Supporting Information for

Oxidative Debenzylation of *N*-Benzyl Amides and *O*-Benzyl Ethers Using Alkali Metal Bromide

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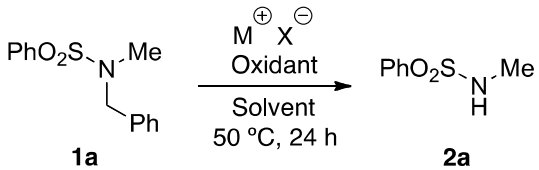
1. General Methods. ^{1}H NMR spectra were measured on a JEOL ECS-400 (400 MHz) spectrometer at ambient temperature. Data were recorded as follows: chemical shift in ppm from internal tetramethylsilane on the δ scale, multiplicity (s = singlet; d = doublet; t = triplet; q = quartet; sep = septet; m = multiplet; br = broad), coupling constant (Hz), integration, and assignment. ^{13}C NMR spectra were measured on a JEOL ECS-400 (100 MHz) spectrometer. Chemical shifts were recorded in ppm from the solvent resonance employed as the internal standard (deuterochloroform at 77.0 ppm). High-resolution mass spectra were recorded by Thermo Fisher Scientific Exactive Orbitrap mass spectrometers. Infrared (IR) spectra were recorded on a JASCO FT/IR 4100 spectrometer. For thin-layer chromatography (TLC) analysis throughout this work, Merck precoated TLC plates (silica gel 60GF254 0.25 mm) were used. The products were purified by neutral column chromatography on silica gel (Kanto Chemical Co., Inc. silica gel 60N, Prod. No. 37560-84; Merck silica gel 60, Prod. No. 1.09385.9929). Visualization was accomplished by UV light (254 nm), anisaldehyde, $KMnO_4$, and phosphomolybdic acid. In experiments that required dry solvents such as nitoromethane and acetonitrile were distilled in prior to use.

2. General procedure for Oxidative Debenzylation of *N*-Benzyl Amides 1 Using Alkali Metal Bromide (Scheme 1, eq 1 and Scheme 2).

To the solution of **1a** (65.3mg, 0.25 mmol) and KBr (29.8 mg, 0.25 mmol) in $MeNO_2$ (1.5 mL) was added Oxone® (230.5 mg, 0.375 mmol) at room temperature, and was stirred at 30 ºC for 24 h. Saturated Na_2SO_3 aqueous solution (10 mL) was added to the reaction mixture, and the product was extracted with AcOEt (15 mL × 3). The combined extracts were washed by brine (10 mL) and dried over Na_2SO_4. The organic phase was concentrated under reduced pressure and the crude product was purified by silica gel column chromatography (eluent: hexane/AcOEt = 5/1), to give the desired product **2a** (42.6 mg, >99% yield).

Table S1. Screening of Oxidative Debenzylation of Benzylamide **1a**.

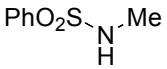


1a **2a**

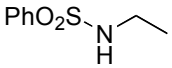
Entry	MX (equiv.)	Oxidant (equiv.)	Solvent	Yield (%)[a]
1	KBr (1.0)	Oxone® (1.2)	$MeNO_2$	95 (5)
2	KBr (1.0)	Oxone® (1.2)	MeCN	92

3	KBr (1.0)	Oxone® (1.2)	AcOEt	52 (48)
4	KBr (1.0)	Oxone® (1.2)	THF	0 (>99)
5	KBr (1.0)	Oxone® (1.2)	$ClCH_2CH_2Cl$	74 (26)
6	KBr (1.0)	*m*CPBA (1.2)	$MeNO_2$	0 (95)
7	KBr (1.0)	*t*-BuOCl (1.2)	$MeNO_2$	0 (>99)
8	KBr (1.0)	$PhI(OAc)_2$ (1.2)	$MeNO_2$	0 (99)
9	KBr (1.0)	H_2O_2 (1.2)	$MeNO_2$	0 (>99)
10	NaBr (1.0)	Oxone® (1.2)	$MeNO_2$	94 (6)
11	$CaBr_2$ (1.0)	Oxone® (1.2)	$MeNO_2$	0 (>99)
12	TBABr (1.0)	Oxone® (1.2)	$MeNO_2$	0 (97)
13	KCl (1.0)	Oxone® (1.2)	$MeNO_2$	12 (88)
14	KI (1.0)	Oxone® (1.2)	$MeNO_2$	0 (>99)
15	KBr (1.0)	Oxone® (1.5)	$MeNO_2$	>99
16	NBS (1.0)	-	$MeNO_2$	3 (45)
17	Br_2 (1.0)	-	$MeNO_2$	25 (58)
18	-	Oxone® (1.2)	$MeNO_2$	0 (>99)
19[b]	KBr (1.0)	Oxone® (1.5)	$MeNO_2$	54 (46)
20[c]	KBr (1.0)	Oxone® (1.5)	$MeNO_2$	>99

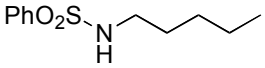
[a] Number in the parentheses indicate the recovery of **1a**. [b] The reaction was carried out under the dark conditions. [c] The reaction was carried out at 30 ºC.



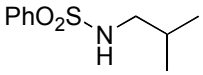
***N*-Methylbenzenesulfonamide (2a, *commercially available*):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.66 (d, *J* = 5.5 Hz, 3H), 4.72 (brs, 1H), 7.50-7.56 (m, 2H), 7.57-7.62 (m, 1H), 7.86-7.90 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 29.3, 127.2 (2C), 129.1 (2C), 132.7, 138.7. IR (neat) 3290, 2924, 1309, 1155, 1092 cm^{-1}. MS (ESI) calcd for $C_7H_{10}NO_2S$ $[M+H]^+$ 172.0427, found 172.0428.



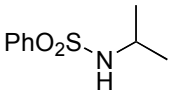
***N*-Ethylbenzenesulfonamide (2b):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.11 (t, *J* = 7.3 Hz, 3H), 3.02 (qd, *J* = 7.3, 6.1 Hz, 2H), 4.57 (brs, 1H), 7.49-7.55 (m, 2H), 7.56-7.61 (m, 1H), 7.87-7.90 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 15.1, 38.2, 127.0 (2C), 129.1 (2C), 132.6, 140.0. IR (neat) 3248, 2979, 1321, 1156, 1089 cm^{-1}. MS (ESI) calcd for $C_8H_{12}NO_2S$ $[M+H]^+$ 186.0583, found 186.0585.



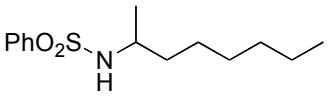
***N*-Pentylbenzenesulfonamide (2c):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.83 (t, *J* = 7.2 Hz, 3H), 1.17-1.30 (m, 4H), 1.45 (quin, *J* = 7.2 Hz, 2H), 2.94 (q, *J* = 7.2 Hz, 2H), 4.80 (brs, 1H), 7.48-7.55 (m, 2H), 7.55-7.61 (m, 1H), 7.86-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 13.8, 22.1, 28.6, 29.3, 43.2, 127.0 (2C), 129.1 (2C), 132.6, 140.0. IR (neat) 3282, 2931, 1322, 1156, 1092 cm^{-1}. MS (ESI) calcd for $C_{11}H_{18}NO_2S$ $[M+H]^+$ 228.1053, found 228.1054.



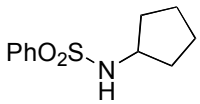
***N*-Isobutylbenzenesulfonamide (2d):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.87 (d, *J* = 6.9 Hz, 6H), 1.64-1.79 (m, 1H), 2.76 (t, *J* = 6.9 Hz, 2H), 4.87-4.95 (br, 1H), 7.48-7.55 (m, 2H), 7.55-7.61 (m, 1H), 7.86-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 19.8 (2C), 28.4, 50.5, 126.9 (2C), 127.0 (2C), 132.5, 140.0. IR (neat) 3287, 2960, 1321, 1156, 1092 cm^{-1}. MS (ESI) calcd for $C_{10}H_{16}NO_2S$ $[M+H]^+$ 214.0896, found 214.0898.



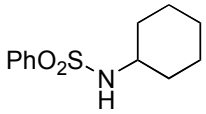
***N*-Isopropylbenzenesulfonamide (2e):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.08 (d, *J* = 6.6 Hz, 6H), 3.41-3.54 (m, 1H), 4.56-4.69 (br, 1H), 7.48-7.54 (m, 2H), 7.54-7.60 (m, 1H), 7.88-7.92 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 27.3 (2C), 46.1, 126.9 (2C), 129.0 (2C), 132.4, 141.1. IR (neat) 3278, 2975, 1305, 1141, 1092 cm^{-1}. MS (ESI) calcd for $C_9H_{14}NO_2S$ $[M+H]^+$ 200.0740, found 200.0740.



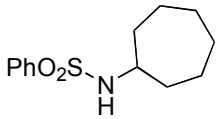
***N*-(1-Methylheptyl)benzenesulfonamide (2f):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.85 (t, *J* = 7.2 Hz, 3H), 1.04 (d, *J* = 6.6 Hz, 3H), 1.07-1.28 (m, 8H), 1.29-1.38 (m, 2H), 3.32 (tq, *J* = 8.2, 6.6 Hz, 1H), 4.29 (brs, 1H), 7.47-7.53 (m, 2H), 7.53-7.60 (m, 1H), 7.86-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 14.0, 21.9, 22.5, 25.4, 28.8, 31.6, 37.5, 50.1, 127.0 (2C), 129.0 (2C), 132.4, 141.2. IR (neat) 3278, 2928, 1322, 1161, 1093 cm^{-1}. MS (ESI) calcd for $C_{14}H_{24}NO_2S$ $[M+H]^+$ 270.1522, found 270.1521.



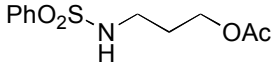
***N*-Cyclopentylbenzenesulfonamide (2g):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.29-1.39 (m, 2H), 1.44-1.55 (m, 2H), 1.57-1.68 (m, 2H), 1.74-1.84 (m, 2H), 3.62 (sext, *J* = 6.9 Hz, 1H), 4.36-4.46 (br, 1H), 7.49-7.55 (m, 2H), 7.55-7.61 (m, 1H), 7.86-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 23.1 (2C), 33.5 (2C), 55.2, 127.0 (2C), 129.0 (2C), 132.5, 140.8. IR (neat) 3274, 2959, 1308, 1152, 1092 cm^{-1}. IR (neat) 3274, 2959, 1308, 1152, 1092 cm^{-1}. MS (ESI) calcd for $C_{11}H_{16}NO_2S$ $[M+H]^+$ 226.0896, found 226.0898.



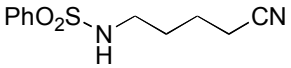
***N*-Cyclohexylbenzenesulfonamide (2h):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.05-1.30 (m, 5H), 1.47-1.57 (m, 1H), 1.58-1.68 (m, 2H), 1.71-1.80 (m, 2H), 3.11-3.21 (m, 1H), 4.47 (brs, 1H), 7.48-7.54 (m, 2H), 7.54-7.60 (m, 1H), 7.87-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 24.6 (2C), 25.1, 33.9 (2C), 52.6, 126.8 (2C), 129.0 (2C), 132.4, 141.4. IR (neat) 3246, 2932, 1318, 1156, 1080 cm^{-1}. MS (ESI) calcd for $C_{12}H_{18}NO_2S$ $[M+H]^+$ 240.1053, found 240.1052.



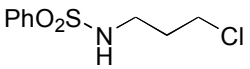
***N*-Cycloheptylbenzenesulfonamide (2i):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.30-1.61 (m, 10H), 1.71-1.82 (m, 2H), 3.31-3.42 (m, 1H), 4.41-4.56 (br, 1H), 7.51 (t, *J* = 7.3 Hz, 2H), 7.57 (t, *J* = 7.3 Hz, 1H), 7.88 (t, *J* = 7.3 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 23.5 (2C), 27.9 (2C), 35.9 (2C), 54.8, 126.9 (2C), 129.0 (2C), 132.4, 141.2. IR (neat) 3249, 2926, 1308, 1152, 1092, 1040 cm^{-1}. MS (ESI) calcd for $C_{13}H_{20}NO_2S$ $[M+H]^+$ 254.1209, found 254.1208.



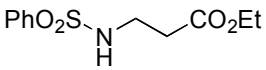
***N*-(2-(Acetoxy)propyl)benzenesulfonamide (2j):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.81 (quin, *J* = 6.4 Hz, 2H), 2.02 (s, 3H), 3.04 (q, *J* = 6.4 Hz, 2H), 4.10 (t, *J* = 6.4 Hz, 2H), 4.80-4.88 (br, 1H), 7.53 (t, *J* = 7.3 Hz, 2H), 7.59 (t, *J* = 7.3 Hz, 1H), 7.87 (d, *J* = 7.3 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 20.8, 28.9, 40.1, 61.3, 127.0 (2C), 129.1 (2C), 132.7, 139.9, 171.1. IR (neat) 3276, 2927, 1733, 1325, 1239, 1155, 1049 cm^{-1}. MS (ESI) calcd for $C_{11}H_{16}NO_4S$ $[M+H]^+$ 258.0795, found 258.0793.



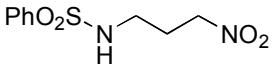
***N*-(4-Cyanobutyl)benzenesulfonamide (2k):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.59-1.76 (m, 4H), 2.35 (t, *J* = 6.8 Hz, 2H), 3.00 (q, *J* = 6.4 Hz, 2H), 4.76-4.86 (br, 1H), 7.51-7.57 (m, 2H), 7.58-7.64 (m, 1H), 7.85-7.89 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 16.7, 22.2, 28.5, 42.2, 119.2, 127.0 (2C), 129.2 (2C), 132.8, 139.7. IR (neat) 3276, 2925, 2247, 1323, 1154, 1092 cm^{-1}. MS (ESI) calcd for $C_{11}H_{15}N_2O_2S$ $[M+H]^+$ 239.0849, found 239.0847.



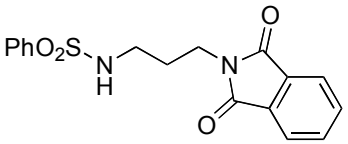
***N*-(3-Chloropropyl)benzenesulfonamide (2l):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.96 (quin, *J* = 6.4 Hz, 2H), 3.15 (q, *J* = 6.4 Hz, 2H), 3.58 (t, *J* = 6.4 Hz, 2H), 4.62-4.71 (br, 1H), 7.51-7.57 (m, 2H), 7.58-7.64 (m, 1H), 7.86-7.91 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 32.2, 40.4, 41.8, 127.0 (2C), 129.2 (2C), 132.8, 139.7. IR (neat) 3279, 2965, 1321, 1153, 1092, 752, 687 cm^{-1}. MS (ESI) calcd for $C_9H_{13}ClNO_2S$ $[M+H]^+$ 234.0350, found 234.0350.



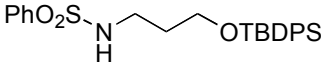
***N*-Benzenesulfonyl-β-alanine ethyl ester (2m):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.24 (t, *J* = 7.3 Hz, 3H), 2.53 (t, *J* = 6.2 Hz, 2H), 3.21 (q, *J* = 6.2 Hz, 2H), 4.12 (q, *J* = 7.3 Hz, 2H), 5.15-5.28 (br, 1H), 7.49-7.56 (m, 2H), 7.56-7.62 (m, 1H), 7.85-7.90 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 14.1, 34.0, 38.8, 61.0, 126.9 (2C), 129.2 (2C), 132.7, 139.9, 172.1. IR (neat) 3283, 2985, 1725, 1325, 1155, 1092 cm^{-1}. MS (ESI) calcd for $C_{11}H_{16}NO_4S$ $[M+H]^+$ 258.0795, found 258.0794.



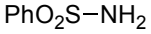
***N*-(3-Nitropropyl)benzenesulfonamide (2n):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.22 (quin, *J* = 6.6 Hz, 2H), 3.11 (q, *J* = 6.6 Hz, 2H), 4.50 (t, *J* = 6.6 Hz, 2H), 4.61-4.67 (br, 1H), 7.52-7.57 (m, 2H), 7.58-7.65 (m, 1H), 7.84-7.88 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 27.4, 39.9, 72.2, 127.0 (2C), 129.3 (2C), 133.0, 139.3. IR (neat) 3270, 2974, 1550, 1316, 1158, 1069 cm^{-1}. MS (ESI) calcd for $C_9H_{13}N_2O_4S$ $[M+H]^+$ 245.0591, found 245.0590.



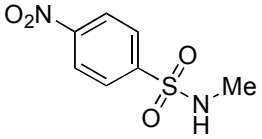
***N*-(3-(1,3-Dioxoisoindolin-2-yl)propyl)benzenesulfonamide (2o):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.84 (quin, *J* = 6.4 Hz, 2H), 2.96 (q, *J* = 6.4 Hz, 2H), 3.75 (t, *J* = 6.4 Hz, 2H), 5.27-5.35 (br, 1H), 7.46-7.57 (m, 3H), 7.70-7.75 (m, 2H), 7.79-7.85 (m, 2H), 7.86-7.90 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 28.8, 34.5, 39.9, 123.4 (2C), 127.0 (2C), 129.1 (2C), 131.8, 132.5 (2C), 134.2 (2C), 140.1, 168.6 (2C). IR (neat) 3269, 2973, 1709, 1338, 1162, 1044 cm^{-1}. MS (ESI) calcd for $C_{17}H_{17}N_2O_4S$ $[M+H]^+$ 345.0904, found 345.0902.



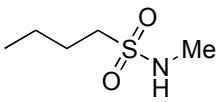
***N*-(3-((*tert*-Butyldiphenylsilyl)oxy)propyl)benzenesulfonamide (2p):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.04 (s, 9H), 1.64-1.73 (m, 2H), 3.15 (q, *J* = 6.2 Hz, 2H), 3.67 (t, *J* = 5.5 Hz, 2H), 5.04-5.13 (br, 1H), 7.34-7.40 (m, 4H), 7.41-7.46 (m, 2H), 7.46-7.52 (m, 2H), 7.55-7.61 (m, 5H), 7.79-7.84 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 19.0, 26.8 (3C), 31.1, 41.9, 62.8, 127.0 (2C), 127.8 (4C), 129.0 (2C), 129.8 (2C), 132.4, 133.0 (2C), 135.4 (4C), 134.0. IR (neat) 3285, 1326, 1160, 1109, 1090 cm^{-1}. MS (ESI) calcd for $C_{25}H_{32}NO_3SSi$ $[M+H]^+$ 454.1867, found 454.1862.



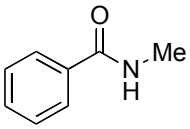
Benzenesulfonamide (2q, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 4.85 (brs, 2H), 7.50-7.57 (m, 2H), 7.57-7.63 (m, 1H), 7.92-7.97 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 126.4 (2C), 129.2 (2C), 132.8, 141.9. IR (neat) 3346, 3251, 1722, 1688, 1310, 1274, 1154 cm^{-1}. MS (ESI) calcd for $C_6H_7NNaO_2S$ $[M+Na]^+$ 180.0090, found 180.0089.



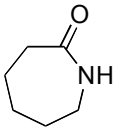
***N*-Methyl-4-nitrobenzenesulfonamide (2r):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.74 (d, *J* = 5.2 Hz, 3H), 4.50-4.75 (br, 1H), 8.06 (dt, *J* = 9.0, 2.3 Hz, 2H), 8.38 (dt, *J* = 9.0, 2.3 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 29.3, 124.4 (2C), 128.4 (2C), 144.9, 150.1. IR (neat) 3302, 2971, 1530, 1306, 1160, 1090 cm^{-1}. MS (ESI) calcd for $C_7H_7N_2O_4S$ $[M–H]^–$ 215.0121, found 215.0132.



***N*-Methyl-1-butanesulsonamide (2s):** Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.96 (t, J = 7.4 Hz, 3H), 1.47 (sext, J = 7.4 Hz, 2H), 1.74-1.84 (m, 2H), 2.81 (d, J = 5.5 Hz, 3H), 2.98-3.05 (m, 2H), 4.21-4.37 (br, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 13.6, 21.5, 25.6, 29.3, 51.1. IR (neat) 3296, 2962, 1314, 1128, 1074 cm^{-1}. MS (ESI) calcd for $C_5H_{13}NNaO_2S$ $[M+Na]^+$ 174.0559, found 174.0560.



***N*-Methylbenzamide (2t, *commercially available*):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 3.02 (d, J = 5.2 Hz, 3H), 6.15 (brs, 1H), 7.39-7.46 (m, 2H), 7.46-7.53 (m, 1H), 7.73-7.79 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 26.8, 126.8 (2C), 128.5 (2C), 131.3, 134.6, 168.2. IR (neat) 3321, 2939, 1633, 1547, 1302, 1163 cm^{-1}.

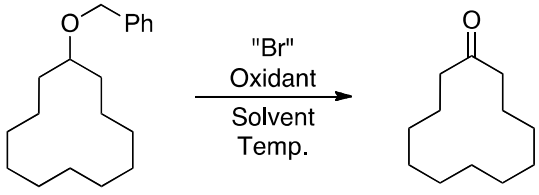


ε-Caprolactam (2u): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.60-1.82 (m, 6H), 2.43-2.51 (m, 2H), 3.21 (dd, J = 10.0, 6.2 Hz, 2H), 6.08 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 23.2, 29.8, 30.6, 36.6, 42.9, 178.9. IR (neat) 3197, 3072, 2927, 1652, 1416, 1198 cm^{-1}.

3. General procedure for Oxidative Debenzylation of *O*-Benzyl Ethers 3 Using Alkali Metal Bromide (Scheme 1, eq 2 and Scheme 3)

To the solution of **3a** (68.6mg, 0.25 mmol) and KBr (29.8 mg, 0.25 mmol) in MeCN (1.5 mL) was added Oxone® (230.5 mg, 0.375 mmol) at 0 ºC. The reaction mixture was stirred at 0 ºC for 30 min, and then at 30 ºC for 24 h. Saturated Na_2SO_3 aqueous solution (10 mL) was added to the reaction mixture, and the product was extracted with AcOEt (15 mL × 3). The combined extracts were washed by brine (10 mL) and dried over Na_2SO_4. The organic phase was concentrated under reduced pressure and the crude product was purified by silica gel column chromatography (eluent: hexane/AcOEt = 30/1), to give the desired product **4a** (43.5 mg, 95% yield).

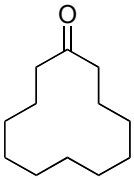
Table S1. Screening for Oxidation involved Debenzylation of Benzyl cyclododecylether **3a**.



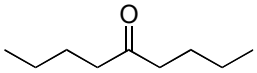
3a **4a**

Entry	MX (equiv)	Oxone® (equiv)	Solvent	Temp. (ºC)	Yield (%)
1	KBr (1.0)	1.5	$MeNO_2$	30	40 (15)[a](15)[b]
2	KBr (1.0)	1.5	$MeNO_2$	r.t.	44 (4)[a](19)[b]
3	KBr (1.0)	3.0	$MeNO_2$	30	27
4	KBr (1.2)	2.0	$MeNO_2$	30	74
5	KBr (1.2)	2.0	MeCN	30	42 (22)[a]
6	KBr (1.2)	2.0	MeCN	0 to 30	75
7	KBr (1.2)	2.0	$MeNO_2$	0 to 30	38 (7)[a]
8	KBr (1.2)	2.0	MeCN	0	0 (86)[a]
9	KBr (1.0)	1.5	MeCN	0 to 30	69 (6)[c]
10	KBr (1.0)	1.2	MeCN	0 to 30	32 (19)[a] (36)[c]
11[d]	KBr (1.0)	1.5	MeCN	0 to 30	95
12	KCl (1.0)	1.5	MeCN	0 to 30	34 (10)[a](19)[e]
13	KI (1.0)	1.5	MeCN	0 to 30	0 (>99)[a]

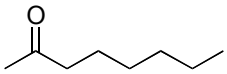
[a] Number in the parentheses indicates the recovery of **3a**. [b] Number in the parentheses indicates the yield of cyclododecyl alcohol. [c] Number in the parentheses indicates the yield of α-bromo-cyclododecanone. [d] Reaction was carried out under the dark conditions. [e] Number in the parenthesis indicates the yield of α-chloro-cyclododecanone.



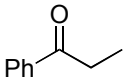
Cyclododecanone (4a, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.22-1.37 (m, 14H), 1.67-1.76 (m, 4H), 2.44-2.49 (m, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 22.3, 22.5 (2C), 24.2 (2C), 24.6 (2C), 24.7 (2C), 40.3 (2C), 212.9. IR (neat) 2927, 1702, 1470, 1362, 1204, 1131 cm^{-1}.



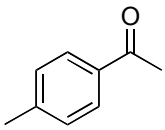
5-Nonanonne (4b, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.90 (t, *J* = 7.6 Hz, 6H), 1.31 (sext, *J* = 7.6 Hz, 4H), 1.55 (quin, *J* = 7.6 Hz, 4H), 2.39 (t, *J* = 7.6 Hz, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 13.8 (2C), 22.3 (2C), 26.0 (2C), 42.5 (2C), 211.7. IR (neat) 2958, 1712, 1465, 1379, 1133, 1043 cm^{-1}.



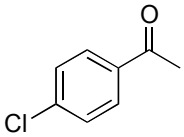
2-Octanone (4c, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.88 (t, *J* = 6.9 Hz, 3H), 1.24-1.36 (m, 6H), 1.52-1.62 (m, 2H), 2.13 (s, 3H), 2.42 (t, *J* = 7.6 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 14.0, 22.4, 23.8, 28.8, 29.8, 31.5, 43.7, 209.3. IR (neat) 2928, 1715, 1410, 1359, 1226, 1164 cm^{-1}.



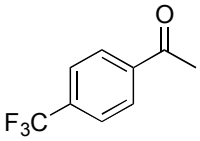
Propiophenone (4d, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.23 (t, *J* = 7.3 Hz, 3H), 3.00 (q, *J* = 7.3 Hz, 2H), 7.45 (t, *J* = 7.8 Hz, 2H), 7.55 (t, *J* = 7.8 Hz, 1H), 7.97 (d, *J* = 7.8 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 8.2, 31.7, 127.9 (2C), 128.5 (2C), 132.8, 136.8, 200.7. IR (neat) 2979, 1685, 1597, 1448, 1351, 1218 cm^{-1}.



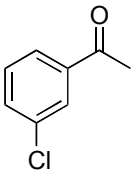
4-Methylacetophenone (4e, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.41 (s, 3H), 2.58 (s, 3H), 7.26 (d, *J* = 8.2 Hz, 2H), 7.86 (d, *J* = 8.2 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 21.6, 26.5, 128.4 (2C), 129.2 (2C), 134.7, 143.8, 197.8. IR (neat) 1679, 1605, 1574, 1265, 1181 cm^{-1}.



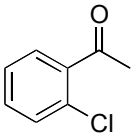
4-Chloroacetophenone (4f, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.59 (s, 3H), 7.44 (d, *J* = 8.9 Hz, 2H), 7.90 (d, *J* = 8.9 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 26.6, 128.9 (2C), 129.7 (2C), 135.4, 139.6, 196.8. IR (neat) 1683, 1587, 1357, 1258, 1092 cm^{-1}.



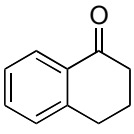
4-Trifluoromethylacetophenone (4g, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.66 (s, 3H), 7.74 (d, J = 8.2 Hz, 2H), 8.07 (d, J = 8.2 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 26.7, 123.6 (q, $J_{C–F}$ = 274.0 Hz), 125.6 (q, $J_{C–F}$ = 3.8 Hz) (2C), 128.6 (2C), 134.4 (q, $J_{C–F}$ = 32.6 Hz), 139.6, 196.9. IR (neat) 2971, 1690, 1321, 1164, 1125, 1110, 1060 cm^{-1}.



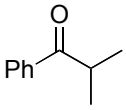
3-Chloroacetophenone (4h, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.60 (s, 3H), 7.41 (t, J = 8.0 Hz, 1H), 7.54 (ddd, J = 8.0, 2.0, 1.2 Hz, 1H), 7.83 (ddd, J = 8.0, 2.0, 1.2 Hz, 1H), 7.93 (t, J = 2.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 26.6, 126.4, 128.4, 129.9, 133.0, 134.9, 138.5, 196.7. IR (neat) 1688, 1572, 1422, 1358, 1251 cm^{-1}.



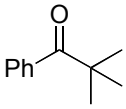
2-Chloroacetophenone (4i, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.65 (s, 3H), 7.32 (ddd, J = 7.8, 7.1, 1.8 Hz, 1H), 7.36-7.44 (m, 2H), 7.55 (dd, J = 7.8, 1.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 30.7, 126.9, 129.4, 130.6, 131.3, 132.0, 139.1, 200.5. IR (neat) 1695, 1432, 1357, 1276, 1240, 1095 cm^{-1}.



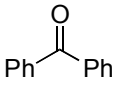
α-Tetralone (4j, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.14 (quin, J = 6.4 Hz, 2H), 2.66 (t, J = 6.4 Hz, 2H), 2.97 (t, J = 6.4 Hz, 2H), 7.25 (d, J = 7.6 Hz, 1H), 7.30 (t, J = 8.0 Hz, 1H), 7.47 (td, J = 7.6, 1.4 Hz, 1H), 8.03 (dd, J = 8.0, 1.4 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 23.4, 29.7, 39.1, 126.6, 127.1, 128.7, 132.6, 133.4, 144.4, 198.4. IR (neat) 2944, 1679, 1600, 1324, 1284 cm^{-1}.



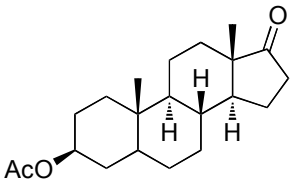
Isobutyrophenone (4k, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.22 (d, *J* = 6.9 Hz, 6H), 3.56 (sept, *J* = 6.9 Hz, 1H), 7.46 (t, *J* = 7.3 Hz, 2H), 7.55 (t, *J* = 7.3 Hz, 1H), 7.96 (d, *J* = 7.3 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 19.2 (2C), 35.4, 128.4 (2C), 128.7 (2C), 132.9, 136.3, 204.6. IR (neat) 2972, 1684, 1465, 1383, 1225, 1161 cm^{-1}.



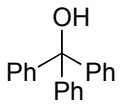
Pivalophenone (4l, *commercially available*): Colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.35 (s, 9H), 7.39 (tt, *J* = 7.3, 1.6 Hz, 2H), 7.45 (tt, *J* = 7.3, 1.6 Hz, 1H), 7.68 (dt, *J* = 7.3, 1.6 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 27.9 (3C), 44.1, 127.8 (2C), 128.0 (2C), 130.7, 138.5, 209.2. IR (neat) 2969, 1674, 1476, 1366, 1277, 1175 cm^{-1}.



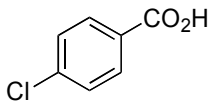
Benzophenone (4m, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (t, *J* = 7.8 Hz, 4H), 7.60 (t, *J* = 7.8 Hz, 2H), 7.81 (d, *J* = 7.8 Hz, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 128.2 (4C), 130.0 (4C), 132.2 (2C), 137.6 (2C), 196.7. IR (neat) 3055, 1652, 1596, 1319, 1278 cm^{-1}.



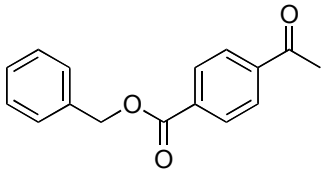
(3β,5α)-3-(Acethyloxy)-androstan-17-one (5n): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 0.67-0.76 (m, 1H), 0.85 (s, 3H), 0.86 (s, 3H), 0.91-1.10 (m, 2H), 1.14-1.42 (m, 7H), 1.43-1.58 (m, 3H), 1.58-1.70 (m, 2H), 1.70-1.87 (m, 4H), 1.88-1.98 (m, 1H), 2.02 (s, 3H), 2.01-2.12 (m,1H), 2.43 (dd, *J* = 19.5, 8.2 Hz, 1H), 4.63-4.74 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 12.2, 13.8, 20.4, 21.4, 21.7, 27.4, 28.2, 30.8, 31.5, 33.9, 35.0, 35.6, 35.8, 36.7, 44.6, 47.7, 51.3, 54.3, 73.5, 170.6, 221.2. IR (neat) 2939, 1743, 1730, 1367, 1242, 1234, 1021 cm^{-1}. MS (ESI) calcd for $C_{21}H_{32}O_3Na$ $[M+Na]^+$ 355.2244, found 355.2239.



Triphenylmethanol (5o, *commercially available*): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.80 (s, 1H), 7.25-7.35 (m, 15H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 82.1, 127.4 (3C), 128.01 (6C), 128.03 (6C), 146.9 (3C). IR (neat) 3467, 2924, 1444, 1156, 1010 cm^{-1}.



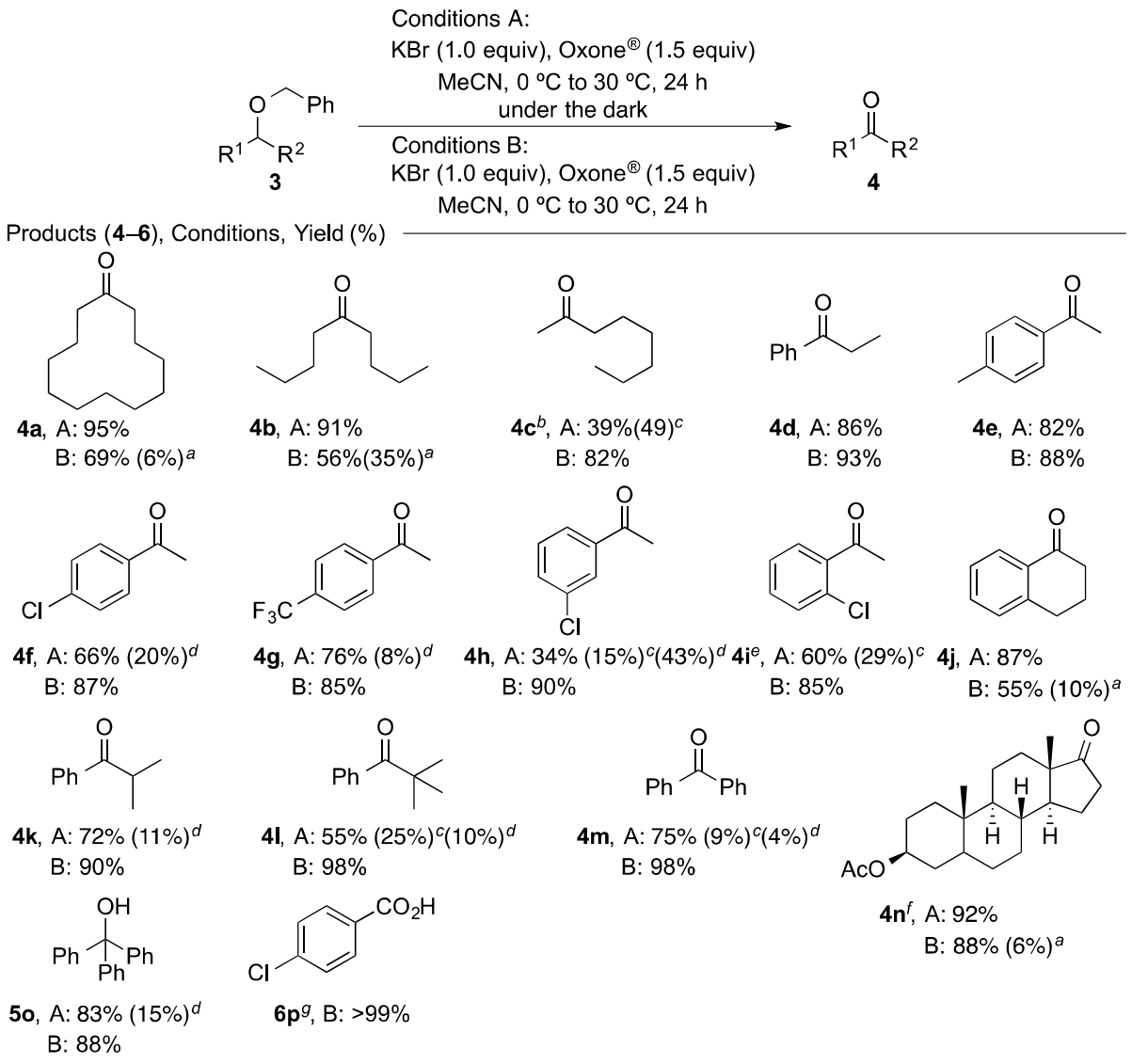
4-Chlorobenzoic acid (6p, *commercially available*): White solid, ^{1}H NMR (400 MHz, DMSO-d_6) δ 3.35 (brs, 1H), 7.58 (d, J = 8.6 Hz, 2H), 7.94 (d, J = 8.6 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 128.8 (2C), 129.6, 131.2 (2C), 137.8, 166.5. IR (neat) 2839, 1685, 1592, 1425, 1324, 1092 cm^{-1}.



