Supporting Information

Self-Immolative Base Mediated Conjugate Release from Triazolylmethylcarbamates

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Materials and Methods

Chemicals were purchased from the Sigma-Aldrich Corporation or Acros Organics and were used without any further purification. Dichloromethane was stored over and distilled from CaH_2 and used immediately. THF was distilled from sodium and benzophenone and used immediately.

Melting points were recorded using a Stuart MP10 melting point apparatus and are uncorrected. Thin layer chromatography was carried out on aluminium-backed plates coated with Merck silica gel 60 F_{254}. Column chromatography was performed using Merck silica gel 60 (40 – 63 μm particle size) and a mobile phase as specified. IR spectra were recorded using a Perkin Elmer IRX FT-IR spectrometer as thin films between NaCl plates, or featuring an attenuated total reflectance (ATR) attachment and germanium crystal. NMR spectra were recorded on a Bruker DPX 250 spectrometer at 250 MHz (^{1}H) or 62.5 MHz (^{13}C) or on a Bruker AMX 400 spectrometer at 400 MHz (^{1}H) or 100 MHz (^{13}C). ^{1}H/^{13}C resonances corresponding to the triazole moiety have been distinguished (Ar', *c.f.* Ar) from other aromatic systems for clarity. Rotameric signals have been assigned as r_a (most abundant) and r_b. Mass spectrometric (MS) analysis was conducted on a Finnigan MAT95 instrument operating in chemical ionisation mode or on a ThermoFisher Scientific Orbitrap XL mass spectrometer operating in electrospray ionisation mode (ESI).

Degradation experimental procedure

An aliquot of triazole stock solution (0.5 mL, 0.0097 mmol) containing TMS (0.25 %) was transferred to an NMR tube and an ^{1}H NMR spectrum obtained for $t = 0$. An aliquot of NaOMe-d_3 solution (0.125 mL, 0.0427 mmol) was added using an auto-pipette, the NMR tube subjected to turbulent mixing for 5 seconds and analysed using ^{1}H NMR spectroscopy at regular time intervals. The reaction was continued until high conversion (typically > 90 %) had been reached. Stability experiments were conducted over a period of typically 8 – 12 weeks. Each NMR degradation experiment was conducted in triplicate. ^{1}H NMR spectra were processed with Mestrelabs Mnova suite 5.0 (or later versions) software. ^{1}H NMR spectra were calibrated to the TMS signal, which was set to δ_H 0.00 ppm. Reaction conversion and component concentrations were calculated by integration of sample resonances against TMS or a component resonance that was unchanged throughout the reaction. Standard deviation errors were calculated. The integral method of analysis was used to evaluate the kinetics of self-immolative elimination.

General method for the synthesis of propargyl *N*-methylbenzylcarbamates **5b**, **5d** – **j**, and characterisation data/spectra of propargyl *N*-methylbenzylcarbamates **5b**, **5d** – **j**.[1]

The corresponding propargyl alcohol (1 equiv.) and pyridine (2 equiv.) were sequentially added to *p*-nitrophenyl chloroformate (1 – 1.25 equiv.) dissolved in dichloromethane (10 – 50 mL) under argon. After stirring at room temperature for 12 – 20 hours *N*-methylbenzylamine (1 – 2 equiv.) was added. After stirring for a further 16 – 24 hours the reaction mixture was washed with water (200 mL) and saturated aqueous ammonium chloride (200 mL) or aqueous sodium carbonate (10 % w/v, 200 mL), dried ($MgSO_4$), filtered and concentrated *in vacuo*. Purification by column chromatography (EtOAc:hexane) afforded the desired propargyl benzylcarbamate.

1-Methylpropargyl *N*-methylbenzylcarbamate **5b**

Pale yellow oil (2.10 g, 62 %, R_f = 0.38 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.53 (3H, t, *J* = 7.6 Hz, CC**H$_3$**), 2.46 (1H, s, C≡C**H**), 2.84 (3H, s, r_a, NC**H$_3$**) + 2.88 (3H, s, r_b, NC**H$_3$**), 4.42 – 4.54 (2H, m, NC**H$_2$**), 5.46 (1H, q, *J* = 6.2 Hz, C**H**CH$_3$), 7.24 – 7.28 (3H, m, Ar**H**), 7.31 – 7.35 (2H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 21.63 (C**C**H$_3$), 33.53 (r_a, N**C**H$_3$) + 34.25 (r_b, N**C**H$_3$), 52.29 (r_b, N**C**H$_2$) + 52.60 (r_a, N**C**H$_2$), 61.25 (**C**HO), 72.62 (C≡**C**H), 82.97 (**C**≡CH), 127.45 (2 × Ar**C**H), 127.88 (Ar**C**H), 128.59 (2 × Ar**C**H), 137.25 (Ar**C**C), 155.24 (r_b, **C**=O) + 155.71 (r_a, **C**=O) ppm; FTIR (thin film) ν 3287, 3249, 3070, 3030, 2985, 2935, 2118, 1700, 1449, 1404, 1234, 1118, 1094, 1024 cm^{-1}; CIMS calculated for $(C_{13}H_{16}NO_2)^+$ 218.1176, found 218.1177 m/z.

1-Phenylpropargyl *N*-methylbenzylcarbamate **5d**

Pale yellow viscous oil (1.13 g, 69 %, R_f = 0.22 (1:9)). ^{1}H NMR (400 MHz, $CDCl_3$) ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.66 (1H, s, C≡C**H**), 2.85 (3H, s, r_b, NC**H$_3$**) + 2.89 (3H, s, r_a, NC**H$_3$**), 4.46 (2H, s, r_a, NC**H$_2$**) + 4.50 (2H, s, r_b, NC**H$_2$**), 6.48 (1H, s, r_a, C**H**O) + 6.49 (1H, s, r_b, C**H**O), 7.17 – 7.41 (8H, m, Ar**H**), 7.50 – 7.57 (2H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.64 (r_b, N**C**H$_3$) + 34.47 (r_a, N**C**H$_3$), 52.40 (r_a, N**C**H$_2$) + 52.79 (r_b, N**C**H$_2$), 66.57 (r_b, **C**HO) + 66.63 (r_a, **C**HO), 75.26 (r_b, C≡**C**H) + 75.34 (r_a, C≡**C**H), 80.90 (r_a, **C**≡CH) + 81.08 (r_b, **C**≡CH), 127.49 (2 × Ar**C**H), 127.55 (Ar**C**H), 127.91 (Ar**C**H), 128.62 (4 × Ar**C**H), 128.85 (2 × Ar**C**H), 137.05 (r_a, Ar**C**) + 137.26 (r_b, Ar**C**), 137.11 (Ar**C**), 155.12 (r_b, **C**=O) + 155.64 (r_a, **C**=O) ppm; FTIR (ATR, Ge) ν 3279, 3059, 3026, 2922, 2119, 1696, 1396, 1131, 696 cm^{-1}; ESIMS calculated for $(C_{18}H_{18}NO_2)^+$ 280.1332, found 280.1333 m/z.

1-(*p*-Bromophenyl)propargyl *N*-methylbenzylcarbamate **5e**

Yellow viscous oil (1.470 g, 50 %, R_f = 0.22 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.67 (1H, s, C≡C**H**), 2.85 (3H, s, r_a, NC**H$_3$**) + 2.91 (3H, s, r_b, NC**H$_3$**), 4.46 (2H, AB system, r_b, NC**H$_2$**) + 4.49 (2H, AB system, r_a, NC**H$_2$**), 6.43 (1H, s, r_b, C**H**O) + 6.43 (1H, s, r_a, C**H**O), 7.15 – 7.53 (9H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.61 (r_a, N**C**H$_3$) + 34.61 (r_b, N**C**H$_3$), 52.39 (r_b, N**C**H$_2$) + 52.80 (r_a, N**C**H$_2$), 65.90 (**C**HO), 75.59 (r_a, C≡**C**H) + 75.65 (r_b, C≡**C**H), 80.31 (r_b, **C**≡CH) + 80.48 (r_a, **C**≡CH), 122.98 (Ar**C**Br), 127.37 (Ar**C**H), 127.52 (Ar**C**H), 127.86 (Ar**C**H), 128.62 (2 × Ar**C**H), 129.19 (2 × Ar**C**H), 131.75 (r_b, 2 × Ar**C**H) + 131.79 (r_a, 2 × Ar**C**H), 136.11 (r_b, Ar**C**CH) + 136.30 (r_a, Ar**C**CH), 136.95 (Ar**C**CH$_2$), 154.90 (r_b, **C**=O) + 155.40 (r_a, **C**=O) ppm; FT-IR (thin film, KBr) ν 3291, 3063, 3029, 2927, 2123, 1705, 1487, 1454, 1402, 1231, 1136, 1012, 700 cm^{-1}; CIMS calculated for $(C_{18}H_{16}BrNO_2Na)^+$ 380.0257, found 380.0249 m/z.

1-(*p*-Fluorophenyl)propargyl *N*-methylbenzylcarbamate **5f**

Pale yellow viscous oil (2.030 g, 67 %, R_f = 0.20 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.67 (1H, s, C≡C**H**), 2.85 (3H, s, r_a, NC**H$_3$**) + 2.90 (3H, s, r_b, NC**H$_3$**), 4.46 (2H, s, r_a, NC**H$_2$**) + 4.49 (2H, AB system, r_b, CN**H$_2$**), 6.45 (1H, s, r_b, C**H**O) + 6.46 (1H, s, r_a, C**H**O), 7.00 – 7.10 (2H, AA'XX' system, Ar**H**), 7.15 – 7.16 (1H, m, Ar**H**),

7.23 – 7.33 (4H, m, Ar**H**), 7.46 – 7.57 (2H, AA'XX' system, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.61 (r_a, N**C**H_3) + 34.54 (r_b, N**C**H_3), 52.38 (r_b, N**C**H_2) + 52.78 (r_a, N**C**H_2), 65.90 (C≡**C**H), 75.44 (r_a, **C**HO) + 75.51 (r_b, **C**HO), 80.62 (r_b, **C**≡CH) + 80.80 (r_a, **C**≡CH), 115.52 (d, J = 21.5 Hz, 2 × Ar**C**H), 127.42 (r_a, 2 × Ar**C**H) + 127.50 (r_b, 2 × Ar**C**H), 127.87 (Ar**C**H), 128.61 (2 × Ar**C**H), 129.48 (d, J = 8.4 Hz, 2 × Ar**C**H), 133.01 (r_b, Ar**C**CHO) + 133.18 (r_a, Ar**C**CHO), 137.01 (Ar**C**CH_2), 154.99 (r_b, **C**=O) + 155.49 (r_a, **C**=O), 162.93 (d, J = 246.4 Hz, Ar**C**F) ppm; FTIR (ATR, Ge) ν 3285, 3240, 3028, 2921, 2118, 1696, 1604, 1507, 1397, 1221, 1130, 1039, 833, 700 cm^{-1}; ESIMS calculated for $(C_{18}H_{16}FNO_2Na)^+$ 320.1057, found 320.1053 m/z.

1-(*m*-Fluorophenyl)propargyl *N*-methylbenzylcarbamate **5g**

Pale yellow viscous oil (1.820 g, 66 %, R_f = 0.20 (1:10)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.68 (1H, s, C≡C**H**), 2.87 (3H, s, r_a, NC**H$_3$**) + 2.92 (3H, s, r_b, NC**H$_3$**), 4.48 (2H, s, r_a, NC**H$_2$**) + 4.51 (2H, AB system, r_b, NC**H$_2$**), 6.46 (1H, s, r_b, C**H**O) + 6.47 (1H, s, r_a, C**H**O), 7.02 – 7.07 (1H, m, Ar**H**), 7.17 – 7.19 (1H, m, Ar**H**), 7.22 – 7.39 (7H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.63 (r_a, N**C**H_3) + 34.62 (r_b, N**C**H_3), 52.42 (r_b, N**C**H_2) + 52.83 (r_a, N**C**H_2), 65.81 (C≡**C**H), 75.57 (r_a, **C**HO) + 75.65 (r_b, **C**HO), 80.27 (r_b, **C**≡CH) + 80.46 (r_a, **C**≡CH), 114.33 (d, J = 22.0 Hz, r_b, Ar**C**H) + 114.55 (d, J = 22.0 Hz, r_a, Ar**C**H) , 115.78 (d, J = 21.0 Hz, Ar**C**H), 123.04 (Ar**C**H), 127.42 (r_b, Ar**C**H) + 127.88 (r_a, Ar**C**H), 127.54 (2 × Ar**C**H), 128.64 (2 × Ar**C**H), 130.14 (d, J = 8.5 Hz, r_a, Ar**C**H) + 130.22 (d, J = 8.5 Hz, r_b, Ar**C**H), 136.96 (Ar**C**CH_2), 139.41 (d, J = 21.0 Hz, r_a, Ar**C**CH) + 139.62 (d, J = 21.0 Hz, r_b, Ar**C**CH) 154.90 (r_b, **C**=O) + 155.40 (r_a, **C**=O), 162.77 (d, J = 242.4 Hz, Ar**C**F) ppm; FTIR (ATR, Ge) ν 3299, 3059, 3028, 2930, 2118, 1696, 1398, 1224, 1135, 907, 730 cm^{-1}; ESIMS calculated for $(C_{18}H_{16}FNO_2Na)^+$ 320.1057, found 320.1058 m/z.

1-(*p*-Methylphenyl)propargyl *N*-methylbenzylcarbamate **5h**

Pale yellow oil (1.63 g, 58 %, R_f = 0.50 (1:8)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.35 (3H, s, ArC**H$_3$**), 2.64 (1H, s, C≡C**H**), 2.84 (3H, s, r_a, NC**H$_3$**) + 2.88 (3H, s, r_b, NC**H$_3$**), 4.45 (2H, AB system, r_b, NC**H$_2$**) + 4.49 (2H, AB system, r_a, NC**H$_2$**), 6.44 (1H, s, r_b, OC**H**) + 6.46 (1H, s, r_a, OC**H**), 7.16 – 7.34 (7H, m, Ar**H**), 7.43 (2H, AA'XX' system, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 21.21 (Ar**C**H_3), 33.59 (r_a, N**C**H_3) + 34.36 (r_b, N**C**H_3), 52.34 (r_b, N**C**H_2) + 52.73 (r_a, N**C**H_2), 66.44 (r_a, **C**HO) + 66.52 (r_b, **C**HO), 75.03 (r_a, C≡**C**H) + 75.09 (r_b, C≡**C**H), 81.05 (r_b, **C**≡CH) + 81.22 (r_a, **C**≡CH), 127.46 (3 × Ar**C**H), 127.55 (Ar**C**H), 127.88 (Ar**C**H), 128.57 (2 × Ar**C**H), 129.21 (2 × Ar**C**H), 134.16 (r_b, Ar**C**CH) + 134.35 (r_a, Ar**C**CH), 137.11 (Ar**C**CH_2), 138.75 (Ar**C**CH_3), 155.15 (r_b, **C**=O) + 155.66 (r_a, **C**=O) ppm; FT-IR (thin film, KBr) ν 3286, 3058, 3028, 2923, 2117, 1699, 1451, 1398, 1231, 1137, 1043 cm^{-1}; CIMS calculated for $(C_{19}H_{19}NO_2Na)^+$ 316.1308, found 316.1309 m/z.

1-(2-Naphthyl)propargyl *N*-methylbenzylcarbamate **5i**

Pale brown amorphous solid (1.49 g, 55 %, R_f = 0.49 (1:2)). m.p. 63 – 66 °C (EtOAc); ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.72 (1H, s, C≡C**H**), 2.86 (3H, s, r_a, NC**H$_3$**) + 2.91 (3H, s, r_b, NC**H$_3$**), 4.44 – 4.55 (2H, m, NC**H$_2$**), 6.65 (1H, d, J = 2.2 Hz, C**H**O), 7.13 – 7.33 (5H, m, Ar**H**), 7.48 – 7.51 (2H, m, Ar**H**), 7.65 – 7.67 (1H, m, Ar**H**), 7.82 – 7.88 (3H, m, Ar**H**), 7.97 – 8.03 (1H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.64 (r_a, N**C**H_3) + 34.52 (r_b, N**C**H_3), 52.40 (r_b, N**C**H_2) + 52.72 (r_a, N**C**H_2), 66.75 (**C**HO), 75.59 (C≡**C**H), 80.84 (r_b, **C**≡CH) + 81.00 (r_a, **C**≡CH), 124.93 (Ar**C**H), 126.37 (2 × Ar**C**H), 126.59 (Ar**C**H), 126.84 (Ar**C**H), 127.47 (2 × Ar**C**H), 127.67 (Ar**C**H), 127.87 (Ar**C**H), 128.30 (2 × Ar**C**H), 128.58 (2 × Ar**C**H), 133.07 (Ar**C**CAr), 133.40 (ArC**C**Ar), 134.34 (r_b, Ar**C**CH) + 134.50 (r_a, Ar**C**CH), 137.07 (Ar**C**CH_2), 155.11 (r_b, **C**=O) + 155.62 (r_a, **C**=O) ppm; FT-IR (thin film, KBr) ν 3286, 3238, 3058, 3028, 2926, 2121, 1703, 1453, 1402, 1229, 1134, 1044 cm^{-1}; ESIMS calculated for $(C_{22}H_{19}NO_2Na)^+$ 352.1308, found 352.1304 m/z.

1-(Biphenyl-*p*-yl)propargyl N-methylbenzylcarbamate **5j**

Pale yellow viscous oil (1.55 g, 53 %, R_f = 0.14 (1:10)). ^{1}H NMR (400 MHz, Acetone-d_6) δ_H 2.90 (3H, s, NC**H$_3$**), 3.34 (1H, d, J = 2.3 Hz, C≡C**H**), 4.54 (2H, s, r_a, NC**H$_2$**) + 4.54 (2H, s, r_b, NC**H$_2$**), 6.58 (1H, d, J = 2.3 Hz, C**H**O),

7.27 – 7.36 (5H, m, Ar**H**), 7.40 (1H, tt, J = 7.4 Hz, J' = 1.2 Hz, Ar**H**), 7.47 – 7.51 (2H, m, Ar**H**), 7.64 – 7.75 (6H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, Acetone-d_6) δ_C 33.97 (r_b, N**C**H$_3$) + 34.65 (r_a, N**C**H$_3$), 52.70 (r_b, N**C**H$_2$) + 53.10 (r_a, N**C**H$_2$), 66.77 (r_a, **C**HO) + 66.81 (r_b, **C**HO), 77.23 (C≡**C**H), 81.84 (r_b, **C**≡CH) + 81.95 (r_a, **C**≡CH), 127.84 (2 × Ar**C**H), 128.02 (2 × Ar**C**H), 128.23 (Ar**C**H), 128.52 (3 × Ar**C**H), 128.82 (2 × Ar**C**H), 129.41 (2 × Ar**C**H), 129.82 (2 × Ar**C**H), 137.67 (r_a, Ar**C**CH) + 137.81 (r_b, Ar**C**CH), 138.57 (Ar**C**CH$_2$), 141.20 (ArC**C**Ar), 142.38 (Ar**C**CAr), 155.41 (r_a, **C**=O) + 156.06 (r_b, **C**=O) ppm; FT-IR (thin film, KBr) ν 3286, 3058, 3030, 2925, 2122, 1698, 1485, 1400, 1136, 1008 cm^{-1}; ESIMS calculated for $(C_{24}H_{21}NO_2Na)^+$ 378.1465, found 378.1464 m/z.

