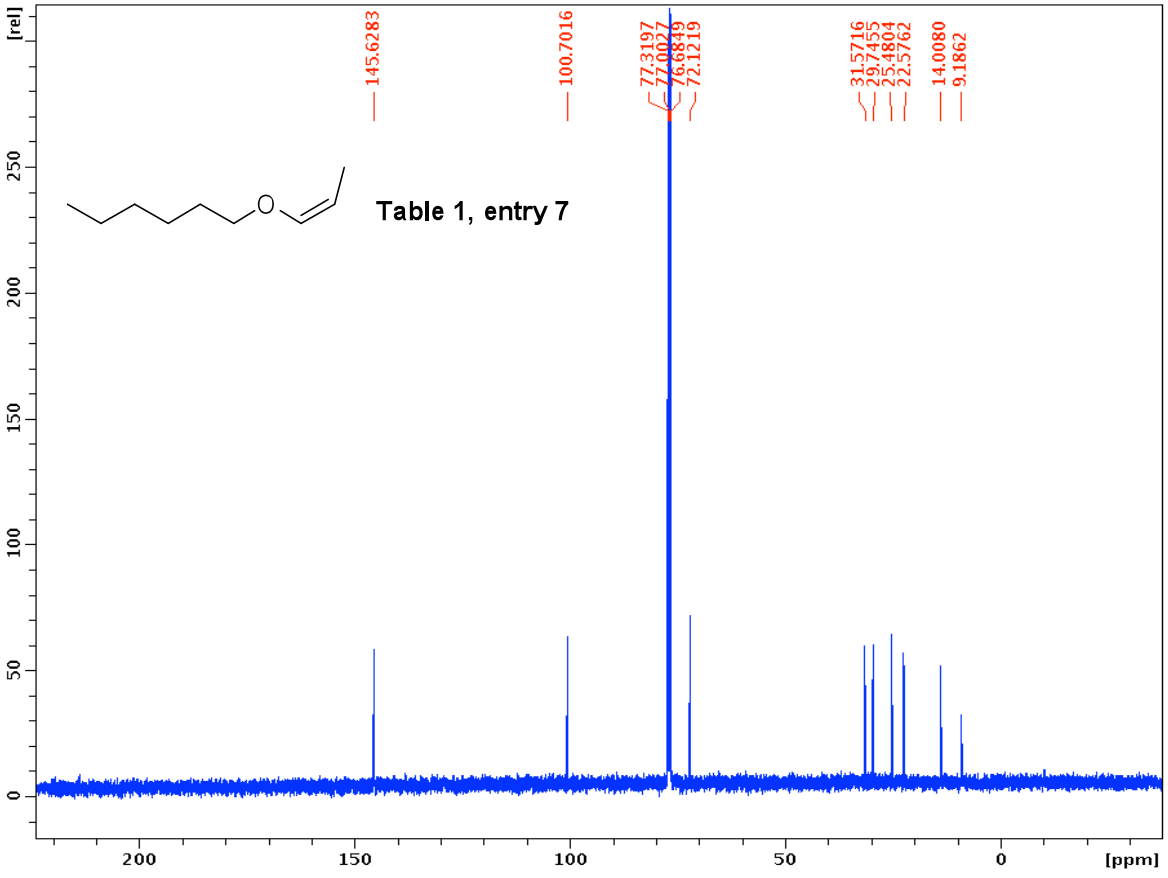
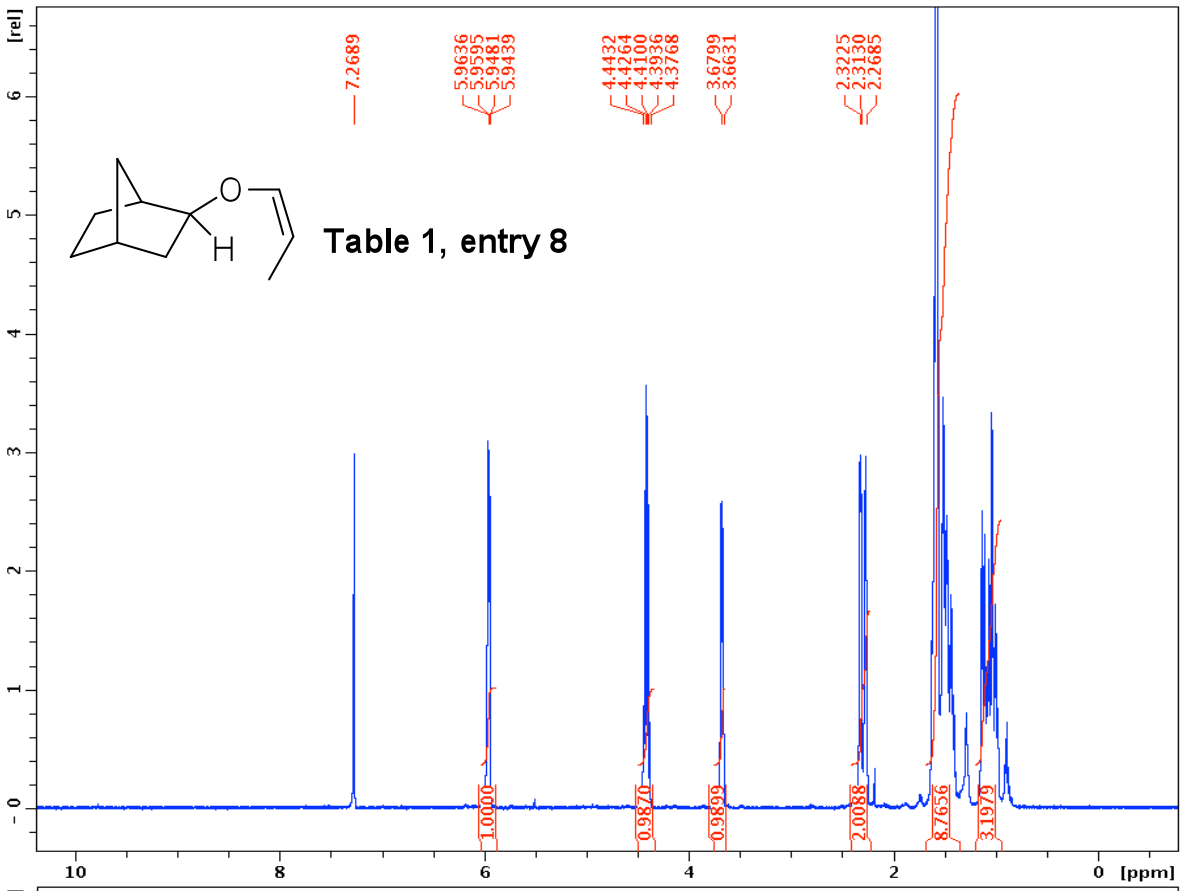
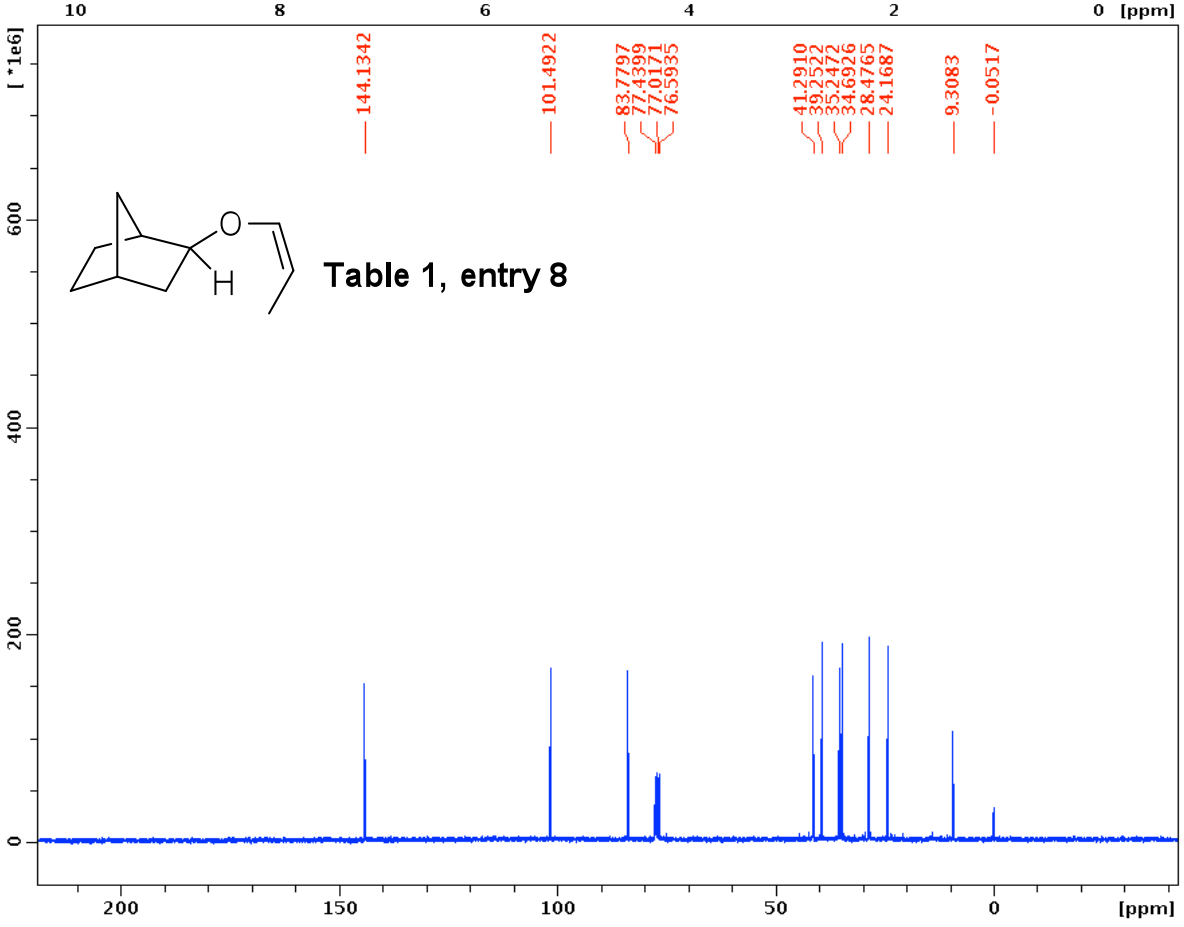


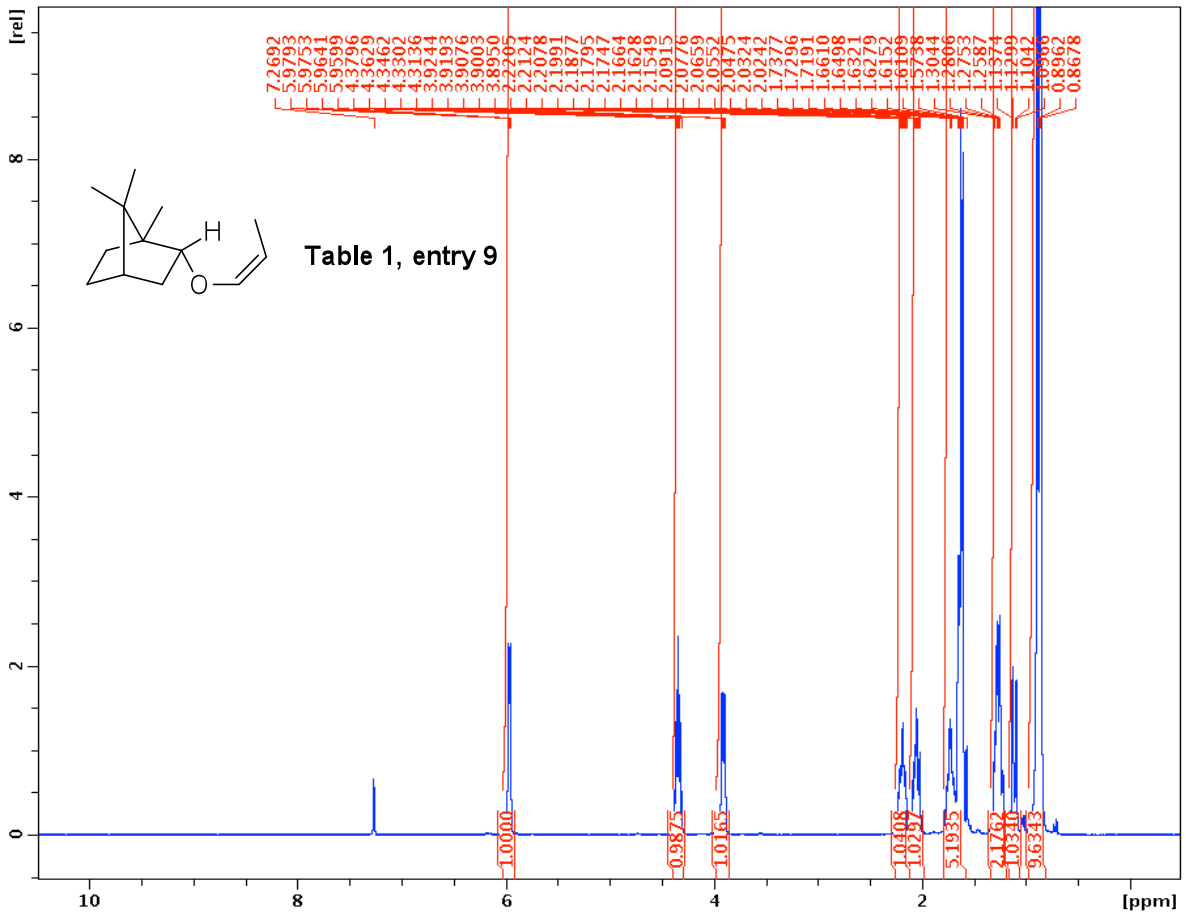
Table 1, entry 6
[rel]
[ppm]

