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N-Functionalized Organolithium Compounds *via* Tellurium/Lithium Exchange Reaction

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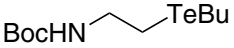
Experimental

General

Elemental tellurium was purchased from Sigma Aldrich. All reagents and solvents were purified and dried using procedures described in the literature.[1] THF was distilled under nitrogen from sodium/benzophenone just before use. *N*-Butyllithium was titrated using 1,10-phenanthroline as indicator prior to use. Lithium-naphthalenide (LiNp) was prepared according to the procedure described in the literature.[2] All operations were carried out in flame-dried glassware. Column chromatographic separations were performed over Acros Organics silica gel (0.035-0.075 mm; pore diameter *ca.* 6 nm). The melting points were determined using a Büchi, model B-545. Optical rotations were determined on a Perkin Elmer 343 polarimeter and IR spectra were recorded on a Bomem MB-100 spectrophotometer. NMR spectra were recorded on Varian-Inova (300 MHz, ^{1}H; 75 MHz, ^{13}C) or Bruker model DRX-500 (500 MHz, ^{1}H; 125 MHz, ^{13}C) spectrometers using $CDCl_3$ as solvent. The internal references were TMS (^{1}H NMR), the central peak of the $CDCl_3$ signal (^{13}C NMR) and a capillary of diphenyl ditelluride 1 mol^{-1} (^{125}Te NMR). High resolution mass spectroscopy was performed using a LC-MS - Bruker Daltonics instrument at the Microanalytical Laboratory of the Institute of Chemistry, University of São Paulo.

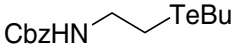
General procedure for the preparation of tellurium amines

n-Butyllithium (1 mmol, 1.5 mol L^{-1} in hexane) was slowly added at room temperature to a suspension of elemental tellurium (1.2 mmol) in dry THF (5 mL). Deoxygenated ethanol (2 mL) was added to the light yellow solution of lithium butyl tellurolate so formed, and the resulting red-brown mixture was stirred at room temperature for 10 min and subsequently cooled to 0 °C. The corresponding aziridine or mesylate (1 mmol) was added in a single portion, and the resulting mixture was stirred for 2 h at room temperature. The mixture was quenched with a saturated NH_4Cl solution and extracted with CH_2Cl_2, and the combined organic fractions were dried over $MgSO_4$, and filtered. The solvent was removed in vacuo, yielding the crude products, which were purified by flash chromatography.



*tert-Butyl 2-(butyltellanyl)ethylcarbamate (**1a**)*

The *N*-Boc β-telluro amine **1a** was prepared according to the general procedure using $BocHNCH_2CH_2OMs$ as starting material. Yield: 76%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3349, 2962, 1697, 1539, 1249, 1164; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.96 (br s, 1H), 3.43-3.41 (m, 2H), 2.72 (t, *J* 7.1 Hz, 2H), 2.66 (t, *J* 7.5 Hz, 2H), 1.72 (qui, *J* 7.5 Hz, 2H), 1.44 (s, 9H), 1.38 (sex, *J* 7.5 Hz, 2H), 0.91 (t, *J* 7.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 155.6, 79.1, 42.4, 34.2, 28.4, 24.9, 13.3, 3.1, 2.7; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 182.6; HRMS-ESI *m/z* calculated for $C_{11}H_{23}NO_2Te + Na^+$ 354.0690, found 354.0703.



*Benzyl 2-(butyltellanyl)ethylcarbamate (**1b**)*

The *N*-Cbz β-telluro amine **1b** was prepared according to the general procedure using $CbzHNCH_2CH_2OMs$ as starting material. Yield: 78%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3331, 2957, 1701, 1523, 1247; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.33-7.28 (m, 5H), 5.15 (br s, 1H), 5.10 (s, 2H), 3.48 (qua, *J* 7.0 Hz, 2H), 2.73 (t, *J* 7.0 Hz, 2H), 2.63 (t, *J* 7.0 Hz, 2H),

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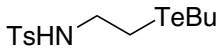
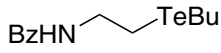
[1] Perrin, D. D.; Armarego, W. L. F.; *Purification of Laboratory Chemicals*, Pergamon: Oxford, 1980.
[2] Screttas, C. G.; Micha-Screttas, M.; *J. Org. Chem.* **1978**, *43*, 1064.

1.68 (qui, *J* 7.0 Hz, 2H), 1.37 (sex, *J* 7.0 Hz, 2H), 0.90 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 156.0, 136.3, 128.3, 127.9 (2C), 66.5, 42.7, 34.1, 24.8, 13.2, 2.8, 2.7; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 183.5; HRMS-ESI *m/z* calculated for $C_{14}H_{21}NO_2Te + Na^+$ 388.0532, found 388.0532.



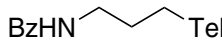
*N-(2-(Butyltellanyl)ethyl)-4-methylbenzenesulfonamide (**1c**)*

The *N*-Ts β-telluro amine **1c** was prepared according to the general procedure using *N*-Ts aziridine as starting material. Yield: 83%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3277, 2957, 2926, 2867, 1597, 1455, 1325, 1156; ^{1}H NMR ($CDCl_3$, 300 MHz) δ 7.80-7.73 (m, 2H), 7.31-7.24 (m, 2H), 3.20 (t, *J* 7.2 Hz, 2H), 2.63 (t, *J* 7.2 Hz, 2H), 2.54 (t, *J* 7.2 Hz, 2H), 2.42 (s, 3H), 1.83 (qui, *J* 7.2 Hz, 2H), 1.32 (sex, *J* 7.2 Hz, 2H), 0.88 (t, *J* 7.2 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75 MHz) δ 143.5, 137.1, 129.8, 127.1, 44.8, 34.2, 25.0, 21.5, 13.4, 3.3, 2.3; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 192.2; HRMS-ESI *m/z* calculated for $C_{13}H_{21}NO_2STe + Na^+$ 408.0253, found 408.0250.



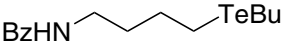
*N-(2-(Butyltellanyl)ethyl)benzamide (**1d**)*

The *N*-Bz β-telluro amine **1d** was prepared according to the general procedure using *N*-Bz aziridine as starting material. Yield: 82%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3308, 2957, 1642, 1306; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.79-7.78 (m, 2H), 7.50-7.47 (m, 1H), 7.43-7.39 (m, 2H), 6.80 (br s, 1H), 3.74-3.70 (m, 2H), 2.85 (t, *J* 7.0 Hz, 2H), 2.67 (t, *J* 7.0 Hz, 2H), 1.72 (qui, *J* 7.5 Hz, 2H), 1.36 (sex, *J* 7.5 Hz, 2H), 0.89 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.2, 134.4, 131.5, 128.5, 126.9, 41.3, 34.2, 25.0, 13.3, 3.0, 2.6; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 184.6; HRMS-ESI *m/z* calculated for $C_{13}H_{19}NOTe + Na^+$ 358.0427, found 358.0407.



*N-(3-(Butyltellanyl)propyl)benzamide (**1e**)*

The *N*-Bz γ-telluro amine **1e** was prepared according to the general procedure using *N*-$BzNHCH_2CH_2CH_2OMs$ as starting material. Yield: 75%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3326, 2955, 1650, 1308; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.79-7.77 (m, 2H), 7.47-7.44 (m, 1H), 7.39-7.36 (m, 2H), 6.99 (br s, 1H), 3.47 (qua, *J* 7.0 Hz, 2H), 2.62 (t, *J* 7.0 Hz, 4H), 2.04 (qui, *J* 7.0 Hz, 2H), 1.70 (qui, *J* 7.5 Hz, 2H), 1.36 (sex, *J* 7.5 Hz, 2H), 0.89 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.8, 134.6, 131.6, 128.5, 127.0, 42.0, 34.3, 32.0, 25.1, 13.5, 3.0, -1.3; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 232.7; HRMS-ESI *m/z* calculated for $C_{14}H_{21}NOTe + Na^+$ 372.0583, found 372.0577.

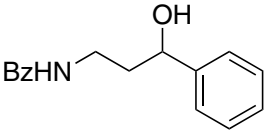


*N-(4-(Butyltellanyl)butyl)benzamide (**1f**)*

The *N*-Bz δ-telluro amine **1f** was prepared according to the general procedure using *N*-$BzNHCH_2(CH_2)_2CH_2OMs$ as starting material. Yield: 80%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3318, 2956, 1643, 1308; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.77-7.76 (m, 2H), 7.50-7.46 (m, 1H), 7.42-7.39 (m, 2H), 6.41 (br s, 1H), 3.46 (qua, *J* 7.0 Hz, 2H), 2.66-2.62 (m, 4H), 1.82 (qui, *J* 7.5 Hz, 2H), 1.74-1.67 (m, 4H), 1.36 (sex, *J* 7.5 Hz, 2H), 0.90 (t, *J* 7.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.5, 134.6, 131.3, 128.4, 126.8, 39.3, 34.2, 31.9, 29.5, 25.0, 13.3, 2.7, 1.8; ^{125}Te NMR ($CDCl_3$, 157 MHz) δ 225.4; HRMS-ESI *m/z* calculated for $C_{15}H_{23}NOTe + Na^+$ 386.0740, found 386.0737.

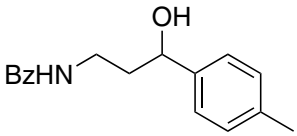
General procedure for the tellurium/lithium exchange reaction

n-Butyllithium (2 mmol, 1.5 mol L^{-1} in hexane) was slowly added to a solution of telluro amine (1 mmol) in dry THF (12 mL) at −78 °C. The progress of the tellurium/lithium exchange reaction was monitorated by TLC. Then, a solution of lithium naphthalenide (LiNp) (2.5 mmol) in THF was added dropwise to the mixture and stirred at −78 °C for 2 h. To the resulting mixture was added a solution of the corresponding electrophile (2 mmol) in THF (1 mL) and then allowed to rise to room temperature overnight. The mixture was quenched with a saturated NH_4Cl solution and extracted with CH_2Cl_2, and the combined organic fractions were collected, dried over $MgSO_4$, and filtered. The solvent was removed in vacuum, yielding the crude products, which were purified by flash chromatography.



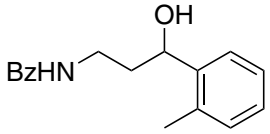
*N-(3-Hydroxy-3-phenylpropyl)benzamide (**2a**)*

Yield: 79%; colorless oil; IR ν_{max}(film)/cm^{-1}: 3343, 1640, 1541, 1310; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.75-7.72 (m, 2H), 7.49-7.46 (m, 1H), 7.43-7.37 (m, 2H), 7.35-7.33 (m, 4H), 7.27-7.23 (m, 1H), 7.05 (br s, 1H), 4.80 (dd, *J* 8.5 Hz, *J* 4.0 Hz, 1H), 3.84-3.77 (m, 1H), 3.45-3.41 (m, 1H), 1.99-1.93 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.2, 144.1, 134.2, 131.4, 128.5, 128.4, 127.4, 126.9, 125.6, 72.5, 38.4, 37.5; HRMS-ESI *m/z* calculated for $C_{16}H_{17}NO_2 + Na^+$ 278.1157, found 278.1152.



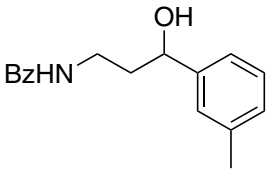
*N-(3-Hydroxy-3-p-tolylpropyl)benzamide (**2b**)*

Yield: 72%; orange solid; mp 89.6-91.2 °C; IR ν_{max}(KBr)/cm^{-1}: 3359, 1639, 1551, 1075, 927; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.74-7.72 (m, 2H), 7.50-7.46 (m, 1H), 7.42-7.39 (m, 2H), 7.24 (d, *J* 8.0 Hz, 2H), 7.14 (d, *J* 8.0 Hz, 2H), 6.90 (br s, 1H), 4.79 (t, *J* 6.5 Hz, 1H), 3.85-3.78 (m, 1H), 3.48-3.42 (m, 1H), 2.32 (s, 3H), 1.98 (qua, *J* 6.0 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.9, 141.1, 137.0, 134.2, 131.3, 129.0, 128.4, 126.8, 125.5, 72.5, 38.3, 37.5, 21.0; HRMS-ESI *m/z* calculated for $C_{17}H_{19}NO_2 + Na^+$ 292.1313, found 292.1314.



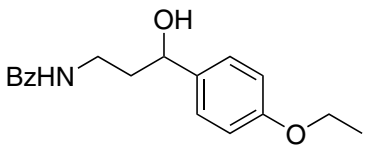
*N-(3-Hydroxy-3-o-tolylpropyl)benzamide (**2c**)*

Yield: 82%; white solid; mp 104-106 °C; IR ν_{max}(KBr)/cm^{-1} 3309, 1628, 1558, 1050; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.79-7.77 (m, 2H), 7.56-7.51 (m, 2H), 7.47-7.44 (m, 2H), 7.27-7.24 (m, 1H), 7.21-7.18 (m, 1H), 7.16 - 7.14 (m, 1H), 6.95 (br s, 1H), 5.11 (dd, *J* 8.8 Hz, *J* 3.3 Hz, 1H), 3.94-3.91 (m, 1H), 3.53-3.47 (m, 1H), 2.33 (s, 3H), 2.02-1.95 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.1, 142.1, 134.3, 133.9, 131.4, 130.4, 128.5, 127.2, 126.9, 126.3, 125.0, 69.4, 37.8, 36.9, 18.9; HRMS-ESI *m/z* calculated for $C_{17}H_{19}NO_2 + Na^+$ 292.1313, found 292.1301.



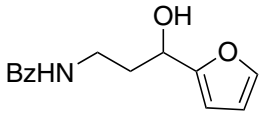
*N-(3-hydroxy-3-m-tolylpropyl)benzamide (**2d**)*

Yield: 72%; colorless oil; IR ν_{max}(film)/cm^{-1}: 3354, 1644, 1538, 1075; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.74-7.72 (m, 2H), 7.49-7.46 (m, 1H), 7.40-7.37 (m, 2H), 7.22-7.19 (m, 1H), 7.16-7.12 (m, 2H), 7.07 - 7.06 (m, 1H), 7.03 (br s, 1H), 4.77 (dd, *J* 8.0 Hz, *J* 4.5 Hz, 1H), 3.83-3.77 (m, 1H), 3.46-3.43 (m, 1H), 2.32 (s, 3H), 1.98-1.95 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.2, 144.1, 137.9, 134.0, 131.3, 128.3, 128.2, 128.0, 126.9, 126.3, 122.6, 72.3, 38.2, 37.5, 21.3; HRMS-ESI *m/z* calculated for $C_{17}H_{19}NO_2 + Na^+$ 292.1313, found 292.1309.



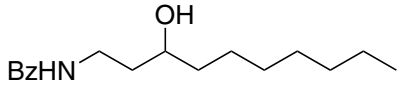
*N-(3-(4-Ethoxyphenyl)-3-hydroxypropyl)benzamide (**2e**)*

Yield: 70%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3341, 1642, 1541, 1512, 1304, 1245, 1047; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.75-7.73 (m, 2H), 7.50-7.46 (m, 1H), 7.42-7.39 (m, 2H), 7.28-7.25 (m, 2H), 6.91 (br s, 1H), 6.87-6.85 (m, 2H), 4.77 (t, *J* 6.5 Hz, 1H), 4.00 (qua, *J* 7.0 Hz, 2H), 3.85-3.78 (m, 1H), 3.47-3.41 (m, 1H), 1.97 (qua, *J* 6.5 Hz, 2H), 1.40 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.9, 158.1, 136.1, 134.1, 131.2, 128.3, 126.8, 126.7, 114.2, 72.1, 63.3, 38.1, 37.4, 14.7; HRMS-ESI *m/z* calculated for $C_{18}H_{21}NO_3 + Na^+$ 322.1419, found 322.1411.



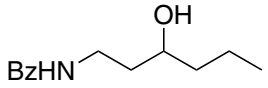
*N-(3-(Furan-2-yl)-3-hydroxypropyl)benzamide (**2f**)*

Yield: 68%; orange oil; IR ν_{max}(film)/cm^{-1}: 3335, 1640, 1544, 1310, 1148; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.75-7.72 (m, 2H), 7.48-7.45 (td, *J* 7.0 Hz, *J* 1.5 Hz, 1H), 7.40-7.36 (m, 2H), 7.32 (s, 1H), 7.07 (br s, 1H), 6.30-6.28 (m, 1H), 6.24-6.23 (m, 1H), 4.81 (t, *J* 7.0 Hz, 1H), 3.83-3.80 (m, 1H), 3.50-3.44 (m, 1H), 2.12-2.03 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.4, 156.2, 141.7, 134.0, 131.4, 128.5, 126.9, 110.1, 105.7, 65.6, 36.9, 34.8; HRMS-ESI *m/z* calculated for $C_{14}H_{15}NO_3 + Na^+$ 268.0950, found 268.0948.



*N-(3-Hydroxydecyl)benzamide (**2g**)*

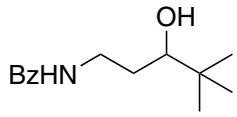
Yield: 79%; colorless oil; IR ν_{max}(film)/cm^{-1}: 3305, 2922, 1634, 1549; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.78-7.76 (m, 2H), 7.49-7.46 (m, 1H), 7.43-7.39 (m, 2H), 7.05 (br s, 1H), 3.86-3.83 (m, 1H), 3.72-3.68 (m, 1H), 3.39-3.34 (m, 1H), 1.77-1.74 (m, 1H), 1.62-1.58 (m, 1H), 1.52-1.41 (m, 3H), 1.27-1.23 (m, 9H), 0.87 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.2, 134.2, 131.4, 128.5, 127.0, 69.9, 37.5, 36.5, 31.8, 29.6, 29.2, 25.8, 22.6, 14.1; HRMS-ESI *m/z* calculated for $C_{17}H_{27}NO_2 + Na^+$ 300.1939, found 300.1949.



*N-(3-Hydroxyhexyl)benzamide (**2h**)*

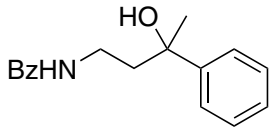
Yield: 75%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3334, 2957,

1642, 1545; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.78-7.76 (m, 2H), 7.49-7.46 (m, 1H), 7.42-7.39 (m, 2H), 7.05 (br s, 1H), 3.87-3.85 (m, 1H), 3.73-3.70 (m, 1H), 3.39-3.34 (m, 1H), 1.76-1.73 (m, 1H), 1.62-1.58 (m, 1H), 1.52-1.42 (m, 4H), 0.91 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.4, 134.2, 131.4, 128.4, 127.0, 69.4, 39.5, 37.4, 36.4, 18.9, 14.0; HRMS-ESI *m/z* calculated for $C_{13}H_{19}NO_2 + Na^+$ 244.1313, found 244.1307.



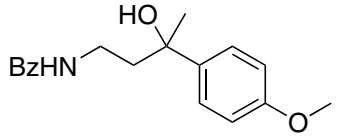
*N-(3-Hydroxy-4,4-dimethylpentyl)benzamide (**2i**)*

Yield: 76%; white solid; mp 143-144 °C; IR ν_{max}(KBr)/cm^{-1}: 3329, 2968, 1637, 1549; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.78-7.77 (m, 2H), 7.49-7.48 (m, 1H), 7.44-7.41 (m, 1H), 6.91 (br s, 1H), 3.96-3.93 (m, 1H), 3.37-3.33 (m, 2H), 1.85-1.81 (m, 1H), 1.57-1.55 (m, 1H), 0.92 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.0, 134.4, 131.4, 128.5, 126.9, 78.3, 38.4, 34.8, 30.8, 25.7; HRMS-ESI *m/z* calculated for $C_{14}H_{21}NO_2 + Na^+$ 258.1470, found 258.1456.



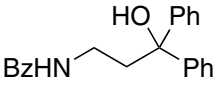
*N-(3-Hydroxy-3-phenylbutyl)benzamide (**2j**)*

Yield: 69%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3344, 1642, 1540, 1489, 1445, 1312; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.63-7.61 (m, 2H), 7.47-7.42 (m, 3H), 7.37-7.30 (m, 4H), 7.23-7.20 (m, 1H), 6.93 (br s, 1H), 3.59-3.52 (m, 1H), 3.35-3.29 (m, 1H), 2.87 (s, 1H), 2.19-2.13 (m, 1H), 2.09-2.03 (m, 1H), 1.62 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.3, 147.2, 134.4, 131.2, 128.5, 128.3, 126.8, 126.7, 124.6, 74.9, 42.3, 36.3, 31.1. HRMS-ESI *m/z* calculated for $C_{17}H_{19}NO_2 + Na^+$ 292.1313, found 292.1302.



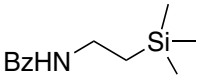
*N-(3-Hydroxy-3-(4-methoxyphenyl)butyl)benzamide (**2k**)*

Yield: 65%; orange oil; IR ν_{max}(film)/cm^{-1}: 3355, 1643, 1593, 1511, 1299, 1248, 1179; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.64-7.61 (m, 2H), 7.46-7.43 (m, 1H), 7.38-7.34 (m, 4H), 6.89 (br s, 1H), 6.86-6.83 (m, 2H), 3.76 (s, 3H), 3.58-3.53 (m, 1H), 3.36-3.32 (m, 1H), 2.74 (br s, 1H), 2.15-2.10 (m, 1H), 2.07-2.01 (m, 1H), 1.60 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.2, 158.1, 139.4, 134.2, 131.1, 128.2, 126.7, 125.7, 113.5, 74.3, 55.1, 42.1, 36.3, 30.9; HRMS-ESI *m/z* calculated for $C_{18}H_{21}NO_3 + Na^+$ 322.1419, found 322.1420.



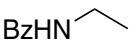
*N-(3-Hydroxy-3,3-diphenylpropyl)benzamide (**2l**)*

Yield: 61%; white solid; mp 149-150 °C; IR ν_{max}(KBr)/cm^{-1}: 3435, 3331, 1650, 1532, 1219; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.62-7.61 (m, 2H), 7.49-7.45 (m, 5H), 7.40-7.37 (m, 2H), 7.34-7.31 (m, 4H), 7.25-7.22 (m, 2H), 6.74 (br s, 1H), 3.55 (qua, *J* 6.0 Hz, 2H), 2.65 (t, *J* 6.0 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.4, 146.6, 134.3, 131.2, 128.3, 127.0, 126.8, 125.9, 78.2, 40.7, 36.1; HRMS-ESI *m/z* calculated for $C_{22}H_{21}NO_2 + Na^+$ 354.1470, found 354.1458.



