Supporting Information

**Gold-Catalyzed Efficient Formation of Alkenyl Enol
Esters/Carbonates from Trimethylsilylmethyl-
Substituted Propargyl Esters/Carbonates**

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General. Ethyl acetate (ACS grade), hexanes (ACS grade) and diethyl ether (ACS grade) were purchased from Fisher Scientific and used without further purification. Anhydrous dichloromethane (HPLC grade) was purified by distillation over calcium hydride. Anhydrous tetrahydrofuran in Pure-Pac™ from Aldrich was used directly without further purification. Commercially available reagents were used without further purification. Reactions were monitored by thin layer chromatography(TLC) using whatman precoated silica gel plates. Flash column chromatography was performed over silicycle silica gel (230-400 mesh). ¹H NMR and ¹³C NMR spectra were recorded on a Varian 500 MHz Unity plus spectrometer and a Varian 400 MHz spectrometer using residue solvent peaks as internal standards. Infrared spectra were recorded with a Perkin Elmer FT-IR spectrum 2000 spectrometer and are reported in reciprocal centimeter (cm⁻¹). Mass spectra were recorded with Waters micromass ZQ detector using electron spray method.

General procedure A: Preparation of trimethylsilylmethyl-substituted propargylic acetate

To a solution of alkyne (2.5 mmol) in THF (5.0 mL) was added *n*-BuLi (1.6M solution in hexanes, 1.56 mL, 2.5 mmol) at -78°C and the resulting solution was stirred at the same temperature for 15 min. To this solution was added the aldehyde (2.5 mmol) neat via syringe and the reaction mixture was stirred for another 15 min. Saturated NH₄Cl aqueous solution was added to quench the reaction. Upon warming to room temperature, the resulting mixture was extracted with diethyl ether (3 × 20 mL). The combined organic layers were washed with water (40 mL) and brine (40 mL) successively, dried (anhydrous MgSO₄) and concentrated. The residue was purified through silica gel flash column chromatography (hexanes/ethyl acetate = 4/1) to yield the corresponding trimethylsilyl-substituted propargyl alcohol.

To a solution of the above alcohol (2.0 mmol), pyridine (1.65 mL, 20.0 mL) and catalytic amount of DMAP in anhydrous CH₂Cl₂ (6.0 mL) at 0°C, was slowly added acetyl

chloride (0.29 mL, 4.0 mmol). The reaction was stirred at the same temperature for 30 min before being diluted with hexanes (30 mL). The solid precipitates were filtered off and the filtrate obtained was concentrated. The residue was purified through silica gel flash column chromatography (hexanes/ethyl acetate = 20/1) to yield the desired acetate.

Compound **2** was prepared in 95% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 5.35-5.32 (m, 1H), 2.06 (s, 3H), 1.73- 1.67 (m, 2H), 1.49 (d, 2H, J = 2.5 Hz), 1.42 (p, 2H, J = 8.0 Hz), 1.33- 1.28 (m, 4H), 0.89 (t, 3H, J = 6.5 Hz), 0.09 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 170.2, 84.1, 76.6, 65.0, 35.2, 31.3, 24.8, 22.5, 21.2, 14.0, 7.1, -2.1; IR (neat): 2957, 2929, 2861, 2232, 1743, 1370; MS (ES^+) Calculated for $[\text{C}_{14}\text{H}_{26}\text{NaO}_2\text{Si}]^+$: 277.2; Found: 277.2.

Compound **6a** was prepared in 75% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 5.21-5.19 (m, 1H), 2.06 (s, 3H), 1.85- 1.59 (m, 6H), 1.50 (d, 2H, J = 2.5 Hz), 1.27- 1.05 (m, 5H), 0.10 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 170.2, 84.7, 75.4, 69.2, 42.1, 28.7, 28.1, 26.3, 25.8, 25.7, 21.1, 7.1, -2.0; IR (neat): 2957, 2931, 2855, 2226, 1743, 1452, 1370; MS (ES^+) Calculated for $[\text{C}_{15}\text{H}_{26}\text{NaO}_2\text{Si}]^+$: 289.2; Found: 289.2.