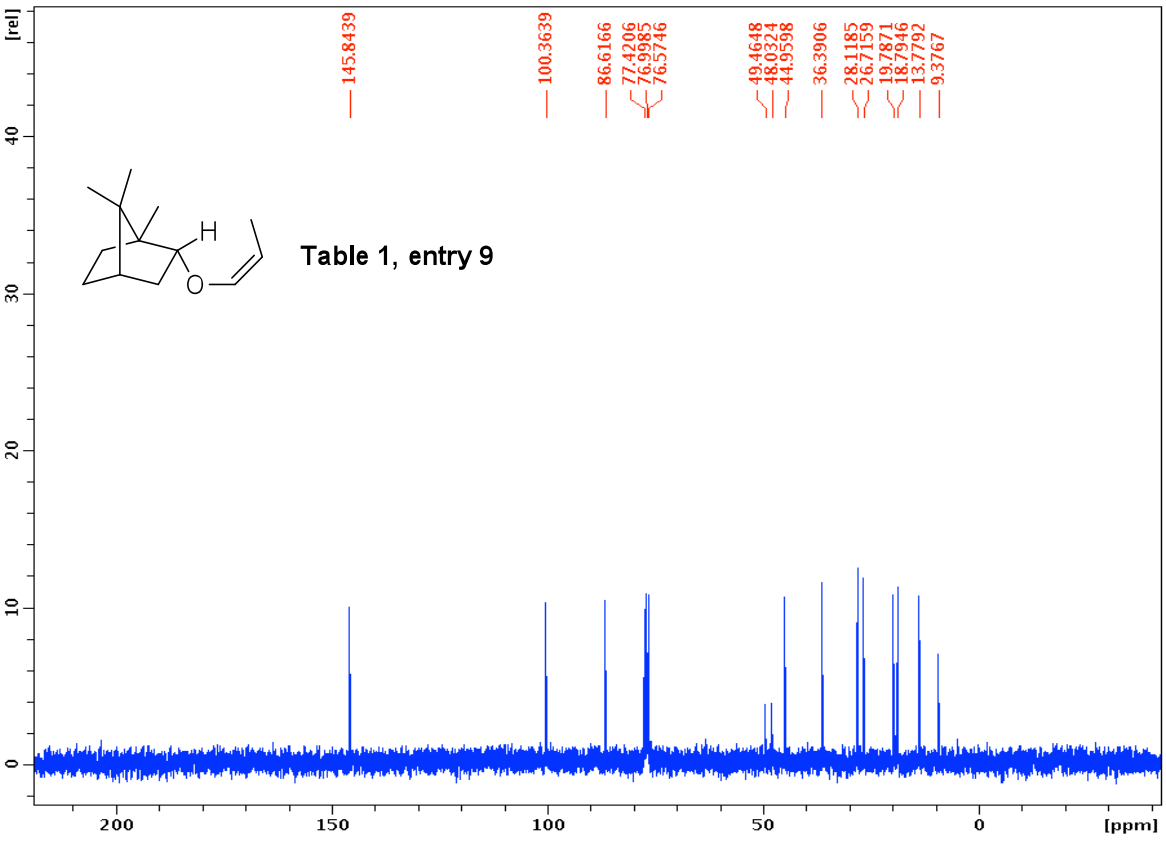

[rel]
7.2701
5.9532
5.9427
4.4091
4.3925
4.3759
4.3598
3.7377
3.7213
3.7049
1.6216
1.6028
1.5991
1.5862
1.5823
1.3193
0.9016
1.0000
0.9920
2.0789
5.4142
6.4687
3.2729
10
8
6
4
2
0
[ppm]
Table 1, entry 7

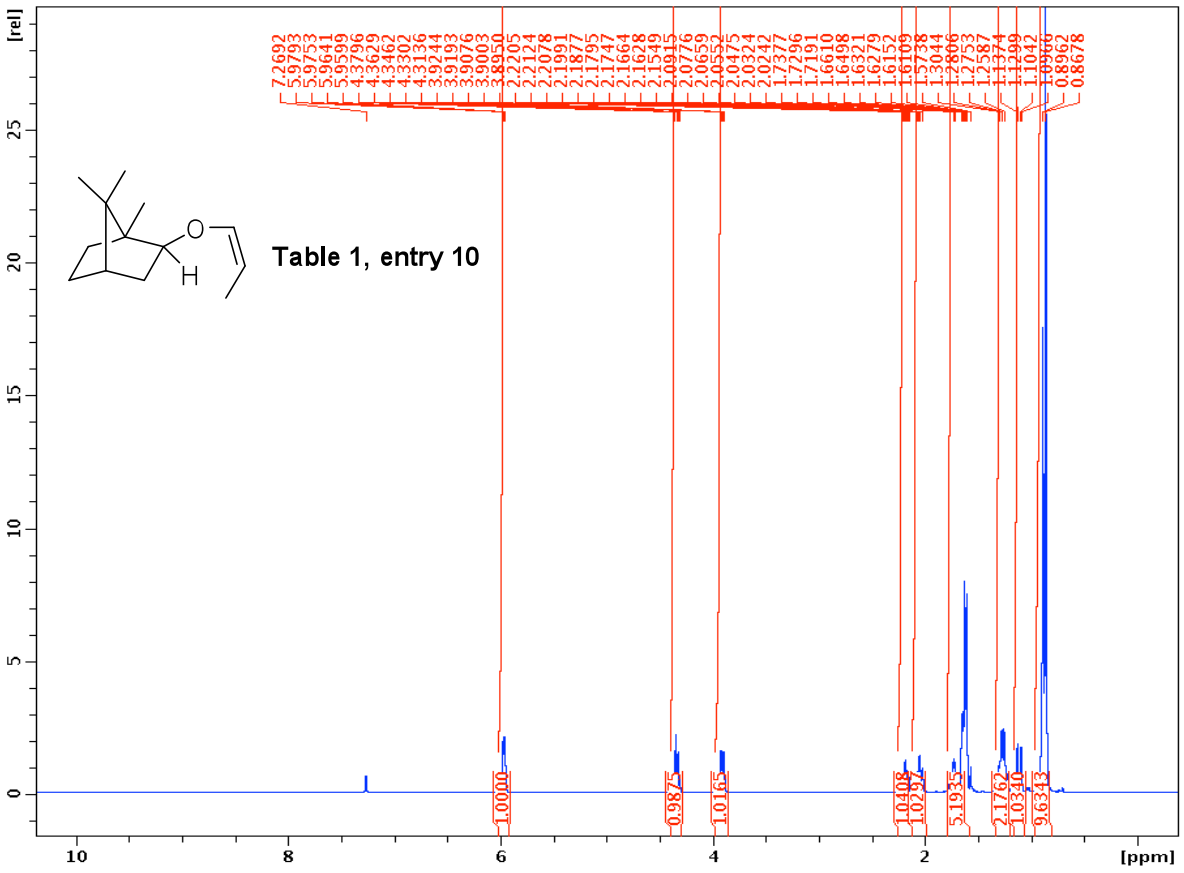

[rel]
145.6283
100.7016
77.3197
77.0027
76.6849
72.1219
31.5716
29.7455
25.4804
22.5762
14.0080
9.1862
250
200
150
100
50
0
200
150
100
50
0
[ppm]
Table 1, entry 7


7.2689
5.9636
5.9595
5.9481
5.9439
4.4432
4.4264
4.4100
4.3936
4.3768
3.6799
3.6631
2.3225
2.3130
2.2685
1.0000
0.9870
0.9899
2.0088
8.7656
3.1979
[rel]
[ppm]
Table 1, entry 8


144.1342
101.4922
83.7797
77.4399
77.0171
76.5935
41.2910
39.2522
35.2472
34.6926
28.4765
24.1687
9.3083
-0.0517
[*1e6]
[ppm]
Table 1, entry 8


[rel]
7.2692
5.9793
5.9753
5.9641
5.9599
4.3796
4.3629
4.3462
4.3302
4.3136
3.9244
3.9193
3.9076
3.9003
3.8950
2.2205
2.2124
2.2078
2.1991
2.1877
2.1795
2.1747
2.1664
2.1628
2.1549
2.0915
2.0776
2.0659
2.0552
2.0475
2.0324
2.0242
1.7377
1.7296
1.7191
1.6610
1.6498
1.6321
1.6279
1.6152
1.6109
1.5738
1.3044
1.2806
1.2753
1.2587
1.1374
1.1299
1.1042
1.0966
0.8962
0.8678
1.0000
0.9875
1.0165
1.0408
1.0297
5.1935
2.1762
1.0340
9.6343
Table 1, entry 9
[ppm]


[rel]
145.8439
100.3639
86.6166
77.4206
76.9985
76.5746
49.4648
48.0324
44.9598
36.3906
28.1185
26.7159
19.7871
18.7946
13.7792
9.3767
Table 1, entry 9
[ppm]


