Copper-Catalyzed Tandem Oxidative Cyclization of Arylacetamides: Efficient Access to *N*-Functionalized Isatins

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Supporting Information

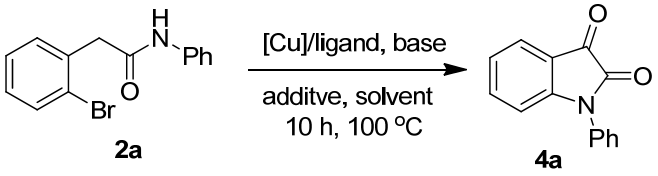
CONTENTS:

1. General Information

All reagents and metal catalysts were obtained from commercial sources without further purification, and commercially available solvents were purified before use. All new compounds were fully characterized. All melting points were taken on a WRS-1A or a WRS-1B Digital Melting Point Apparatus without correction. Infrared spectra were obtained using an AVATAR 370 FT-IR spectrometer. ^{1}H and ^{13}C NMR spectra were recorded with a Bruker AV-500 spectrometer operating at 500 and 125 MHz, respectively, with chemical shift values being reported in ppm relative to chloroform (δ = 7.26 ppm), dimethyl sulfoxide (δ = 2.50 ppm) or TMS (δ = 0.00 ppm) for ^{1}H NMR, and chloroform (δ = 77.16 ppm) or dimethyl sulfoxide (δ = 39.52 ppm) for ^{13}C NMR. Mass spectra and high resolution mass spectra were recorded with an Agilent 5975N using an Electron impact (EI) or Electrospray ionization (ESI) techniques. Elemental analyses were carried out on an Elementar Vario EL elemental analyzer. Silica gel plate GF254 were used for thin layer chromatography (TLC) and silica gel H or 300-400 mesh were used for flash column chromatography. Yields refer to chromatographically and spectroscopically pure compounds, unless otherwise indicated.

2. Screening of the Reaction Conditions

Table S1. Condition Optimizations of Isatin Synthesis[a]

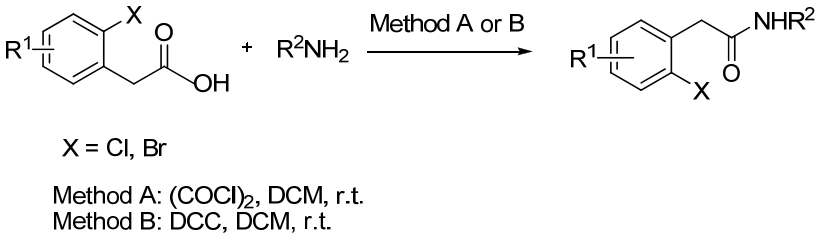


Entry	Cu source	Base	Solvent	Additive	Ligand	Yield[b] (%)
1	CuI	Pyridine	dioxane	TBAB	1,10-Phen	<5
2	CuI	Et_3N	dioxane	TBAB	1,10-Phen	<5
3	CuI	NaOH	dioxane	TBAB	1,10-Phen	<5
4	CuI	Na_2CO_3	dioxane	TBAB	1,10-Phen	26
5	CuI	K_2CO_3	dioxane	TBAB	1,10-Phen	29
6	CuI	NaOAc	dioxane	TBAB	1,10-Phen	34
7	**CuI**	**KOAc**	**dioxane**	**TBAB**	**1,10-Phen**	**75**
8	CuI	KOAc	CH_3CN	TBAB	1,10-Phen	<5
9	CuI	KOAc	NMP	TBAB	1,10-Phen	<5
10	CuI	KOAc	DMF	TBAB	1,10-Phen	18
11	CuI	KOAc	toluene	TBAB	1,10-Phen	52
12	CuI	KOAc	dioxane	TBAB	Bipyridine	34
13	CuBr	KOAc	dioxane	TBAB	1,10-Phen	53
14	CuCl	KOAc	dioxane	TBAB	1,10-Phen	58
15	CuI	KOAc	dioxane	Bu_4NOAc	1,10-Phen	47
16	CuI	KOAc	dioxane	Bn_3NCl	1,10-Phen	37
17	CuI	KOAc	dioxane	Bu_4NF	1,10-Phen	42

[a] Reaction conditions: **2a** (0.25 mmol), [Cu] (10 mol %), ligand (20 mol %), base (3.0 equiv), additive (1.4 equiv) in solvent (1 mL) for 10 h at 100 °C, open to air, dried through a calcium chloride tube, NMP = *N*-Methyl-2-pyrrolidone, 1,10-Phen = 1,10-Phenanthroline, TBAB = Tetra-*n*-butylammonium bromide. [b] Isolated yields.

3. Synthesis and Characterization for Substrates

Two methods were used for the synthesis of start materials using **Method A** and **Method B**.

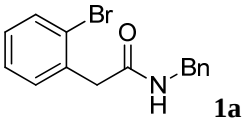


Method A:

To a solution of the corresponding substituted (2-halogenphenyl)acetic acid (1.0 equiv) in CH_2Cl_2 (0.3 M) was added $(COCl)_2$ (1.27 equiv) slowly at 0 °C, and then the reaction mixture was stirred at room temperature for 2h, after that CH_2Cl_2 was removed under diminished pressure. The resulting residue was dissolved in CH_2Cl_2 (0.5 M) and was slowly added to a solution of corresponding amine (2.0 equiv) in CH_2Cl_2 chilled to 0 °C. The reaction mixture was stirred at room temperature until TLC revealed the disappearance of the starting material, then the mixture was filtered through a thin pad of celite. The filtrate was washed with water, 1 N HCl and 5% sodium bicarbonate solution and brine. The organic layer was dried over Na_2SO_4, and concentrated in vacuo. The crude product was purified by recrystallization from EtOAc/ petroleum ether.

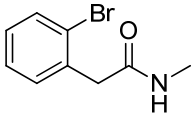
Method B:

To a solution of the corresponding substituted (2-halogenphenyl)acetic acid (1.0 equiv) and dicyclohexylcarbodiimide (DCC) (1.2 equiv) in CH_2Cl_2 (0.3 M) was added amine (1.2 equiv) at room temperature. After the reaction was finished (monitored by TLC), the mixture was filtered through a thin pad of celite and the filtrate was concentrated in vacuo. The crude product was purified by flash chromatography employing mixtures of EtOAc/ petroleum ether as eluents.



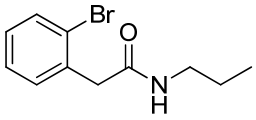
1a

***N*-benzyl-2-(2-bromophenyl)acetamide (1a)**[1]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol) and benzylamine (1.99 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1a** as a white solid (2.21 g, 78%). M.p. 132-133 °C; IR (KBr, cm^{-1}): 3276, 3064, 3029, 1643, 1547, 1471, 1453, 1412, 1365, 1338, 1244, 1069, 1027, 735, 693; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.61 (dd, J = 8.0, 1.0 Hz, 1H), 7.40-7.24 (m, 7H), 7.18 (td, J = 8.0, 1.5 Hz, 1H), 5.83 (br ,1H), 4.46 (d, J = 6.0 Hz, 2H), 3.79 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.5, 138.0, 134.8, 133.2, 131.8, 129.2, 128.7, 128.1, 127.6, 127.5, 125.0, 44.1, 43.7; MS (EI) m/z (%): 305(4) [M^+ (^{81}Br)], 303(4) [M^+ (^{79}Br)], 224(34), 134(3), 91(100), 84(2).



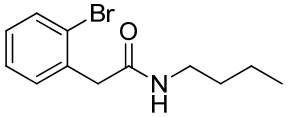
1b

2-(2-bromophenyl)-*N*-methylacetamide (1b)[2]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), methylamine hydrochloride (1.25 g, 18.6 mmol) and triethylamine (1.88 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1b** as a colorless solid (1.61 g, 76%). M.p. 101-102 ^{o}C; IR (KBr, cm^{-1}): 3292, 1648, 1556, 1470, 1251, 1027, 738; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.58 (d, *J* = 8 Hz, 1H), 7.35-7.28 (m, 2H), 7.17-7.14 (m, 1H), 5.49 (br, 1H), 3.70 (s, 2H), 2.43 (d, *J* = 5.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 170.2, 134.9, 133.2, 131.8, 129.2, 128.0, 125.0, 43.9, 26.6; LC-MS (ESI) m/z: 230 [M^+H (^{81}Br)], 228 [M^+H (^{79}Br)].



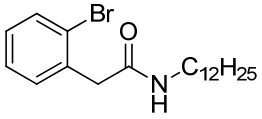
1c

2-(2-bromophenyl)-*N*-propylacetamide (1c)[3]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), propyl amine (1.09 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1c** as a white solid (1.42 g, 60%). M.p. 92-93 ^{o}C; IR (KBr, cm^{-1}): 3296, 3080, 2962, 2932, 2873, 1646, 1550, 1470, 1438, 1412, 1341, 1248, 1152, 1028, 736; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.59 (d, *J* = 8.0 Hz, 1H), 7.36-7.29 (m, 2H), 7.16 (td, *J* = 8.0, 1.5 Hz, 1H), 5.45 (br, 1H), 3.18 (q, *J* = 6.5 Hz, 2H), 1.50-1.43 (m, 2H), 0.85 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.4, 135.1, 133.1, 131.7, 129.1, 128.0, 125.0, 44.1, 41.4, 22.7, 11.3; LC-MS (ESI) m/z: 258 [M^+H (^{81}Br)], 256 [M^+H (^{79}Br)].



1d

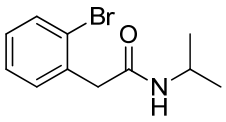
2-(2-bromophenyl)-*N*-butylacetamide (1d)[4]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), butylamine (1.32 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1d** as a white solid (1.99 g, 80%). M.p. 80-81^{o}C; IR (KBr, cm^{-1}): 3299, 2955, 1645, 1548, 1242, 1028, 1090, 738; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.58 (d, *J* = 8.0 Hz, 1H), 7.35-7.29 (m, 2H), 7.17-7.14 (m, 1H), 5.45 (br, 1H), 3.69 (s, 2H), 3.21 (q, *J* = 6.5 Hz, 2H), 1.45-1.39 (m, 2H), 1.31-1.23 (m, 2H), 0.87 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.6, 135.3, 133.3, 131.9, 129.3, 128.2, 125.2, 44.3, 39.7, 31.7, 20.2, 13.9; LC-MS (ESI) m/z: 271 [M^+H (^{81}Br)], 269 [M^+H (^{79}Br)].



1e

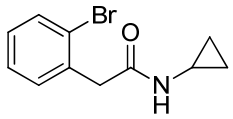
2-(2-bromophenyl)-*N*-dodecylacetamide (1e): Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), dodecan-1-amine (3.44 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1e** as a white solid (2.58 g, 73%). M.p. 76-78 ^{o}C; IR (KBr, cm^{-1}): 3299, 2962, 2918, 2849,

1649, 1557, 1242, 1027, 736; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.58 (d, *J* = 8.0 Hz, 1H), 7.36-7.29 (m, 2H), 7.16 (td, *J* = 8.0, 1.5 Hz, 1H), 5.42 (br, 1H), 3.70 (s, 2H), 3.21 (q, *J* = 6.5 Hz, 2H), 1.44-1.41 (m, 2H), 1.29-1.23 (m, 18H), 0.88 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.5, 135.2, 133.2, 131.8, 129.2. 128.1, 125.1, 44.2, 39.8, 32.0, 29.7, 29.6, 29.6, 29.5, 29.5, 29.3, 26.9, 22.8, 14.2; LC-MS (ESI) m/z: 384 [M^+H (^{81}Br)], 382 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{20}H_{33}BrNO$ [M^+H] 382.1740; Found: 382.1756.



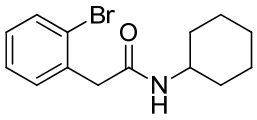
1f

2-(2-bromophenyl)-*N*-isopropylacetamide (1f)[3]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), isopropylamine (1.10 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1f** as a white solid (1.74 g, 73%). M.p. 155-156 ^{o}C; IR (KBr, cm^{-1}): 3281, 3071, 2971, 1638, 1550, 1440, 1416, 1358, 1251, 1028, 739; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.58 (d, *J* = 8.5 Hz, 1H), 7.36-7.29 (m, 2H), 7.16 (td, *J* = 8.0, 2.0 Hz, 1H), 5.24 (br, 1H), 4.11-4.04 (m, 1H), 3.66 (s, 2H), 1.09 (d, *J* = 6.5 Hz, 6H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 168.5, 135.1, 133.1, 131.7, 129.0, 128.0, 124.9, 44.3, 41.6, 22.6; LC-MS (ESI) m/z: 258 [M^+H (^{81}Br)], 256 [M^+H (^{79}Br)].



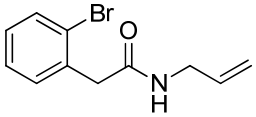
1g

2-(2-bromophenyl)-*N*-cyclopropylacetamide (1g): Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), cyclopropylamine (1.06 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1g** as a white solid (1.51 g, 64%). M.p. 158-160 ^{o}C; IR (KBr, cm^{-1}): 3271, 3063, 1655, 1543, 1472, 1264, 1025, 773; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.57 (d, *J* = 8.0 Hz, 1H), 7.34-7.28 (m, 2H), 7.15 (td, *J* = 8.0, 2.0 Hz, 1H), 5.58 (br, 1H), 3.65 (s, 2H), 2.68-2.65 (m, 1H), 0.74-0.70 (m, 2H), 0.45-0.42 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 170.9, 134.9, 133.1, 131.7, 129.1. 128.0, 124.9, 44.0, 22.8, 6.6; LC-MS (ESI) m/z: 256 [M^+H (^{81}Br)], 254 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{11}H_{13}BrNO$ [M^+H] 254.0175; Found: 254.0174.



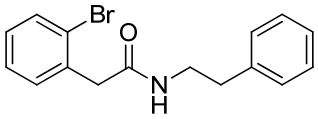
1h

2-(2-bromophenyl)-*N*-cyclohexylacetamide (1h): Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), cyclohexylamine (1.84 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1h** as a white solid (1.78 g, 65%). M.p. 168-170 ^{o}C; IR (KBr, cm^{-1}): 3288, 2932, 1639, 1545, 1472, 1248, 1028, 737; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.56 (d, *J* = 8.0 Hz, 1H), 7.34-7.27 (m, 2H), 7.15-7.12 (m, 1H), 5.41 (br ,1H), 3.78-3.72 (m, 1H), 3.65 (s, 2H), 1.85-1.00 (m, 10H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 168.5, 135.1, 133.1, 131.7, 129.0. 128.0, 125.0, 48.3, 44.3, 32.8, 25.5, 24.7; LC-MS (ESI) m/z: 298 [M^+H (^{81}Br)], 296 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{14}H_{19}BrNO$ [M^+H] 296.0645; Found: 296.0645.



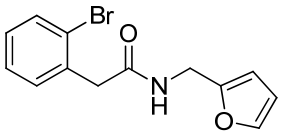
1i

***N*-allyl-2-(2-bromophenyl)acetamide (1i)**: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), allylamine (1.06 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1i** as a white solid (1.29 g, 55%). M.p. 103-104 ^oC; IR (KBr, cm^{-1}): 3285, 3064, 1652, 1639, 1553, 1408, 1244, 1028, 736; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.59 (d, J = 8.0 Hz, 1H), 7.37-7.30 (m, 2H), 7.17 (td, J = 8.0, 1.5 Hz, 1H), 5.82-5.75 (m, 1H), 5.56 (br, 1H), 5.13-5.07 (m, 2H), 3.87-3.85 (m, 2H), 3.74 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.6, 134.8, 133.9, 133.2, 131.8, 129.2, 128.1, 125.0, 116.2, 43.9, 42.0; LC-MS (ESI) m/z: 256 [M^+H (^{81}Br)], 254 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{11}H_{13}BrNO$ [M^+H] 254.0175; Found: 254.0176.



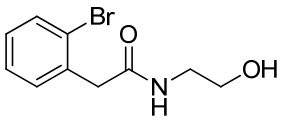
1j

2-(2-bromophenyl)-*N*-phenethylacetamide (1j)[5]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), phenethylamine (2.25 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1j** as a white solid (2.27 g, 77%). M.p. 120-122 ^oC; IR (KBr, cm^{-1}): 3268, 3083, 1643, 1561, 1026; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.59 (d, J = 8.5 Hz, 1H), 7.30-7.16 (m, 6H), 7.09 (d, J = 7.0 Hz, 2H), 5.49 (br ,1H), 3.69 (s, 2H), 3.51 (q, J = 6.5 Hz, 2H), 2.78 (t, J = 6.9 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.5, 138.7, 134.8, 133.1, 131.8, 129.1, 128.7, 128.6, 128.0, 126.4, 125.0, 44.0, 40.8, 35.5; LC-MS (ESI) m/z: 320 [M^+H (^{81}Br)], 318 [M^+H (^{79}Br)].



1k

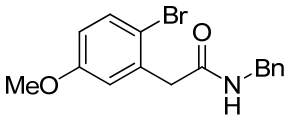
2-(2-bromophenyl)-*N*-(furan-2-ylmethyl)acetamide (1k): Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol), furan-2-ylmethanamine (1.80 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1k** as a white solid (1.58 g, 58%). M.p. 126-128 ^oC; IR (KBr, cm^{-1}): 3281, 3069, 1647, 1548, 1027, 744; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.57 (d, J = 8.0 Hz, 1H), 7.35-7.28 (m, 3H), 7.15 (td, J = 8.0, 1.5 Hz, 1H), 6.29-6.28 (m, 1H), 6.17 (d, J = 3.0 Hz, 1H), 5.87 (br, 1H), 4.41 (d, J = 6.0 Hz, 2H) , 3.72 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.4, 151.2, 142.1, 134.6, 133.1, 131.7, 129.2, 128.0, 125.0, 110.4, 107.3, 43.9, 36.7; LC-MS (ESI) m/z: 296 [M^+H (^{81}Br)], 294 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{13}H_{12}BrNNaO_2$ [M^+] 315.9944; Found: 315.9936.



1l

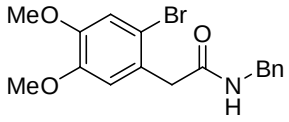
2-(2-bromophenyl)-*N*-(2-hydroxyethyl)acetamide (1l)[6]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (2.00 g, 9.3 mmol), $(COCl)_2$ (1.12 mL, 11.80 mmol),

ethanolamine (1.13 g, 18.6 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **1l** as a white solid (1.41 g, 59%). M.p. 95-96 ^{o}C; IR (KBr, cm^{-1}): 3445, 3282, 1655, 1559, 1028; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.58 (d, *J* = 8.0 Hz, 1H), 7.35-7.29 (m, 2H), 7.18-7.14 (m, 1H), 6.08 (br ,1H), 3.71 (s, 2H), 3.67 (t, *J* = 5.0 Hz, 2H), 3.39-3.36 (m, 2H) , 2.63 (s, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 170.9, 134.6, 133.2, 131.8, 129.3, 128.1, 125.0, 62.1, 43.9, 42.8; LC-MS (ESI) m/z: 260 [M^{+}H (^{81}Br)], 258 [M^{+}H (^{79}Br)].



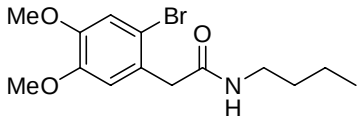
1m

***N*-benzyl-2-(2-bromo-5-methoxyphenyl)acetamide (1m):** Following the same procedure as Method B with (2-bromo-5-methoxy)phenylacetic acid (0.49 g, 2.0 mmol), DCC (0.49 g, 2.4 mmol), benzylamine (0.26 g, 2.4 mmol). The crude product was purified by flash chromatography with EtOAc/ petroleum ether (1:1) to give **1m** as a white solid (0.50 g, 75%). M.p. 146-147 ^{o}C; IR (KBr, cm^{-1}): 3284, 3075, 3031, 1646, 1553, 1473, 1257, 1053, 1017, 797, 691; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.47 (d, *J* = 9.0 Hz, 1H), 7.34-7.24 (m, 5H), 6.92 (d, *J* = 3.0 Hz, 1H), 6.74 (dd, *J* = 8.5, 2.5 Hz, 1H), 5.93 (br ,1H), 4.45 (d, *J* = 5.5 Hz, 2H), 3.79 (s, 3H), 3.73 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.5, 159.3, 138.0, 135.6, 133.7, 128.7, 127.5, 127.5, 117.1, 115.2, 115.2, 55.5, 44.2, 43.7; LC-MS (ESI) m/z: 336 [M^{+}H (^{81}Br)], 334 [M^{+}H (^{79}Br)]; HRMS: m/z calcd for $C_{16}H_{17}BrNO_2$ [M^{+}H] 334.0437; Found: 334.0442.



1n

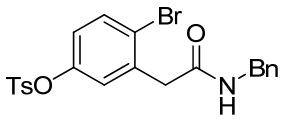
***N*-benzyl-2-(2-bromo-4,5-dimethoxyphenyl)acetamide (1n):** Following the same procedure as Method B with (2-bromo-4,5-dimethoxy)phenylacetic acid (0.55 g, 2.0 mmol), DCC (0.49 g, 2.4 mmol), benzylamine (0.26 g, 2.4 mmol). The crude product was purified by flash chromatography with EtOAc/ petroleum ether (1:1) to give **1n** as a white solid (0.41 g, 56%). M.p. 156-157 ^{o}C; IR (KBr, cm^{-1}): 3293, 3063, 2930, 2850, 1641, 1509, 1257, 1216, 1033, 697; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.34-7.24 (m, 5H), 7.04 (s, 1H), 6.87 (s, 1H), 5.84 (br, 1H), 4.46 (d, *J* = 5.5 Hz, 2H), 3.88 (s, 3H), 3.87 (s, 3H), 3.72 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.9, 149.0, 148.8, 138.1, 128.7, 127.6, 127.5, 126.5, 115.6, 114.8, 113.8, 56.2, 56.1, 43.7, 33.7; LC-MS (ESI) m/z: 366 [M^{+}H (^{81}Br)], 364 [M^{+}H (^{79}Br)]; HRMS: m/z calcd for $C_{17}H_{19}BrNO_3$ [M^{+}H] 364.0543; Found: 364.0542.



1o

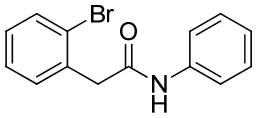
2-(2-bromo-4,5-dimethoxyphenyl)-*N*-butylacetamide (1o): Following the same procedure as Method B with (2-bromo-4,5-dimethoxy)phenylacetic acid (0.55 g, 2.0 mmol), DCC (0.49 g, 2.4 mmol), butylamine (0.18 g, 2.4 mmol). The crude product was purified by flash chromatography with EtOAc/ petroleum ether (1:1) to give **1o** as a white solid (0.31 g, 47%). M.p. 116-118 ^{o}C; IR (KBr, cm^{-1}): 3297, 3069, 2960, 1637, 1545, 1512, 1261, 1213, 1029, 846, 564; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.03 (s, 1H), 6.83 (s, 1H), 5.47 (br, 1H), 3.88 (s, 3H), 3.87(s, 3H); 3.61 (s, 2H), 3.21

(q, J = 7.0 Hz, 2H), 1.45-1.39 (m, 2H), 1.30-1.25 (m, 2H), 0.88 (t, J = 7.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.8, 148.9, 148.7, 126.8, 115.6, 114.7, 113.8, 56.2, 56.1, 43.7, 39.4, 31.5, 20.0, 13.7; LC-MS (ESI) m/z: 332 [M^+H (^{81}Br)], 330 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{14}H_{21}BrNO_3$ [M^+H] 330.0699; Found: 330.0688.



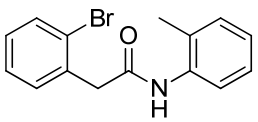
1p

4-(2-(benzylamino)-2-oxoethyl)-3-bromophenyl-4-methylbenzenesulfonate (1p): To a solution of **1m** (0.71 g, 1.5 mmol) in 30 mL of CH_2Cl_2 at 0 °C was added BBr_3 (4 N, 288 μL, 3.0 mmol). The resulting mixture was allowed to warm to the room temperature and stirred overnight. After the reaction was completed, the mixture was poured into ice water and extracted with EtOAc (2×30 mL). The organic layer was washed with saturated $NaHCO_3$ solution and saturated brine. The combined organic phase was dried over Na_2SO_4, concentrated in vacuo, purified by flash column chromatography (EtOAc/ petroleum ether =1:1) to give the crude phenol. Then a solution of the crude phenol and Et_3N (140 μL, 1.5 mmol) in CH_2Cl_2 (30 mL) was added tosyl chloride (0.28 g, 1.5 mmol). The reaction mixture was stirred at room temperature for 12 h. The organic layer was washed with saturated $NaHCO_3$ solution and saturated brine. Combined organic phase was dried over Na_2SO_4, concentrated in vacuo, purified on flash column chromatography (EtOAc/petroleum ether =1:5) to give **1p** as a white solid (0.55 g, 78%). M.p. 117-118 °C; IR (KBr, cm^{-1}): 3343, 3068, 1663, 1546, 1380, 1246, 1178, 1092, 833, 577; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.69 (d, J = 8.0 Hz, 2H), 7.50 (d, J = 8.5 Hz, 1H), 7.35-7.24 (m, 7H), 7.06 (d, J = 3.0 Hz, 1H), 6.81 (dd, J = 8.5, 2.5 Hz, 1H), 5.86 (br, 1H), 4.43 (d, J = 5.5 Hz, 2H), 3.66 (s, 2H), 2.46 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 168.5, 148.9, 145.8, 137.9, 136.6, 134.0, 132.0, 130.0, 128.7, 128.5, 127.6, 127.6, 125.6, 123.1, 123.0, 43.8, 21.8; LC-MS (ESI) m/z: 476 [M^+H (^{81}Br)], 474 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{22}H_{21}BrNO_4S$ [M^+H] 474.0369; Found: 474.0390.



2a

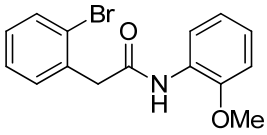
2-(2-bromophenyl)-*N*-phenylacetamide (2a)[7]: Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), aniline (0.87 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2a** as a white solid (1.21 g, 90%). M.p. 150-151°C; IR (KBr, cm^{-1}): 3425, 3263, 1655, 1534, 751; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.65 (d, J = 8.0 Hz, 1H), 7.48-7.44 (m, 3H), 7.39-7.29 (m, 4H), 7.23 (td, J = 8.0, 1.5 Hz, 1H), 7.12 (t, J = 7.5 Hz, 1H), 3.90 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.7, 137.6, 134.5, 133.3, 131.8, 129.4, 129.0, 128.2, 125.0, 124.6, 120.0, 45.1; LC-MS (ESI) m/z: 292 [M^+H (^{81}Br)], 290 [M^+H (^{79}Br)].



2b

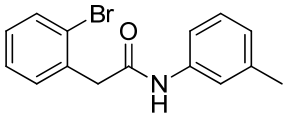
2-(2-bromophenyl)-*N*-(*o*-tolyl)acetamide (2b): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), *o*-toluidine (1.00

g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2b** as a white solid (1.13 g, 80%). M.p. 183-184°C; IR (KBr, cm^{-1}): 3470, 3254, 1654, 1530, 754; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.86 (d, *J* = 7.5 Hz, 1H), 7.65 (d, *J* = 8.0 Hz, 1H), 7.45 (d, *J* = 6.5 Hz, 1H), 7.37 (t, *J* = 7.5 Hz, 1H), 7.24-7.15 (m, 2H), 7.11 (d, *J* = 7.0 Hz, 1H), 7.06-6.99 (m, 2H), 3.93 (s, 2H), 2.03 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 167.6, 135.5, 134.8, 133.4, 131.9, 130.4, 130.1, 128.6, 128.3, 126.8, 125.2, 125.1, 122.5, 45.1, 17.4; MS (EI) *m*/*z* (%): 305 (13) [M^+ (^{81}Br)], 303 (14) [M^+ (^{79}Br)], 224 (71), 169 (24), 107 (100), 91 (22); Anal. Calcd. for $C_{15}H_{14}BrNO$: C, 59.23; H, 4.64; N, 4.60. Found: C, 59.31; H, 4.60; N, 4.61.



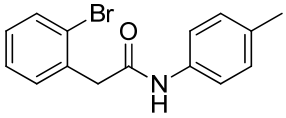
2c

2-(2-bromophenyl)-*N*-(2-methoxyphenyl)acetamide (2c): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 2-methoxyaniline (1.15 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2c** as a white solid (1.16 g, 78%). M.p. 133-134°C; IR (KBr, cm^{-1}): 3455, 3260, 1659, 1538, 750; ^1H NMR ($CDCl_3$, 500 MHz): δ 8.35 (dd, *J* = 8.0, 1.5 Hz, 1H), 7.92 (br, 1H), 7.62 (dd, *J* = 8.0, 0.5 Hz, 1H), 7.44 (dd, *J* = 7.5, 1.5 Hz, 1H), 7.34 (td, *J* = 7.5, 1.0 Hz, 1H), 7.19 (td, *J* = 8.0, 1.5 Hz, 1H), 7.02 (td, *J* = 7.5, 1.5 Hz, 1H), 6.95-6.92 (m, 1H), 6.83-6.82 (m, 1H), 3.90 (s, 2H), 3.77 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.5, 147.9, 134.7, 133.1, 131.8, 129.2, 128.0, 127.6, 125.0, 123.8, 121.1, 119.6, 110.0, 55.8, 45.3; MS (EI) m/z (%): 321 (25) [M^+ (^{81}Br)], 319 (26) [M^+ (^{79}Br)], 123 (100). HRMS: m/z calcd for $C_{15}H_{14}BrNNaO_2$ [M^+] 342.0100; Found: 342.0106.



2d

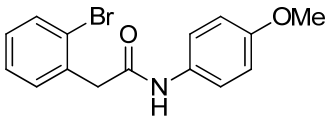
2-(2-bromophenyl)-*N*-(*m*-tolyl)acetamide (2d): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), m-Toluidine (1.00 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2d** as a white solid (1.17 g, 83%). M.p. 128-130 °C; IR (KBr, cm^{-1}): 3265, 1653, 1538, 1026, 751; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.63 (d, *J* = 7.5 Hz, 1H), 7.43 (d, *J* = 7.5 Hz, 1H), 7.35 (t, *J* = 7.0 Hz, 1H), 7.30-7.16 (m, 5H), 6.91 (d, *J* = 7.0 Hz, 1H), 3.87 (s, 2H), 2.31 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.7, 139.0, 137.5, 134.5, 133.3, 131.8, 129.4, 128.8, 128.2, 125.4, 125.0, 120.6, 117.0, 45.1, 21.4; LC-MS (ESI) m/z: 306 [M^+H (^{81}Br)], 304 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{15}H_{15}BrNO$ [M^+H] 304.0332; Found: 304.0338.



2e

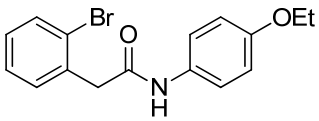
2-(2-bromophenyl)-*N*-(*p*-tolyl)acetamide (2e): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), *p*-toluidine (1.00 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2e** as a

white solid (1.20 g, 85%). M.p. 128-130 °C; IR (KBr, cm^{-1}): 3265, 1653, 1538, 1026, 751; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.63 (d, *J* = 7.5 Hz, 1H), 7.43 (d, *J* = 7.5 Hz, 1H), 7.35 (t, *J* = 7.0 Hz, 1H), 7.30-7.16 (m, 5H), 6.91 (d, *J* = 7.0 Hz, 1H), 3.87 (s, 2H), 2.31 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.7, 139.0, 137.5, 134.5, 133.3, 131.8, 129.4, 128.8, 128.2, 125.4, 125.0, 120.6, 117.0, 45.1, 21.4; LC-MS (ESI) m/z: 306 [M^+H (^{81}Br)], 304 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{15}H_{15}BrNO$ [M^+H] 304.0332; Found: 304.0338.



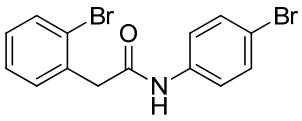
2f

2-(2-bromophenyl)-*N*-(4-methoxyphenyl)acetamide (2f): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 4-methoxyaniline (1.15 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2f** as a white solid (1.34 g, 90%). M.p. 179-181°C; IR (KBr, cm^{-1}): 3473, 3270, 1659, 1533, 1246, 1028; ^1H NMR ($CDCl_3$, 500 MHz): 7.63-7.61 (m, 1H), 7.43-7.41 (m, 1H), 7.35-7.33 (m, 3H), 7.19 (td, *J* = 8.0, 1.5 Hz, 1H), 7.15 (br, 1H), 6.82 (d, *J* = 9.0 Hz, 2H), 3.85 (s, 2H), 3.77 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz,): δ 167.7, 156.6, 134.6, 133.3, 131.8, 130.7, 129.4, 128.2, 125.0, 122.1, 114.1, 55.5, 44.9. MS (EI) m/z: 321 (29) [M^+ (^{81}Br)], 319 (30) [M^+ (^{79}Br), 149 (16), 123 (100), 122 (24), 90 (14), 89 (13); Anal. Calcd. for $C_{15}H_{14}BrNO_2$: C, 56.27; H, 4.41; N, 4.37. Found: C, 56.51; H, 4.37; N, 4.48.



2g

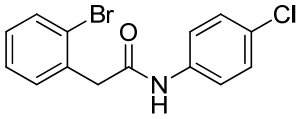
2-(2-bromophenyl)-*N*-(4-ethoxyphenyl)acetamide (2g): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 4-ethoxyaniline (1.28 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2g** as a white solid (1.25 g, 82%). M.p. 172-174°C; IR (KBr, cm^{-1}): 3461, 3282, 1659, 1530, 1246; ^1H NMR ($CDCl_3$, 500 MHz): 7.62 (d, *J* = 8.0 Hz, 1H), 7.42-7.41 (m, 1H), 7.35-7.31 (m, 3H), 7.21-7.18 (m, 2H), 6.81 (dd, *J* =7.0, 2.0 Hz, 2H), 3.98 (q, *J* = 7.0 Hz, 2H), 3.84 (s, 2H), 1.38 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167. 6, 156.0, 134.7, 133.2, 131.8, 130.6, 129.4, 128.2, 125.0, 122.0, 114.7, 63.7, 44.9, 14.8; MS (EI) m/z: 335 (47) [M^+ (^{81}Br)], 333 (48) [M^+ (^{79}Br)], 171 (22), 169 (23), 137 (100), 109 (45), 108 (62); Anal. Calcd. for $C_{15}H_{14}BrNO$: C, 57.50; H, 4.83; N, 4.19. Found: C, 57.47; H, 4.76; N, 4.15.



2h

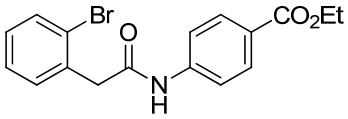
2-(2-bromophenyl)-*N*-(4-bromophenyl)acetamide (2h): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 4-bromoaniline (1.60 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2h** as a white solid (0.99 g, 58%). M.p. 168-170°C; IR (KBr, cm^{-1}): 3294, 3243, 1658, 1520, 1070, 827, 742, 500; ^1H NMR ($CDCl_3$, 500 MHz): 7.62 (d, *J* = 8.0 Hz, 1H), 7.45-7.36 (m, 6H), 7.27-7.22 (m, 2H), 3.89 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.8, 136.7, 134.2, 133.3,

131.9, 131.8, 129.6, 128.3, 124.9, 122,6, 117.2, 45.0; LC-MS (ESI) m/z: 372 [M^+H ($^{81}Br\times2$)], 370 [M^+H (^{81}Br)(^{79}Br)], 368 [M^+H ($^{79}Br\times2$)]; HRMS: m/z calcd for $C_{14}H_{12}Br_2NO$ [M^+H] 367.9280; Found: 367.9278.



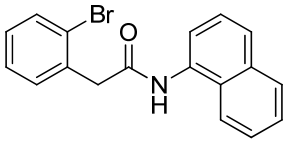
2i

2-(2-bromophenyl)-*N*-(4-chlorophenyl)acetamide (2i): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 4-chloroaniline (1.18 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2i** as a white solid (1.05 g, 70%). M.p. 205-206°C; IR (KBr, cm^{-1}): 3439, 3297, 1660, 1520, 1397; ^1H NMR ($CDCl_3$, 500 MHz): 7.65 (d, J = 8.0 Hz, 1H), 7.43-7.23 (m, 8H), 3.88 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 167.8, 136.2, 134.3, 133.3, 131.8, 129.5, 129.4, 129.0, 128.3, 124.9, 121.3, 45.0; MS (EI) m/z: 327 (4) [M^+ (^{81}Br)(^{37}Cl)], 325 (14) [M^+ (^{81}Br)(^{35}Cl)], 323 (11) [M^+ (^{79}Br)(^{35}Cl)], 171 (35), 169 (36), 127 (100), 90 (27), 89 (26). Anal. Calcd. for $C_{14}H_{11}BrClNO$: C, 51.80; H, 3.42; N, 4.32. Found: C, 52.09; H, 3.37; N, 4.05.



2j

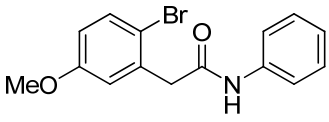
Ethyl 4-(2-(2-bromophenyl)acetamido)benzoate (2j): Following the same procedure as Method B with 2-(2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), DCC (1.15 g, 5.58 mmol), ethyl 4-aminobenzoate (0.92 g, 5.58 mmol). The crude product was purified by flash chromatography with EtOAc/ petroleum ether (1:1) to give **2j** as a white solid (1.09 g, 65%). M.p. 136-138 °C; IR (KBr, cm^{-1}): 3257, 1698, 1674, 1674, 1597, 1540, 1281, 1253, 1023, 769, 748; ^1H NMR ($CDCl_3$, 500 MHz): 7.97 (d, J = 8.5 Hz, 2H), 7.63 (d, J = 5.0 Hz, 1H), 7.53 (d, J = 8.5 Hz, 2H), 7.48 (br, 1H), 7.42 (dd, J = 7.5, 1.5 Hz, 1H), 7.35 (t, J = 7.5 Hz, 1H), 7.21 (td, J = 8.0, 1.5 Hz, 1H), 4.34 (q, J = 7.0 Hz, 2H), 3.89 (s, 2H), 1.37 (t, J = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 169.0, 165.8, 144.0, 135.9, 132.8, 132.7, 130.8, 129.4, 128.1, 125.1, 124.6, 118.9, 60.9, 43.8, 14.7; LC-MS (ESI) m/z: 364 [M^+H (^{81}Br)], 362 [M^+H (^{79}Br)]; Anal. Calcd. for $C_{17}H_{16}BrNO_3$: C, 56.37; H, 4.45; N, 3.87. Found: C, 56.24; H, 4.47; N, 3.88.



2k

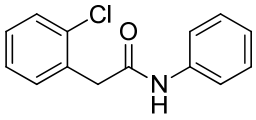
2-(2-bromophenyl)-*N*-(naphthalen-1-yl)acetamide (2k): Following the same procedure as Method A with (2-bromophenyl)acetic acid (1.00 g, 4.65 mmol), $(COCl)_2$ (0.56 mL, 5.90 mmol), 1-Aminonaphthalene (1.37 g, 9.3 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2k** as a white solid (0.76 g, 48%). M.p. 218-219 °C; IR (KBr, cm^{-1}): 3240, 1649, 1537, 1029, 780, 749; ^1H NMR (d_6-DMSO, 500 MHz): δ 10.20 (s, 1H), 8.16 (d, J = 8.0 Hz, 1H), 7.95 (d, J = 8.0 Hz, 1H), 7.78 (d, J = 8.0 Hz, 1H), 7.70 (d, J = 7.5 Hz, 1H), 7.65 (d, J = 8.0 Hz, 1H), 7.60-7.50 (m, 4H), 7.39 (t, J = 7.0 Hz, 1H), 7.24 (t, J = 7.5 Hz, 1H), 4.04 (s, 2H); ^{13}C NMR (d_6-DMSO, 125 MHz): δ 169.1, 136.5, 134.2, 134.0,132.8, 132.8, 129.3, 128.6, 128.3,

128.1, 126.5, 126.3, 126.0, 125.8, 125.1, 123.2, 122.2, 43.4; LC-MS (ESI) m/z: 342 [M^+H (^{81}Br)], 340 [M^+H (^{79}Br)]; HRMS: m/z calcd for $C_{18}H_{15}BrNO$ [M^+H] 340.0332; Found: 340.0346.



2l

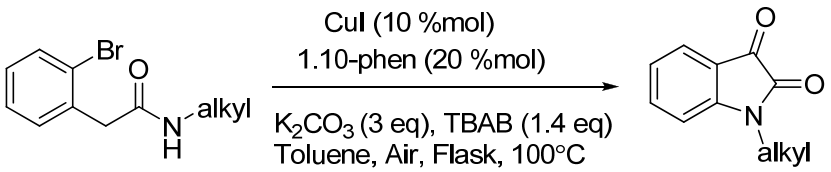
2-(2-bromo-5-methoxyphenyl)-*N*-phenylacetamide (2l): Following the same procedure as Method B with (2-bromo-5-methoxy)phenylacetic acid (0.49 g, 2.0 mmol), DCC (0.50 g, 2.4 mmol), aniline (0.22 g, 2.4 mmol). The crude product was purified by flash chromatography with EtOAc/ petroleum ether (1:1) to give **2l** as a white solid (0.59 g, 92%). M.p. 192-193 °C; IR (KBr, cm^{-1}): 3264, 1659, 1532, 1538, 1253, 1018, 807, 756, 696; ^1H NMR (d_6-DMSO, 500 MHz): δ 10.18 (s, 1H), 7.58 (d, *J* = 7.5 Hz, 2H), 7.47 (d, *J* = 8.5 Hz, 1H), 7.29 (t, *J* = 7.0 Hz, 2H), 7.02 (s, 2H), 6.81 (d, *J* = 7.5 Hz, 1H), 3.79 (s, 2H), 3.74 (s, 3H); ^{13}C NMR (d_6-DMSO, 125 MHz): δ 172.9, 163.7, 144.4, 141.9, 138.0, 133.9, 128.4, 124.2, 123.3, 120.1, 119.5, 60.6, 48.5; LC-MS (ESI) m/z: 320 [M^+H]; HRMS: m/z calcd for $C_{15}H_{14}BrNO_2$ [M^+H] 320.0281; Found: 320.0272.



2m

2-(2-chlorophenyl)-*N*-phenylacetamide (2m)[8]: Following the same procedure as Method A with (2-chlorophenyl)acetic acid (1.00 g, 5.86 mmol), $(COCl)_2$ (0.63 mL, 7.43 mmol), aniline (1.09 g, 11.72 mmol). The crude product was recrystallized from EtOAc/ petroleum ether to give **2b** as a white solid (1.22 g, 85%). M.p. 126-128°C; IR (KBr, cm^{-1}): 3296, 1659, 1598, 753, 692 ; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.48-7.41 (m, 5H), 7.32-7.29 (m, 4H), 7.11 (t, *J* = 7.0 Hz, 1H), 3.86 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 168.0, 137.7, 134.4, 132.7, 131.8, 129.9, 129.2, 129.0, 127.5, 124.5, 120.1, 42.5; LC-MS (ESI) m/z: 247 [M^+H (^{37}Cl)], 245 [M^+H (^{35}Cl)].

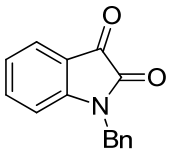
4. General Procedure for the Cu-catalyzed *N*-alkyl substituted isatins synthesis



1 **3**

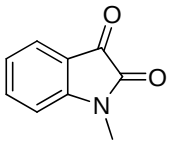
A 25 mL round bottom flask equipped with drying tube, a magnetic stirring bar, is charged with 2 mL of anhydrous toluene, *N*-alkyl-2-(2-halogenphenyl)acetamide **1** (0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) . The mixture was stirred at 100 °C in an oil bath, and monitored by TLC. Upon completion, the reaction mixture was eluted with H_2O (15 mL) and extracted with EtOAc (2×15 mL). The combined organic phase was washed with brine and dried over anhydrous Na_2SO_4. After that the organic phase was filtered, and the filtrate was evaporated in vacuum to give the crude product which was purified by column chromatography on silica gel using appropriate eluent.

5. Synthesis and characterization for *N*-alkyl substituted isatins products



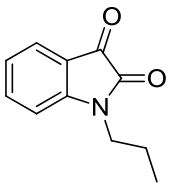
3a

1-benzylindoline-2,3-dione (3a)[9]: According to the general procedure, a mixture of **1a** (76 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3(104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 8 h gave **3a** (EtOAc/petroleum ether = 1:5) as a red solid (44 mg, 74%). M.p. 130-132 °C; IR (KBr, cm^{-1}): 1732, 1612, 1470, 1349, 1176, 1078, 1063, 765, 753, 694; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.60 (d, *J* = 7.5 Hz, 1H), 7.48 (td, *J* = 7.5, 1.0 Hz, 1H), 7.37-7.29 (m, 5H), 7.09 (t, *J* = 7.5 Hz, 1H), 6.78 (d, *J* = 8.0 Hz, 1H), 4.93 (s, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.3, 158.3, 150.7, 138.3, 134.5, 129.1, 128.2, 127.4, 125.4, 123.9, 117.7, 111.0, 44.1; MS (EI) m/z (%): 237 (35) [M^+], 146 (49), 91 (48).



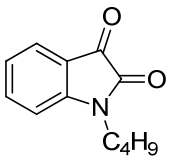
3b

1-methylindoline-2,3-dione (3b)[10]: According to the general procedure, a mixture of **1b** (57 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 8 h gave **3b** (EtOAc/petroleum ether = 1:5) as a red solid (27 mg, 67%). M.p. 126-128 °C; IR (KBr, cm^{-1}): 2924, 1745, 1607, 1470, 756; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.62-7.58 (m, 2H), 7.12 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.0 Hz, 1H), 3.25(s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.8, 158.3, 151.5, 138.4, 125.3, 123.9, 117.5, 109.9, 26.2; MS (EI) m/z (%): 161 (72) [M^+], 133 (32), 104 (100).



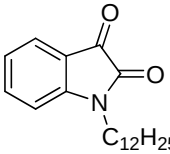
3c

1-propylindoline-2,3-dione (3c)[11]: According to the general procedure, a mixture of **1c** (64 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 12 h gave **3c** (EtOAc/petroleum ether = 1:5) as a red solid (30 mg, 64%). M.p. 72-74 °C; IR (KBr, cm^{-1}): 1743, 1612, 1470, 754; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.59-7.56 (m, 2H), 7.10 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.0 Hz, 1H), 3.68 (t, *J* = 7.5 Hz, 2H), 1.75-1.71 (m, 2H), 0.99 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.7, 158.2, 151.1, 138.3, 125.4, 123.6, 117.6, 110.2, 41.8, 20.6, 11.4; MS (EI) m/z (%): 189 (57) [M^+], 133 (100).



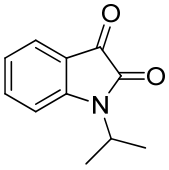
3d

1-butylindoline-2,3-dione (3d)[12]**:** According to the general procedure, a mixture of **1d** (67.5 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 12 h gave **3d** (EtOAc/petroleum ether = 1:5) as a red solid (31 mg, 61%). M.p. 36-38 °C; IR (KBr, cm^{-1}): 1733, 1610, 1468, 752; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.58-7.56 (m, 2H), 7.09 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.0 Hz, 1H), 3.70 (t, *J* = 7.5 Hz, 2H), 1.70-1.64 (m, 2H), 1.43-1.36 (m, 2H), 0.95 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.7, 158.1, 151.1, 138.3, 125.4, 123.6, 117.6, 110.3, 40.3, 29.3, 20.1, 13.7; MS (EI) m/z (%): 203 (39) [M^+], 132 (100).



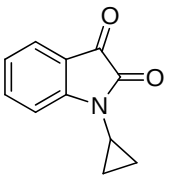
3e

1-dodecylindoline-2,3-dione (3e)[13]**:** According to the general procedure, a mixture of **1e** (95.6 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 16 h gave **3e** (EtOAc/petroleum ether = 1:5) as a red solid (46 mg, 58%). M.p. 70-72 °C; IR (KBr, cm^{-1}): 1738, 1610, 1466, 763; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.59-7.58 (m, 2H), 7.10 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.0 Hz, 1H), 3.70 (t, *J* = 7.5 Hz, 2H), 1.70-1.66 (m, 2H), 1.35-1.24 (m, 18H), 0.89 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.7, 158.1, 151.1, 138.3, 125.4, 123.6, 117.6, 110.2, 40.3, 31.9, 29.6, 29.5, 29.5, 29.3, 29.2, 27.3, 26.9, 22.7, 14.1; MS (EI) m/z (%): 315 (60) [M^+], 161(100).



3f

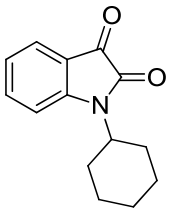
1-isopropylindoline-2,3-dione (3f)[14]**:** According to the general procedure, a mixture of **1f** (64 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 12 h gave **3f** (EtOAc/petroleum ether = 1:5) as a red solid (35 mg, 74%). M.p. 62-64 °C; IR (KBr, cm^{-1}): 1739, 1608, 1732, 1468, 756; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.60-7.54 (m, 2H), 7.08 (t, *J* = 7.5 Hz, 1H), 7.03 (d, *J* = 8.0 Hz, 1H), 4.56-4.50 (m, 1H), 1.51 (d, *J* = 7.0 Hz, 6H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.9, 157.9, 150.5, 138.1, 125.6, 123.3, 117.9, 111.3, 44.8, 19.4; MS (EI) m/z (%): 189 (64) [M^+], 146 (100).



3g

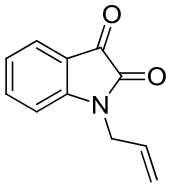
1-cyclopropylindoline-2,3-dione (3g): According to the general procedure, a mixture of **1g** (64 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 6 h gave **3g** (EtOAc/petroleum ether = 1:5) as a red solid (32 mg, 69%).

M.p. 90-92 °C; IR (KBr, cm^{-1}): 1741, 1611, 1428, 757; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.62-7.57 (m, 2H), 7.18 (d, *J* = 8.0 Hz, 1H), 7.12 (t, *J* = 7.5 Hz, 1H), 2.70-2.66 (m, 1H), 1.14-1.10 (m, 2H), 0.97-0.94 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.7, 158.6, 151.9, 138.3, 125.0, 123.7, 117.3, 113.3, 22.2, 6.2; MS (EI) m/z (%): 187 (67) [M^+], 132 (100); HRMS: m/z calcd for $C_{11}H_{10}NO_2$ [M^+H] 188.0706; Found: 188.0702.



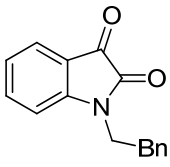
3h

1-cyclohexylindoline-2,3-dione (3h)[15]**:** According to the general procedure, a mixture of **1h** (74 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in *o*-xylene (2 mL) was stirred at 120 °C for 12 h gave **3h** (EtOAc/petroleum ether = 1:5) as a red solid (39 mg, 68%). M.p. 190-192 °C; IR (KBr, cm^{-1}): 1745, 1733, 1615, 750; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.60-7.53 (m, 2H), 7.09-7.05 (m, 2H), 4.08-4.03 (m, 1H), 2.16-1.25 (m, 10H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.9, 157.9, 151.0, 138.1, 125.6, 123.2, 117.9, 111.5, 53.1, 29.1, 25.8, 25.2; LC-MS (ESI) m/z: 230 [M^+H].



3i

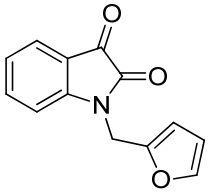
1-allylindoline-2,3-dione (3i)[16]**:** According to the general procedure, a mixture of **1i** (63.5 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 8 h gave **3i** (EtOAc/petroleum ether = 1:5) as a red solid (34 mg, 72%). M.p. 102-104 °C; IR (KBr, cm^{-1}): 1729, 1606, 1469, 762; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.61-7.55 (m, 2H), 7.12 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 7.5 Hz, 1H), 5.88-5.80 (m, 1H), 5.34-5.28 (m, 2H), 4.36 (d, *J* = 5.0 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.2, 157.9, 150.8, 138.3, 130.4, 125.4, 123.8, 118.7, 117.6, 110.9, 42.5; MS (EI) m/z (%): 187 (63) [M^+], 130 (100).



3j

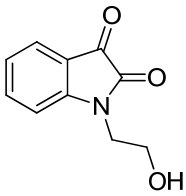
1-phenethylindoline-2,3-dione (3j)[17]**:** According to the general procedure, a mixture of **1j** (79.5 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 8 h gave **3j** (EtOAc/petroleum ether = 1:5) as a red solid (31 mg, 50%). M.p. 108-110 °C; IR (KBr, cm^{-1}): 1732, 1604, 1467, 758; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.62 (d, *J* = 7.5 Hz, 1H), 7.56 (t, *J* = 7.0 Hz, 1H), 7.34-7.27 (m, 5H), 7.12 (t, *J* = 7.5 Hz, 1H), 6.78 (d, *J* = 8.0 Hz, 1H), 3.99 (t, *J* = 7.5 Hz, 2H), 3.04 (t, *J* = 7.5 Hz, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.4, 158.1, 150.9, 138.3, 137.6, 128.8, 128.8, 127.0, 125.5, 123.6, 117.5, 110.1, 41.8, 33.7; MS

(EI) m/z (%): 251 (45) [M^+], 132(100).



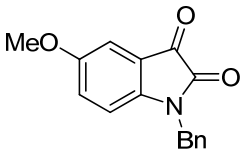
3k

1-(furan-2-ylmethyl)indoline-2,3-dione (3k)[18]**:** According to the general procedure, a mixture of **1k** (73.5 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 4 h gave **3k** (EtOAc/petroleum ether = 1:5) as a red solid (39 mg, 69%). M.p. 136-138 °C; IR (KBr, cm^{-1}): 1738, 1614, 1470, 1343, 760; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.59-7.55 (m, 2H), 7.35 (d, *J* = 1.0 Hz, 1H), 7.12-7.09 (m, 1H), 7.05(d, *J* = 8.0 Hz, 1H), 6.38 (d, *J* = 3.0 Hz, 1H), 6.33-6.32 (m, 1H), 4.89 (s, 2H); ^{13}C NMR ($CDCl_3$, 500 MHz): δ 183.1, 157.8, 150.6, 148.1, 142.8, 138.4, 125.4, 123.9, 117.6, 110.9, 110.7, 109.3, 36.8; LC-MS (ESI) m/z: 228 [M^+H].



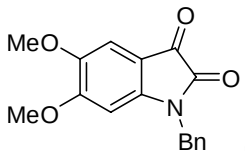
3l

1-(2-hydroxyethyl)indoline-2,3-dione (3l)[19]**:** According to the general procedure, a mixture of compound **1l** (64.5 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 8 h gave **3l** (EtOAc/petroleum ether = 1:5) as a red solid (29 mg, 60%). M.p. 102-104 °C; IR (KBr, cm^{-1}): 3442, 1055, 1028, 1008; ^{1}H NMR (d_6-DMSO, 500 MHz): δ 7.65 (t, *J* = 7.5 Hz, 1H), 7.54 (d, *J* = 8.0 Hz, 1H), 7.21 (d, *J* = 8.0 Hz, 1H), 7.12 (t, *J* = 7.5 Hz, 1H), 3.75 (t, *J* = 5.5 Hz, 2H), 3.63 (t, *J* = 5.5 Hz, 2H); ^{13}C NMR (d_6-DMSO, 125 MHz): δ 184.2, 158.8, 151.8, 138.5, 124.7, 123.4, 117.9, 111.6, 58.2, 42.9; LC-MS (ESI) m/z: 192 [M^+H].



