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SUPPORTING INFORMATION

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Supporting Information

A Practical Route to Regiospecifically Substituted (*R*)- and (*S*)-Oxazolylphenols

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IR spectra were recorded on a Nicolet 205 FT-IR spectrometer for liquid films between NaCl plates and are reported in wavenumbers (cm^{-1}). NMR spectra were measured using dilute solutions on a Brucker ARX 400 (^1H at 400.13 MHz, ^{13}C at 100.61 MHz) spectrometer. Chemical shifts are reported in ppm on the δ scale from tetramethylsilane (TMS) which is used as an internal standard. Elemental analyses were performed by ICSN in Gif-Sur-Yvette or at the Institut für Organische Chemie in Erlangen. Low resolution mass spectra were carried out at the Institut für Organische Chemie in Erlangen. High-resolution mass spectra (HRMS) were obtained under electronic impact at 70 eV from a Varian MAT 311 spectrometer at the Centre Régional de Mesures Physiques de l'Ouest (Rennes).
Detailed characterization data are given for the described compounds. Selected ^1H and ^{13}C NMR spectra are shown for twelve of them.

Methyl 3,5-di-*tert*-butyl-2-hydroxybenzoate 1

IR (Nujol, NaCl): $\tilde{n}$ 3095, 1806 (small, aromatic harmonic), 1675 (C=O), 1608 (C=C), 1602 (C=C), 1463, 1457, 1440, 1362, 1343, 1276, 1247, 1216, 1199, 1115, 985, 896, 824, 802, 760, 741, 724, 641 cm^{-1}.

^1H NMR (400 MHz, $CDCl_3$): *d* 11.35 (s, 1H, O<u>H</u>), 7.71 (d, 1H, *J* = 2.6 Hz, C<u>H</u> aromatic), 7.52 (d, 1H, *J* = 2.6 Hz, C<u>H</u> aromatic), 3.94 (s, 3H, $CO_2C\underline{H}_3$), 1.43 (s, 9H, $C(C\underline{H}_3)_3$), 1.30 (s, 9H, $C(C\underline{H}_3)_3$).

^{13}C NMR (100 MHz, $CDCl_3$): *d* 171.74 (1C, $\underline{C}O_2CH_3$), 158.97 (1C, C_{ipso} α to OH), 140.42 (1C, C_{ipso} α to $\underline{C}(CH_3)_3$), 137.17 (1C, C_{ipso} α to $\underline{C}(CH_3)_3$), 130.42 (1C, <u>C</u>H aromatic), 123.59 (1C, <u>C</u>H aromatic),

111.31 (1C, C_{ipso} α to CO_2CH_3), 52.19 (1C, $CO_2\underline{C}H_3$), 35.13 (1C, $\underline{C}(CH_3)_3$), 34.27 (1C, $\underline{C}(CH_3)_3$), 31.41 (3C, $C(\underline{C}H_3)_3$), 29.38 (3C, $C(\underline{C}H_3)_3$).

MS (EI, 70 eV) *m/z* (rel intens) 264 (49) $[M]^+$, 249 (93) $[M - CH_3]^+$, 232 (21) $[M - CH_3OH]^+$, 217 (100) $[M - CH_3 - CH_3OH]^+$, 175 (36) $[M - C_4H_9 - CH_3OH]^+$, 87 (24), 57 (24), 41 (24).

3,5-Di-*tert*-butyl-2-hydroxybenzoic acid 7

IR (Nujol, NaCl): $\tilde{n}$ 3425 (broad, OH), 1649 (C=O), 1606 (C=C), 1437, 1364, 1294, 1279, 1234, 1190, 1118, 804, 709 cm^{-1}.

^1H NMR (400 MHz, $CDCl_3$): *d* 11.05 (broad s, 1H, O<u>H</u>), 7.80 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 7.59 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 6.90-5.40 (broad s, 1H, $CO_2\underline{H}$), 1.44 (s, 9H, $C(C\underline{H}_3)_3$), 1.32 (s, 9H, $C(C\underline{H}_3)_3$).

^{13}C NMR (100 MHz, $CDCl_3$): *d* 175.79 (1C, $\underline{C}O_2H$), 159.71 (1C, C_{ipso} α to OH), 140.86 (1C, C_{ipso} α to $\underline{C}(CH_3)_3$), 137.41 (1C, C_{ipso} α to $\underline{C}(CH_3)_3$), 131.73 (1C, <u>C</u>H aromatic), 124.57 (1C, <u>C</u>H aromatic), 110.35 (1C, C_{ipso} α to $\underline{C}O_2H$), 35.16 (1C, $\underline{C}(CH_3)_3$), 34.29 (1C, $\underline{C}(CH_3)_3$), 31.34 (3C, $C(\underline{C}H_3)_3$), 29.38 (3C, $C(\underline{C}H_3)_3$).

MS (EI, 70 eV) *m/z* (rel intens) 250 (26) $[M]^+$, 235 (41) $[M - CH_3]^+$, 217 (100) $[M - CH_3 - H_2O]^+$, 175 (33) $[M - C_4H_9 - H_2O]^+$, 87 (26), 57 (20), 41 (16).

Methyl 3-*tert*-butyl-2-hydroxy-5-nitrobenzoate 3

IR (Nujol, NaCl): $\tilde{n}$ 3106, 1822 (small, aromatic harmonic), 1687 and 1674 (C=O), 1615, 1583, 1531, 1453, 1359, 1336, 1249, 1206, 1151, 1098, 980, 926, 805, 739, 707 cm^{-1}.

^{1}H NMR (400 MHz, $CDCl_3$): *d* 12.26 (s, 1H, O<u>H</u>), 8.70 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 8.34 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 4.03 (s, 3H, $CO_2C\underline{H}_3$), 1.45 (s, 9H, $C(C\underline{H}_3)_3$).

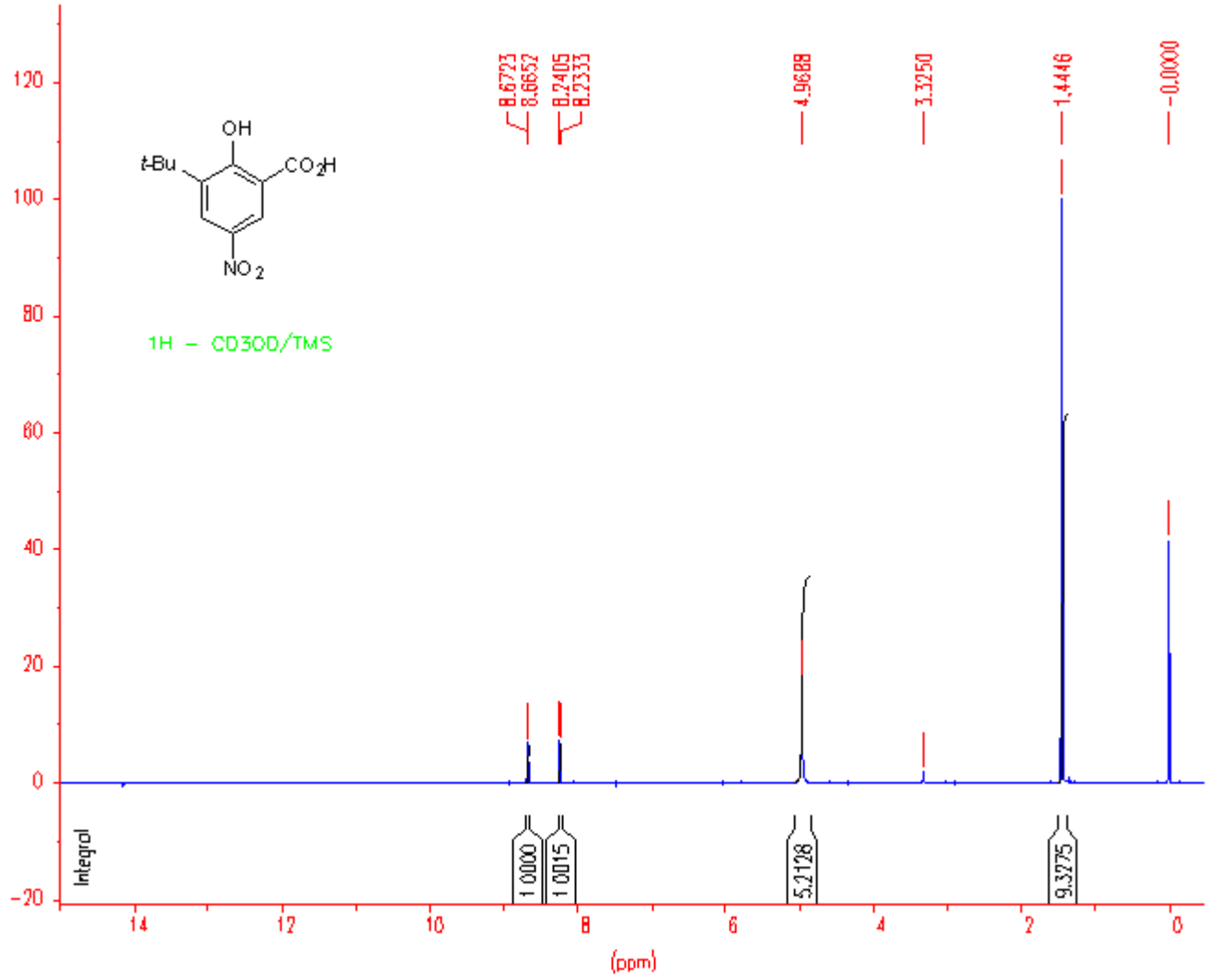
^{13}C NMR (100 MHz, $CDCl_3$): *d* 170.39 (1C, $\underline{C}O_2CH_3$), 165.88 (1C, C_{ipso} α to OH), 139.90 and 139.21 (2C, C_{ipso} α to $\underline{C}(CH_3)_3$ and C_{ipso} α to NO_2), 127.51 (1C, <u>C</u>H aromatic), 124.49 (1C, <u>C</u>H aromatic), 111.87 (1C, C_{ipso} α to CO_2CH_3), 53.14 (1C, $CO_2\underline{C}H_3$), 35.42 (1C, $\underline{C}(CH_3)_3$), 28.94 (3C, $C(\underline{C}H_3)_3$).

MS (EI, 70 eV) *m/z* (rel intens) 253 (15) $[M]^+$, 238 (56) $[M - CH_3]^+$, 206 (100) $[M - CH_3 - CH_3OH]^+$, 160 (26) $[M - CH_3 - CH_3OH - NO_2]^+$.

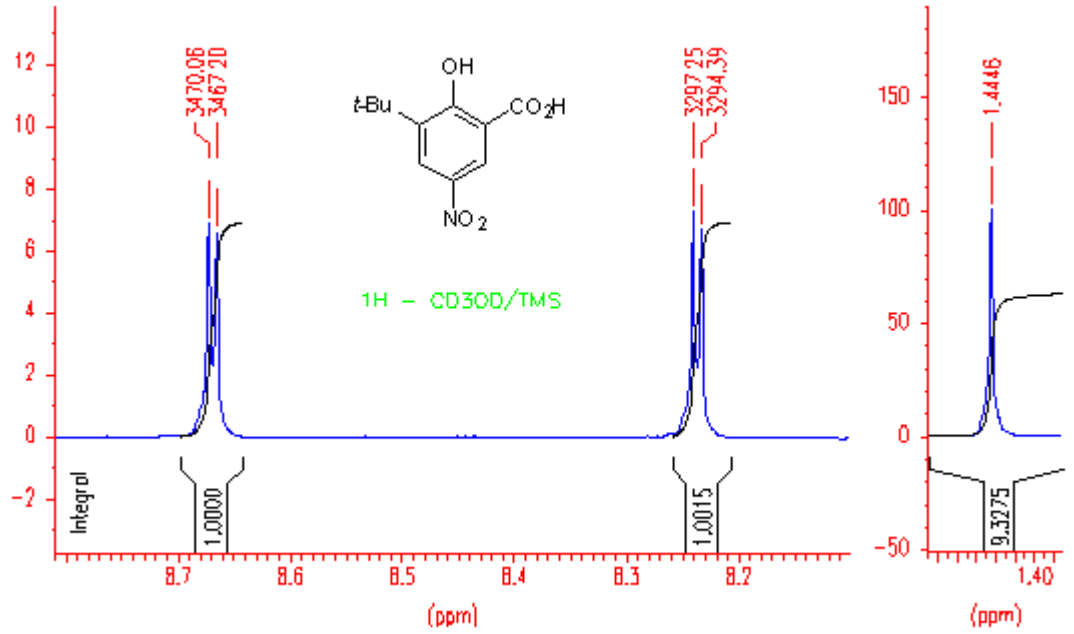
Anal. Calcd for $C_{12}H_{15}NO_5$: C, 56.91; H, 5.97; N, 5.53. Found: C, 57.28; H, 6.17; N, 5.46.

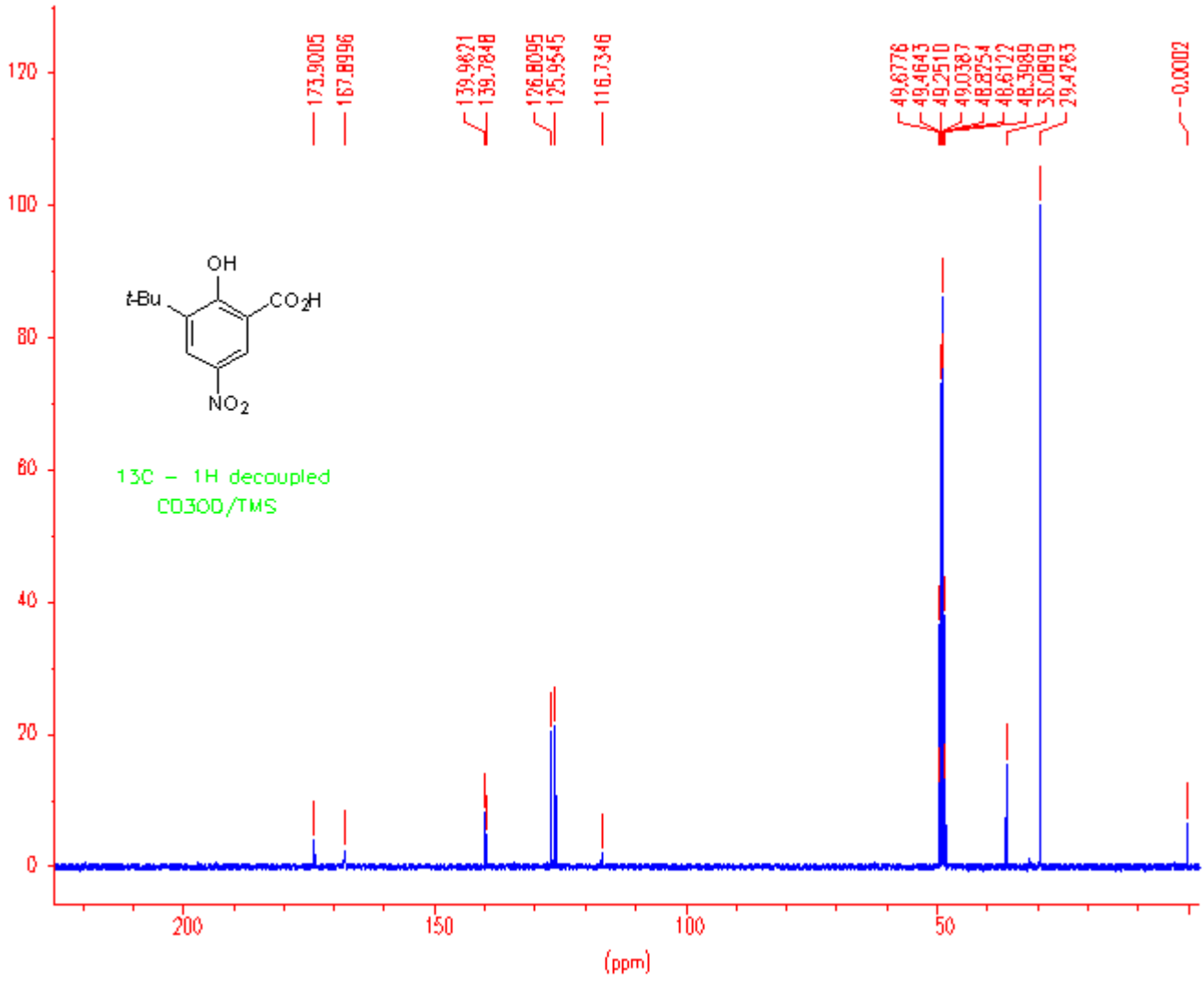
3-*tert*-Butyl-2-hydroxy-5-nitrobenzoic acid 5

IR (HCB, NaCl): $\tilde{n}$ 3640-2390 (broad envelope, OH), 3103, 2965, 2915, 2876, 1742, 1666, 1453, 1442, 1341, 1238, 1159, 1099, 1047, 937, 740, 697, 654 cm^{-1}.



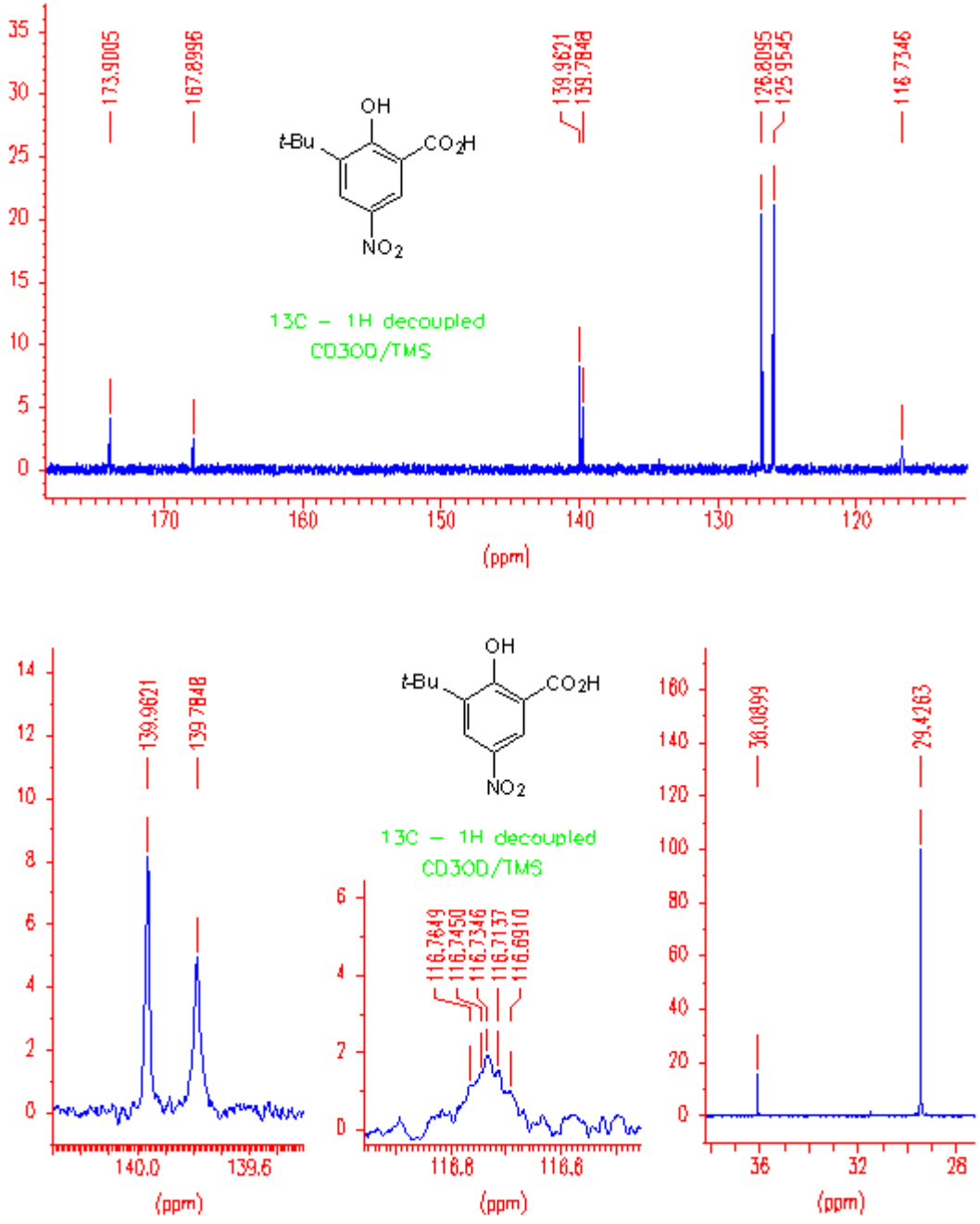
^{1}H NMR (400 MHz, CD_3OD): *d* 8.67 (d, 1H, *J* = 2.9 Hz, C<u>H</u> aromatic), 8.24 (d, 1H, *J* = 2.9 Hz, C<u>H</u> aromatic), 1.44 (s, 9H, C(C<u>H</u>$_3$)$_3$).

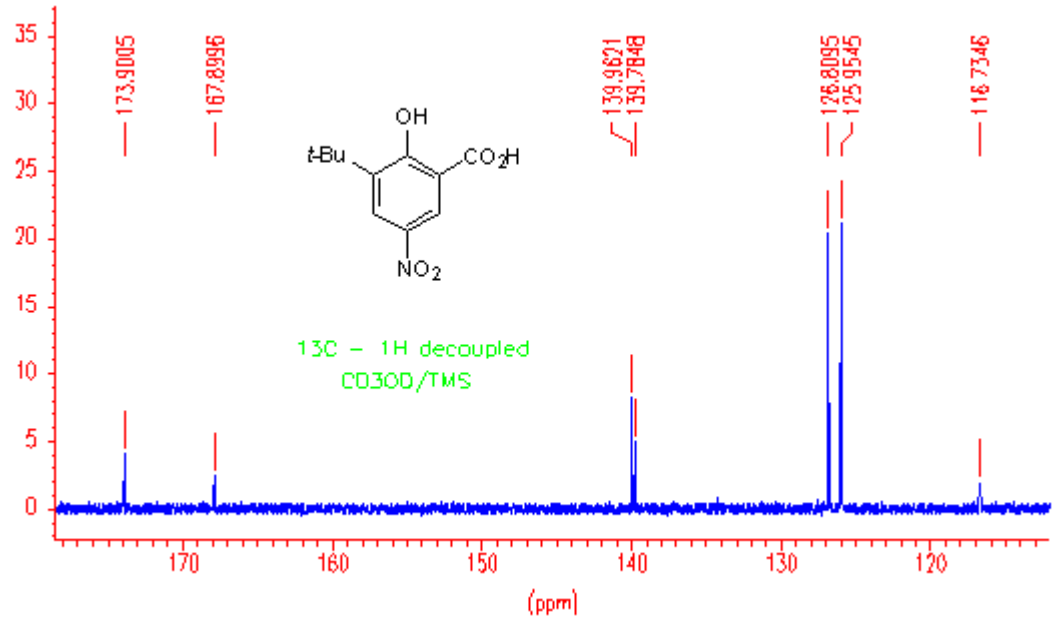

3470.06
3467.20
3297.25
3294.39
1.4446
OH
t-Bu
CO2H
NO2
1H – CD3OD/TMS
Integral
1.0000
1.0015
9.3275
(ppm)
(ppm)

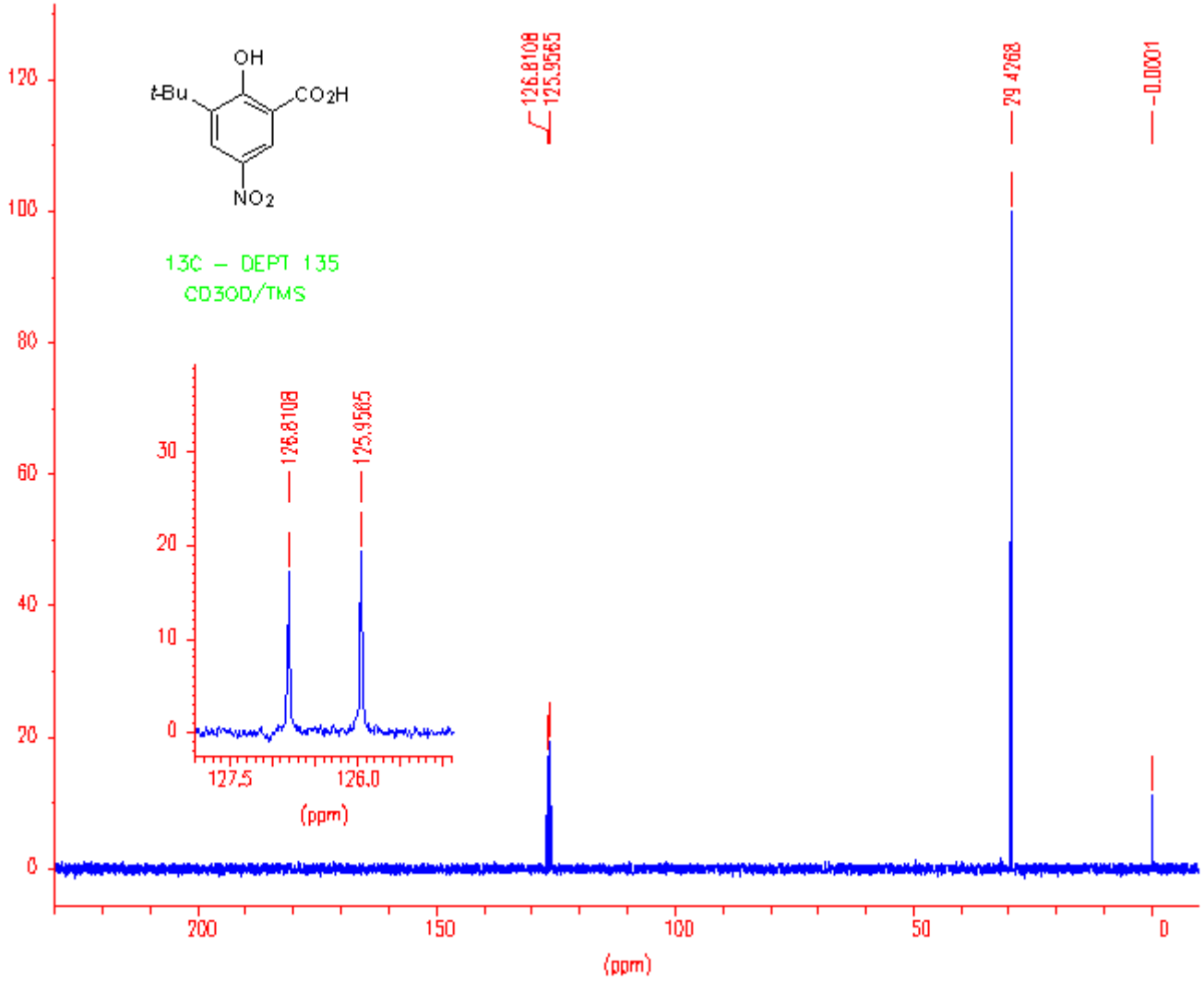

173.9005
167.8996
139.9821
139.7848
126.8095
125.9545
116.7346
49.6776
49.4643
49.2510
49.0387
48.8254
48.6122
48.3989
36.0899
29.4263
-0.0002
OH
t-Bu
CO2H
NO2
13C – 1H decoupled
CD3OD/TMS
(ppm)

^{13}C NMR (100 MHz, CD_3OD): *d* 173.90 (1C, $\underline{C}O_2H$), 167.90 (1C, C_{ipso} α to OH), 139.96 and 139.78 (2C, C_{ipso} α to $\underline{C}(CH_3)_3$ and C_{ipso} α to NO_2), 126.81 (1C, $\underline{C}H$ aromatic), 125.95 (1C, $\underline{C}H$ aromatic), 116.74 (broad, 1C, C_{ipso} α to $\underline{C}O_2H$), 36.09 (1C, $\underline{C}(CH_3)_3$), 29.43 (3C, $C(\underline{C}H_3)_3$).

MS (EI, 70 eV) *m/z* (rel intens) 239 (21) $[M]^+$, 224 (69) $[M - CH_3]^+$, 206 (100) $[M - CH_3 - H_2O]^+$, 160 (39) $[M - CH_3 - H_2O - NO_2]^+$.




173.9005
167.8996
139.9621
139.7848
126.8095
125.9545
116.7346
OH
t-Bu
CO2H
NO2
13C – 1H decoupled
CD3OD/TMS
(ppm)


126.8108
125.9565
29.4268
-0.0001
OH
t-Bu
CO2H
NO2
13C – DEPT 135
CD3OD/TMS
(ppm)
(ppm)

3,5-Di-*tert*-butyl-2-hydroxybenzonitrile 4

IR (Nujol, NaCl): $\tilde{n}$ 3300 (OH), 2998, 2870, 2233 (C≡N), 1819 and 1787 (very small, aromatic harmonics), 1752 (small, aromatic harmonic), 1603 (C=C), 1480, 1466, 1448, 1409, 1389, 1364, 1331, 1252, 1220, 1202, 1158, 1124, 937, 902, 879 cm^{-1}.

^{1}H NMR (400 MHz, $CDCl_3$): *d* 7.52 (d, 1H, *J* = 2.4 Hz, C<u>H</u> aromatic), 7.30 (d, 1H, *J* = 2.4 Hz, C<u>H</u> aromatic), 6.12 (broad s, 1H, O<u>H</u>), 1.41 (s, 9H, $C(C\underline{H}_3)_3$), 1.29 (s, 9H, $C(C\underline{H}_3)_3$).

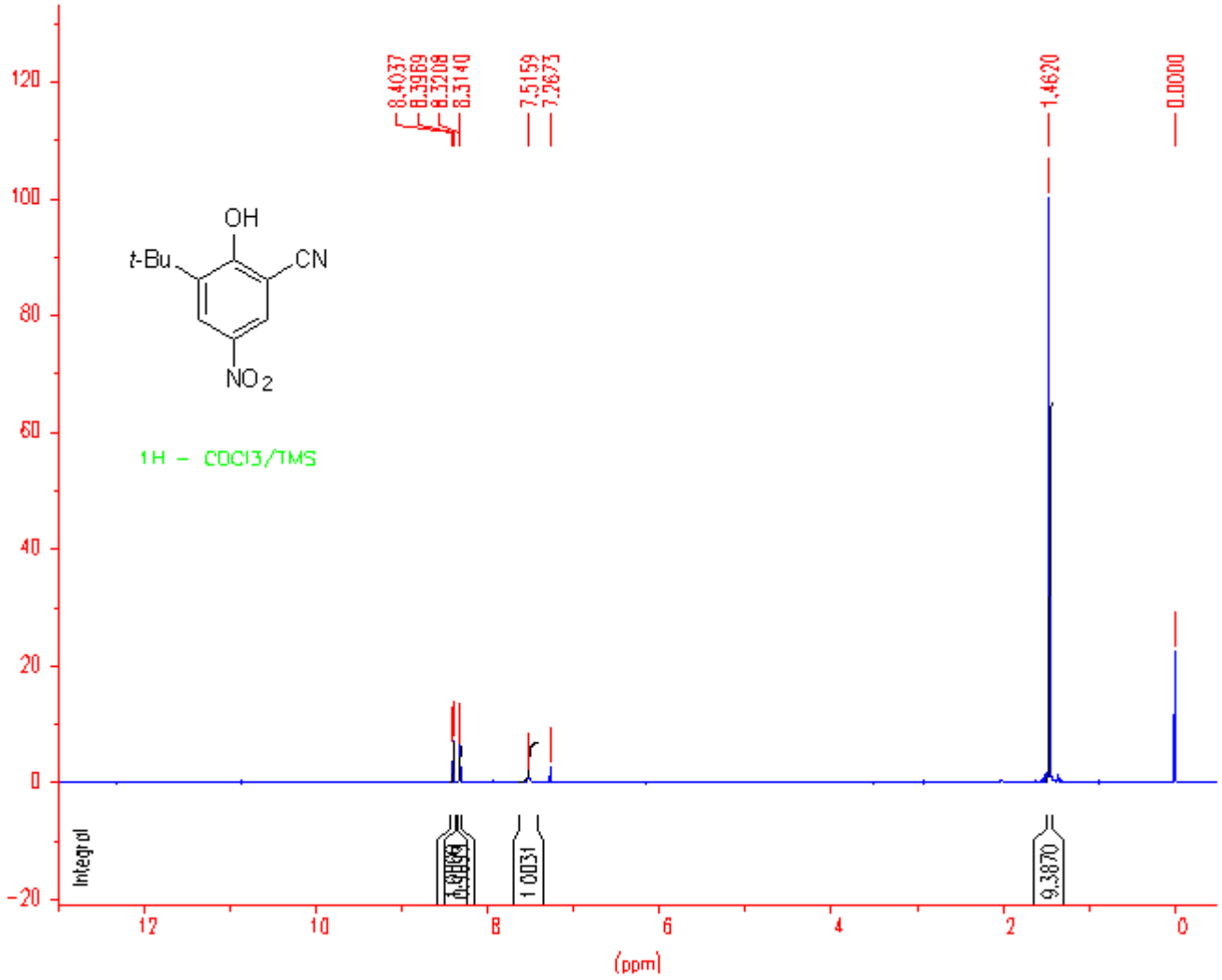
^{13}C NMR (100 MHz, $CDCl_3$): *d* 154.97 (1C, C_{ipso} α to OH), 143.51 (1C, C_{ipso} α to $C(CH_3)_3$), 137.17 (1C, C_{ipso} α to $C(CH_3)_3$), 129.79 (1C, <u>C</u>H aromatic), 126.07 (1C, <u>C</u>H aromatic), 117.41 (1C, <u>C</u>N), 99.48 (1C, C_{ipso} α to CN), 35.16 (1C, $\underline{C}(CH_3)_3$), 34.42 (1C, $\underline{C}(CH_3)_3$), 31.23 (3C, $C(\underline{C}H_3)_3$), 29.34 (3C, $C(\underline{C}H_3)_3$).

MS (EI, 70 eV) *m/z* (rel intens) 231 (18) $[M]^+$, 216 (100) $[M - CH_3]^+$, 188 (10) $[M - CH_3 - CO]^+$, 57 (20) $[C_4H_9]^+$.

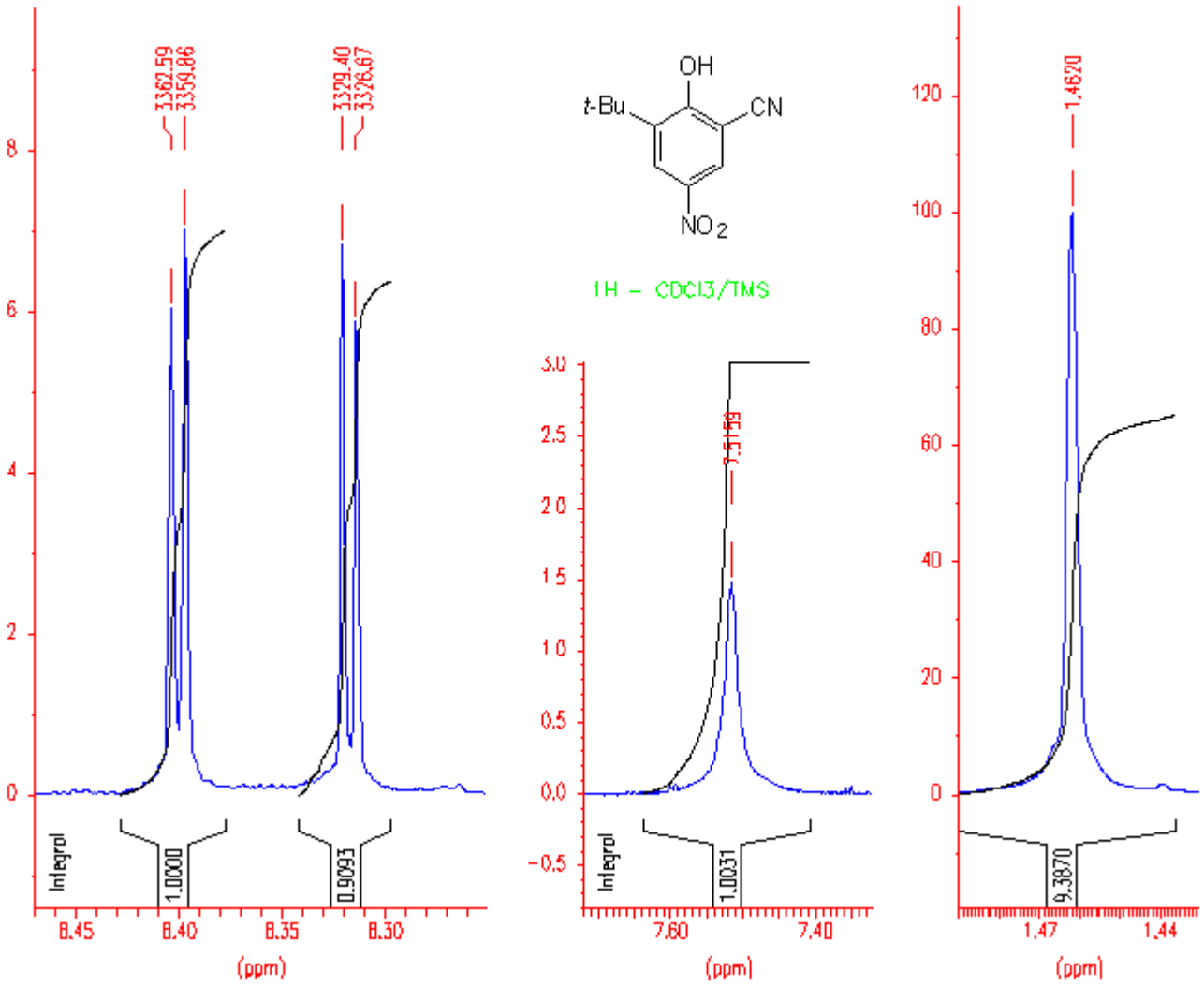
Anal. Calcd for $C_{15}H_{21}NO$: C, 77.88; H, 9.12; N, 6.06. Found: C, 80.84; H, 9.45; N, 6.18.

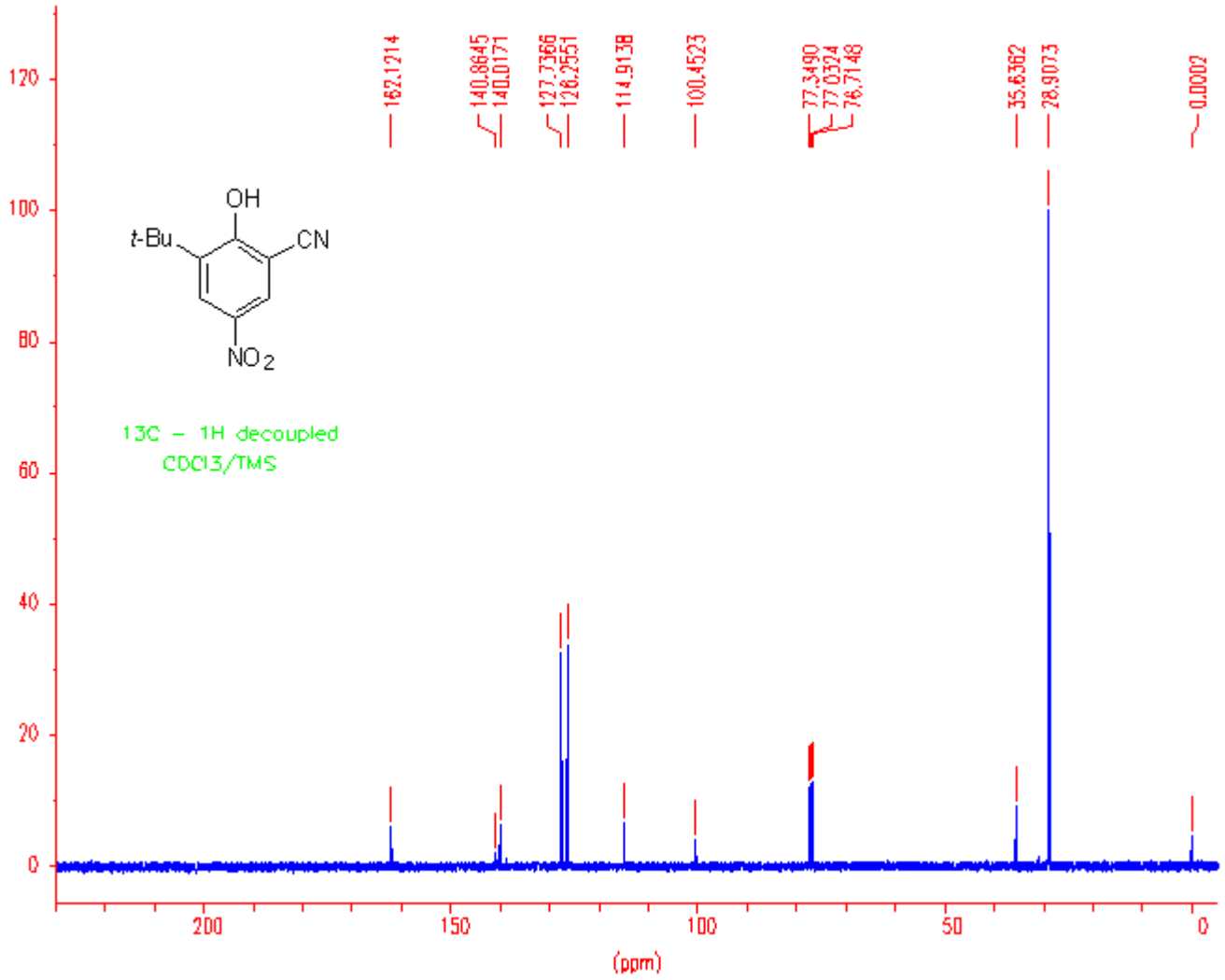
3-*tert*-Butyl-2-hydroxy-5-nitrobenzonitrile 6

IR (Nujol, NaCl): $\tilde{n}$ 3300 (broad, OH), 3094, 2243 (C≡N), 1611 (C=C), 1583 (C=C), 1527, 1347, 1245, 1159, 1106, 900 cm^{-1}.