Benzyl 4-acetylbenzoate (4r): White solid, ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.64 (s, 3H), 5.39 (s, 2H), 7.33-7.48 (m, 5H), 8.00 (dt, J = 8.7, 1.8 Hz, 2H), 8.16 (dt, J = 8.7, 1.8 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 26.9, 67.2, 128.2 (2C), 128.3 (2C), 128.4, 128.7 (2C), 129.9 (2C), 133.9, 135.6, 140.3, 165.6, 197.5. IR (neat) 1719, 1686, 1258, 1102, 1015 cm^{-1}. MS (ESI) calcd for $C_{16}H_{16}O_3$ $[M+H]^+$ 255.1016, found 255.1017.

4. A Comparative Experiment for Debenzylation of *O*-Benzyl Ethers under the Dark Conditions or not

Scheme S1. A Comparative Experiment for Debenzylation of Ethers **3** under the Dark Conditions (Conditions A) or not (Conditions B).

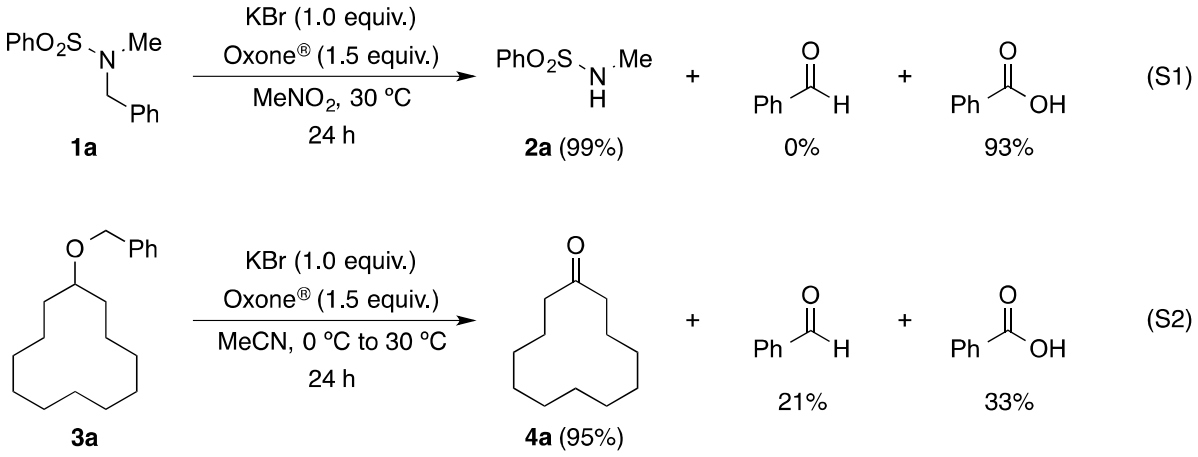


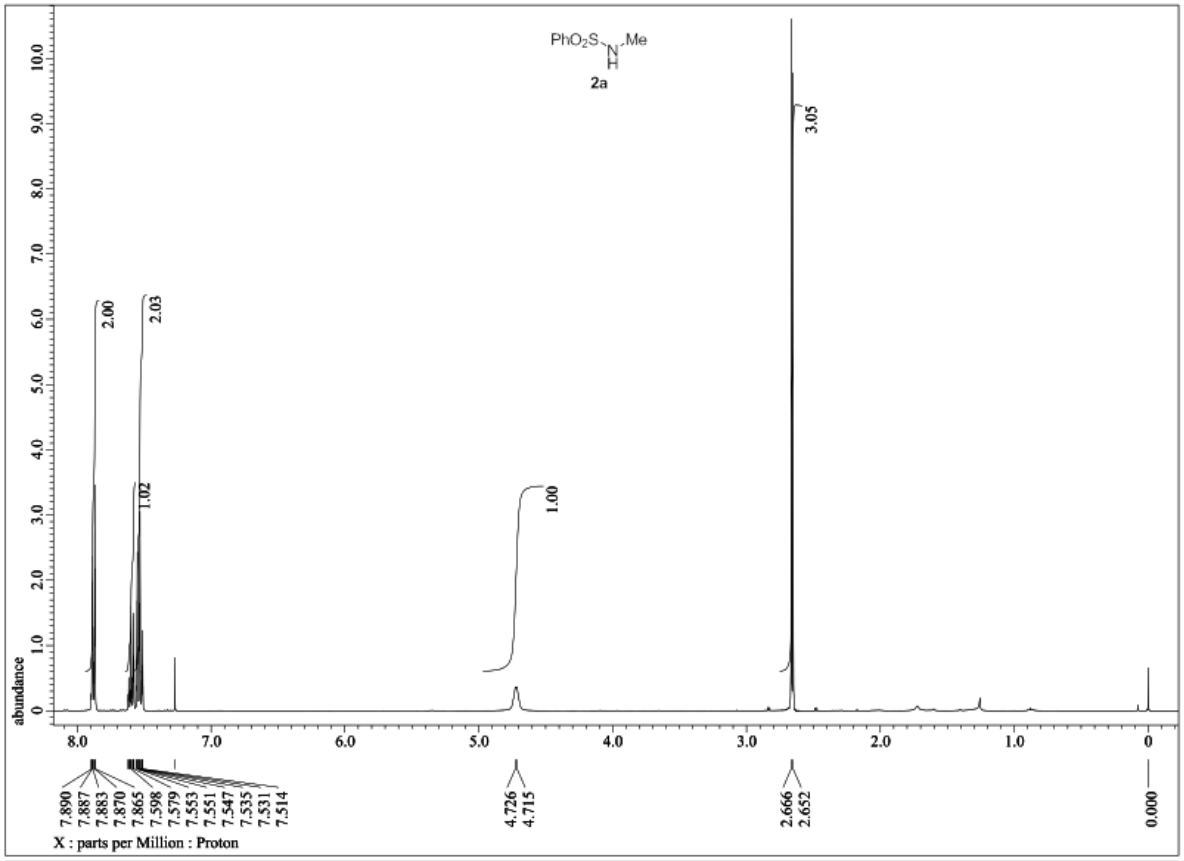
[a] Number in parentheses indicates the yield of α-bromo ketones. [b] KBr (1.2 equiv) and Oxone® (1.8 equiv) were used. [c] Number in parentheses indicates the yield of alcohols. [d] Number in parentheses indicates the recovery of **3**. [e] KBr (1.0 equiv) and Oxone® (1.8 equiv) were used. [f] The reaction was carried out for 28 h. [g] KBr (2.0 equiv) and Oxone® (3.0 equiv) were used.

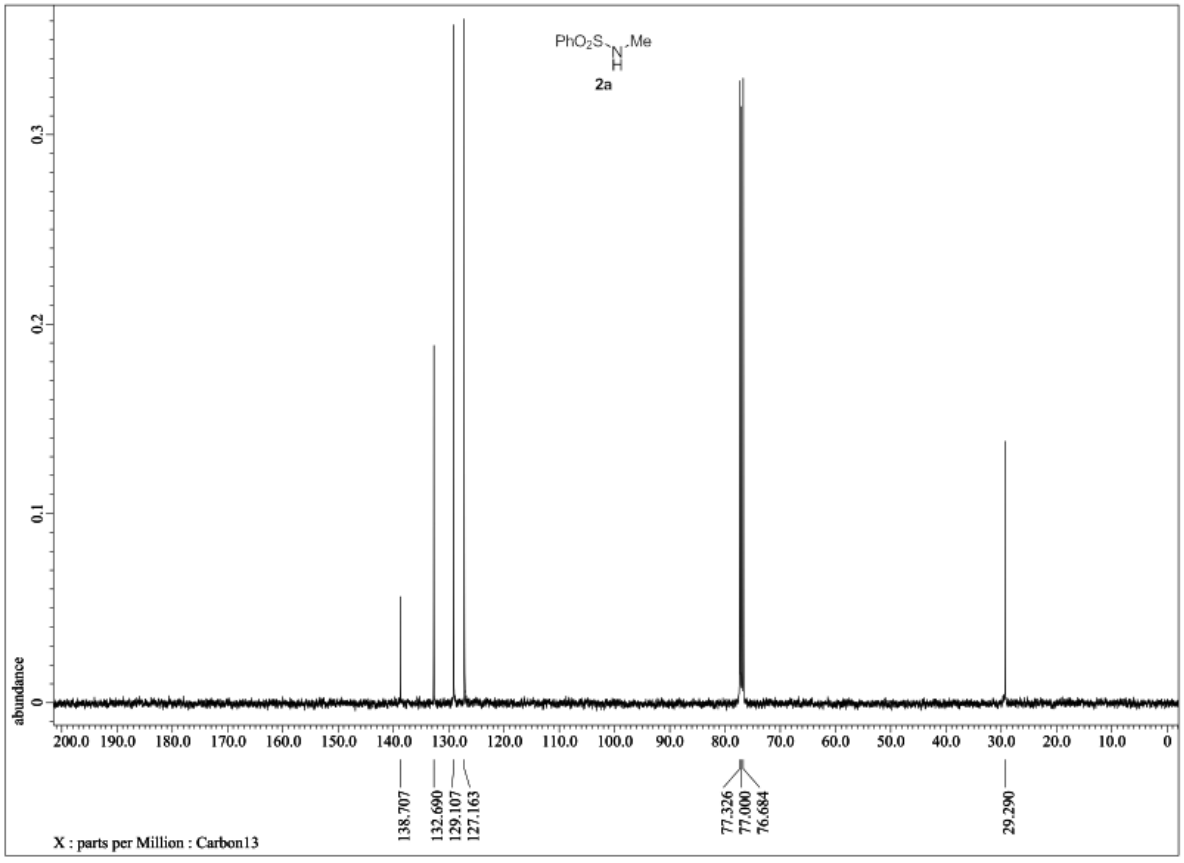
5. Mechanistic Study of the Oxidative Debenzylation of *N*-Benzylamide (1a) and *O*-Benzyl Ether (3a) Using Alkali Metal Bromide

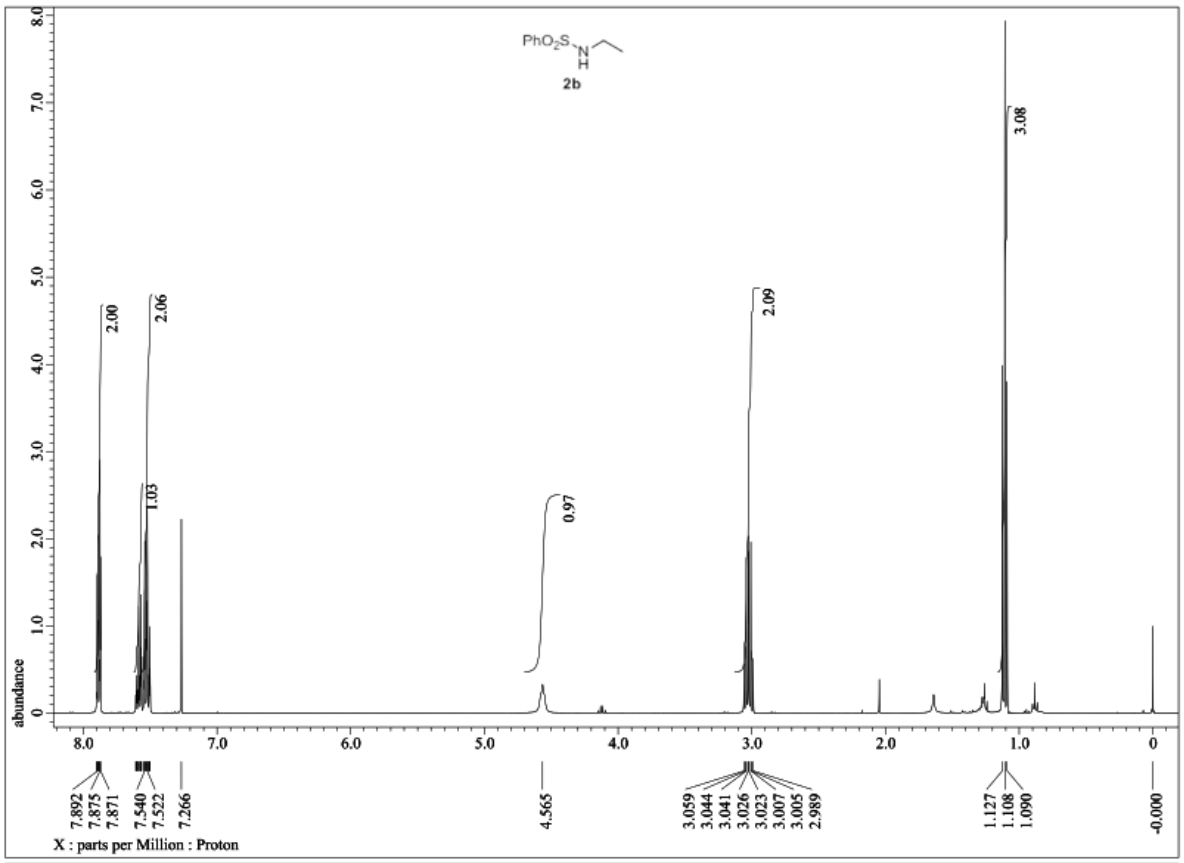
Treatment of **1a** with KBr (1.0 equiv.) and Oxone® (1.5 equiv.) in $MeNO_2$ at 30 ºC for 24 h gave the desired product **2a** (99%) together with benzoic acid (93%) (Scheme S2, eq S1). Reaction of **3a** with KBr (1.0 equiv.) and Oxone® (1.5 equiv.) in MeCN at 0 ºC to 30 ºC for 24 h also provided the desired ketone **4a** (95%) together with benzaldehyde (30%) and benzoic acid (15%) (Scheme S2, eq. S2). It is noteworthy that benzaldehyde easily oxdize to benzoic acid by a redundant amount of potassium peroxymonosulfate (Oxone® = $2KHSO_5 \bullet KHSO_4 \bullet K_2SO_4$) during the oxidative debenzylation.

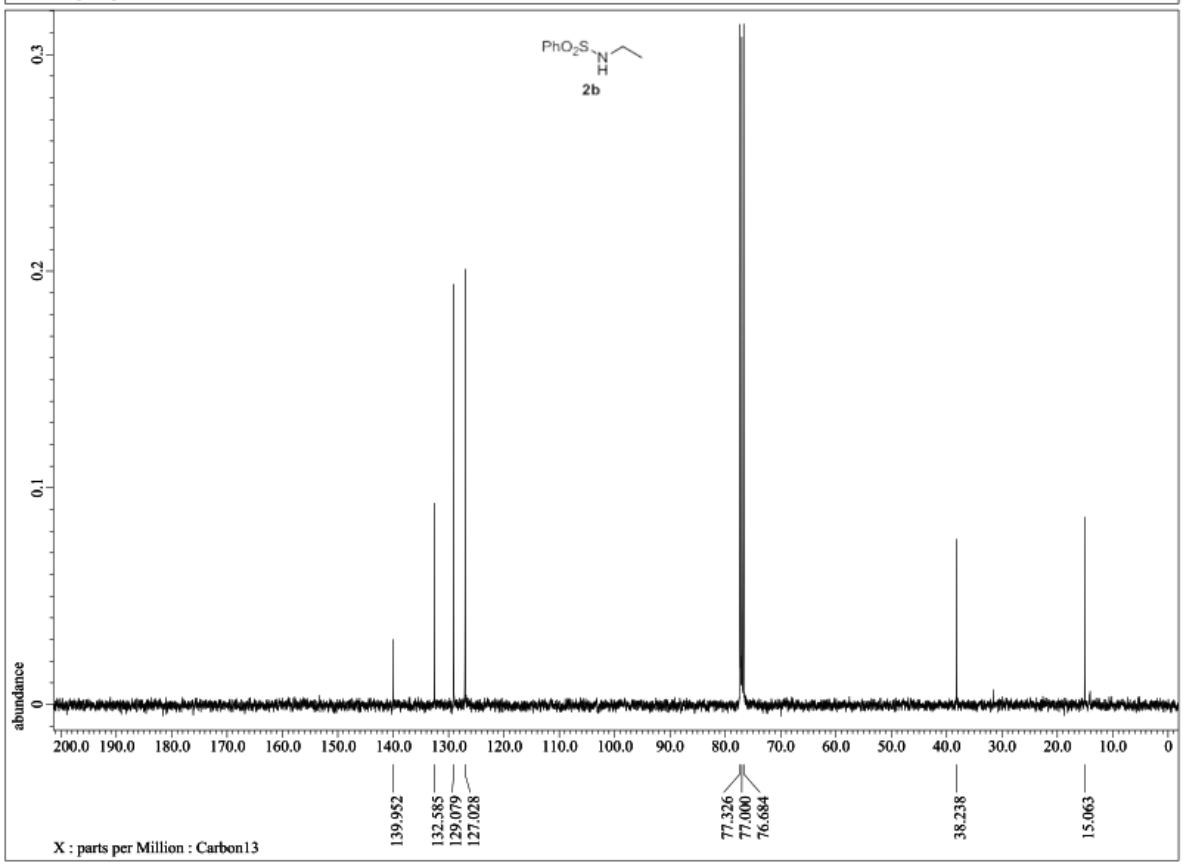
Scheme S2. The Oxidative Debenzylation of **1a** and **3a** Using Alkali Metal Bromide.

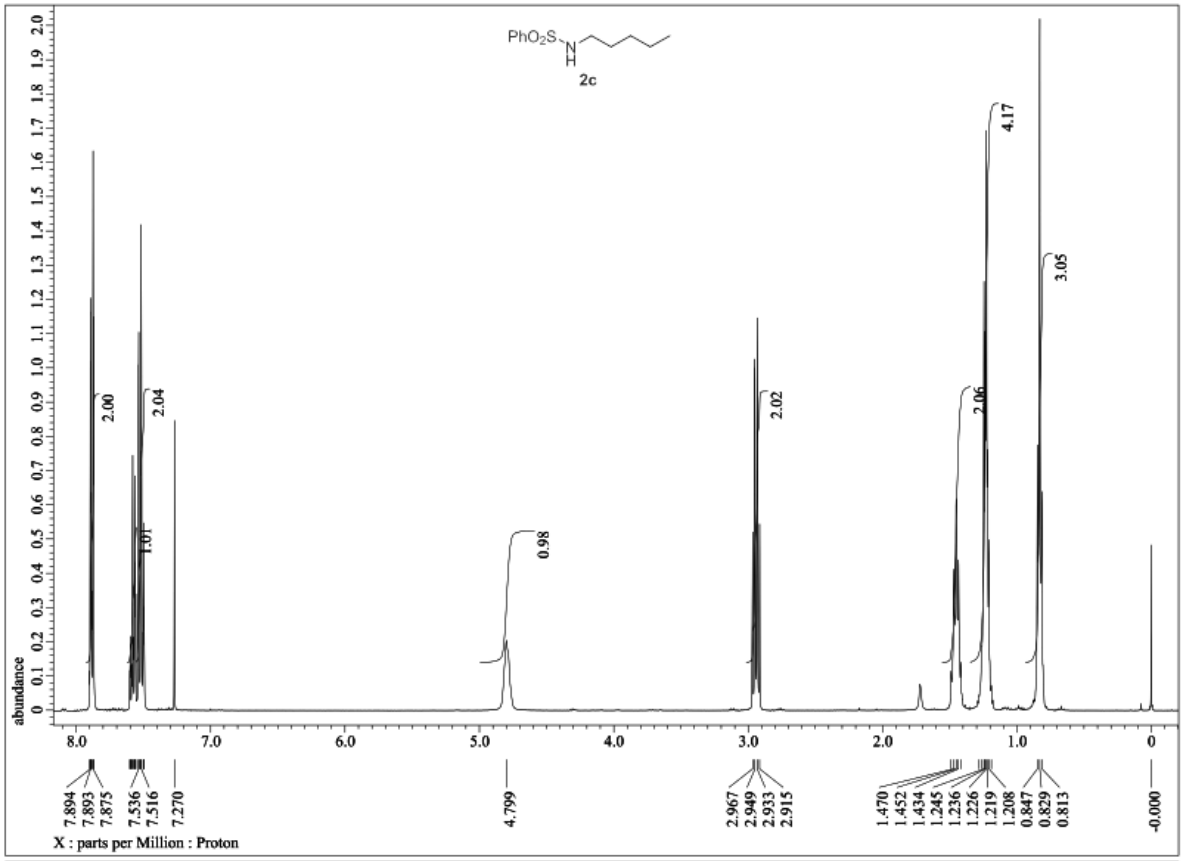


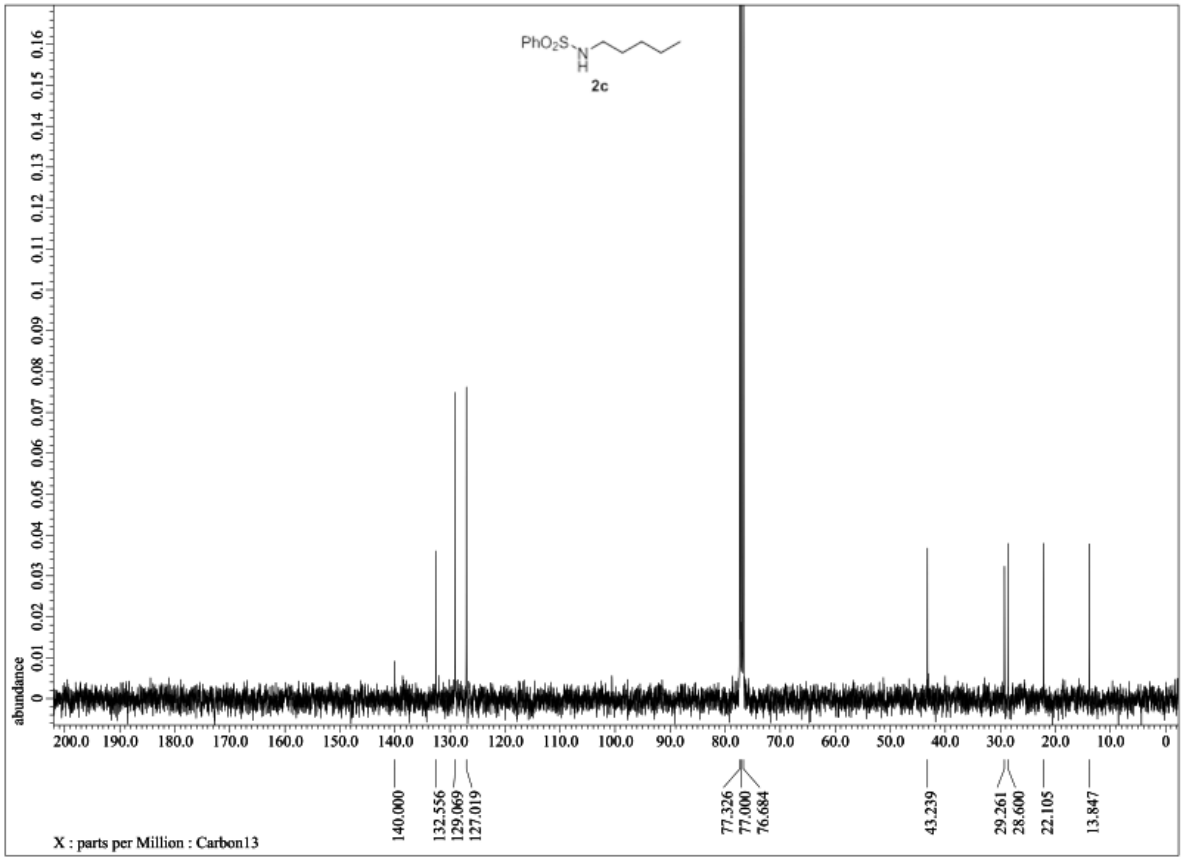

PhO2S
N
H
Me
2a
3.05
2.00
2.03
1.02
1.00
abundance
7.890
7.887
7.883
7.870
7.865
7.598
7.579
7.553
7.551
7.547
7.535
7.531
7.514
4.726
4.715
2.666
2.652
0.000
X : parts per Million : Proton

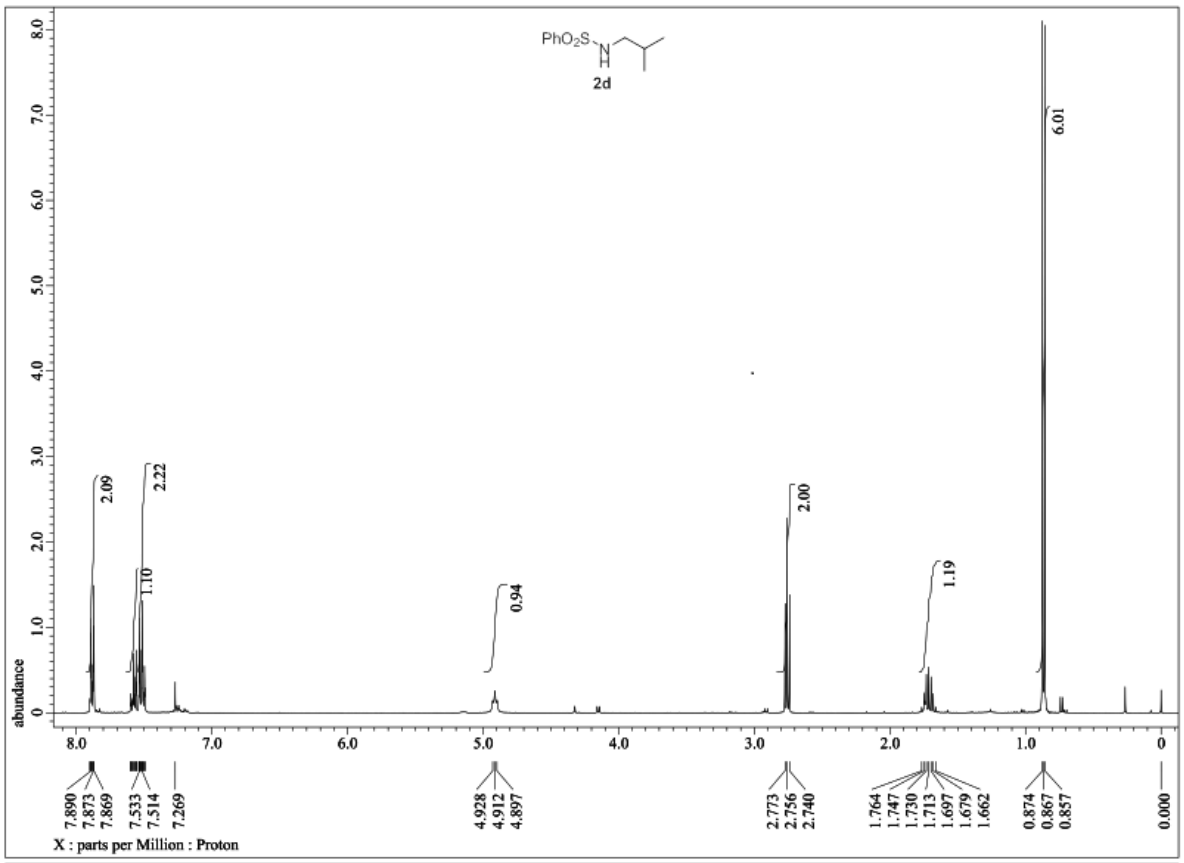

PhO2S
N
H
Me
2a
abundance
138.707
132.690
129.107
127.163
77.326
77.000
76.684
29.290
X : parts per Million : Carbon13

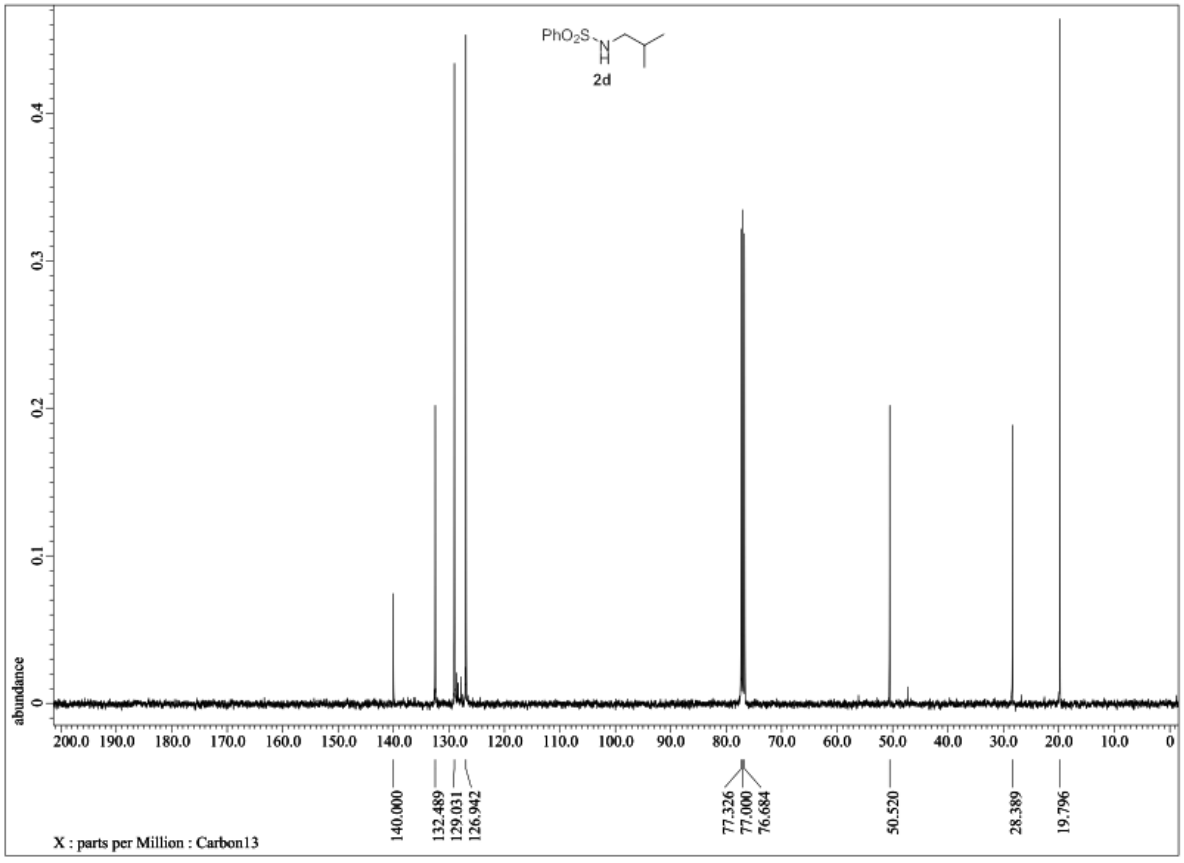

PhO2S
N
H
2b
abundance
2.00
2.06
1.03
0.97
2.09
3.08
7.892
7.875
7.871
7.540
7.522
7.266
4.565
3.059
3.044
3.041
3.026
3.023
3.007
3.005
2.989
1.127
1.108
1.090
-0.000
X : parts per Million : Proton

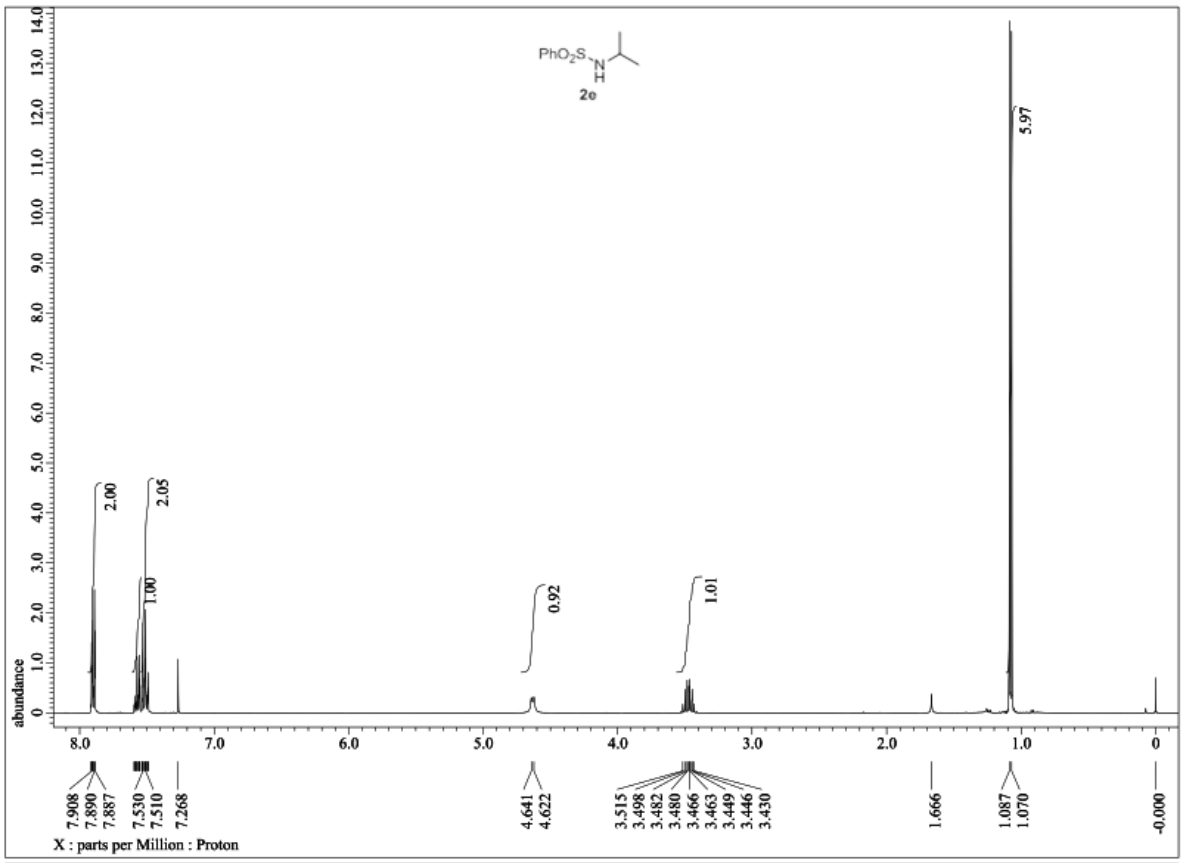

PhO2S
N
H
2b
abundance
139.952
132.585
129.079
127.028
77.326
77.000
76.684
38.238
15.063
X : parts per Million : Carbon13

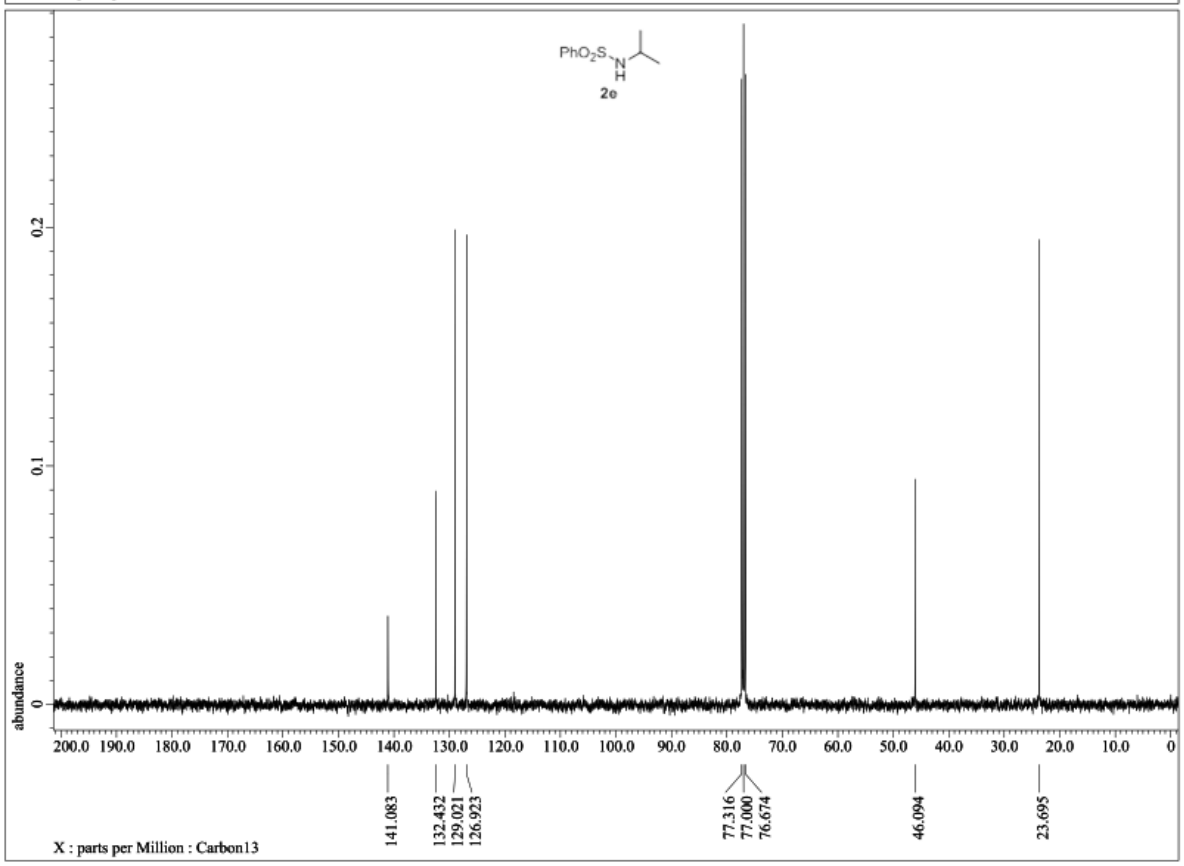

PhO2S
N
H
2c
abundance
2.00
2.04
1.01
0.98
2.02
2.06
4.17
3.05
7.894
7.893
7.875
7.536
7.516
7.270
4.799
2.967
2.949
2.933
2.915
1.470
1.452
1.434
1.245
1.236
1.226
1.219
1.208
0.847
0.829
0.813
-0.000
X : parts per Million : Proton