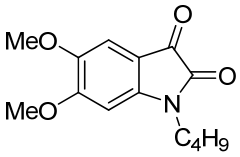
3m

1-benzyl-5-methoxyindoline-2,3-dione (3m)[20]**:** According to the general procedure, a mixture of **1l** (84 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 6 h gave **3m** (EtOAc/petroleum ether = 1:5) as a brown solid (40 mg, 60%). M.p. 120-122 °C; IR (KBr, cm^{-1}): 1723, 1621, 1437, 1271, 1080; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.34-7.29 (m, 5H), 7.14 (d, *J* = 2.5 Hz, 1H), 7.02 (dd, *J* = 9.0, 2.5 Hz, 1H), 6.67 (d, *J* = 8.5 Hz, 1H), 4.90 (s, 2H), 3.78 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.7, 158.4, 156.6, 144.6, 134.6, 129.1, 128.1, 127.4, 124.7, 118.1, 112.1, 109.6, 56.0, 44.1; LC-MS (ESI) m/z: 268 [M^+H].



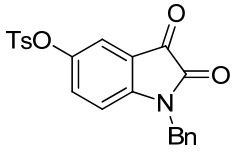
3n

1-benzyl-5,6-dimethoxyindoline-2,3-dione (3n): According to the general procedure, a mixture of **1n** (91 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 6 h gave **3n** (EtOAc/petroleum ether = 1:5) as a brown solid (53 mg, 65%). M.p. 132-134°C; IR (KBr, cm^{-1}): 2928, 1734, 1618, 1245; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.37-7.30 (m, 5H), 7.11 (s, 1H), 6.25 (s, 1H), 4.91 (s, 2H), 3.84(s, 3H) , 3.84(s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 180.9, 159.5, 158.2, 148.7, 145.9, 134.9, 129.1, 128.2, 127.3, 109.1, 107.5, 95.4, 56.6, 56.5, 43.9; LC-MS (ESI) m/z: 298 [M^+H]; HRMS: m/z calcd for $C_{17}H_{15}NO_4$: 297.1006; Found: 297.1001.



3o

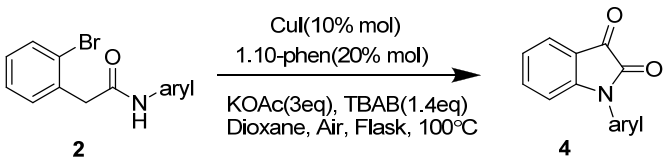
1-butyl-5,6-dimethoxyindoline-2,3-dione (3o): According to the general procedure, a mixture of **1o** (83 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 16 h gave **3o** (EtOAc/petroleum ether = 1:5) as a brown solid (30 mg, 46%). M.p. 130-132 °C; IR (KBr, cm^{-1}): 2933, 1731, 1708, 1616, 1251; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.07 (s, 1H), 6.37 (s, 1H), 4.01 (s, 3H), 3.83 (s, 3H), 3.66 (t, *J* = 7.5 Hz, 2H), 1.67-1.61 (m, 2H), 1.41-1.36 (m, 2H), 0.94 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 181.3, 159.4, 158.4, 149.1, 145.7, 109.0, 107.6, 94.4, 56.8, 56.5, 39.7, 29.8, 20.1, 13.7; LC-MS (ESI) m/z: 264 [M^+H]; HRMS: m/z calcd for $C_{14}H_{17}NO_4$: 263.1160; Found: 263.1158.



3p

1-benzyl-2,3-dioxoindolin-5-yl-4-methylbenzenesulfonate (3p): According to the general procedure, a mixture of **1p** (119 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), K_2CO_3 (104 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 2 h gave **3p** (EtOAc/petroleum ether = 1:5) as a red solid (58 mg, 57%). M.p. 148-150 °C; IR (KBr, cm^{-1}): 1740, 1613, 1478, 1378, 1175, 739; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.68 (d, *J* = 8.5 Hz, 2H), 7.37-7.29 (m, 7H), 7.20 (dd, *J* = 8.5, 2.5Hz, 1H), 7.11 (d, *J* = 2.0 Hz, 1H), 6.73 (d, *J* = 8.5 Hz, 1H), 4.90 (s, 1H), 2.45 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 182.2, 158.0, 149.1, 146.1, 145.7, 134.0, 132.5, 131.7, 130.1, 129.2, 128.5, 128.4, 127.5, 119.4, 117.9, 112.0, 44.3, 21.8; LC-MS (ESI) m/z: 408 [M^+H]; HRMS: m/z calcd for $C_{22}H_{17}NNaO_5S$: 430.0720; Found: 430.0730.

6. General Procedure for the Cu-catalyzed *N*-aryl substituted isatins synthesis

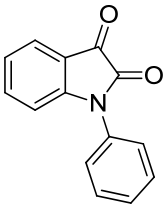


2 **4**

A 25 mL round bottom flask equipped with drying tube, a magnetic stirring bar, is charged with

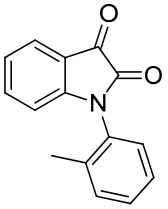
2mL of anhydrous dioxane, Compound **2** (0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv). The mixture was stirred at 100 °C in an oil bath, and monitored by TLC. Upon completion, the reaction mixture was eluted with H_2O (15 mL) and extracted with EtOAc (2×15 mL). The combined organic phase was washed with brine and dried over anhydrous Na_2SO_4. After that the organic phase was filtered, and the filtrate was evaporated in vacuum to give the crude product which was purified by column chromatography on silica gel using appropriate eluent.

7. Synthesis and characterization for *N*-aryl substituted isatins products



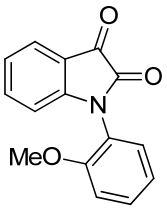
4a

1-phenylindoline-2,3-dione (4a)[21]**:** According to the general procedure, a mixture of **2a** (75 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4a** (EtOAc/petroleum ether = 1:5) as a red solid (42 mg, 75%). M.p. 85-87°C; IR (KBr, cm^{-1}): 3451, 1741, 1610, 752; ^{1}H NMR (500 MHz, $CDCl_3$): 7.71-7.69 (m, 1H), 7.59-7.53 (m, 3H), 7.49-7.41 (m, 3H), 7.18 (t, *J* = 7.5 Hz, 1H), 6.90 (d, *J* = 8.0 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 183.0, 157.4, 151.8, 138.4, 133.0, 130.1, 129.0, 126.1, 125.7, 124.4, 117.6, 111.4; MS (EI) *m*/*z* (%): 223 (23) [M^+], 195 (100), 167 (30), 161 (15), 77 (17).



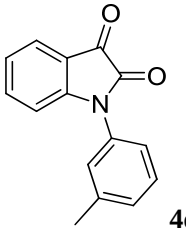
4b

1-(*o*-tolyl)indoline-2,3-dione (4b)[22]**:** According to the general procedure, a mixture of **2b** (76 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4b** (EtOAc/petroleum ether = 1:5) as a red solid (28 mg, 47%). M.p. 107-109 °C; IR (KBr, cm^{-1}): 3456, 2923, 1736, 1605, 752; ^{1}H NMR (500 MHz, $CDCl_3$): 7.73 (dd, *J* = 7.5, 0.5 Hz, 1H), 7.54 (td, *J* = 8.0, 1.5 Hz, 1H), 7.44-7.37 (m, 3H), 7.29-7.28 (m, 1H), 7.20-7.17 (m, 1H), 6.58 (d, *J* = 8.0 Hz, 1H), 2.26 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 183.1, 157.3, 152.0, 138.5, 136.4, 131.9, 131.7, 129.8, 127.6, 127.6, 125.6, 124.2, 117.5, 111.3, 18.0; MS (EI) *m*/*z* (%): 237 (47) [M^+], 209 (100), 181 (10), 180 (62), 90 (12).



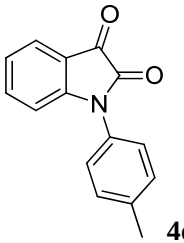
4c

1-(2-methoxyphenyl)indoline-2,3-dione (4c)[23]: According to the general procedure, a mixture of **2c** (80 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4c** (EtOAc/petroleum ether = 1:5) as a red solid (30 mg, 47%). M.p. 122-126 °C; IR (KBr, cm^{-1}): 3457, 2924, 1738, 1608, 755; ^1H NMR (500 MHz, $CDCl_3$): 7.68-7.66 (m, 1H), 7.51-7.44 (m, 2H), 7.32 (dd, *J* = 7.5, 1.5Hz, 1H), 7.14-7.08 (m, 3H), 6.57 (d, *J* = 8.0 Hz, 1H), 3.80 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 183.1, 157.7, 155.2, 152.3, 138.2, 130.9, 129.1, 125.2, 123.8, 121.3, 121.2, 117.6, 112.6, 111.5, 55.8; MS (EI) *m*/*z* (%): 253 (45) [M^+], 225 (38), 224 (100), 196 (68), 195 (43), 154 (18).



4d

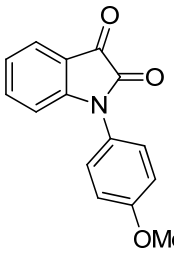
1-(m-tolyl)indoline-2,3-dione (4d) : According to the general procedure, a mixture of **2d** (76 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4d** (EtOAc/petroleum ether = 1:5) as a red solid (36 mg, 61%). M.p. 136-138 °C; IR (KBr, cm^{-1}): 1729, 1604, 1466, 759; ^1H NMR ($CDCl_3$, 500 MHz): δ 7.69 (d, *J* = 7.5 Hz, 1H), 7.57-7.54 (m, 1H), 7.45 (t, *J* = 7.5 Hz, 1H), 7.29-7.16 (m, 4H), 6.90 (d, *J* = 8.0 Hz, 1H), 2.45 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.0, 157.4, 151.9, 140.2, 138.4, 132.8, 129.8, 129.7, 126.6, 125.5, 124.2, 123.0, 117.5, 111.4, 21.4; LC-MS (ESI) m/z: 238 [M^+H]; HRMS: m/z calcd for $C_{15}H_{11}NNaO_2$: 260.0682; Found: 260.0674.



4e

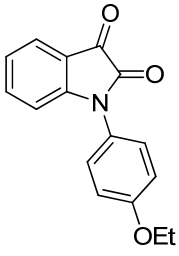
1-(p-tolyl)indoline-2,3-dione (4e)[21]: According to the general procedure, a mixture of **2e** (76 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4e** (EtOAc/petroleum ether = 1:5) as a red solid (38 mg, 64%). M.p. 125-126°C; IR (KBr, cm^{-1}): 3443, 2923, 1738, 1611; ^1H NMR (500 MHz, $CDCl_3$): 7.68 (d, *J* = 6.5 Hz, 1H), 7.53 (td, *J* = 7.5, 1.5 Hz, 1H), 7.35 (AA' of AA'BB', *J* = 8.0 Hz, 2H), 7.29 (BB' of AA'BB', *J* = 8.0 Hz, 2H), 7.16 (t, *J* = 7.5 Hz, 1H), 6.87 (d, *J* = 8.0 Hz, 1H), 2.43 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 183.1, 157.5, 151.9, 139.0, 138.3, 130.6, 130.2, 125.9, 125.6, 124.2,

117.5, 111.3, 21.3; MS (EI) *m*/*z* (%): 237 (25) [M^+], 210 (16), 209 (100), 180 (37), 65 (12).



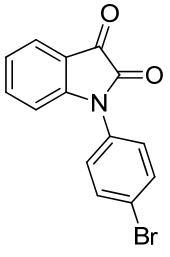
4f

1-(4-methoxyphenyl)indoline-2,3-dione (4f)[21]**:** According to the general procedure, a mixture of **2f** (80 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4f** (EtOAc/petroleum ether = 1:5) as a red solid (41 mg, 64%). M.p. 117-118 °C; IR (KBr, cm^{-1}): 3450, 2425, 2853, 1610; ^1H NMR ($CDCl_3$, 500 MHz): 7.67 (d, *J* = 7.5 Hz, 1H), 7.53 (td, *J* = 8.0, 1.0 Hz, 1H), 7.31 (AA' of AA'BB', *J* = 8.5 Hz, 2H), 7.15 (t, *J* = 7.5 Hz, 1H), 7.05 (BB' of AA'BB', *J* = 8.5 Hz, 2H), 6.82 (d, *J* = 8.0 Hz, 1H), 3.86 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.2, 159.7, 157.7, 152.1, 138.4, 127.5, 125.5, 125.4, 124.2, 117.5, 115.2, 111.2, 55.6; MS (EI) *m*/*z* (%): 253 (43) [M^+], 225 (100), 210 (43), 185 (37), 183 (47), 182 (74), 154 (23), 149 (23), 122 (20).



4g

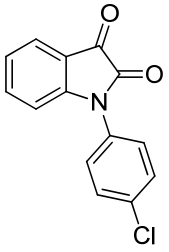
1-(4-ethoxyphenyl)indoline-2,3-dione (4g): According to the general procedure, a mixture of **2g** (84 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 10 h gave **4g** (EtOAc/petroleum ether = 1:5) as a red solid (42 mg, 62%). M.p. 84-86 °C; IR (KBr, cm^{-1}): 3451, 2969, 1736, 1616, 1510, 1247; ^1H NMR ($CDCl_3$, 500 MHz): 7.67-7.65 (m, 1H), 7.52 (td, *J* = 7.5, 1.5Hz, 1H), 7.15 (AA' of AA'BB', *J* = 8.5 Hz, 2H), 7.14 (td, *J* = 7.5, 1.0 Hz, 1H), 7.03 (BB' of AA'BB', *J* = 8.5 Hz, 2H), 6.82 (d, *J* = 8.0 Hz, 1H), 4.07 (q, *J* = 7.0 Hz, 2H), 1.44 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.2, 159.1, 157.7, 152.1, 138.4, 127.4, 125.5, 125.1, 124.2, 117.4, 115.7, 111.2, 63.9, 14.8; MS (EI) *m*/*z* (%): 267 (8) [M^+], 253 (24), 185 (21), 183 (20), 167 (24), 163 (32), 149 (100), 57 (58); HRMS: m/z calcd for $C_{16}H_{13}NNaO_3$: 290.0788; Found: 290.0775.



4h

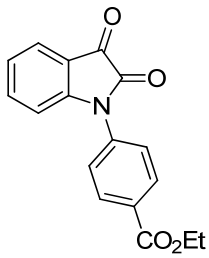
1-(4-bromophenyl)indoline-2,3-dione (4h)[21]**:** According to the general procedure, a mixture of

2h (92 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 12 h gave **4h** (EtOAc/petroleum ether = 1:5) as a red solid (25 mg, 33%). M.p. 155-156 ^{o}C; IR (KBr, cm^{-1}): 1735, 1611, 1463, 756; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.71-7.68 (m, 3H), 7.56 (t, *J* = 7.5 Hz, 1H), 7.32 (d, *J* = 8.5 Hz, 2H), 7.19 (t, *J* = 7.5 Hz, 1H), 6.90 (d, *J* = 8.0 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 182.4, 157.2, 151.1, 138.4, 133.2, 131.9, 127.6, 125.8, 124.6, 122.5, 117.6, 111.1; LC-MS (ESI) m/z: 304 [M^{+}H (^{81}Br)], 302 [M^{+}H (^{79}Br)].



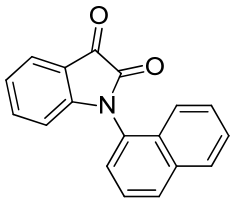
4i

1-(4-chlorophenyl)indoline-2,3-dione (4i)[21]: According to the general procedure, a mixture of **2j** (81 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 12 h gave **4i** (EtOAc/petroleum ether = 1:5) as a red solid (22 mg, 34%). M.p. 196-198 °C; IR (KBr, cm^{-1}): 3462, 2924, 2854, 1739, 1610, 1494, 1464; ^{1}H NMR ($CDCl_3$, 500 MHz): 7.72-7.70 (m, 1H), 7.58-7.53 (m, 3H), 7.38 (d, *J* = 9.0 Hz, 2H), 7.20 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.0 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 182.4, 157.2, 151.2, 138.4, 134.6, 130.2, 127.3, 125.8, 124.6, 121.1, 117.6, 111.1; MS (EI) m/z (%): 259 (7) [M^{+} (^{37}Cl)], 257 (18) [M^{+} (^{35}Cl)], 231 (34), 229 (100), 194 (61), 183 (16), 166 (41), 149 (49), 111 (24), 75 (29).



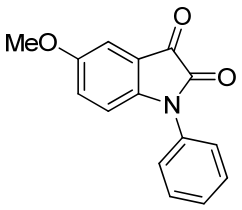
4j

ethyl 4-(2,3-dioxoindolin-1-yl)benzoate (4j)[21]: According to the general procedure, a mixture of **2j** (91 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 12 h gave **4j** (EtOAc/petroleum ether = 1:5) as a red solid (17 mg, 23%). M.p. 110-112 ^{o}C; IR (KBr, cm^{-1}): 1744, 1718, 1613, 1291, 1281, 766, 745; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 8.24 (d, *J* = 8.5 Hz, 2H), 7.73 (d, *J* = 7.5 Hz, 1H), 7.59-7.53 (m, 3H), 7.21 (t, *J* = 7.5 Hz, 1H), 6.97 (d, *J* = 8.0 Hz, 1H), 4.42(q, *J* = 7.0 Hz, 2H), 1.42 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 182.6, 165.5, 157.0, 150.9, 138.4, 136.8, 131.2, 130.6, 125.9, 125.5, 124.7, 117.7, 111.3, 61.4, 14.3; LC-MS (ESI) m/z: 296 [M^{+}H].



4k

1-(naphthalen-1-yl)indoline-2,3-dione (4k)[21]**:** According to the general procedure, a mixture of **2k** (85 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 6 h gave **4k** (EtOAc/petroleum ether = 1:5) as a red solid (41 mg, 61%). M.p. 148-150 ^{o}C; IR (KBr, cm^{-1}): 1738, 1607, 1467, 776, 756; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 8.01(d, *J* = 8.2 Hz, 1H), 7.97 (d, *J* = 8.2 Hz, 1H), 7.74 (d, *J* = 7.5 Hz, 1H), 7.70 (d, *J* = 8.0 Hz, 1H), 7.63-7.49 (m, 4H), 7.44 (t, *J* = 7.5 Hz, 1H), 7.17 (t, *J* = 7.5 Hz, 1H), 6.43 (t, *J* = 7.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.0, 158.1, 152.7, 138.6, 134.9, 130.2, 129.4, 128.9, 127.5, 127.0, 126.0, 125.9, 125.5, 124.3, 122.4, 117.5, 111.8; LC-MS (ESI) m/z: 274 [M^{+}H].



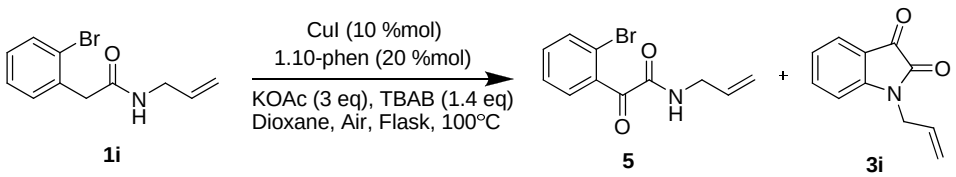
4l

5-methoxy-1-phenylindoline-2,3-dione (4l)[24]**:** According to the general procedure, a mixture of compound **2l** (80 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in Dioxane (2 mL) was stirred at 100 °C for 6 h gave **4l** (EtOAc/petroleum ether = 1:5) as a red solid (32 mg, 51%). M.p. 149-150 ^{o}C; IR (KBr, cm^{-1}): 1734, 1722, 1490, 1287; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.54 (t, *J* = 7.5 Hz, 2H), 7.44-7.40 (m, 3H), 7.20 (d, *J* = 2.5 Hz, 1H), 7.09 (dd, *J* = 8.5, 2.5 Hz, 1H), 6.84 (d, *J* = 8.5 Hz, 1H), 3.82 (s, 3H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 183.3, 157.4, 156.8, 145.7, 133.1, 129.9, 128.6, 125.7, 125.0, 117.9, 112.4, 109.2, 56.0; LC-MS (ESI) m/z: 254 [M^{+}H].

8. Mechenism Study

Tracing the isolated yields of compounds 3i and 5 during the reaction:

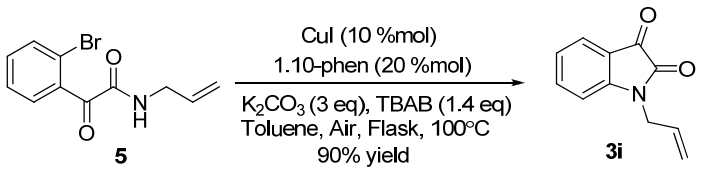
Following the same procedure as for **4a** with **1i** (64 mg, 0.25 mmol), CuI (4.8 mg, 0.025 mmol, 10 mol%), 1,10-Phen (9 mg, 0.05 mmol, 20 mol%), KOAc (74 mg, 0.75 mmol, 3 equiv), TBAB (113 mg, 0.35 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 12 h. Compounds **3i** (18 mg) and **5** (23 mg) were isolated in 38% and 34% yield, respectively.



1i | **5** 34% yield | **3i** 38% yield

***N*-allyl-2-(2-bromophenyl)-2-oxoacetamide (5):** yellow oil; IR (KBr, cm^{-1}): 3400, 1736, 1681, 1524, 1211, 758; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 7.64-7.63 (m, 2H), 7.43-7.36 (m, 2H), 7.10 (br, 1H), 5.94-5.86 (m, 1H), 5.32-5.21 (m, 2H), 4.03-4.01 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 190.6, 160.2, 135.9, 133.6, 133.0, 132.8, 131.2, 127.1, 120.9, 117.5, 42.0; LC-MS (ESI) m/z: 270 [M^{+}H (^{81}Br)], 268 [M^{+}H (^{79}Br)]; HRMS: m/z calcd for $C_{11}H_{10}NNaO_2$: 289.9787; Found: 289.9785.

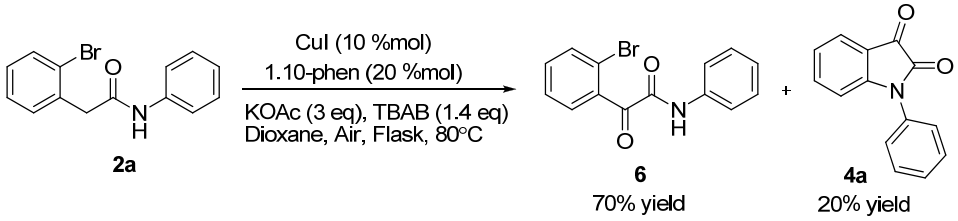
Synthesis of compound 3i from intermediate 5:



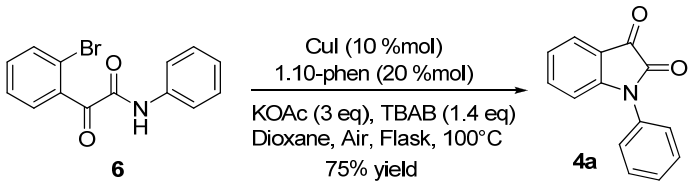
Following the same procedure as for **3a** with **5** (40 mg, 0.15 mmol), CuI (5.6 mg, 0.015 mmol, 10 mol%), 1,10-Phen (11.2 mg, 0.03 mmol, 20 mol%), K_2CO_3 (63 mg, 0.45 mmol, 3 equiv), TBAB (68 mg, 0.21 mmol, 1.4 equiv) in toluene (2 mL) was stirred at 100 °C for 4 h. The reaction gave **3i** (25 mg, 90%) as a red solid.

Tracing the isolated yields of compound 4a and 6 during the reaction:

Following the same procedure as for **4a** with **2a** (100 mg, 0.35 mmol), CuI (6.7 mg, 0.035 mmol, 10 mol%), 1,10-Phen (12.6 mg, 0.07 mmol, 20 mol%), KOAc (103 mg, 1.05 mmol, 3 equiv), TBAB (158 mg, 0.49 mmol, 1.4 equiv) in dioxane (4 mL) was stirred at 80 °C for 4 h. Compounds **4a** (16 mg) and **6** (75 mg) were isolated in 20% and 70% yield, respectively.



2-(2-bromophenyl)-2-oxo-*N*-phenylacetamide (6): white solid, M.p. 80-82 ^{o}C; IR (KBr, cm^{-1}): 3320, 1708, 1664, 1599, 1533, 1283, 758; ^{1}H NMR ($CDCl_3$, 500 MHz): δ 8.86 (br, 1H), 7.71-7.66 (m, 4H), 7.45-7.38 (m, 4H), 7.20 (t, *J* = 7.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 190.8, 157.6, 136.5, 135.7, 133.6, 133.2, 131.2, 129.3, 127.2, 125.5, 121.0, 119.9; LC-MS (ESI) m/z: 306 [M^{+}H (^{81}Br)], 304 [M^{+}H (^{79}Br)]; HRMS: m/z calcd for $C_{14}H_{10}BrNNaO_2$: 325.9787; Found: 325.9786.



Following the same procedure as for **4a** with **6** (36 mg, 0.12 mmol), CuI (2.3 mg, 0.012 mmol, 10 mol%), 1,10-Phen (4.3 mg, 0.024 mmol, 20 mol%), KOAc (35 mg, 0.36 mmol, 3 equiv), TBAB (54 mg, 0.17 mmol, 1.4 equiv) in dioxane (2 mL) was stirred at 100 °C for 8 h. The reaction gave **4a** (20 mg, 75%) as a red solid.

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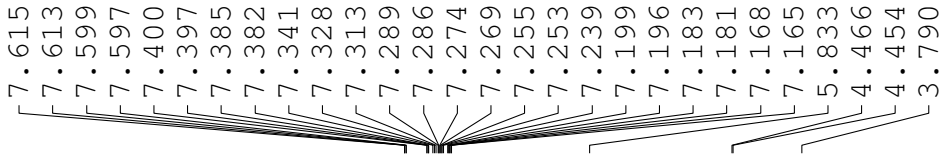

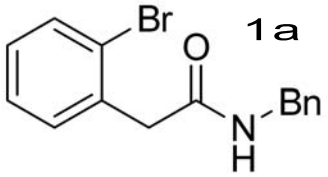

1a

SUNJ-3-38
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TE	294.8 K
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TD0	1
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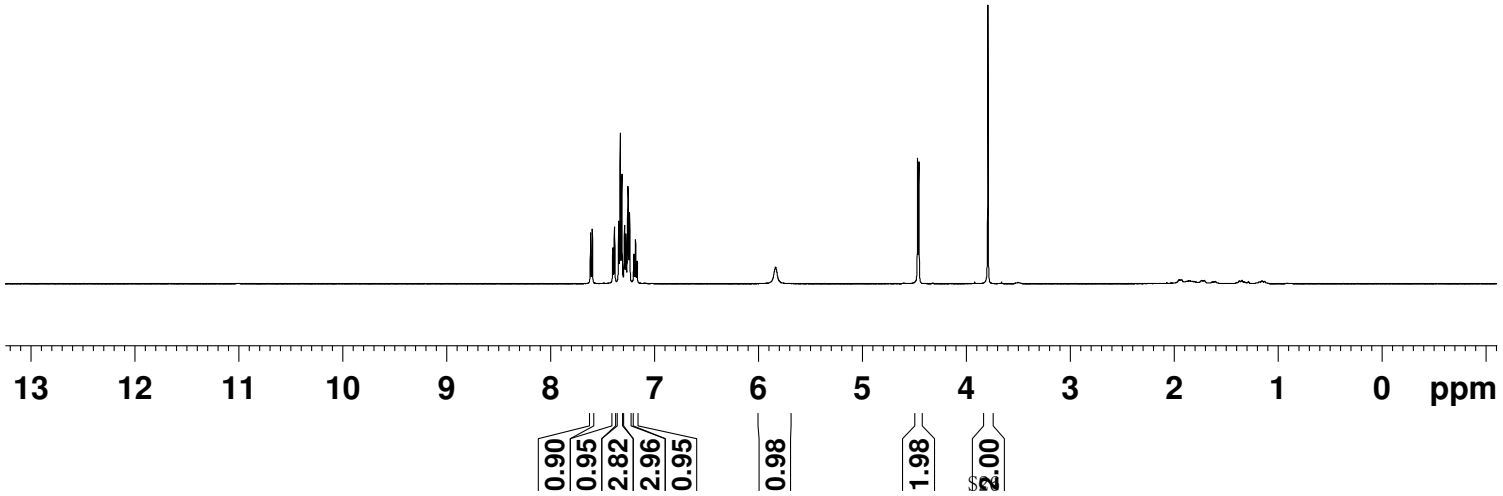

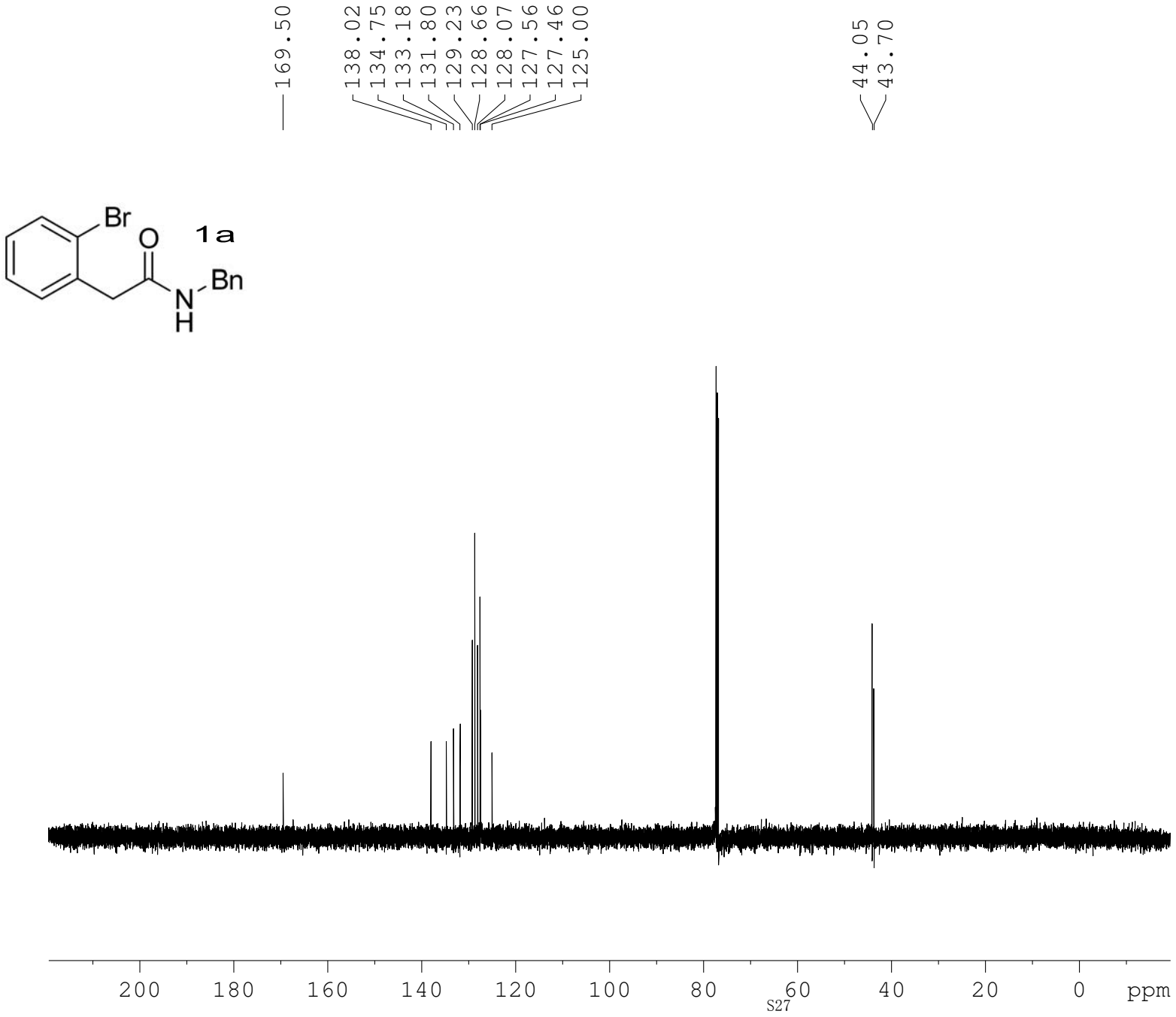

SUNJ-3-38
C13CPD CDCl3 D:\\ deng 22

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PL1	-0.50 dB
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PCPD2	80.00 usec
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PL12	16.31 dB
PL13	16.50 dB
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SSB	0
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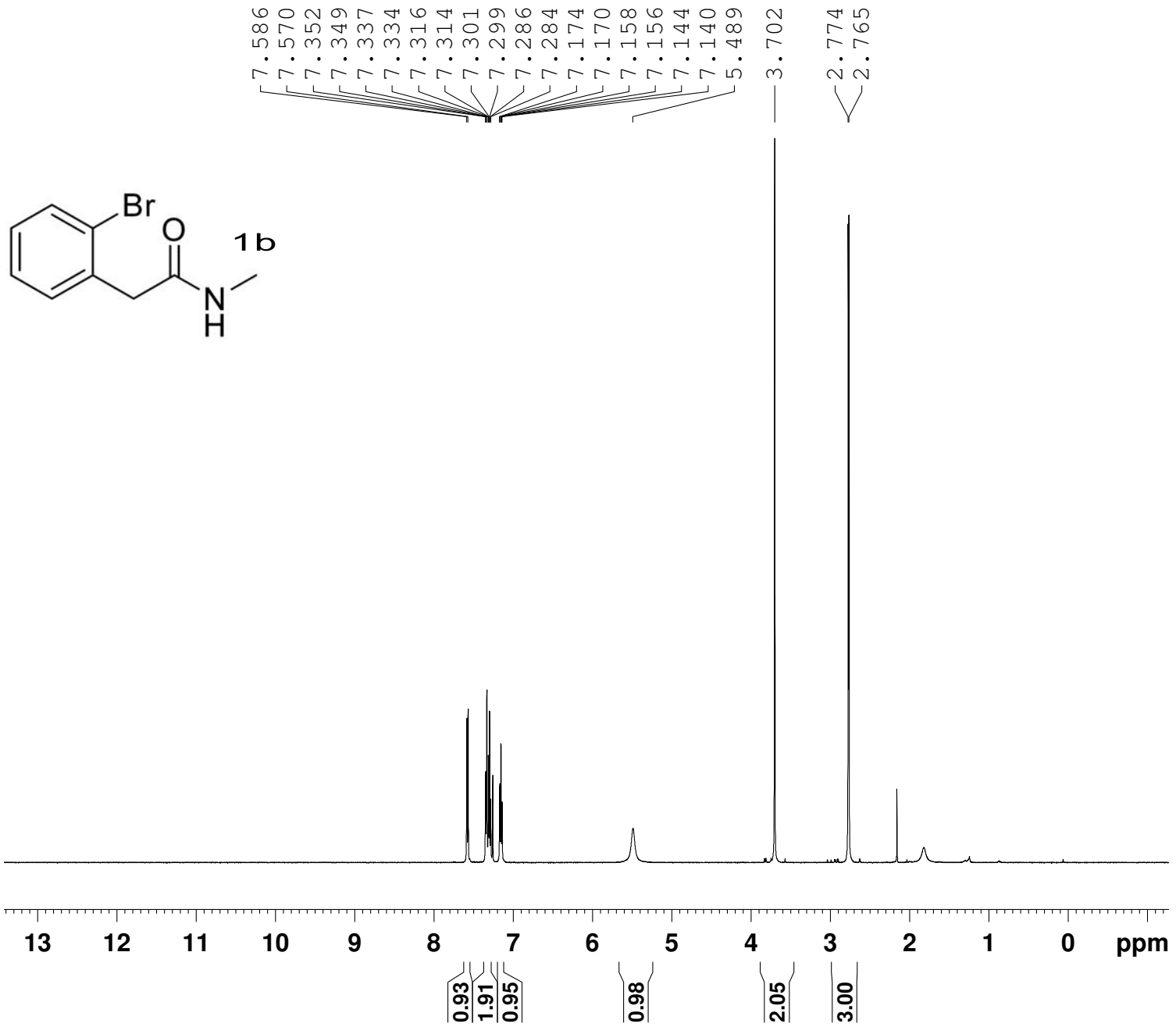

SunJ-1-254-1
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PULPROG	zg30
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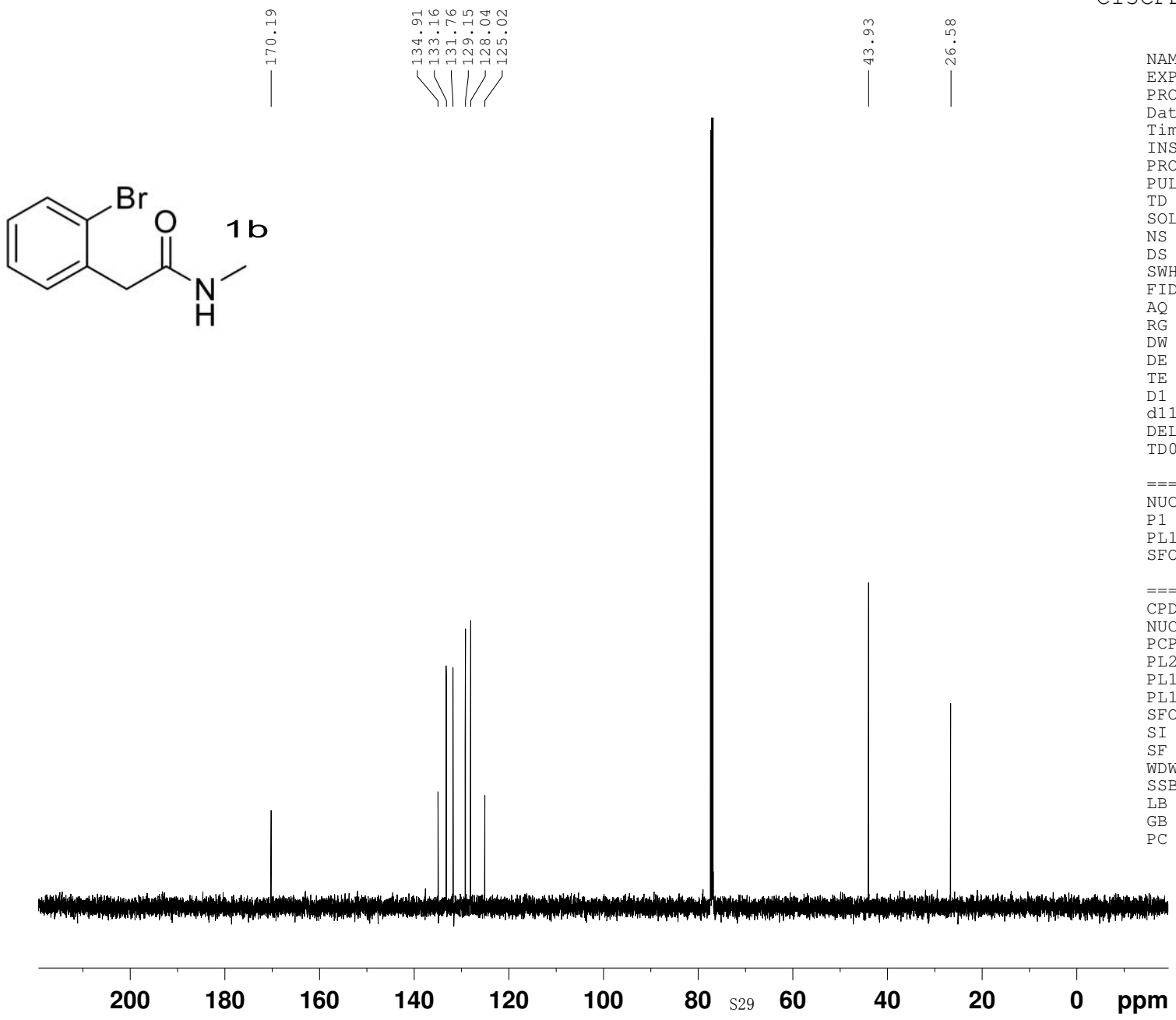

SunJ-1-254-1
C13CPD CDCl3 D:\\ deng 10

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PL2	2.00 dB
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PL13	16.50 dB
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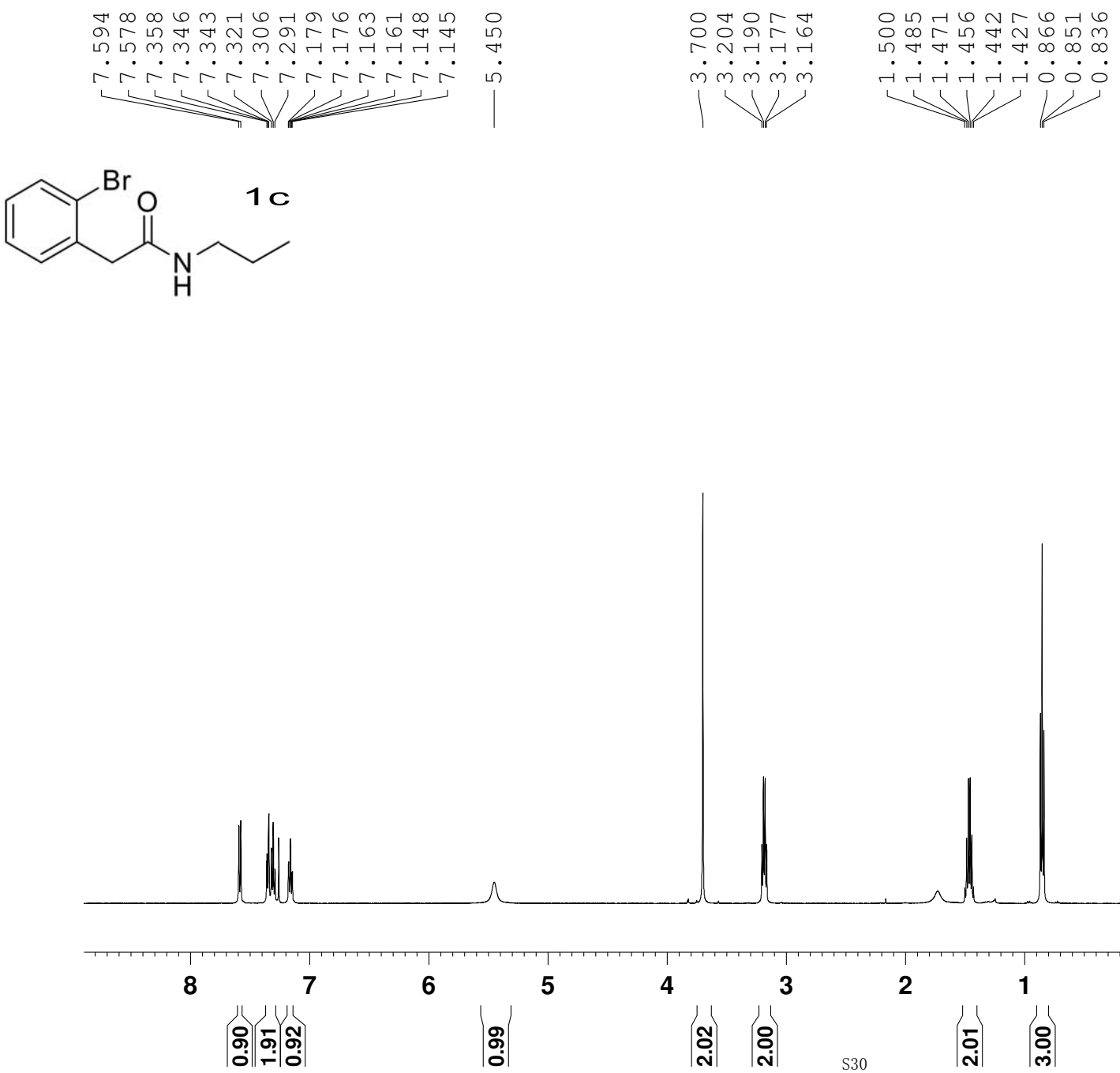

SunJ-1-254-2
PROTON CDCl3 D:\\ deng 5

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PROCNO	1
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D1	1.00000000 sec
TD0	1

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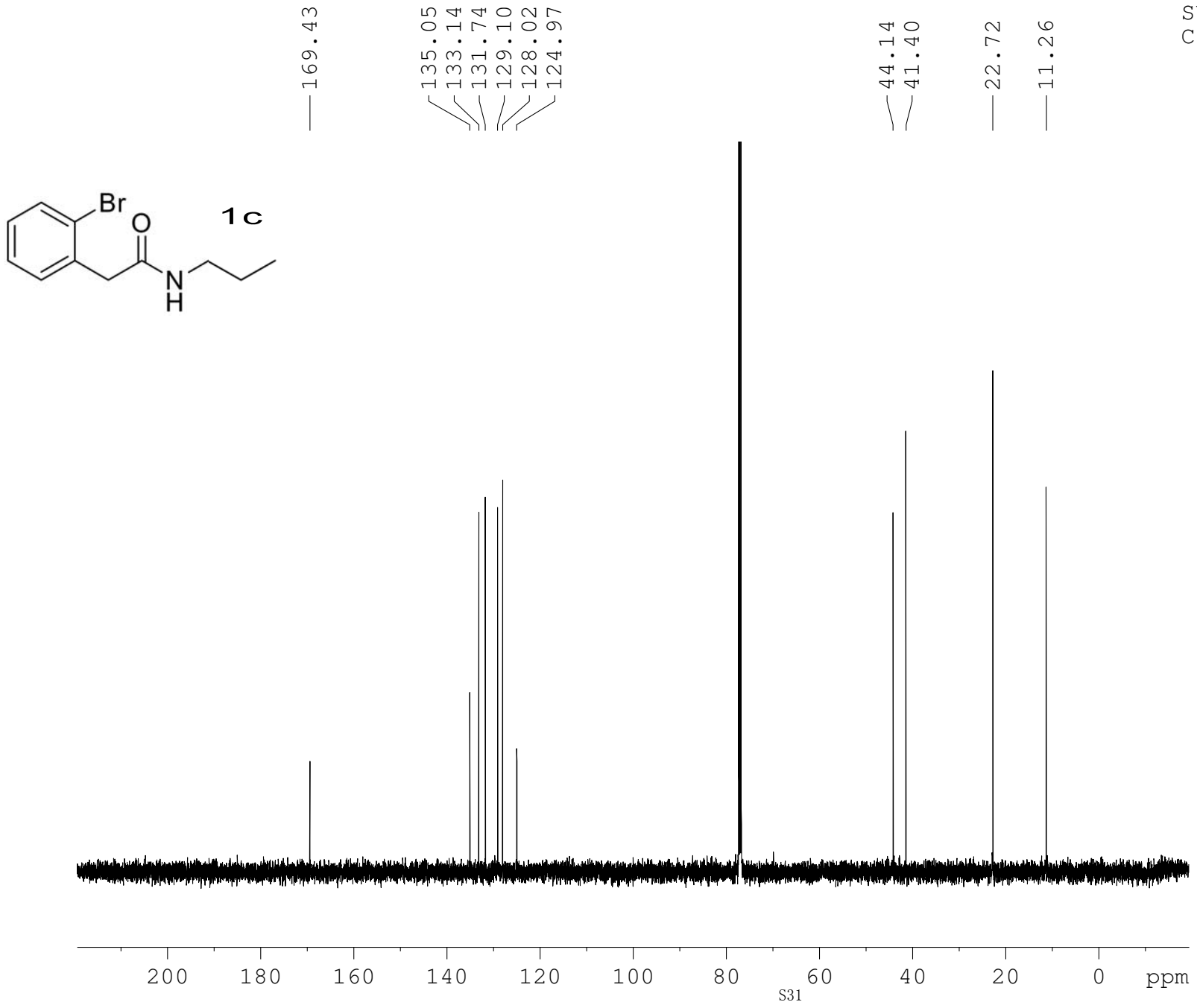

SUNJ-1-254-2
C13CPD CDCl3 D:\\ deng 44

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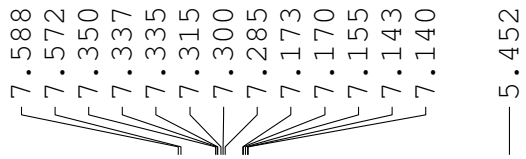
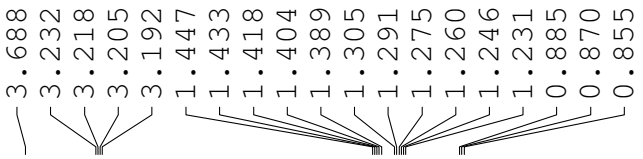
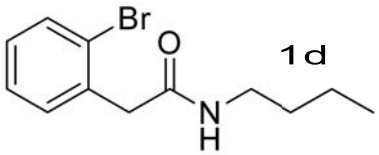
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	101.6
DW	16.650 usec
DE	6.00 usec
TE	298.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



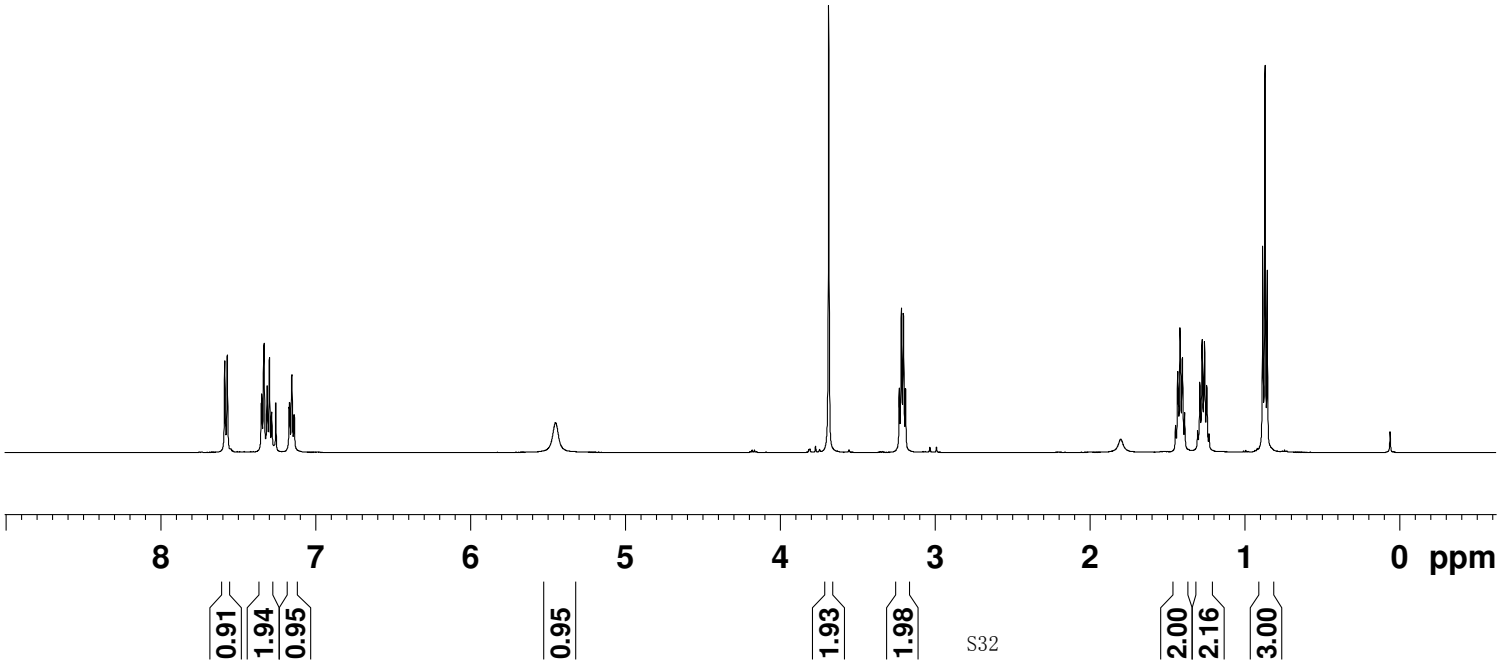


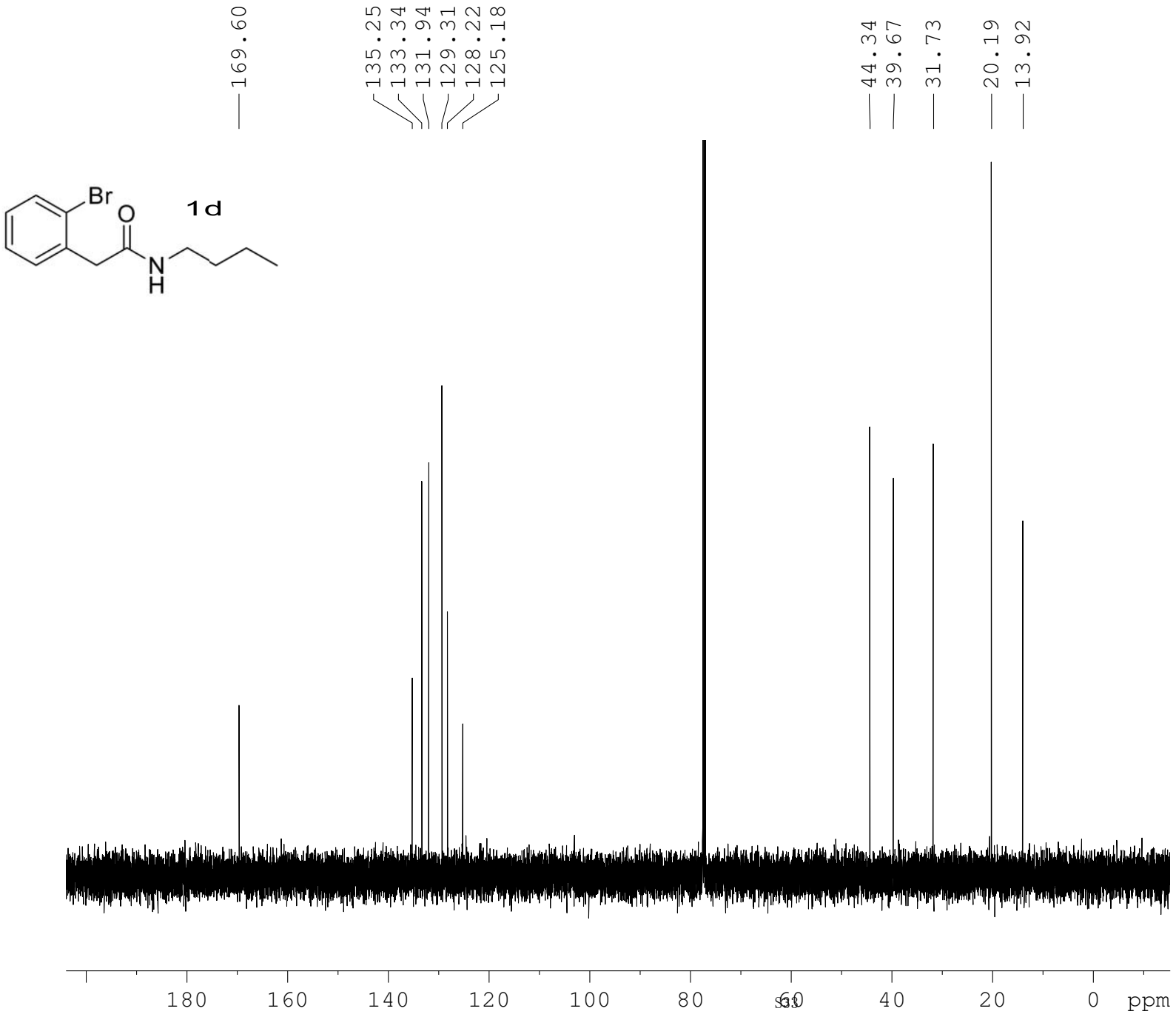
SUNJ1-272-1
PROTON CDCl3 D:\\ deng 4



NAME	xb20110920	
EXPNO	1	
PROCNO	1	
Date_	20110920	
Time	9.26	
INSTRUM	spect	
PROBHD	5 mm PATXO 19F	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	8	
DS	2	
SWH	10330.578	Hz
FIDRES	0.157632	Hz
AQ	3.1720407	sec
RG	181	
DW	48.400	usec
DE	6.00	usec
TE	295.6	K
D1	1.00000000	sec
TD0	1	