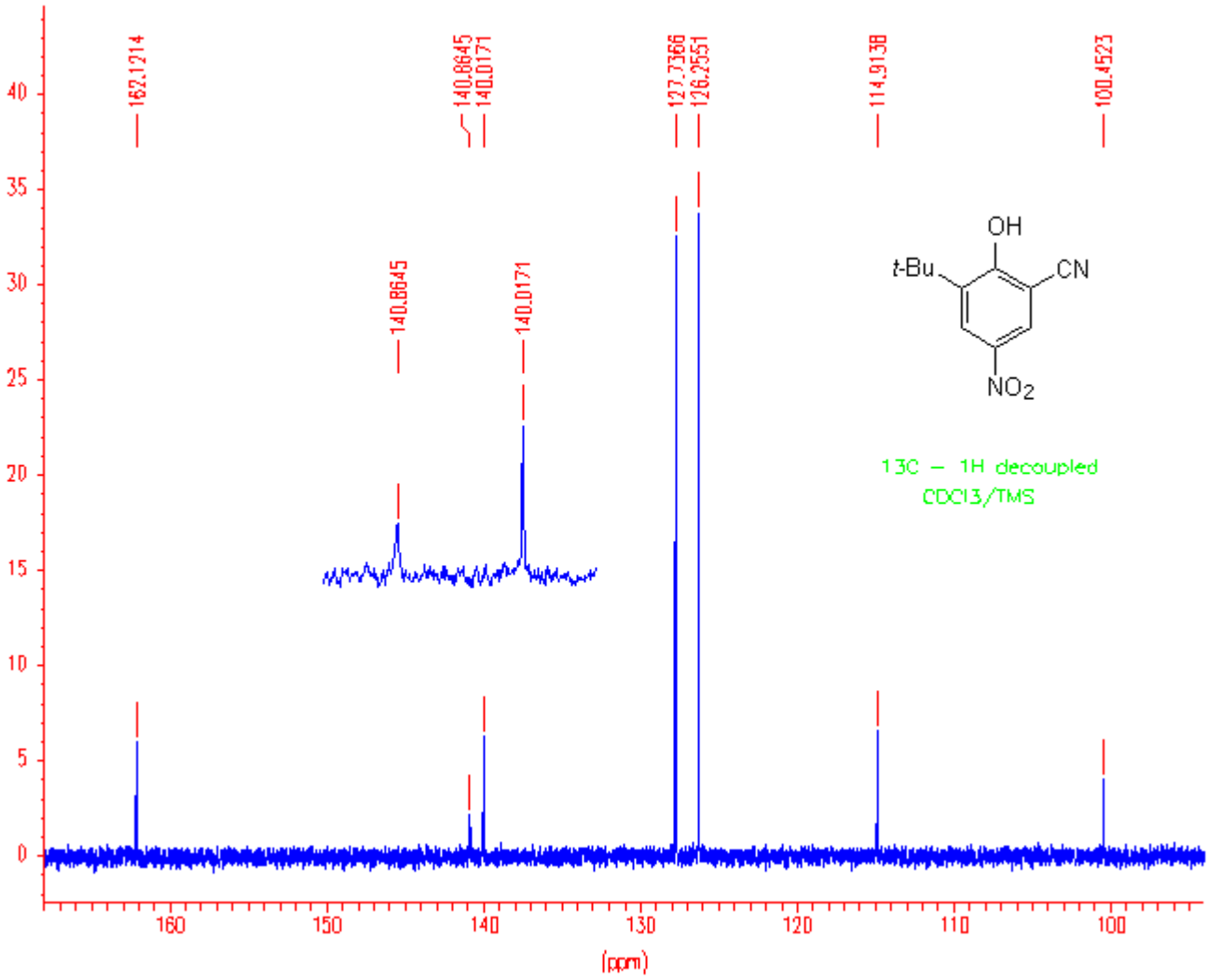


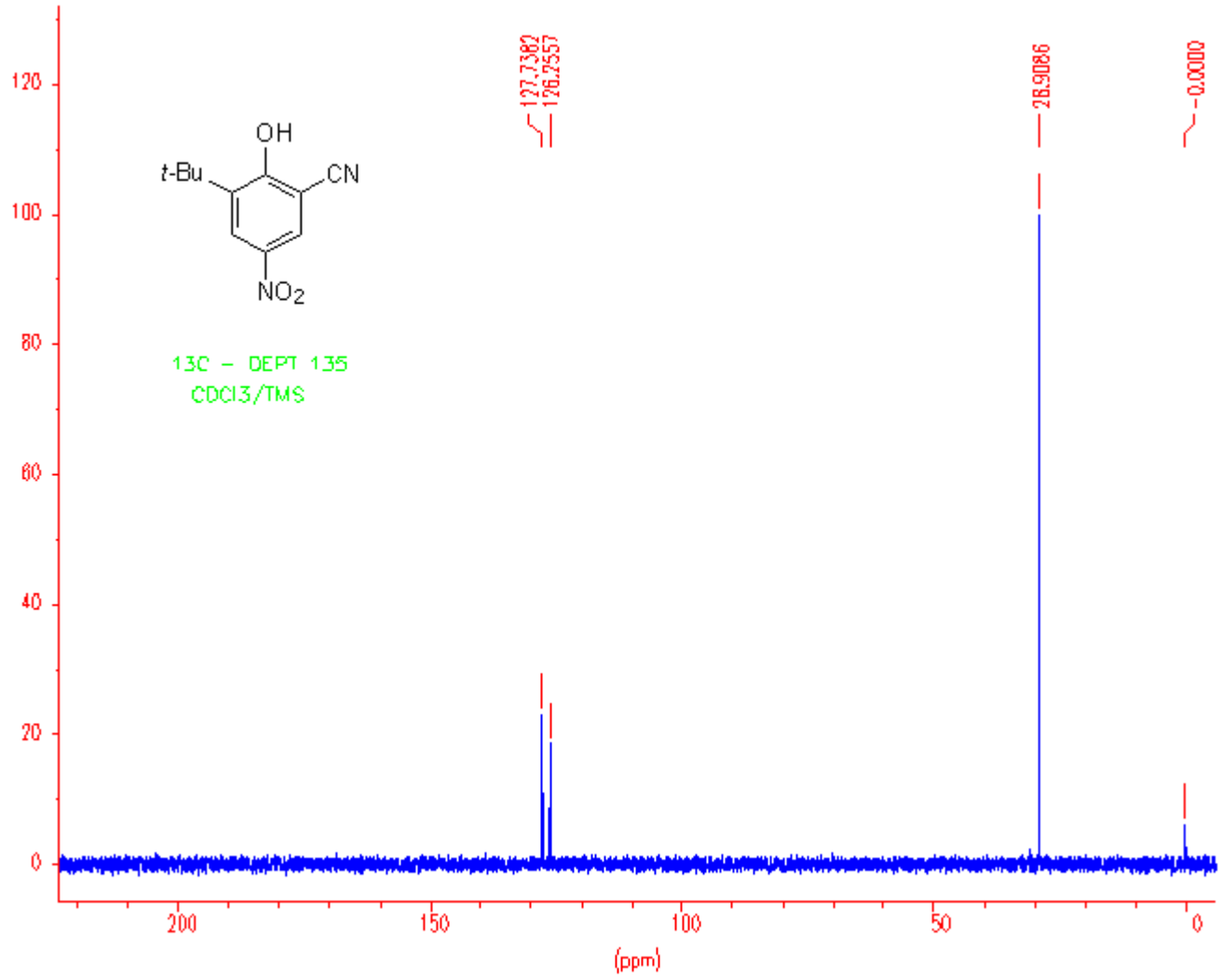
^{1}H NMR (400 MHz, $CDCl_3$): *d* 8.40 (d, 1H, *J* = 2.7 Hz, C<u>H</u> aromatic), 8.32 (d, 1H, *J* = 2.7 Hz, C<u>H</u> aromatic), 7.52 (broad s, 1H, OH), 1.46 (s, 9H, $C(C\underline{H}_3)_3$).


3362.59
3359.86
3329.40
3326.67
Integral
1.0000
0.9093
8.45
8.40
8.35
8.30
(ppm)
OH
t-Bu
CN
NO2
1H - CDCl3/TMS
7.5159
Integral
1.0031
7.60
7.40
(ppm)
1.4620
Integral
9.3870
1.47
1.44
(ppm)



^{13}C NMR (100 MHz, $CDCl_3$): *d* 162.12 (1C, C_{ipso} α to OH), 140.86 and 140.02 (2C, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} α to NO_2), 127.74 (1C, CH aromatic), 126.25 (1C, CH aromatic), 114.91 (1C, CN), 100.45 (1C, C_{ipso} α to CN), 35.64 (1C, $C(CH_3)_3$), 28.91 (3C, $C(CH_3)_3$).


162.1214
140.8645
140.0171
127.7366
126.2551
114.9138
100.4523
140.8645
140.0171
OH
t-Bu
CN
NO2
13C – 1H decoupled
CDCl3/TMS
40
35
30
25
20
15
10
5
0
160
150
140
130
120
110
100
(ppm)



MS (EI, 70 eV) *m/z* (rel intens) 220 (26) $[M]^+$, 205 (100) $[M - CH_3]^+$, 177 (54) $[M - CH_3 - CO]^+$, 159 (12) $[M - CH_3 - NO_2]^+$, 131 (15) $[M - CH_3 – CO - NO_2]^+$.

Anal. Calcd for $C_{11}H_{12}N_2O_3$: C, 59.99; H, 5.49; N, 12.72. Found: C, 60.22; H, 5.69; N, 12.47.

***N*-(Benzyloxycarbonyl)-D-serine (*R*)-9**

IR (Nujol, NaCl): $\tilde{n}$ 3443 (broad, OH), 3338 (NH), 3318 (NH), 3205 (broad, NH), 3062, 3029, 1748 (CO of acid), 1691 (CO of carbamate), 1537, 1478, 1455, 1401, 1350, 1306, 1249, 1061, 1030, 966, 912, 840, 786, 750, 731, 697 cm^{-1}.

^1H NMR (400 MHz, CD_3COCD_3): *d* 7.42-7.26 (m, 5H, Ph), 6.42 (d, 1H, *J* = 8.1 Hz, NH), 5.90-4.20 (broad s, 2H, $CO_2\underline{H}$ and O<u>H</u>), 5.10 (s, 2H, $OC\underline{H}_2Ph$), 4.34 (ddd, 1H, *J* = 8.1, 4.6, 3.9 Hz, $CH_2C\underline{H}$), 3.97 (dd, 1H, *J* = 11.1, 4.6 Hz, $C\underline{H}_2CH$), 3.89 (dd, 1H, *J* = 11.1, 3.9 Hz, $C\underline{H}_2CH$).

^{13}C NMR (100 MHz, CD_3COCD_3): *d* 172.31 (1C, $\underline{C}O_2H$), 157.04 (1C, NH<u>C</u>O), 138.03 (1C, C_{ipso} aromatic), 129.18 (2C, <u>C</u>H aromatic), 128.63 and 128.62 (3C, <u>C</u>H aromatic), 66.83 (1C, $\underline{C}H_2Ph$), 62.95 (1C, $\underline{C}H_2CH$), 57.16 (1C, $CH_2\underline{C}H$).

MS (EI, 70 eV) *m/z* (rel intens) 239 (3) $[M]^+$, 148 (5) $[M - C_7H_7]^+$, 108 (74) $[PhCH_2OH]^+$, 91 (100) $[C_7H_7]^+$, 86 (34), 79 (54), 77 (30) $[C_6H_5]^+$, 65 (24) $[C_5H_5]^+$, 42 (25).

***N*-(Benzyloxycarbonyl)-D-serine methyl ester (*R*)-10**

IR (Nujol, NaCl): $\tilde{n}$ 3390 (broad, OH, NH), 1715 (CO of carbamate) with a shoulder at 1750 (CO of ester), 1526, 1345, 1215, 1063, 1029, 740, 699 cm^{-1}.

^1H NMR (400 MHz, $CDCl_3$): *d* 7.40-7.26 (m, 5H, Ph), 5.93 (d, 1H, *J* = 7.9 Hz, N<u>H</u>), 5.10 (s, 2H, $OC\underline{H}_2Ph$), 4.42 (ddd, 1H, *J* = 7.9, 3.6, 3.4 Hz, $CH_2C\underline{H}$), 3.96 (dd, 1H, *J* = 11.3, 3.6 Hz, $C\underline{H}_2CH$), 3.86 (dd, 1H, *J* = 11.3, 3.4 Hz, $C\underline{H}_2CH$), 3.74 (s, 3H, $CO_2C\underline{H}_3$), 2.98 (broad s, 1H, O<u>H</u>).

^{13}C NMR (100 MHz, $CDCl_3$): *d* 171.18 (1C, $\underline{C}O_2CH_3$), 156.33 (1C, NH<u>C</u>O), 136.06 (1C, C_{ipso} aromatic), 128.53 (2C, $\underline{C}H_{meta}$ aromatic), 128.23 (1C, $\underline{C}H_{para}$ aromatic), 128.11 (2C, $\underline{C}H_{ortho}$ aromatic), 67.17 (1C, $\underline{C}H_2Ph$), 63.05 (1C, $\underline{C}H_2CH$), 56.06 (1C, $CH_2\underline{C}H$), 52.71 (1C, $CO_2\underline{C}H_3$).

MS (EI, 70 eV) *m/z* (rel intens) 253 (3) $[M]^+$, 223 (2) $[M - CH_2OH]^+$, 194 (3) $[M - CO_2CH_3]^+$, 162 (10) $[M - C_7H_7]^+$, 150 (8) $[M - HOCH_2CO_2CH_3]^+$, 132 (4), 108 (59) $[PhCH_2OH]^+$, 91 (100) $[C_7H_7]^+$, 65 (26) $[C_5H_5]^+$.

$[\alpha]_D^{23}$ = -5.4, $[\alpha]_{578}^{23}$ = -5.7, $[\alpha]_{546}^{23}$ = -6.6, $[\alpha]_{436}^{23}$ = -12.1, $[\alpha]_{365}^{23}$ = -20.9 (c = 6.0, $CHCl_3$), starting from L-serine: $[\alpha]_D^{24}$ = +6.3, $[\alpha]_{578}^{24}$ = +6.4, $[\alpha]_{546}^{24}$ = +7.4, $[\alpha]_{436}^{24}$ = +12.9, $[\alpha]_{365}^{24}$ = +22.0 (c = 6.0, $CHCl_3$).

(*R*)-*N*-(Benzyloxycarbonyl)-2-amino-3-methyl-1,3-butanediol (*R*)-11

IR (neat, NaCl): $\tilde{n}$ 3404 (broad, OH), 3330 (broad, NH), 3090, 3066, 3035, 2977, 2892, 1700 (C=O), 1534, 1456, 1379, 1337, 1258, 1157, 1057, 738, 699 cm^{-1}.

^{1}H NMR (400 MHz, $CDCl_3$): *d* 7.39-7.28 (m, 5H, Ph), 5.80 (d, 1H, *J* = 9.1 Hz, N<u>H</u>), 5.10 (d, 2H, *J* = 12.5 Hz, C<u>H</u>$_2$Ph), 5.09 (d, 2H, *J* = 12.5 Hz, C<u>H</u>$_2$Ph), 3.96 (dd, 1H, *J* = 11.4, 2.8 Hz, C<u>H</u>$_2$CH), 3.78 (dd, 1H, *J* = 11.4, 2.3 Hz, C<u>H</u>$_2$CH), 3.51 (ddd, 1H, *J* = 9.1, 2.8, 2.3 Hz, CH$_2$C<u>H</u>), 3.40-3.34 (broad s, 1H, O<u>H</u>), 3.27 (s, 1H, O<u>H</u>), 1.32 (s, 3H, C(C<u>H</u>$_3$)$_2$), 1.21 (s, 3H, C(C<u>H</u>$_3$)$_2$).

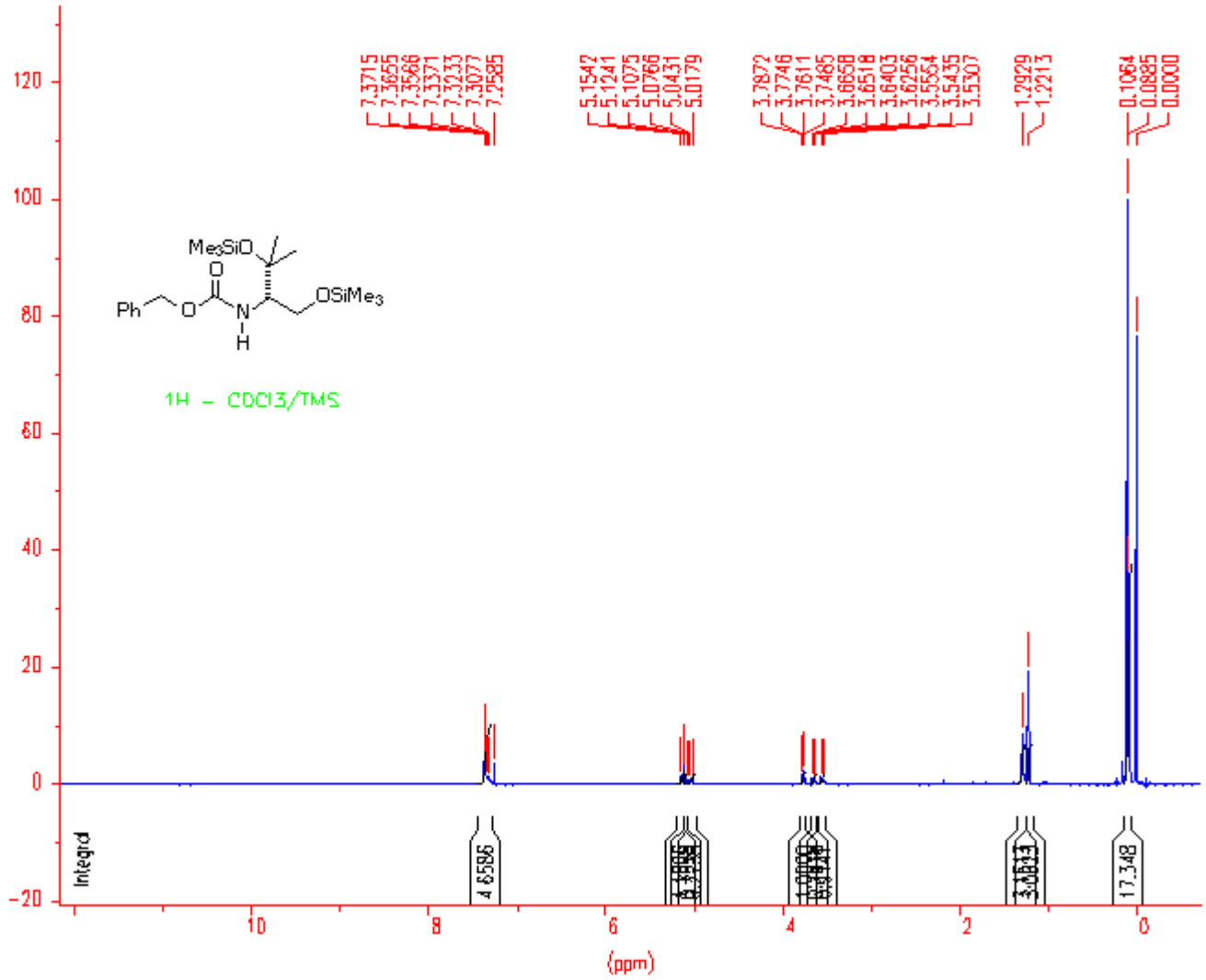
^{13}C NMR (100 MHz, $CDCl_3$): *d* 156.92 (1C, NH<u>C</u>O), 136.36 (1C, C_{ipso} aromatic), 128.54 (2C, <u>C</u>H$_{meta}$ aromatic), 128.17 and 128.03 (3C, 2<u>C</u>H$_{ortho}$ and 1<u>C</u>H$_{para}$ aromatic), 73.54 (1C, <u>C</u>(CH$_3$)$_2$), 66.91 (1C, <u>C</u>H$_2$Ph), 63.13 (1C, <u>C</u>H$_2$CH), 58.30 (1C, CH$_2$<u>C</u>H), 27.44 (1C, C(<u>C</u>H$_3$)$_2$), 27.26 (1C, C(<u>C</u>H$_3$)$_2$).

MS (EI, 70 eV) *m/z* (rel intens) 253 (1) $[M]^+$, 235 (1) $[M - H_2O]^+$, 222 (4) $[M - CH_2OH]^+$, 194 (2) $[M - C(CH_3)_2OH]^+$, 177 (22) $[M - C_6H_5]^+$, 132 (13), 91 (100) $[C_7H_7]^+$, 65 (34) $[C_5H_5]^+$, 60 (41).

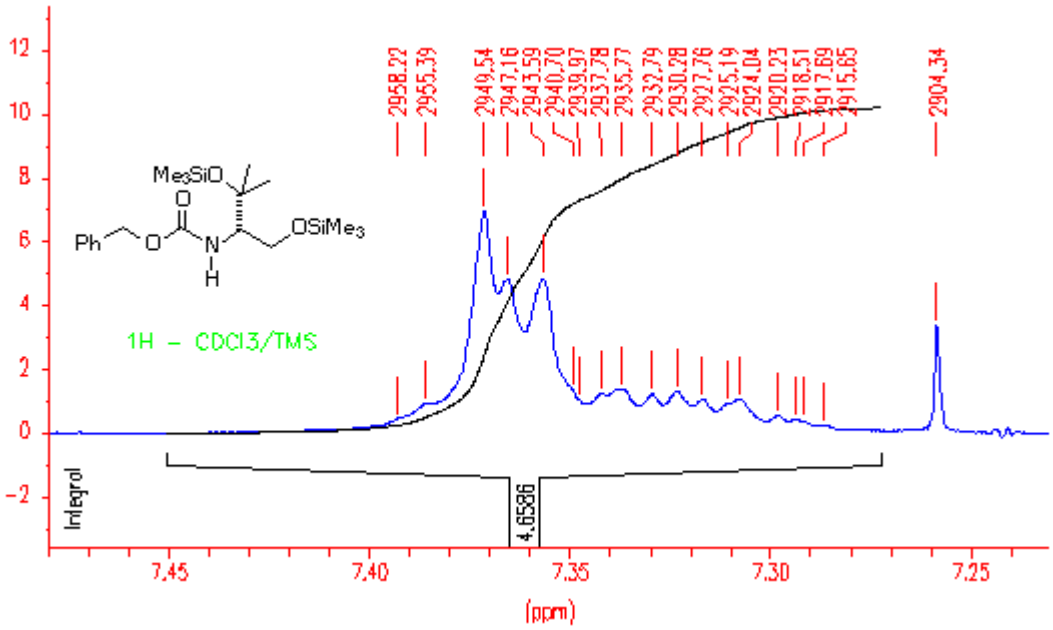
$[\alpha]_D^{23}$ = -28.8, $[\alpha]_{578}^{23}$ = -30.0, $[\alpha]_{546}^{23}$ = -34.1, $[\alpha]_{436}^{23}$ = -58.5, $[\alpha]_{365}^{23}$ = -92.6 (c = 6.0, $CHCl_3$), starting from L-serine: $[\alpha]_D^{24}$ = +29.1, $[\alpha]_{578}^{24}$ = +30.4, $[\alpha]_{546}^{24}$ = +34.4, $[\alpha]_{436}^{24}$ = +59.0, $[\alpha]_{365}^{24}$ = +93.4 (c = 6.0, $CHCl_3$).

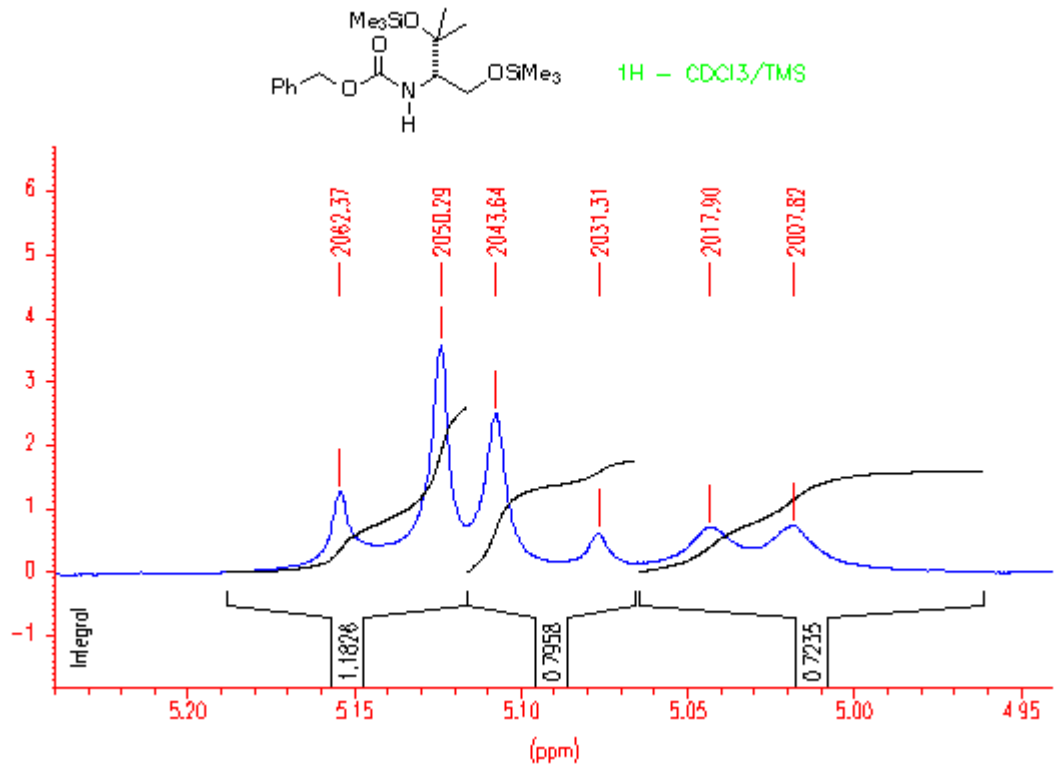
(*R*)-*N*-(Benzyloxycarbonyl)-2-amino-3-methyl-1,3-bis(trimethylsilyloxy)butane (*R*)-12

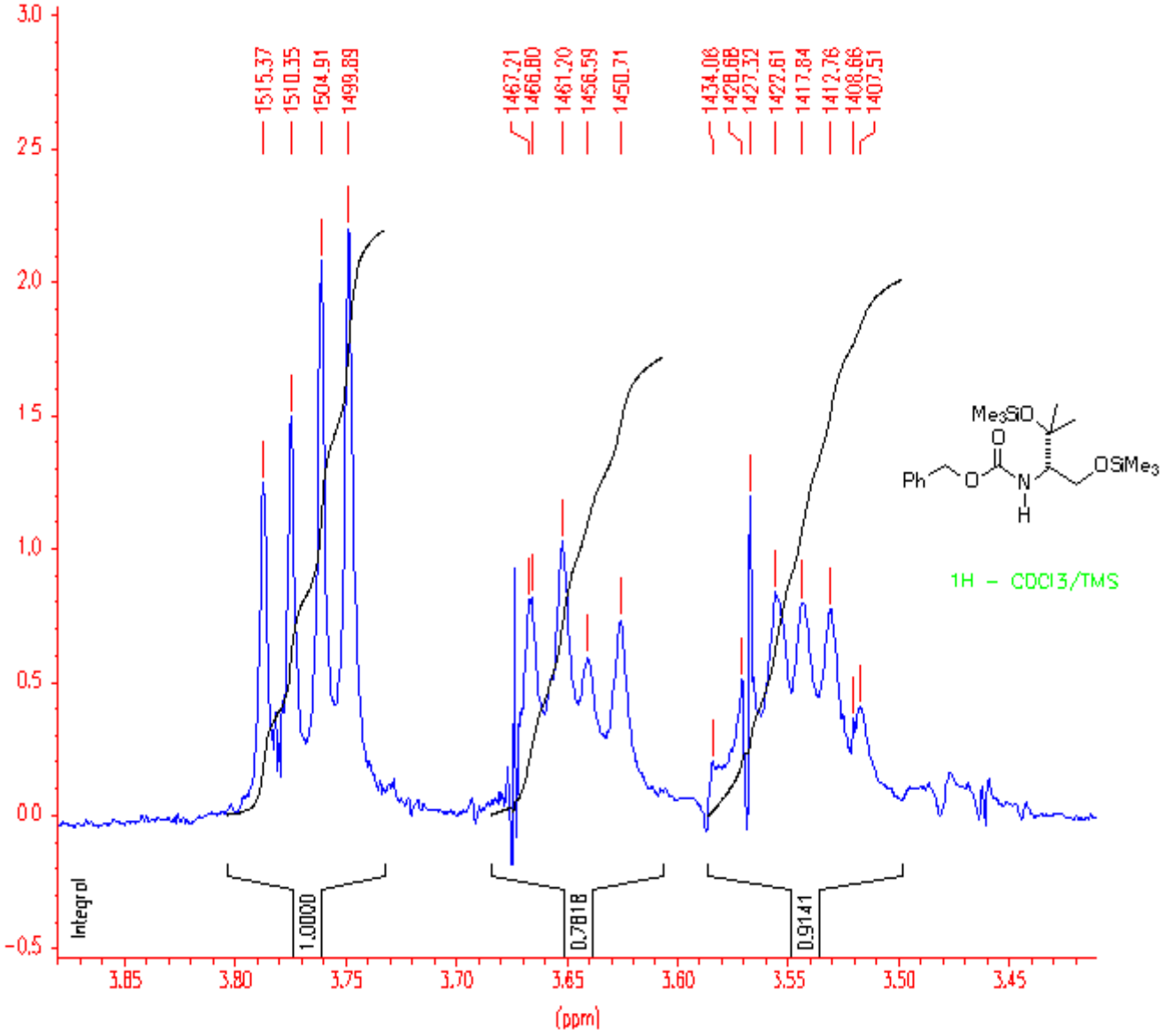
IR (neat, NaCl): $\tilde{n}$ 3446, 3342 (broad, NH), 3091, 3067, 3035, 2958, 2899, 2251 (small, aromatic harmonic), 1726 (C=O), 1504, 1339, 1252, 1171, 1037, 842, 752, 735, 697 cm^{-1}.

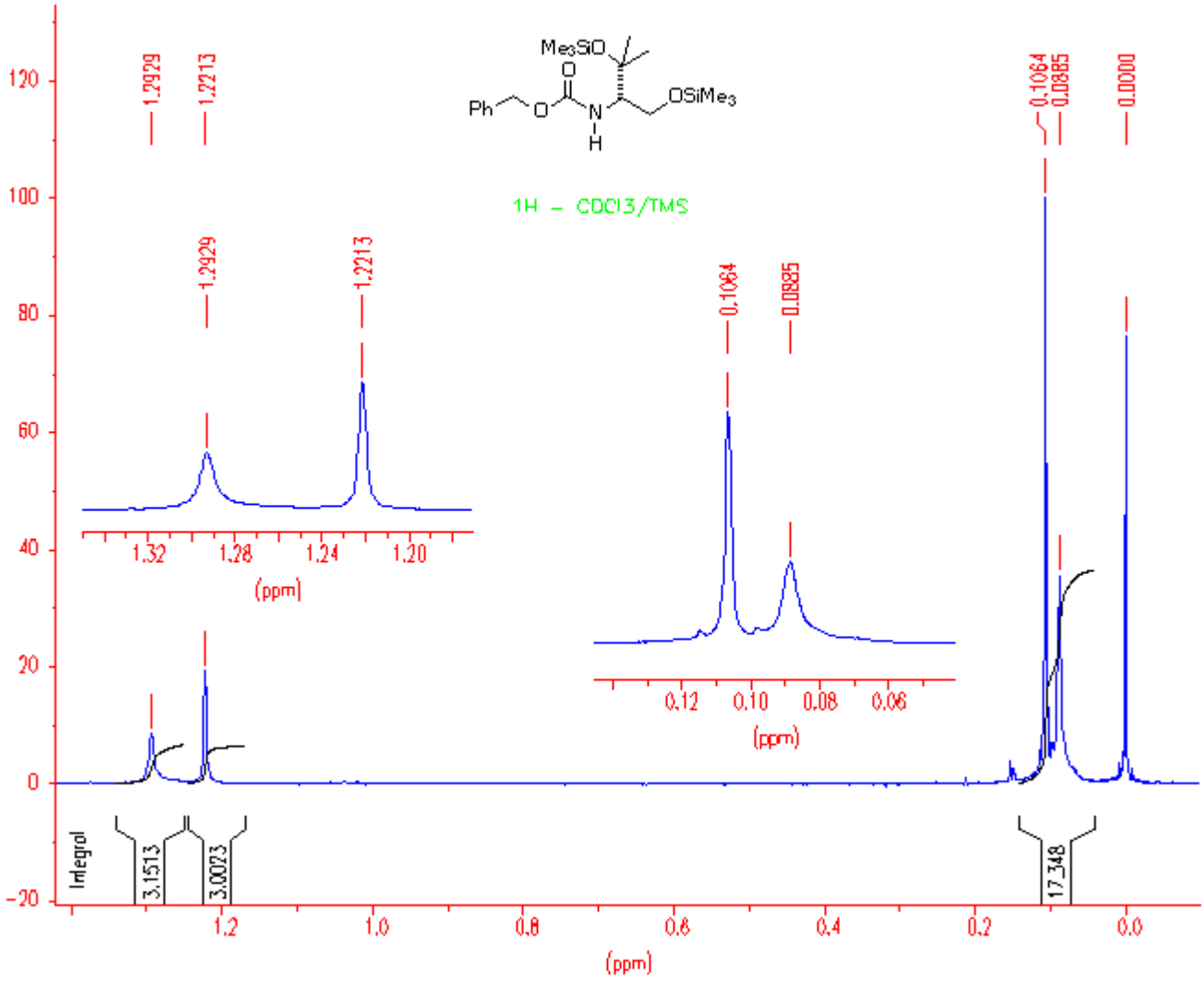


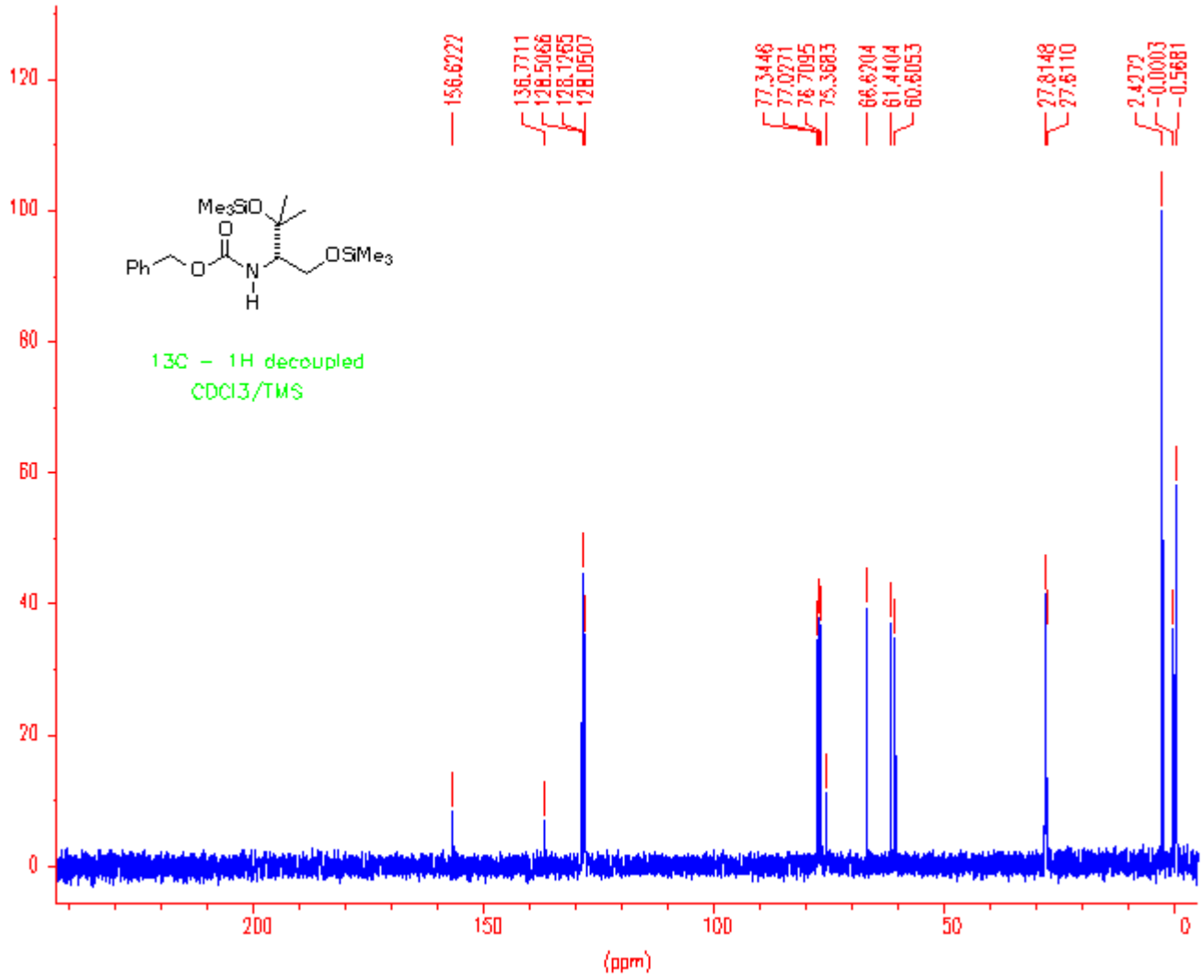
^{1}H NMR (400 MHz, $CDCl_3$): *d* 7.40 - 7.28 (m, 5H, Ph), 5.13 (d, 1H, *J* = 12.1 Hz, C$\underline{H}_2$Ph), 5.10 (d, 1H, *J* = 12.1 Hz, C$\underline{H}_2$Ph), 5.03 (d, 1H, *J* = 10.1 Hz, N$\underline{H}$), 3.77 (dd, 1H, *J* = 10.5, 5.0 Hz, C$\underline{H}_2$CH), 3.65 (dd, 1H, *J* = 10.5, 5.8 Hz, C$\underline{H}_2$CH), 3.54 (ddd, 1H, *J* = 10.1, 5.8, 5.0 Hz, $CH_2C\underline{H}$), 1.29 (broad s, 3H, C(C$\underline{H}_3$)$_2$), 1.22 (s, 3H, C(C$\underline{H}_3$)$_2$), 0.11 (s, 9H, Si(C$\underline{H}_3$)$_3$), 0.09 (broad s, 9H, Si(C$\underline{H}_3$)$_3$).