[rel]
25
20
15
10
5
0
10
8
6
4
2
[ppm]
Table 1, entry 10
O
H
7.2692
5.9793
5.9753
5.9641
5.9599
4.3796
4.3629
4.3462
4.3302
4.3136
3.9244
3.9193
3.9076
3.9003
3.8950
2.2205
2.2124
2.2078
2.1991
2.1877
2.1795
2.1747
2.1664
2.1628
2.1549
2.0915
2.0776
2.0659
2.0552
2.0475
2.0324
2.0242
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1.7296
1.7191
1.6610
1.6498
1.6321
1.6279
1.6152
1.6109
1.3738
1.3044
1.2806
1.2753
1.2587
1.1374
1.1299
1.1042
1.0966
0.8962
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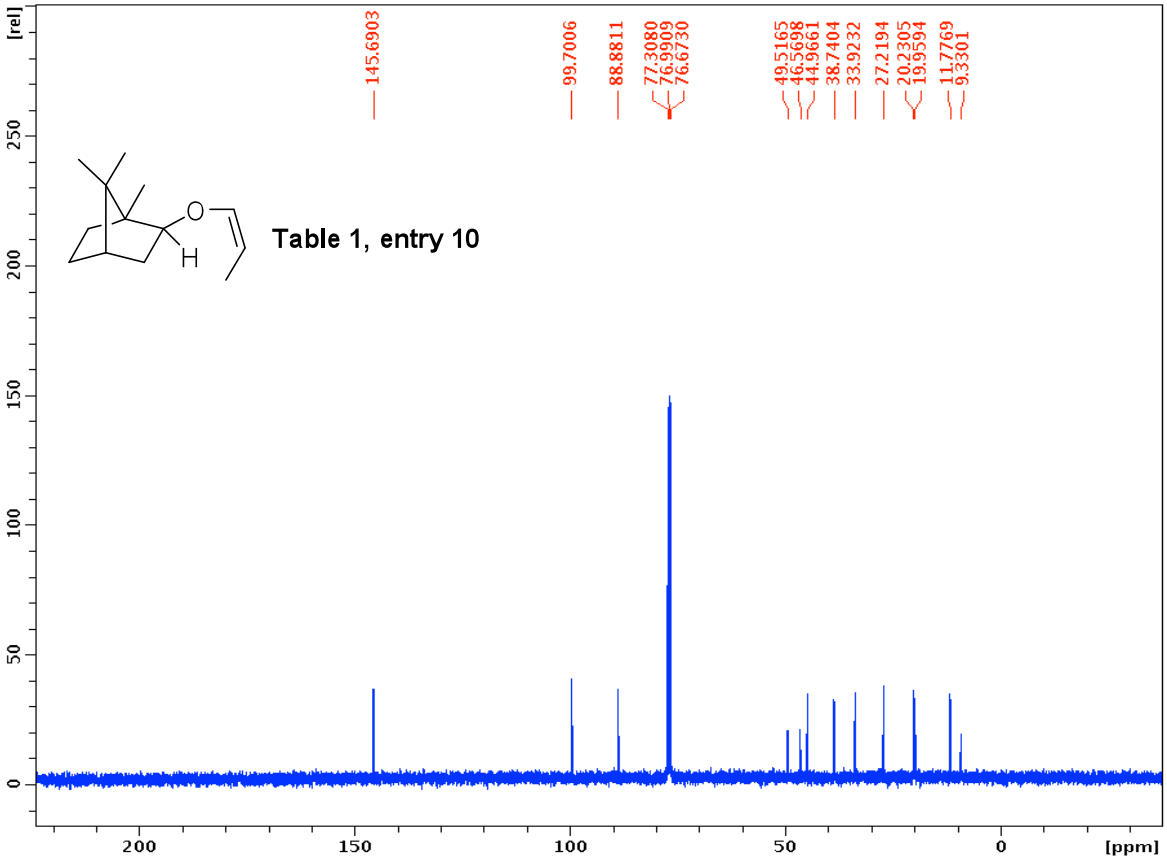
1.0408
1.0297
5.1935
2.1762
1.0346
9.6343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88.8811
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76.9909
76.6730
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27.2194
20.2305
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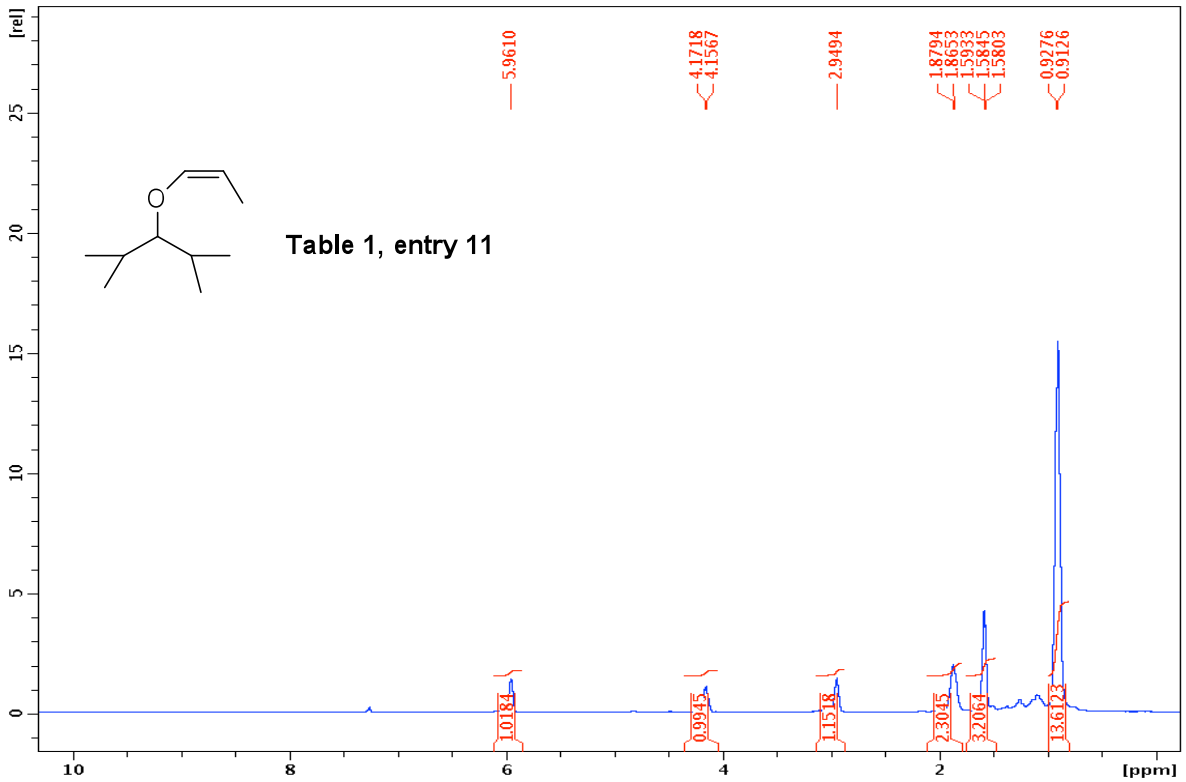
9.3301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2.3045
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8
6
4
2
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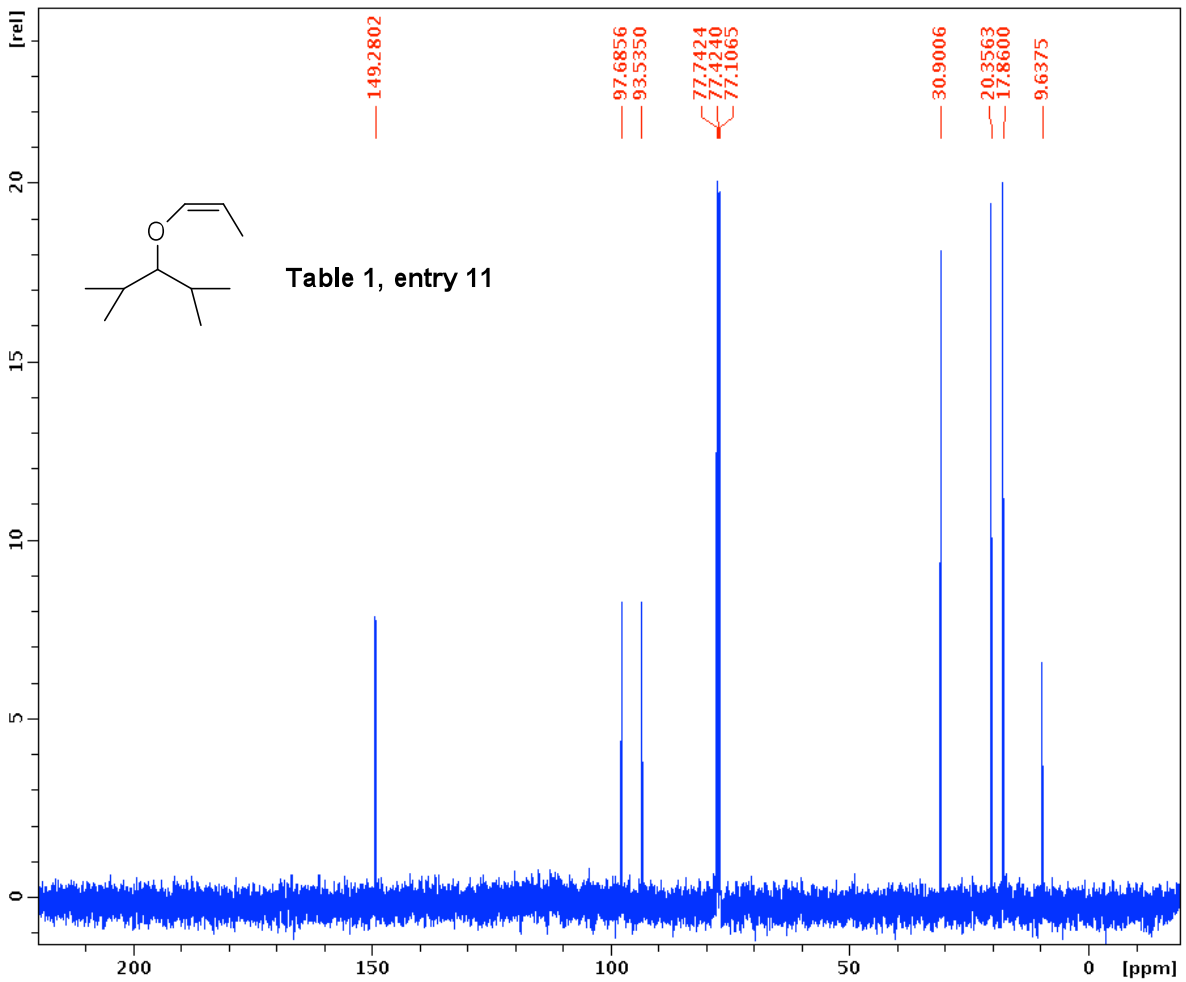
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9.6375
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100
50
0
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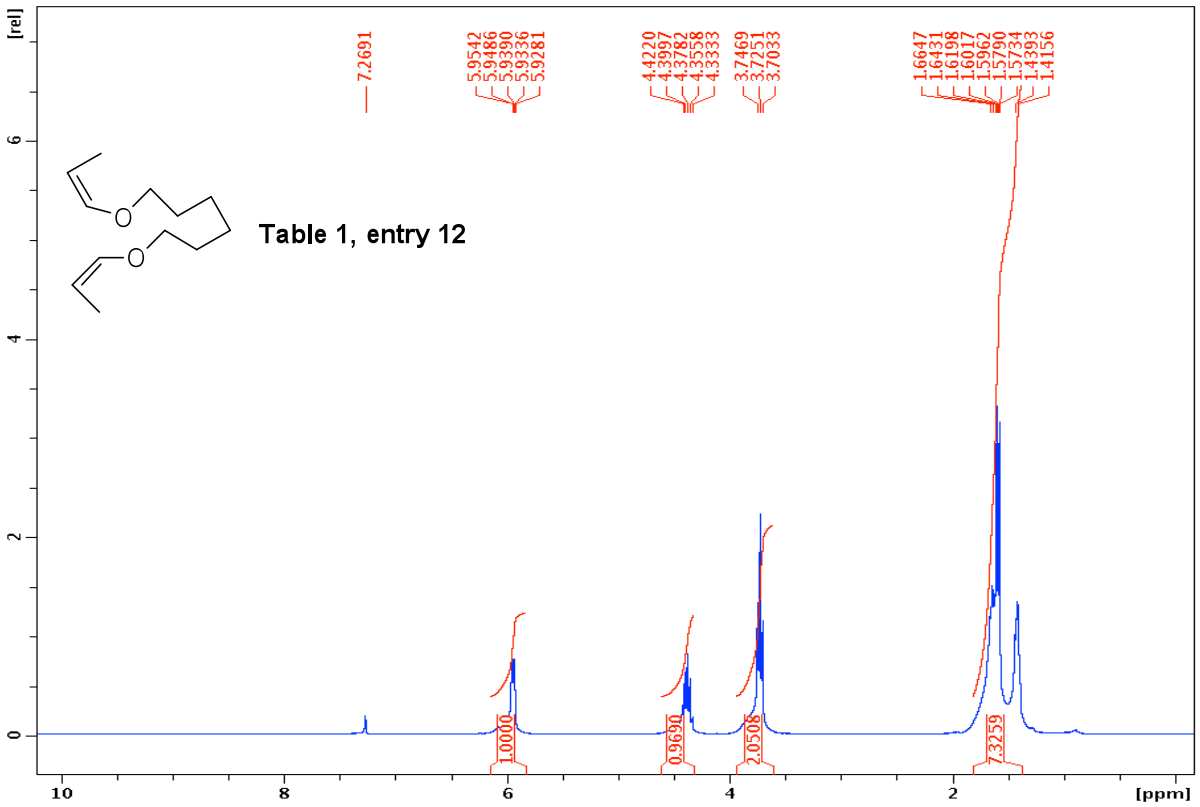
Table 1, entry 11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3.7469
3.7251
3.7033
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1.6431
1.6198
1.6017
1.5962
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Table 1, entry 12