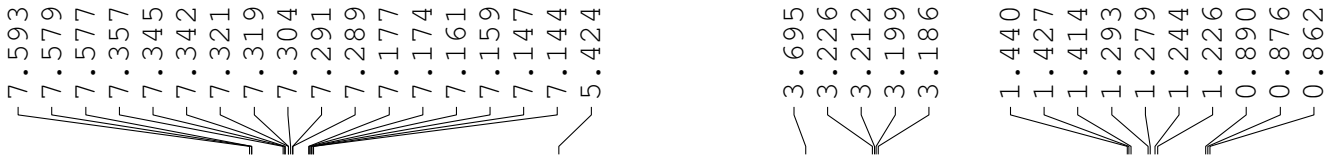
======== CHANNEL f1 ========		
NUC1	1H	
P1	13.76	usec
PL1	1.00	dB
SFO1	500.1330885	MHz
SI	32768	
SF	500.1300133	MHz
WDW	EM	
SSB	0	
LB	0.30	Hz
GB	0	
PC	1.00	



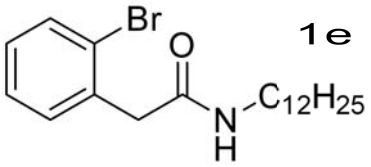


SUNJ-1-272
C13CPD CDCl3 D:\\ deng 5

NAME	xb20110923
EXPNO	41
PROCNO	1
Date_	20110923
Time	14.50
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	161.3
DW	16.650 usec
DE	6.00 usec
TE	297.9 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577628 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



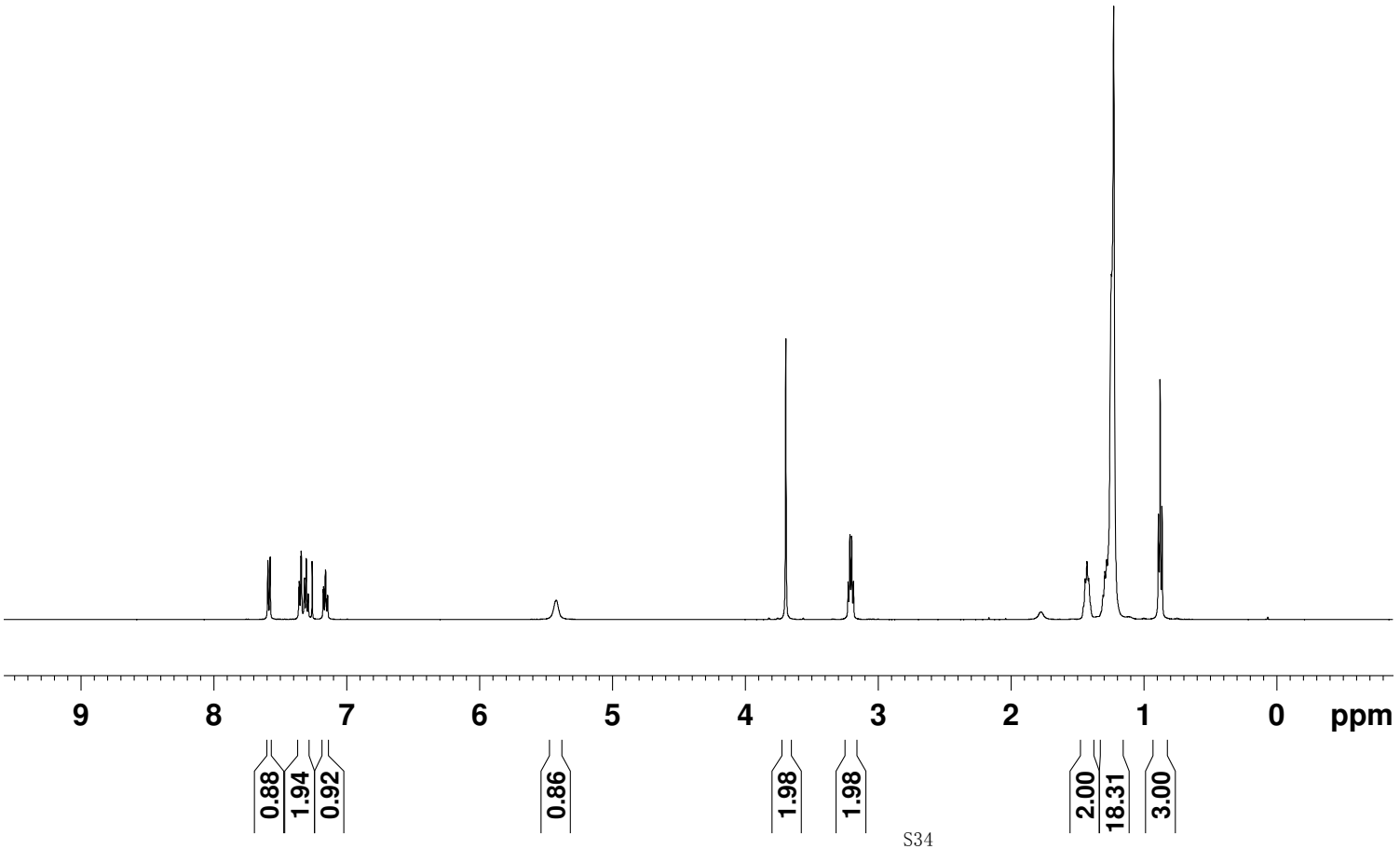
SUNJ-1-262
PROTON CDCl3 D:\\ deng

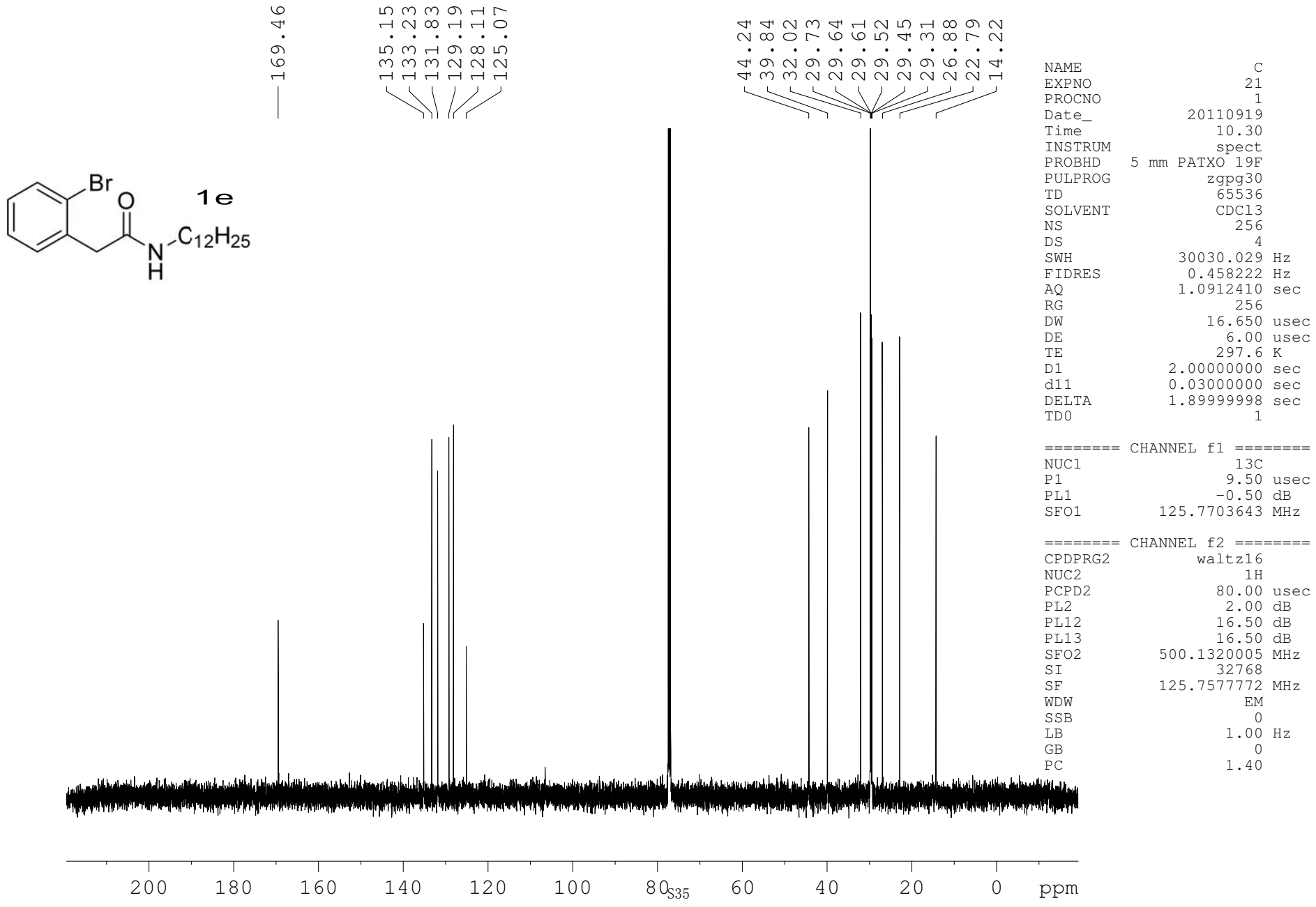


1e

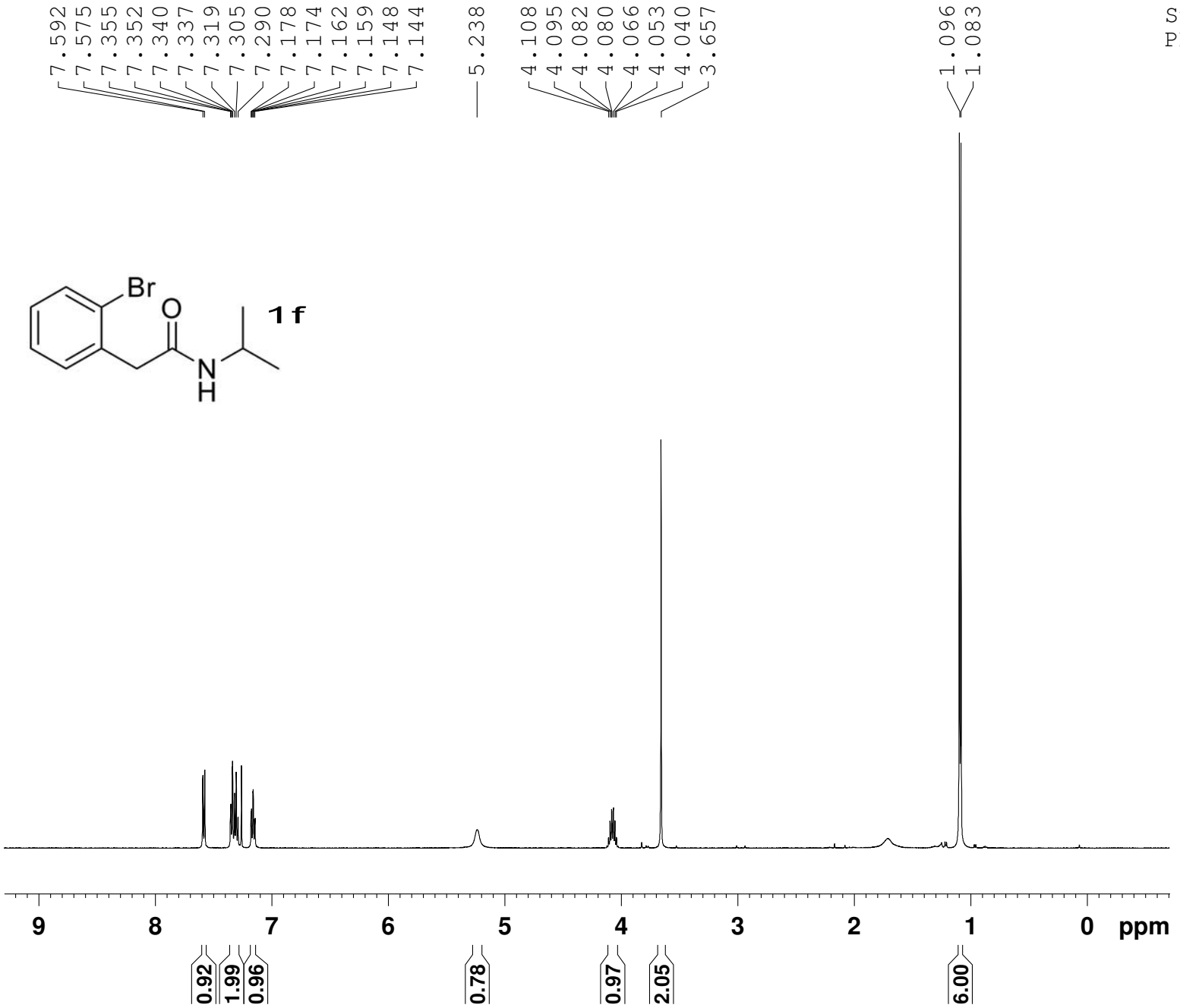
NAME	xb20110916
EXPNO	11
PROCNO	1
Date_	20110916
Time	18.04
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	143.7
DW	48.400 usec
DE	6.00 usec
TE	297.5 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300130 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



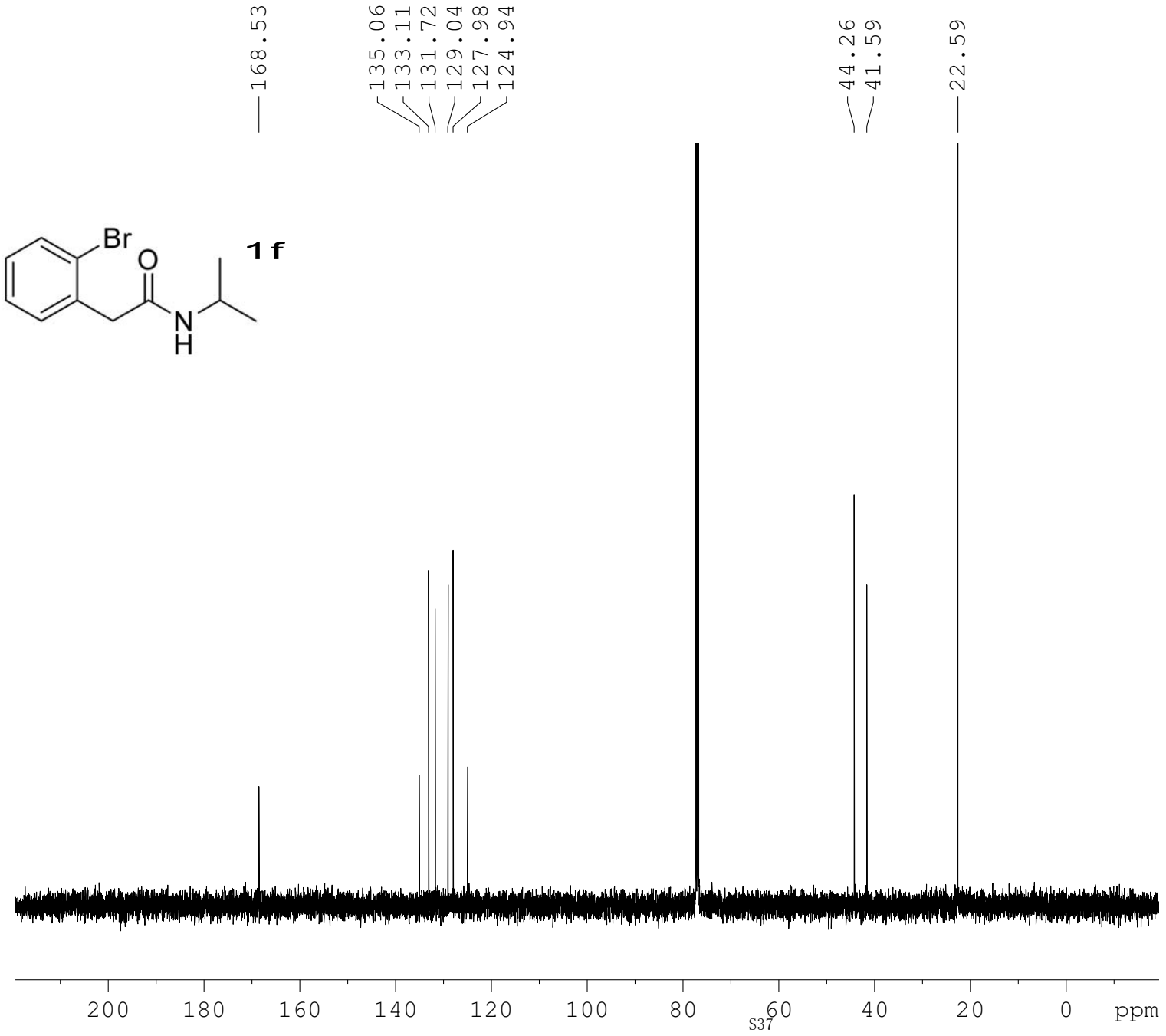


NAME	C
EXPNO	21
PROCNO	1
Date_	20110919
Time	10.30
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	256
DW	16.650 usec
DE	6.00 usec
TE	297.6 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577772 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



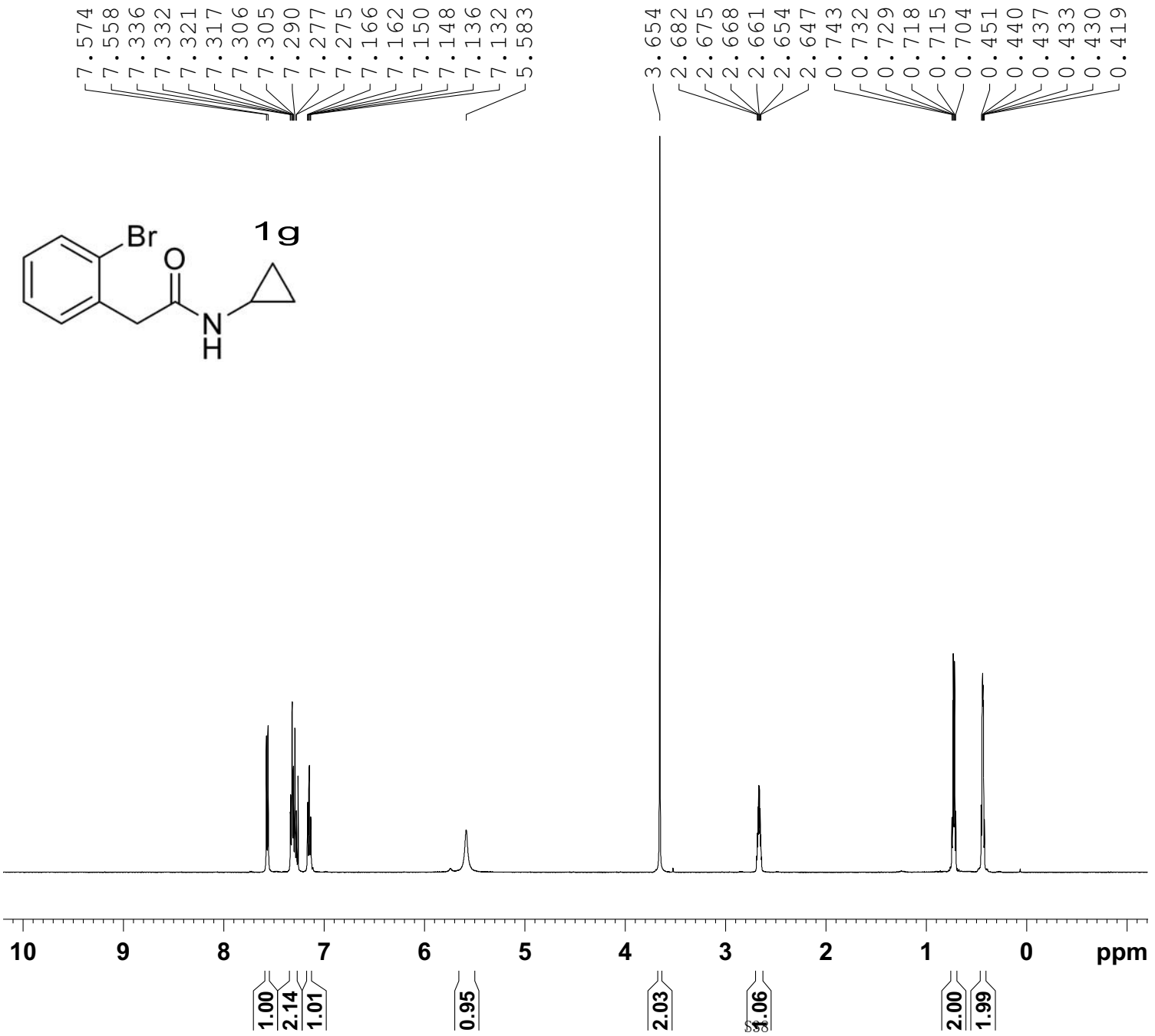
SunJ-1-254-3
PROTON CDCl3 D:\\ deng 5

NAME	XUBIN20110909
EXPNO	2
PROCNO	1
Date_	20110909
Time	9.19
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	296.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300129 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



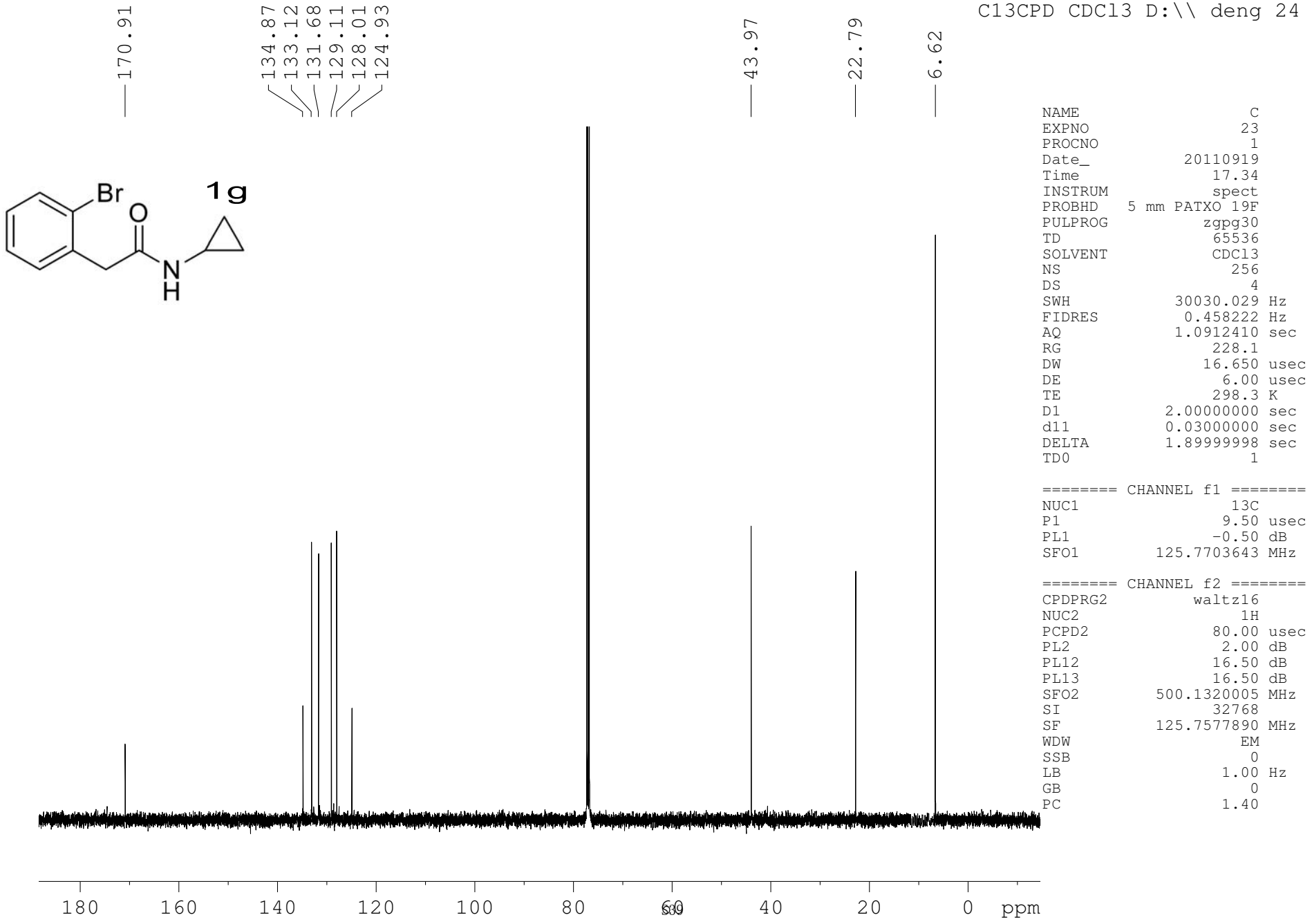
SUNJ-1-254-3
C13CPD CDCl3 D:\\ deng 4

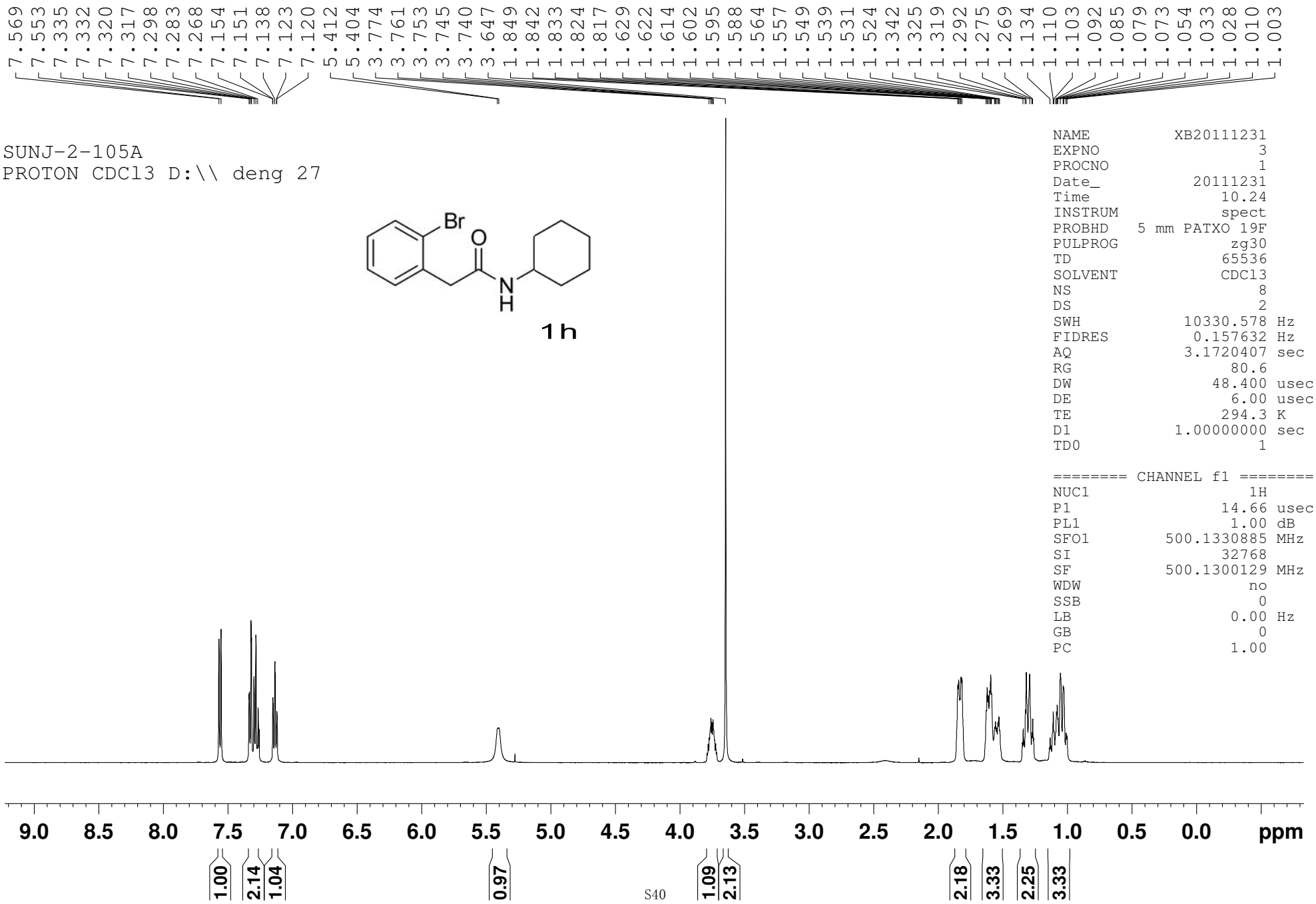
NAME	EEEE
EXPNO	7
PROCNO	1
Date_	20110915
Time	17.52
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	322.5
DW	16.650 usec
DE	6.00 usec
TE	298.7 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

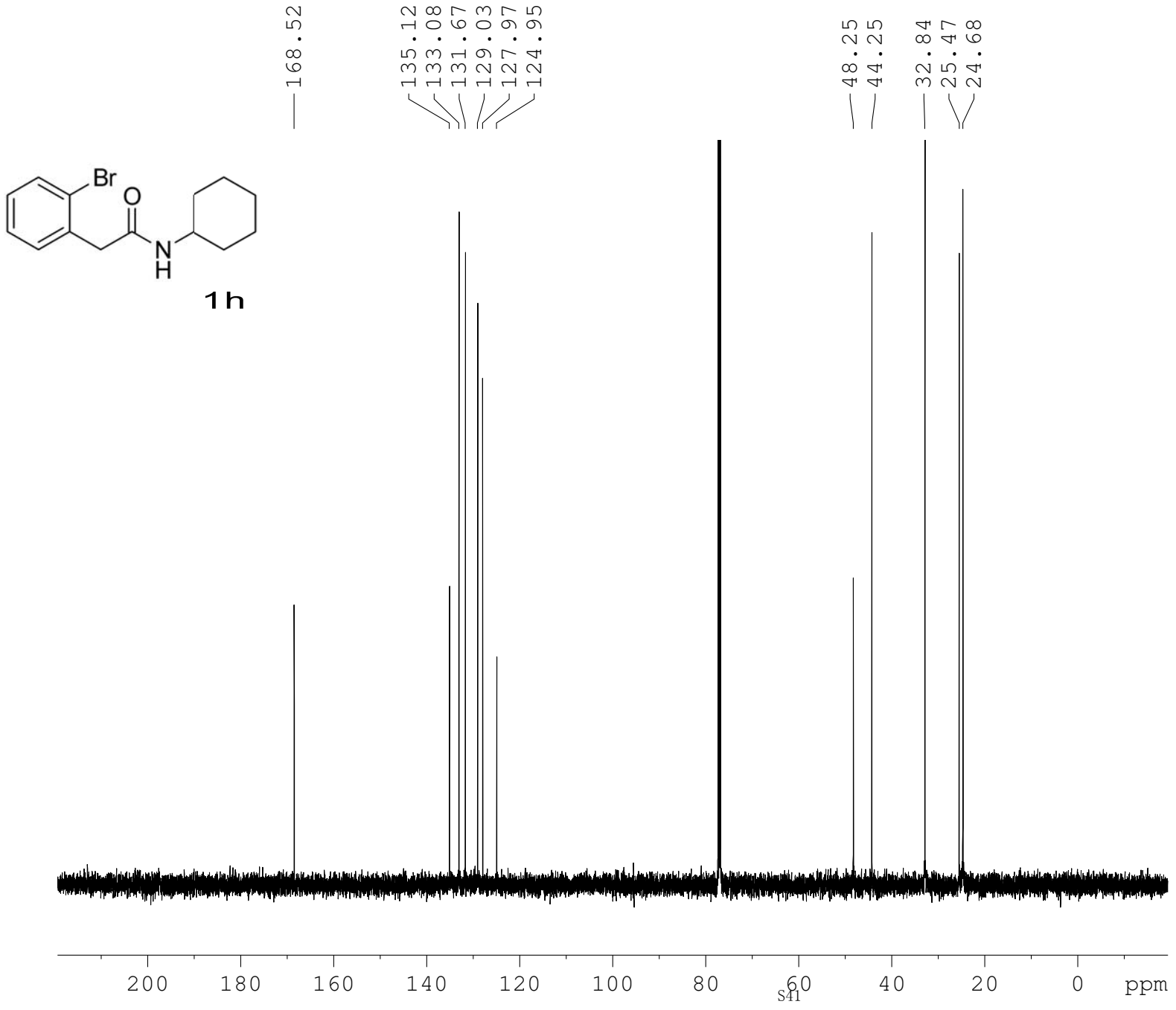


SUNJ-1-263
PROTON CDCl3 D:\\ deng 5

NAME	xb20110916
EXPNO	12
PROCNO	1
Date_	20110916
Time	18.09
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	297.4 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300133 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





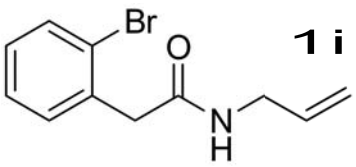


SUNJ-2-105A
C13CPD CDCl3 D:\\ deng 2

NAME	XB20111231
EXPNO	4
PROCNO	1
Date_	20111231
Time	10.32
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	295.3 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

SUNJ1-272-3
PROTON CDCl3 D:\\ deng 42

7.585 7.370 7.357 7.355 7.328 7.314 7.313 7.300 7.298 7.187 7.184 7.171 7.169 7.156 7.153 5.824 5.813 5.803 5.792 5.779 5.768 5.758 5.747 5.564 5.127 5.125 5.090 5.071 5.069 3.873 3.862 3.854 3.851 3.738

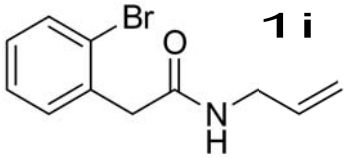


1 i

NAME	xb20110920
EXPNO	3
PROCNO	1
Date_	20110920
Time	9.36
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300105 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

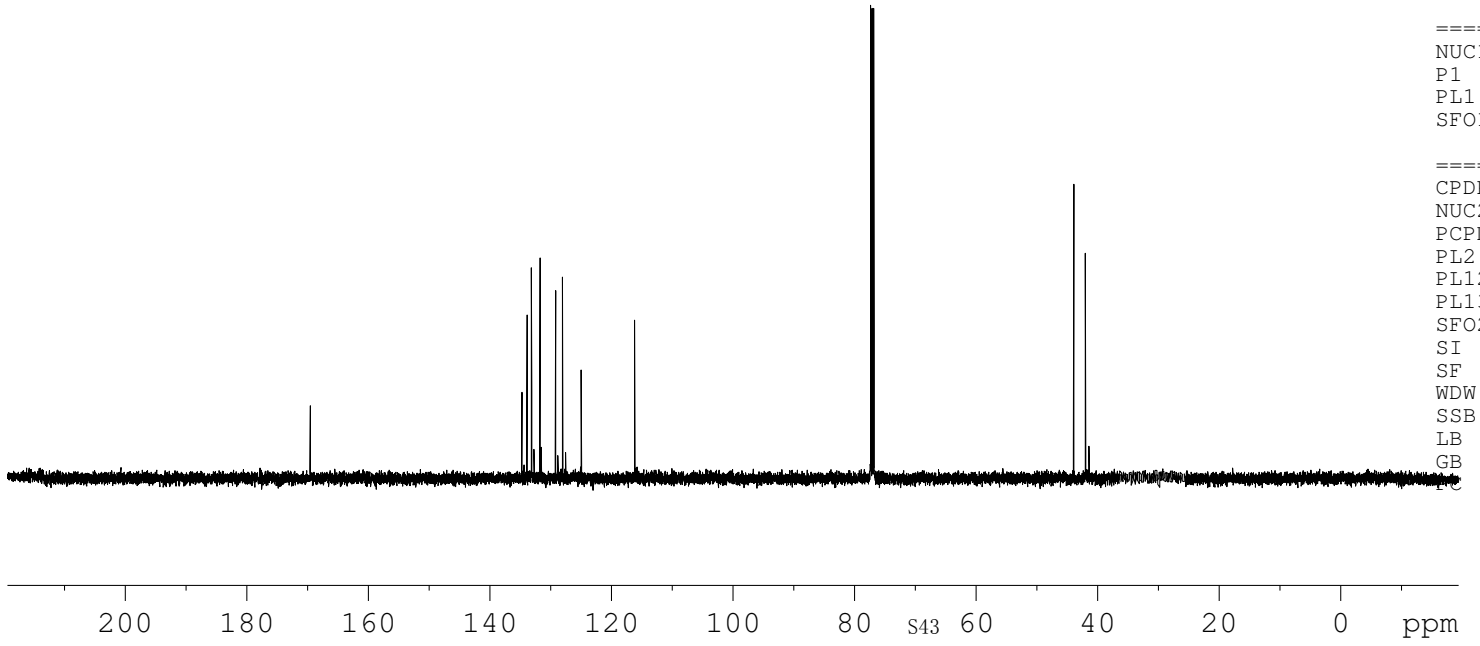
SUNJ-1-308-4
C13CPD CDCl3 D:\\ deng 20

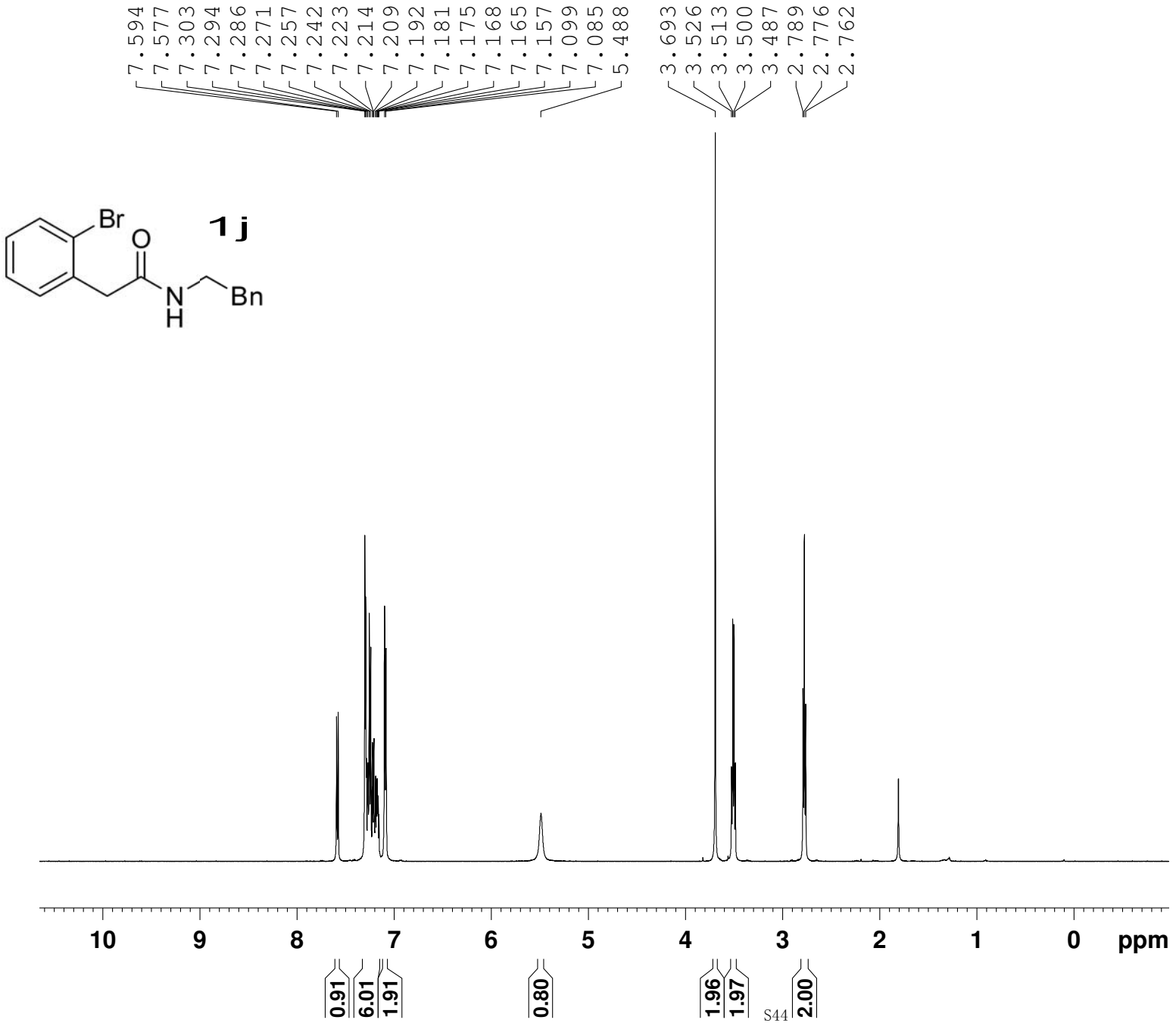
169.58
134.75
133.90
133.17
131.78
129.21
128.07
124.99
116.21
43.93
42.00



1 i

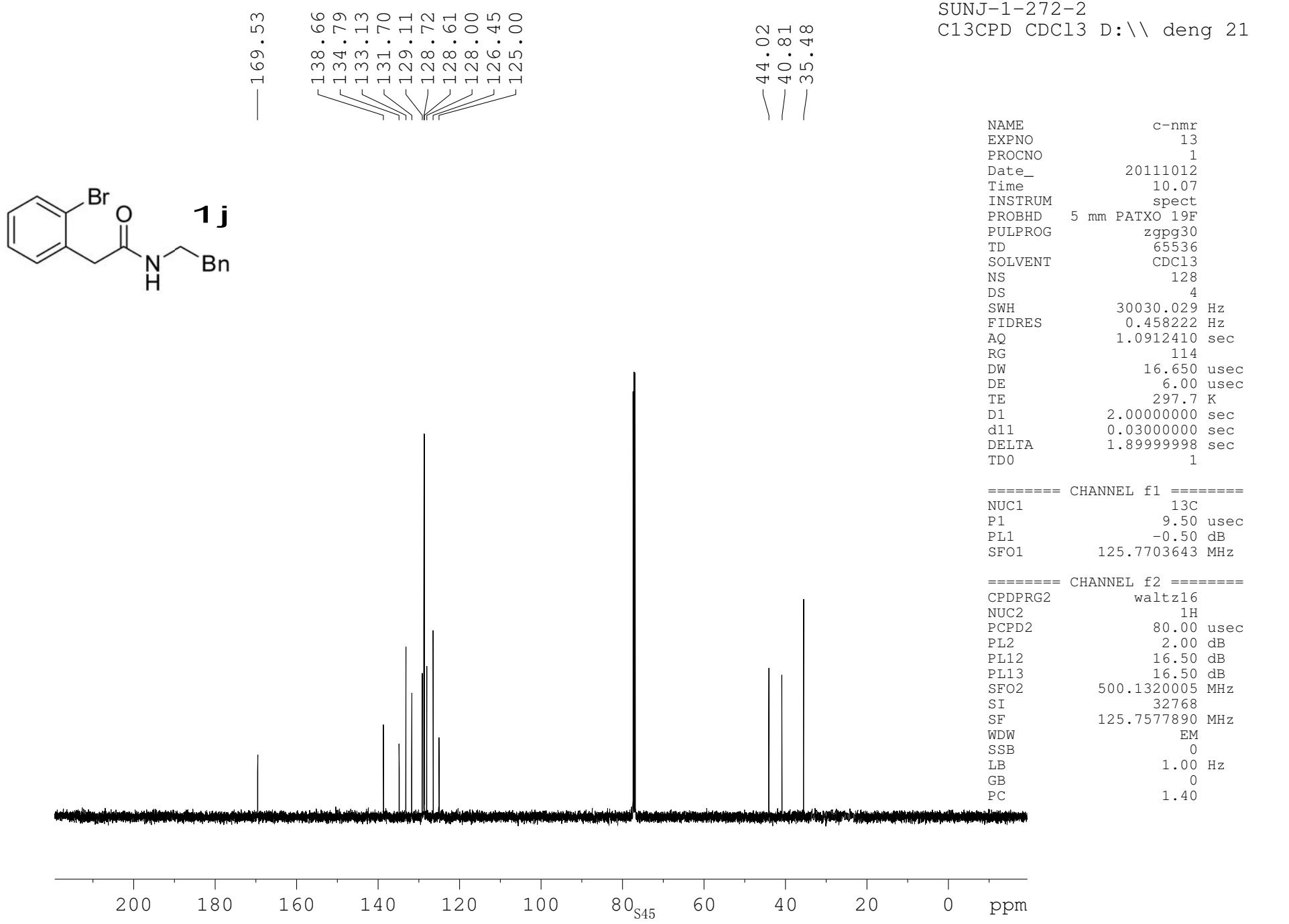
NAME	c-nmr
EXPNO	12
PROCNO	1
Date_	20111012
Time	9.55
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	297.5 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
	1.40





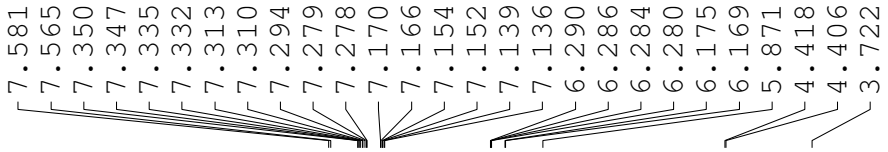
SUNJ1-272-2
PROTON CDCl3 D:\\ deng 4

NAME	xb20110920
EXPNO	2
PROCNO	1
Date_	20110920
Time	9.31
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	161.3
DW	48.400 usec
DE	6.00 usec
TE	295.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

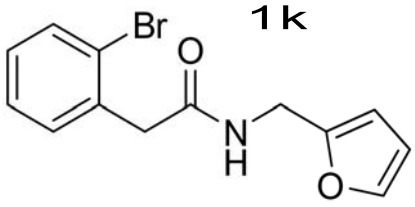


SUNJ-1-272-2
C13CPD CDCl3 D:\\ deng 21

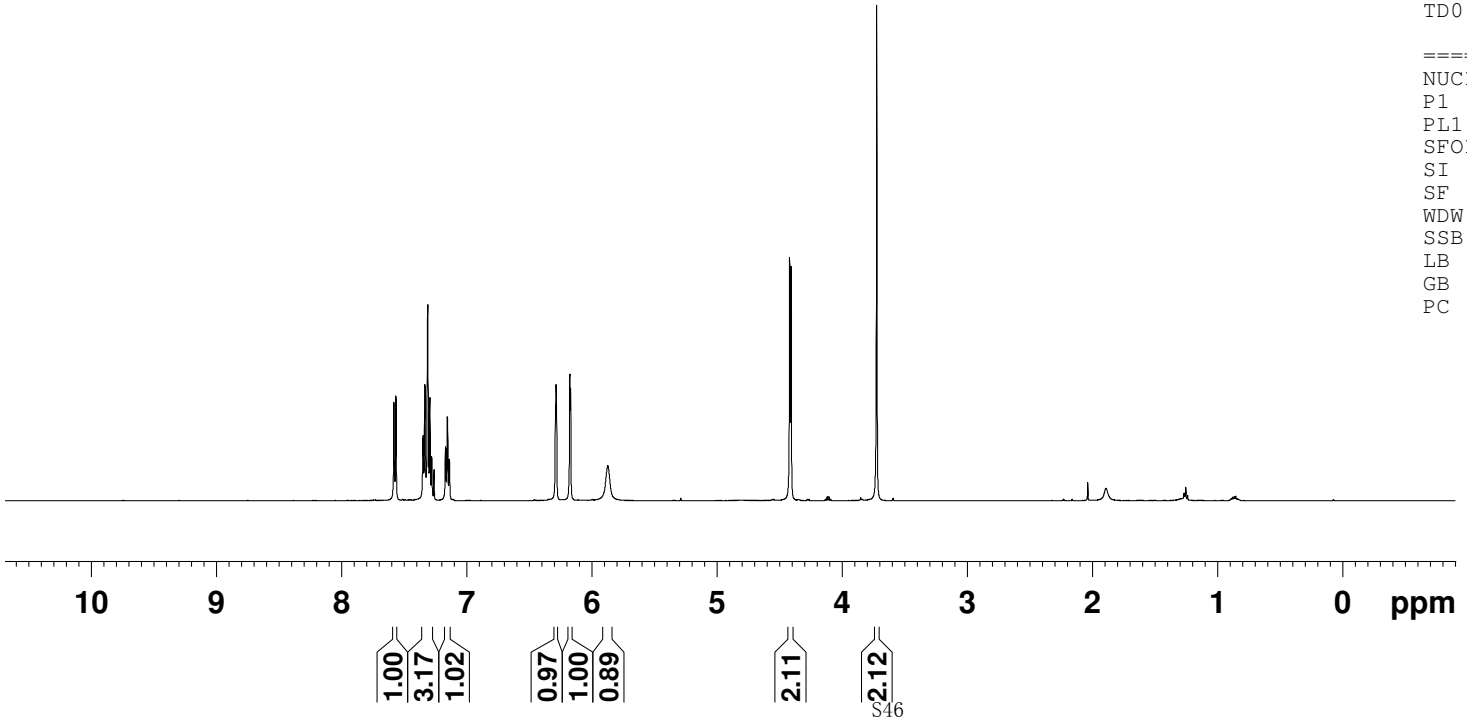
NAME	c-nmr
EXPNO	13
PROCNO	1
Date_	20111012
Time	10.07
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	297.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

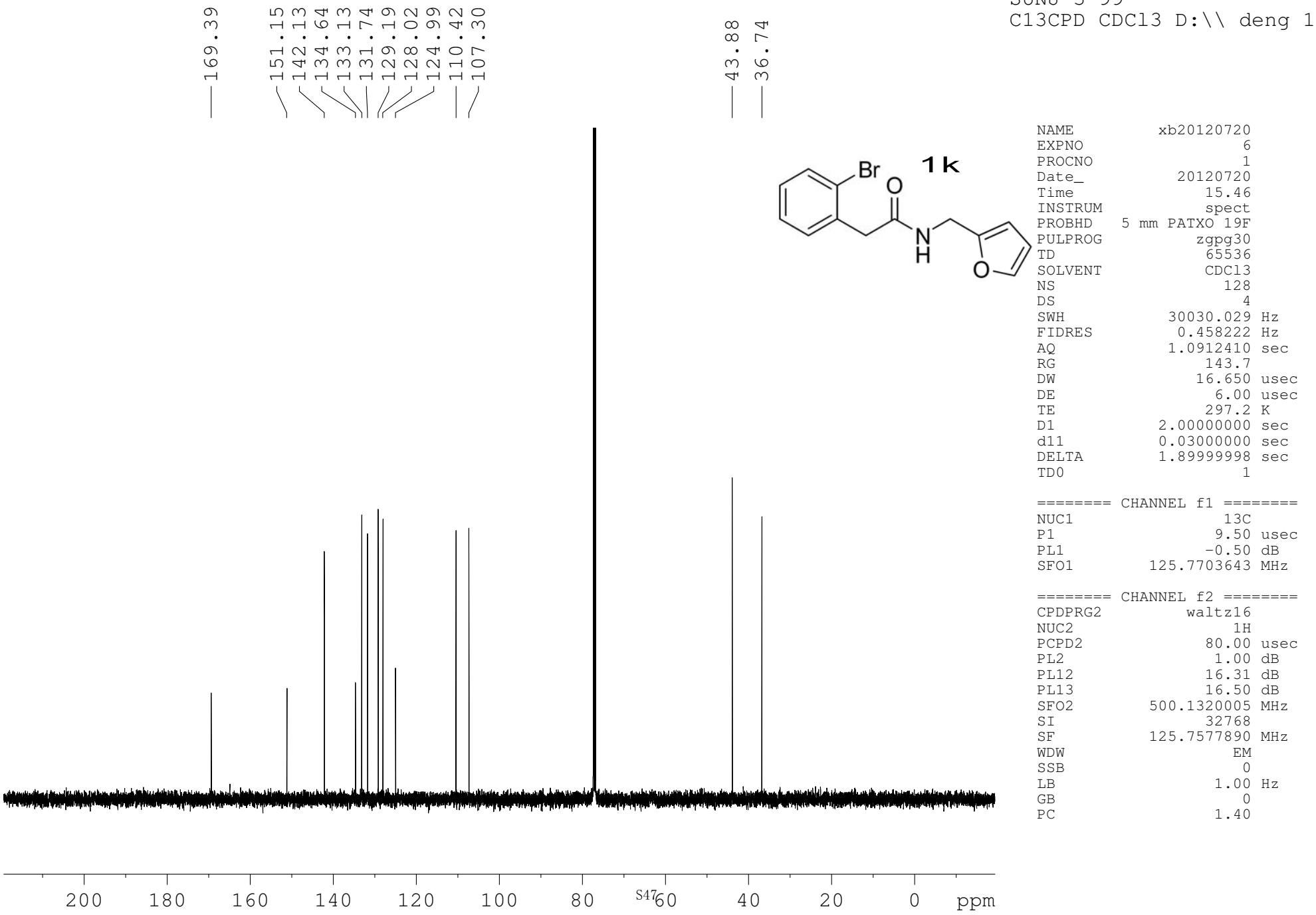


SUNJ-3-99
PROTON CDCl3 D:\\ deng 13



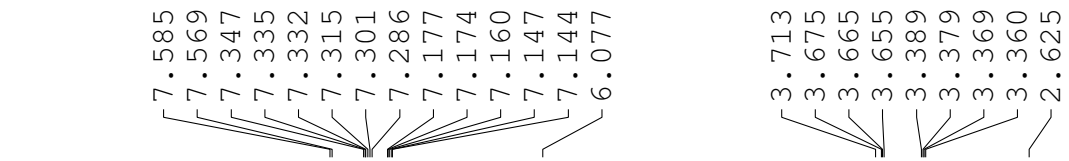
NAME	xb20120719
EXPNO	5
PROCNO	1
Date_	20120719
Time	15.54
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	181
DW	48.400 usec
DE	6.00 usec
TE	295.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300127 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



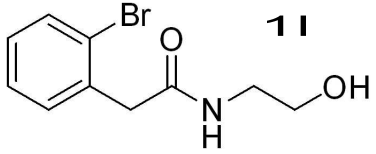


SUNJ-3-99
C13CPD CDCl3 D:\\ deng 1

NAME	xb20120720
EXPNO	6
PROCNO	1
Date_	20120720
Time	15.46
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	143.7
DW	16.650 usec
DE	6.00 usec
TE	297.2 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