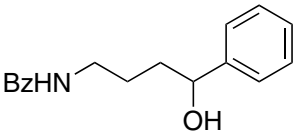
*N-(2-(Trimethylsilyl)ethyl)benzamide (**2m**)*

Yield: 67%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3316, 2953, 1638, 1543, 1249; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.75-7.73 (m, 2H), 7.49-7.46 (m, 1H), 7.42-7.40 (m, 2H), 6.12 (br s, 1H), 3.52-3.47 (m, 2H), 0.93-0.90 (m, 2H), 0.06 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.2, 134.8, 131.2, 128.5, 126.7, 36.5, 17.7, -1.6; HRMS-ESI *m/z* calculated for $C_{12}H_{19}NOSi + Na^+$ 244.1134, found 244.1136.



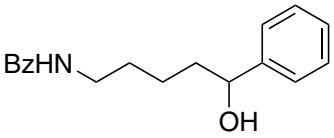
*N-Ethylbenzamide (**2n**)*

Yield: 78%; yellow solid; mp 65.2-65.6 °C; IR ν_{max}(KBr)/cm^{-1}: 1637, 1549, 1310, 1145; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.77-7.75 (m, 2H), 7.50-7.46 (m, 1H), 7.43-7.40 (m, 2H), 6.18 (br s, 1H), 3.49 (qui, *J* 7.0 Hz, 2H), 1.25 (t, *J* 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.4, 134.7, 131.1, 128.3, 126.8, 34.8, 14.7; HRMS-ESI *m/z* calculated for $C_9H_{11}NO + Na^+$ 172.0738, found 172.0731.



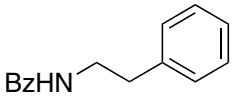
*N-(4-Hydroxy-4-phenylbutyl)benzamide (**2o**)*

Yield: 72%; white solid; mp 75-76 °C; IR ν_{max}(KBr)/cm^{-1}: 3327, 1638, 1310, 700; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.72-7.70 (m, 2H), 7.45-7.42 (m, 1H), 7.36-7.33 (m, 2H), 7.30-7.29 (m, 4H), 7.25-7.21 (m, 1H), 6.79 (br s, 1H), 4.68 (dd, *J* 7.5 Hz, *J* 5.0 Hz, 1H), 3.47-3.35 (m, 2H), 1.85-1.52 (m, 4H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.7, 144.6, 134.5, 131.2, 128.4, 128.3, 127.4, 126.9, 125.7, 73.9, 39.8, 36.1, 25.8; HRMS-ESI *m/z* calculated for $C_{17}H_{19}NO_2 + Na^+$ 292.1313, found 292.1314.



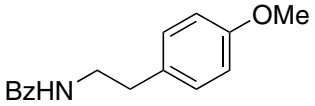
*N-(5-Hidroxy-5-phenylpentyl)benzamide (**2p**)*

Yield: 70%; yellow oil; IR ν_{max}(film)/cm^{-1}: 3357, 1643, 1310, 701; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.70-7.68 (m, 2H), 7.44-7.41 (m, 1H), 7.36-7.33 (m, 2H), 7.28-7.27 (m, 4H), 7.24-7.19 (m, 1H), 6.49 (br s, 1H), 4.62 (dd, *J* 8.0 Hz, *J* 5.5 Hz, 1H), 3.36 (qua, *J* 7.0 Hz, 2H), 1.81-1.75 (m, 1H), 1.72-1.65 (m, 1H), 1.62-1.52 (m, 2H), 1.51-1.42 (m, 1H), 1.38-1.29 (m, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.7, 144.7, 134.6, 131.2, 128.4, 128.3, 127.3, 126.8, 125.7, 74.1, 39.7, 38.4, 29.2, 23.0; HRMS-ESI *m/z* calculated for $C_{18}H_{21}NO_2$ + Na$^+$ 306.1470, found 306.1461.



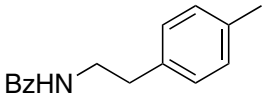
*N-Phenethylbenzamide (**3a**)*

Yield: 65%; yellowish solid; mp 113-114 ºC; IR ν_{max}(KBr)/cm^{-1}: 3344, 1639, 1544, 1312, 1193, 695; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.69-7.67 (m, 2H), 7.49-7.46 (m, 1H), 7.41-7.38 (m, 2H), 7.34-7.31 (m, 2H), 7.26-7.23 (m, 3H), 6.17 (br s, 1H), 3.72 (qua, *J* 7,0 Hz, 2H), 2.94 (t, *J* 7;0 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.5, 138.7, 134.6, 131.3, 128.7, 128.6, 128.5, 126.8, 126.5, 41.1, 35.6; HRMS-ESI *m/z* calculated for $C_{15}H_{15}NO$ + Na$^+$ 248.1051, found 248.1052.



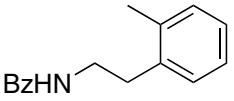
*N-(4-Methoxyphenethyl)benzamide (**3b**)*

Yield: 69%; yellowish solid; mp 123-124 ºC; IR ν_{max}(KBr)/cm^{-1}: 3320, 1635, 1538, 1308, 1243, 693; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.70-7.68 (m, 2H), 7.50-7.46 (m, 1H), 7.42-7.39 (m, 2H), 7.17-7.14 (m, 2H), 6.88-6,86 (m, 2H), 6.12 (br s, 1H), 3.80 (s, 1H), 3.69 (qua, *J* 7.0 Hz, 2H), 2.88 (t, *J* 7.0 Hz, 2H). ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.5, 158.3, 134.7, 131.4, 130.9, 129.8, 128.5, 126.8, 114.1; 55.3, 41.3, 34.8; HRMS-ESI *m/z* calculated for $C_{16}H_{17}NO_2$ + Na+ 278.1157, found 278.1150.



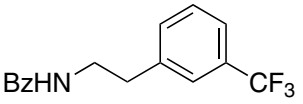
*N-(4-Metylphenetyl)benzamide (**3c**)*

Yield: 66%; yellowish solid; mp 85-86 ºC; IR ν_{max}(KBr)/cm^{-1}: 3324, 1640, 1544, 1313, 807, 692; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.75-7.68 (m, 2H), 7.49-7.46 (m, 1H), 7.42-7.38 (m, 2H), 7.15-7.11 (m, 4H), 6.15 (br s, 1H), 3.70 (qua, *J* 7.0 Hz, 2H), 2.89 (t, *J* 7.0 Hz, 2H), 2.33 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.4, 136.0, 135.7, 134.6, 131.3, 129.3, 128.6, 128.4, 126.8, 41.2, 35.2, 21.0; HRMS-ESI *m/z* calculated for $C_{16}H_{17}NO$ + Na+ 262.1208, found 262.1197.



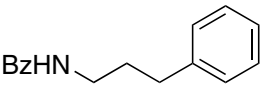
*N-(2-Metylphenetyl)benzamide (**3d**)*

Yield: 42%; yellowish solid; mp 76-77 ºC; IR ν_{max}(KBr)/cm^{-1}: 3306, 1632, 1536, 1309, 751, 694; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.72-7.70 (m, 2H), 7.49-7.46 (m, 1H), 7.43-7.39 (m, 2H), 7.19-7.14 (m, 4H), 6.25 (br s, 1H), 3.68 (qua, *J* 7.0 Hz, 2H), 2.95 (t, *J* 7.0 Hz, 2H), 2.37 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.6, 137.0, 136.4, 134.6, 131.4, 130.5, 129.4, 128.5, 126.9, 126.7, 126.1, 40.0, 33.1, 19.3; HRMS-ESI *m/z* calculated for $C_{16}H_{17}NO$ + Na+ 262.1208, found 262.1214.



*N-(3-(Trifluoromethyl)phenethyl)benzamide (**3e**)*

Yield: 35%; yellowish solid, mp 81-82 ºC; IR ν_{max}(KBr)/cm^{-1}: 3304, 1629, 1555, 1337, 1170, 801, 699; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.71-7.69 (m, 2H), 7.50-7.46 (m, 3H), 7.44-7.38 (m, 4H), 6.34 (br s, 1H), 3.70 (qua, *J* 7.0 Hz, 2H), 2.99 (t, *J* 7.0 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.7, 139.9, 134.5, 132.3, 131.6, 131.0 (qua, *J* 32.0 Hz), 129.2, 128.6, 126.8, 125.6, 125.5, 123.5, 123.4, 41.0, 35.6; HRMS-ESI *m/z* calculated for $C_{16}H_{14}F_3NO$ + Na$^+$ 316.0925, found 316.0927.



*N-(3-Phenylproyl)benzamide (**3f**)*

Yield: 35%; yellowish oil, IR ν_{max}(film)/cm^{-1}: 3318, 1638, 1578, 1309, 1181, 698; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 7.69-7.67 (m, 2H), 7.45-7.41 (m, 1H), 7.36-7.33 (m, 2H), 7.27-7.23 (m, 2H), 7.18-7.16 (m, 3H), 6.43 (br s, 1H), 3.44 (qua, *J* 6.0 Hz, 2H), 2.67 (t, *J* 7.5 Hz, 2H), 1.92 (qui, *J* 7.5 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 167.5, 141.4, 134.5, 131.1, 128.4, 128.3, 128.2, 126.8, 125.9, 39.7, 33.4, 31.0; HRMS-ESI *m/z* calculated for $C_{16}H_{17}NO$ + Na$^+$ 262.1208, found 262.1204.

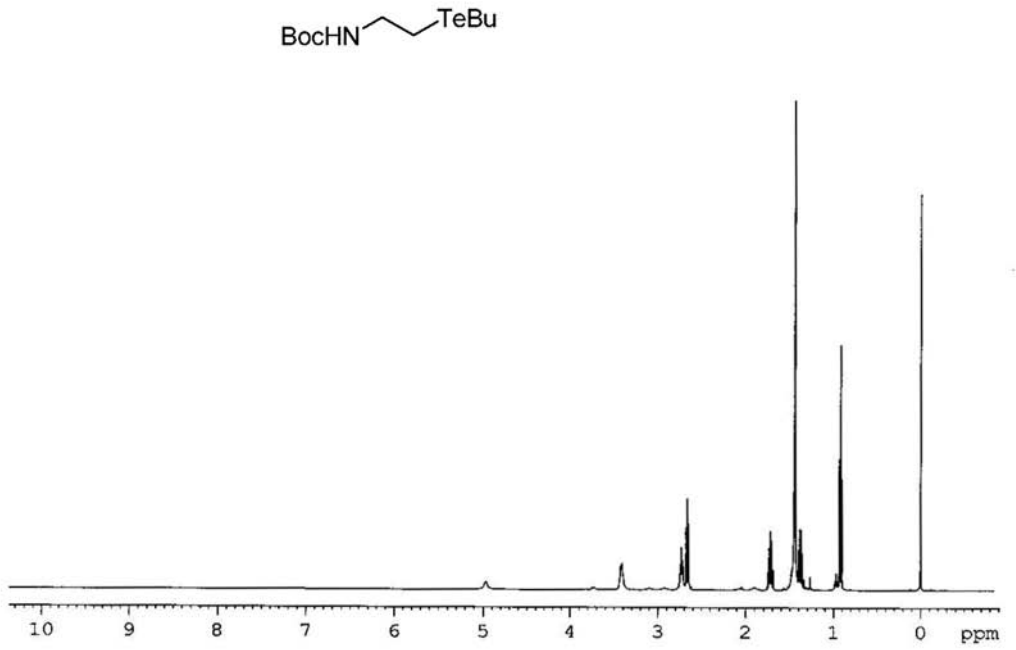


Figure S1. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **1a**.

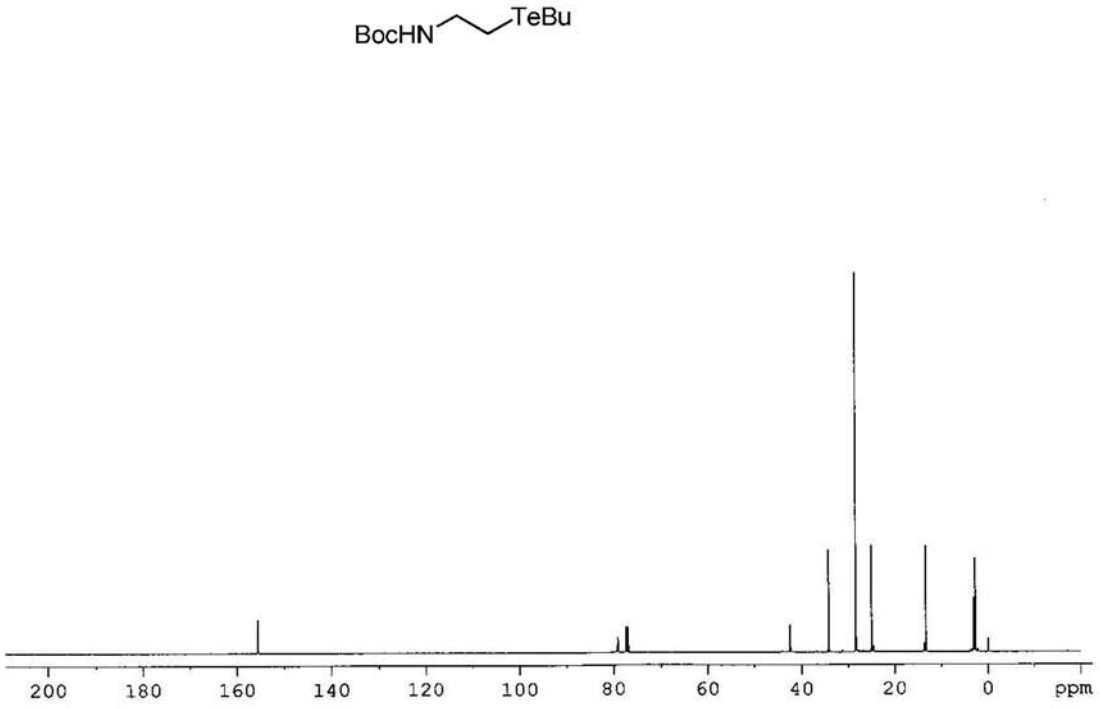


Figure S2. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **1a**.

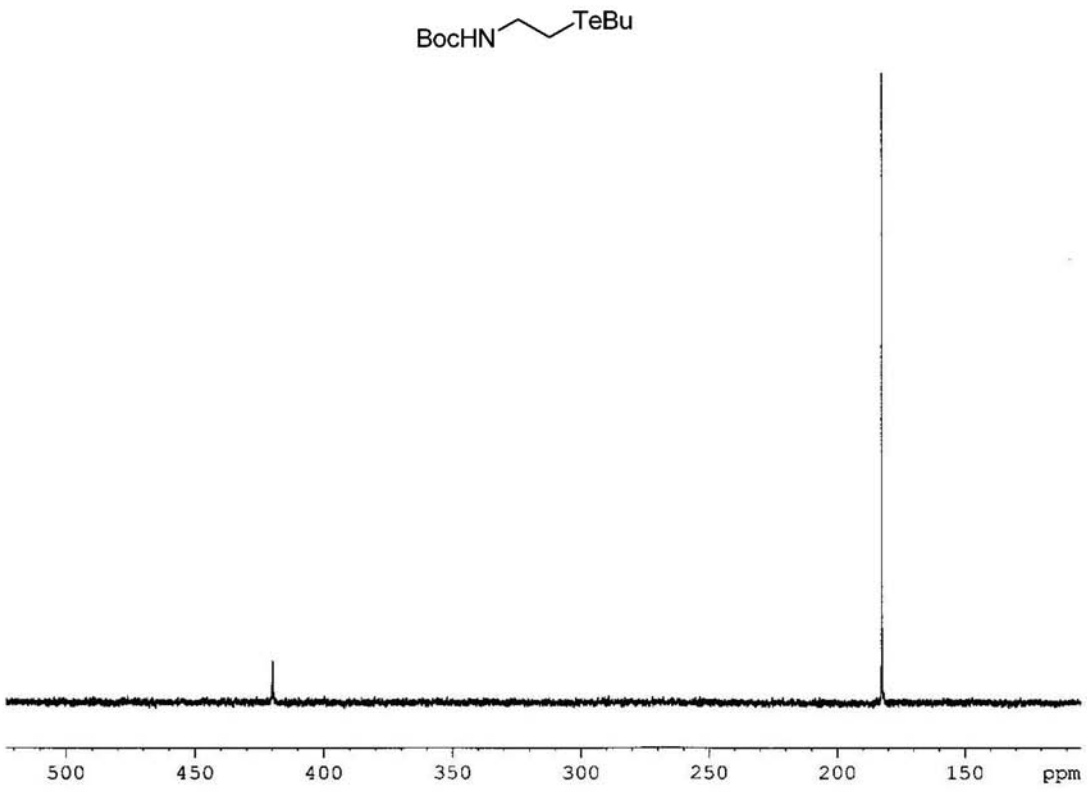


Figure S3. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1a**.

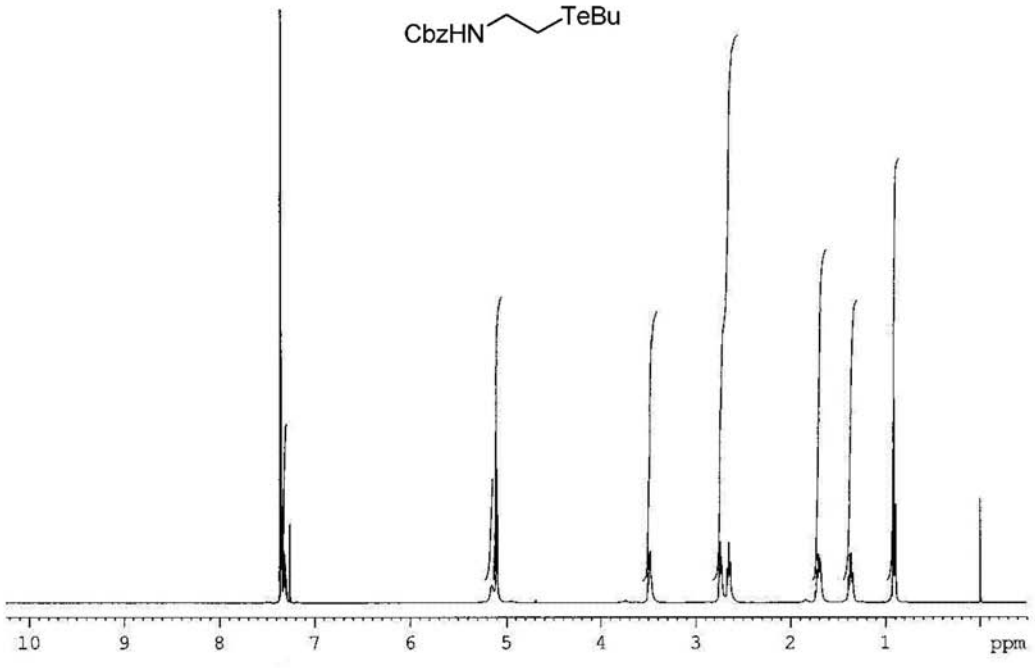


Figure S4. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **1b**.

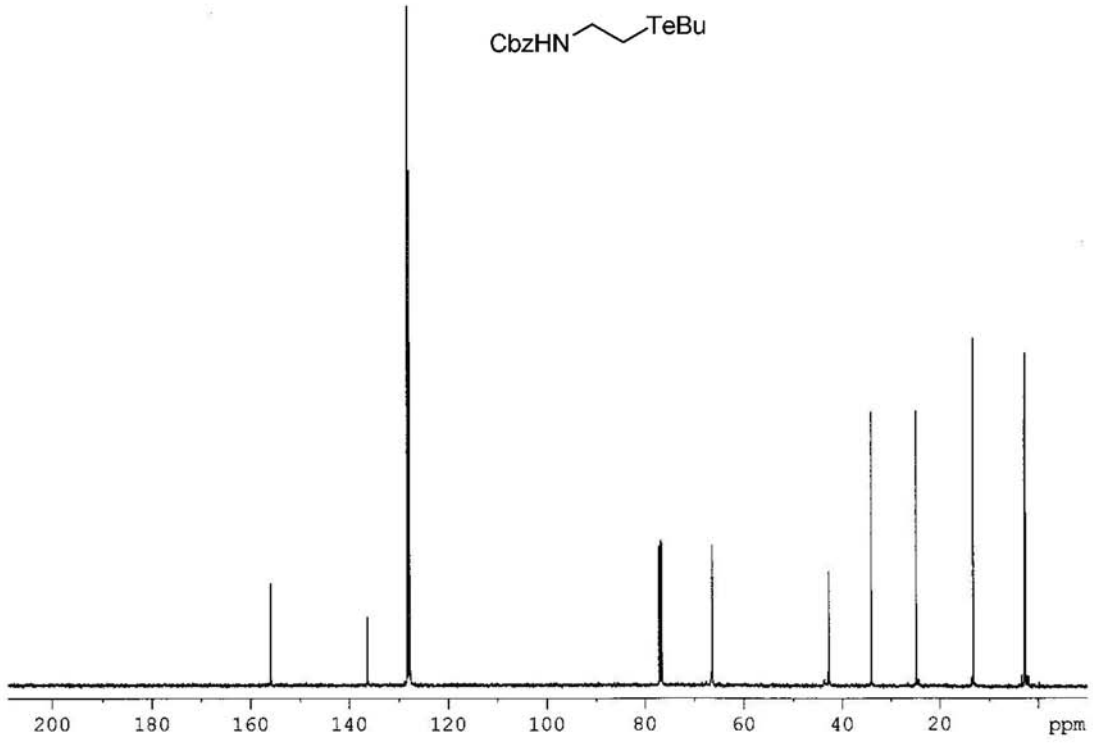


Figure S5. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **1b**.