2958.22
2955.39
2949.54
2947.16
2943.59
2940.70
2939.97
2937.78
2935.77
2932.79
2930.28
2927.76
2925.19
2924.04
2920.23
2918.51
2917.69
2915.65
2904.34
Me3SiO
OSiMe3
Ph
O
N
H
1H – CDCl3/TMS
Integral
4.6586
12
10
8
6
4
2
0
-2
7.45
7.40
7.35
7.30
7.25
(ppm)

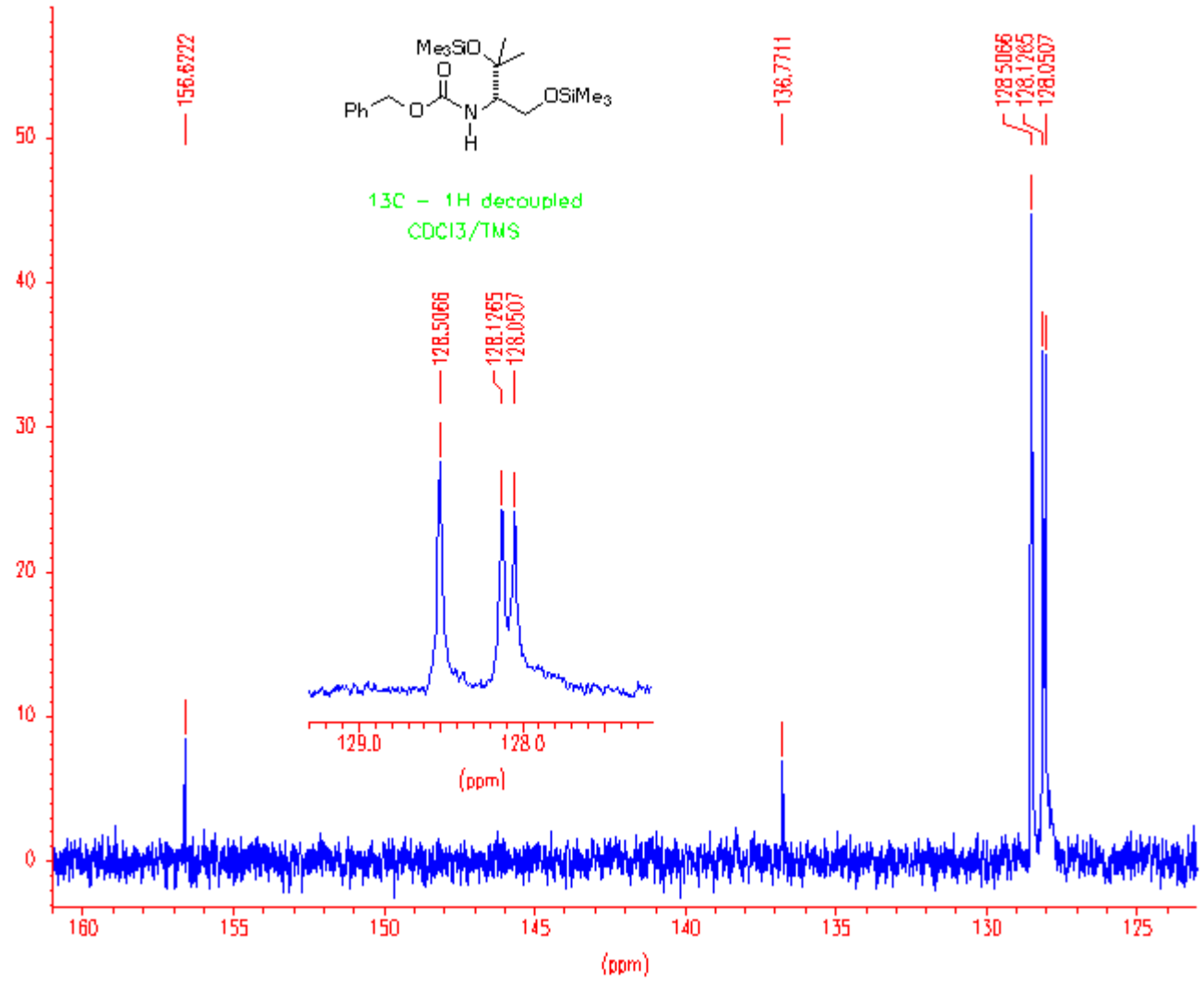

Me3SiO
OSiMe3
Ph
O
N
H
1H – CDCl3/TMS
2062.37
2050.29
2043.64
2031.31
2017.90
2007.82
Integral
1.1828
0.7958
0.7235
6
5
4
3
2
1
0
-1
5.20
5.15
5.10
5.05
5.00
4.95
(ppm)

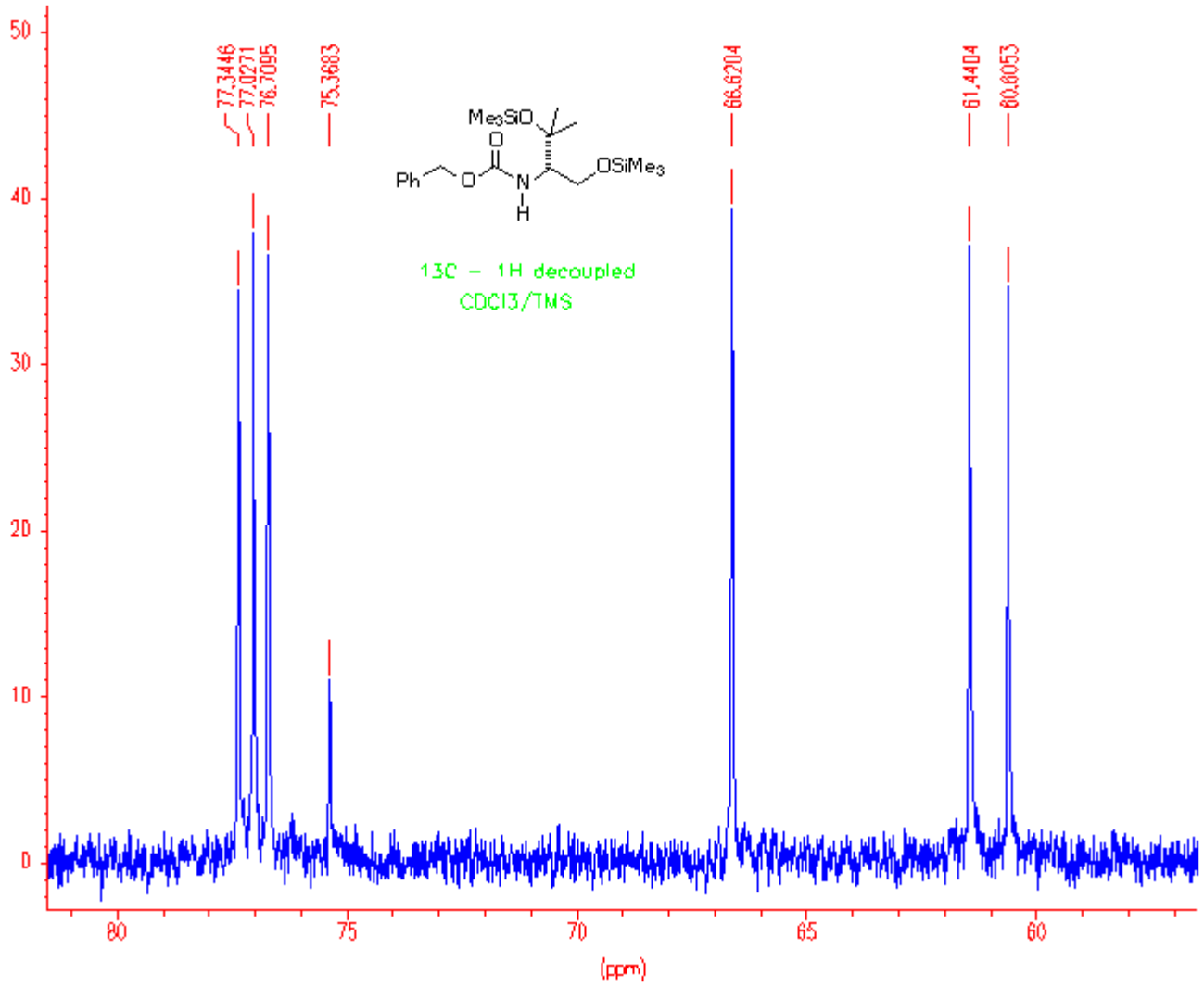

1515.37
1510.35
1504.91
1499.89
1467.21
1466.80
1461.20
1456.59
1450.71
1434.08
1428.68
1427.32
1422.61
1417.84
1412.76
1408.66
1407.51
Integral
1.0000
0.7818
0.9141
3.85
3.80
3.75
3.70
3.65
3.60
3.55
3.50
3.45
(ppm)
Me3SiO
Ph
OSiMe3
1H – CDCl3/TMS

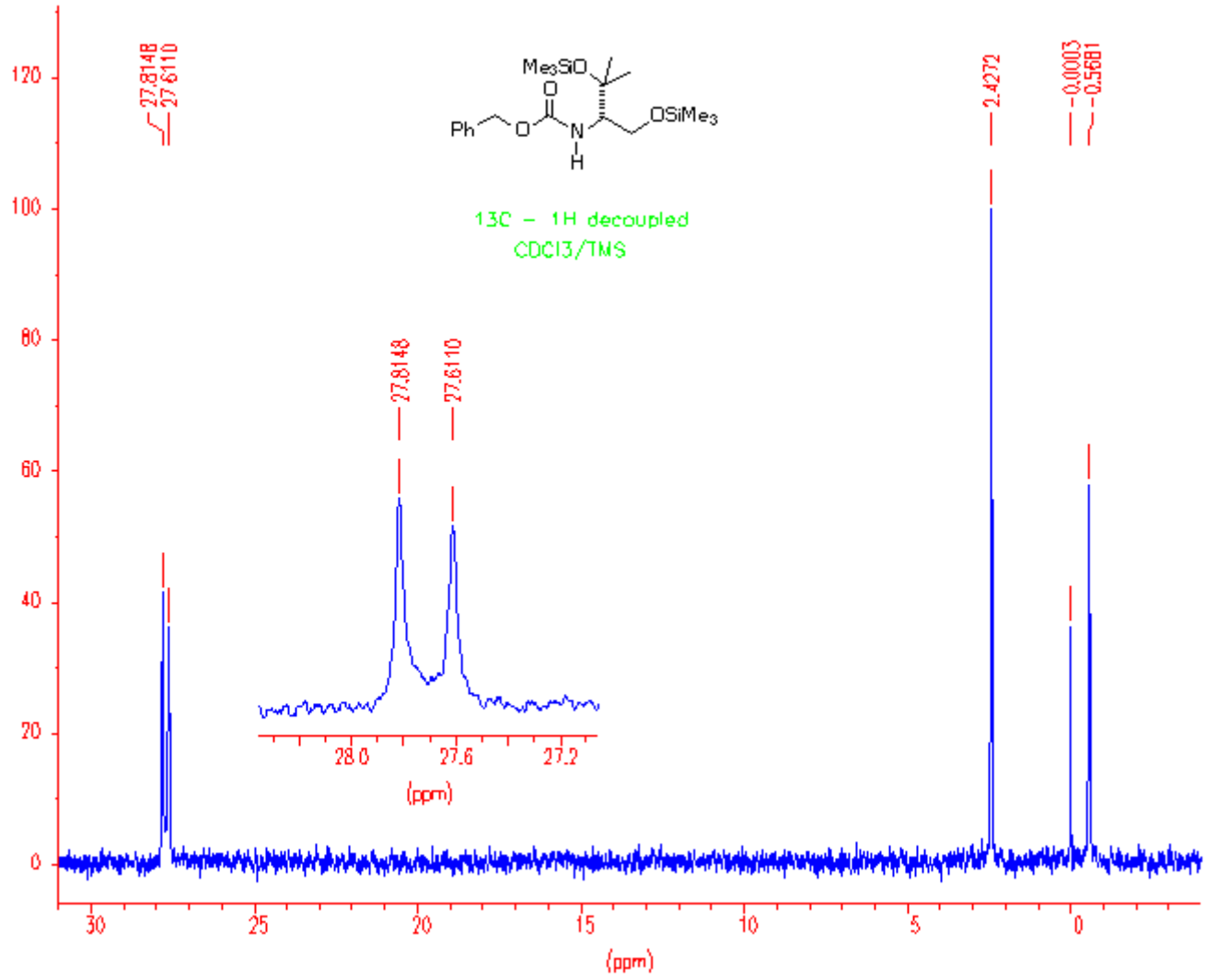

1.2929
1.2213
0.1064
0.0885
0.0000
Me3SiO
O
Ph
O
N
H
OSiMe3
1H – CDCl3/TMS
1.32
1.28
1.24
1.20
(ppm)
0.12
0.10
0.08
0.06
(ppm)
Integral
3.1513
3.0023
17.348
(ppm)



^{13}C NMR (100 MHz, $CDCl_3$): *d* 156.63 (1C, NH<u>C</u>O), 136.77 (1C, C_{ipso} aromatic), 128.51 (2C, <u>C</u>H_{meta} aromatic), 128.13 and 128.05 (3C, 2<u>C</u>H_{ortho} and 1<u>C</u>H_{para} aromatic), 75.37 (1C, <u>C</u>$(CH_3)_2$), 66.62 (1C, <u>C</u>H_2Ph), 61.44 (1C, <u>C</u>H_2CH), 60.60 (1C, CH_2<u>C</u>H), 27.81 (1C, C(<u>C</u>$H_3)_2$, correlates with protons at 1.29 ppm), 27.61 (1C, C(<u>C</u>$H_3)_2$, correlates with protons at 1.22 ppm), 2.43 (3C, Si(<u>C</u>$H_3)_3$, correlates with protons at 0.11 ppm), -0.57 (3C, Si(<u>C</u>$H_3)_3$, correlates with protons at 0.09 ppm).


156.6722
136.7711
128.5066
128.1265
128.0507
Me3SiO
O
Ph
O
N
H
OSiMe3
13C – 1H decoupled
CDCl3/TMS
128.5066
128.1265
128.0507
129.0
128.0
(ppm)
50
40
30
20
10
0
160
155
150
145
140
135
130
125
(ppm)


77.3446
77.0271
76.7095
75.3683
66.6204
61.4404
60.6053
Me3SiO
O
Ph
O
N
H
OSiMe3
13C – 1H decoupled
CDCl3/TMS
50
40
30
20
10
0
80
75
70
65
60
(ppm)



HRMS (EI, 70 eV) *m/z* (%): calcd for $C_{18}H_{32}NO_4Si_2$ 382.1870 $[M-Me]^+$, found 382.1869 (1.7), 294 (2.0) $[M-CH_2OSiMe_3]^+$, 248 (34) $[M-Me-CO_2CHPh]^+$, 204 (4.6) $[M-CH_2OSiMe_3-Me_3SiOH]^+$, 131 (100) $[CMe_2OSiMe_3]^+$, 91 (57) $[C_7H_7]^+$, 75 (6.7) $[Me_2Si{=}OH]^+$, 73 (62) $[Me_3Si]^+$.

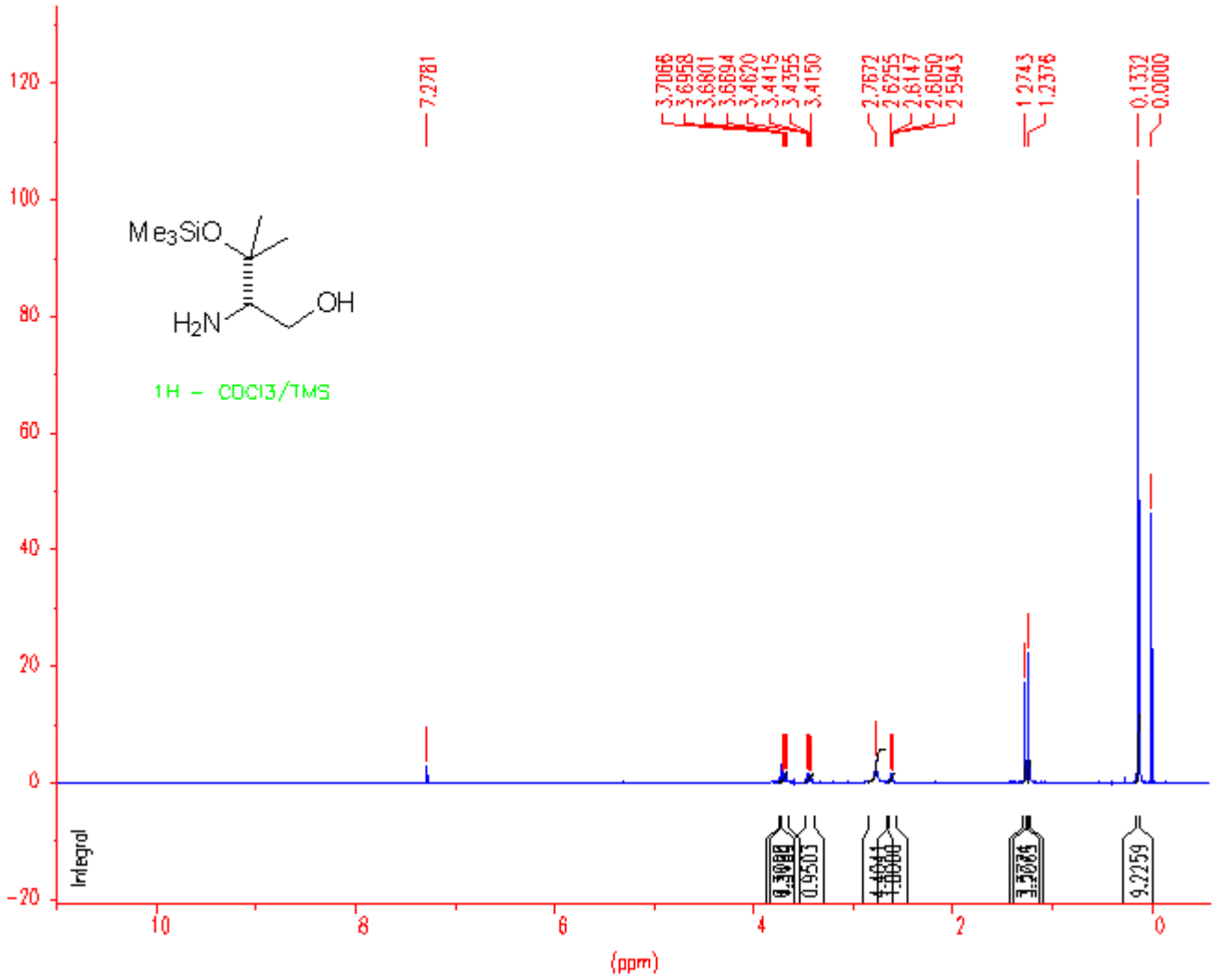
MS (FAB, *m*-nitrobenzylic alcohol matrix) *m/z* (%) Calcd for $C_{19}H_{35}NO_4Si_2$ 397.2 $[M]^+$, found 470 (97) $[M + SiMe_3]^+$, 398 (54) $[M + H]^+$, 382 (59) $[M - CH_3]^+$, 308 (100) $[M - OSiMe_3]^+$.

$[\alpha]_D^{27}$ = -3.0, $[\alpha]_{578}^{27}$ = -3.1, $[\alpha]_{546}^{27}$ = -3.4, $[\alpha]_{436}^{27}$ = -6.8, $[\alpha]_{365}^{27}$ = -11.9 (c = 4.4, $CHCl_3$), starting from L-serine: $[\alpha]_D^{23}$ = +3.2, $[\alpha]_{578}^{23}$ = +3.3, $[\alpha]_{546}^{23}$ = +3.9, $[\alpha]_{436}^{23}$ = +7.3, $[\alpha]_{365}^{23}$ = +13.2 (c = 4.3, $CHCl_3$).

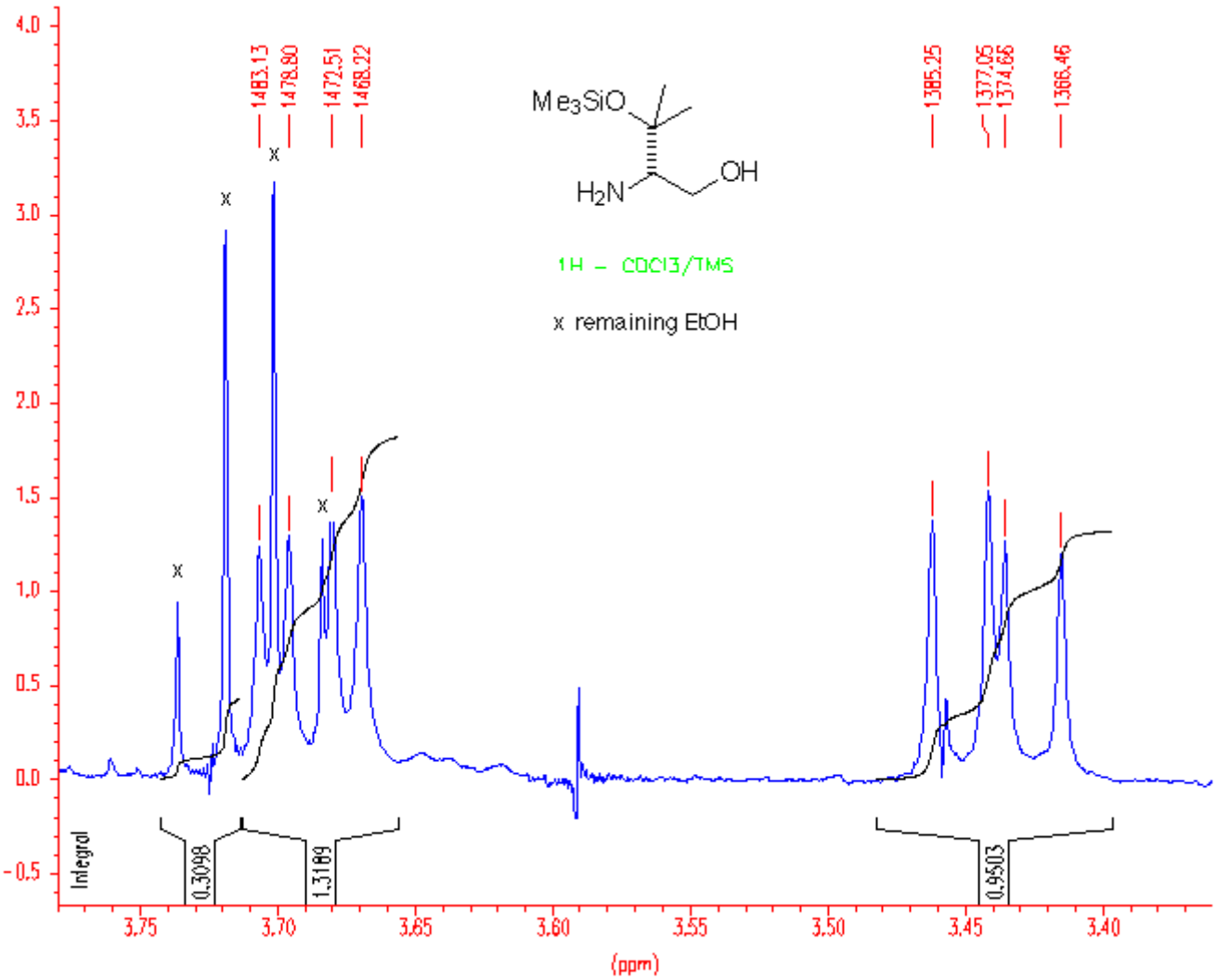
Anal. Calcd for $C_{19}H_{35}NO_4Si_2$: C, 57.39; H, 8.87; N, 3.52. Found: C, 56.96; H, 8.32; N, 3.62.

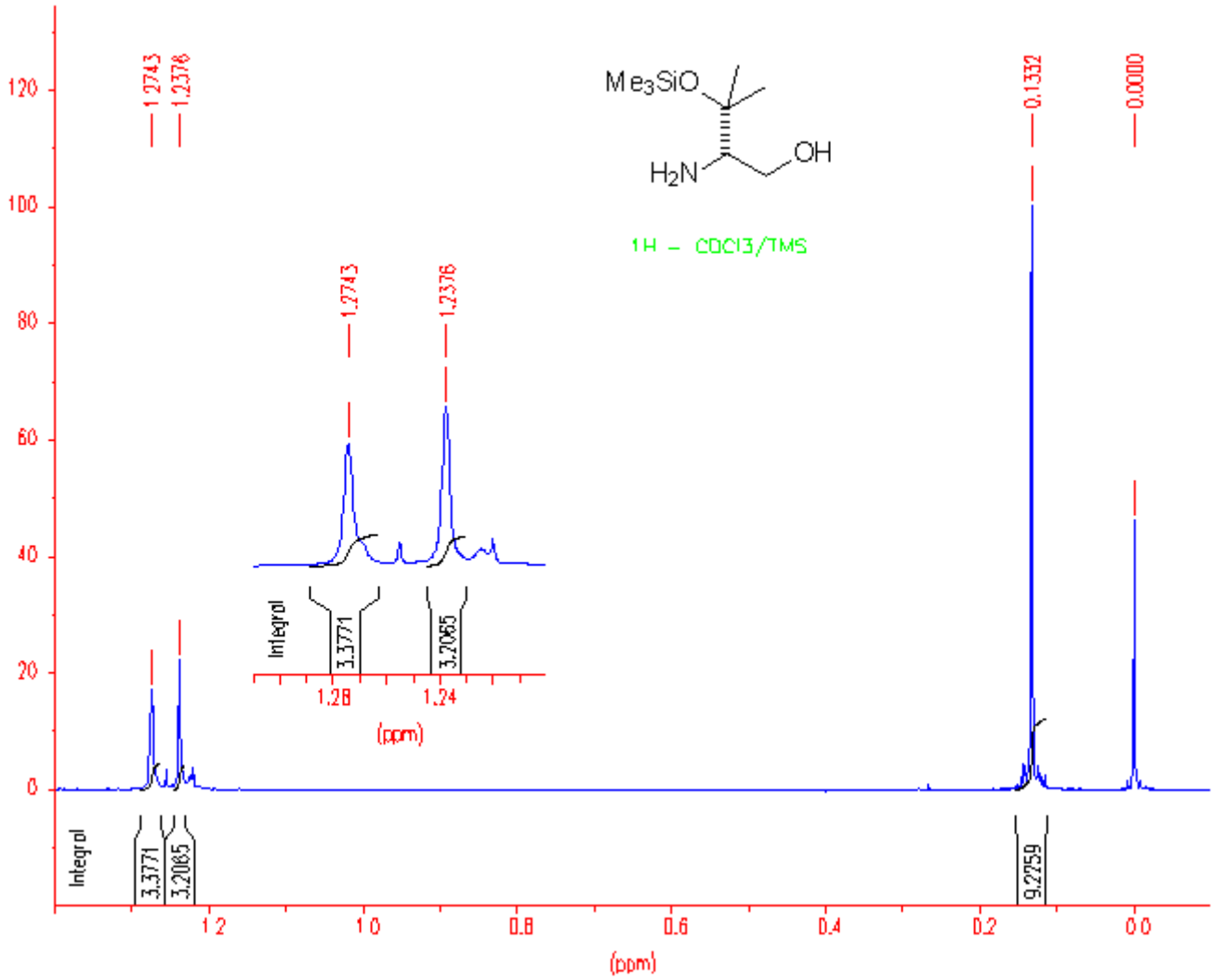
(*R*)-2-Amino-3-methyl-3-(trimethylsilyloxy)butan-1-ol (*R*)-13a

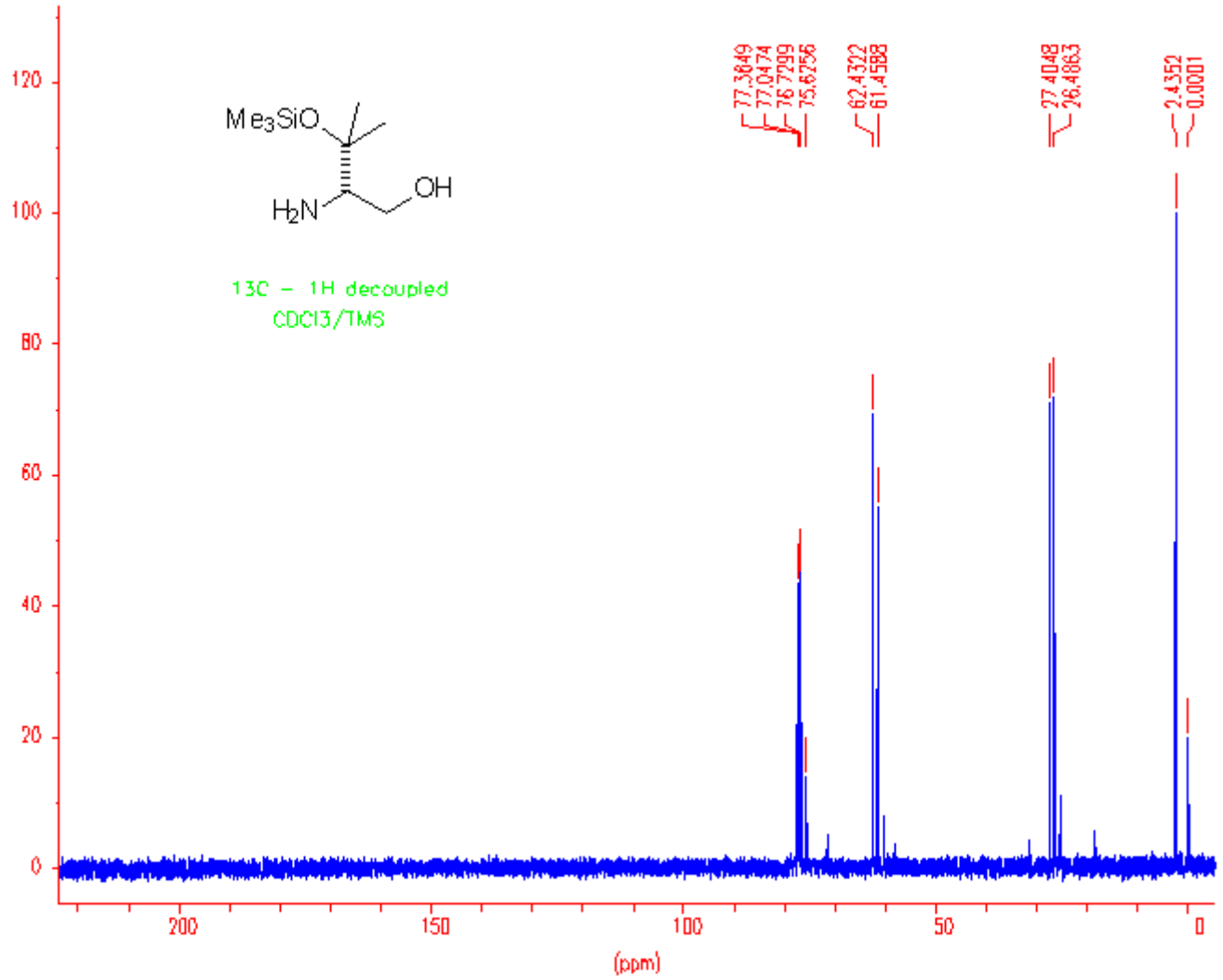
IR (neat, NaCl): $\tilde{n}$ 3360 (broad, OH), 3296 (broad, NH), 2960, 2899, 1585, 1465, 1385, 1367, 1251, 1158, 1033, 889, 840, 754 cm^{-1}.



^{1}H NMR (400 MHz, $CDCl_3$): *d* 3.69 (dd, 1H, *J* = 10.6, 4.3 Hz, C$\underline{H}_2$CH), 3.44 (dd, 1H, *J* = 10.6, 8.2 Hz, C$\underline{H}_2$CH), 2.77 (broad s, 3H, N$\underline{H}_2$ and O$\underline{H}$), 2.61 (dd, 1H, *J* = 8.2, 4.3 Hz, $CH_2C\underline{H}$), 1.27 (s, 3H, C(C$\underline{H}_3$)$_2$), 1.24 (s, 3H, C(C$\underline{H}_3$)$_2$), 0.13 (s, 9H, Si(C$\underline{H}_3$)$_3$).

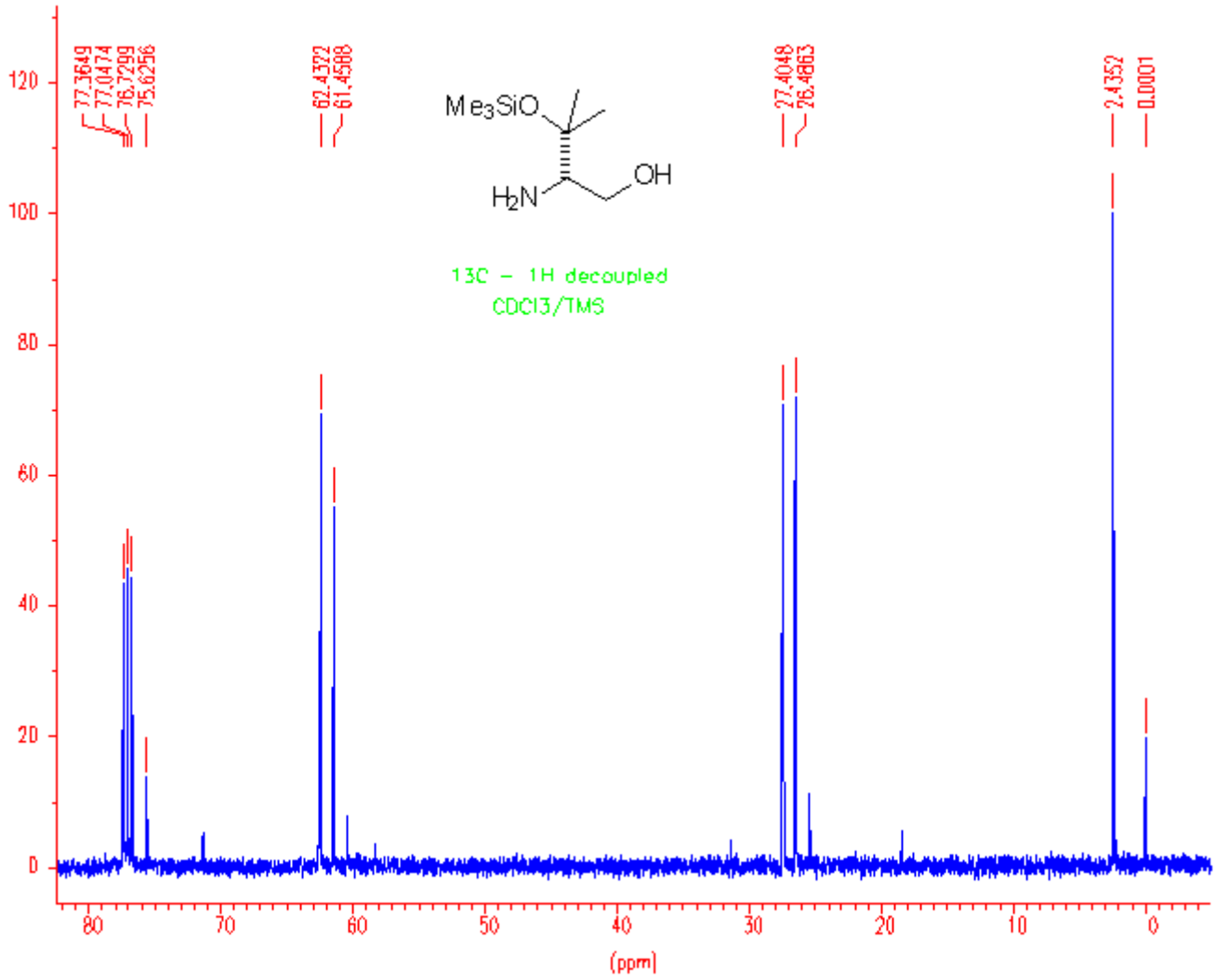

1483.13
1478.80
1472.51
1468.22
1385.25
1377.05
1374.66
1366.46
Me3SiO
OH
H2N
1H – CDCl3/TMS
x remaining EtOH
Integral
0.3098
1.3189
0.9503
(ppm)


1.2743
1.2376
0.1332
0.0000
Me3SiO
H2N
OH
1H – CDCl3/TMS
Integral
3.3771
3.2065
9.2259
(ppm)



^{13}C NMR (100 MHz, $CDCl_3$): *d* 75.63 (1C, $\underline{C}(CH_3)_2$), 62.43 (1C, $\underline{C}H_2CH$), 61.46 (1C, $CH_2\underline{C}H$), 27.41 (1C, $C(\underline{C}H_3)_2$, correlates with protons at 1.27 ppm), 26.49 (1C, $C(\underline{C}H_3)_2$, correlates with protons at 1.24 ppm), 2.44 (3C, $Si(\underline{C}H_3)_3$).

As a remark, this compound proved to be highly sensitive to the acidity of $CDCl_3$ which resulted in the apparition of extra peaks due to some degradation during recording the ^{13}C NMR spectrum.

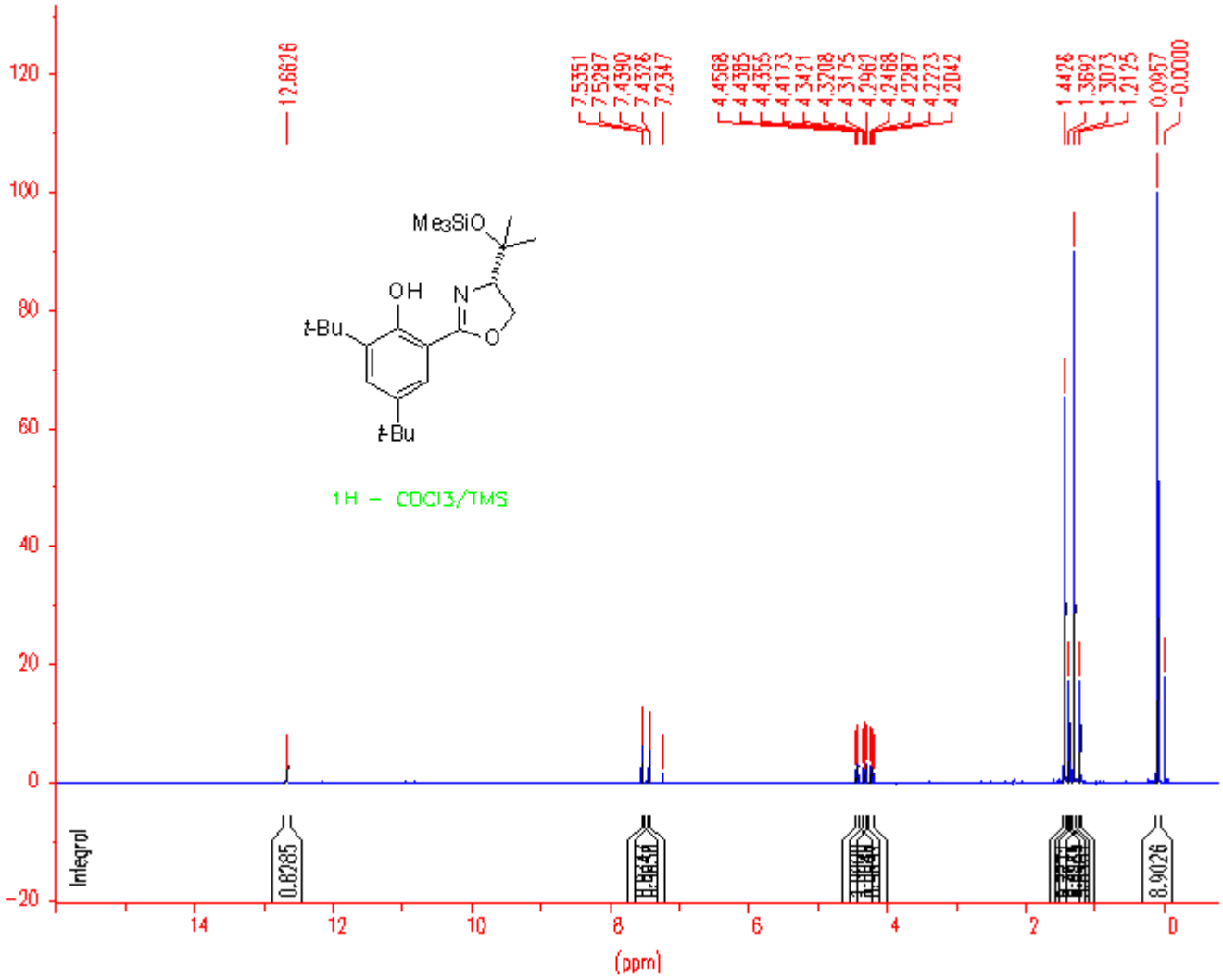


MS (EI, 70 eV) *m/z* (rel intens) 192 (1) $[M + H]^+$, 176 (4) $[M - CH_3]^+$, 160 (18) $[M - CH_2OH]^+$, 131 (100) $[M - HOCH_2CHNH_2$ *e.g.* $Me_3SiOC(CH_3)_2]^+$, 116 (14) $[M - C_2H_7OSi]^+$, 105 (16), 85 (56), 73 (90) $[SiMe_3]^+$, 60 (70) $[HOCH_2CHNH_2]^+$.

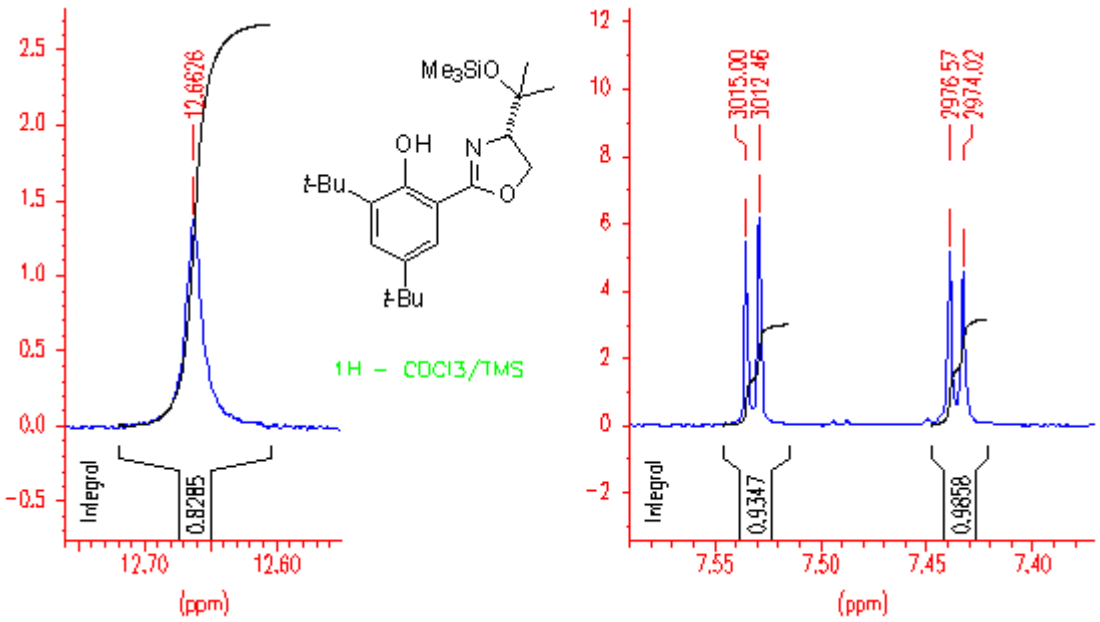
$[\alpha]_D^{23}$ = +14.8, $[\alpha]_{578}^{23}$ = +15.3, $[\alpha]_{546}^{23}$ = +17.3, $[\alpha]_{436}^{23}$ = +28.3, $[\alpha]_{365}^{23}$ = +42.4 (c = 3.4, $CHCl_3$), starting from L-serine: $[\alpha]_D^{24}$ = -15.3, $[\alpha]_{578}^{24}$ = -15.8, $[\alpha]_{546}^{24}$ = -17.6, $[\alpha]_{436}^{24}$ = -28.3, $[\alpha]_{365}^{24}$ = -41.7 (c = 2.5, $CHCl_3$).

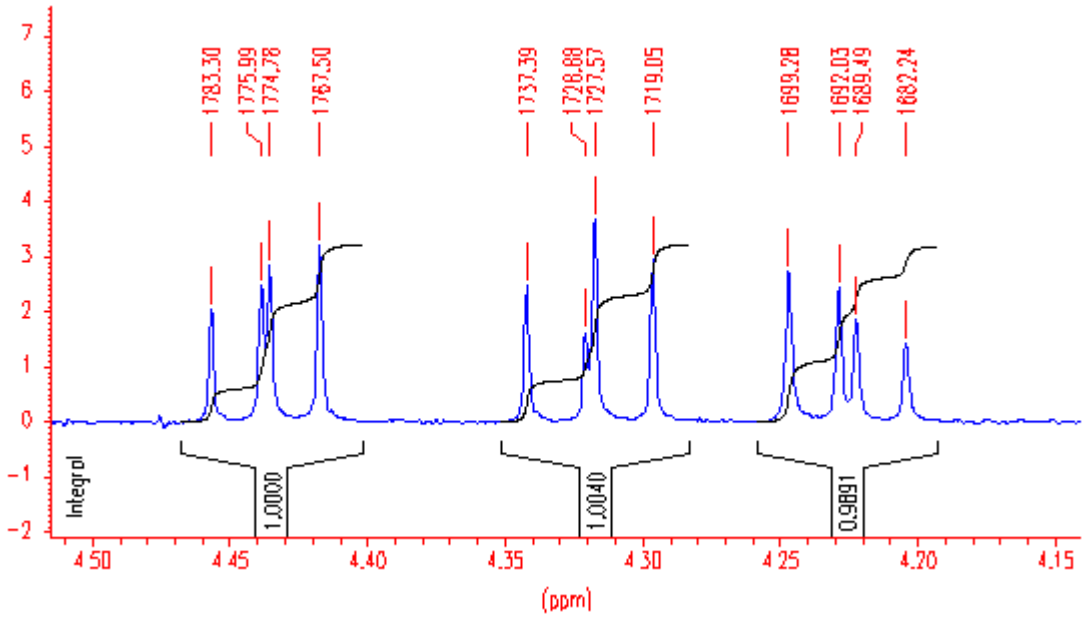
(*R*)-2,4-Di-*tert*-butyl-6-[4-(1-methyl-1-trimethylsilyloxyethyl)-4,5-dihydro-2-oxazolyl]-phenol (*R*)-14a

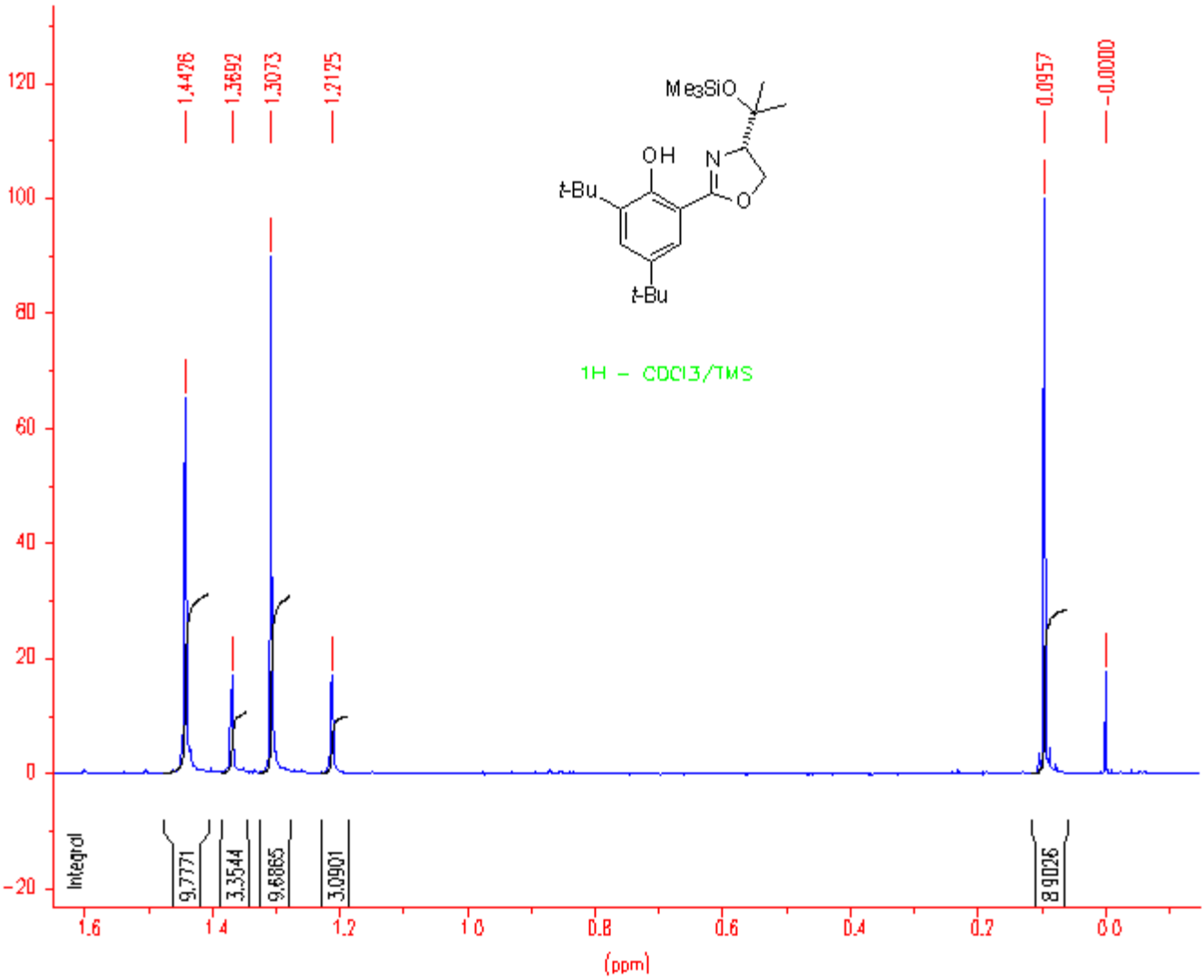
IR (Nujol, NaCl): $\tilde{n}$ 1635 (C=N), 1598 (C=C), 1444, 1252, 1189, 1165, 1106, 1059, 977, 840 cm^{-1}.