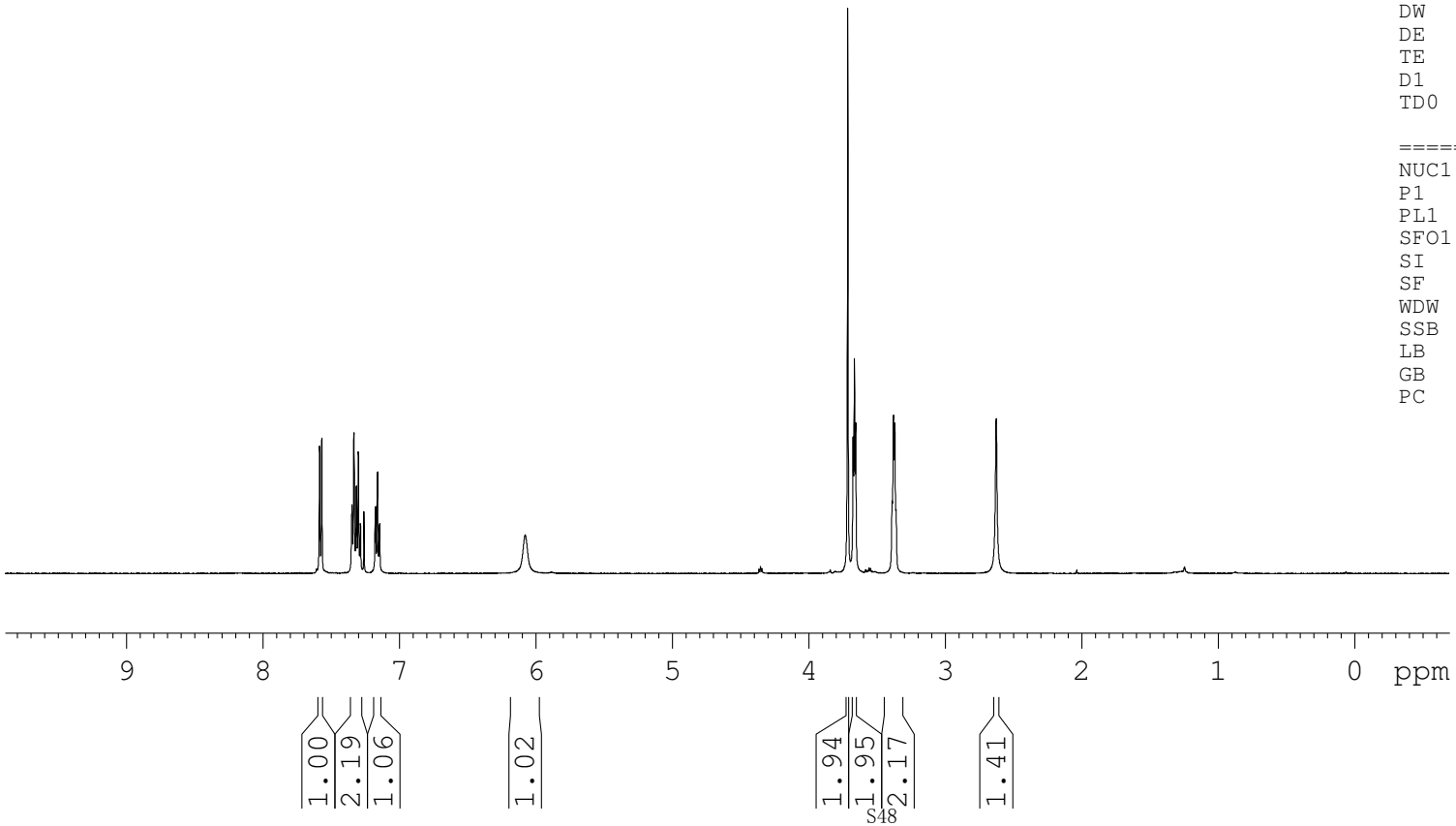


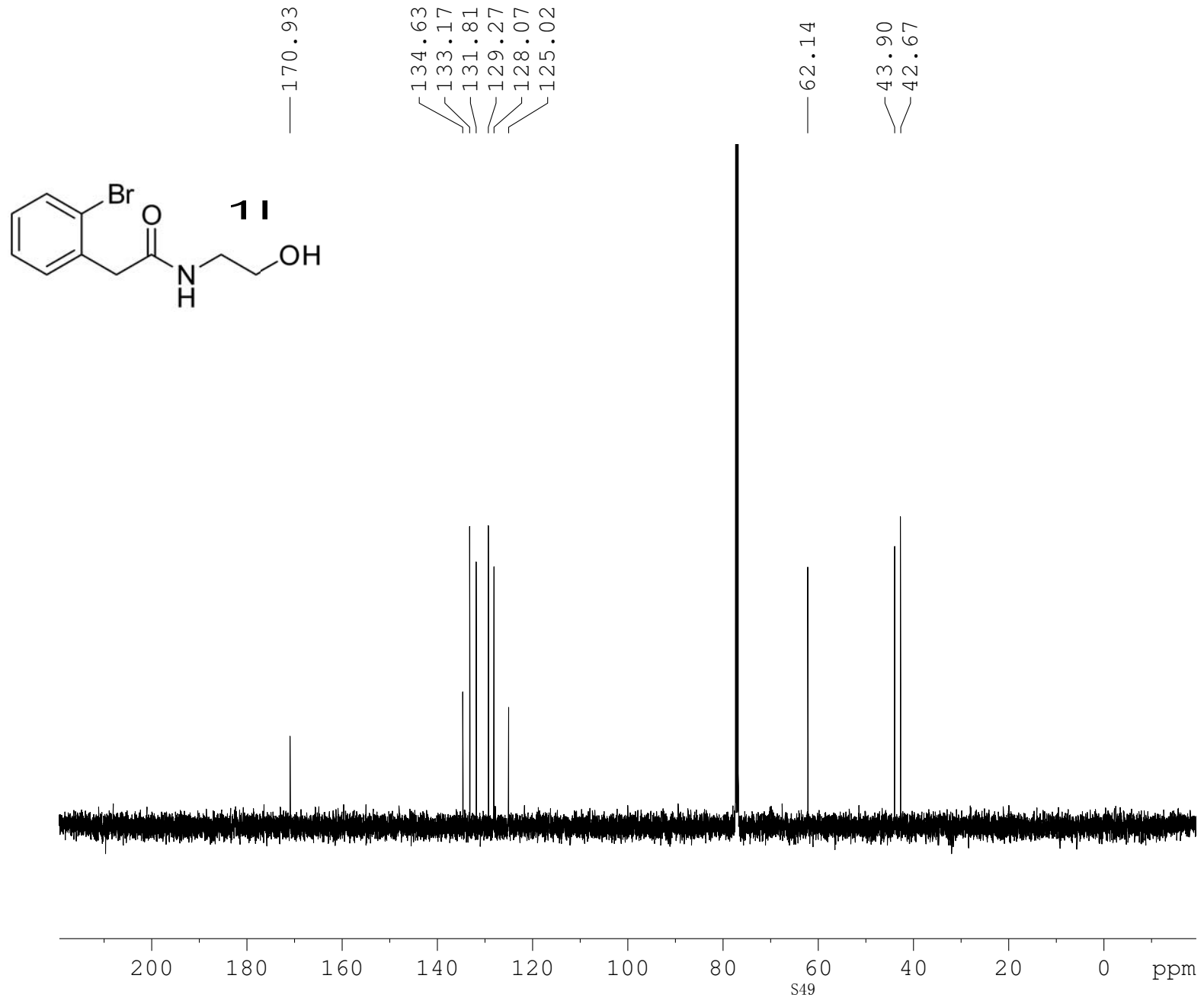
SUNJ-1-308-3
PROTON CDCl3 D:\\ deng 8



11

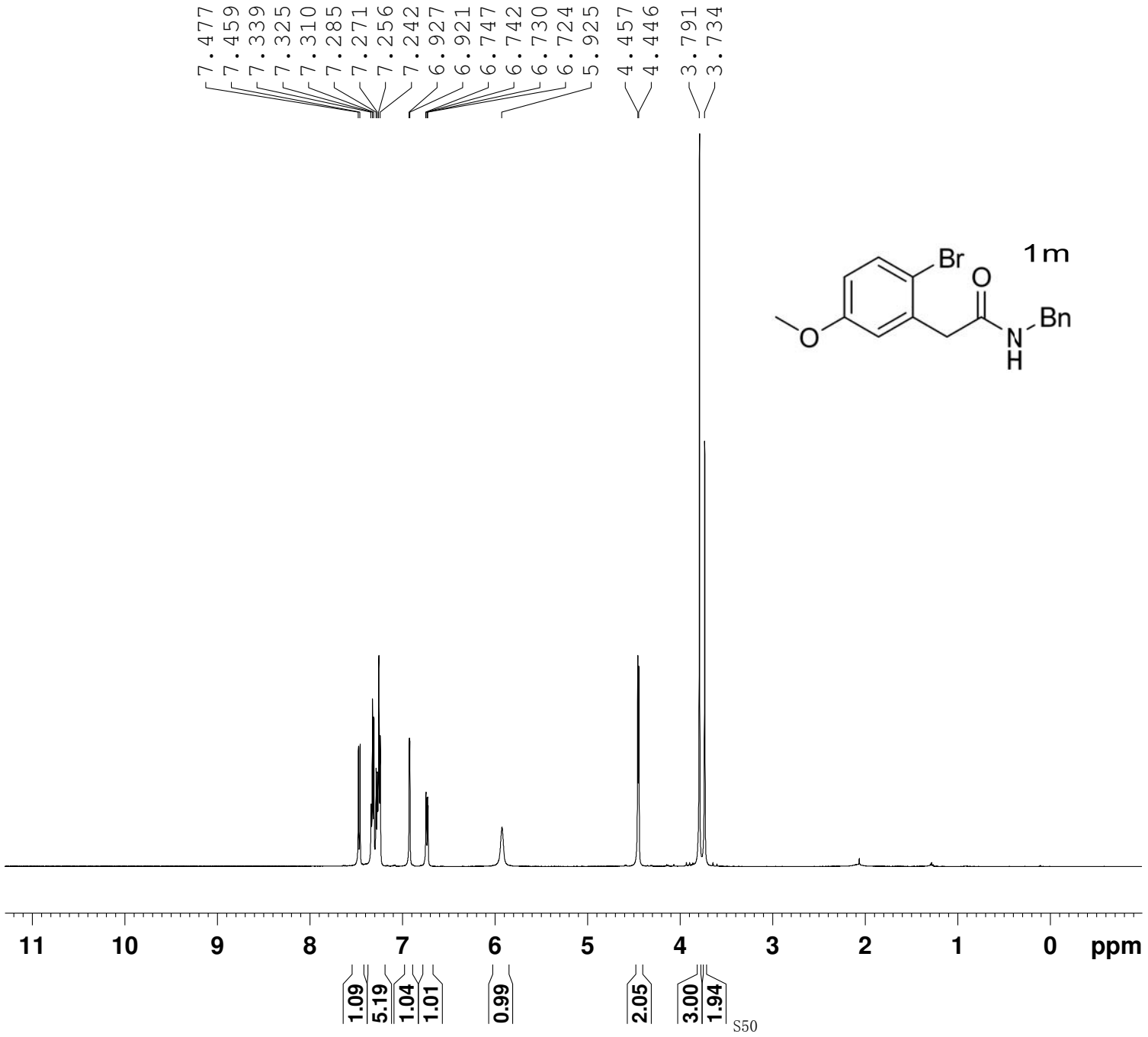
NAME	XB20111012
EXPNO	1
PROCNO	1
Date_	20111012
Time	8.28
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.66 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300130 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





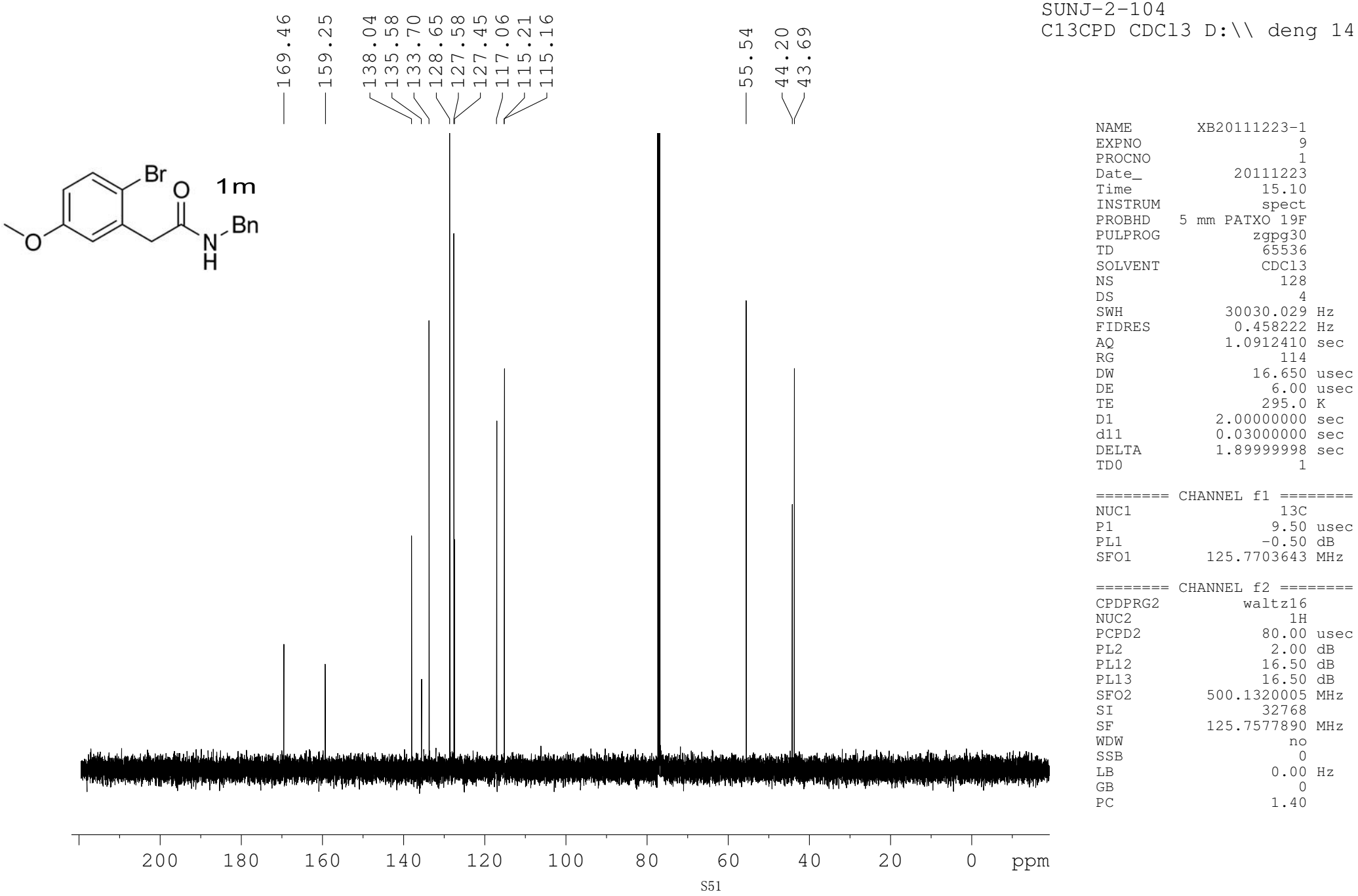
SunJ-1-308-3
C13CPD CDCl3 D:\\ deng 42

NAME	xb20111013
EXPNO	5
PROCNO	1
Date_	20111013
Time	10.33
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	297.3 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



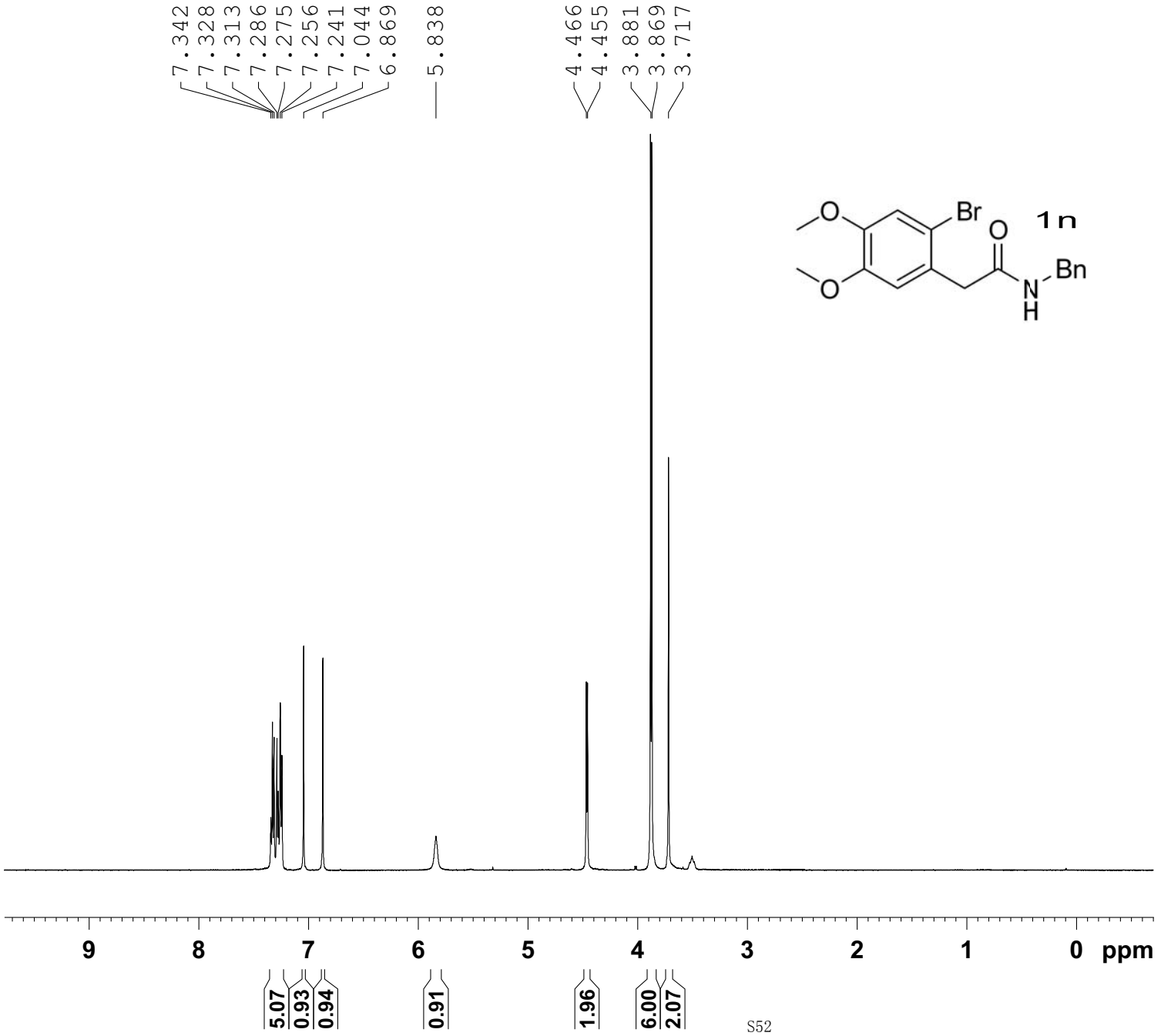
SunJ-2-104
PROTON CDCl3 D:\\ deng 7

NAME	XB20111222
EXPNO	10
PROCNO	1
Date_	20111222
Time	16.25
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	128
DW	48.400 usec
DE	6.00 usec
TE	293.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.66 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



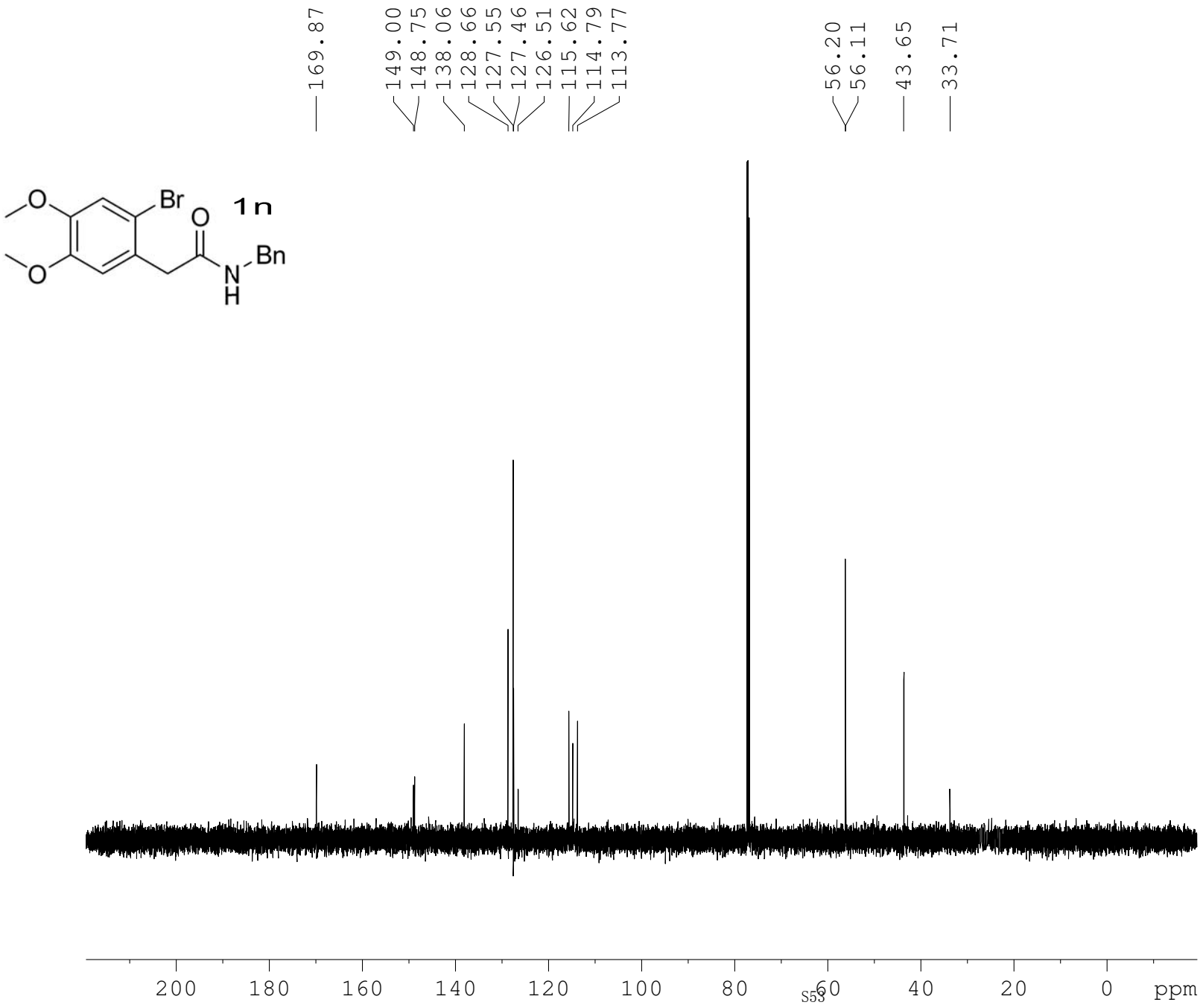
SUNJ-2-104
C13CPD CDCl3 D:\\ deng 14

NAME	XB20111223-1
EXPNO	9
PROCNO	1
Date_	20111223
Time	15.10
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	295.0 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



SUNJ-2-138-1
PROTON CDCl3 D:\\ deng 60

NAME	xb20120306
EXPNO	1
PROCNO	1
Date_	20120306
Time	13.04
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	287.4
DW	48.400 usec
DE	6.00 usec
TE	294.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

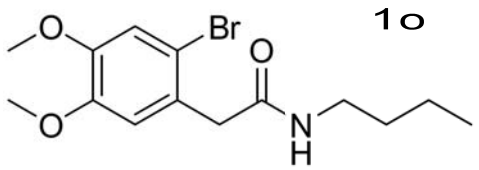


SUNJ-2-151-1
C13CPD CDCl3 D:\\ deng 5

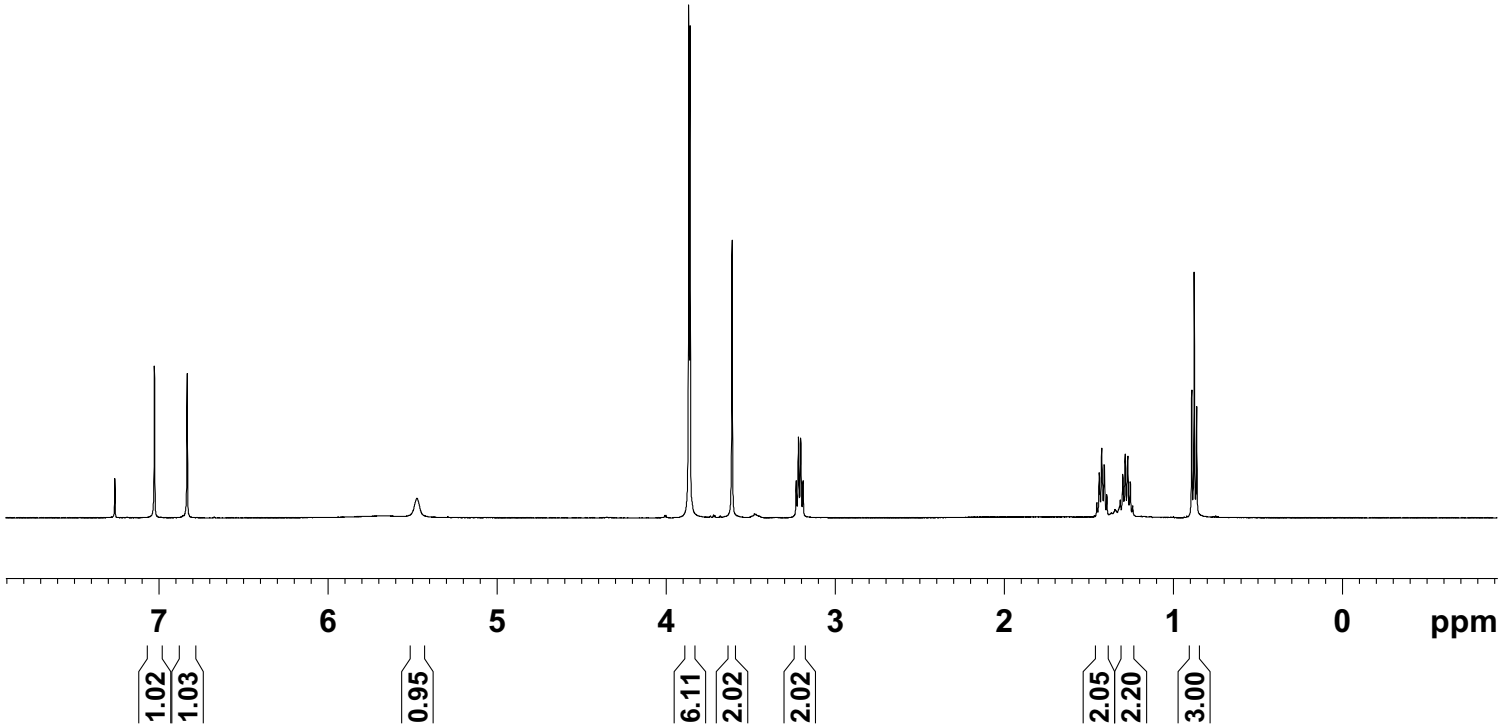
NAME	XB20120315
EXPNO	7
PROCNO	1
Date_	20120315
Time	17.00
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

SUNJ-2-138-2

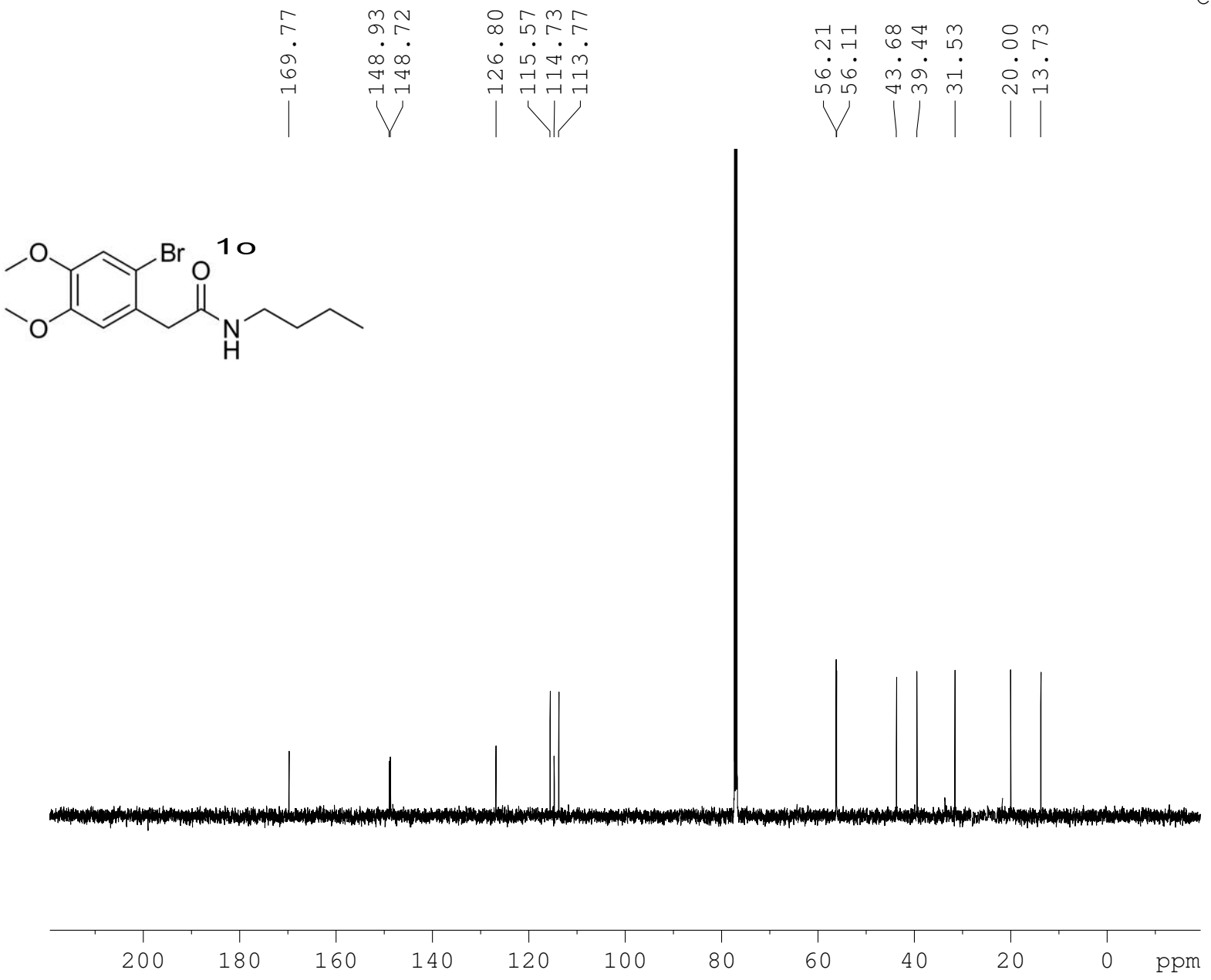
7.026
6.832
5.472
3.865
3.858
3.608
3.229
3.215
3.203
3.189
1.450
1.436
1.422
1.407
1.392
1.297
1.282
1.267
1.252
0.889
0.875
0.860



1o

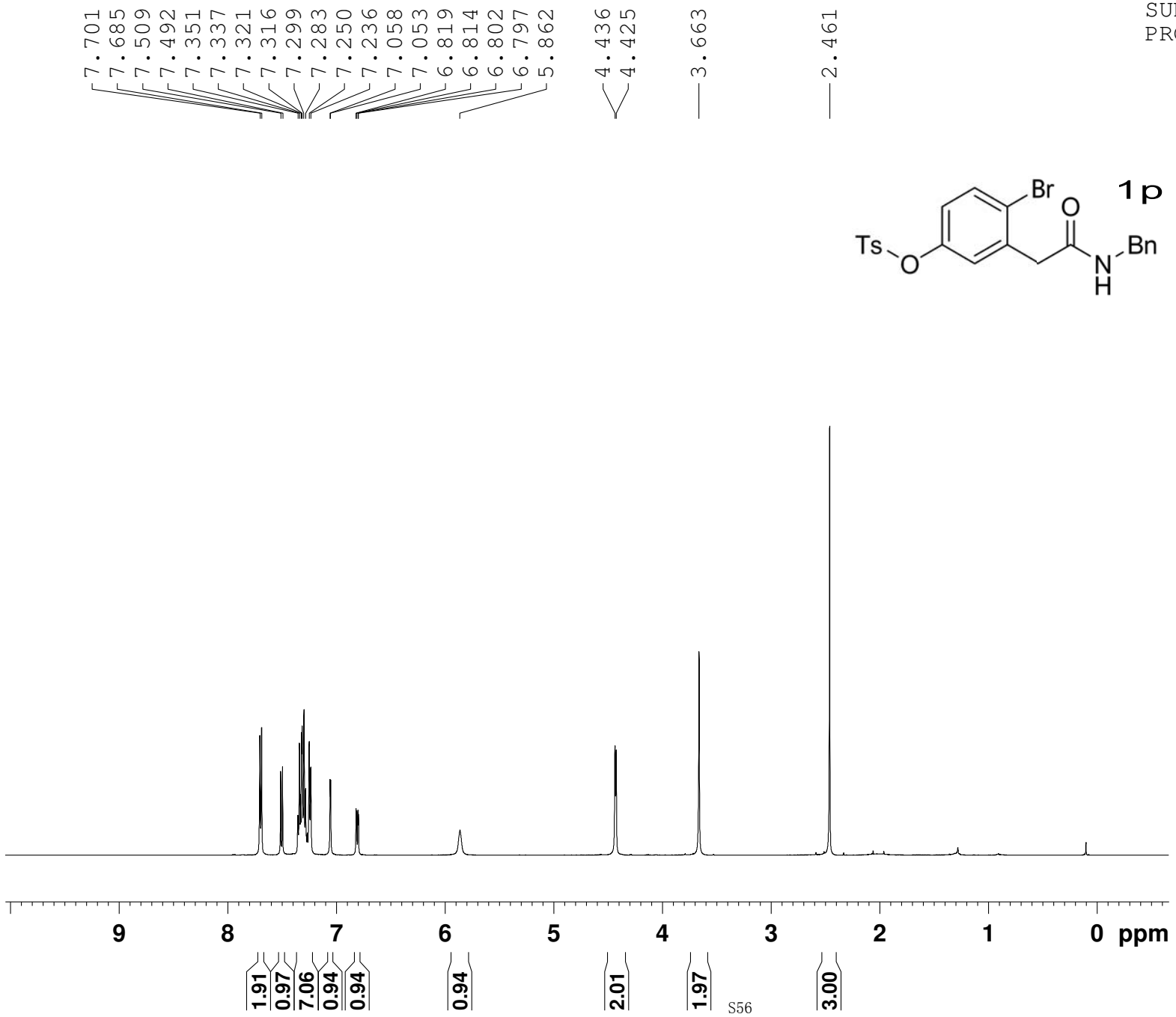


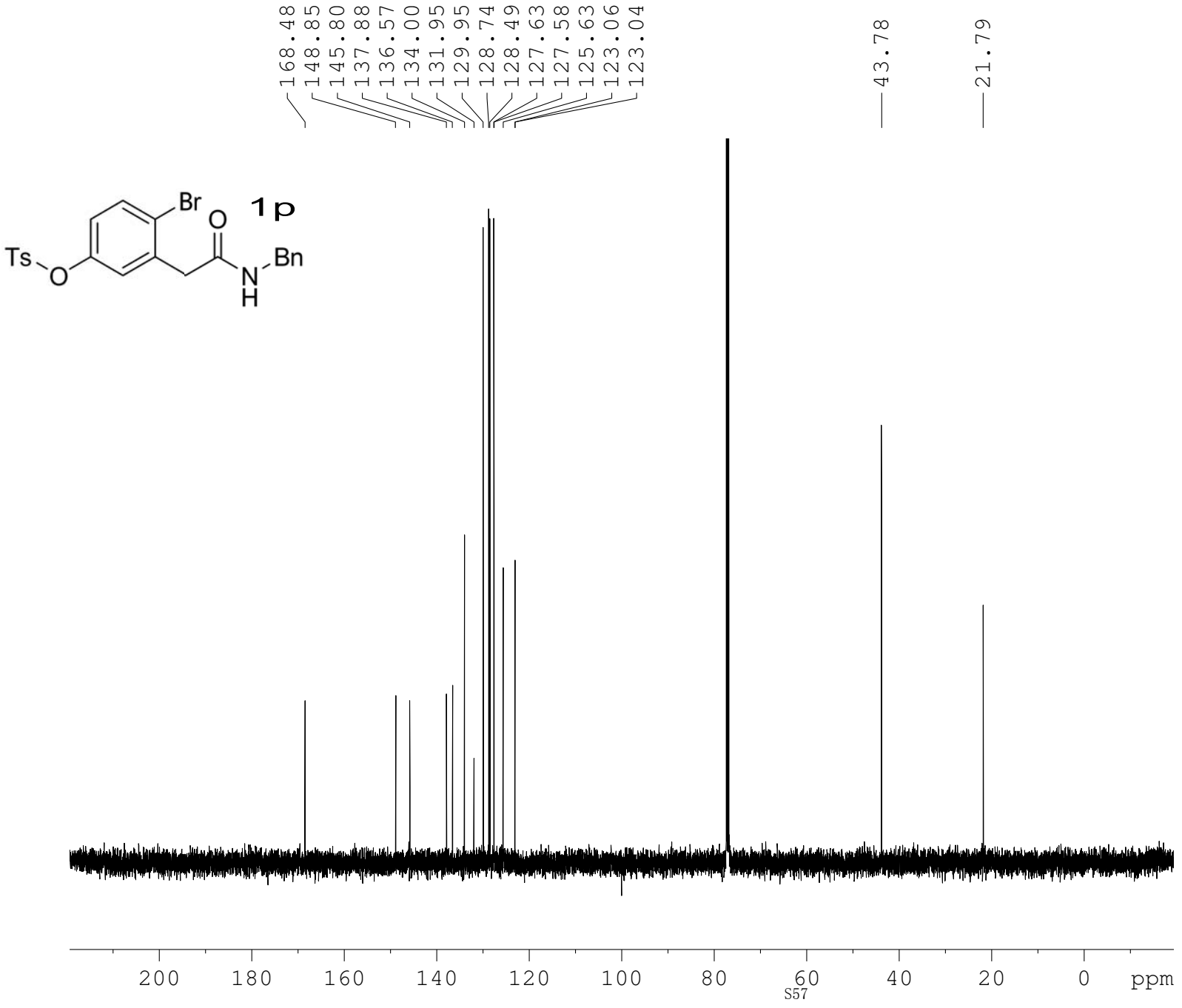
NAME	xb20120306
EXPNO	2
PROCNO	1
Date_	20120306
Time	13.10
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	228.1
DW	48.400 usec
DE	6.00 usec
TE	294.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300128 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



SUNJ-2-148-3
C13CPD CDCl3 D:\\ deng 55

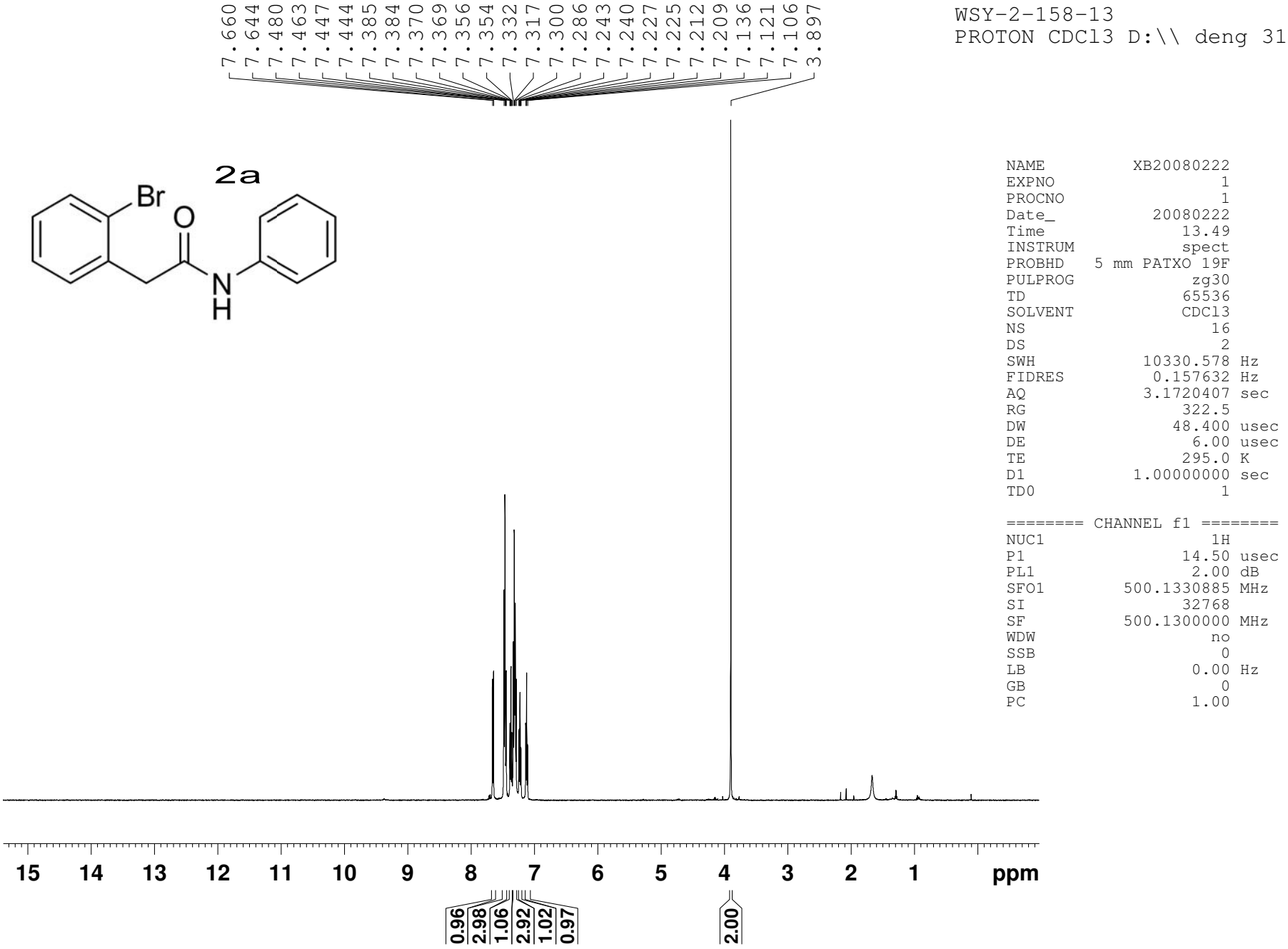
NAME	XB20120314
EXPNO	5
PROCNO	1
Date_	20120314
Time	10.14
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	228.1
DW	16.650 usec
DE	6.00 usec
TE	295.5 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	2.00 Hz
GB	0
PC	1.40

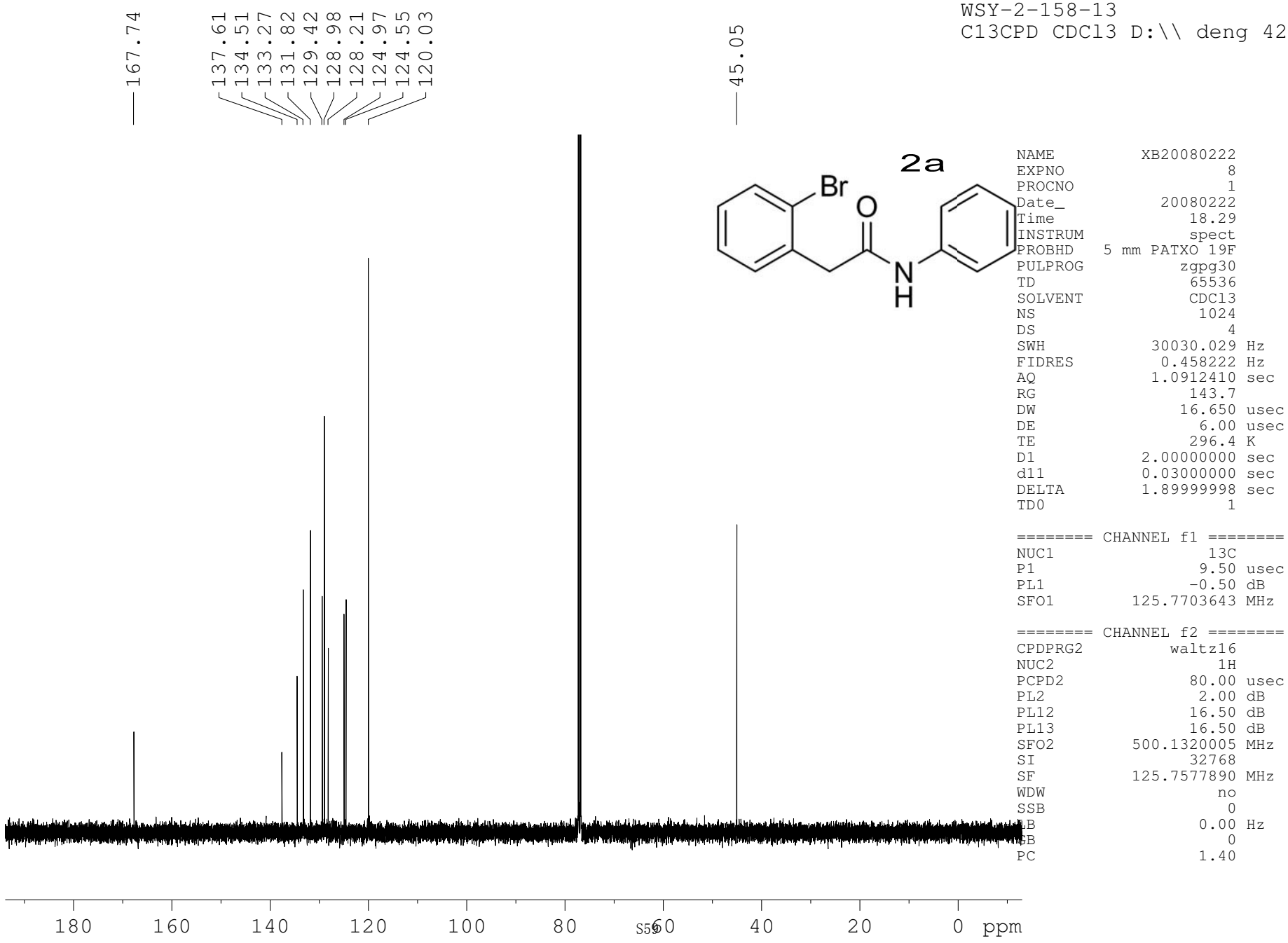


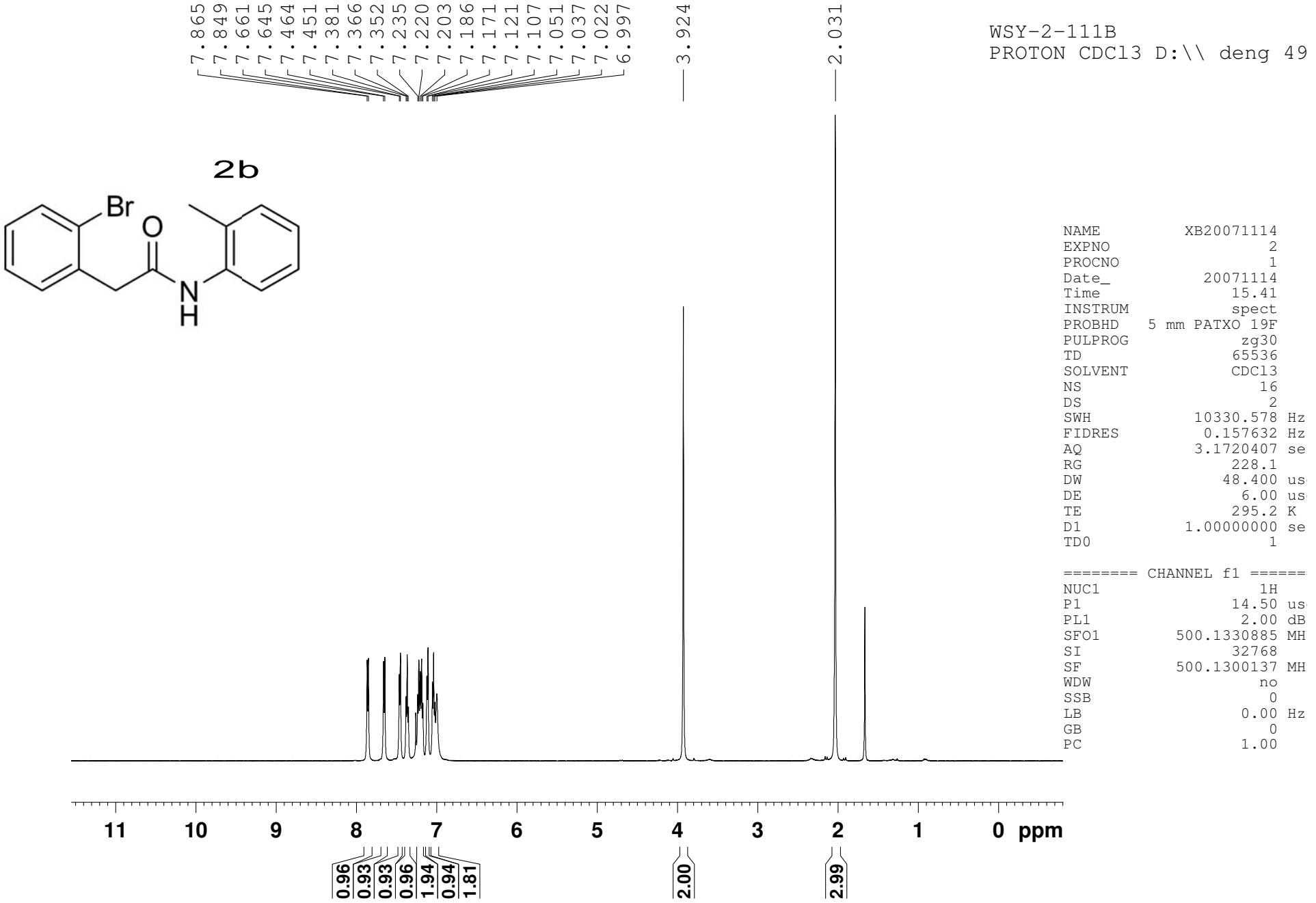


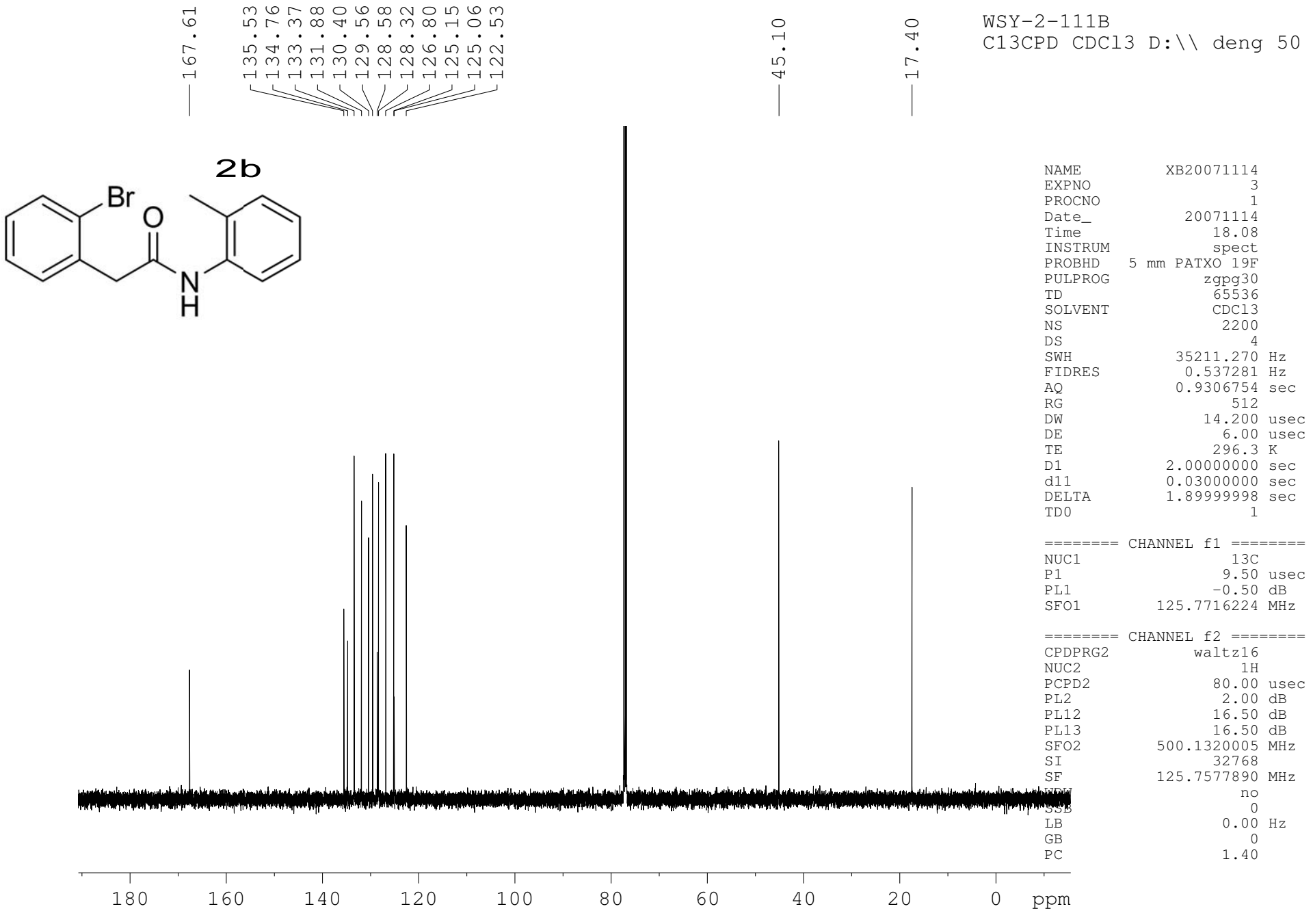
SUNJ-2-113A
C13CPD CDCl3 D:\\ deng 56

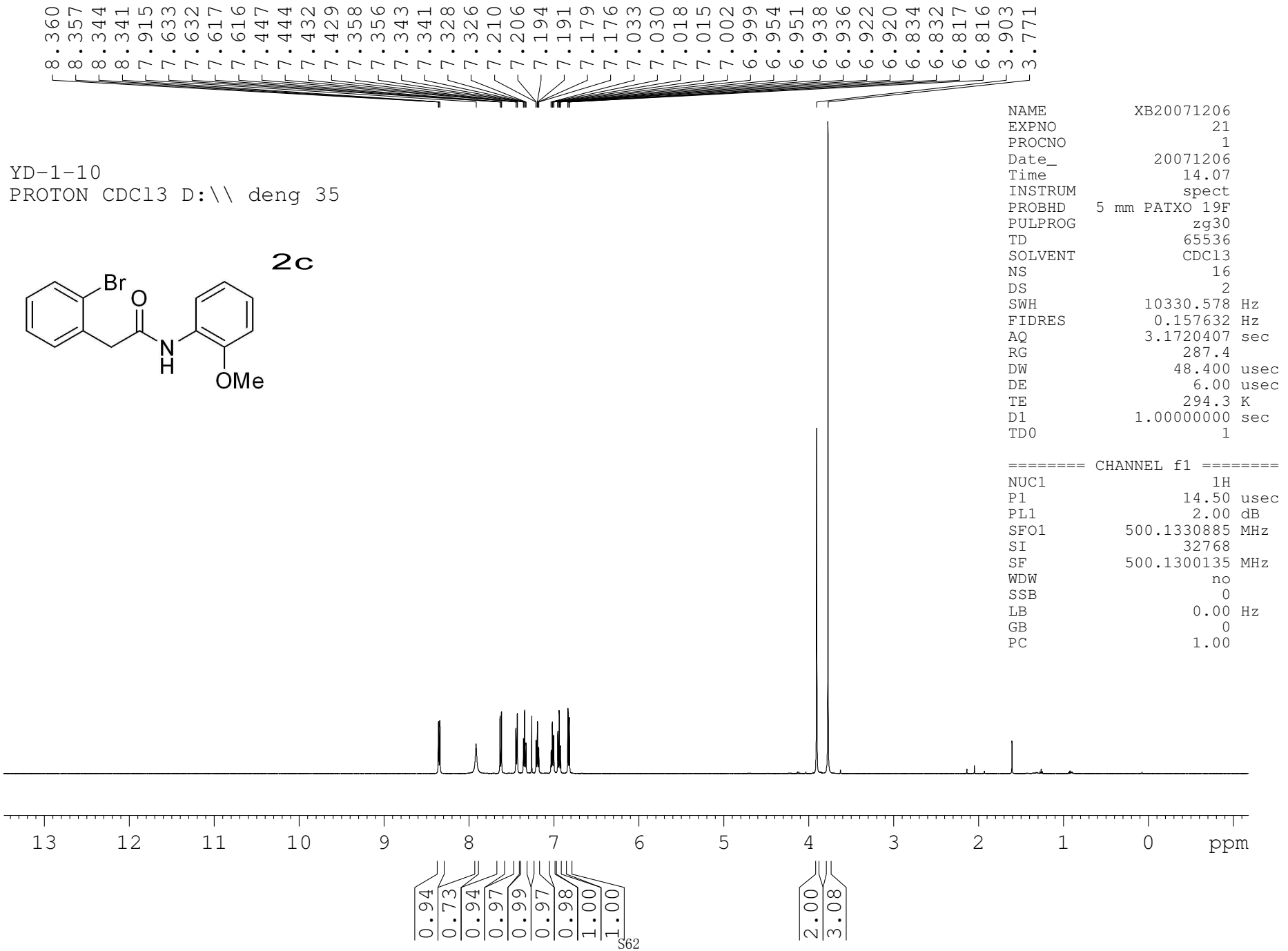
NAME	xb20111229
EXPNO	2
PROCNO	1
Date_	20111229
Time	10.17
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	101.6
DW	16.650 usec
DE	6.00 usec
TE	295.0 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

