Electronic Supplementary Information (ESI)

Regioselective *N*-alkylation of 2-aminobenzothiazoles with benzylic alcohols

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General Experimental Details.

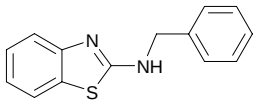
Infrared spectra were recorded on a Nicolet iS10 FT-IR spectrometer. High-resolution mass spectra (HRMS) were obtained on a HPLC-Q-Tof MS(Micro) spectrometer and are reported as m/z (relative intensity). Accurate masses are reported for the molecular ion $[M+H]^+$, $[M-H]^+$ or a suitable fragment ion. Melting points were measured on a X-6 micro-melting apparatus (Beijing Tech Instrument Co., Ltd). Proton nuclear magnetic resonance (^{1}H NMR) spectra were recorded at 500 MHz using a Bruker Avance 500 spectrometer. Chemical shifts are reported in delta (δ) units, parts per million (ppm) downfield from trimethylsilane or ppm relative to the center of the singlet at 7.26 ppm for $CDCl_3$ and 2.50 ppm for DMSO-d_6. Coupling constants J values are reported in Hertz (Hz), and the splitting patterns were designated as follows: s, singlet; d, doublet; t, triplet; q, quartet; m, multiplet; b, broad. Carbon-13 nuclear magnetic resonance (^{13}C NMR) spectra were recorded at 125 MHz using a Bruker Avance 500 spectrometer. Chemical shifts are reported in delta (δ) units, ppm relative to the center of the triplet at 77.0 ppm for $CDCl_3$ and 39.5 ppm for DMSO-d_6. ^{13}C NMR spectra were routinely run with broadband decoupling.

All reactions were run under an atmosphere of nitrogen, unless otherwise indicated. Anhydrous solvents were transferred *via* oven-dried syringe. Reaction tubes were oven-dried and cooled under a stream of nitrogen. Reactions tubes were purchased from Beijing Synthware Glass Inc. Commercially unavailable 2-aminobenzothiazoles were readily prepared according to the previously reported procedures.[1] *p*-Xylene was distilled from calcium hydride. Analytical thin-layer chromatography (TLC) was carried out using 0.2-mm commercial silica gel plates.

General Procedure for the regioselective N-alkylation of 2-aminobenzothiazoles with alcohols.

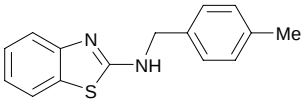
To an oven-dried, nitrogen purged 20 ml Schlenk tube were added 2-aminobenzothiazole (1mmol), copper salt (0.01 mmol, 1 mol%), base (0.2 mmol, 20 mol%), alcohol (1.2 mmol, 120 mol%) and *p*-xylene (1 ml). The mixture was then heated at 130 ^{o}C for 12h, at which point the reaction mixture was allowed to cool to ambient temperature. The reaction mixture was concentrated in *vacuo* and purified by flash column chromatography with hexane/ethyl acetate to afford the corresponding product.

N-benzylbenzo[d]thiazol-2-amine (1c)[2]



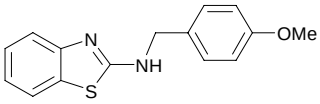
mp 164.4-165.2 °C (lit.[2] mp 164-168 °C); ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.51 (t, *J* = 5.5 Hz, 1H, NH), 7.67 (d, *J* = 7.8 Hz, 1H, ArH), 7.39-7.33 (m, 5H, ArH), 7.26 (t, *J* = 7.1Hz, 1H, ArH), 7.22 (t, *J* = 7.7 Hz, 1H, ArH), 7.02 (t, *J* = 7.5 Hz, 1H, ArH), 4.60 (s, 2H, CH_2N); ^{13}C NMR (125MHz, DMSO-d_6) δ 166.2, 152.4, 138.9, 130.4, 128.3, 127.3, 127.0, 125.5, 121.0, 120.9, 118.1, 47.2.

N-(4-methylbenzyl)benzo[d]thiazol-2-amine (2c)[3]



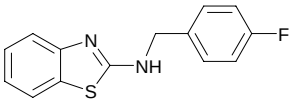
mp 188.9-189.4 °C (lit.[3] mp 186-188 °C); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.9 Hz, 1H, ArH), 7.43 (d, *J* = 8.1Hz, 1H, ArH), 7.29-7.25 (m, 3H, ArH), 7.16 (d, *J* = 7.8 Hz, 2H, ArH), 7.07 (t, *J* = 7.5 Hz, 1H, ArH), 6.38 (br s, 1H, NH), 4.58 (s, 2H, CH_2N), 2.34 (s, 3H, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$) δ 167.4, 152.2, 137.7, 134.4, 130.5, 129.5, 127.7, 126.0, 121.6, 120.8, 118.9, 49.2, 21.1.

N-(4-methoxybenzyl)benzo[d]thiazol-2-amine (3c)[4]



mp 173.5-174.0 °C; ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.58 (d, *J* = 7.8 Hz, 1H, ArH), 7.52 (d, *J* = 8.1 Hz, 1H, ArH), 7.33-7.28 (m, 3H, ArH), 7.09 (t, *J* = 7.6 Hz, 1H, ArH), 6.90-6.88 (m, 2H, ArH), 5.86 (br s, 1H, NH), 4.57 (s, 2H, CH_2N), 3.81 (s, 3H, OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$) δ 167.4, 159.3, 152.1, 130.4, 129.4, 129.1, 126.0, 121.6, 120.8, 118.8, 114.2, 55.3, 48.9.

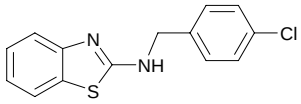
N-(4-fluorobenzyl)benzo[d]thiazol-2-amine (4c)[4]



mp 148.0-149.2 °C; ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.58 (d, *J* = 7.8 Hz, 1H, ArH), 7.44 (d, *J* = 8.0 Hz,

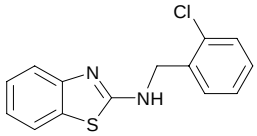
1H, ArH), 7.37 (t, *J* = 6.8 Hz, 2H, ArH), 7.28 (t, *J* = 7.8 Hz, 1H, ArH), 7.10 (t, *J* = 7.6 Hz, 1H, ArH), 7.04 (t, *J* = 8.6 Hz, 2H, ArH), 6.43 (br s, 1H, NH), 4.60 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, $CDCl_3$) δ 167.7, 162.4 (d, J_{C-F} = 243.8 Hz), 152.0, 133.2 (d, J_{C-F} = 3.8 Hz), 130.2, 129.3 (d, J_{C-F} = 8.1 Hz), 126.0, 121.7, 120.8, 118.7, 115.6 (d, J_{C-F} = 20.8 Hz), 48.6.

N-(4-chlorobenzyl)benzo[d]thiazol-2-amine (5c)[2]



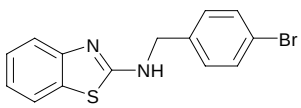
mp 188.2-188.8 ºC (lit.[2] mp 175-180 ºC); ^1H NMR (500 MHz, DMSO-d_6) δ 8.53 (t, *J* = 5.7 Hz, 1H, NH), 7.67 (d, *J* = 7.6 Hz, 1H, ArH), 7.42-7.37 (m, 5H, ArH), 7.22 (t, *J* = 7.6 Hz, 1H, ArH), 7.03 (t, *J* = 7.6 Hz, 1H, ArH), 4.59 (d, *J* = 3.8 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.0, 152.3, 138.0, 131.5, 130.4, 129.2, 128.3, 125.5, 121.0, 118.1, 46.3.

N-(2-chlorobenzyl)benzo[d]thiazol-2-amine (6c)



mp 134.7-135.2 ºC; ^1H NMR (500 MHz, DMSO-d_6) δ 8.54 (t, *J* = 5.4 Hz, 1H, NH), 7.69 (d, *J* = 7.8 Hz, 1H, ArH), 7.48 (dd, *J* = 6.6 Hz and 2.1Hz, 2H, ArH), 7.40 (d, *J* = 7.9 Hz, 1H, ArH), 7.35-7.30 (m, 2H, ArH), 7.22 (t, *J* = 7.7 Hz, 1H, ArH), 7.04(t, *J* = 7.6 Hz, 1H, ArH), 4.68 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.0, 152.3, 135.9, 132.3, 130.5, 129.3, 129.1, 128.9, 127.3, 125.6, 121.1, 121.30, 118.2, 45.0; FTIR (net, cm^{-1}) 3198, 3050, 1631, 1591, 1443, 1285; HRMS-EI (70 eV) m/z calcd for $C_{14}H_{12}N_2SCl$ $[M+H]^+$ 275.0410, found 275.0411.

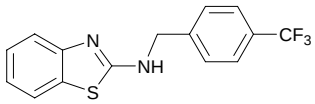
N-(4-bromobenzyl)benzo[d]thiazol-2-amine (7c)[5]



mp 195.1-195.6 ºC (lit.[5] mp 197-200 ºC); ^1H NMR (500 MHz, DMSO-d_6) δ 8.54 (s, 1H, NH), 7.67 (d, *J* = 7.9 Hz, 1H, ArH), 7.54 (d, *J* = 8.5 Hz, 2H, ArH), 7.39-7.33 (m, 3H, ArH), 7.22 (t, *J* = 7.6 Hz, 1H, ArH), 7.03(t, *J* = 7.6 Hz, 1H, ArH), 4.57 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.0,

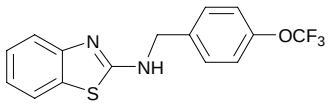
152.3, 138.4, 131.2, 130.4, 129.5, 125.5, 121.0, 120.9, 120.0, 118.1, 46.3; HRMS-EI (70 eV) m/z calcd for $C_{14}H_{12}N_2SBr$ $[M+H]^+$ 318.9905, found 318.9905.

N-(4-(trifluoromethyl)benzyl)benzo[d]thiazol-2-amine (8c)



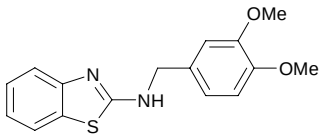
mp 164.2-164.8 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.63 (t, *J* = 5.9 Hz, 1H, NH), 7.72 (d, *J* = 8.2 Hz, 2H, ArH), 7.69 (dd, *J* = 7.9 Hz, 1H, ArH), 7.60 (d, *J* = 8.0 Hz, 2H, ArH), 7.38 (d, *J* = 8.0 Hz, 1H, ArH), 7.22 (t, *J* = 7.8 Hz, 1H, ArH), 7.03 (t, *J* = 7.7 Hz, 1H, ArH), 4.70 (d, *J* = 5.7 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.6, 152.8, 144.5, 130.9, 128.4, 128.1 (q, $J_{C\text{-}F}$ = 31.6 Hz), 126.0, 125.7 (q, $J_{C\text{-}F}$ = 3.6 Hz), 124.8 (q, $J_{C\text{-}F}$ = 270.0 Hz), 121.6, 121.5, 118.7, 47.1; FTIR (net, cm^{-1}) 3139, 3089, 1606, 1558, 1448, 1267; HRMS-EI (70 eV) m/z calcd for $C_{15}H_{12}N_2F_3S$ $[M+H]^+$ 309.0673, found 309.0678.

N-(4-(trifluoromethoxy)benzyl)benzo[d]thiazol-2-amine (9c)



mp 149.8-150.7 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.55 (t, *J* = 5.8 Hz, 1H, NH), 7.68 (d, *J* = 7.4 Hz, 1H, ArH), 7.50 (d, *J* = 8.5 Hz, 2H, ArH), 7.39-7.34 (m, 3H, ArH), 7.22 (t, *J* = 7.7 Hz, 1H, ArH), 7.03 (t, *J* = 7.6 Hz, 1H, ArH), 4.63 (d, *J* = 5.9 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.1, 152.4, 147.3, 138.6, 130.4, 129.2, 125.5, 121.1, 120.99, 120.95, 120.1 (q, *J*C-F = 254.6 Hz), 118.2, 46.4; FTIR (net, cm^{-1}) 3180, 3086, 1614, 1576, 1449, 1210; HRMS-EI (70 eV) m/z calcd for $C_{15}H_{12}N_2OSF_3$ $[M+H]^+$ 325.0622, found 325.0615.

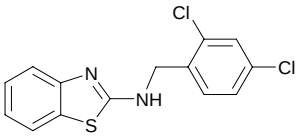
N-(3,4-dimethoxybenzyl)benzo[d]thiazol-2-amine (10c)



mp 145.8-146.6 °C; ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.57 (d, *J* = 7.7 Hz, 1H, ArH), 7.45 (d, *J* = 8.1 Hz, 1H, ArH), 7.27 (t, *J* = 6.6 Hz, 1H, ArH), 7.08 (t, *J* = 7.4 Hz, 1H, ArH), 6.93 (t, *J* = 6.8 Hz, 2H, ArH),

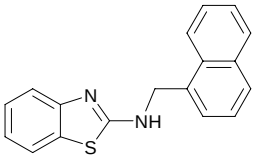
6.83 (d, *J* = 7.9 Hz, 1H, ArH), 6.43 (br s, 1H, NH), 4.55 (s, 2H, CH_2N), 3.87 (s, 3H, OCH_3), 3.82 (s, 3H, OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$) δ 167.9, 152.0, 149.2, 148.6, 130.1, 129.9, 125.9, 121.4, 120.7, 120.0, 118.6, 111.2, 110.8, 55.8, 55.7, 49.3; FTIR (net, cm^{-1}) 3184, 3085, 1598, 1549, 1444, 1260; HRMS-EI (70 eV) m/z calcd for $C_{16}H_{17}N_2O_2S$ $[M+H]^+$ 301.1011, found 301.1011.

N-(2,4-dichlorobenzyl)benzo[d]thiazol-2-amine (11c)



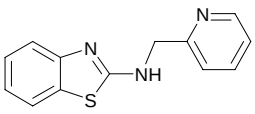
mp 144.8-145.2 °C; ^1H NMR (500 MHz, $CDCl_3$) δ 7.57 (d, *J* = 7.9 Hz, 1H, ArH), 7.48 (d, *J* = 8.0 Hz, 1H, ArH), 7.44 (d, *J* = 8.3 Hz, 1H, ArH), 7.41 (d, *J* = 2.2 Hz, 1H, ArH), 7.28 (t, *J* = 7.7 Hz, 1H, ArH), 7.21 (dd, *J* = 8.3 Hz and 2.1 Hz, 1H, ArH), 7.09 (t, *J* = 7.6 Hz, 1H, ArH), 6.27 (br s, 1H, NH), 4.70 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, $CDCl_3$) δ 167.5, 152.0, 134.2, 134.1, 133.7, 130.3, 130.2, 129.5, 127.4, 126.1, 121.8, 120.9, 118.9, 46.5; FTIR (net, cm^{-1}) 3178, 3083, 1606, 1585, 1445, 1221; HRMS-EI (70 eV) m/z calcd for $C_{11}H_{15}N_2S_2Cl_2$ $[M+H]^+$ 309.0054, found 309.0050.

N-(naphthalen-1-ylmethyl)benzo[d]thiazol-2-amine (12c)



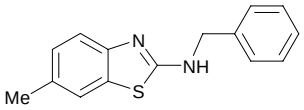
mp 150.1-150.8 °C; ^1H NMR (500 MHz, DMSO-d_6) δ 8.55 (t, *J* = 5.3 Hz, 1H, NH), 8.13 (d, *J* = 8.1 Hz, 1H, ArH), 7.98 (d, *J* = 7.8 Hz, 1H, ArH), 7.88 (d, *J* = 8.2 Hz, 1H, ArH), 7.68 (d, *J* = 7.9 Hz, 1H, ArH), 7.60-7.54 (m, 3H, ArH), 7.49 (t, *J* = 7.6 Hz, 1H, ArH), 7.41 (d, *J* = 8.0, 1H, ArH), 7.23 (t, *J* = 7.7 Hz, 1H, ArH), 7.03 (t, *J* = 7.6 Hz, 1H, ArH), 5.07 (d, *J* = 5.4 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.5, 152.9, 134.5, 133.8, 131.5, 131.0, 129.0, 128.3, 126.8, 126.4, 126.1, 126.0, 125.9, 124.0, 121.5, 121.4, 118.6, 45.9; FTIR (net, cm^{-1}) 3139, 3045, 1608, 1557, 1448, 1275; HRMS-EI (70 eV) m/z calcd for $C_{18}H_{15}N_2S$ $[M+H]^+$ 291.0956, found 291.0953.

N-(pyridin-2-ylmethyl)benzo[d]thiazol-2-amine (13c)



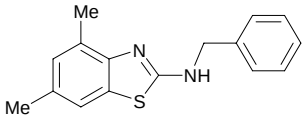
mp 156.9-157.5 °C; ^{1}H NMR (500 MHz, DMSO-d_6 at 353k) δ 8.54 (s, 1H, NH), 8.33 (brs, 1H, ArH), 7.74 (t, *J* = 7.6 Hz, 1H, ArH), 7.64 (d, *J* = 7.8 Hz, 1H, ArH), 7.42 (d, *J* = 7.5 Hz, 1H, ArH), 7.37 (d, *J* = 7.9 Hz, 1H, ArH), 7.25 (t, *J* = 5.5 Hz, 1H, ArH), 7.20 (t, *J* = 7.6 Hz, 1H, ArH), 7.00 (t, *J* = 7.6 Hz, 1H, ArH), 4.69 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6 at 353k) δ 160.0, 157.8, 152.1, 148.4, 136.2, 130.2, 125.0, 121.8, 121.0, 120.6, 120.4, 117.8, 48.9; FTIR (net, cm^{-1}) 3241, 3036, 1596, 1567, 1455, 1251; HRMS-EI (70 eV) m/z calcd for $C_{13}H_{12}N_3S$ $[M+H]^+$ 242.0752, found 242.0751.

N-benzyl-6-methylbenzo[d]thiazol-2-amine (14c)[6]



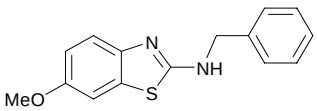
mp 179.7-180.2 °C (lit.[6] mp176-178 °C); ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.39 (t, *J* = 5.7 Hz, 1H, NH), 7.46 (s, 1H, ArH), 7.39-7.33 (m, 4H, ArH), 7.28-7.24 (m, 2H, ArH), 7.02 (d, *J* = 8.0 Hz, 1H, ArH), 4.58 (s, 2H, CH_2N), 2.31(s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO-d_6) δ 165.4, 150.3, 139.0, 130.5, 130.1, 128.3, 127.4, 127.0, 126.5, 120.9, 117.8, 47.1, 20.7.

N-benzyl-4,6-dimethylbenzo[d]thiazol-2-amine (15c)



mp 115.0-115.8 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.37 (t, *J* = 5.7 Hz, 1H, NH), 7.40 (d, *J* = 7.5 Hz, 2H, ArH), 7.34 (t, *J* = 7.5 Hz, 2H, ArH), 7.26 (t, *J* = 6.6 Hz, 2H, ArH), 6.87 (s, 1H, ArH), 4.56 (d, *J* = 5.8 Hz, 2H, CH_2N), 2.39 (s, 3H, CH_3) 2.27 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO-d_6) δ 164.9, 149.2, 139.1, 129.9, 129.8, 128.3, 127.6, 127.4, 127.0, 126.8, 118.2, 47.4, 20.7, 18.0; FTIR (net, cm^{-1}) 3222, 3029, 1594, 1561, 1451, 1274; HRMS-EI (70 eV) m/z calcd for $C_{16}H_{17}N_2S$ $[M+H]^+$ 269.1112, found 269.1111.

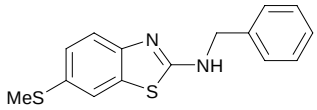
N-benzyl-6-methoxybenzo[d]thiazol-2-amine (16c)



mp 133.4-134.7 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.28 (t, *J* = 5.8 Hz, 1H, NH), 7.38-7.24 (m, 7H,

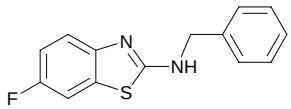
ArH), 6.82 (dd, J = 8.7 Hz and 2.6 Hz, 1H, ArH), 4.56 (d, J = 5.7 Hz, 2H, CH_2N), 3.73 (s, 3H, OCH_3); ^{13}C NMR (125 MHz, DMSO-d_6) δ 164.6, 154.4,146.5, 139.1, 131.4, 128.3, 127.3, 126.9, 118.4, 112.9, 105.6, 55.5, 47.2; FTIR (net, cm^{-1}) 3171, 3092, 1606, 1557, 1445, 1261; HRMS-EI (70 eV) m/z calcd for $C_{15}H_{15}N_2OS$ $[M+H]^+$ 271.0905, found 271.0909.

N-benzyl-6-(methylthio)benzo[d]thiazol-2-amine (17c)



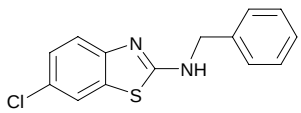
mp 176.8-177.2 °C; ^1H NMR (500 MHz, DMSO-d_6) δ 8.51 (t, J = 5.6 Hz, 1H, NH), 7.66 (d, J = 1.3 Hz, 1H, ArH), 7.38-7.31 (m, 5H, ArH), 7.27 (t, J = 7.0 Hz, 1H, ArH), 7.16 (dd, J = 8.3 Hz and 1.6 Hz, 1H, ArH), 4.58 (d, J = 5.6 Hz, 2H, CH_2N), 2.46 (s, 3H, SCH_3); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.0, 150.6, 138.8, 131.6, 129.3, 128.3, 127.4, 127.0, 125.6, 119.9, 118.3, 47.2, 16.6; FTIR (net, cm^{-1}) 3174, 3088, 1603, 1567, 1445, 1260; HRMS-EI (70 eV) m/z calcd for $C_{15}H_{15}N_2S$ $[M+H]^+$ 287.0677, found 287.0686.

N-benzyl-6-fluorobenzo[d]thiazol-2-amine (18c)[2]



mp 191.1-192.0 °C (lit.[2] mp180-184 °C); ^1H NMR (500 MHz, DMSO-d_6) δ 8.49 (t, J = 5.9 Hz, 1H, NH), 7.61 (dd, J = 8.7 Hz and 2.8 Hz, 1H, ArH), 7.38-7.33 (m, 5H, ArH), 7.27 (t, J = 6.9 Hz, 1H, ArH), 7.05 (dd, J = 9.1 Hz and 2.7 Hz, 1H, ArH), 4.58 (s, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d6) δ 166.0 (d, $J_{C\text{-}F}$ = 13.8 Hz), 157.2 (d, $J_{C\text{-}F}$ = 233.8 Hz), 149.1, 138.8, 131.4 (d, $J_{C\text{-}F}$ = 10.8 Hz), 128.4, 127.4, 127.0, 118.5 (d, $J_{C\text{-}F}$ = 8.6 Hz), 112.8 (d, $J_{C\text{-}F}$ = 23.5 Hz), 107.8 (d, $J_{C\text{-}F}$ = 27.1 Hz), 47.1; HRMS-EI (70 eV) m/z calcd for $C_{14}H_{12}N_2SF$ $[M+H]^+$ 259.0705, found 259.0706.

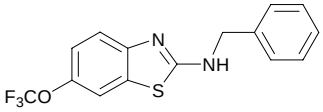
N-benzyl-6-chlorobenzo[d]thiazol-2-amine (19c)



mp 194.7-195.1 °C; ^1H NMR (500 MHz, DMSO-d_6) δ 8.62 (s, 1H, NH), 7.80 (s, 1H, ArH), 7.37-7.22 (m, 7H, ArH), 4.59 (d, J = 4.3 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 166.8, 151.4, 138.7,

132.1, 128.4, 127.4, 127.0, 125.6, 124.7, 120.6, 118.9, 47.2; FTIR (net, cm^{-1}) 3183, 3086, 1616, 1573, 1447, 1263; HRMS-EI (70 eV) m/z calcd for $C_{14}H_{12}N_2SCl$ $[M+H]^+$ 275.0410, found 275.0407.