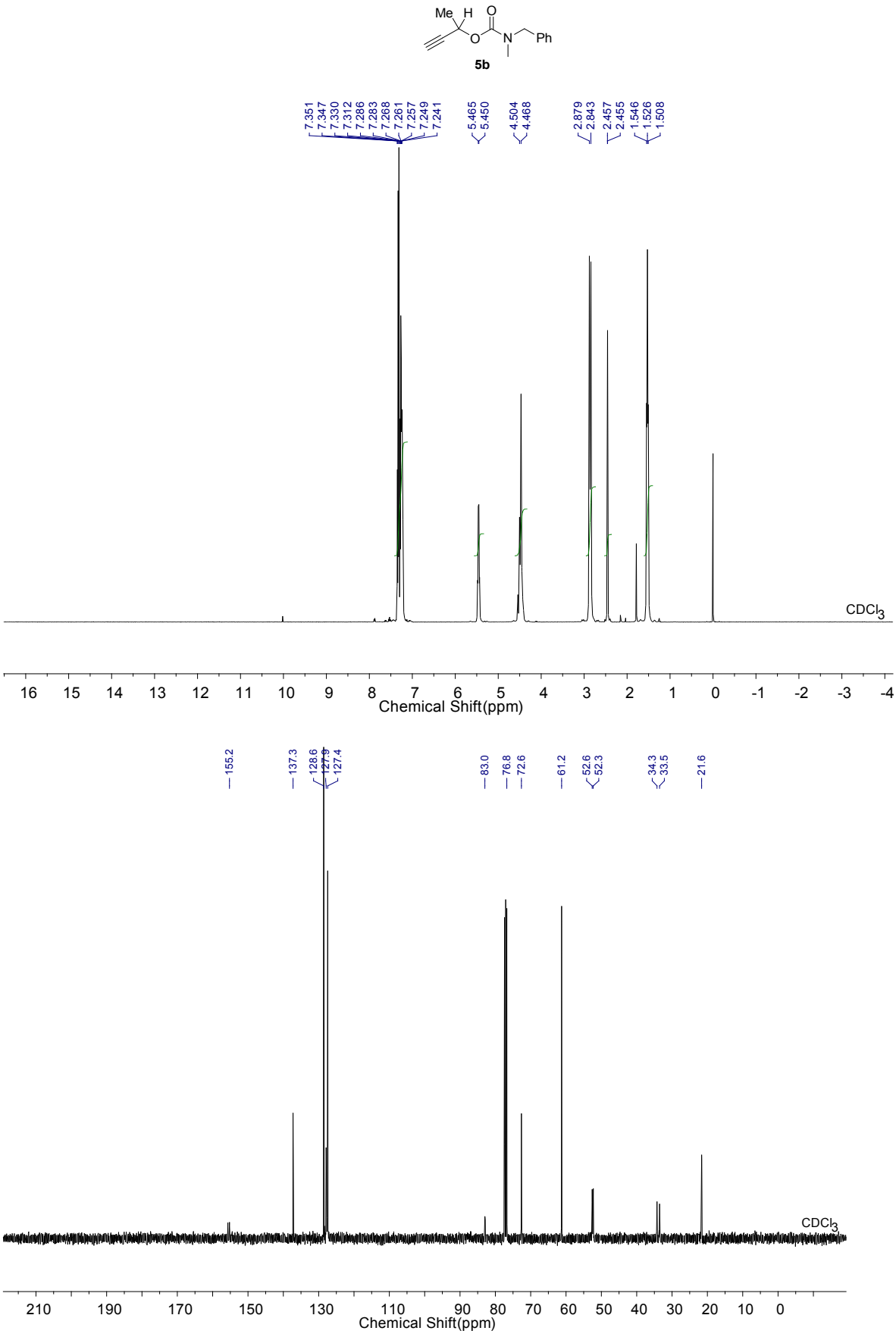

Figure S1 ^{1}H and ^{13}C NMR spectra for **5b**

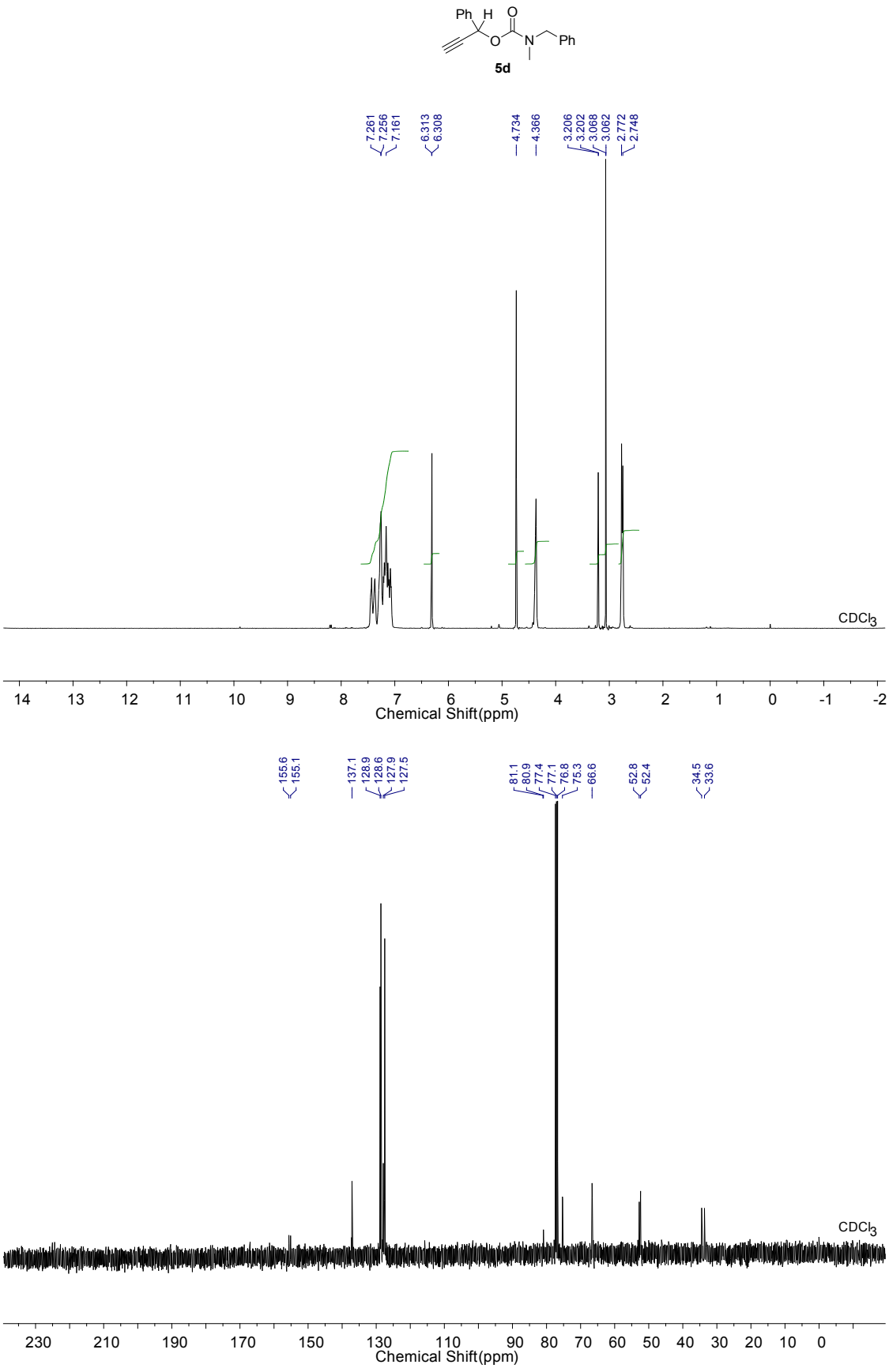

Figure S2 ^{1}H and ^{13}C NMR spectra for **5d**

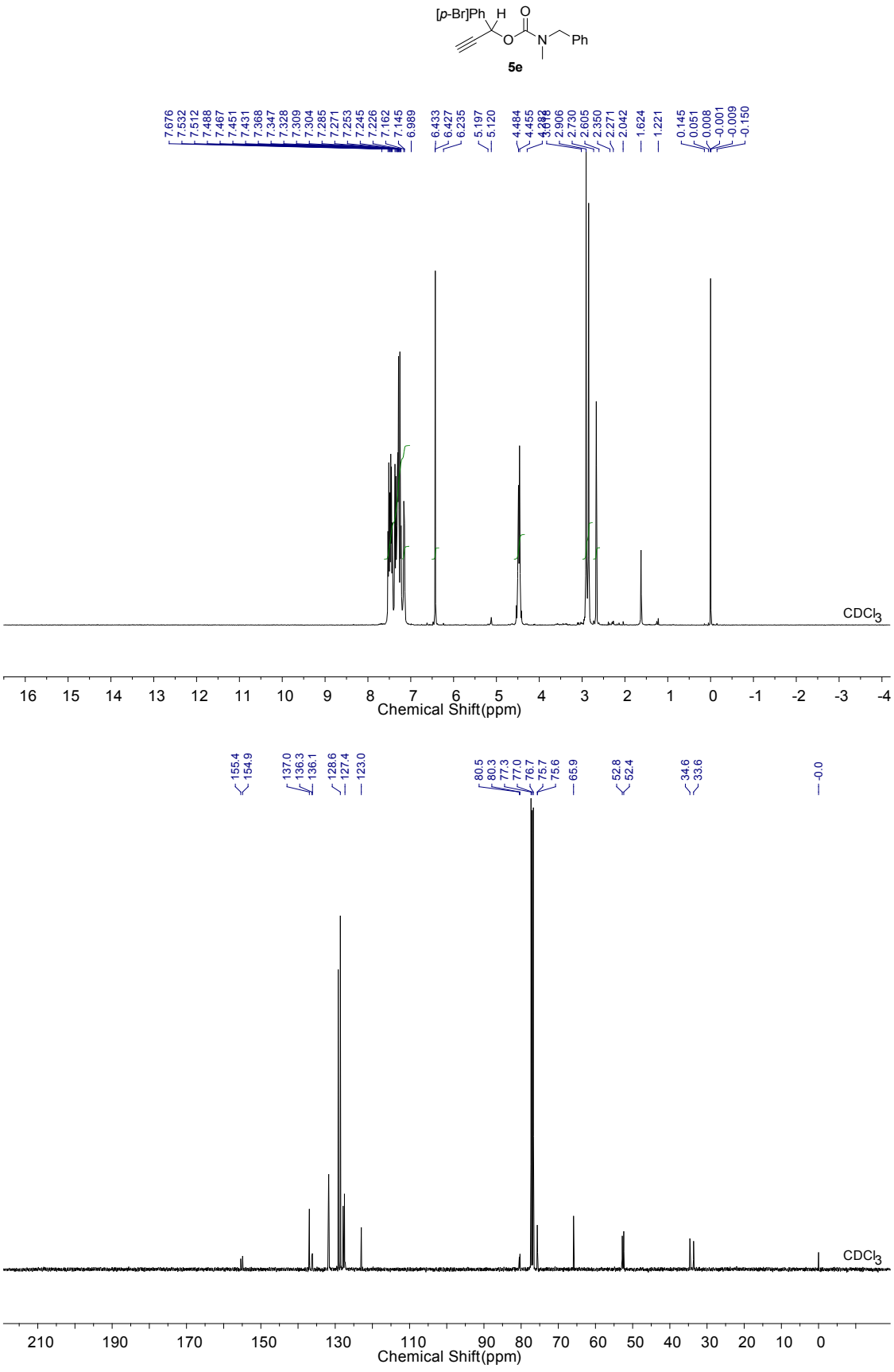

Figure S3 ^{1}H and ^{13}C NMR spectra for **5e**

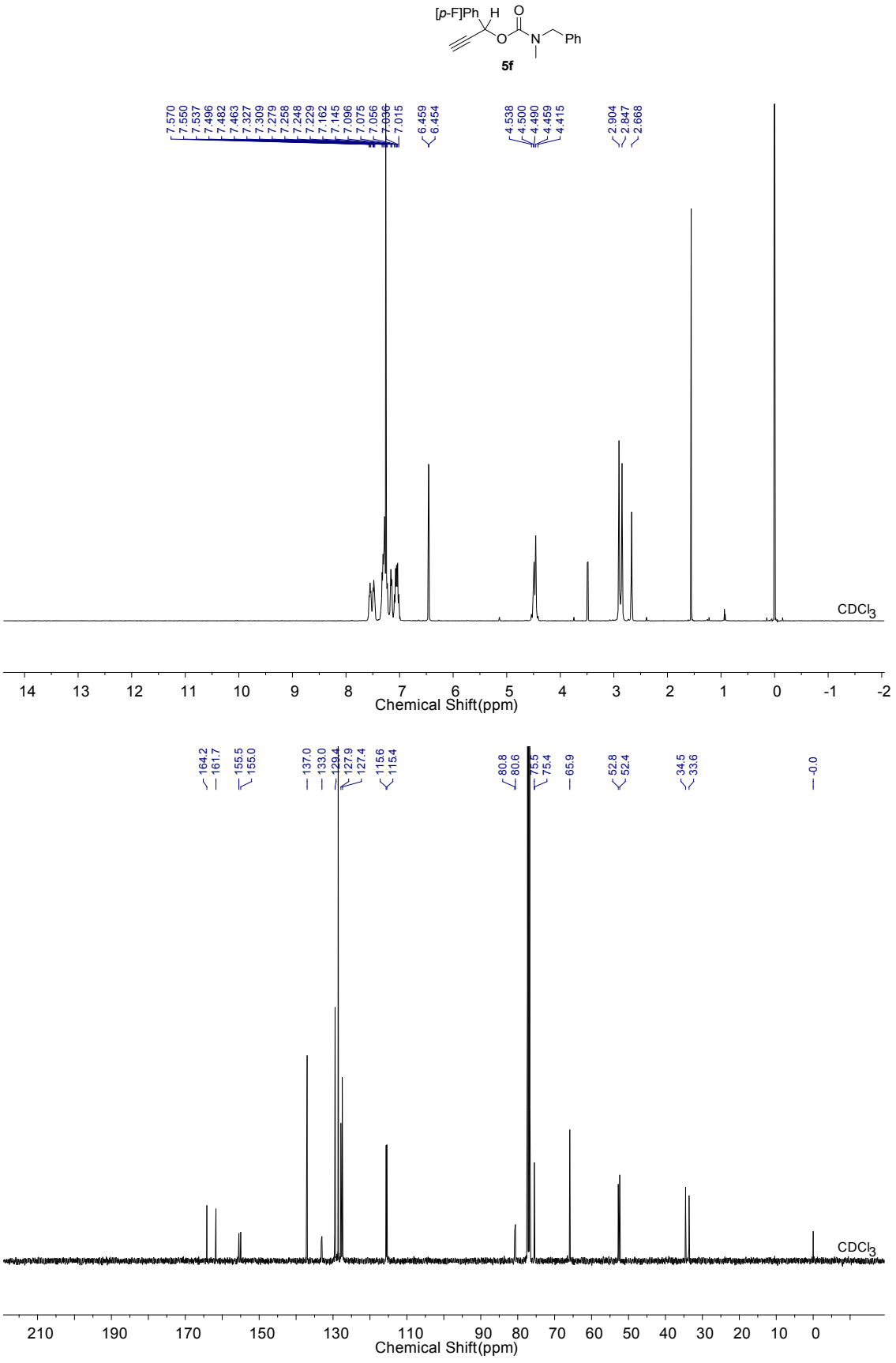

Figure S4 ^{1}H and ^{13}C NMR spectra for **5f**

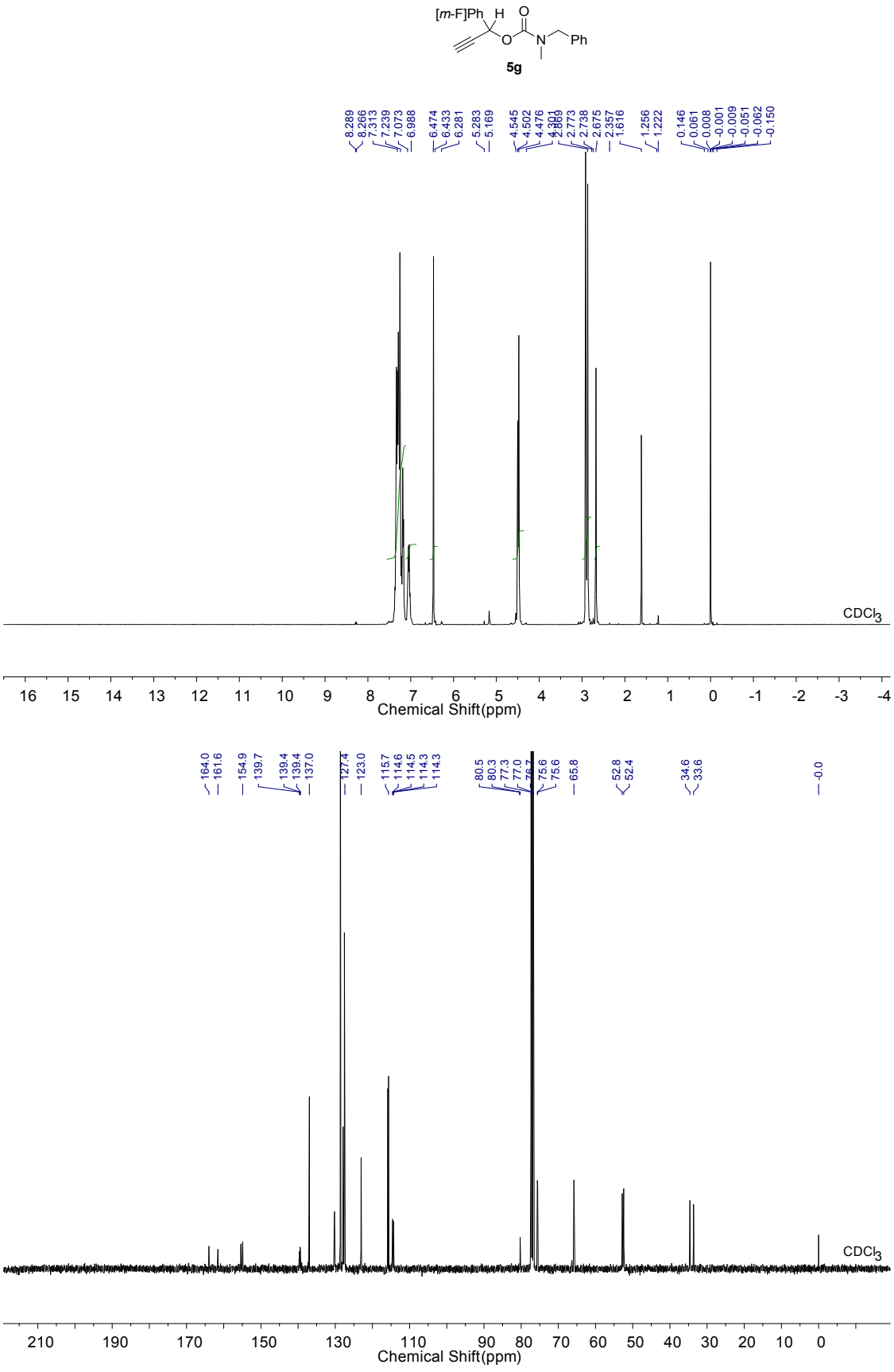

Figure S5 ^{1}H and ^{13}C NMR spectra for **5g**

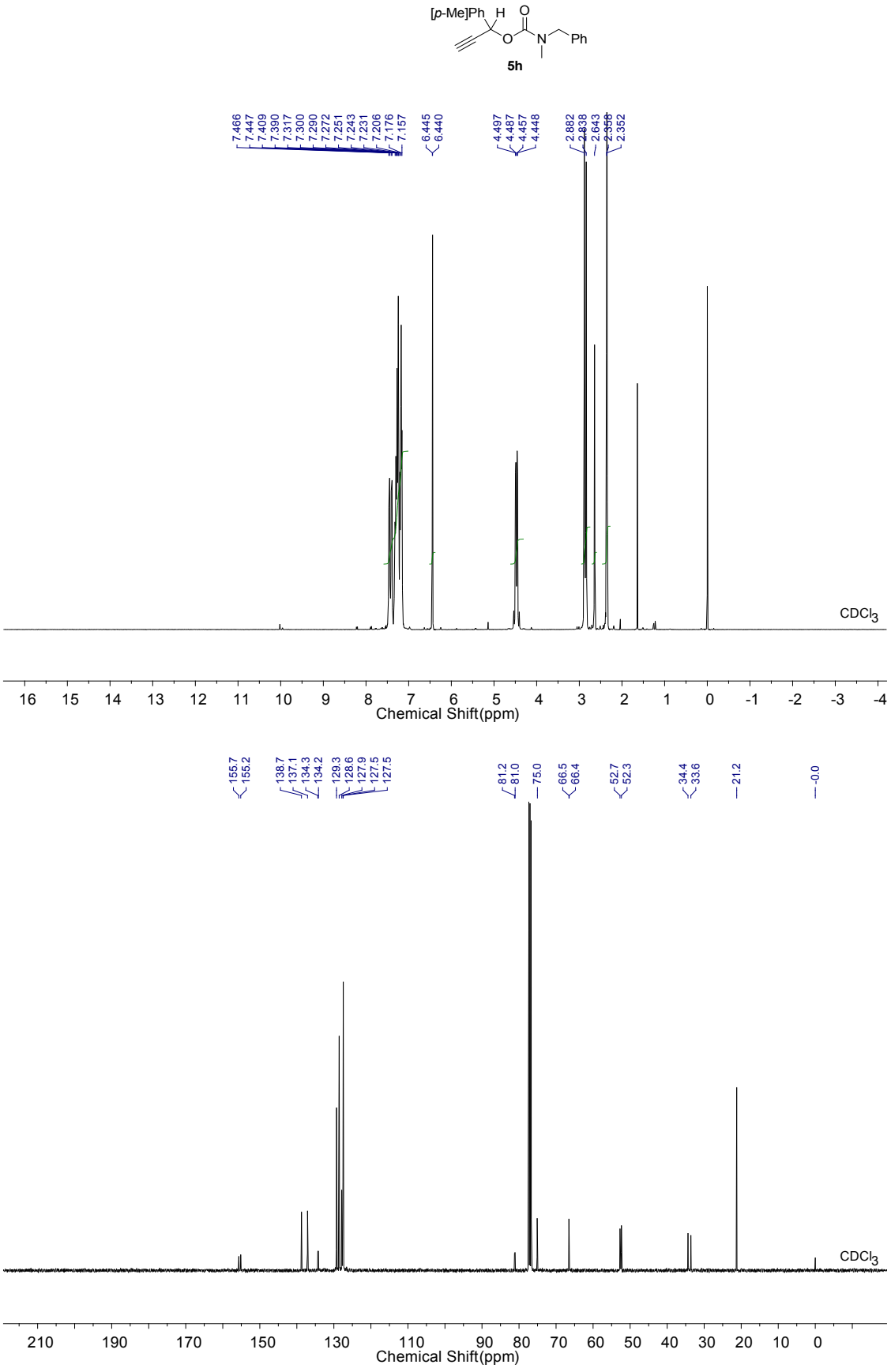

Figure S6 ^{1}H and ^{13}C NMR spectra for **5h**

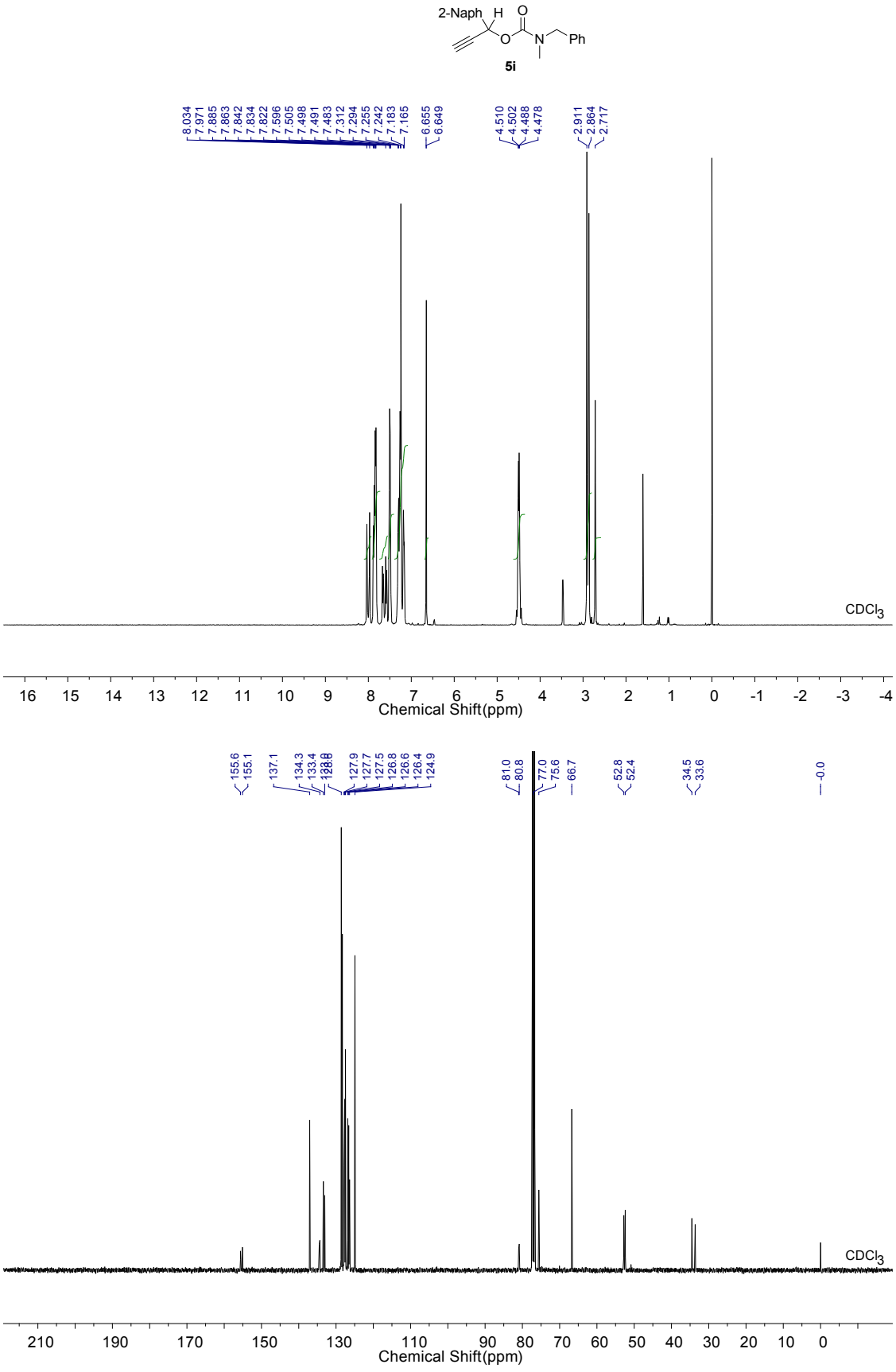

Figure S7 ^{1}H and ^{13}C NMR spectra for **5i**

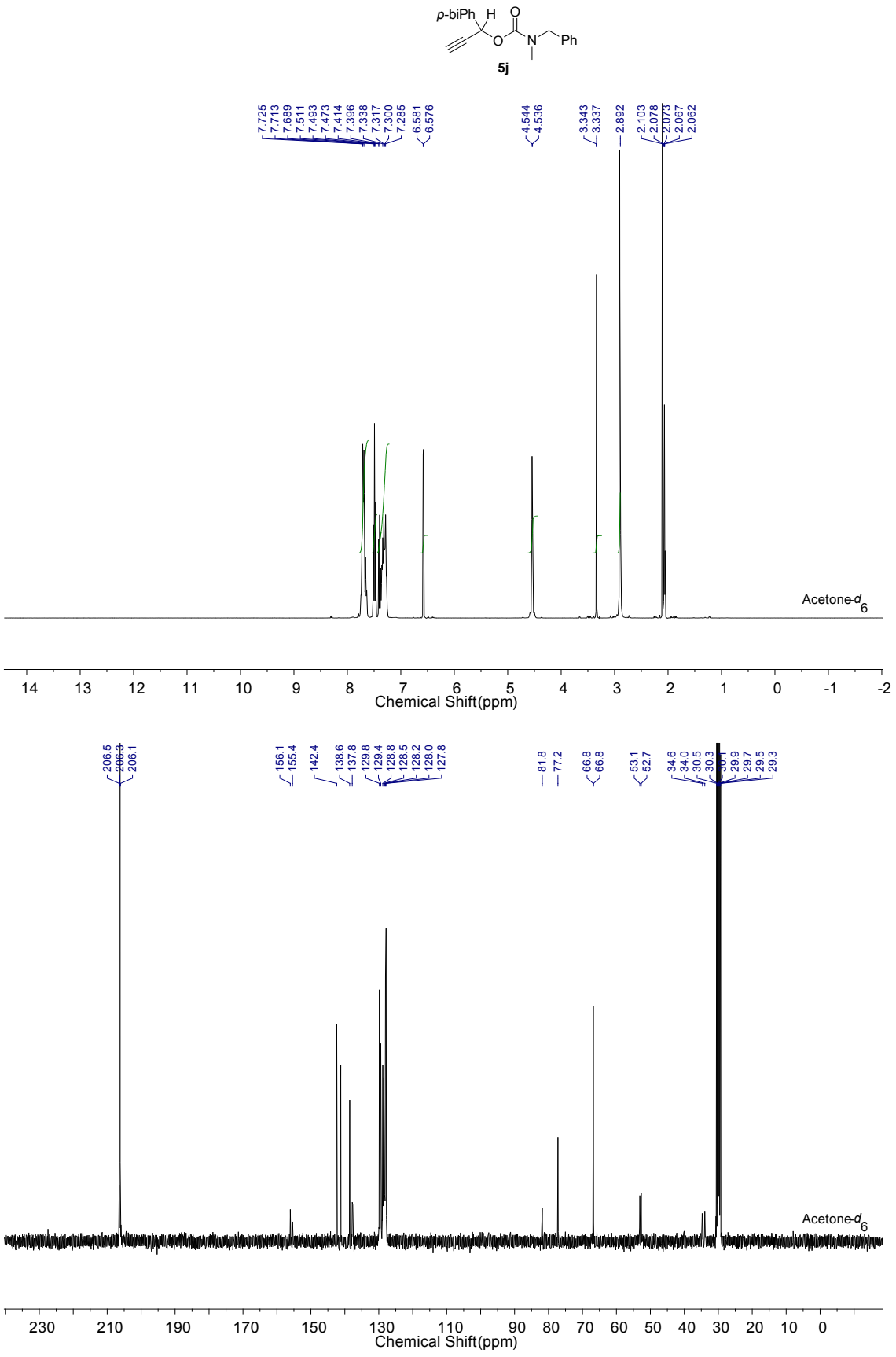

Figure S8 ^{1}H and ^{13}C NMR spectra for **5j**

General method for the synthesis of pivaloyloxymethyl protected triazoles **6a** – **j**, and characterisation data/spectra of pivaloyloxymethyl protected triazoles **6a** – **j**, ((1-pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl methyl ether and ((1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl alcohol.[1, 2]

Pivaloyloxymethyl azide (1 equiv.) dissolved in pyridine (1 – 2 mL) was added to a mixture of the corresponding alkyne (1 equiv.) and copper (I) iodide (0.05 – 0.1 equiv.) and the resulting mixture stirred under argon at room temperature. After 2 – 24 hours the reaction mixture was diluted with toluene (*ca* 10 mL) and concentrated *in vacuo*. Purification by column chromatography (EtOAc:hexane) afforded the desired 1,4-disubstituted-1*H*-1,2,3-triazole.

(1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)methyl *N*-methylbenzylcarbamate **6a**

Colourless oil (0.220 g, 67 %, R_f = 0.15 (1:2)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.19 (9H, s, C(C**H$_3$**)$_3$), 2.82 (3H, s, r_a, NC**H$_3$**) + 2.89 (3H, s, r_b, NC**H$_3$**), 4.44 (2H, s, r_b, NC**H$_2$**) + 4.48 (2H, s, r_a, NC**H$_2$**), 5.29 (2H, s, C**H$_2$**O), 6.23 (2H, s, OC**H$_2$**N), 7.15 – 7.32 (5H, m, Ar**H**), 7.81 (1H, s, r_b, Ar'**H**) + 7.90 (1H, s, r_a, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.81 (C(**C**H$_3$)$_3$), 33.65 (r_a, N**C**H$_3$) + 34.43 (r_b, N**C**H$_3$), 38.80 (**C**(CH$_3$)$_3$), 52.37 (r_b, N**C**H$_2$) + 52.62 (r_a, N**C**H$_2$), 58.45 (**C**H$_2$O), 69.70 (O**C**H$_2$N), 125.09 (Ar'**C**H), 127.42 (2 × Ar**C**H), 127.80 (Ar**C**H), 128.62 (2 × Ar**C**H), 137.19 (Ar**C**), 144.30 (Ar'**C**), 156.00 (r_b, **C**=O) + 156.47 (r_a, **C**=O), 177.62 (**C**=O) ppm; FT-IR (ATR, Ge) ν 3158, 3097, 3068, 3035, 2980, 2953, 2878, 1747, 1705, 1455, 1407, 1130, 1036, 994 cm^{-1}; CIMS calculated for $(C_{18}H_{25}N_4O_4)^+$ 361.1870, found 361.1872 m/z.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-methyl)methyl *N*-methylbenzylcarbamate **6b**

Pale brown viscous oil (0.780 g, 79 %, R_f = 0.15 (1:3)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.18 (9H, s, C(C**H$_3$**)$_3$), 1.70 (3H, d, *J* = 6.9 Hz, CHC**H$_3$**), 2.83 (3H, s, r_a, NC**H$_3$**) + 2.90 (3H, s, r_b, NC**H$_3$**), 4.40 – 4.53 (2H, m, NC**H$_2$**), 6.03 (1H, q, *J* = 6.3 Hz, C**H**CH$_3$), 6.21 (2H, AB system, OC**H$_2$**N), 7.19 – 7.34 (5H, m, Ar**H**), 7.61 (1H, s, r_b, Ar'**H**) + 7.78 (1H, s, r_a, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 19.89 (CH**C**H$_3$), 26.81 (C(**C**H$_3$)$_3$), 33.59 (r_a, N**C**H$_3$) + 34.50 (r_b, N**C**H$_3$), 38.79 (**C**(CH$_3$)$_3$), 52.38 (r_b, N**C**H$_2$) + 52.53 (r_a, N**C**H$_2$), 65.94 (r_a, **C**HCH$_3$) + 66.00 (r_b, **C**HCH$_3$), 69.71 (O**C**H$_2$N), 123.07 (r_b, Ar'**C**H) + 123.22 (r_a, Ar'**C**H), 127.40 (2 × Ar**C**H), 127.81 (Ar**C**H), 128.61 (2 × Ar**C**H), 137.34 (r_a, Ar**C**) + 137.46 (r_b, Ar**C**), 148.99 (Ar'**C**), 155.61 (r_b, **C**=O) + 156.09 (r_a, **C**=O), 177.72 (**C**=O) ppm; FTIR (ATR, Ge) ν 3147, 2976, 2930, 2868, 1740, 1690, 1398, 1217, 1119, 1031 cm^{-1}; ESIMS calculated for $(C_{19}H_{27}N_4O_4)^+$ 375.2027, found 375.2025 m/z.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1,1-dimethyl)methyl *N*-methylbenzylcarbamate **6c**

Pale yellow viscous oil (0.840 g, 54 %, R_f = 0.03 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.18 (9H, s, C(C**H$_3$**)$_3$), 1.86 (6H, s, r_a, C(C**H$_3$**)$_2$) + 1.90 (6H, s, r_b, C(C**H$_3$**)$_2$), 2.79 (3H, s, r_a, NC**H$_3$**) + 2.84 (3H, s, r_b, NC**H$_3$**), 4.38 (2H, s, r_b, NC**H$_2$**) + 4.46 (2H, s, r_a, NC**H$_2$**), 6.21 (2H, AB system, OC**H$_2$**N), 7.16 – 7.18 (1H, m, Ar**H**), 7.23 – 7.33 (4H, m, Ar**H**), 7.66 (1H, s, r_a, Ar'**H**) + 7.77 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 27.76 (C(**C**H$_3$)$_2$), 33.92 (r_b, N**C**H$_3$) + 34.04 (r_a, N**C**H$_3$), 38.78 (**C**(CH$_3$)$_3$), 51.95 (r_b, N**C**H$_2$) + 52.71 (r_a, N**C**H$_2$), 69.74 (O**C**H$_2$N), 76.15 (r_b, **C**(CH$_3$)$_2$) + 76.35 (r_a, **C**(CH$_3$)$_2$), 122.37 (r_a, Ar'**C**H) + 122.45 (r_b, Ar'**C**H), 127.27 (2 × Ar**C**H), 127.58 (Ar**C**H), 128.59 (2 × Ar**C**H), 137.53 (r_b, Ar**C**) + 137.76 (r_a, Ar**C**), 152.64 (Ar'**C**), 154.92 (r_a, **C**=O) + 155.40 (r_b, **C**=O), 177.74 (**C**=O) ppm; FTIR (ATR, Ge) ν 3147, 2978, 2930, 2873, 1741, 1691, 1390, 1227, 1118, 1024, 983 cm^{-1}; ESIMS calculated for $(C_{20}H_{28}N_4O_4Na)^+$ 411.2003, found 411.2001 m/z.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl *N*-methylbenzylcarbamate **6d**

Colourless viscous oil (0.810 g, 85 %, R_f = 0.23 (1:4)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.91 (3H, s, NC**H$_3$**), 4.45 – 4.58 (2H, m, NC**H$_2$**), 6.18 (2H, AB system, OC**H$_2$**N), 7.01 (1H, s, C**H**O), 7.18 – 7.37 + 7.50 (10H, m, Ar**H**), 7.47 (1H, s, r_a, Ar'**H**) + 7.68 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 33.67 (r_b, N**C**H$_3$) + 34.79 (r_a, N**C**H$_3$), 38.78 (**C**(CH$_3$)$_3$), 52.55 (r_a, N**C**H$_2$) + 52.70 (r_b, N**C**H$_2$), 69.67 (O**C**H$_2$N), 71.12 (r_b, **C**HO) + 71.25 (r_a, **C**HO), 123.45 (r_a, Ar'**C**H) + 123.60 (r_b, Ar'**C**H), 127.05 (r_b, 2 × Ar**C**H) + 127.15 (r_a, 2 × Ar**C**H), 127.30 (Ar**C**H), 127.43 (2 × Ar**C**H), 127.84 (Ar**C**H), 128.35 (2 × Ar**C**H), 128.61 (2 × Ar**C**H), 137.15 (r_a, Ar**C**) + 137.38 (r_b, Ar**C**), 138.63 (r_a, Ar**C**) + 138.76 (r_b, Ar**C**), 148.48 (Ar'**C**), 155.19 (r_a, **C**=O) + 155.72 (r_b, **C**=O), 177.77 (**C**=O) ppm; FTIR (ATR, Ge) ν 3142, 3028, 2972, 2930, 2868, 1741, 1695, 1398, 1115, 1031, 983, 694 cm^{-1}; ESIMS calculated for $(C_{24}H_{29}N_4O_4)^+$ 437.2183, found 437.2183 m/z.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(*p*-bromophenyl))methyl *N*-methylbenzylcarbamate **6e**