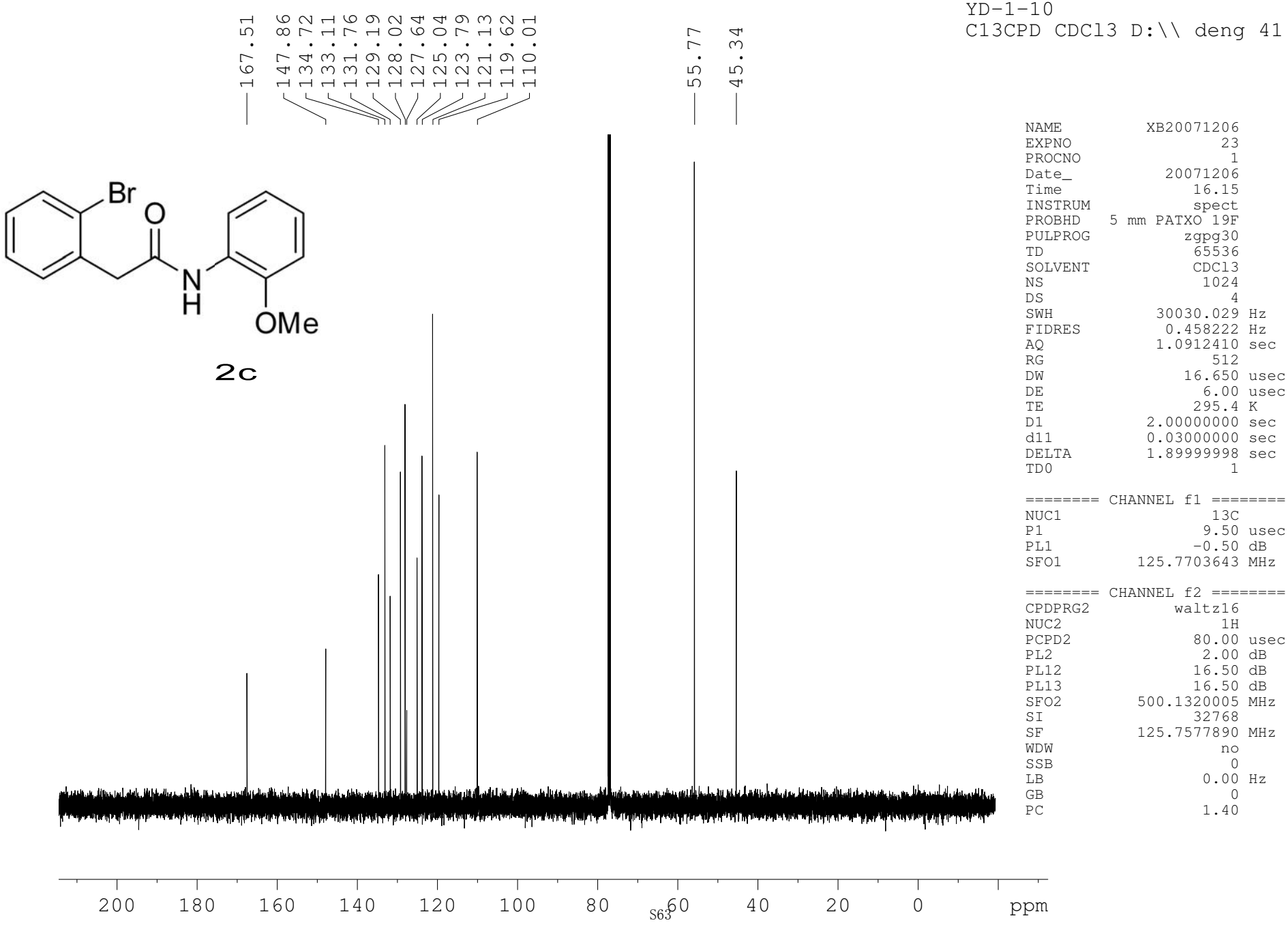






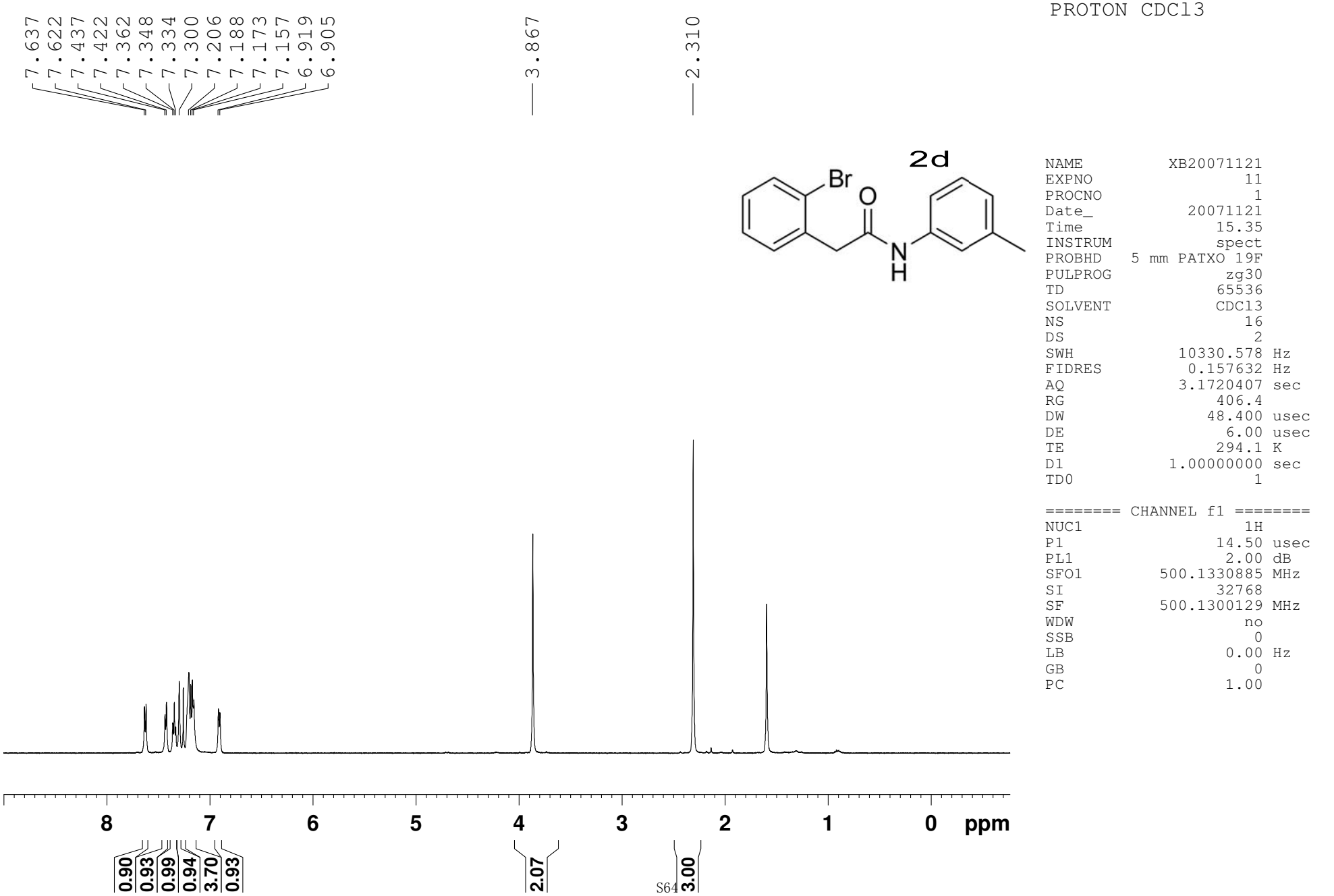


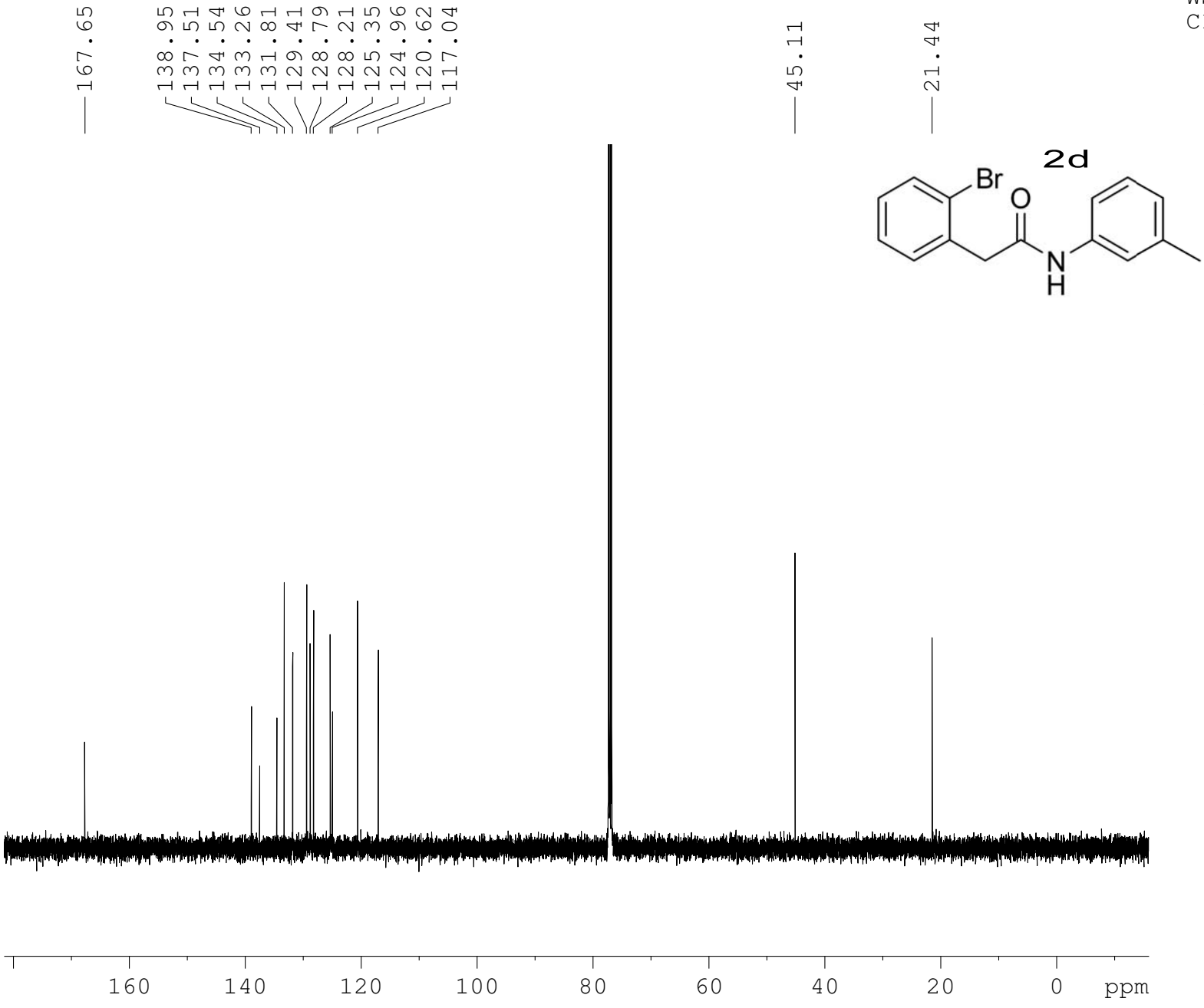




YD-1-10
C13CPD CDCl3 D:\\ deng 41

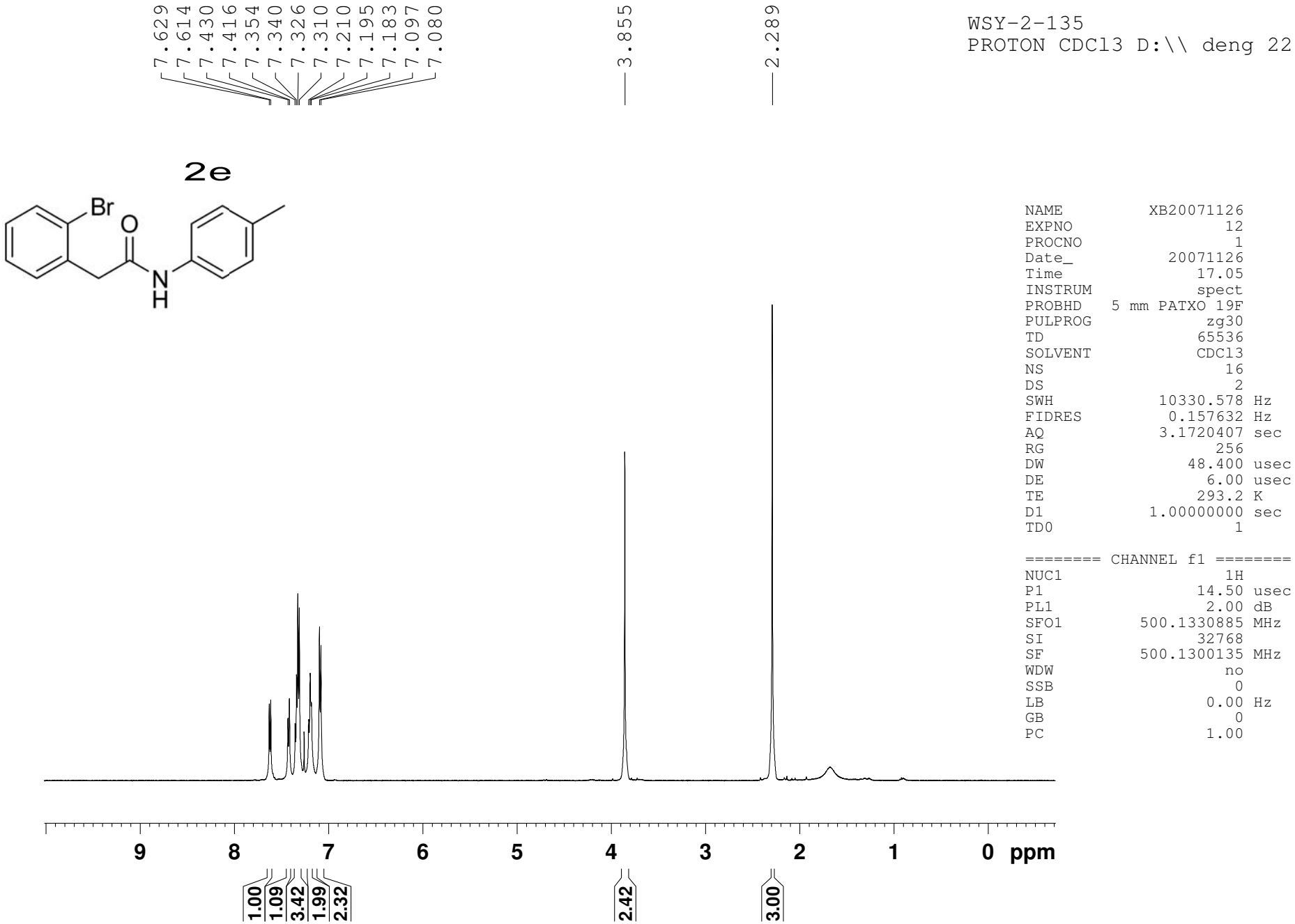
NAME	XB20071206
EXPNO	23
PROCNO	1
Date_	20071206
Time	16.15
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	512
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

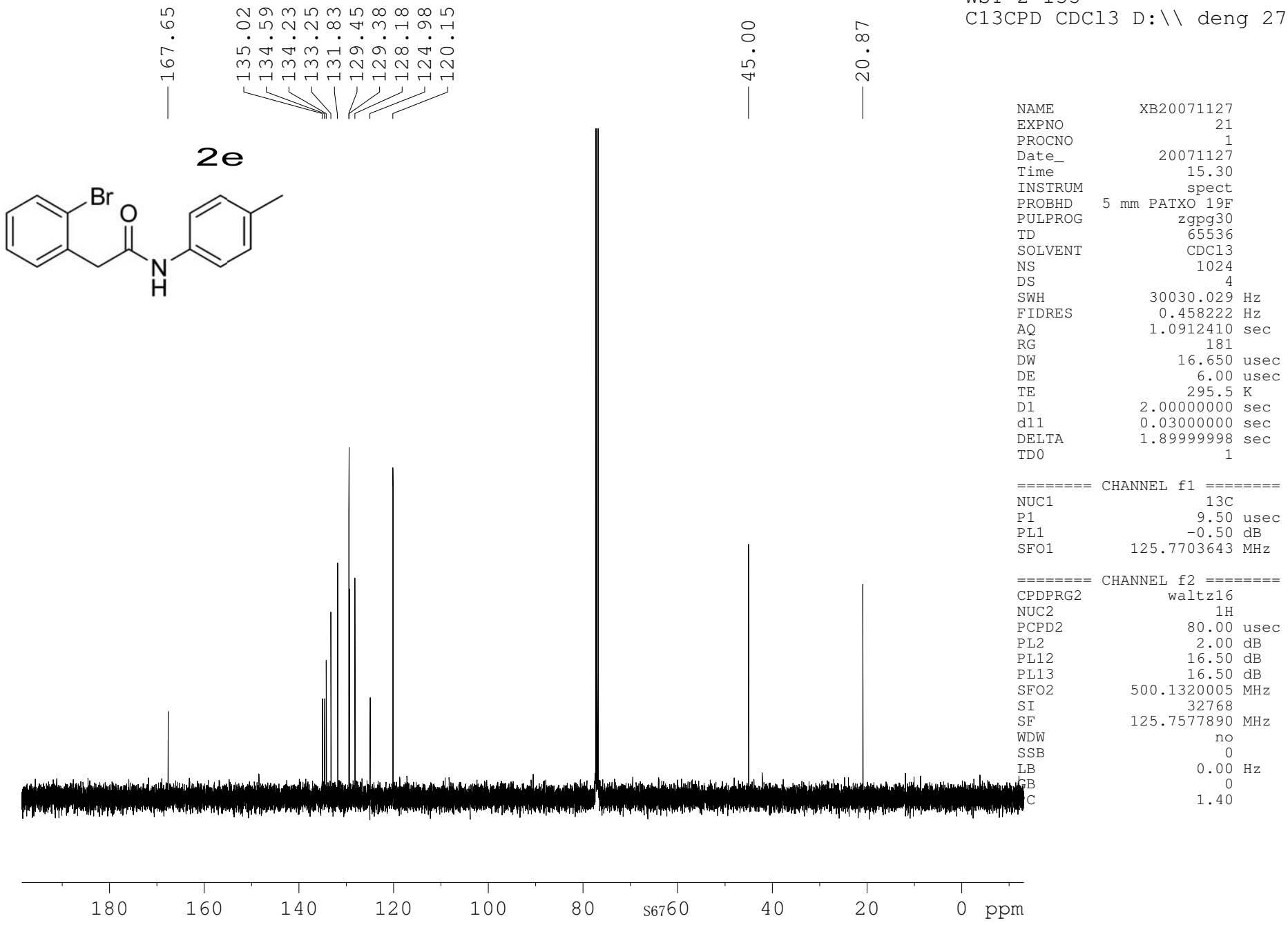




WSY-2-112
C13CPD CDCl3

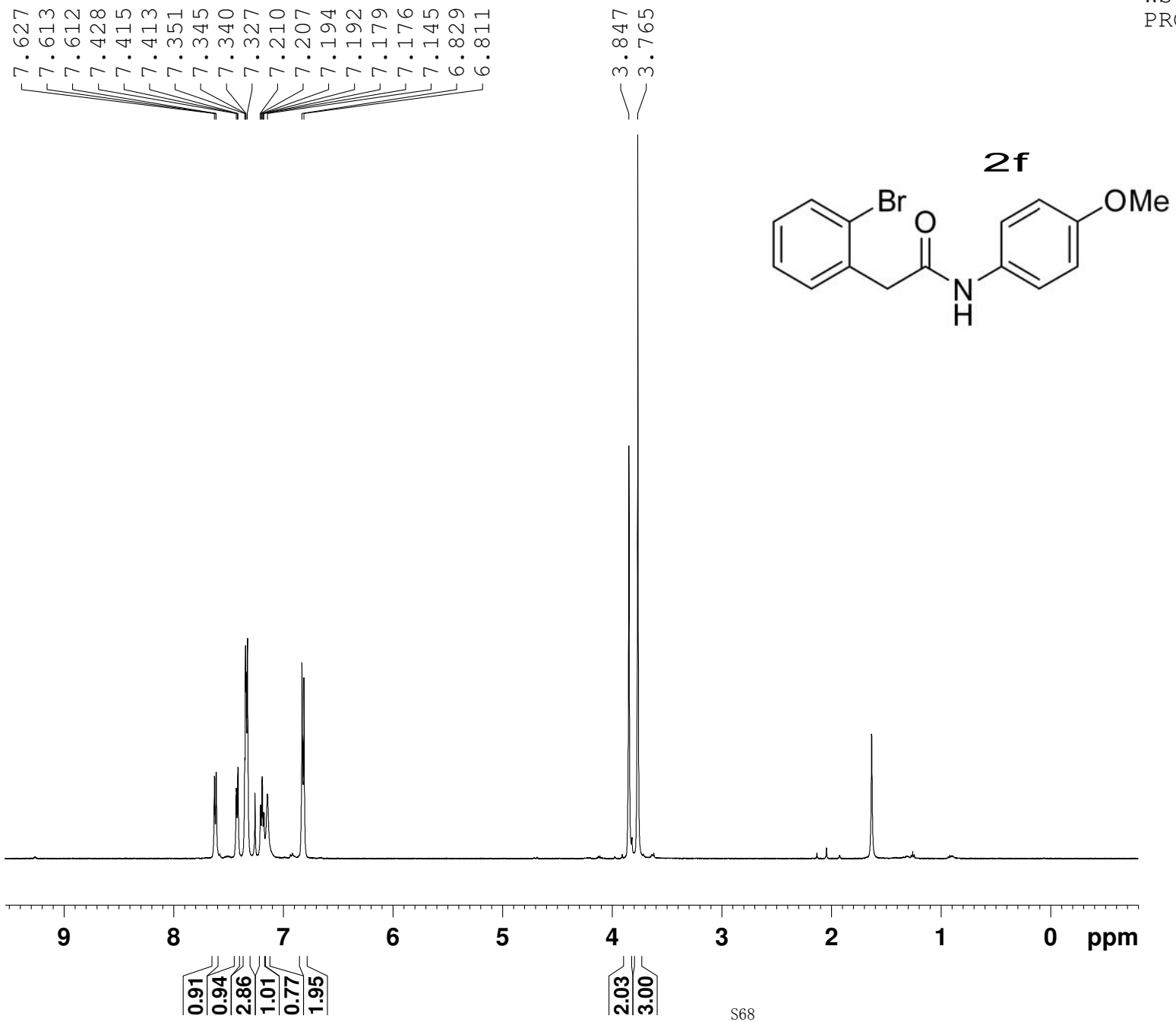
NAME	XB20071121
EXPNO	15
PROCNO	1
Date_	20071122
Time	20.05
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	6051
DS	4
SWH	35211.270 Hz
FIDRES	0.537281 Hz
AQ	0.9306754 sec
RG	456.1
DW	14.200 usec
DE	6.00 usec
TE	295.9 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7716224 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40





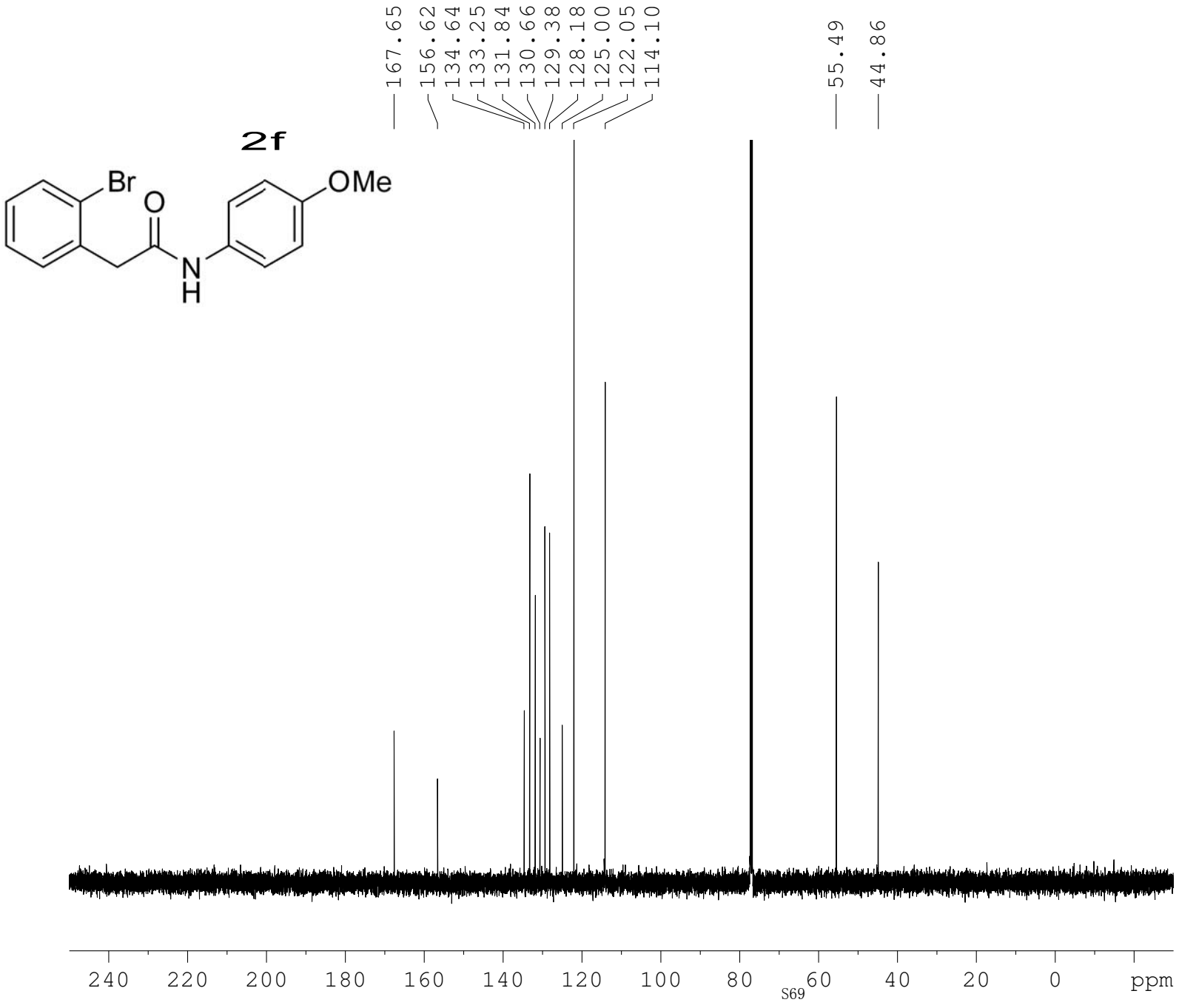
WSY-2-135
C13CPD CDCl3 D:\\ deng 27

NAME	XB20071127
EXPNO	21
PROCNO	1
Date_	20071127
Time	15.30
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	295.5 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
C	1.40



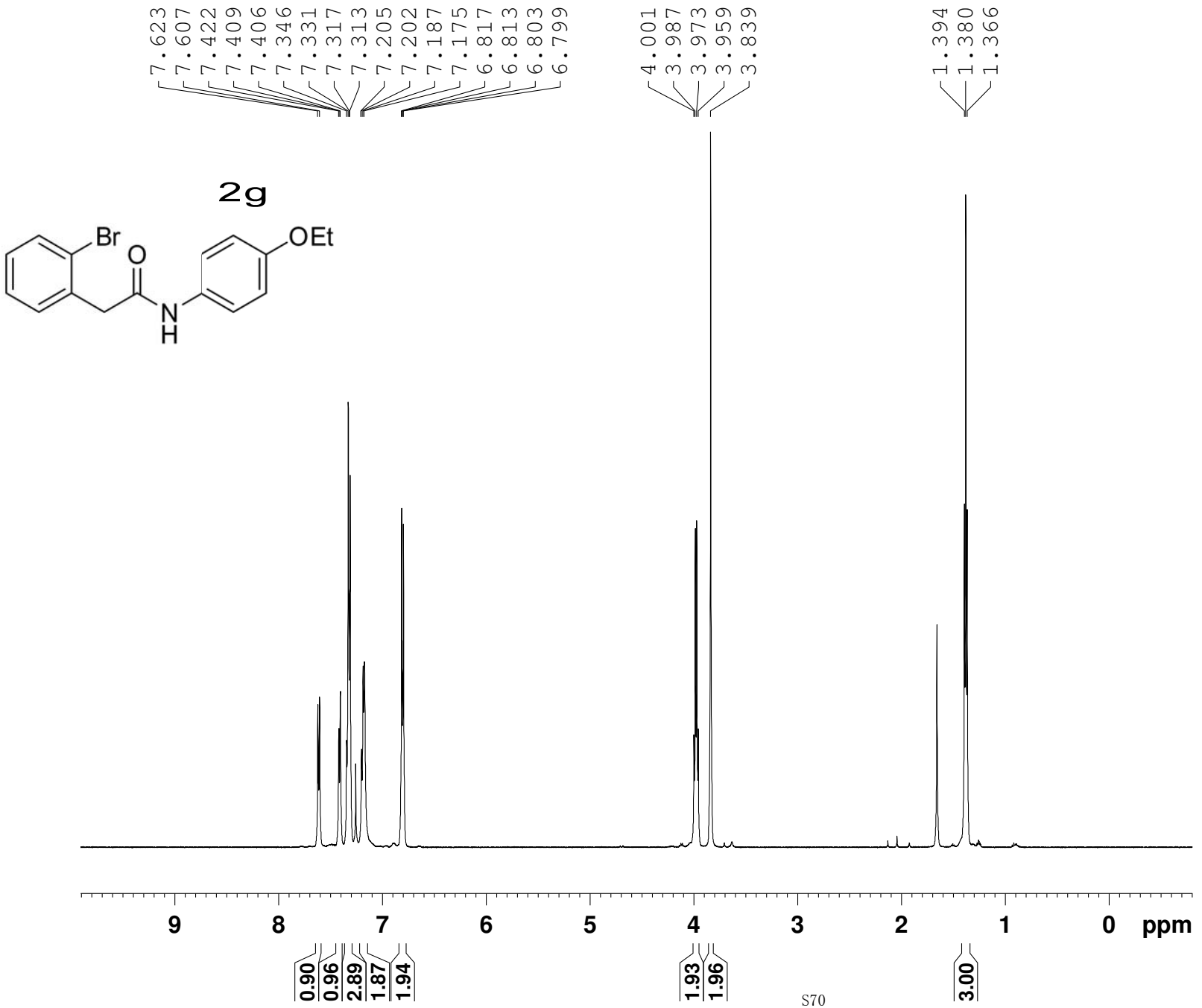
WSY-2-63
PROTON CDCl3 D:\\ deng 24

NAME	XB20071112
EXPNO	22
PROCNO	1
Date_	20071112
Time	15.49
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	294.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300139 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



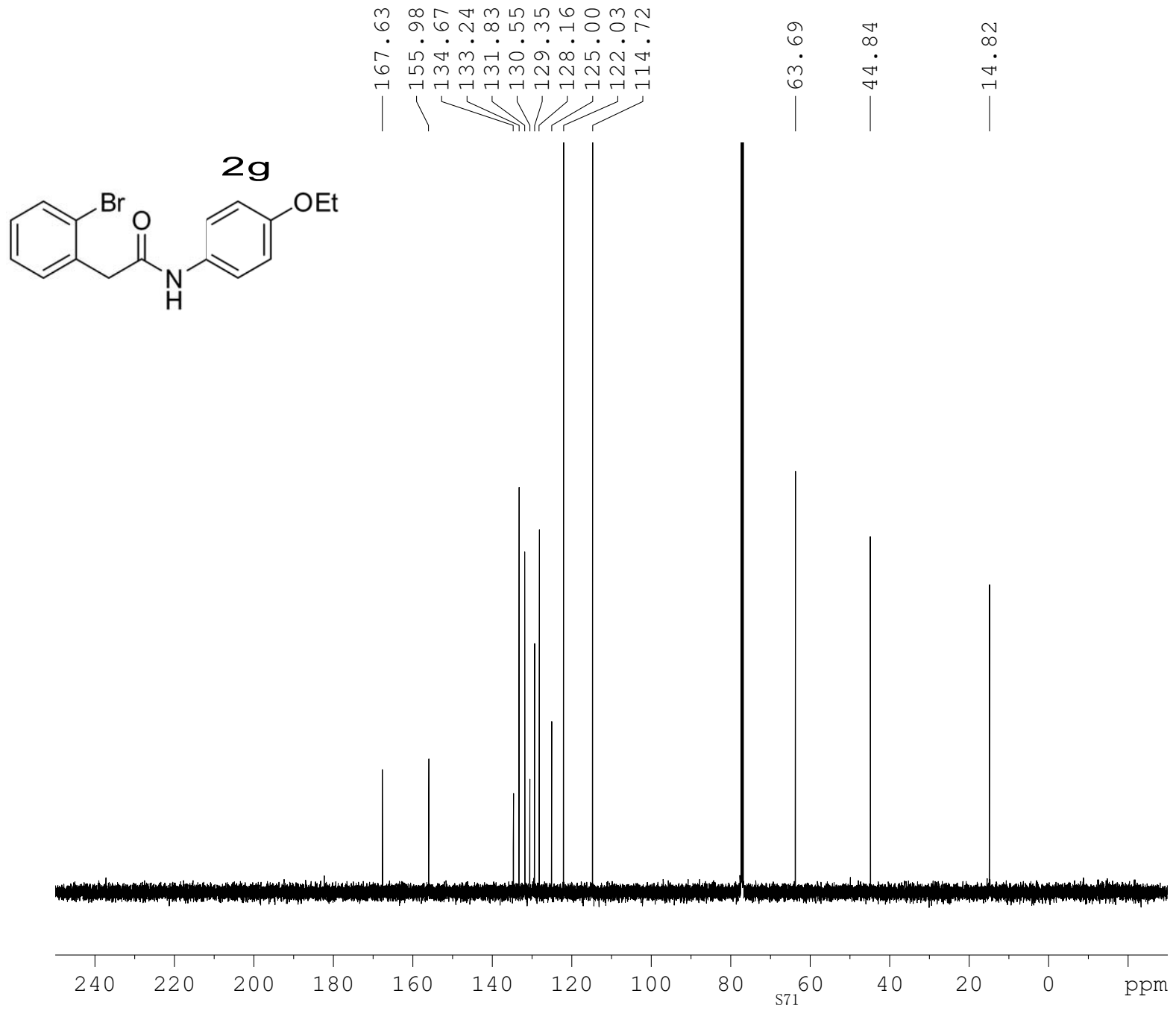
WSY-2-63
C13CPD CDCl3 D:\\ deng 2

NAME	XB20071112
EXPNO	25
PROCNO	1
Date_	20071113
Time	5.58
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2200
DS	4
SWH	35211.270 Hz
FIDRES	0.537281 Hz
AQ	0.9306754 sec
RG	456.1
DW	14.200 usec
DE	6.00 usec
TE	294.8 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7716224 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



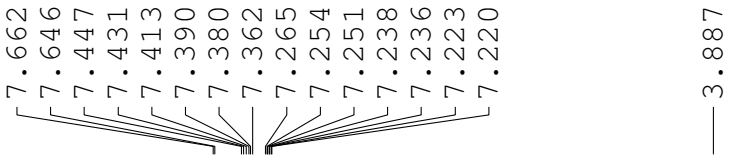
WSY-2-128
PROTON CDCl3 D:\\ deng 60

NAME	XB20071121
EXPNO	12
PROCNO	1
Date_	20071121
Time	15.53
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	228.1
DW	48.400 usec
DE	6.00 usec
TE	294.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300136 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

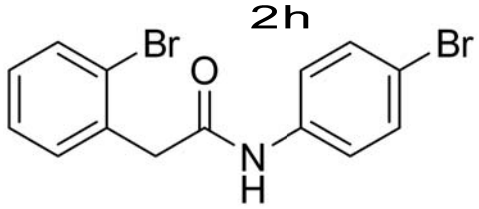


WSY-2-128
C13CPD CDCl3 D:\\ deng 4

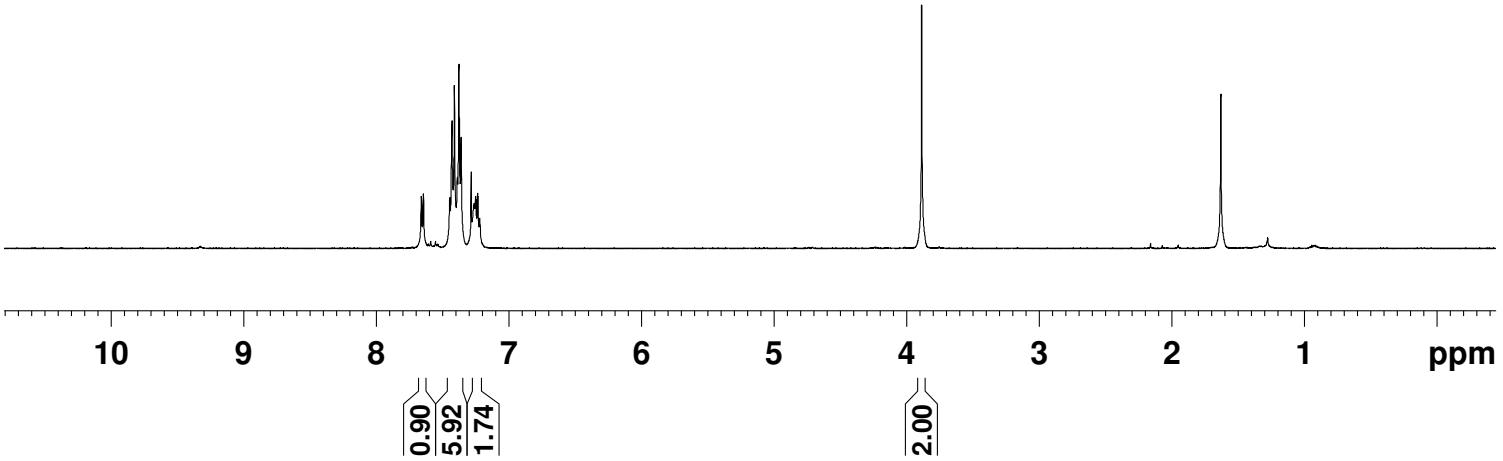
NAME	XB20071121
EXPNO	14
PROCNO	1
Date_	20071121
Time	18.26
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2400
DS	4
SWH	35211.270 Hz
FIDRES	0.537281 Hz
AQ	0.9306754 sec
RG	456.1
DW	14.200 usec
DE	6.00 usec
TE	296.1 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7716224 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

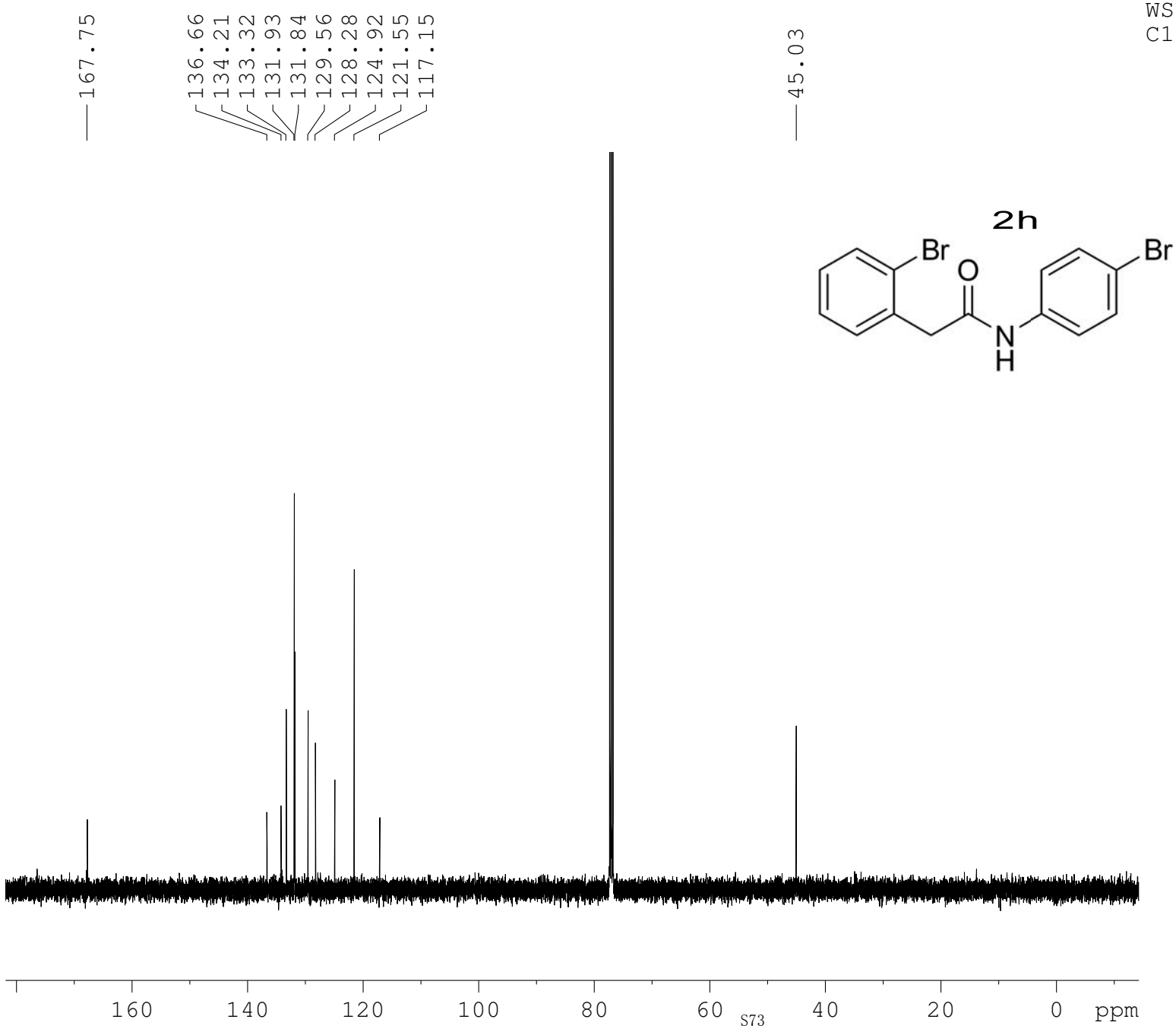


WSY-2-124
PROTON CDCl3

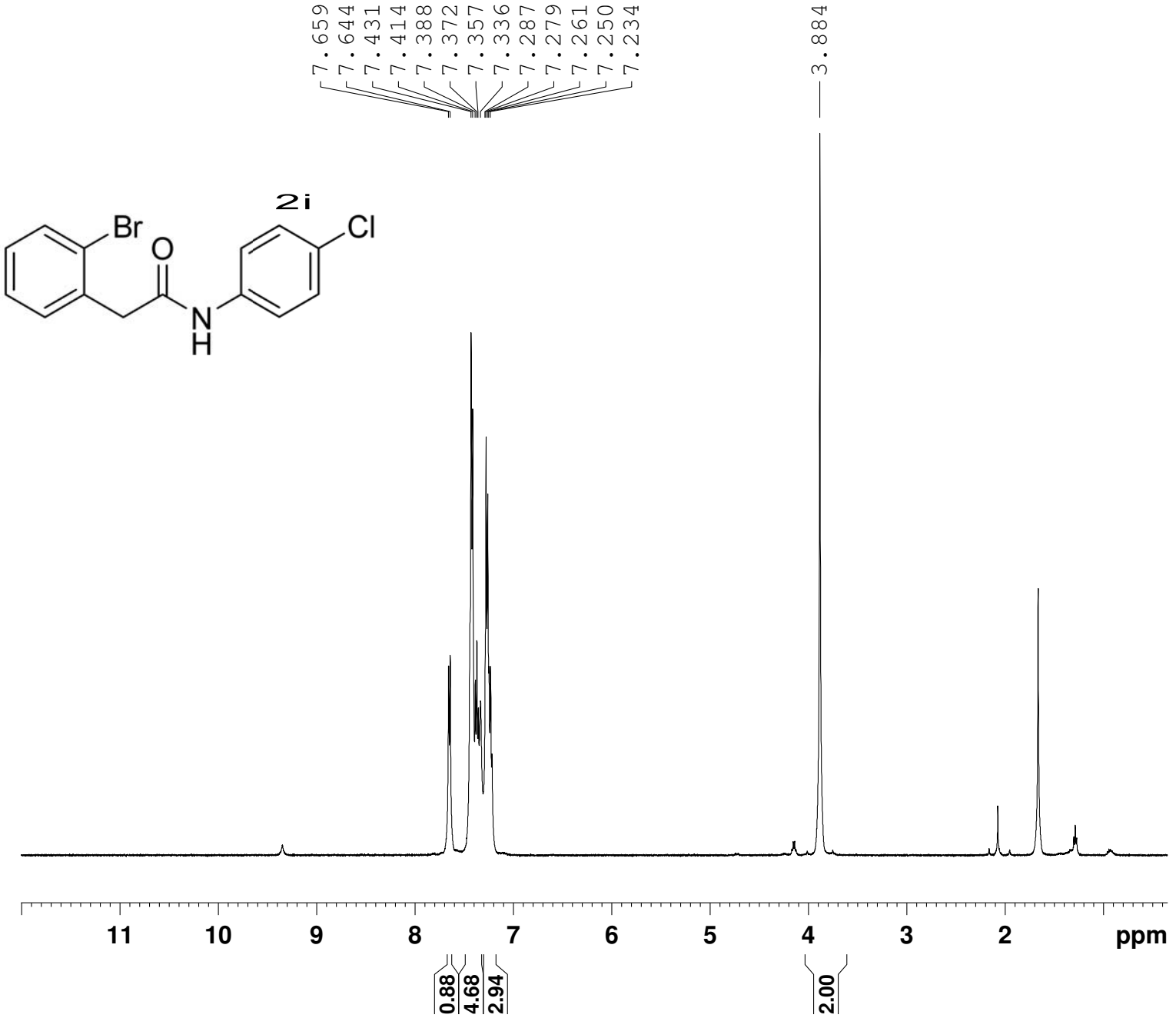


NAME	XB20071126
EXPNO	13
PROCNO	1
Date_	20071126
Time	19.30
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	293.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



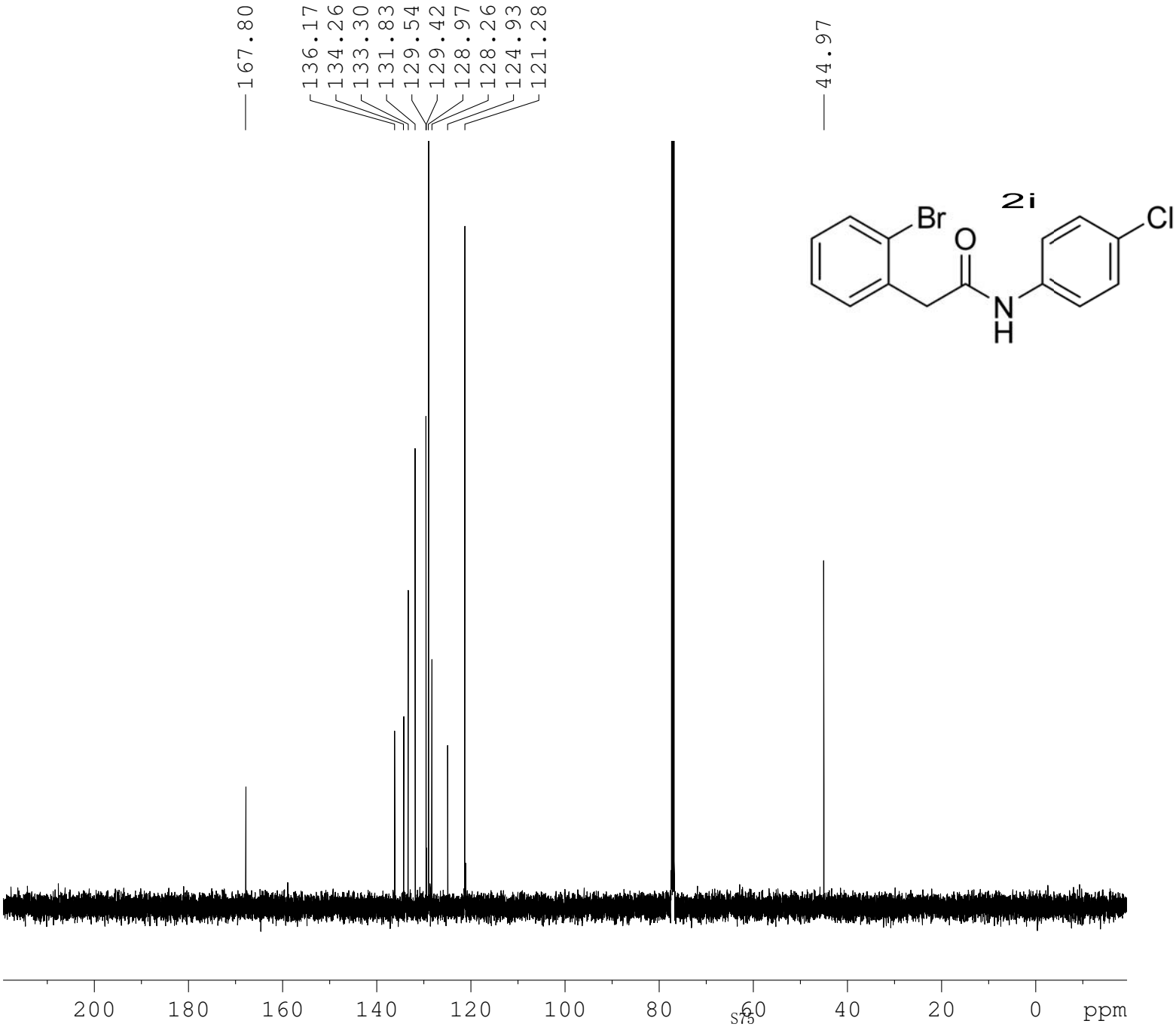


NAME	XB20071127
EXPNO	22
PROCNO	1
Date_	20071127
Time	19.14
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2048
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