N-benzyl-6-(trifluoromethoxy)benzo[d]thiazol-2-amine (20c)



mp 176.2-177.1 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.67 (t, J = 5.4 Hz, 1H, NH), 7.81 (s, 1H, ArH), 7.43 (d, J = 8.6 Hz, 1H, ArH), 7.38-7.34 (m, 4H, ArH), 7.27 (t, J = 6.8 Hz, 1H, ArH), 7.20 (d, J = 8.4 Hz, 1H, ArH), 4.61 (d, J = 4.9 Hz, 2H, CH_2N); ^{13}C NMR (125 MHz, DMSO-d_6) δ 167.4, 151.6, 142.2, 138.6, 131.5, 128.3, 127.3, 127.0, 120.2 (q, $J_{C\text{-}F}$ = 254.0 Hz), 119.0, 118.3, 114.4, 47.2; FTIR (net, cm^{-1}) 3195, 3094, 1620, 1587, 1461, 1250; HRMS-EI (70 eV) m/z calcd for $C_{15}H_{12}N_2OF_3S$ $[M+H]^+$ 325.0622, found 325.0630.

References

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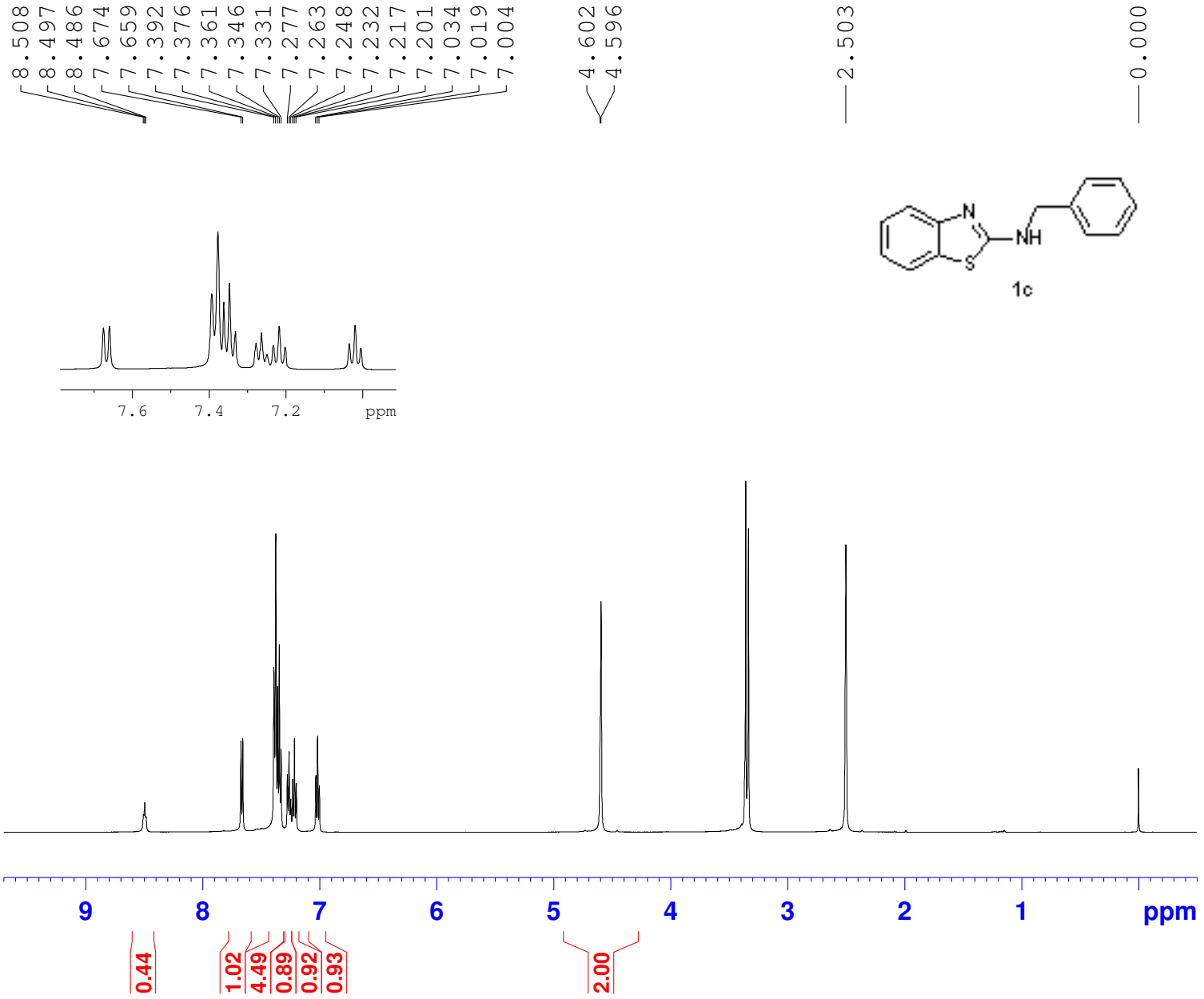
N-benzylbenzo[d]thiazol-2-amine
PROTON DMSO-d6



Current Data Parameters
NAME Lifeng-1H
EXPNO 125
PROCNO 1

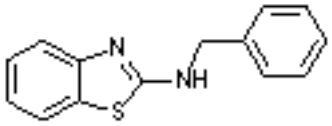
F2 - Acquisition Parameters
Date_ 20100729
Time 2.10
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 203
DW 48.400 usec
DE 6.50 usec
TE 298.7 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 11.50 usec
PL1 1.10 dB
PL1W 16.96364784 W
SFO1 500.0330879 MHz

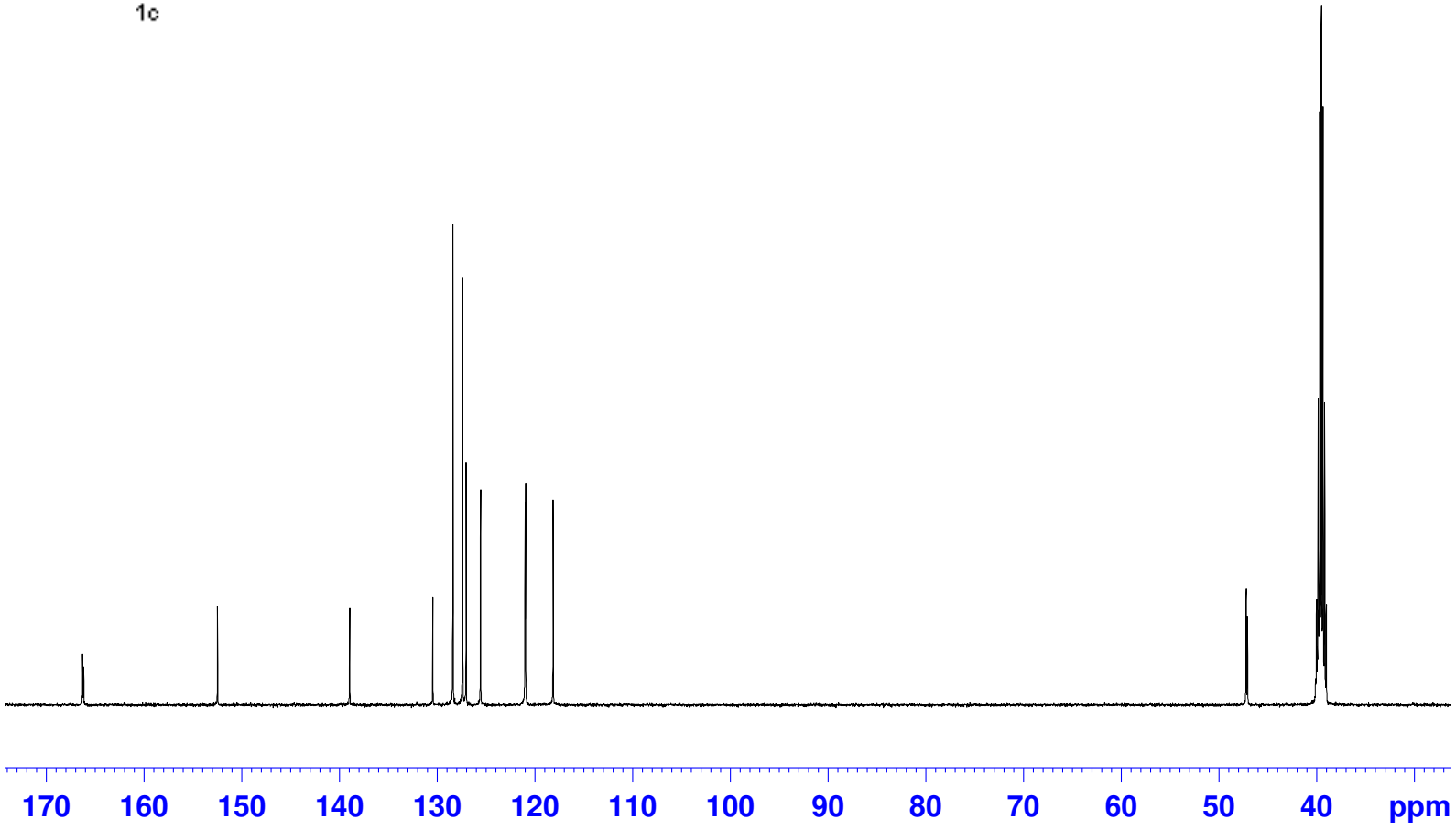
F2 - Processing parameters
SI 32768
SF 500.0300013 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

N-benzylbenzo[d]thiazol-2-amine
C13CPD DMSO-d6

166.24
152.42
138.90
130.39
128.34
127.35
126.99
125.51
120.95
120.89
118.08
47.20
39.50



1c



Current Data Parameters
NAME Lifeng-1H
EXPNO 126
PROCNO 1

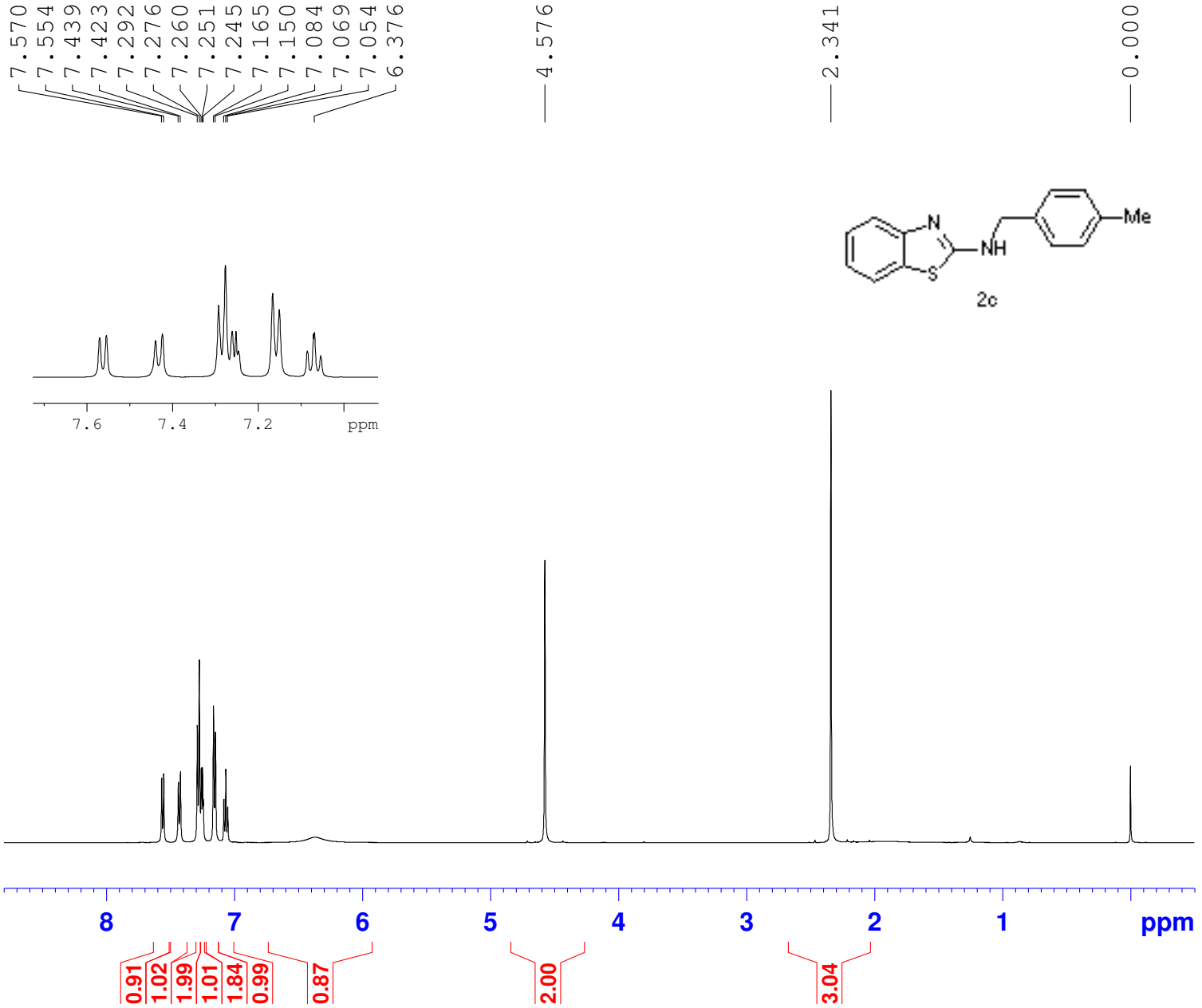
F2 - Acquisition Parameters
Date_ 20100729
Time 4.40
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 1024
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 300.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

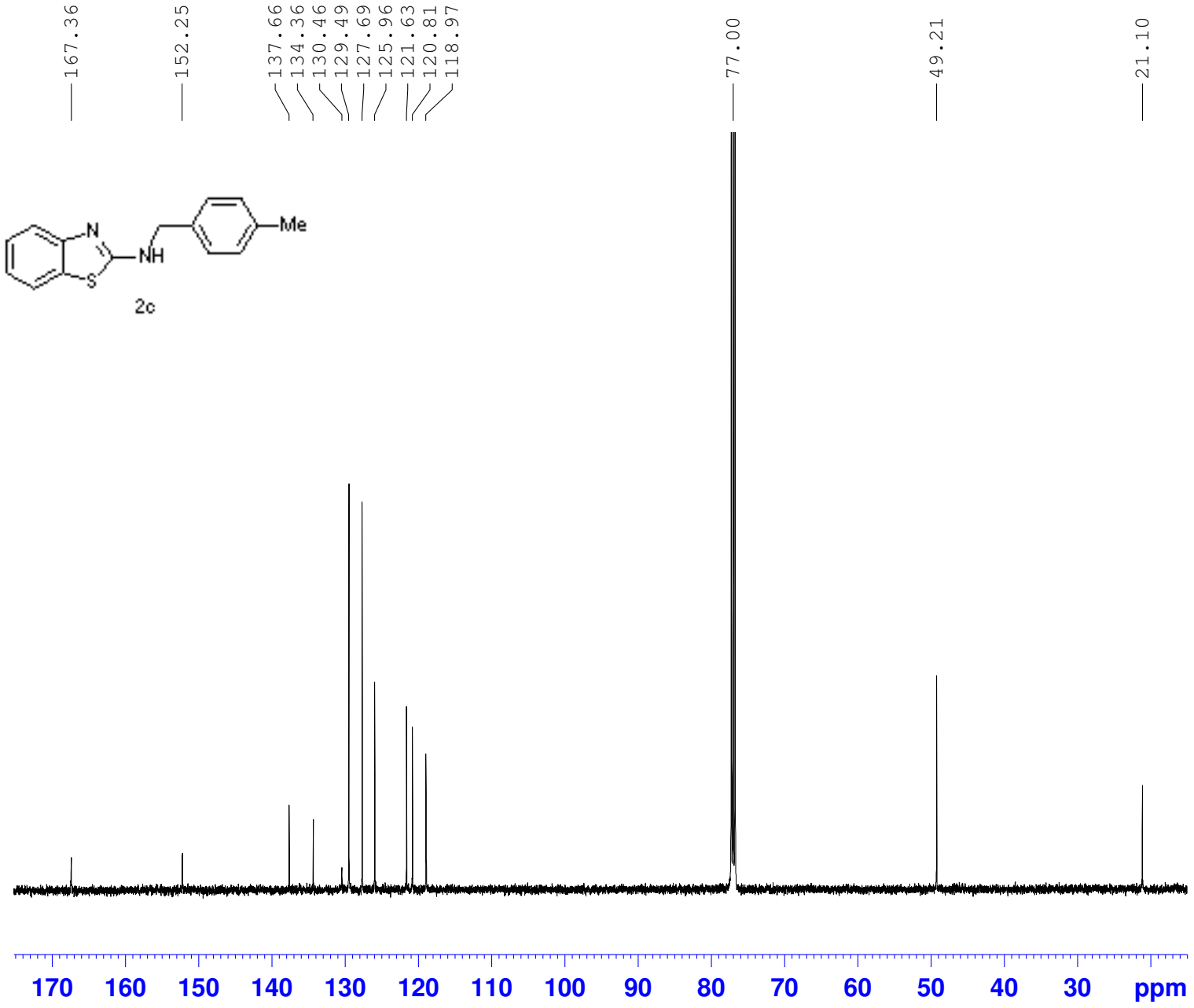
F2 - Processing parameters
SI 32768
SF 125.7327077 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

N-(4-methylbenzyl)benzo[d]thiazol-2-amine
PROTON CDCl3



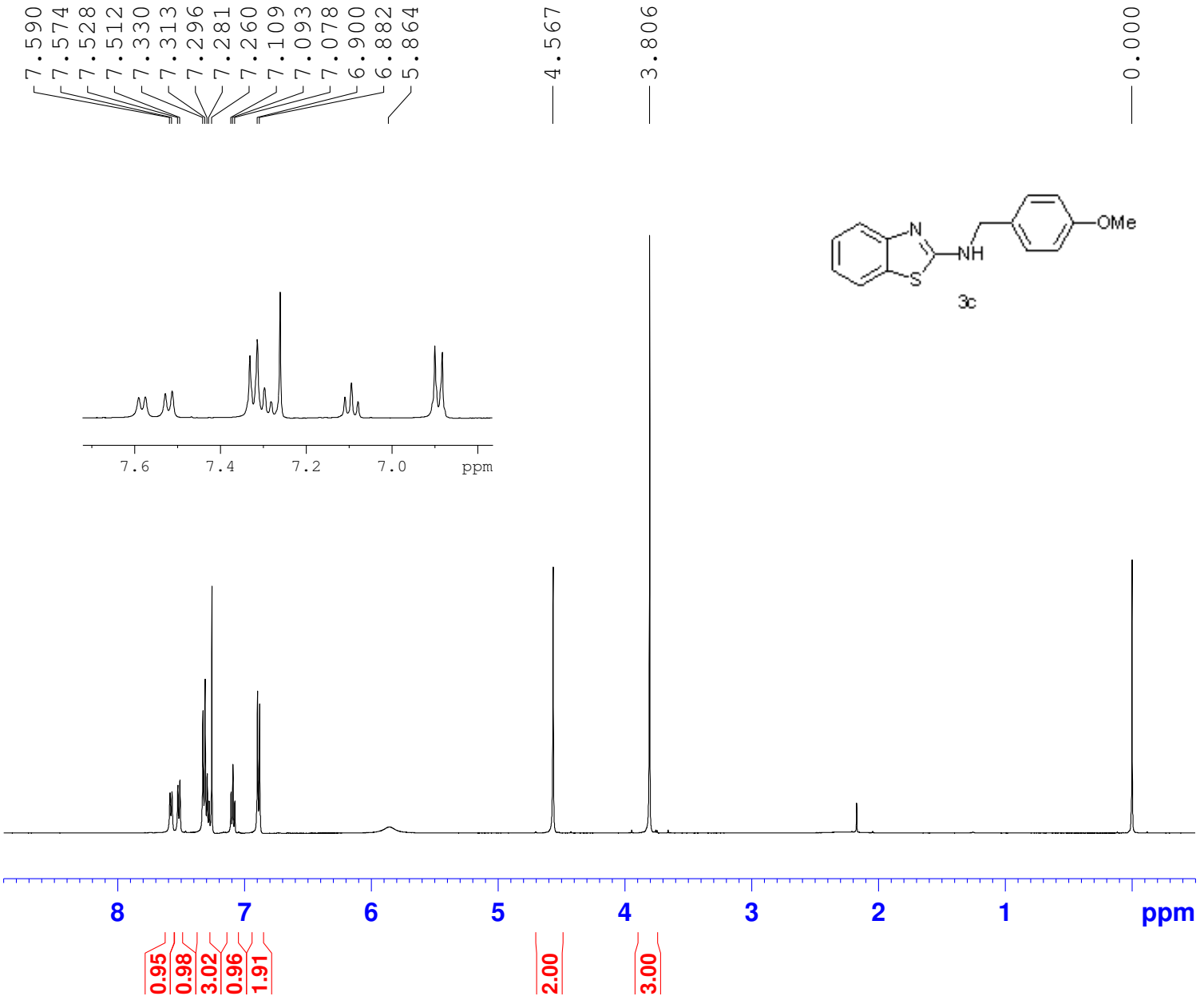

```
Current Data Parameters
NAME            Lifeng-1H
EXPNO                  99
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100708
Time                1.48
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10330.578 Hz
FIDRES         0.157632 Hz
AQ             3.1719923 sec
RG                   101
DW                48.400 usec
DE                 6.50 usec
TE                295.6 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                11.50 usec
PL1                1.10 dB
PL1W        16.96364784 W
SFO1        500.0330879 MHz

F2 - Processing parameters
SI                 32768
SF          500.0300155 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

N-(4-methylbenzyl)benzo[d]thiazol-2-amine
C13CPD CDCl3



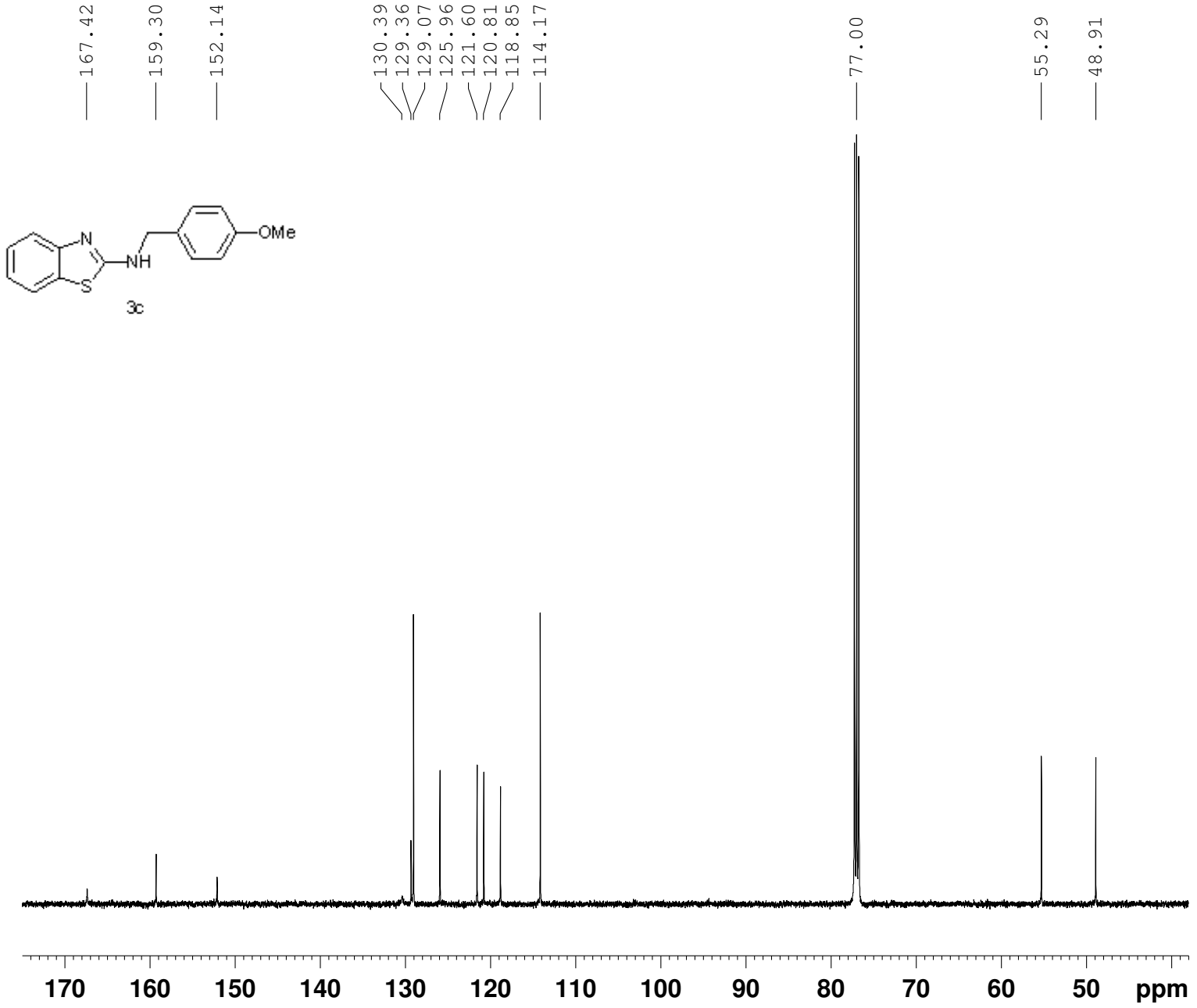