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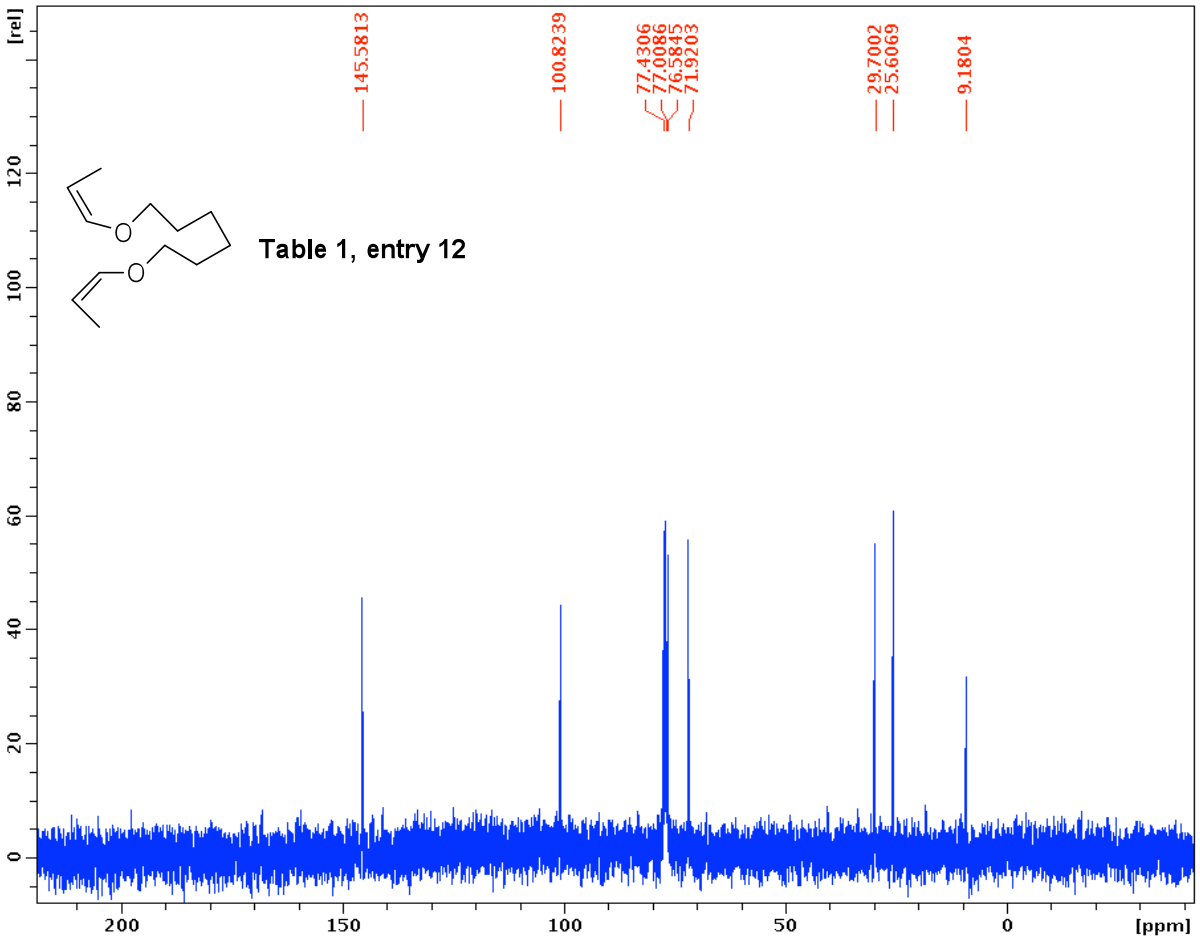
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9.1804
Table 1, entry 12
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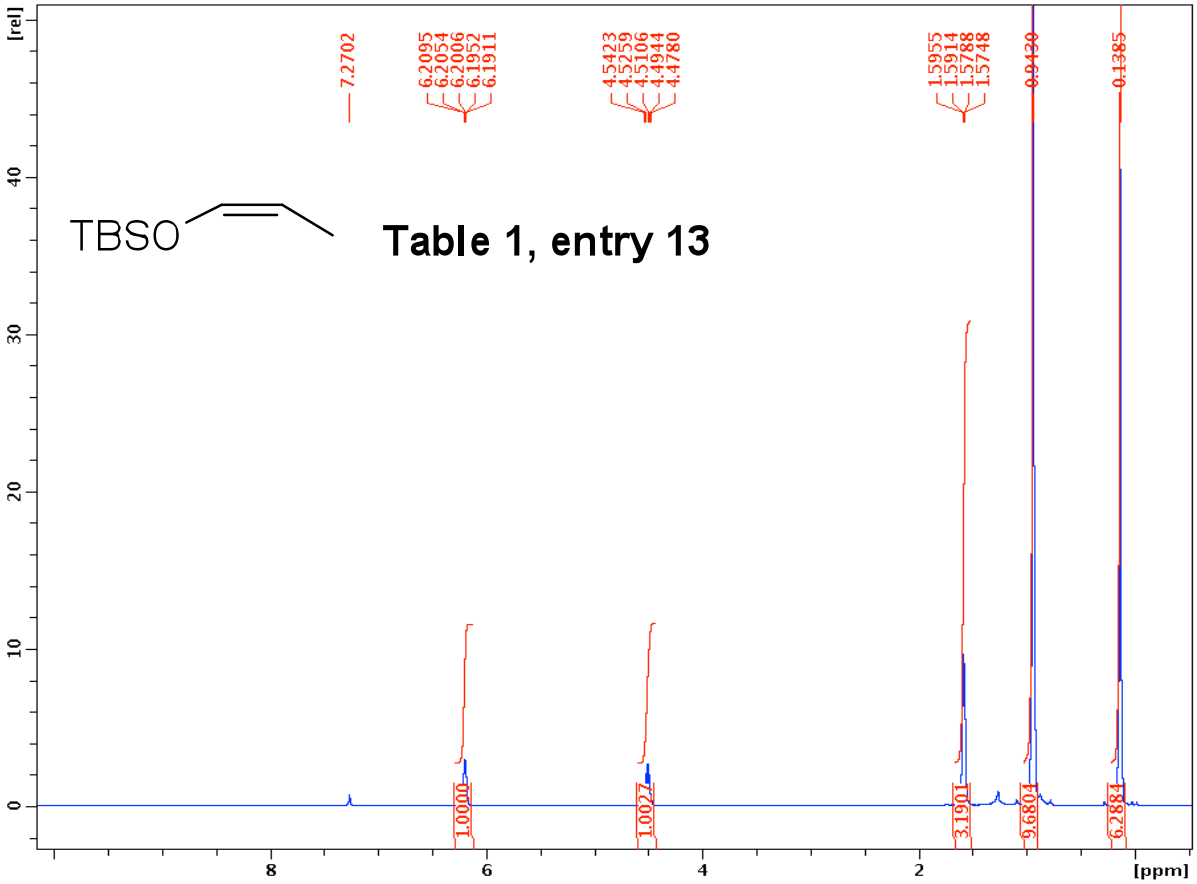
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6.2054
6.2006
6.1952
6.1911
4.5423
4.5259
4.5106
4.4944
4.4780
1.5955
1.5914
1.5788
1.5748
0.0430
0.1385
TBSO
Table 1, entry 13
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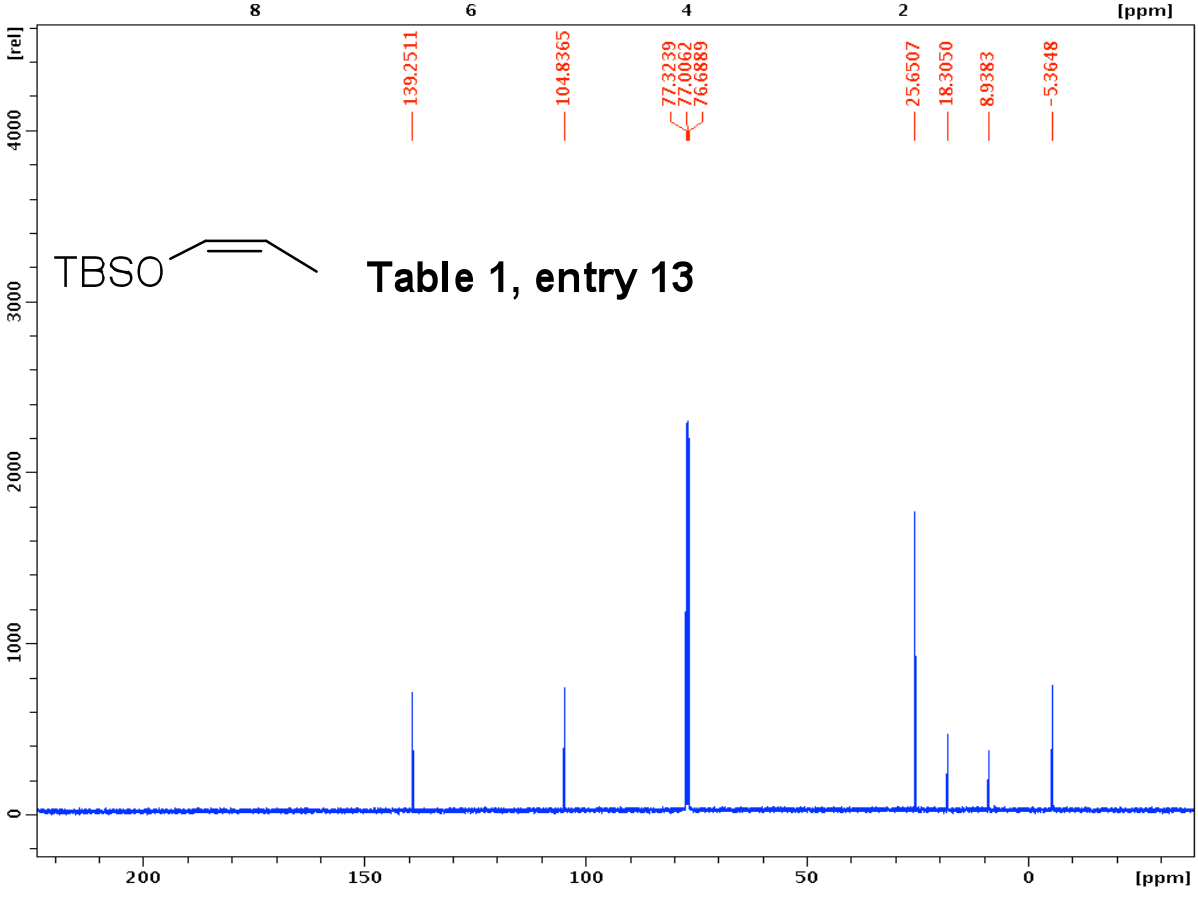
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-5.3648
TBSO
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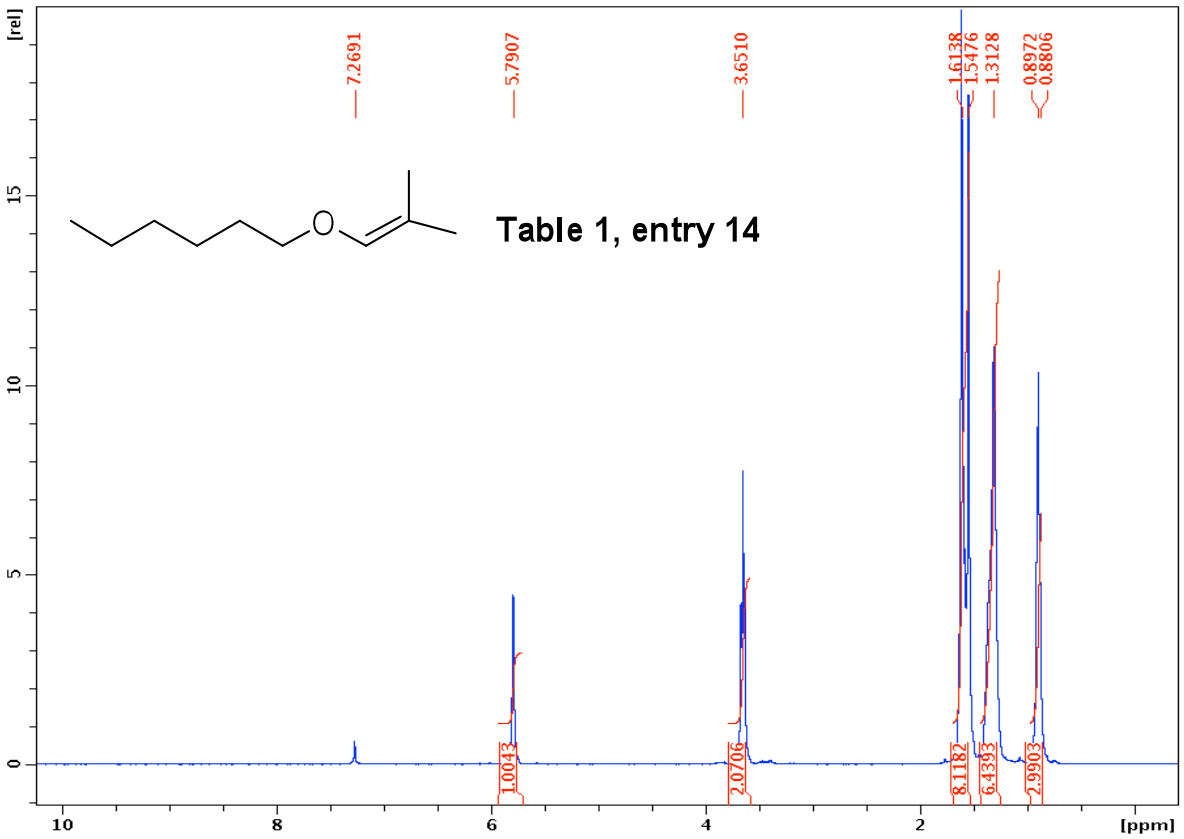
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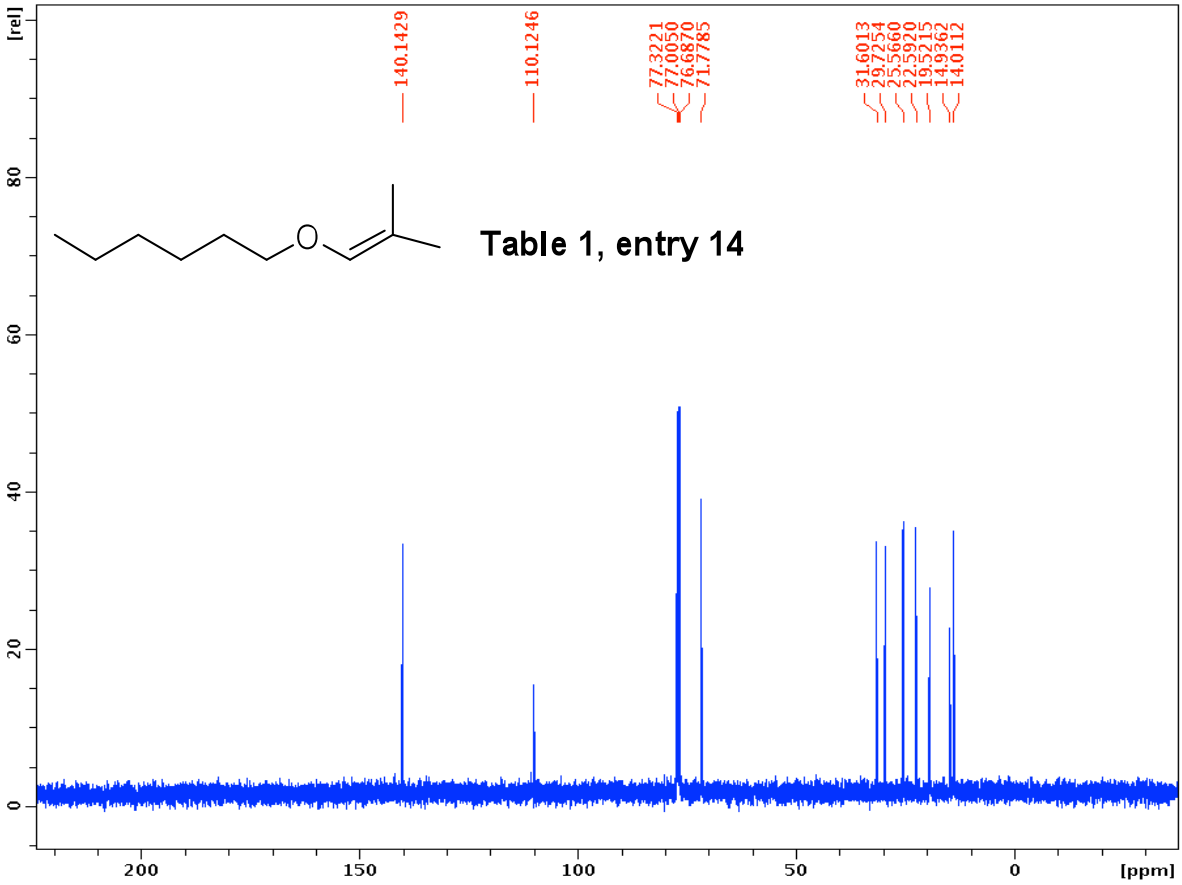
[ppm]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77.0050
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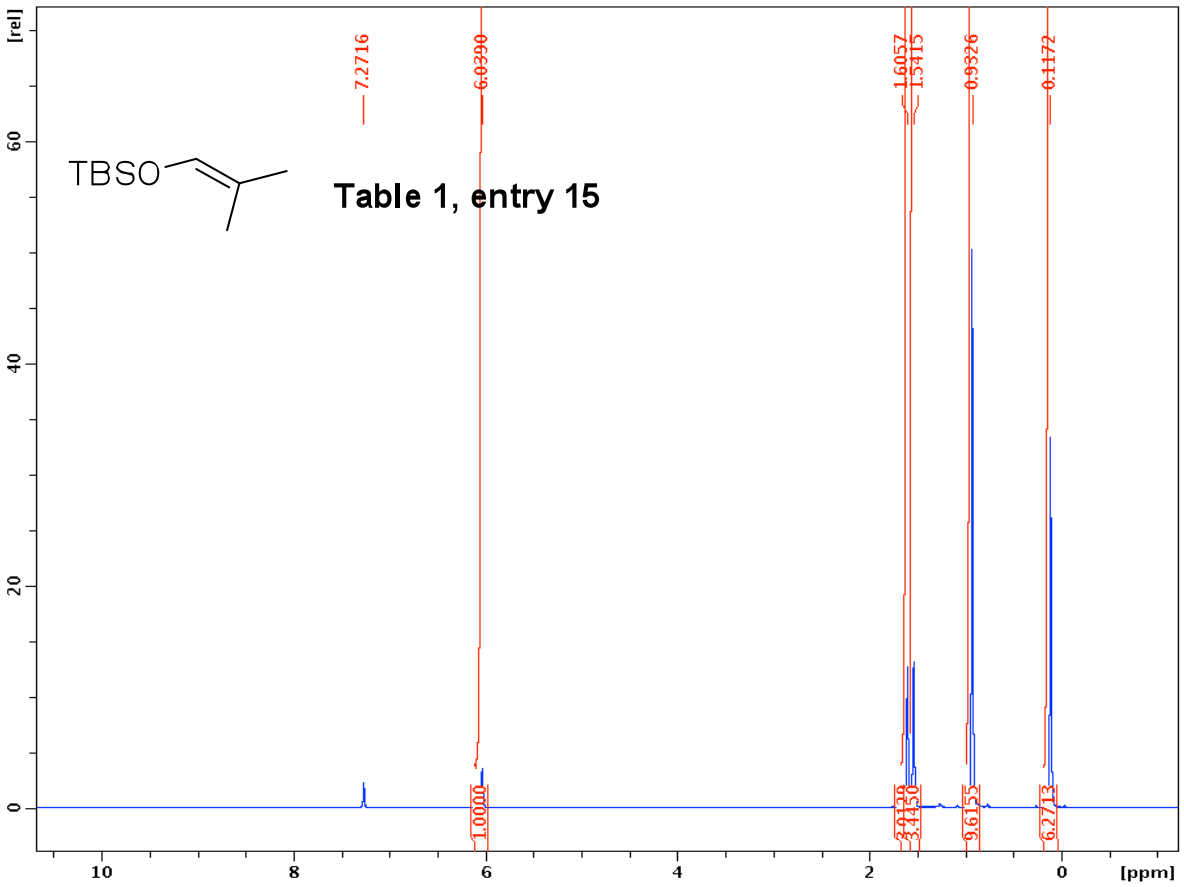
71.7785
31.6013
29.7254
25.5660
22.5920
19.5215
14.9362
14.0112
Table 1, entry 14
[ppm]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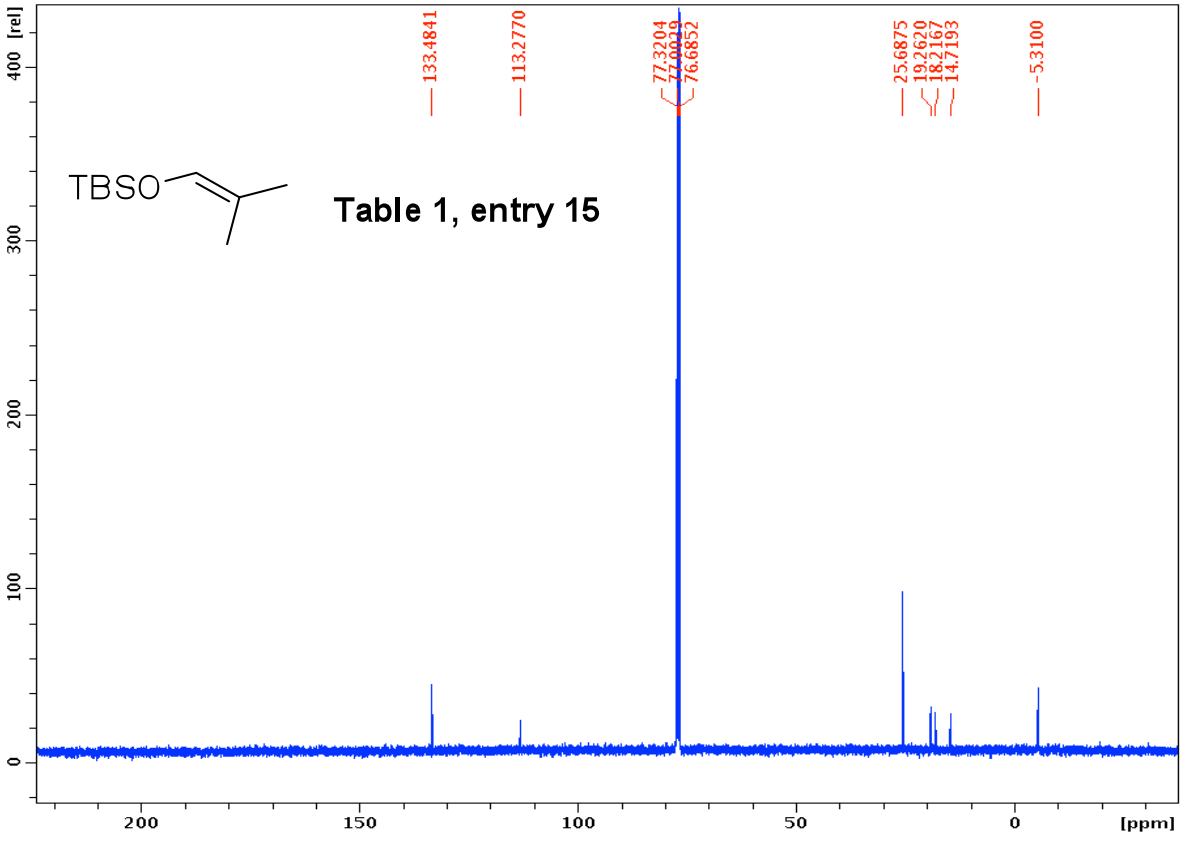
9.6155
6.2713
10
8
6
4
2
0
[ppm]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300
200
100
0
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19.2620
18.2167
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-5.3100
TBSO
Table 1, entry 15
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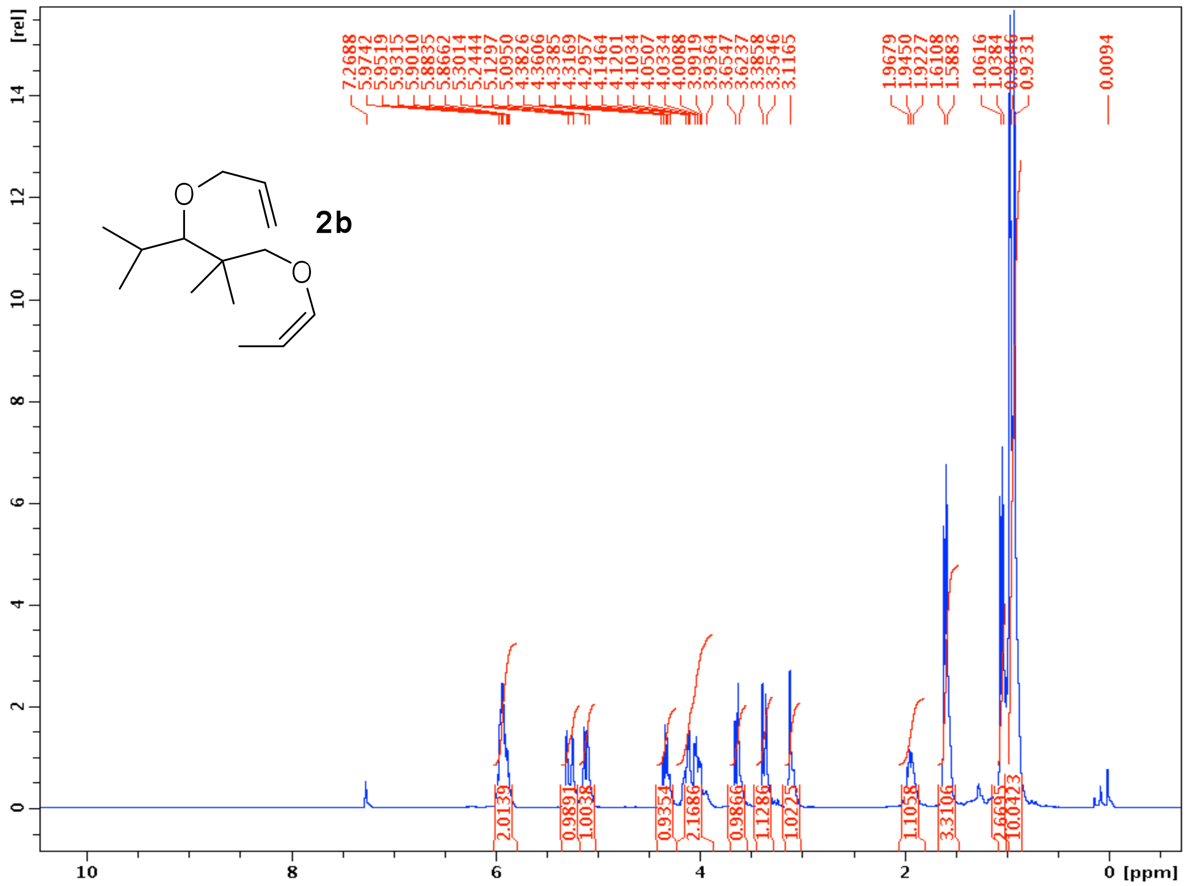
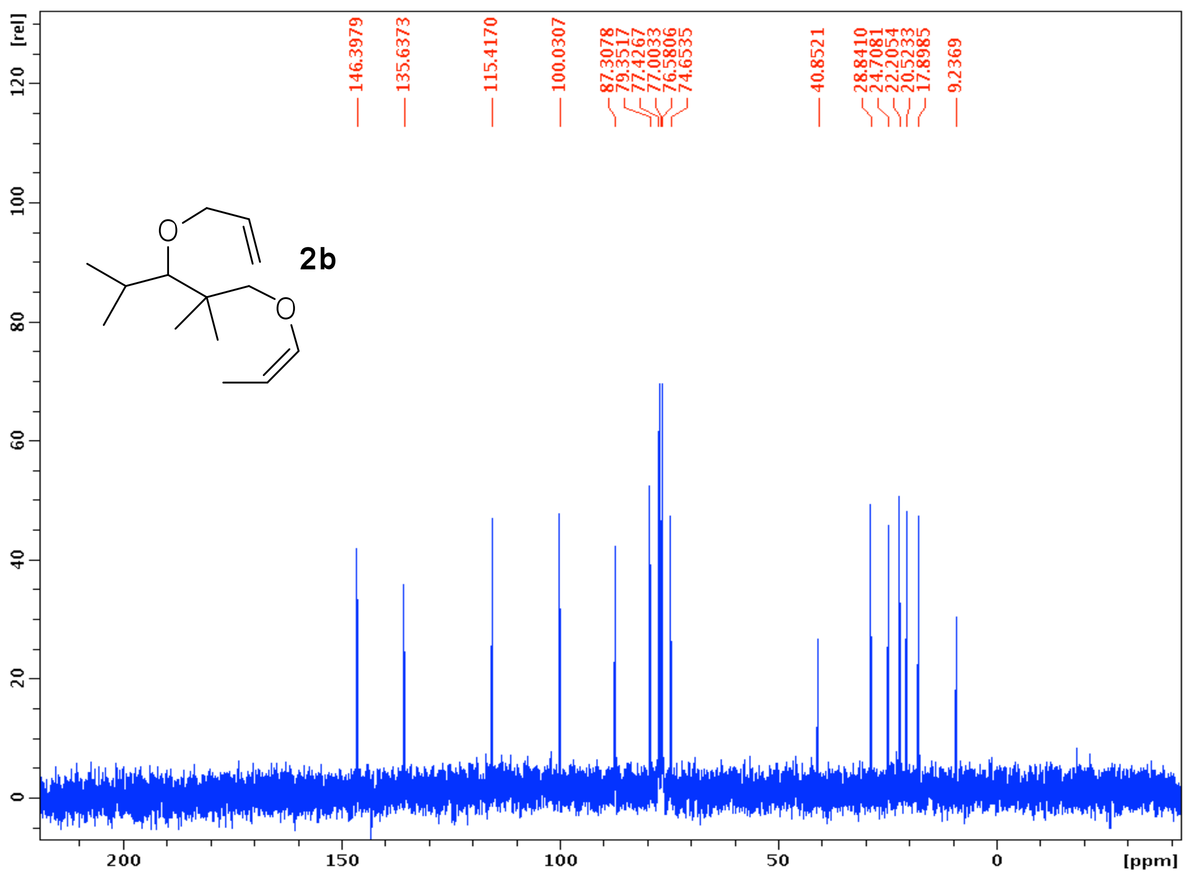
100
50
0
[ppm]