Colourless viscous oil (0.500 g, 78 %, R_f = 0.21 (1:2)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.91 (3H, s, r_a, NC**H$_3$**) + 2.92 (3H, s, r_b, NC**H$_3$**), 4.47 (2H, s, r_a, NC**H$_2$**) + 4.52 (2H, AB system, r_b, NC**H$_2$**), 6.18 (2H, AB system, OC**H$_2$**N), 6.94 (1H, s, C**H**O), 7.16 – 7.53 (10H, m, Ar**H** + r_a, Ar'**H**), 7.72 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 33.68 (r_a, N**C**H$_3$) + 34.98 (r_b, N**C**H$_3$), 38.78 (**C**(CH$_3$)$_3$), 52.57 (r_b, N**C**H$_2$) + 52.72 (r_a, N**C**H$_2$), 69.66 (O**C**H$_2$N), 70.50 (r_a, **C**HO) + 70.61 (r_b, **C**HO), 122.44 (Ar**C**Br), 123.51 (r_b, Ar'**C**H) + 123.67 (r_a, Ar'**C**H), 127.13 (Ar**C**H), 127.49 (Ar**C**H), 127.83 (Ar**C**H), 128.63 (r_b, 2 × Ar**C**H) + 128.70 (r_a, 2 × Ar**C**H), 128.85 (r_b, 2 × Ar**C**H) + 128.92 (r_a, 2 × Ar**C**H), 131.74 (2 × Ar**C**H), 136.99 (r_a, Ar**C**) + 137.28 (r_b, Ar**C**), 137.64 (r_b, Ar**C**) + 137.77 (r_a, Ar**C**), 147.81 (Ar'**C**), 154.99 (r_b, **C**=O) + 155.50 (r_a, **C**=O), 177.69 (**C**=O) ppm; FTIR (ATR, Ge) ν 3126, 2966, 1745, 1701, 1398, 1211, 1107, 986 cm^{-1}; ESIMS calculated for $(C_{24}H_{28}Br^{79}N_4O_4)^+$ 515.1289 and $(C_{24}H_{28}Br^{81}N_4O_4)^+$ 517.1268, found 515.1284 and 517.1263 m/z.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(*p*-fluorophenyl))methyl *N*-methylbenzylcarbamate **6f**

Yellow-brown viscous oil (0.670 g, 74 %, R_f = 0.08 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.92 (3H, s, NC**H$_3$**), 4.47 (2H, s, r_a, NC**H$_2$**) + 4.52 (2H, AB system, r_b, NC**H$_2$**), 6.18 (2H, AB system, OC**H$_2$**N), 6.97 (1H, s, C**H**O), 6.99 – 7.08 (2H, m, Ar**H**), 7.16 – 7.49 (7H, m, Ar**H**), 7.52 (1H, s, r_a, Ar'**H**) + 7.71 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 33.68 (r_b, N**C**H$_3$) + 34.92 (r_a, N**C**H$_3$), 38.79 (**C**(CH$_3$)$_3$), 52.56 (r_a, N**C**H$_2$) + 52.72 (r_b, N**C**H$_2$), 69.67 (O**C**H$_2$N), 70.53 (r_b, **C**HO) + 70.64 (r_a, **C**HO), 115.53 (d, J = 21.7 Hz, 2 × Ar**C**H), 123.43 (r_a, Ar'**C**H) + 123.59 (r_b, Ar'**C**H), 127.17 (Ar**C**H), 127.48 (Ar**C**H), 127.83 (Ar**C**H), 128.63 (r_b, 2 × Ar**C**H) + 128.69 (r_a, 2 × Ar**C**H), 129.12 (m, 2 × Ar**C**H), 136.99 (d, J = 11.1 Hz, Ar**C**), 137.04 (r_b, Ar**C**) + 137.33 (r_a, Ar**C**), 148.18 (Ar'**C**), 155.09 (r_a, **C**=O) + 155.59 (r_b, **C**=O), 162.62 (d, J = 245.7 Hz, Ar**C**F), 177.70 (**C**=O) ppm; FT-IR (thin film, KBr) ν 3142, 3060, 3031, 2975, 2934, 2873, 1739, 1704, 1510, 1454, 1402, 1223, 1123, 1034 cm^{-1}; CIMS calculated for $(C_{24}H_{28}FN_4O_4)^+$ 455.2089, found 455.2093 m/z; EA calculated, C 63.42, H 5.99, N 12.32, O 14.09, F 4.18; found, C 62.83, H 6.31, N 12.32, O 14.03, F 4.51 %.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(*m*-fluorophenyl))methyl *N*-methylbenzylcarbamate **6g**

Orange-brown viscous oil (0.550 g, 75 %, R_f = 0.10 (1:6)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.93 (3H, s, NC**H$_3$**), 4.48 (2H, s, r_a, NC**H$_2$**) + 4.54 (2H, AB system, r_b, NC**H$_2$**), 6.19 (2H, AB system, OC**H$_2$**N), 6.99 (1H, s, C**H**O), 7.01 – 7.06 (2H, m, Ar**H**), 7.15 – 7.37 (7H, m, Ar**H**), 7.52 (1H, s, r_a, Ar'**H**) + 7.72 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.78 (C(**C**H$_3$)$_3$), 33.70 (r_b, N**C**H$_3$) + 34.98 (r_a, N**C**H$_3$), 38.79 (**C**(CH$_3$)$_3$), 52.59 (r_a, N**C**H$_2$) + 52.75 (r_b, N**C**H$_2$), 69.66 (O**C**H$_2$N), 70.39 (r_b, **C**HO) + 70.52 (r_a, **C**HO), 113.91 (d, J = 22.3 Hz, r_b, Ar**C**H) + 114.13 (d, J = 22.3 Hz, r_a, Ar**C**H), 115.30 (d, J = 21.0 Hz, Ar**C**H), 122.74 (d, J = 9.0, Ar**C**CHO), 123.53 (r_a, Ar'**C**H) + 123.70 (r_b, Ar'**C**H), 127.15 (Ar**C**H), 127.52 (Ar**C**H), 127.84 (Ar**C**H),

128.64 (r_b, 2 × Ar**C**H) + 128.72 (r_a, 2 × Ar**C**H), 130.19 (d, *J* = 8.0 Hz, Ar**C**H), 136.99 (r_b, Ar**C**) + 137.25 (r_a, Ar**C**), 141.07 (d, *J* = 19.0 Hz, r_a, Ar**C**H) + 141.25 (d, *J* = 19.0 Hz, r_b, Ar**C**H), 147.86 (Ar'**C**), 154.99 (r_a, **C**=O) + 155.49 (r_b, **C**=O), 162.62 (d, *J* = 247.6 Hz, Ar**C**F), 177.70 (r_a, **C**=O) + 177.80 (r_b, **C**=O) ppm; FT-IR (thin film, KBr) ν 3145, 3060, 3031, 2975, 2934, 2873, 1736, 1704, 1453, 1222, 1121, 1033 cm^{-1}; CIMS calculated for $(C_{24}H_{28}FN_4O_4)^+$ 455.2089, found 455.2083 m/z; EA calculated, C 63.42, H 5.99, N 12.32, O 14.09, F 4.18; found, C 62.49, H 6.33, N 12.34, O 14.51, F 4.33 %.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(*p*-methylphenyl))methyl *N*-methylbenzylcarbamate **6h**

White sticky solid (0.586 g, 72 %, R_f = 0.06 (1:6)). m.p. 71 – 72 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.34 – 2.35 (3H, m, ArC**H$_3$**), 2.90 (3H, s, NC**H$_3$**), 4.43 (2H, s, r_a, NC**H$_2$**) + 4.51 (2H, AB system, r_b, NC**H$_2$**), 6.17 (2H, AB system, OC**H$_2$**N), 6.96 (1H, s, C**H**O), 7.13 – 7.39 (9H, m, Ar**H**), 7.49 (1H, s, r_a, Ar'**H**) + 7.67 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 21.20 (Ar**C**H$_3$), 26.80 (C(**C**H$_3$)$_3$), 33.66 (r_b, N**C**H$_3$) + 34.73 (r_a, N**C**H$_3$), 38.78 (**C**(CH$_3$)$_3$), 52.52 (r_a, N**C**H$_2$) + 52.66 (r_b, N**C**H$_2$), 69.66 (O**C**H$_2$N), 71.06 (r_b, **C**HO) + 71.21 (r_a, **C**HO), 123.38 (r_a, Ar'**C**H) + 123.53 (r_b, Ar'**C**H), 127.08 (r_b, 2 × Ar**C**H) + 127.16 (r_a, 2 × Ar**C**H), 127.40 (2 × Ar**C**H), 127.85 (Ar**C**H), 128.63 (2 × Ar**C**H), 219.30 (2 × Ar**C**H), 135.69 (r_b, Ar**C**) + 135.81 (r_a, Ar**C**), 137.18 (r_b, Ar**C**) + 137.42 (r_a, Ar**C**), 138.16 (Ar**C**), 148.65 (Ar'**C**), 155.23 (r_a, **C**=O) + 155.76 (r_b, **C**=O), 177.67 (r_a, **C**=O) + 177.78 (r_b, **C**=O) ppm; FT-IR (thin film, KBr) ν 3142, 3027, 2975, 2934, 2868, 1744, 1703, 1454, 1402, 1229, 115, 1034 cm^{-1}; CIMS calculated for $(C_{25}H_{30}N_4O_4Na)^+$ 473.2159, found 473.2156 m/z; EA calculated, C 66.65, H 6.71, N 12.43, O 14.21; found, C 66.95, H 6.74, N 12.48, O 13.83 %.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(2-naphthyl))methyl *N*-methylbenzylcarbamate **6i**

Orange-brown viscous oil (0.370 g, 71 %, R_f = 0.02 (1:5)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.16 (9H, s, C(C**H$_3$**)$_3$), 2.93 (3H, s, r_a, NC**H$_3$**) + 2.96 (3H, s, r_b, NC**H$_3$**), 4.48 (2H, s, r_a, NC**H$_2$**) + 4.58 (2H, AB system, r_b, NC**H$_2$**), 6.18 (2H, AB system, OC**H$_2$**N), 7.17 (1H, s, C**H**O), 7.20 – 7.94 (13H, m, Ar**H** + Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 33.73 (r_b, N**C**H$_3$) + 34.90 (r_a, N**C**H$_3$), 38.78 (**C**(CH$_3$)$_3$), 52.60 (r_a, N**C**H$_2$) + 52.72 (r_b, N**C**H$_2$), 69.68 (O**C**H$_2$N), 71.40 (**C**HO), 123.55 (r_a, Ar'**C**H) + 123.67 (r_b, Ar'**C**H), 124.76 (Ar**C**H), 126.34 (2 × Ar**C**H), 127.24 (Ar**C**H), 127.44 (2 × Ar**C**H), 127.67 (Ar**C**H), 127.84 (Ar**C**H), 128.22 (2 × Ar**C**H), 128.50-128.71 (m, 2 × Ar**C**H), 133.12 (Ar**C**), 133.22 (Ar**C**), 135.97 (r_a, Ar**C**) + 136.09 (r_b, Ar**C**), 137.12 (r_b, Ar**C**) + 137.42 (r_a, Ar**C**), 148.41 (Ar'**C**), 155.19 (r_a, **C**=O) + 155.71 (r_b, **C**=O), 177.67 (r_a, **C**=O) + 177.77 (r_b, **C**=O) ppm; FT-IR (thin film, KBr) ν 3142, 3060, 3027, 2974, 2928, 2868, 1744, 1704, 1454, 1402, 1229, 1124, 1034 cm^{-1}; CIMS calculated for $(C_{28}H_{30}N_4O_4Na)^+$ 509.2159, found 509.2151 m/z; EA calculated, C 69.12, H 6.21, N 11.51, O 13.16; found, C 69.21, H 6.49, N 11.39, O 12.91 %.