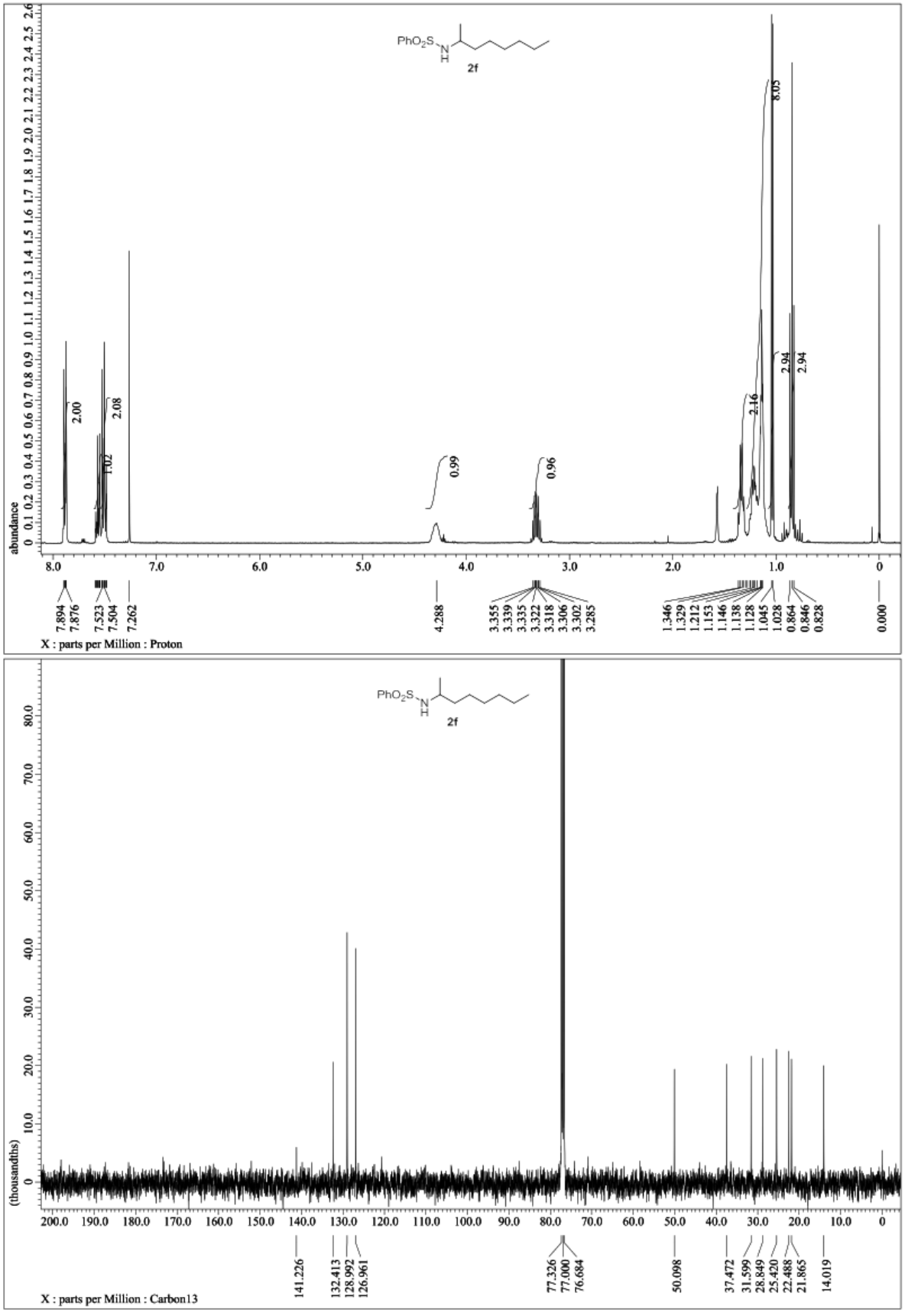

PhO2S
N
H
2c
abundance
140.000
132.556
129.069
127.019
77.326
77.000
76.684
43.239
29.261
28.600
22.105
13.847
X : parts per Million : Carbon13

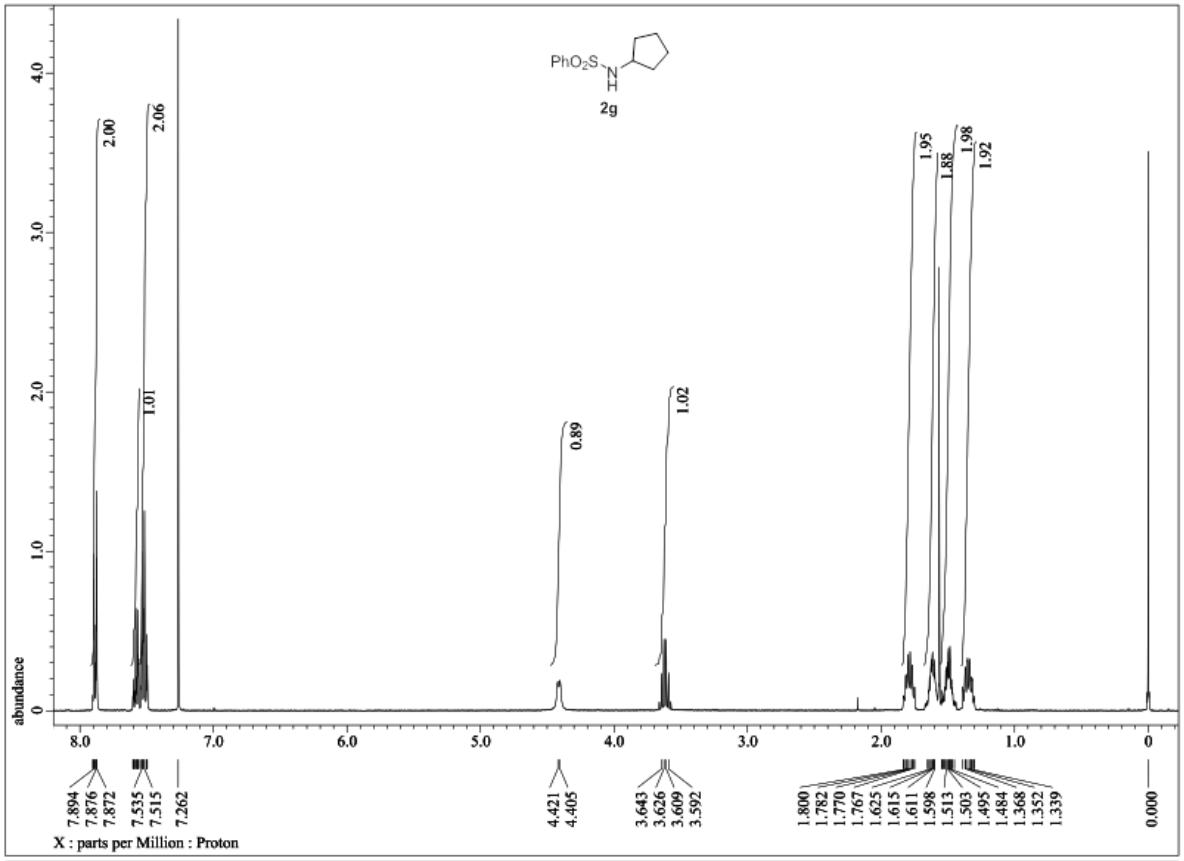

PhO2S
N
H
2d
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
2.09
2.22
1.10
0.94
2.00
1.19
6.01
7.890
7.873
7.869
7.533
7.514
7.269
4.928
4.912
4.897
2.773
2.756
2.740
1.764
1.747
1.730
1.713
1.697
1.679
1.662
0.874
0.867
0.857
0.000
X : parts per Million : Proton

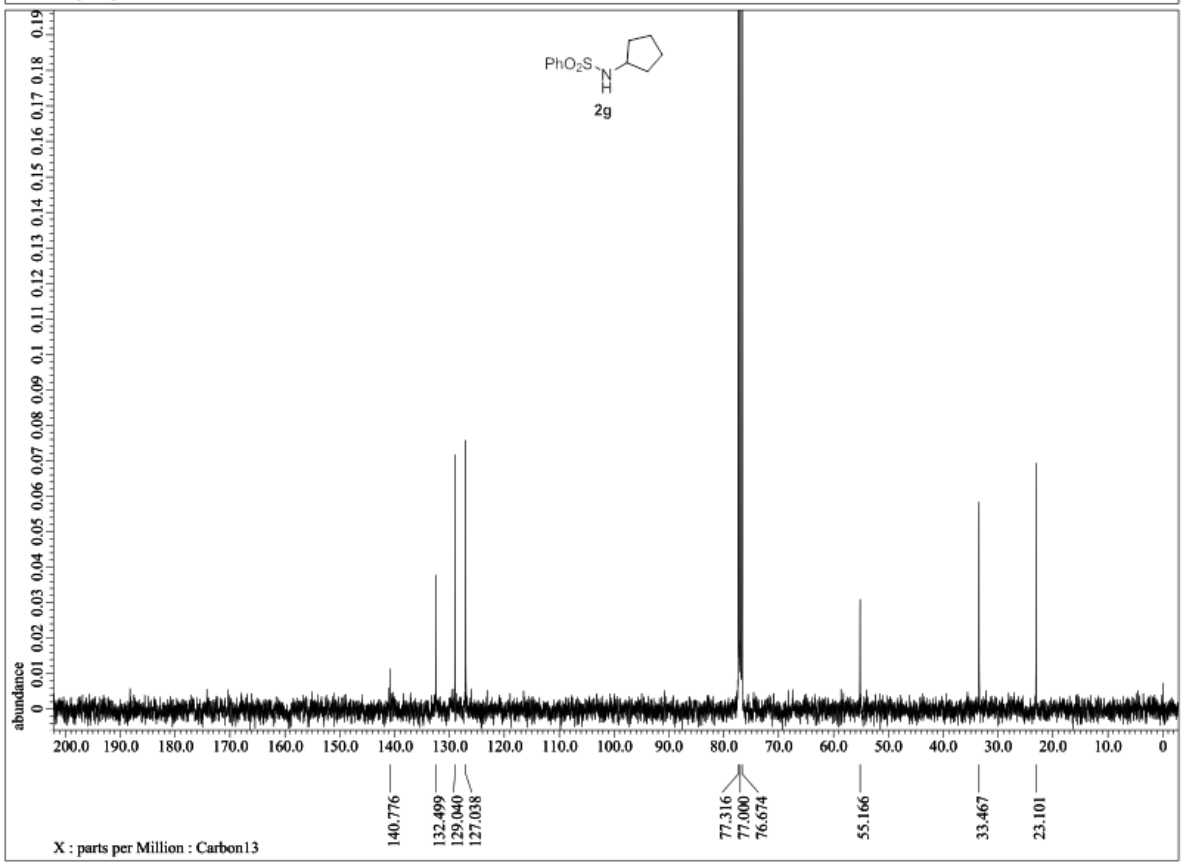

PhO2S
N
H
2d
abundance
0.4
0.3
0.2
0.1
0
200.0 190.0 180.0 170.0 160.0 150.0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0
140.000
132.489
129.031
126.942
77.326
77.000
76.684
50.520
28.389
19.796
X : parts per Million : Carbon13

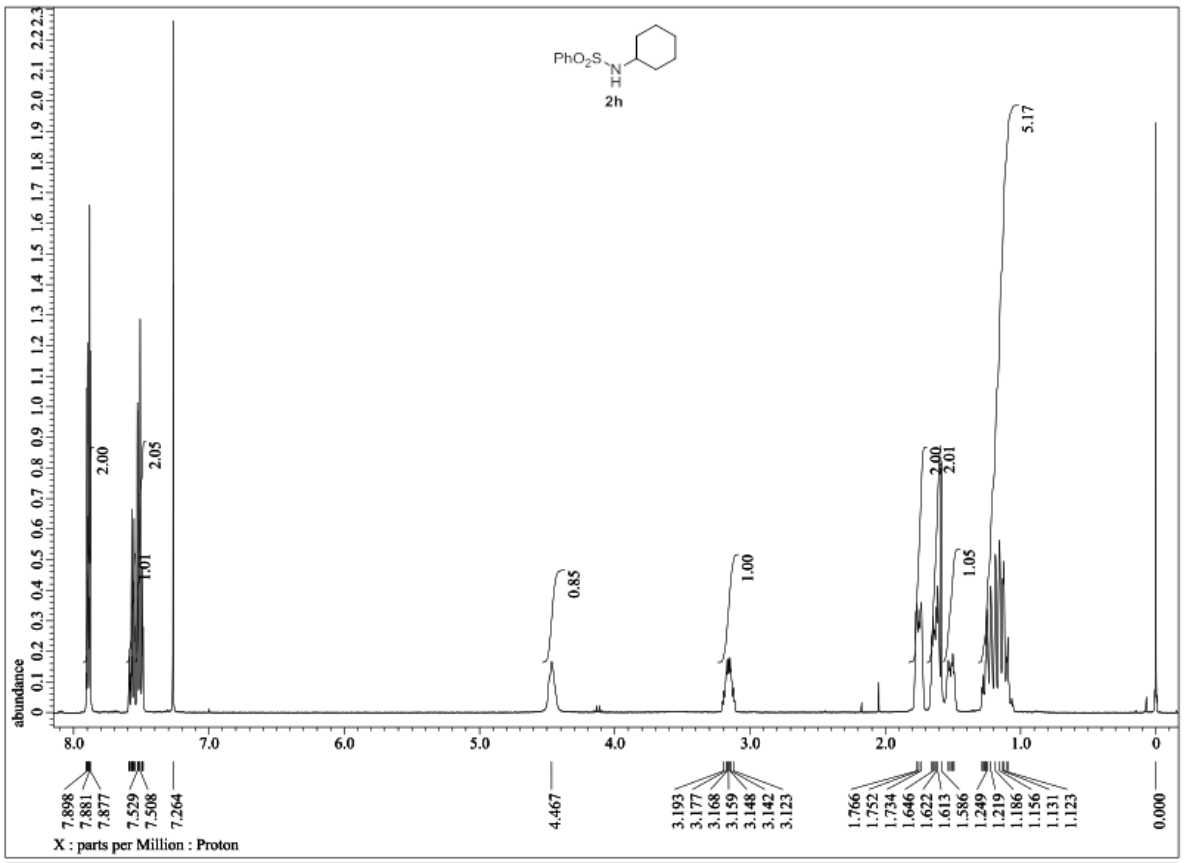

2e
abundance
2.00
2.05
1.00
0.92
1.01
5.97
7.908
7.890
7.887
7.530
7.510
7.268
4.641
4.622
3.515
3.498
3.482
3.480
3.466
3.463
3.449
3.446
3.430
1.666
1.087
1.070
-0.000
X : parts per Million : Proton

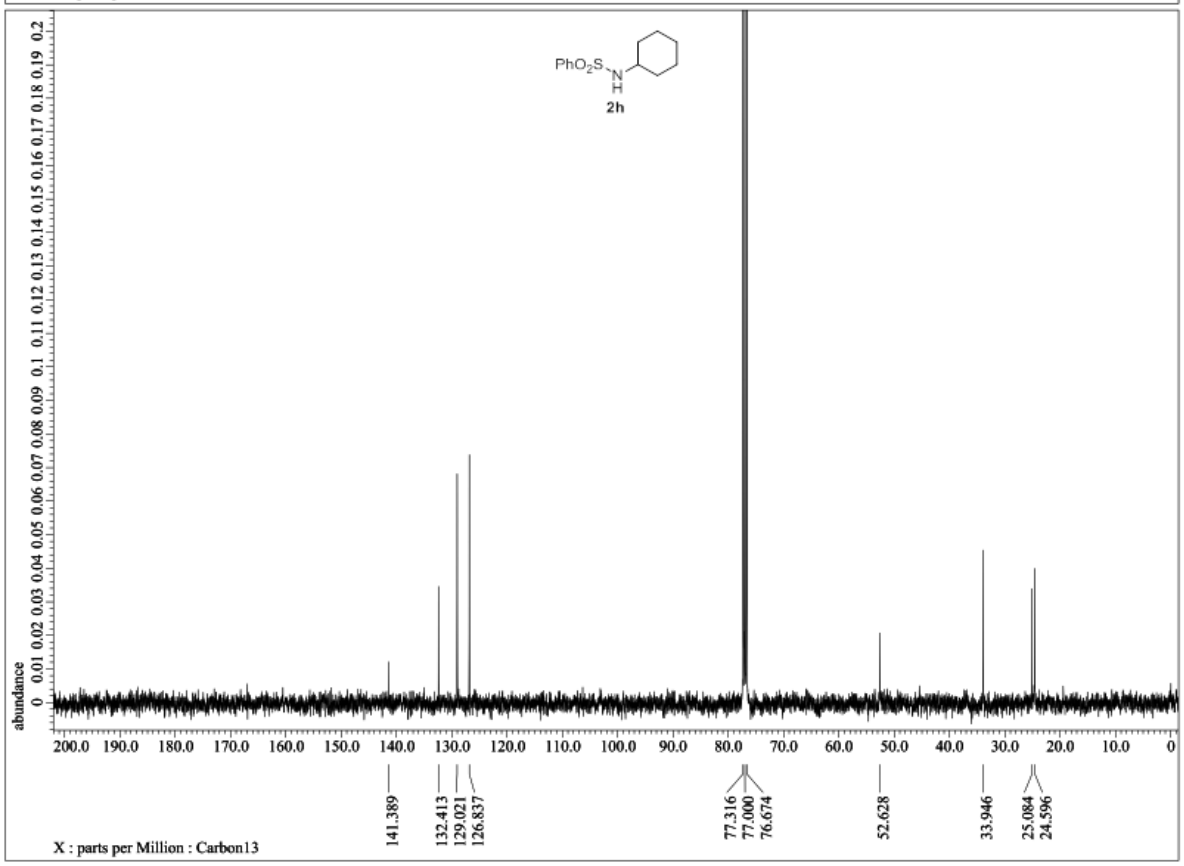

2e
abundance
141.083
132.432
129.021
126.923
77.316
77.000
76.674
46.094
23.695
X : parts per Million : Carbon13

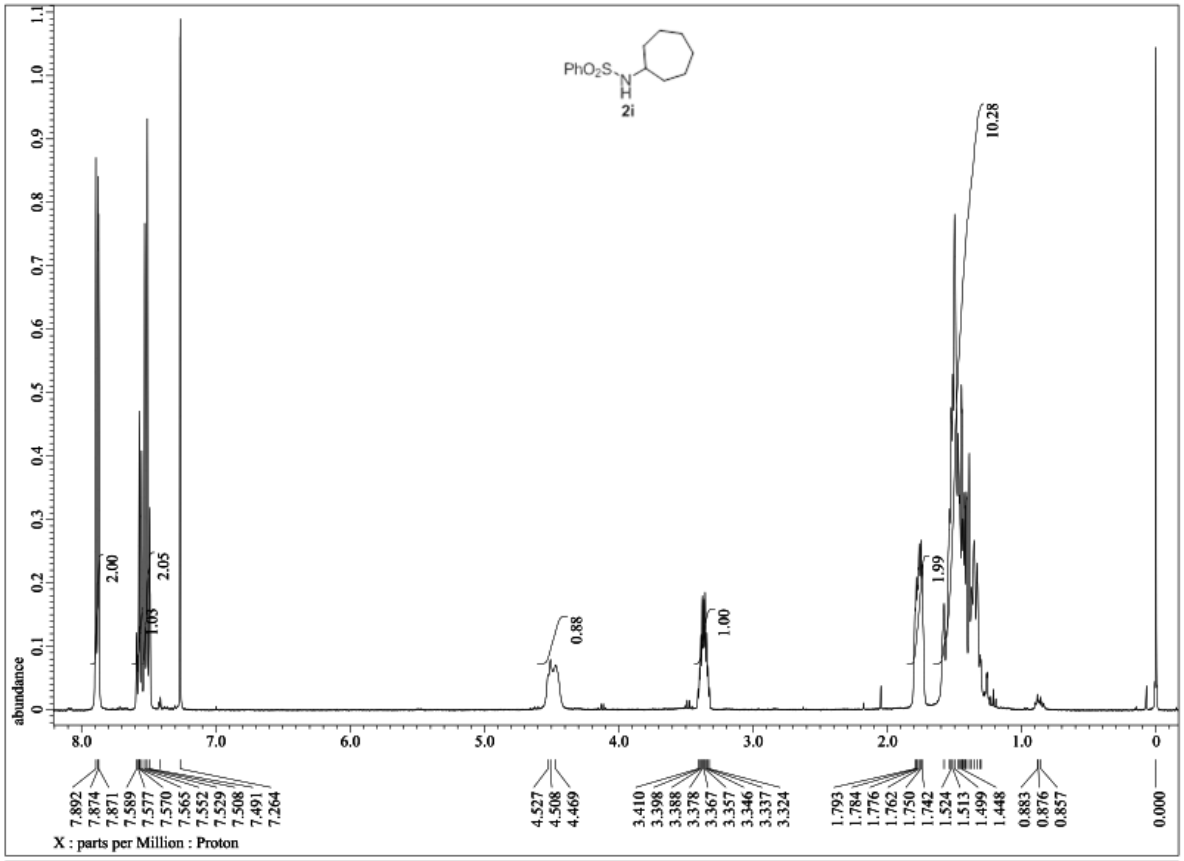

PhO2S
N
H
2f
abundance
2.00
1.02
2.08
0.99
0.96
2.16
8.05
2.94
2.94
7.894
7.876
7.523
7.504
7.262
4.288
3.355
3.339
3.335
3.322
3.318
3.306
3.302
3.285
1.346
1.329
1.212
1.153
1.146
1.138
1.128
1.045
1.028
0.864
0.846
0.828
0.000
X : parts per Million : Proton
(thousandths)
141.226
132.413
128.992
126.961
77.326
77.000
76.684
50.098
37.472
31.599
28.849
25.420
22.488
21.865
14.019
X : parts per Million : Carbon13

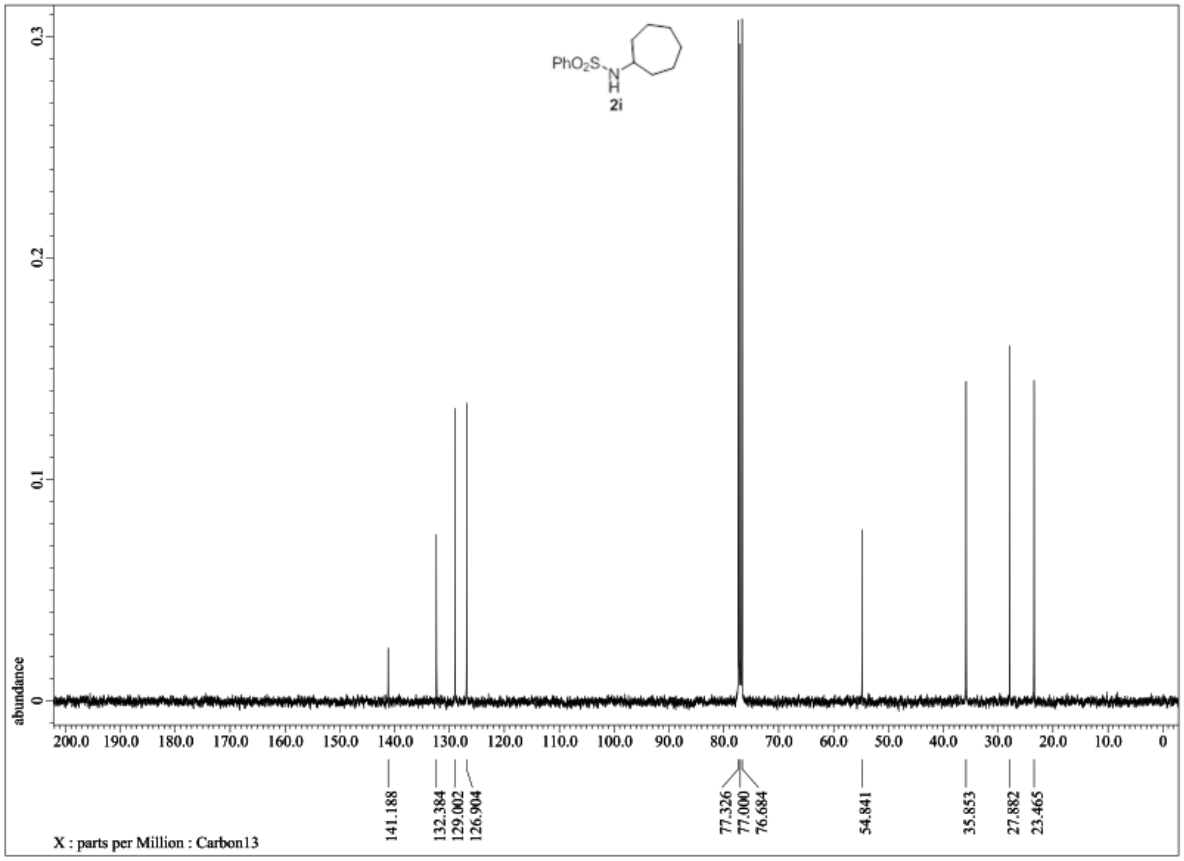

PhO2S
N
H
2g
abundance
X : parts per Million : Proton
2.00
2.06
1.01
0.89
1.02
1.95
1.88
1.98
1.92
7.894
7.876
7.872
7.535
7.515
7.262
4.421
4.405
3.643
3.626
3.609
3.592
1.800
1.782
1.770
1.767
1.625
1.615
1.611
1.598
1.513
1.503
1.495
1.484
1.368
1.352
1.339
0.000

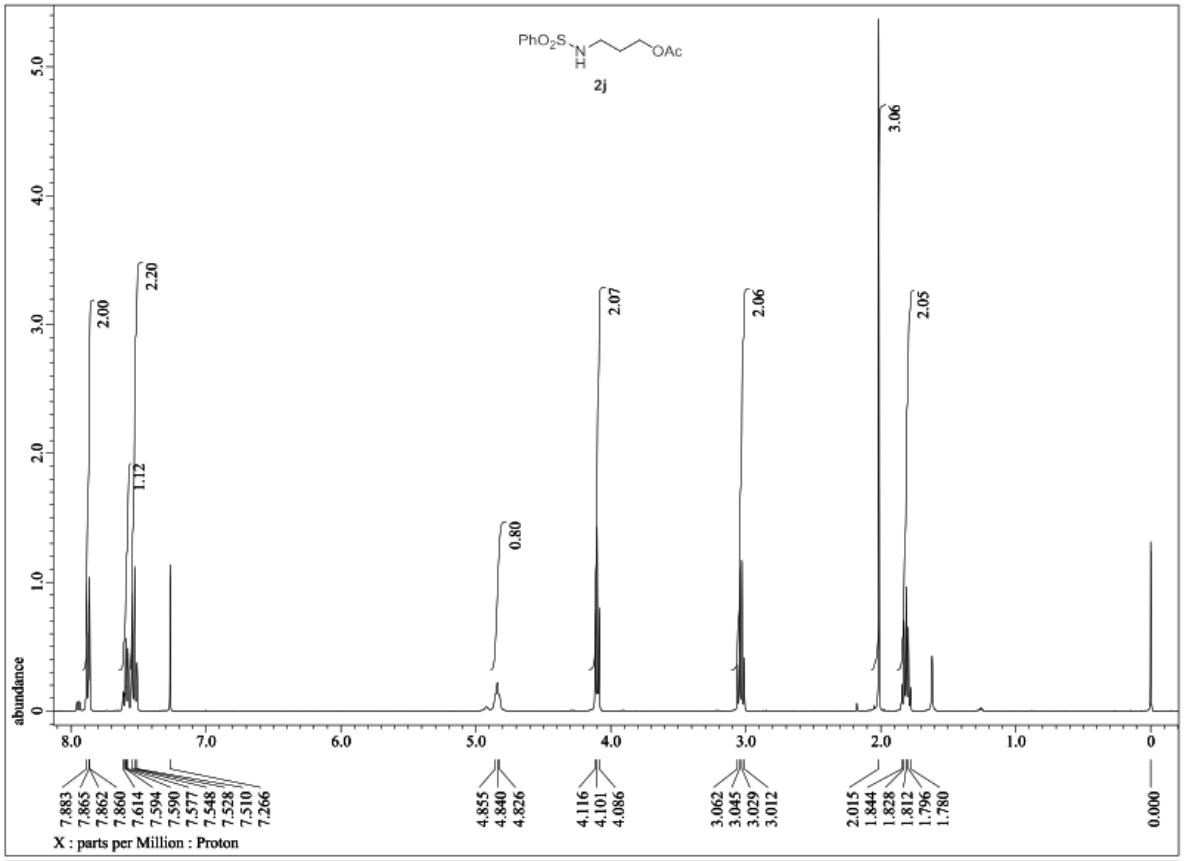

PhO2S
N
H
2g
abundance
X : parts per Million : Carbon13
140.776
132.499
129.040
127.038
77.316
77.000
76.674
55.166
33.467
23.101

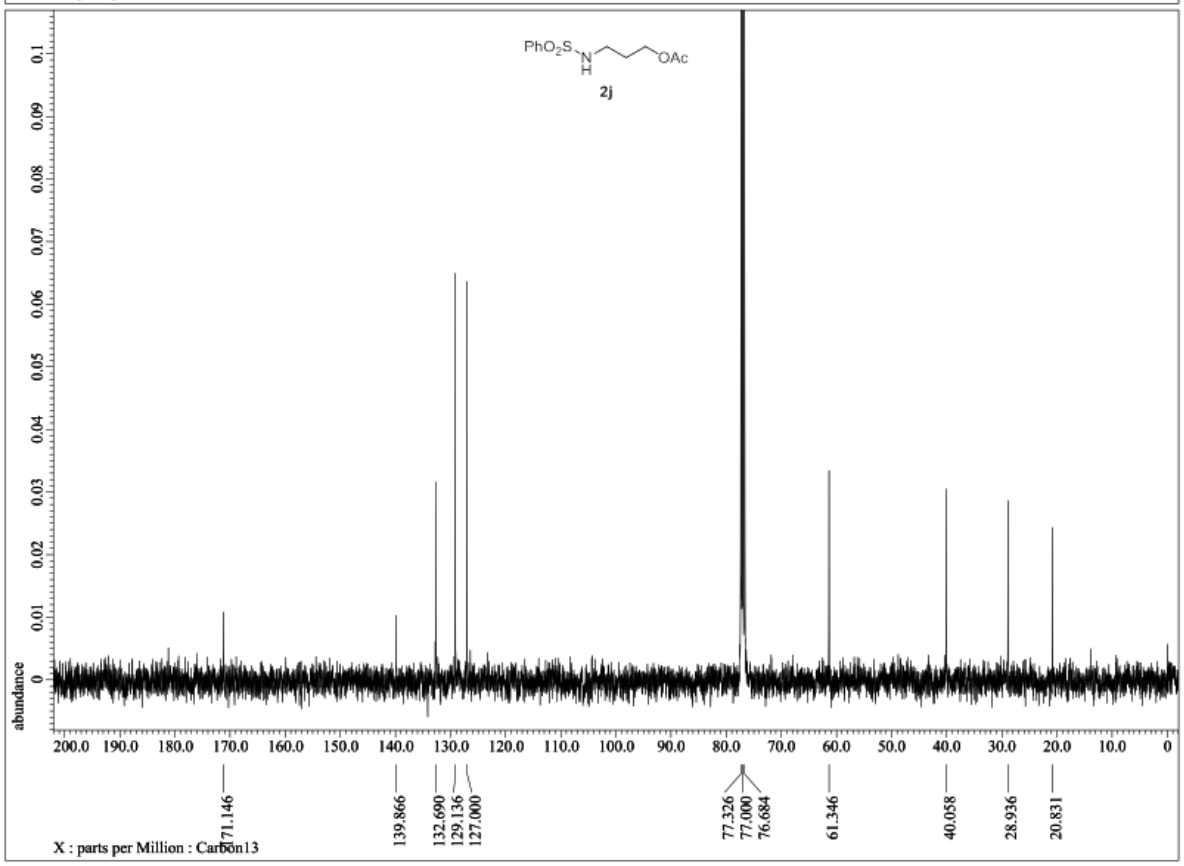

PhO2S
N
H
2h
abundance
X : parts per Million : Proton
7.898
7.881
7.877
7.529
7.508
7.264
4.467
3.193
3.177
3.168
3.159
3.148
3.142
3.123
1.766
1.752
1.734
1.646
1.622
1.613
1.586
1.249
1.219
1.186
1.156
1.131
1.123
0.000
2.00
2.05
1.01
0.85
1.00
2.00
2.01
1.05
5.17

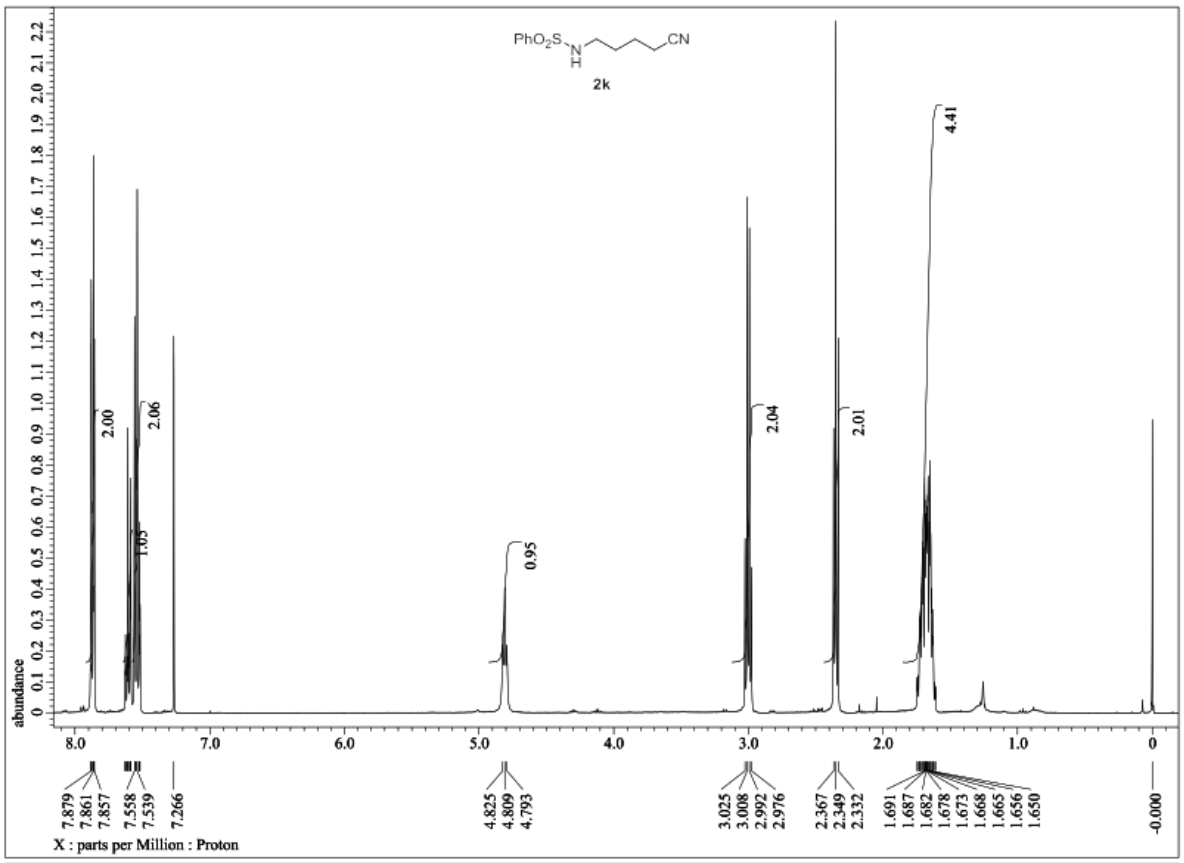

PhO2S
N
H
2h
abundance
X : parts per Million : Carbon13
141.389
132.413
129.021
126.837
77.316
77.000
76.674
52.628
33.946
25.084
24.596