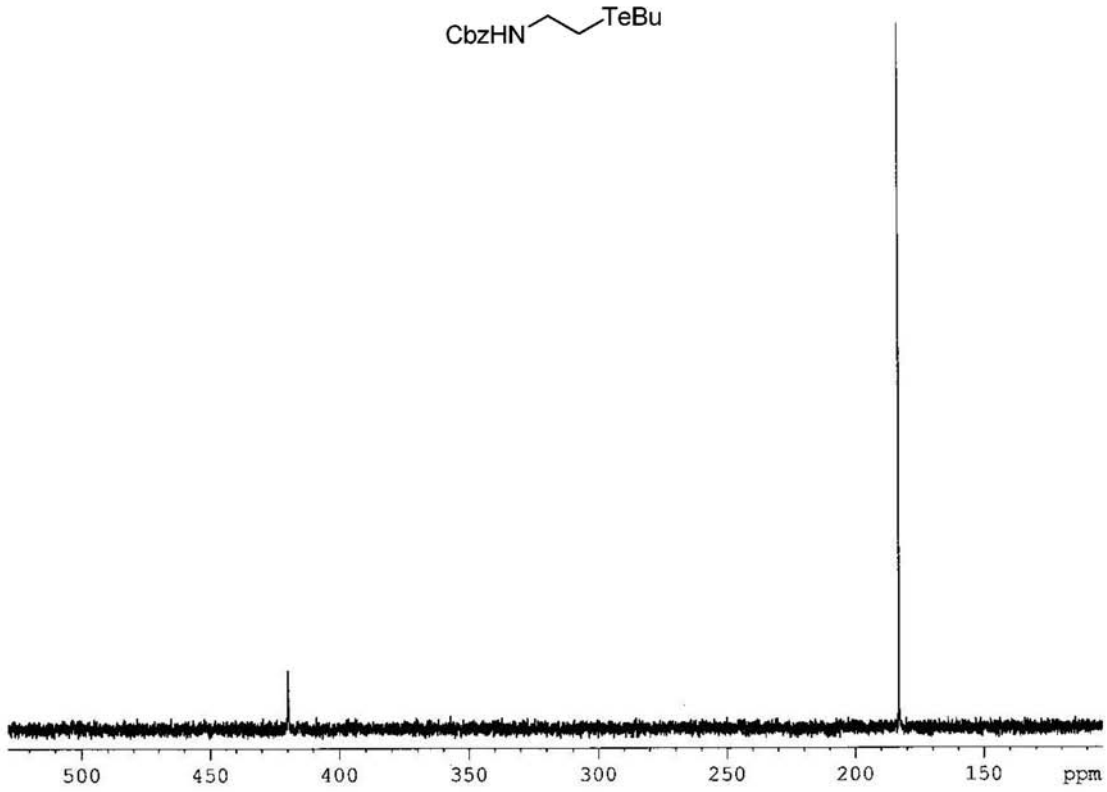


Figure S6. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1b**.

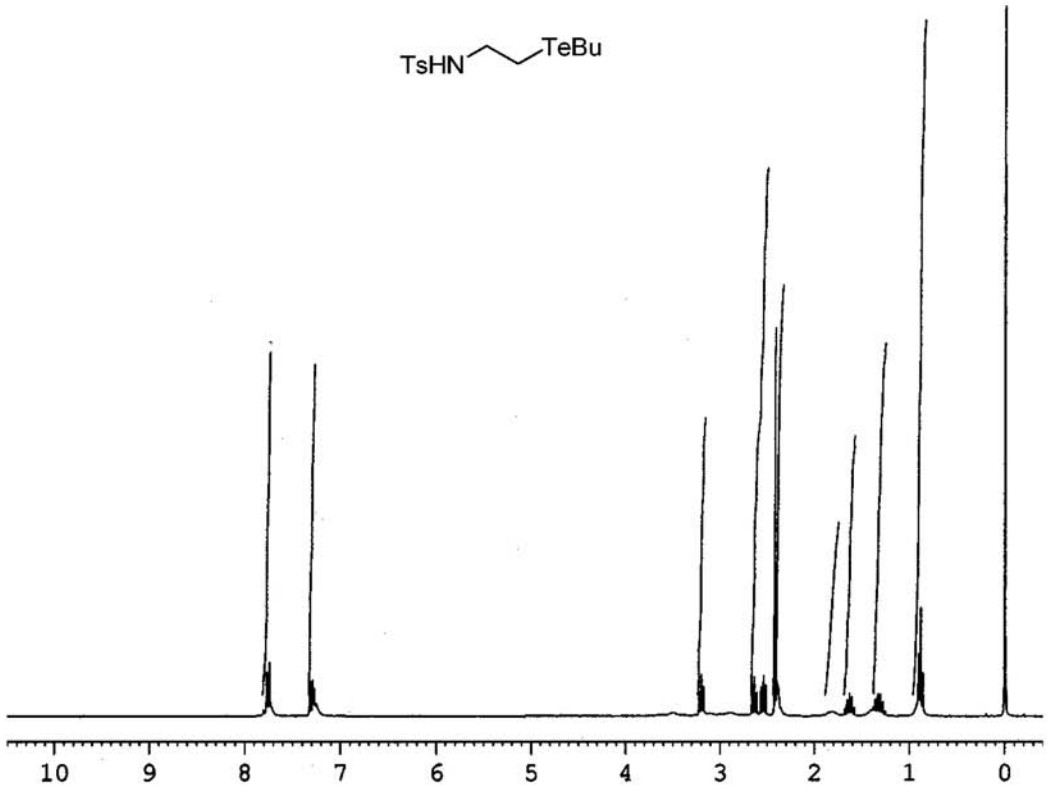


Figure S7. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of **1c**.

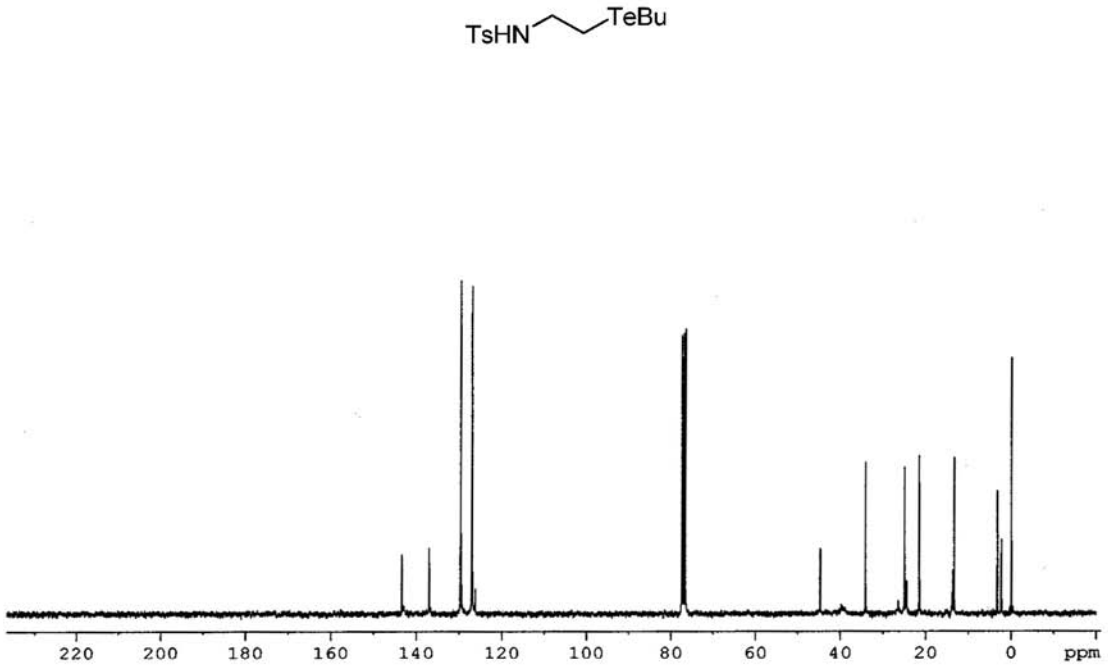


Figure S8. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of **1c**.

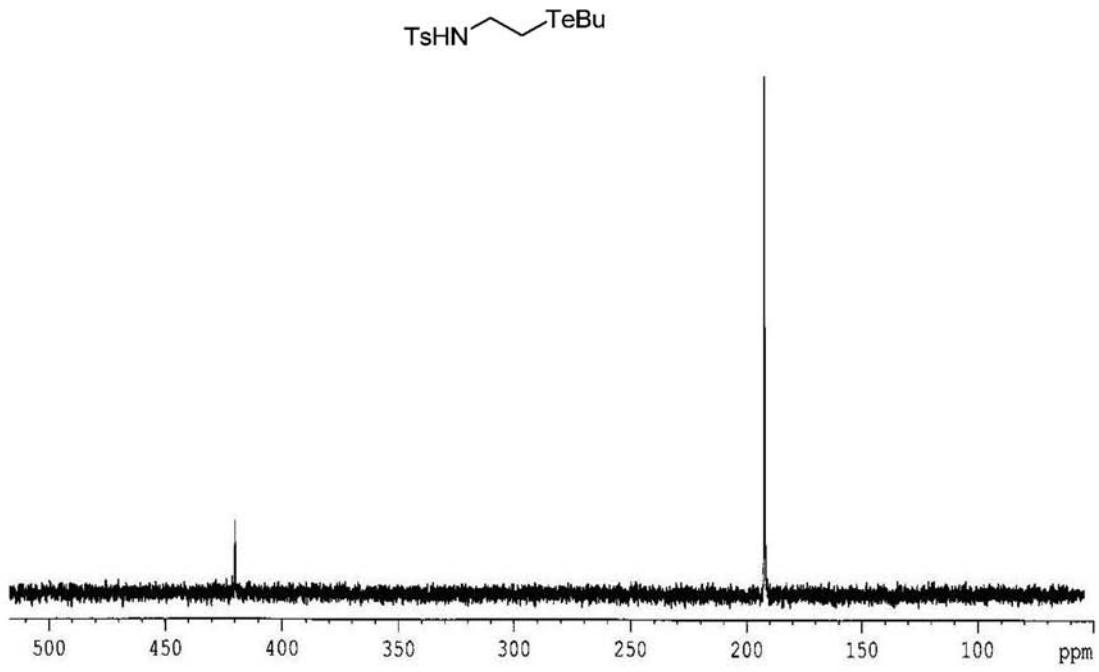


Figure S9. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1c**.

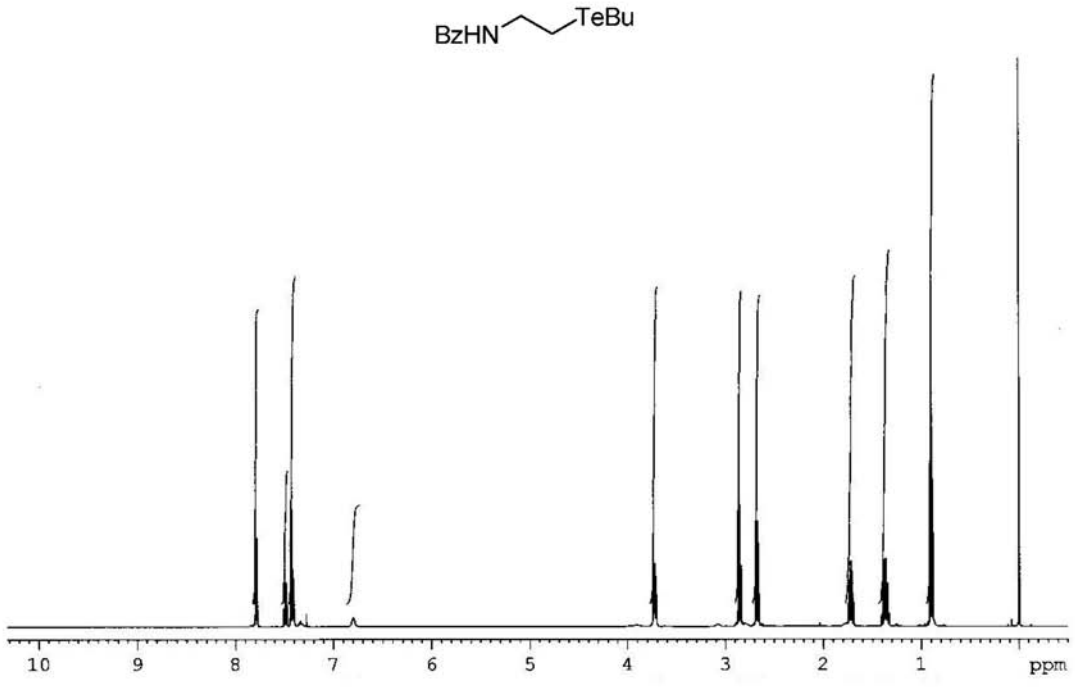


Figure S10. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **1d**.

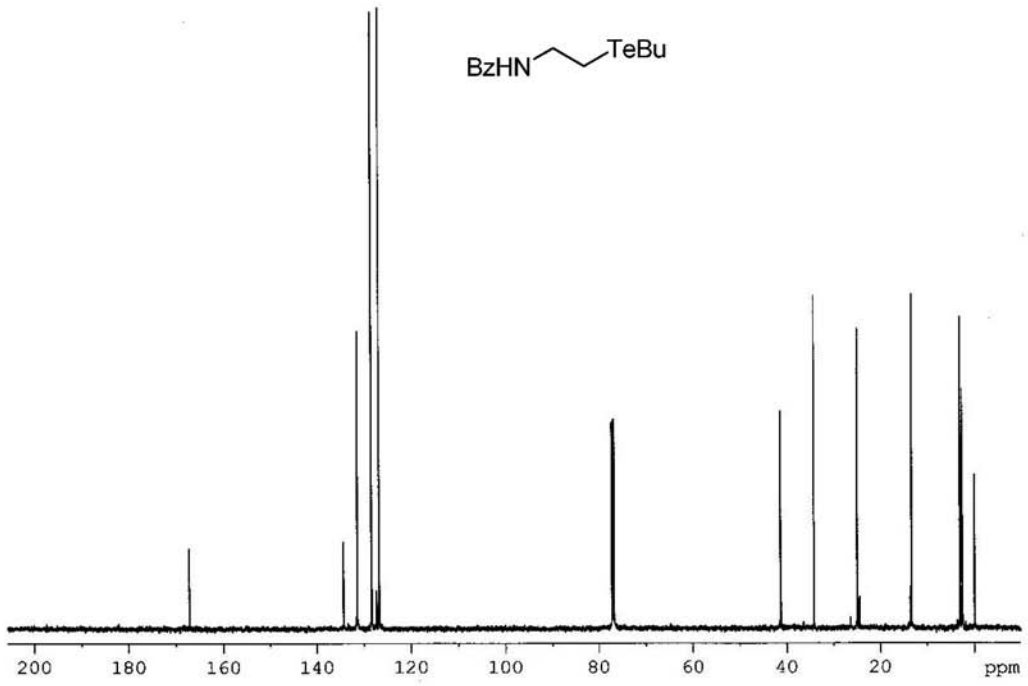


Figure S11. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **1d**.

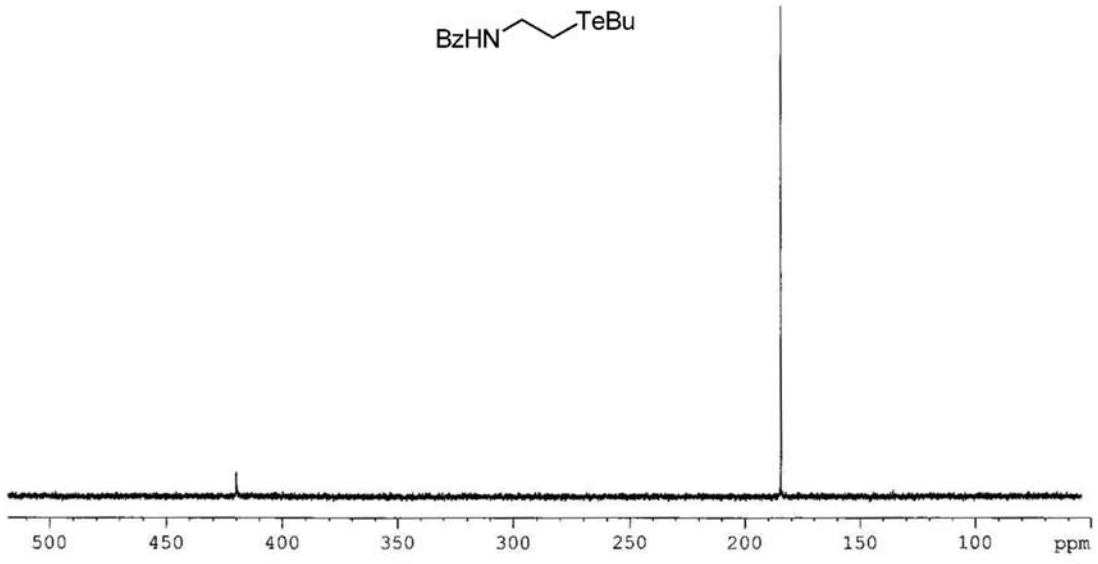


Figure S12. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1d**.

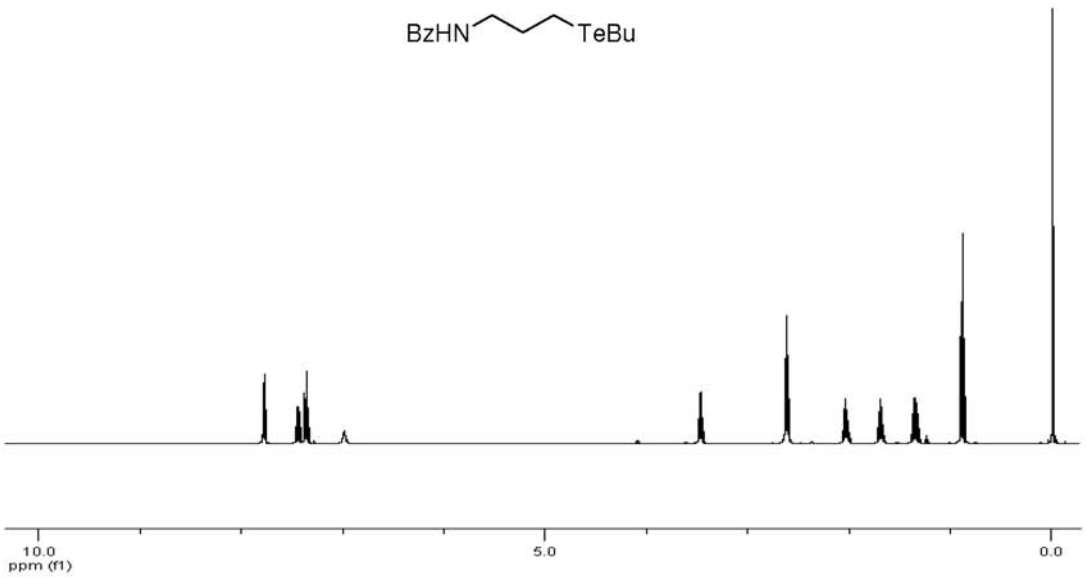


Figure S13. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **1e**.

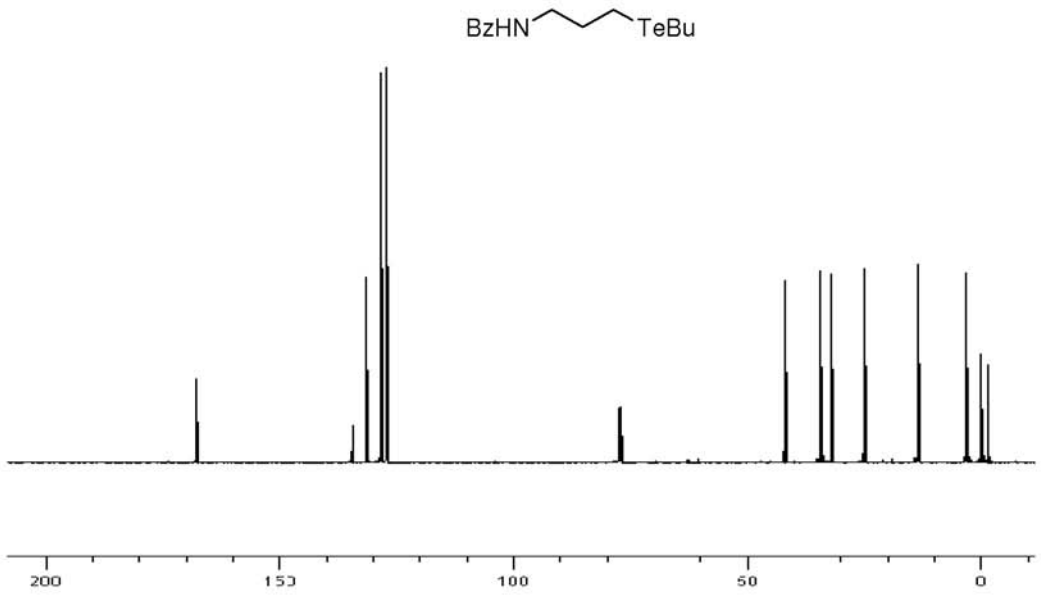


Figure S14. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **1e**.

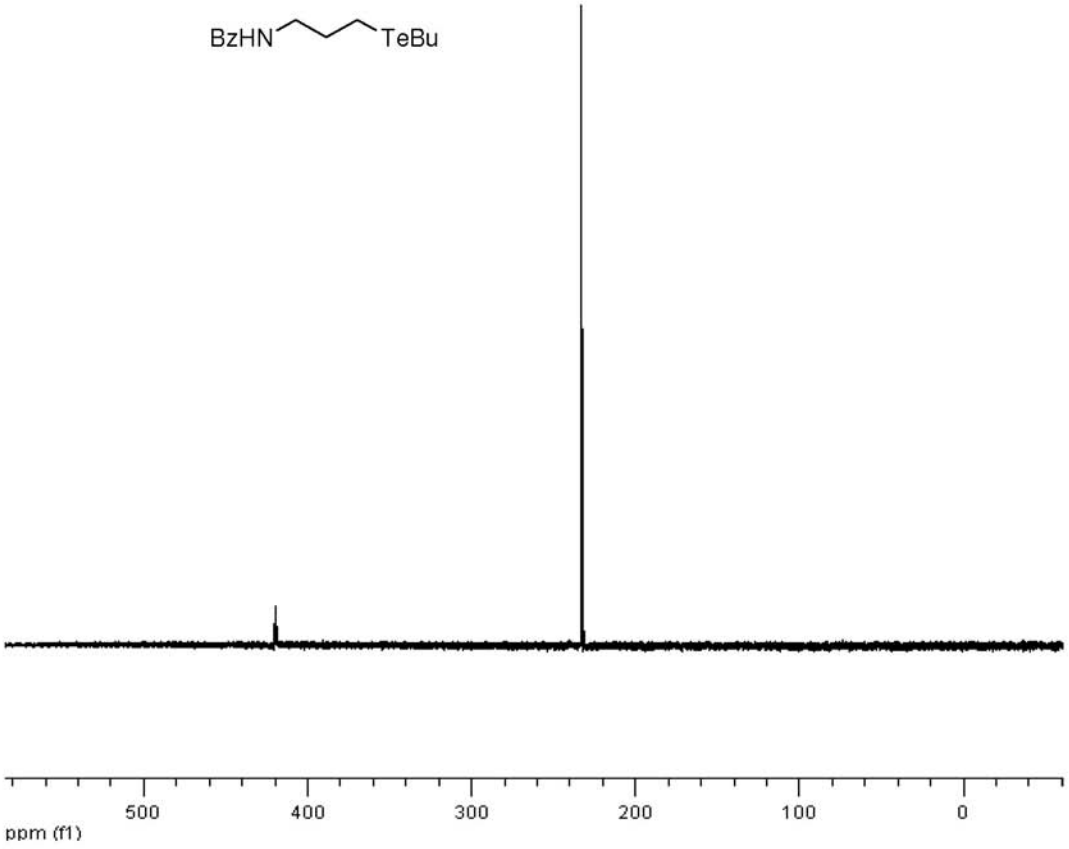


Figure S15. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1e**.