6b

Compound **6b** was prepared in 80% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 5.10 (s, 1H), 2.08 (s, 3H), 1.50 (d, 2H, $J = 2.0$ Hz), 0.99 (s, 9H), 0.10 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 170.3, 84.4, 75.2, 72.7, 35.1, 25.6, 21.0, 7.1, -2.0; IR (neat): 2959, 2907, 2872, 2228, 1743, 1370; MS (ES^+) Calculated for $[\text{C}_{13}\text{H}_{24}\text{NaO}_2\text{Si}]^+$: 263.1; Found: 263.1.

6c

Compound **6c** was prepared in 91% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 7.49 (d, 2H, $J = 8.0$ Hz), 7.39 (d, 2H, $J = 8.0$ Hz), 6.39 (bs, 1H), 2.08 (s, 3H), 1.55 (d, 2H, $J = 2.5$ Hz), 0.09 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 169.8, 137.1, 131.6, 129.3, 122.7, 87.1, 75.2, 65.7, 21.1, 7.3, -2.0; IR (neat): 2957, 2898, 2226, 1743, 1487, 1370, 1251, 1227; MS (ES^+) Calculated for $[\text{C}_{15}\text{H}_{19}\text{BrNaO}_2\text{Si}]^+$: 361.0, 363.0; Found: 361.1, 363.0.

6d

Compound **6d** was prepared in yield 89% according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 7.63 (s, 4H), 6.47 (t, 1H, $J = 2.0$ Hz), 2.10 (s, 3H), 1.56 (d, 2H, $J = 2.0$ Hz), 0.10 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 169.8, 141.9, 130.7 (q, $J = 32.6$ Hz), 127.9, 125.5 (q, $J = 4.0$ Hz), 124.0 (q, $J = 270.9$ Hz), 87.6, 75.0, 65.7, 21.0, 7.3, -2.0; IR

(neat): 2960, 2899, 2228, 1745, 1622, 1328, 1229; MS (ES^+) Calculated for $[\text{C}_{16}\text{H}_{19}\text{F}_3\text{NaO}_2\text{Si}]^+$: 351.1; Found: 351.1.

Compound **6e** was prepared in 86% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 8.04 (d, 2H, $J = 8.5$ Hz), 7.57 (d, 2H, $J = 8.5$ Hz), 6.47 (t, 1H, $J = 2.0$ Hz), 3.92 (s, 3H), 2.10 (s, 3H), 1.56 (d, 2H, $J = 2.0$ Hz), 0.09 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 169.8, 166.7, 142.8, 130.2, 129.8, 127.4, 87.4, 75.1, 65.8, 52.2, 21.1, 7.3, -2.0; IR (neat): 2956, 2227, 1727, 1614, 1436, 1371, 1281, 1227; MS (ES^+) Calculated for $[\text{C}_{17}\text{H}_{22}\text{NaO}_4\text{Si}]^+$: 341.1; Found: 341.2.

Compound **6f** was prepared in 92% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 5.34- 5.28 (m, 1H), 1.75- 1.65 (m, 2H), 1.48 (d, 2H, $J = 2.0$ Hz), 1.42 (p, 2H, $J = 7.0$ Hz), 1.30- 1.29 (m, 4H), 1.20 (s, 9H), 0.89 (t, 3H, $J = 7.0$ Hz), 0.09 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.5, 83.6, 76.9, 64.6, 38.7, 35.2, 31.3, 27.1, 24.7, 22.5, 14.0, 7.1, -2.1; IR (neat): 2959, 2934, 2874, 2232, 1733, 1480, 1397, 1280, 1250; MS (ES^+) Calculated for $[\text{C}_{17}\text{H}_{32}\text{NaO}_2\text{Si}]^+$: 319.2; Found: 319.2.

Compound **6f** was prepared in 95% yield according to the general procedure A. ^1H NMR (500MHz, CDCl_3) δ 8.06 (d, 2H, $J = 7.3$ Hz), 7.55 (t, 1H, $J = 7.3$ Hz), 7.44 (t, 2H, $J = 7.3$ hz), 5.61- 5.58 (m, 1H), 1.90- 1.81 (m, 2H), 1.55- 1.50 (m, 4H), 1.37- 1.30 (m, 2H), 0.90

(t, 3H, $J = 6.9$ Hz), 0.09 (s, 9H). ^{13}C NMR (125 MHz, CDCl_3) δ 165.7, 132.9, 130.4, 129.7, 128.3, 84.4, 76.7, 65.6, 35.4, 31.4, 24.9, 22.6, 14.0, 7.1, -2.1; IR (neat): 3064, 2957, 2933, 2862, 2233, 1723, 1603, 1452, 1315, 1268, 1251; MS (ES^+) Calculated for $[\text{C}_{19}\text{H}_{28}\text{NaO}_2\text{Si}]^+$: 339.2; Found: 339.2.