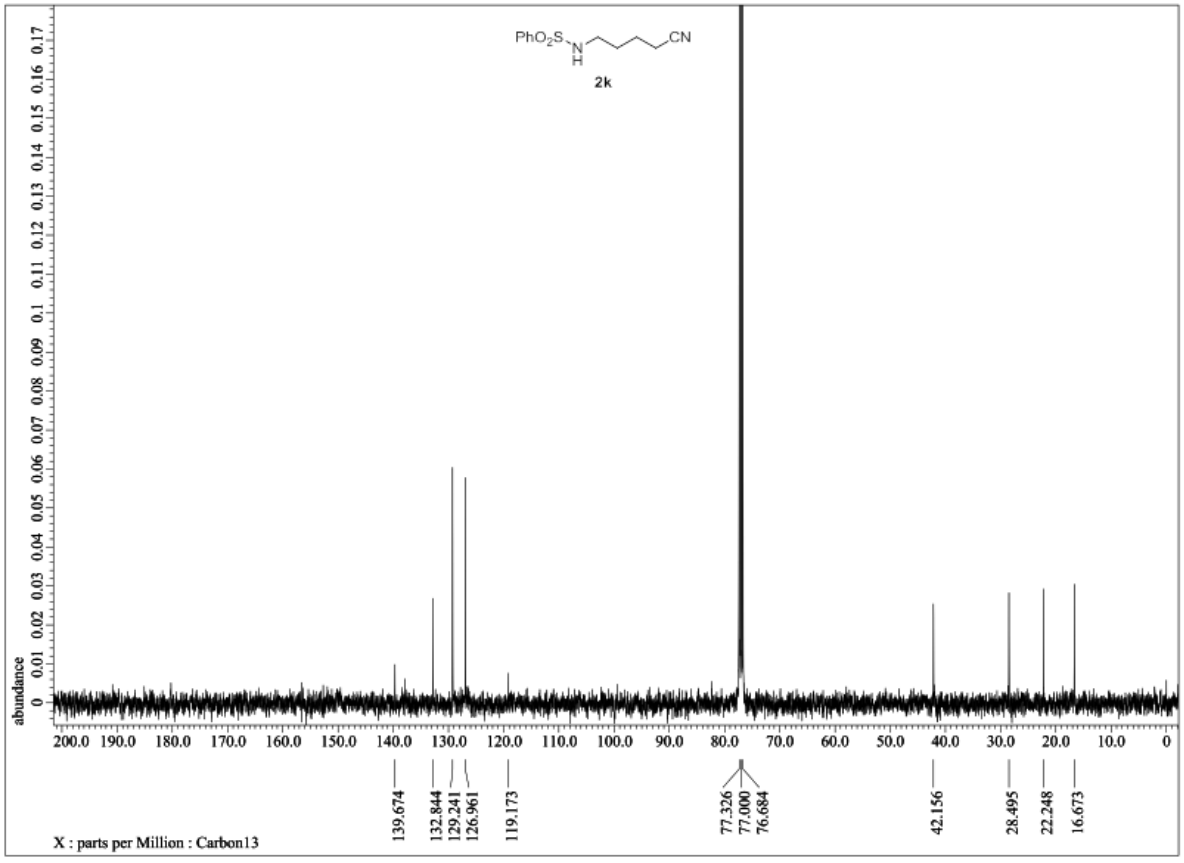

PhO2S
N
H
2i
10.28
2.00
2.05
1.03
0.88
1.00
1.99
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.892
7.874
7.871
7.589
7.577
7.570
7.565
7.552
7.529
7.508
7.491
7.264
4.527
4.508
4.469
3.410
3.398
3.388
3.378
3.367
3.357
3.346
3.337
3.324
1.793
1.784
1.776
1.762
1.750
1.742
1.524
1.513
1.499
1.448
0.883
0.876
0.857
0.000
X : parts per Million : Proton

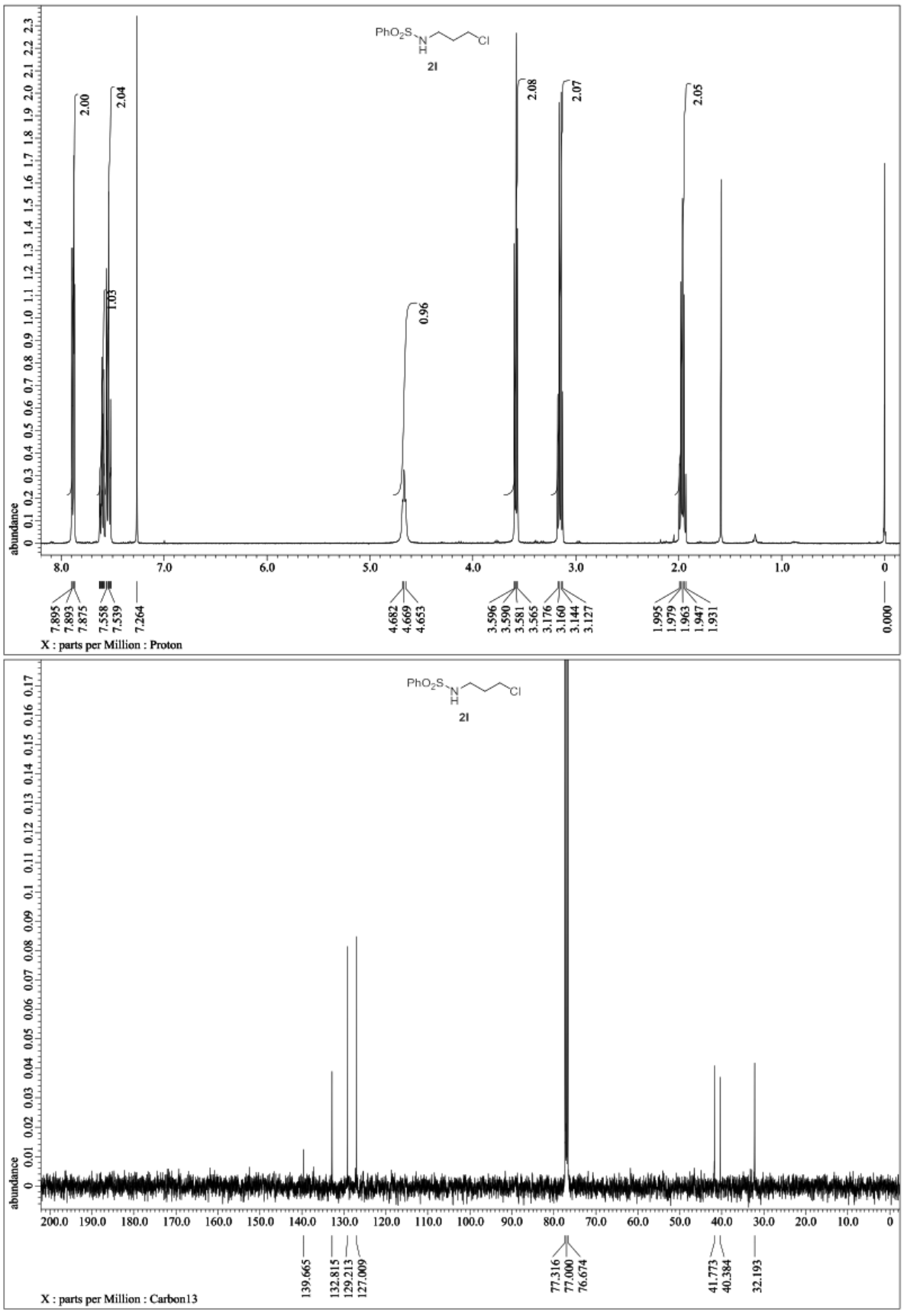

PhO2S
N
H
2i
abundance
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
141.188
132.384
129.002
126.904
77.326
77.000
76.684
54.841
35.853
27.882
23.465
X : parts per Million : Carbon13

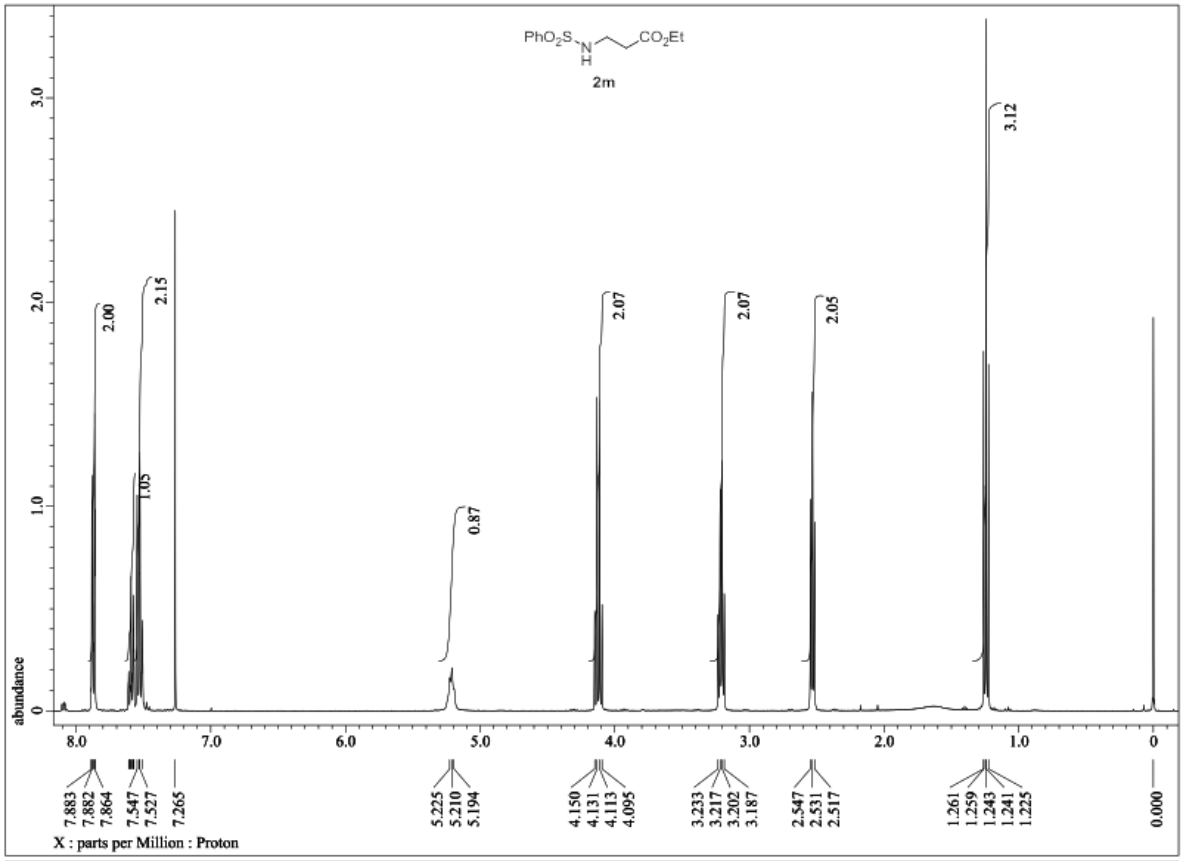

PhO2S
N
H
OAc
2j
abundance
2.00
2.20
1.12
0.80
2.07
2.06
3.06
2.05
7.883
7.865
7.862
7.860
7.614
7.594
7.590
7.577
7.548
7.528
7.510
7.266
4.855
4.840
4.826
4.116
4.101
4.086
3.062
3.045
3.029
3.012
2.015
1.844
1.828
1.812
1.796
1.780
0.000
X : parts per Million : Proton

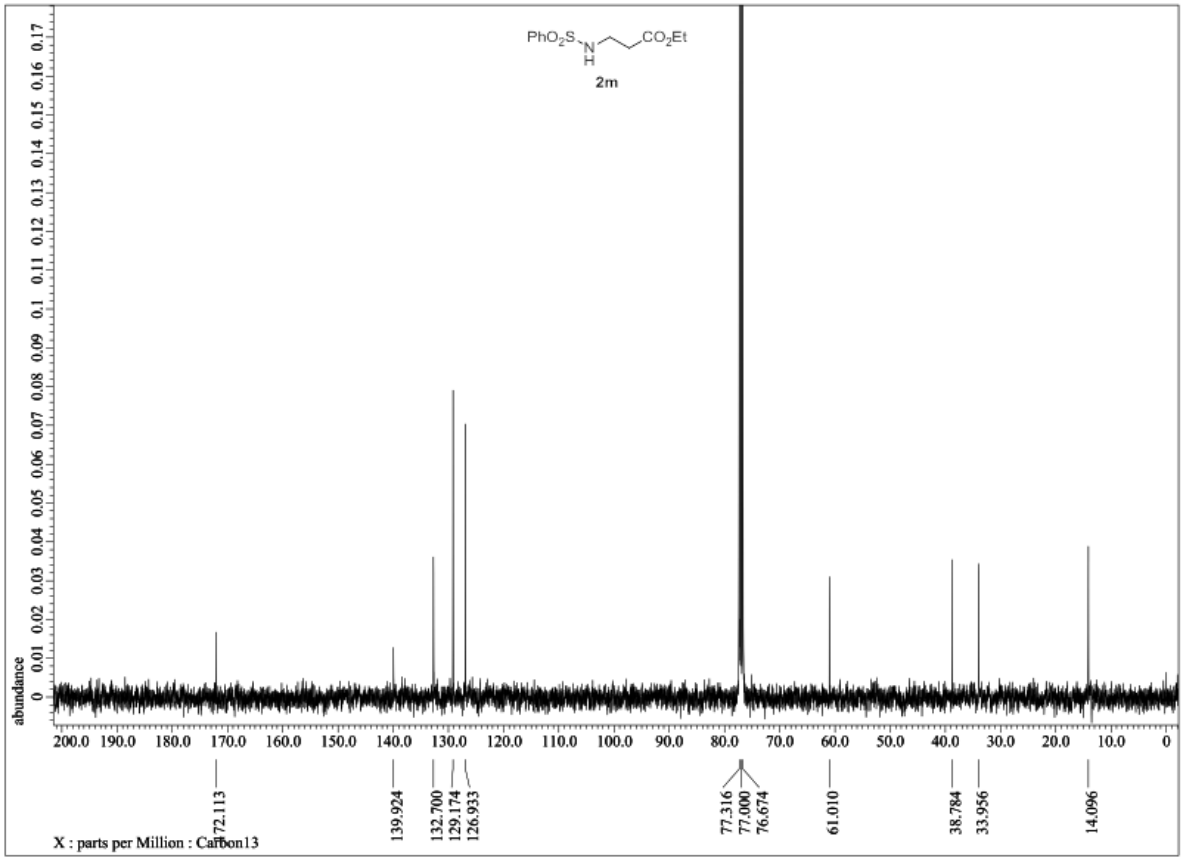

PhO2S
N
H
OAc
2j
abundance
171.146
139.866
132.690
129.136
127.000
77.326
77.000
76.684
61.346
40.058
28.936
20.831
X : parts per Million : Carbon13

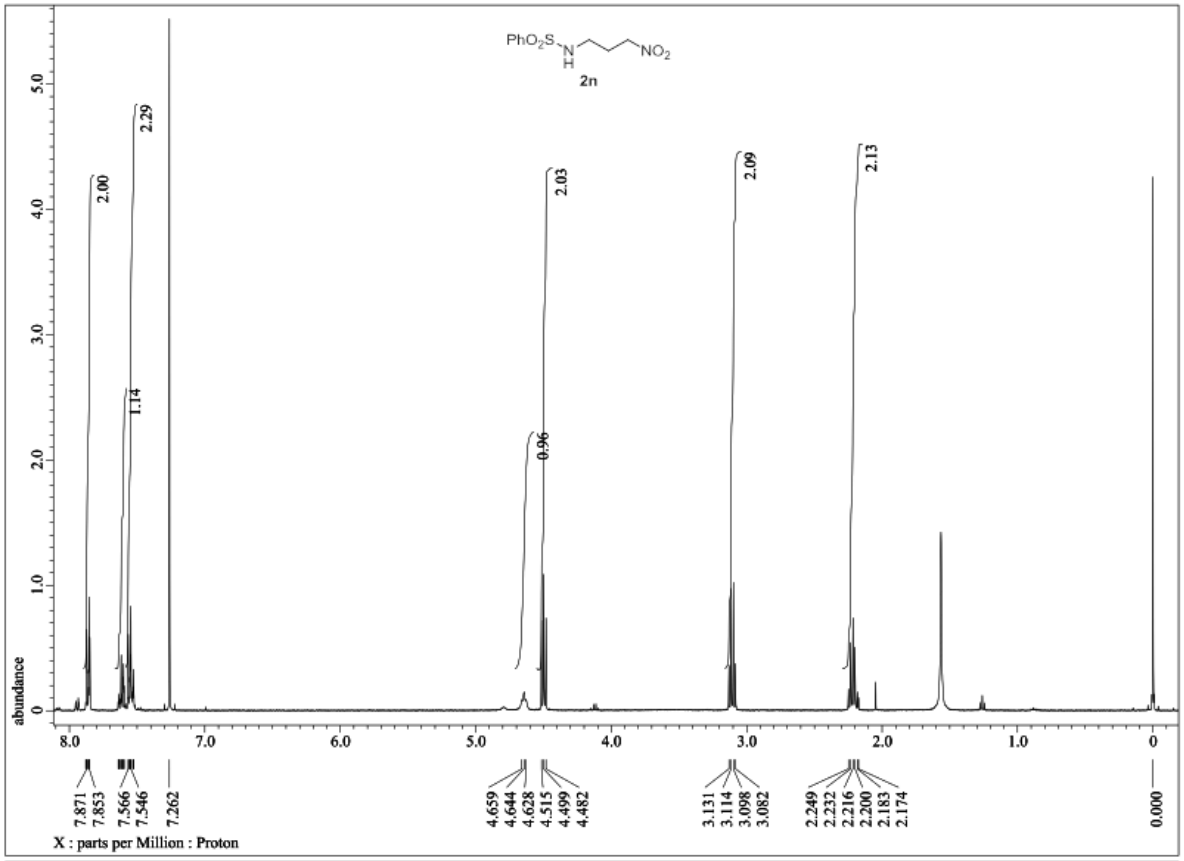

PhO2S
N
H
CN
2k
abundance
2.00
2.06
1.03
0.95
2.04
2.01
4.41
7.879
7.861
7.857
7.558
7.539
7.266
4.825
4.809
4.793
3.025
3.008
2.992
2.976
2.367
2.349
2.332
1.691
1.687
1.682
1.678
1.673
1.668
1.665
1.656
1.650
-0.000
X : parts per Million : Proton

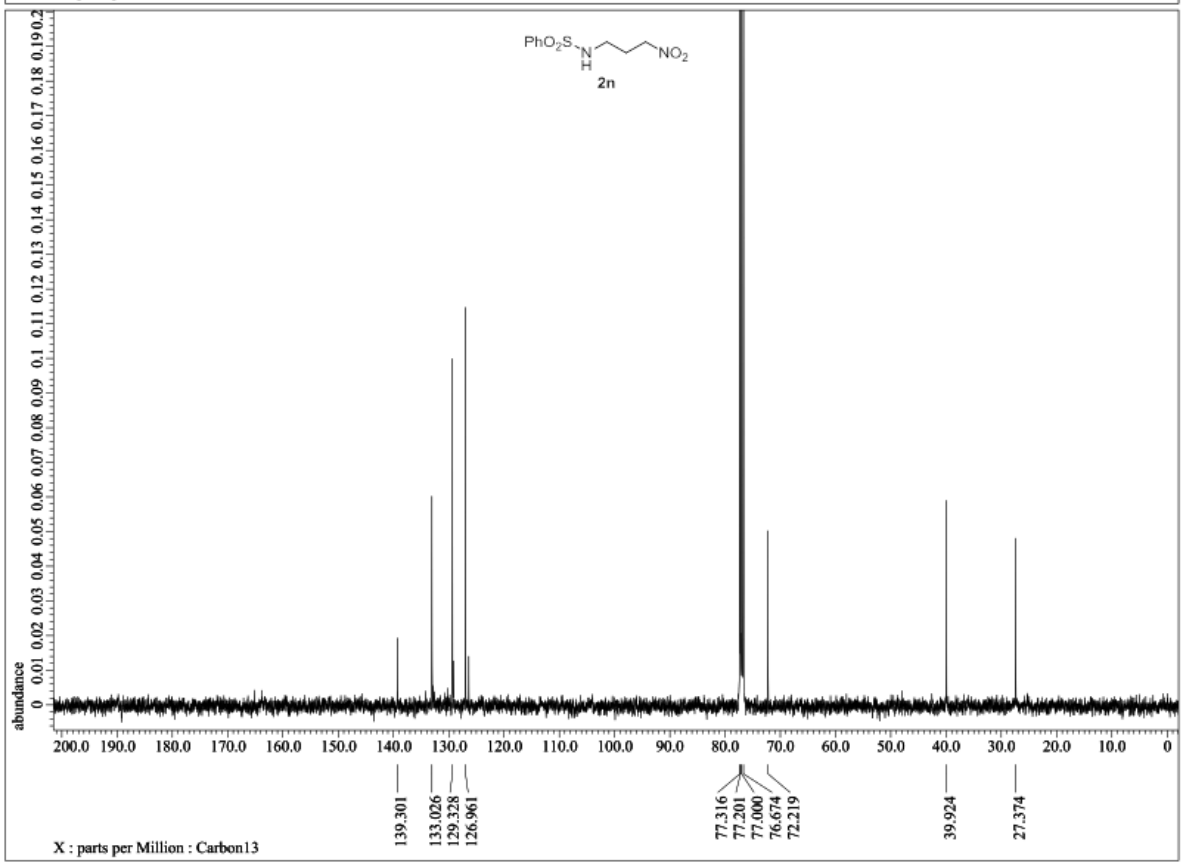

PhO2S
N
H
CN
2k
abundance
139.674
132.844
129.241
126.961
119.173
77.326
77.000
76.684
42.156
28.495
22.248
16.673
X : parts per Million : Carbon13

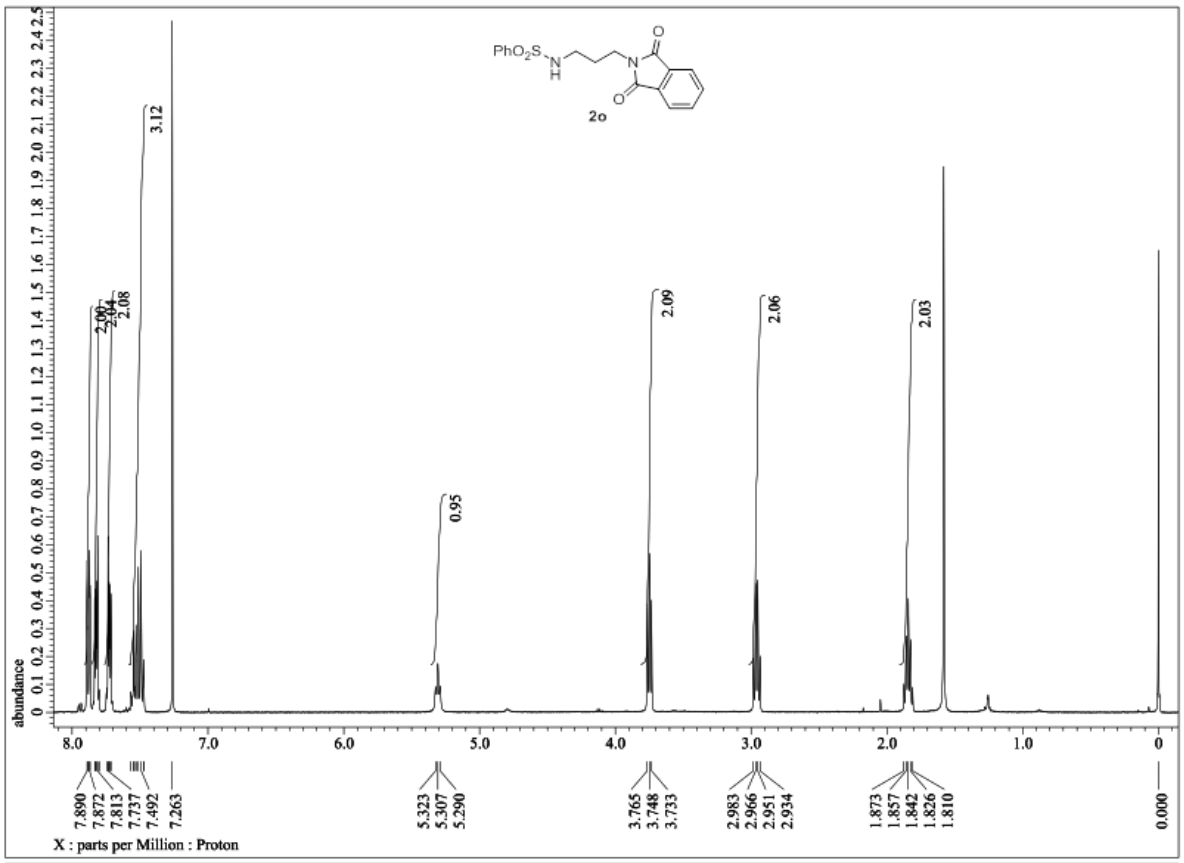

PhO2S
N
H
Cl
2l
2.00
2.04
1.03
0.96
2.08
2.07
2.05
abundance
7.895
7.893
7.875
7.558
7.539
7.264
4.682
4.669
4.653
3.596
3.590
3.581
3.565
3.176
3.160
3.144
3.127
1.995
1.979
1.963
1.947
1.931
0.000
X : parts per Million : Proton
PhO2S
N
H
Cl
2l
abundance
139.665
132.815
129.213
127.009
77.316
77.000
76.674
41.773
40.384
32.193
X : parts per Million : Carbon13

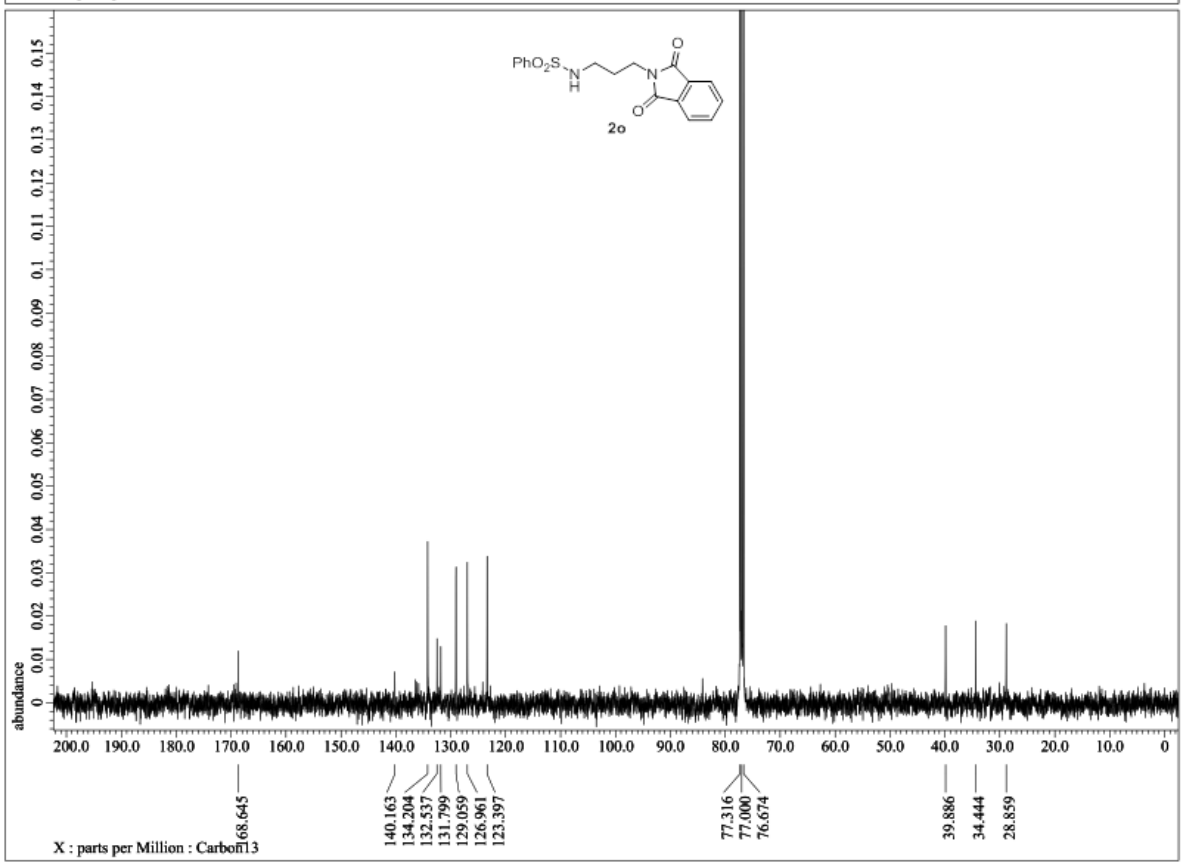

PhO2S
N
H
CO2Et
2m
abundance
2.00
2.15
1.05
0.87
2.07
2.07
2.05
3.12
7.883
7.882
7.864
7.547
7.527
7.265
5.225
5.210
5.194
4.150
4.131
4.113
4.095
3.233
3.217
3.202
3.187
2.547
2.531
2.517
1.261
1.259
1.243
1.241
1.225
0.000
X : parts per Million : Proton

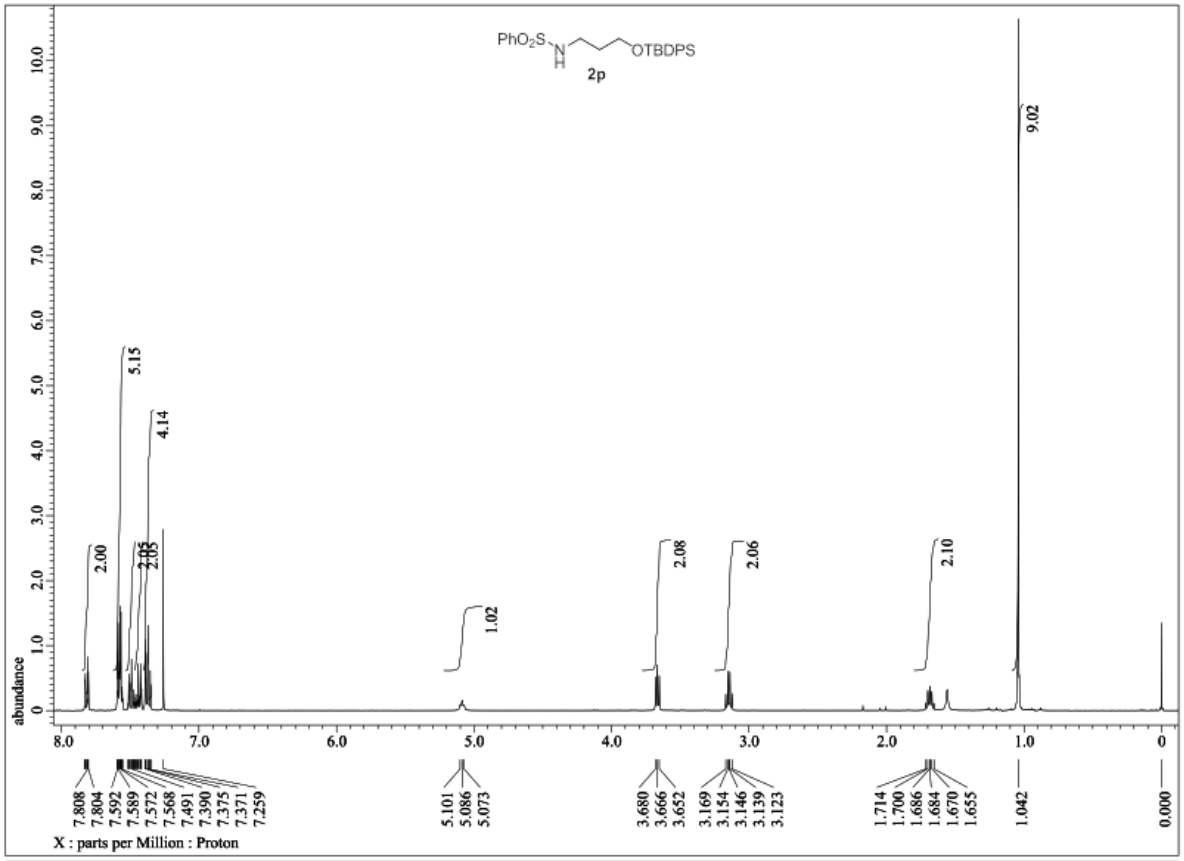

PhO2S
N
H
CO2Et
2m
abundance
172.113
139.924
132.700
129.174
126.933
77.316
77.000
76.674
61.010
38.784
33.956
14.096
X : parts per Million : Carbon13

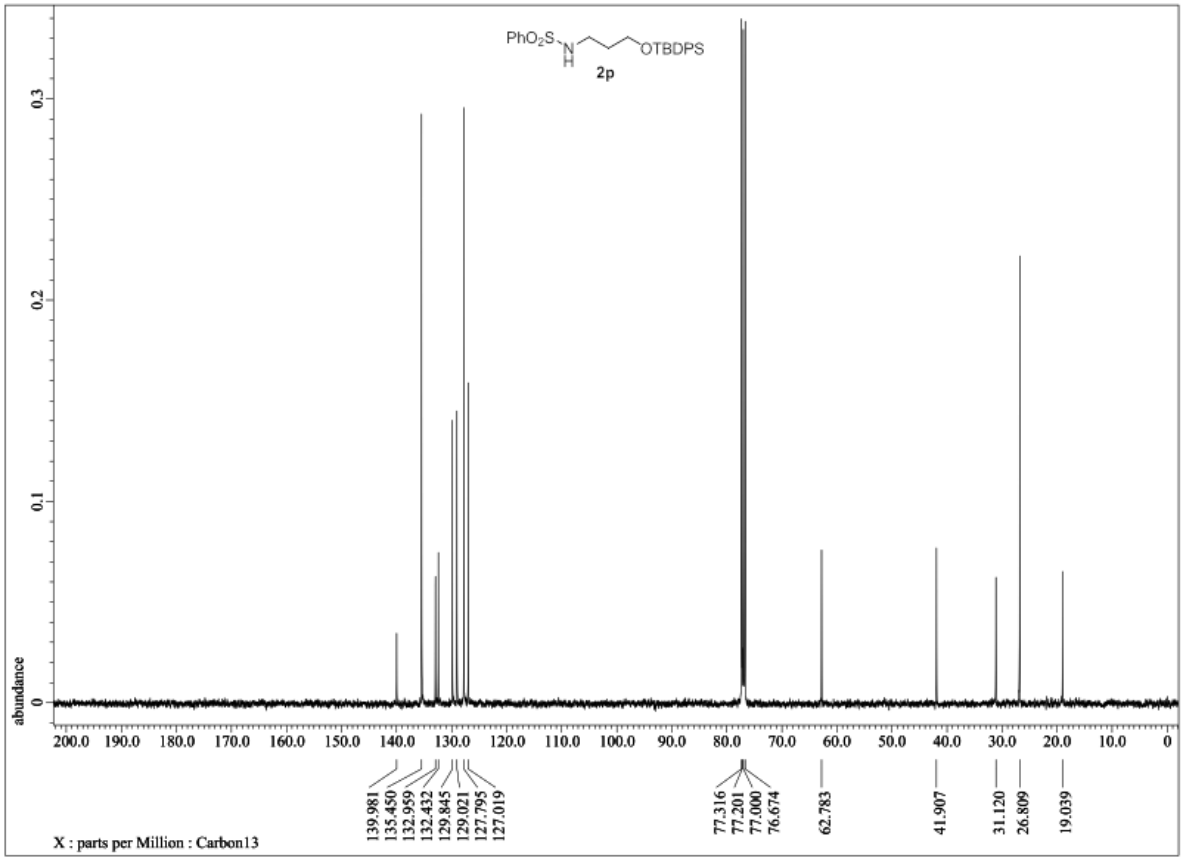

PhO2S
N
H
NO2
2n
2.00
2.29
1.14
0.96
2.03
2.09
2.13
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.871
7.853
7.566
7.546
7.262
4.659
4.644
4.628
4.515
4.499
4.482
3.131
3.114
3.098
3.082
2.249
2.232
2.216
2.200
2.183
2.174
0.000
X : parts per Million : Proton