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-(biphenyl-*p*-yl))methyl *N*-methylbenzylcarbamate **6j**

Yellow viscous oil (0.580 g, 90 %, R_f = 0.02 (1:5)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.17 (9H, s, C(C**H$_3$**)$_3$), 2.93 (3H, s, r_a, NC**H$_3$**) + 2.94 (3H, s, r_b, NC**H$_3$**), 4.49 (2H, s, r_a, NC**H$_2$**) + 4.56 (2H, AB system, r_b, NC**H$_2$**), 6.19 (2H, AB system, OC**H$_2$**N), 7.05 (1H, s, C**H**O), 7.19 – 7.62 (15H, m, Ar**H** + r_a, Ar'**H**), 7.74 (1H, s, r_b, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.82 (C(**C**H$_3$)$_3$), 33.73 (r_b, N**C**H$_3$) + 34.87 (r_a, N**C**H$_3$), 38.81 (**C**(CH$_3$)$_3$), 52.59 (r_a, N**C**H$_2$) + 52.73 (r_b, N**C**H$_2$), 69.70 (O**C**H$_2$N), 70.97 (r_b, **C**HO) + 71.10 (r_a, **C**HO), 123.52 (r_a, Ar'**C**H) + 123.68 (r_b, Ar'**C**H), 127.18 (2 × Ar**C**H), 127.29 (Ar**C**H), 127.44 (4 × Ar**C**H), 127.56 (Ar**C**H), 127.65 (Ar**C**H), 127.87 (Ar**C**H), 128.63 (r_b, 2 × Ar**C**H) + 128.69 (r_a, 2 × Ar**C**H), 128.79 (2 × Ar**C**H), 137.14 (r_b, Ar**C**) + 137.40 (r_a, Ar**C**), 137.61 (r_a, Ar**C**) + 137.74 (r_b, Ar**C**), 140.71 (Ar**C**), 141.34 (Ar**C**), 148.38 (Ar'**C**), 155.24 (r_b, **C**=O) + 155.74 (r_a, **C**=O), 177.71 (r_a, **C**=O) + 177.81 (r_b, **C**=O) ppm; FT-IR (thin film, KBr) ν 3142, 3060, 3027, 2975, 2934, 2868, 1744, 1704, 1482, 1454, 1402, 1229, 1124, 1034 cm^{-1}; CIMS calculated for $(C_{30}H_{32}N_4O_4Na)^+$ 535.2316, found 535.2310 m/z; EA calculated, C 70.29, H 6.29, N 10.92, O 12.50; found, C 70.02, H 6.37, N 10.97, O 12.64 %.