Compound **8** was prepared in 91% yield according to the general procedure A: ^1H NMR (500MHz, CDCl_3) δ 5.21- 5.18 (m, 1H), 3.78 (s, 3H), 1.81- 1.70 (m, 2H), 1.50 (d, 2H, $J = 2.0$ Hz), 1.45 (p, 2H, $J = 7.5$ Hz), 1.33- 1.25 (m, 2H), 0.89 (t, 3H, $J = 6.5$ Hz), 0.09 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 155.1, 85.3, 75.9, 66.3, 54.7, 35.3, 31.3, 24.7, 22.5, 14.0, 7.1, -2.1; IR (neat): 2958, 2935, 2863, 2233, 1751, 1443, 1265; MS (ES^+) Calculated for $[\text{C}_{14}\text{H}_{26}\text{NaO}_3\text{Si}]^+$: 293.2; Found: 293.1.

Compound **10** was prepared in 95% yield according to the procedure A: ^1H NMR (400MHz, CDCl_3) δ 5.99- 5.89 (m, 1H), 5.36 (dq, 1H, $J = 1.6, 17.2$ Hz), 5.26 (dd, 1H, $J = 1.2, 10.4$ Hz), 5.22- 5.18 (m, 1H), 4.63 (d, 2H, $J = 5.6$ Hz), 1.82 -1.70 (m, 2H), 1.50 (d, 2H, $J = 1.6$ Hz), 1.45 (p, 2H, $J = 7.6$ Hz), 0.89 (t, 3H, $J = 7.2$ Hz), 0.10 (s, 9H); ^{13}C NMR (100 MHz, CDCl_3) δ 154.4, 131.6, 118.8, 85.3, 76.0, 69.3, 68.4, 35.3, 31.3, 24.7, 22.5, 14.0, 7.1, -2.1; IR (neat): 2957, 2863, 2233, 1749, 1252, 852; MS (ES^+) Calculated for $[\text{C}_{16}\text{H}_{28}\text{NaO}_3\text{Si}]^+$: 319.2; Found: 319.2.

Procedure B: Au- catalyzed the preparation of dienol acetate/carbonate from TMS-propargylic ester

To a solution of the propargylic ester (0.1 mmol) in dry CH_2Cl_2 (2.0 mL) was added 1.0 mol% AuClPPh_3 (generated as 0.01M solution in CH_2Cl_2), 1.0 mol % AgClO_4 (generated as 0.05M solution in isopropanol) successively, and the reaction mixture was stirred at room temperature until the ester consumed completely (monitored by TLC). The mixture was concentrated and the residue was purified by silica gel flash column chromatography (eluent: ethyl acetate/hexanes) to give the corresponding alkenyl enol ester/carbonate.

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Compound **3** was prepared in 84% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 5.95 (d, 1H, $J = 15.5$ Hz), 5.78-5.72 (m, 1H), 4.89 (s, 1H), 4.76 (s, 1H), 2.22 (s, 3H), 2.12- 2.07 (m, 2H), 1.39 (p, 2H, $J = 7.0$ Hz), 1.33- 1.25 (m, 4H), 0.88 (t, 3H, $J = 7.0$ Hz); ^{13}C NMR (125 MHz, CDCl_3) δ 168.9, 151.9, 133.0, 123.8, 103.5, 32.2, 31.4, 28.5, 22.5, 20.8, 14.0; IR (neat): 2957, 2928, 2856, 1767, 1370; MS (ES^+) Calculated for $[\text{C}_{11}\text{H}_{18}\text{NaO}_2]^+$: 205.1; Found: 205.1.

7a

Compound **7a** was prepared in 82% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 5.91 (d, 1H, $J = 15.5$ Hz), 5.70 (dd, 1H, $J = 15.5, 6.5$ Hz), 4.90 (s, 1H), 4.77 (s, 1H), 2.22 (s, 3H), 2.03- 2.01 (m, 1H), 1.74- 1.63 (m, 5H), 1.30- 1.05 (m,

5H); ^{13}C NMR (125 MHz, CDCl_3) δ 168.9, 152.1, 138.2, 121.5, 103.6, 40.2, 32.4, 26.0, 25.9, 20.9; IR (neat): 2927, 2853, 1766, 1603, 1451, 1371; MS (ES^+) Calculated for $[\text{C}_{12}\text{H}_{18}\text{NaO}_2]^+$: 217.1; Found: 217.1.