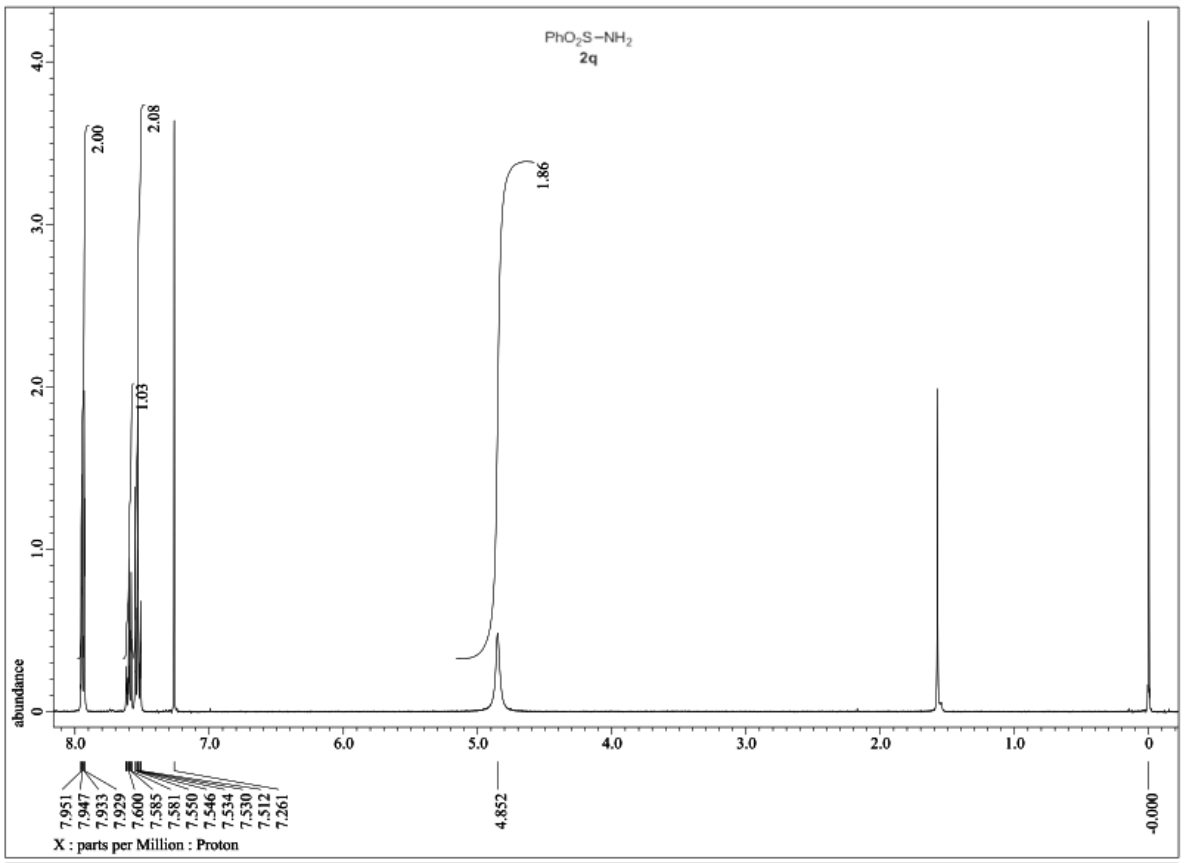

PhO2S
N
H
NO2
2n
abundance
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
139.301
133.026
129.328
126.961
77.316
77.201
77.000
76.674
72.219
39.924
27.374
X : parts per Million : Carbon13

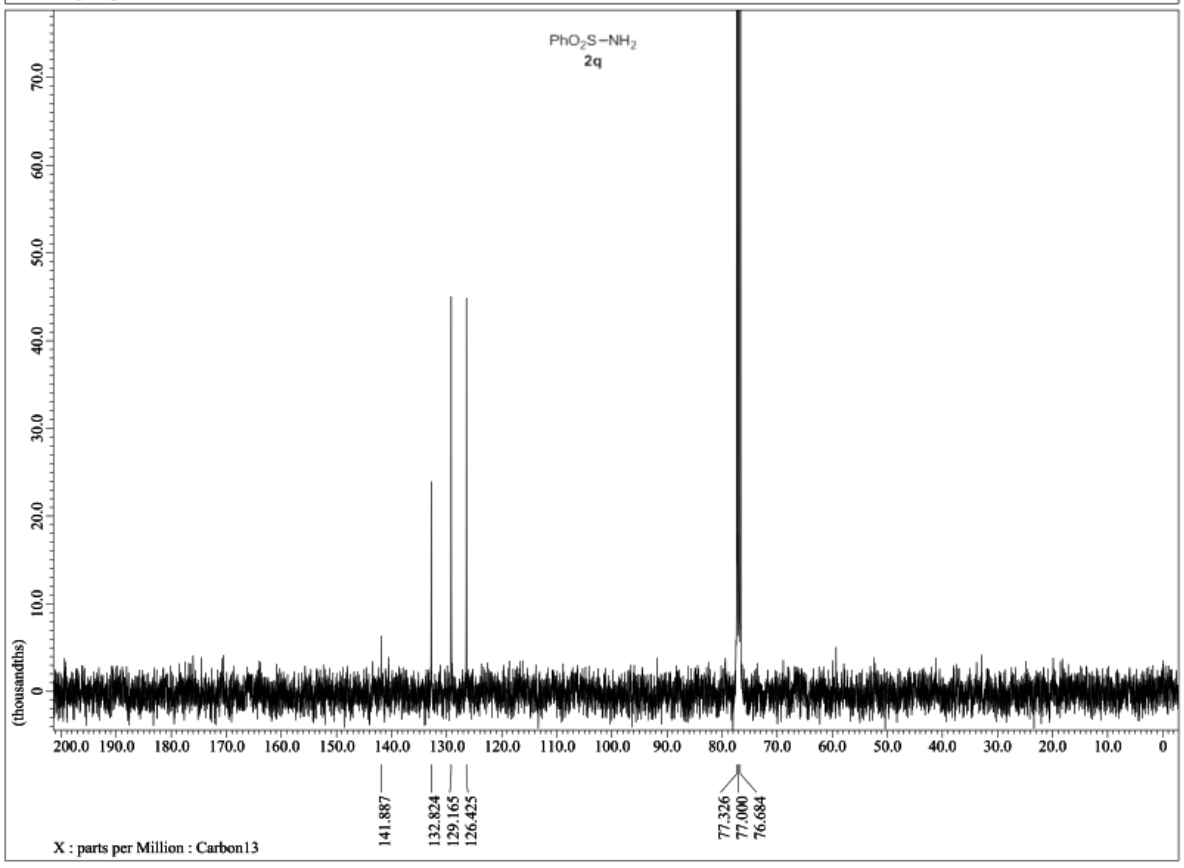

2o
abundance
X : parts per Million : Proton
7.890
7.872
7.813
7.737
7.492
7.263
5.323
5.307
5.290
3.765
3.748
3.733
2.983
2.966
2.951
2.934
1.873
1.857
1.842
1.826
1.810
0.000
3.12
2.09
2.06
2.03
0.95

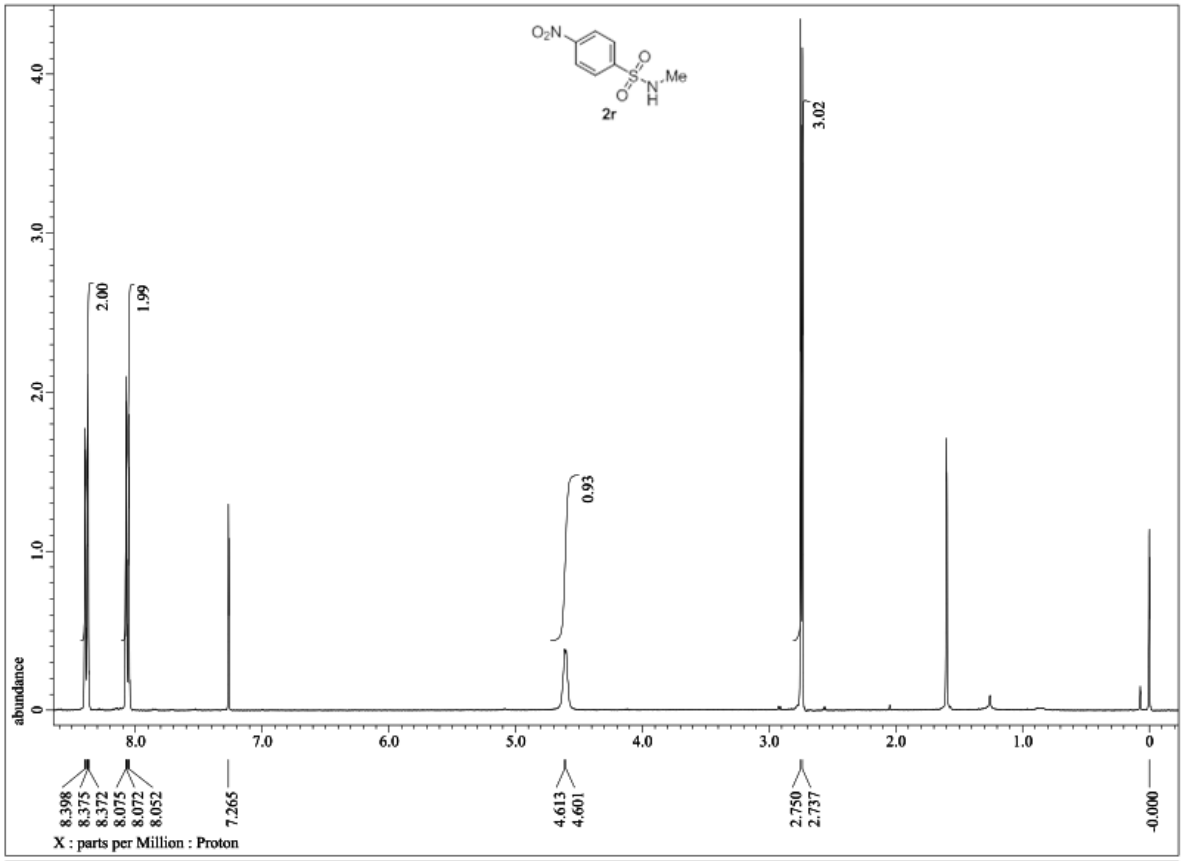

2o
abundance
X : parts per Million : Carbon13
68.645
140.163
134.204
132.537
131.799
129.059
126.961
123.397
77.316
77.000
76.674
39.886
34.444
28.859

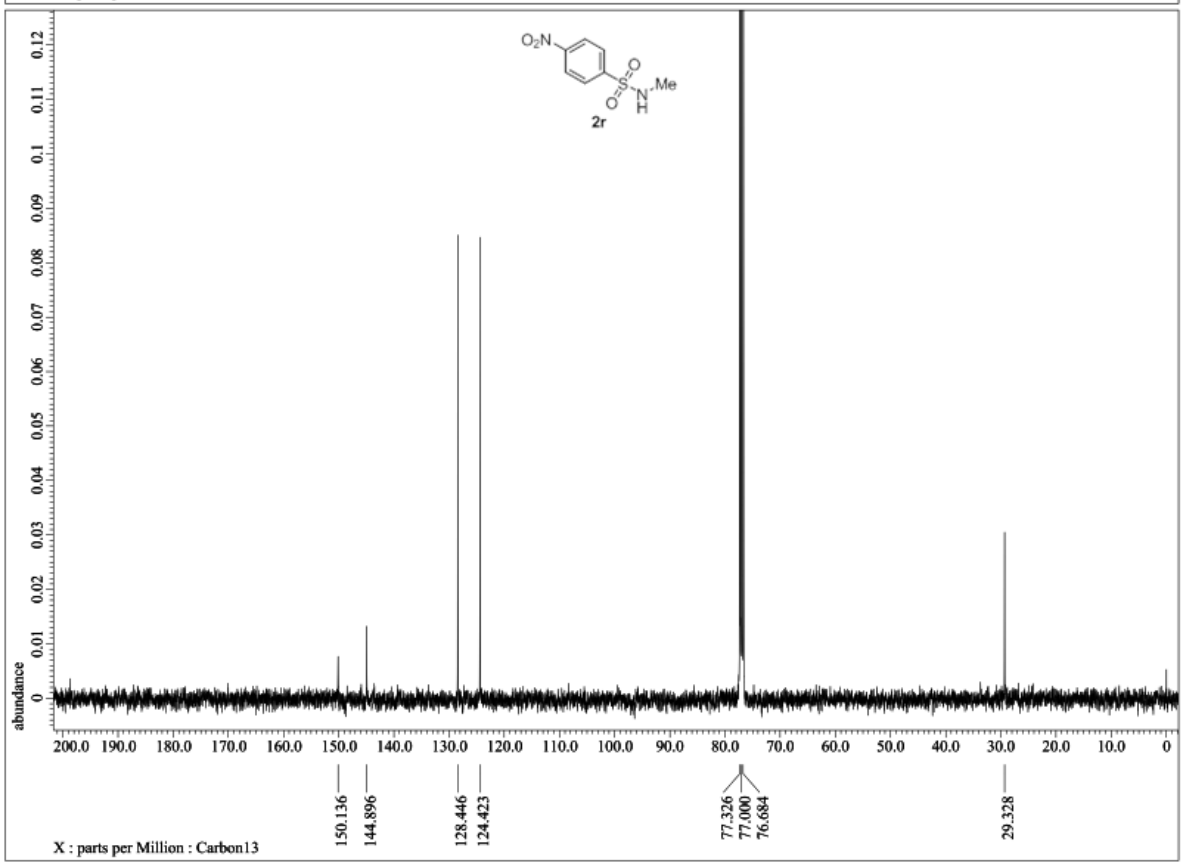

PhO2S
N
H
OTBDPS
2p
9.02
5.15
4.14
2.00
2.05
2.05
1.02
2.08
2.06
2.10
abundance
X : parts per Million : Proton
7.808
7.804
7.592
7.589
7.572
7.568
7.491
7.390
7.375
7.371
7.259
5.101
5.086
5.073
3.680
3.666
3.652
3.169
3.154
3.146
3.139
3.123
1.714
1.700
1.686
1.684
1.670
1.655
1.042
0.000

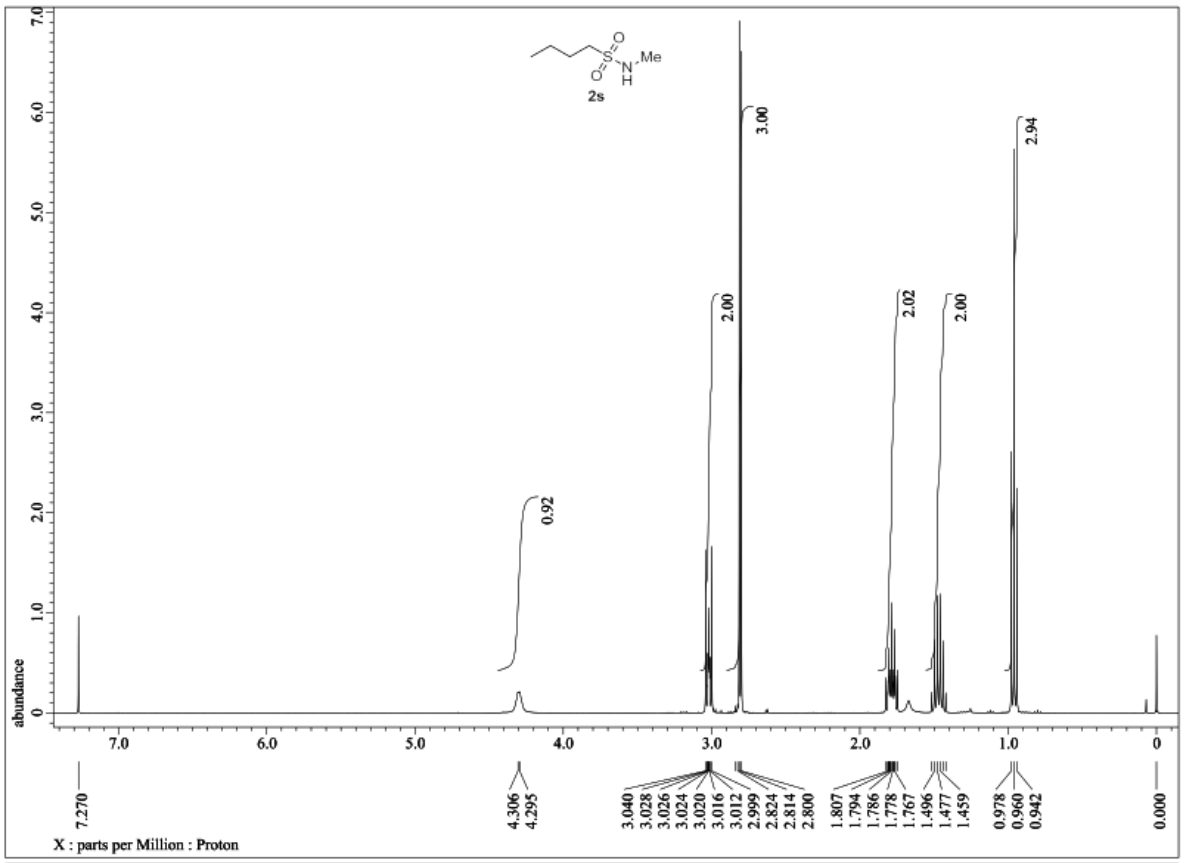

PhO2S
N
H
OTBDPS
2p
abundance
X : parts per Million : Carbon13
139.981
135.450
132.959
132.432
129.845
129.021
127.795
127.019
77.316
77.201
77.000
76.674
62.783
41.907
31.120
26.809
19.039

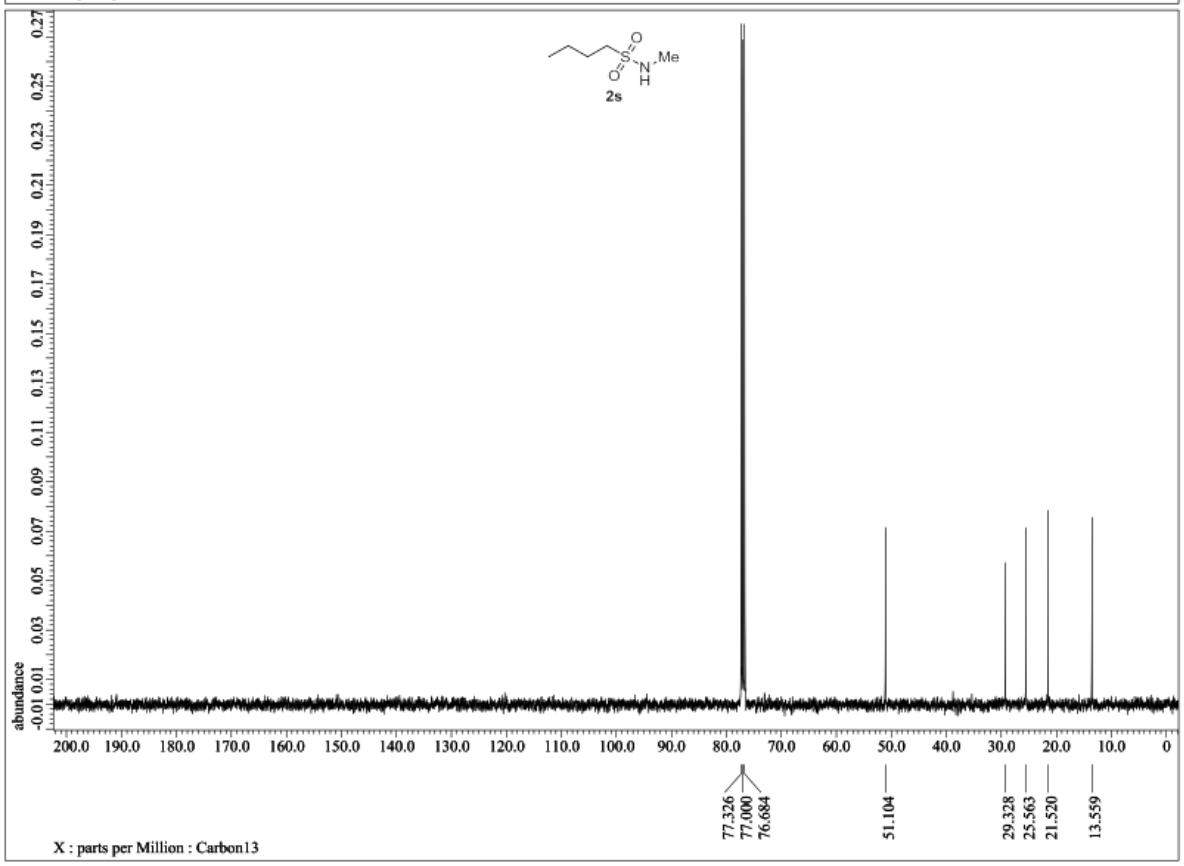

PhO2S–NH2
2q
2.00
2.08
1.86
1.03
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.951
7.947
7.933
7.929
7.600
7.585
7.581
7.550
7.546
7.534
7.530
7.512
7.261
4.852
-0.000
X : parts per Million : Proton

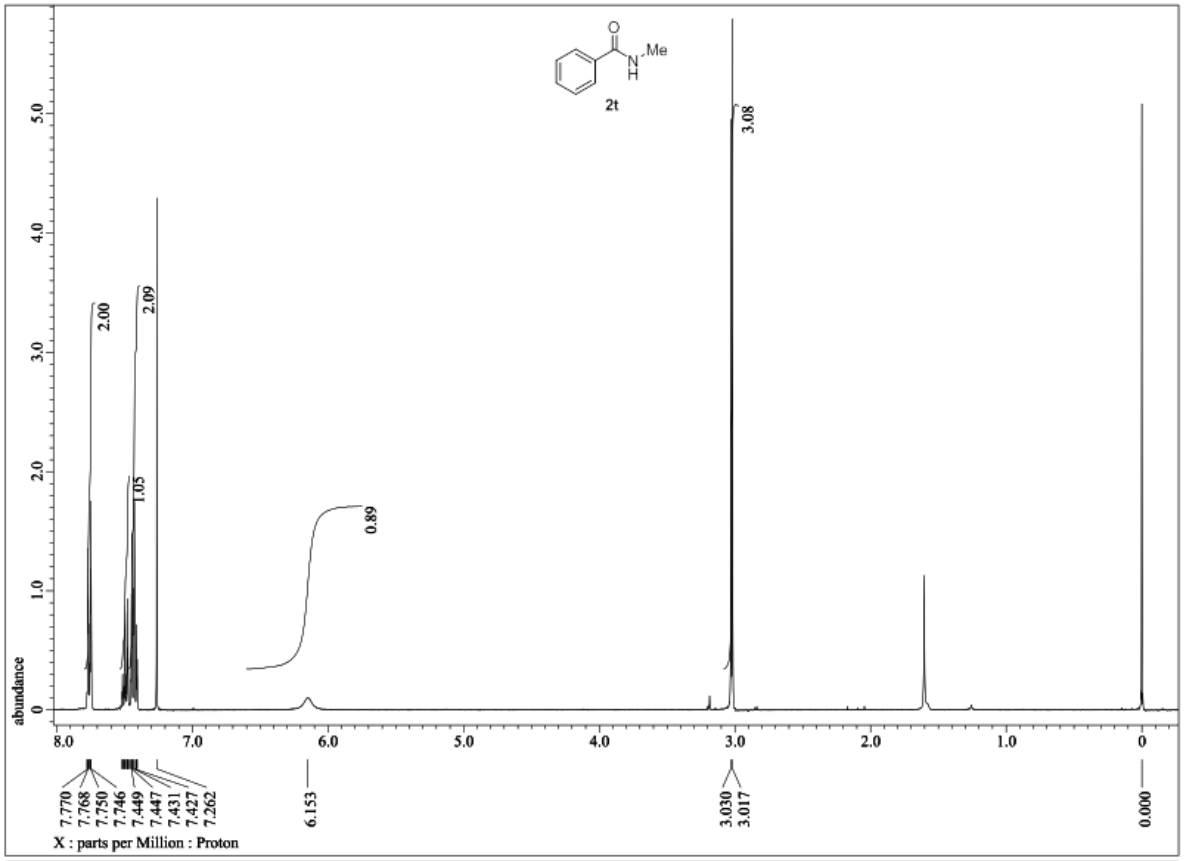

PhO2S–NH2
2q
(thousandths)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
200.0 190.0 180.0 170.0 160.0 150.0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0
141.887
132.824
129.165
126.425
77.326
77.000
76.684
X : parts per Million : Carbon13

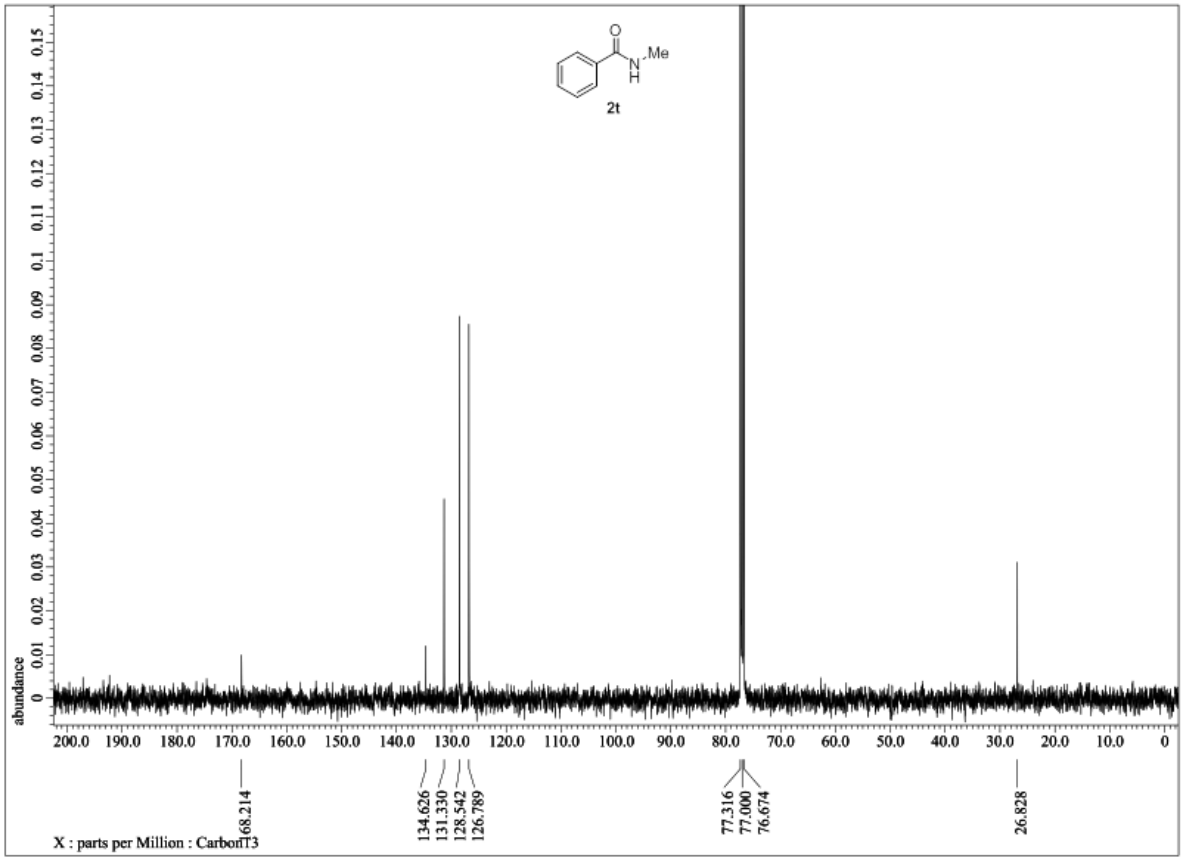

2r
2.00
1.99
0.93
3.02
abundance
8.398
8.375
8.372
8.075
8.072
8.052
7.265
4.613
4.601
2.750
2.737
-0.000
X : parts per Million : Proton

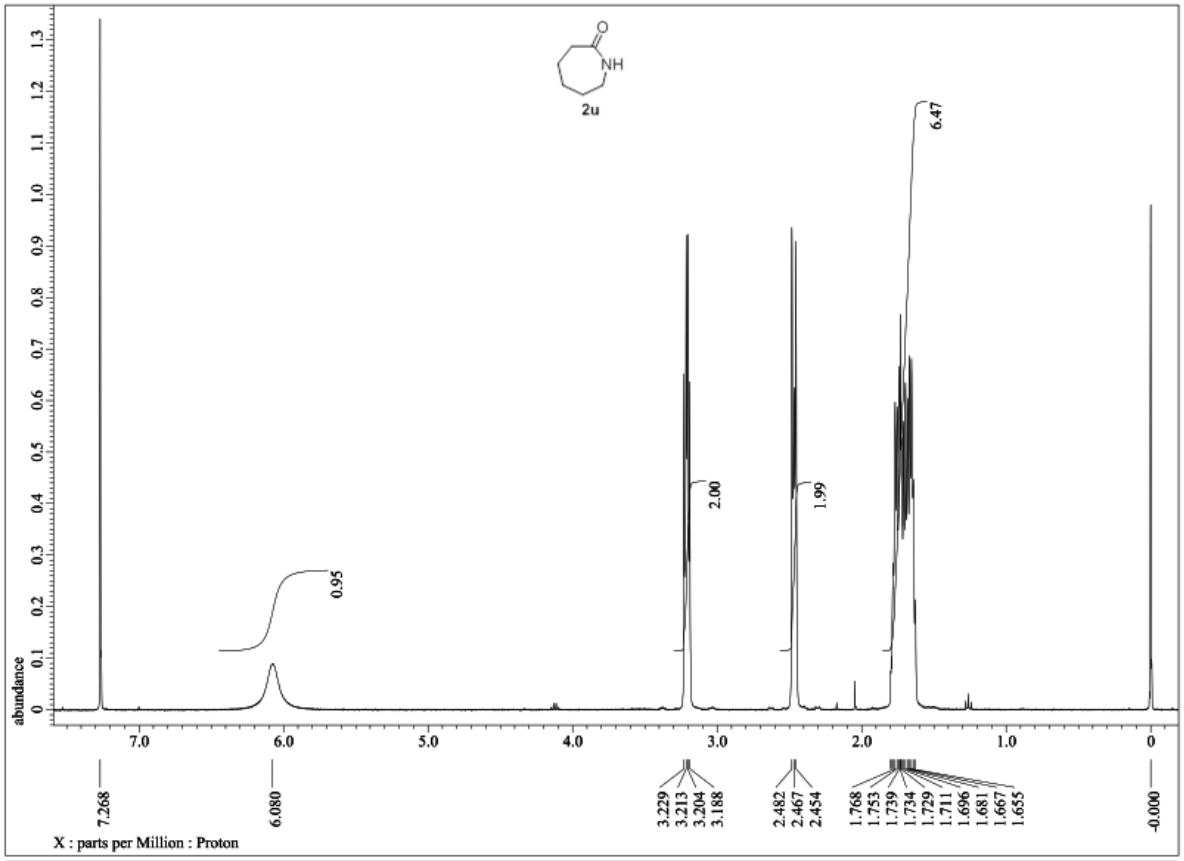

2r
abundance
150.136
144.896
128.446
124.423
77.326
77.000
76.684
29.328
X : parts per Million : Carbon13

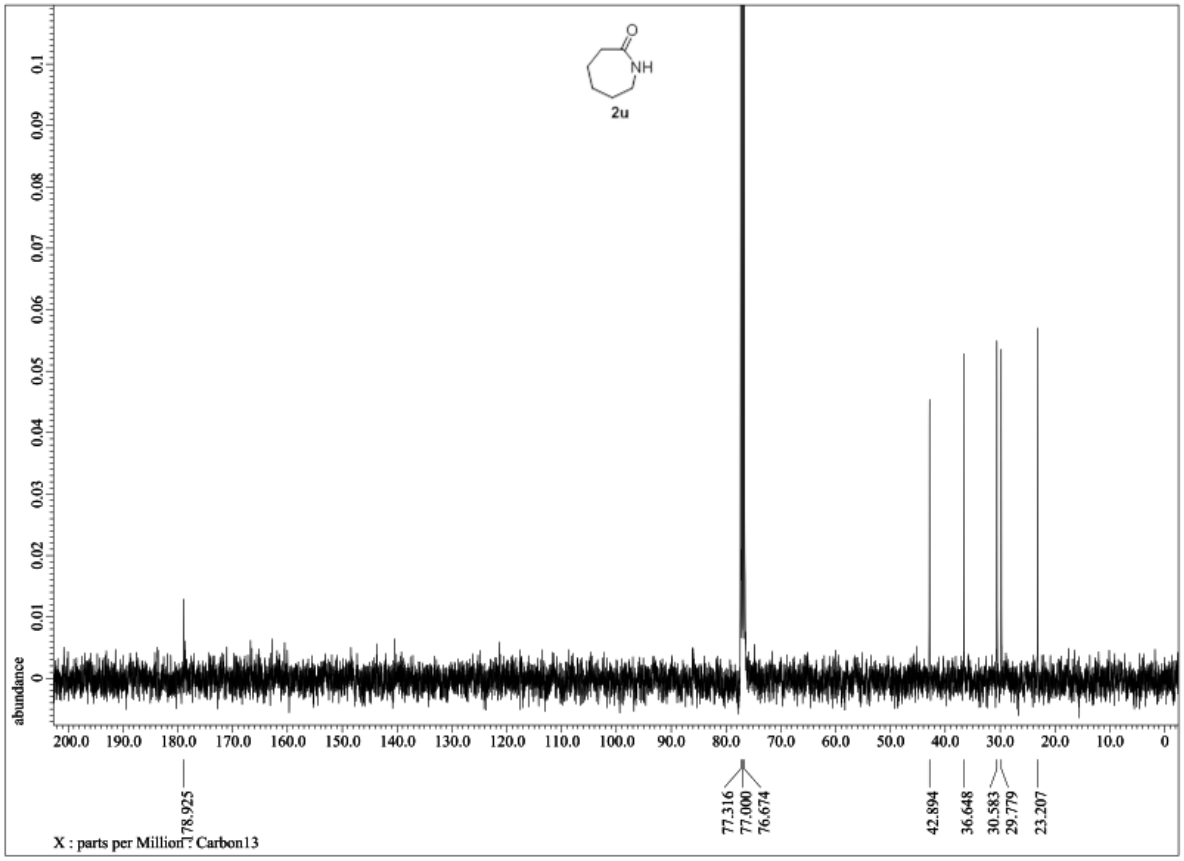

2s
0.92
2.00
3.00
2.02
2.00
2.94
abundance
X : parts per Million : Proton
7.270
4.306
4.295
3.040
3.028
3.026
3.024
3.020
3.016
3.012
2.999
2.824
2.814
2.800
1.807
1.794
1.786
1.778
1.767
1.496
1.477
1.459
0.978
0.960
0.942
0.000

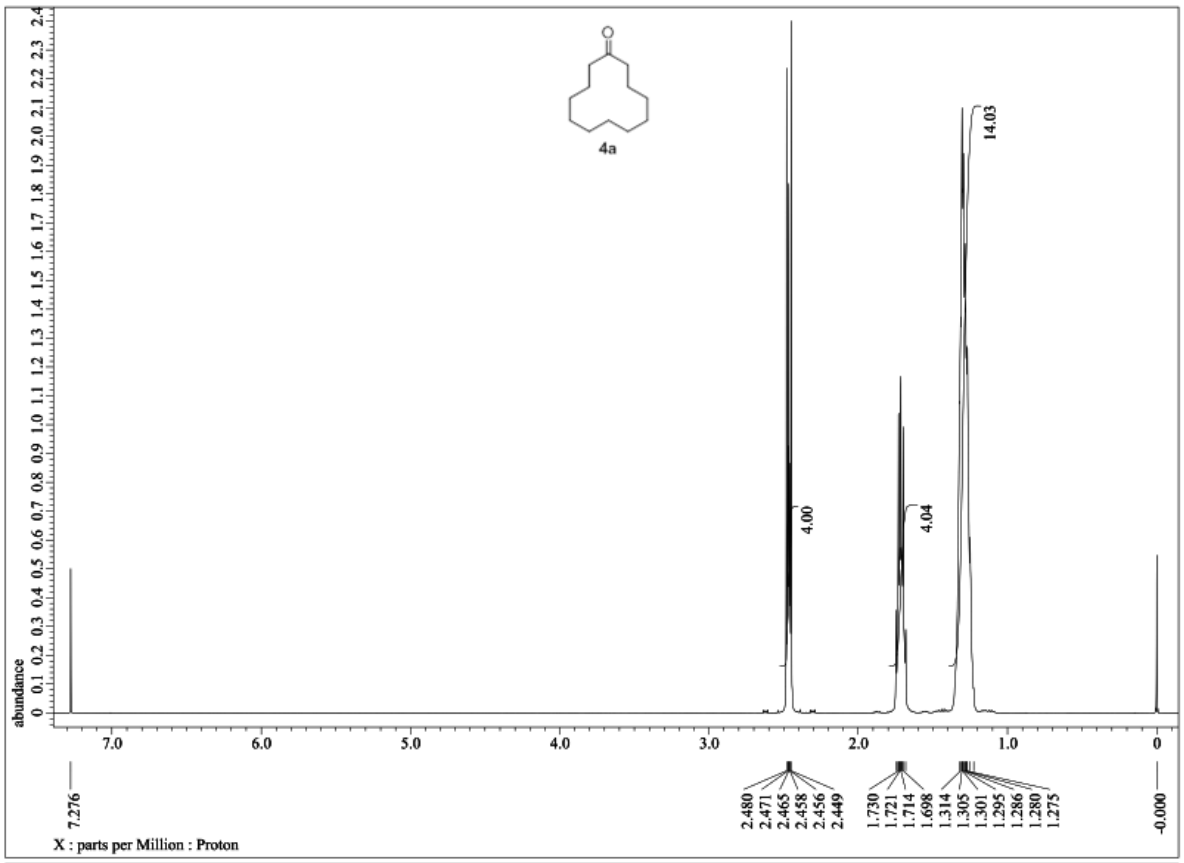

2s
abundance
X : parts per Million : Carbon13
77.326
77.000
76.684
51.104
29.328
25.563
21.520
13.559