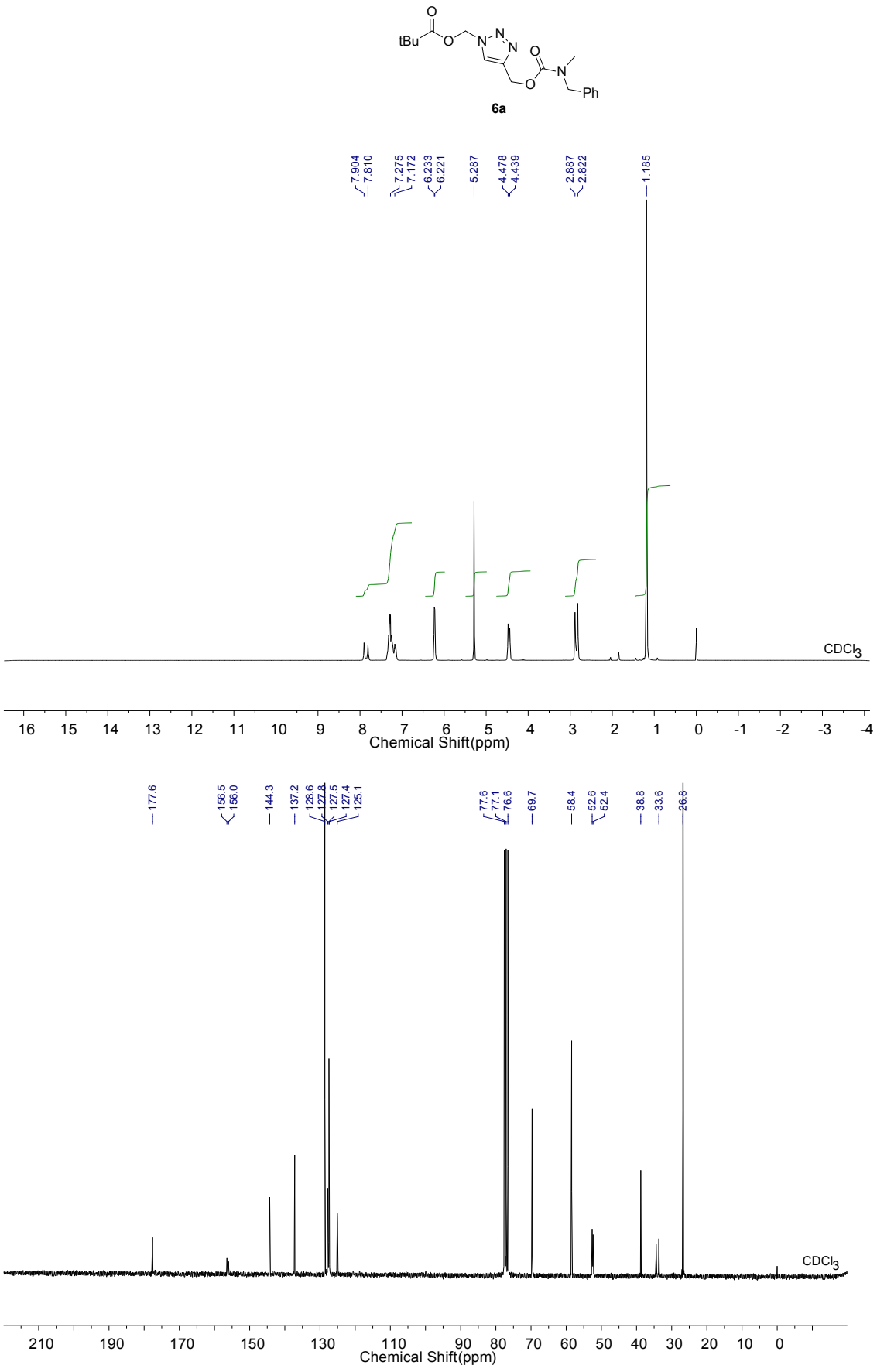

Figure S9 ^{1}H and ^{13}C NMR spectra for **6a**

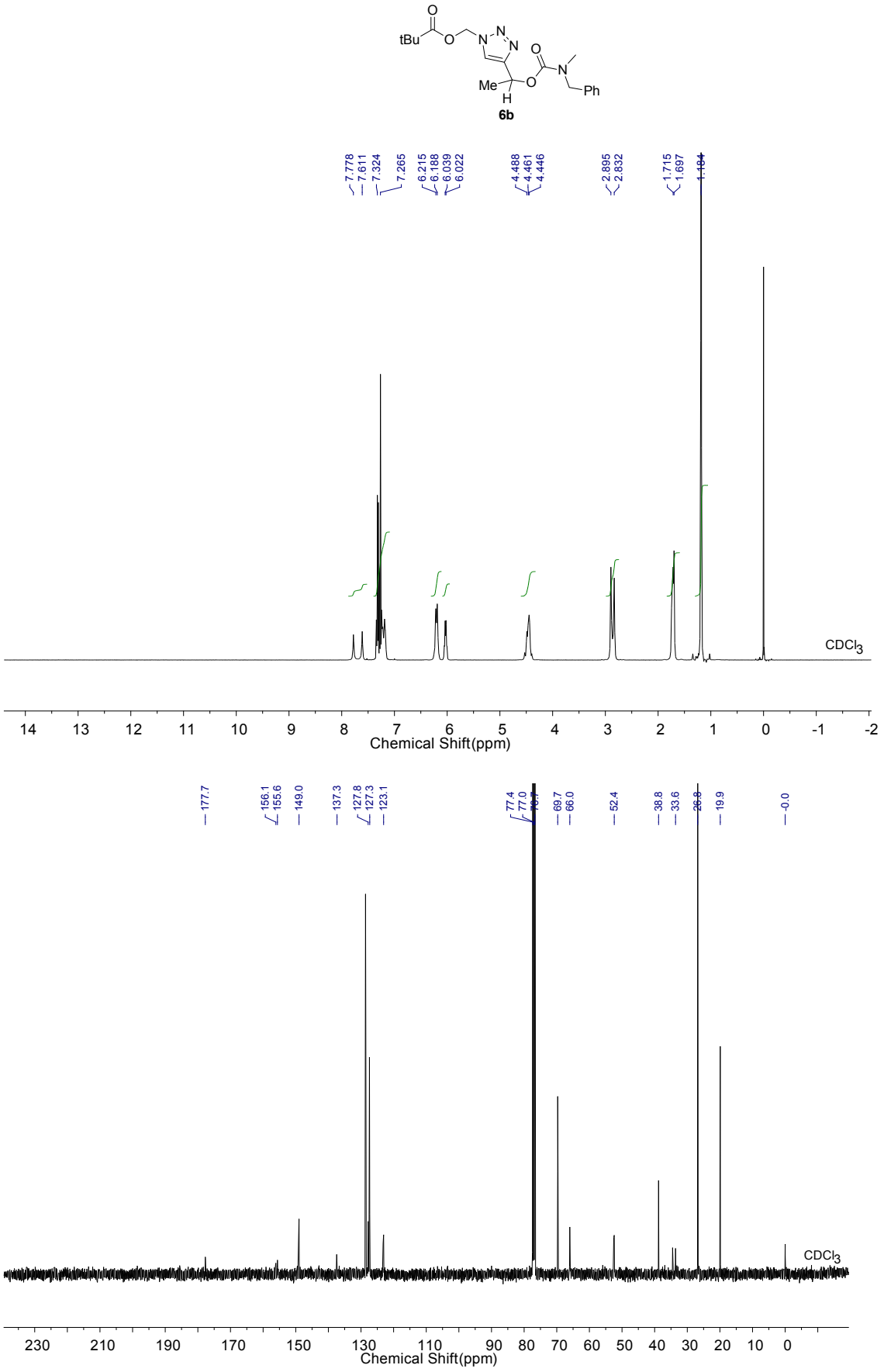

Figure S10 ^{1}H and ^{13}C NMR spectra for **6b**

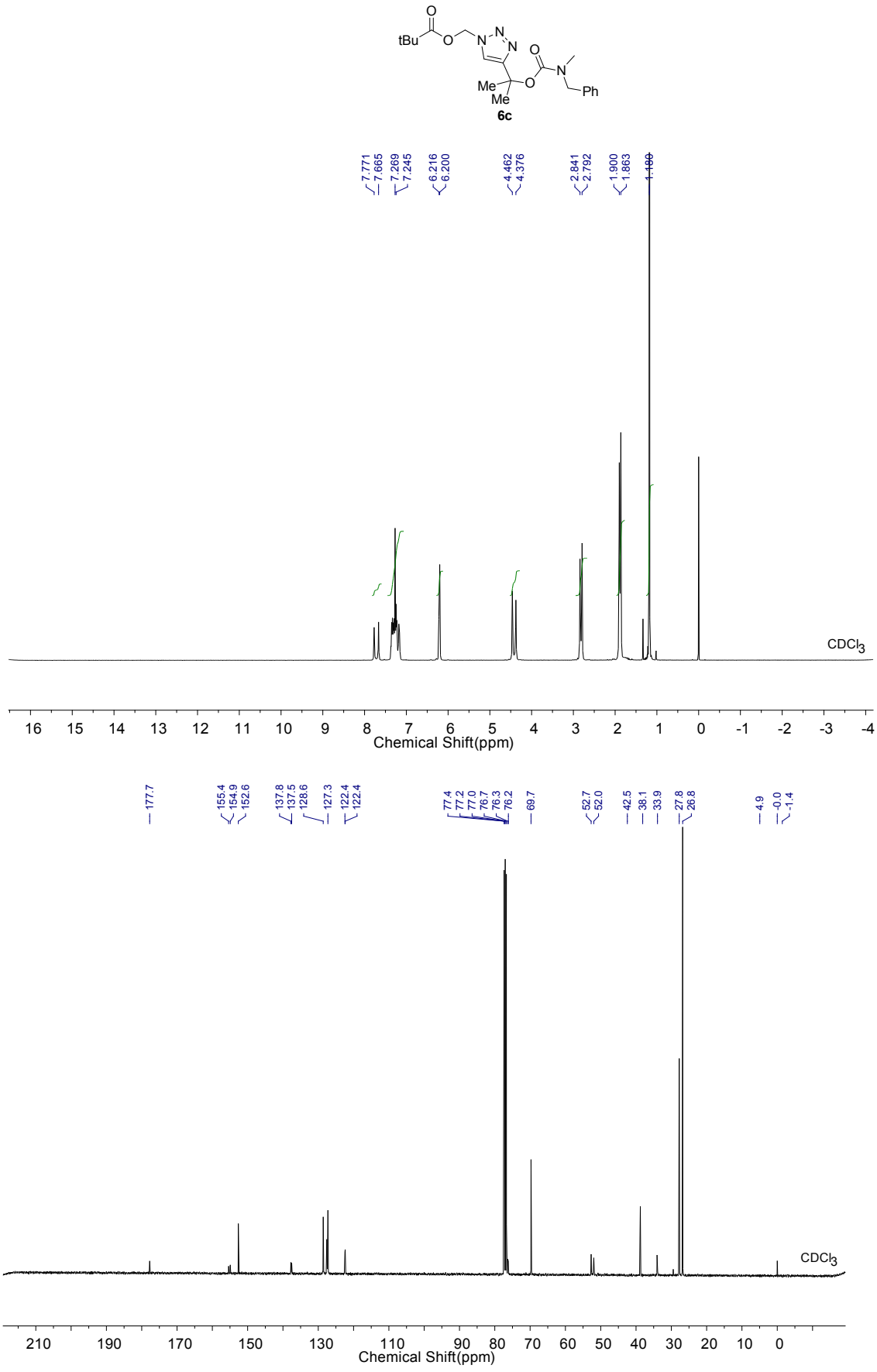

Figure S11 ^{1}H and ^{13}C NMR spectra for **6c**

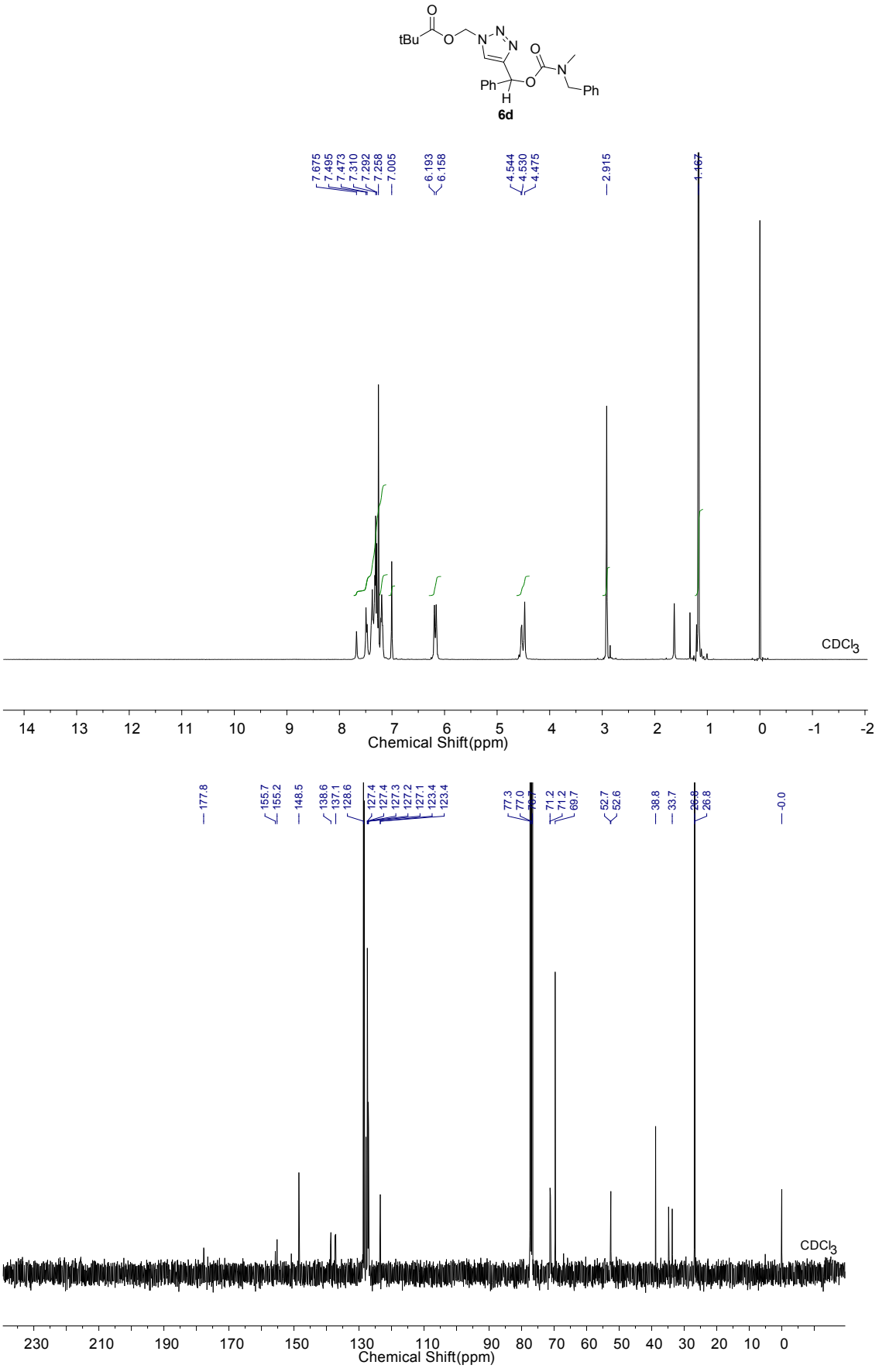

Figure S12 ^{1}H and ^{13}C NMR spectra for **6d**

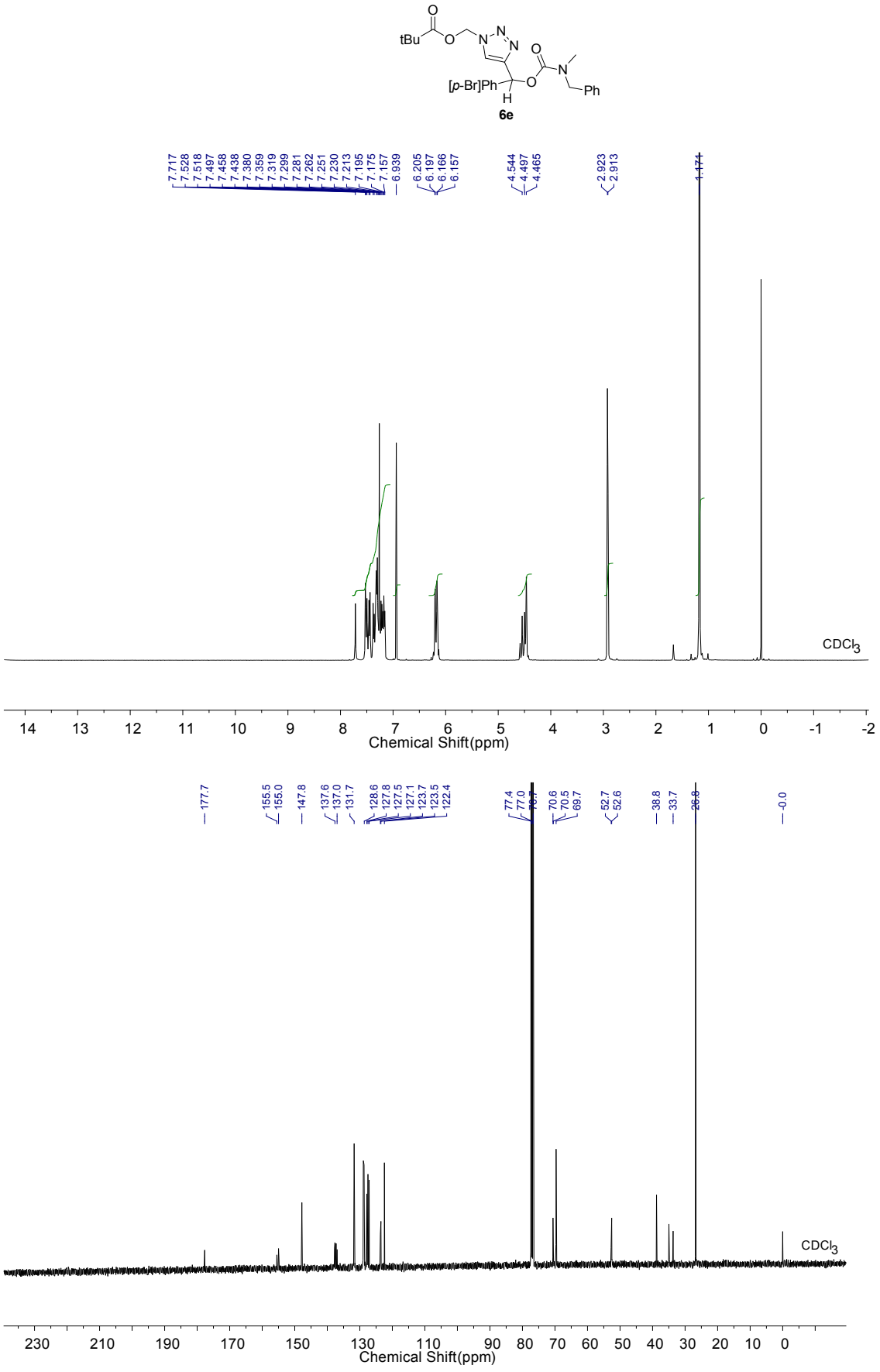

Figure S13 ^{1}H and ^{13}C NMR spectra for **6e**

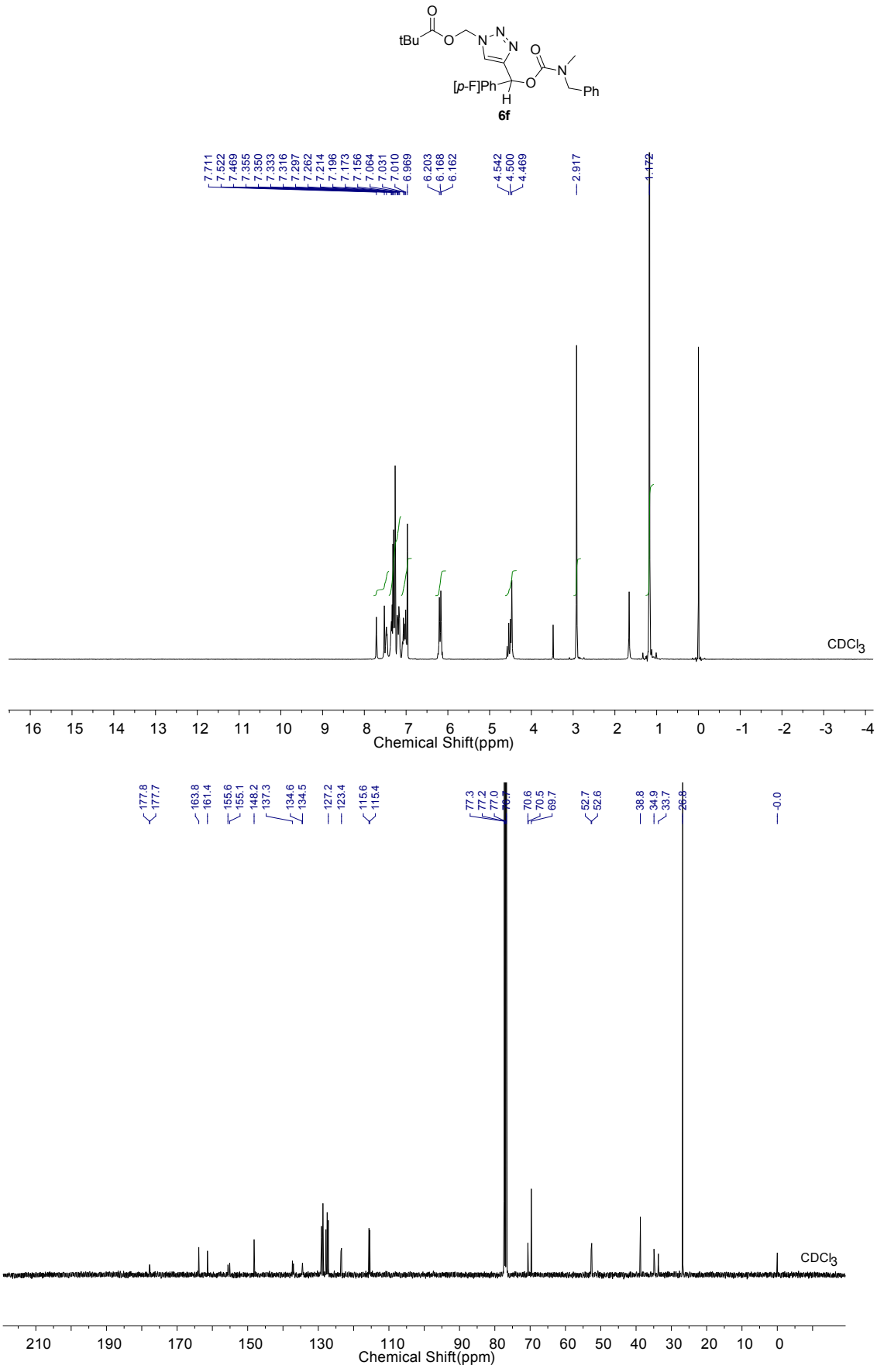

Figure S14 ^{1}H and ^{13}C NMR spectra for **6f**

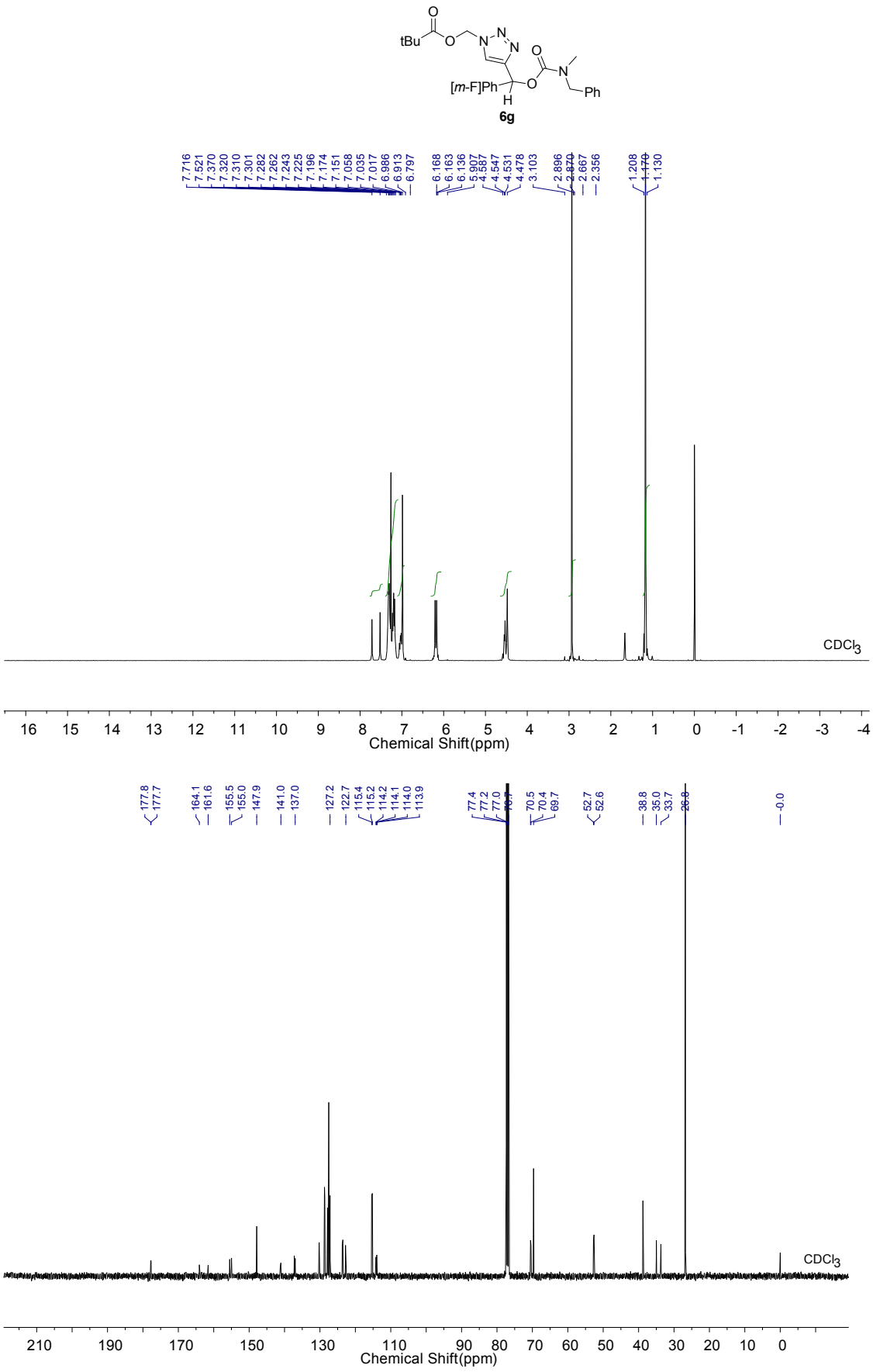

Figure S15 ^{1}H and ^{13}C NMR spectra for **6g**

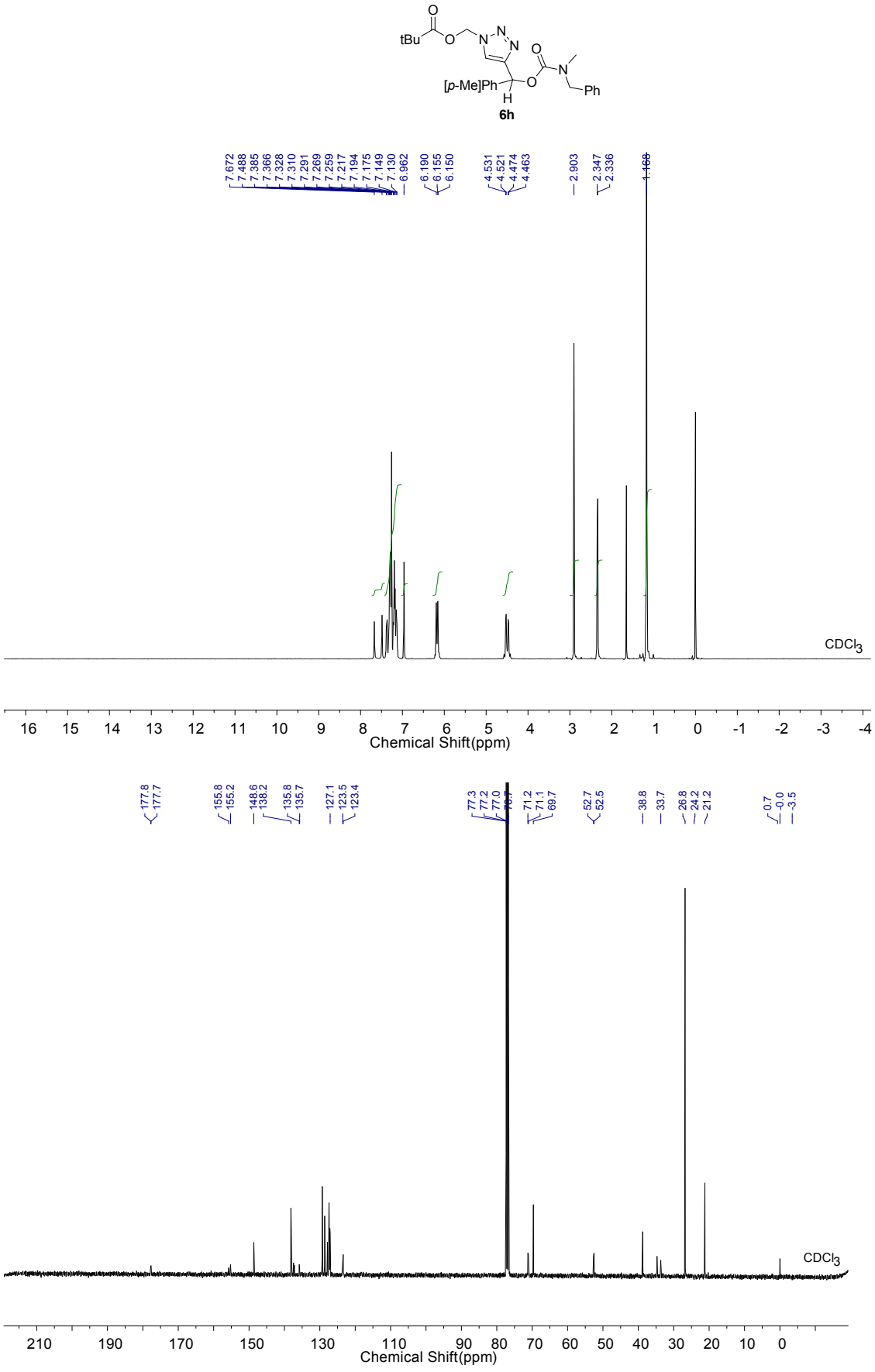

Figure S16 ^{1}H and ^{13}C NMR spectra for **6h**

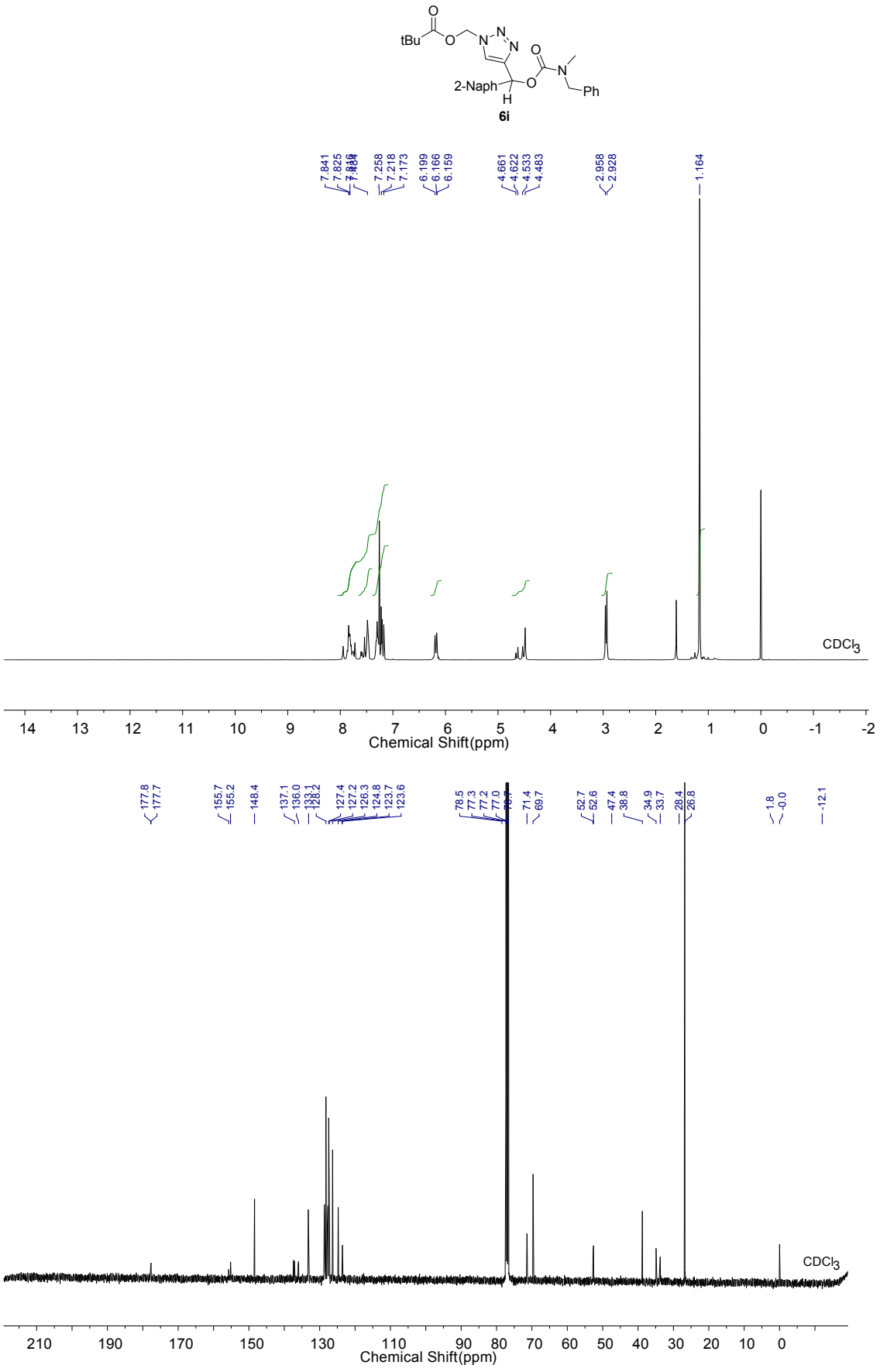

Figure S17 ^{1}H and ^{13}C NMR spectra for **6i**

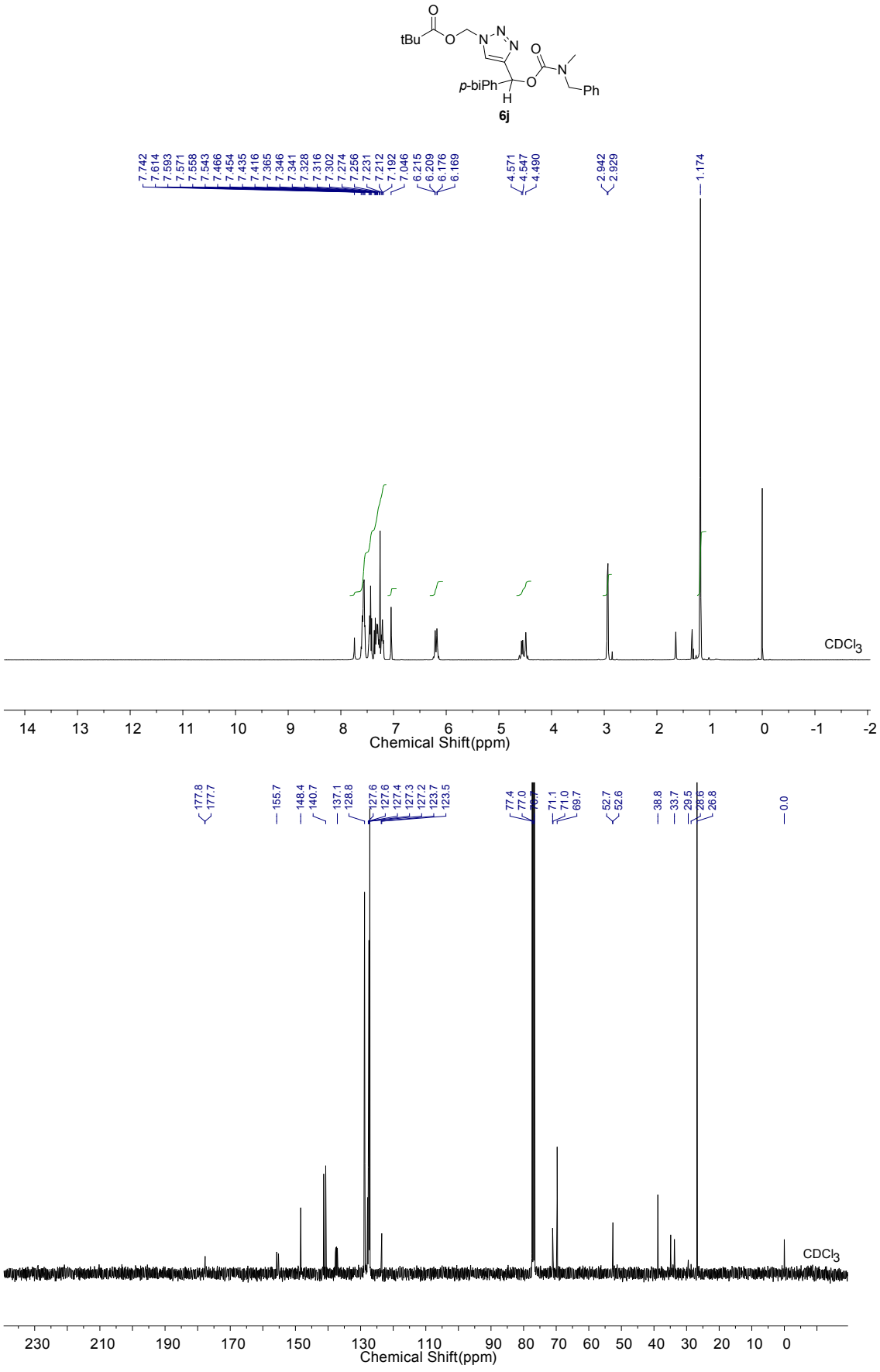

Figure S18 ^{1}H and ^{13}C NMR spectra for **6j**

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl methyl ether[2]

Pivaloyloxymethyl azide (0.595 g, 3.95 mmol), 1-phenylpropargyl methyl ether (0.499 g, 3.41 mmol) and Amberlyst.A21.CuI (0.235 g, 0.341 mmol, 1.45 g mol^{-1}) were combined in dichloromethane (5 mL) and stirred under argon at room temperature. After 6 hours, the reaction mixture was filtered and concentrated *in vacuo*. Purification of the residue by column chromatography (EtOAc:hexane 1:9 → 1:6) afforded ((1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl methyl ether as a colourless oil (0.770 g, 74 %, R_f = 0.03 (1:9)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.18 (9H, s, C(C**H$_3$**)$_3$), 3.40 (3H, s, OC**H$_3$**), 5.49 (1H, s, C**H**O), 6.17 (2H, AB system, C**H$_2$**), 7.29-7.41 (5H, m, Ar**H**), 7.59 (1H, s, ArC**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.79 (C(**C**H$_3$)$_3$), 38.78 (**C**(CH$_3$)$_3$), 57.05 (O**C**H$_3$), 69.69 (**C**H$_2$), 78.31 (**C**HO), 122.91 (Ar'**C**H), 126.90 (2 × Ar**C**H), 128.15 (Ar**C**H), 128.65 (2 × Ar**C**H), 139.78 (Ar**C**), 150.38 (Ar'**C**), 177.70 (**C**=O) ppm; FTIR (ATR, Ge) ν 3147, 2972, 2935, 2823, 1742, 1453, 1276, 1116, 1095, 1030, 986, 696 cm^{-1}; ESIMS calculated for $(C_{16}H_{22}N_3O_3)^+$ 304.1656, found 304.1648 m/z.