```
Current Data Parameters
NAME          Lifeng-1H
EXPNO               100
PROCNO                1

F2 - Acquisition Parameters
Date_          20100708
Time               3.49
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgpg30
TD              65536
SOLVENT          CDCl3
NS                2048
DS                   4
SWH          29761.904 Hz
FIDRES        0.454131 Hz
AQ           1.1010548 sec
RG                 203
DW              16.800 usec
DE               6.50 usec
TE              297.7 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                  1

======== CHANNEL f1 ========
NUC1               13C
P1               9.60 usec
PL1             -1.00 dB
PL1W       125.85865021 W
SFO1        125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2               1H
PCPD2           80.00 usec
PL2              1.10 dB
PL12            17.95 dB
PL13            17.95 dB
PL2W       16.96364784 W
PL12W       0.35036376 W
PL13W       0.35036376 W
SFO2       500.0320001 MHz

F2 - Processing parameters
SI               32768
SF          125.7326440 MHz
WDW                 EM
SSB      0
LB                1.00 Hz
GB       0
PC                1.40
```

N-(4-methoxybenzyl)benzo[d]thiazol-2-amine
PROTON CDCL3



NAME	600-700
EXPNO	100
PROCNO	1
Date_	20110302
Time	13.40
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	181
DW	48.400 usec
DE	6.50 usec
TE	294.0 K
D1	1.00000000 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
SI	32768
SF	500.0300117 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

N-(4-methoxybenzo[d]thiazol-2-amine
C13CPD CDCl3



Current Data Parameters
NAME Lifeng-13C
EXPNO 660
PROCNO 1

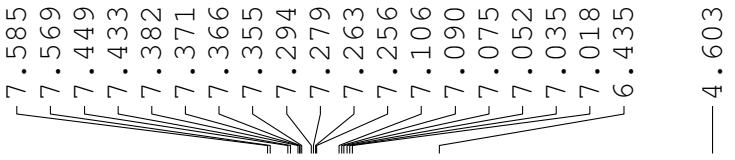
F2 - Acquisition Parameters
Date_ 20110301
Time 13.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2048
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 295.6 K
D1 2.00000000 sec
D11 0.03000000 sec

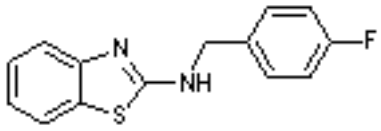
======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PLW1 125.86000061 W
SFO1 125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PLW2 16.96400070 W
PLW12 0.35054001 W
PLW13 0.22434001 W
SFO2 500.0320001 MHz

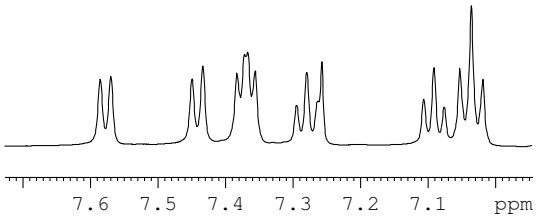
F2 - Processing parameters
SI 32768
SF 125.7327685 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

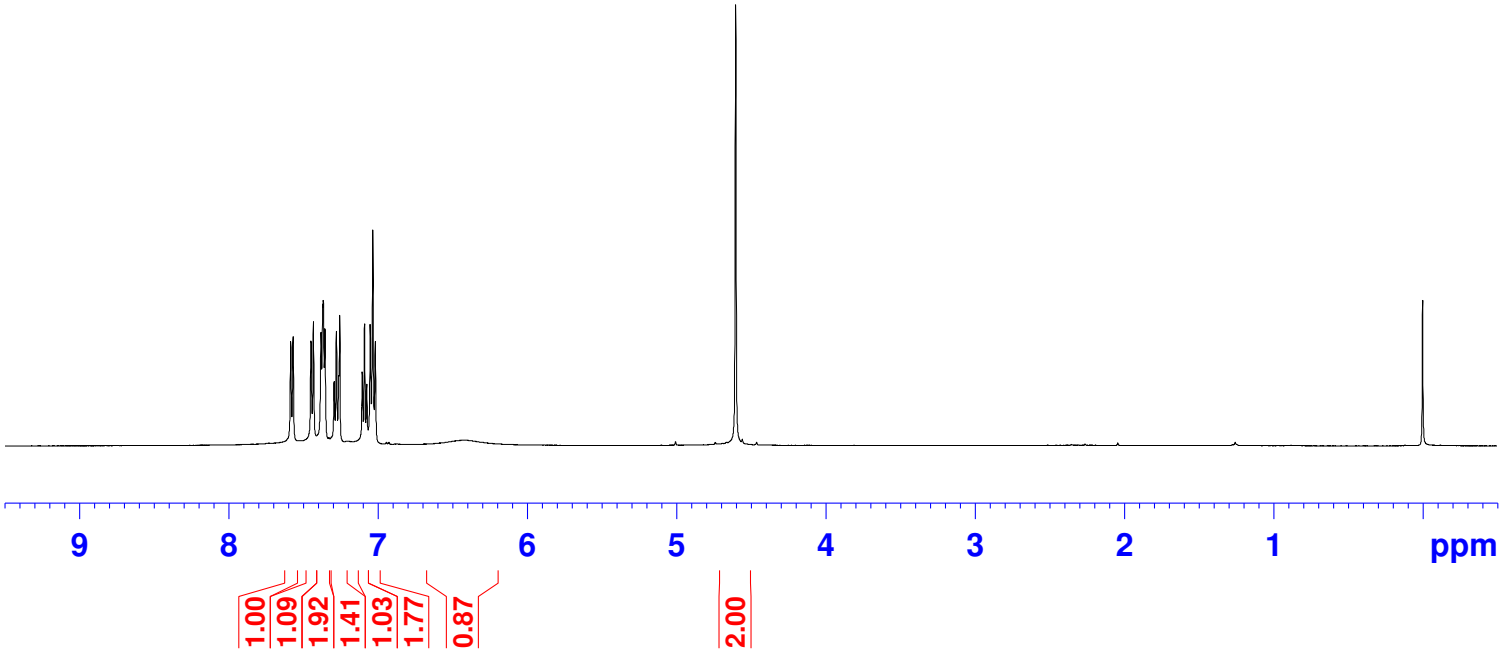
N-(4-fluorobenzyl)benzo[d]thiazol-2-amine
PROTON CDCl3





4c

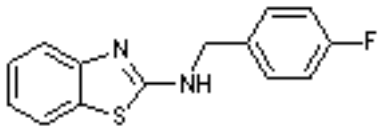




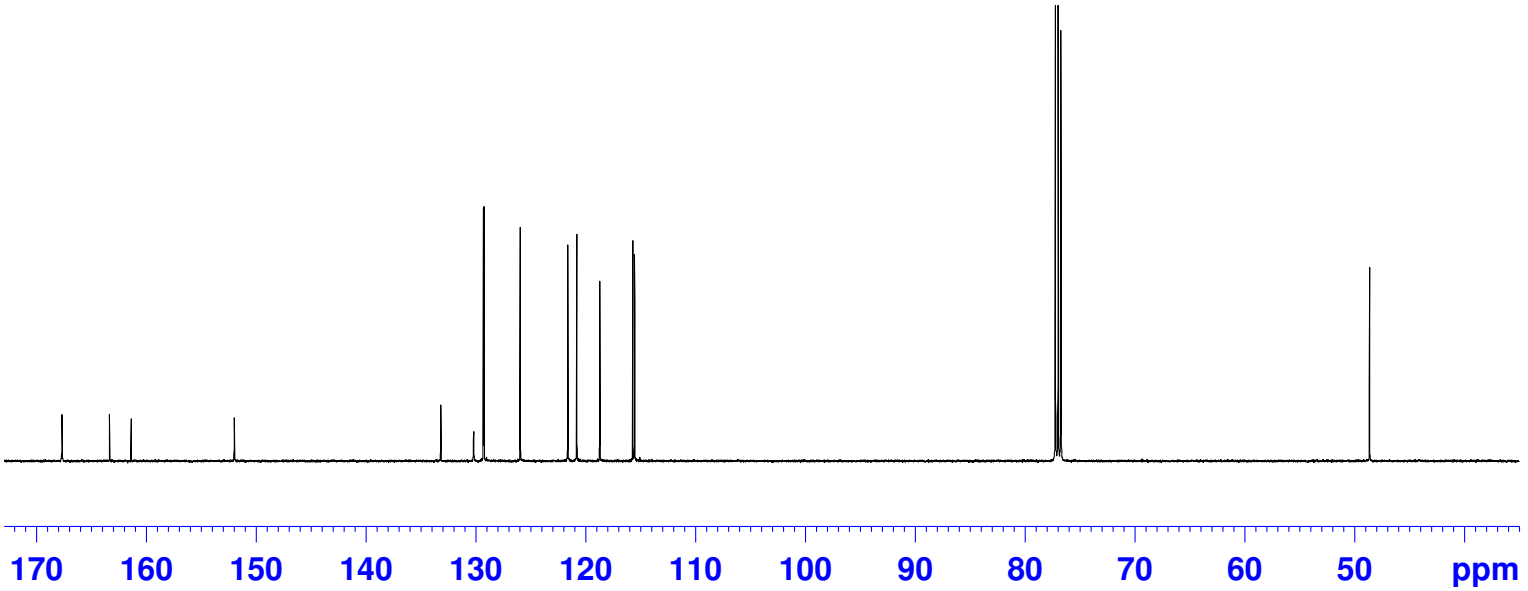

```
Current Data Parameters
NAME                  Lifeng-1H
EXPNO                       584
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20101121
Time                       0.03
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                    zg30
TD                        65536
SOLVENT                   CDCl3
NS                           16
DS                            2
SWH                 10330.578 Hz
FIDRES               0.157632 Hz
AQ                   3.1719923 sec
RG                           64
DW                      48.400 usec
DE                       6.50 usec
TE                      294.4 K
D1                  1.00000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                         1H
P1                       11.50 usec
PL1                       1.10 dB
PL1W               16.96364784 W
SFO1               500.0330879 MHz