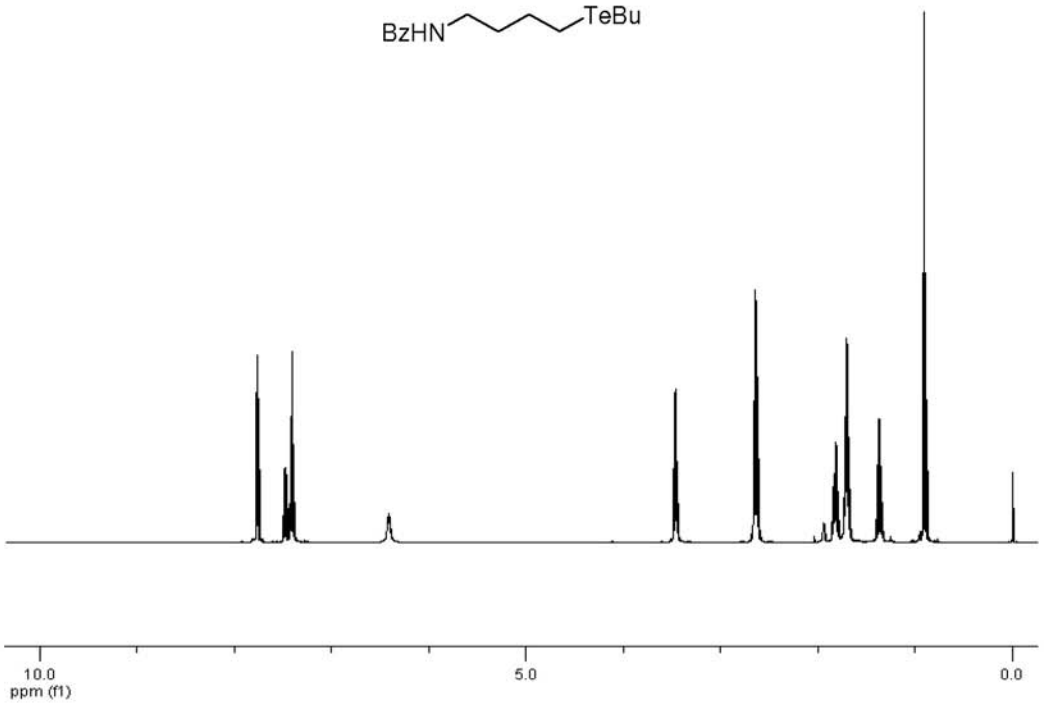


Figure S16. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **1f**.

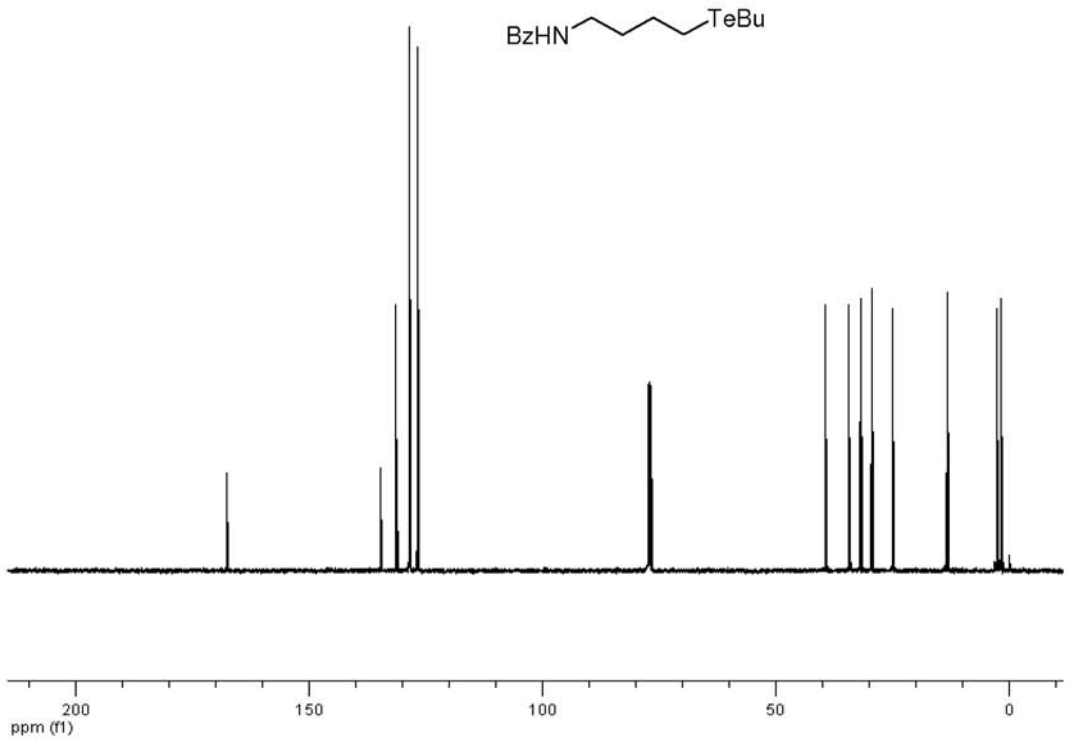


Figure S17. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **1f**.

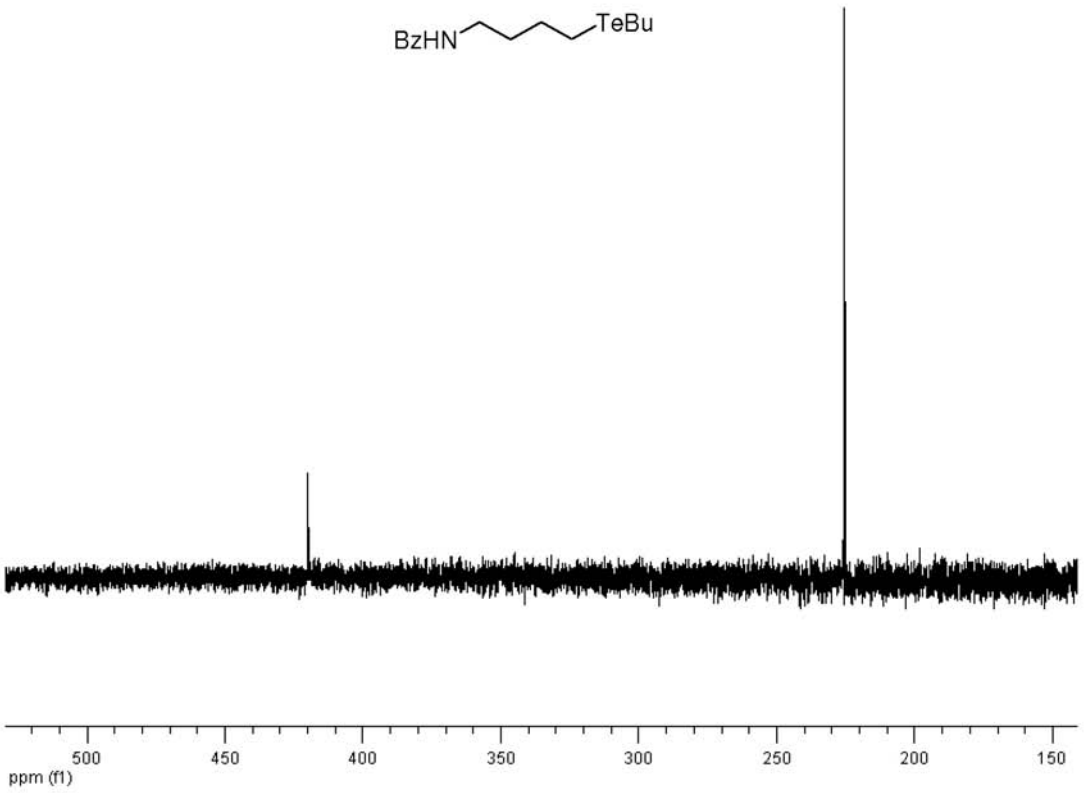


Figure S18. ^{125}Te NMR (157 MHz, $CDCl_3$) spectrum of **1f**.

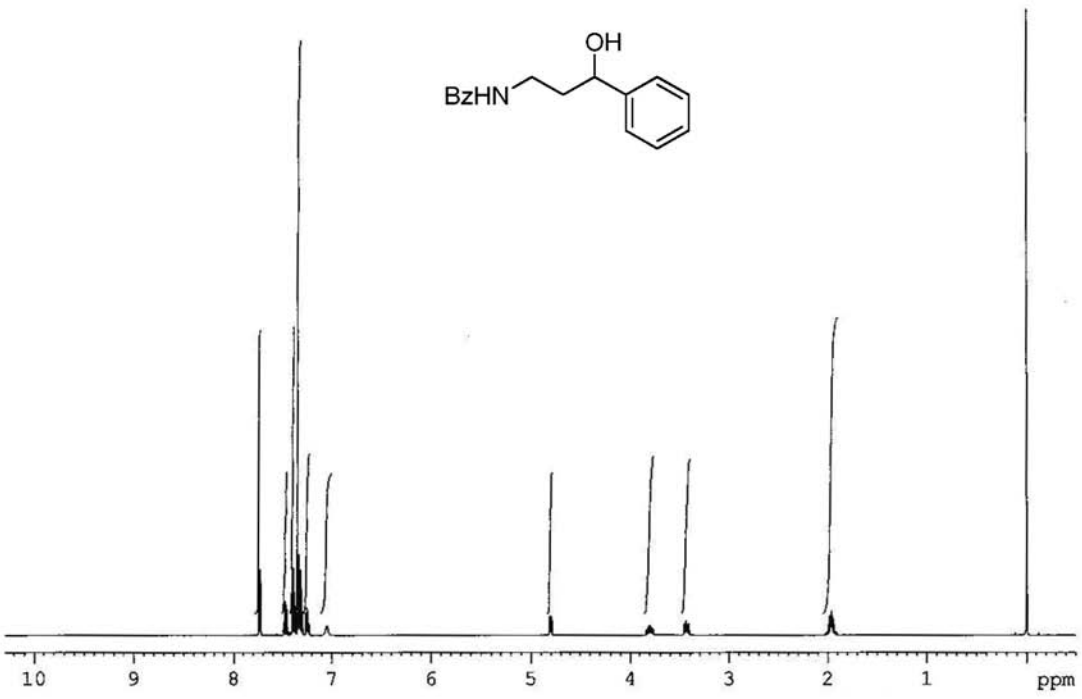


Figure S19. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2a**.

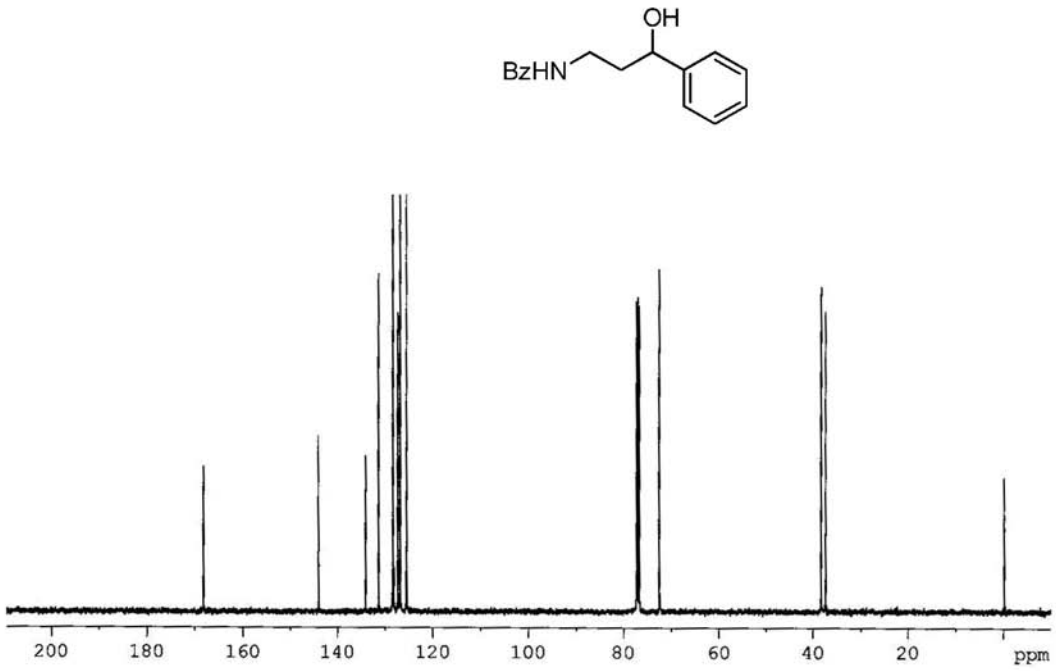


Figure S20. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2a**.

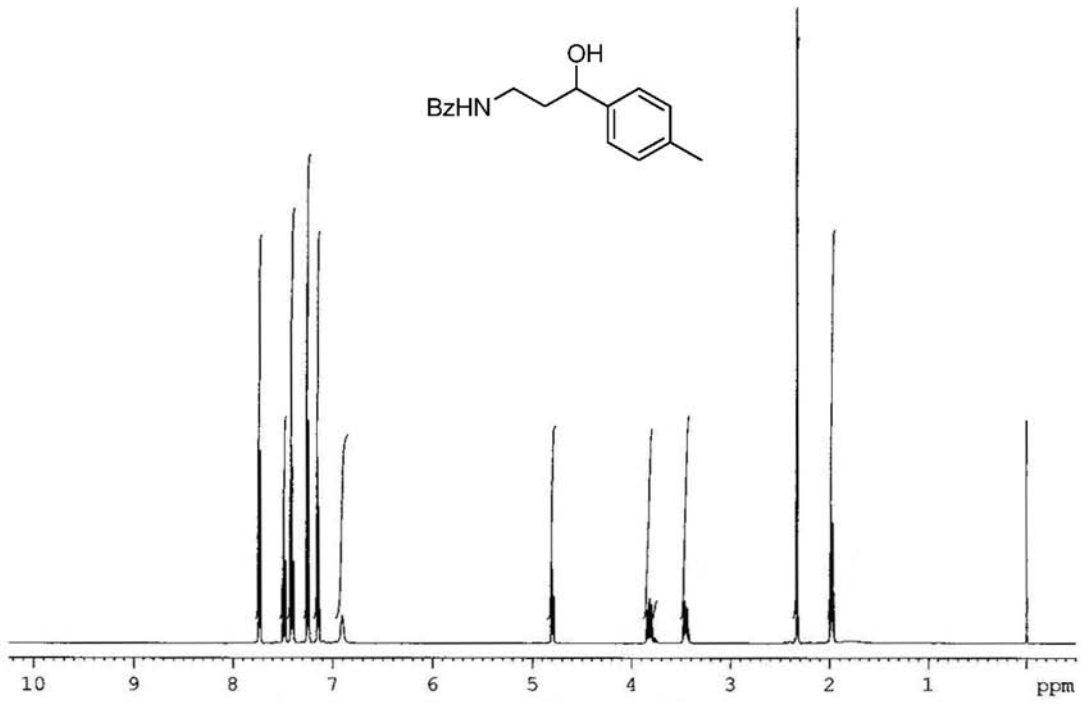


Figure S21. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2b**.

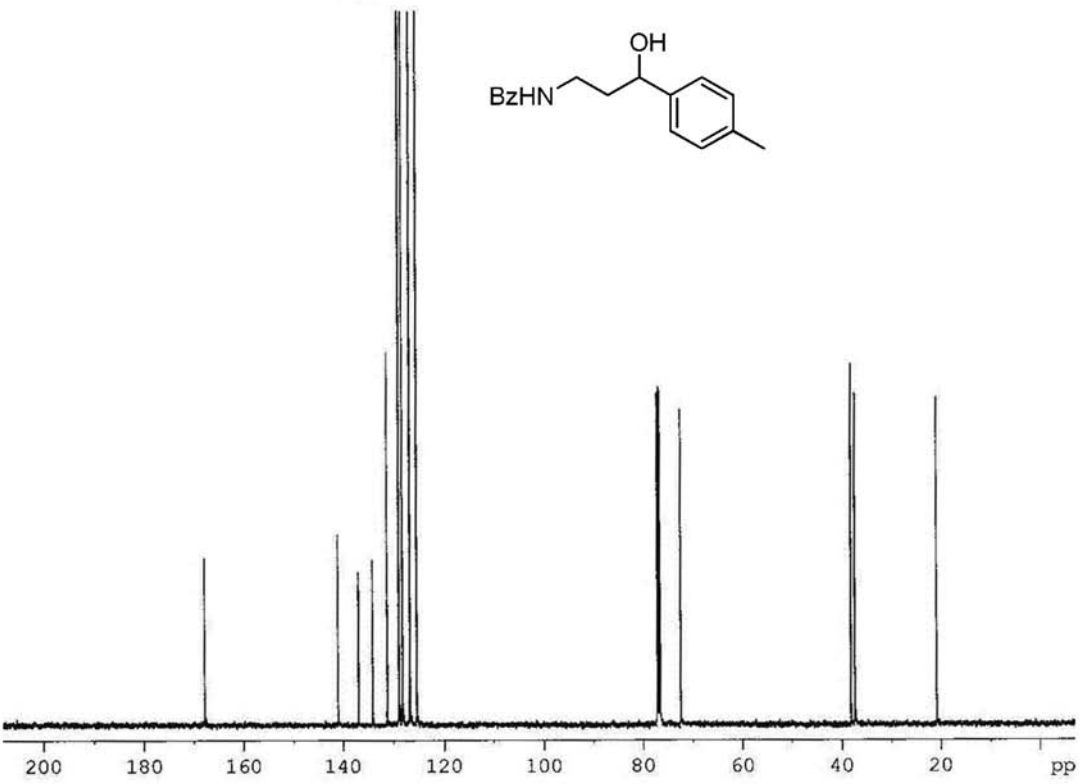


Figure S22. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2b**.

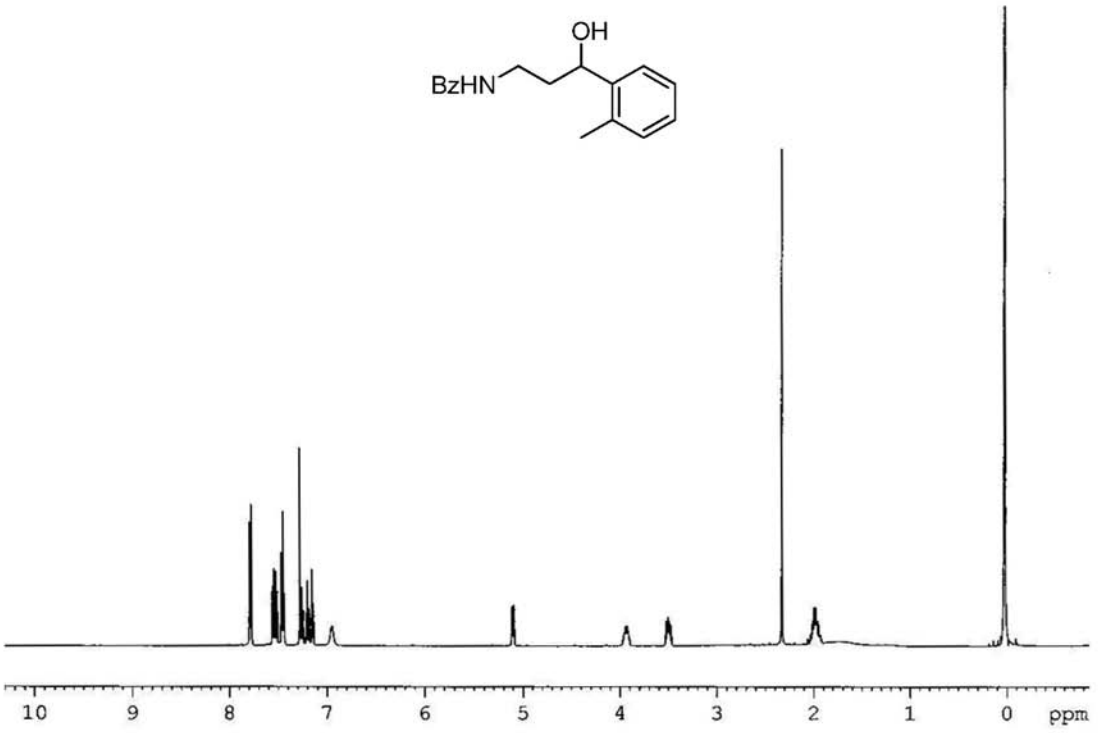


Figure S23. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2c**.

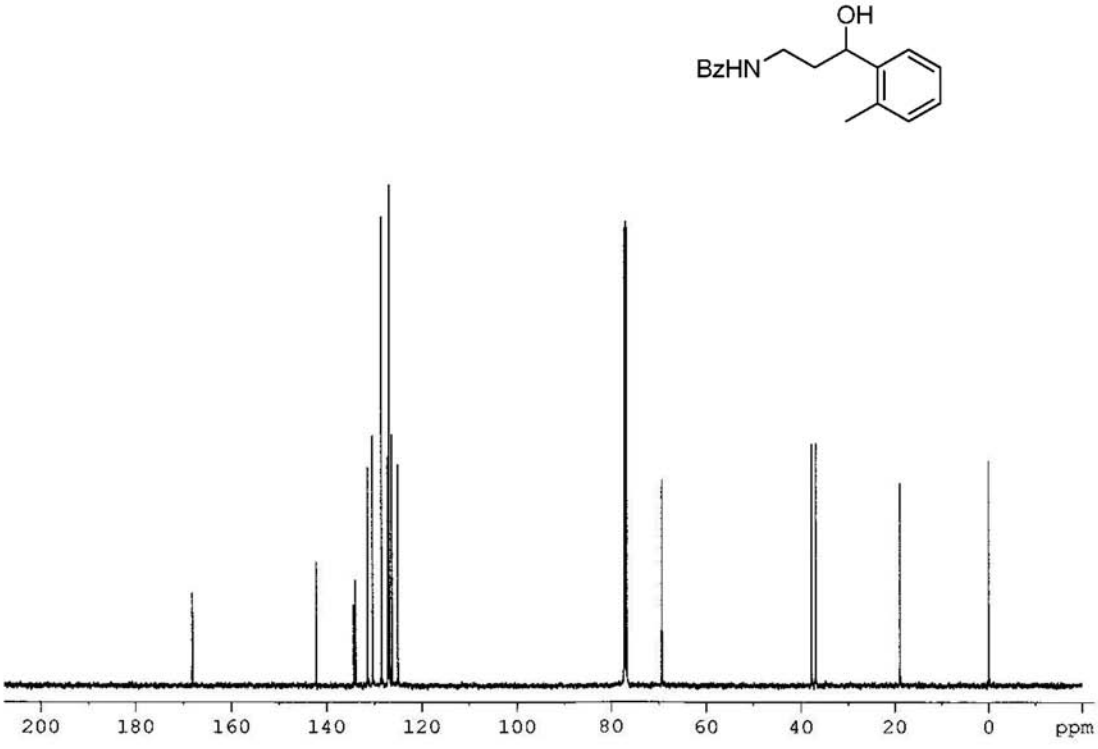


Figure S24. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2c**.