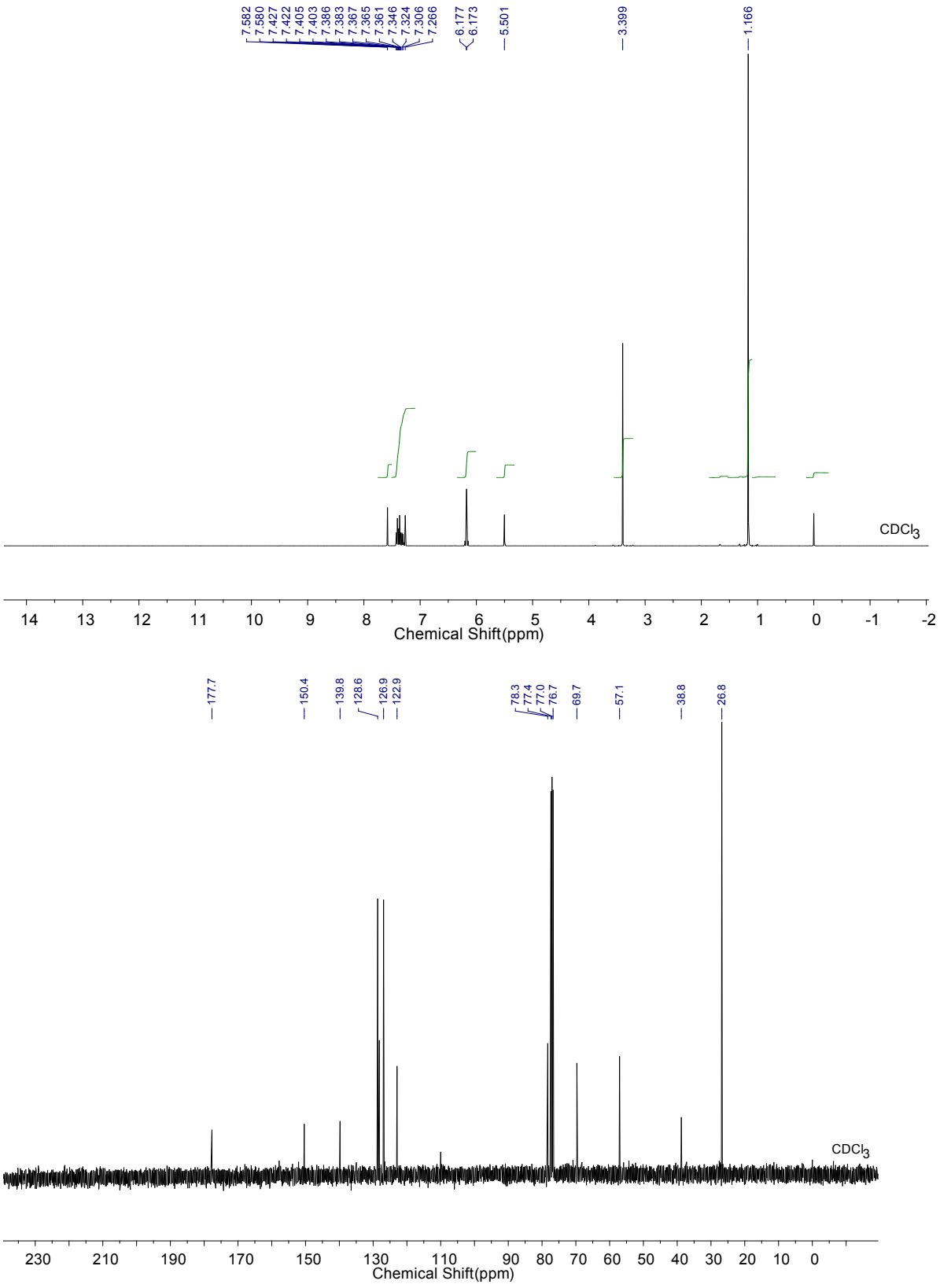

Figure S19 ^{1}H and ^{13}C NMR spectra for ((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl methyl ether

((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl alcohol[1]

Pivaloyloxymethyl azide (1.429 g, 9.09 mmol), 1-phenylpropargyl alcohol (1.098 g, 8.27 mmol) and copper (I) iodide (0.079 g, 0.41 mmol) were combined in pyridine (2 mL) and stirring under argon at room temperature. After 12 hours, the reaction was diluted with toluene (10 mL) and concentrated *in vacuo*. Purification of the residue by column chromatography (EtOAc:petroleum ether 40-60 °C, 1:4 → 1:1) afforded ((1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl alcohol as a pale orange waxy solid (1.790 g, 75 %, R_f = 0.04 (1:4)). m.p. 74 – 77 °C (EtOAc); ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.16 (9H, s, C(C**H$_3$)$_3$**), 3.61 (1H, d, *J* = 4.0 Hz, O**H**), 6.01 (1H, d, *J* = 4.0 Hz, C**H**O), 6.15 (2H, s, C**H**$_2$), 7.30-7.44 (5H, m, ArC**H**), 7.54 (1H, s, Ar'C**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 26.78 (C(**C**H$_3$)$_3$), 38.76 (**C**(CH$_3$)$_3$), 68.98 (**C**HO), 69.72 (**C**H$_2$), 122.64 (Ar'**C**H), 126.42 (2 × Ar**C**H), 128.07 (Ar**C**H), 128.61 (2 × Ar**C**H), 141.72 (Ar**C**), 151.87 (Ar'**C**), 177.68 (**C**=O) ppm; FTIR (ATR, Ge) ν 3236 br, 3147, 2976, 2868, 1745, 1446, 1274, 1217, 1116, 1033, 698 cm^{-1}; ESIMS calculated for $(C_{15}H_{20}N_3O_3)^+$ 290.1499, found 290.1490 m/z.

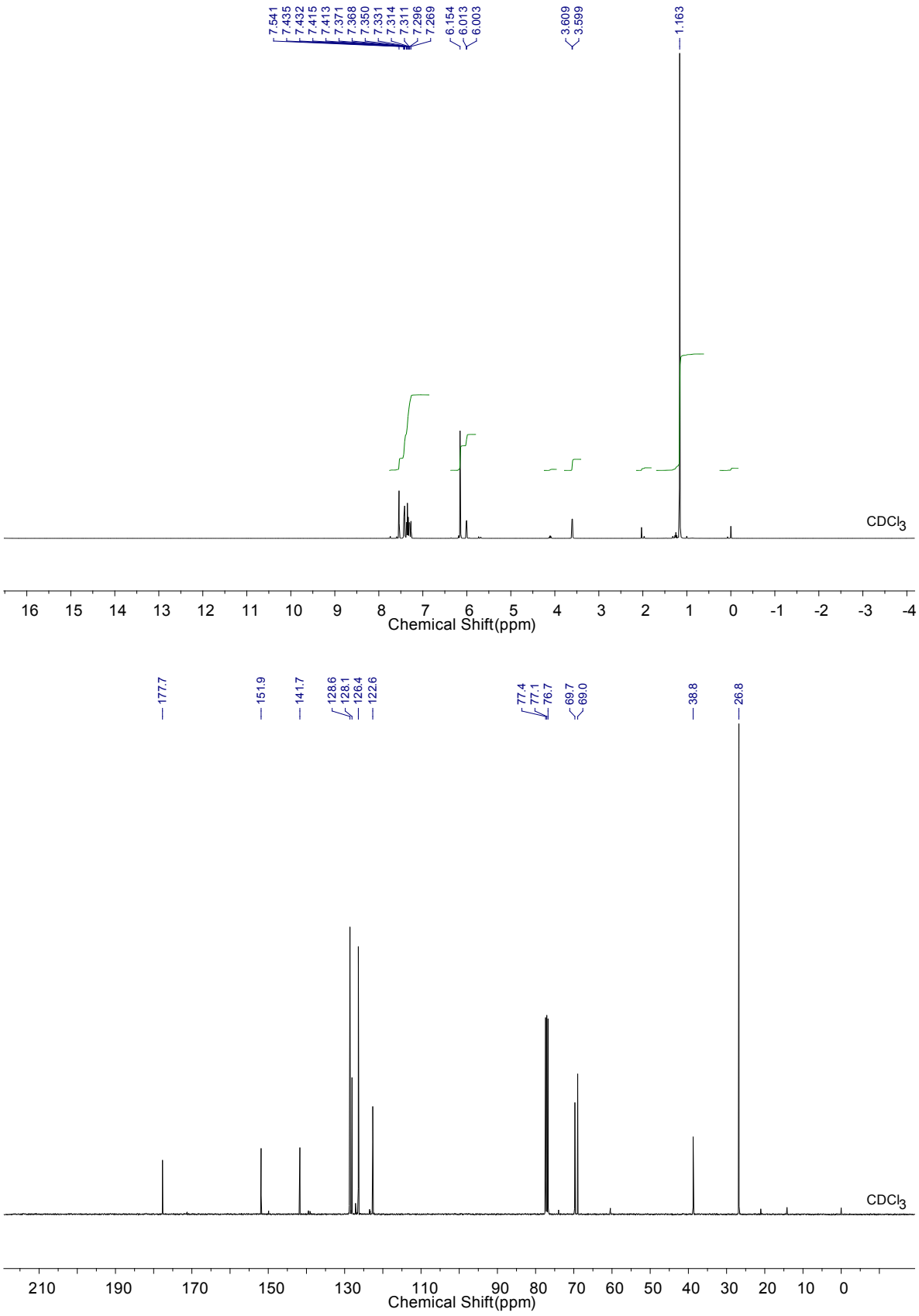

Figure S20 ^{1}H and ^{13}C NMR spectra for ((1-(Pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl alcohol

General method for the synthesis of benzyl protected triazoles, and characterisation data/spectra of benzyl protected triazoles **7a** – **d**.[1]

Benzyl azide (1 equiv.) dissolved in pyridine (1 – 2 mL) was added to a mixture of the corresponding alkyne (1 equiv.) and copper (I) iodide (0.05 – 0.1 equiv.) and the resulting mixture stirred under argon at room temperature. After 2 – 24 hours the reaction mixture was diluted with toluene (*ca.* 10 mL) and concentrated *in vacuo*. Purification by column chromatography (EtOAc:hexane) afforded the desired 1,4-disubstituted-1*H*-1,2,3-triazole.

(1-Benzyl-1*H*-1,2,3-triazol-4-yl)methyl *N*-methylbenzylcarbamate **7a**

Pale yellow amorphous solid (0.520 g, 68 %, R_f = 0.06 (1:2)). m.p. 66 – 68 °C ($CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.80 (3H, s, r_a, NC**H$_3$**) + 2.87 (3H, s, r_b, NC**H$_3$**), 4.41 (2H, s, r_b, NC**H$_2$**) + 4.45 (2H, s, r_a, NC**H$_2$**), 5.25 (2H, s, C**H$_2$**O), 5.49 (2H, s, r_b, C**H$_2$**NAr') + 5.51 (2H, s, r_a, C**H$_2$**NAr'), 7.14 – 7.37 (10H, m, Ar**H**), 7.47 (1H, s, r_b, Ar'**H**) + 7.59 (1H, s, r_a, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.67 (r_a, N**C**H$_3$) + 34.44 (r_b, N**C**H$_3$), 52.37 (r_b, N**C**H$_2$) + 52.60 (r_a, N**C**H$_2$), 54.16 (**C**H$_2$NAr'), 58.65 (**C**H$_2$O), 123.62 (r_b, Ar**C**CH$_2$N) + 123.81 (r_a, Ar**C**CH$_2$N), 127.40 (2 × Ar**C**H), 127.73 (Ar**C**H), 128.11 (Ar**C**H), 128.57 (2 × Ar**C**H), 128.77 (Ar**C**H), 129.12 (2 × Ar**C**H), 134.55 (Ar**C**), 137.26 (Ar**C**), 144.14 (Ar'**C**), 156.12 (r_b, **C**=O) + 156.60 (r_a, **C**=O) ppm; FTIR (ATR, Ge) ν 3111, 3023, 2919, 1690, 1450, 1211, 1137, 1049, 693 cm^{-1}; ESIMS calculated for $(C_{19}H_{21}N_4O_2)^+$ 337.1659, found 337.1663 m/z.

((1-Benzyl-1*H*-1,2,3-triazol-4-yl)-1-methyl)methyl *N*-methylbenzylcarbamate **7b**

Pale grey amorphous solid (0.659 g, 75 %, R_f = 0.12 (1:3)). m.p. 80 – 81 °C ($CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.68-1.73 (3H, m, CHC**H$_3$**), 2.80 (3H, s, r_a, NC**H$_3$**) + 2.89 (3H, s, r_b, NC**H$_3$**), 4.38 – 4.49 (2H, m, NC**H$_2$**), 5.41 – 5.56 (2H, m, C**H$_2$**NAr'), 6.00 – 6.01 (1H, m, C**H**CH$_3$), 7.15 – 7.39 (11H, m, Ar**H** + r_b, Ar'**H**) + 7.48 (1H, s, r_a, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 19.72 (r_a, CH**C**H$_3$) + 19.83 (r_b, CH**C**H$_3$), 33.60 (r_a, N**C**H$_3$) + 34.57 (r_b, N**C**H$_3$), 52.35 (r_b, N**C**H$_2$) + 52.46 (r_a, N**C**H$_2$), 54.05 (**C**H$_2$NAr'), 66.01 (r_a, **C**HCH$_3$) + 66.19 (r_b, **C**HCH$_3$), 121.69 (r_b, Ar'**C**H) + 121.98 (r_a, Ar'**C**H), 127.26 (r_a, 2 × Ar**C**H) + 127.32 (r_b, 2 × Ar**C**H), 127.75 (2 × **C**H), 128.05 (Ar**C**H) + 128.69 (Ar**C**H), 128.54 (2 × Ar**C**H) + 129.07 (2 × Ar**C**H), 134.61 (Ar**C**), 137.35 (r_a, Ar**C**) + 137.53 (r_b, Ar**C**), 148.72 (Ar'**C**), 155.66 (r_b, **C**=O) + 156.17 (r_a, **C**=O); FTIR (ATR, Ge) ν 3128, 3080, 2971, 1679, 1433, 1207, 1147, 1069, 702, 694 cm^{-1}; ESIMS calculated for $(C_{20}H_{23}N_4O_2)^+$ 351.1816, found 351.1814 m/z.

((1-Benzyl-1*H*-1,2,3-triazol-4-yl)-1,1-dimethyl)methyl *N*-methylbenzylcarbamate **7c**

White crystalline solid (0.258 g, 55 %, R_f = 0.06 (1:4)). m.p. 86 – 87 °C ($CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 1.84 (6H, s, r_a, C(C**H$_3$**)$_2$) + 1.88 (6H, s, r_b, C(C**H$_3$**)$_2$), 2.80 (3H, s, r_a, NC**H$_3$**) + 2.82 (3H, s, r_b, NC**H$_3$**), 4.37 (2H, s, r_b, NC**H$_2$**) + 4.43 (2H, s, r_a, NC**H$_2$**), 5.48 (2H, s, r_a, C**H$_2$**NAr') + 5.51 (2H, s, r_b, C**H$_2$**NAr), 7.14 – 7.39 (10H, m, Ar**H** + r_b, Ar'**H**) + 7.48 (1H, s, r_a, Ar'**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 27.79 (C(**C**H$_3$)$_2$), 33.95 (r_a, N**C**H$_3$) + 34.15 (r_b, N**C**H$_3$), 51.95 (r_a, N**C**H$_2$) + 52.73 (r_b, N**C**H$_2$), 54.01 (**C**H$_2$NAr'), 76.34 (**C**(CH$_3$)$_2$), 121.10 (r_b, Ar'**C**H) + 121.29 (r_a, Ar'**C**H), 127.23 (2 × Ar**C**H), 127.55 (2 × Ar**C**H), 127.99 (Ar**C**H), 128.53 (Ar**C**H), 128.58 (2 × Ar**C**H), 129.04 (2 × Ar**C**H), 134.81 (Ar**C**), 137.59 (r_a, Ar**C**) + 137.87 (r_b, Ar**C**), 152.37 (Ar'**C**), 155.04 (r_b, **C**=O) + 155.50 (r_a, **C**=O); FTIR (ATR, Ge) ν 3116, 3023, 2976, 1684, 1391, 1217, 1128, 1048, 859, 694 cm^{-1}; ESIMS calculated for $(C_{21}H_{24}N_4O_2Na)^+$ 387.1791, found 387.1790 m/z.

((1-Benzyl-1*H*-1,2,3-triazol-4-yl)-1-phenyl)methyl *N*-methylbenzylcarbamate **7d**

Pink viscous oil (0.260 g, 57 %, R_f = 0.15 (1:4)). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.80 (3H, s, NC**H$_3$**), 4.46 (2H, s, r_a, NC**H$_2$**) + 4.51 (2H, s, r_b, NC**H$_2$**), 5.39 – 5.53 (2H, m, C**H$_2$**NAr), 6.97 (1H, s, r_a, C**H**O) + 6.99 (1H, s, r_b, C**H**O), 7.11 – 7.51 (16H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.72 (r_a, N**C**H$_3$) + 34.88 (r_b, N**C**H$_3$), 52.54 (r_b, N**C**H$_2$) + 52.66 (r_a, N**C**H$_2$), 54.10 (**C**H$_2$NAr'), 71.23 (r_a, **C**HO) + 71.41 (r_b, **C**HO), 121.99 (r_b, Ar'**C**H) + 122.25 (r_a, Ar'**C**H), 127.08 (Ar**C**H) 127.17 (Ar**C**H), 127.22 (Ar**C**H), 127.83 (Ar**C**H), 128.03 (Ar**C**H) + 128.19 (2 × Ar**C**H), 128.54 (2 × Ar**C**H), 128.57 (2 × Ar**C**H), 128.72 (Ar**C**H), 129.0927 (2 × Ar**C**H), 134.51 (Ar**C**), 137.51 (Ar**C**) + 138.88 (Ar**C**), 148.20 (Ar'**C**), 155.24 (**C**=O) ppm; FT-IR (thin film, KBr) ν 1047, 1138, 1226, 1402, 1454, 1495, 1699, 2930, 3031, 3064, 3134 cm^{-1}; CIMS calculated for $(C_{25}H_{24}N_4O_2Na)^+$ 435.1791, found 435.1790 m/z.