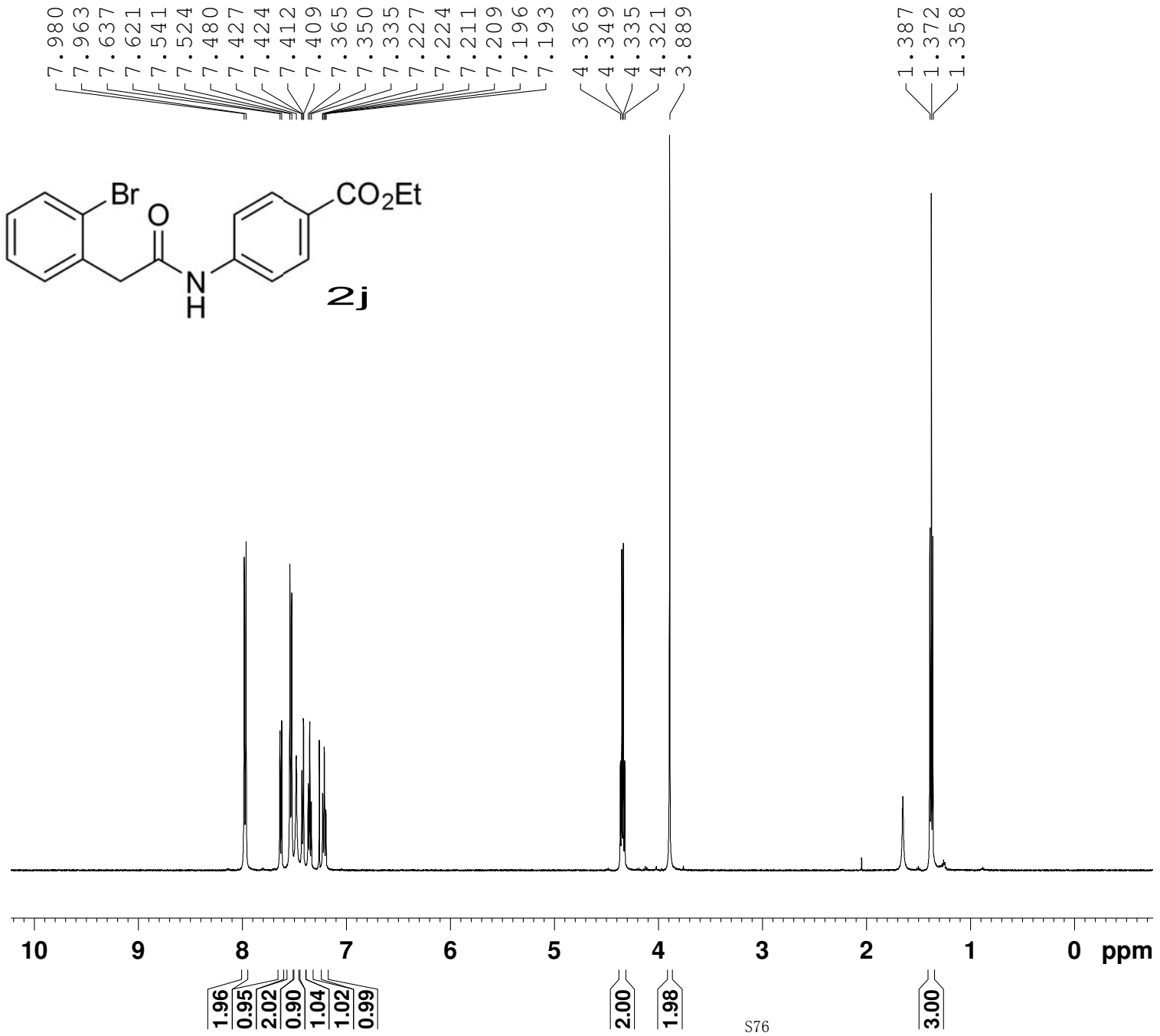
WSY-2-123
PROTON CDCl3 D:\\ deng 21

NAME	XB20071126
EXPNO	11
PROCNO	1
Date_	20071126
Time	16.58
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	293.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1299990 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



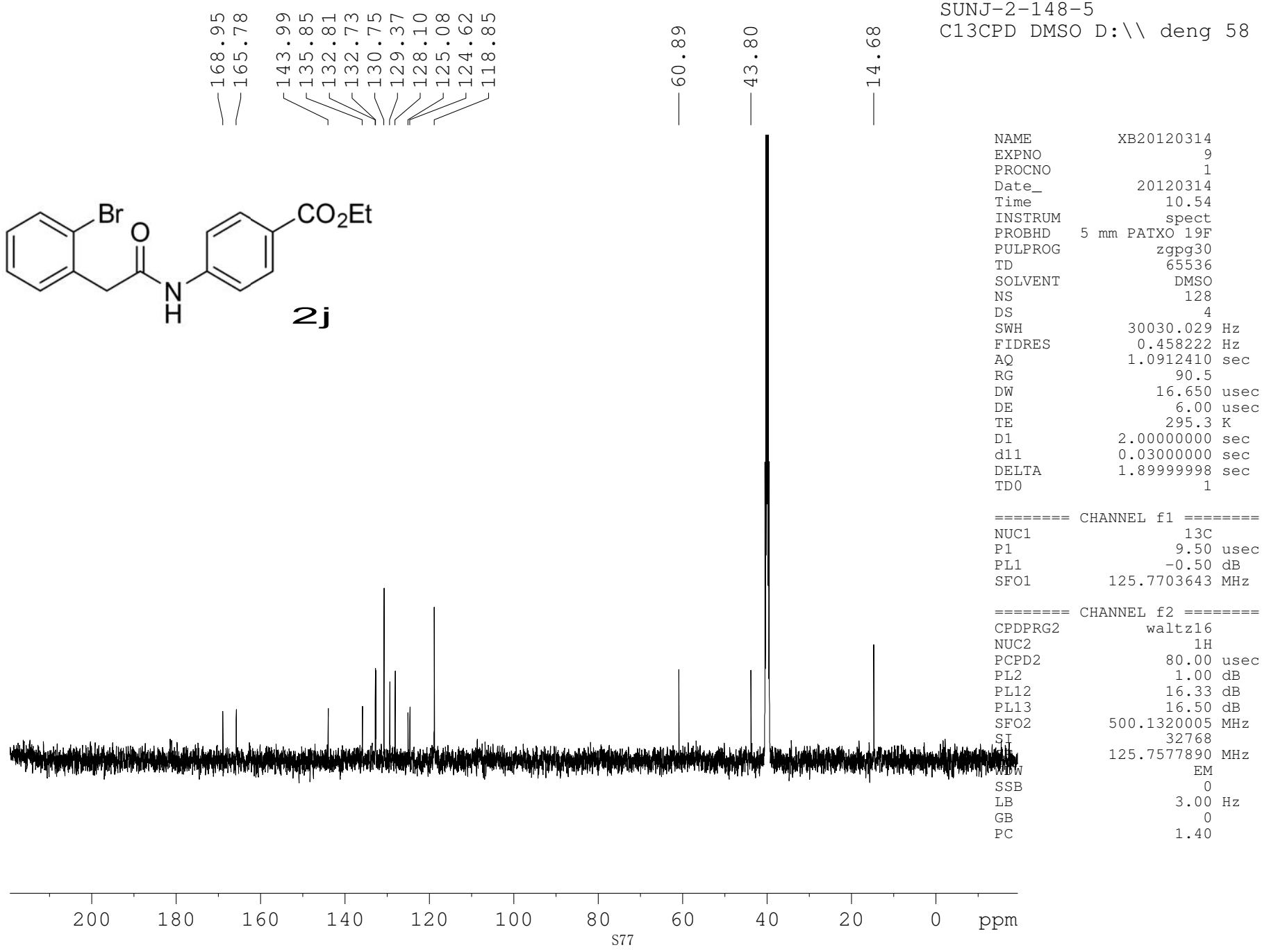
WSY-2-123
C13CPD CDCl3

NAME	XB20071127
EXPNO	23
PROCNO	1
Date_	20071127
Time	21.09
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2048
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



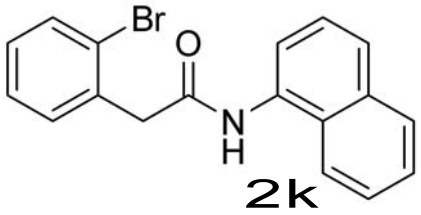
SUNJ-2-144-2
PROTON CDCl3 D:\\ deng 2

NAME	xb20120312
EXPNO	5
PROCNO	1
Date_	20120312
Time	9.58
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	287.4
DW	48.400 usec
DE	6.00 usec
TE	293.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300137 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

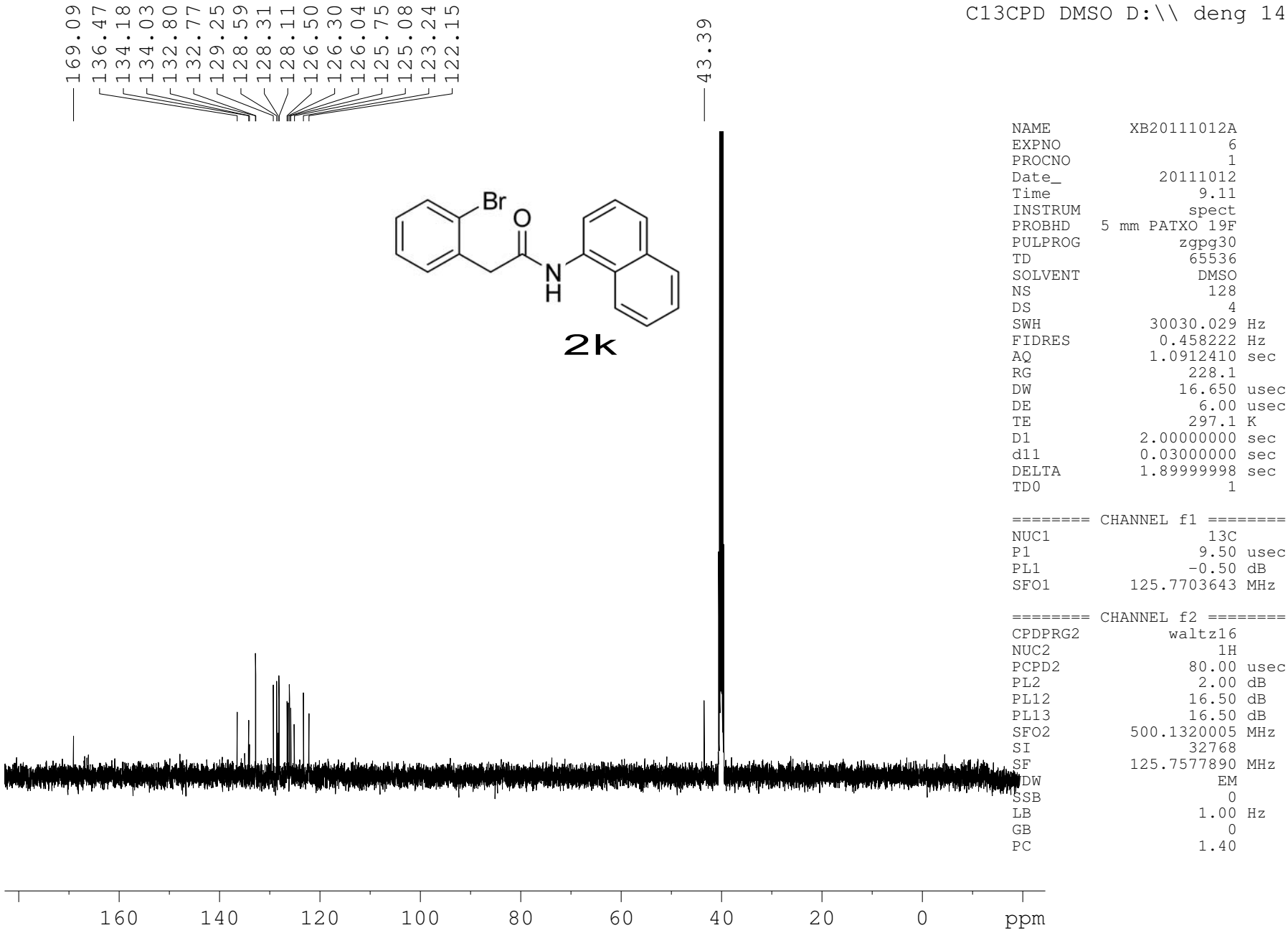


SUNJ-1-308-1
PROTON DMSO D:\\ deng 42

10.203
8.172
8.156
7.960
7.944
7.786
7.770
7.709
7.694
7.654
7.638
7.597
7.584
7.567
7.552
7.539
7.517
7.502
7.495
7.402
7.388
7.373
7.253
7.238
7.223
4.040

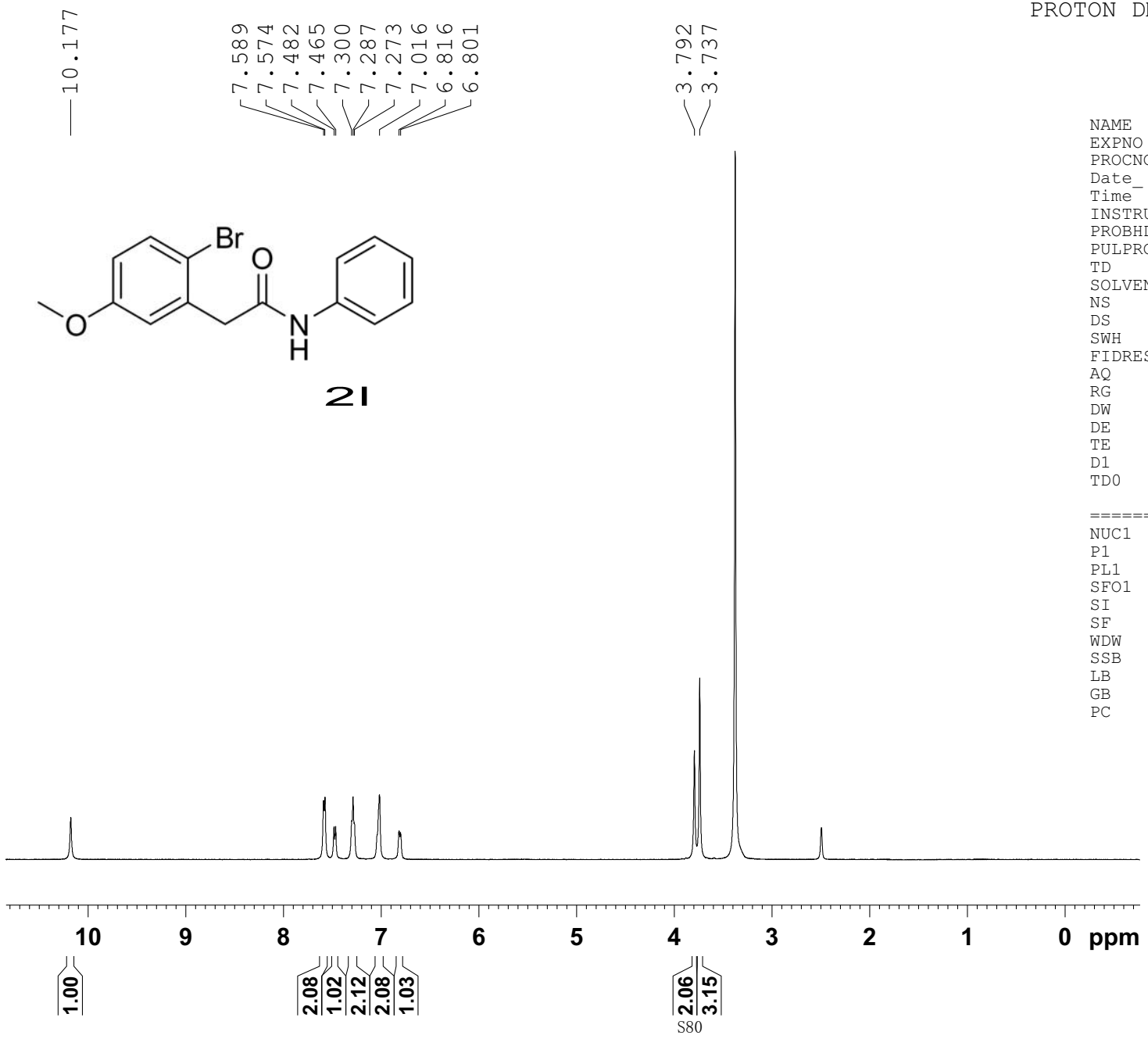


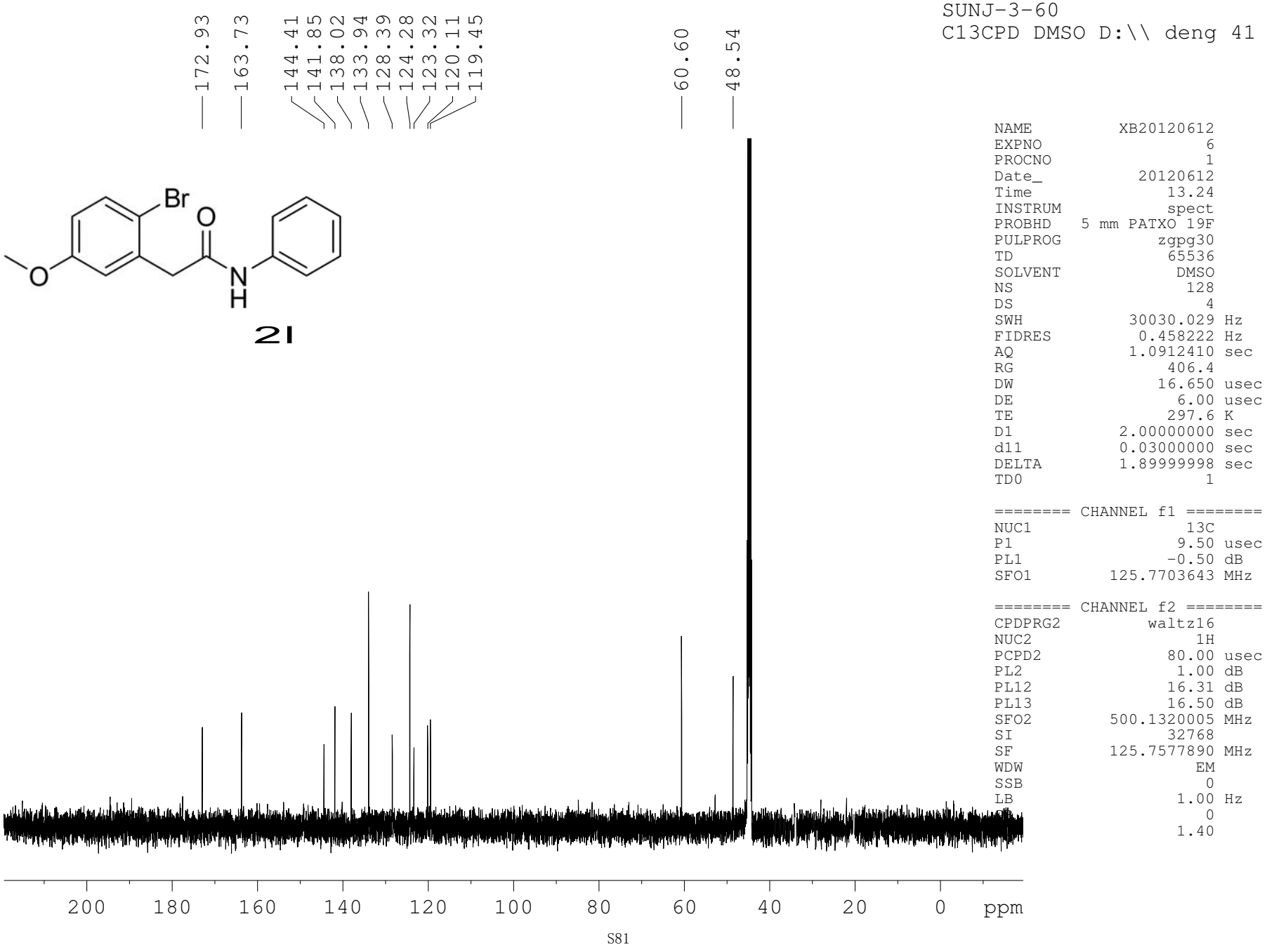
NAME	xb20111011
EXPNO	6
PROCNO	1
Date_	20111011
Time	15.15
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	287.4
DW	48.400 usec
DE	6.00 usec
TE	296.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.66 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



SUNJ-1-308-1
C13CPD DMSO D:\\ deng 14

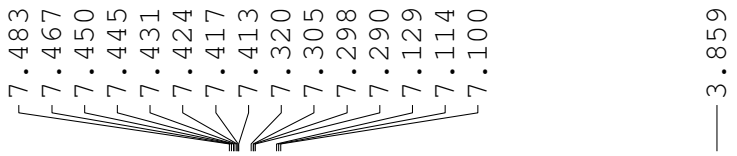
NAME	XB20111012A
EXPNO	6
PROCNO	1
Date_	20111012
Time	9.11
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	228.1
DW	16.650 usec
DE	6.00 usec
TE	297.1 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



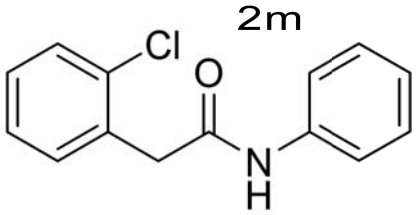


SUNJ-3-60
C13CPD DMSO D:\\ deng 41

NAME	XB20120612
EXPNO	6
PROCNO	1
Date_	20120612
Time	13.24
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	406.4
DW	16.650 usec
DE	6.00 usec
TE	297.6 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
	0
	1.40

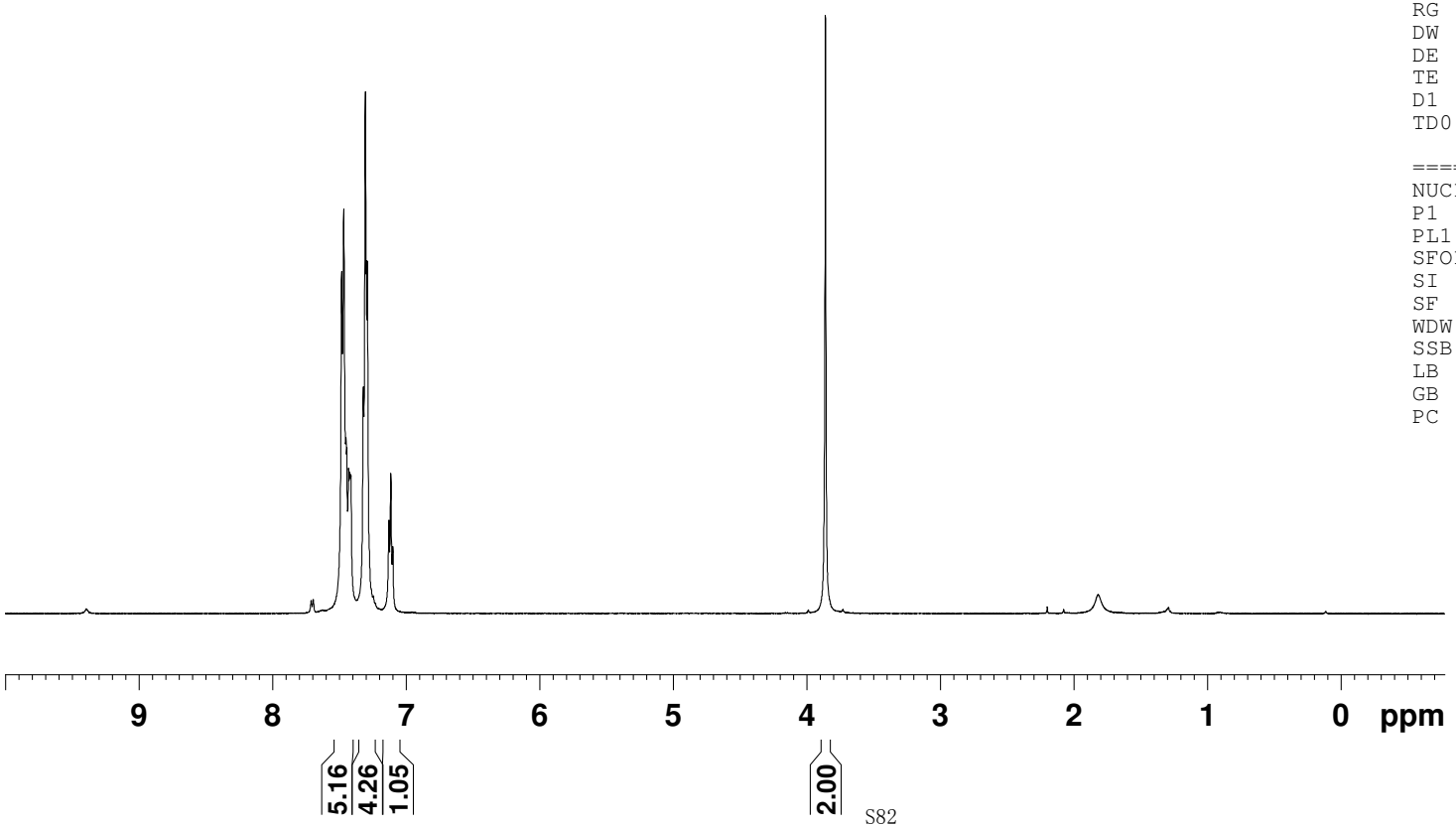


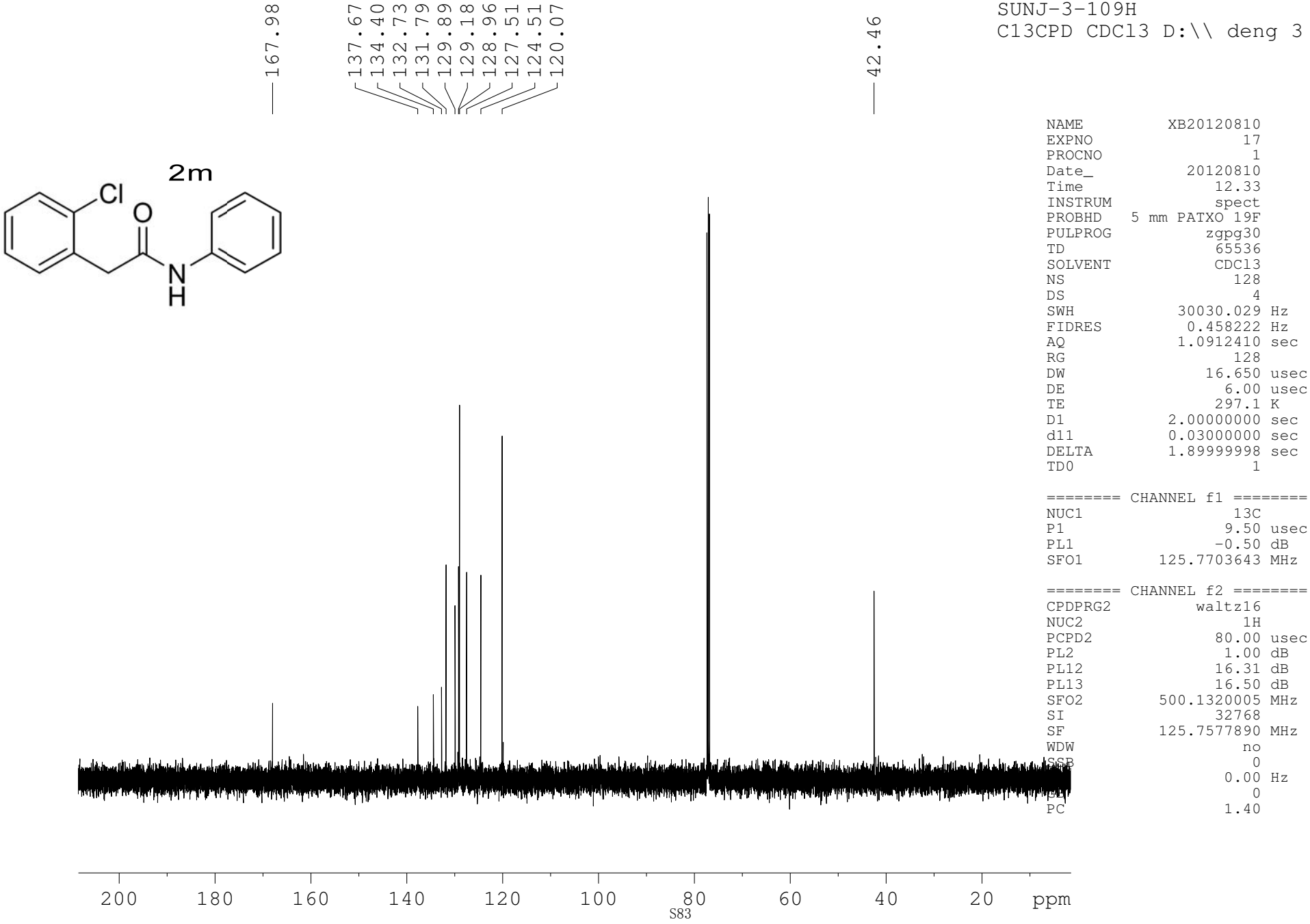
SUNJ-3-109H
PROTON CDCl3 D:\\ deng 3

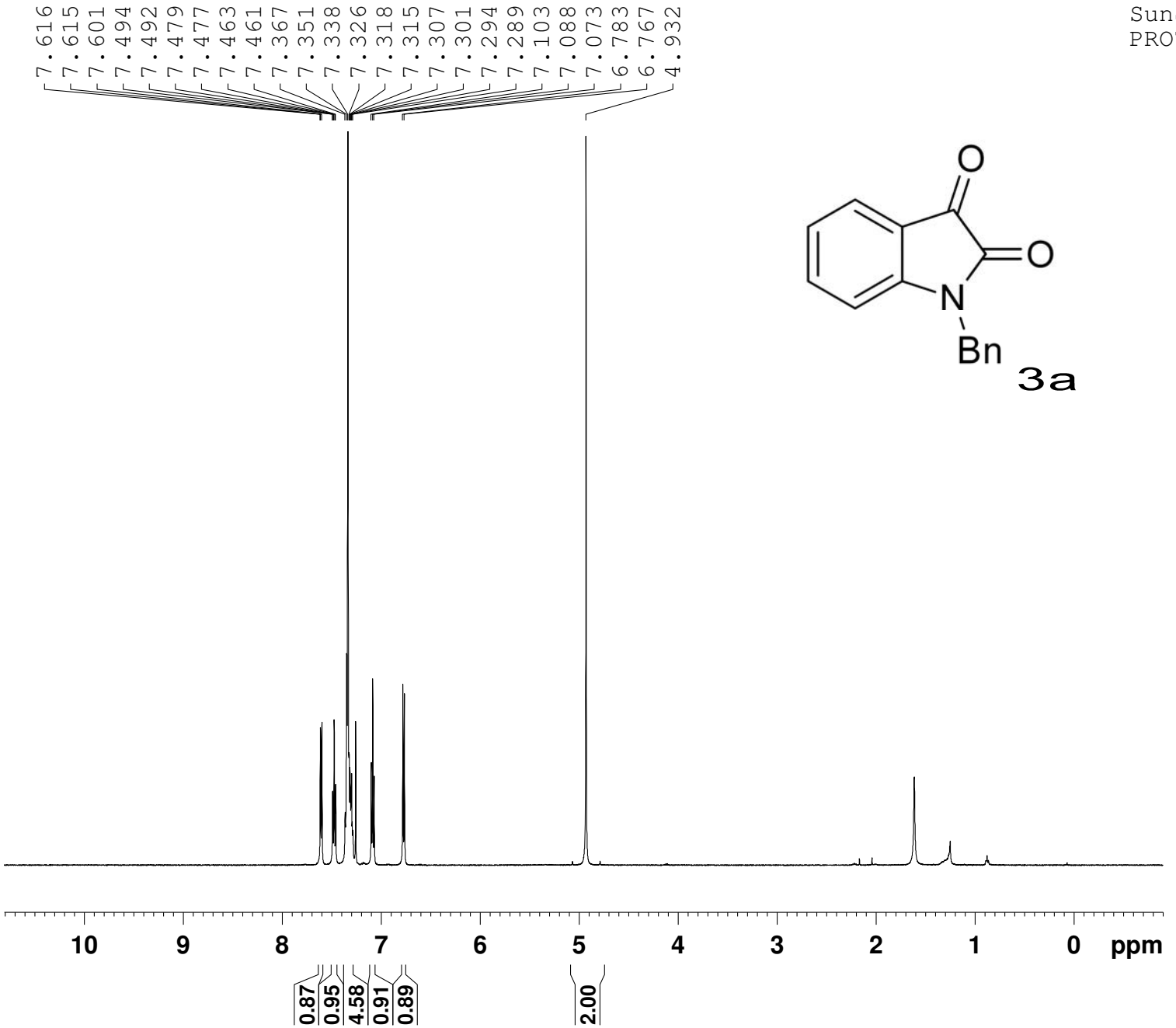


NAME	XB20120810
EXPNO	16
PROCNO	1
Date_	20120810
Time	12.25
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	143.7
DW	48.400 usec
DE	6.00 usec
TE	296.0 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





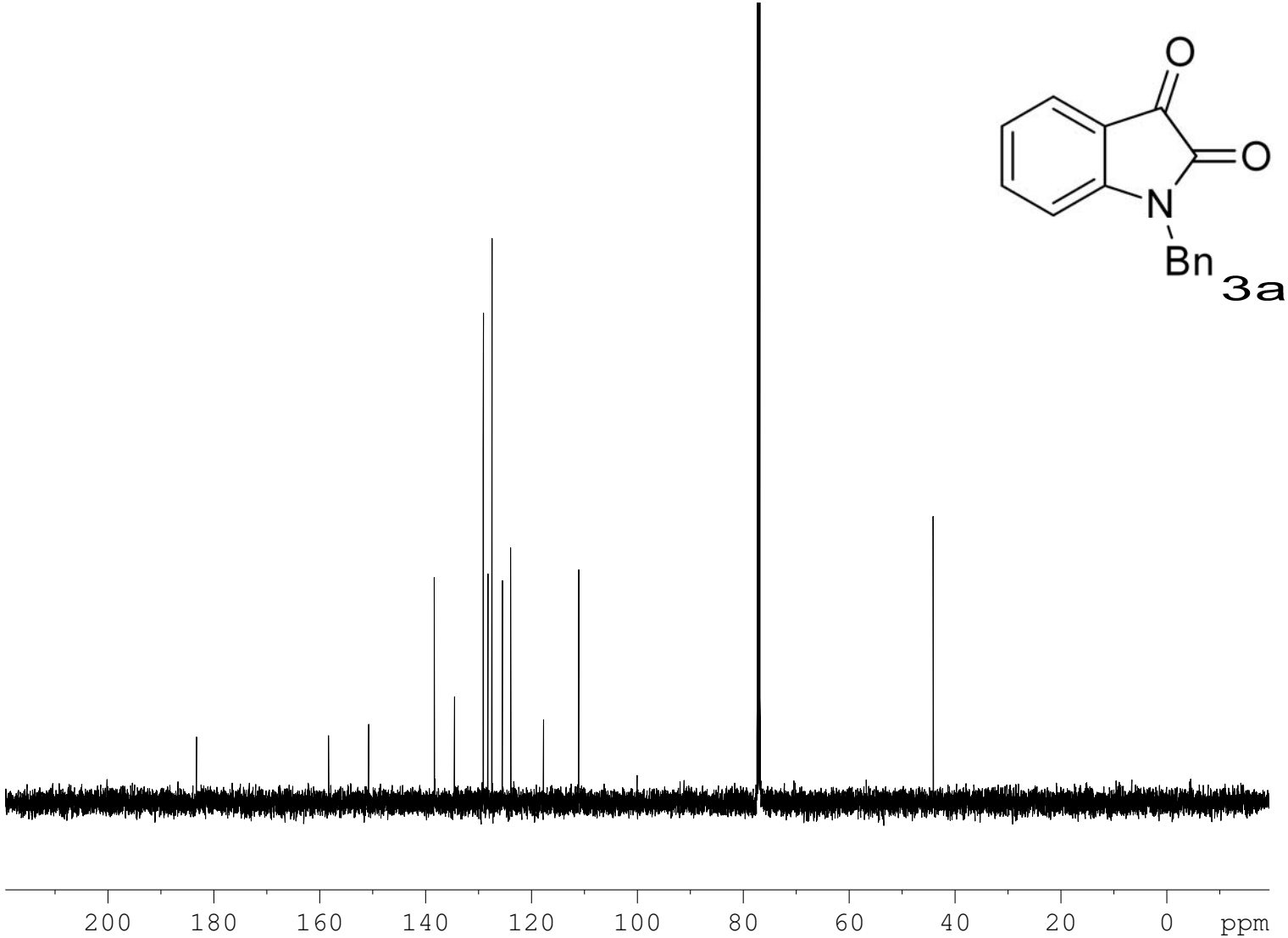


SunJ-1-288-3
PROTON CDCl3 D:\\ deng 13

NAME	xb20110928
EXPNO	7
PROCNO	1
Date_	20110928
Time	14.02
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300131 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

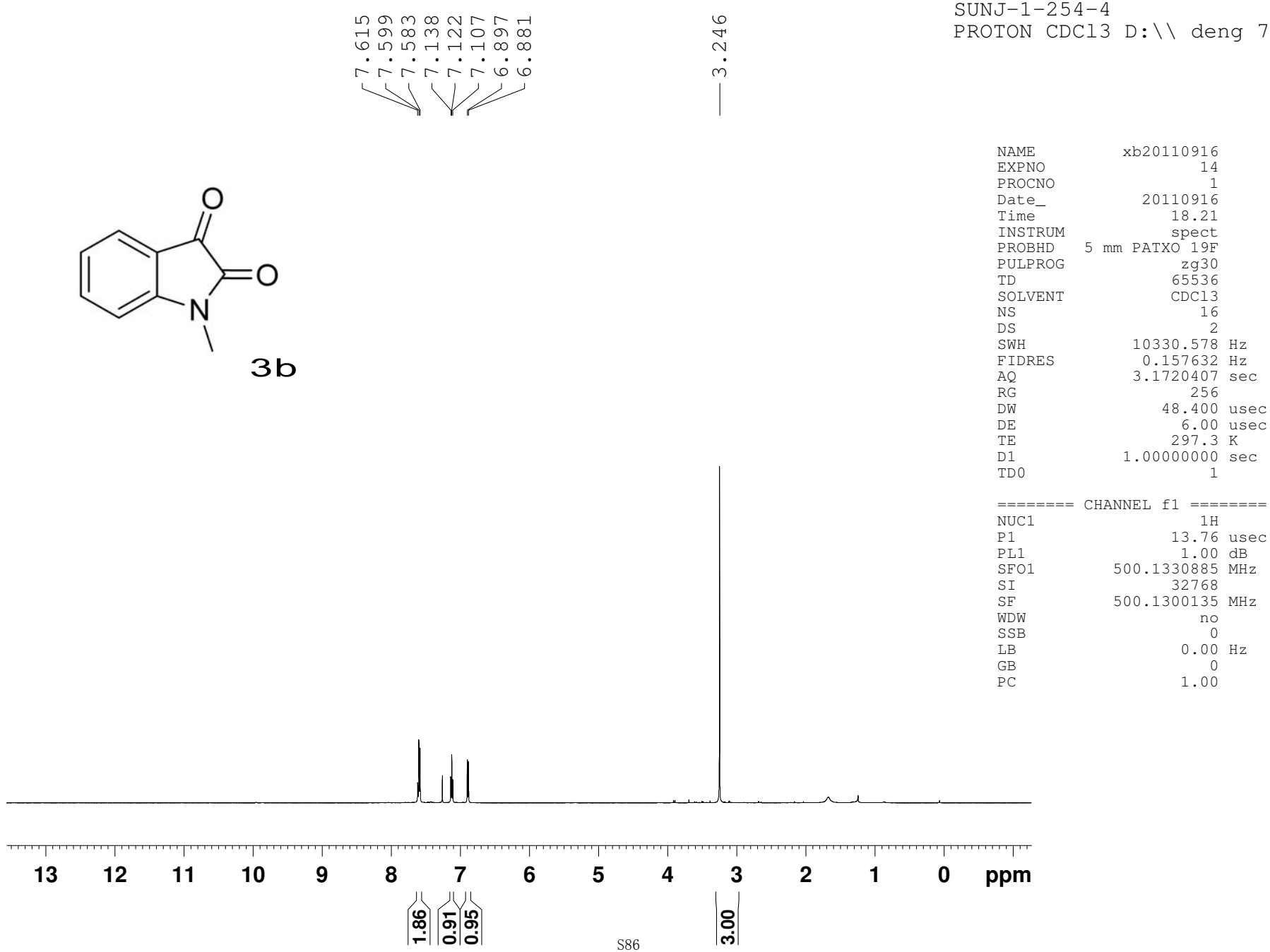
SUNJ-1-288-3
C13CPD CDCl3 D:\\ deng 49

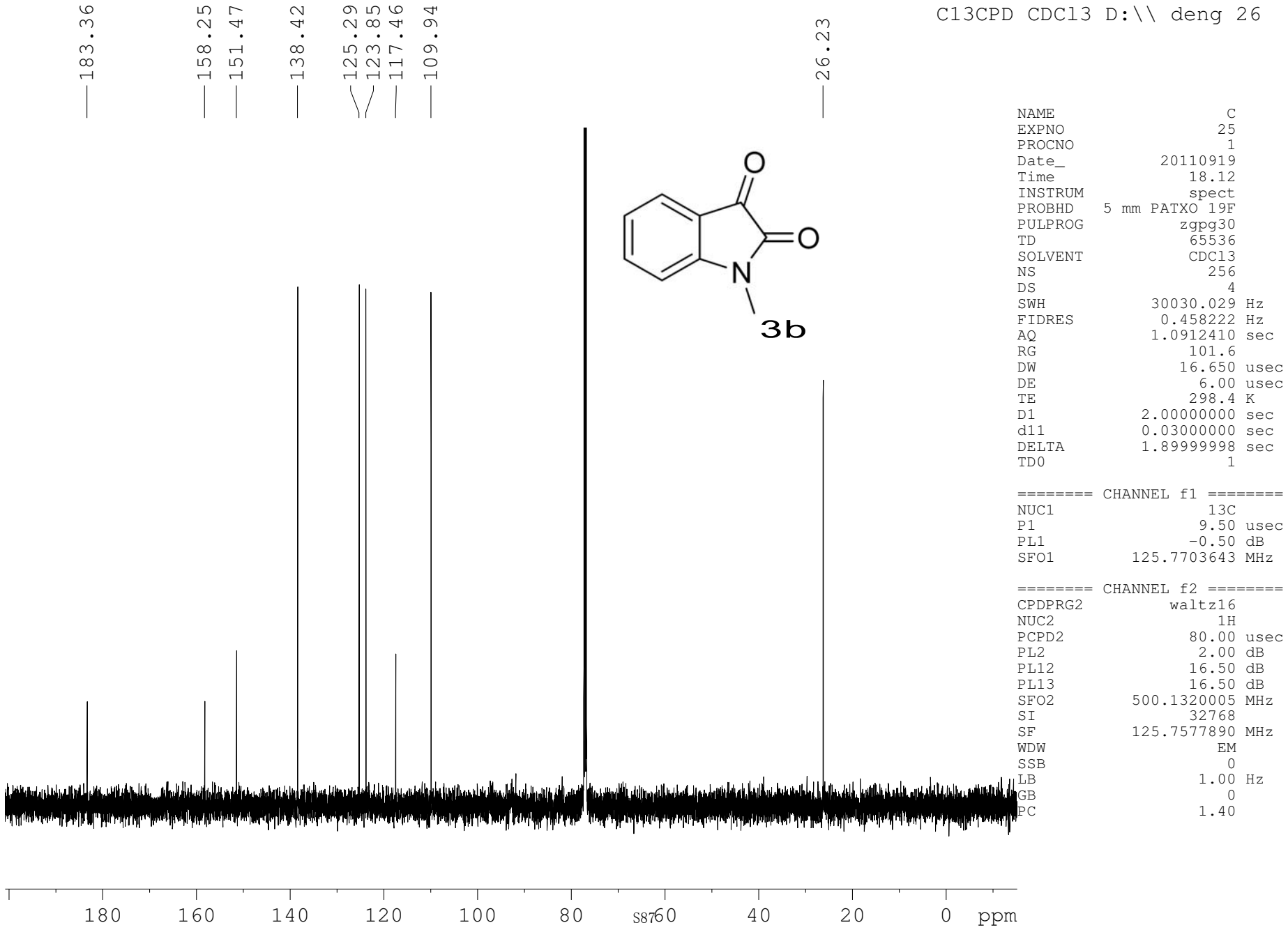
183.25
158.28
150.74
138.32
134.51
129.06
128.18
127.44
125.43
123.87
117.70
111.01
44.06



3a

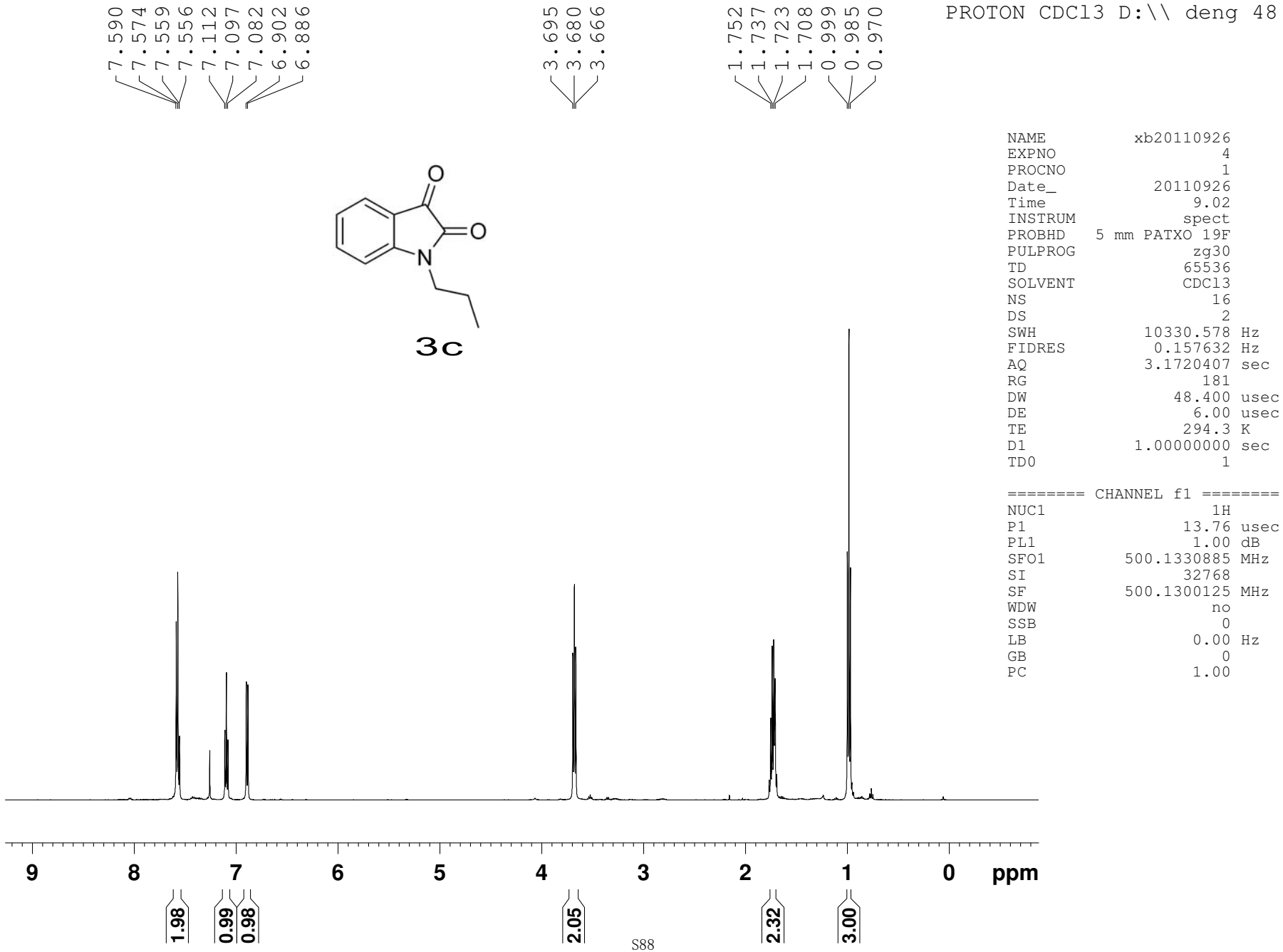
NAME	sunj1
EXPNO	8
PROCNO	1
Date_	20110928
Time	17.55
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	101.6
DW	16.650 usec
DE	6.00 usec
TE	297.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

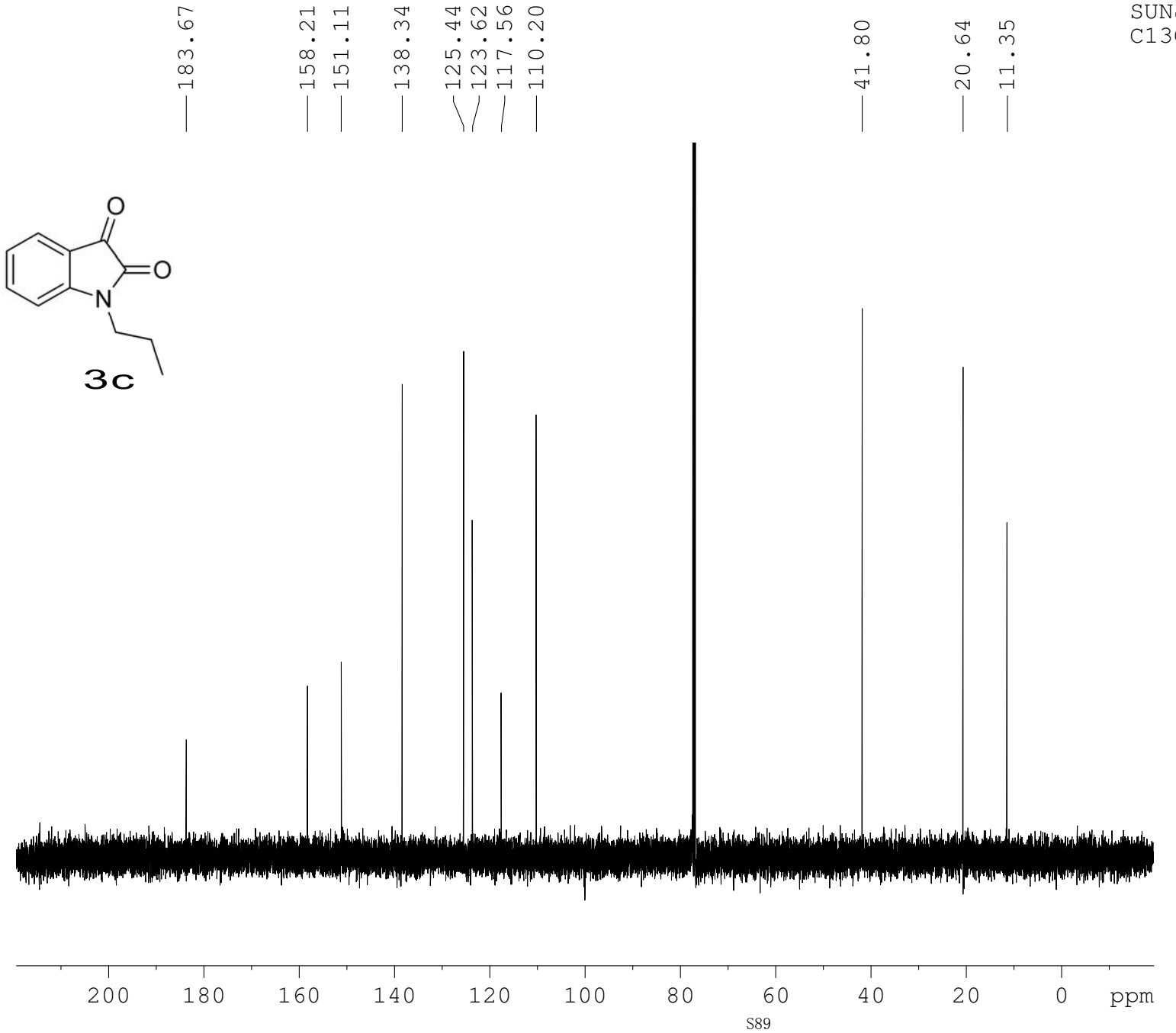




SUNJ-1-254-4
C13CPD CDCl3 D:\\ deng 26

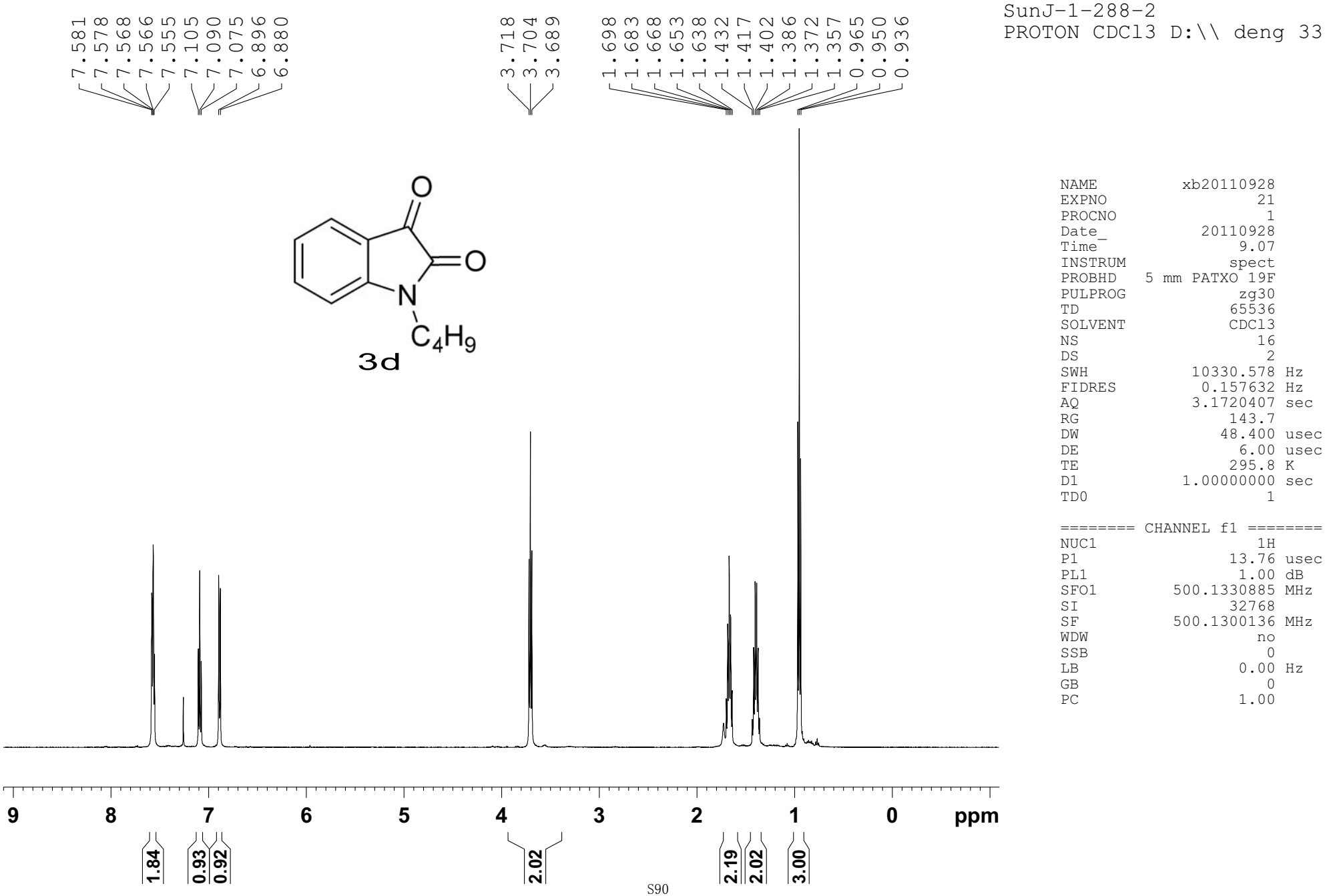
NAME	C
EXPNO	25
PROCNO	1
Date_	20110919
Time	18.12
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	101.6
DW	16.650 usec
DE	6.00 usec
TE	298.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