Compound **7b** was prepared in 76% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 5.88 (d, 1H, $J = 16.0$ Hz), 5.76 (d, 1H, $J = 16.0$ Hz), 4.93 (s, 1H), 4.79 (s, 1H), 2.24 (s, 3H), 1.04 (s, 9H); ^{13}C NMR (125 MHz, CDCl_3) δ 168.9, 152.1, 143.1, 119.2, 103.8, 33.0, 29.3, 20.9; IR (neat): 2963, 2868, 1766, 1658, 1611, 1370, 1200; MS (ES^+) Calculated for $[\text{C}_{10}\text{H}_{16}\text{NaO}_2]^+$: 191.1; Found: 191.1.

Compound **7c** was prepared in 54% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 7.45 (d, 2H, $J = 8.5$ Hz), 7.26 (d, 2H, $J = 8.5$ Hz), 6.63 (d, 1H, $J = 16.0$ Hz), 6.52 (d, 1H, $J = 16.0$ Hz), 5.15 (d, 1H, $J = 1.5$ Hz), 5.01 (s, 1H, $J = 1.5$ Hz), 2.30 (s, 3H); ^{13}C NMR (125 MHz, CDCl_3) δ 168.7, 151.6, 134.9, 131.8, 128.6, 128.3, 123.3, 122.1, 106.8, 20.9; IR (neat): 3041, 2922, 2851, 1761, 1603, 1587, 1488, 1369, 1196; MS (ES^+) Calculated for $[\text{C}_{12}\text{H}_{11}\text{BrNaO}_2]^+$: 289.0, 291.0; Found: 289.0, 291.0.

Compound **7d** was prepared in 87% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 7.58 (d, 2H, $J = 8.2$ Hz), 7.50 (d, 2H, $J = 8.2$ Hz), 6.72 (d, 1H, $J = 16.0$ Hz), 6.61 (d, 1H, $J = 16.0$ Hz), 5.20 (s, 1H), 5.07 (s, 1H), 2.31 (s, 3H); ^{13}C NMR (125 MHz, CDCl_3) δ 168.7, 151.4, 139.4, 129.9 (q, $J = 32.4$ Hz), 128.3, 127.0, 125.6 (q, $J = 4.0$ Hz), 125.1, 124.1 (q, $J = 270.5$ Hz), 107.7, 20.9; IR (neat): 3026, 2933, 1766, 1755, 1609, 1329, 1199; MS (ES^+) Calculated for $[\text{C}_{13}\text{H}_{11}\text{F}_3\text{NaO}_2]^+$: 279.1; Found: 279.1.

7e

Compound **7e** was prepared in 86% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 7.99 (d, 2H, $J = 8.2$ Hz), 7.46 (d, 2H, $J = 8.2$ Hz), 6.74 (d, 1H, $J = 16.0$ Hz), 6.62 (d, 1H, $J = 16.0$ Hz), 5.20 (s, 1H), 5.06 (s, 1H), 3.91 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (125 MHz, CDCl_3) δ 168.7, 166.7, 151.5, 140.4, 130.0, 129.6, 128.7, 126.7, 125.0, 107.7, 52.1, 20.9; IR (neat): 2957, 1761, 1717, 1609, 1283, 1213; MS (ES^+) Calculated for $[\text{C}_{14}\text{H}_{14}\text{NaO}_4]^+$: 269.1; Found: 269.1.

7f

Compound **7f** was prepared in 65% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 5.96 (d, 1H, $J = 15.5$ Hz), 5.74 (dt, 1H, $J = 7.1, 15.5$ Hz), 4.87 (s, 1H), 4.70 (s, 1H), 2.08 (q, 2H, $J = 7.1$ Hz), 1.38 (p, 2H, $J = 7.1$ Hz), 1.33- 1.24 (m, 13H), 0.88 (t, 3H, $J = 7.0$ Hz); ^{13}C NMR (125 MHz, CDCl_3) δ 176.3, 152.1, 132.6, 124.2, 103.1, 39.1, 32.1, 31.3, 28.5, 27.2, 22.5, 14.0; IR (neat): 2960, 2931, 2873, 2860, 1755, 1650, 1614, 1480, 1262; MS (ES^+) Calculated for $[\text{C}_{14}\text{H}_{24}\text{NaO}_2]^+$: 247.2; Found: 247.1.