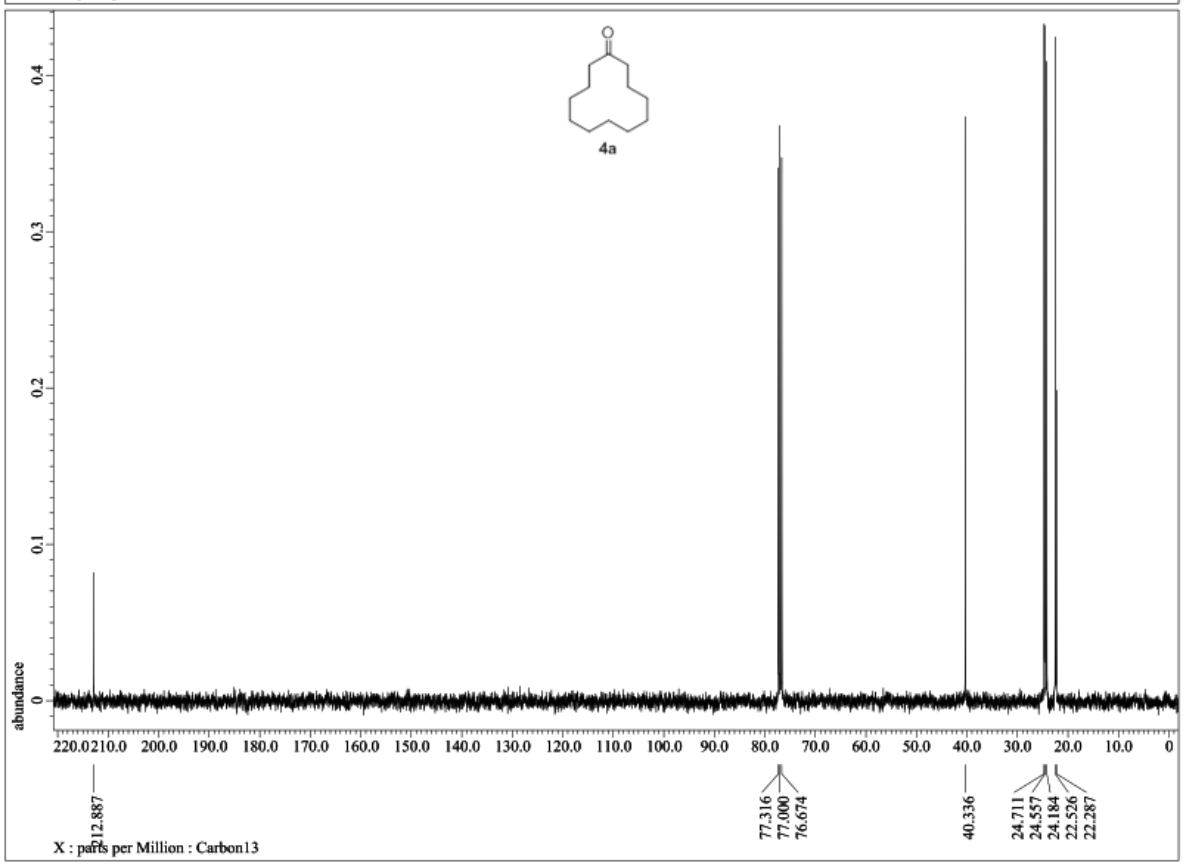

2t
3.08
2.00
2.09
1.05
0.89
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.770
7.768
7.750
7.746
7.449
7.447
7.431
7.427
7.262
6.153
3.030
3.017
0.000
X : parts per Million : Proton

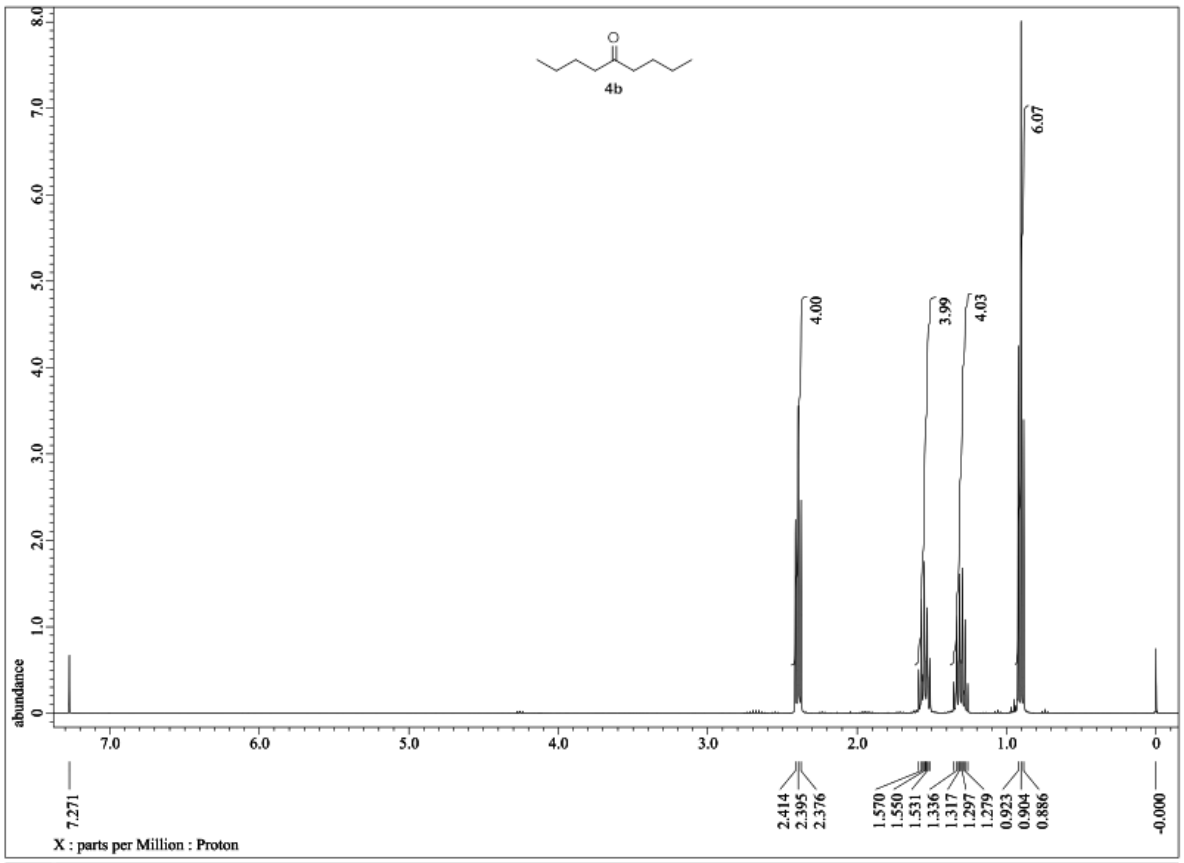

2t
abundance
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
68.214
134.626
131.330
128.542
126.789
77.316
77.000
76.674
26.828
X : parts per Million : Carbon13

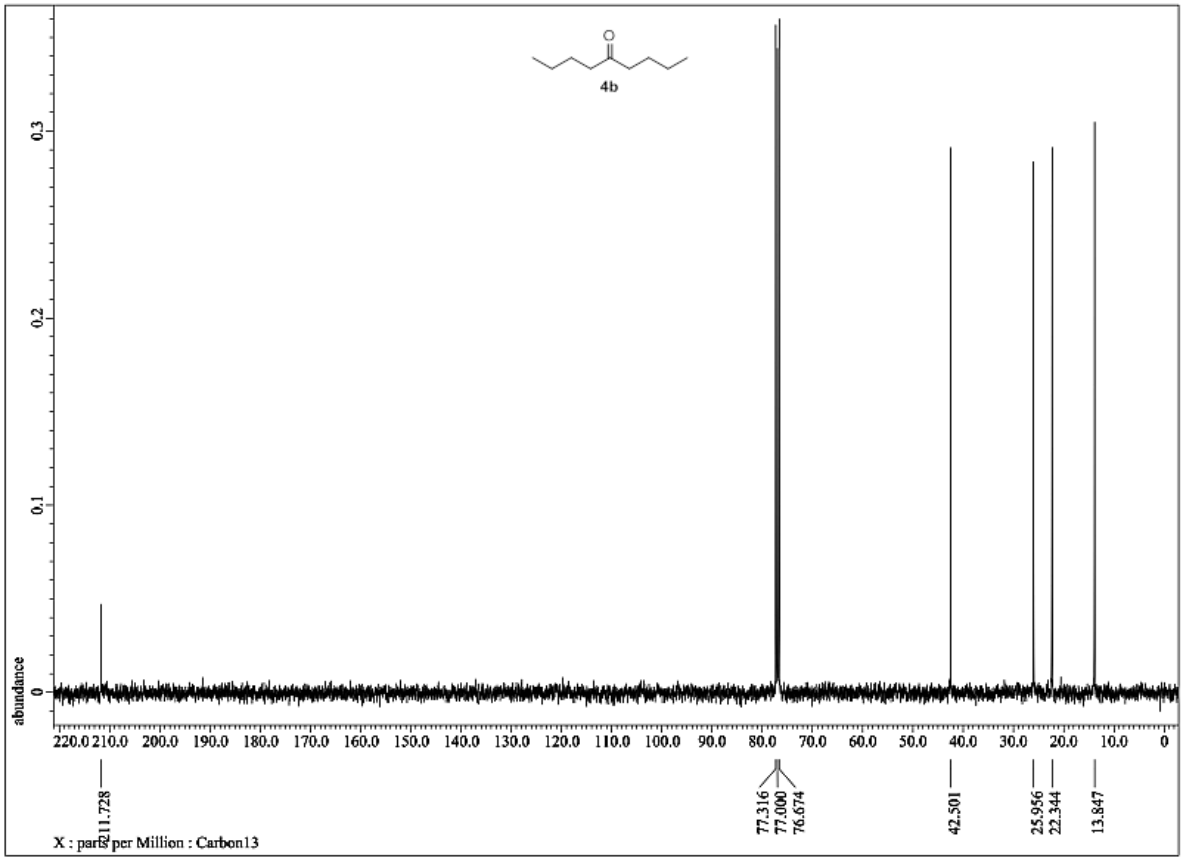

O
NH
2u
6.47
2.00
1.99
0.95
abundance
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.268
6.080
3.229
3.213
3.204
3.188
2.482
2.467
2.454
1.768
1.753
1.739
1.734
1.729
1.711
1.696
1.681
1.667
1.655
-0.000
X : parts per Million : Proton

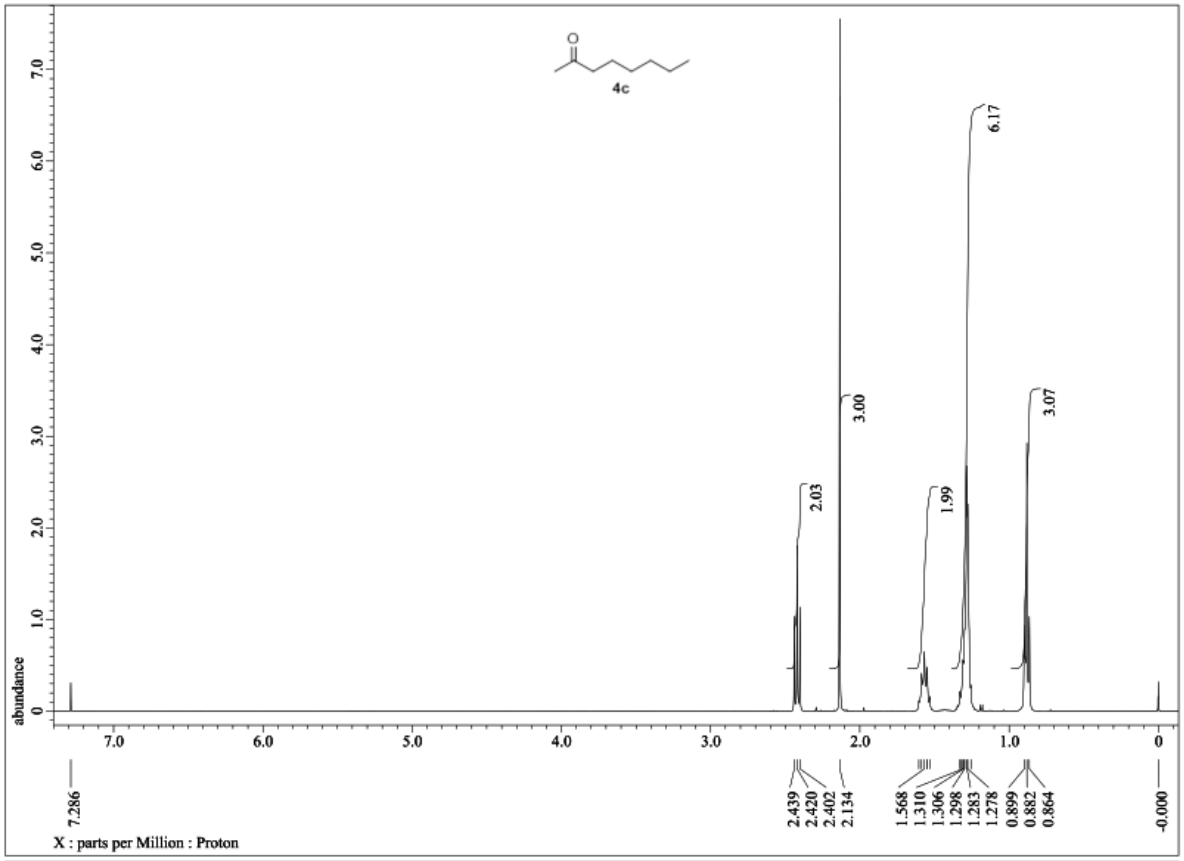

O
NH
2u
abundance
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
78.925
77.316
77.000
76.674
42.894
36.648
30.583
29.779
23.207
X : parts per Million : Carbon13

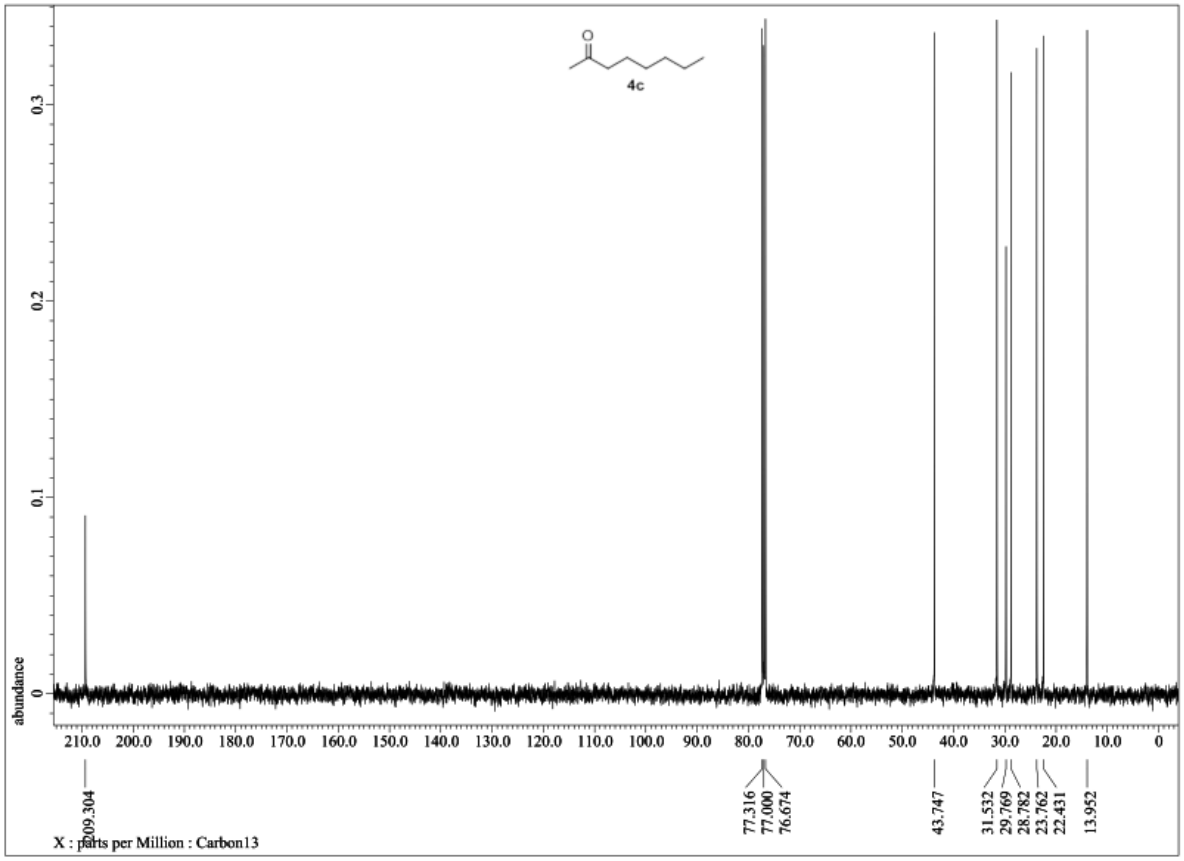

4a
14.03
4.00
4.04
abundance
7.276
2.480
2.471
2.465
2.458
2.456
2.449
1.730
1.721
1.714
1.698
1.314
1.305
1.301
1.295
1.286
1.280
1.275
-0.000
X : parts per Million : Proton

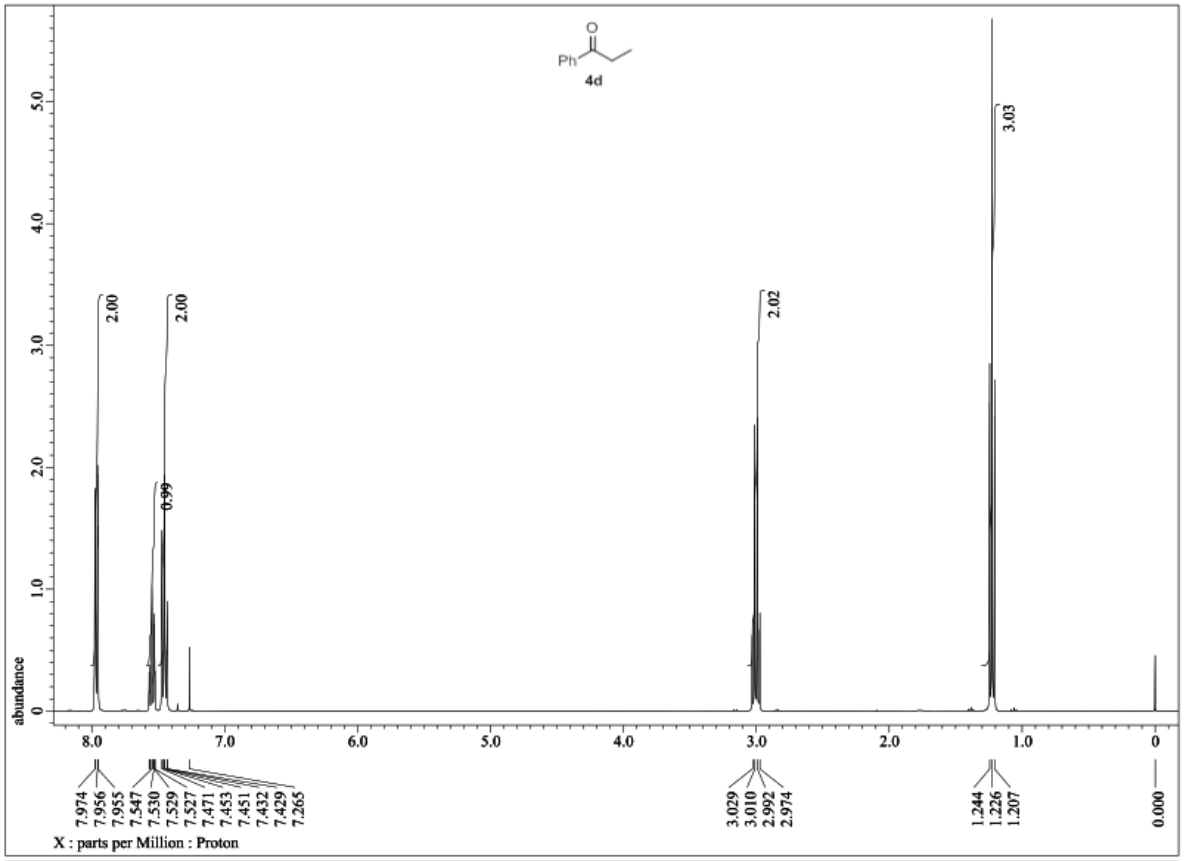

4a
abundance
212.887
77.316
77.000
76.674
40.336
24.711
24.557
24.184
22.526
22.287
X : parts per Million : Carbon13

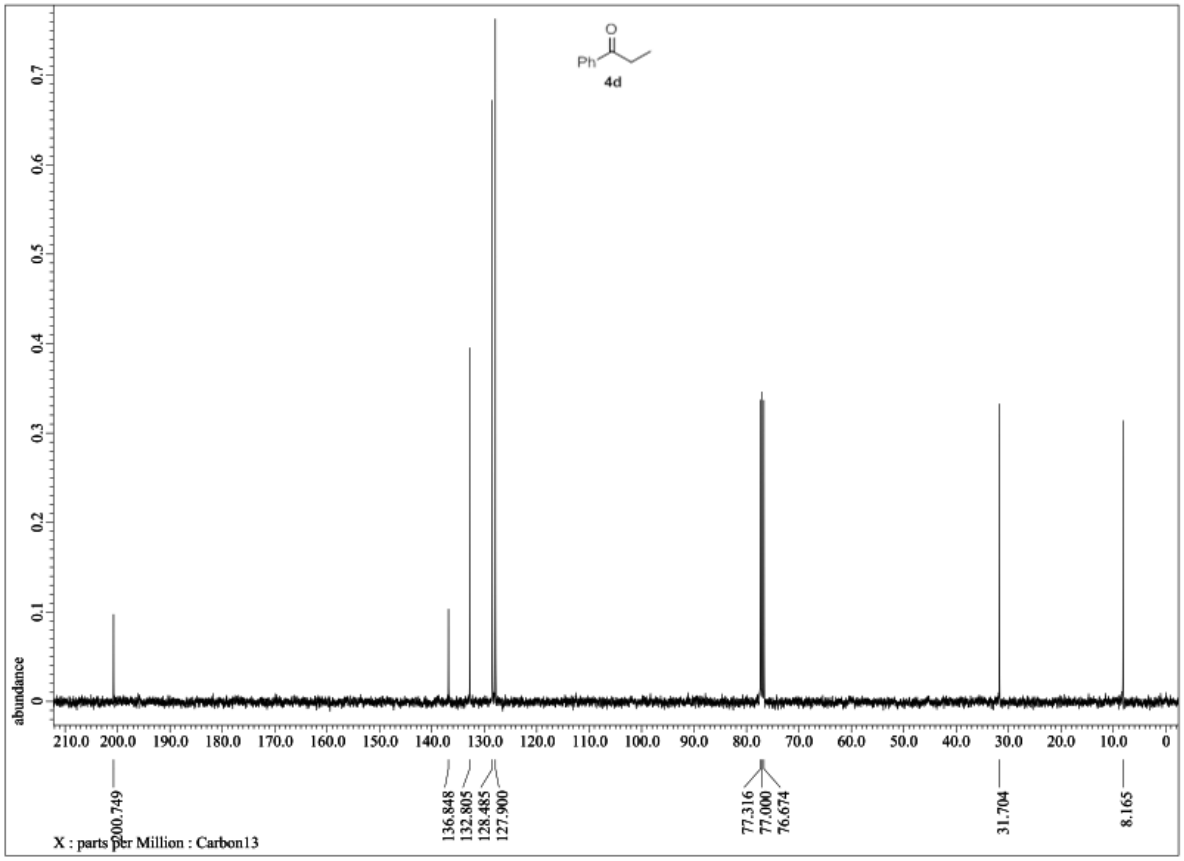

4b
6.07
4.00
3.99
4.03
abundance
7.271
2.414
2.395
2.376
1.570
1.550
1.531
1.336
1.317
1.297
1.279
0.923
0.904
0.886
-0.000
X : parts per Million : Proton

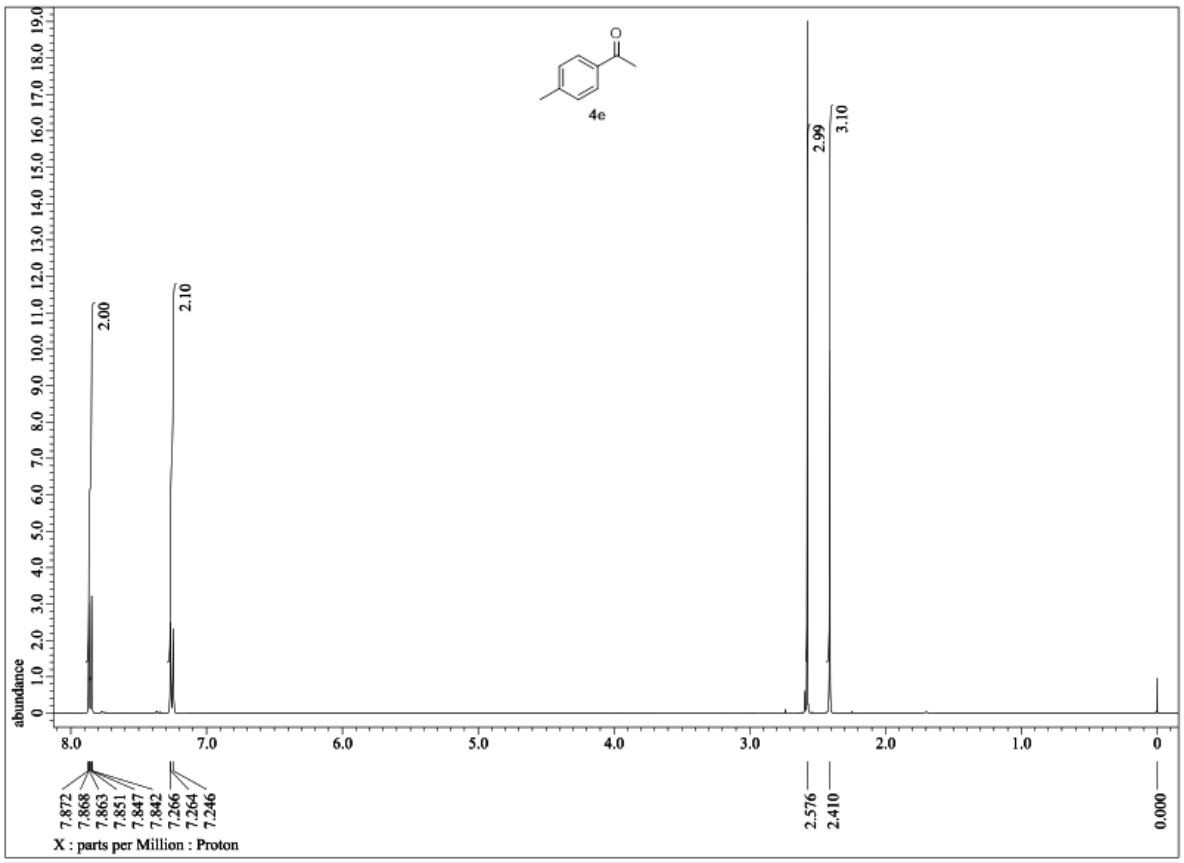

4b
abundance
211.728
77.316
77.000
76.674
42.501
25.956
22.344
13.847
X : parts per Million : Carbon13

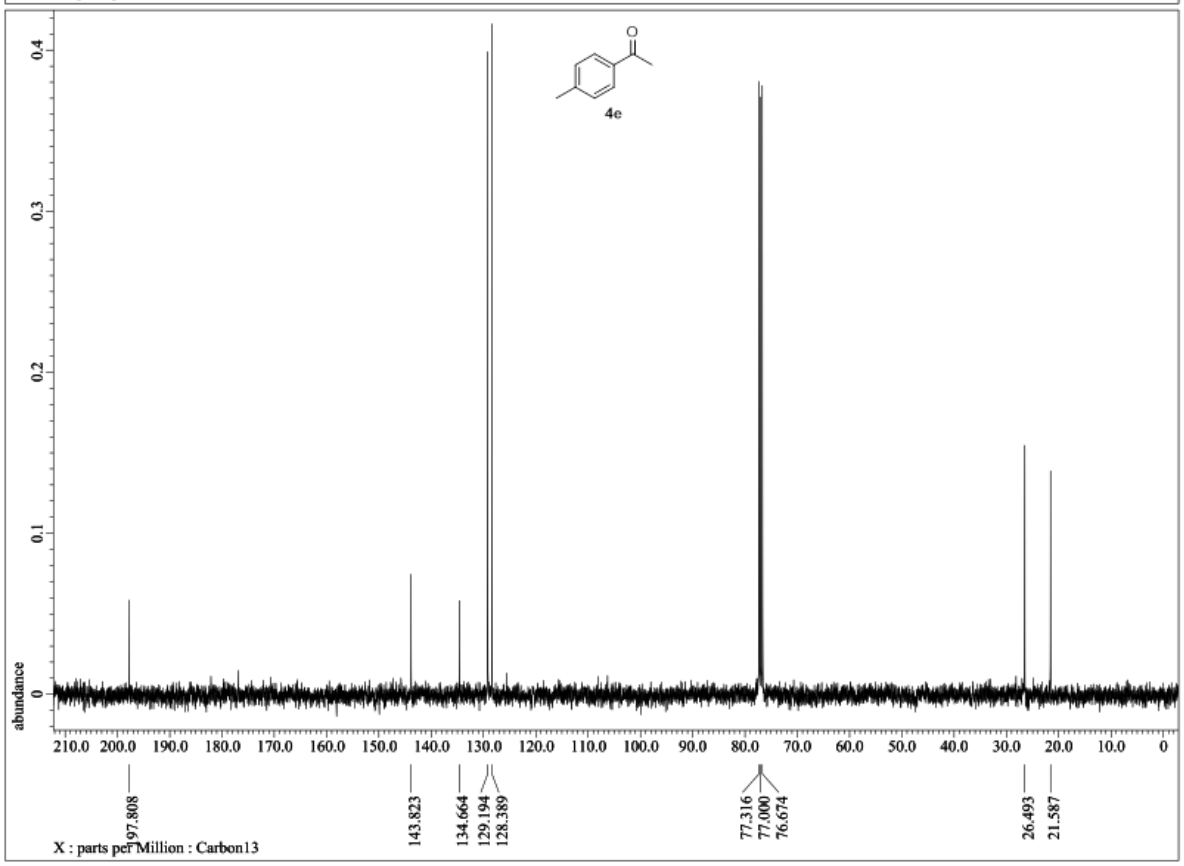

4c
abundance
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
6.17
3.00
3.07
2.03
1.99
7.286
2.439
2.420
2.402
2.134
1.568
1.310
1.306
1.298
1.283
1.278
0.899
0.882
0.864
-0.000
X : parts per Million : Proton

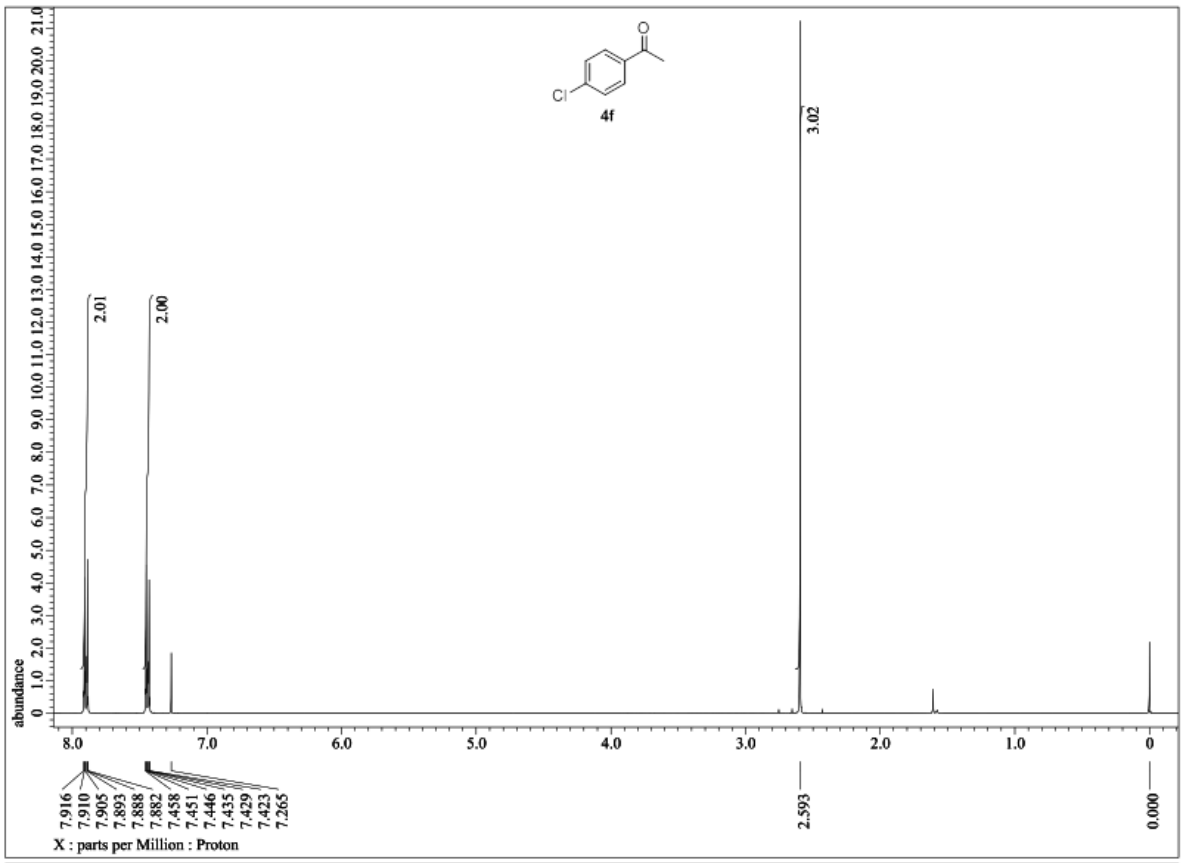

4c
abundance
0.3
0.2
0.1
0
209.304
77.316
77.000
76.674
43.747
31.532
29.769
28.782
23.762
22.431
13.952
X : parts per Million : Carbon13

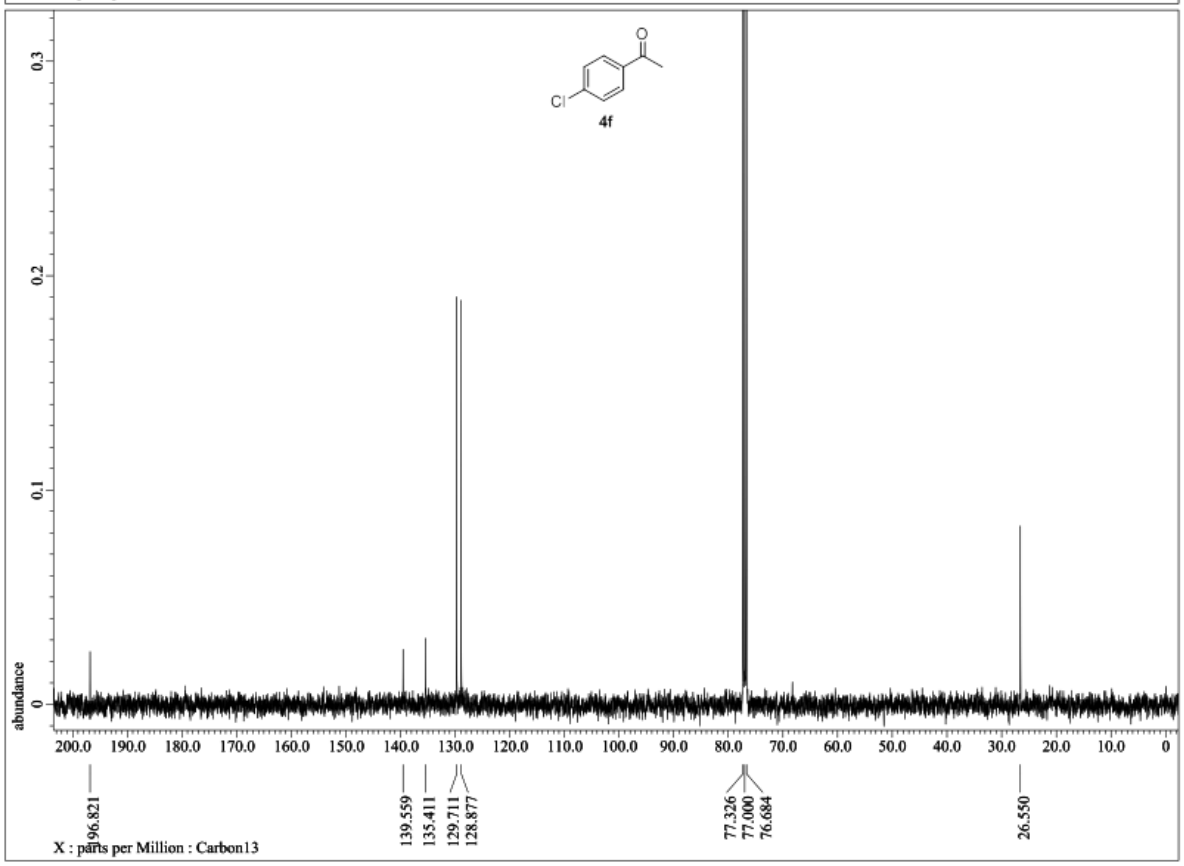

O
Ph
4d
3.03
2.00
2.00
2.02
0.99
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.974
7.956
7.955
7.547
7.530
7.529
7.527
7.471
7.453
7.451
7.432
7.429
7.265
3.029
3.010
2.992
2.974
1.244
1.226
1.207
0.000
X : parts per Million : Proton