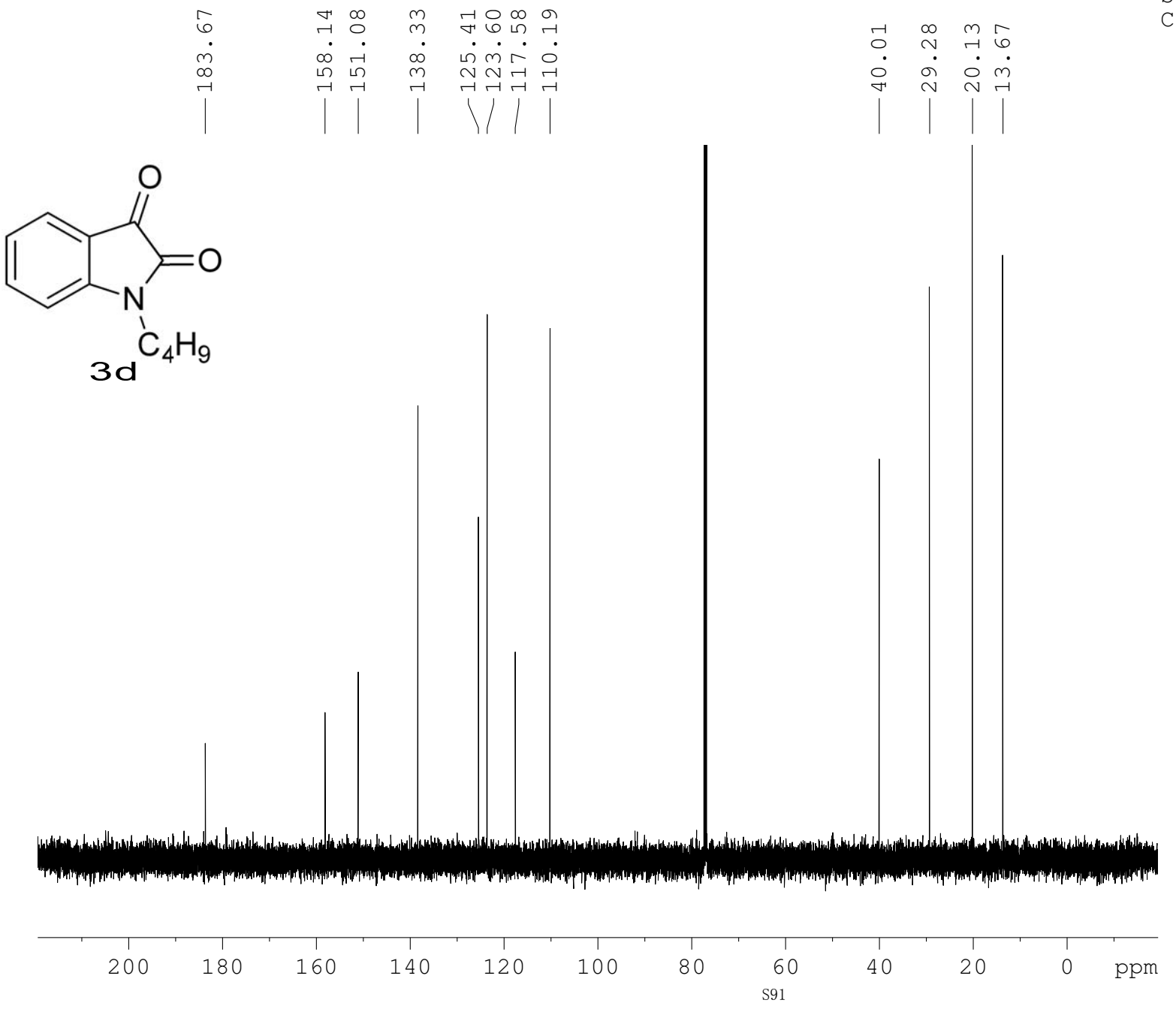
SUNJ-1-282-2
C13CPD CDCl3 D:\\ deng 12

NAME	xb20110926
EXPNO	9
PROCNO	1
Date_	20110926
Time	11.29
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	296.8 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



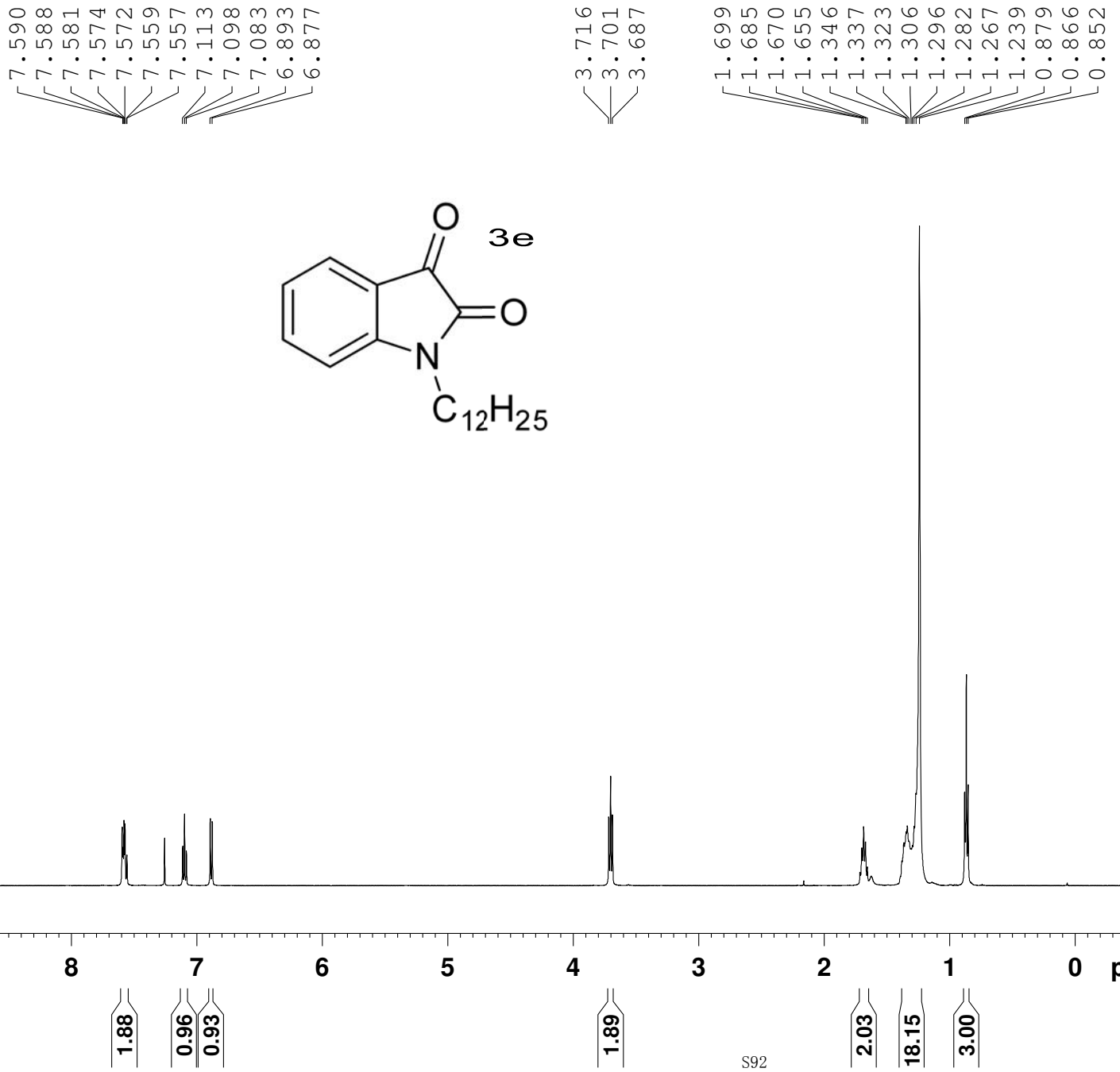
SunJ-1-288-2
PROTON CDCl3 D:\\ deng 33

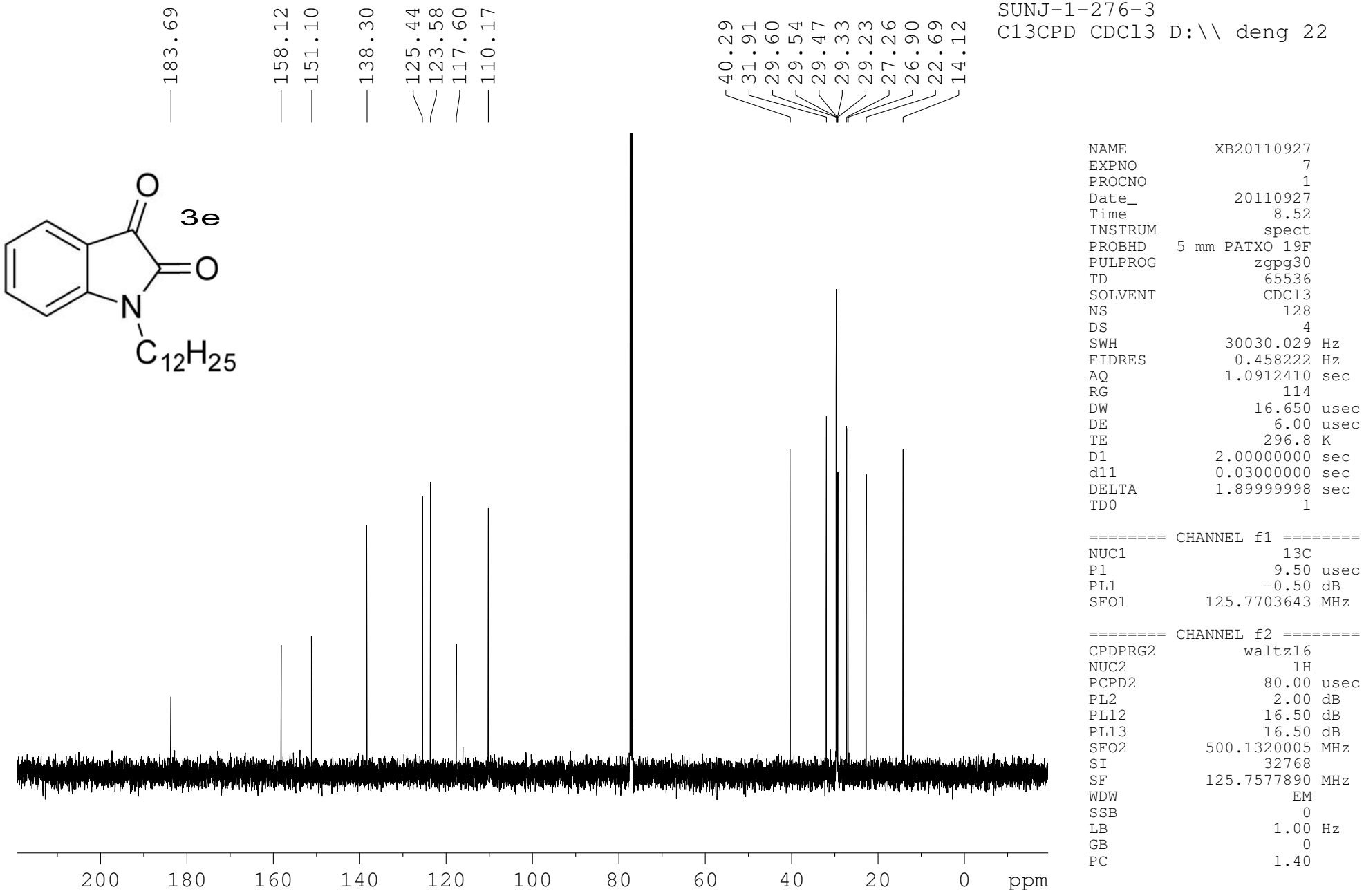
NAME	xb20110928	
EXPNO	21	
PROCNO	1	
Date_	20110928	
Time	9.07	
INSTRUM	spect	
PROBHD	5 mm PATXO 19F	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	16	
DS	2	
SWH	10330.578	Hz
FIDRES	0.157632	Hz
AQ	3.1720407	sec
RG	143.7	
DW	48.400	usec
DE	6.00	usec
TE	295.8	K
D1	1.00000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	1H	
P1	13.76	usec
PL1	1.00	dB
SFO1	500.1330885	MHz
SI	32768	
SF	500.1300136	MHz
WDW	no	
SSB	0	
LB	0.00	Hz
GB	0	
PC	1.00	



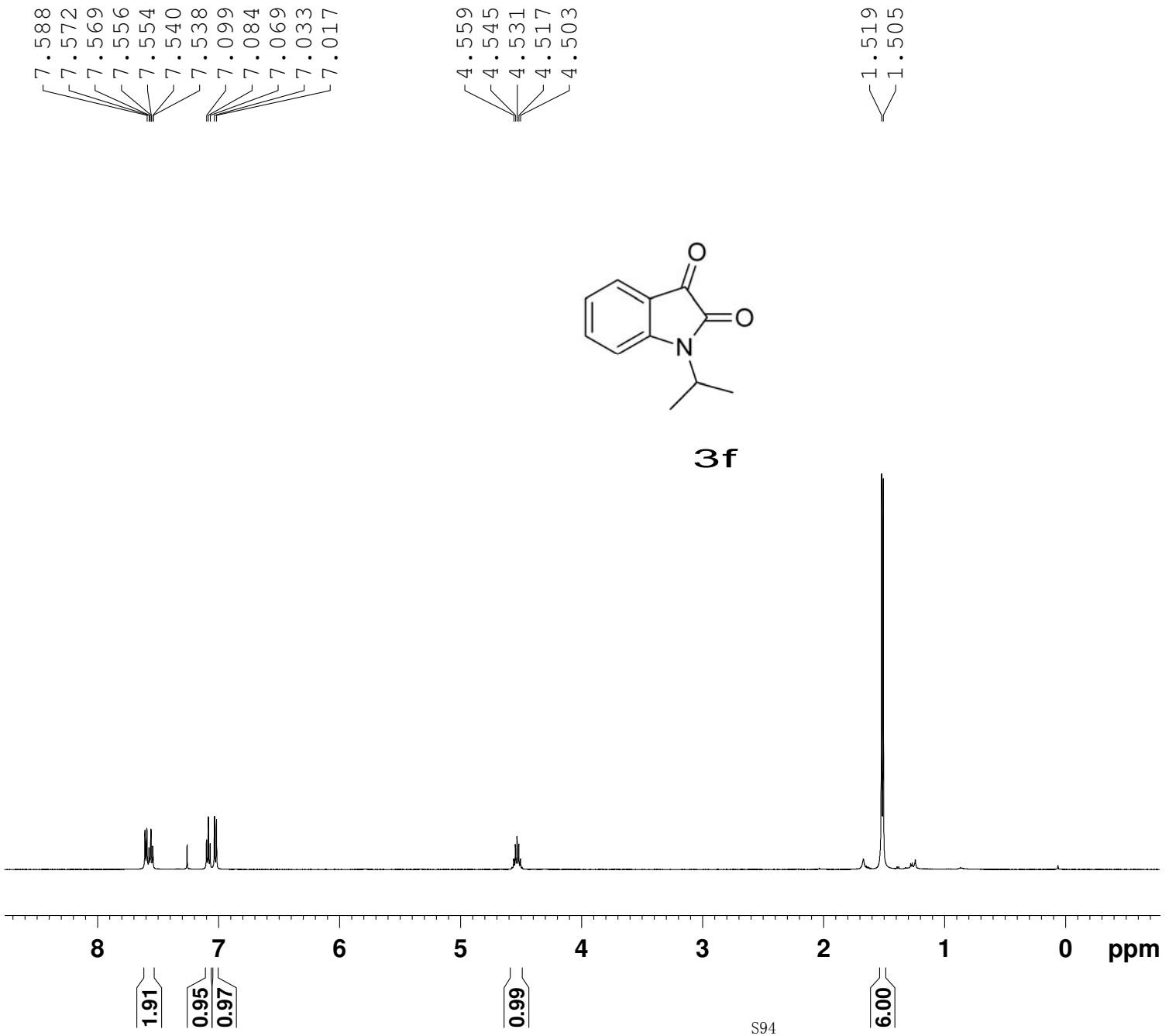
SunJ-1-288-C
C13CPD CDCl3 D:\\ deng 12

NAME	xb20110928
EXPNO	6
PROCNO	1
Date_	20110928
Time	13.56
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	136
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	297.5 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



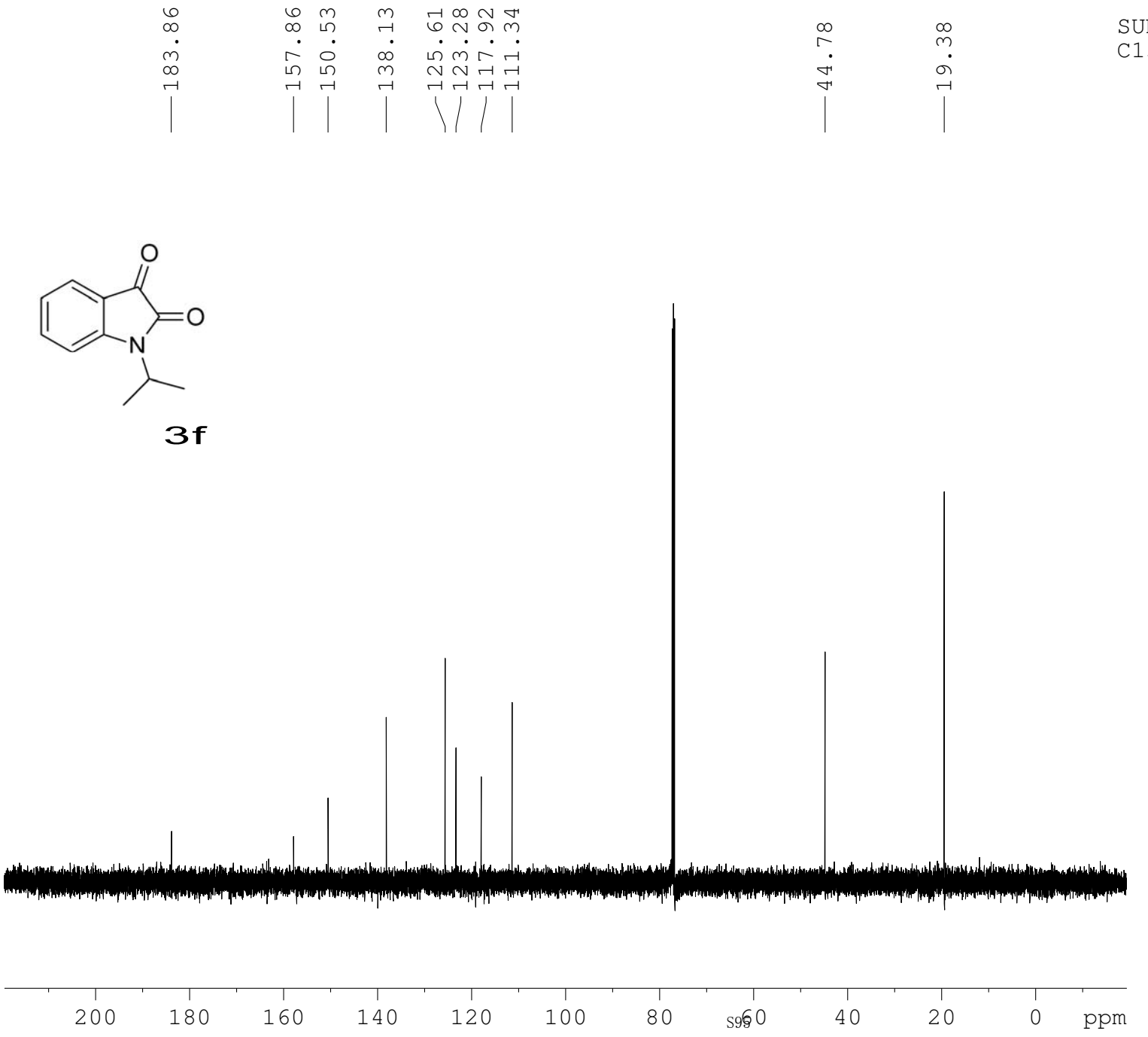


NAME	XB20110927
EXPNO	7
PROCNO	1
Date_	20110927
Time	8.52
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	296.8 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



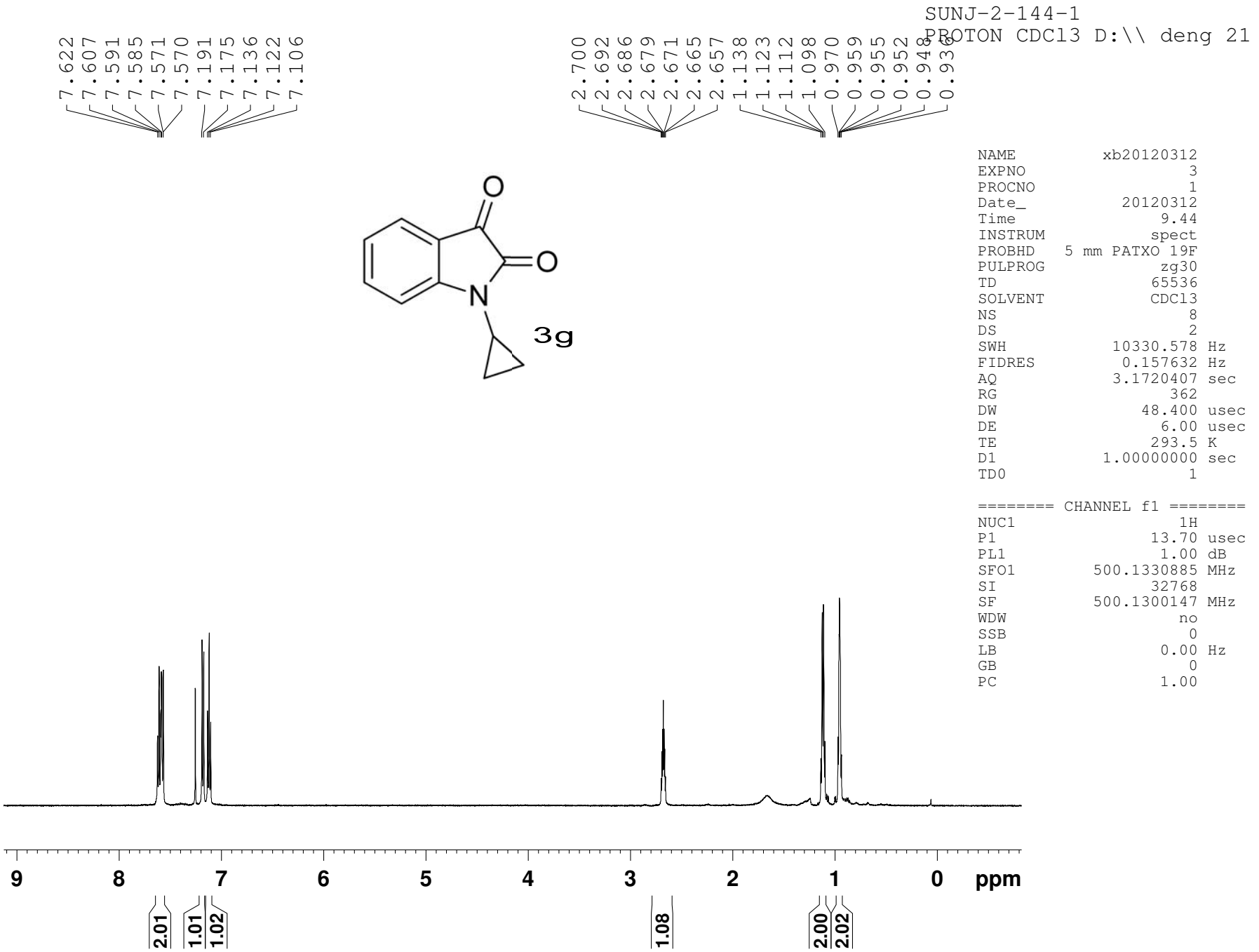
SunJ-1-276
PROTON CDCl3 D:\\ deng 45

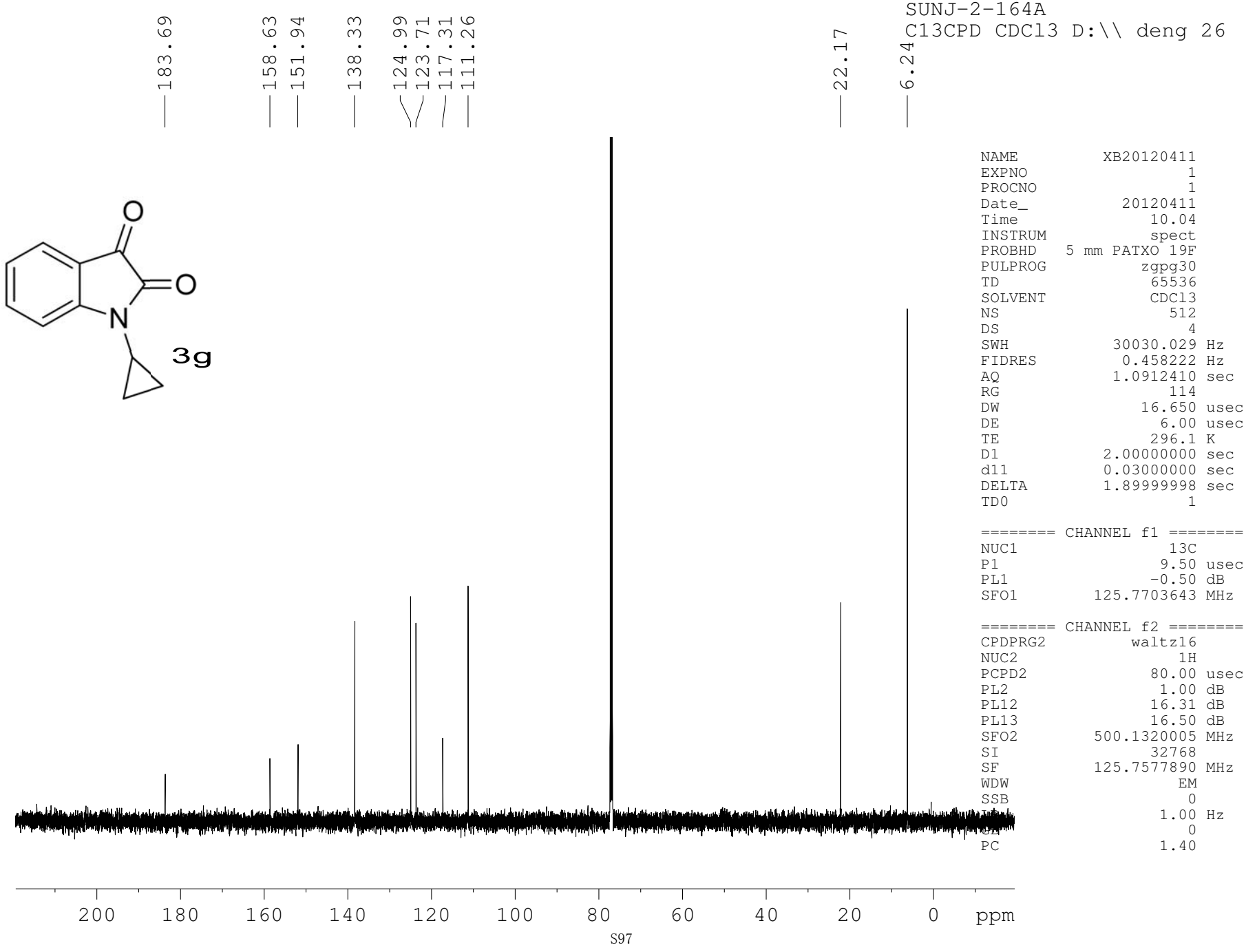
NAME	xb20110926
EXPNO	1
PROCNO	1
Date_	20110926
Time	8.45
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	294.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.76 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300133 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

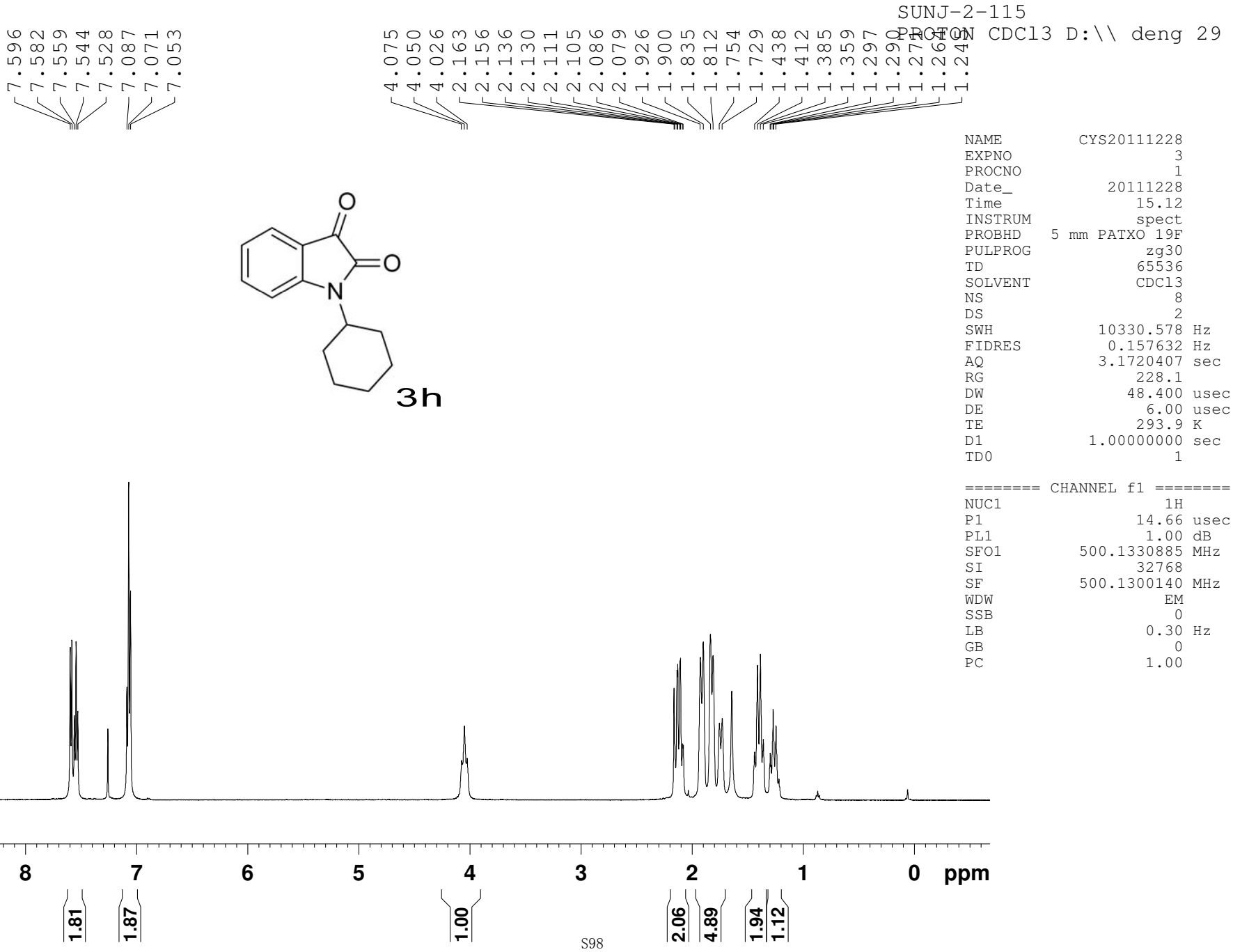


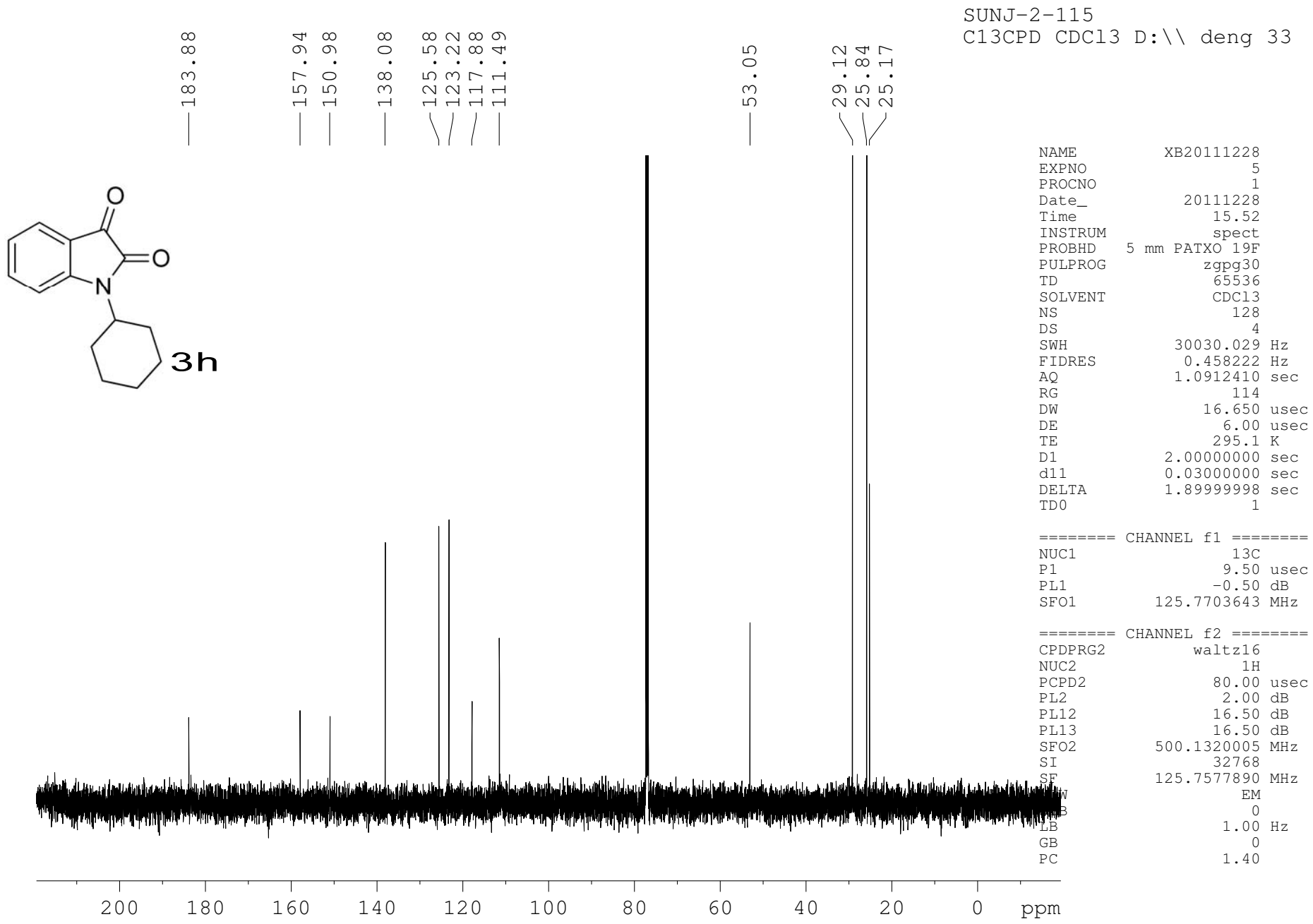
SUNJ-1-276-2
C13CPD CDCl3 D:\\ deng 11

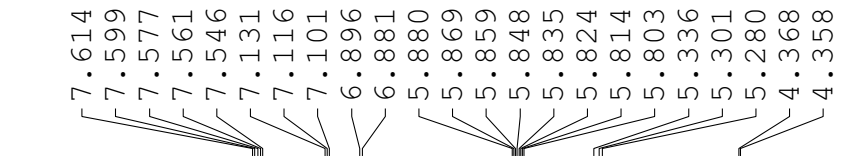
NAME	xb20110926
EXPNO	8
PROCNO	1
Date_	20110926
Time	11.17
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	143.7
DW	16.650 usec
DE	6.00 usec
TE	296.6 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



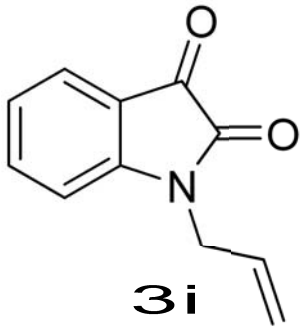






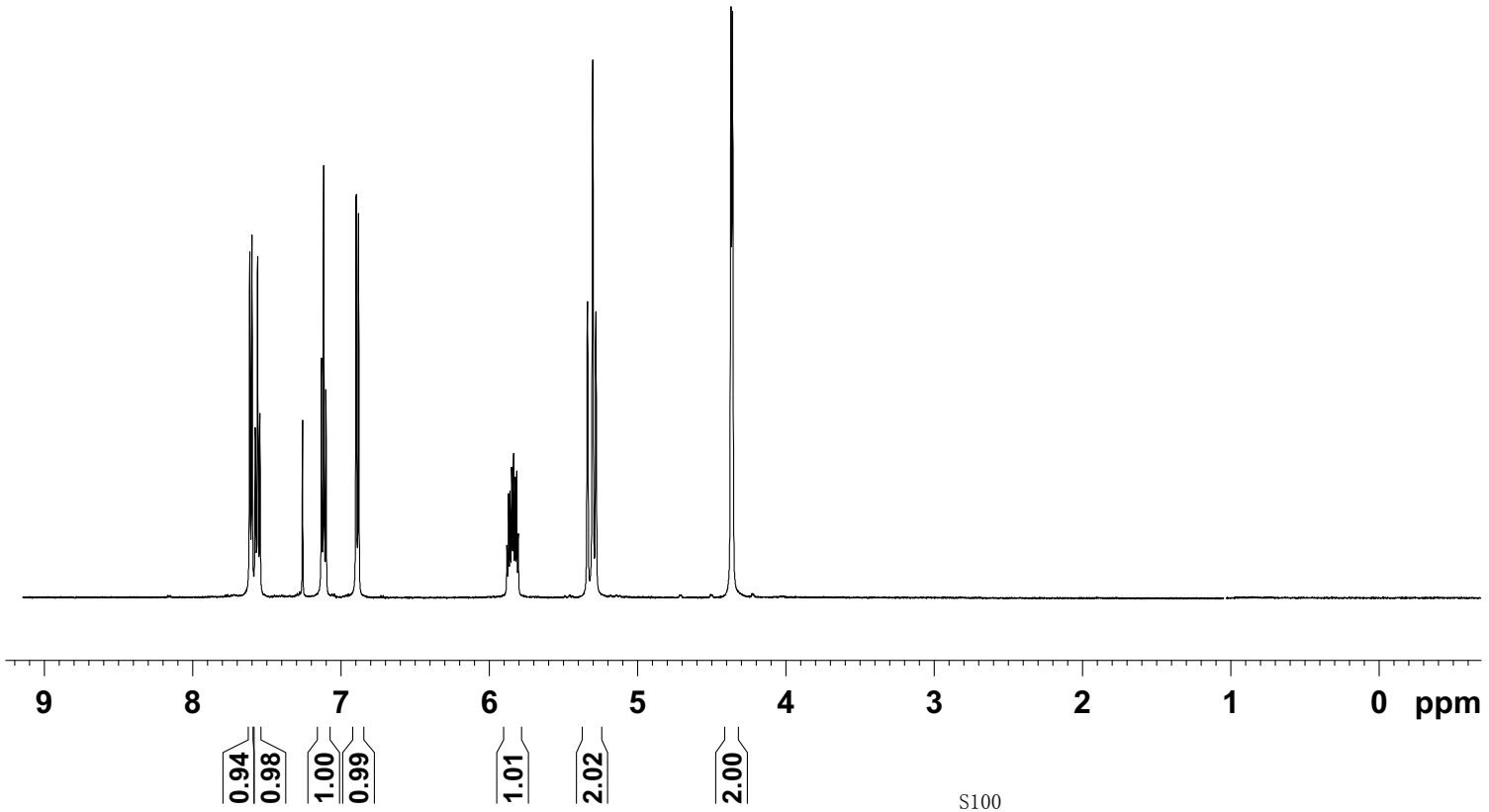


SUNJ-1-319-A

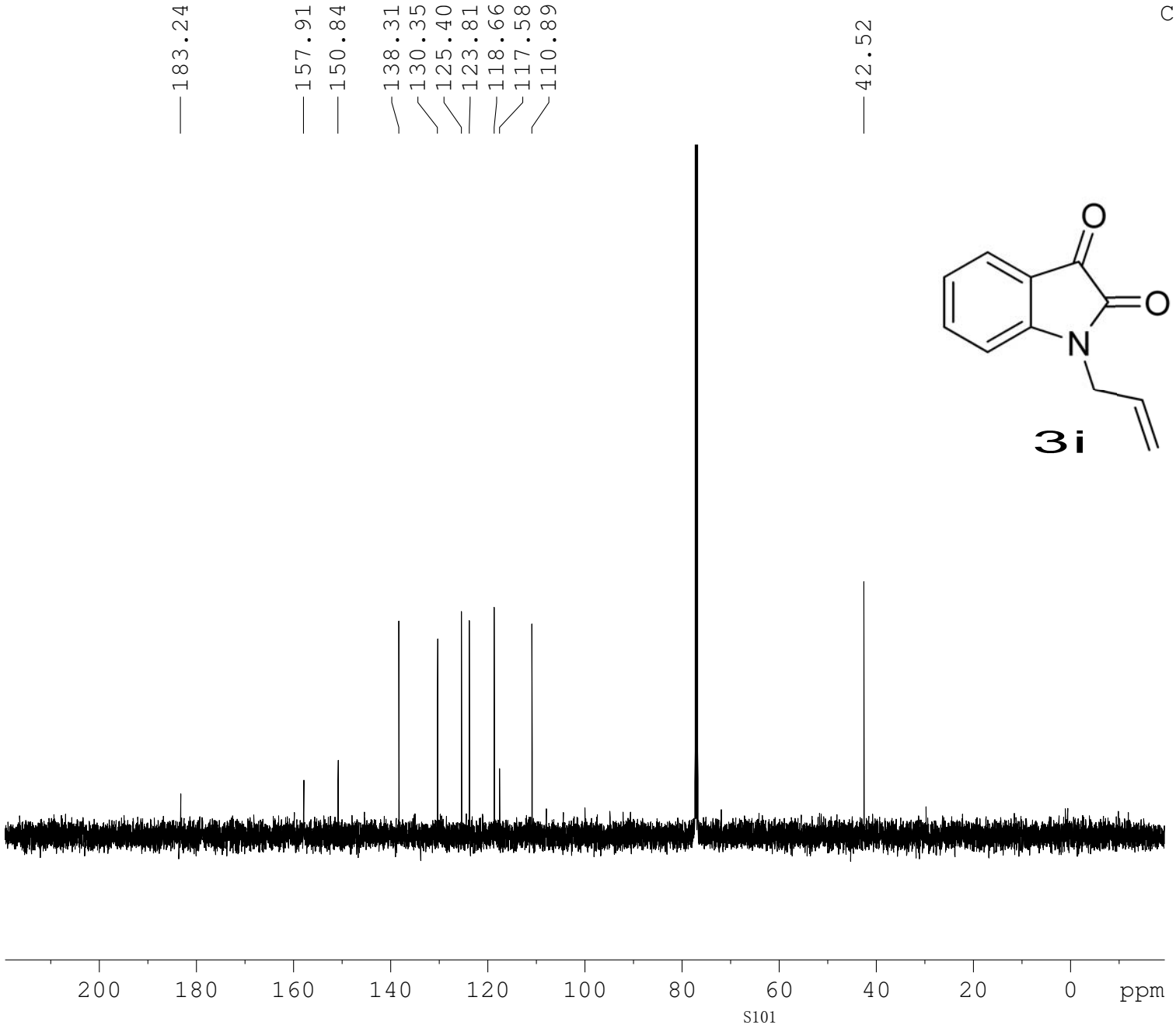


3i

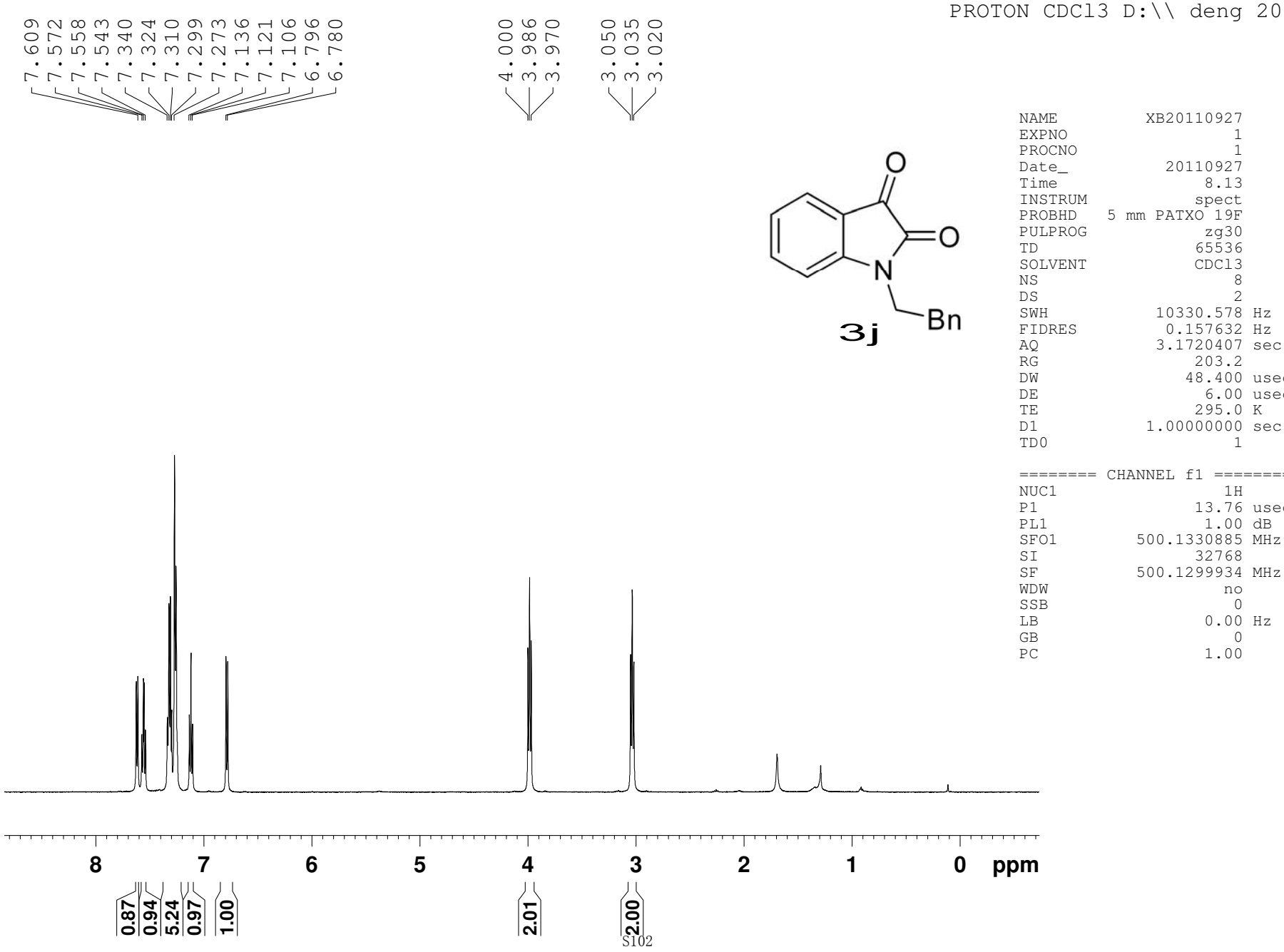
NAME	xb20111014
EXPNO	4
PROCNO	1
Date_	20111014
Time	11.00
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	297.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.66 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300139 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

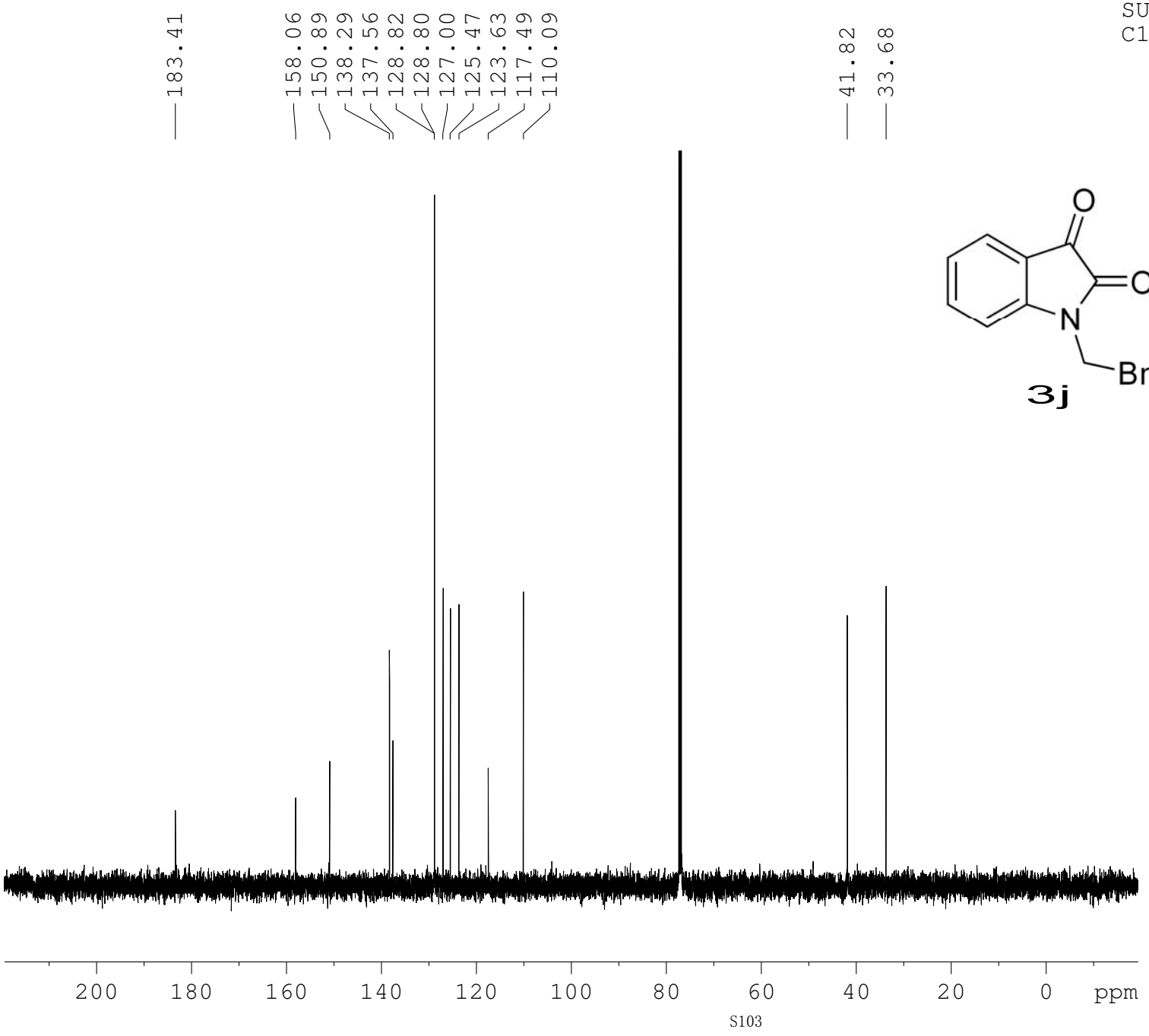


SUNJ-1-288-4
C13CPD CDCl3 D:\\ deng 50

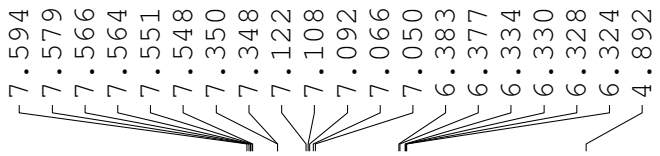


NAME	sunj1
EXPNO	10
PROCNO	1
Date_	20110928
Time	18.10
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	161.3
DW	16.650 usec
DE	6.00 usec
TE	297.8 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

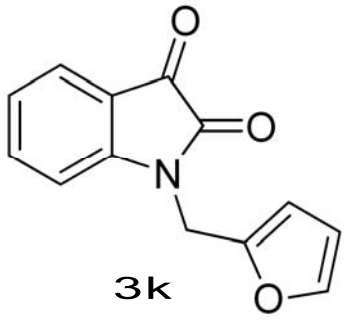




NAME	XB20110927
EXPNO	3
PROCNO	1
Date_	20110927
Time	8.24
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	101.6
DW	16.650 usec
DE	6.00 usec
TE	296.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