7g

Compound **7f** was prepared in 80% yield according to the general procedure B. ^1H NMR (500MHz, CDCl_3) δ 8.16 (d, 2H, $J = 7.3$ Hz), 7.62 (t, 1H, $J = 7.3$ Hz), 7.50 (t, 2H, $J = 7.3$ Hz), 6.06 (d, 1H, $J = 15.5$ Hz), 5.83 (dt, 1H, $J = 6.9, 15.5$ Hz), 5.00 (s, 1H), 4.90 (s, 1H), 2.09 (q, 2H, $J = 7.3$ Hz), 1.39- 1.22 (m, 6H), 0.87 (t, 3H, $J = 7.3$ Hz). ^{13}C NMR (125 MHz, CDCl_3) δ 164.5, 152.1, 133.4, 133.1, 130.1, 129.5, 128.5, 123.9, 103.6, 32.2, 31.4, 28.5, 22.4, 14.0; IR (neat): 2958, 2930, 2859, 1739, 1602, 1452, 1270, 1237; MS (ES^+) Calculated for $[\text{C}_{16}\text{H}_{20}\text{NaO}_2]^+$: 267.1; Found: 276.1.

9

Compound **9** was prepared in 71% yield according to the general procedure B: ^1H NMR (500MHz, CDCl_3) δ 5.95 (d, 1H, $J = 15.5$ Hz), 5.87 (dt, 1H, $J = 6.0, 15.5$ Hz), 4.88 (s, 1H), 4.87 (s, 1H), 3.85 (s, 3H), 2.10 (q, 2H, $J = 7.3$ Hz), 1.41 (p, 2H, $J = 7.3$ Hz), 1.34- 1.23 (m, 4H), 0.89 (t, 3H, $J = 7.3$ Hz); ^{13}C NMR (125 MHz, CDCl_3) δ 153.7, 152.1, 133.3, 123.4, 102.9, 55.2, 32.2, 31.3, 28.4, 22.5, 14.0; IR (neat): 2959, 2931, 2859, 1769, 1663, 1614, 1442, 1269, 1231; MS (ES^+) Calculated for $[\text{C}_{11}\text{H}_{18}\text{NaO}_3]^+$: 221.1; Found: 221.0.

11

Compound **11** was prepared in yield according to the procedure B: ^1H NMR (400MHz, CDCl_3) δ 6.00- 5.86 (m, 2H), 5.41 (dd, 1H, $J = 1.6, 16.8$ Hz), 5.31 (dd, 1H, $J = 1.6, 10.5$

Hz), 4.88 (d, 2H, $J = 5.0$ Hz), 4.69 (d, 2H, $J = 6.0$ Hz), 4.64- 4.62 (m, 1H), 2.10 (q, 2H, $J = 6.8$ Hz), 1.40 (p, 2H, $J = 7.2$ Hz), 1.31- 1.26 (m, 4H), 0.89 (t, 3H, $J = 6.8$ Hz); ^{13}C NMR (100 MHz, CDCl_3) 152.9, 152.2, 133.4, 131.3, 123.5, 119.2, 102.9, 68.9, 32.2, 31.3, 28.5, 22.5, 14.0; IR (neat): 2959, 2933, 2859, 1768, 1597, 1223, 1122, 1043; MS (ES^+) Calculated for $[\text{C}_{13}\text{H}_{20}\text{NaO}_3]^+$: 247.1; Found: 247.1.

STANDARD IN RESERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1 499.8006811 MHZ
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

13C NMR

Pulse Sequence: s2pul1
Solvent: CDCl3
Temp: 25.0 C / 298.1 K
UNIT: plus-500 "ernst"
PULSE SEQUENCE
Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 28261.2 Hz
1056 repetitions
OBSERVE C13, 125.6749815 MHz
DECOUPLE H1, 499.8037245 MHz
Power 36 dB
on during acquisition
off during delay
WALTZ-16 modulated
DATA PROCESSING
Line broadening 1.0 Hz
FT size 131072
Total time 31 hr, 55 min, 2 sec

STANDARD 1H NMR

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1 499.8006811 MHZ
 DATA PROCESSING
 Line broadening 1.0 Hz
 F1 size 32768
 Total time 1 min, 4 sec