F2 - Processing parameters
SI                        32768
SF                 500.0300139 MHz
WDW                          EM
SSB          0
LB                        0.30 Hz
GB           0
PC                        1.00
```

N-(4-fluorobenzyl)benzo[d]thiazol-2-amine
C13CPD CDCl3

167.67
163.33
161.38
152.03
133.24
133.21
130.23
129.34
129.28
125.99
121.65
120.83
118.74
115.73
115.56
77.00
48.64



4c

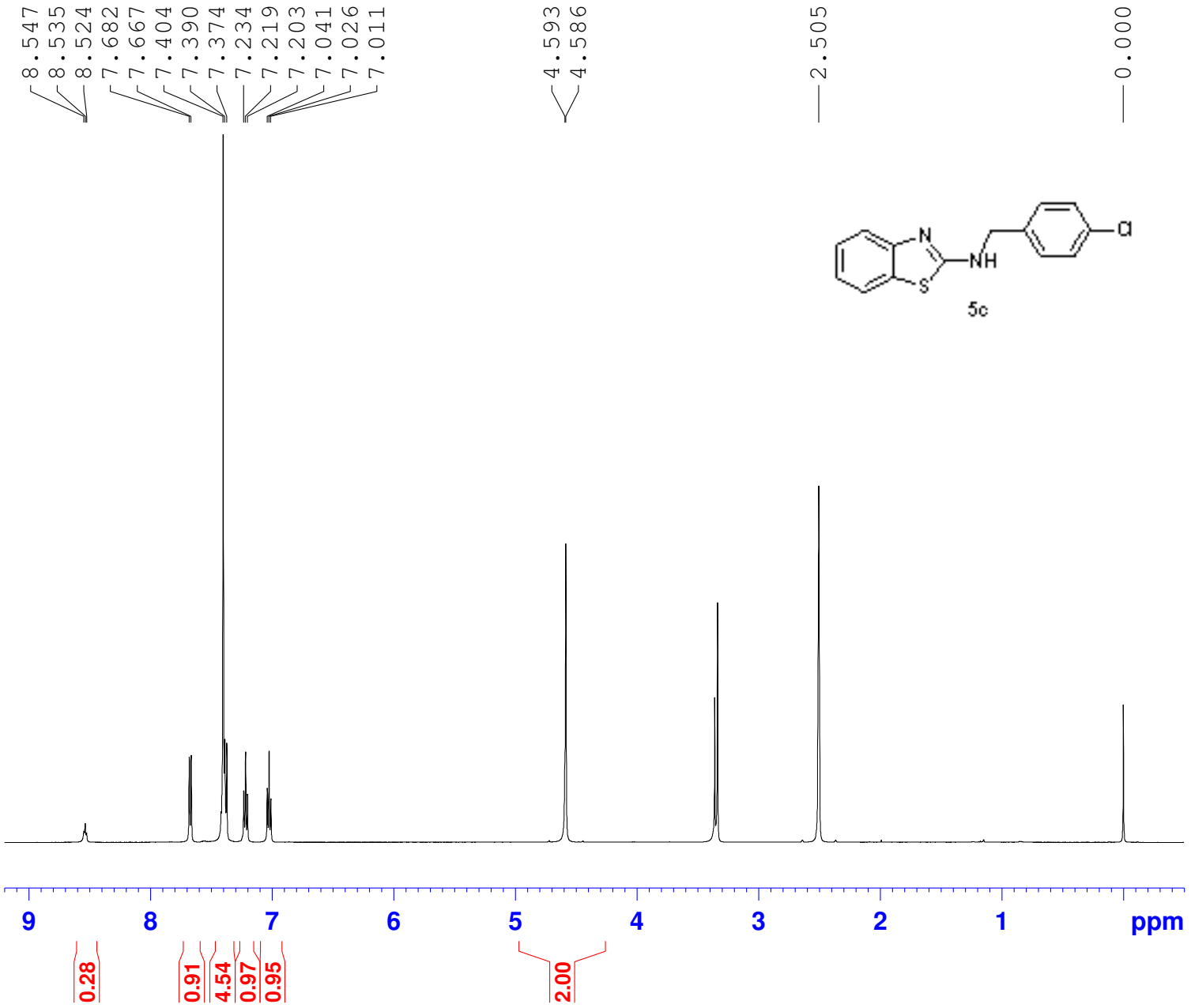


NAME	3
EXPNO	610
PROCNO	1
Date_	20101229
Time	20.07
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	1868
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	296.7 K
D1	2.00000000 sec
D11	0.03000000 sec

======== CHANNEL f1 ========

NUC1	13C
P1	9.60 usec
SI	32768
SF	125.7320527 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-(4-chlorobenzyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6



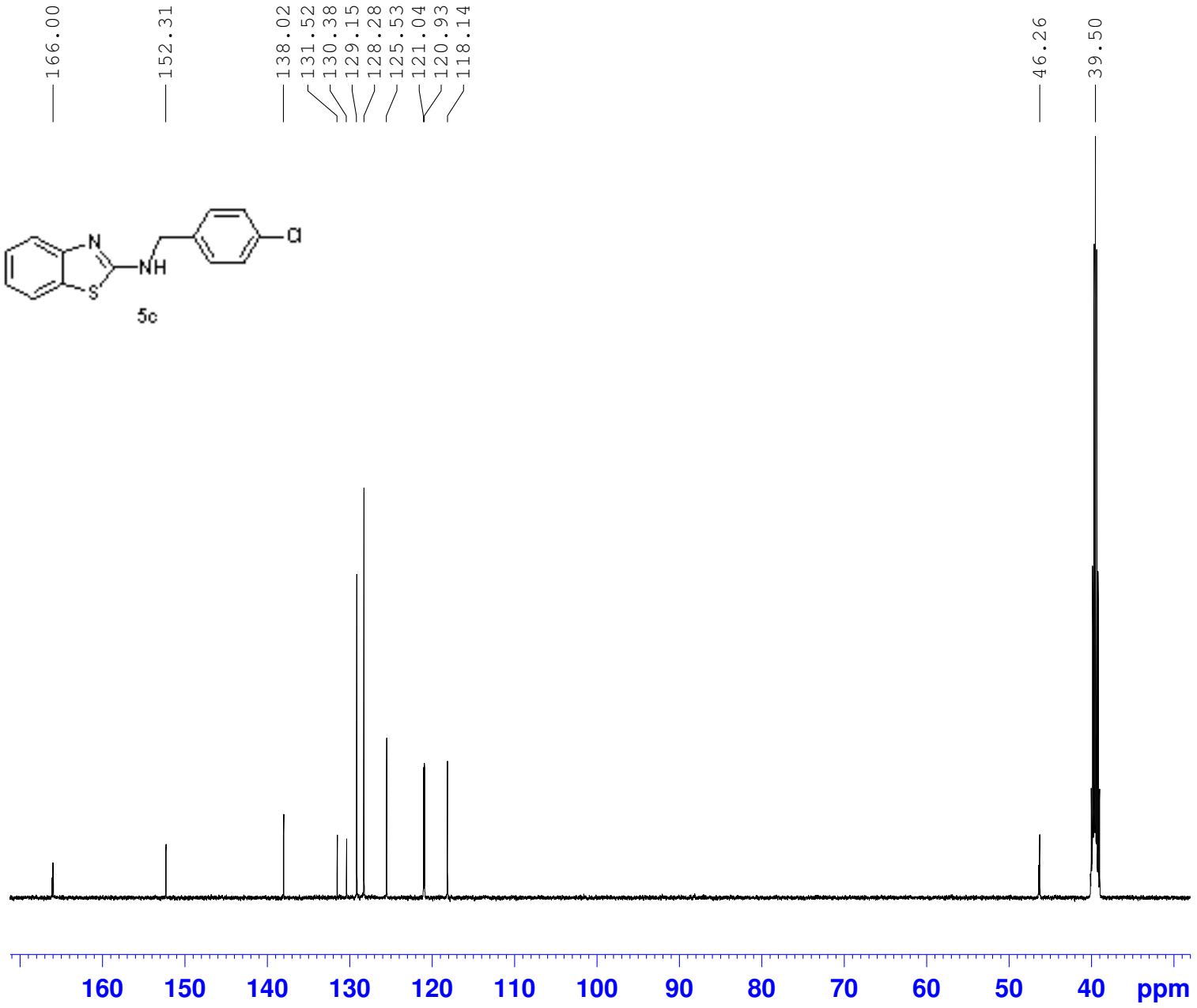
Current Data Parameters
NAME Lifeng-1H
EXPNO 101
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100708
Time 4.40
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 128
DW 48.400 usec
DE 6.50 usec
TE 295.9 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 11.50 usec
PL1 1.10 dB
PL1W 16.96364784 W
SFO1 500.0330879 MHz

F2 - Processing parameters
SI 32768
SF 500.0323755 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

N-(4-chlorobenzyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6

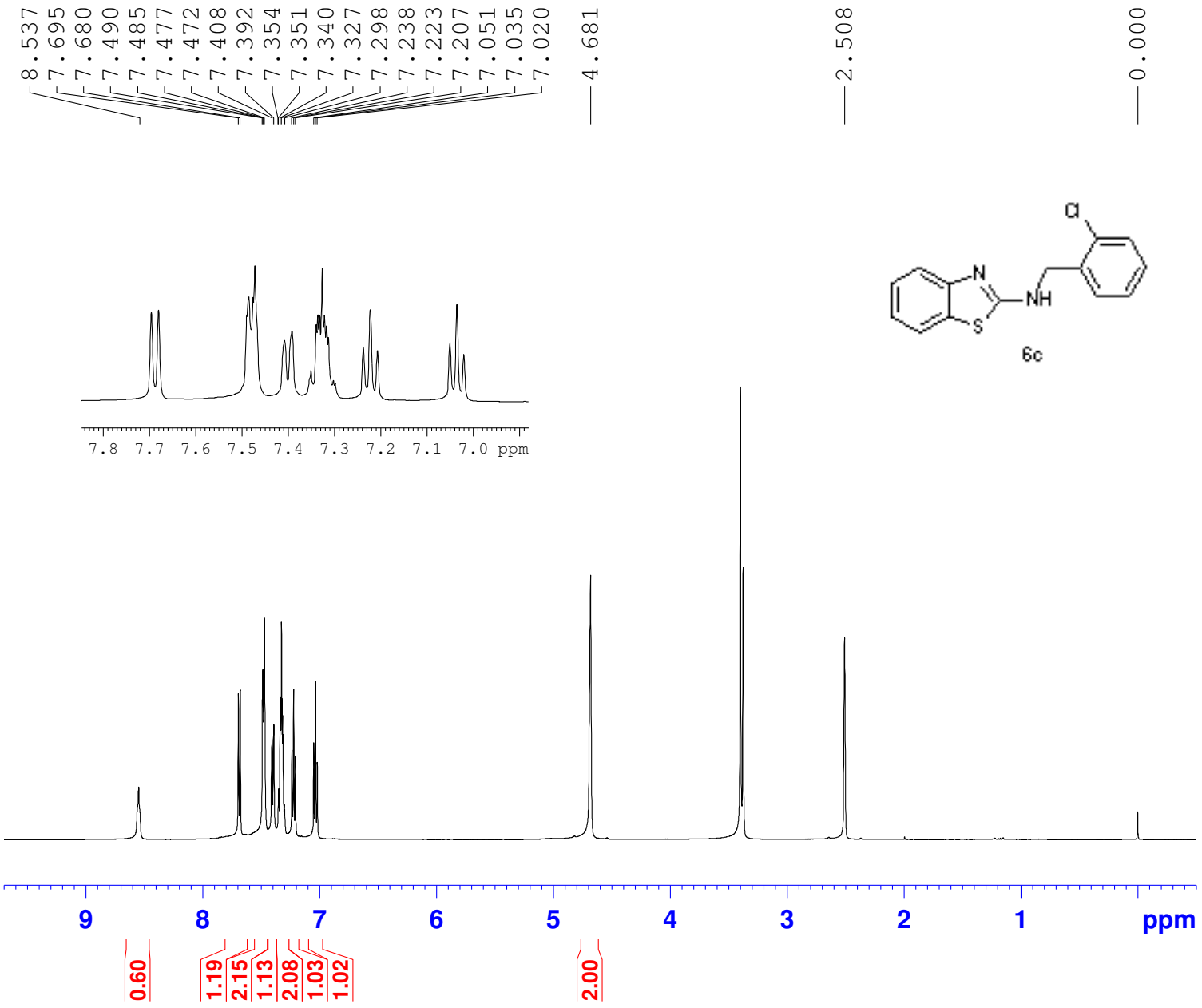


Current Data Parameters
NAME Lifeng-1H
EXPNO 102
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100708
Time 18.05
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 1024
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
NUC1 13C
P1 9.60 usec
PLW1 -1.00000000 W
SFO1 125.7452168 MHz
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PLW2 -1.00000000 W
PLW12 -1.00000000 W
PLW13 -1.00000000 W
SFO2 500.0320001 MHz

F2 - Processing parameters
SI 32768
SF 125.7327077 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

N-(2-chlorobenzyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6



Current Data Parameters

NAME	Lifeng-1H
EXPNO	107
PROCNO	1

F2 - Acquisition Parameters

Date_	20100708
Time	16.10
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	50.8
DW	48.400 usec
DE	6.50 usec
TE	295.4 K
D1	1.00000000 sec
TD0	1

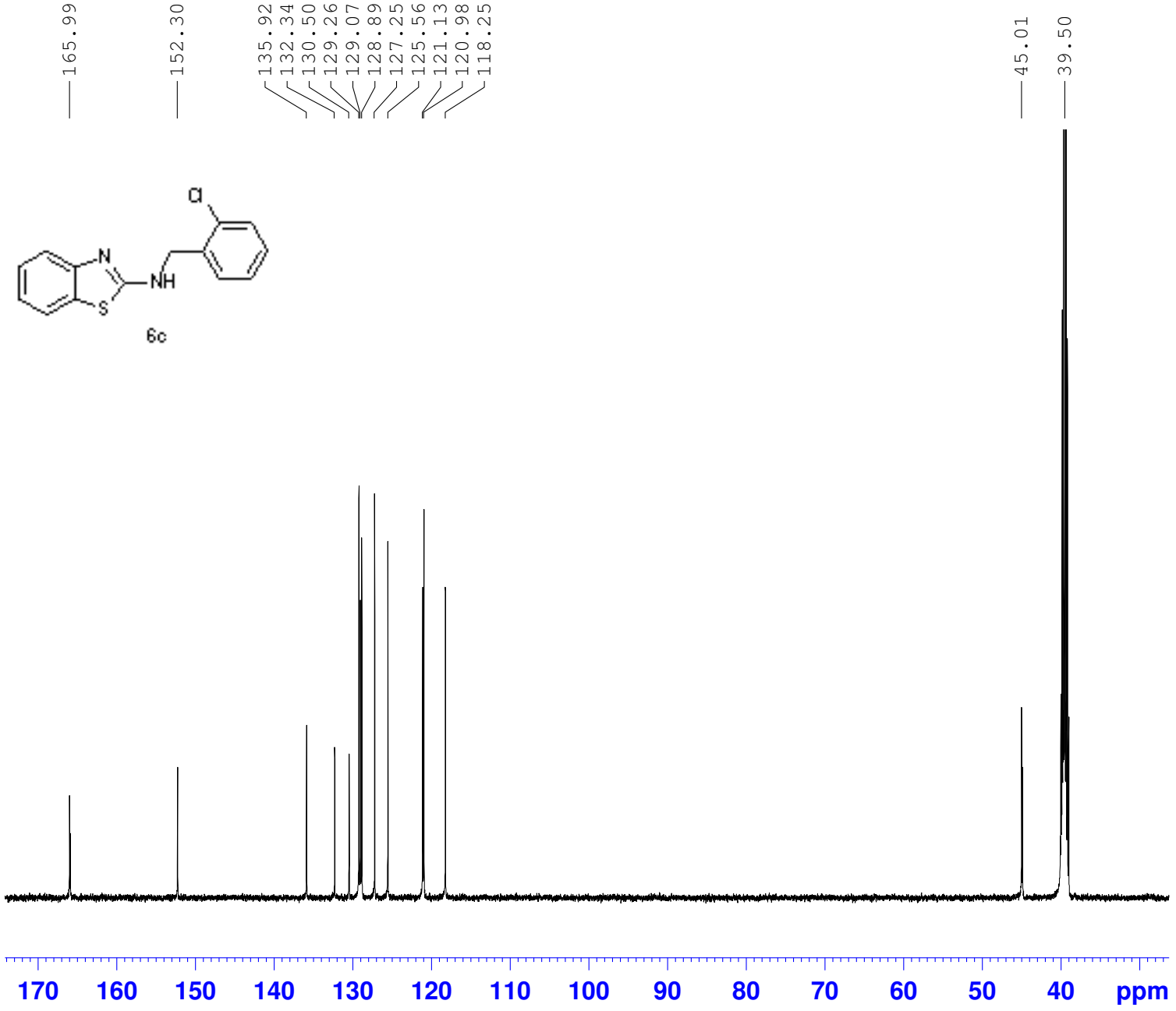
======== CHANNEL f1 ========

NUC1	1H
P1	11.50 usec
PL1	1.10 dB
PL1W	16.96364784 W
SFO1	500.0330879 MHz

F2 - Processing parameters

SI	32768
SF	500.0299986 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

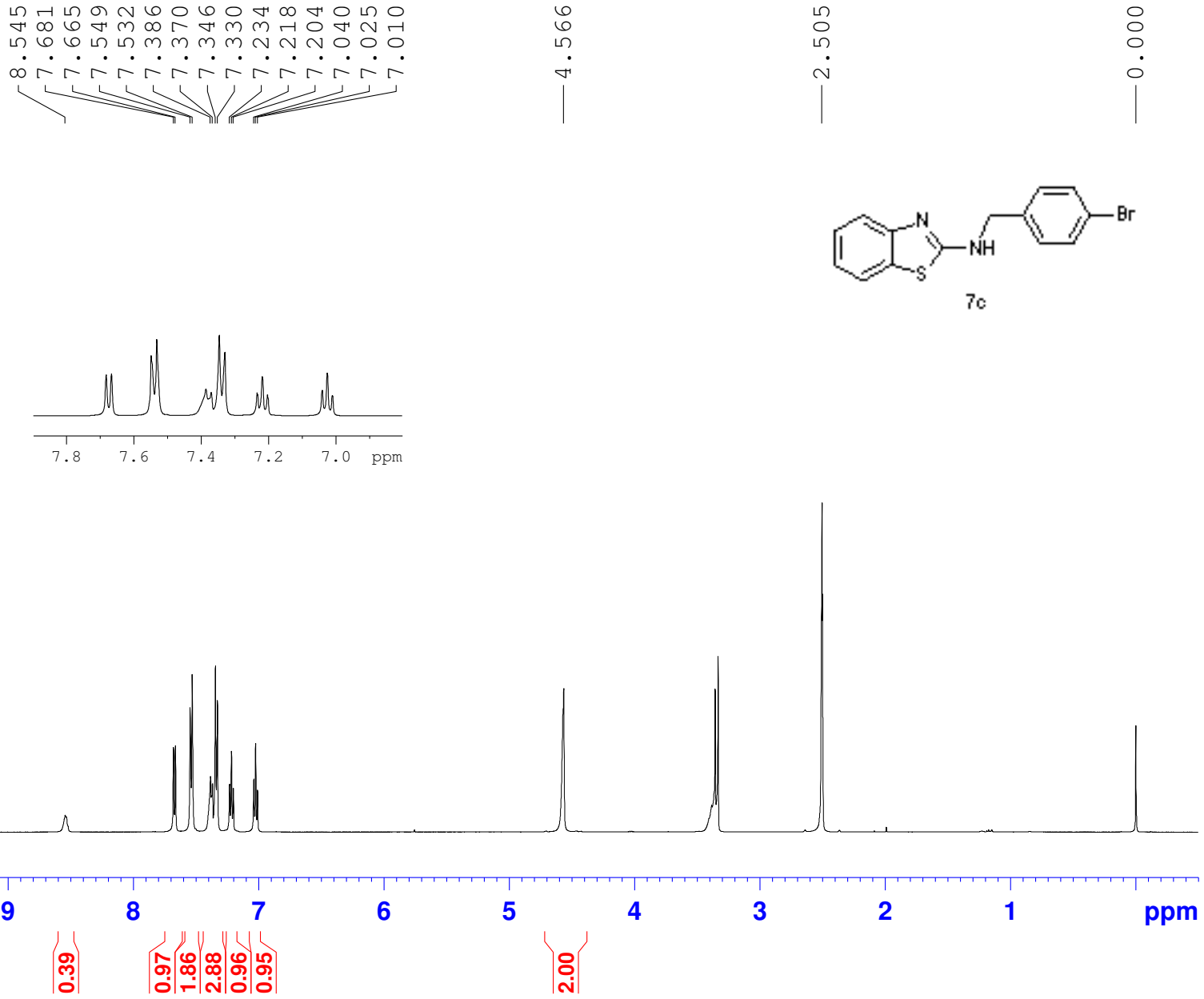
N-(2-chlorobenzyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



BRUKER

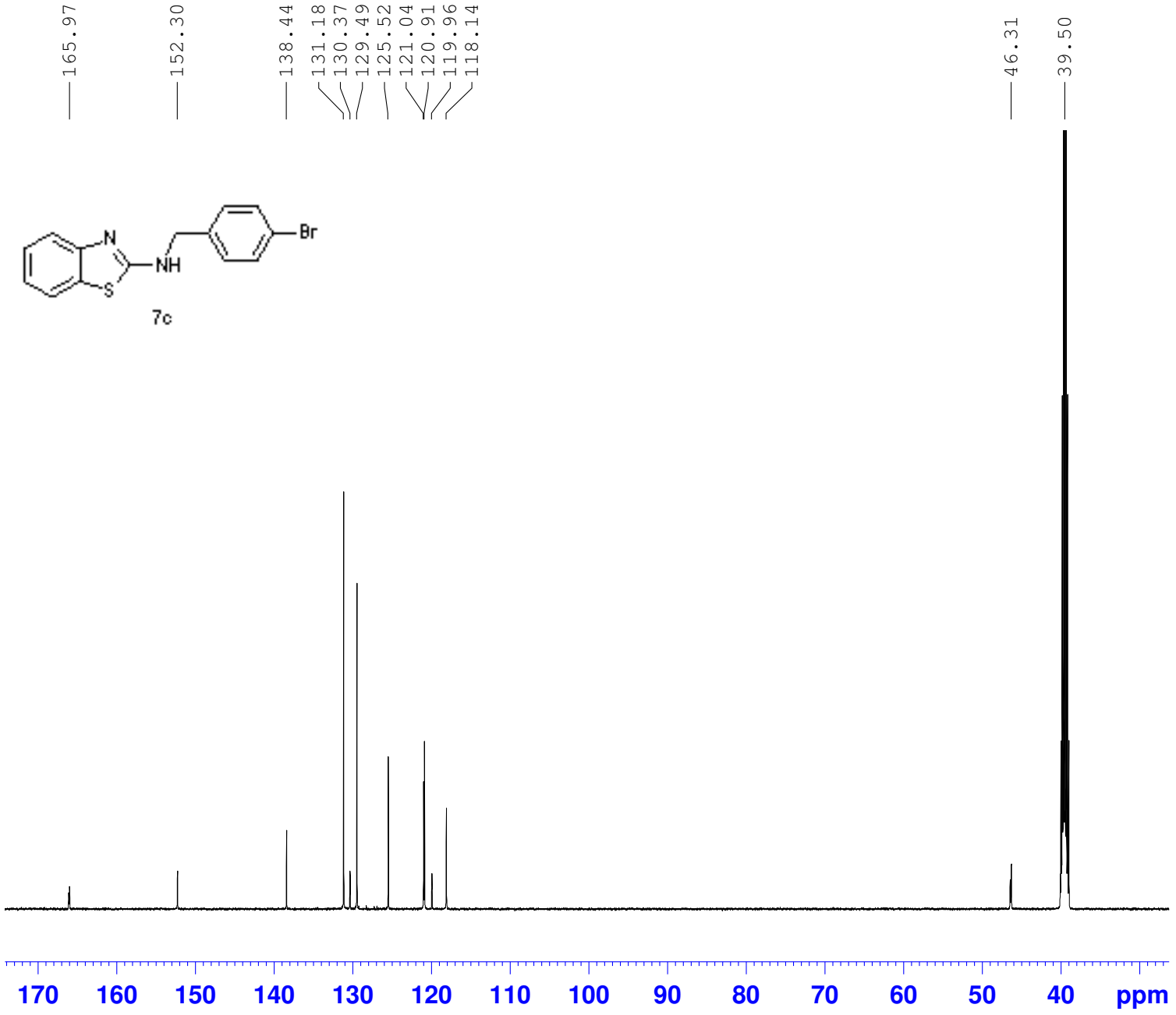
```
Current Data Parameters
NAME                  Lifeng-1H
EXPNO                       109
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20100708
Time                      17.07
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                    DMSO
NS                         1024
DS                            4
SWH                   29761.904 Hz
FIDRES                 0.454131 Hz
AQ                    1.1010548 sec
RG                          203
DW                       16.800 usec
DE                        6.50 usec
TE                       297.7 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                        13C
P1                        9.60 usec
PL1                      -1.00 dB
PL1W              125.85865021 W
SFO1               125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                        1H
PCPD2                    80.00 usec
PL2                       1.10 dB
PL12                     17.95 dB
PL13                     17.95 dB
PL2W              16.96364784 W
PL12W              0.35036376 W
PL13W              0.35036376 W
SFO2              500.0320001 MHz

F2 - Processing parameters
SI                        32768
SF                 125.7327039 MHz
WDW                          EM
SSB             0
LB                        1.00 Hz
GB              0
PC                        1.40
```

N-(4-bromobenzyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6




```
Current Data Parameters
NAME                  Lifeng-1H
EXPNO                       103
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20100708
Time                       5.04
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                   zg30
TD                       65536
SOLVENT                   DMSO
NS                          16
DS                           2
SWH                10330.578 Hz
FIDRES              0.157632 Hz
AQ                  3.1719923 sec
RG                         71.8
DW                    48.400 usec
DE                     6.50 usec
TE                     296.0 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                     11.50 usec
PL1                     1.10 dB
PL1W              16.96364784 W
SFO1              500.0330879 MHz