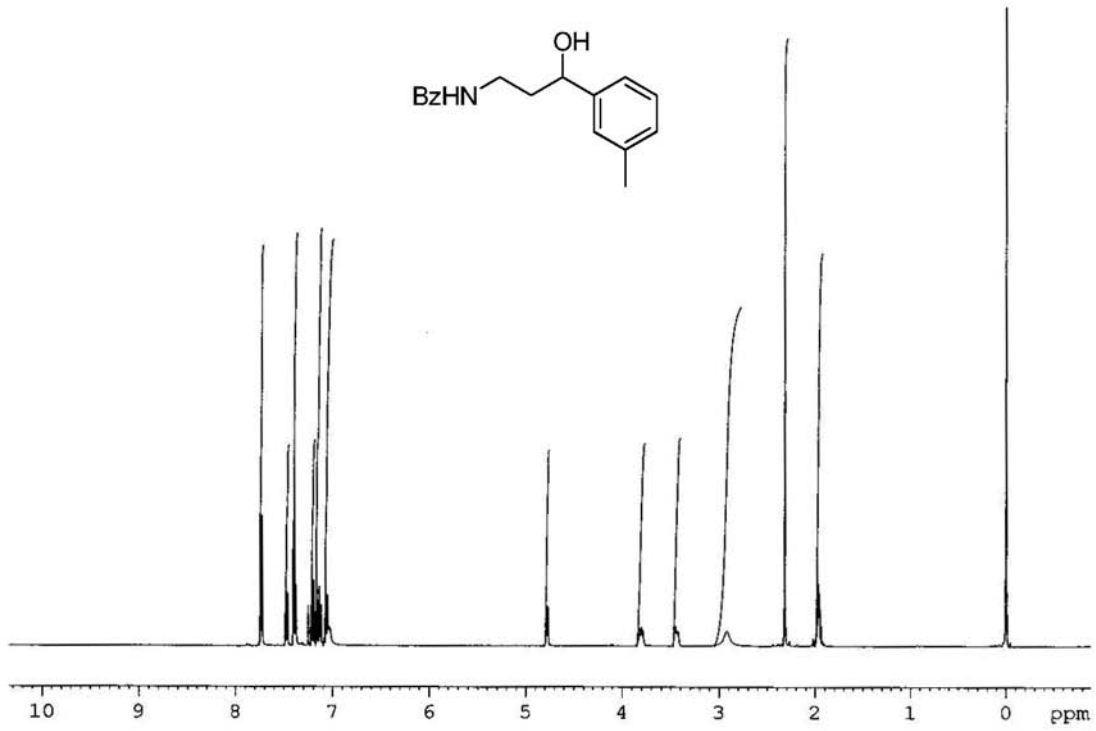


Figure S25. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2d**.

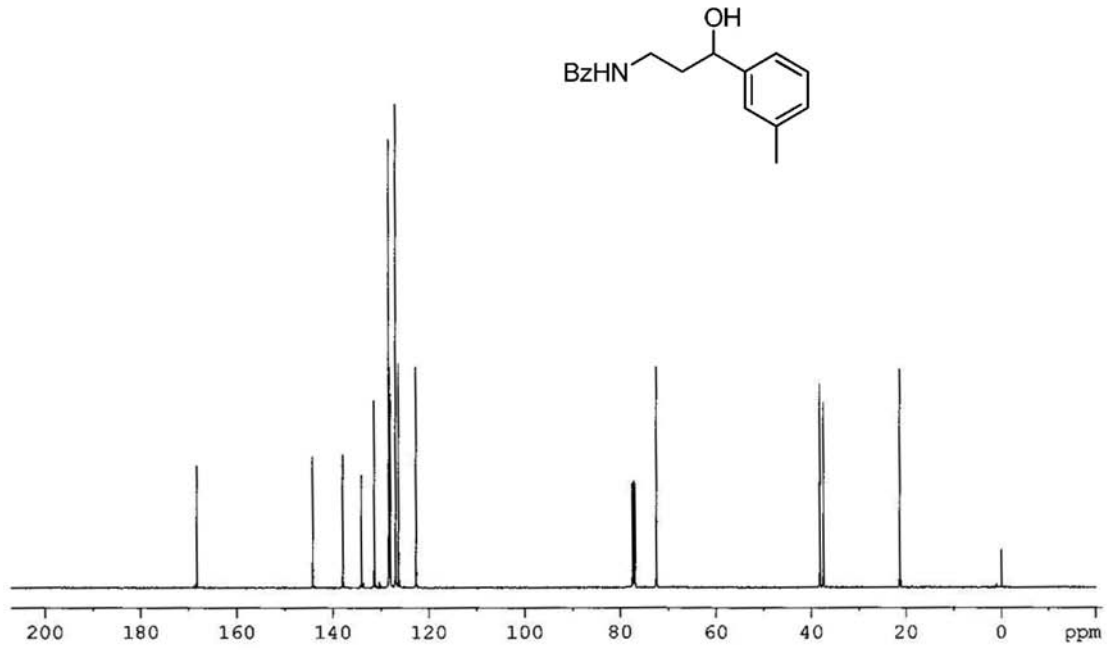


Figure S26. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2d**.

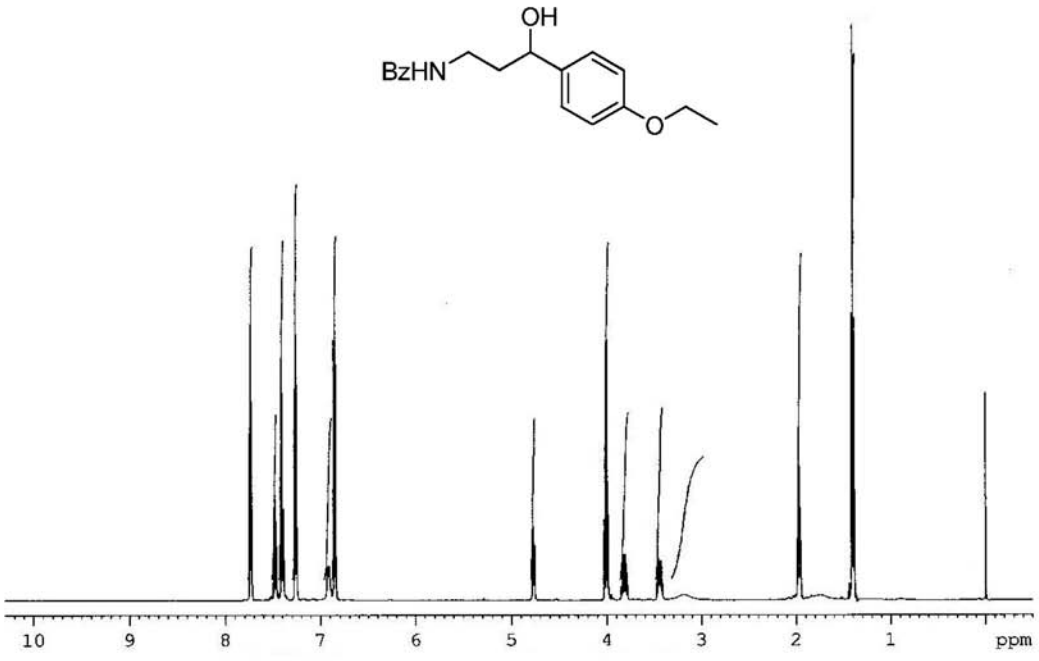


Figure S27. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2e**.

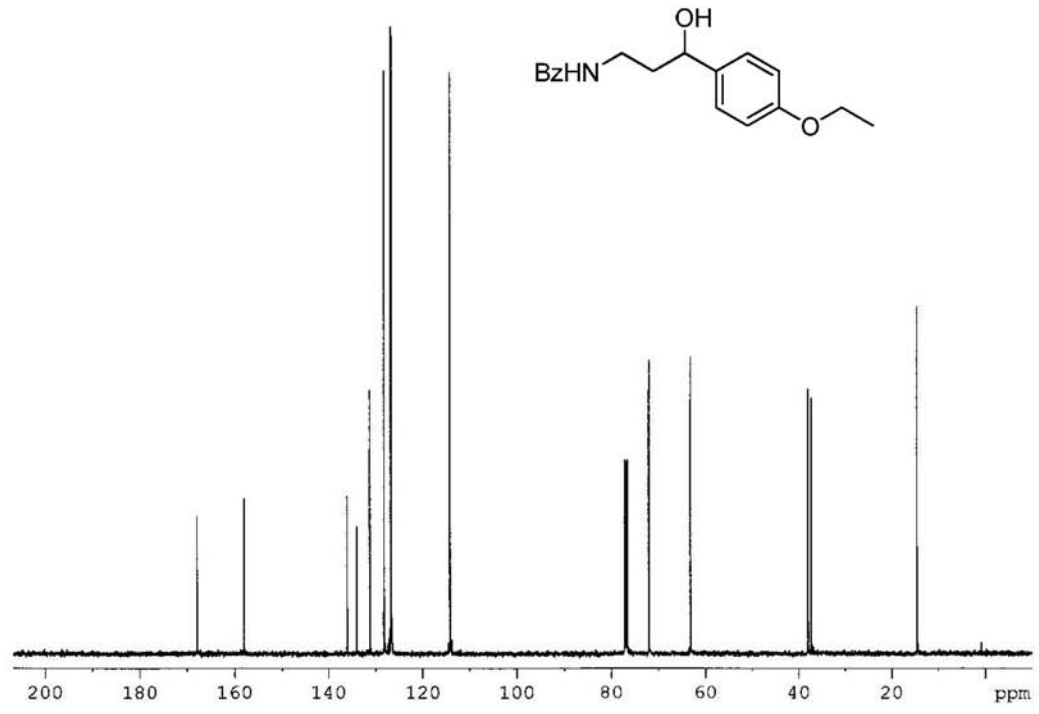


Figure S28. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2e**.

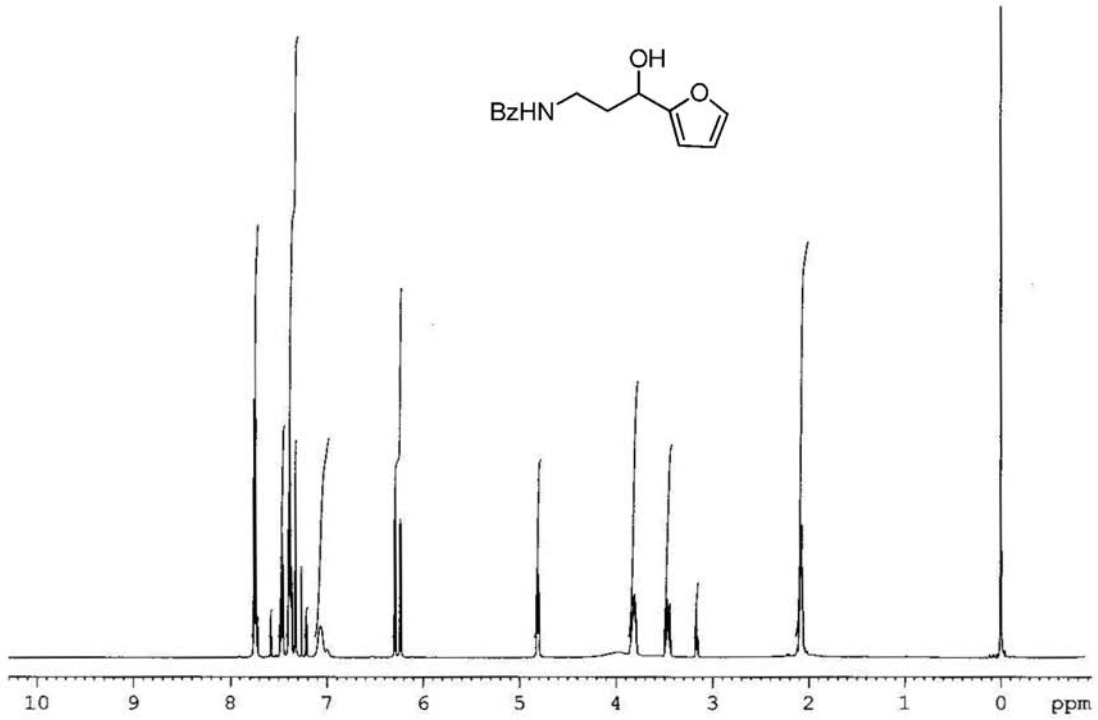


Figure S29. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2f**.

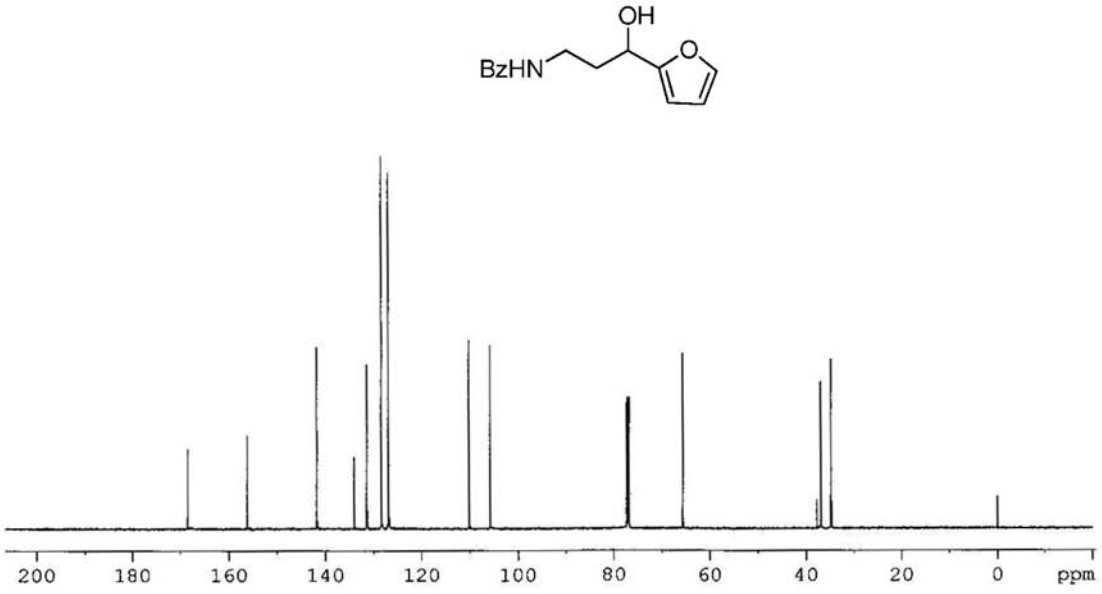


Figure S30. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2f**.

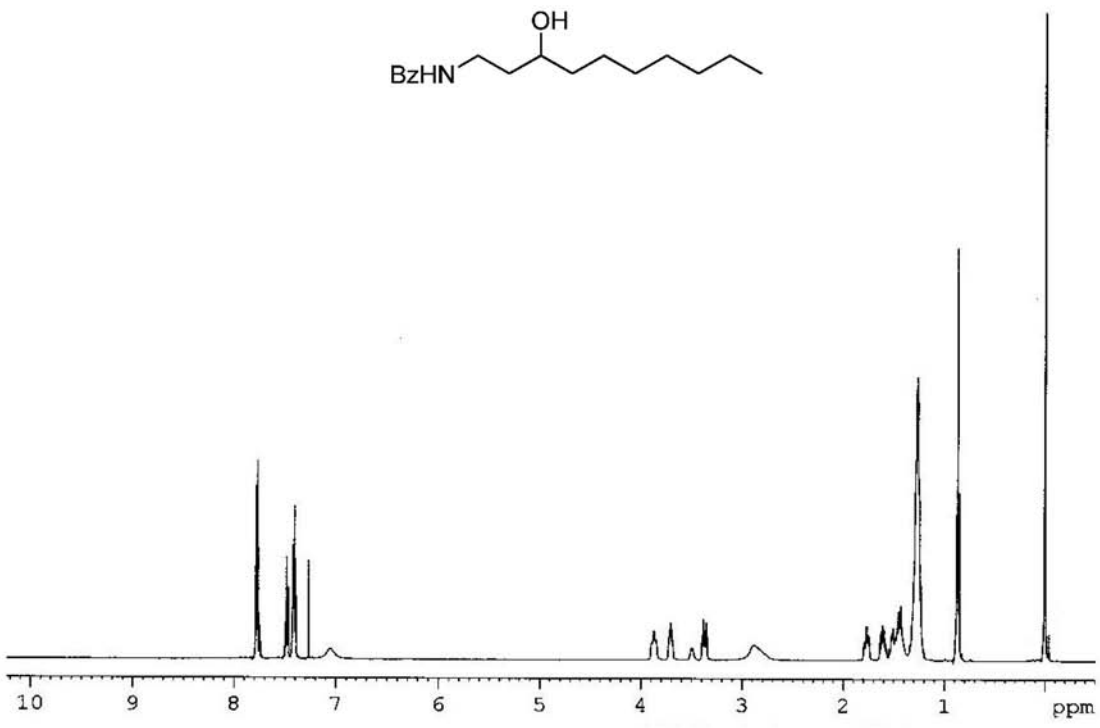


Figure S31. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2g**.

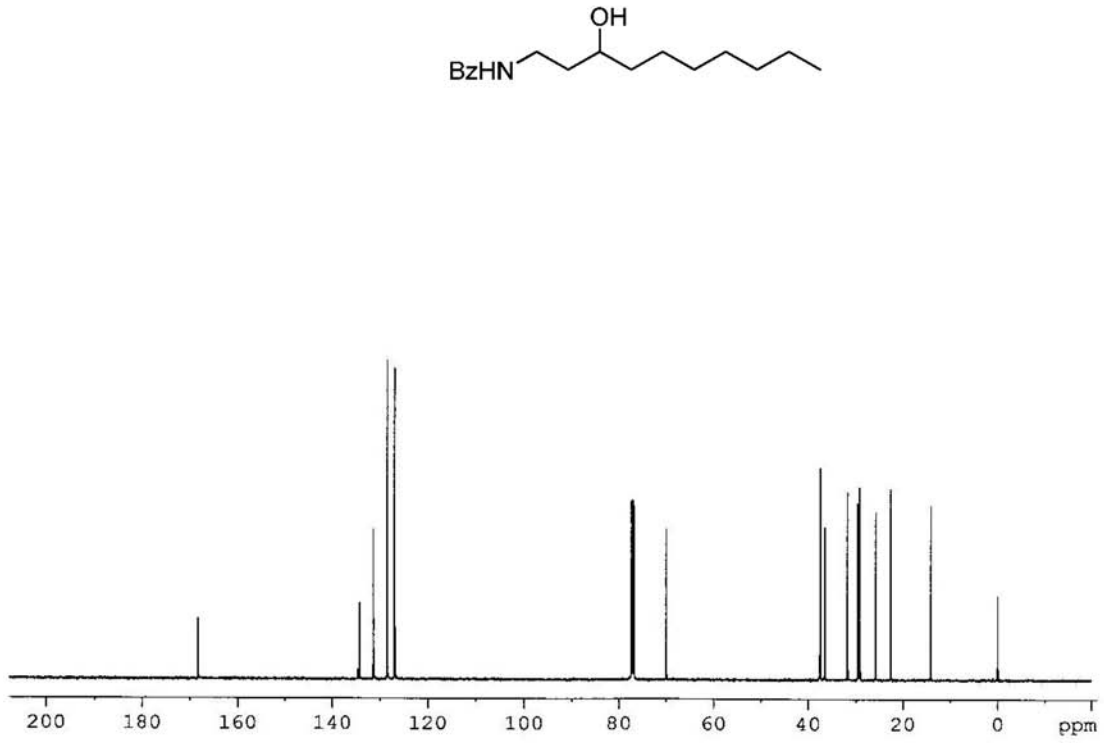


Figure S32. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2g**.

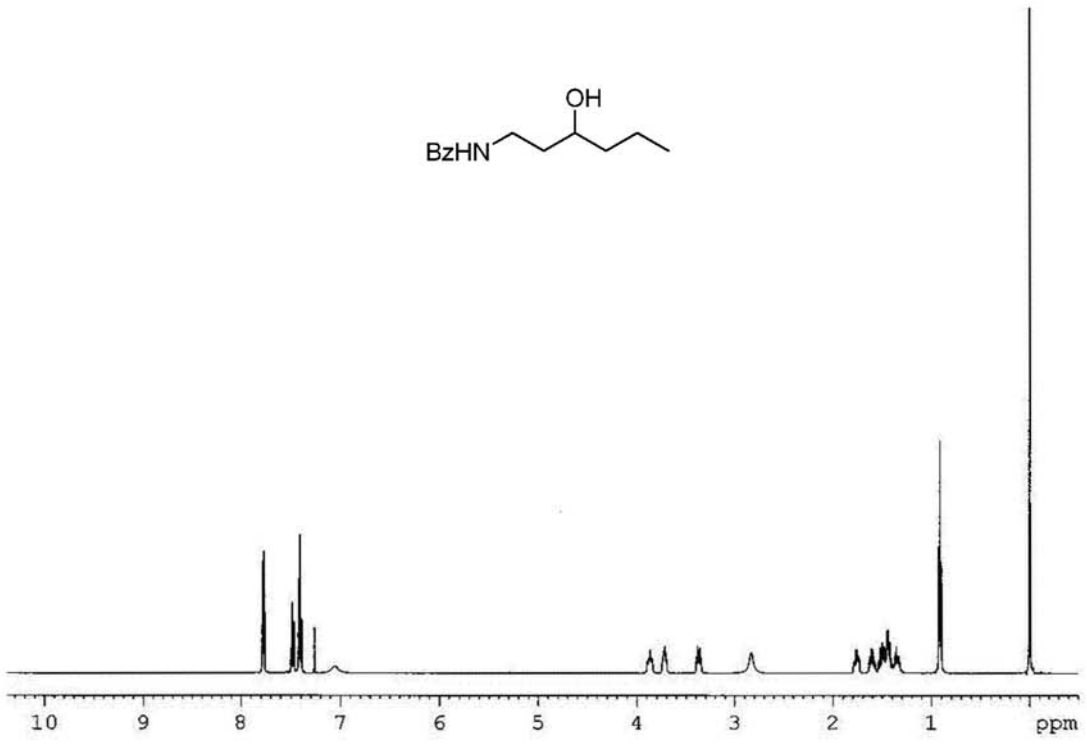


Figure S33. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2h**.