Pulse Sequence: s2pul
Solvent: CDCl₃
Temp. 25.0 C / 298.1 K
UNITYplus-500 "ernst"
PULSE SEQUENCE
Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 29261.2 Hz
816 repetitions
OBSERVE C13, 125.6749801 MHz
DECOUPLE H1, 499.8037245 MHz
Power 36 dB
on during acquisition
off during delay
WALTZ-16 modulated
DATA PROCESSING
Line broadening 1.0 Hz
FT size 131072
Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.8006802 MHz
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul
Solvent: CDCl3
Temp. 25.0 C / 298.1 K
UNITYplus-500 "ernst"
PULSE SEQUENCE
Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 29261.2 Hz
976 repetitions
OBSERVE C13, 125.6749793 MHz
DECOUPLE H1, 499.8037245 MHz
Power 36 dB
on during acquisition
off during delay
WALTZ-16 modulated
DATA PROCESSING
line broadening 1.0 Hz
FT size 131072
Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp. 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1 499.8008811 MHZ

DATA PROCESSING

Line broadening 1.0 Hz

FI size 32768

Total time 1 min, 4 sec

¹³C OBSERVE

Pulse Sequence: s2pu1
 Solvent: CDCl3
 Temp.: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 23261.2 Hz
 2672 repetitions
 OBSERVE C13, 125.6749801 MHZ
 DECOUPLE H1, 499.8037245 MHZ
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 131072
 Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.800821 MHz
 DATA PROCESSING
 Line broadening 1.0 Hz
 FI size 32768
 Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 19184 repetitions
 OBSERVE C13, 125.6749793 MHZ
 DECOUPLE H1, 499.8037245 MHZ
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 131072
 Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.8006811 MHz
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

¹³C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl₃
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 640 repetitions
 OBSERVE C13, 125.6749806 MHz
 DECOUPLE H1, 499.8637245 MHz
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 131072
 Total time 31 hr, 55 min, 2 sec

6e

STANDARD 11 OBSERVE

Pulse Sequence: s2pu1

Solvent: CDCl3

Temp: 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1 499.8005798 MHz

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3
Temp. 25.0 C / 298.1 K
UNITYplus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 29261.2 Hz
640 repetitions

OBSERVE C13, 125.6749815 MHZ
DECOUPLE H1, 499.8037245 MHZ

Power 36 dB
on during acquisition
off during delay
WALTZ-16 modulated
DATA PROCESSING

Line broadening 1.0 Hz
FT size 131072

Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp: 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1 499.8006802 MHZ

DATA PROCESSING

Line broadening 1.0 Hz

F1 size 32768

Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 896 repetitions
 OBSERVE C13, 125.6749815 MHz
 DECOUPLE H1, 499.8037245 MHz
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FI size 131072
 Total time 31 hr, 55 min, 2 sec

STANDARD 1H NMR

Pulse Sequence: s2put
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1 499.8006811 MHZ
 DATA PROCESSING
 Line broadening 1.0 Hz
 FI size 32768
 Total time 1 min, 4 sec

8

¹³C OBSERVE

Pulse Sequence: s2pul1

Solvent: CDCl₃

Temp: 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec

Pulse 41.5 degrees

Acq. time 2.187 sec

Width 29261.2 Hz

13104 repetitions

OBSERVE C13, 125.6749819 MHz

DECOUPLE H1, 499.8037245 MHz

power 36 dB

on during acquisition

off during delay

WALTZ-16 modulated

DATA PROCESSING

Line broadening 1.0 Hz

FT size 131072

Total time 31 hr, 55 min, 2 sec

8

```

exp1 Proton
SAMPLE
date Jul 17 2006 temp 25.0
solvent cdc13 gain not used
file /home/walkup/~ spin not used
nmrsvs/data/auto~ hst 0.008
2006.07.15.07/s.20~ pw90 13.900
060717_001/data/cd~ alfa 6.600
ACQUISITION
sw 6410.3 in n
at 2.049 dp n
np 26264 hs nn
fb 4000
bs 32 lb 0.20
ss 2 fn 65536
d1 1.000
nt 8 sp -165.7
ct 8 wf 3765.4
TRANSMITTER H1 rfp 805.4
tn 399.782 rp -114.0
tof 399.5 lp -23.8
tpwr 59
pw 6.950 wc 250
DECOUPLER C13 vs 180
dn 0 th 3
dof 0 ai cdc ph
dm nnn
dmm c
dpwr 34
dmf 29412