F2 - Processing parameters
SI                       32768
SF                500.0300006 MHz
WDW                         EM
SSB          0
LB                      0.30 Hz
GB           0
PC                      1.00
```

N-(4-bromobenzyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



Current Data Parameters
NAME Lifeng-1H
EXPNO 104
PROCNO 1

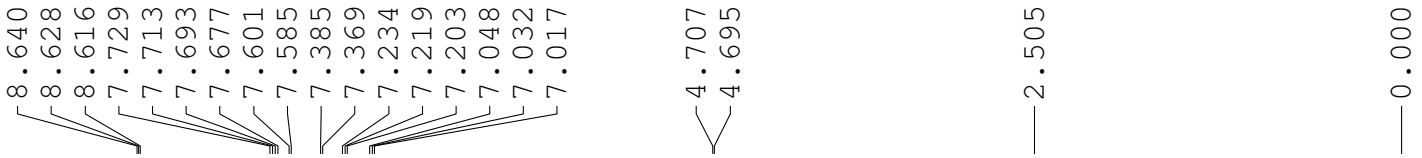
F2 - Acquisition Parameters
Date_ 20100708
Time 10.38
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 6144
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

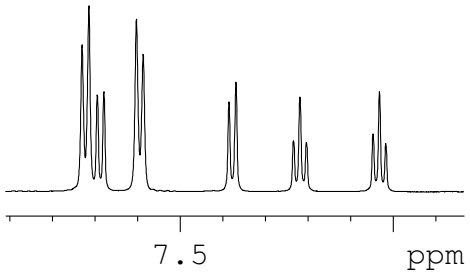
======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

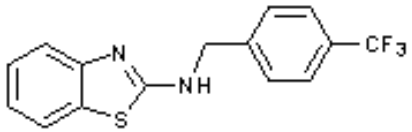
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

F2 - Processing parameters
SI 32768
SF 125.7327104 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

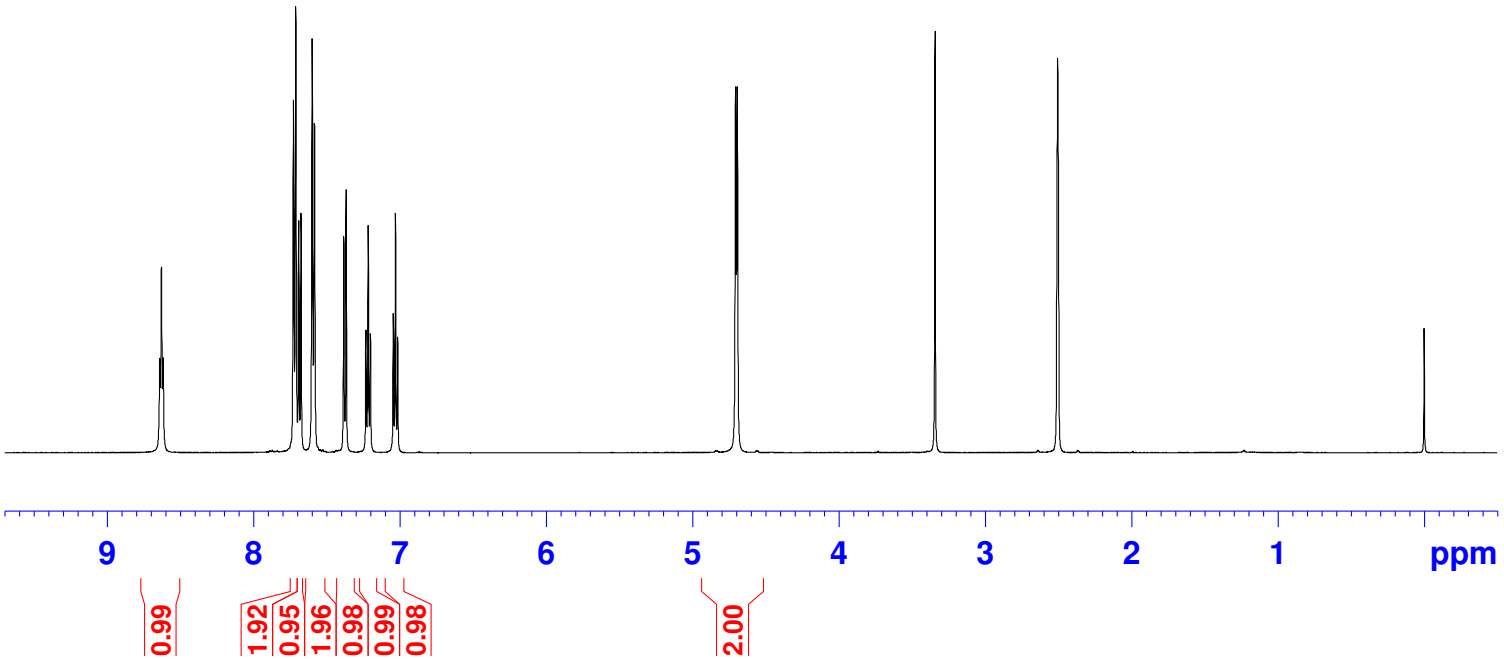
N-(4-(trifluoromethyl)benyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6





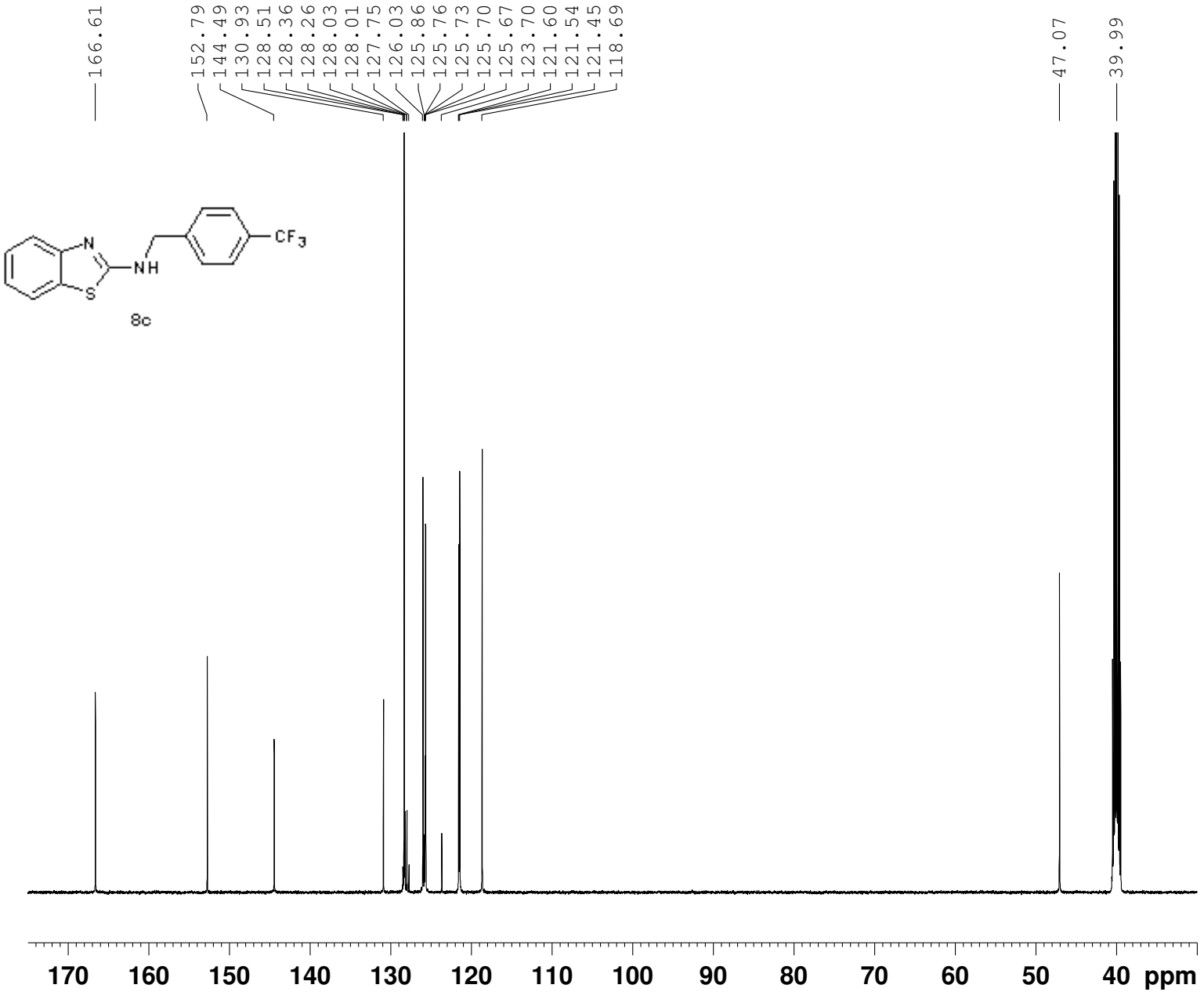


8c



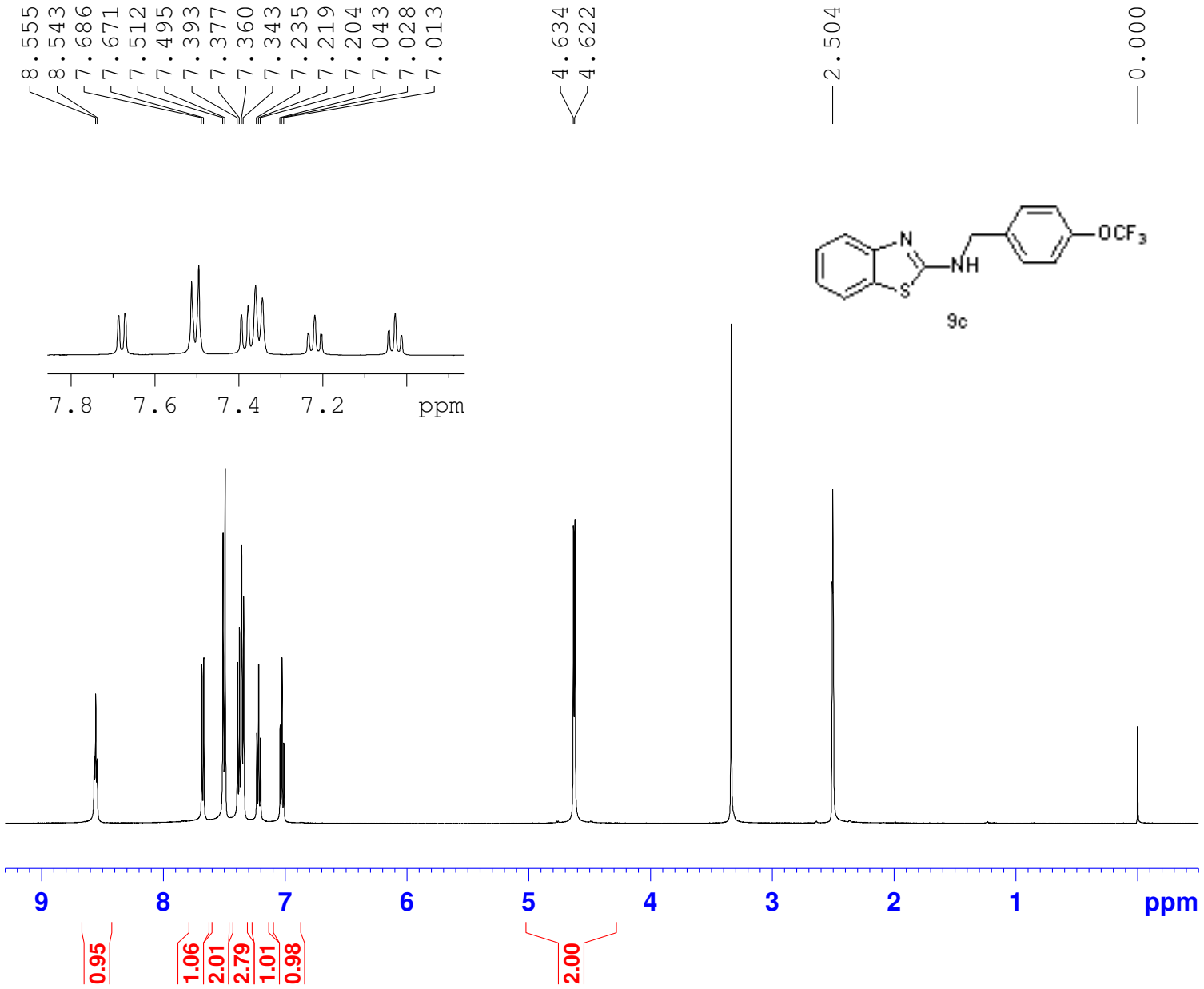
NAME	Shx-1
EXPNO	570
PROCNO	1
Date_	20101121
Time	1.08
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	64
DW	48.400 usec
DE	6.50 usec
TE	294.5 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
PL1	1.10 dB
PL1W	16.96364784 W
SFO1	500.0330879 MHz
SI	32768
SF	500.0300000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

N-(4-(trifluoromethyl)benzyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



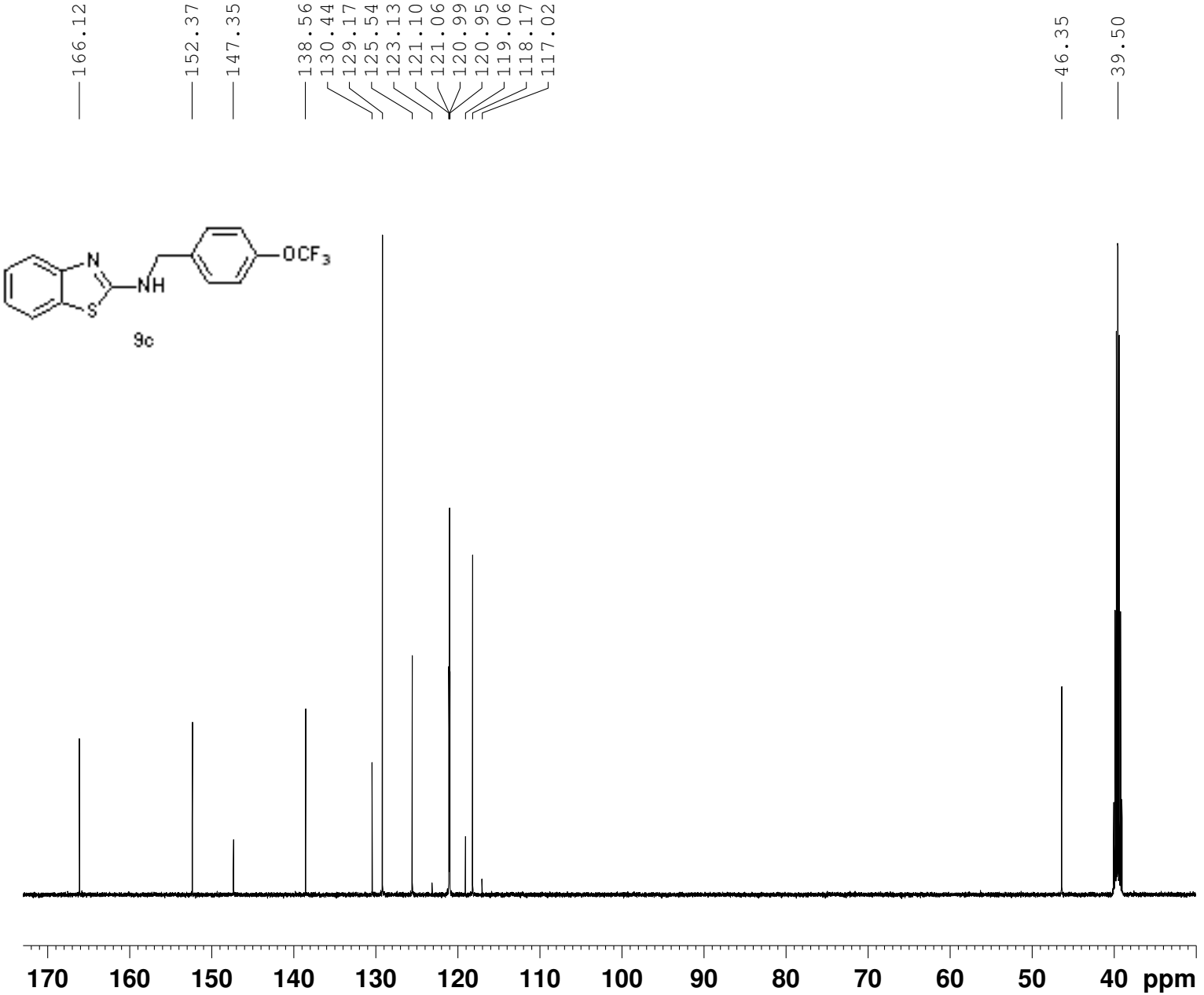
NAME	Shx-1
EXPNO	577
PROCNO	1
Date_	20101122
Time	4.41
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	4287
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	296.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
PL1	-1.00 dB
PL1W	125.85865021 W
SFO1	125.7452168 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.10 dB
PL12	17.95 dB
PL13	17.95 dB
PL2W	16.96364784 W
PL12W	0.35036376 W
PL13W	0.35036376 W
SFO2	500.0320001 MHz
SI	32768
SF	125.7326450 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-(4-trifluoromethoxy)benzyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6



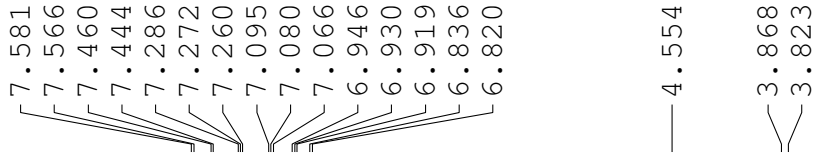
NAME	Shx-1
EXPNO	580
PROCNO	1
Date_	20101122
Time	5.11
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	64
DW	48.400 usec
DE	6.50 usec
TE	295.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
PL1	1.10 dB
PL1W	16.96364784 W
SFO1	500.0330879 MHz
SI	32768
SF	500.0300008 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

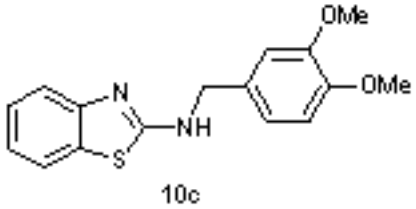
N-(4-trifluoromethoxy)benzyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



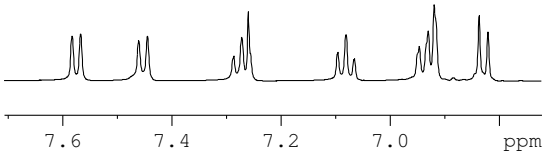
NAME	Shx-1
EXPNO	572
PROCNO	1
Date_	20101121
Time	16.50
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	2048
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	296.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
PL1	-1.00 dB
PL1W	125.85865021 W
SFO1	125.7452168 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.10 dB
PL12	17.95 dB
PL13	17.95 dB
PL2W	16.96364784 W
PL12W	0.35036376 W
PL13W	0.35036376 W
SFO2	500.0320001 MHz
SI	32768
SF	125.7327054 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

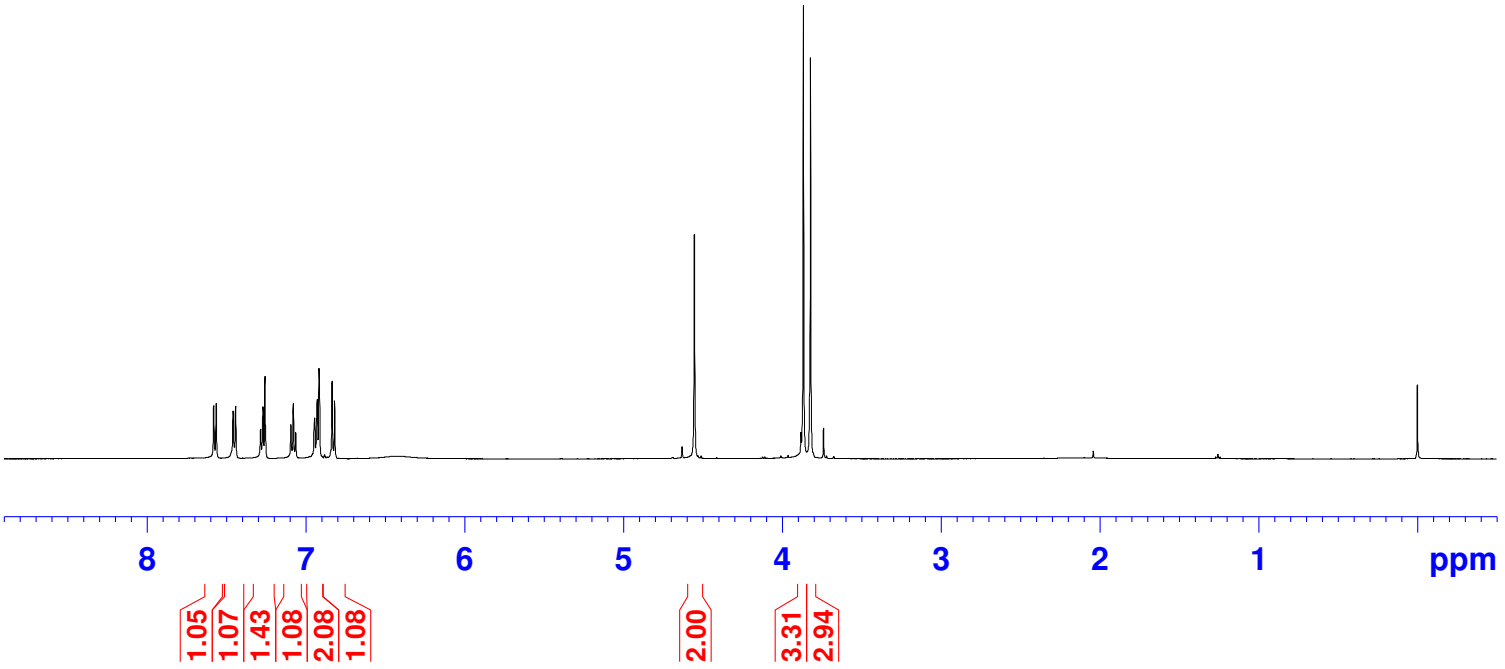
N-(3,4-dimethoxybenzyl)benzo[d]thiazol-2-amine
PROTON CDCl3





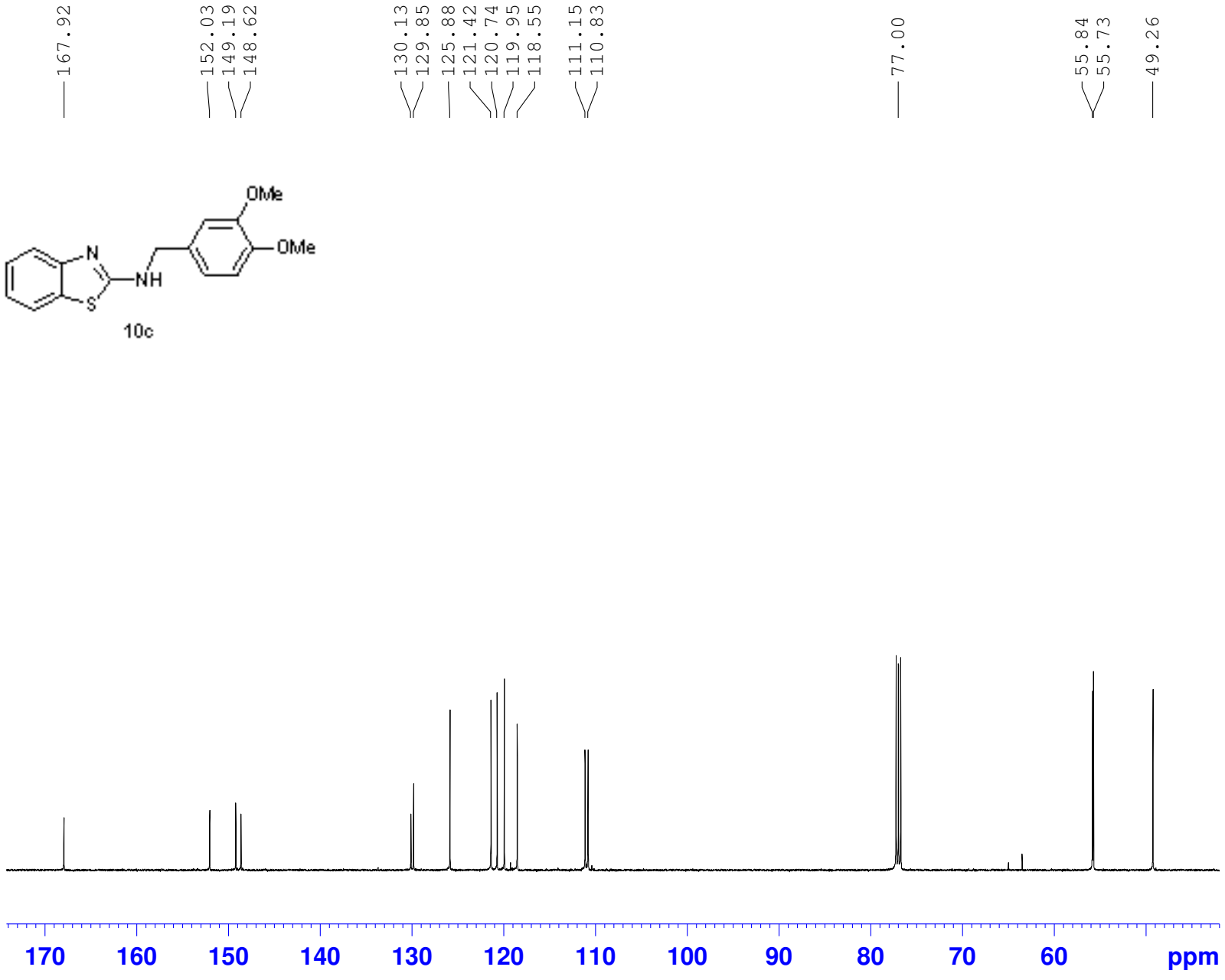
10c






```
Current Data Parameters
NAME                  Lifeng-1H
EXPNO                       115
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20100808
Time                       0.58
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                   zg30
TD                       65536
SOLVENT                  CDCl3
NS                          16
DS                           2
SWH                  10330.578 Hz
FIDRES                0.157632 Hz
AQ                    3.1719923 sec
RG                          36
DW                       48.400 usec
DE                        6.50 usec
TE                       296.9 K
D1                    1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                       11.50 usec
PL1                       1.10 dB
PL1W                16.96364784 W
SFO1                500.0330879 MHz