2b
[rel]
[ppm]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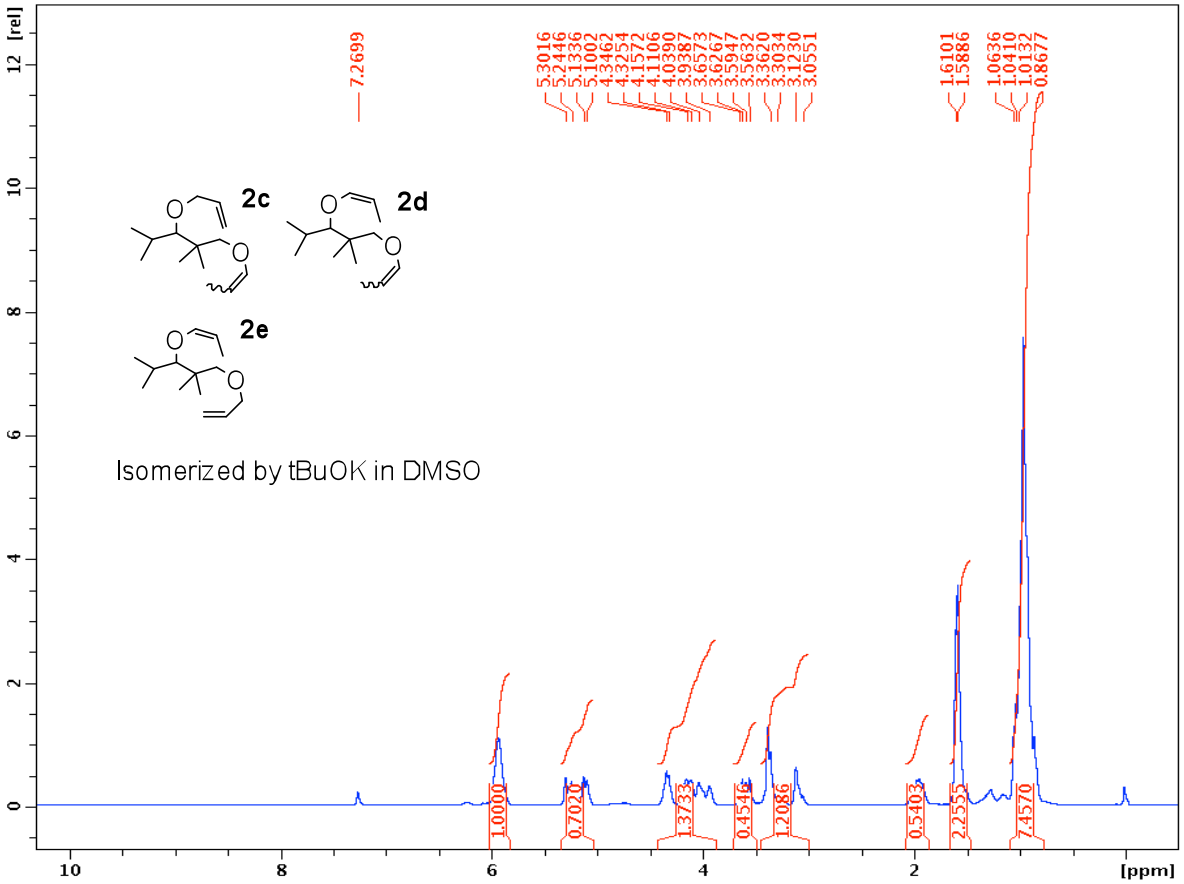
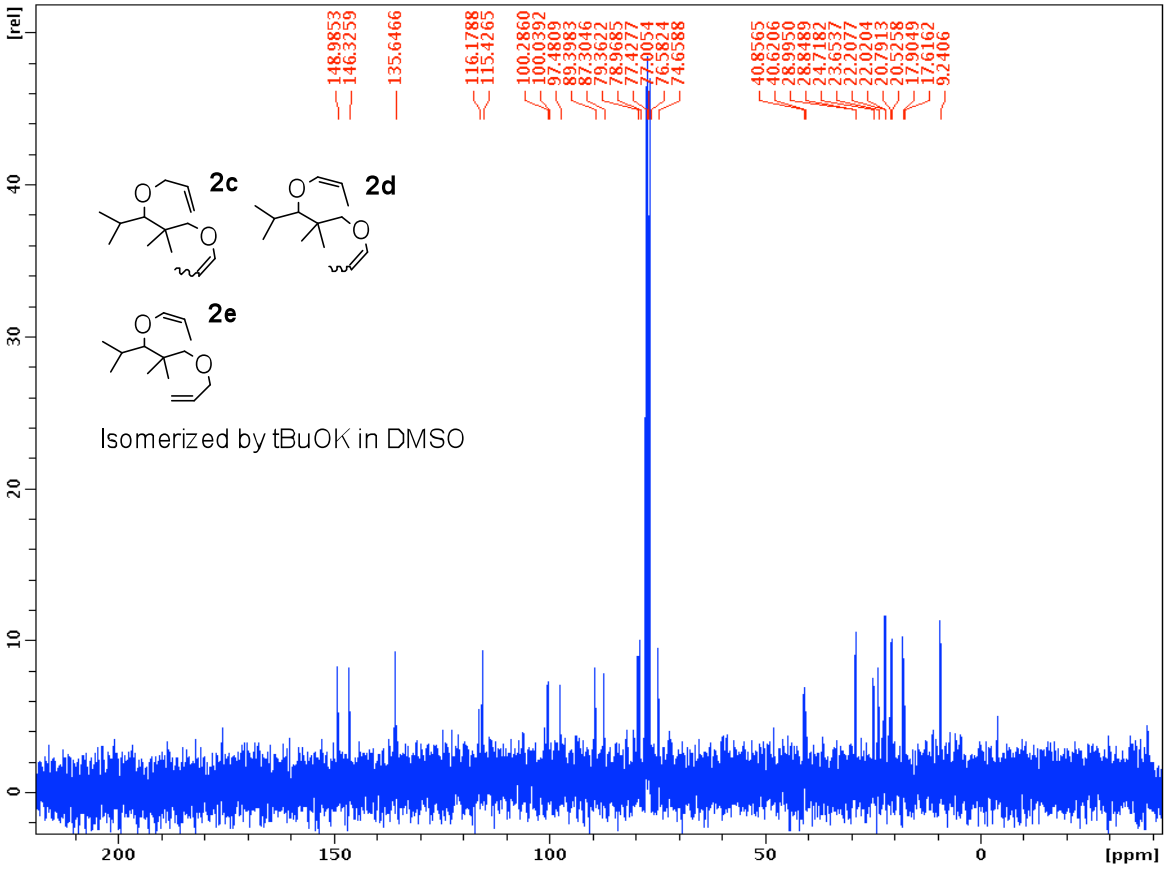
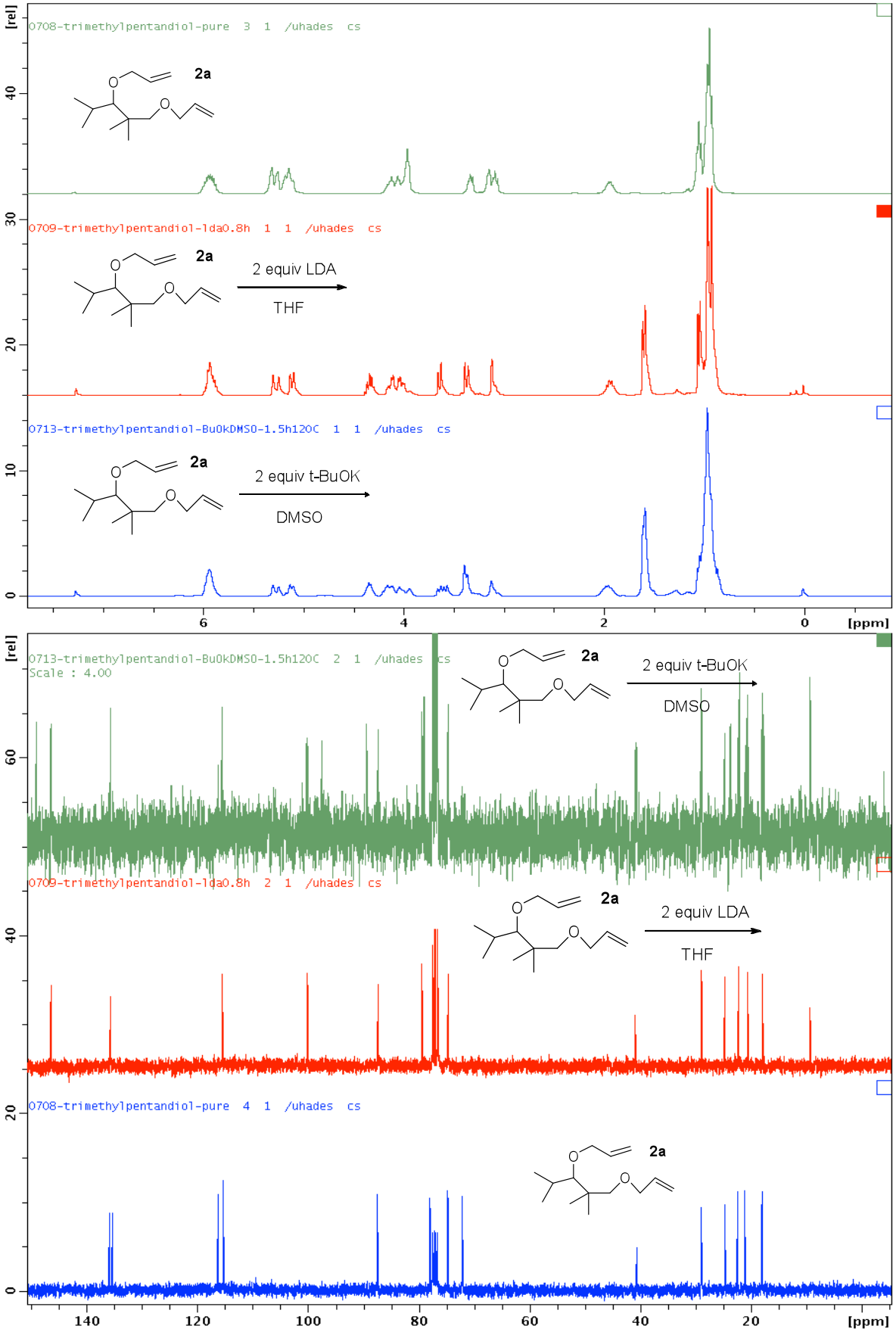
87.3078
79.3517
77.4267
77.0033
76.5806
74.6535
40.8521
28.8410
24.7081
22.2054
20.5233
17.8985
9.2369
[rel]
[ppm]