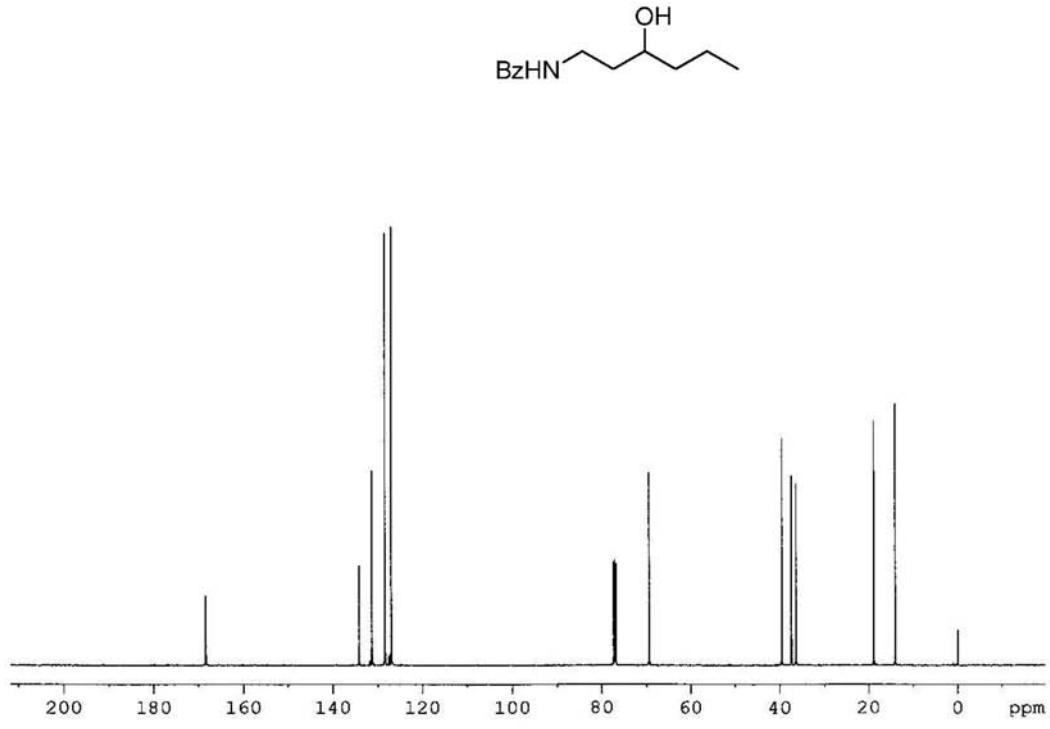


Figure S34. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2h**.

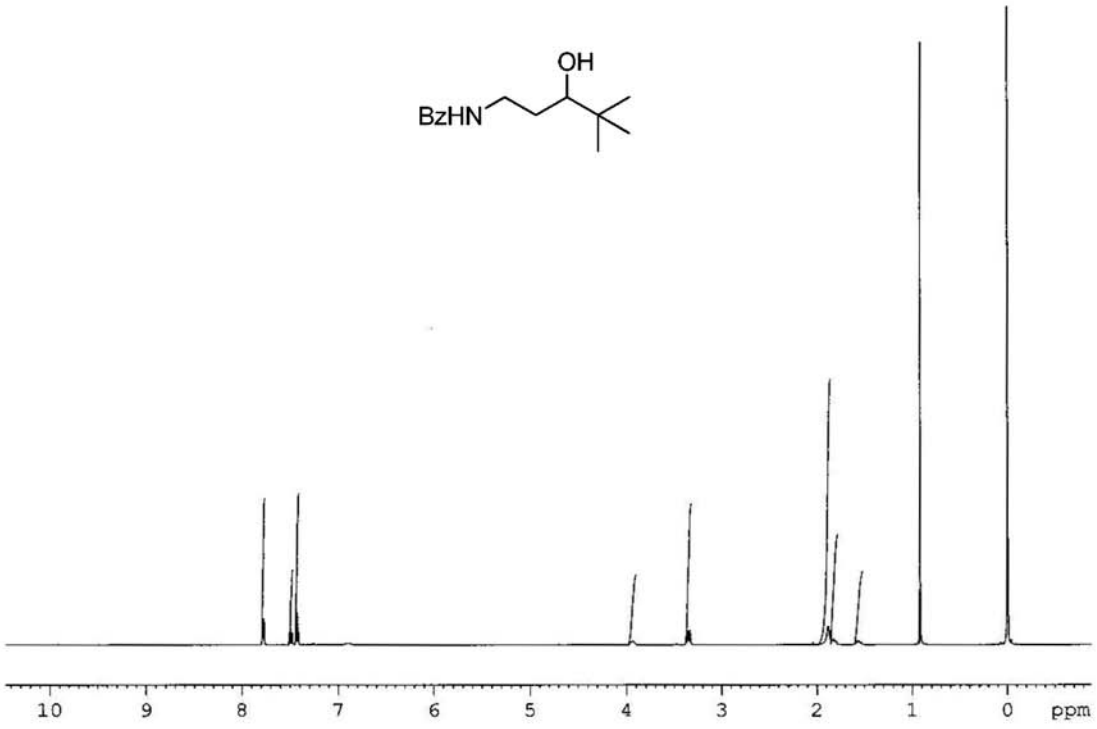


Figure S35. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2i**.

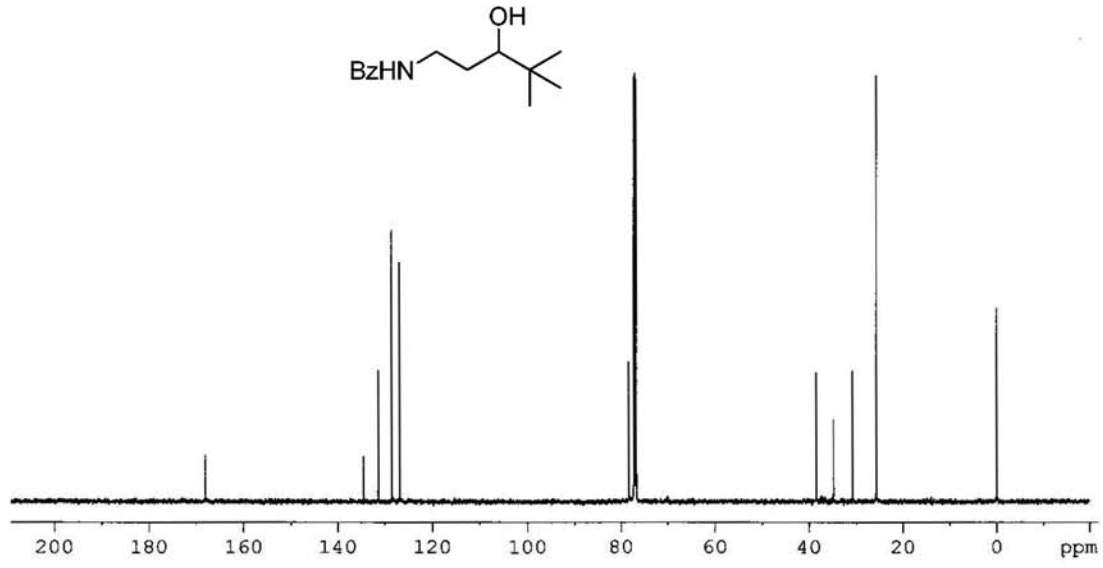


Figure S36. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2i**.

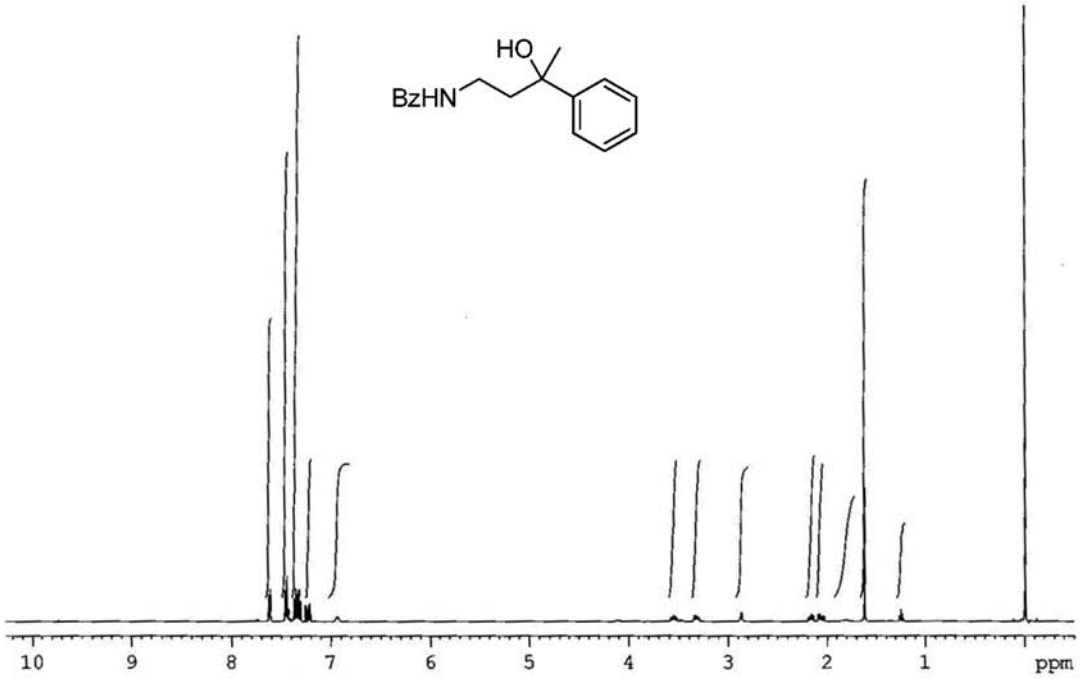


Figure S37. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2j**.

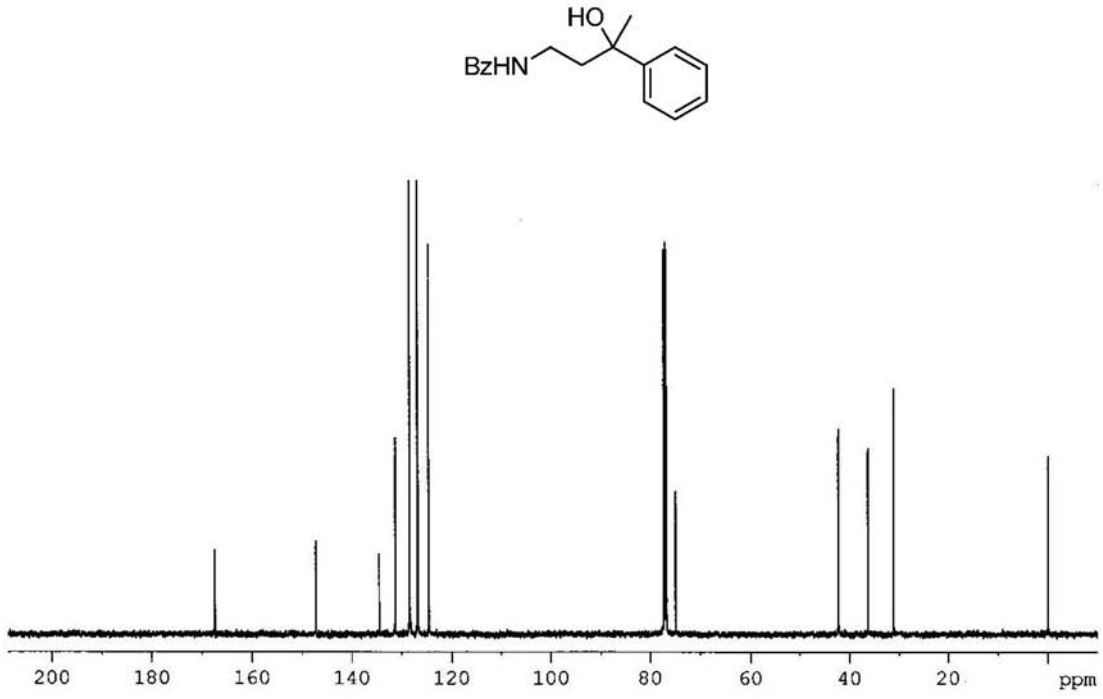


Figure S38. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2j**.

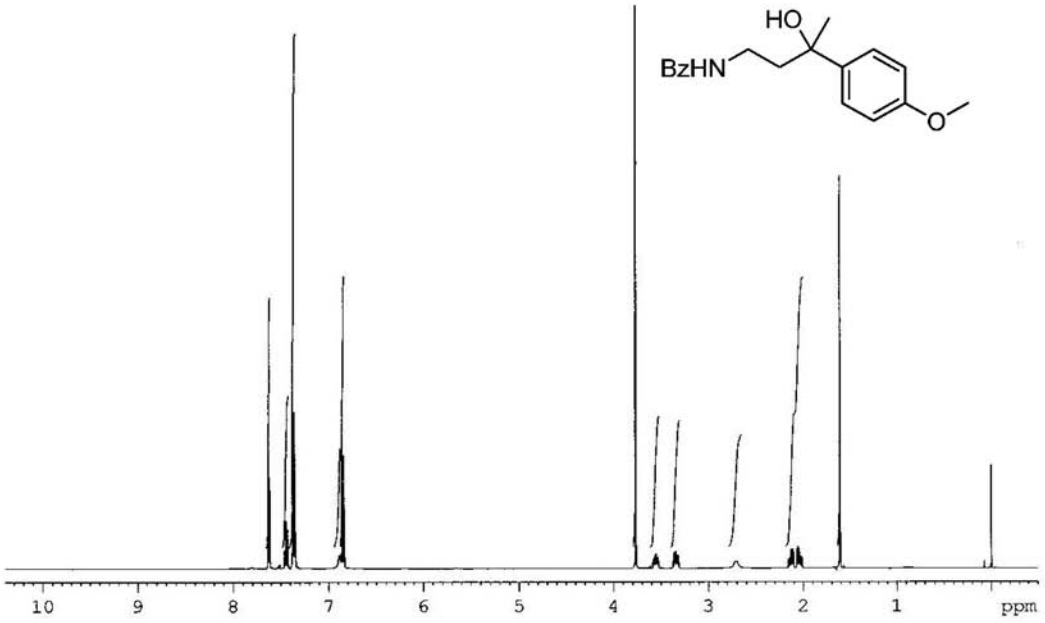


Figure S39. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2k**.

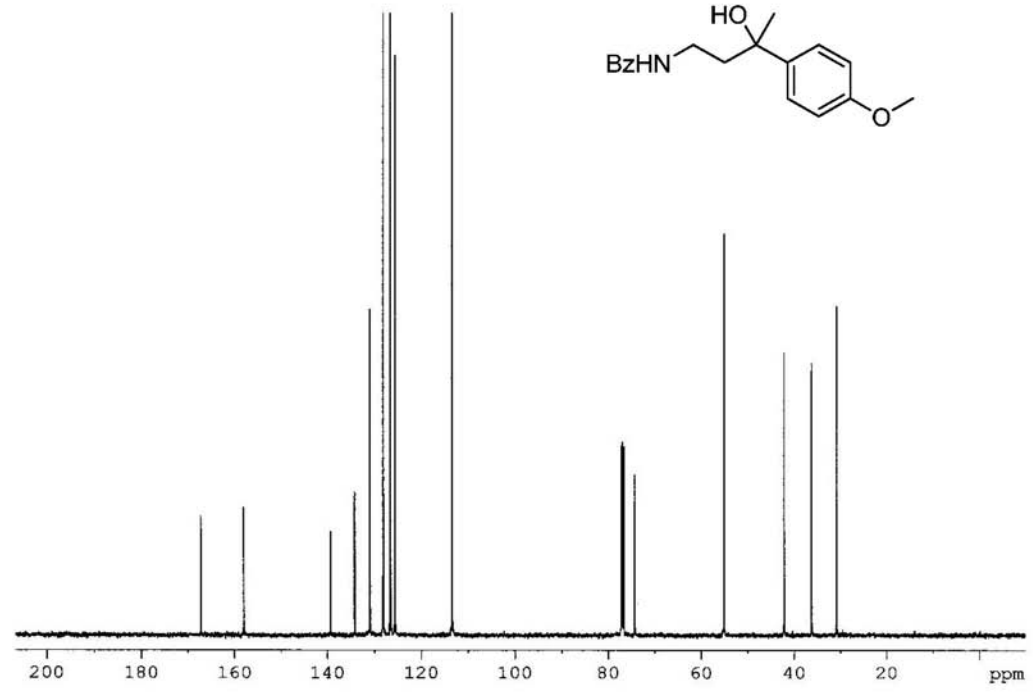


Figure S40. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2k**.

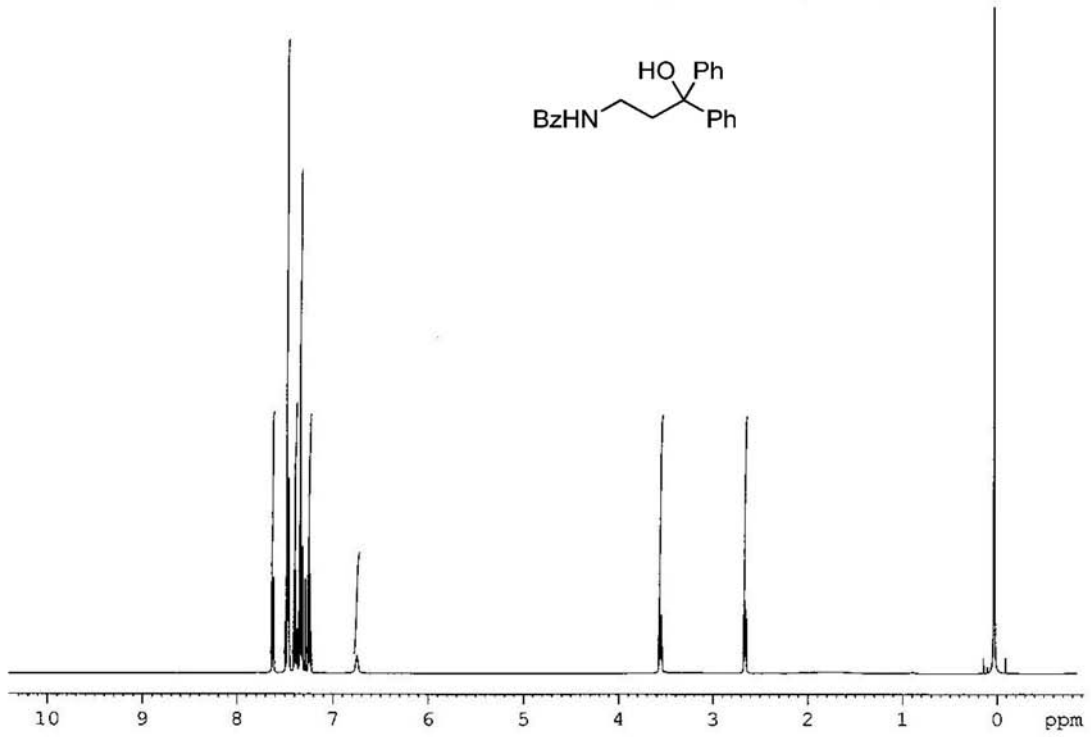


Figure S41. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2l**.

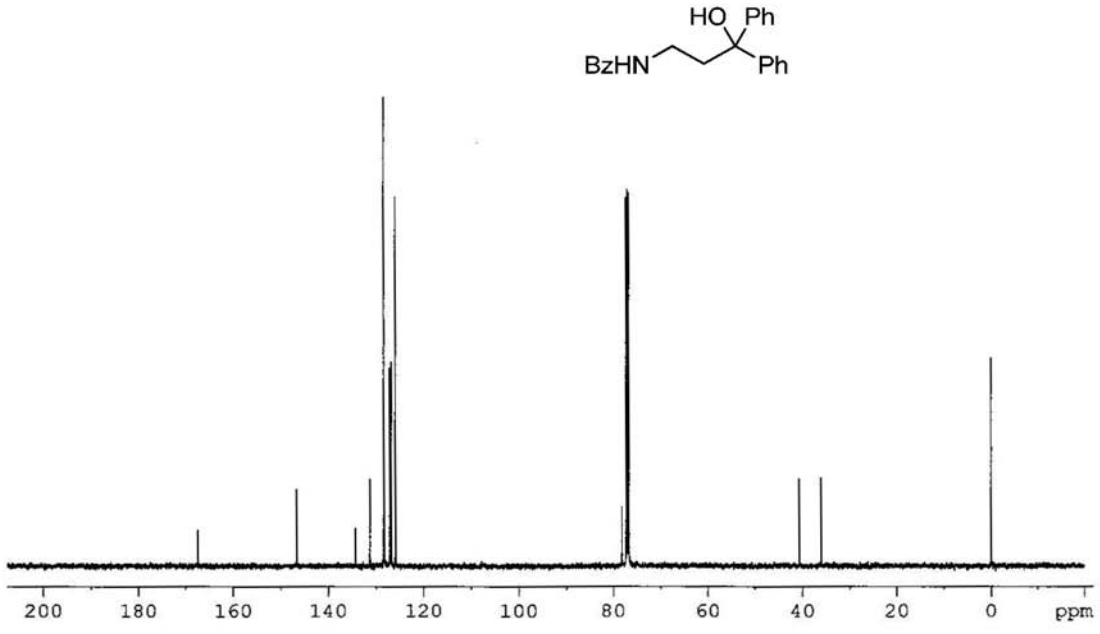


Figure S42. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2l**.

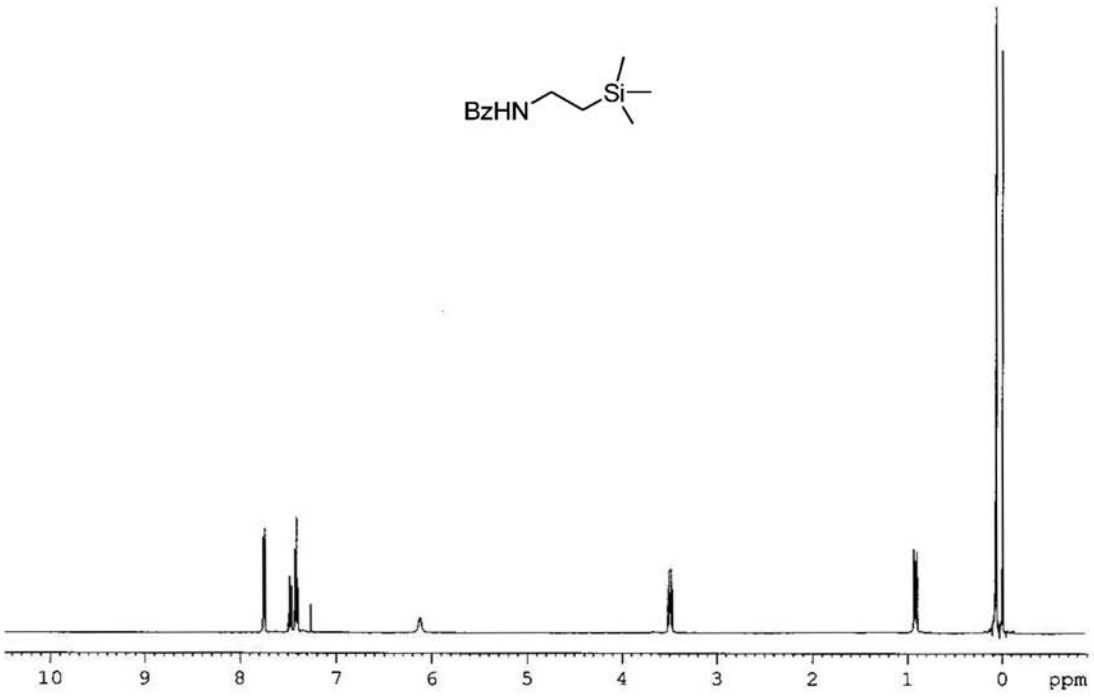


Figure S43. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2m**.