F2 - Processing parameters
SI                       32768
SF                  500.0300106 MHz
WDW                         EM
SSB                  0
LB                        0.30 Hz
GB                   0
PC                        1.00
```

N-(3,4-dimethoxylbenzyl)benzo[d]thiazol-2-amine
C13CPD CDCl3



Current Data Parameters
NAME Lifeng-1H
EXPNO 116
PROCNO 1

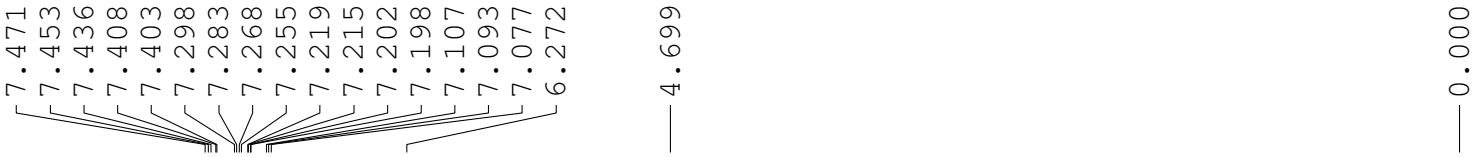
F2 - Acquisition Parameters
Date_ 20100808
Time 16.53
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

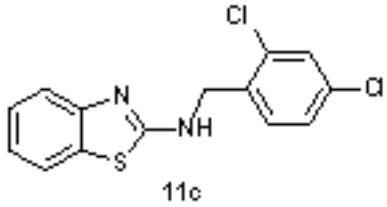
======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

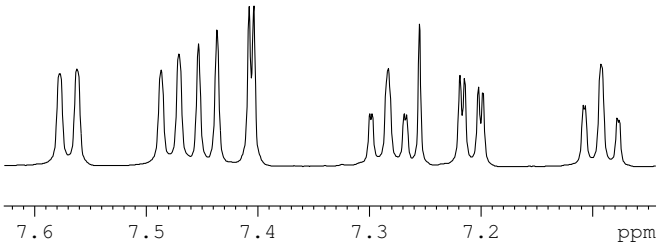
F2 - Processing parameters
SI 32768
SF 125.7326564 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

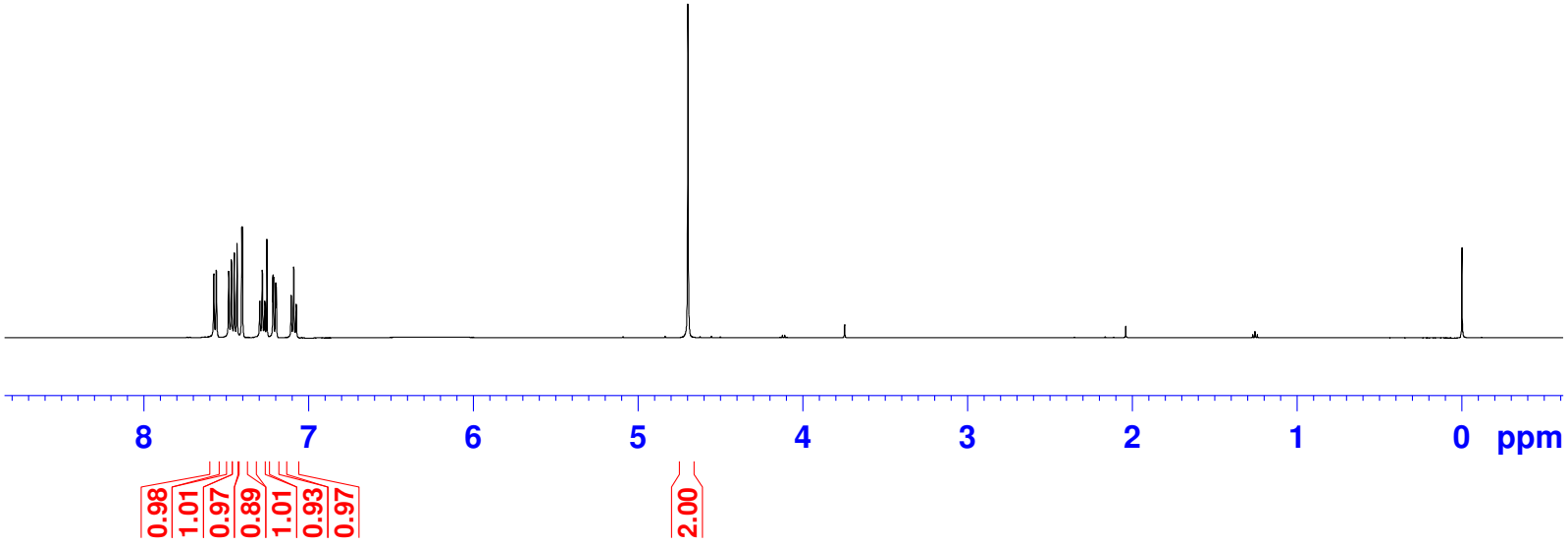
N-(2,4-dichlorobenzyl)benzo[d]thiazol-2-amine
PROTON CDCl3





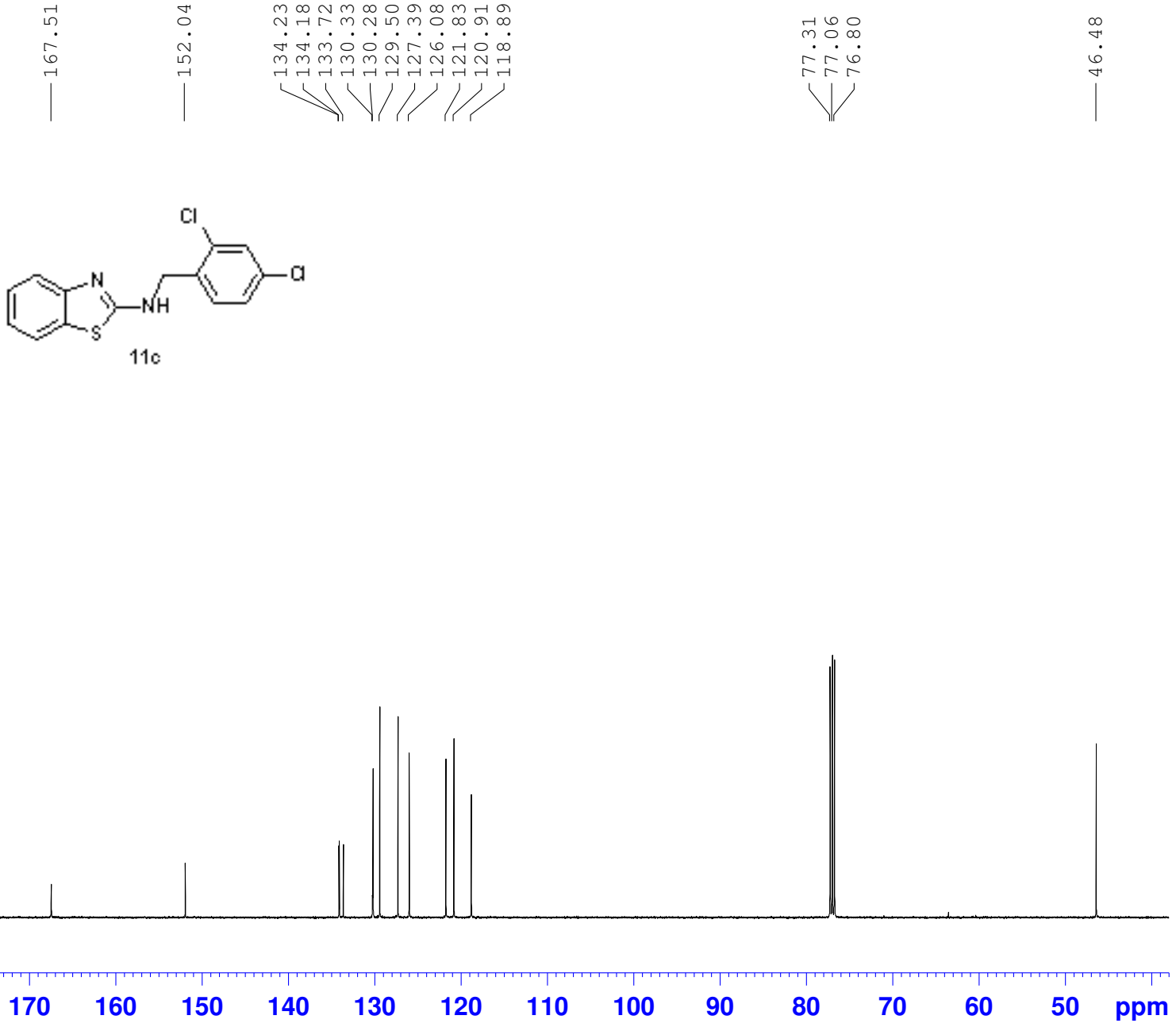
11c





NAME	Shx-1	
EXPNO	131	
PROCNO	1	
Date_	20100804	
Time	1.13	
INSTRUM	spect	
PROBHD	5 mm PABBO BB-	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	16	
DS	2	
SWH	10330.578	Hz
FIDRES	0.157632	Hz
AQ	3.1719923	sec
RG	203	
DW	48.400	usec
DE	6.50	usec
TE	298.9	K
D1	1.00000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	1H	
P1	11.50	usec
PL1	1.10	dB
PL1W	16.96364784	W
SFO1	500.0330879	MHz
SI	32768	
SF	500.0300132	MHz
WDW	EM	
SSB	0	
LB	0.30	Hz
GB	0	
PC	1.00	

N-(2,4-dichlorobenzyl)benzo[d]thiazol-2-amine
C13CPD CDCl3



Current Data Parameters
NAME Lifeng-1H
EXPNO 161
PROCNO 1

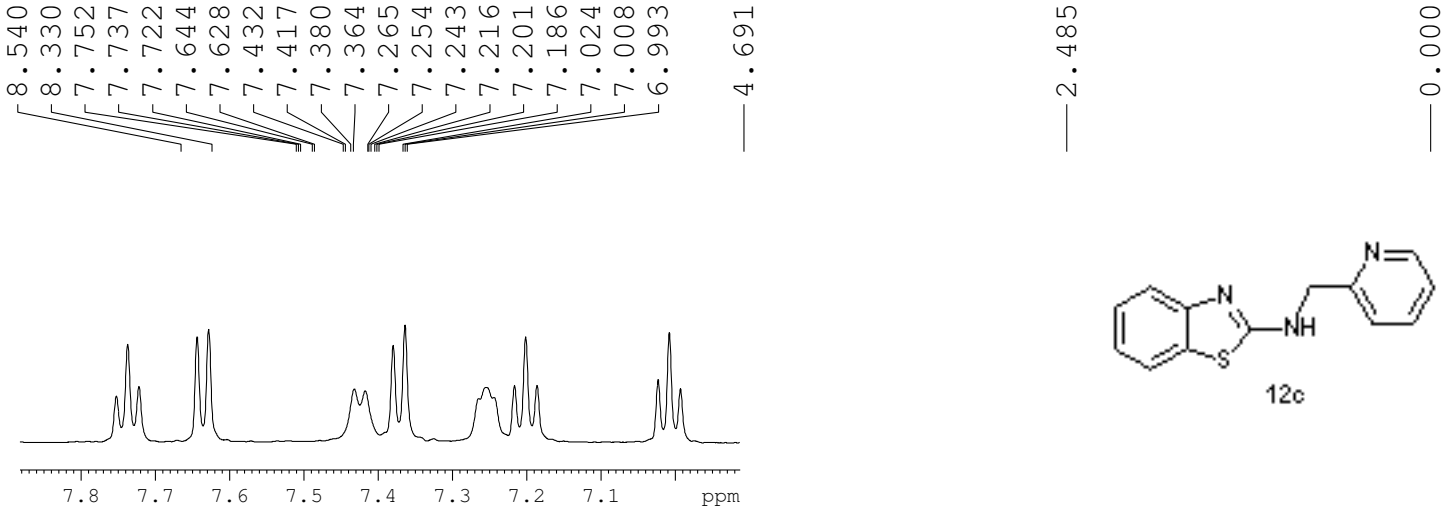
F2 - Acquisition Parameters
Date_ 20100808
Time 15.25
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

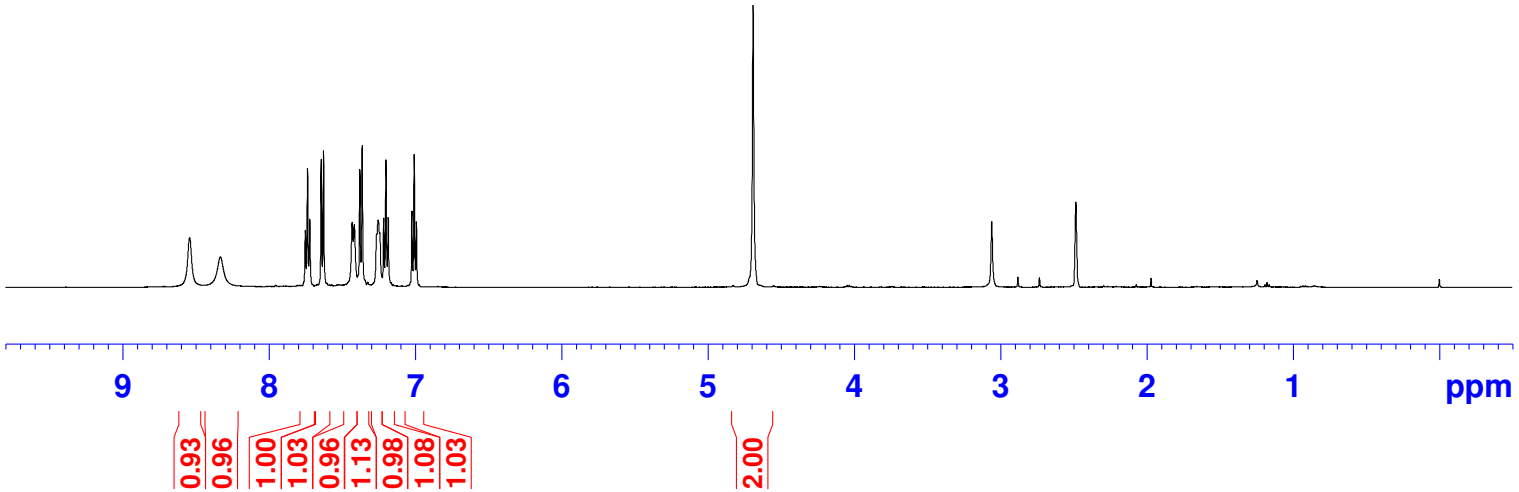
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

F2 - Processing parameters
SI 32768
SF 125.7326512 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

N-(pyridin-2-ylmethyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6, at 353 K

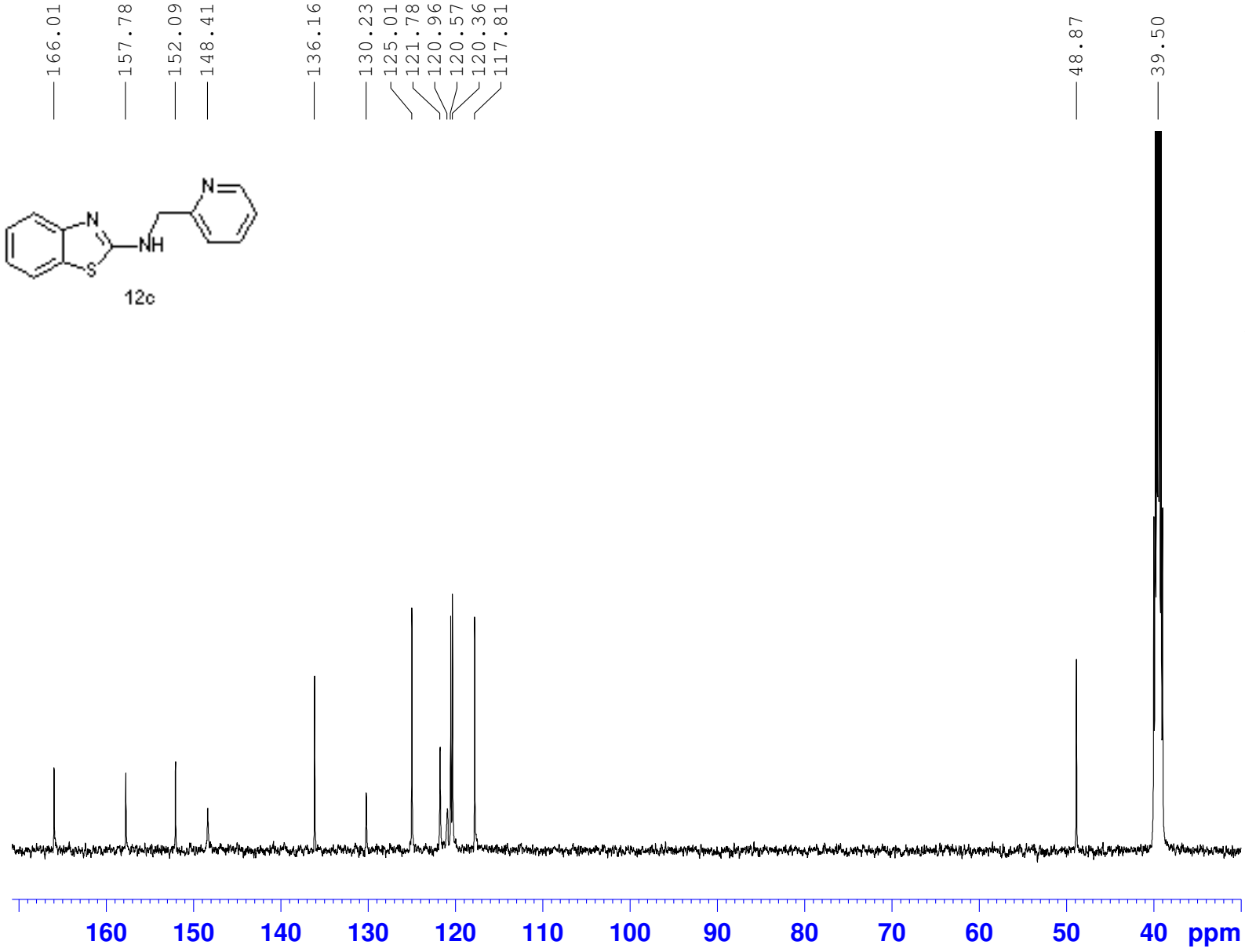


12c



NAME	test
EXPNO	3
PROCNO	1
Date_	20110104
Time	17.10
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	8
DS	2
SWH	8000.000 Hz
FIDRES	0.122070 Hz
AQ	4.0960498 sec
RG	90.5
DW	62.500 usec
DE	9.46 usec
TE	353.0 K
D1	1.00000000 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
SI	32768
SF	500.0300109 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

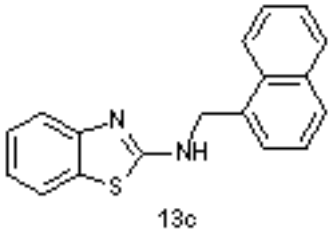
N-(pyridin-2-ylmethyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6 at 353 K



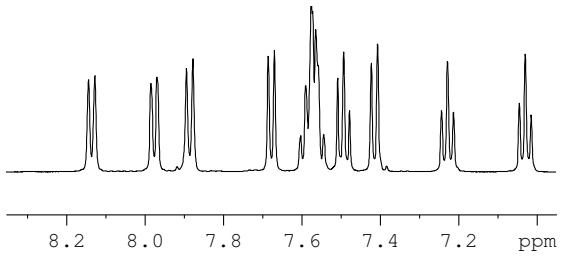
NAME	test
EXPNO	4
PROCNO	1
Date_	20110104
Time	17.11
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	490
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	353.3 K
D1	2.00000000 sec
D11	0.03000000 sec
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
SI	32768
SF	125.7327579 MHz
WDW	EM
SSB	0
LB	5.00 Hz
GB	0
PC	1.40

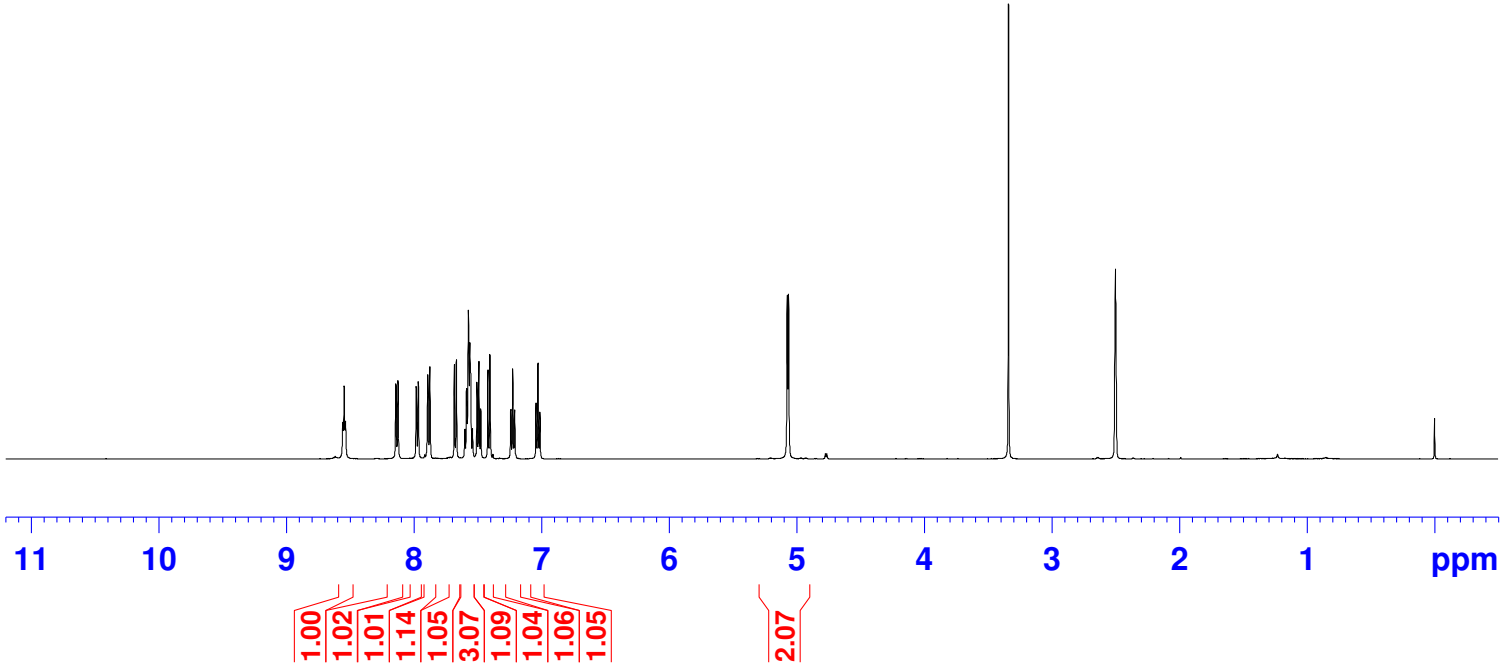
N-(naphthalen-1-ylmethyl)benzo[d]thiazol-2-amine
PROTON DMSO-d6

8.549 8.538 8.143 8.127 7.984 7.968 7.893 7.877 7.685 7.669 7.602 7.589 7.575 7.563 7.557 7.543 7.508 7.492 7.477 7.422 7.406 7.243 7.228 7.212 7.044 7.029 7.014 5.075 5.064 2.502 0.000



13c





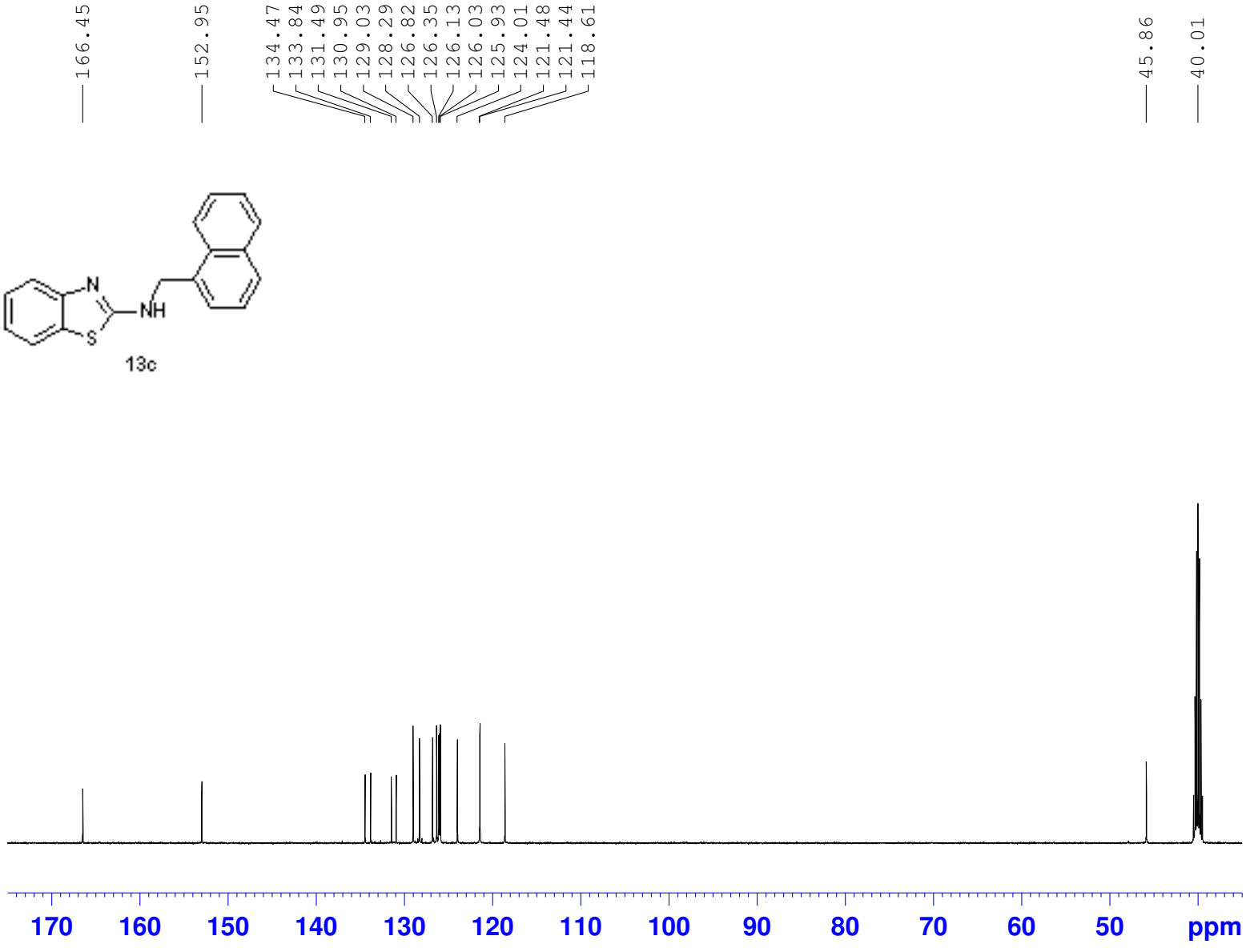
Current Data Parameters
NAME Lifeng-1H
EXPNO 582
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101122
Time 5.25
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 64
DW 48.400 usec
DE 6.50 usec
TE 295.0 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 11.50 usec
PL1 1.10 dB
PL1W 16.96364784 W
SFO1 500.0330879 MHz

F2 - Processing parameters
SI 32768
SF 500.0300018 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

N-(naphthalen-1-ylmethyl)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



Current Data Parameters
NAME Lifeng-1H
EXPNO 576
PROCNO 1

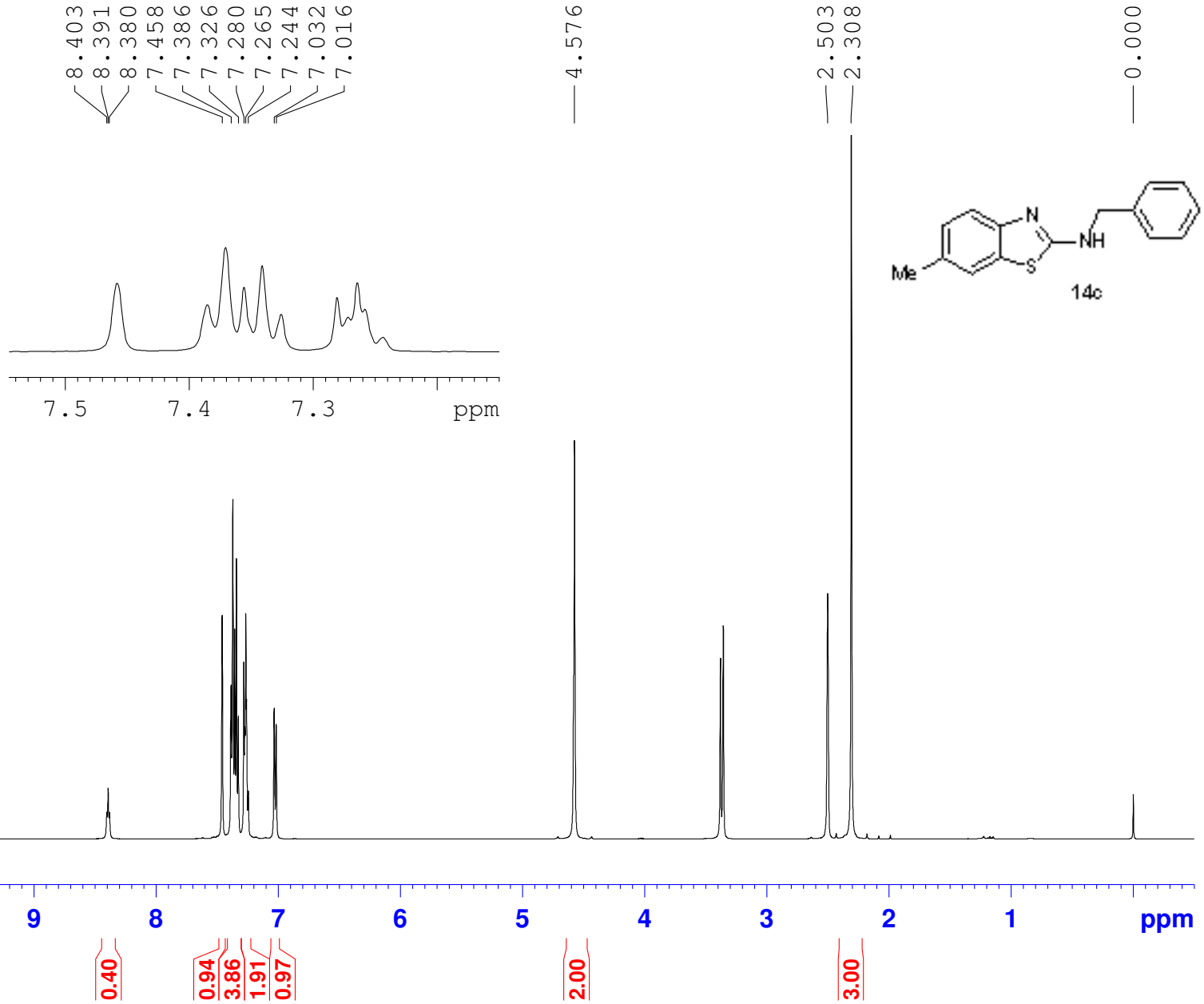
F2 - Acquisition Parameters
Date_ 20101122
Time 0.46
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 833
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 296.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

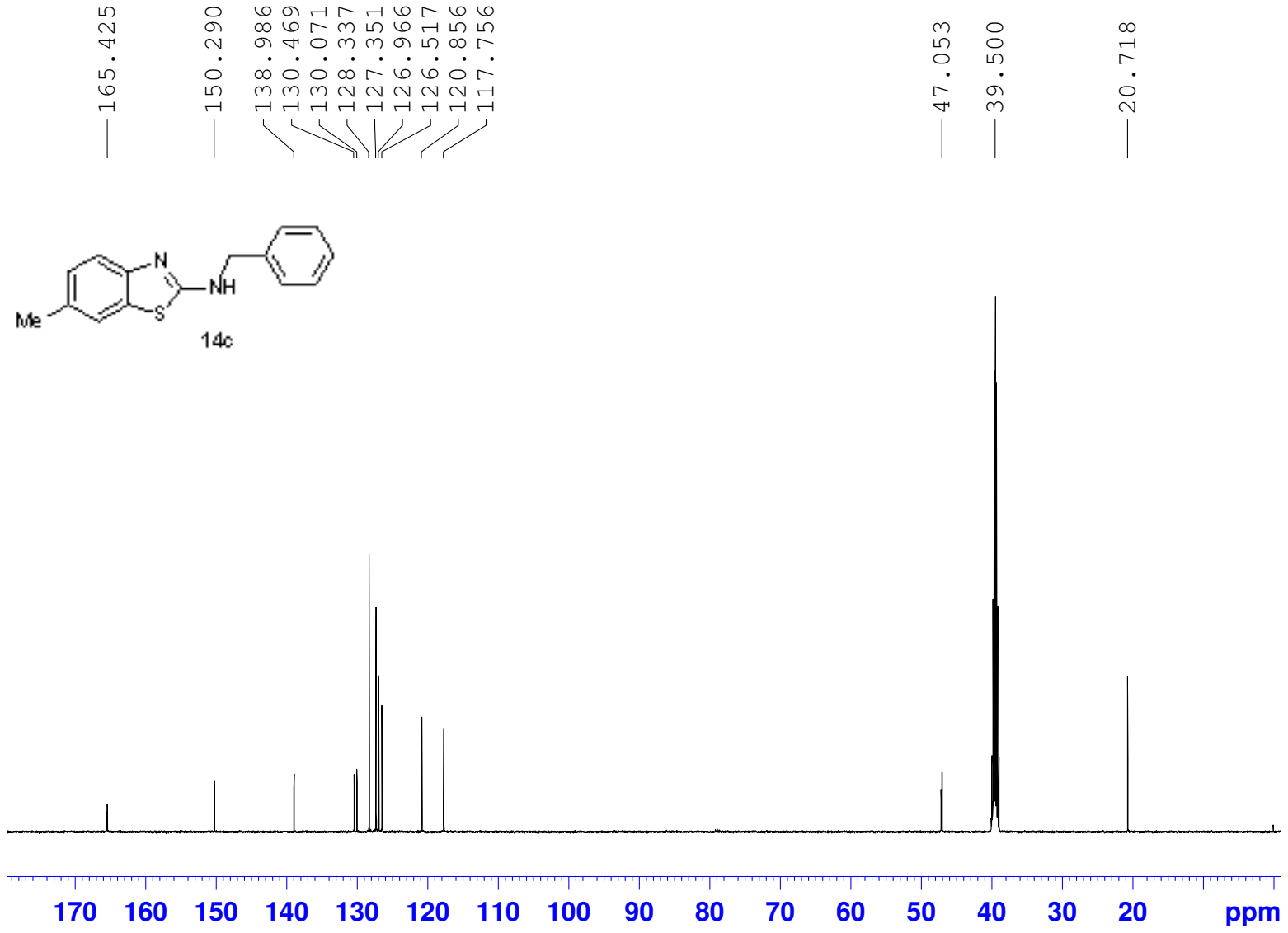
F2 - Processing parameters
SI 32768
SF 125.7326450 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

N-benzyl-6-methylbenzo[d]thiazol-2-amine
PROTON DMSO-d6



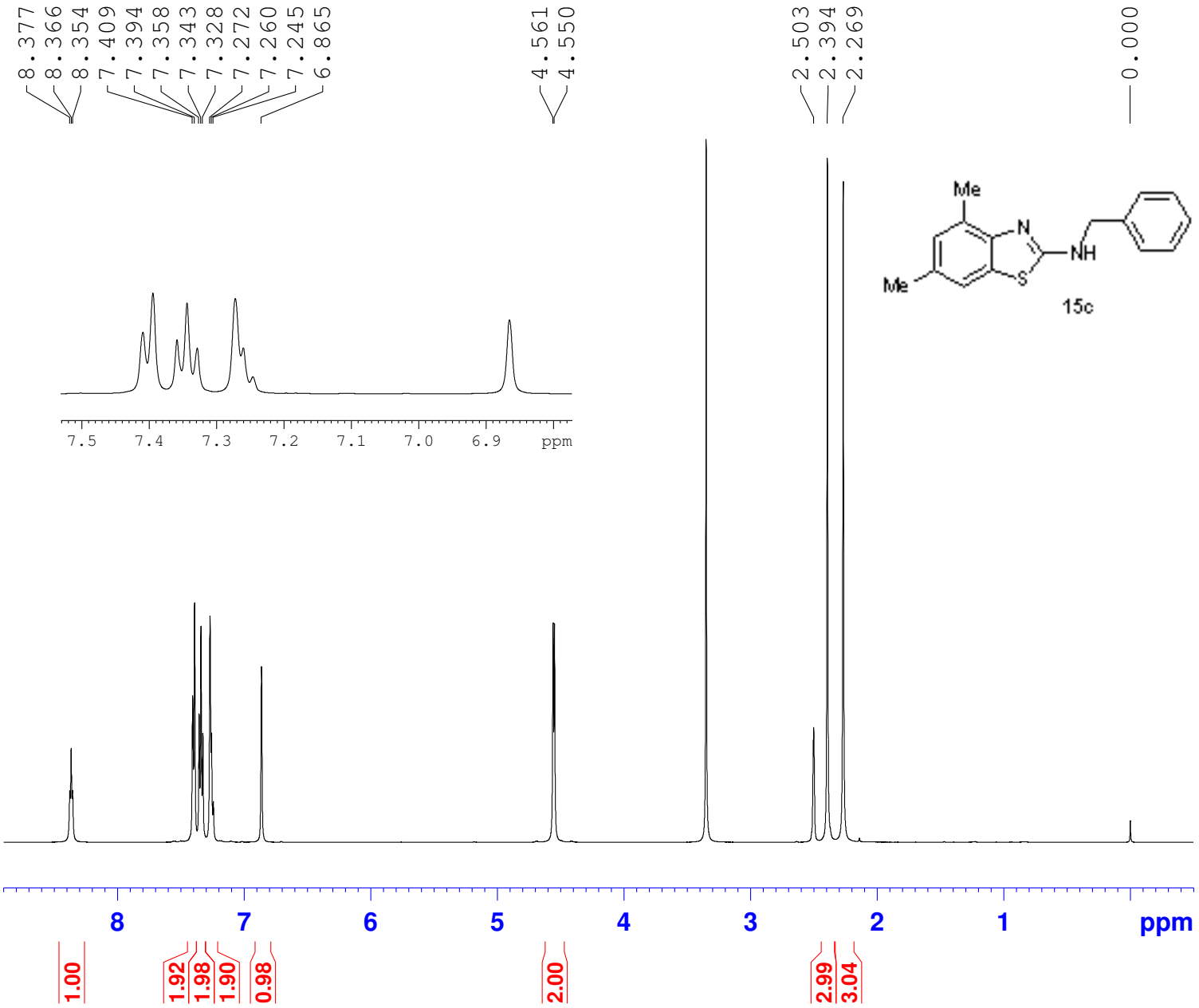
NAME	Shx-1