2c
2d
2e
Isomerized by tBuOK in DMSO
[rel]
[ppm]


2c
2d
2e
Isomerized by tBuOK in DMSO
[rel]
[ppm]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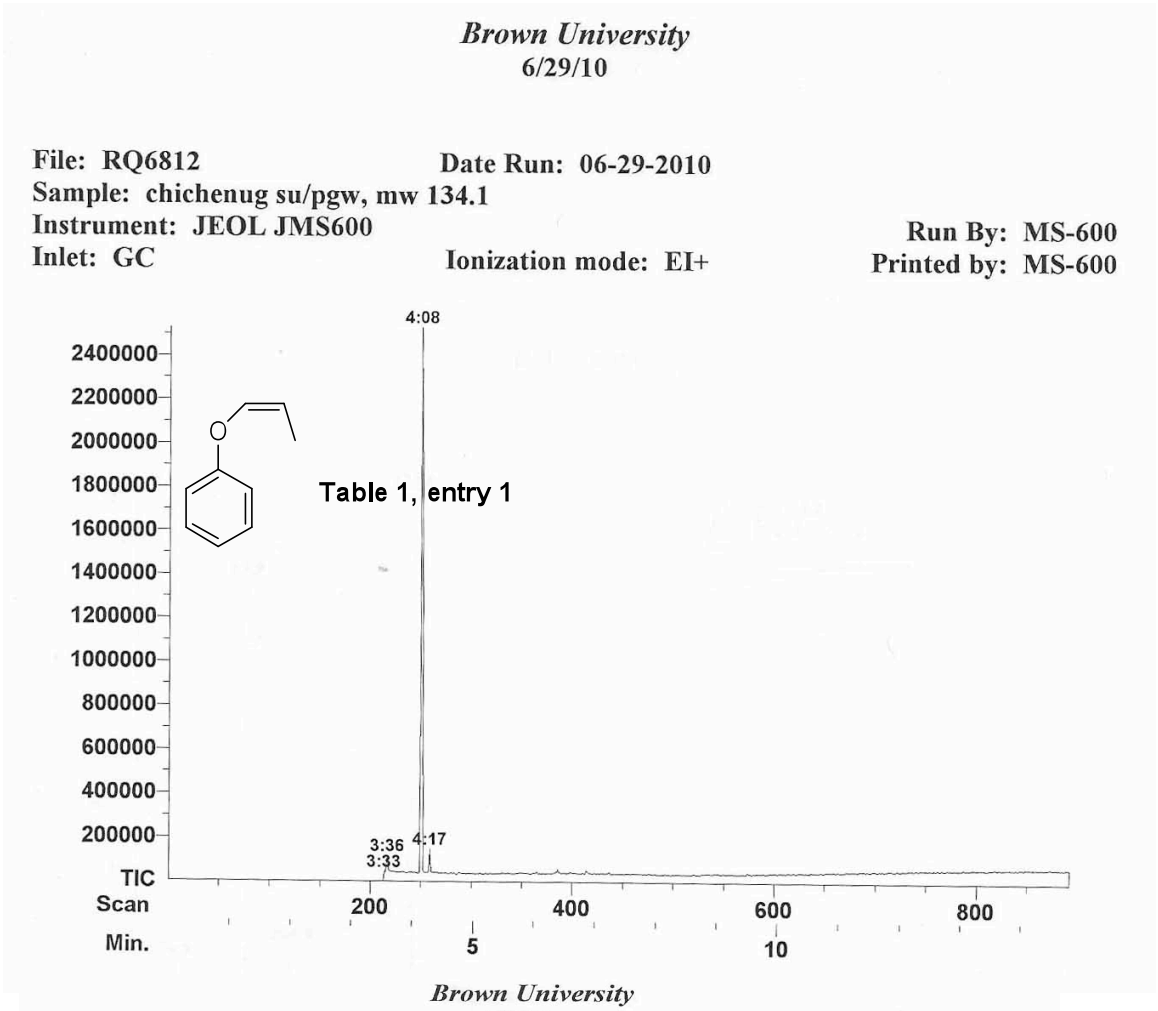
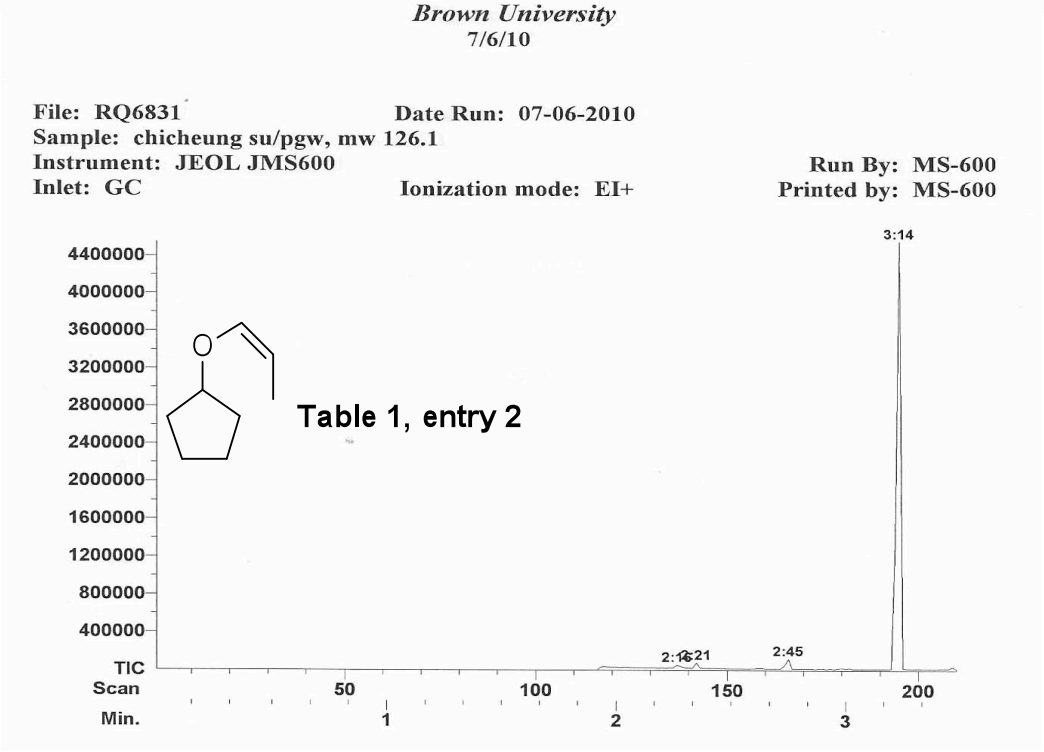
2a
0709-trimethylpentandiol-lda0.8h 1 1 /uhades cs
2a
2 equiv LDA
THF
0713-trimethylpentandiol-BuOkDMSO-1.5h120C 1 1 /uhades cs
2a
2 equiv t-BuOK
DMSO
[ppm]
0713-trimethylpentandiol-BuOkDMSO-1.5h120C 2 1 /uhades cs
Scale : 4.00
2a
2 equiv t-BuOK
DMSO
0709-trimethylpentandiol-lda0.8h 2 1 /uhades cs
2a
2 equiv LDA
THF
0708-trimethylpentandiol-pure 4 1 /uhades cs
2a
[ppm]