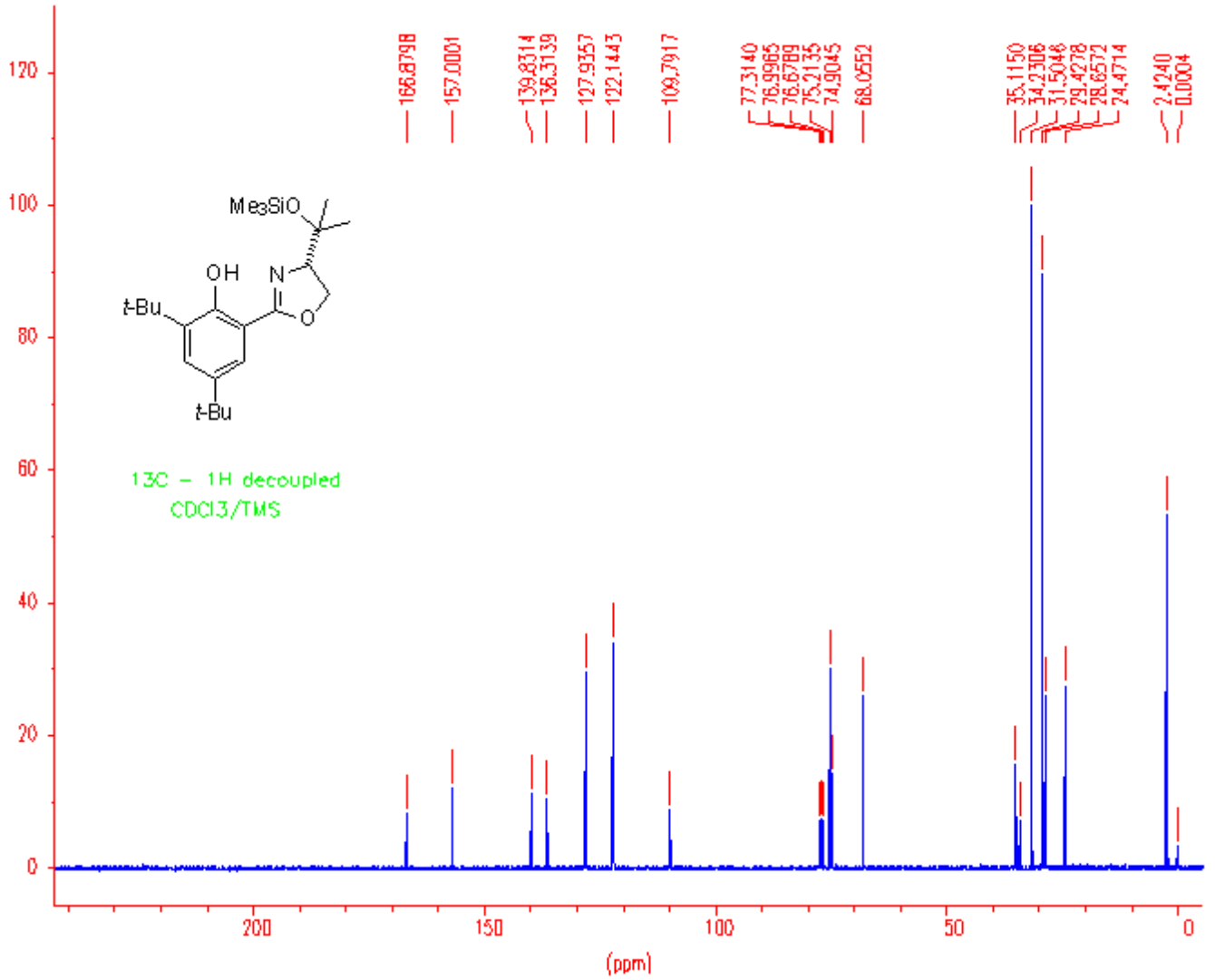


^{1}H NMR (400 MHz, $CDCl_3$): *d* 12.66 (broad s, 1H, O<u>H</u>), 7.53 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 7.44 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 4.44 (dd, 1H, *J* = 8.5, 7.3 Hz, C<u>H</u>$_2$CH), 4.32 (dd, 1H, *J* = 9.8, 8.5 Hz, C<u>H</u>$_2$CH), 4.23 (dd, 1H, *J* = 9.8, 7.3 Hz, CH$_2$C<u>H</u>), 1.44 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.37 (s, 3H, C(C<u>H</u>$_3$)$_2$O), 1.31 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.21 (s, 3H, C(C<u>H</u>$_3$)$_2$O), 0.10 (s, 9H, OSi(C<u>H</u>$_3$)$_3$).

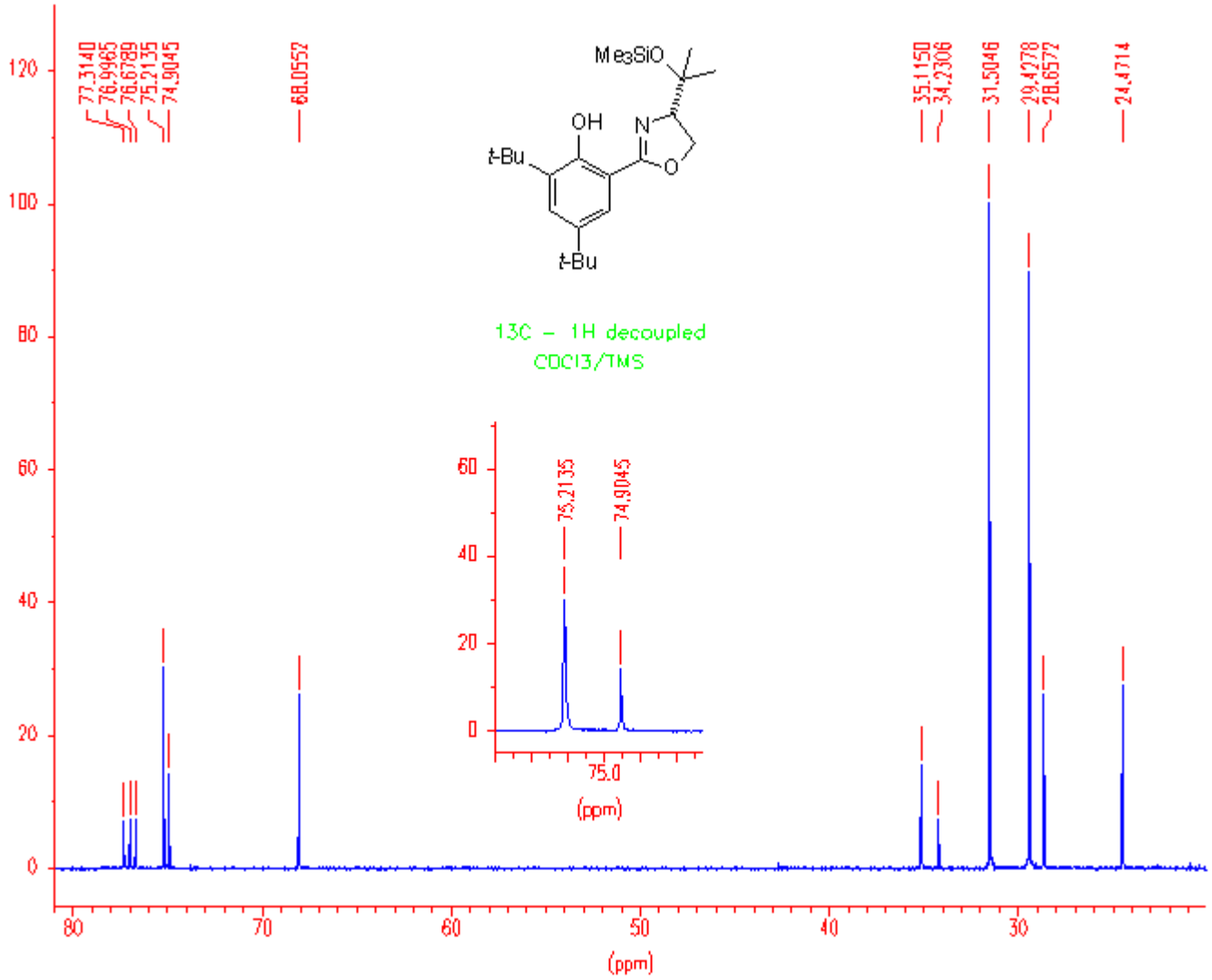

12.6626
Integral
0.8285
12.70
12.60
(ppm)
Me3SiO
OH
N
O
t-Bu
t-Bu
1H – CDCl3/TMS
3015.00
3012.46
2976.57
2974.02
Integral
0.9347
0.9858
7.55
7.50
7.45
7.40
(ppm)

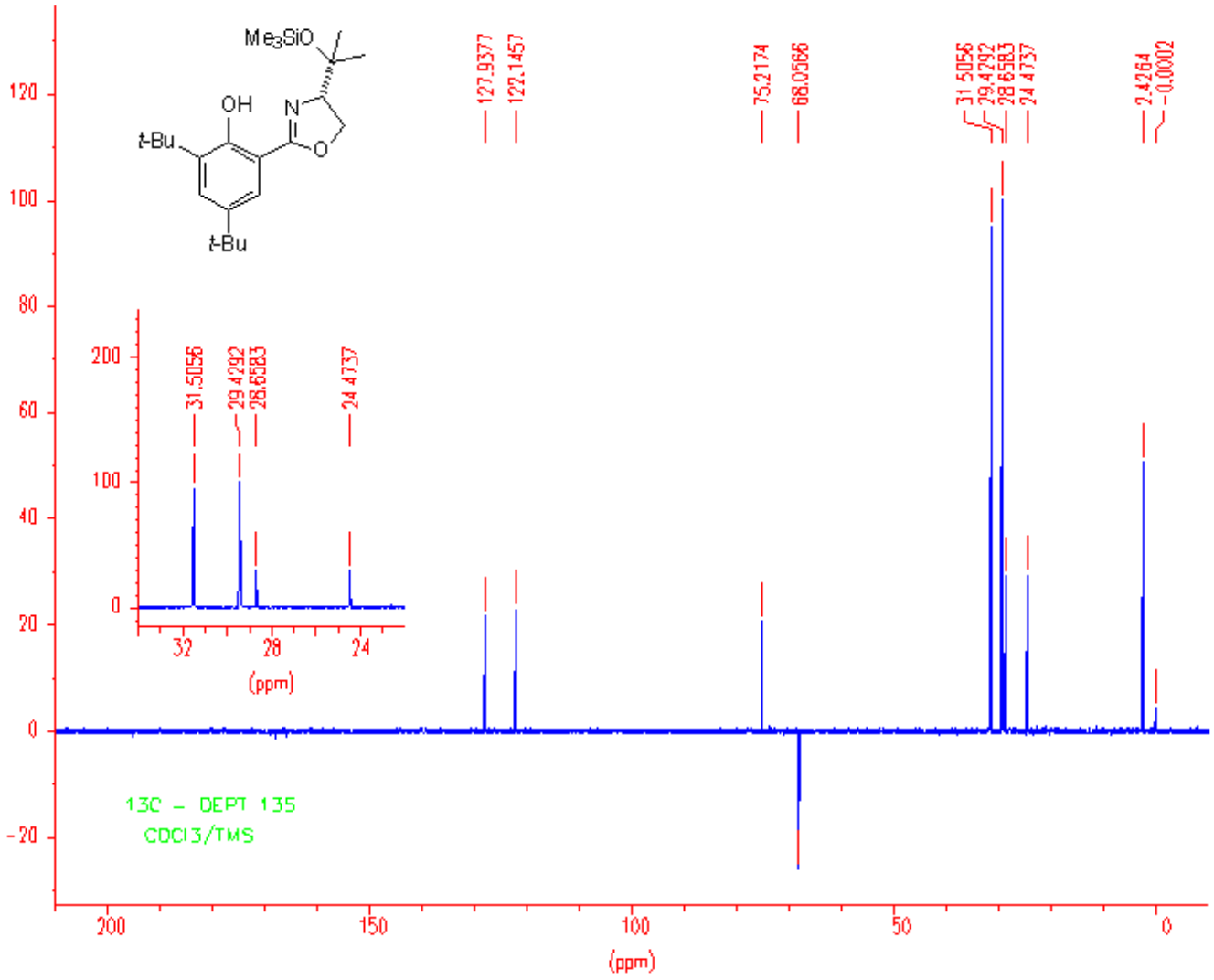

1783.30
1775.99
1774.78
1767.50
1737.39
1728.88
1727.57
1719.05
1699.28
1692.03
1689.49
1682.24
Integral
1.0000
1.0040
0.9891
4.50
4.45
4.40
4.35
4.30
4.25
4.20
4.15
(ppm)


1.4426
1.3692
1.3073
1.2125
0.0957
-0.0000
Me3SiO
OH
N
O
t-Bu
t-Bu
1H – CDCl3/TMS
Integral
9.7771
3.3544
9.6865
3.0901
8.9026
120
100
80
60
40
20
0
-20
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
(ppm)



^{13}C NMR (100 MHz, $CDCl_3$): *d* 166.88 (1C, O-C=N), 157.00 (1C, C_{ipso} α to OH), 139.83 (1C, C_{ipso} α to $C(CH_3)_3$), 136.32 (1C, C_{ipso} α to $C(CH_3)_3$), 127.94 (1C, CH aromatic, correlates with proton at 7.44 ppm), 122.14 (1C, CH aromatic, correlates with proton at 7.53 ppm), 109.80 (1C, C_{ipso} α to oxazoline), 75.22 (1C, CH_2CH), 74.91 (1C, $C(CH_3)_2O$), 68.06 (1C, CH_2CH), 35.12 (1C, $C(CH_3)_3$), 34.24 (1C, $C(CH_3)_3$), 31.51 (3C, $C(CH_3)_3$, correlates with protons at 1.31 ppm), 29.43 (3C, $C(CH_3)_3$, correlates with protons at 1.44 ppm), 28.66 (1C, $C(CH_3)_2O$, correlates with protons at 1.37 ppm), 24.47 (1C, $C(CH_3)_2O$, correlates with protons at 1.21 ppm), 2.43 (3C, $OSi(CH_3)_3$).


77.3140
76.9965
76.6789
75.2135
74.9045
68.0552
35.1150
34.2306
31.5046
29.4278
28.6572
24.4714
Me3SiO
OH
N
O
t-Bu
t-Bu
13C – 1H decoupled
CDCl3/TMS
75.2135
74.9045
75.0
(ppm)
(ppm)



HRMS (EI, 70 eV) *m/z* (%): calcd for $C_{23}H_{39}NO_3Si$ 405.2699 $[M]^+$, found 405.2676 (18), 390 (3) [M - Me]$^+$, 131 (100) $[CMe_2OSiMe_3]^+$, 75 (3) $[Me_2Si{=}OH]^+$, 73 (13) $[Me_3Si]^+$.

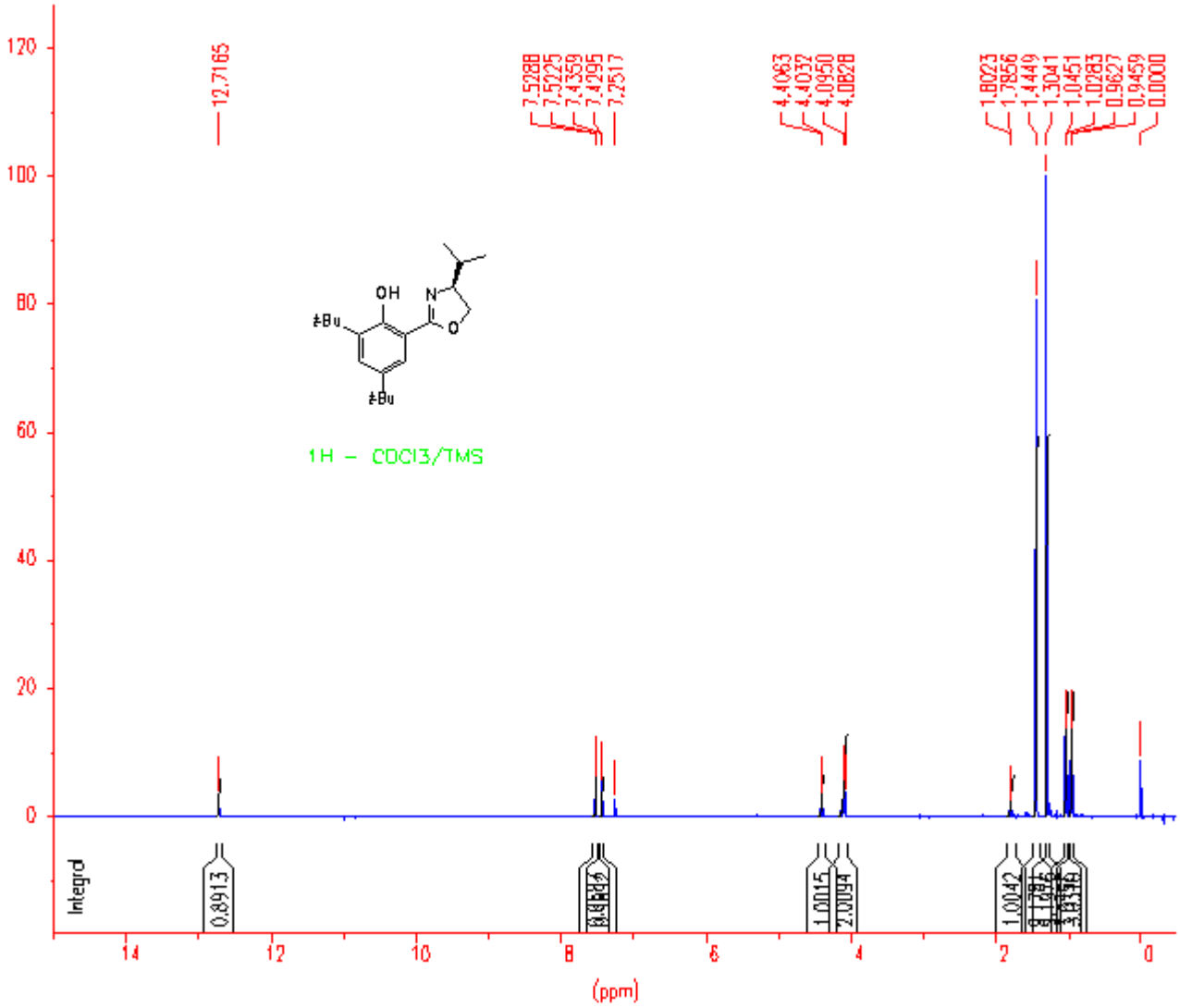
MS (FAB, *m*-nitrobenzylic alcohol matrix) *m/z* (rel intens): Calcd for $C_{23}H_{39}NO_3Si$ 405.3 $[M]^+$, found 405 (100) $[M]^+$, 390 (33) [M - CH_3]$^+$, 316 (7) [M - $OSi(CH_3)_3$]$^+$.

Starting from D-serine: $[\alpha]_D^{24}$ = +6.7, $[\alpha]_{578}^{24}$ = +7.6, $[\alpha]_{546}^{24}$ = +9.3, $[\alpha]_{436}^{24}$ = +30.8 (c = 2.7, $CHCl_3$).
Starting from L-serine: $[\alpha]_D^{27}$ = -6.8, $[\alpha]_{578}^{27}$ = -7.4, $[\alpha]_{546}^{27}$ = -9.3, $[\alpha]_{436}^{27}$ = -32.0 (c = 1.0, $CHCl_3$).

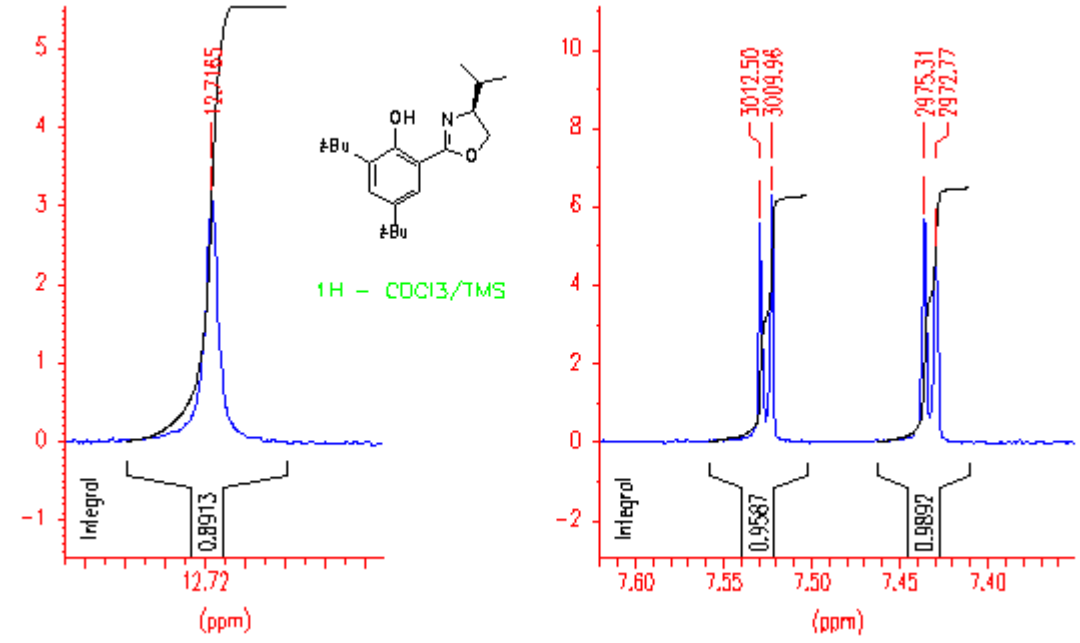
Anal. Calcd for $C_{23}H_{39}NO_3Si$: C, 68.10; H, 9.69; N, 3.45. Found: C, 68.16; H, 9.48; N, 3.56.

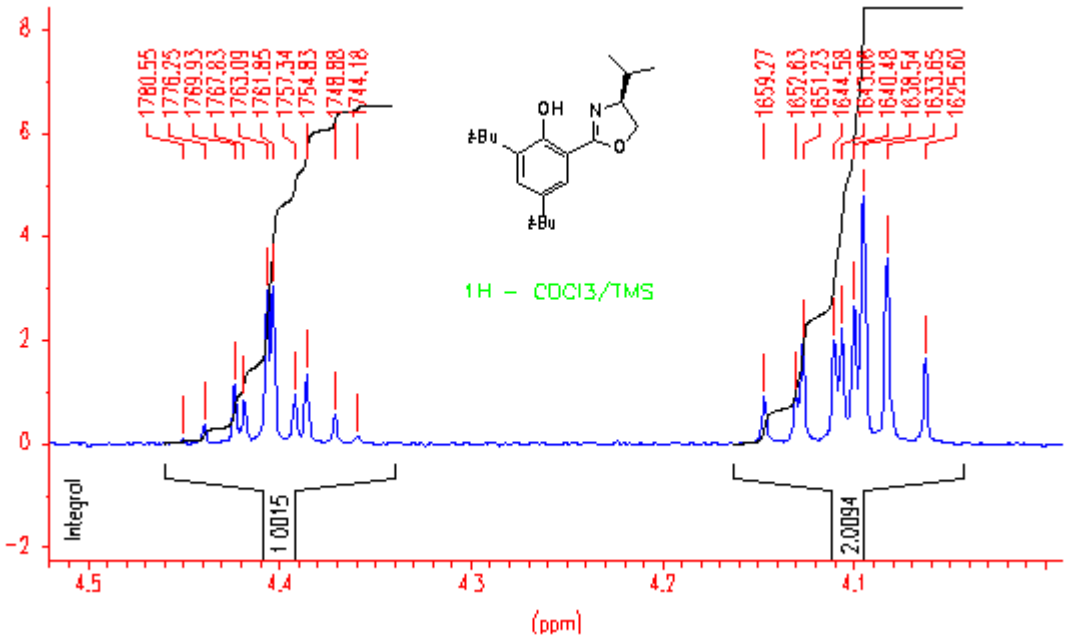
(*S*)-2,4-Di-*tert*-butyl-6-[4-*i*-propyl-4,5-dihydro-2-oxazolyl]-phenol (*S*)-14b

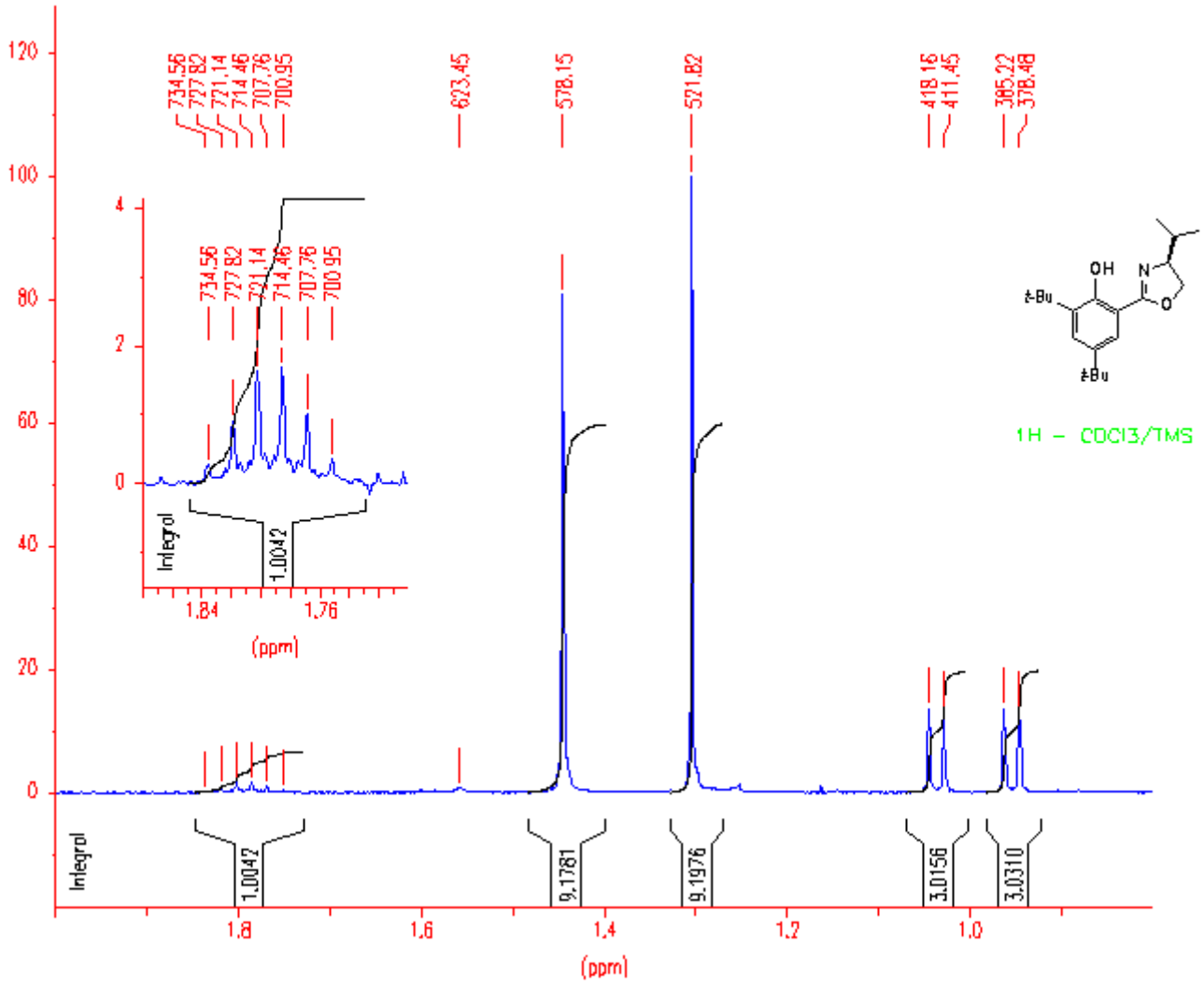
IR (neat, NaCl): $\tilde{n}$ 2960, 2909, 2873, 1795 (small, aromatic harmonic), 1637 (C=N), 1598 (C=C), 1469, 1440, 1392, 1255, 1219, 1103, 1047, 979, 890, 786 cm^{-1}.

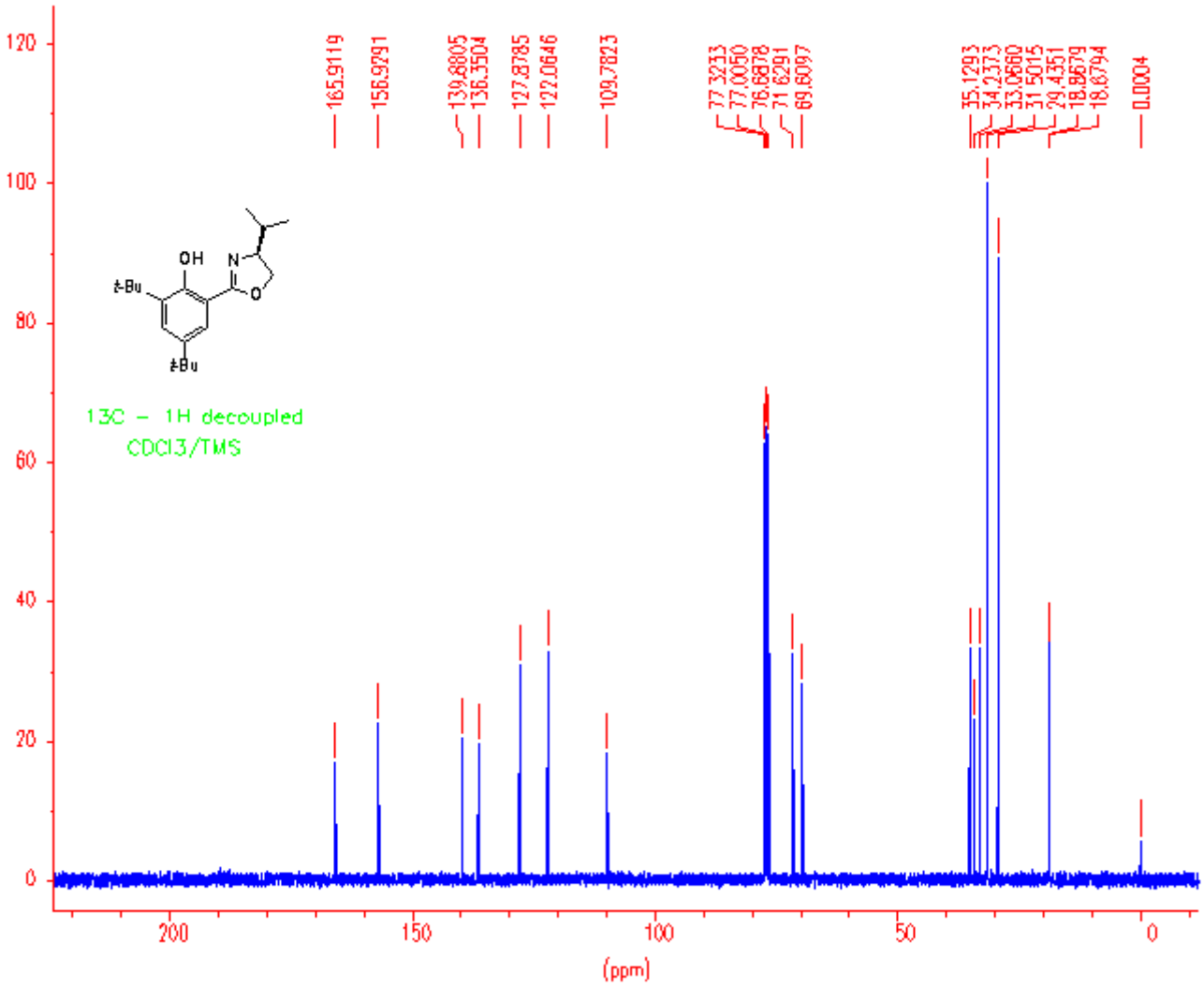


^{1}H NMR (400 MHz, $CDCl_3$): *d* 12.71 (broad s, 1H, O<u>H</u>), 7.53 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 7.44 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 4.44-4.34 (m, 1H, C<u>H</u>$_2$CH), 4.14-4.05 (m, 2H, C<u>H</u>$_2$CH and CH$_2$C<u>H</u>), 1.79 (dqq, 1H, *J* = 6.9, 6.7, 6.7 Hz, C<u>H</u>(CH$_3$)$_2$), 1.45 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.31 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.03 (d, 1H, *J* = 6.7 Hz, CH(C<u>H</u>$_3$)$_2$), 0.95 (d, 1H, *J* = 6.7 Hz, CH(C<u>H</u>$_3$)$_2$).

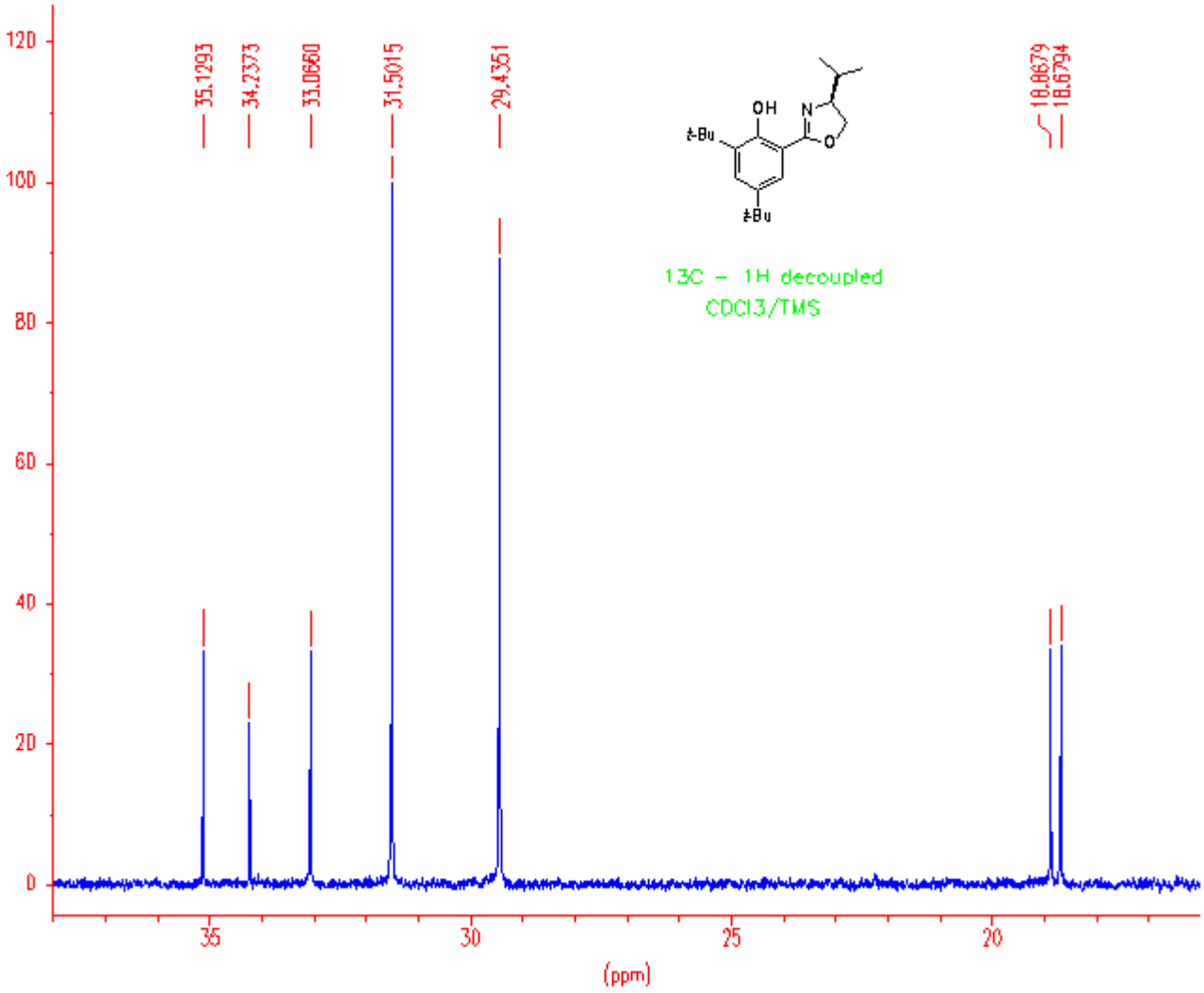

12.7165
OH
N
O
tBu
tBu
1H – CDCl3/TMS
Integral
0.8913
12.72
(ppm)
3012.50
3009.96
2975.31
2972.77
Integral
0.9587
0.9892
7.60
7.55
7.50
7.45
7.40
(ppm)

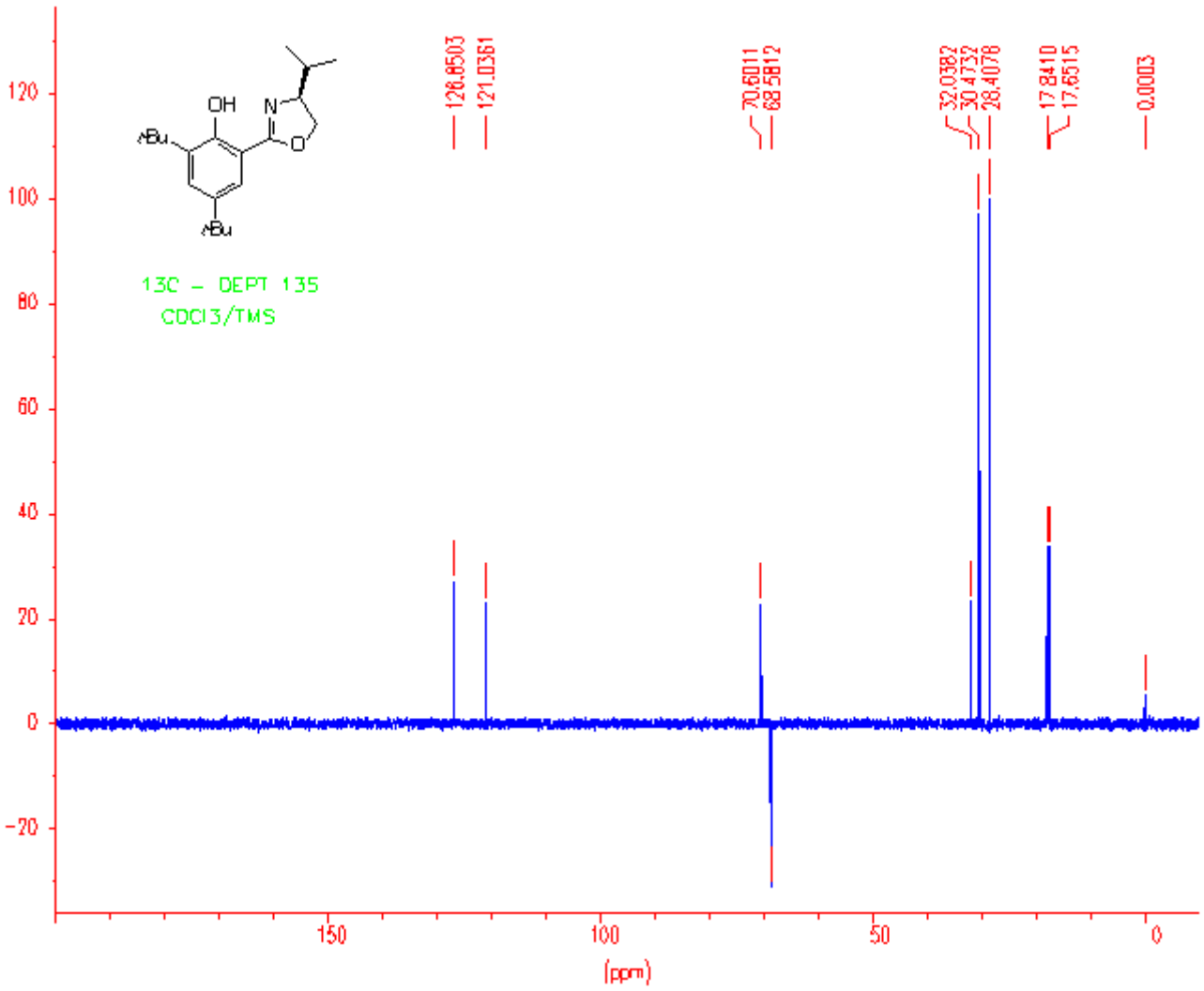

1780.55
1776.25
1769.93
1767.83
1763.09
1761.85
1757.34
1754.83
1748.88
1744.18
OH
N
O
tBu
tBu
1659.27
1652.63
1651.23
1644.58
1643.06
1640.48
1638.54
1633.65
1625.60
1H – CDCl3/TMS
Integral
1.0015
2.0094
4.5
4.4
4.3
4.2
4.1
(ppm)


734.56
727.82
721.14
714.46
707.76
700.95
623.45
578.15
521.82
418.16
411.45
385.22
378.48
Integral
1.0042
9.1781
9.1976
3.0156
3.0310
(ppm)
OH
N
O
t-Bu
t-Bu
1H – CDCl3/TMS



^{13}C NMR (100 MHz, $CDCl_3$): *d* 165.92 (1C, O-C=N), 156.95 (1C, C_{ipso} α to OH), 139.88 (1C, C_{ipso} α to $C(CH_3)_3$), 136.35 (1C, C_{ipso} α to $C(CH_3)_3$), 127.87 (1C, CH aromatic, correlates with proton at 7.44 ppm), 122.08 (1C, CH aromatic, correlates with proton at 7.53 ppm), 109.79 (1C, C_{ipso} α to oxazoline), 71.63 (1C, CH_2CH), 69.60 (1C, CH_2CH), 35.13 (1C, $C(CH_3)_3$), 34.23 (1C, $C(CH_3)_3$), 33.07 (1C, $CH(CH_3)_2$), 31.50 (3C, $C(CH_3)_3$, correlates with protons at 1.31 ppm), 29.45 (3C, $C(CH_3)_3$, correlates with protons at 1.45 ppm), 18.86 (1C, $CH(CH_3)_2$, correlates with protons at 1.03 ppm), 18.67 (1C, $CH(CH_3)_2$, correlates with protons at 0.95 ppm).