EXPNO	111
PROCNO	1
Date_	20100711
Time	15.21
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	50.8
DW	48.400 usec
DE	6.50 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
PL1	1.10 dB
PL1W	16.96364784 W
SFO1	500.0330879 MHz
SI	32768
SF	500.0300013 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

N-benzyl-6-methylbenzo[d]thiazol-2-amine
C13CPD DMSO-d6



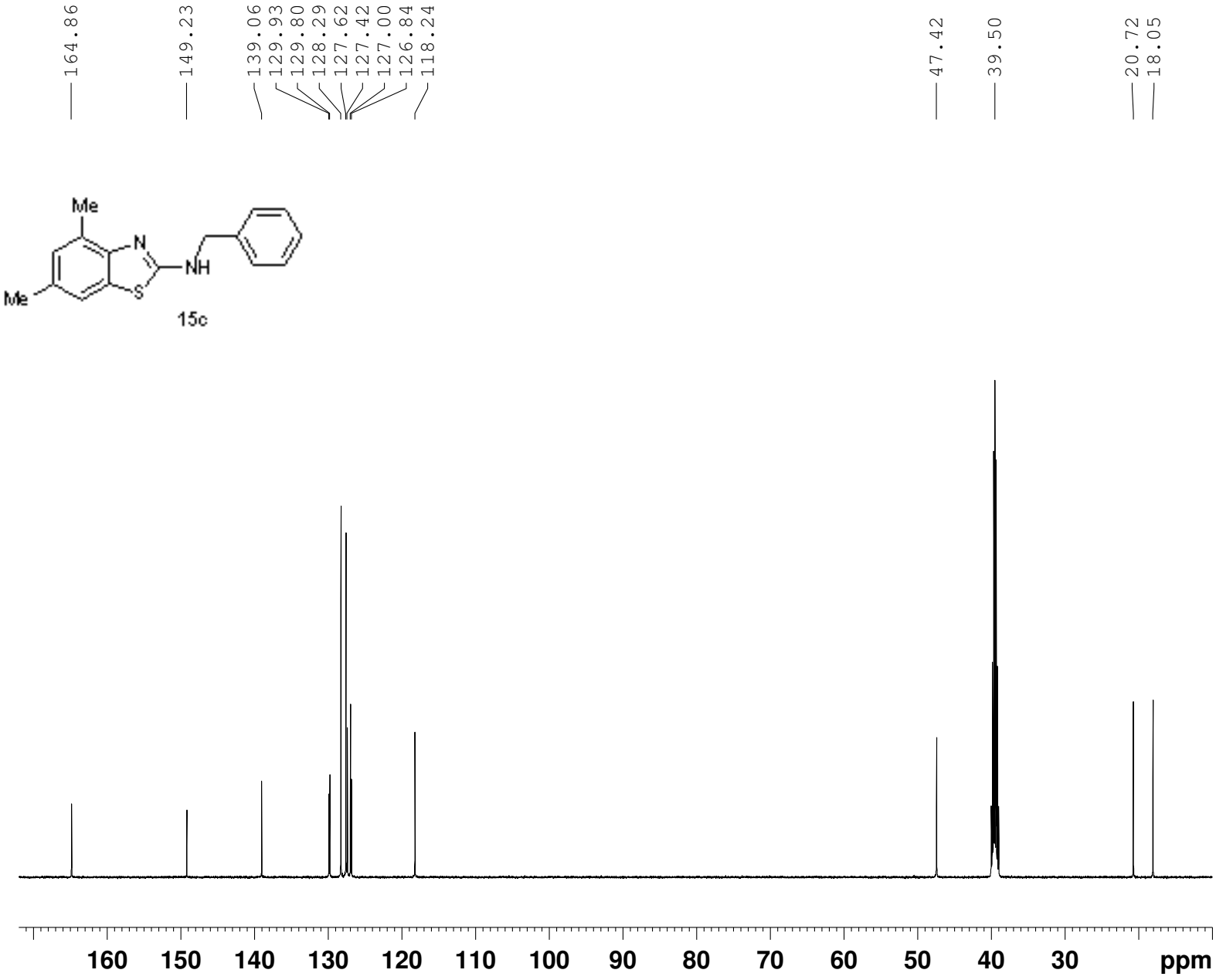
NAME	Shx-1
EXPNO	112
PROCNO	1
Date_	20100711
Time	16.21
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	1024
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	297.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
PL1	-1.00 dB
PL1W	125.85865021 W
SFO1	125.7452168 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.10 dB
PL12	17.95 dB
PL13	17.95 dB
PL2W	16.96364784 W
PL12W	0.35036376 W
PL13W	0.35036376 W
SFO2	500.0320001 MHz
SI	32768
SF	125.7327058 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-benzyl-4,6-dimethylbenzo[d]thiazol-2-amine
PROTON DMSO-d6



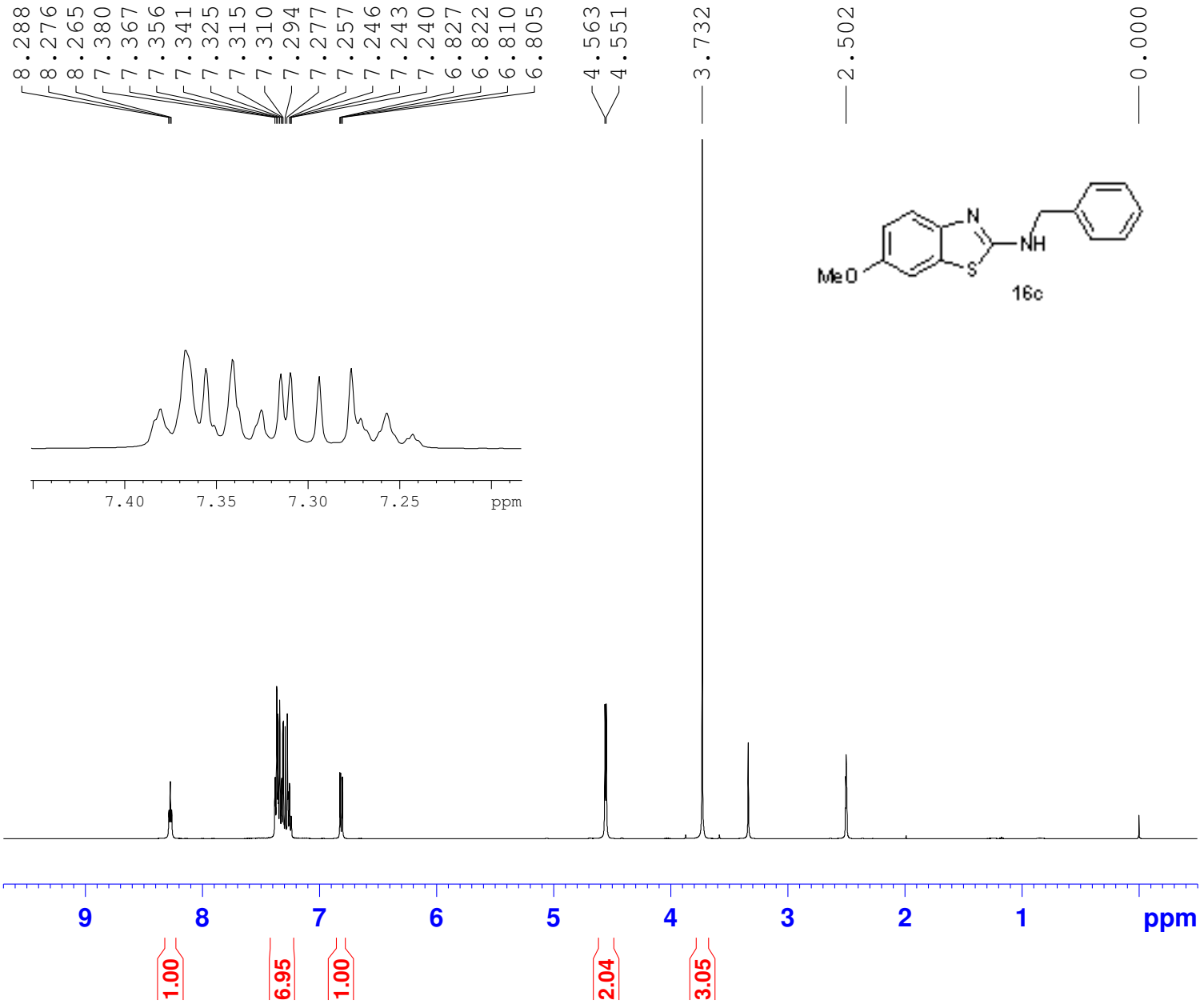
NAME	600-700
EXPNO	638
PROCNO	1
Date_	20110120
Time	11.02
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	114
DW	48.400 usec
DE	6.50 usec
TE	294.2 K
D1	1.00000000 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
SI	65536
SF	500.0300023 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

N-benzyl-4,6-dimethylbenzo[d]thiazol-2-amine
C13CPD DMSO-d6



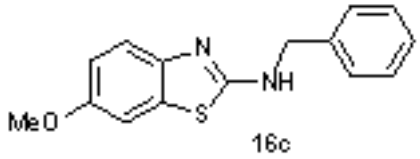
NAME	600-700
EXPNO	641
PROCNO	1
Date_	20110120
Time	13.23
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	1228
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	295.7 K
D1	2.00000000 sec
D11	0.03000000 sec
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
SI	32768
SF	125.7327058 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-benzyl-6-methoxybenzo[d]thiazol-2-amine
PROTON DMSO-d6



NAME	3
EXPNO	608
PROCNO	1
Date_	20101230
Time	1.16
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	64
DW	48.400 usec
DE	6.50 usec
TE	295.7 K
D1	1.00000000 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
SI	32768
SF	500.0300017 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

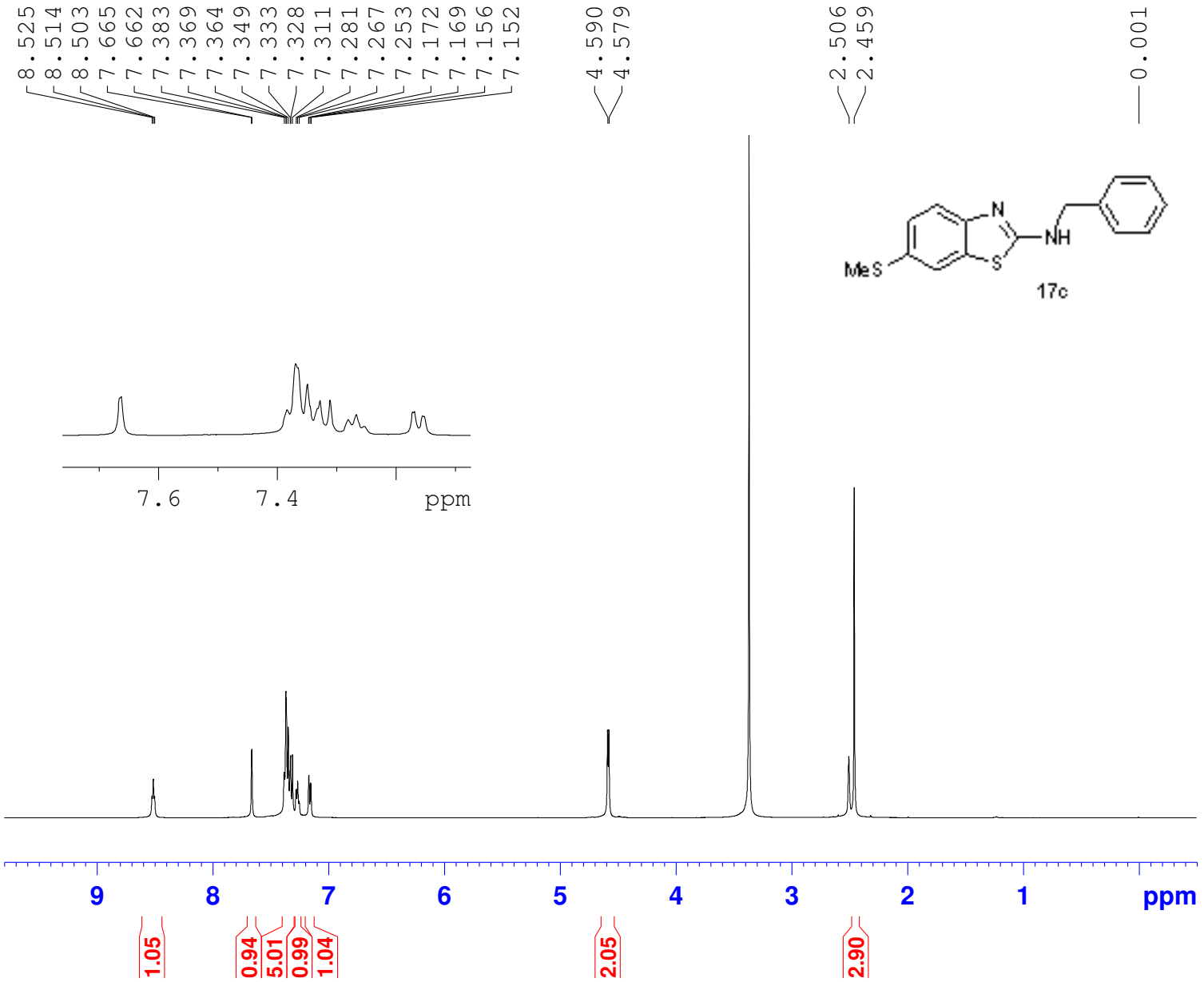
N-benzyl-6--methoxybenzo[d]thiazol-2-amine
C13CPD DMSO-d6



16c

NAME	3
EXPNO	609
PROCNO	1
Date_	20101230
Time	4.45
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	745
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	297.0 K
D1	2.00000000 sec
D11	0.03000000 sec
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
SI	32768
SF	125.7327077 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-benzyl-6-(methylthio)benzo[d]thiazol-2-amine
PROTON DMSO-d6



Current Data Parameters
NAME Lifeng-1H
EXPNO 583
PROCNO 1

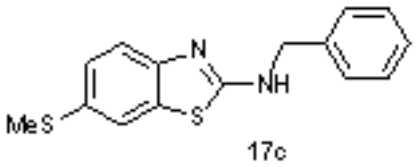
F2 - Acquisition Parameters
Date_ 20101130
Time 5.17
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 181
DW 48.400 usec
DE 6.50 usec
TE 293.3 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 11.50 usec
PL1 1.10 dB
PL1W 16.96364784 W
SFO1 500.0330879 MHz

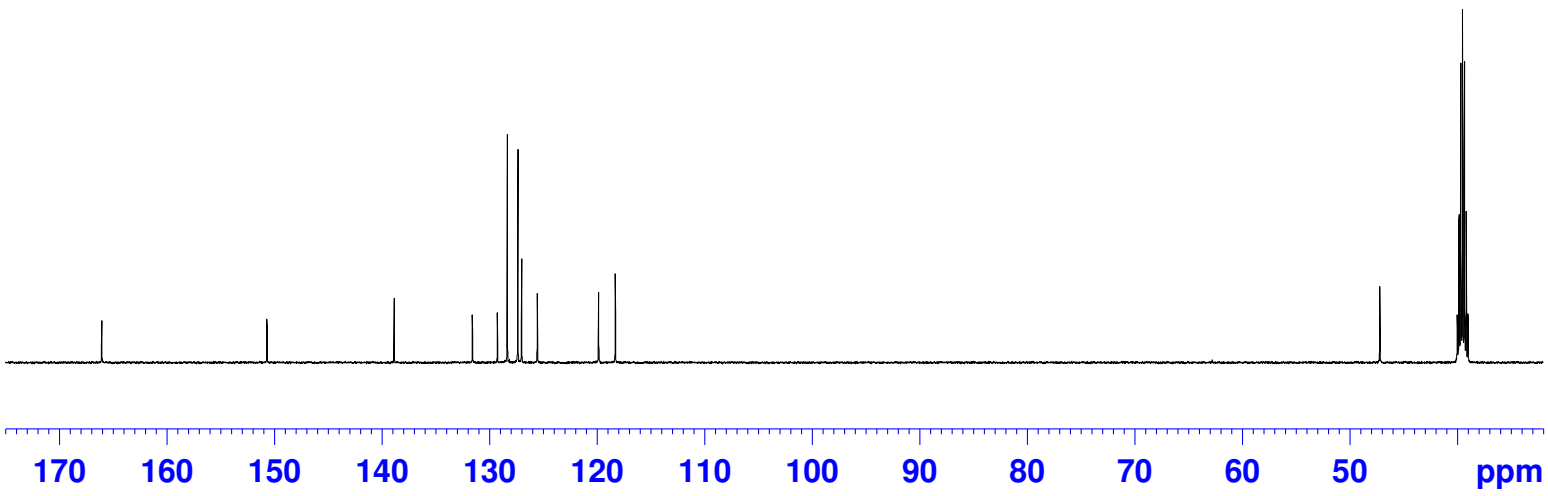
F2 - Processing parameters
SI 32768
SF 500.0300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

N-benzyl-6-(methylthio)benzo[d]thiazol-2-amine
C13CPD DMSO-d6

166.03
150.64
138.81
131.59
129.27
128.34
127.37
127.01
125.56
119.86
118.30
47.22
39.50



17c



Current Data Parameters
NAME Lifeng-1H
EXPNO 575
PROCNO 1

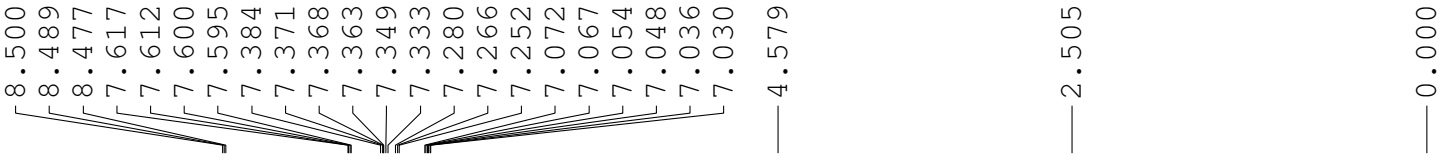
F2 - Acquisition Parameters
Date_ 20101121
Time 23.55
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 600
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 203
DW 16.800 usec
DE 6.50 usec
TE 296.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

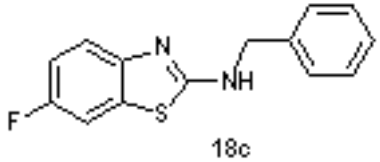
======== CHANNEL f1 ========
NUC1 13C
P1 9.60 usec
PL1 -1.00 dB
PL1W 125.85865021 W
SFO1 125.7452168 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.10 dB
PL12 17.95 dB
PL13 17.95 dB
PL2W 16.96364784 W
PL12W 0.35036376 W
PL13W 0.35036376 W
SFO2 500.0320001 MHz

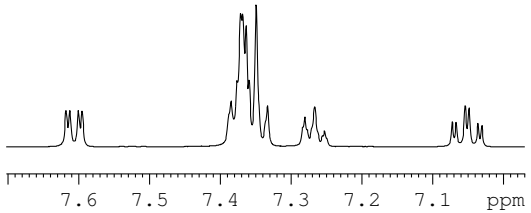
F2 - Processing parameters
SI 32768
SF 125.7327077 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

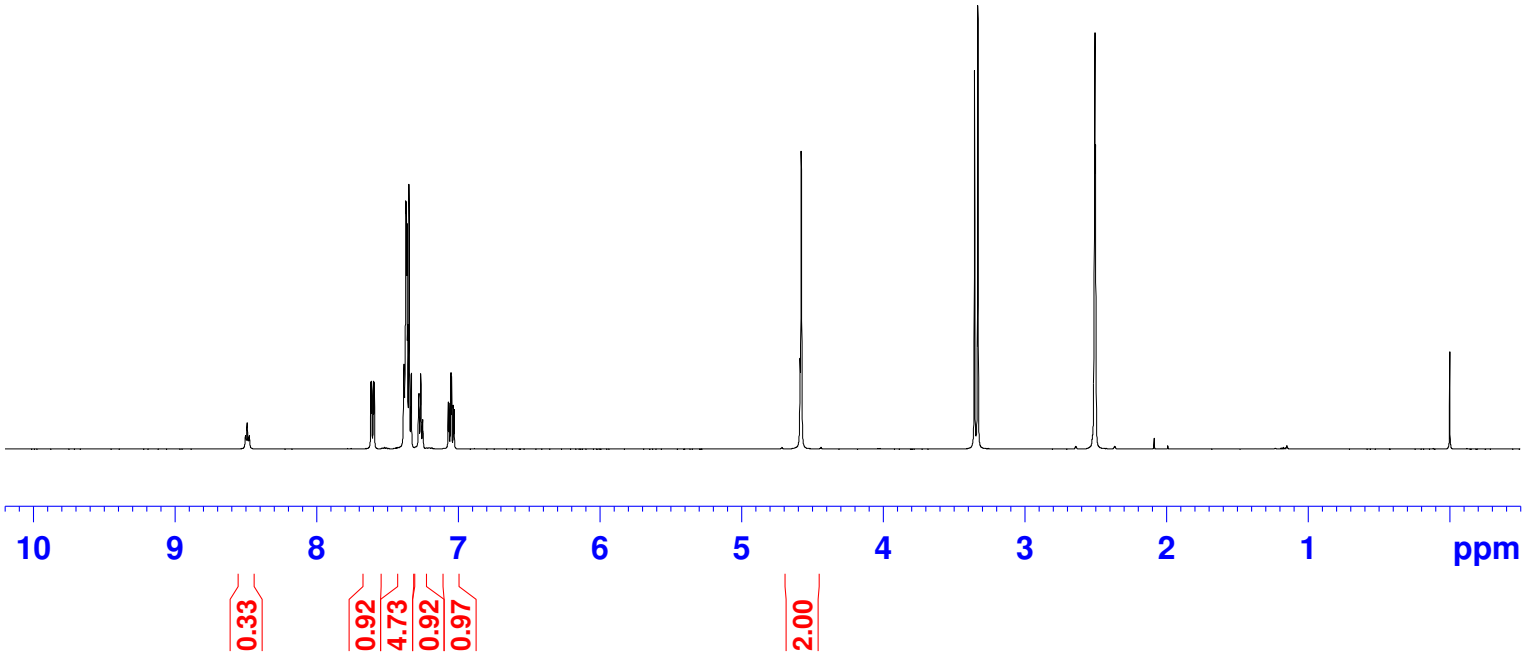
N-benzyl-6-fluorobenzo[d]thiazol-2-amine
PROTON DMSO-d6





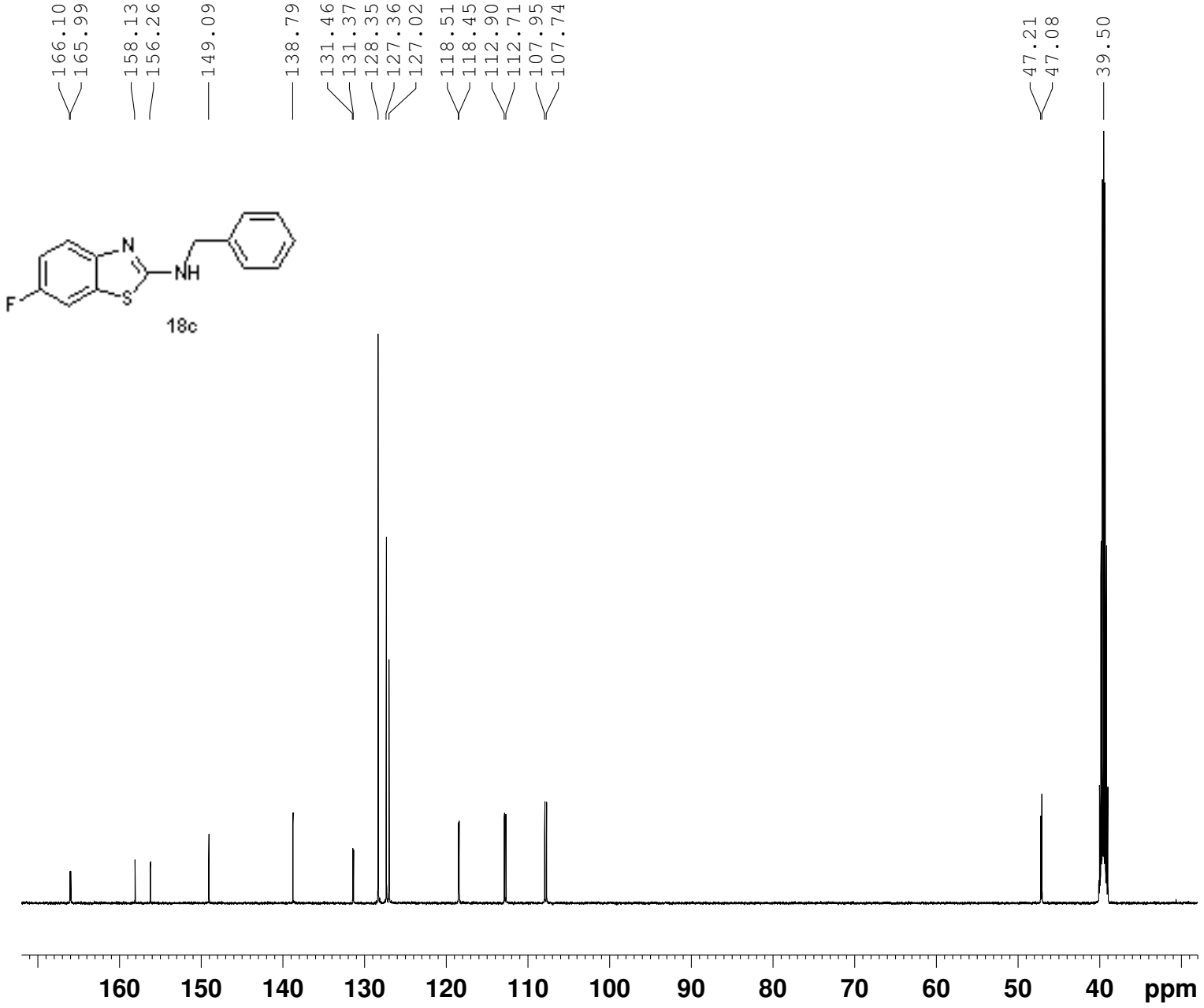
18c