```

10

exp1 Carbon

date	Jul 17 2006	temp	25.0
solvent	cdcl3	gain	30
file	/home/walkup/~ spin	not used	
nmr	sys/data/auto~ hst	0.008	
2006.07.17.19/s.20~ pw90		9.700	
060717_001/data/cd~ alfa		10.000	
060717_001/data/cd~ alfa		10.000	
ACQUISITION	il	n	
sw	24509.8	in	n
at	1.300	dp	y
np	63750	hs	nn
fb	17000		
bs	64	lb	0.50
dl	1.000	fn	not used
nt	3000		
ct	1472	sp	-1721.2
tn	TRANSMITTER C13	wp	24509.1
sfrq	100.535	rfl	9462.3
tof	1042.6	rfp	7740.4
tpwr	55	lp	47.1
pw	4.850		-133.3
deco	DECOUPLER	wc	250
dn	H1	sc	0
dof	0	vs	2.8e+06
dm	yy	th	
dmm	w	ai	cdc ph
dpwr	41		
dmf	9300

10

STANDARD 1H OBSERVE

Pulse Sequence: s2pul1

Solvent: CDCl3

Temp: 25.0 C / 298.1 K

File: Diene-Hexanal-Acetate-Isopropanal

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1 499.8006816 MHz

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

INDEX	FREQUENCY	PPM	HEIGHT
1	21225.609	168.893	8.7
2	19087.336	151.879	17.3
3	16709.295	132.956	50.6
4	15560.906	123.819	46.4
5	13002.480	103.461	49.5
6	9709.121	77.256	79.6
7	9676.974	77.000	83.9
8	9644.826	76.744	82.4
9	4042.186	32.164	44.3
10	3942.171	31.368	25.4
11	3582.295	28.504	27.6
12	2823.251	22.465	22.4
13	2619.648	20.845	26.9
14	1757.910	13.988	11.8

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.8006807 MHz
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 880 repetitions
 OBSERVE C13, 125.6749883 MHz
 DECOUPLE H1, 499.8637245 MHz
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 131072
 Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.8006807 MHz
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

Pulse Sequence: s2pul1

Solvent: CDCl3
Temp. 25.0 C / 298.1 K
UNITYplus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 29261.2 Hz
1392 repetitionsOBSERVE C13, 125.6748815 MHz
DECOUPLE H1, 499.8037245 MHz
Power 36 dBon during acquisition
off during delay

WALTZ-16 modulated

DATA PROCESSING

Line broadening 1.0 Hz
FT size 131072

Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp. 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1, 499.8006811 MHZ

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

13C OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp. 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec

Pulse 41.5 degrees

Acq. time 2.187 sec

Width 29261.2 Hz

2848 repetitions

OBSERVE C13, 125.6749819 MHz

DECOUPLE H1, 499.8037245 MHz

Power 36 dB

on during acquisition

off during delay

WALTZ-16 modulated

DATA PROCESSING

Line broadening 1.0 Hz

FT size 131072

Total time 31 hr, 55 min, 2 sec

¹³C OBSERVE

Pulse Sequence: s2pul1
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 16048 repetitions
 OBSERVE C13, 125.6749801 MHz
 DECOUPLE H1, 499.8037245 MHz
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FI size 131072
 Total time 31 hr, 55 min, 2 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp. 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1, 499.8006807 MHZ

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

STANDARD 1H OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl3
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Pulse 67.5 degrees
 Acq. time 1.999 sec
 Width 7476.6 Hz
 32 repetitions
 OBSERVE H1, 499.8006811 MHZ
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 32768
 Total time 1 min, 4 sec

¹³C OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl₃
Temp. 25.0 C / 298.1 K
UNITYplus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec
Pulse 41.5 degrees
Acq. time 2.187 sec
Width 29261.2 Hz
1424 repetitions

OBSERVE C13, 125.6749806 MHz
DECOUPLE H1, 499.8037245 MHz
Power 36 dB

on during acquisition
off during delay

WALTZ-16 modulated

DATA PROCESSING

Line broadening 1.0 Hz

FT size 131072

Total time 31 hr, 55 min, 2 sec

7e

STANDARD 1H OBSERVE

Pulse Sequence: s2pu1

Solvent: CDCl3

Temp: 25.0 C / 298.1 K

File: Diene-Hexanal-Pivaloyl-Isopropanal

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1, 499.8006816 MHz

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

¹³C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl₃
 Temp. 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 208 repetitions
 OBSERVE C13, 125.6749828 MHz
 DECOUPLE H1, 499.8037245 MHz
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FI size 131072
 Total time 31 hr, 55 min, 2 sec