35.1293
34.2373
33.0660
31.5015
29.4351
18.8679
18.6794
OH
N
O
t-Bu
t-Bu
13C – 1H decoupled
CDCl3/TMS
120
100
80
60
40
20
0
35
30
25
20
(ppm)



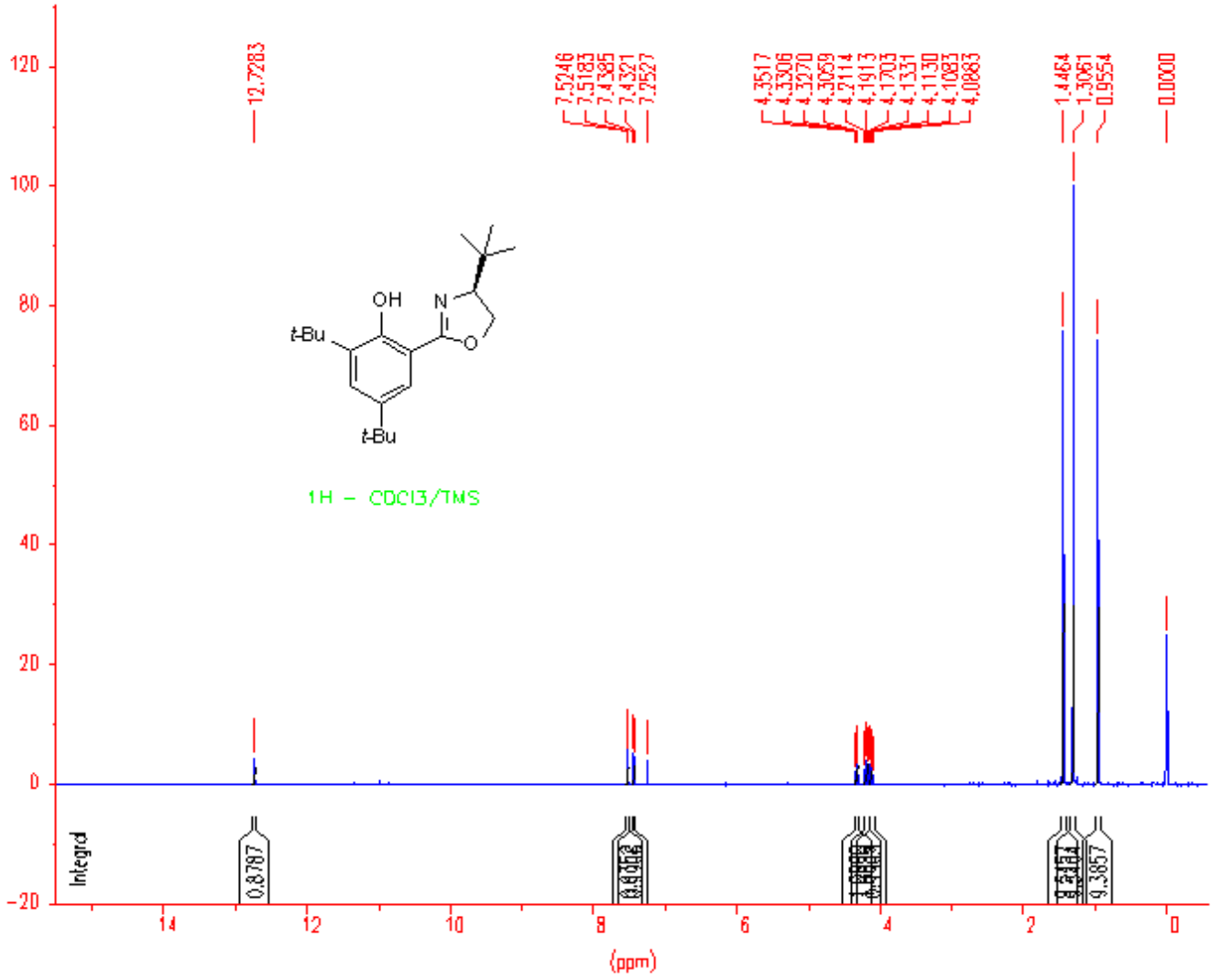
MS (EI, 70 eV) *m/z* (rel intens) 317 (41) $[M]^+$, 302 (72) $[M - CH_3]^+$, 274 (36) $[M - C_3H_7]^+$, 260 (14) $[M - C_4H_9]^+$, 216 (31), 57 (27) $[C_4H_9]^+$, 41 (24), 28 (100).

$[\alpha]_D^{24}$ = -24.9, $[\alpha]_{578}^{24}$ = -26.0, $[\alpha]_{546}^{24}$ = -29.5, $[\alpha]_{436}^{24}$ = -44.0 (c = 1.4, $CHCl_3$).

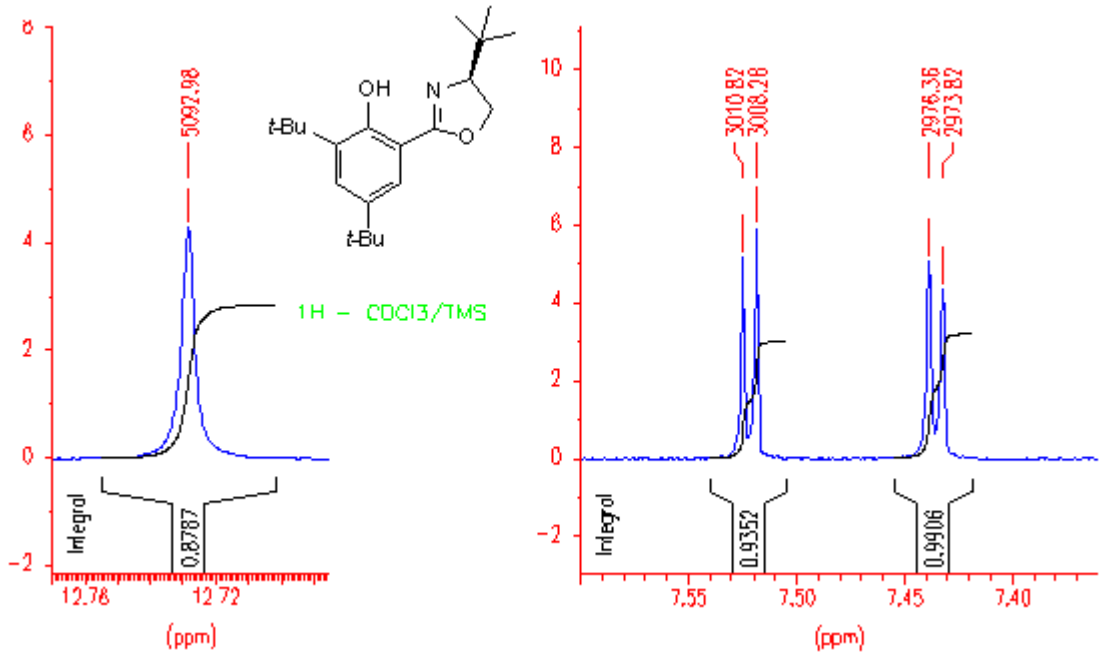
Anal. Calcd for$C_{20}H_{31}NO_2$: C, 75.67; H, 9.84; N, 4.41. Found: C, 75.79; H, 9.87; N, 4.45.

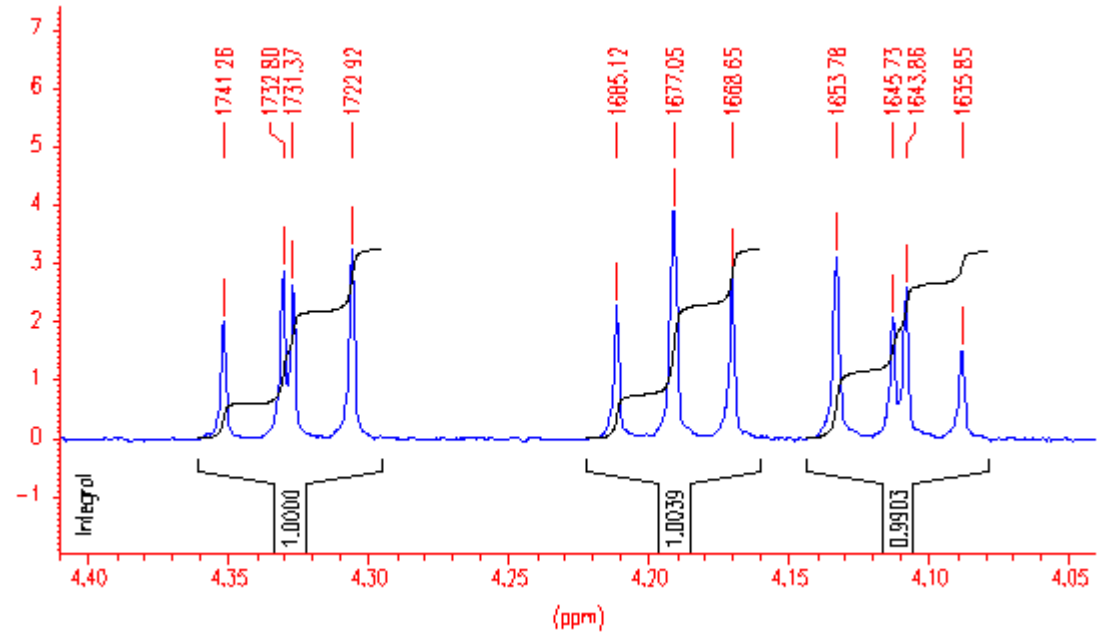
(*S*)-2,4-Di-*tert*-butyl-6-[4-*tert*-butyl-4,5-dihydro-2-oxazolyl]-phenol (*S*)-14c

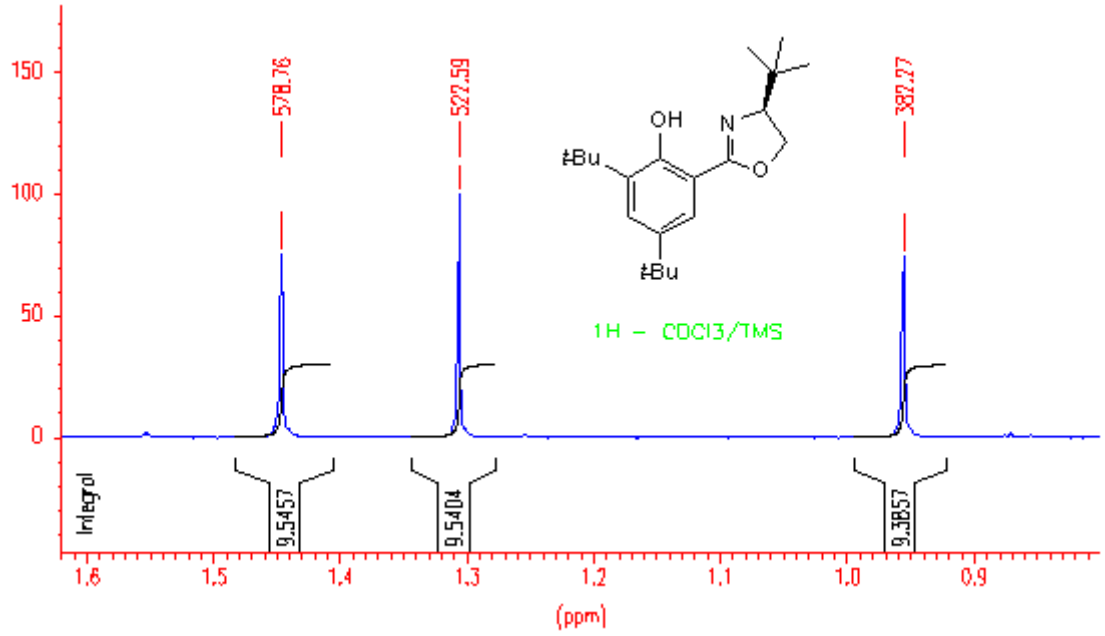
IR (Nujol, NaCl): $\tilde{n}$ 1797 (small, aromatic harmonic), 1635 (C=N), 1596 (C=C), 1440, 1366, 1289, 1255, 1106, 1028, 981, 786 cm^{-1}.

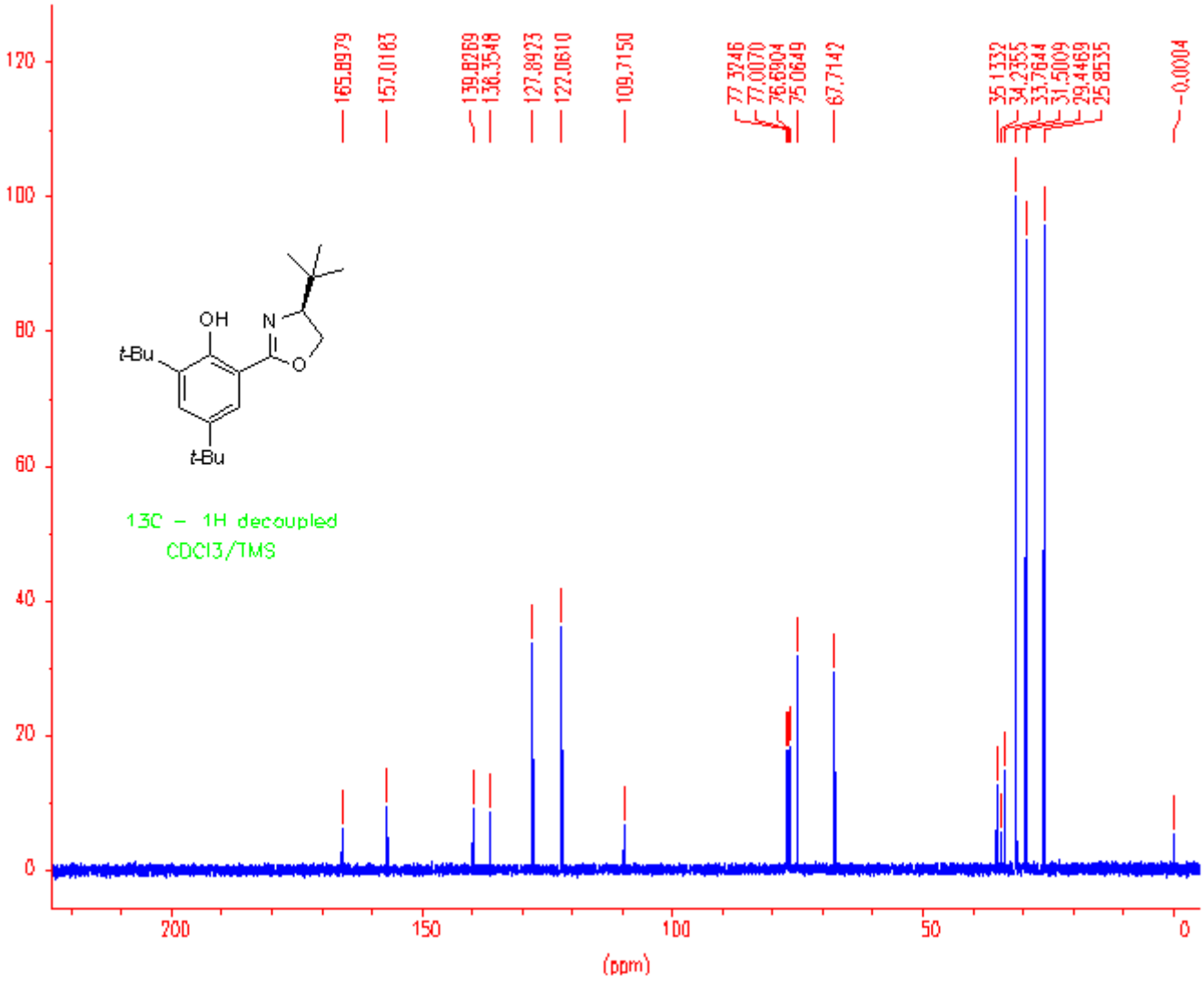


^{1}H NMR (400 MHz, $CDCl_3$): *d* 12.74 (broad s, 1H, O<u>H</u>), 7.52 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 7.44 (d, 1H, *J* = 2.5 Hz, C<u>H</u> aromatic), 4.33 (dd, 1H, *J* = 9.8, 8.5 Hz, C<u>H</u>$_2$CH), 4.19 (dd, 1H, *J* = 8.5, 8.1 Hz, C<u>H</u>$_2$CH), 4.11 (dd, 1H, *J* = 9.8, 8.1 Hz, CH$_2$C<u>H</u>), 1.45 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.31 (s, 9H, C(C<u>H</u>$_3$)$_3$), 0.95 (s, 9H, C(C<u>H</u>$_3$)$_3$).

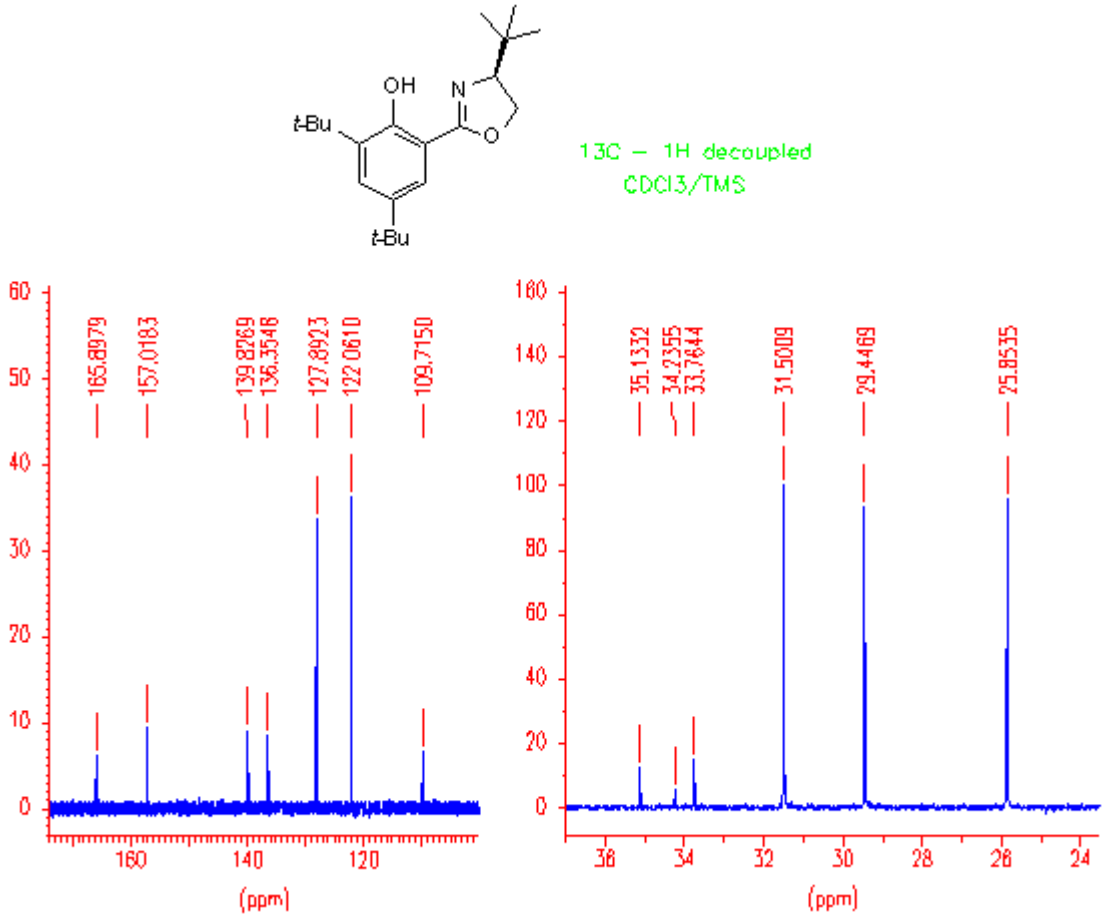

5092.98
OH
N
t-Bu
t-Bu
O
1H – CDCl3/TMS
Integral
0.8787
12.78
12.72
(ppm)
3010.82
3008.28
2976.36
2973.82
Integral
0.9352
0.9906
7.55
7.50
7.45
7.40
(ppm)


1741.26
1732.80
1731.37
1722.92
1685.12
1677.05
1668.65
1653.78
1645.73
1643.86
1635.85
Integral
1.0000
1.0039
0.9903
4.40
4.35
4.30
4.25
4.20
4.15
4.10
4.05
(ppm)


578.76
522.59
382.27
OH
N
O
tBu
tBu
1H – CDCl3/TMS
Integral
9.5457
9.5404
9.3857
(ppm)


165.8979
157.0183
139.8269
138.3548
127.8923
122.0610
109.7150
77.3246
77.0070
76.6904
75.0649
67.7142
35.1332
34.2355
33.7644
31.5009
29.4469
25.8535
-0.0004
OH
N
O
t-Bu
t-Bu
13C – 1H decoupled
CDCl3/TMS
(ppm)

^{13}C NMR (100 MHz, $CDCl_3$): *d* 165.90 (1C, O-C=N), 157.02 (1C, C_{ipso} α to OH), 139.83 (1C, C_{ipso} α to $C(CH_3)_3$), 136.36 (1C, C_{ipso} α to $C(CH_3)_3$), 127.89 (1C, CH aromatic, correlates with proton at 7.44 ppm), 122.07 (1C, CH aromatic, correlates with proton at 7.52 ppm), 109.72 (1C, C_{ipso} α to oxazoline), 75.07 (1C, CH_2CH), 67.72 (1C, CH_2CH), 35.14 (1C, $C(CH_3)_3$), 34.24 (1C, $C(CH_3)_3$), 33.77 (1C, $C(CH_3)_3$ of oxazoline), 31.50 (3C, $C(CH_3)_3$, correlates with protons at 1.31 ppm), 29.45 (3C, $C(CH_3)_3$, correlates with protons at 1.45 ppm), 25.86 (3C, $C(CH_3)_3$ of oxazoline).



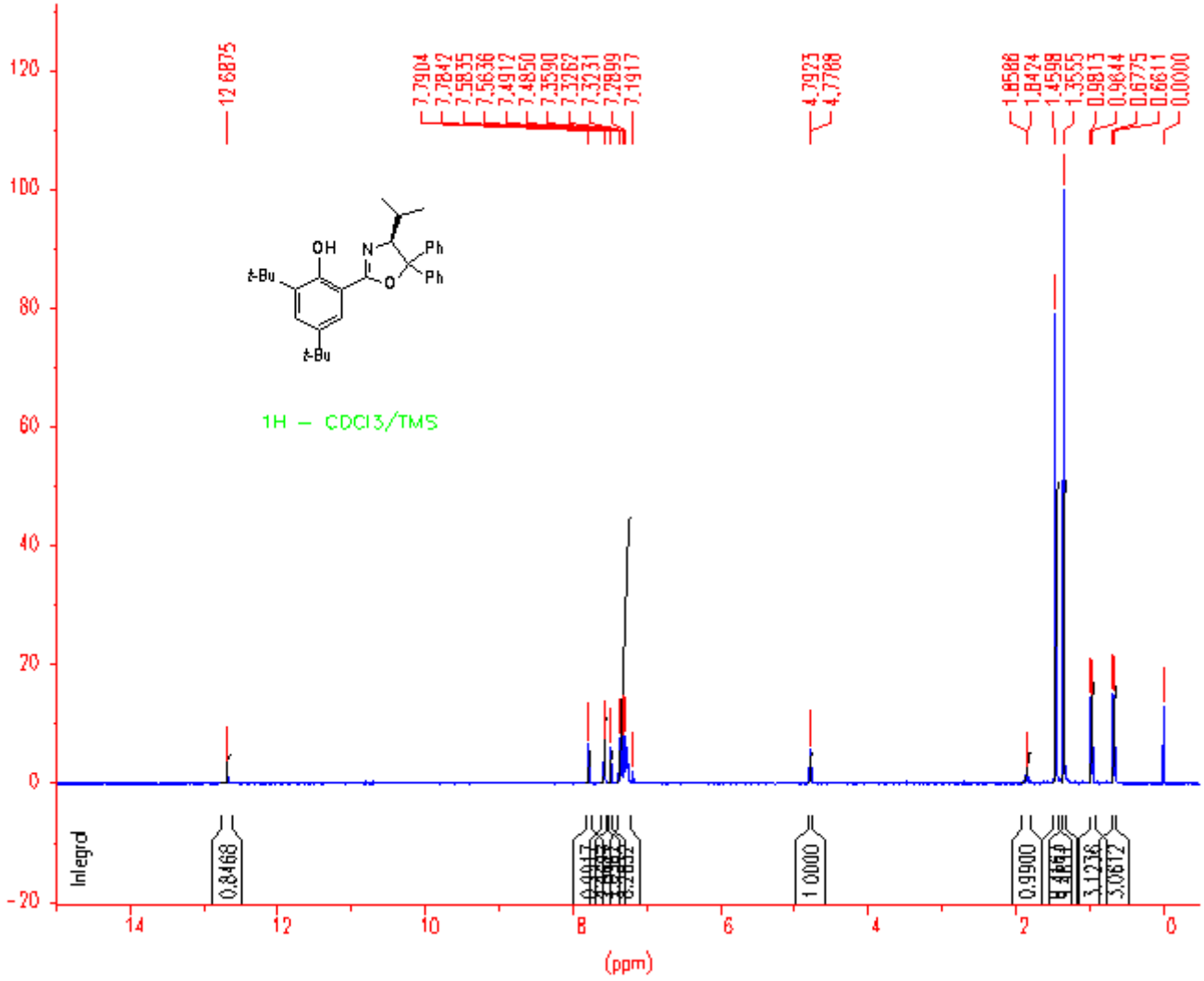
MS (EI, 70 eV) *m/z* (rel intens) 331 (43) $[M]^+$, 316 (59) $[M - CH_3]^+$, 288 (40) $[M - C_3H_7]^+$, 274 (32) $[M - C_4H_9]^+$, 216 (25), 57 (18) $[C_4H_9]^+$, 28 (100).

$[\alpha]_D^{24}$ = -13.7, $[\alpha]_{578}^{24}$ = -14.0, $[\alpha]_{546}^{24}$ = -15.5, $[\alpha]_{436}^{24}$ = -18.6 (c = 2.6, $CHCl_3$).

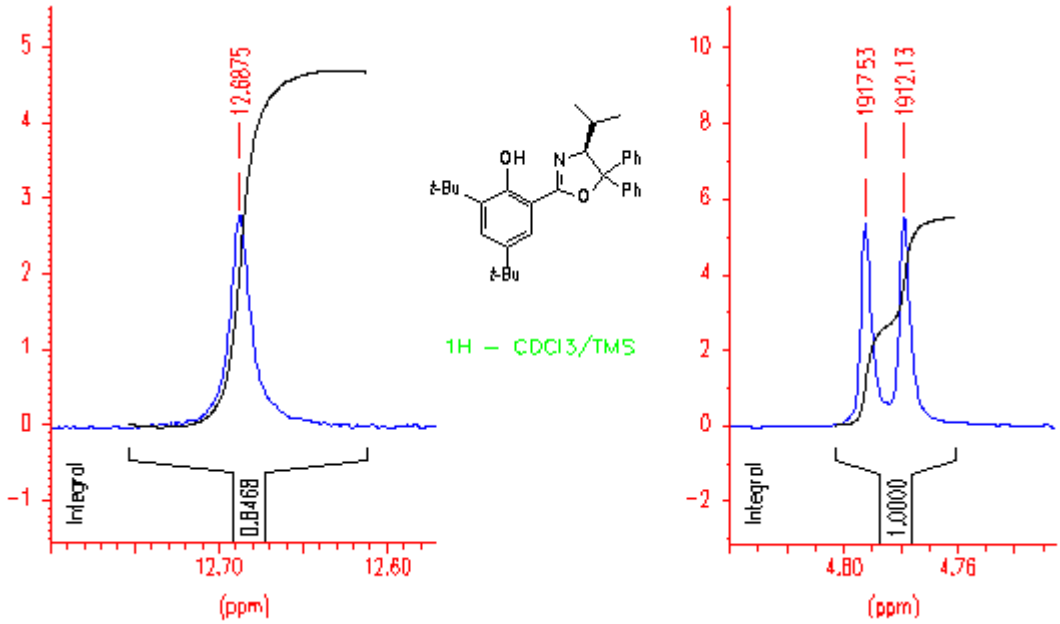
Anal. Calcd for $C_{21}H_{33}NO_2$: C, 76.09; H, 10.03; N, 4.23. Found: C, 76.01; H, 10.11; N, 4.14.

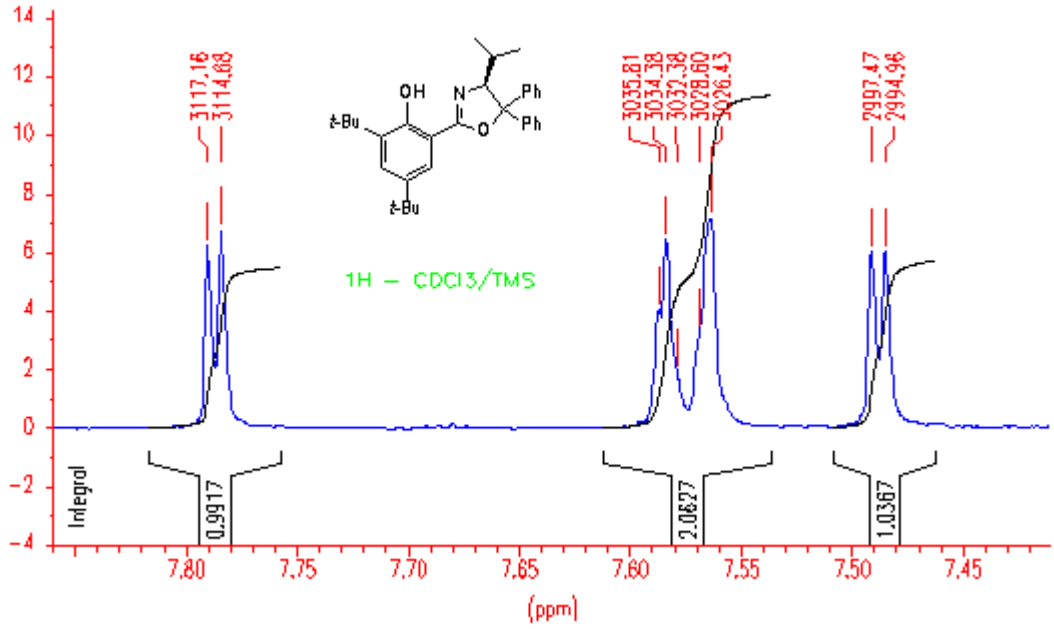
(*S*)-2,4-Di-*tert*-butyl-6-[5,5-diphenyl-4-*i*-propyl-4,5-dihydro-2-oxazolyl]-phenol (*S*)-14d

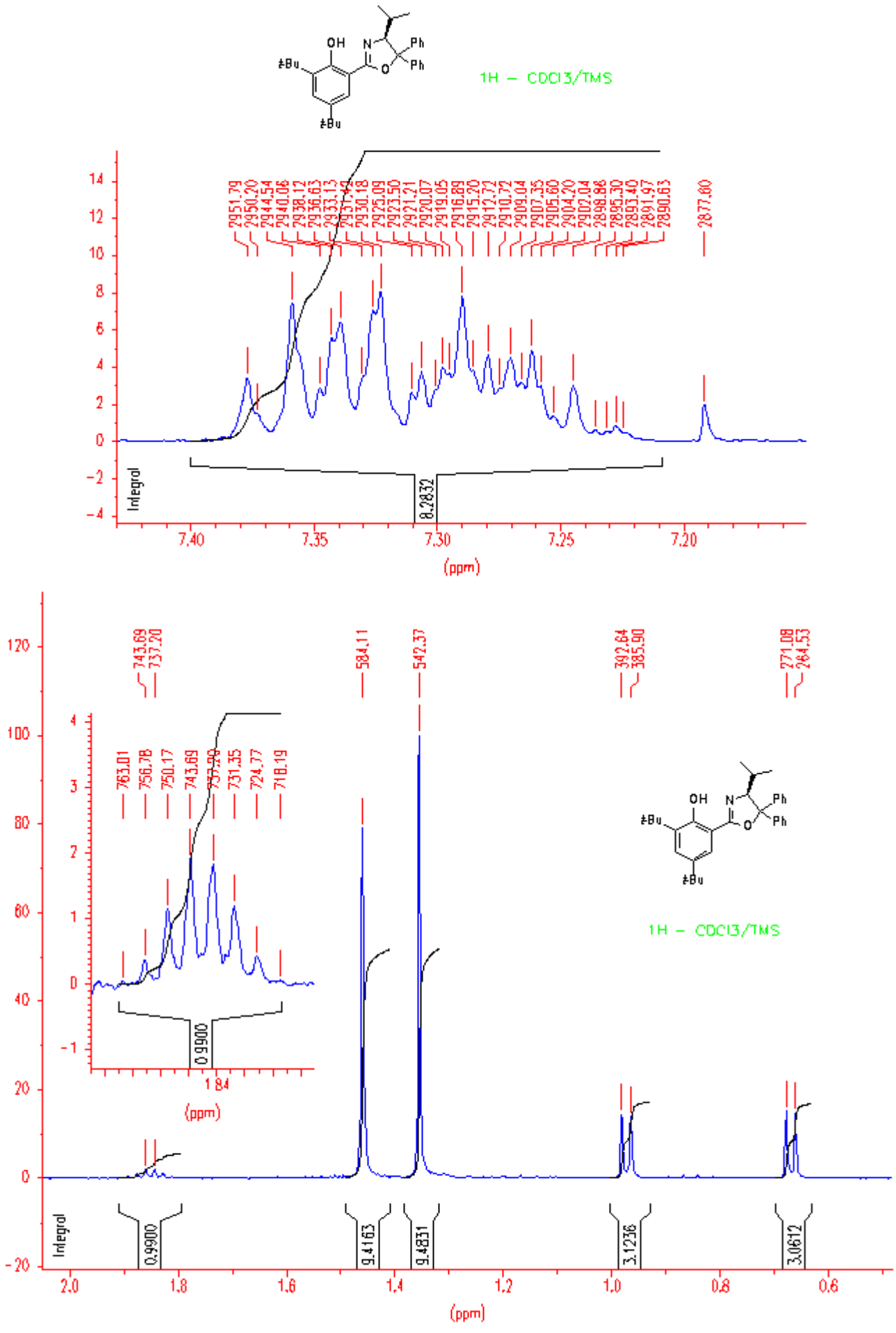
IR (neat, NaCl): $\tilde{n}$ 3089, 3062, 3029, 2959, 2929, 2872, 1644 (C=N), 1600, 1467, 1440, 1391, 1369, 1280, 1254, 1220, 1190, 1109, 977, 804, 700 cm^{-1}.

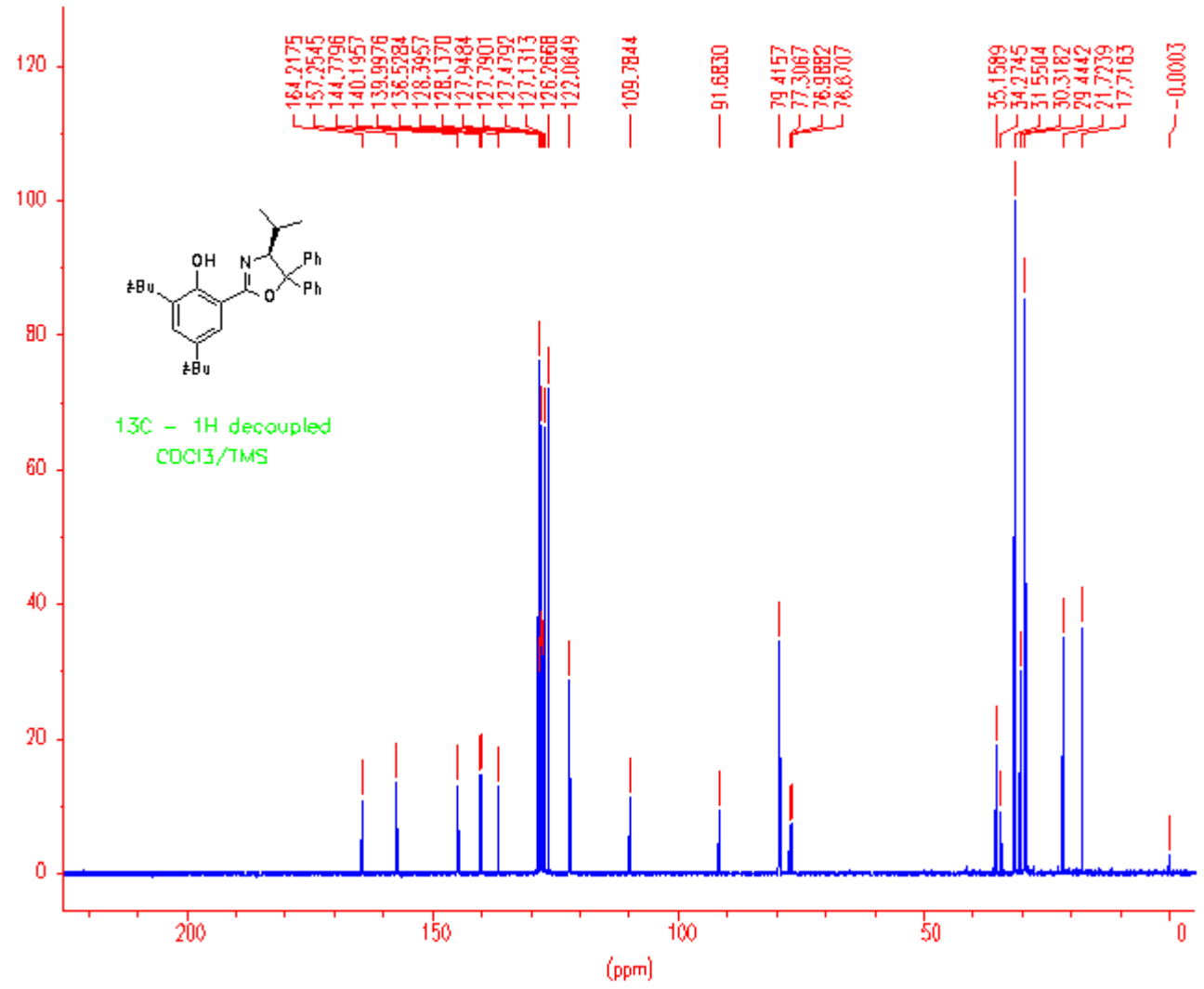


^{1}H NMR (400 MHz, $CDCl_3$): *d* 12.68 (s, 1H, O<u>H</u>), 7.78 (d, 1H, *J* = 2.5 Hz, C<u>H</u> of phenol), 7.60-7.55 (m, 2H, C<u>H</u> of CPh_2), 7.48 (d, 1H, *J* = 2.5 Hz, C<u>H</u> of phenol), 7.40-7.21 (m, 8H, C<u>H</u> of CPh_2), 4.78 (d, 1H, *J* = 5.4 Hz, CPh_2C<u>H</u>), 1.85 (qqd, 1H, *J* = 6.7, 6.5, 5.4 Hz, C<u>H</u>$(CH_3)_2$), 1.45 (s, 9H, $C(C$<u>H</u>$_3)_3$), 1.35 (s, 9H, $C(C$<u>H</u>$_3)_3$), 0.97 (d, 3H, *J* = 6.7 Hz, $CH(C$<u>H</u>$_3)_2$), 0.67 (d, 3H, *J* = 6.5 Hz, $CH(C$<u>H</u>$_3)_2$).