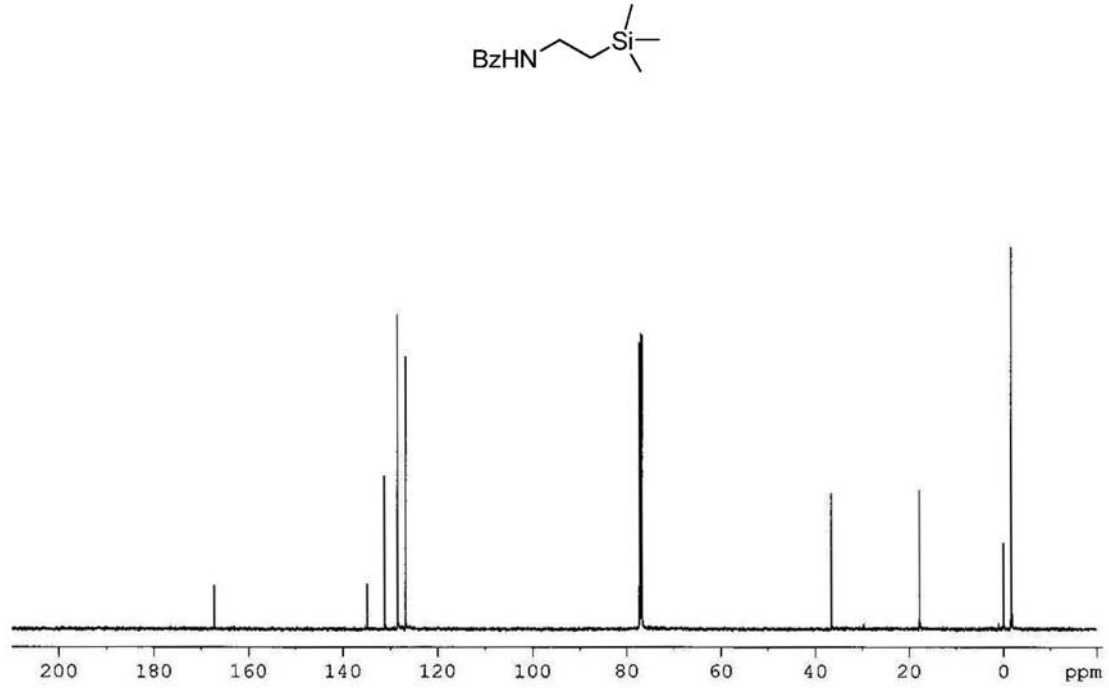


Figure S44. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2m**.

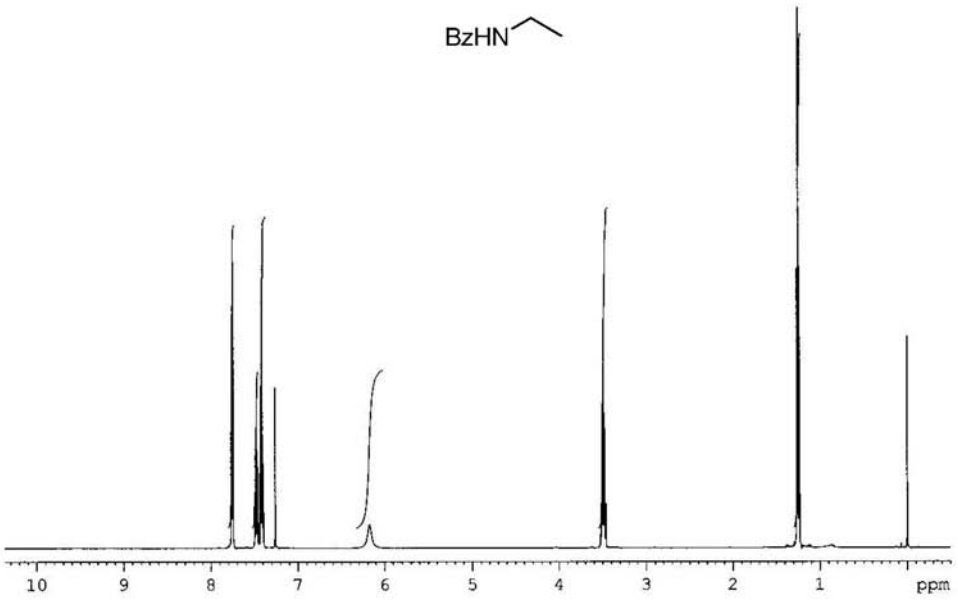


Figure S45. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2n**.

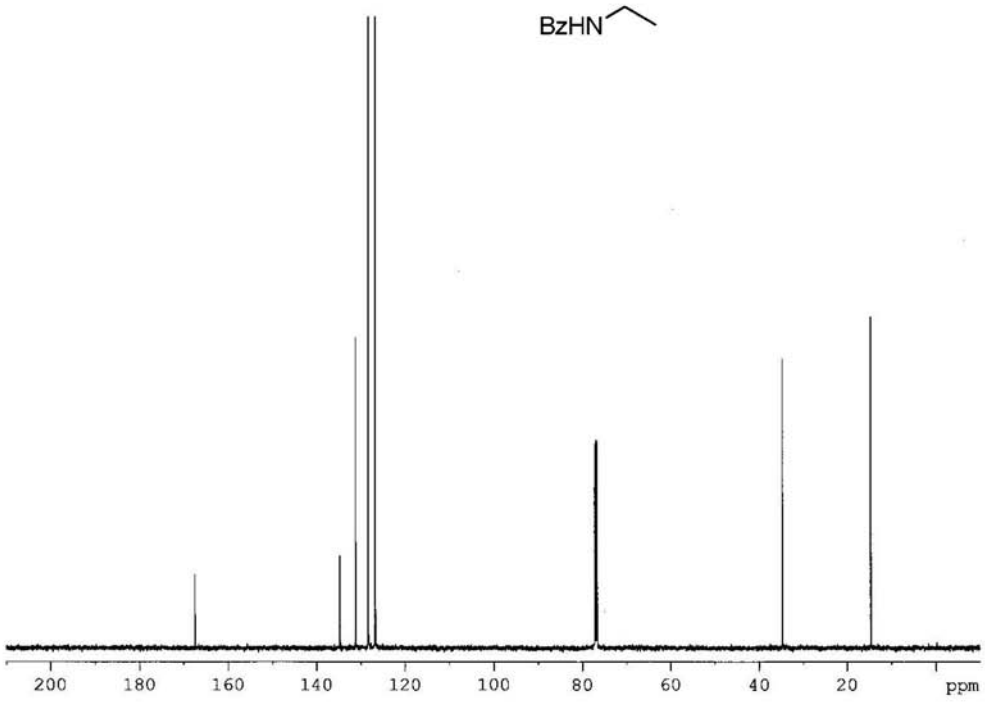


Figure S46. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2n**.

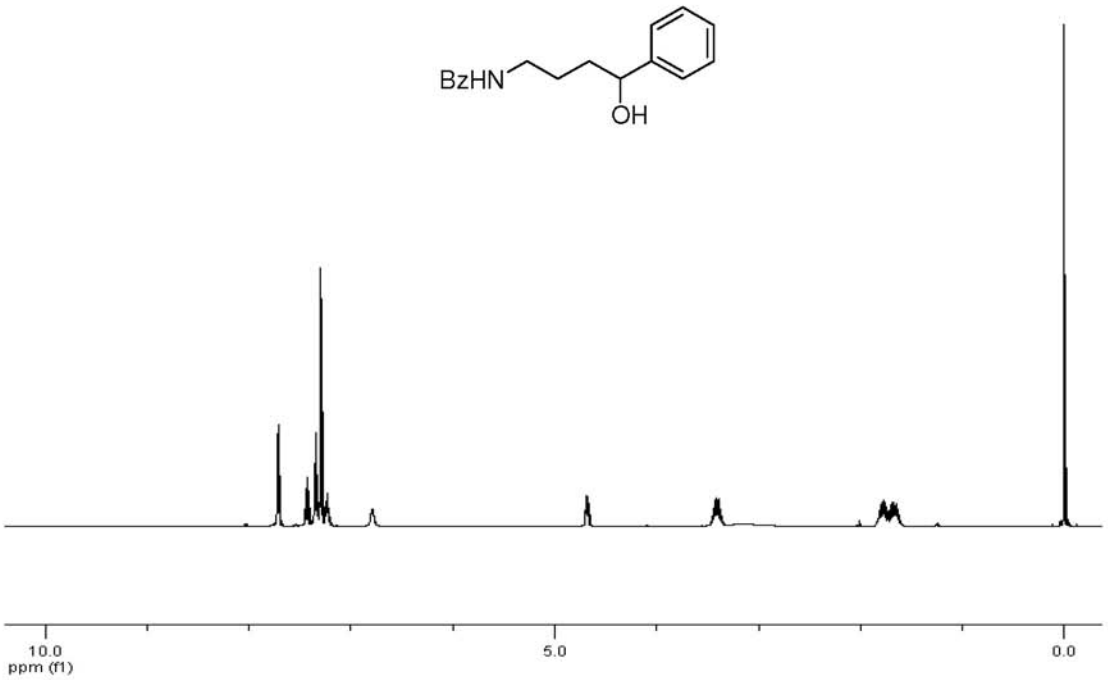


Figure S47. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2o**.

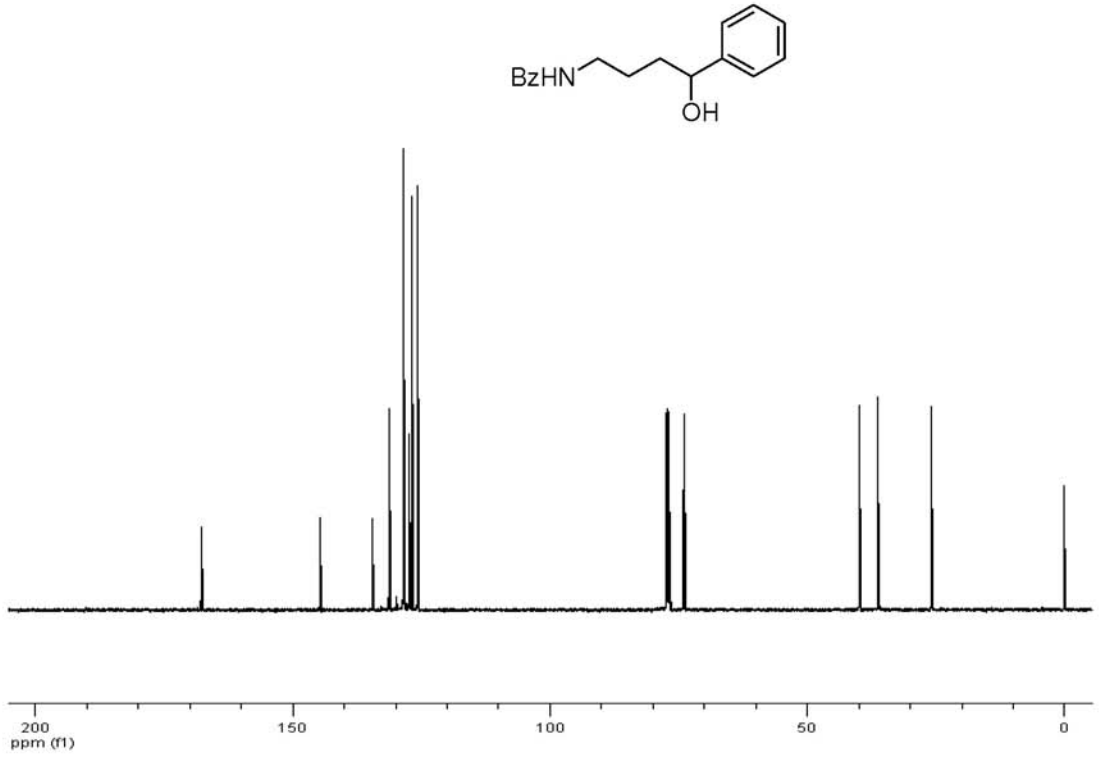


Figure S48. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2o**.

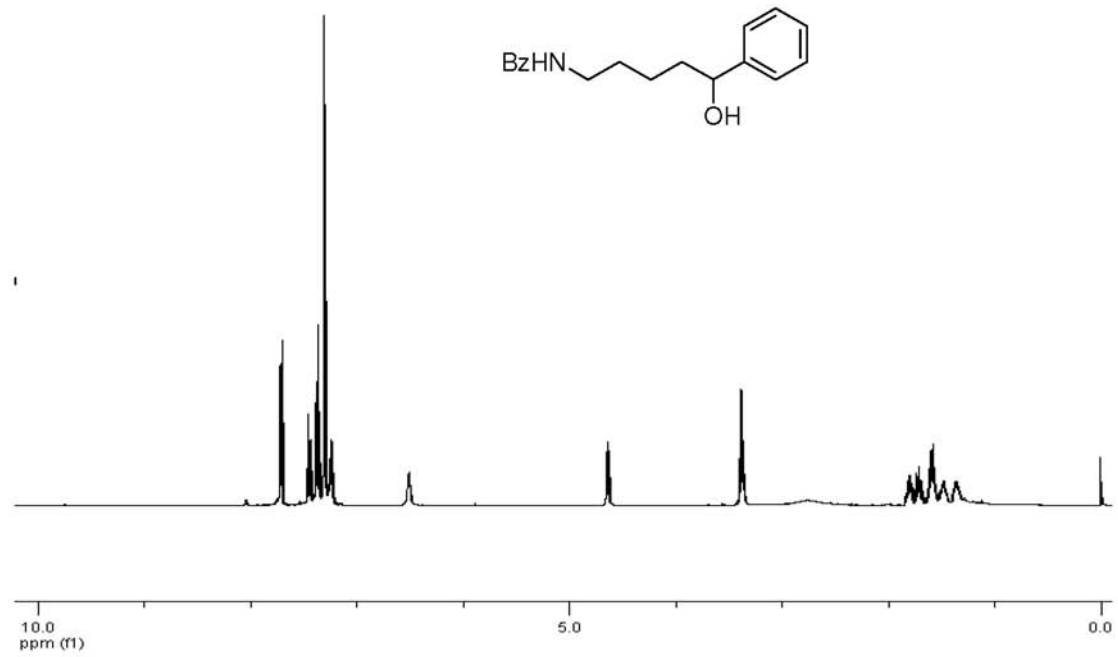


Figure S49. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2p**.

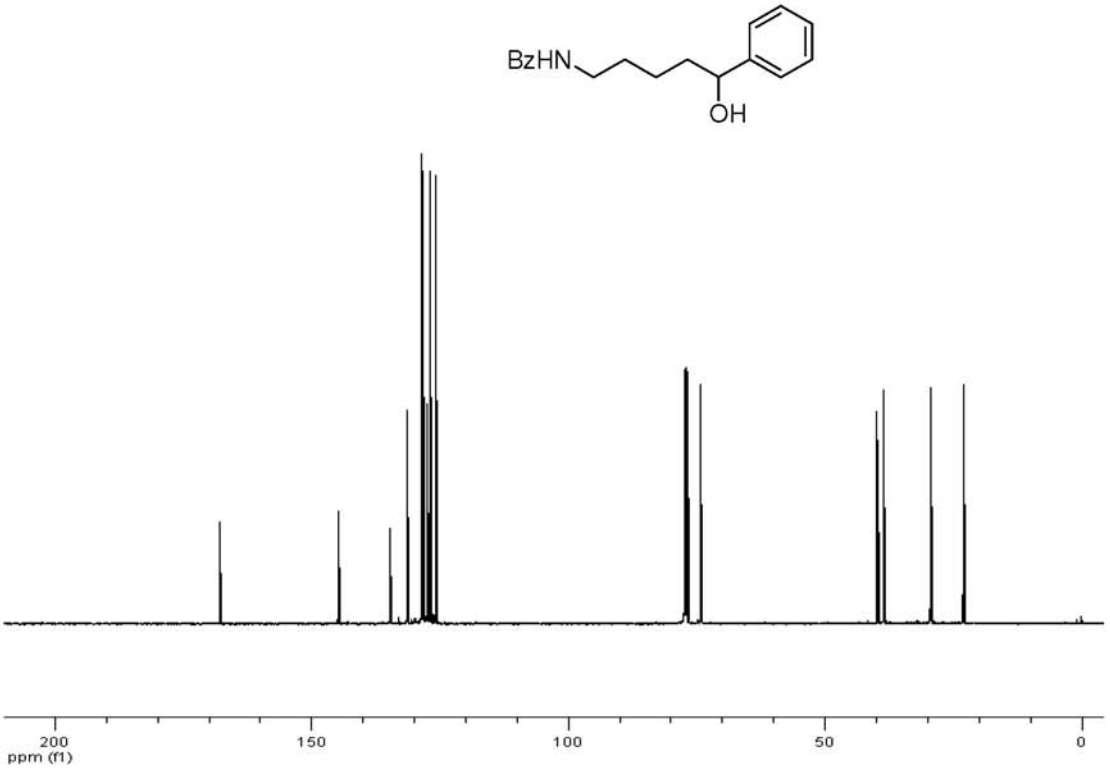


Figure S50. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2p**.

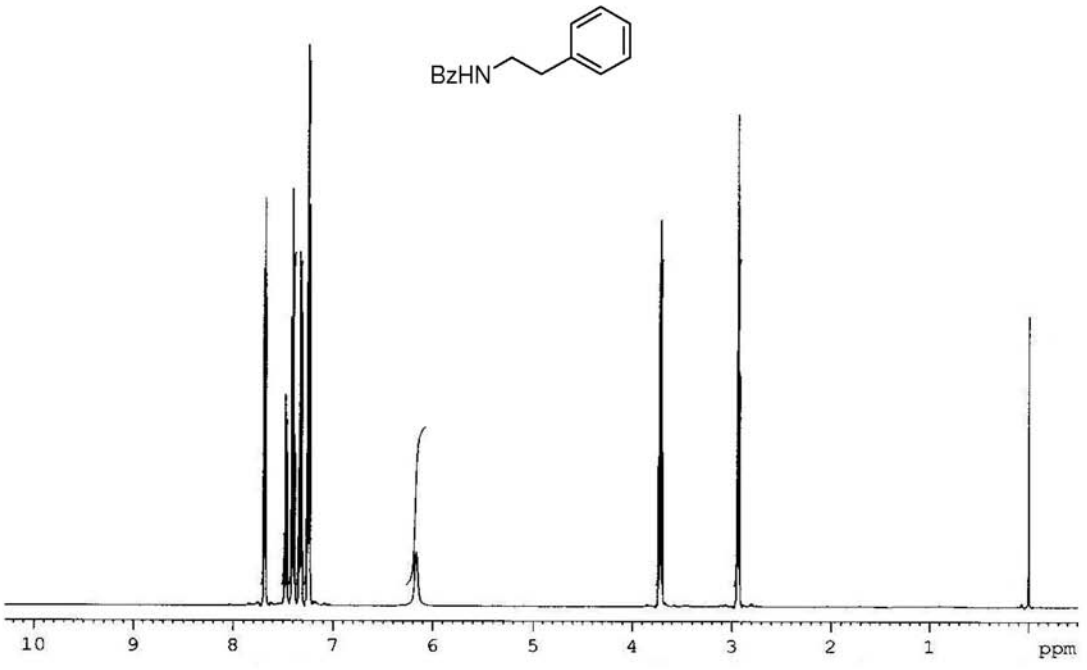


Figure S51. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **3a**.

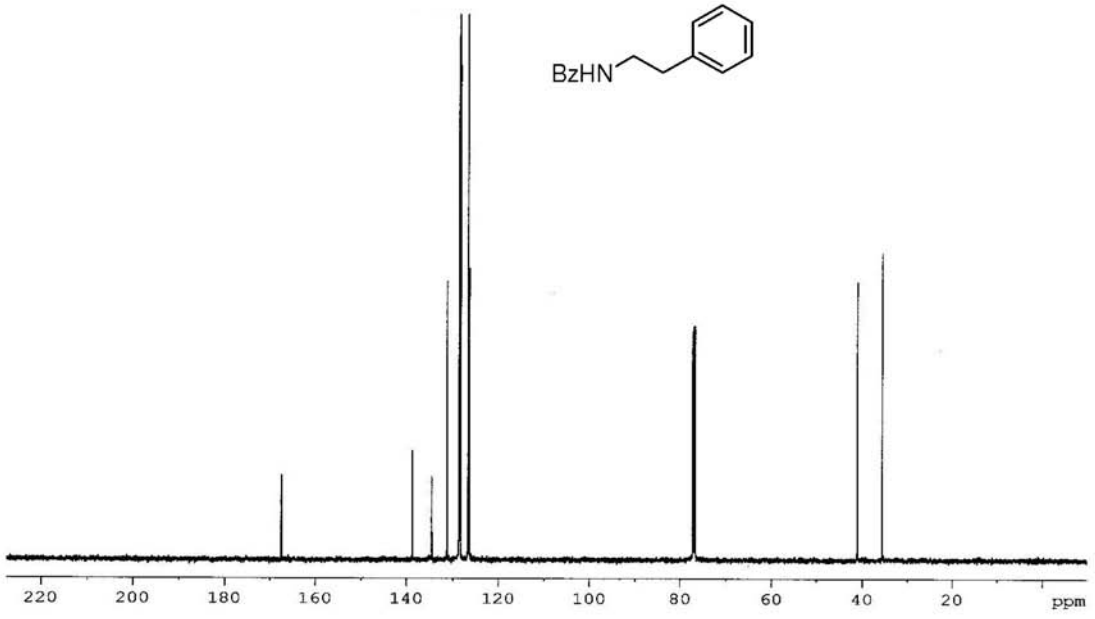


Figure S52. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **3a**.