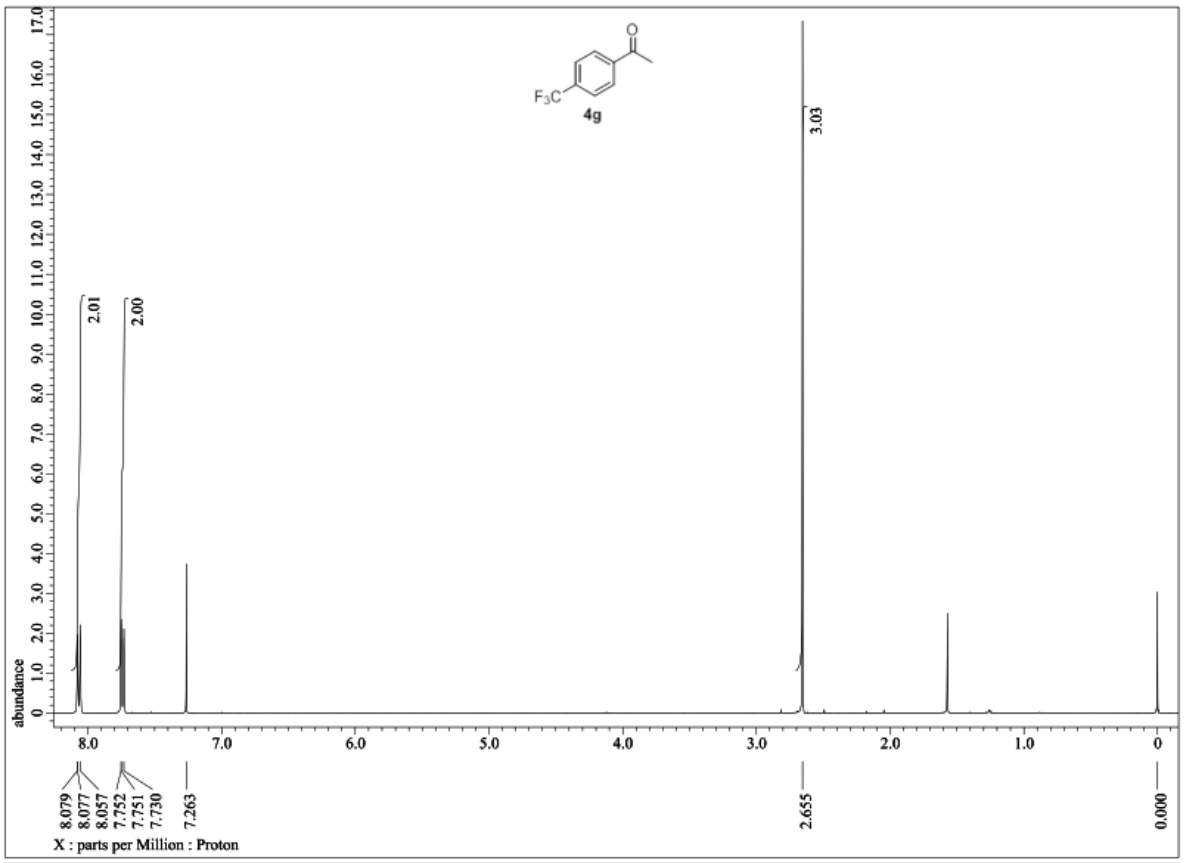

O
Ph
4d
abundance
210.0
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
200.749
136.848
132.805
128.485
127.900
77.316
77.000
76.674
31.704
8.165
X : parts per Million : Carbon13

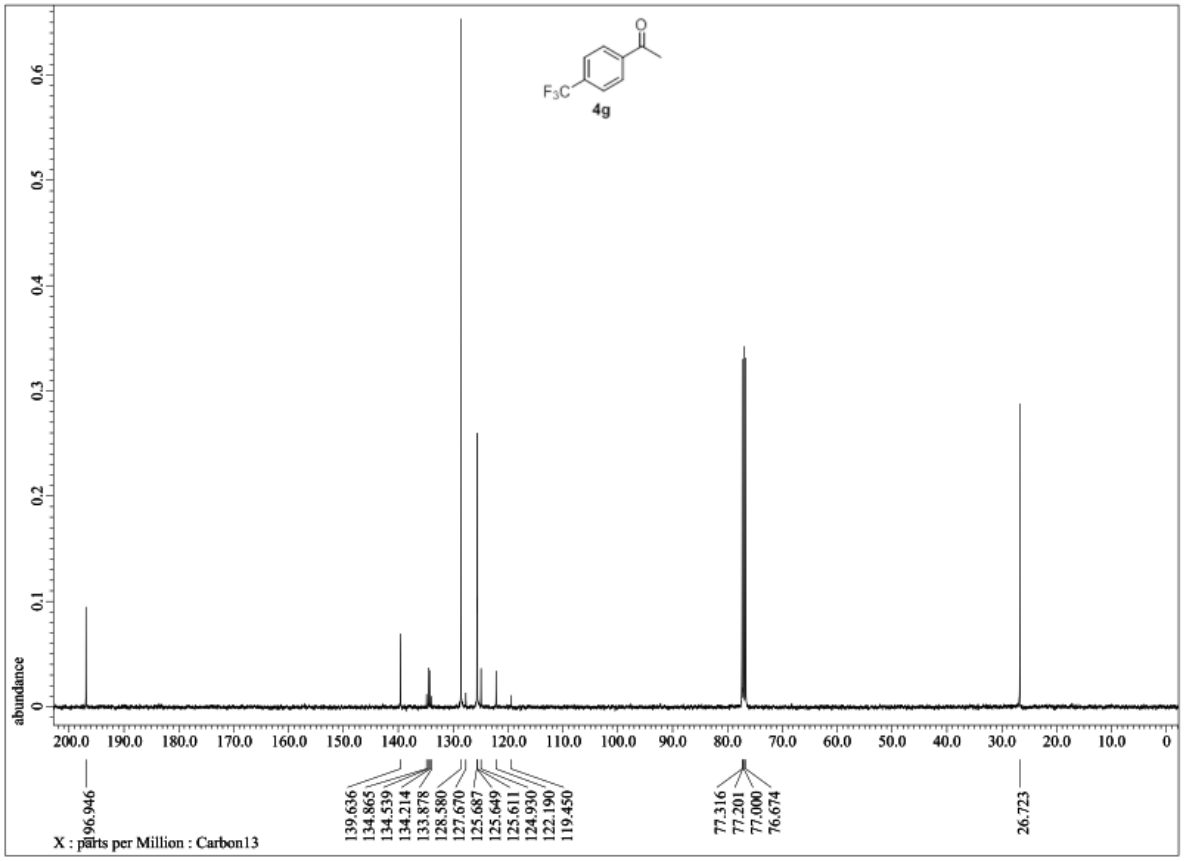

4e
2.00
2.10
2.99
3.10
abundance
7.872
7.868
7.863
7.851
7.847
7.842
7.266
7.264
7.246
2.576
2.410
0.000
X : parts per Million : Proton

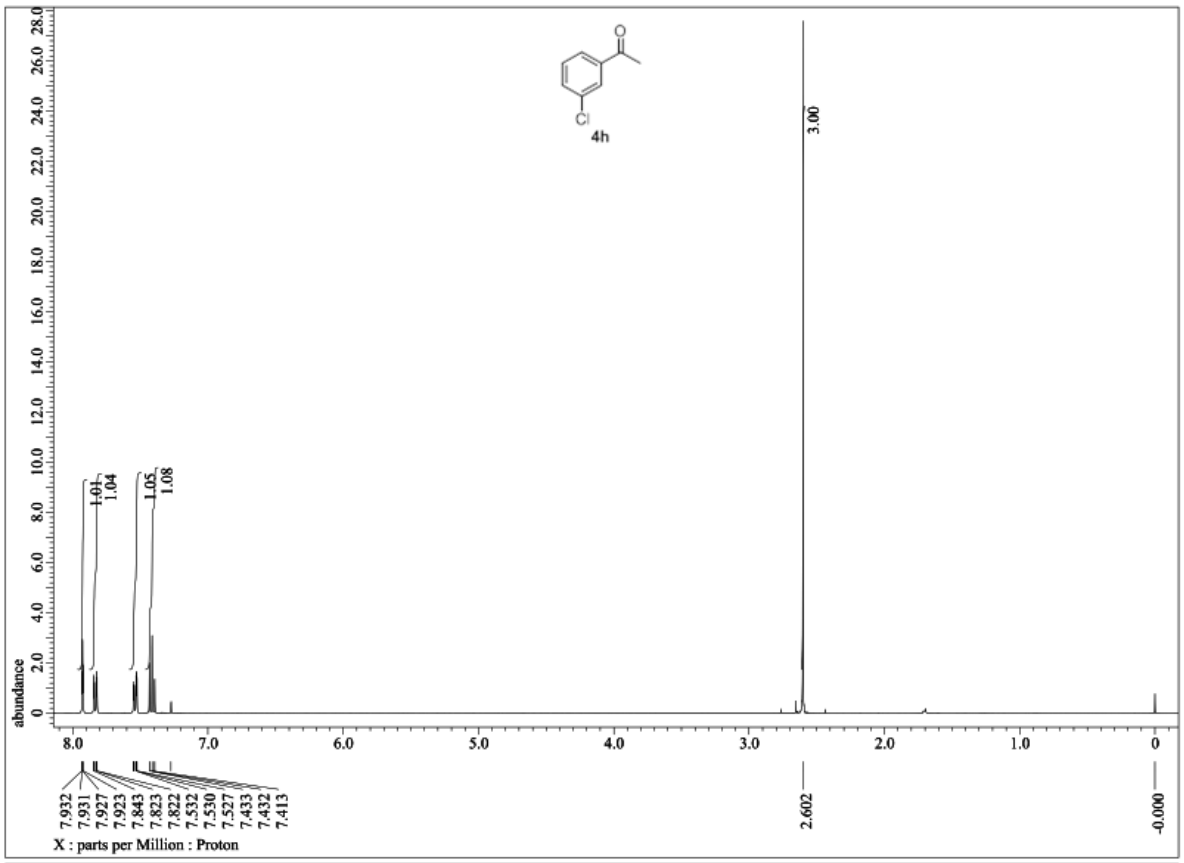

4e
abundance
97.808
143.823
134.664
129.194
128.389
77.316
77.000
76.674
26.493
21.587
X : parts per Million : Carbon13

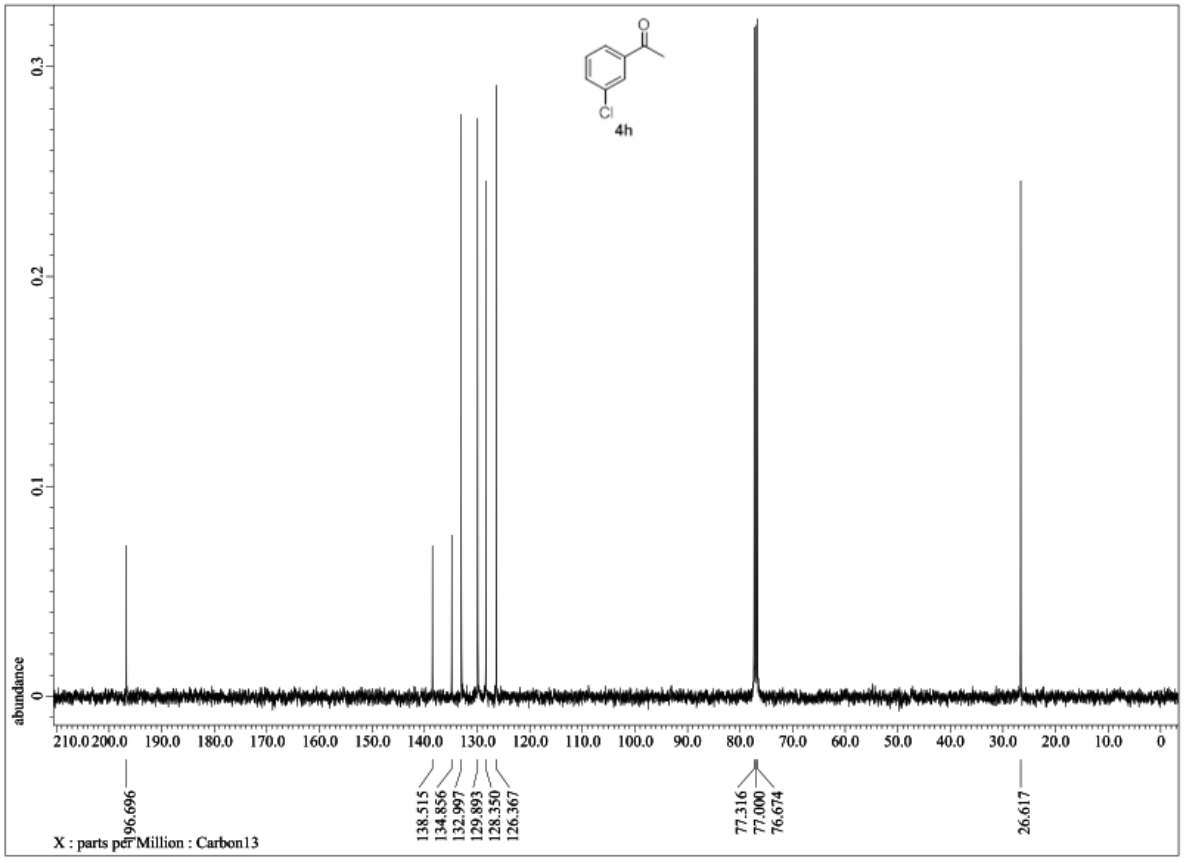

4f
3.02
2.01
2.00
abundance
7.916
7.910
7.905
7.893
7.888
7.882
7.458
7.451
7.446
7.435
7.429
7.423
7.265
2.593
0.000
X : parts per Million : Proton

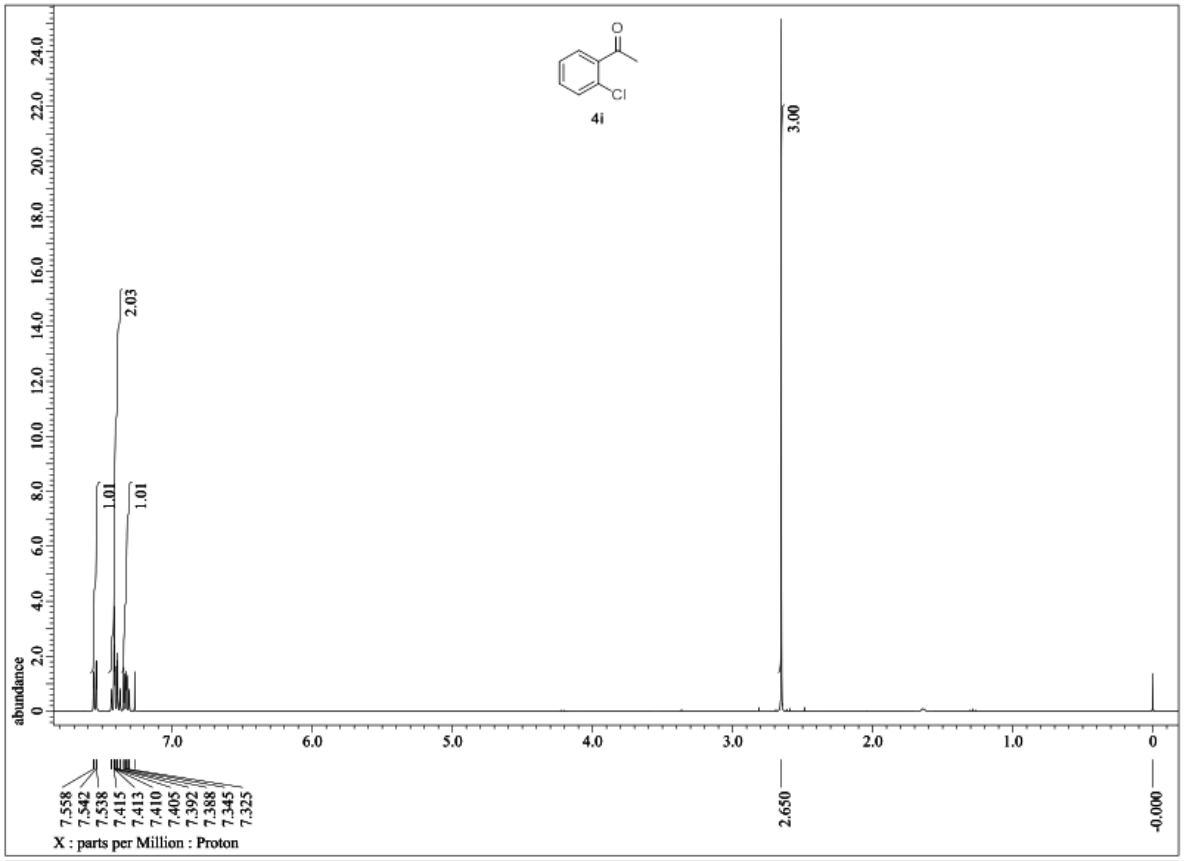

4f
abundance
196.821
139.559
135.411
129.711
128.877
77.326
77.000
76.684
26.550
X : parts per Million : Carbon13

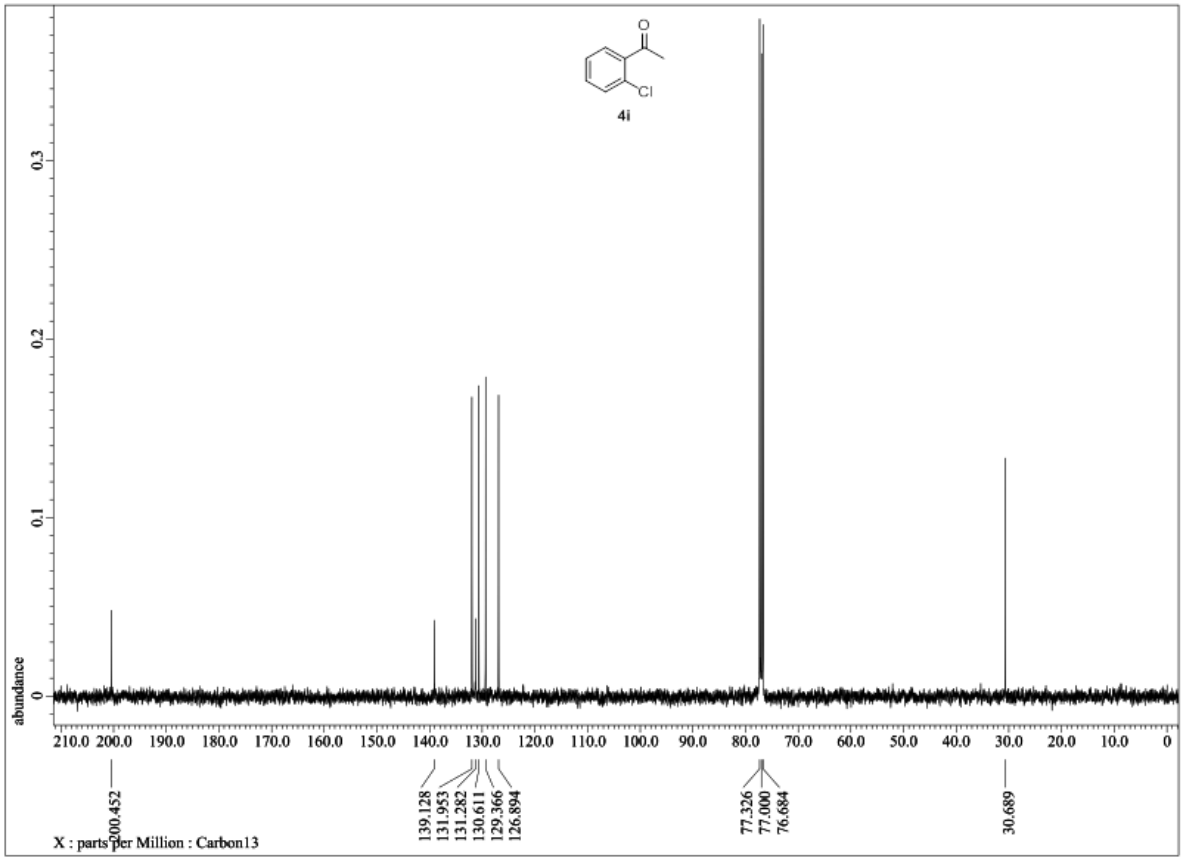

4g
3.03
2.01
2.00
abundance
8.079
8.077
8.057
7.752
7.751
7.730
7.263
2.655
0.000
X : parts per Million : Proton

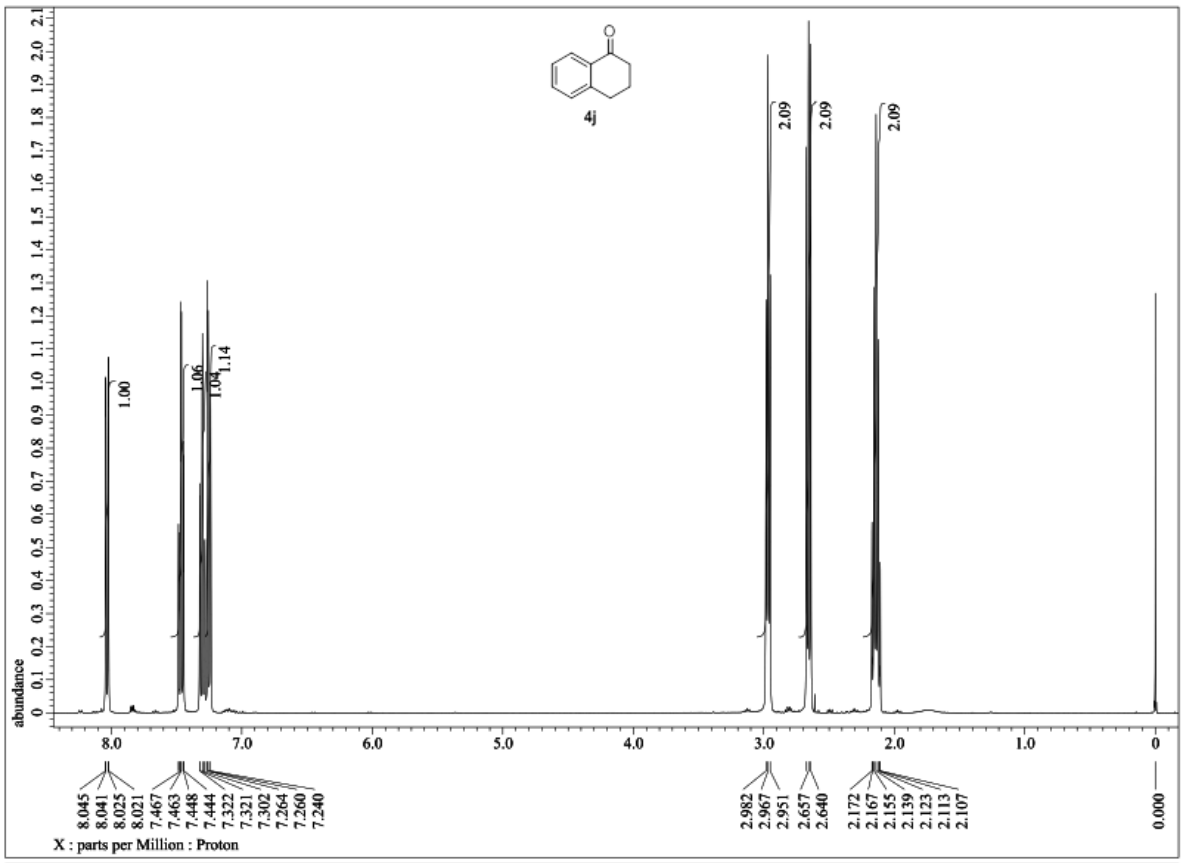

4g
abundance
96.946
139.636
134.865
134.539
134.214
133.878
128.580
127.670
125.687
125.649
125.611
124.930
122.190
119.450
77.316
77.201
77.000
76.674
26.723
X : parts per Million : Carbon13

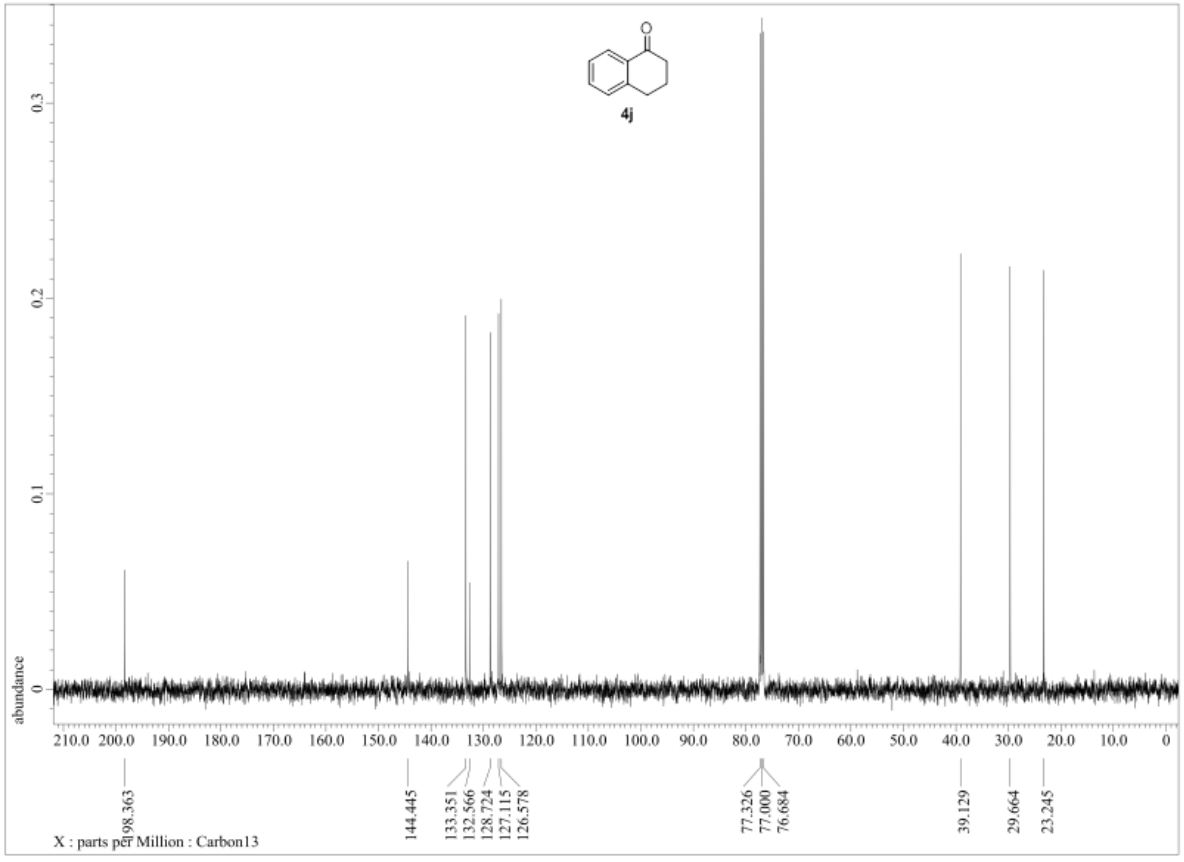

4h
3.00
1.01
1.04
1.05
1.08
abundance
7.932
7.931
7.927
7.923
7.843
7.823
7.822
7.532
7.530
7.527
7.433
7.432
7.413
2.602
-0.000
X : parts per Million : Proton

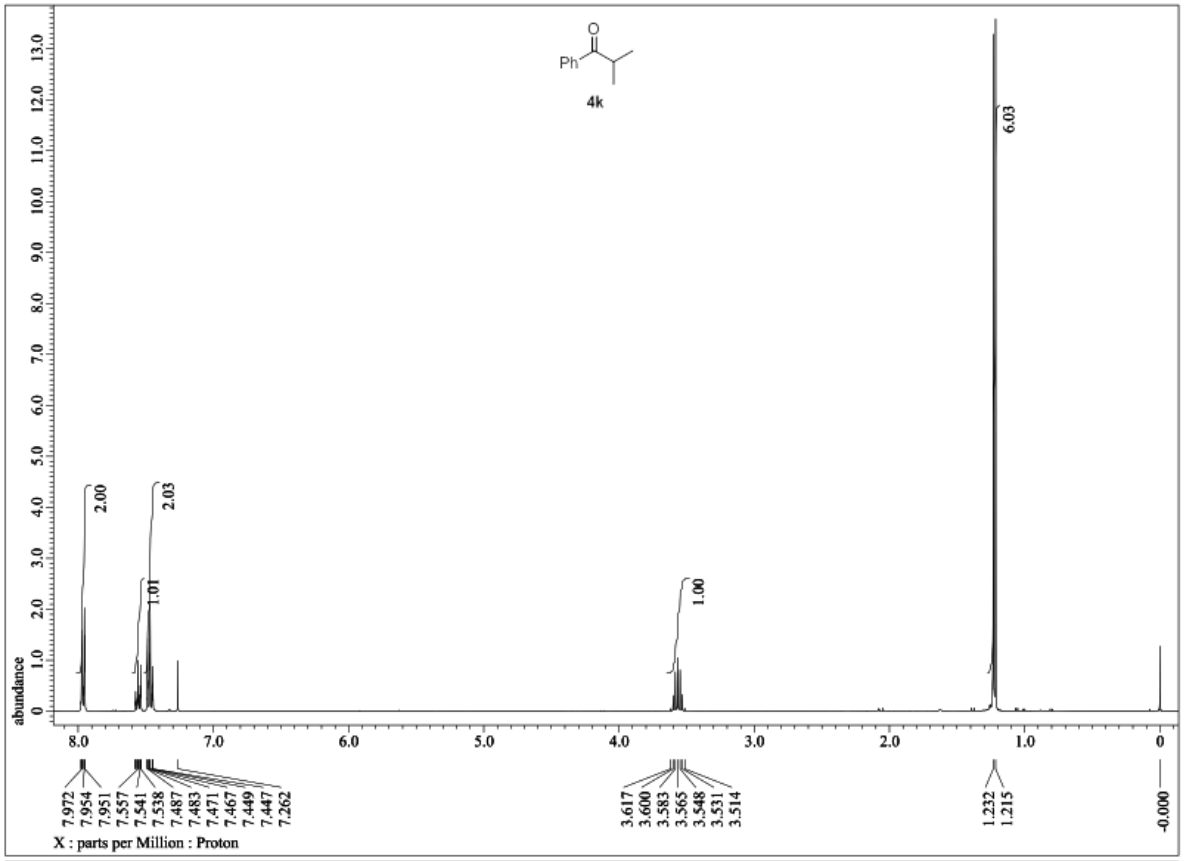

4h
abundance
96.696
138.515
134.856
132.997
129.893
128.350
126.367
77.316
77.000
76.674
26.617
X : parts per Million : Carbon13

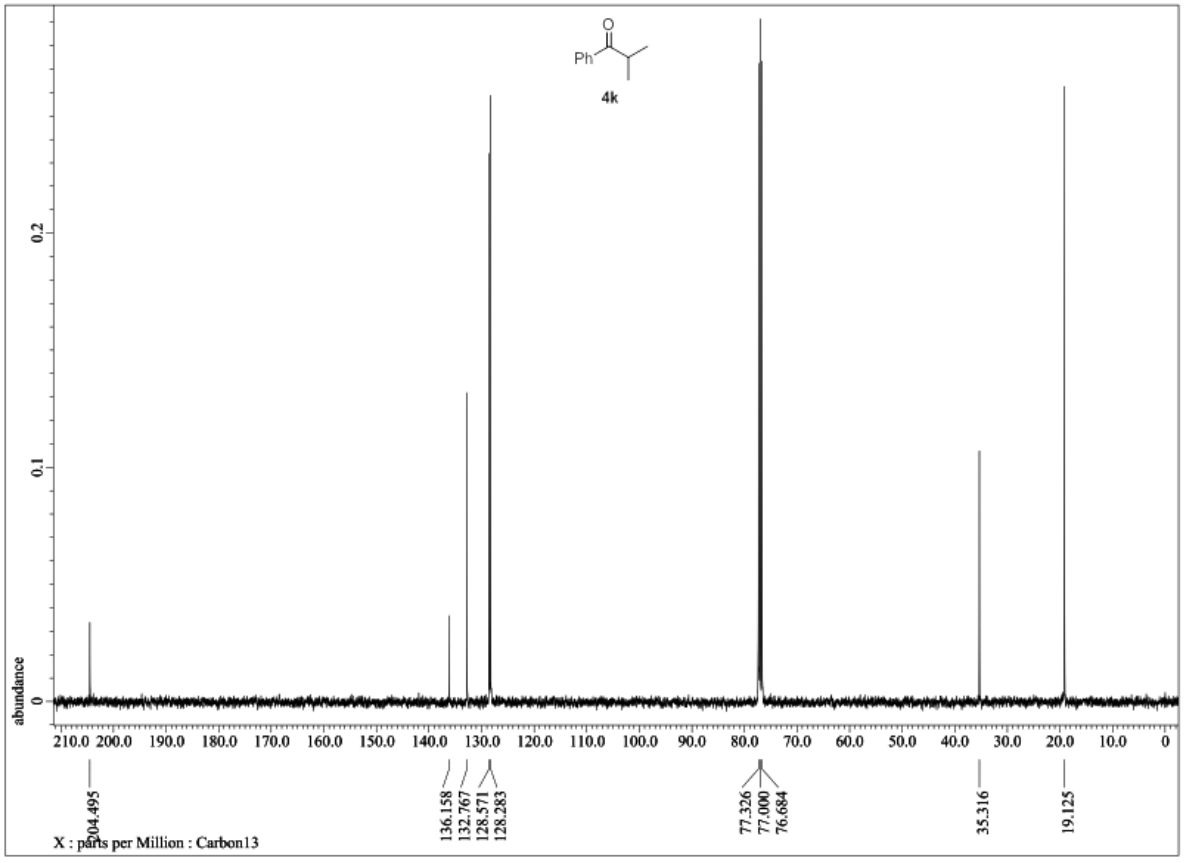

4i
3.00
2.03
1.01
1.01
abundance
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.558
7.542
7.538
7.415
7.413
7.410
7.405
7.392
7.388
7.345
7.325
2.650
-0.000
X : parts per Million : Proton

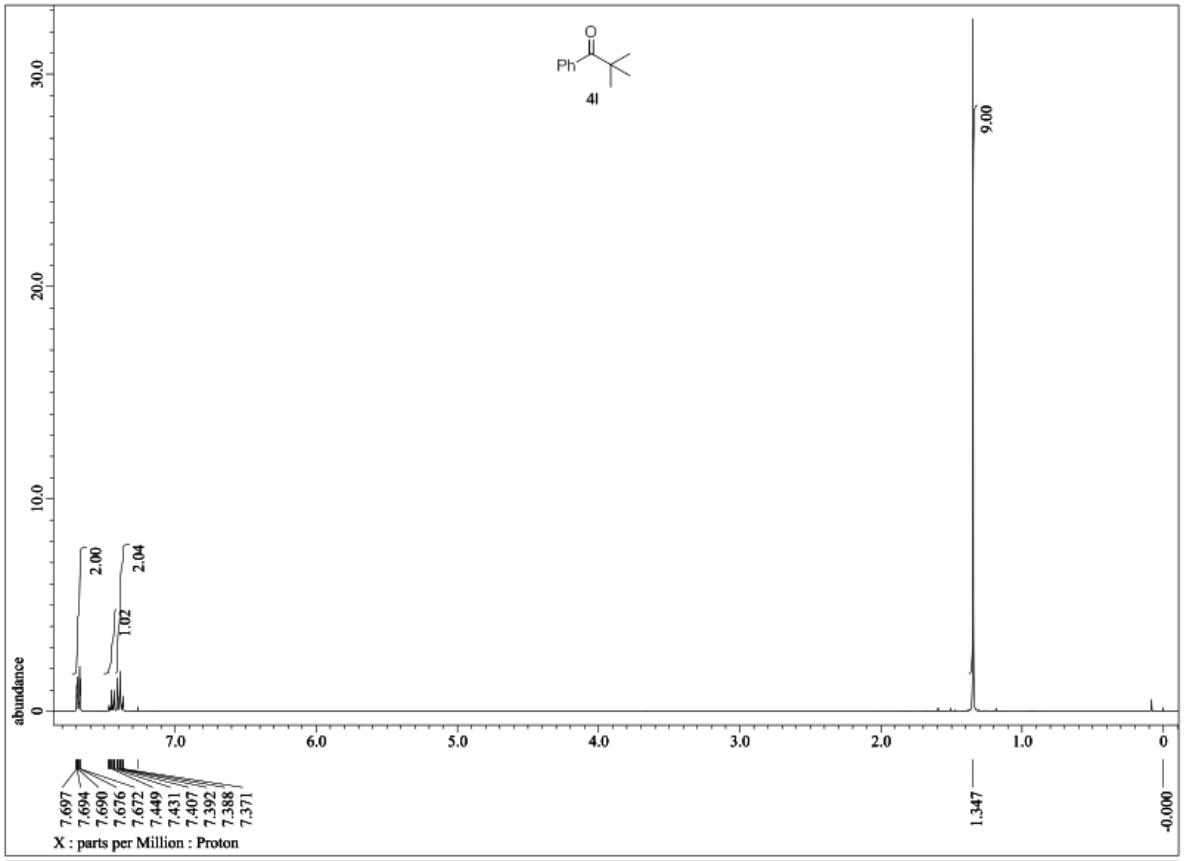

4i
abundance
0.3
0.2
0.1
0
210.0 200.0 190.0 180.0 170.0 160.0 150.0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0
200.452
139.128
131.953
131.282
130.611
129.366
126.894
77.326
77.000
76.684
30.689
X : parts per Million : Carbon13