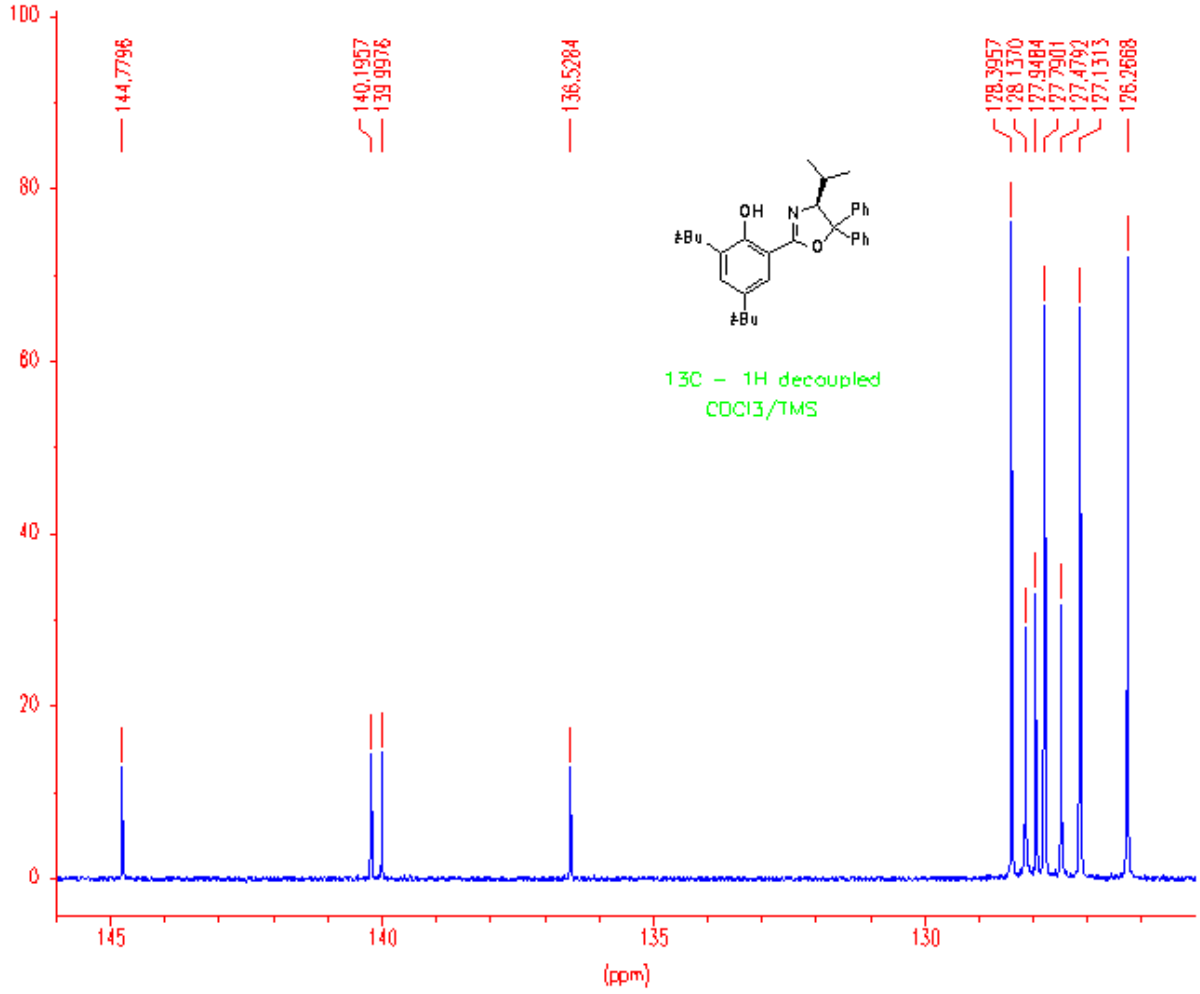

12.6875
OH
N
Ph
Ph
t-Bu
t-Bu
1H – CDCl3/TMS
1917.53
1912.13
Integral
0.8468
1.0000
12.70
12.60
4.80
4.76
(ppm)

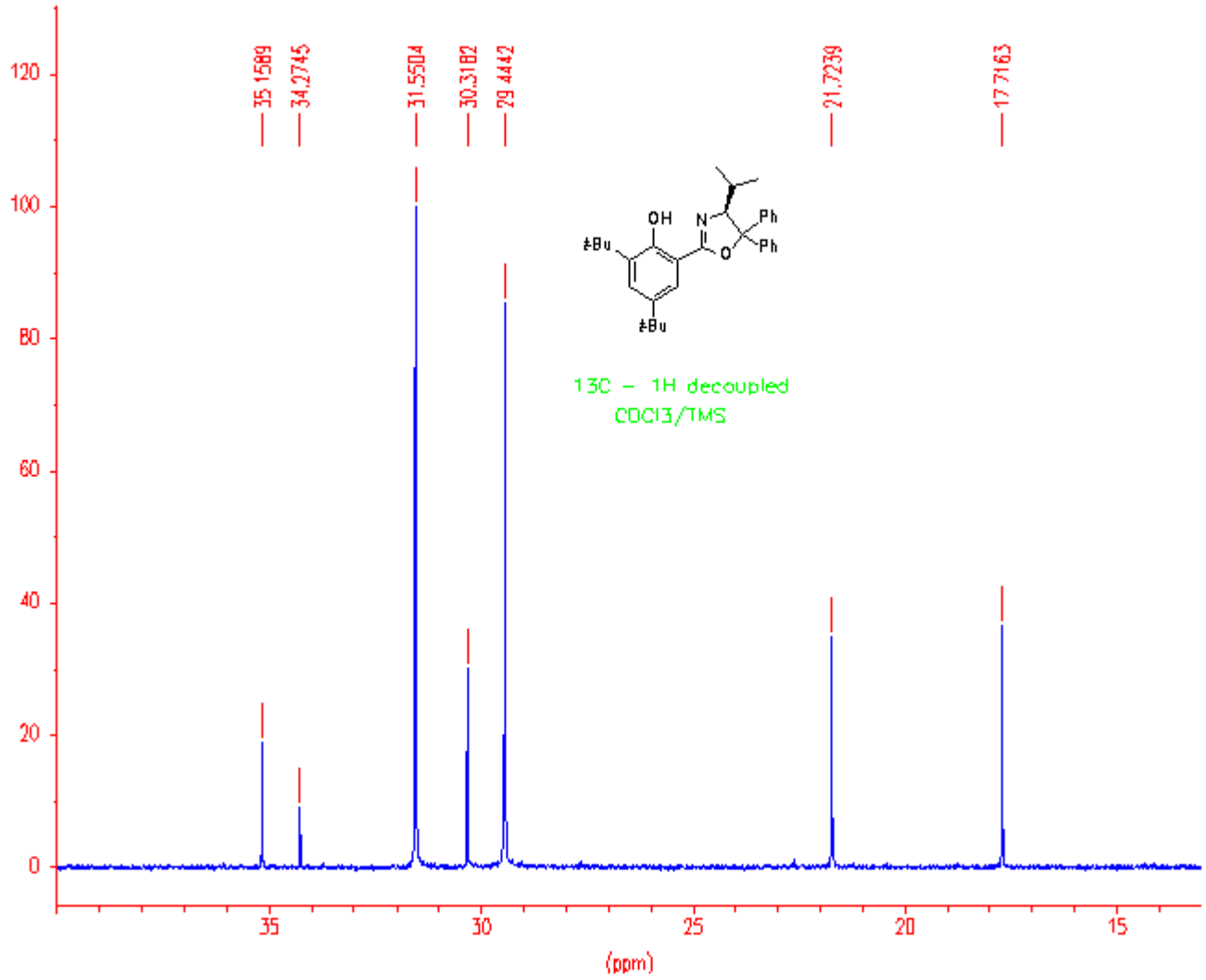

3117.16
3114.68
OH
N
Ph
Ph
t-Bu
t-Bu
1H – CDCl3/TMS
3035.81
3034.38
3032.38
3028.60
3026.43
2997.47
2994.96
Integral
0.9917
2.0627
1.0367
7.80
7.75
7.70
7.65
7.60
7.55
7.50
7.45
(ppm)

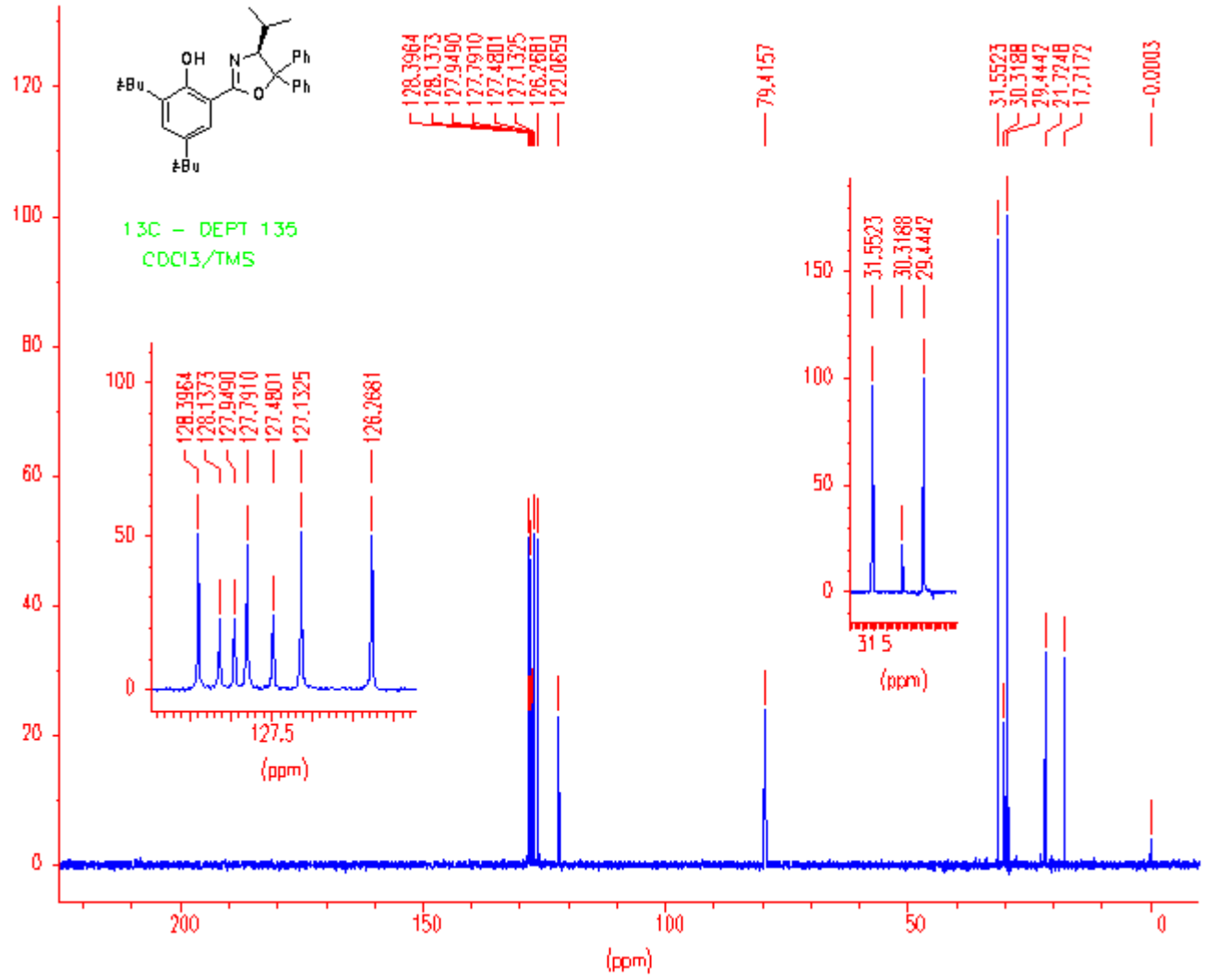

1H – CDCl3/TMS
2951.79
2950.20
2944.54
2940.06
2938.12
2936.63
2933.13
2930.18
2925.09
2923.50
2921.21
2920.07
2919.05
2916.89
2915.20
2912.72
2910.72
2909.04
2907.35
2905.60
2904.20
2902.04
2898.88
2895.30
2893.40
2891.97
2890.63
2877.60
Integral
8.2832
7.40
7.35
7.30
7.25
7.20
(ppm)
743.69
737.20
584.11
542.37
392.64
385.90
271.08
264.53
763.01
756.78
750.17
743.69
737.20
731.35
724.77
718.19
0.9900
1.84
(ppm)
1H – CDCl3/TMS
Integral
0.9900
9.4163
9.4831
3.1236
3.0612
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
(ppm)



^{13}C NMR (100 MHz, $CDCl_3$): *d* 164.21 (1C, O-C=N), 157.23 (1C, C_{ipso} α to OH), 144.79 (1C, C_{ipso} of phenyl), 140.20 and 140.00 (2C, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} of phenyl), 136.52 (1C, C_{ipso} α to $C(CH_3)_3$), 128.40 (2C, CH_{meta} of phenyl), 128.15 (1C, CH_{para} of phenyl), 127.96 (1C, CH_{para} of phenyl), 127.80 (2C, CH_{meta} of phenyl), 127.49 (1C, CH of phenol), 127.14 (2C, CH_{ortho} of phenyl), 126.28 (2C, CH_{ortho} of phenyl), 122.07 (1C, CH of phenol), 109.78 (1C, C_{ipso} α to oxazoline), 91.68 (1C, $C(Ph)_2CH$), 79.42 (1C, $C(Ph)_2CH$), 35.16 (1C, $C(CH_3)_3$), 34.29 (1C, $C(CH_3)_3$), 31.55 (3C, $C(CH_3)_3$), 30.32 (1C, $CH(CH_3)_2$), 29.43 (3C, $C(CH_3)_3$), 21.73 (1C, $CH(CH_3)_2$), 17.72 (1C, $CH(CH_3)_2$).


144.7796
140.1957
139.9976
136.5264
128.3957
128.1370
127.9484
127.7901
127.4792
127.1313
126.2668
tBu
OH
N
O
Ph
Ph
tBu
13C – 1H decoupled
CDCl3/TMS
100
80
60
40
20
0
145
140
135
130
(ppm)


35.1589
34.2745
31.5504
30.3182
29.4442
21.7239
17.7163
OH
N
O
Ph
Ph
tBu
tBu
13C – 1H decoupled
CDCl3/TMS
120
100
80
60
40
20
0
35
30
25
20
15
(ppm)



HRMS (EI, 70 eV) *m/z* (%): calcd for $C_{32}H_{39}NO_2$ 469.2981 $[M]^+$, found 469.2982 (15), 302 (11) [M - $Ph_2CH]^+$, 237 (100) $[C_{17}H_{19}N]^+$.

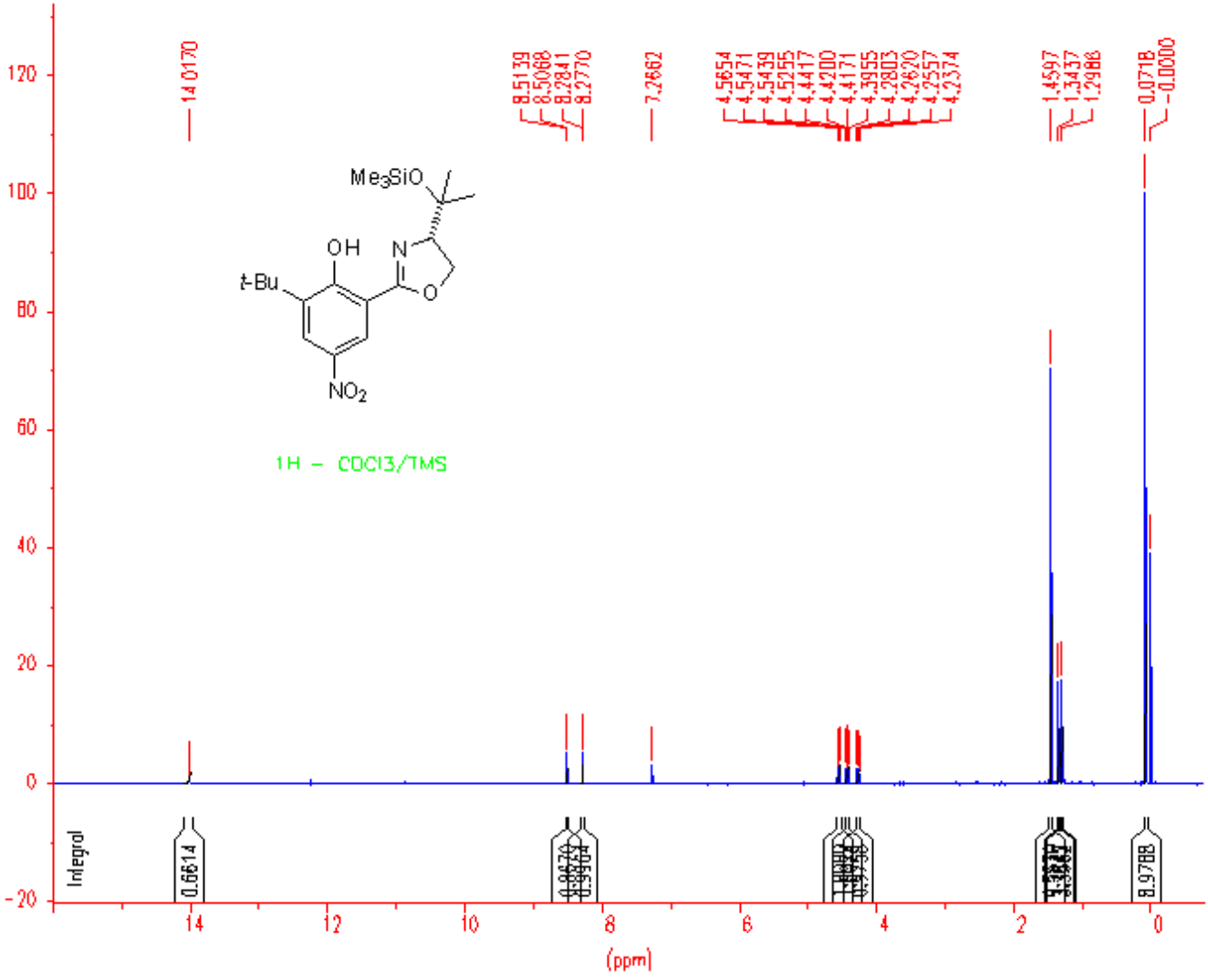
MS (FAB, *m*-nitrobenzylic alcohol matrix) *m/z* (rel intens): Calcd for $C_{32}H_{39}NO_2$ 469.3 $[M]^+$, found 469 (81) $[M]^+$, 302 (17), 260 (7), 237 (100).

$[\alpha]_D^{28}$ = -206.6, $[\alpha]_{578}^{28}$ = -216.4, $[\alpha]_{546}^{28}$ = -249.5, $[\alpha]_{436}^{28}$ = -460.0, $[\alpha]_{365}^{28}$ = -809.4 (c = 1.0, $CHCl_3$).

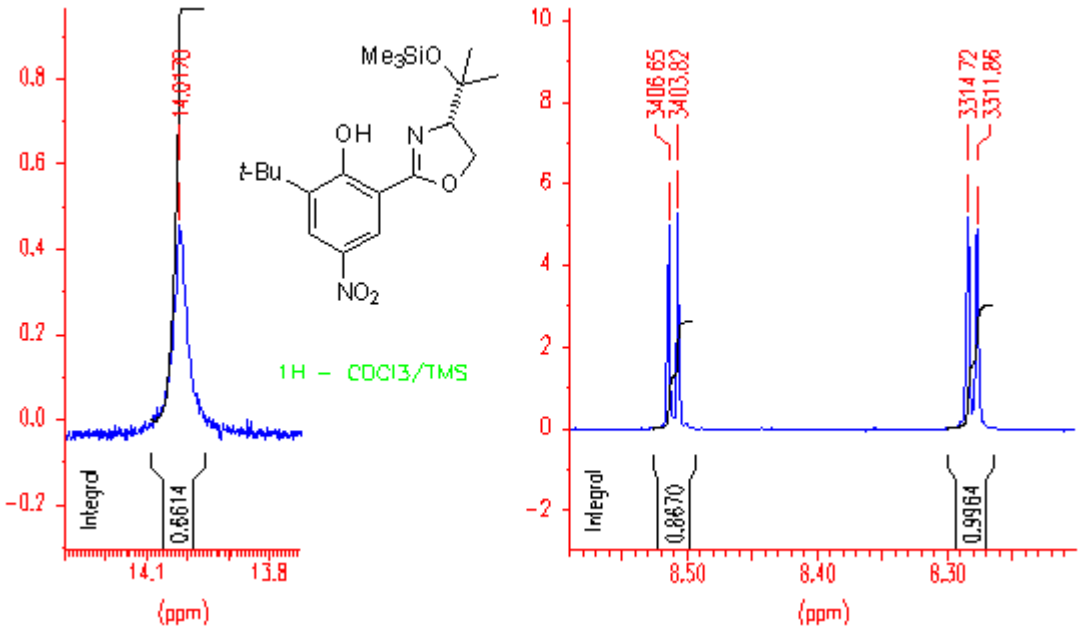
Anal. Calcd for $C_{32}H_{39}NO_2$: C, 81.83; H, 8.37; N, 2.98. Found: C, 81.75; H, 8.17; N, 2.91.

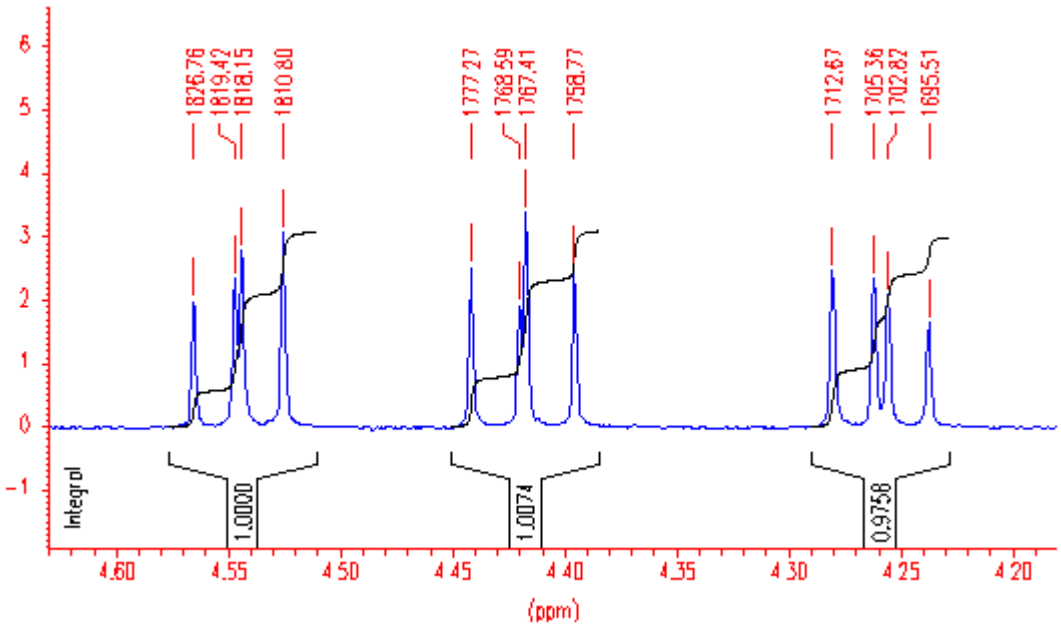
(*R*)-2-*tert*-Butyl-6-[4-(1-methyl-1-trimethylsilyloxyethyl)-4,5-dihydro-2-oxazolyl]-4-nitrophenol (*R*)-15a

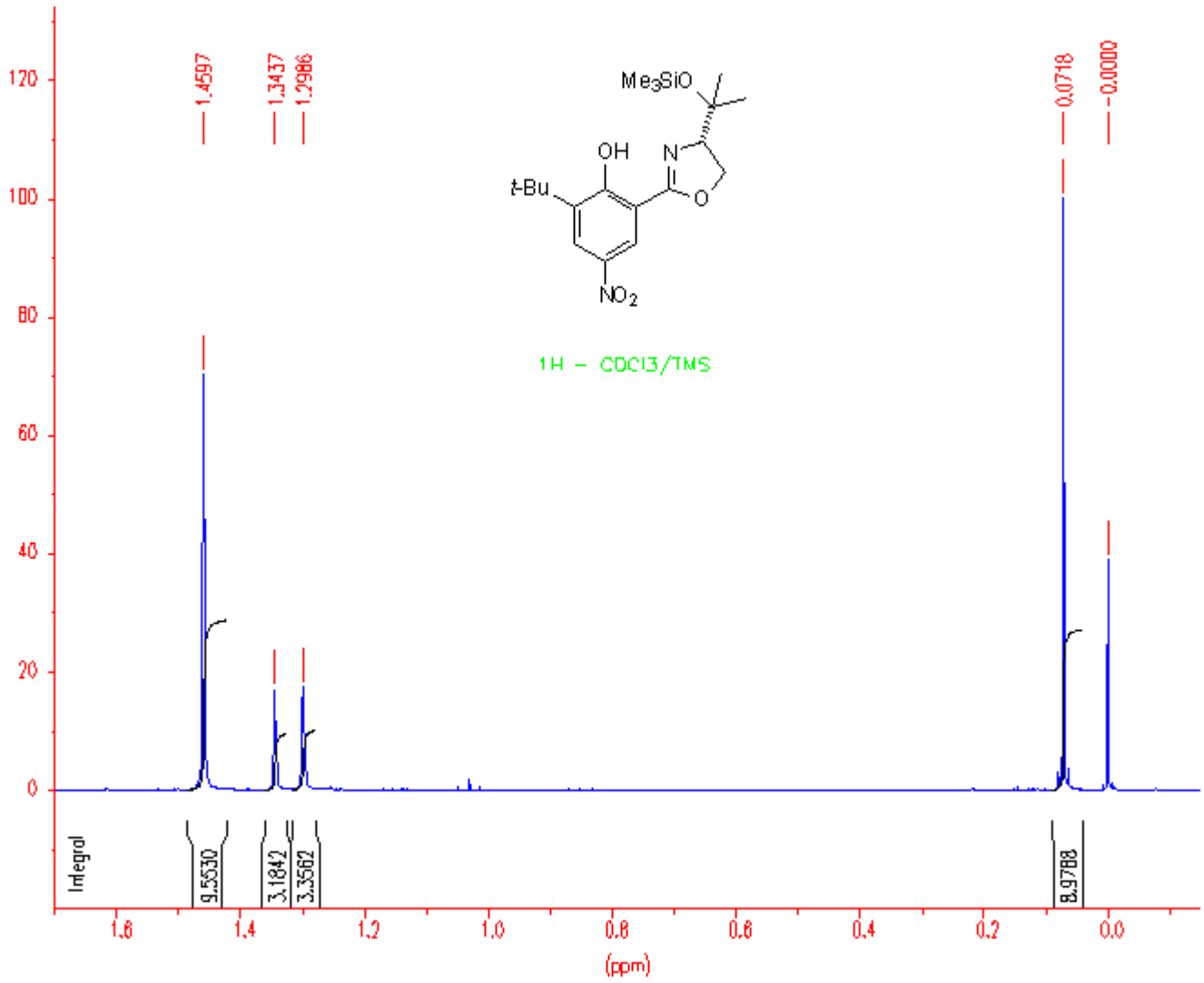
IR (neat, NaCl): $\tilde{n}$ 3107, 2964, 2919, 2876, 1819 (small, aromatic harmonic), 1642 (C=N), 1530, 1481, 1471, 1435, 1367, 1337, 1246, 1171, 1140, 1094, 1056, 974, 908, 842, 750, 708 cm^{-1}.

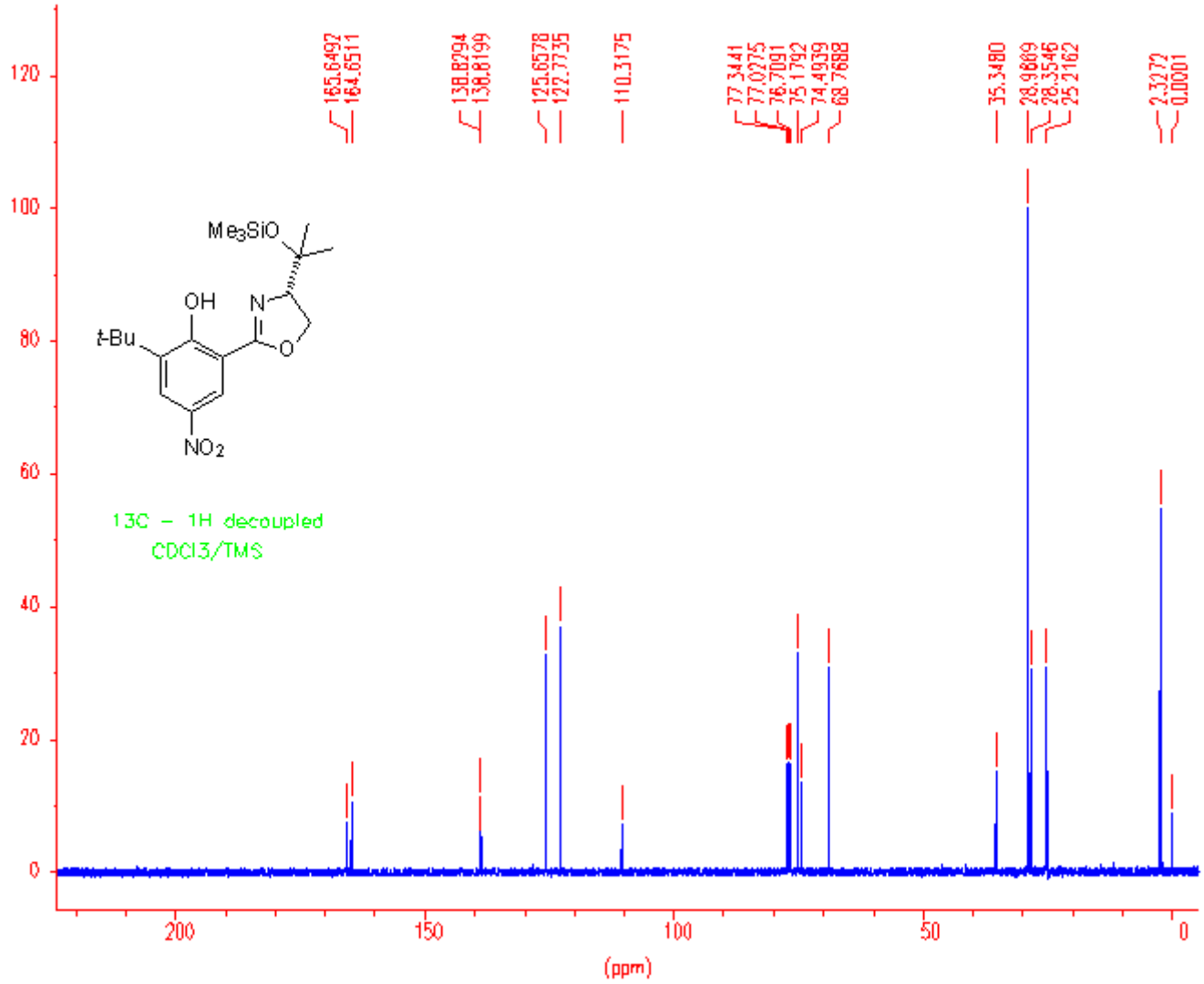


^{1}H NMR (400 MHz, $CDCl_3$): *d* 14.02 (broad s, 1H, O<u>H</u>), 8.51 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 8.28 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 4.55 (dd, 1H, *J* = 8.6, 7.3 Hz, C<u>H</u>$_2$CH), 4.42 (dd, 1H, *J* = 9.9, 8.6 Hz, C<u>H</u>$_2$CH), 4.26 (dd, 1H, *J* = 9.9, 7.3 Hz, CH$_2$C<u>H</u>), 1.46 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.34 (s, 3H, C(C<u>H</u>$_3$)$_2$O), 1.30 (s, 3H, C(C<u>H</u>$_3$)$_2$O), 0.07 (s, 9H, OSi(C<u>H</u>$_3$)$_3$).

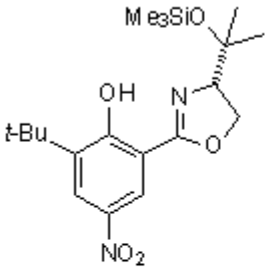

Me3SiO
OH
N
t-Bu
O
NO2
1H – CDCl3/TMS
14.0170
Integral
0.6614
14.1
13.8
(ppm)
3406.65
3403.82
3314.72
3311.86
Integral
0.8670
0.9964
8.50
8.40
8.30
(ppm)


1826.76
1819.42
1818.15
1810.80
1777.27
1768.59
1767.41
1758.77
1712.67
1705.36
1702.82
1695.51
Integral
1.0000
1.0074
0.9758
4.60
4.55
4.50
4.45
4.40
4.35
4.30
4.25
4.20
(ppm)

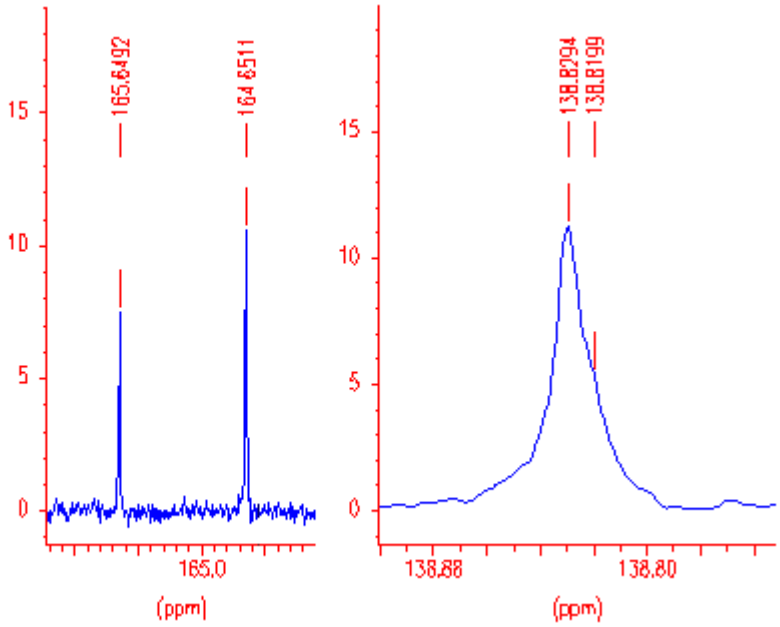

1.4597
1.3437
1.2986
0.0718
-0.0000
Me3SiO
OH
N
t-Bu
O
NO2
1H – CDCl3/TMS
Integral
9.5530
3.1842
3.3562
8.9788
120
100
80
60
40
20
0
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
(ppm)

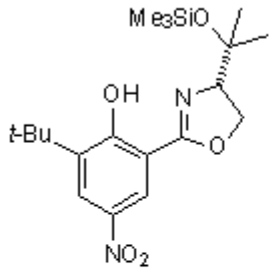


^{13}C NMR (100 MHz, $CDCl_3$): *d* 165.65 (1C, O-C=N), 164.65 (1C, C_{ipso} α to OH), 138.83 and 138.82 (2C, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} α to NO_2), 125.66 (1C, CH aromatic, correlates with proton at 8.28 ppm), 122.77 (1C, CH aromatic, correlates with proton at 8.51 ppm), 110.32 (1C, C_{ipso} α to oxazoline), 75.18 (1C, CH_2CH), 74.50 (1C, $C(CH_3)_2O$), 68.77 (1C, CH_2CH), 35.35 (1C, $C(CH_3)_3$), 28.97 (3C, $C(CH_3)_3$), 28.36 (1C, $C(CH_3)_2O$, correlates with protons at 1.34 ppm), 25.22 (1C, $C(CH_3)_2O$, correlates with protons at 1.30 ppm), 2.33 (3C, $OSi(CH_3)_3$).

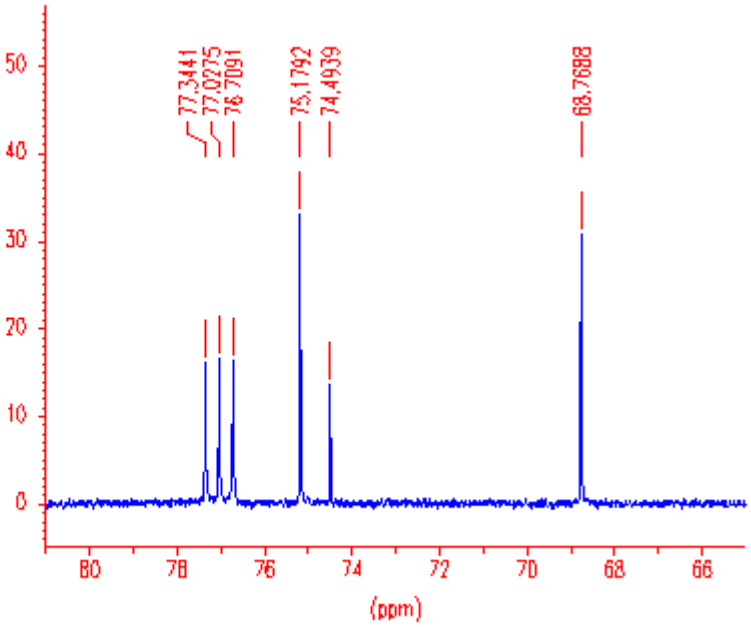


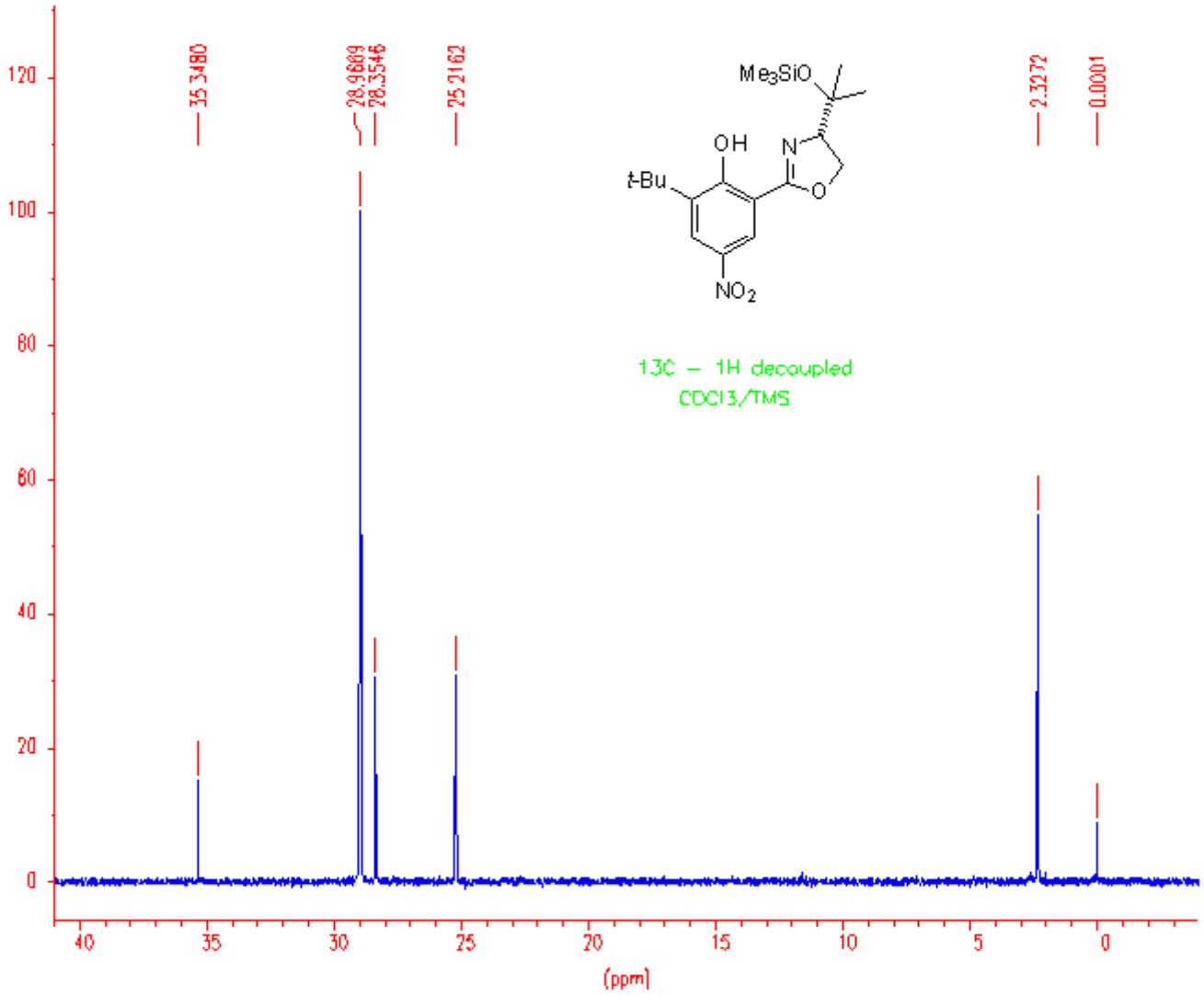
13C – 1H decoupled
CDCl3/TMS

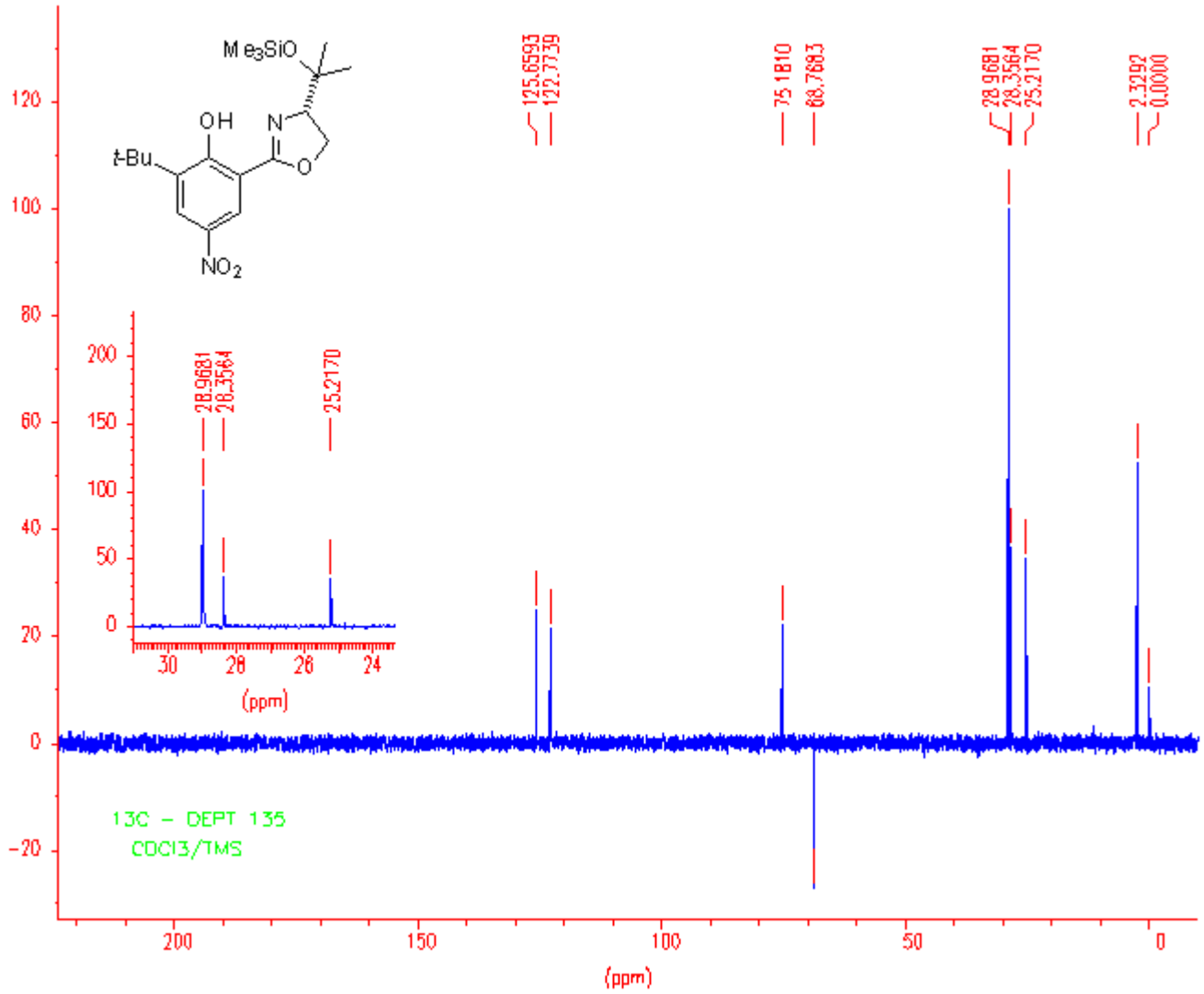




13C – 1H decoupled
CDCl3/TMS




35.3480
28.9689
28.3546
25.2162
2.3272
0.0001
Me3SiO
OH
N
t-Bu
O
NO2
13C – 1H decoupled
CDCl3/TMS
120
100
80
60
40
20
0
40
35
30
25
20
15
10
5
0
(ppm)



HRMS (EI, 70 eV) *m/z* (%): calcd for $C_{19}H_{30}N_2O_5Si$ 394.1924 $[M]^+$, found 394.1929 (5), 379 (7) [M - Me]$^+$, 336 (13) [M - $HCMe_3$]$^+$, 131 (100) $[CMe_2OSiMe_3]^+$, 75 (6) $[Me_2Si{=}OH]^+$, 73 (49) $[Me_3Si]^+$.

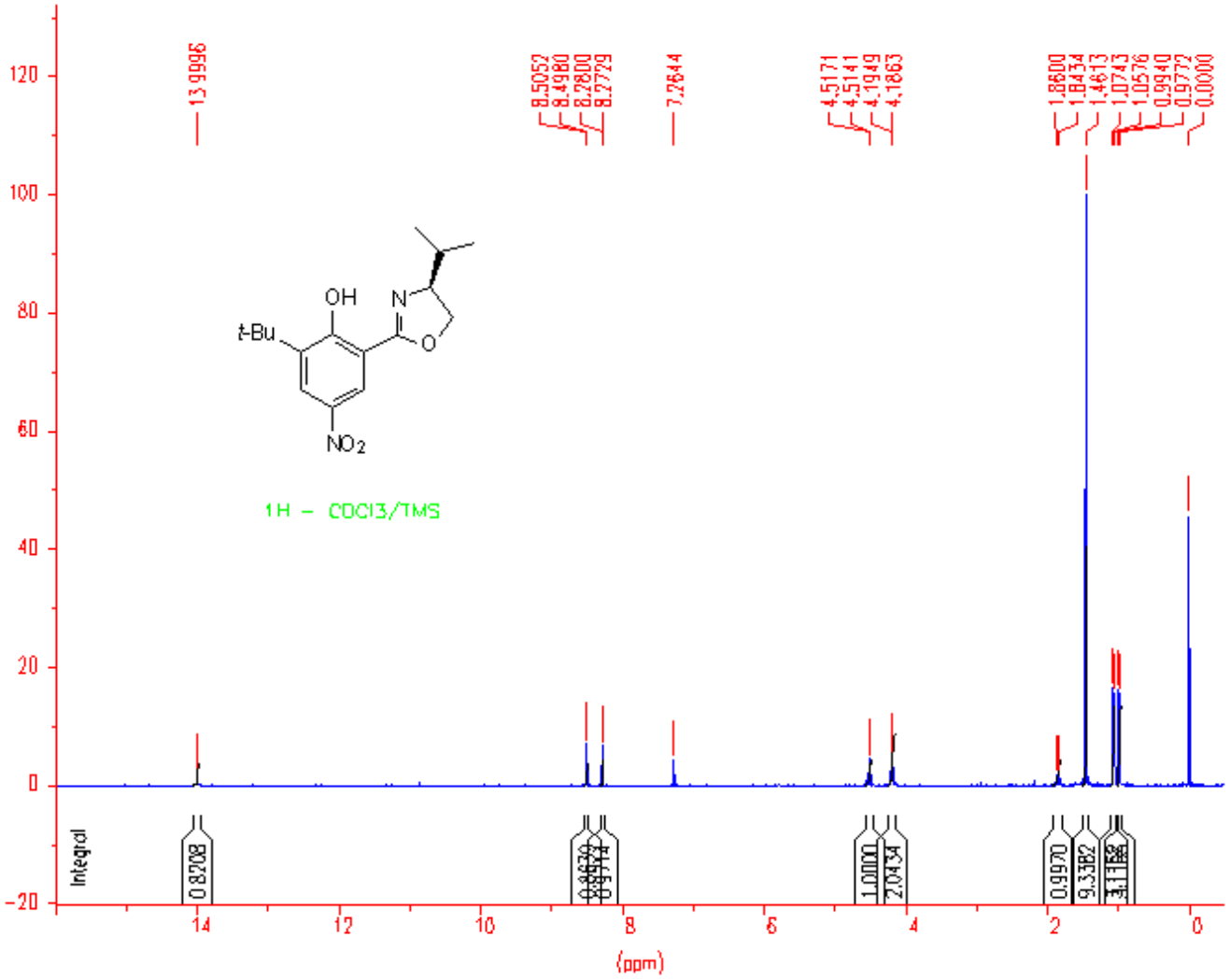
MS (FAB, *m*-nitrobenzylic alcohol matrix) *m/z* (rel intens): Calcd for $C_{19}H_{30}N_2O_5Si$ 394.2 $[M]^+$, found 467 (12) [M + $Si(CH_3)_3]^+$, 395 (100) [M + H]$^+$, 389 (27) [M - $CH_3]^+$, 336 (10), 305 (5) [M - $OSi(CH_3)_3]^+$.