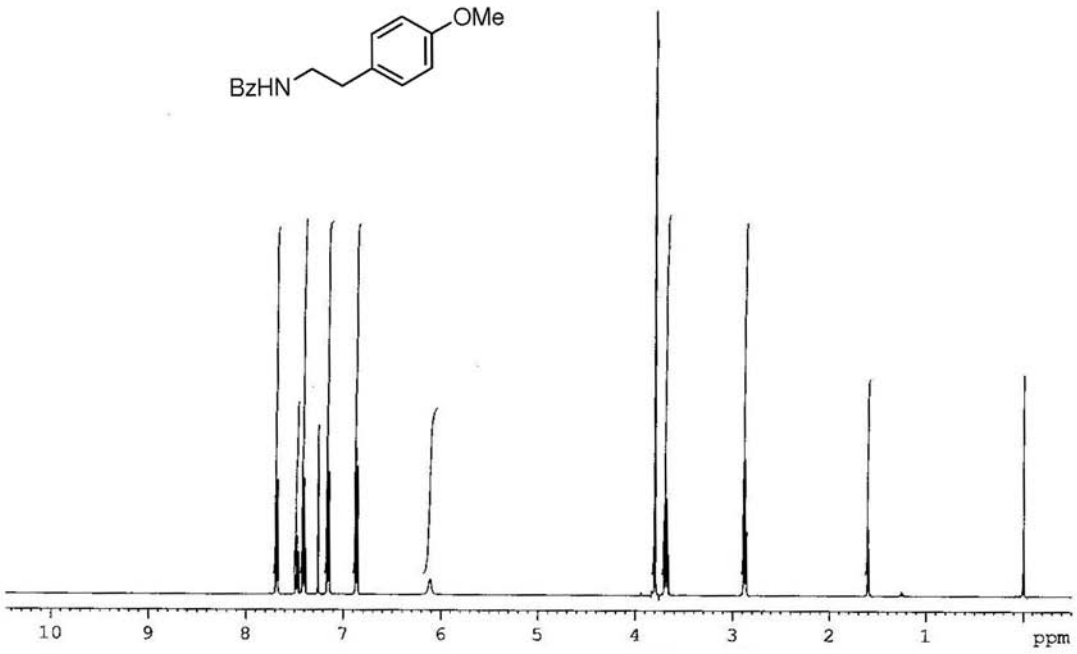


Figure S53. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **2b**.

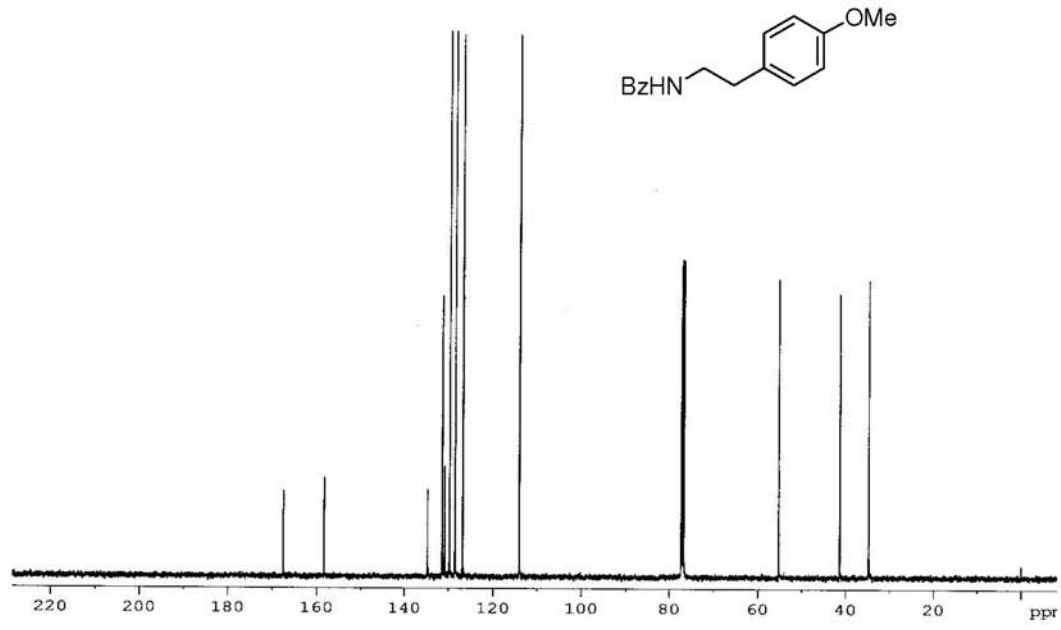


Figure S54. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **2b**.

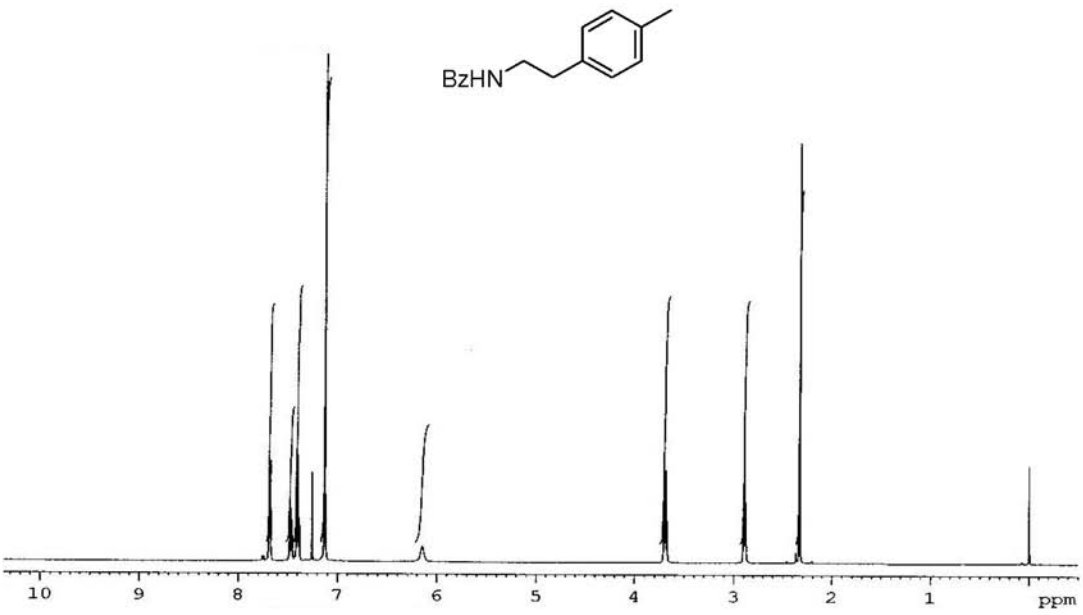


Figure S55. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **3c**.

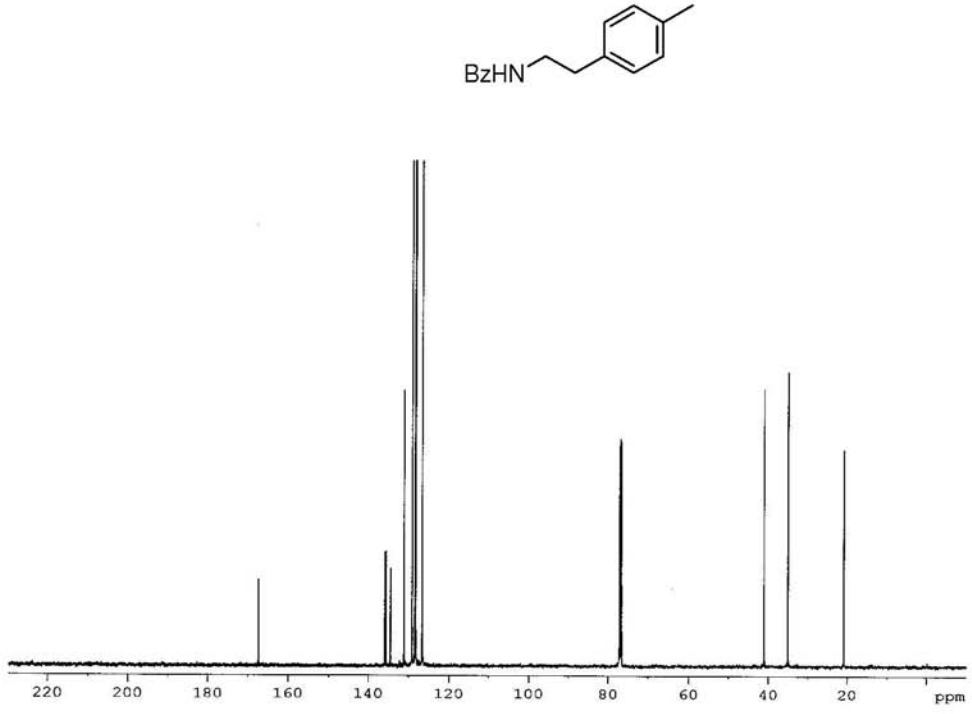


Figure S56. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **3c**.

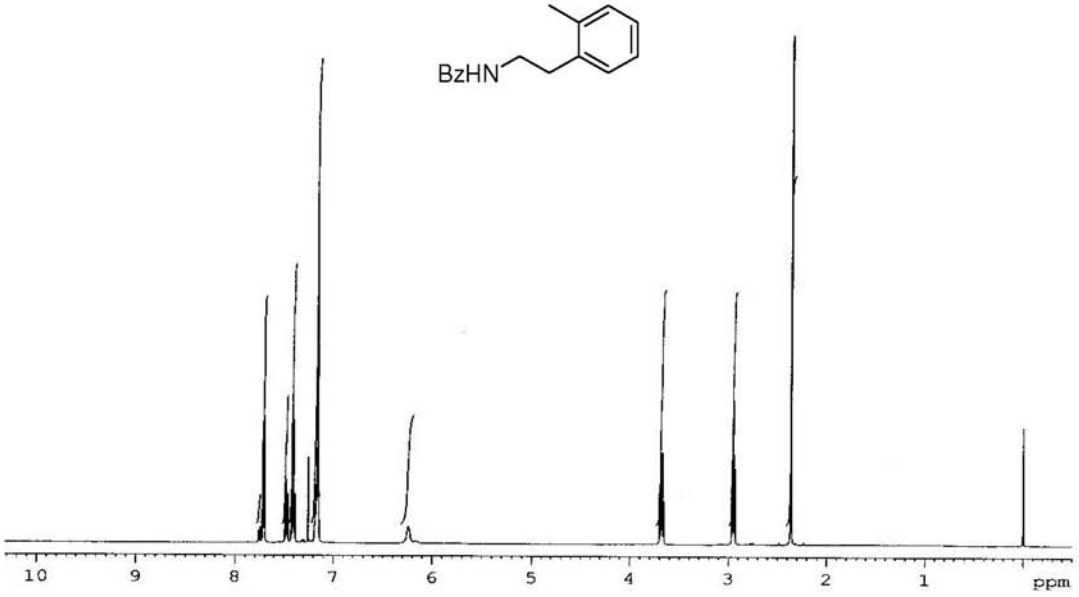


Figure S57. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **3d**.

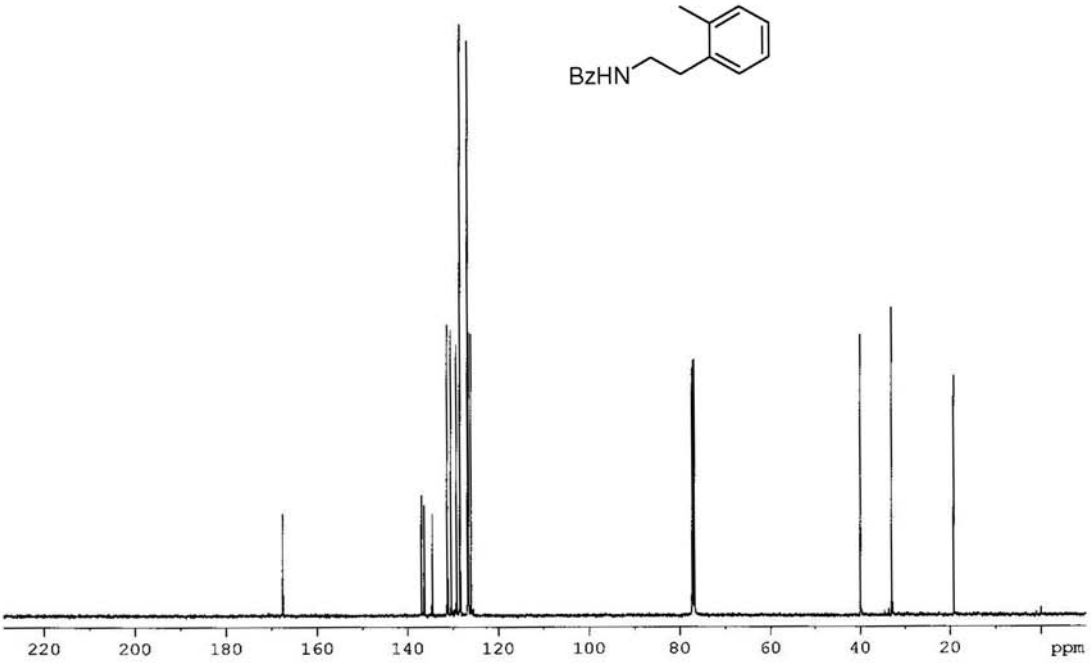


Figure S58. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **3d**.

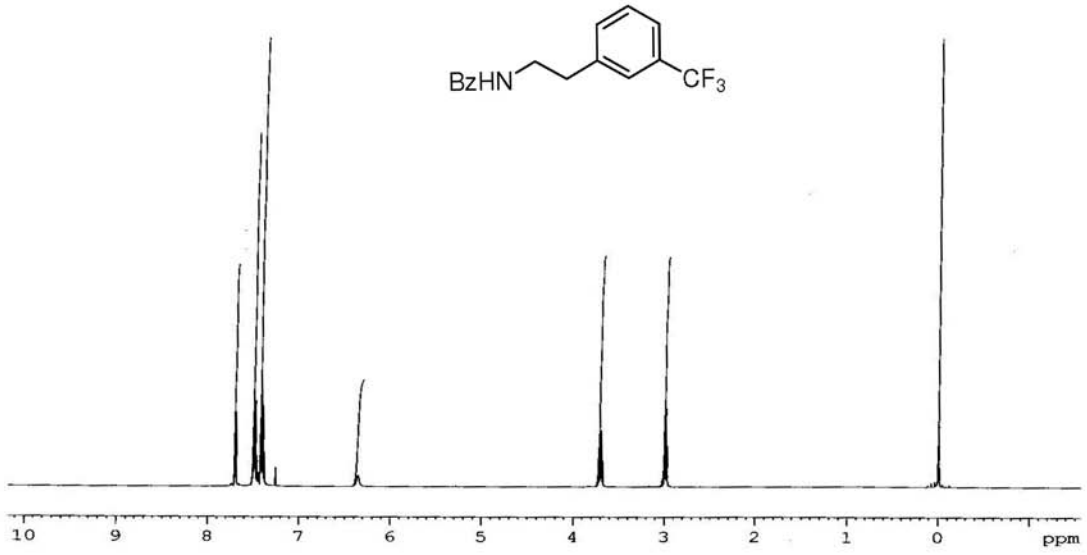


Figure S59. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **3e**.

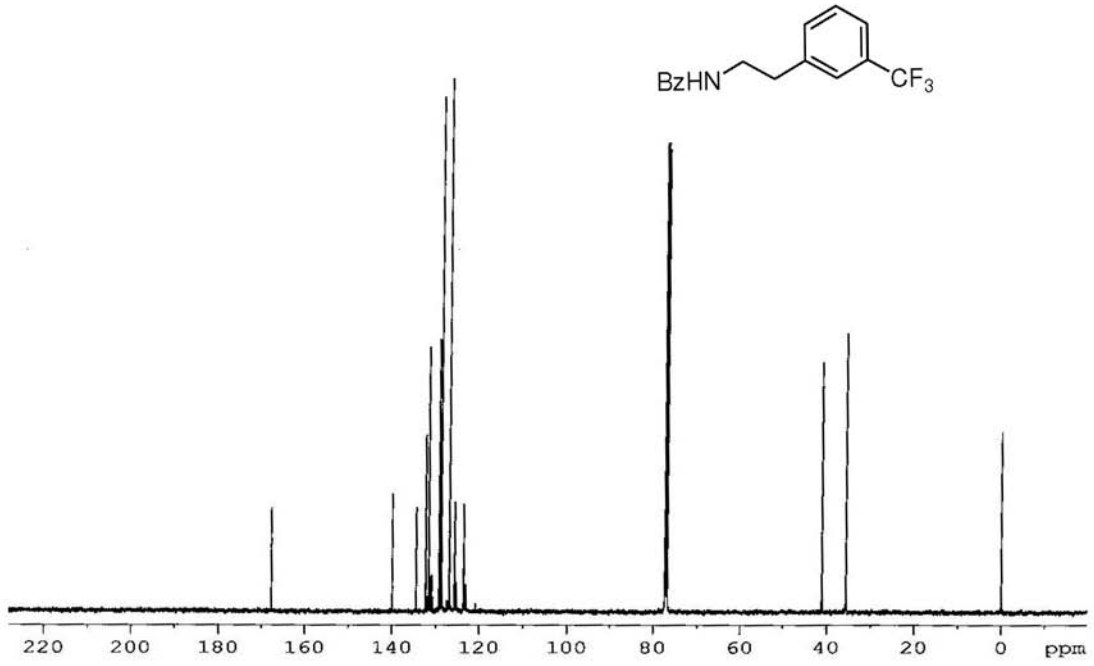


Figure S60. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **3e**.

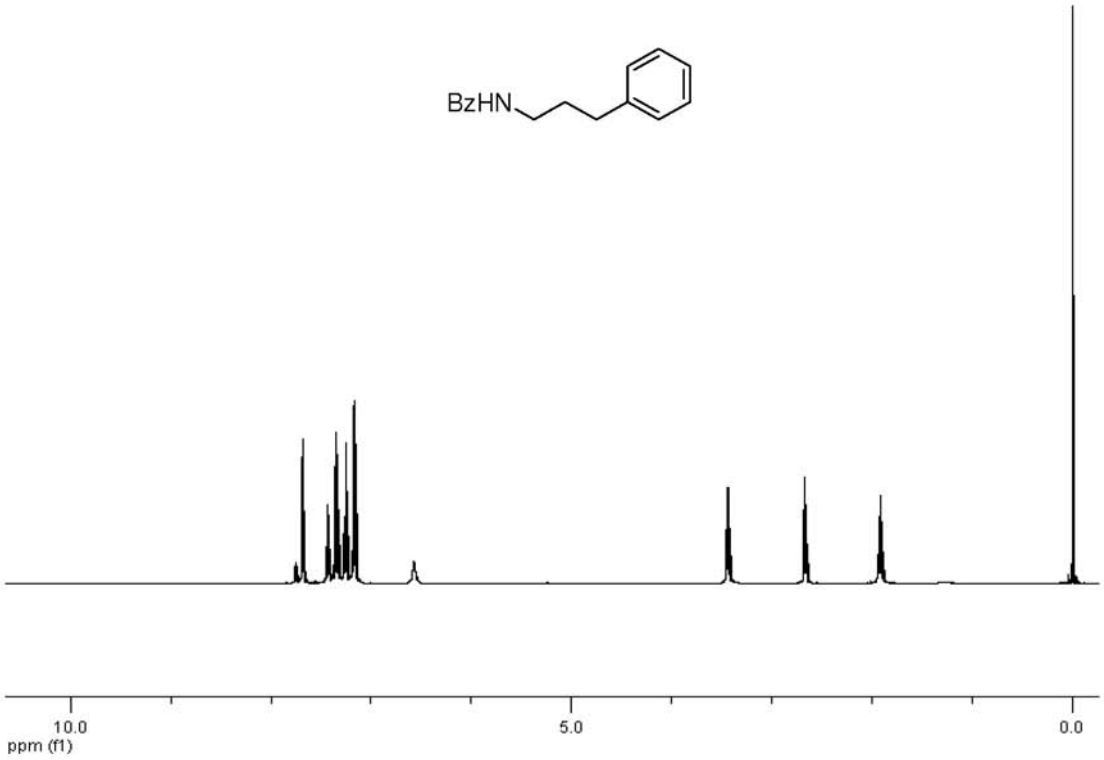


Figure S61. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **3f**.

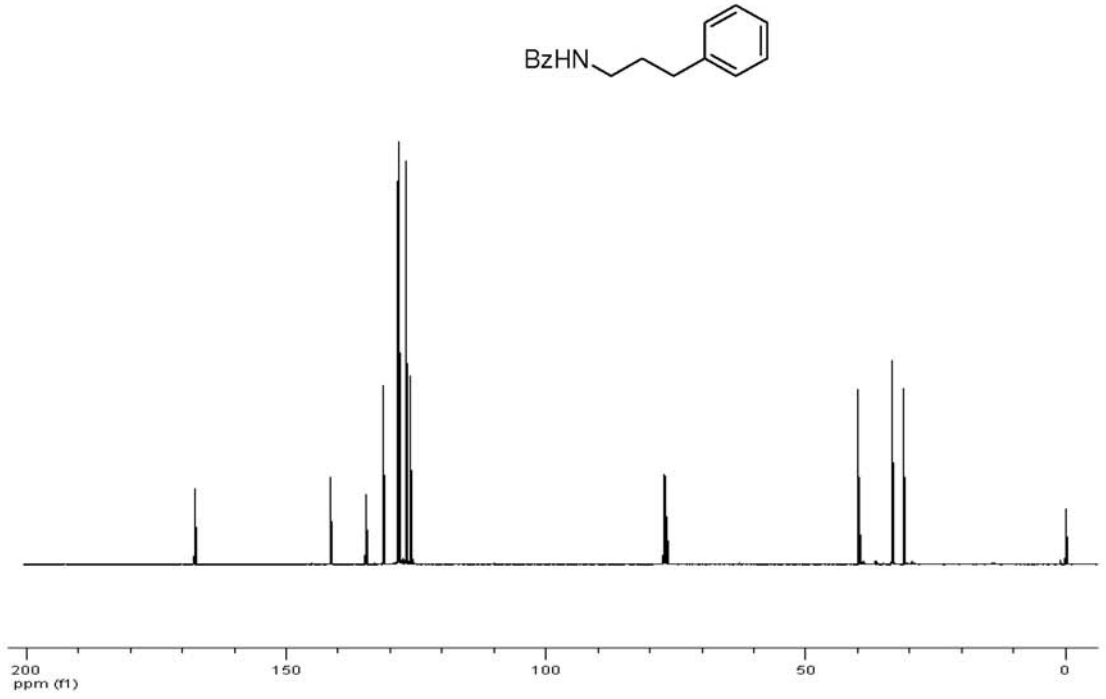


Figure S62. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **3f**.