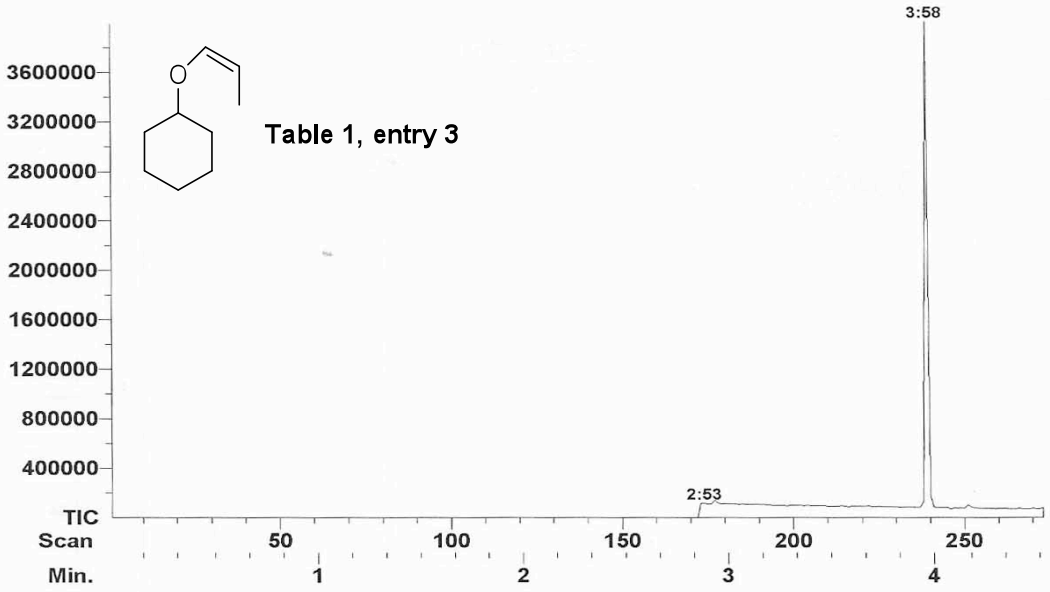
GC Spectra for Vinyl Ethers





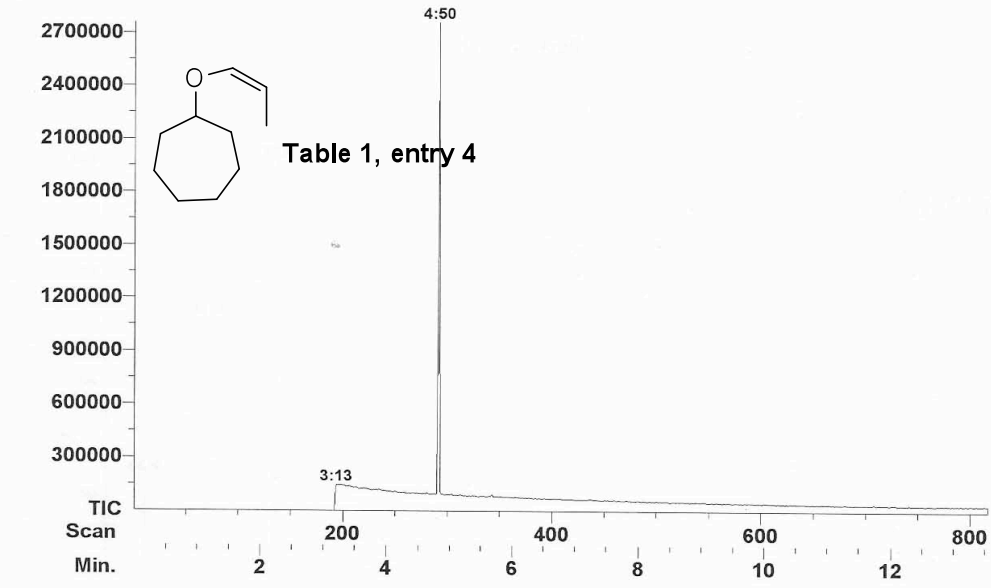
Brown University
6/29/10

File: RQ6780 Date Run: 06-29-2010
Sample: 140.1
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600



Brown University
6/30/10

File: RQ6815 Date Run: 06-30-2010
Sample: chicheung su/pgw, mw 154.1
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600



Brown University
6/29/10

File: RQ6813 Date Run: 06-29-2010
Sample: chicheung su/pgw, mw 196.2
Instrument: JEOL JMS600
Inlet: GC Ionization mode: EI+
Run By: MS-600
Printed by: MS-600

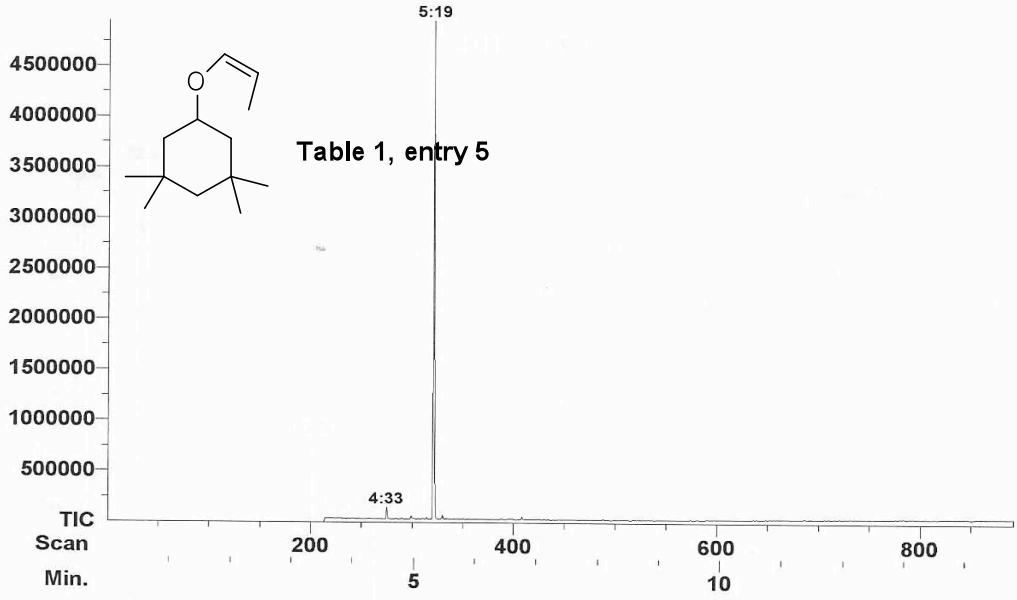


Table 1, entry 5

Brown University
8/19/10

File: RQ6985 Date Run: 08-19-2010
Sample: cs/pgw, mw 196.2
Instrument: JEOL JMS600
Inlet: GC Ionization mode: EI+
Run By: MS-600
Printed by: MS-600

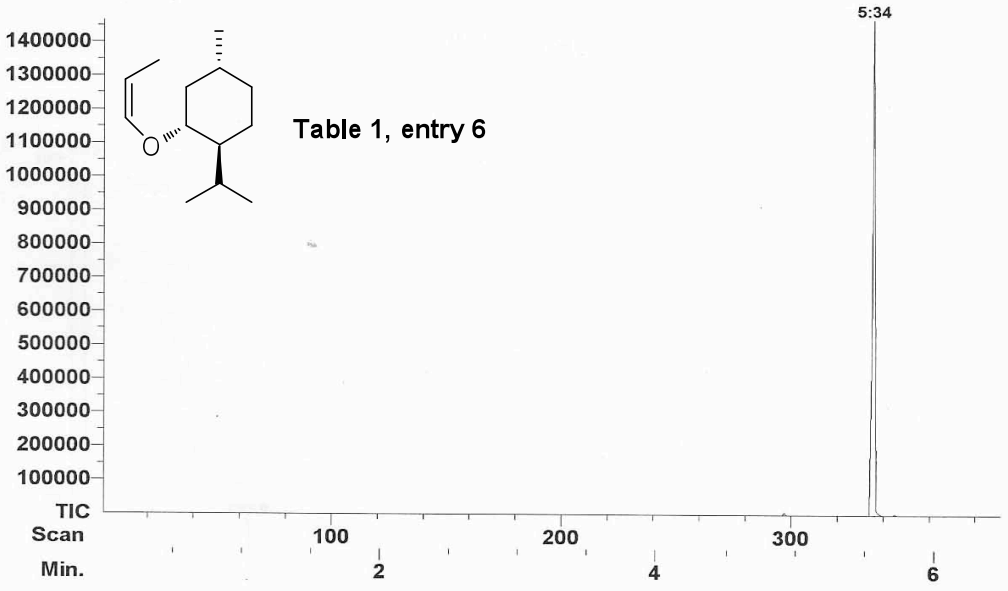


Table 1, entry 6

Brown University
6/24/10

File: RQ6778 Date Run: 06-24-2010
Sample: chicheung su/pgw, mw 142
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600

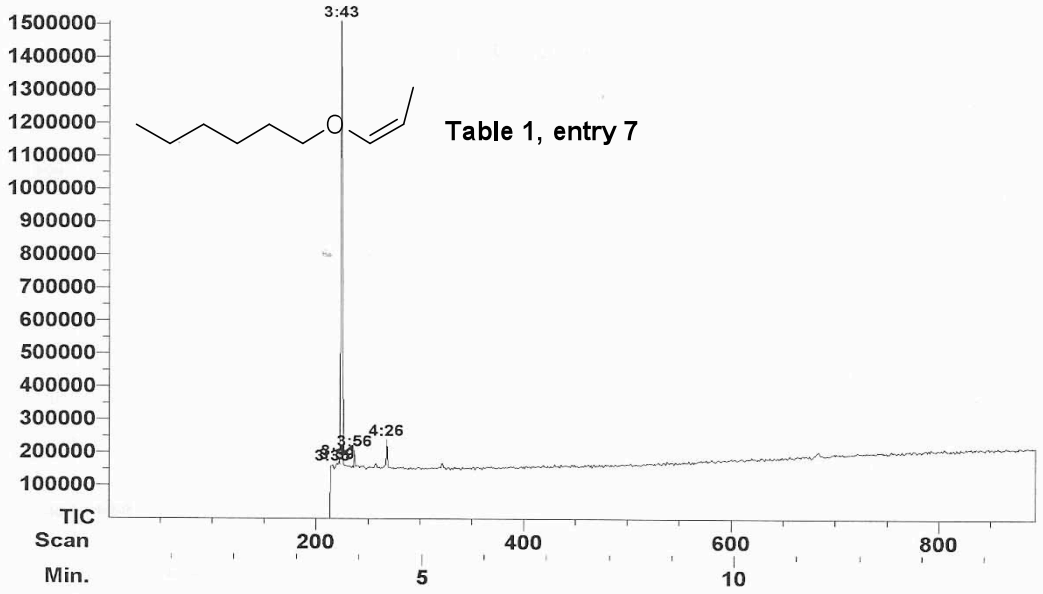


Table 1, entry 7

Brown University
8/18/10

File: RQ6979 Date Run: 08-18-2010
Sample: cs/pgw, mw 152.1
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600