Starting from D-serine: $[\alpha]_D^{24}$ = -12.2, $[\alpha]_{578}^{24}$ = -12.9, $[\alpha]_{546}^{24}$ = -14.6 (c = 3.8, $CHCl_3$), starting from L-serine: $[\alpha]_D^{27}$ = +12.6, $[\alpha]_{578}^{27}$ = +13.2, $[\alpha]_{546}^{27}$ = +15.1 (c = 3.6, $CHCl_3$).

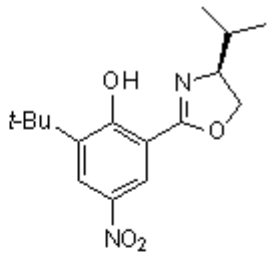
Anal. Calcd for $C_{19}H_{30}N_2O_5Si$: C, 57.84; H, 7.66; N, 7.10. Found: C, 57.93; H, 7.78; N, 7.17.

(*S*)-2-*tert*-Butyl-6-[4-*i*-propyl-4,5-dihydro-2-oxazolyl]-4-nitrophenol (*S*)-15b

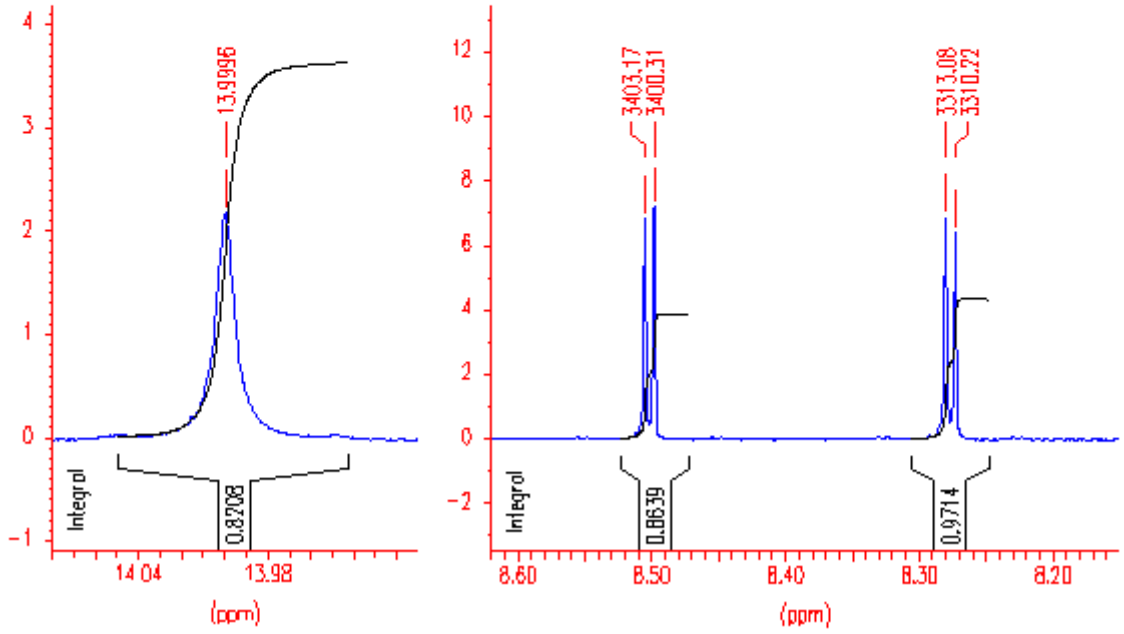
IR (Nujol, NaCl): $\tilde{n}$ 3104, 1816 (small, aromatic harmonic), 1640 (C=N), 1580, 1530, 1487, 1435, 1335, 1244, 1132, 1090, 1047, 969, 939, 867, 748, 705 cm^{-1}.

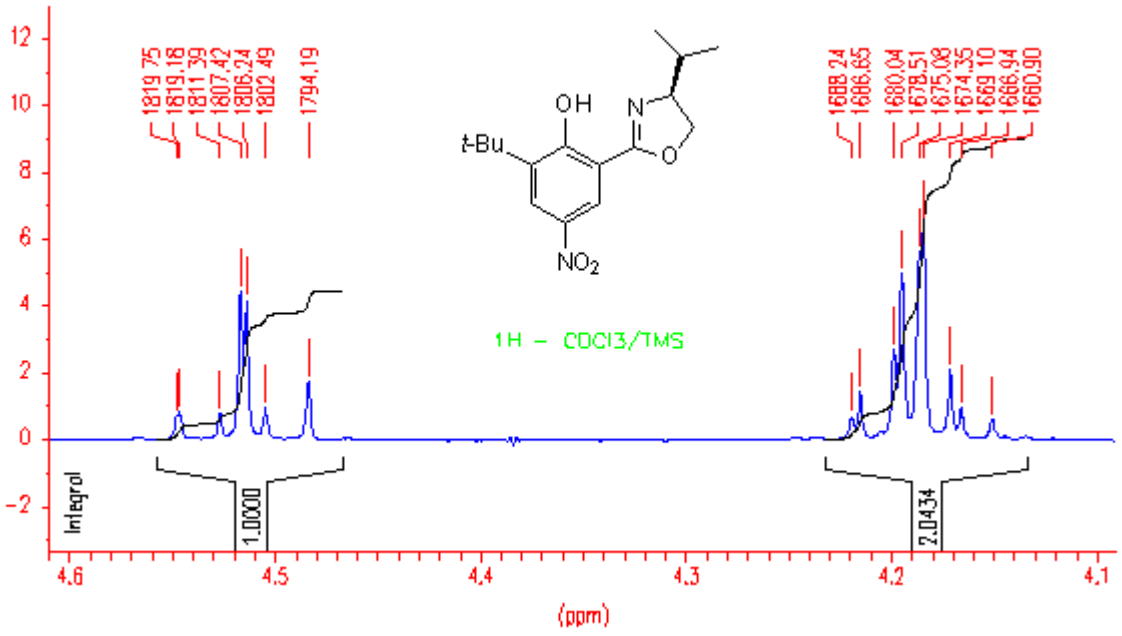


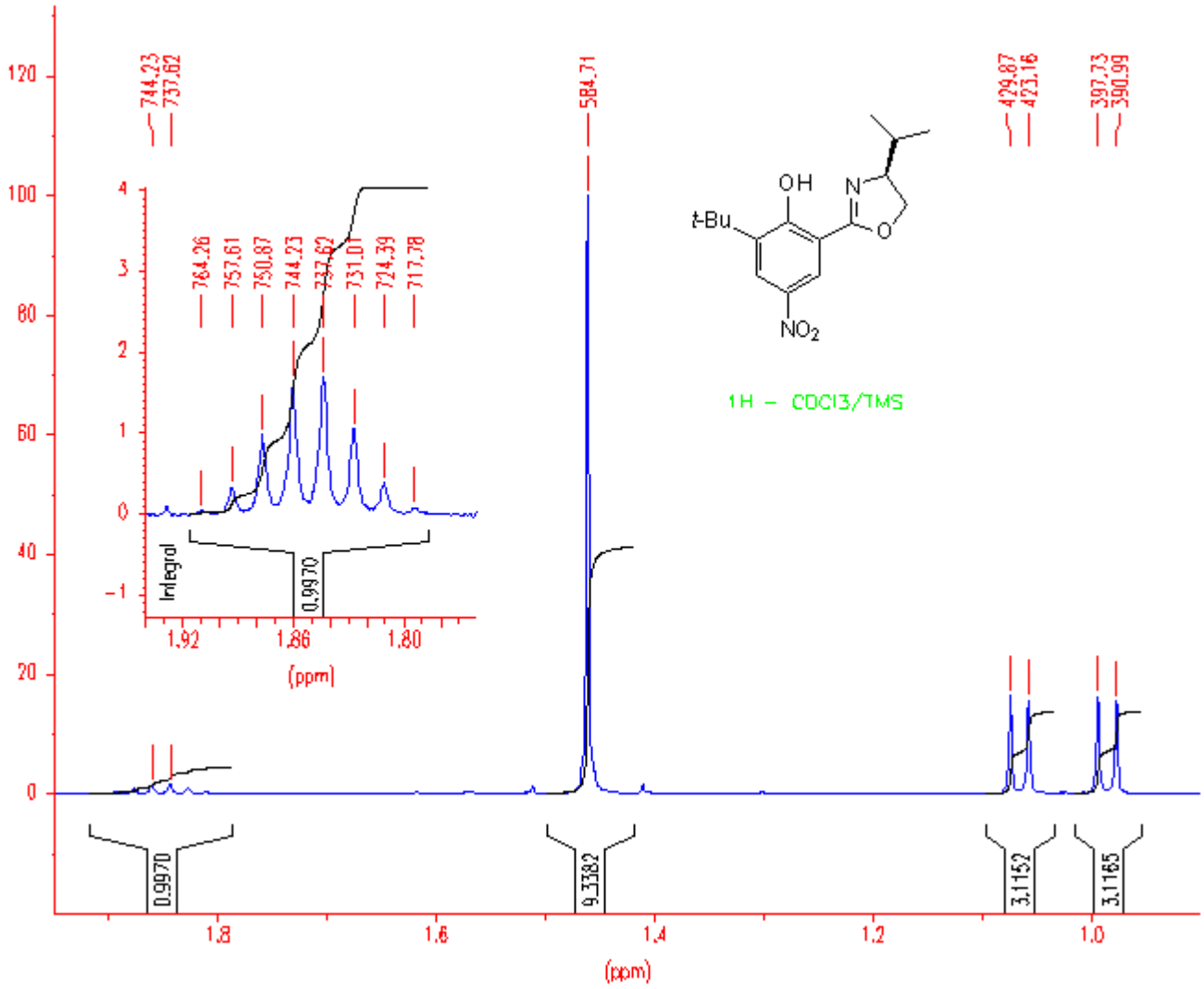
^{1}H NMR (400 MHz, $CDCl_3$): *d* 14.00 (broad s, 1H, O<u>H</u>), 8.50 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 8.28 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 4.55-4.48 (m, 1H, C<u>H</u>$_2$CH), 4.23-4.14 (m, 2H, C<u>H</u>$_2$CH and CH$_2$C<u>H</u>), 1.85 (qqd, 1H, *J* = 6.7, 6.7, 6.3 Hz, C<u>H</u>(CH$_3$)$_3$), 1.46 (s, 9H, C(C<u>H</u>$_3$)$_3$), 1.07 (d, 3H, *J* = 6.7 Hz, CH(C<u>H</u>$_3$)$_2$), 0.99 (d, 3H, *J* = 6.7 Hz, CH(C<u>H</u>$_3$)$_2$).

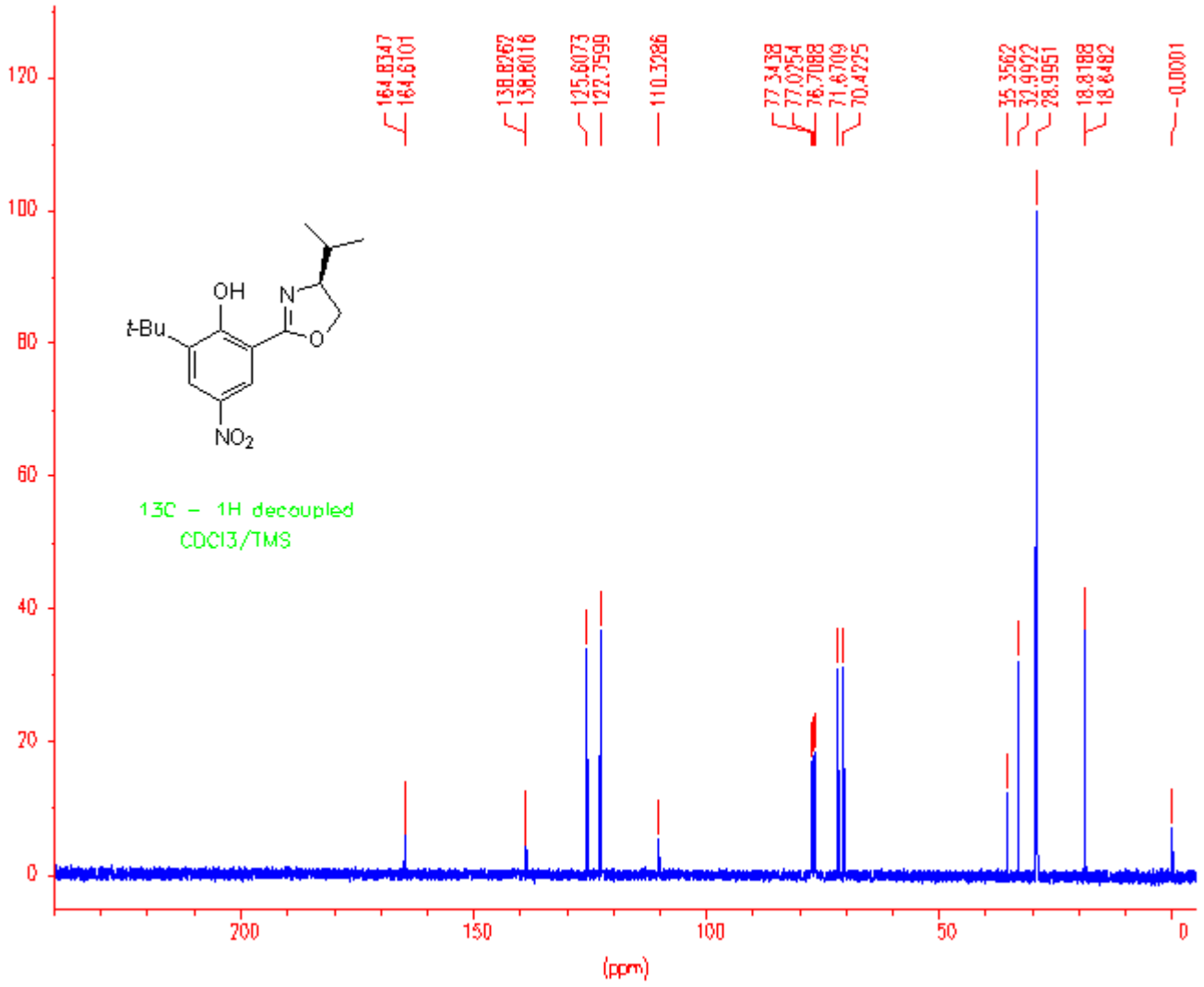

OH
N
t-Bu
O
NO2

1H – CDCl3/TMS

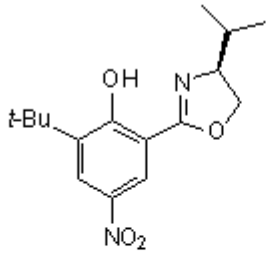

13.9996
Integral
0.8208
14.04
13.98
(ppm)
3403.17
3400.31
3313.08
3310.22
Integral
0.8639
0.9714
8.60
8.50
8.40
8.30
8.20
(ppm)


1819.75
1819.18
1811.39
1807.42
1806.24
1802.49
1794.19
OH
N
t-Bu
O
NO2
1688.24
1686.65
1680.04
1678.51
1675.08
1674.35
1669.10
1666.94
1660.90
1H – CDCl3/TMS
Integral
1.0000
2.0434
4.6
4.5
4.4
4.3
4.2
4.1
(ppm)

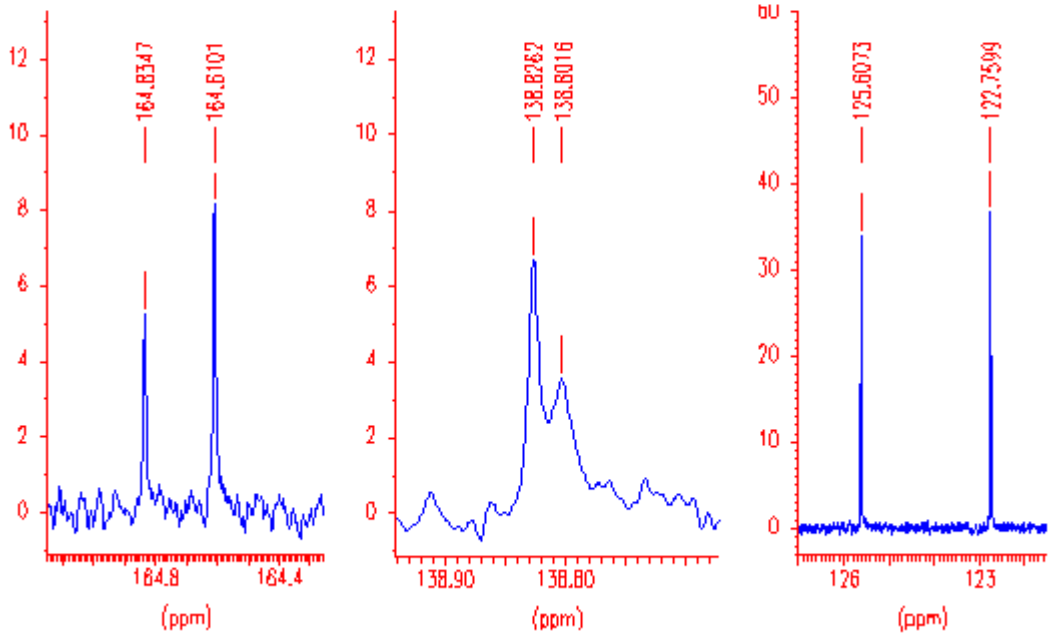

744.23
737.62
584.71
429.87
423.16
397.73
390.99
764.26
757.61
750.87
744.23
737.62
731.01
724.39
717.78
Integral
0.9970
(ppm)
OH
N
t-Bu
O
NO2
1H - CDCl3/TMS
0.9970
9.3382
3.1152
3.1165
(ppm)

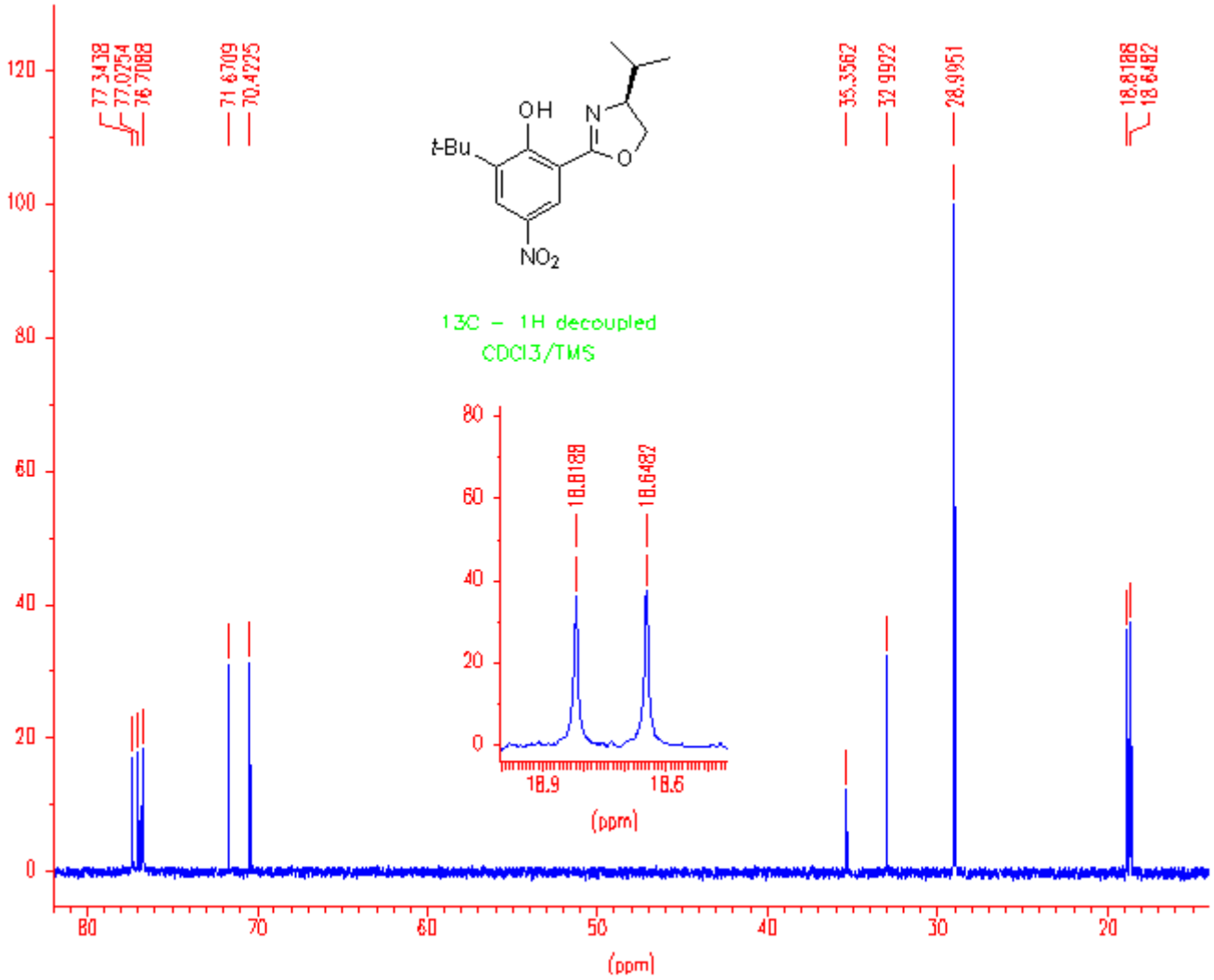


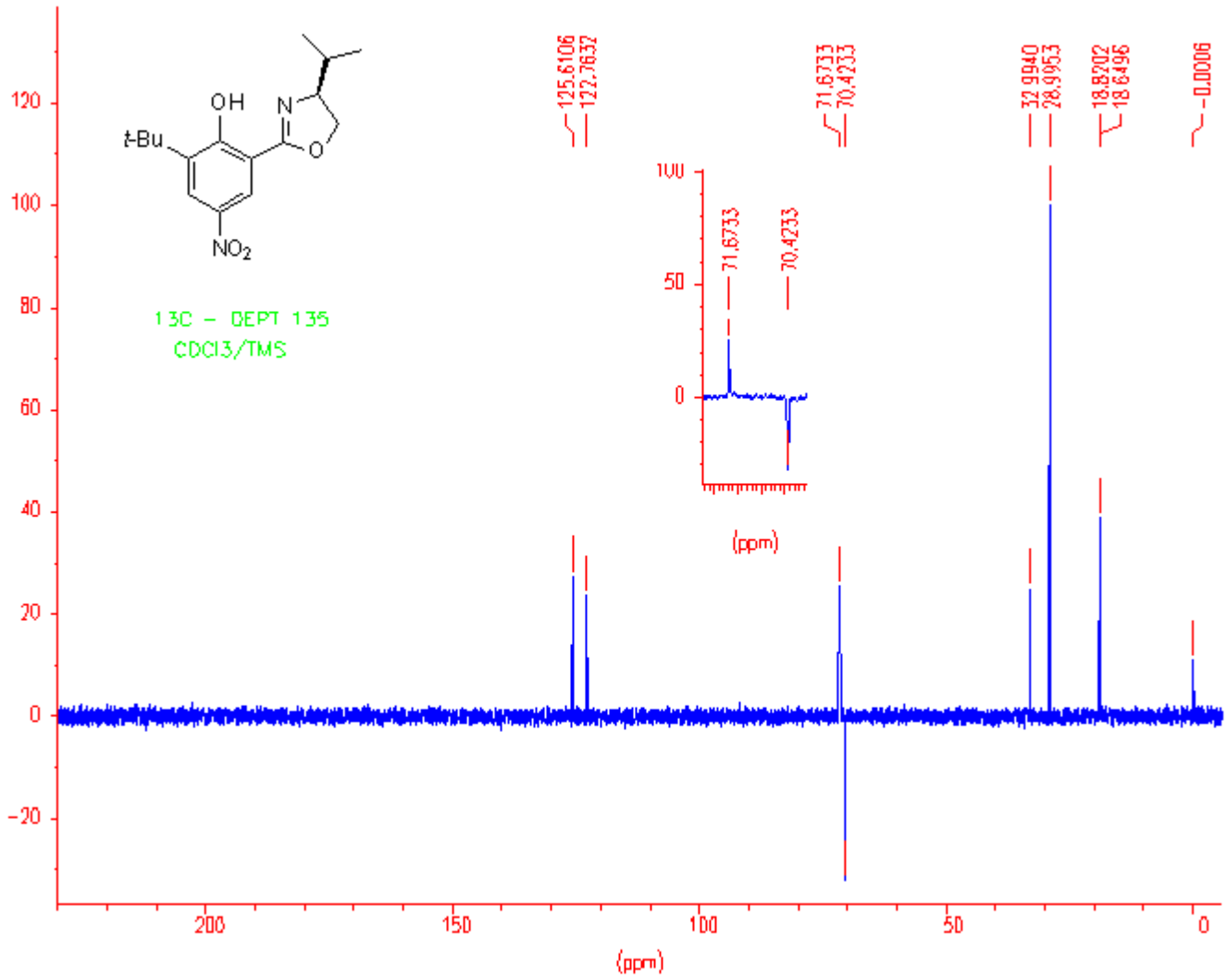
^{13}C NMR (100 MHz, $CDCl_3$): *d* 164.84 and 164.61 (2C, O-C=N and C_{ipso} α to OH), 138.83 and 138.80 (2C, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} α to NO_2), 125.61 (1C, CH aromatic, correlates with proton at 8.28 ppm), 122.76 (1C, CH aromatic, correlates with proton at 8.50 ppm), 110.33 (1C, C_{ipso} α to oxazoline), 71.67 (1C, CH_2CH), 70.42 (1C, CH_2CH), 35.36 (1C, $C(CH_3)_3$), 32.99 (1C, $CH(CH_3)_2$), 29.00 (3C, $C(CH_3)_3$), 18.82 (1C, $CH(CH_3)_2$, correlates with protons at 1.07 ppm), 18.65 (1C, $CH(CH_3)_2$, correlates with protons at 0.99 ppm).



13C – 1H decoupled
CDCl3/TMS




77.3438
77.0254
76.7088
71.6709
70.4225
35.3562
32.9922
28.9951
18.8186
18.6482
OH
N
O
t-Bu
NO2
13C – 1H decoupled
CDCl3/TMS
18.8188
18.6482
18.9
18.6
(ppm)
(ppm)



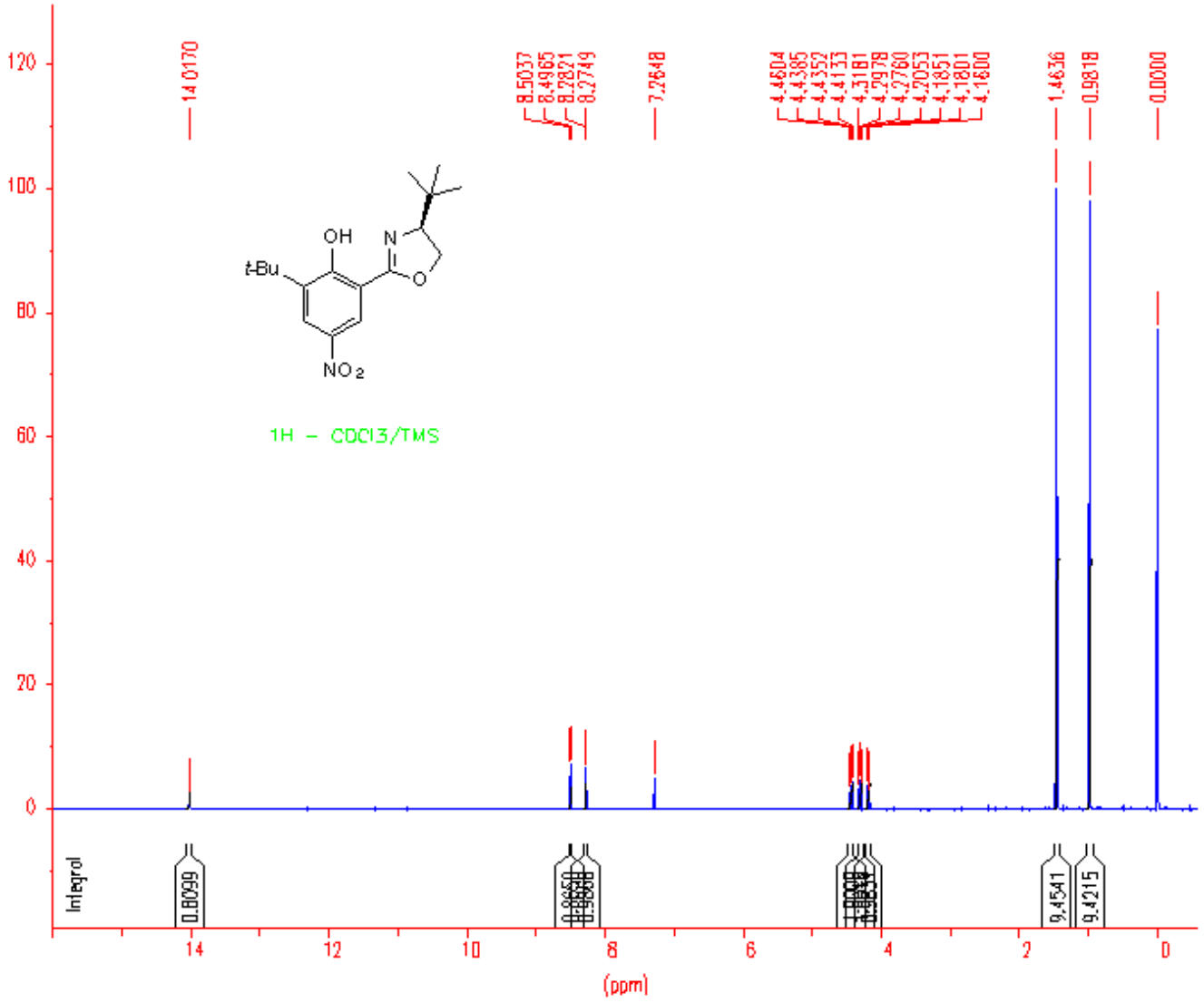
MS (EI, 70 eV) *m/z* (rel intens) 306 (44) $[M]^+$, 291 (100) $[M - CH_3]^+$, 264 (79), 263 (80) $[M - C_3H_7]^+$, 221 (30), 206 (23) $[M - C_3H_7 - C_4H_9]^+$, 177 (16), 160 (16), 131 (39), 85 (61), 73 (37), 57 (28), 41 (47).

$[\alpha]_D^{24}$ = -44.8, $[\alpha]_{578}^{24}$ = -47.1, $[\alpha]_{546}^{24}$ = -54.7 (c = 2.6, $CHCl_3$).

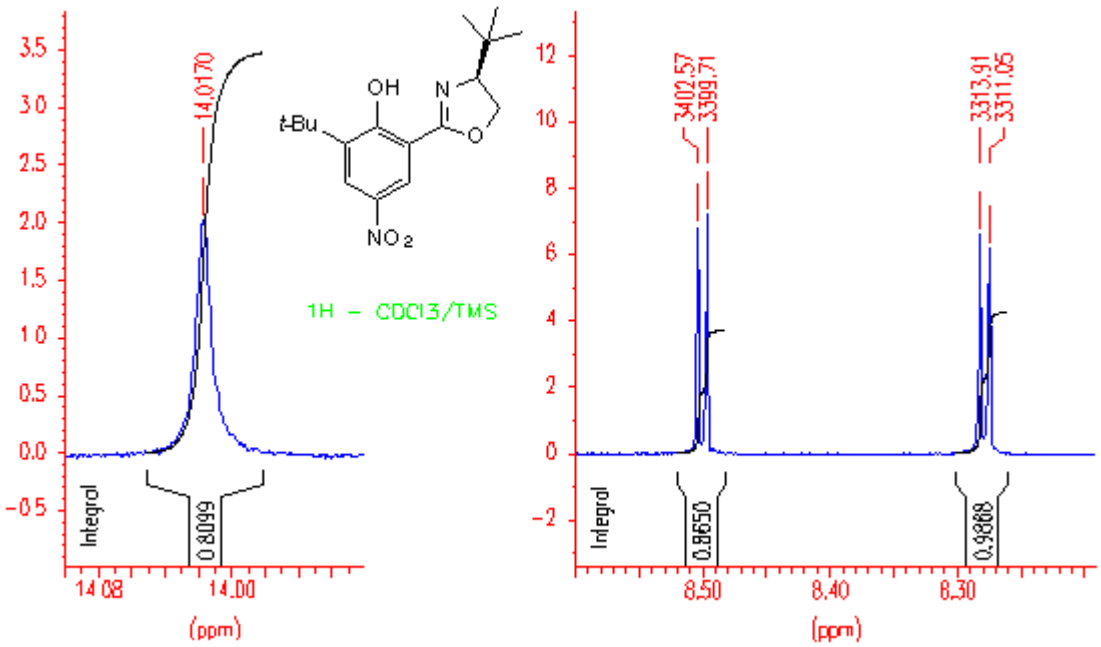
Anal. Calcd for $C_{16}H_{22}N_2O_4$: C, 62.73; H, 7.24; N, 9.14. Found: C, 62.69; H, 7.33; N, 9.13.

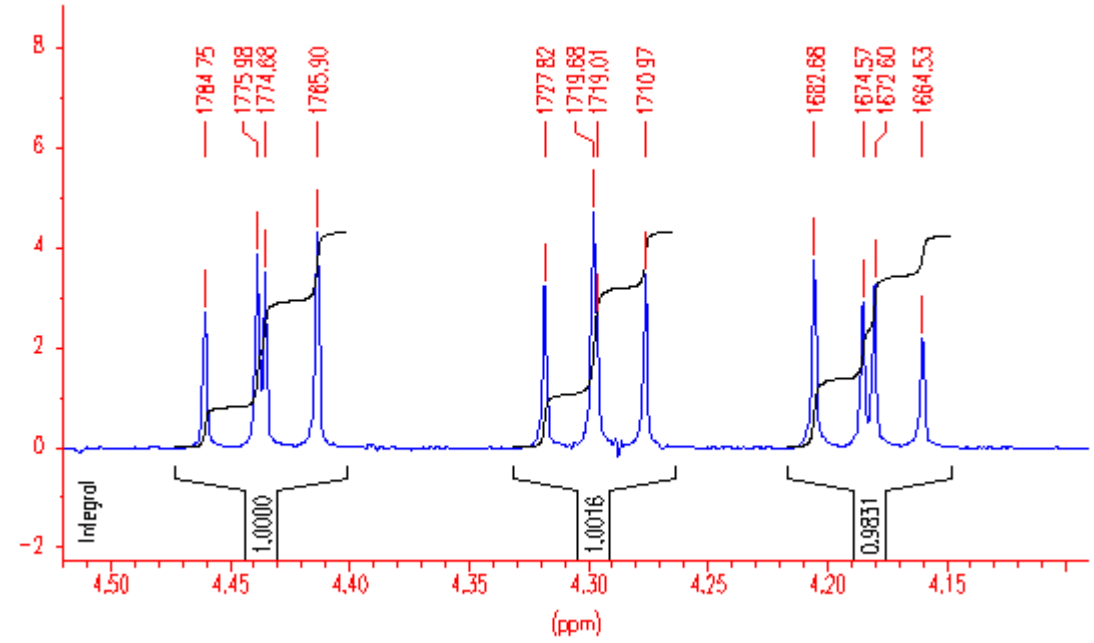
(*S*)-2-*tert*-Butyl-6-[4-*tert*-butyl-4,5-dihydro-2-oxazolyl]-4-nitrophenol (*S*)-15c

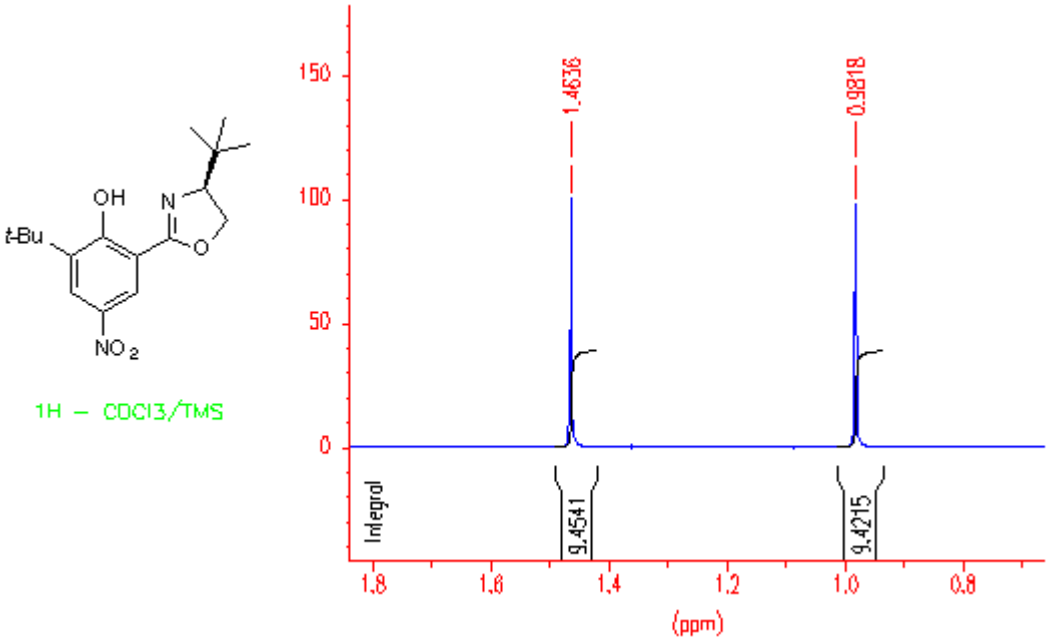
IR (Nujol, NaCl): $\tilde{n}$ 3109, 1825 (very small, aromatic harmonic), 1815 and 1804 (small, aromatic harmonics), 1642 (C=C), 1617, 1530, 1443, 1365, 1333, 1299, 1274, 1242, 1136, 1091, 1029, 977, 840, 748, 705 cm^{-1}.

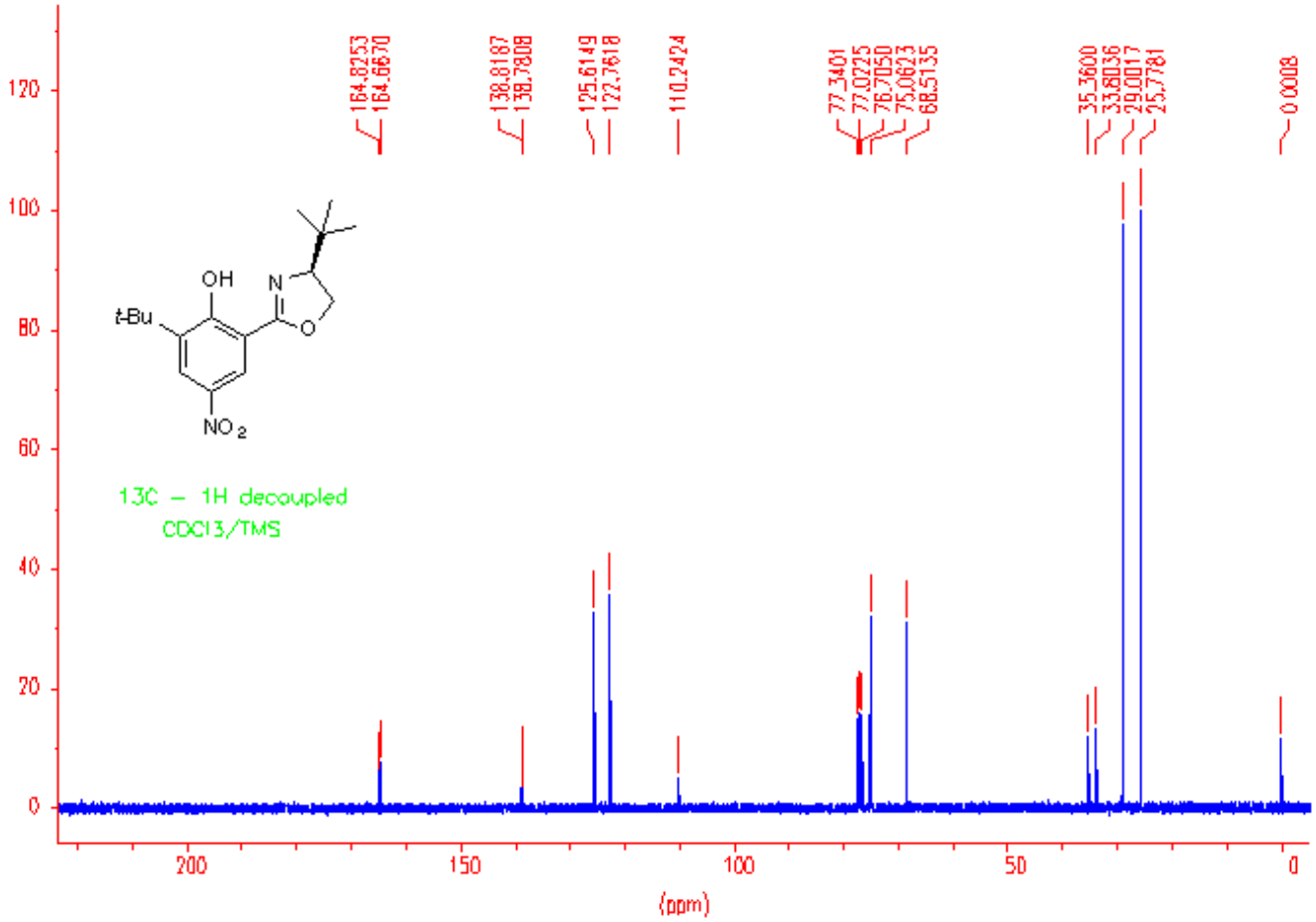


^{1}H NMR (400 MHz, $CDCl_3$): 14.01 (broad s, 1H, O<u>H</u>), 8.50 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 8.28 (d, 1H, *J* = 2.8 Hz, C<u>H</u> aromatic), 4.44 (dd, 1H, *J* = 10.0, 8.8 Hz, C<u>H</u>$_2$CH), 4.30 (dd, 1H, *J* = 8.8, 8.1 Hz, C<u>H</u>$_2$CH), 4.18 (dd, 1H, *J* = 10.0, 8.1 Hz, CH$_2$C<u>H</u>), 1.46 (s, 9H, C(C<u>H</u>$_3$)$_3$), 0.98 (s, 9H, C(C<u>H</u>$_3$)$_3$).