Start Data 1H OBSERVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp.: 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 67.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1 499.8006816 MHZ

DATA PROCESSING

Line broadening 1.0 Hz

FT size 32768

Total time 1 min, 4 sec

Pulse Sequence: s2pul

Solvent: CDCl₃

Temp: 25.0 C / 298.1 K

UNIT: plus-500 "ernst"

PULSE SEQUENCE

Relax. delay 0.100 sec

Pulse 41.5 degrees

Acq. time 2.187 sec

Width 29261.2 Hz

368 repetitions

OBSERVE C13, 125.6749824 MHz

DECOUPLE H1, 499.8037245 MHz

Power 36 dB

on during acquisition

off during delay

WALTZ-16 modulated

DATA PROCESSING

Line broadening 1.0 Hz

FT size 131072

Total time 31 hr, 55 min, 2 sec

7g

STANDARD 1H USSEVE

Pulse Sequence: s2pul

Solvent: CDCl3

Temp. 25.0 C / 298.1 K

UNITYplus-500 "ernst"

PULSE SEQUENCE

Pulse 22.5 degrees

Acq. time 1.999 sec

Width 7476.6 Hz

32 repetitions

OBSERVE H1, 499.8006816 MHz

DATA PROCESSING

Line broadening 0.2 Hz

F1 size 32768

Total time 1 min, 4 sec

¹³C OBSERVE

Pulse Sequence: s2pul
 Solvent: CDCl₃
 Temp.: 25.0 C / 298.1 K
 UNITYplus-500 "ernst"
 PULSE SEQUENCE
 Relax. delay 0.100 sec
 Pulse 41.5 degrees
 Acq. time 2.187 sec
 Width 29261.2 Hz
 368 repetitions
 OBSERVE C13, 125.6749824 MHZ
 DECOUPLE H1, 499.8037245 MHZ
 Power 36 dB
 on during acquisition
 off during delay
 WALTZ-16 modulated
 DATA PROCESSING
 Line broadening 1.0 Hz
 FT size 131072
 Total time 31 hr, 55 min, 2 sec

expl Proton

SAMPLE SPECIAL
 date Jul 17 2006 temp 25.0
 solvent cdc13 not used
 file /home/waikup/~ not used
 vnmr2/data/autoc~ hst 0.008
 2006.07.17.26/s_20~ pw90 13.900
 060717_001/data/cd~ alfa 6.600
 060717_001/c13_01.fid
 ACQUISITION
 sw 6410.3 in n
 at 2.049 dp n
 np 26264 hs y
 fb 4000
 bs 32 lb 0.20
 ss 2 fn 65536
 di 1.000
 nt 8 sp
 ct 8 wp
 TRANSMITTER H1
 tn 399.782 rf
 tof 399.5 lf
 tpwr 59
 pw 6.950 wc 250
 DECOUPLER C13 vs 800
 dn 0
 dof 0 th 2
 dm nnn ai cdc ph
 dmm c
 dpwr 34
 dmf 29412

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exp1 Carbon

SAMPLE		SPECIAL		25.0
date	Jul 17 2006	temp	gain	30
solvent	cdcl3	not used	hst	0.008
nmr	sys/data/autoc~	pw90	9.700	10.000
2006.07.17_26/s_20~	alpha	10.000		
060717_002/data/cd~	alpha	10.000		
060717_c13_01.fid	alpha	10.000		
ACQUISITION				
sw	24509.8	in	n	
at	1.300	dp	y	
np	63750	hs	nm	
fb	17000			
bs	64	lb	0.50	
di	1.000	fn	not used	
nt	15000			
ct	14848	sp	-1722.2	
TRANSMITTER				
tn	C13	wp	24509.1	
sfrq	100.535	rfl	9463.4	
tof	1042.6	rfl	7740.4	
tpwr	55	rp	44.2	
pw	4.850	lp	-133.3	
DECOUPLER				
dn	H1	wc	250	
dof	0	sc	0	
dm	0	vs	4e+06	
dmm	vvv	th	68	
dpwr	w	ai	cdc	ph
dmf	41			
	9300