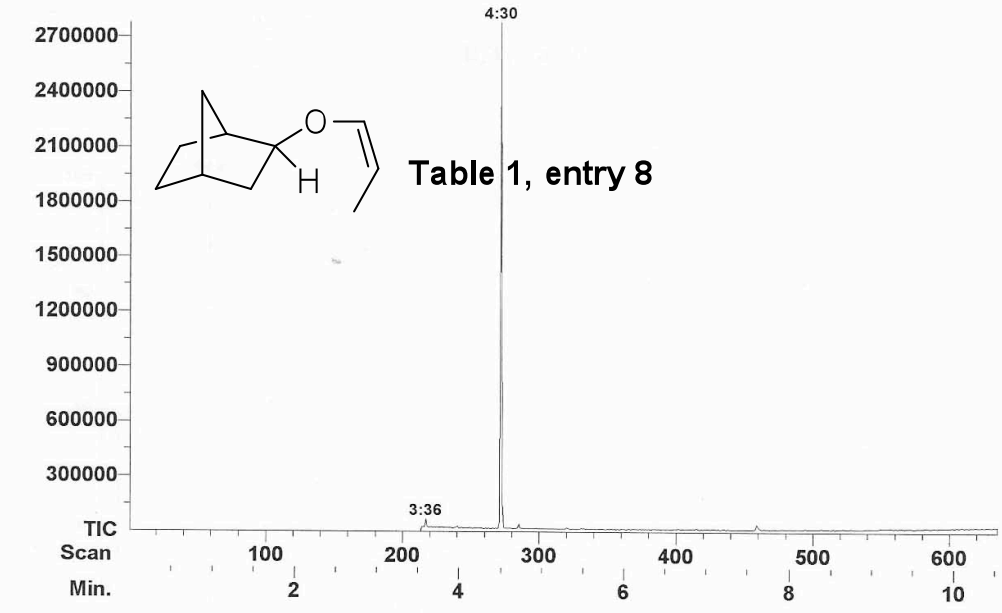


Table 1, entry 8

Brown University
8/19/10

File: RQ6984
Sample: cs/pgw, mw 194.2
Instrument: JEOL JMS600
Inlet: GC

Date Run: 08-19-2010

Ionization mode: EI+

Run By: MS-600
Printed by: MS-600

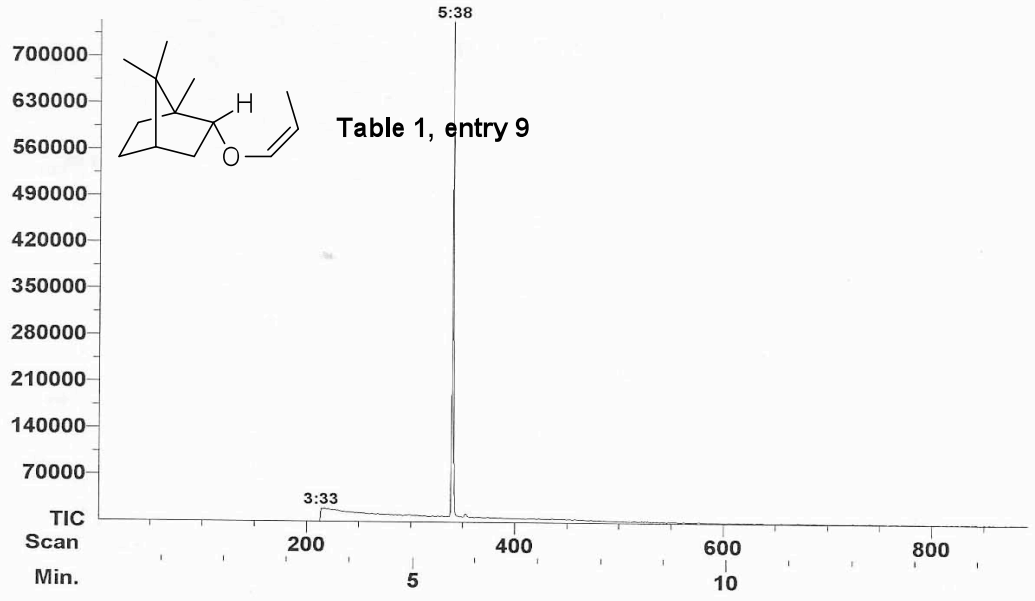


Table 1, entry 9

Brown University
8/18/10

File: RQ6977
Sample: cs/pgw, mw 194.2
Instrument: JEOL JMS600
Inlet: GC

Date Run: 08-18-2010

Ionization mode: EI+

Run By: MS-600
Printed by: MS-600

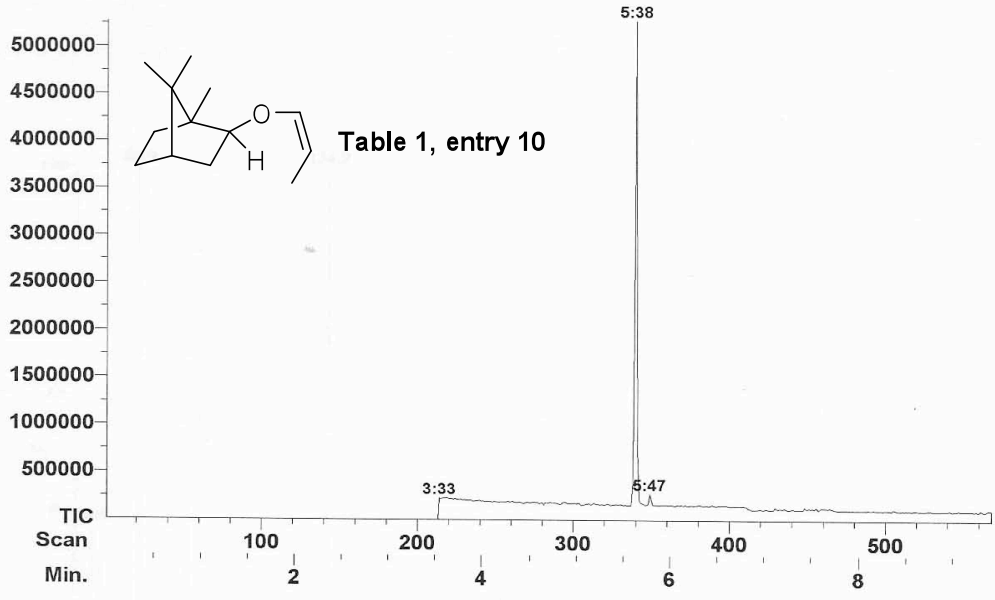


Table 1, entry 10

Brown University
6/24/10

File: RQ6777B Date Run: 06-24-2010
Sample: chicheung su/pgw, mw 156
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600

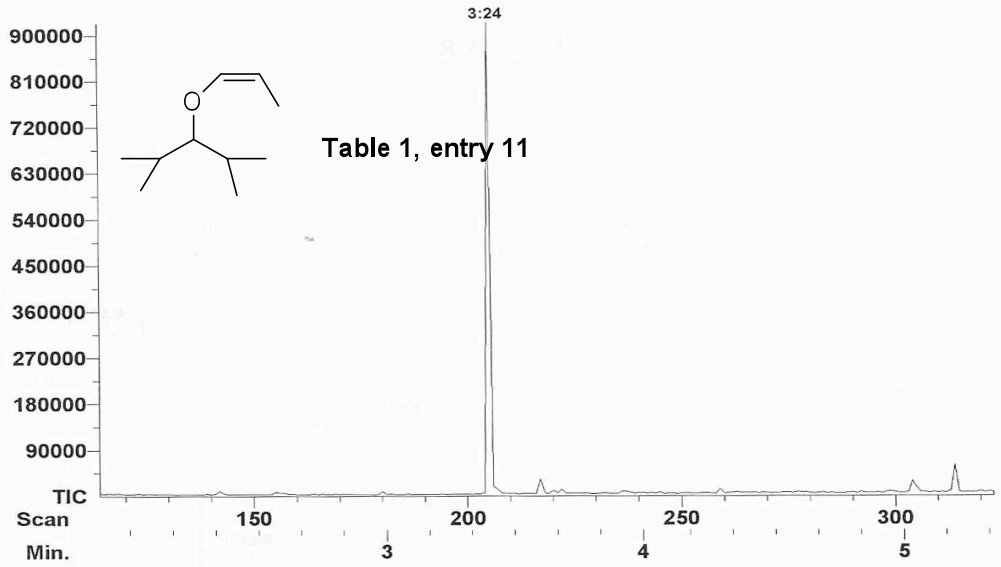


Table 1, entry 11

Brown University
6/29/10

File: RQ6779B Date Run: 06-29-2010
Sample: chicheung su/pgw, mw 198.2
Instrument: JEOL JMS600 Run By: MS-600
Inlet: GC Ionization mode: EI+ Printed by: MS-600

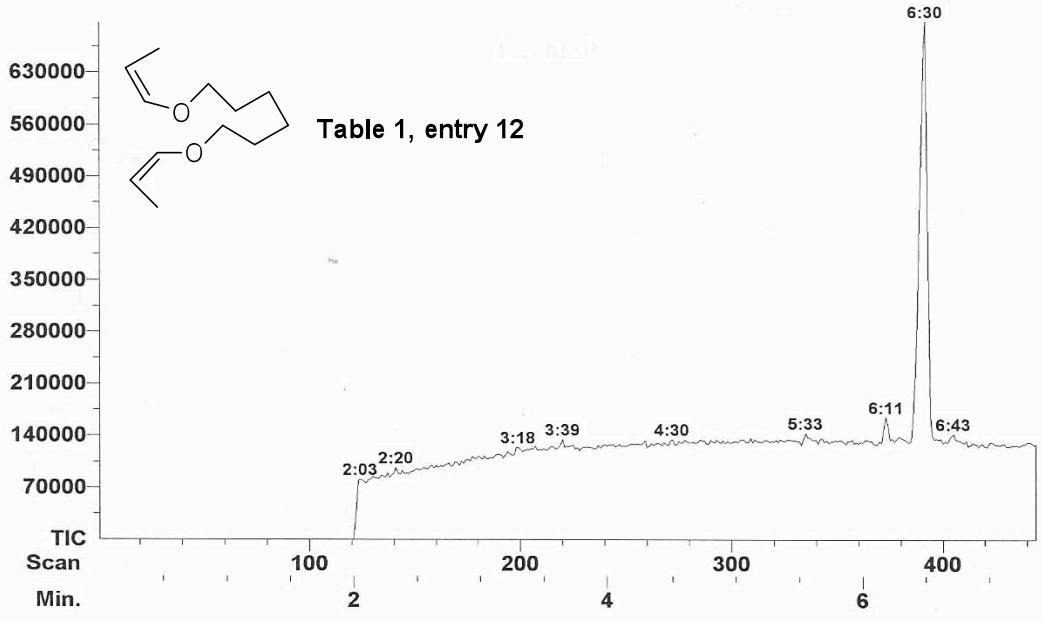


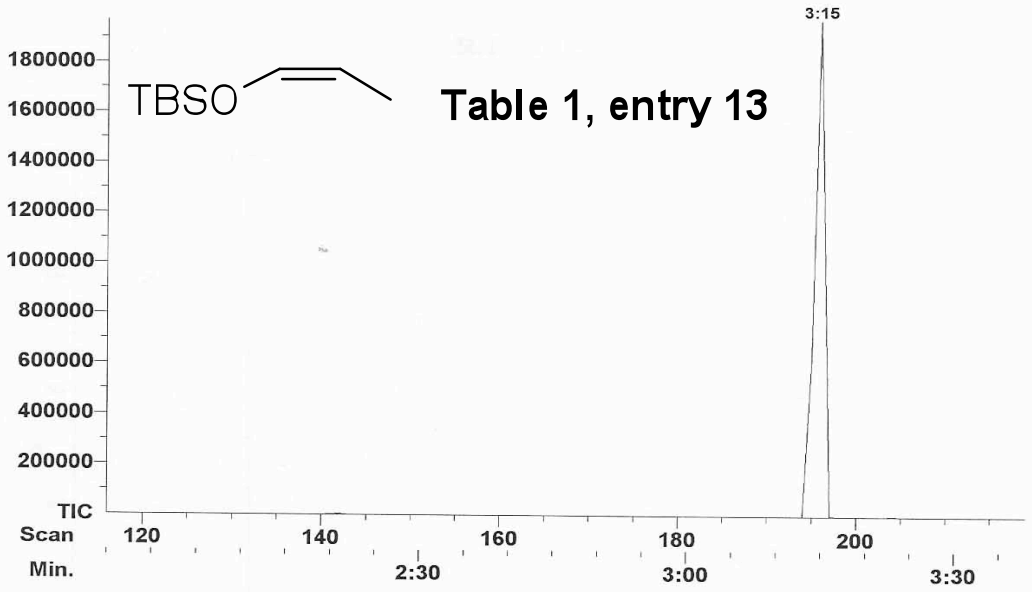
Table 1, entry 12

Brown University
8/19/10

File: RQ6986
Sample: cs/pgw, mw 172.1
Instrument: JEOL JMS600
Inlet: GC

Date Run: 08-19-2010
Ionization mode: EI+

Run By: MS-600
Printed by: MS-600



TBSO

Table 1, entry 13

Brown University
6/24/10

File: RQ6779
Sample: chicheung su/pgw, mw 156
Instrument: JEOL JMS600
Inlet: GC

Date Run: 06-24-2010
Ionization mode: EI+

Run By: MS-600
Printed by: MS-600

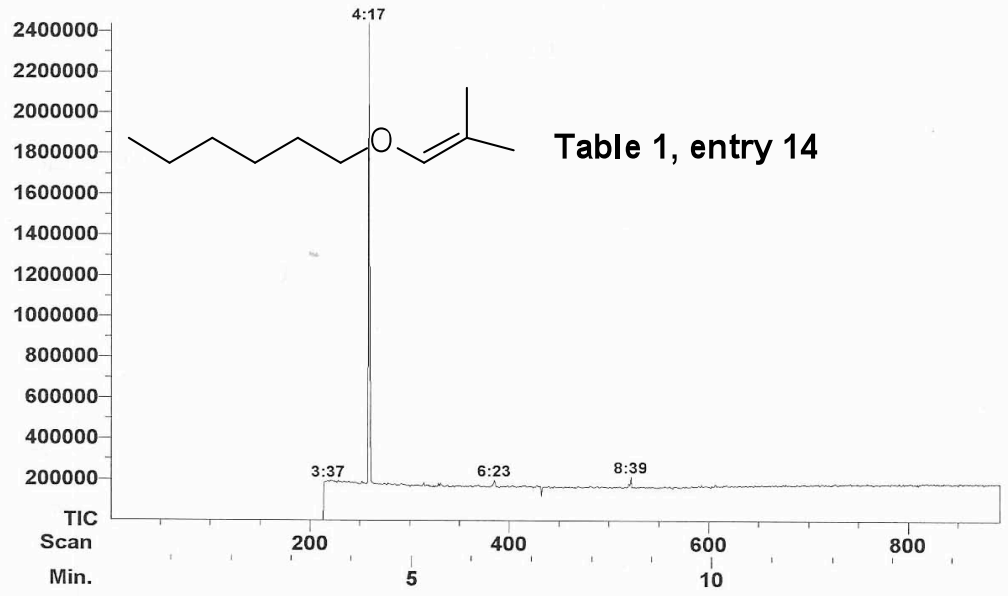


Table 1, entry 14

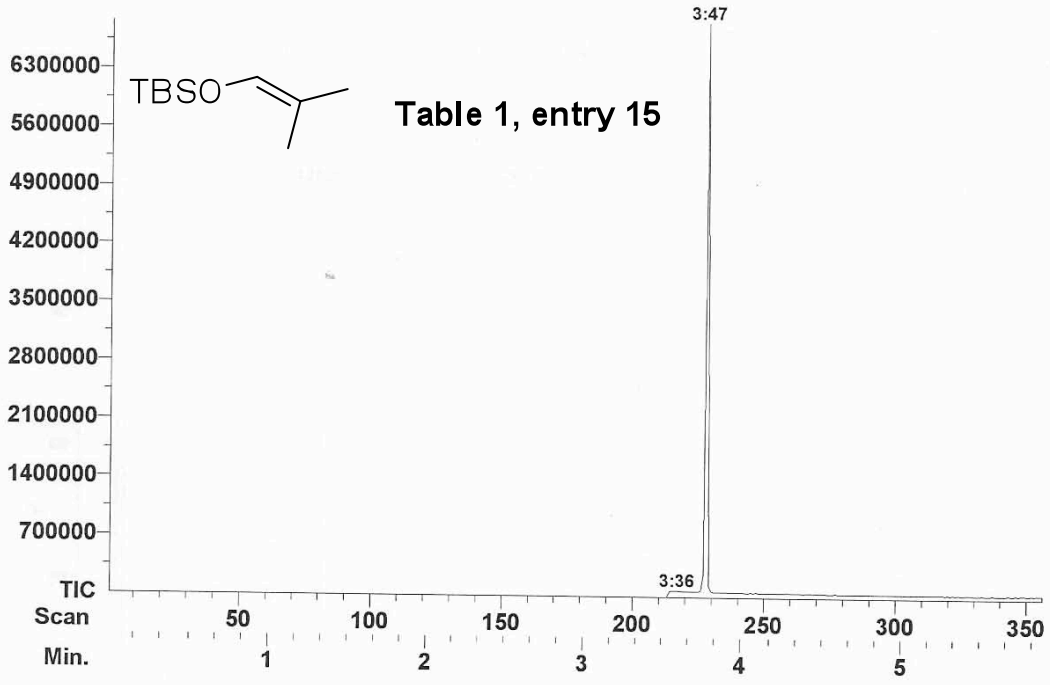
Brown University
8/18/10

File: RQ6978
Sample: cs/pgw, mw186.1
Instrument: JEOL JMS600
Inlet: GC

Date Run: 08-18-2010

Ionization mode: EI+

Run By: MS-600
Printed by: MS-600



References

1. Kofron, W. G.; Baclawski, L. M. *J. Org. Chem*. **1975**, *41*, 1879-1880.