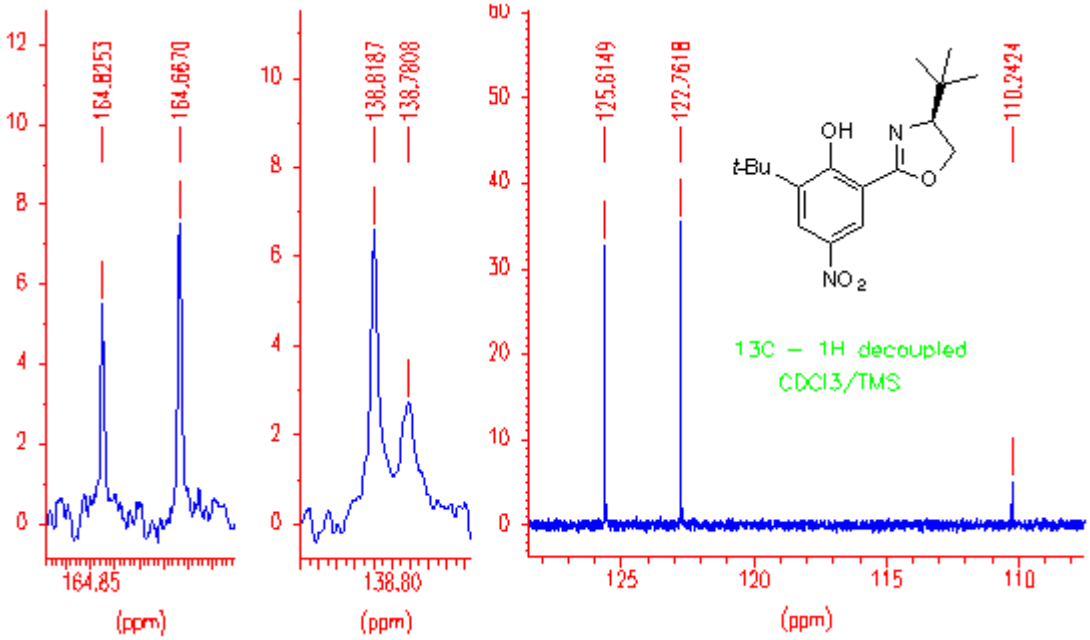

OH
N
t-Bu
O
NO2
1H – CDCl3/TMS
14.0170
Integral
0.8099
14.08
14.00
(ppm)
3402.57
3399.71
3313.91
3311.05
Integral
0.9650
0.9868
8.50
8.40
8.30
(ppm)

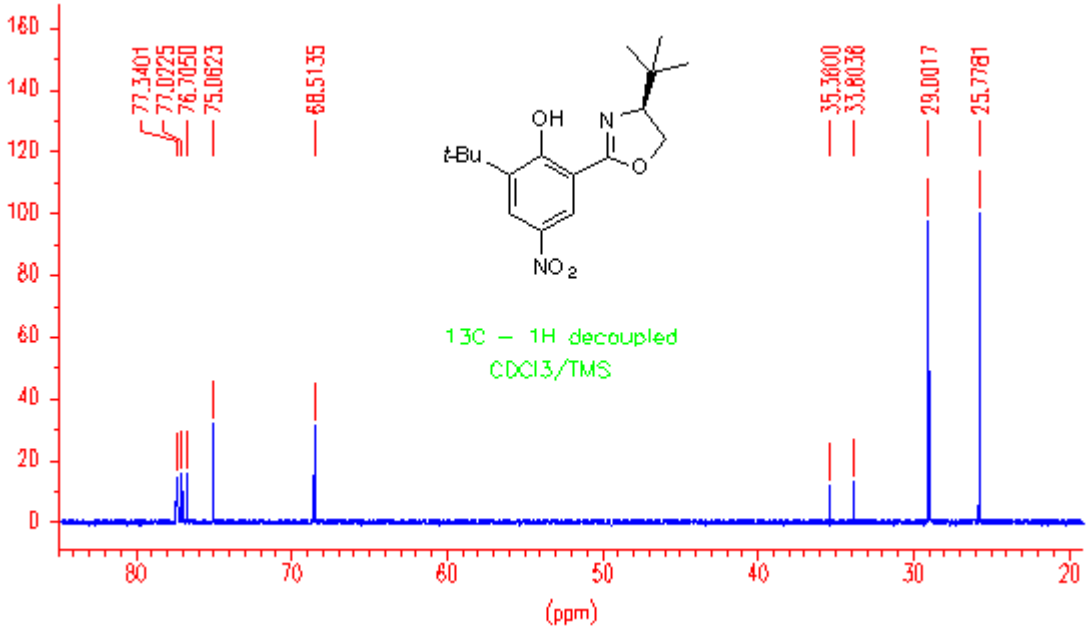

1784.75
1775.98
1774.68
1765.90
1727.82
1719.68
1719.01
1710.97
1682.68
1674.57
1672.60
1664.53
Integral
1.0000
1.0016
0.9831
4.50
4.45
4.40
4.35
4.30
4.25
4.20
4.15
(ppm)

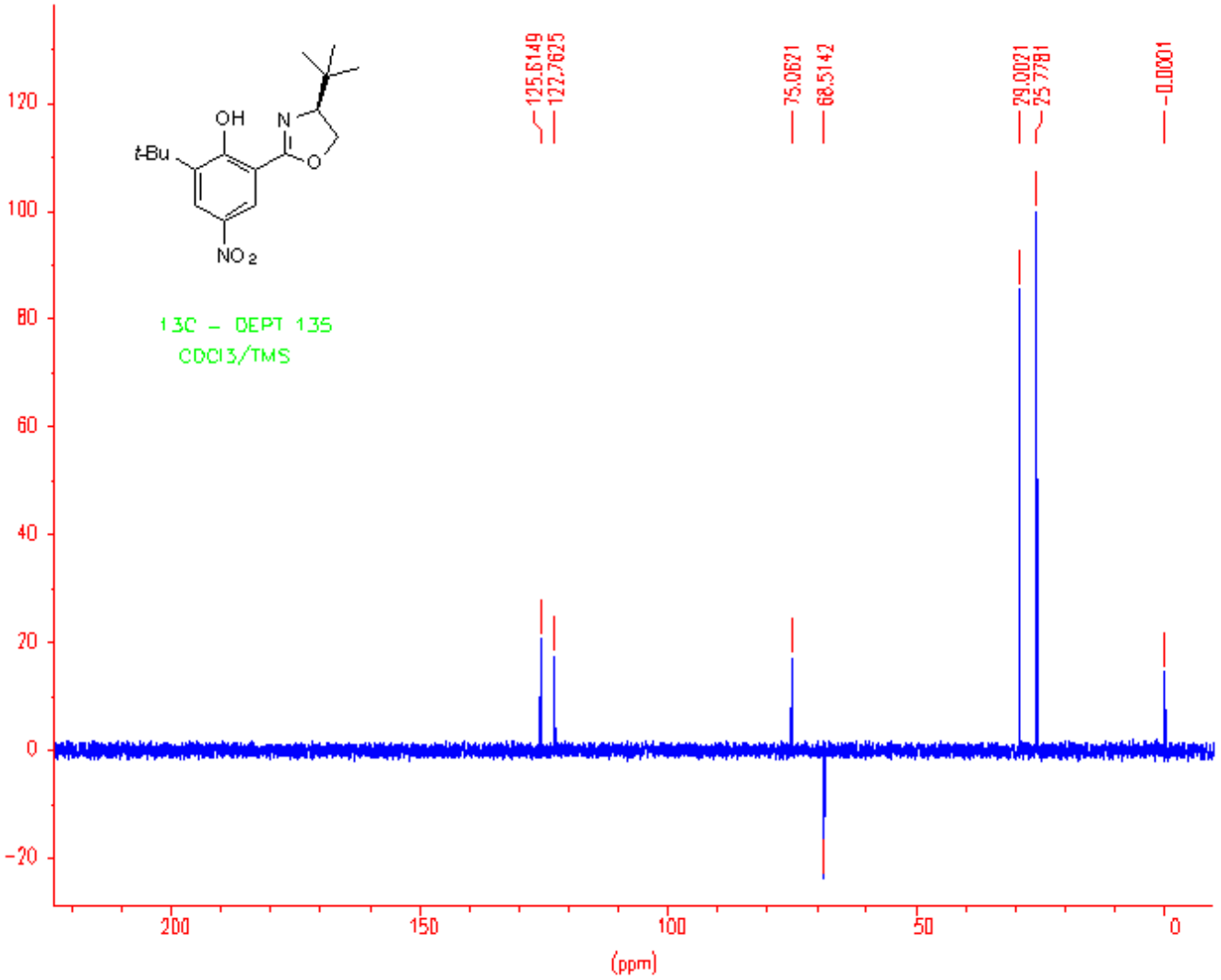

OH
N
t-Bu
O
NO2
1H – CDCl3/TMS
150
100
50
0
1.4636
0.9818
Integral
9.4541
9.4215
1.8
1.6
1.4
1.2
1.0
0.8
(ppm)


164.8253
164.6670
138.8187
138.7808
125.6149
122.7618
110.2424
77.3401
77.0225
76.7050
75.0623
68.5135
35.3600
33.8036
29.0017
25.7781
0.0008
120
100
80
60
40
20
0
OH
N
t-Bu
O
NO2
13C – 1H decoupled
CDCl3/TMS
200
150
100
50
0
(ppm)

^{13}C NMR (100 MHz, $CDCl_3$): *d* 164.84 and 164.67 (1C, O-C=N and 1C_{ipso} α to OH), 138.83 and 138.80 (2C, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} α to NO_2), 125.62 (1C, CH aromatic, correlates with proton at 8.28 ppm), 122.76 (1C, CH aromatic, correlates with proton at 8.50 ppm), 110.25 (1C, C_{ipso} α to oxazoline), 75.07 (1C, CH_2CH), 68.52 (1C, CH_2CH), 35.36 (1C, $C(CH_3)_3$), 33.81 (1C, $C(CH_3)_3$), 29.01 (3C, $C(CH_3)_3$), 25.78 (3C, $C(CH_3)_3$ of oxazoline).







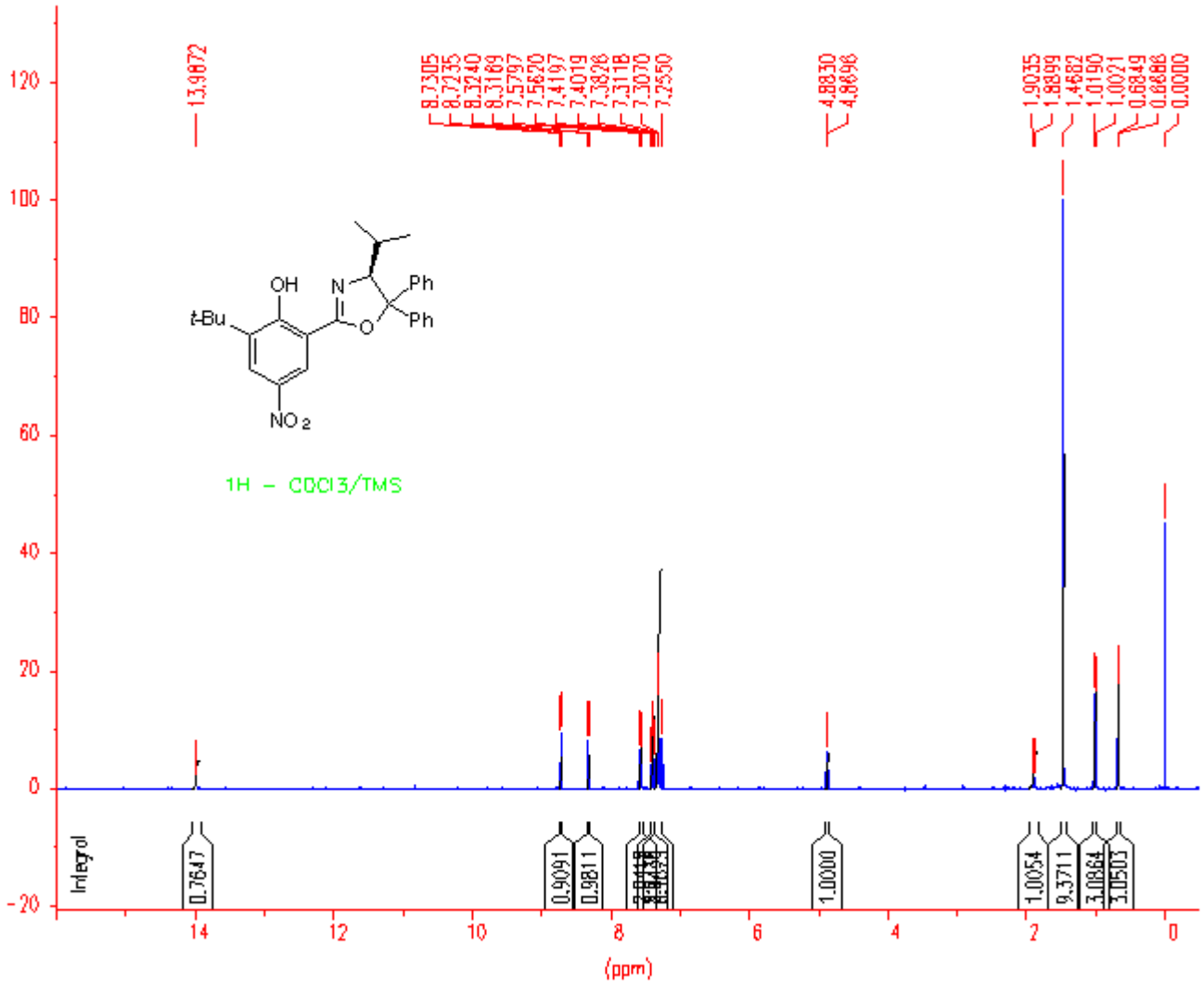
MS (EI, 70 eV) *m/z* (rel intens) 320 (45) $[M]^+$, 305 (100) $[M - CH_3]^+$, 277 (64) $[M - C_3H_7]^+$, 263 (18) $[M - C_4H_9]^+$, 247 (16), 235 (10), 221 (21), 206 (27), 177 (13), 160 (17), 85 (34), 57 (52) $[C_4H_9]^+$, 41 (49).

$[\alpha]_D^{27}$ = -32.4, $[\alpha]_{578}^{27}$ = -34.0, $[\alpha]_{546}^{27}$ = -39.5 (c = 2.2, $CHCl_3$).

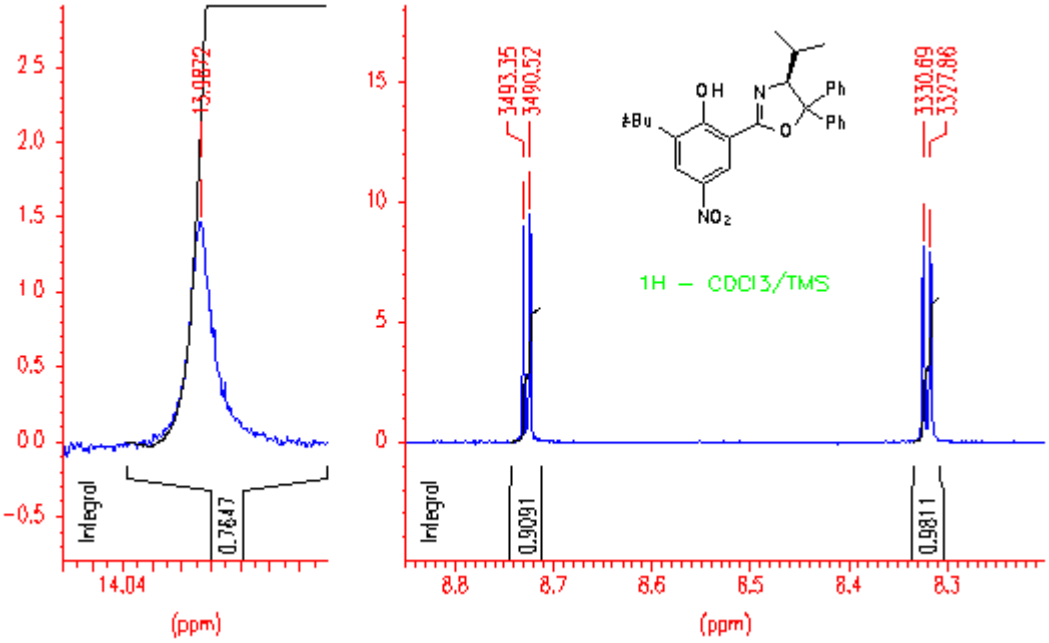
Anal. Calcd for $C_{17}H_{24}N_2O_4$: C, 63.73; H, 7.55; N, 8.74. Found: C, 63.95; H, 7.36; N, 8.87.

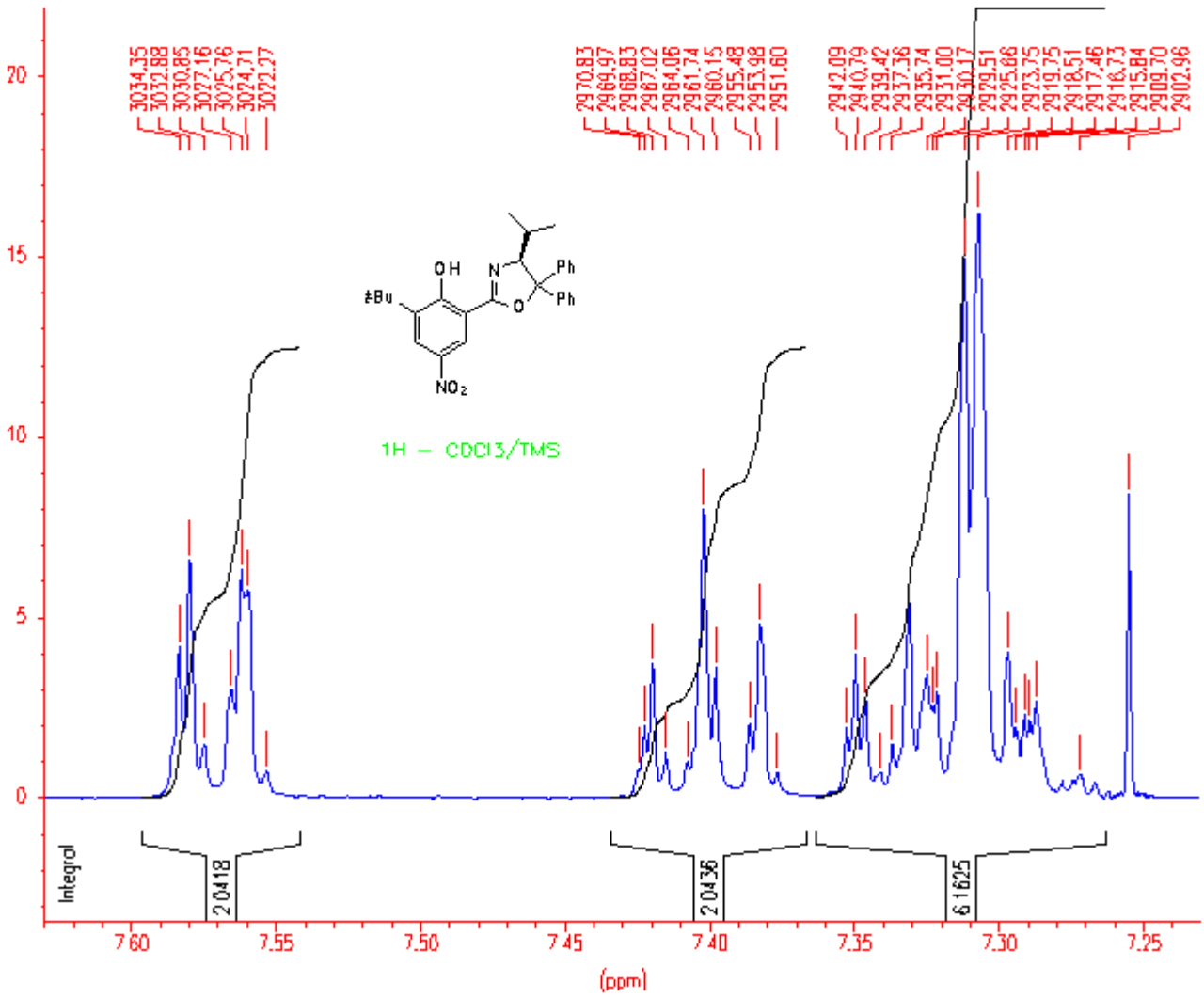
(*S*)-2-*tert*-butyl-6-[5,5-diphenyl-4-*i*-propyl-4,5-dihydro-2-oxazolyl]-4-nitrophenol (*S*)-15d

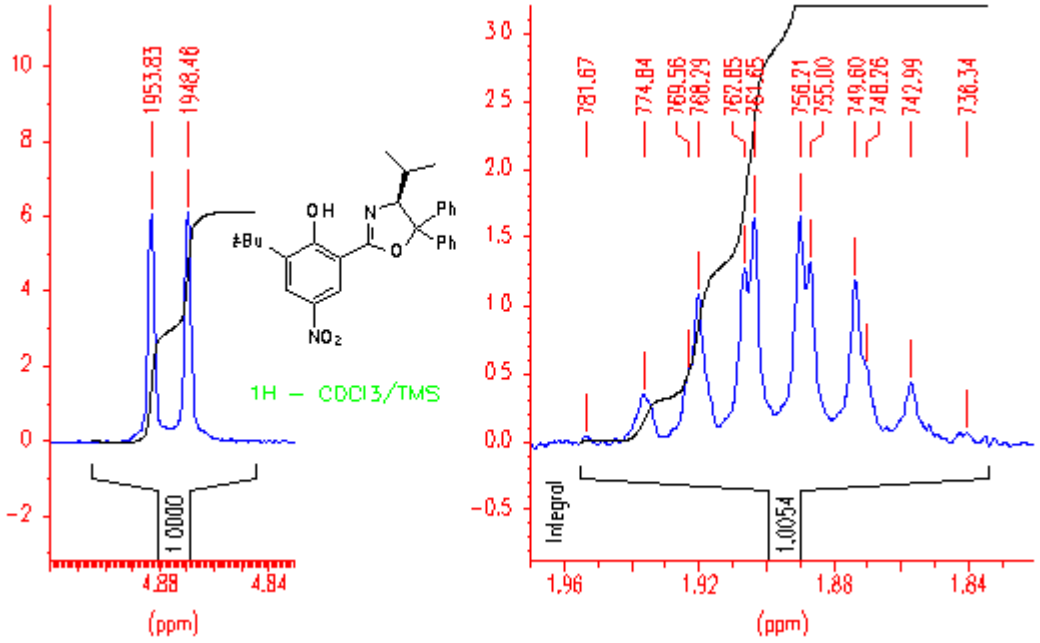
IR (Nujol, NaCl): $\tilde{n}$ 3092, 3062, 3029, 1952 (small, aromatic harmonic), 1889 and 1873 (very small, aromatic harmonics), 1815 (small, aromatic harmonic), 1648 (C=N), 1621, 1587, 1530, 1370, 1336, 1279, 1247, 1210, 1188, 1144, 1091, 972, 918, 839, 749, 701 cm^{-1}.

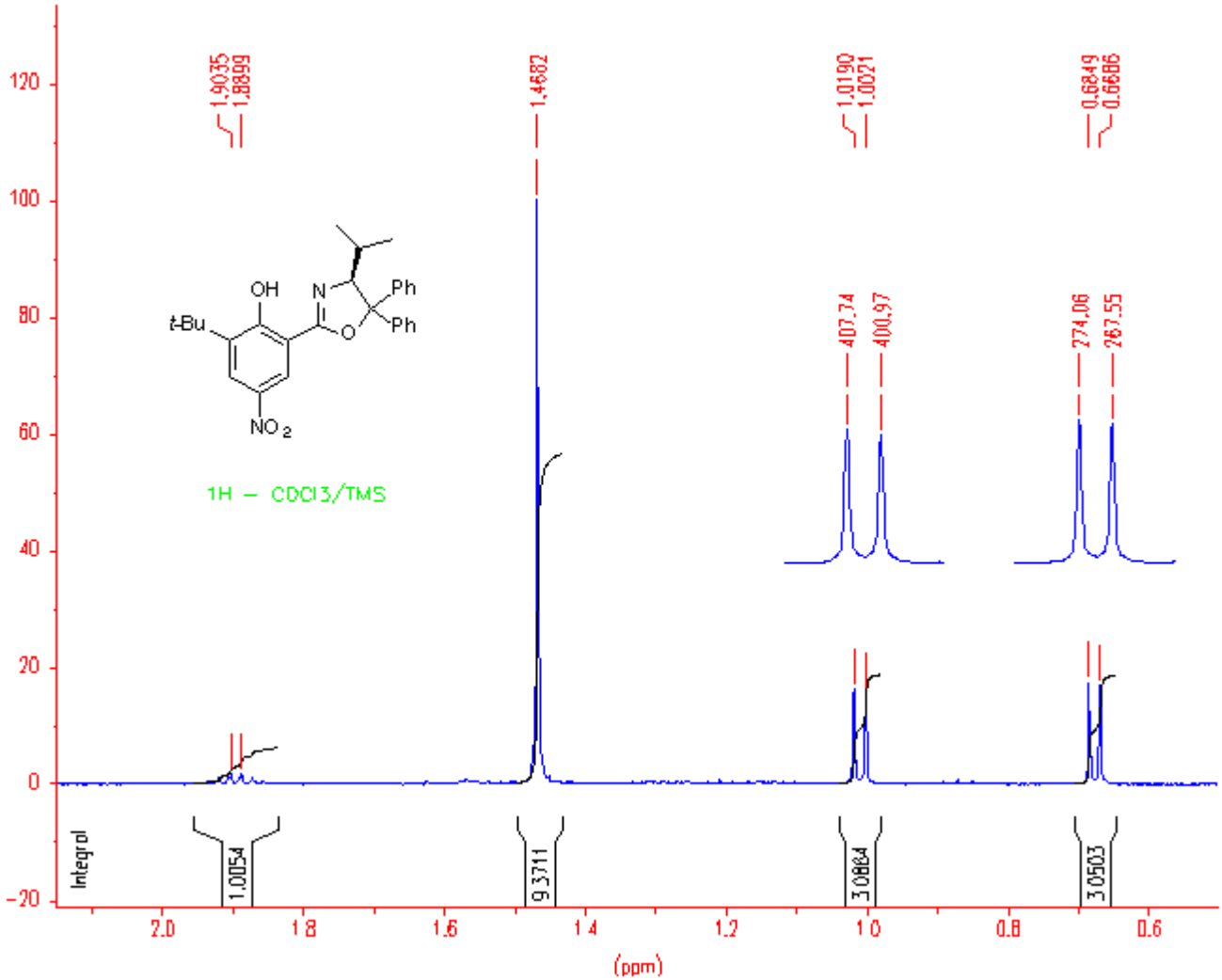


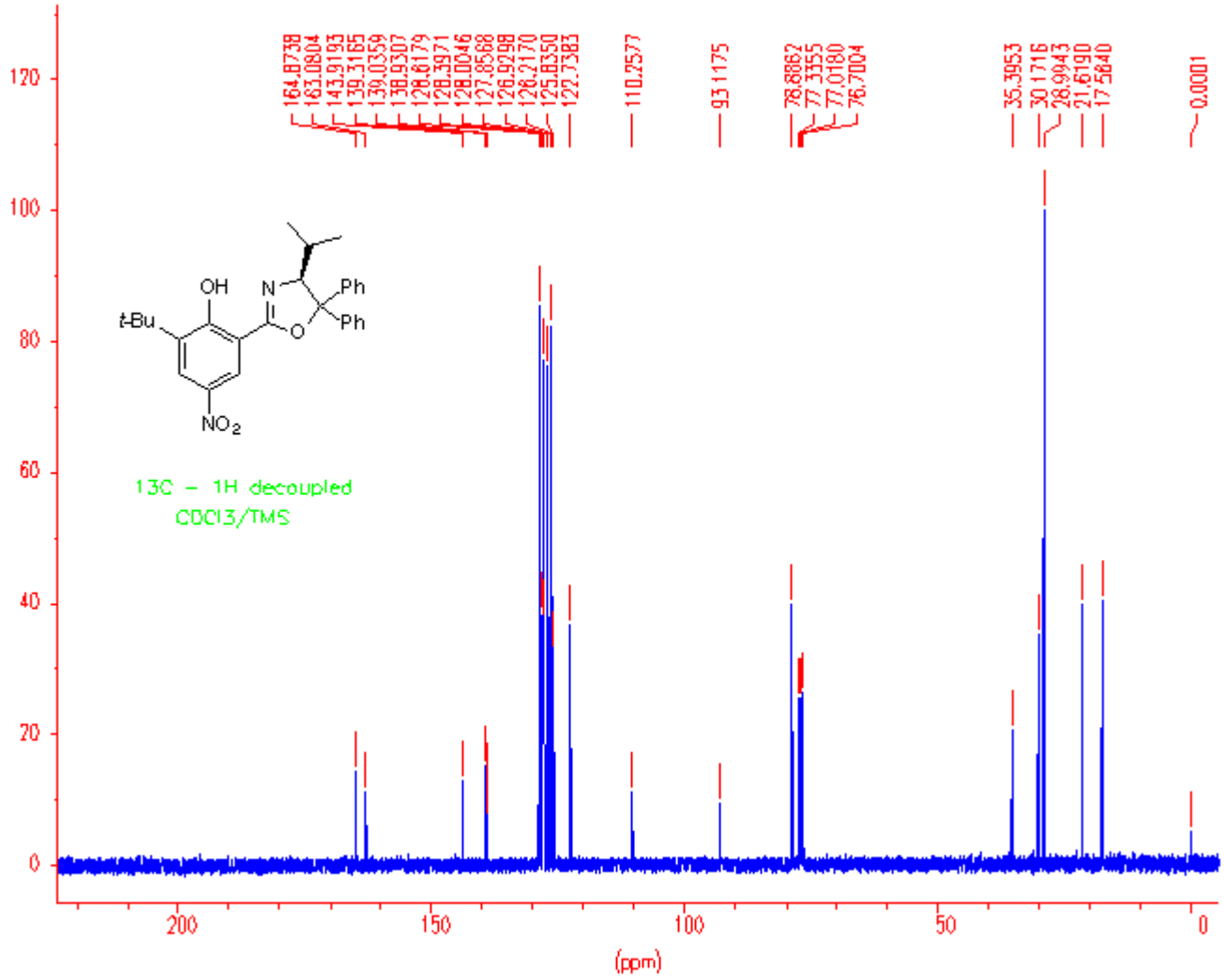
^{1}H NMR (400 MHz, $CDCl_3$): *d* 13.99 (broad s, 1H, O<u>H</u>), 8.73 (d, 1H, *J* = 2.8 Hz, C<u>H</u> of phenol), 8.32 (d, 1H, *J* = 2.8 Hz, C<u>H</u> of phenol), 7.60-7.54 (m, 2H of phenyl), 7.43-7.37 (m, 2H of phenyl), 7.36-7.26 (m, 6H of phenyl), 4.88 (d, 1H, *J* = 5.4 Hz, $C(Ph)_2C\underline{H}$), 1.90 (qqd, 1H, *J* = 6.7, 6.5, 5.4 Hz, $C\underline{H}(CH_3)_2$), 1.47 (s, 9H, $C(C\underline{H}_3)_3$), 1.01 (d, 3H, *J* = 6.7 Hz, $CH(C\underline{H}_3)_2$), 0.68 (d, 3H, *J* = 6.5 Hz, $CH(C\underline{H}_3)_2$).


13.9872
Integral
0.7647
14.04
(ppm)
3493.35
3490.52
3330.69
3327.86
OH
tBu
N
O
Ph
Ph
NO2
1H – CDCl3/TMS
Integral
0.9091
0.9811
8.8
8.7
8.6
8.5
8.4
8.3
(ppm)

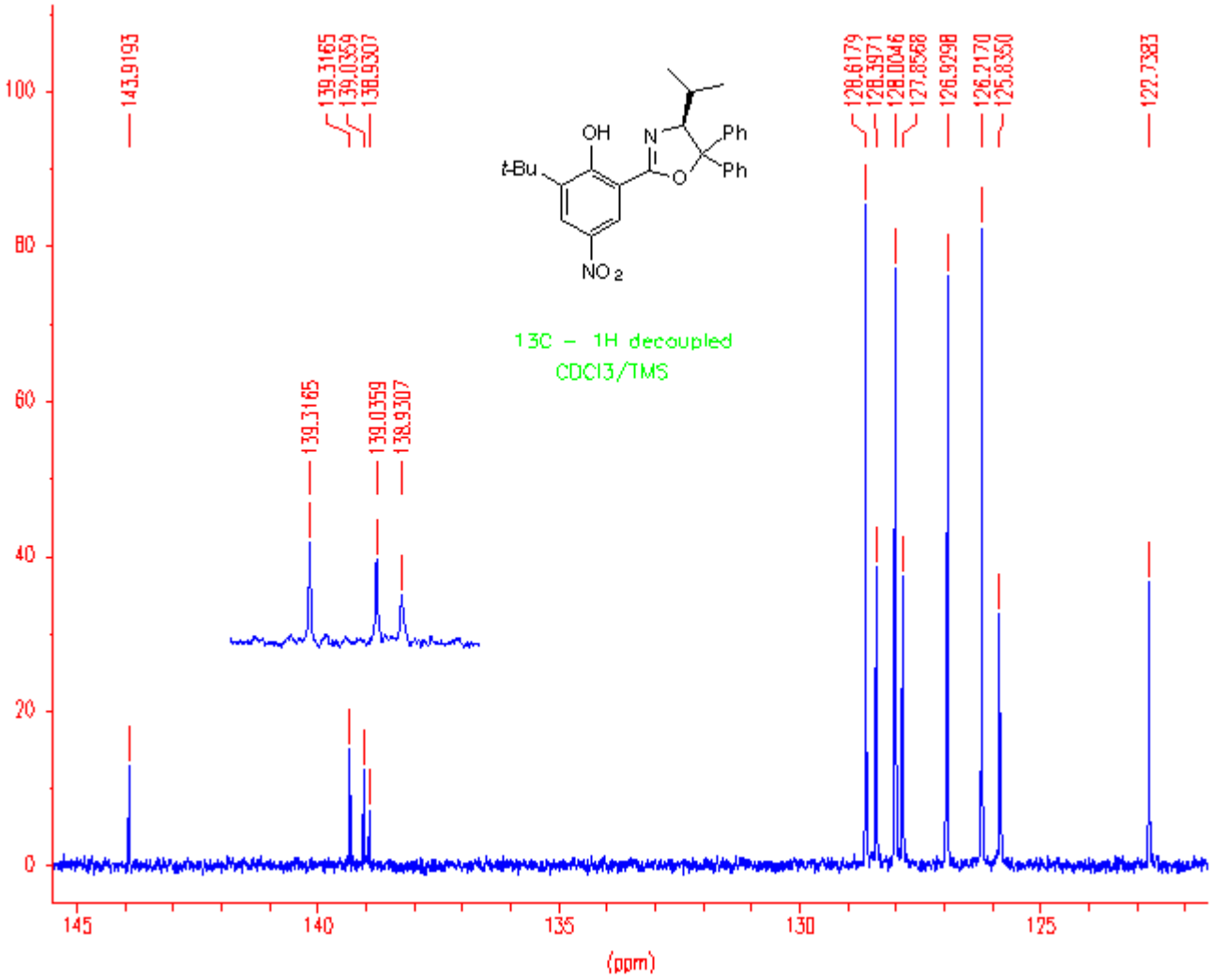

3034.35
3032.88
3030.85
3027.16
3025.76
3024.71
3022.27
2970.83
2969.97
2968.83
2967.02
2964.06
2961.74
2960.15
2955.48
2953.98
2951.60
2942.09
2940.79
2939.42
2937.36
2935.74
2931.00
2930.17
2929.51
2925.66
2923.75
2919.75
2918.51
2917.46
2916.73
2915.84
2909.70
2902.96
OH
tBu
N
O
Ph
Ph
NO2
1H – CDCl3/TMS
Integral
2.0418
2.0436
6.1625
7.60
7.55
7.50
7.45
7.40
7.35
7.30
7.25
(ppm)


1953.83
1948.48
OH
N
Ph
Ph
t-Bu
O
NO2
1H – CDCl3/TMS
1.0000
4.88
4.84
(ppm)
781.67
774.84
769.56
768.29
762.85
761.65
756.21
755.00
749.60
748.26
742.99
736.34
Integral
1.0054
1.96
1.92
1.88
1.84
(ppm)


1.9035
1.8899
1.4682
1.0190
1.0021
0.6849
0.6686
407.74
400.97
274.06
267.55
OH
N
Ph
Ph
t-Bu
O
NO2
1H – CDCl3/TMS
Integral
1.0054
9.3711
3.0864
3.0503
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
(ppm)

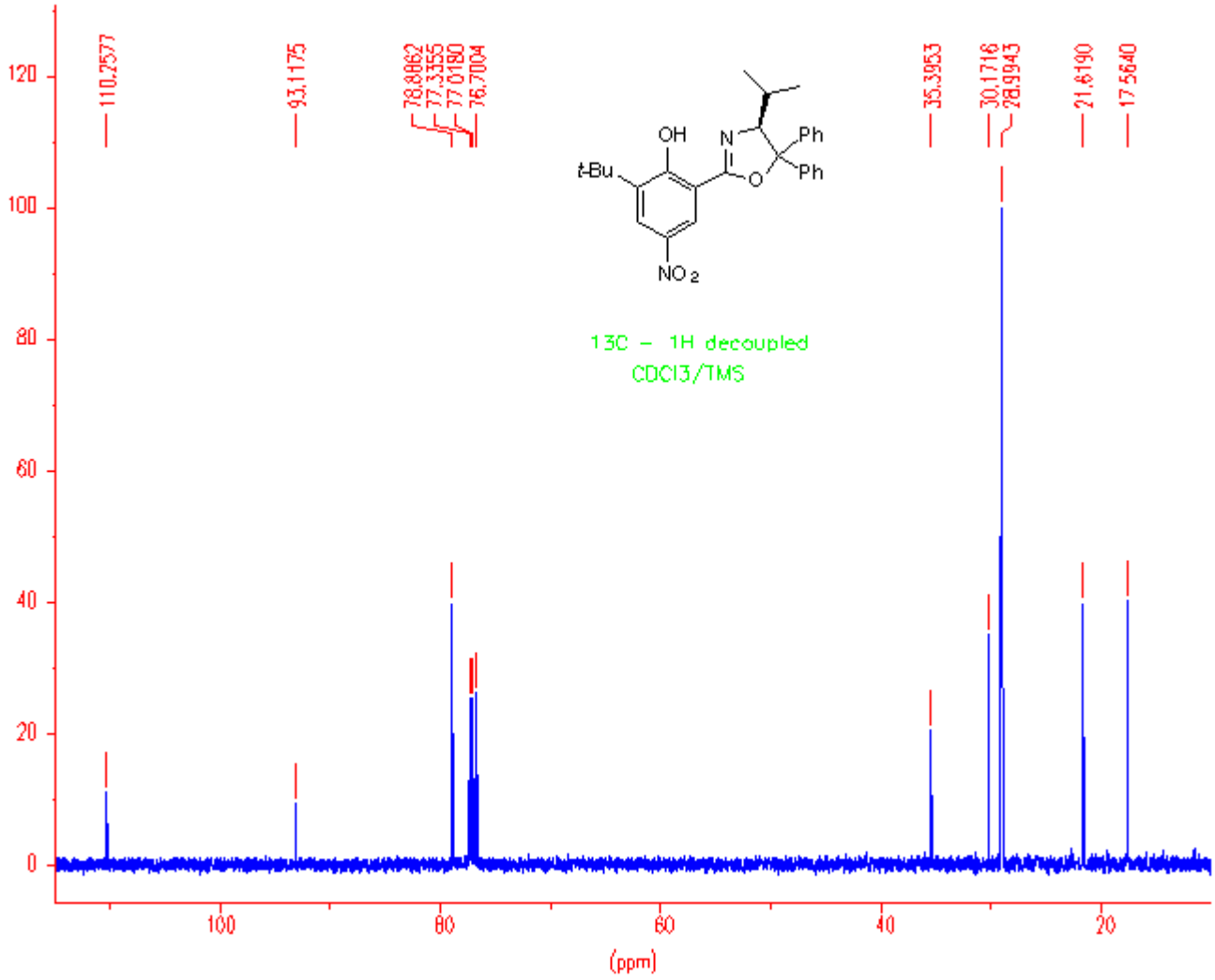


^{13}C NMR (100 MHz, $CDCl_3$): *d* 164.87 (1C, O-C=N), 163.08 (1C, C_{ipso} α to OH), 143.92 (1C, C_{ipso} of phenyl), 139.32, 139.03 and 138.93 (3C, C_{ipso} of phenyl, C_{ipso} α to $C(CH_3)_3$ and C_{ipso} α to NO_2), 128.62 (2C, CH_{meta} of phenyl), 128.40 (1C, CH_{para} of phenyl), 128.01 (2C, CH_{meta} of phenyl), 127.86 (1C, CH_{para} of phenyl), 126.93 (2C, CH_{ortho} of phenyl), 126.22 (2C, CH_{ortho} of phenyl), 125.84 (1C, CH of phenol, correlates with proton at 8.32 ppm), 122.74 (1C, CH of phenol, correlates with proton at 8.73 ppm), 110.26 (1C, C_{ipso} α to oxazoline), 93.12 (1C, $C(Ph)_2CH$), 78.88 (1C, $C(Ph)_2CH$), 35.40 (1C, $C(CH_3)_3$), 30.17 (1C, $CH(CH_3)_2$), 29.00 (3C, $C(CH_3)_3$), 21.62 (1C, $CH(CH_3)_2$, correlates with protons at 1.01 ppm), 17.56 (1C, $CH(CH_3)_2$, correlates with protons at 0.68 ppm).



HRMS (EI, 70 eV) *m/z* (%): calcd for $C_{28}H_{30}N_2O_4$ 458.2205 $[M]^+$, found 458.2184 (42), 443 (3) [M - Me]$^+$, 291 (7) [M - Ph_2CH]$^+$, 276 (6) [M - Ph_2CO]$^+$, 261 (12) [M - Ph_2CO - Me]$^+$, 237 (100) $[C_{17}H_{19}N]^+$, 222 (37) $[C_6H_2(NO_2)(t\text{-Bu})(OH)CO]^+$, 220 (23.5), 207 (23) $[C_6H_2(NO_2)(t\text{-Bu})(OH)CO$ - Me]$^+$, 195 (28) $[C_{14}H_{11}O$ *e.g.* $Ph_2COCH]^+$, 194 (21), 105 (12), 91 (29), 43 (25) $[i\text{-Pr}]^+$.

MS (FAB, *m*-nitrobenzylic alcohol matrix) *m/z* (rel intens): Calcd for $C_{28}H_{30}N_2O_4$ 458.2 $[M]^+$, found 458 (100) $[M]^+$, 276 (5), 237 (38).



$[\alpha]_D^{28}$ = -219.3, $[\alpha]_{578}^{28}$ = -229.6, $[\alpha]_{546}^{28}$ = -264.2 (c = 3.3, $CHCl_3$).

Anal. Calcd for $C_{28}H_{30}N_2O_4$: C, 73.34; H, 6.59; N, 6.11. Found: C, 73.56; H, 6.66; N, 5.97.