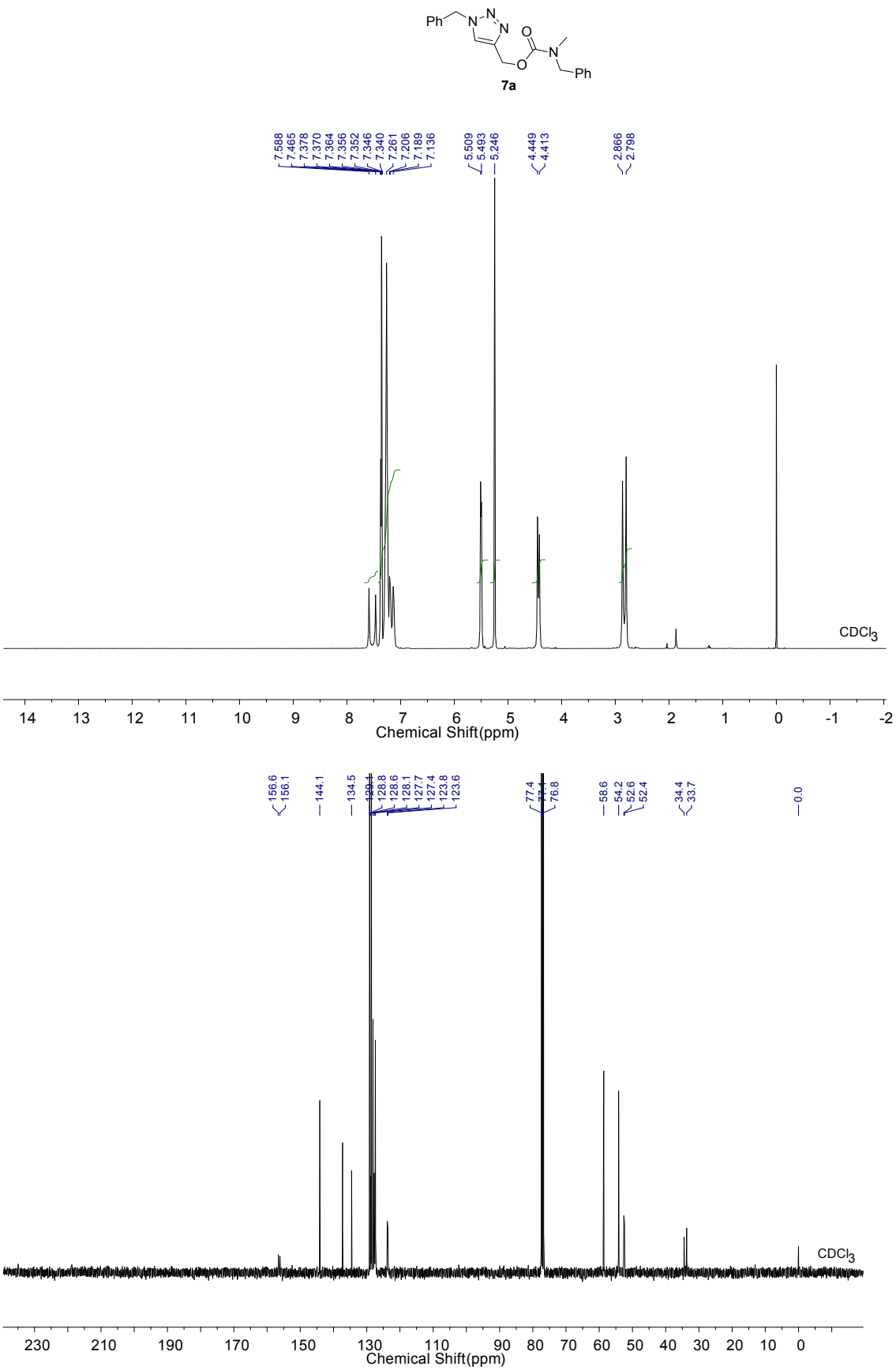

Figure S21 ^{1}H and ^{13}C NMR spectra for **7a**

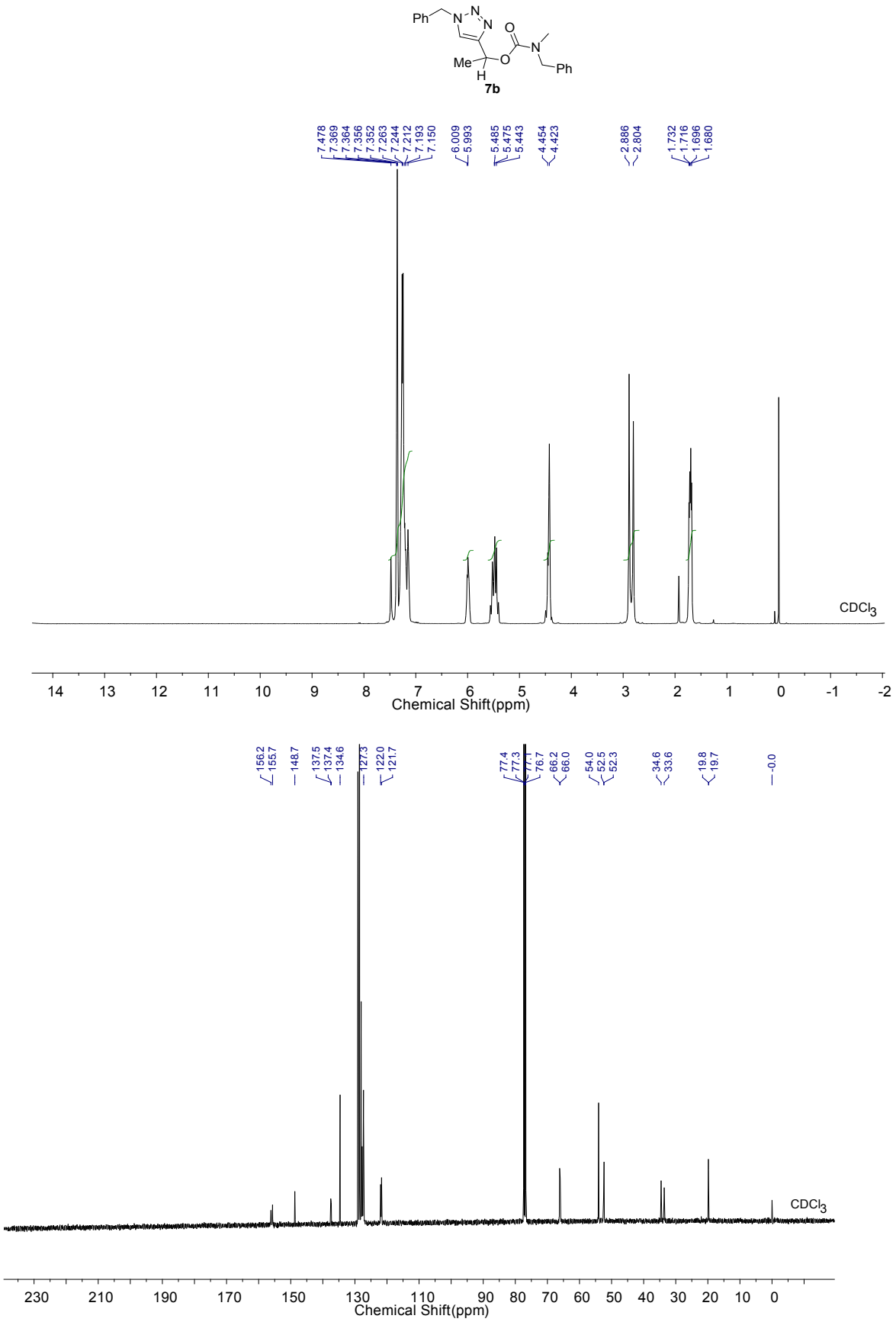

Figure S22 ^{1}H and ^{13}C NMR spectra for **7b**

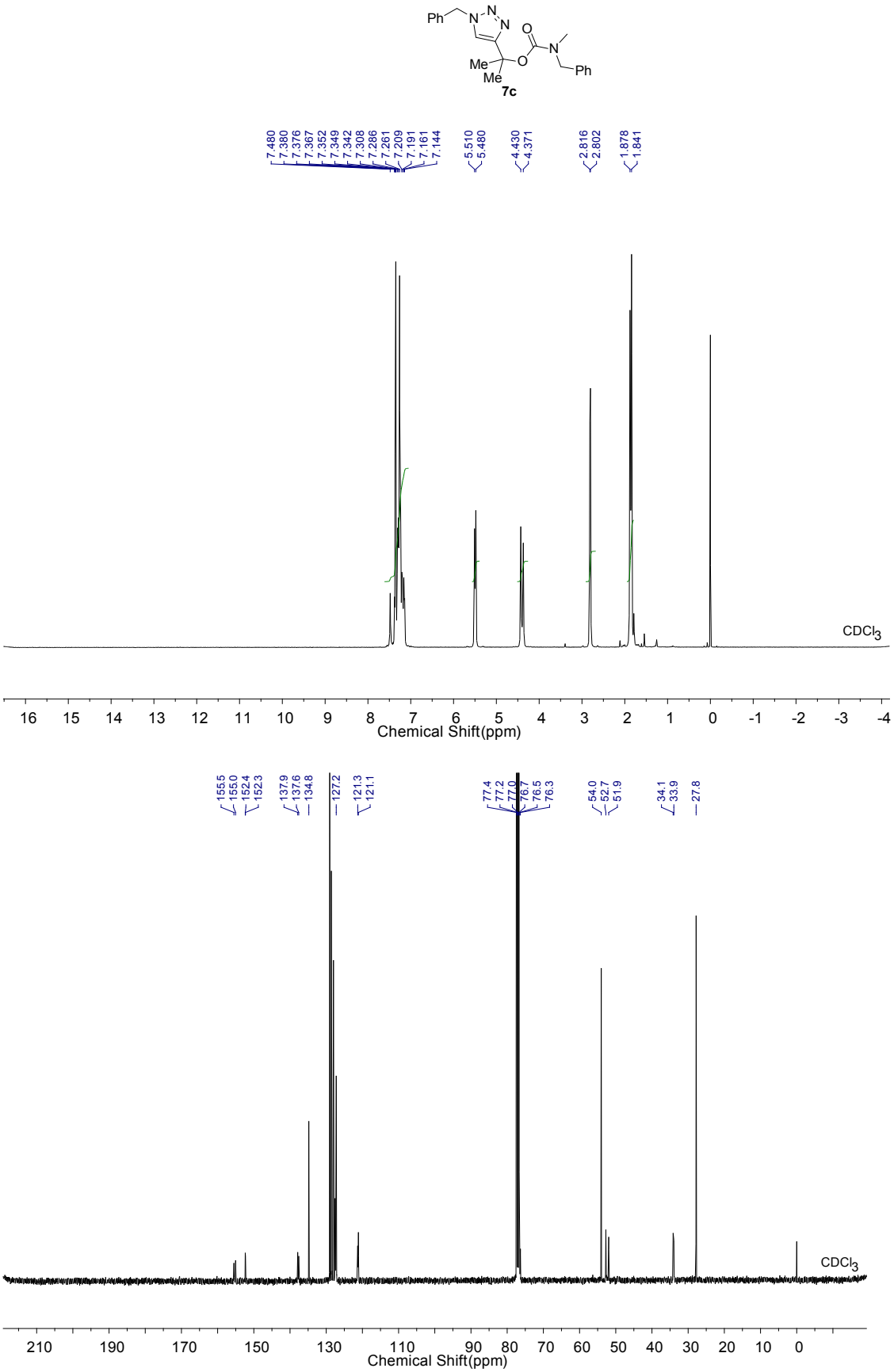

Figure S23 ^{1}H and ^{13}C NMR spectra for **7c**

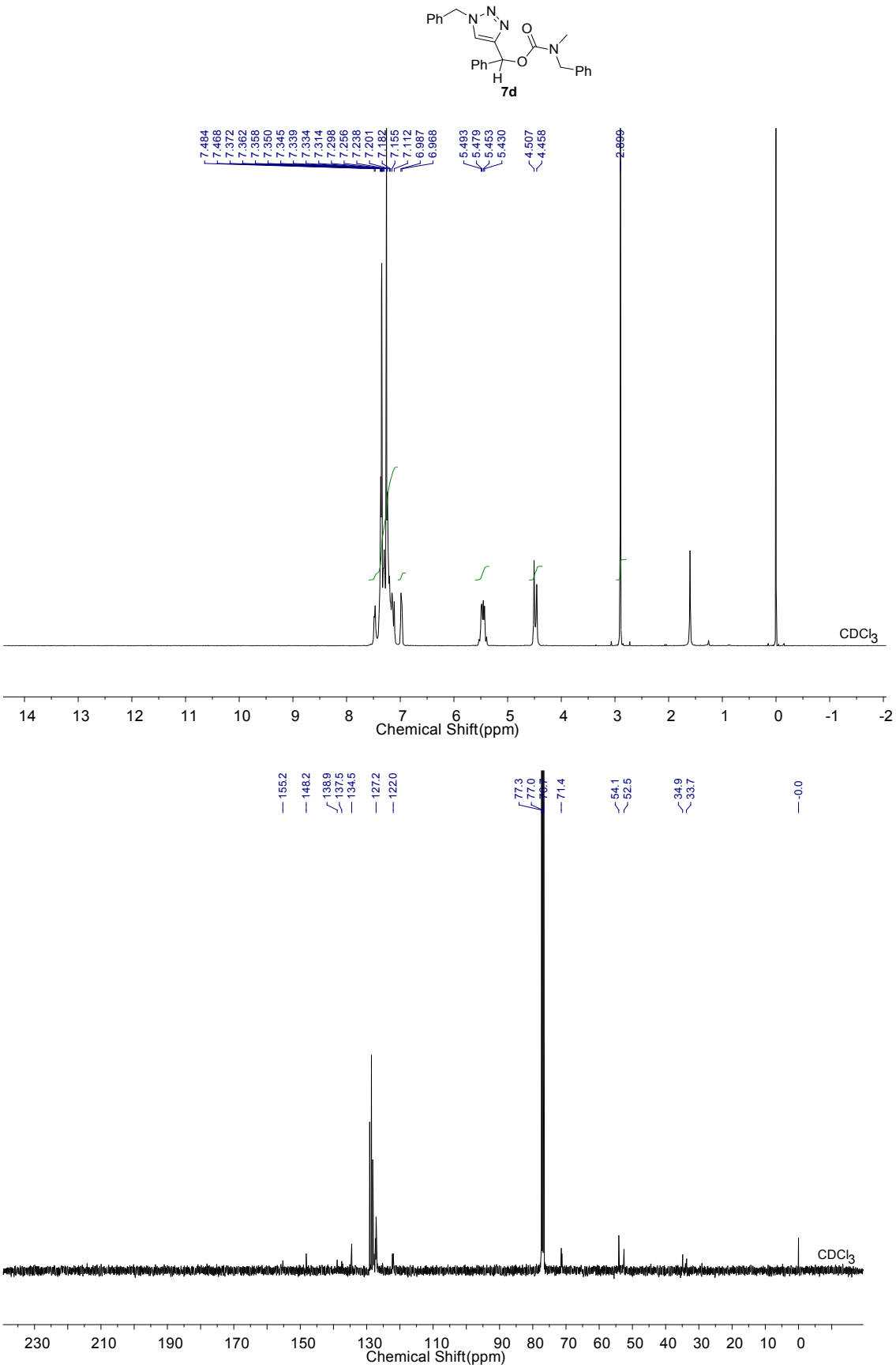

Figure S24 ^{1}H and ^{13}C NMR spectra for **7d**

Method for the synthesis, and characterisation data/spectra of methyl *N*-methylbenzylcarbamate.[1]

Methyl chloroformate (0.72 mL, 9.33 mmol) and pyridine (0.63 mL, 7.77 mmol) were added sequentially dropwise to a stirred solution of *N*-methylbenzylamine (1.00 mL, 7.77 mmol) in dichloromethane (10 mL) under argon at room temperature. After 18 hours continued stirring the mixture was diluted with diethyl ether (20 mL) and washed with water (2 × 25 mL) and saturated aqueous NH_4Cl (25 mL), dried ($MgSO_4$), filtered and concentrated *in vacuo* to afford methyl *N*-methylbenzylcarbamate as a colourless liquid (1.280 g, 92 %). ^{1}H NMR (400 MHz, $CDCl_3$) δ_H 2.83 (3H, s, r_a, NC**H$_3$**) + 2.89 (3H, s, r_b, NC**H$_3$**), 3.75 (3H, s, C**H$_3$**O), 4.46 (2H, s, r_b, NC**H$_2$**) + 4.48 (2H, s, r_a, NC**H$_2$**), 7.21 – 7.29 (3H, m, Ar**H**), 7.32 – 7.35 (2H, m, Ar**H**) ppm; ^{13}C NMR (100 MHz, $CDCl_3$) δ_C 33.55 (r_a, N**C**H$_3$) + 34.37 (r_b, N**C**H$_3$), 52.24 (r_b, N**C**H$_2$) + 52.58 (r_a, N**C**H$_2$), 52.77 (**C**H$_3$O), 127.22 (r_a, 2 × Ar**C**H) + 127.36 (r_b, 2 × Ar**C**H), 127.84 (Ar**C**H), 128.58 (2 × Ar**C**H), 137.50 (Ar**C**), 157.08 (r_b, **C**=O) + 157.43 (r_a, **C**=O) ppm; FTIR (ATR, Ge) ν 3023, 2948, 1695, 1388, 1216, 1140 cm^{-1}; ESIMS calculated for $(C_{10}H_{14}NO_2)^+$ 180.1019, found 180.1012 m/z.

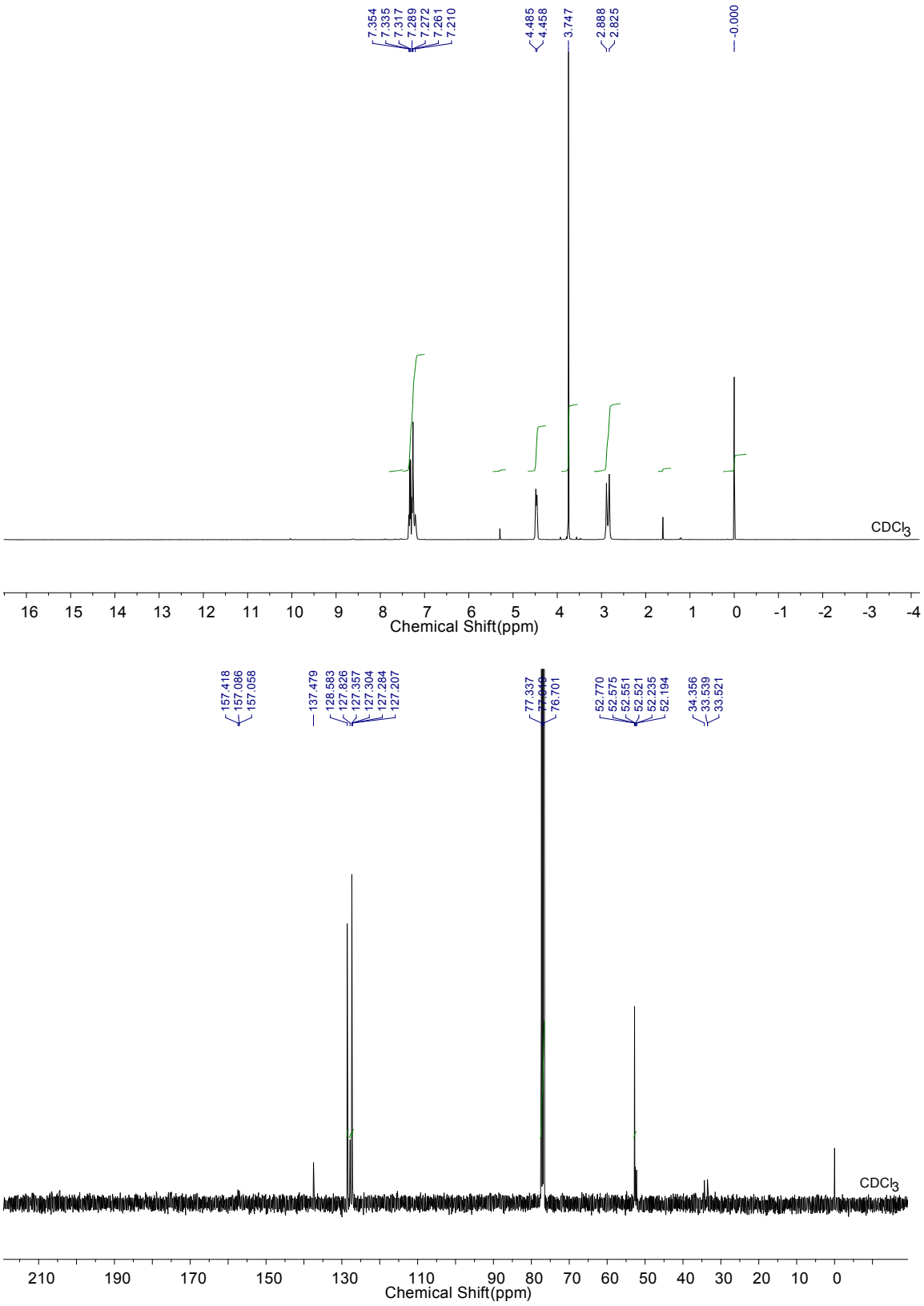

Figure S25 ^{1}H and ^{13}C NMR spectra for methyl *N*-methylbenzylcarbamate

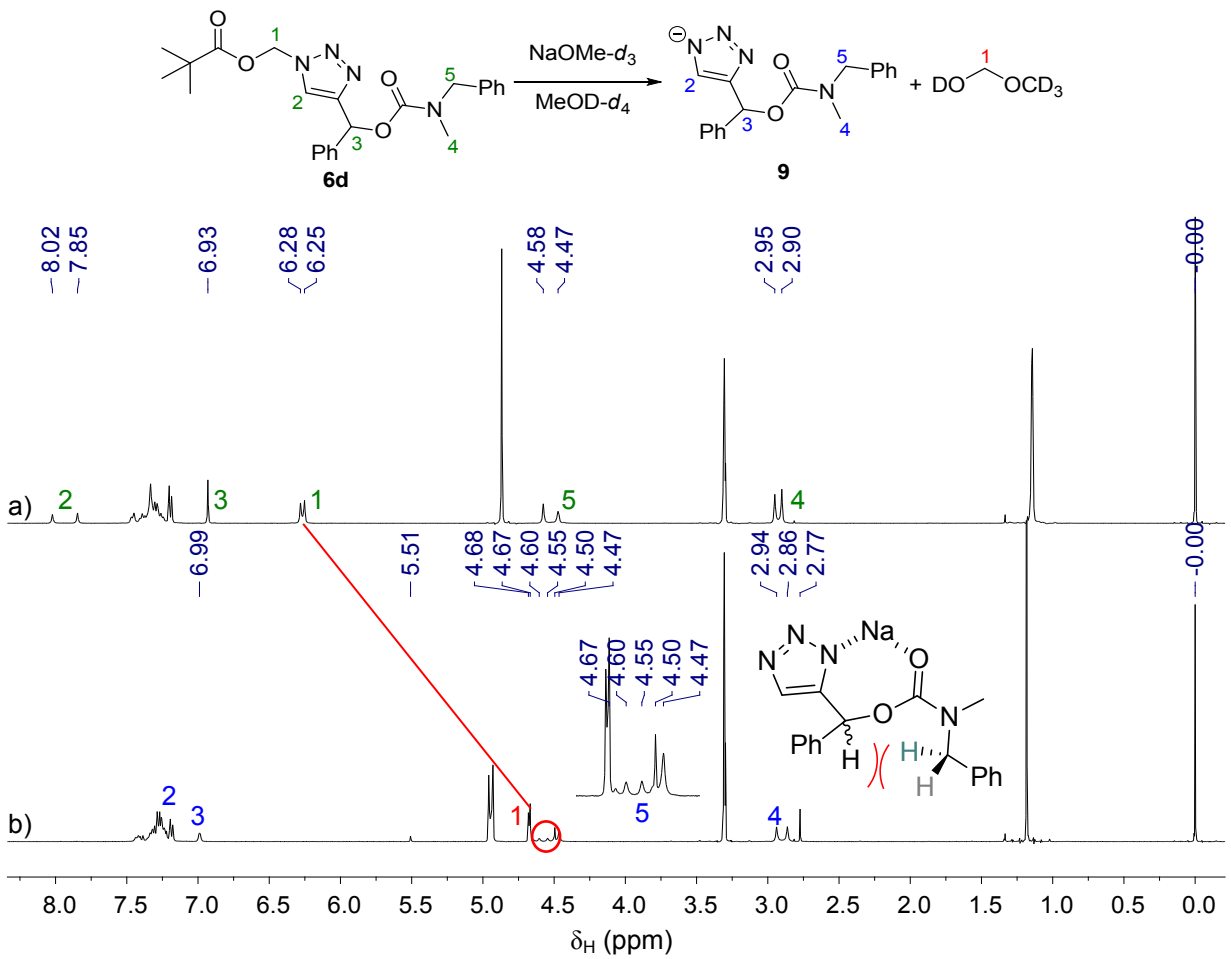

Figure S26 Comparative ^{1}H NMR spectra of the pivaloyloxymethyl deprotection of triazole **6d** to give triazole anion **9** *in situ*. a) t = 0; b) t = 5 minutes, MeOD-d_4; insert – proposed structure that gives rise to the appearance of rotameric resonances.