```
Current Data Parameters
NAME                  Lifeng-1H
EXPNO                       196
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20100904
Time                       3.18
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                   zg30
TD                       65536
SOLVENT                   DMSO
NS                          16
DS                           2
SWH                 10330.578 Hz
FIDRES               0.157632 Hz
AQ                  3.1719923 sec
RG                           4
DW                    48.400 usec
DE                     6.50 usec
TE                     297.6 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                     11.50 usec
PL1                     1.10 dB
PL1W           16.96364784 W
SFO1           500.0330879 MHz

F2 - Processing parameters
SI                       32768
SF             500.0300004 MHz
WDW                         EM
SSB          0
LB                      0.30 Hz
GB           0
PC                      1.00
```

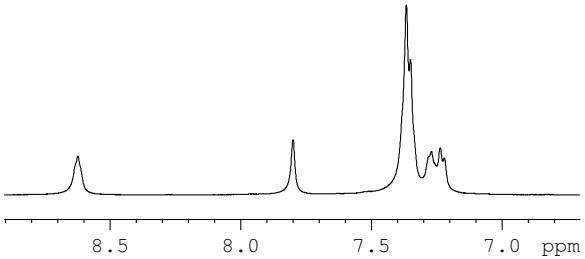
N-benzyl-6-fluorobenzo[d]thiazol-2-amine
C13CPD DMSO-d6

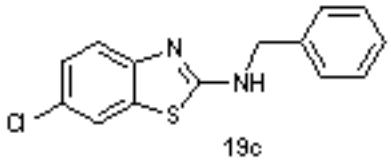


NAME	Shx-1
EXPNO	206
PROCNO	1
Date_	20100905
Time	17.38
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	2048
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	299.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
PL1	-1.00 dB
PL1W	125.85865021 W
SFO1	125.7452168 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.10 dB
PL12	17.95 dB
PL13	17.95 dB
PL2W	16.96364784 W
PL12W	0.35036376 W
PL13W	0.35036376 W
SFO2	500.0320001 MHz
SI	32768
SF	125.7327068 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

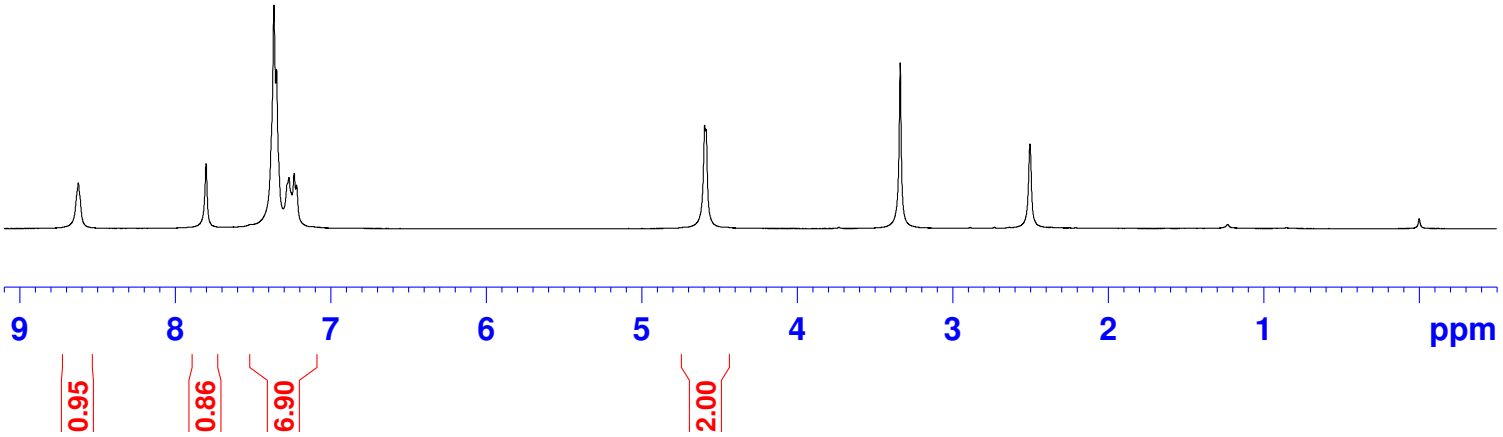
N-benzyl-6-chlorobenzo[d]thiazol-2-amine
PROTON DMSO-d6

8.623
7.803
7.368
7.351
7.283
7.271
7.238
7.222
4.596
4.588
2.504
0.000





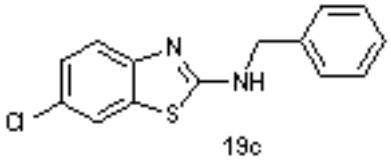
19c



NAME	3
EXPNO	606
PROCNO	1
Date_	20101230
Time	3.59
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	64
DW	48.400 usec
DE	6.50 usec
TE	295.6 K
D1	1.00000000 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	11.50 usec
SI	32768
SF	500.0300012 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

N-benzyl-6-chlorobenzo[d]thiazol-2-amine
C13CPD DMSO-d6

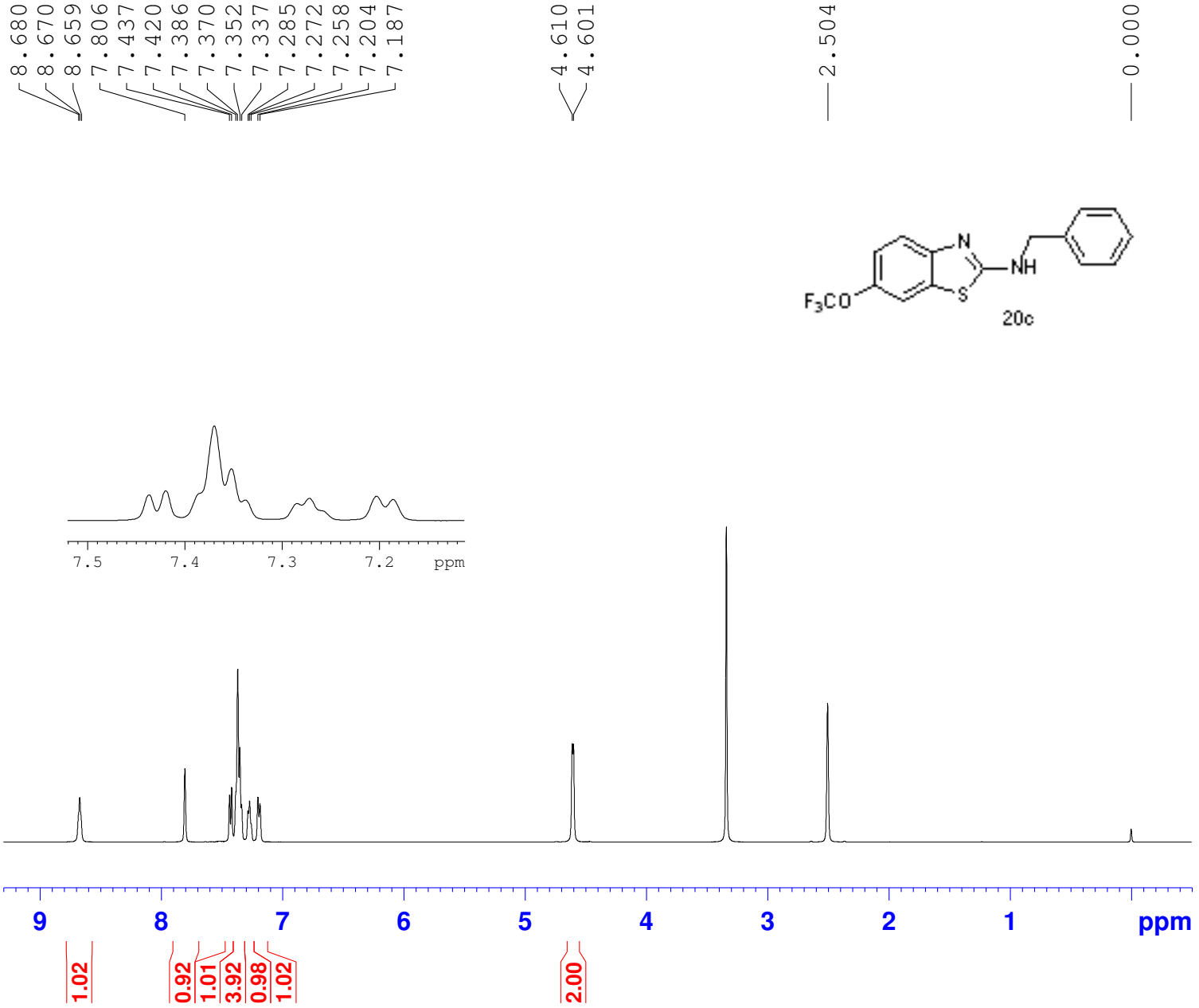
166.792
151.360
138.665
132.114
128.364
127.387
127.056
125.629
124.673
120.589
118.912
47.244
39.501



19c

NAME	3
EXPNO	607
PROCNO	1
Date_	20101230
Time	6.08
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	1075
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	297.0 K
D1	2.00000000 sec
D11	0.03000000 sec
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
SI	32768
SF	125.7327076 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

N-benzyl-6-(trifluoromethoxy)benzo[d]thiazol-2-amine
PROTON DMSO-d6



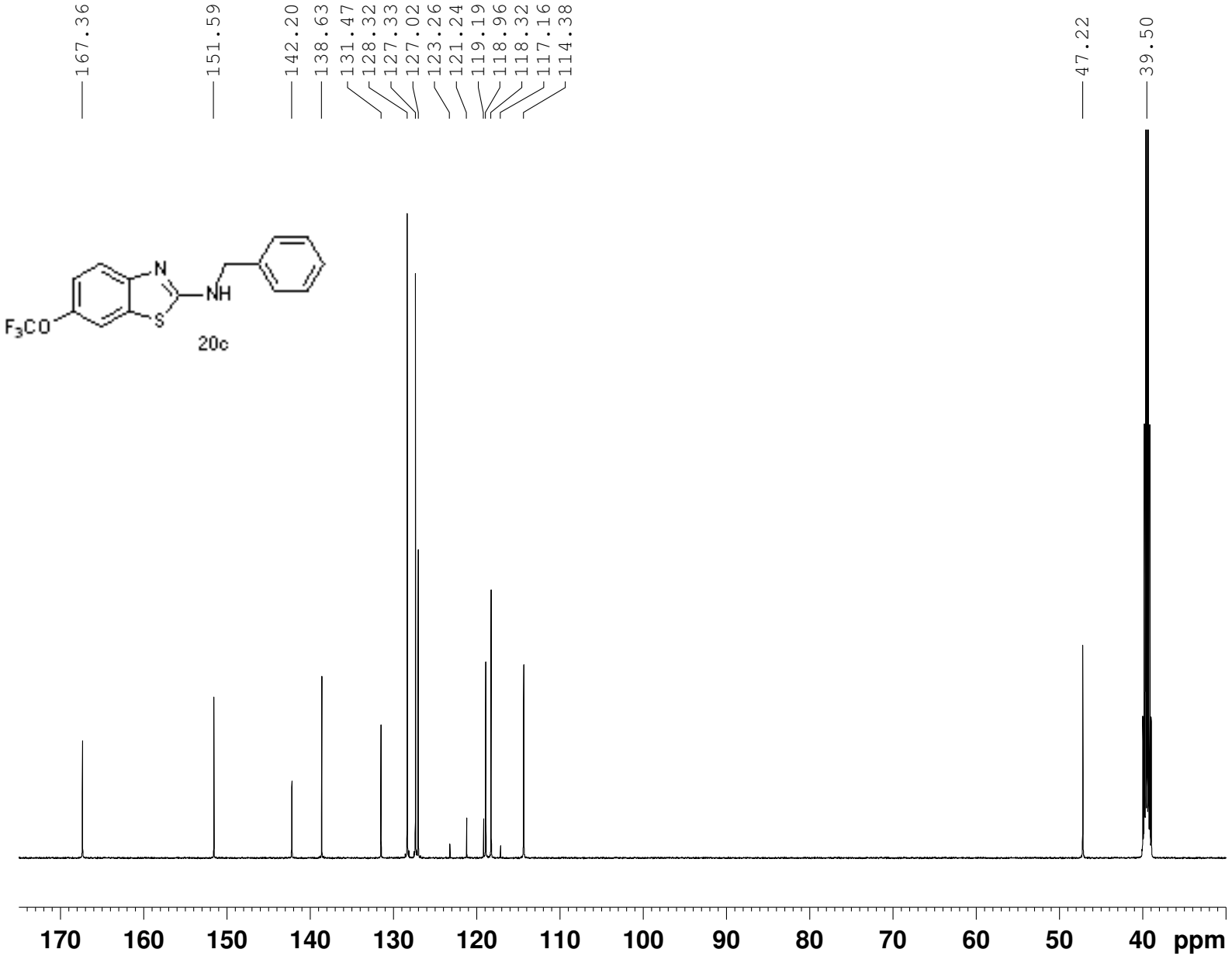
Current Data Parameters
NAME Lifeng-1H
EXPNO 578
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101122
Time 5.01
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 181
DW 48.400 usec
DE 6.50 usec
TE 295.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 11.50 usec
PL1 1.10 dB
PL1W 16.96364784 W
SFO1 500.0330879 MHz

F2 - Processing parameters
SI 32768
SF 500.0300007 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

N-benzyl-6-(trifluoromethoxy)benzo[d]thiazol-2-amine
C13CPD DMSO-d6



NAME	Shx-1
EXPNO	579
PROCNO	1
Date_	20101205
Time	15.01
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	10240
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010548 sec
RG	203
DW	16.800 usec
DE	6.50 usec
TE	299.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.60 usec
PL1	-1.00 dB
PL1W	125.85865021 W
SFO1	125.7452168 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.10 dB
PL12	17.95 dB
PL13	17.95 dB
PL2W	16.96364784 W
PL12W	0.35036376 W
PL13W	0.35036376 W
SFO2	500.0320001 MHz
SI	32768
SF	125.7327113 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40