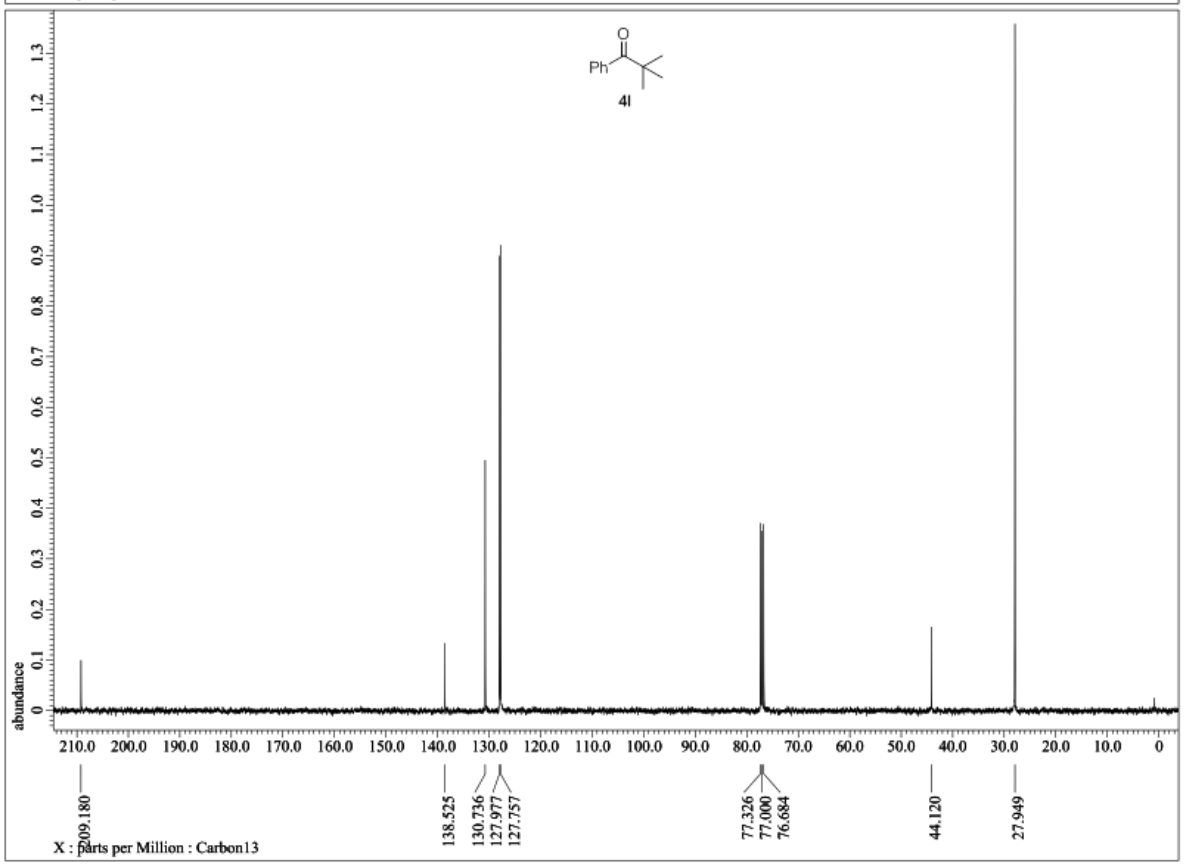

4j
2.09
2.09
2.09
1.00
1.06
1.04
1.14
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
8.045
8.041
8.025
8.021
7.467
7.463
7.448
7.444
7.322
7.321
7.302
7.264
7.260
7.240
2.982
2.967
2.951
2.657
2.640
2.172
2.167
2.155
2.139
2.123
2.113
2.107
0.000
X : parts per Million : Proton

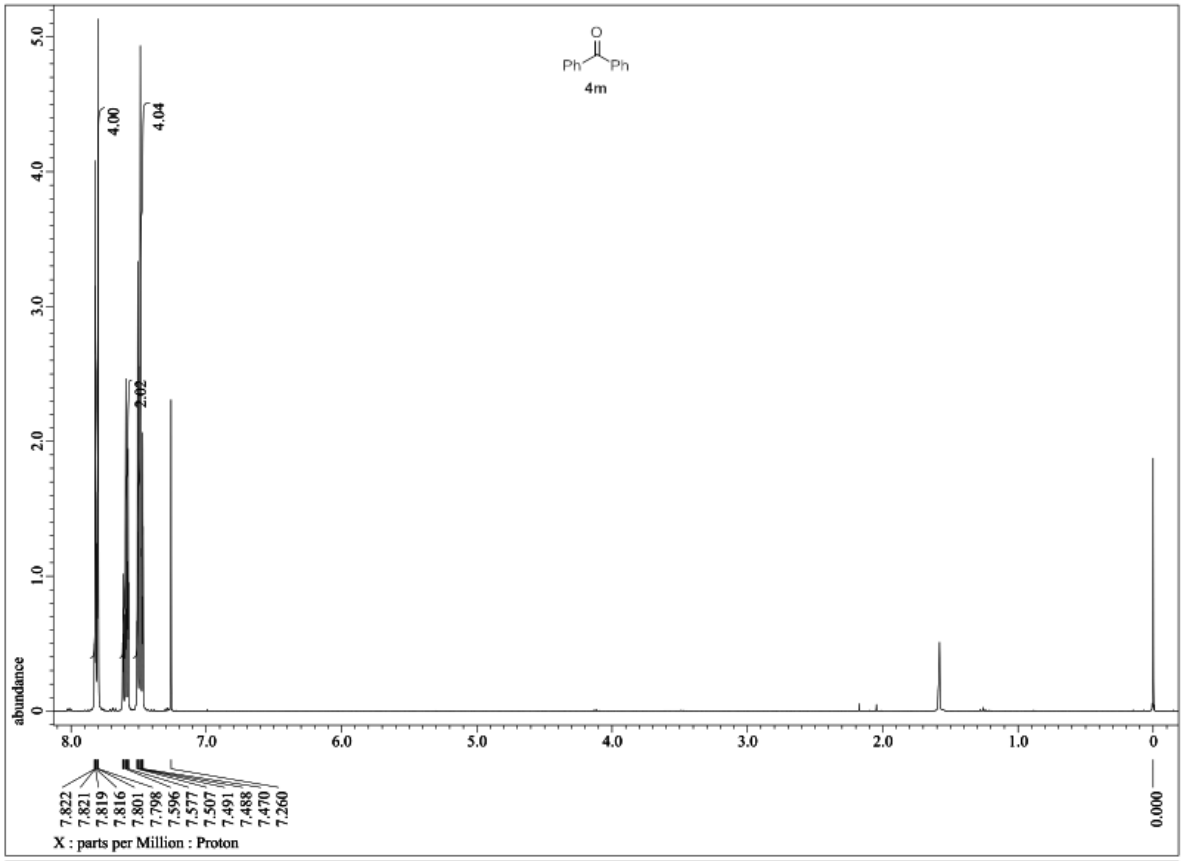

4j
abundance
210.0
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
198.363
144.445
133.351
132.566
128.724
127.115
126.578
77.326
77.000
76.684
39.129
29.664
23.245
X : parts per Million : Carbon13

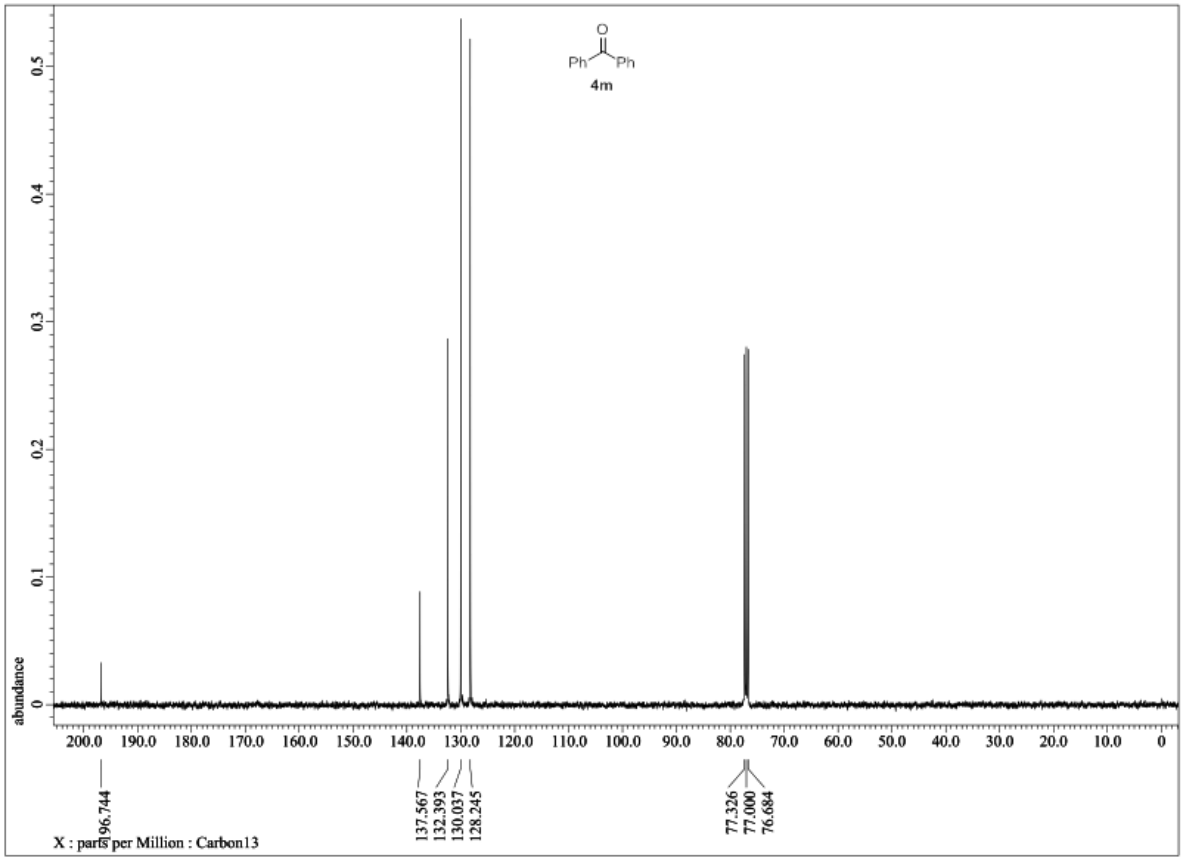

Ph
O
4k
6.03
2.00
2.03
1.01
1.00
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.972
7.954
7.951
7.557
7.541
7.538
7.487
7.483
7.471
7.467
7.449
7.447
7.262
3.617
3.600
3.583
3.565
3.548
3.531
3.514
1.232
1.215
-0.000
X : parts per Million : Proton

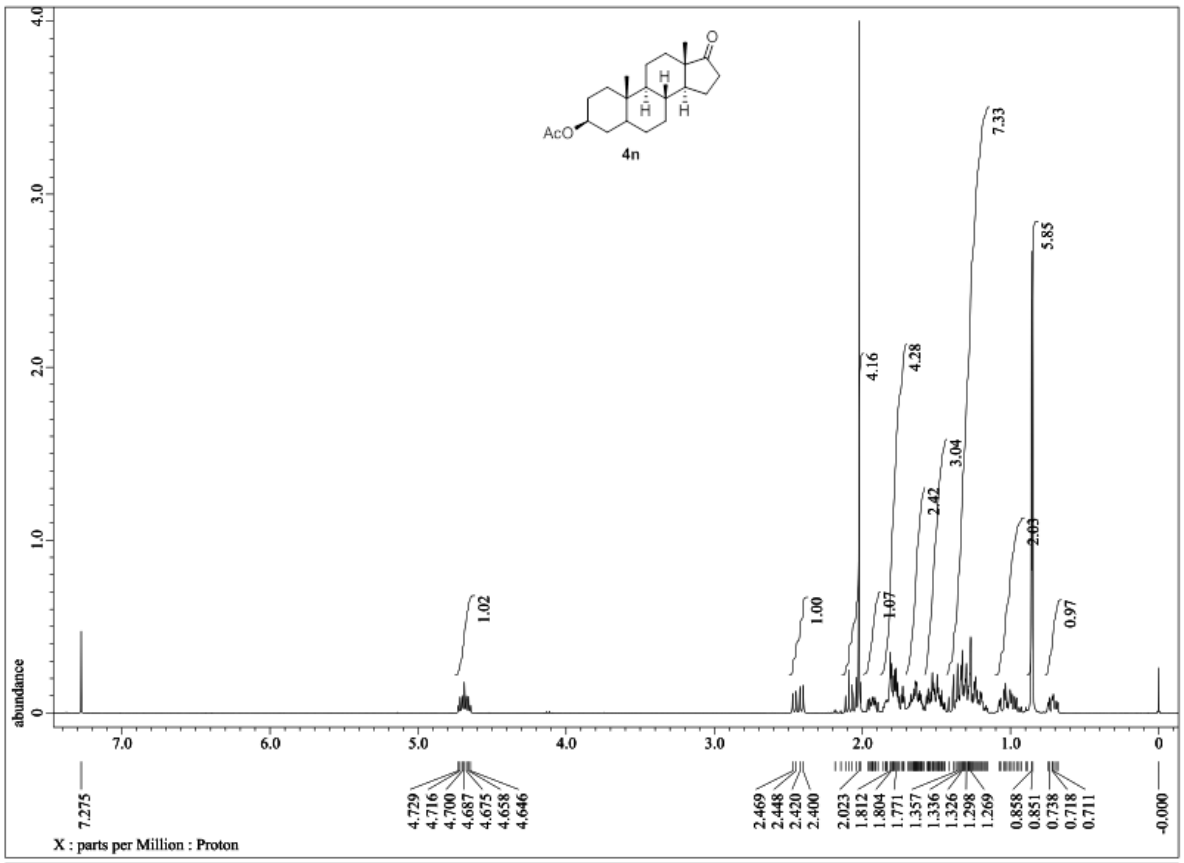

Ph
O
4k
abundance
0.2
0.1
0
210.0
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
204.495
136.158
132.767
128.571
128.283
77.326
77.000
76.684
35.316
19.125
X : parts per Million : Carbon13

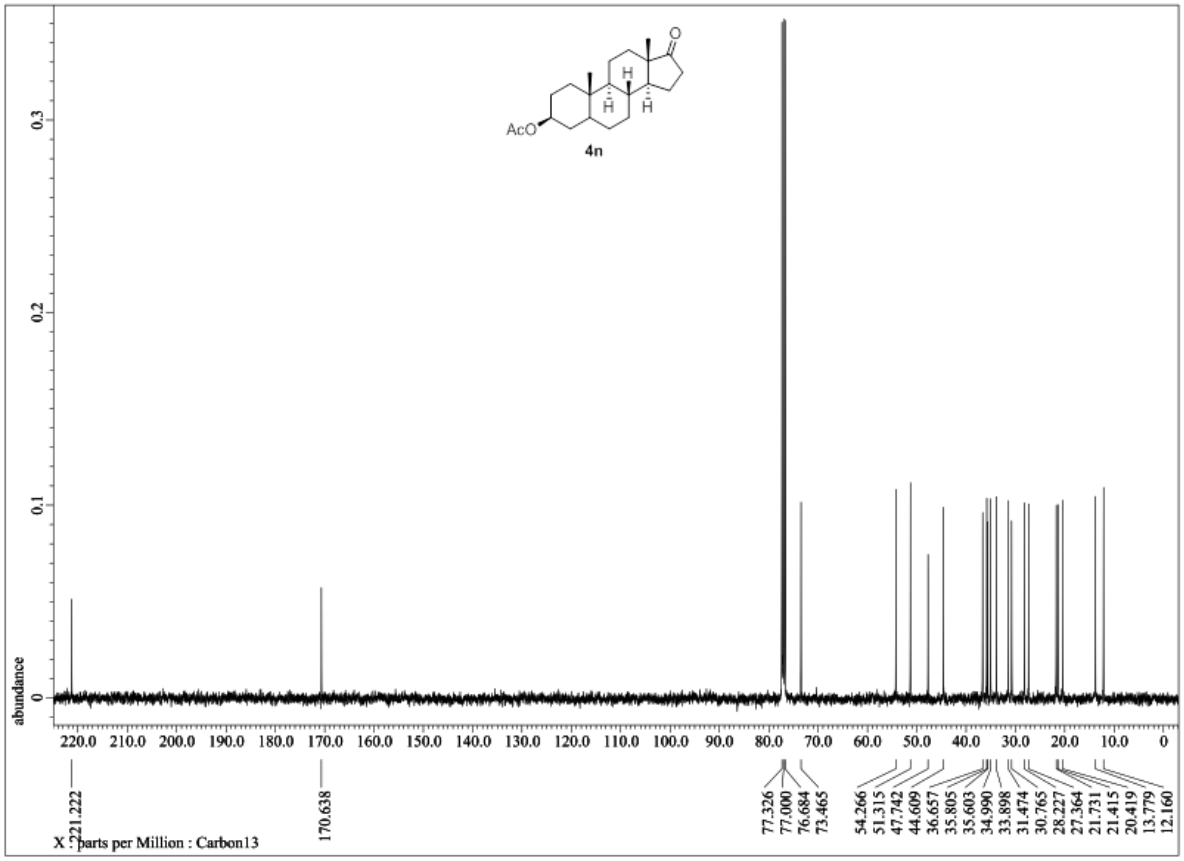

Ph
O
4l
9.00
2.00
2.04
1.02
abundance
7.697
7.694
7.690
7.676
7.672
7.449
7.431
7.407
7.392
7.388
7.371
1.347
-0.000
X : parts per Million : Proton

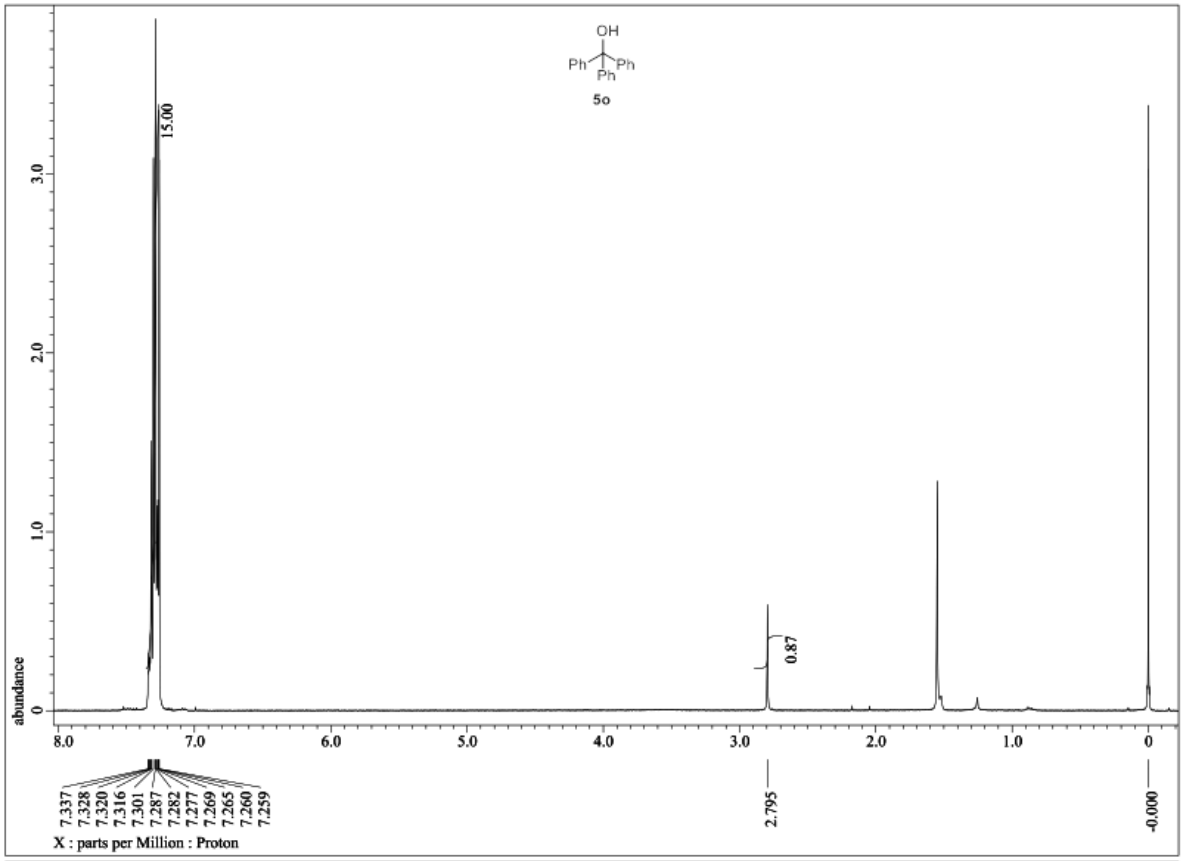

Ph
O
4l
abundance
209.180
138.525
130.736
127.977
127.757
77.326
77.000
76.684
44.120
27.949
X : parts per Million : Carbon13

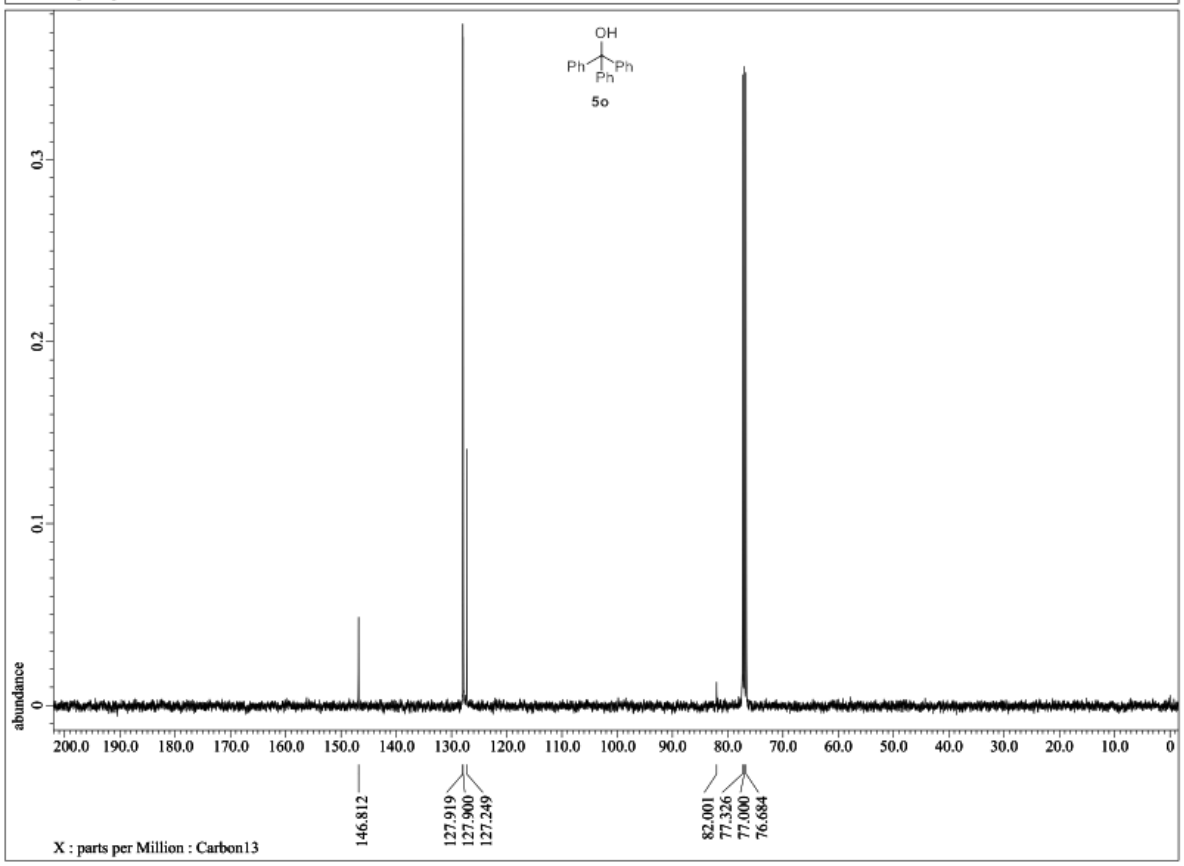

4m
4.00
4.04
2.02
abundance
7.822
7.821
7.819
7.816
7.801
7.798
7.596
7.577
7.507
7.491
7.488
7.470
7.260
0.000
X : parts per Million : Proton

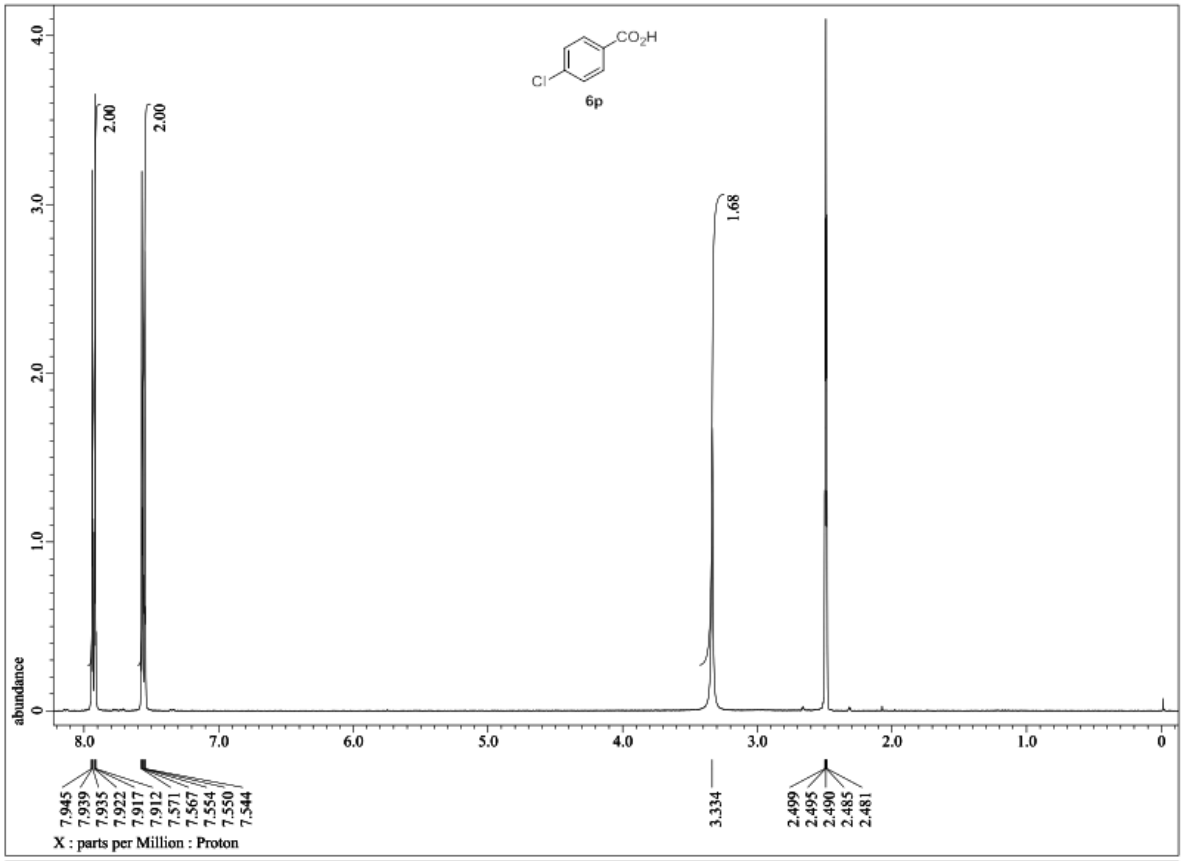

4m
abundance
96.744
137.567
132.393
130.037
128.245
77.326
77.000
76.684
X : parts per Million : Carbon13

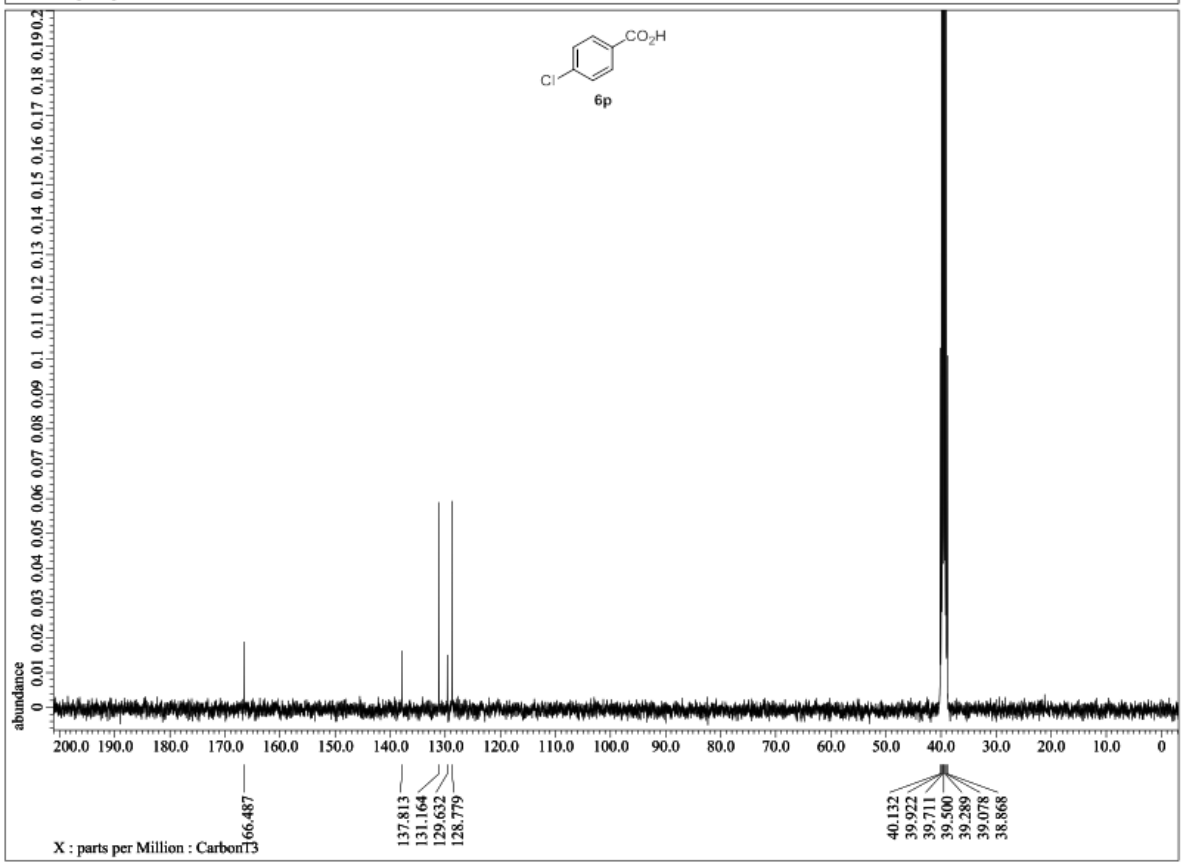

4n
AcO
abundance
X : parts per Million : Proton
7.33
5.85
4.16
4.28
3.04
2.42
2.03
1.02
1.00
1.07
0.97

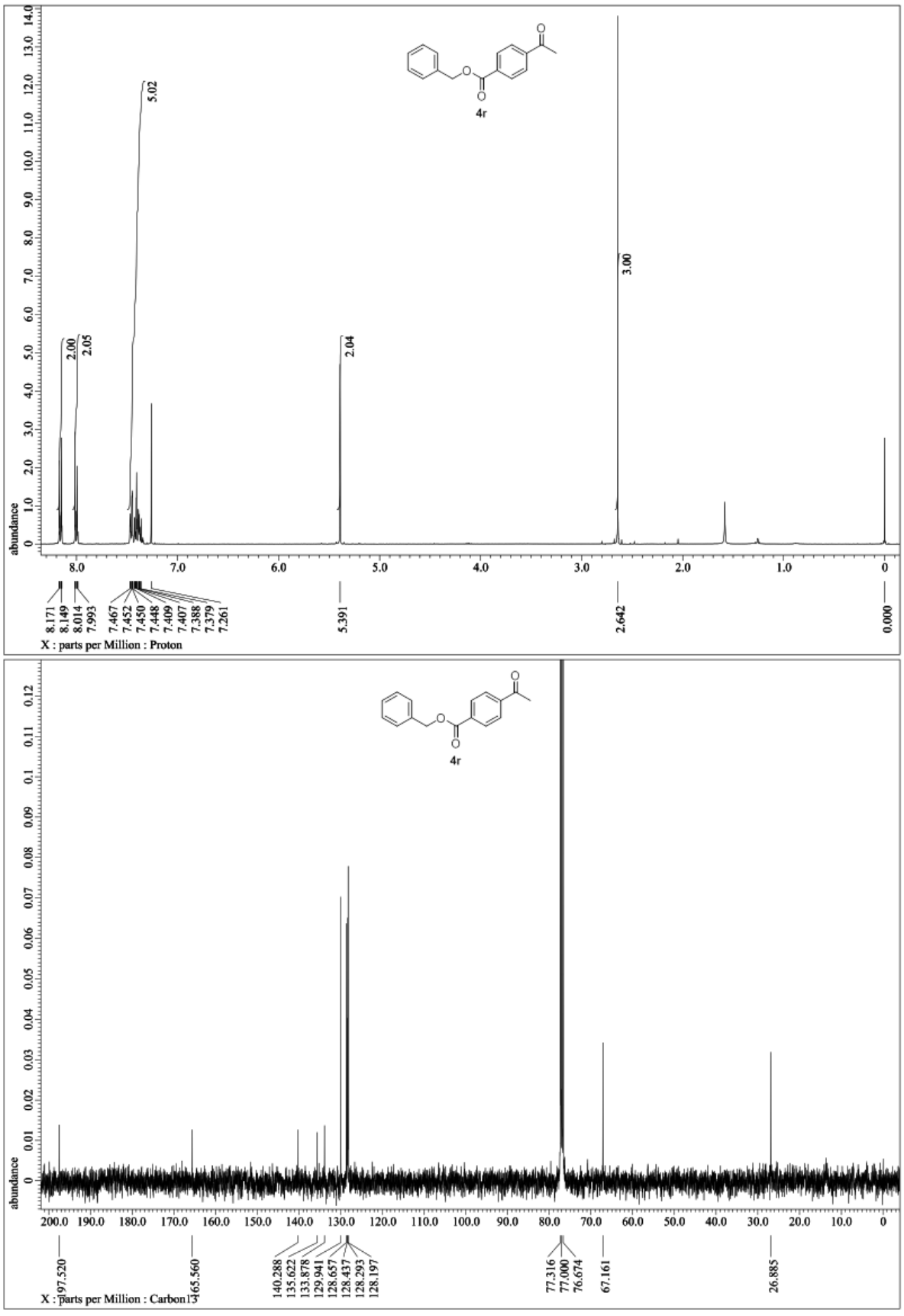

4n
AcO
abundance
X : parts per Million : Carbon13
221.222
170.638
77.326
77.000
76.684
73.465


OH
Ph
Ph
Ph
5o
15.00
0.87
abundance
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
7.337
7.328
7.320
7.316
7.301
7.287
7.282
7.277
7.269
7.265
7.260
7.259
2.795
-0.000
X : parts per Million : Proton


OH
Ph
Ph
Ph
5o
abundance
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
146.812
127.919
127.900
127.249
82.001
77.326
77.000
76.684
X : parts per Million : Carbon13


6p
2.00
2.00
1.68
abundance
7.945
7.939
7.935
7.922
7.917
7.912
7.571
7.567
7.554
7.550
7.544
3.334
2.499
2.495
2.490
2.485
2.481
X : parts per Million : Proton


6p
abundance
166.487
137.813
131.164
129.632
128.779
40.132
39.922
39.711
39.500
39.289
39.078
38.868
X : parts per Million : CarbonT3


4r
5.02
2.00
2.05
2.04
3.00
abundance
8.171
8.149
8.014
7.993
7.467
7.452
7.450
7.448
7.409
7.407
7.388
7.379
7.261
5.391
2.642
0.000
X : parts per Million : Proton
4r
abundance
197.520
165.560
140.288
135.622
133.878
129.941
128.657
128.437
128.293
128.197
77.316
77.000
76.674
67.161
26.885
X : parts per Million : Carbon13