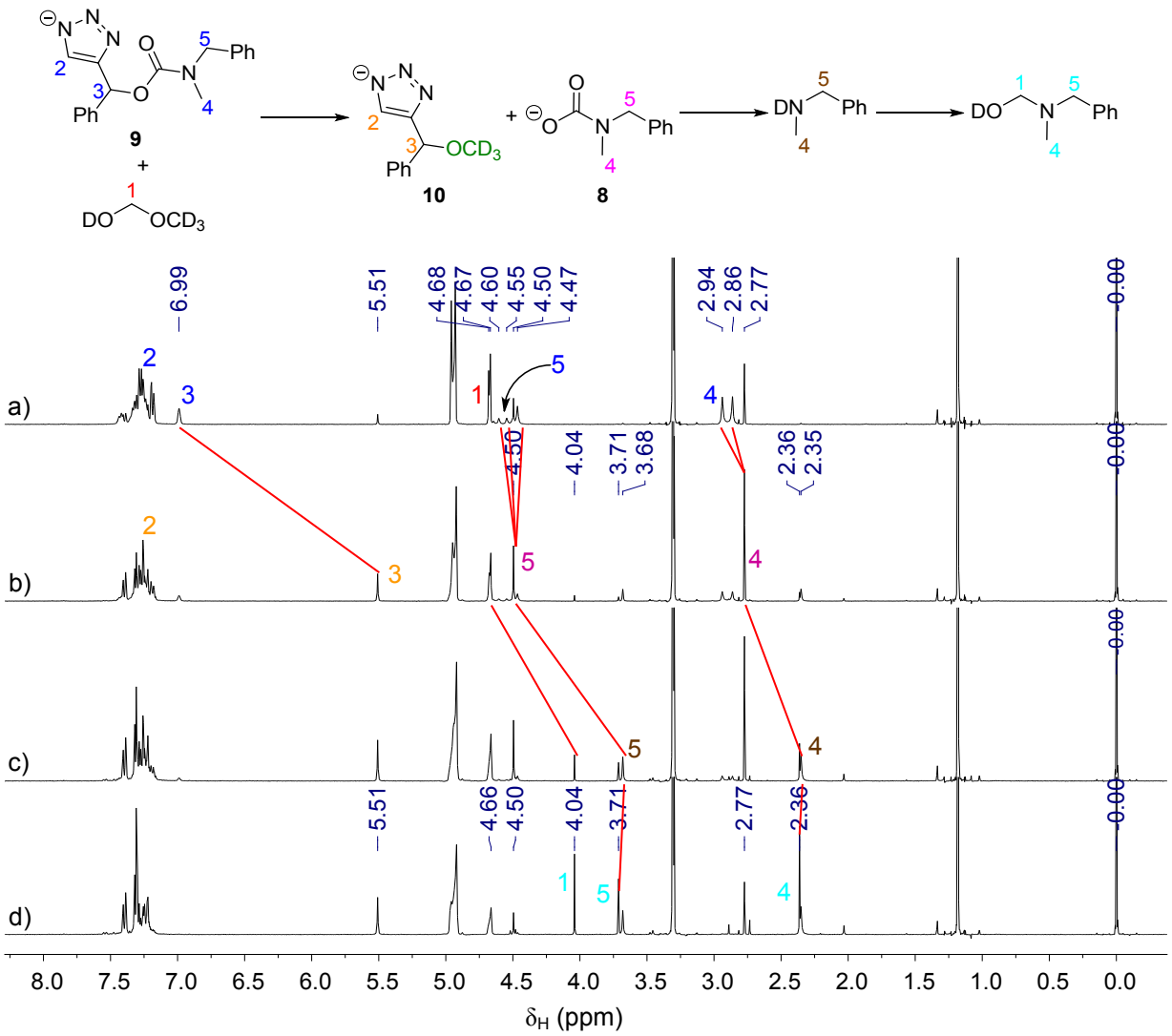

Figure S27 Comparative ^{1}H NMR spectra of the base mediated degradation of triazole **6d** *via* triazole anion **9**. Transient species (e.g. *N*-methylbenzylcarbamate anion **8** and *N*-benzylamine) were observed by this analytical technique. a) t = 5 minutes; b) t = 15 minutes; c) t = 45 minutes; d) t = 100 minutes, MeOD-d_4.

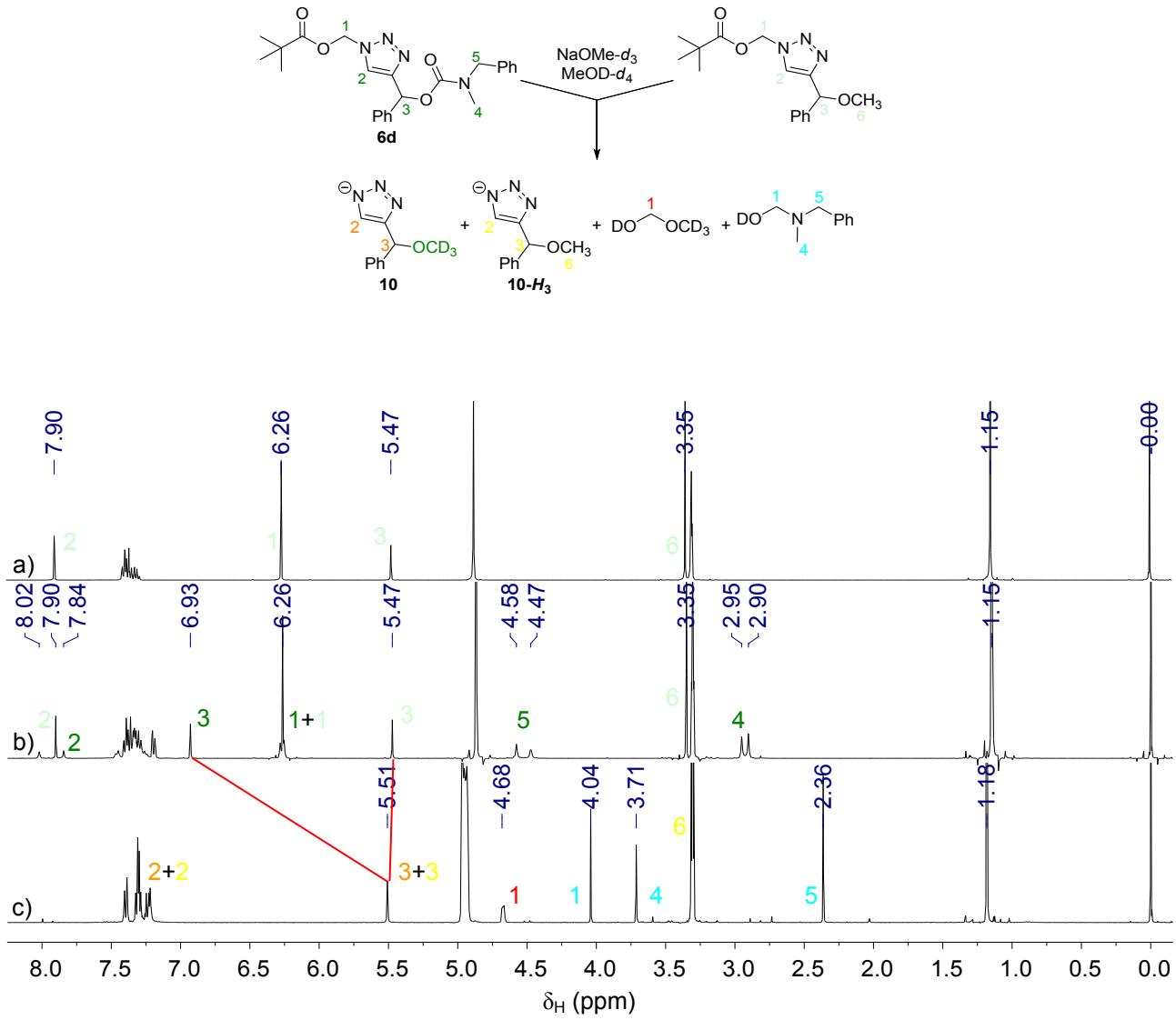

Figure S28 Comparative ^{1}H NMR spectra of the base mediated degradation of a mixture of triazole **6d** and (1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenylmethyl methyl ether. Formation of a common triazole fragment is evidenced by the convolution of α-methine signals at 5.51 ppm. a) triazole **6d**; b) triazole **6d** and (1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenylmethyl methyl ether, t = 0; c) t = 30 hours, MeOD-d_4.

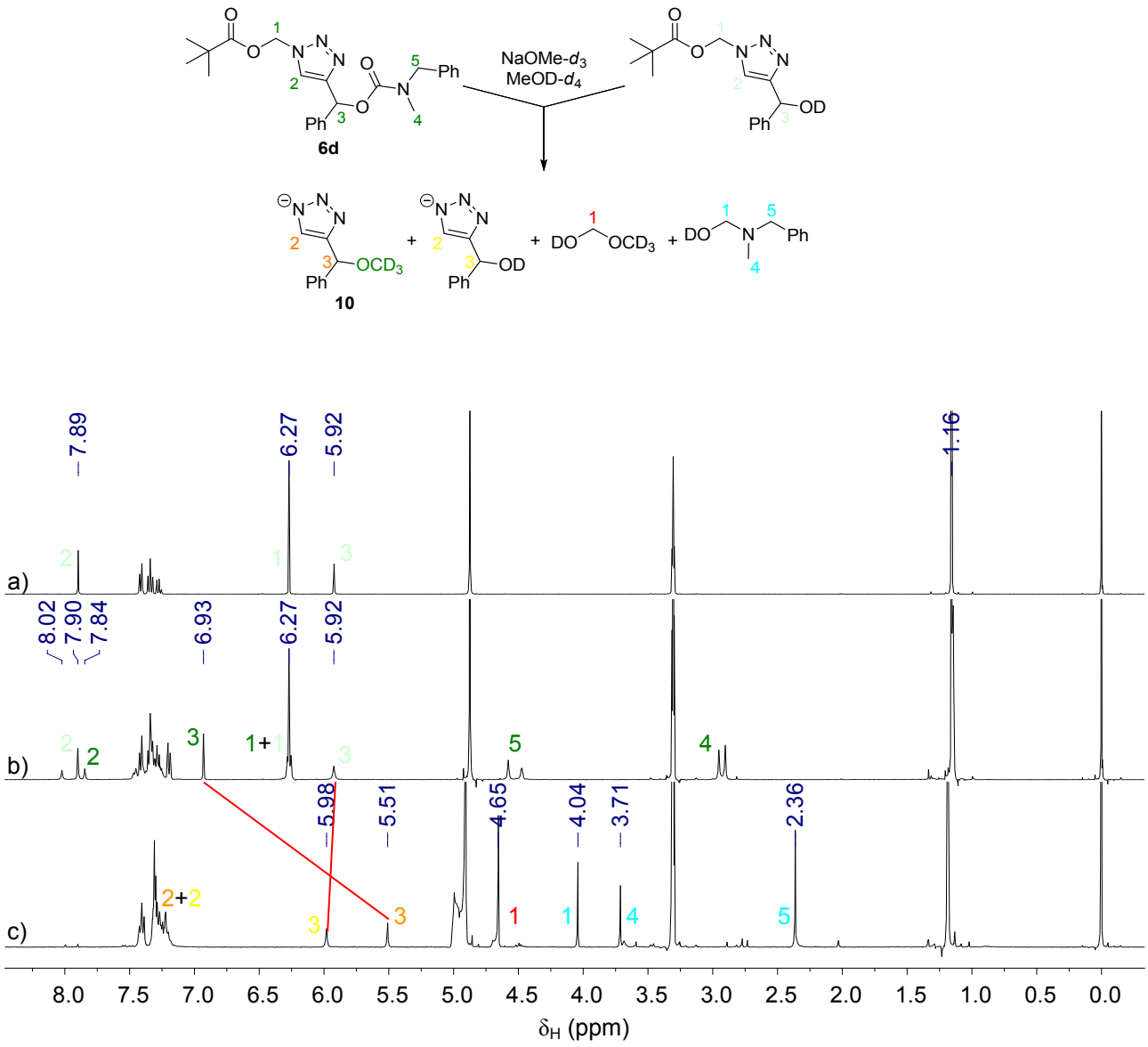

Figure 29 Comparative ^{1}H NMR spectra of the base mediated degradation of a mixture of triazole **6d** and (1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenylmethyl alcohol. Formation of distinct triazole fragments is evidenced by the occurrence of multiple α-methine signals at 5.51 and 5.98 ppm. a) triazole **6d**; b) triazole **6d** and (1-(pivaloyloxymethyl)-1*H*-1,2,3-triazol-4-yl)-1-phenylmethyl alcohol, $t = 0$; c) $t = 2$ hours, MeOD-d_4.

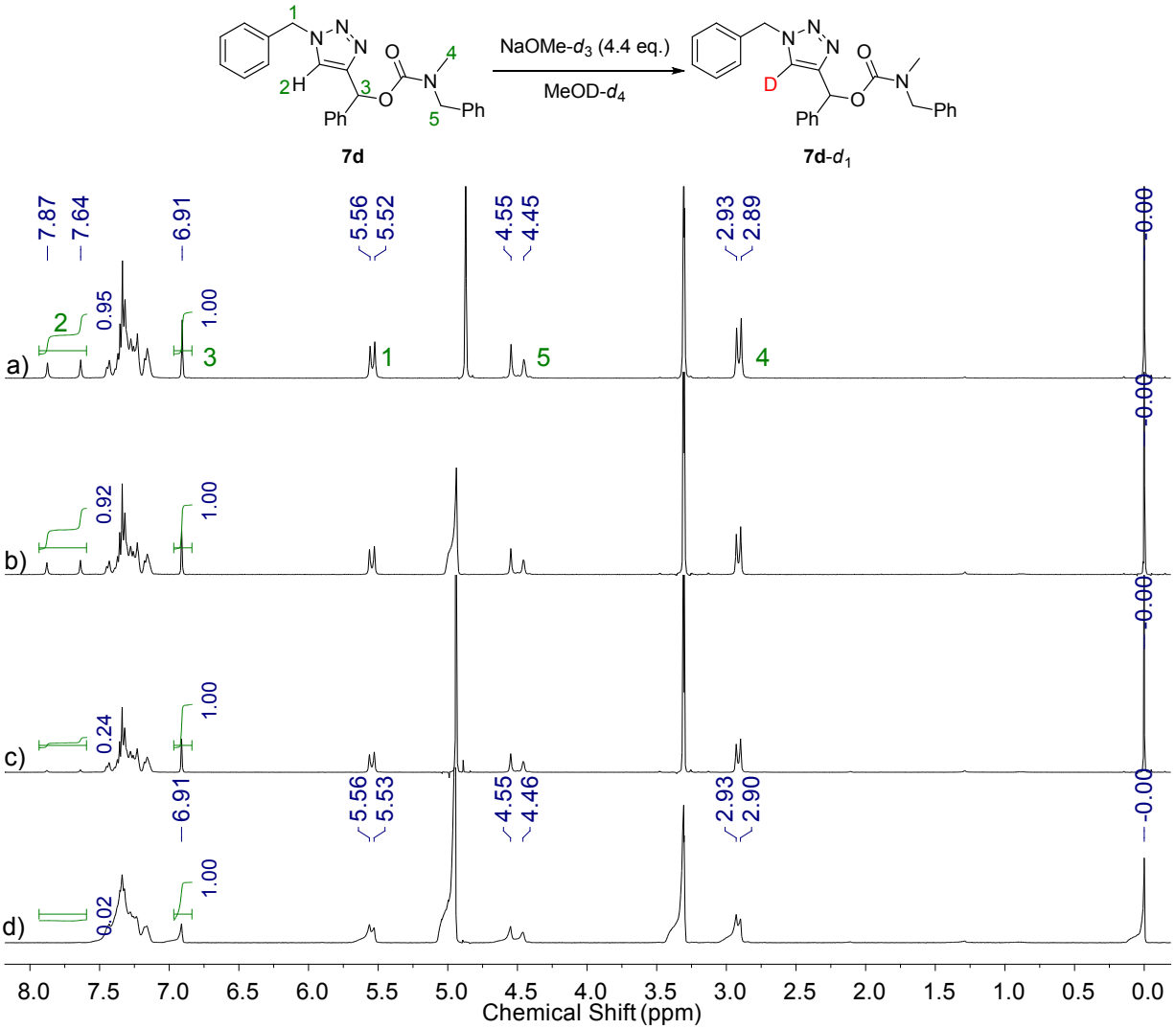

Figure S30 Comparative ^{1}H NMR spectra of the base mediated deuteration of triazole **7d**. a) t = 0; b) t = 1 day; c) t = 7 days; d) t = 28 days, MeOD-d_4.

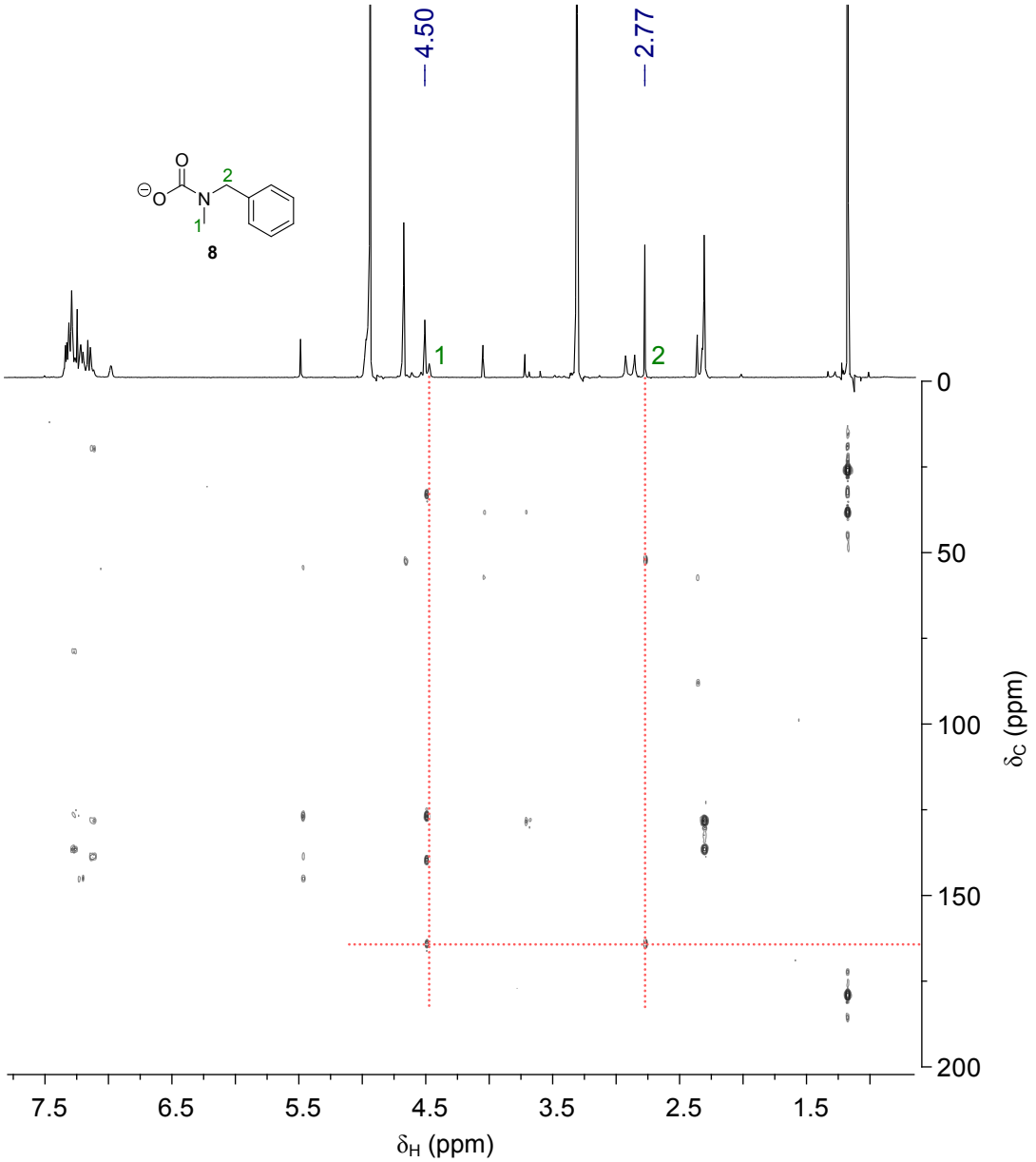

Figure S31 HMBC spectrum of partially degraded triazole **6h** highlighting the formation of *N*-methylbenzylcarbamate anion **8**. t = 4 mins, MeOD-d4.

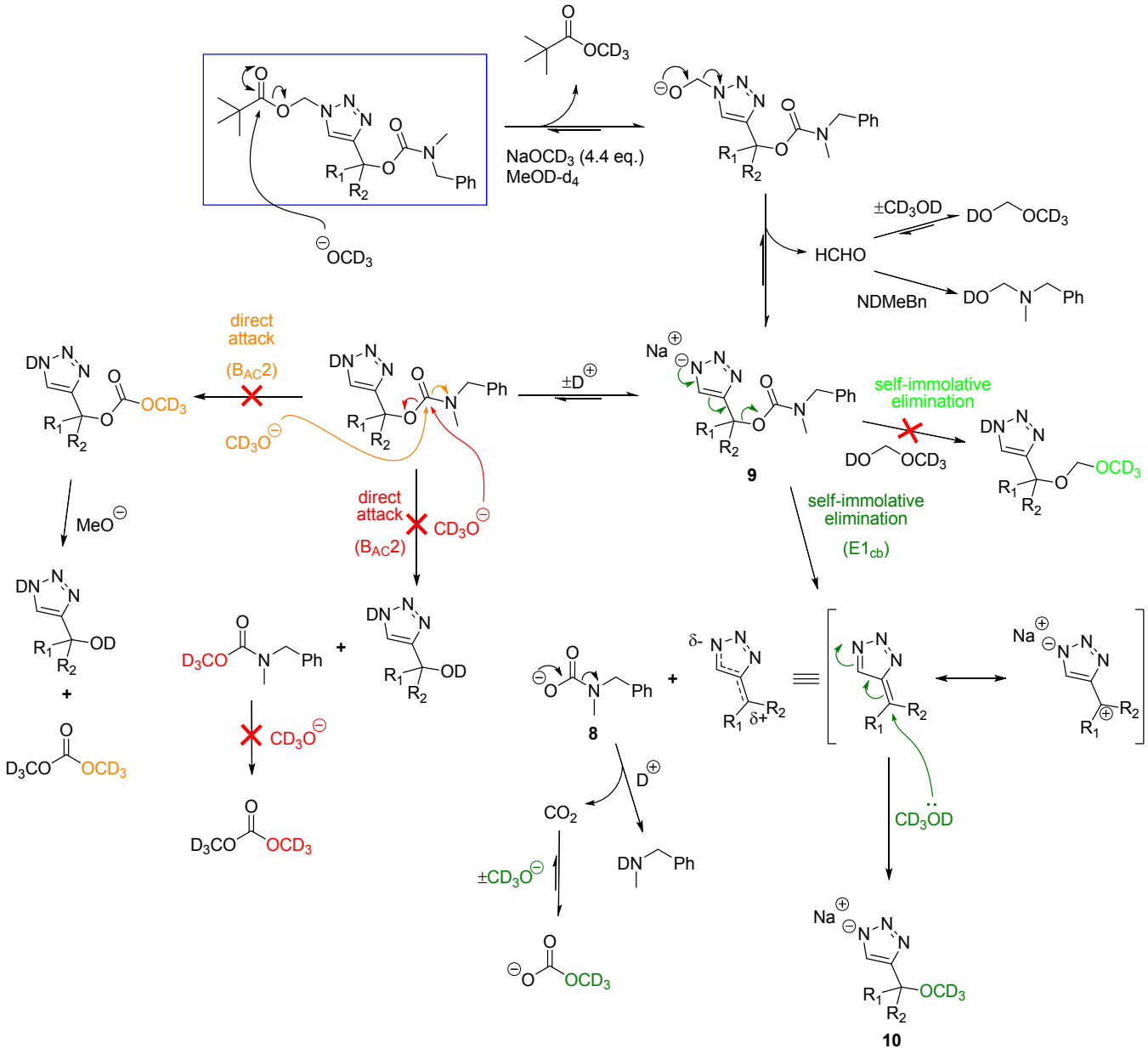

Figure S32 Proposed reaction mechanism for the based mediated degradation of triazoles **6a** – **j**.

References

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