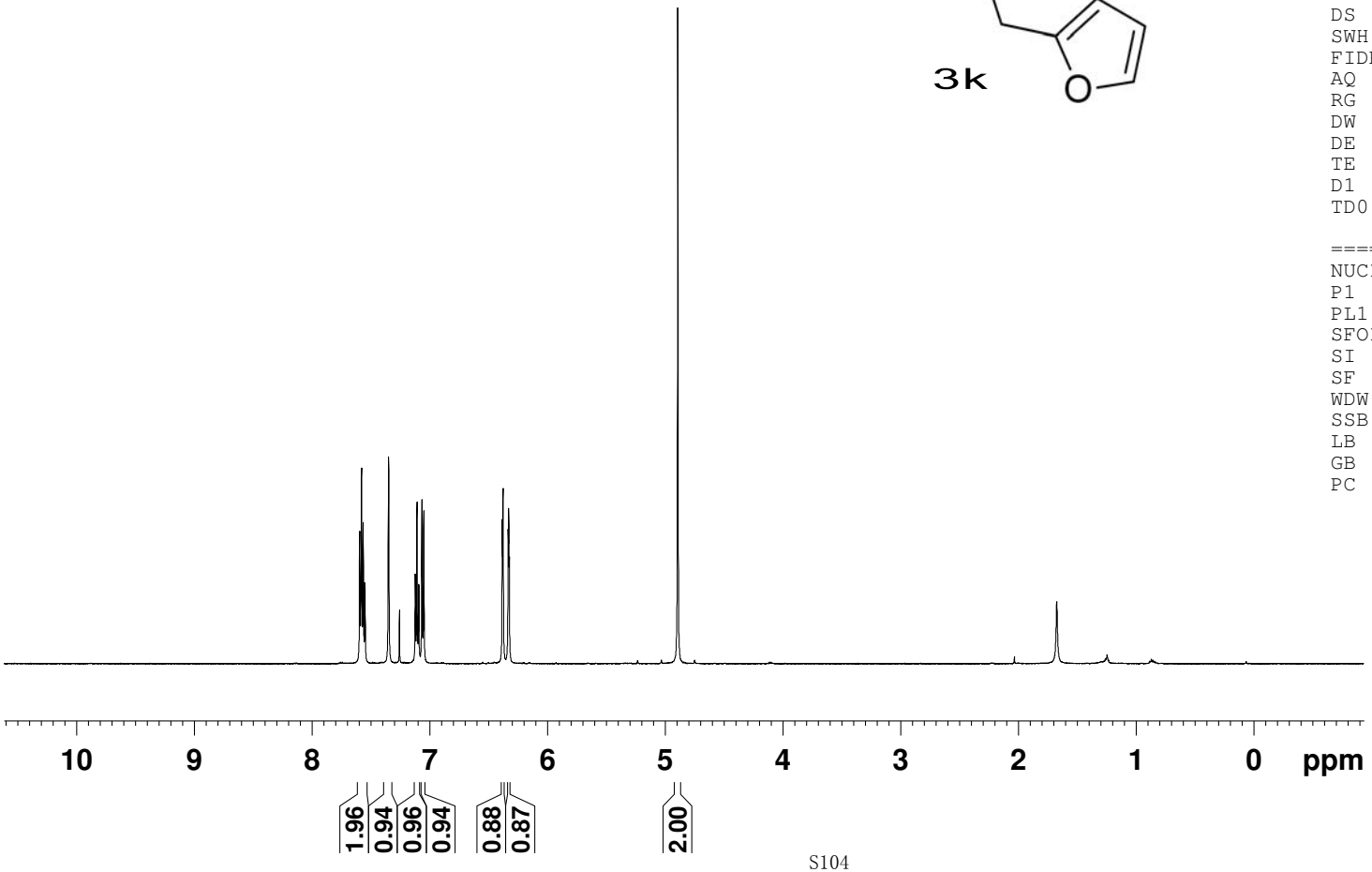
SUNJ-3-112H
PROTON CDCl3 D:\\ deng 54

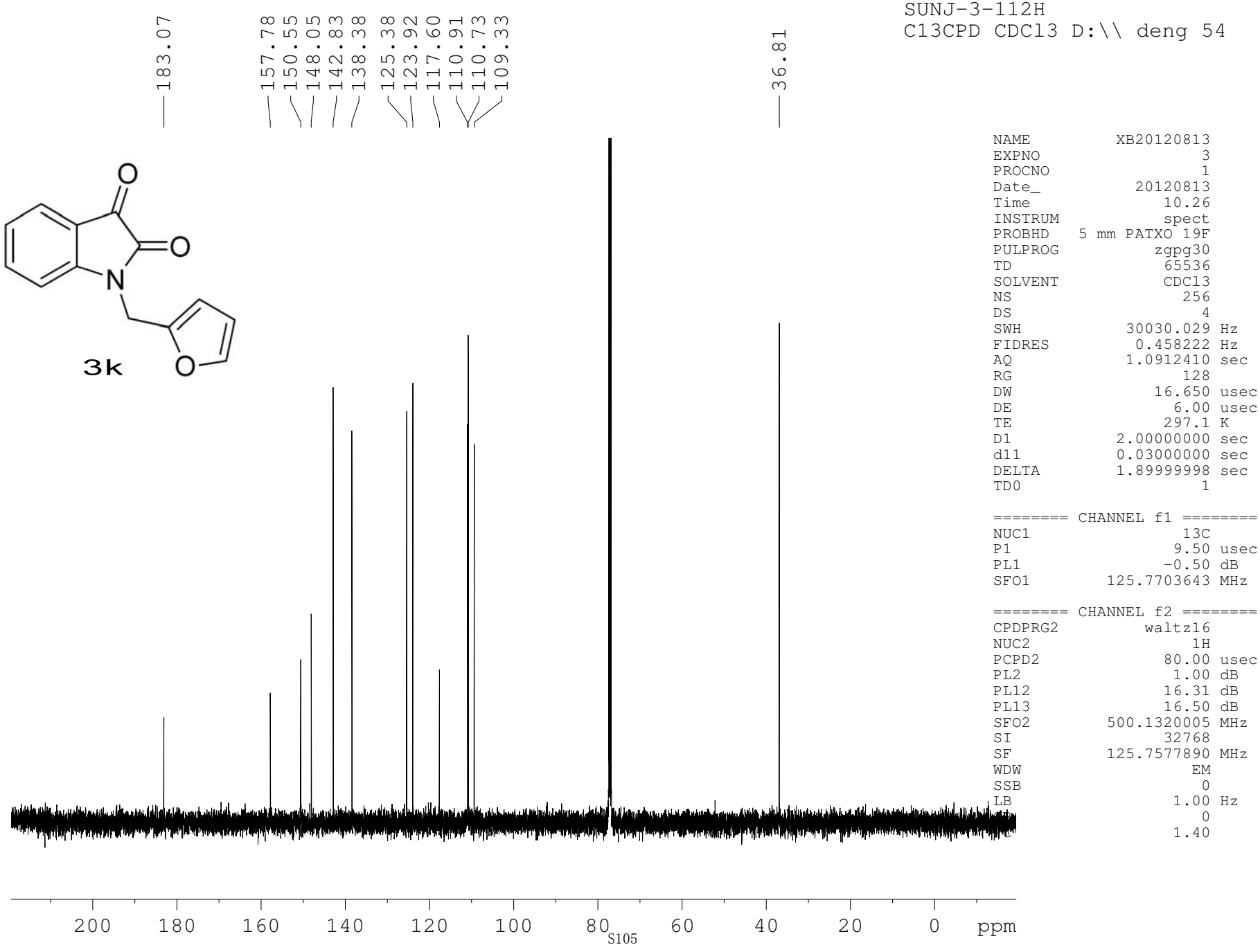


3k

NAME	XB20120813
EXPNO	1
PROCNO	1
Date_	20120813
Time	10.09
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1

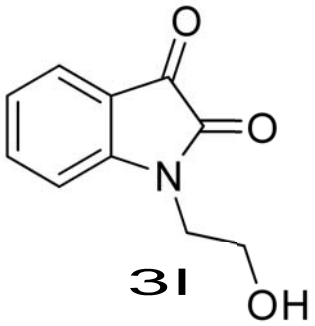
======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300144 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





SUNJ-3-112H
C13CPD CDCl3 D:\\ deng 54

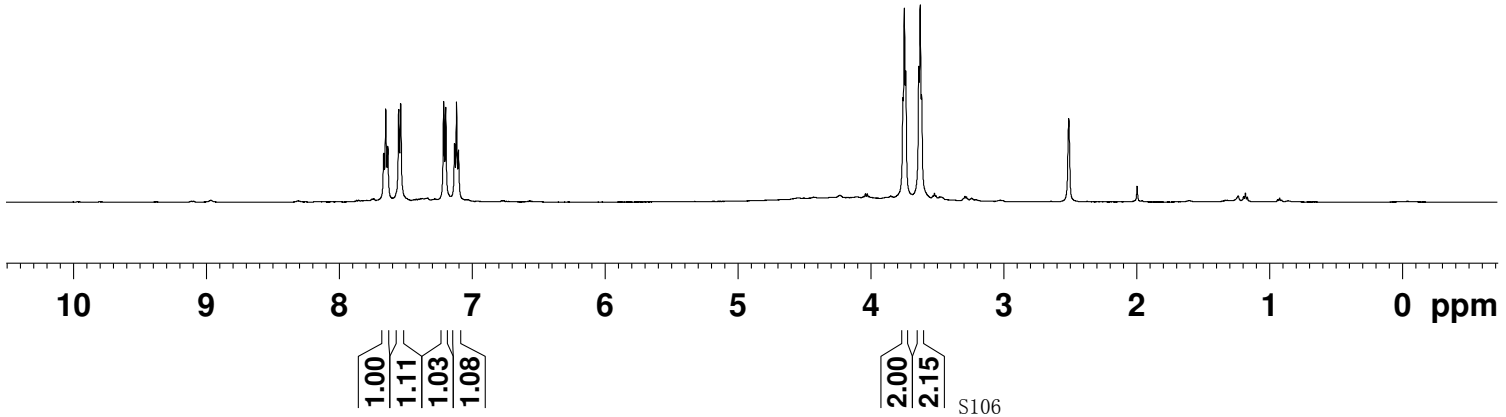
NAME	XB20120813
EXPNO	3
PROCNO	1
Date_	20120813
Time	10.26
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	128
DW	16.650 usec
DE	6.00 usec
TE	297.1 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
	0
	1.40



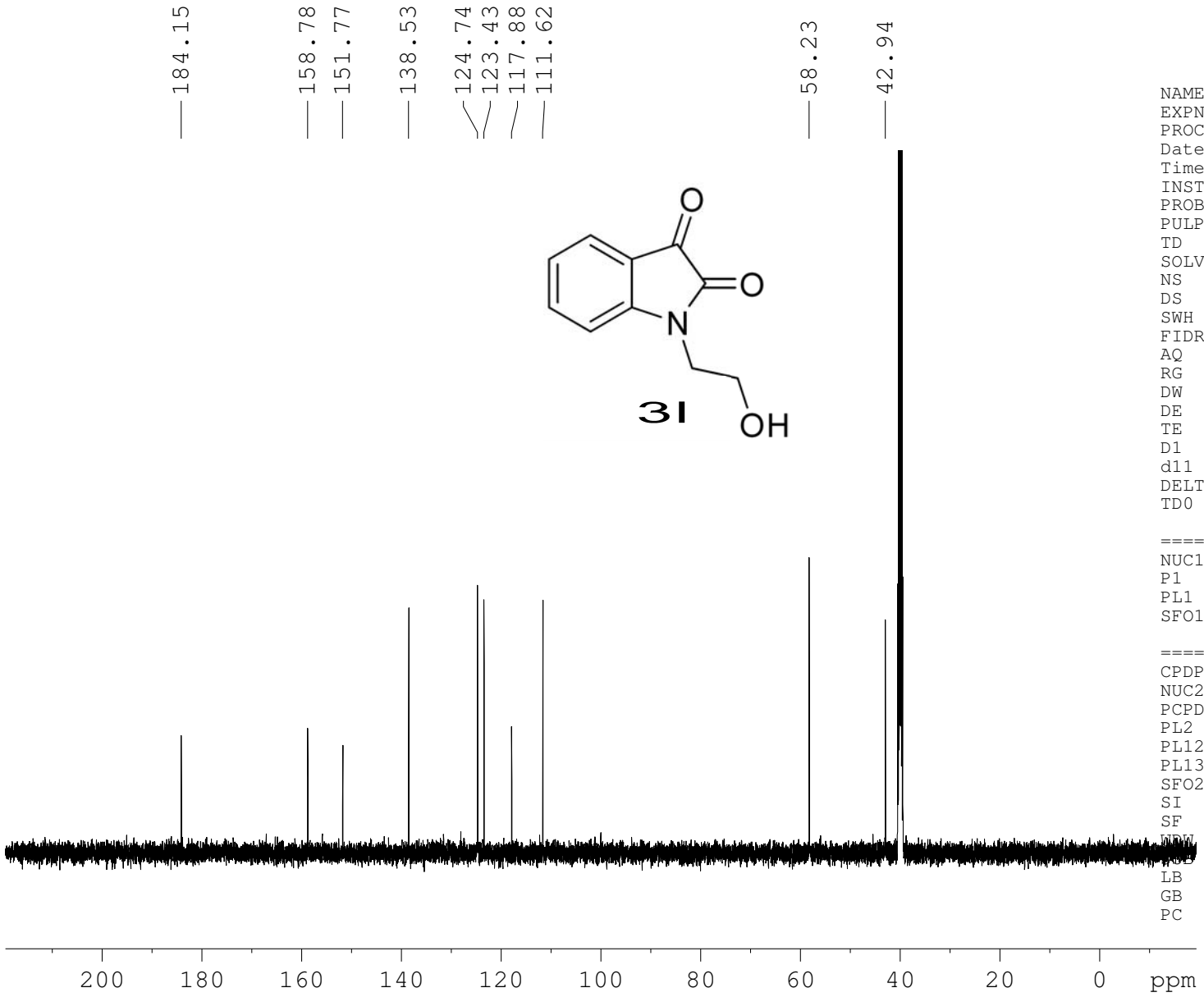
31

SUNJ-1-327-1AA
PROTON DMSO D:\\ deng 52

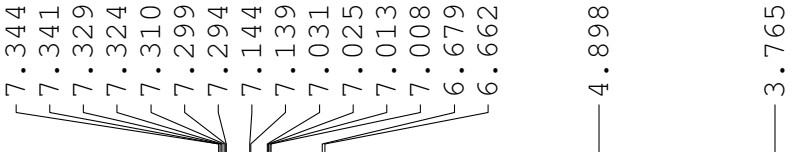
NAME	XB20111031
EXPNO	4
PROCNO	1
Date_	20111031
Time	14.01
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	181
DW	48.400 usec
DE	6.00 usec
TE	294.5 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.66 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



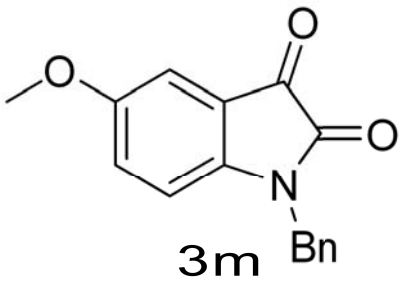
SUNJ-1-327-1AA
C13CPD DMSO D:\\ deng 52



NAME	XB20111031
EXPNO	6
PROCNO	1
Date_	20111031
Time	14.12
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	181
DW	16.650 usec
DE	6.00 usec
TE	295.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

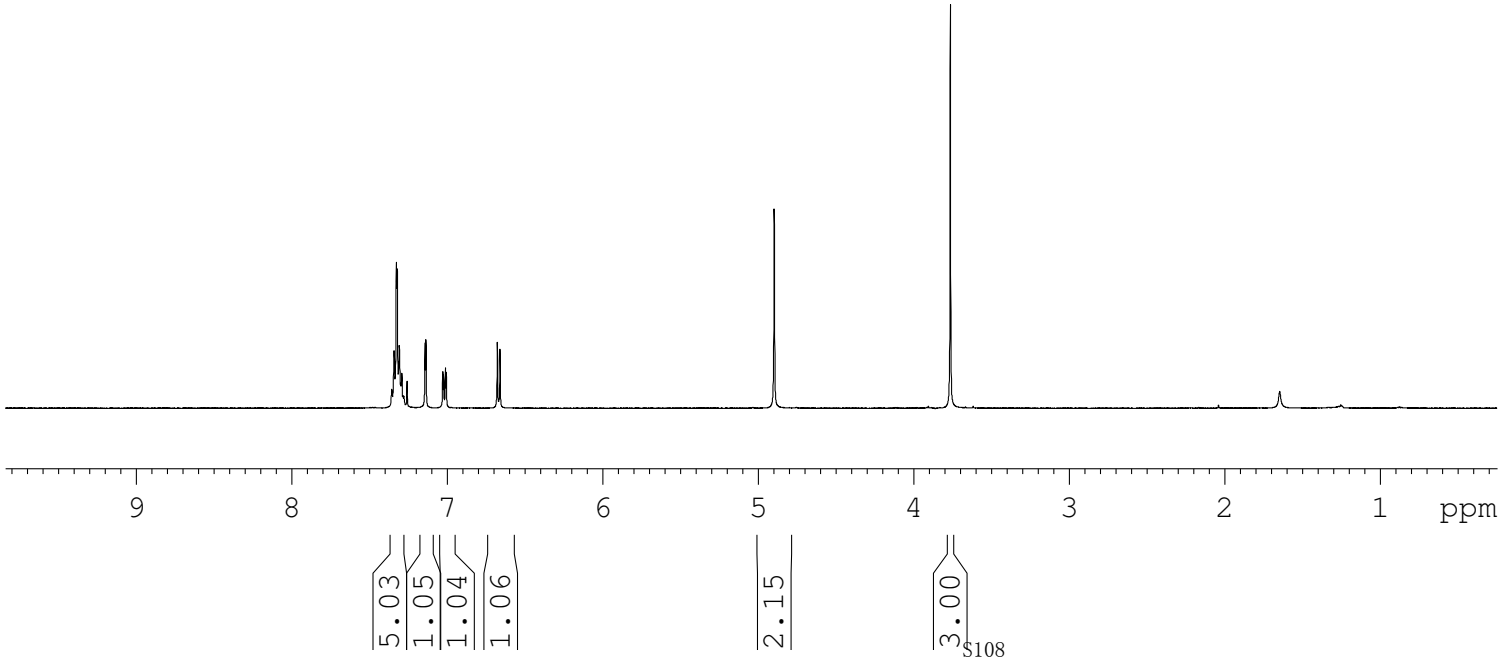


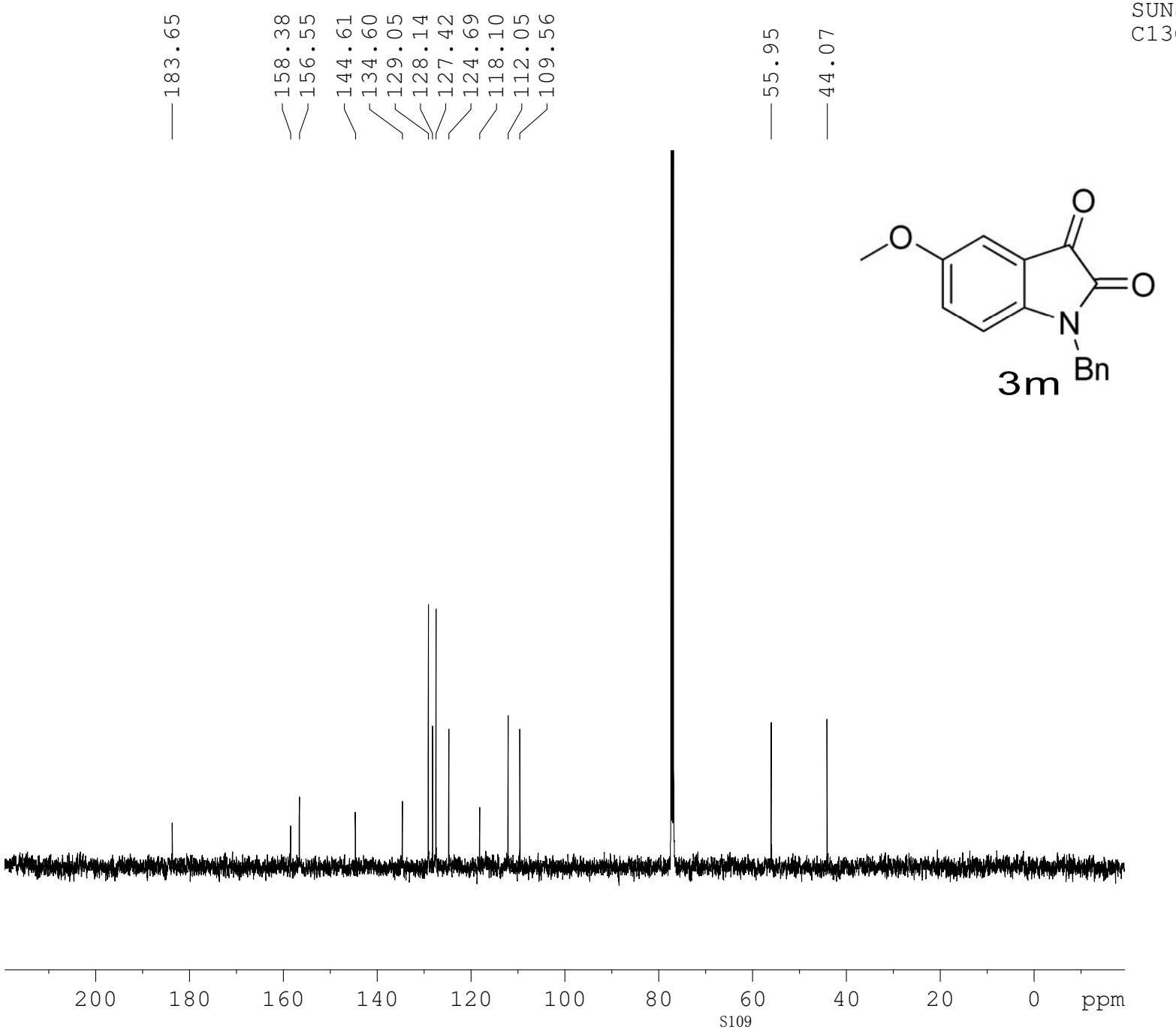
SUNJ-2-153-1
PROTON CDCl3 D:\\ deng 15



3m

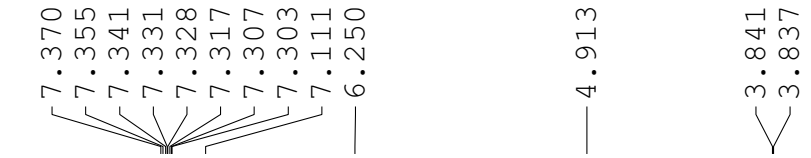
NAME	XB20120319
EXPNO	1
PROCNO	1
Date_	20120319
Time	16.05
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	294.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300129 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



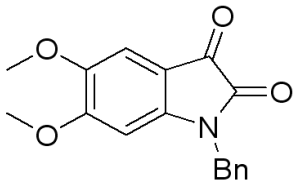


SUNJ-2-153-1
C13CPD CDCl3 D:\\ deng 15

NAME	XB20120319
EXPNO	3
PROCNO	1
Date_	20120319
Time	16.15
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	295.2 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	3.00 Hz
GB	0
PC	0.20

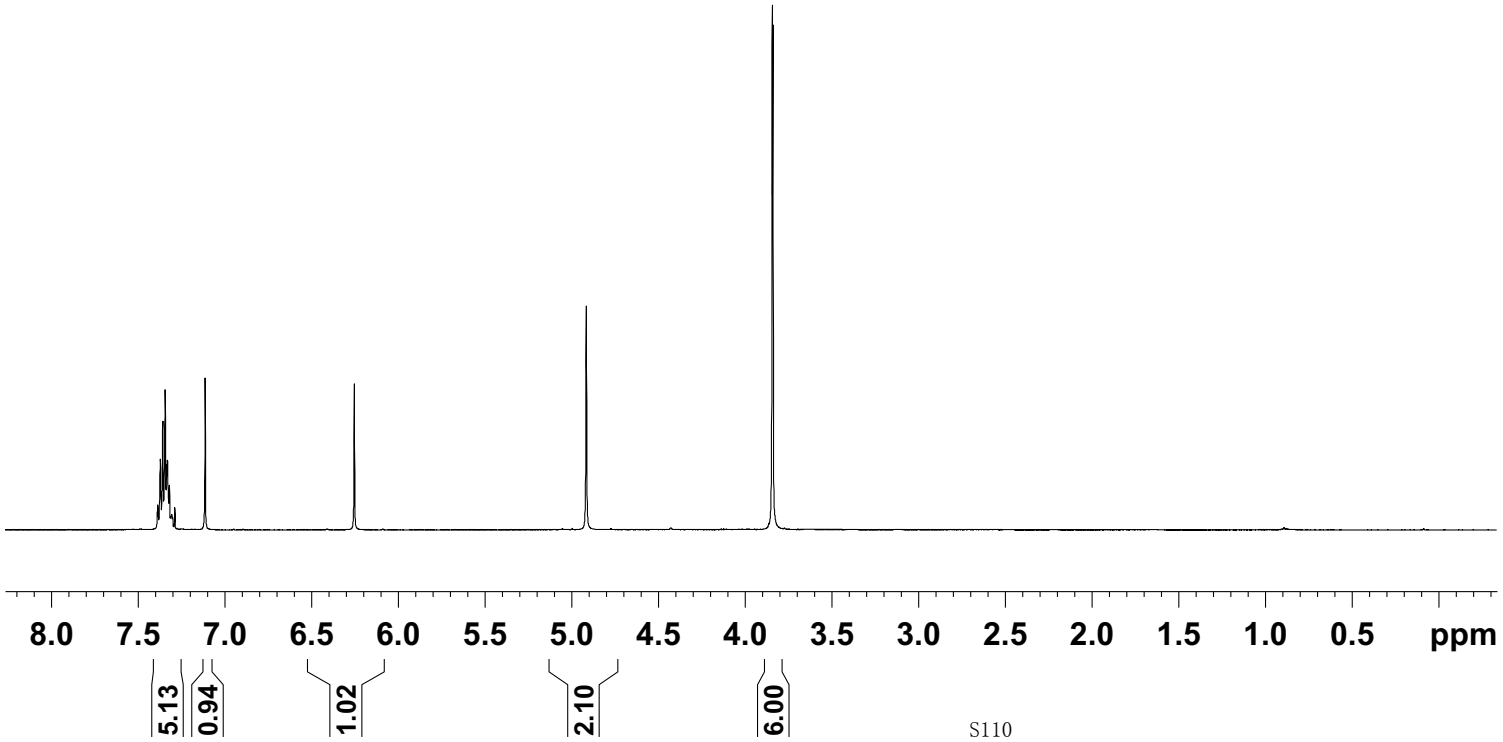


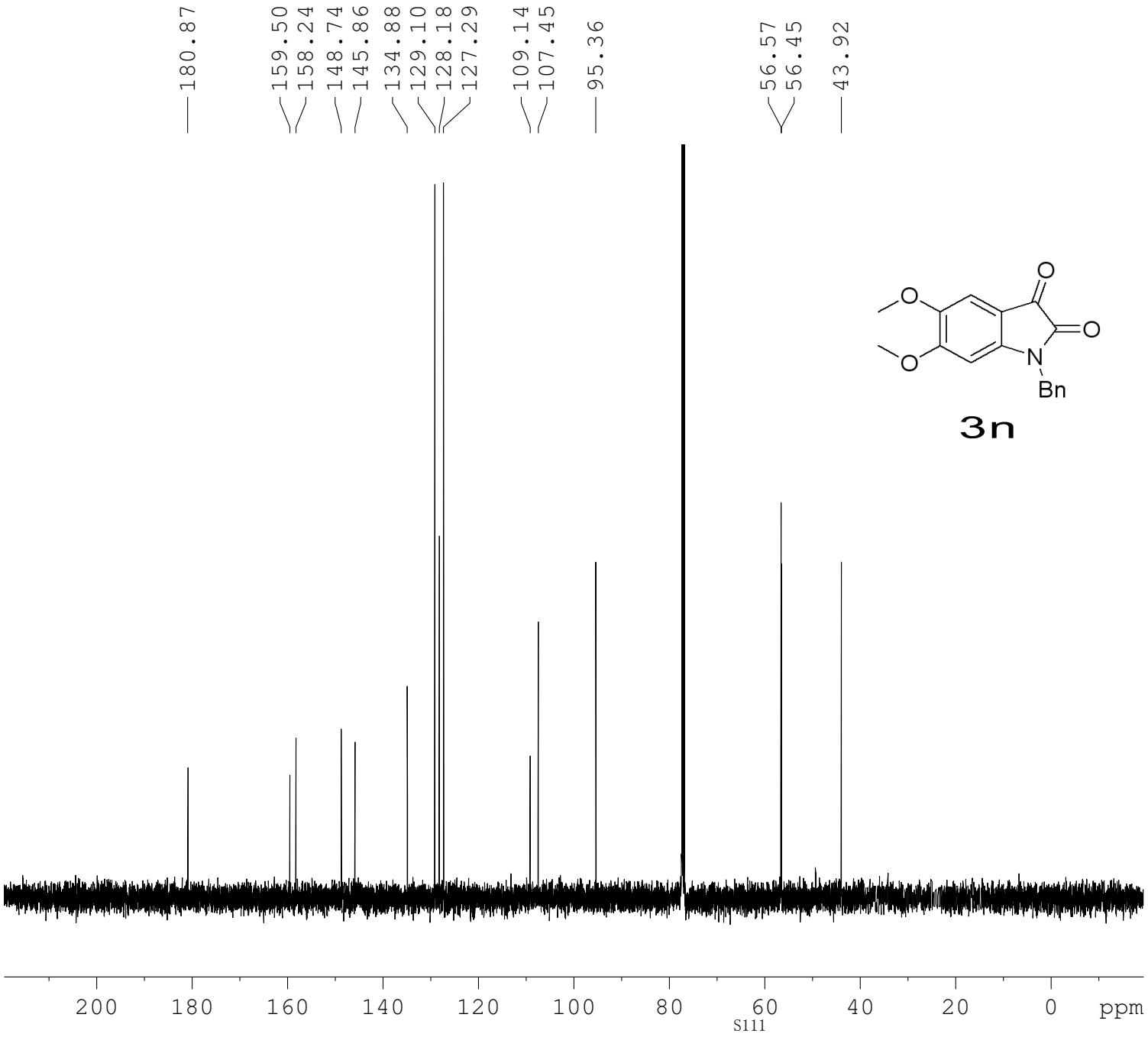
SUNJ-2-148-6
PROTON CDCl3 D:\\ deng 54



3n

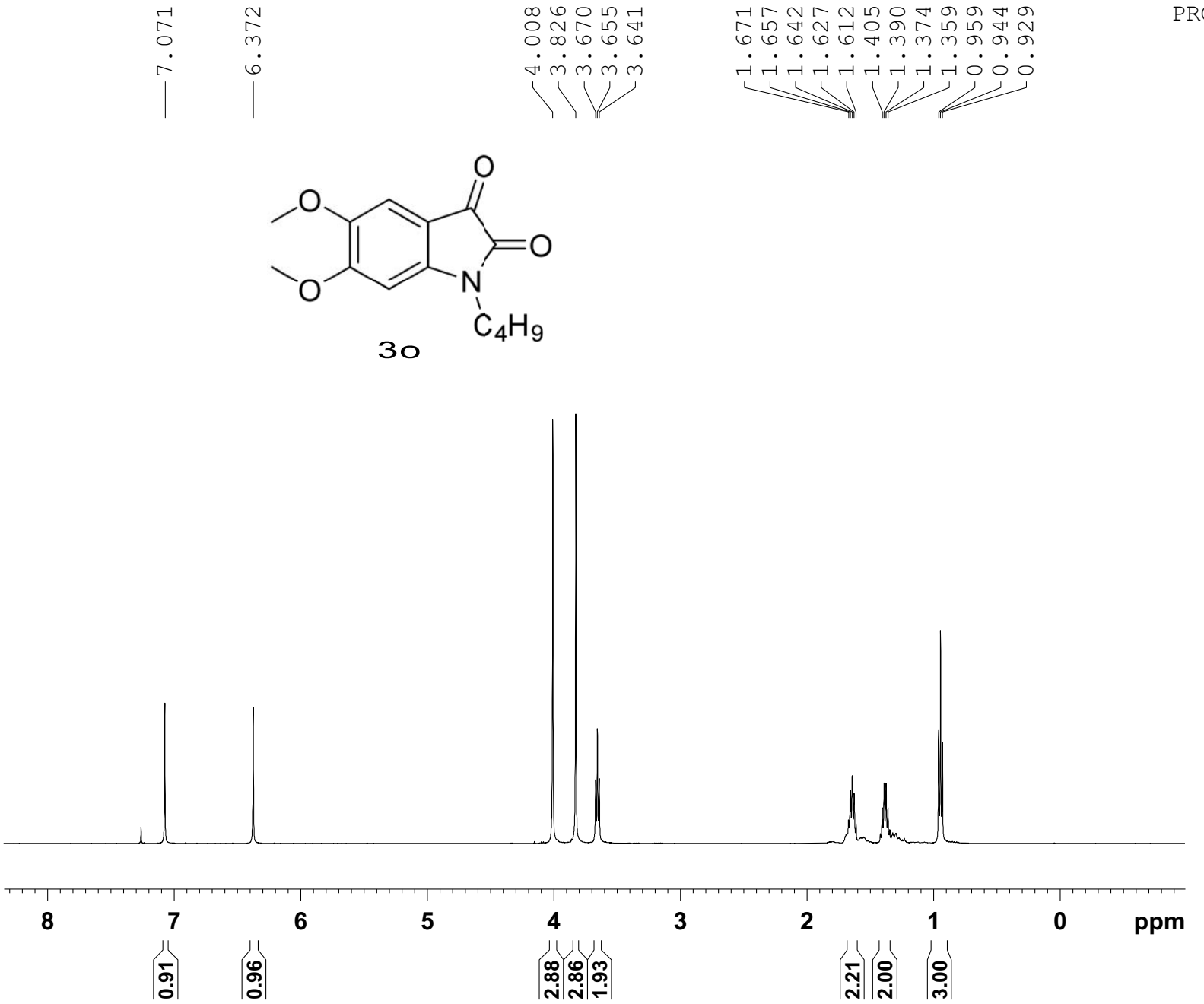
NAME	XB20120316
EXPNO	5
PROCNO	1
Date_	20120316
Time	14.35
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	181
DW	48.400 usec
DE	6.00 usec
TE	294.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





SUNJ-2-148-6
C13CPD CDCl3 D:\\ deng 54

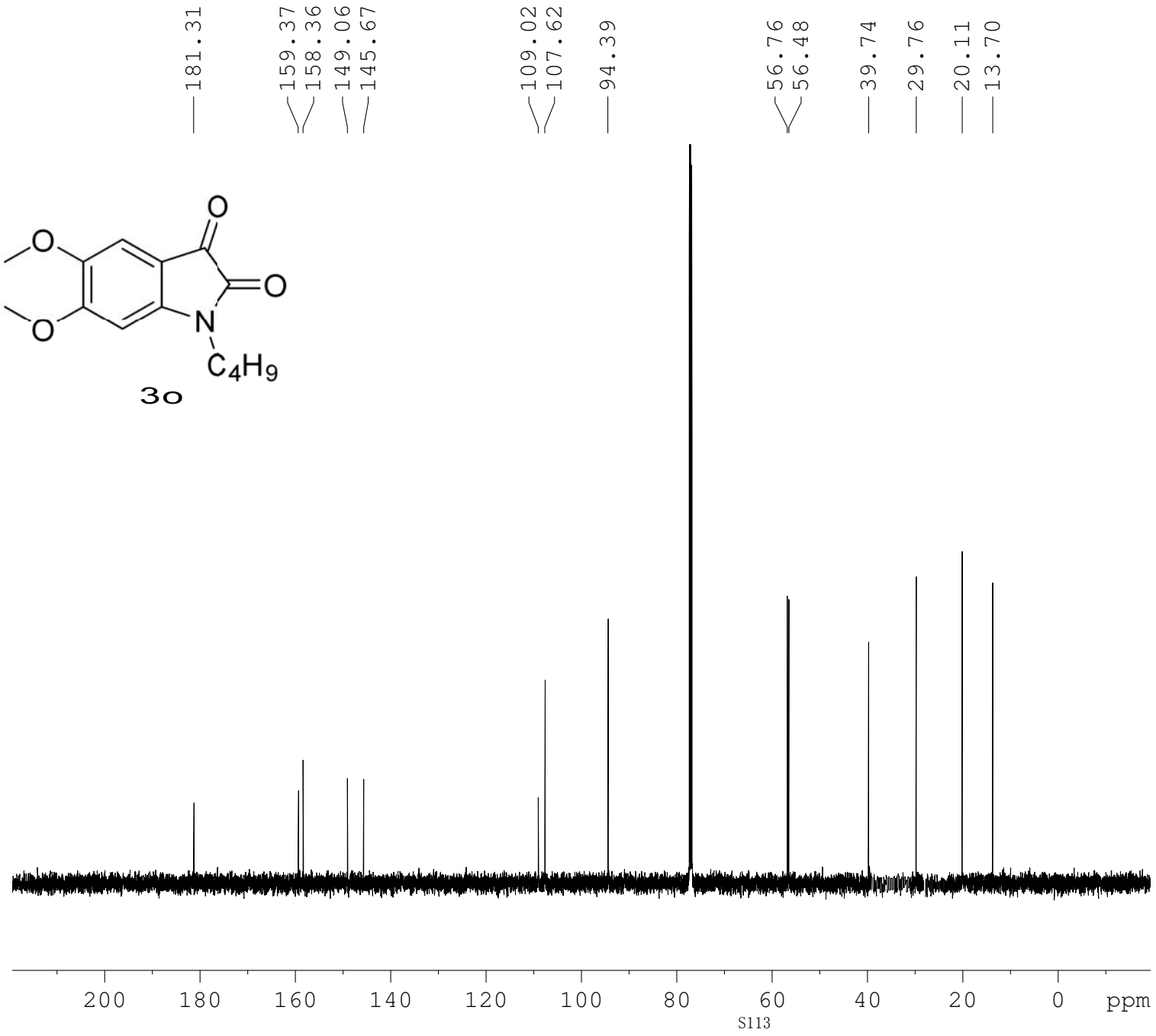
NAME	XB20120316
EXPNO	6
PROCNO	1
Date_	20120316
Time	14.43
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	362
DW	16.650 usec
DE	6.00 usec
TE	295.3 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



30

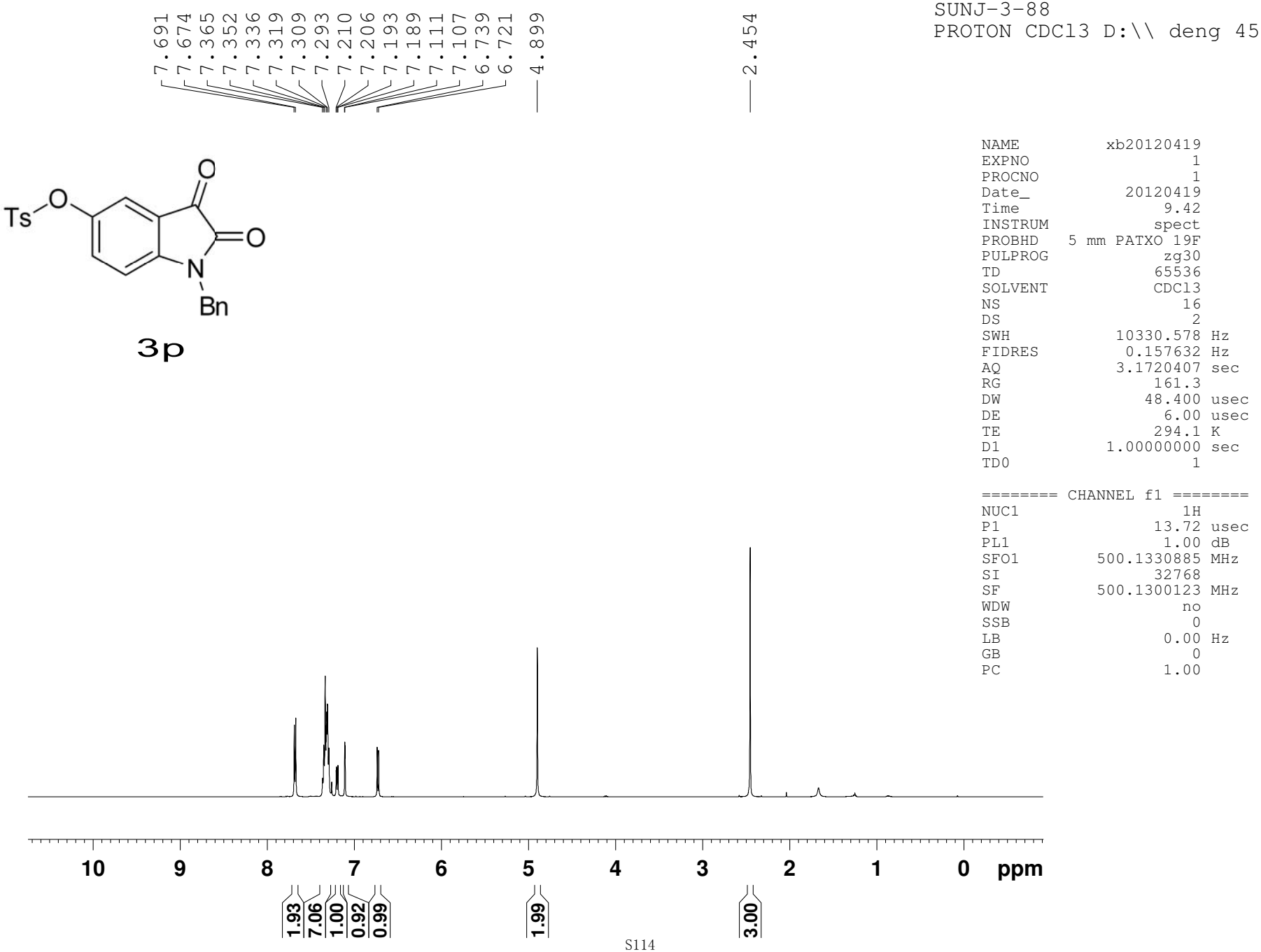
SUNJ-2-157
PROTON CDCl3 D:\\ deng 58

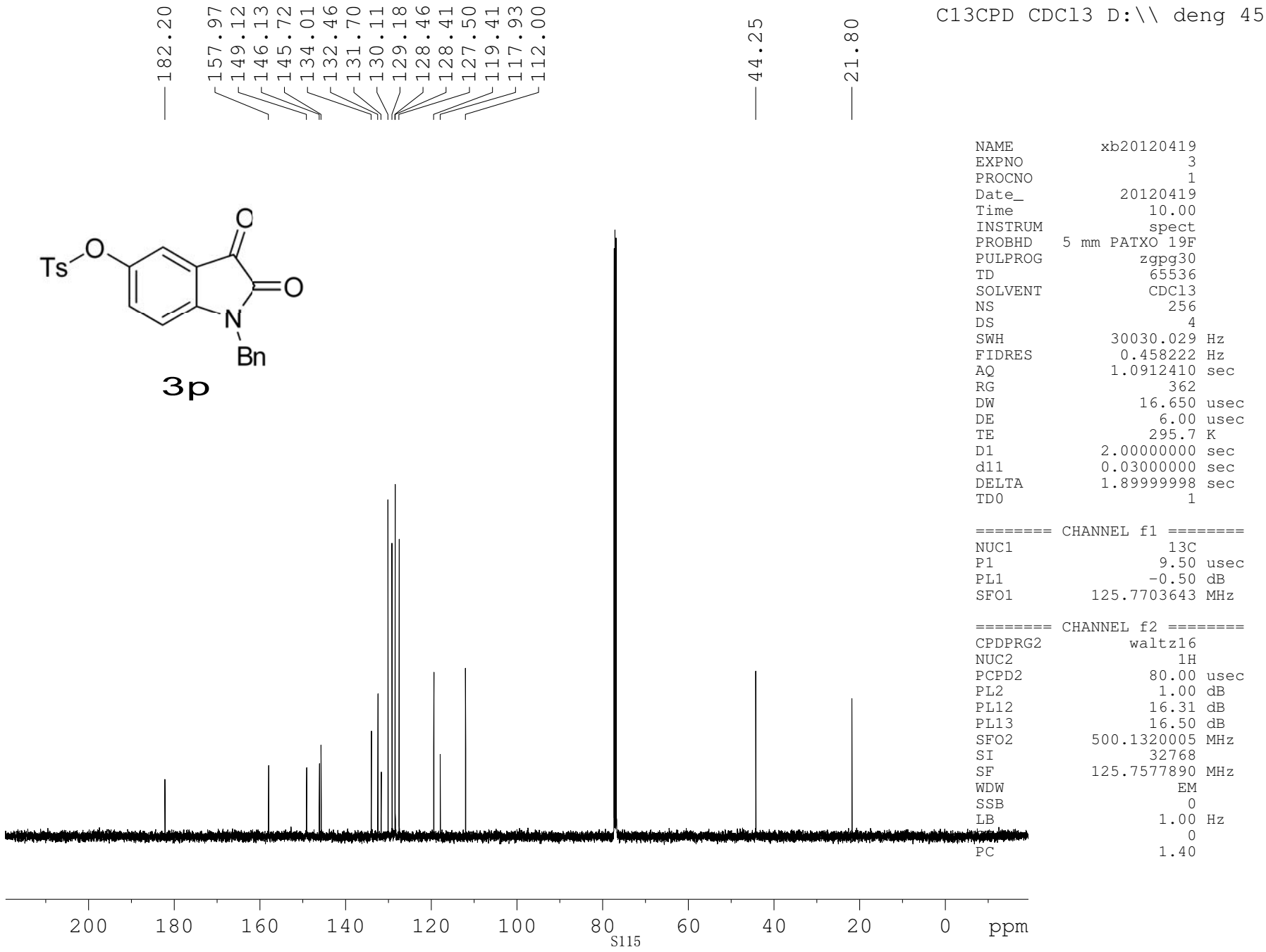
NAME	XB20120326
EXPNO	1
PROCNO	1
Date_	20120326
Time	9.39
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	143.7
DW	48.400 usec
DE	6.00 usec
TE	293.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300135 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

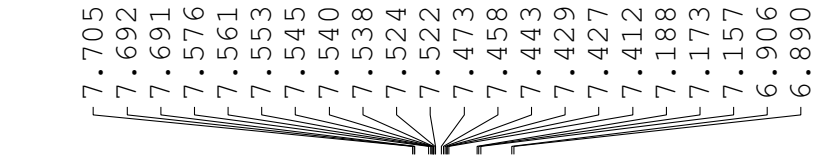


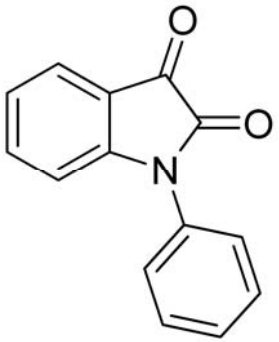
SUNJ-2-157
C13CPD CDCl3 D:\\ deng 58

NAME	XB20120326
EXPNO	3
PROCNO	1
Date_	20120326
Time	9.49
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	228.1
DW	16.650 usec
DE	6.00 usec
TE	295.2 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

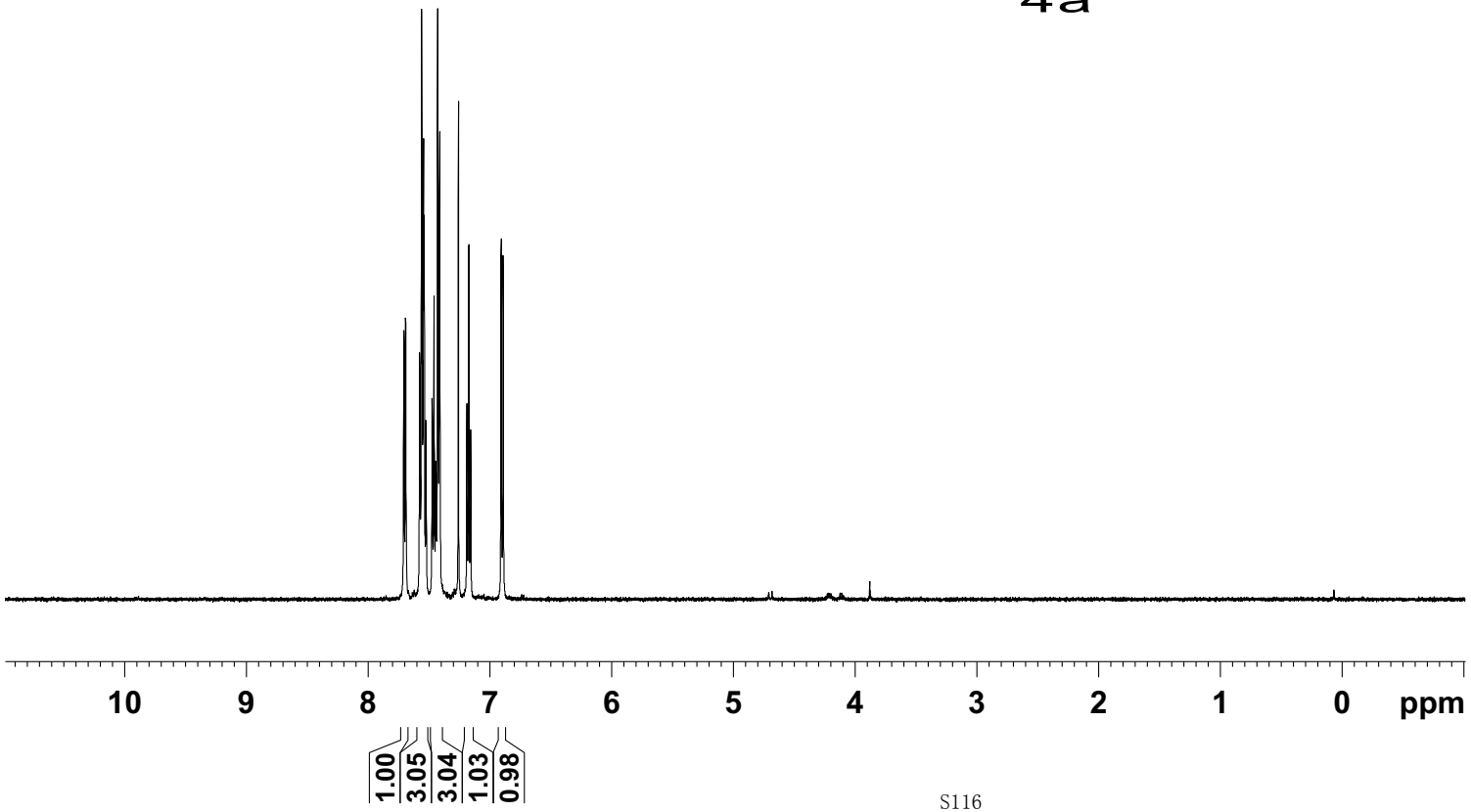






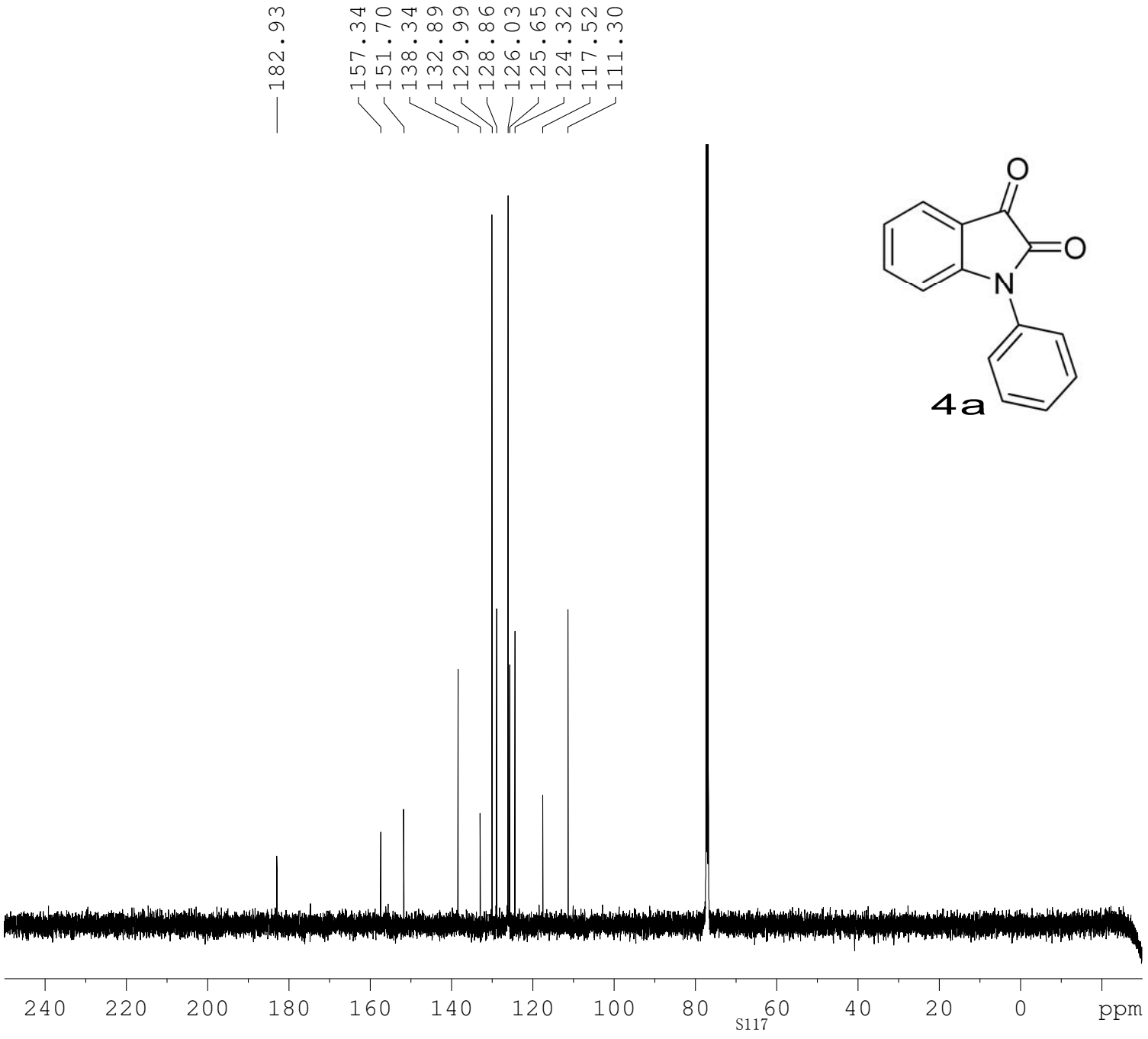


4a



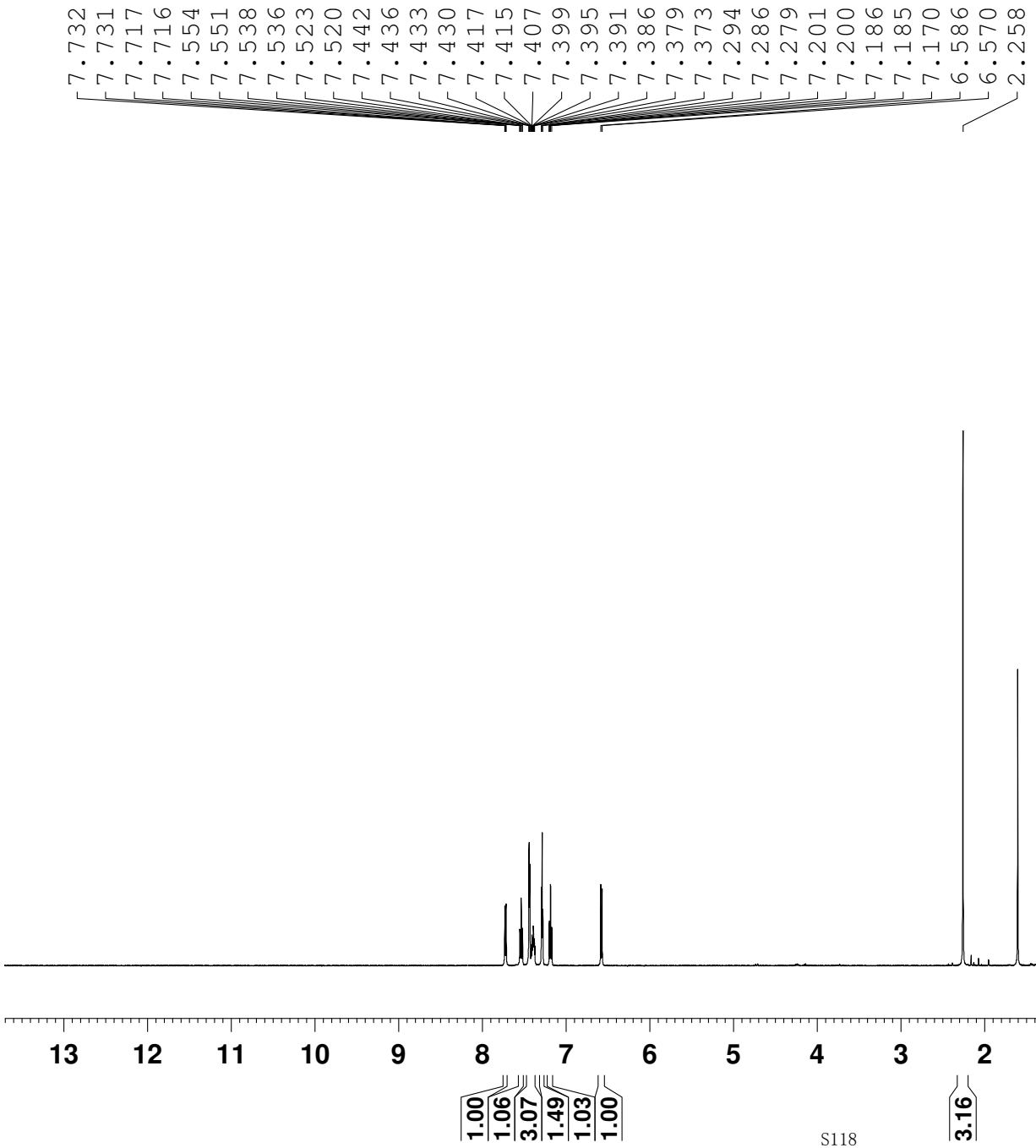
WSY-2-51
PROTON CDCl3 D:\\ deng 32

NAME	XB20071009
EXPNO	1
PROCNO	1
Date_	20071009
Time	9.55
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	362
DW	48.400 usec
DE	6.00 usec
TE	293.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300142 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



WSY-2-51
C13CPD CDCl3

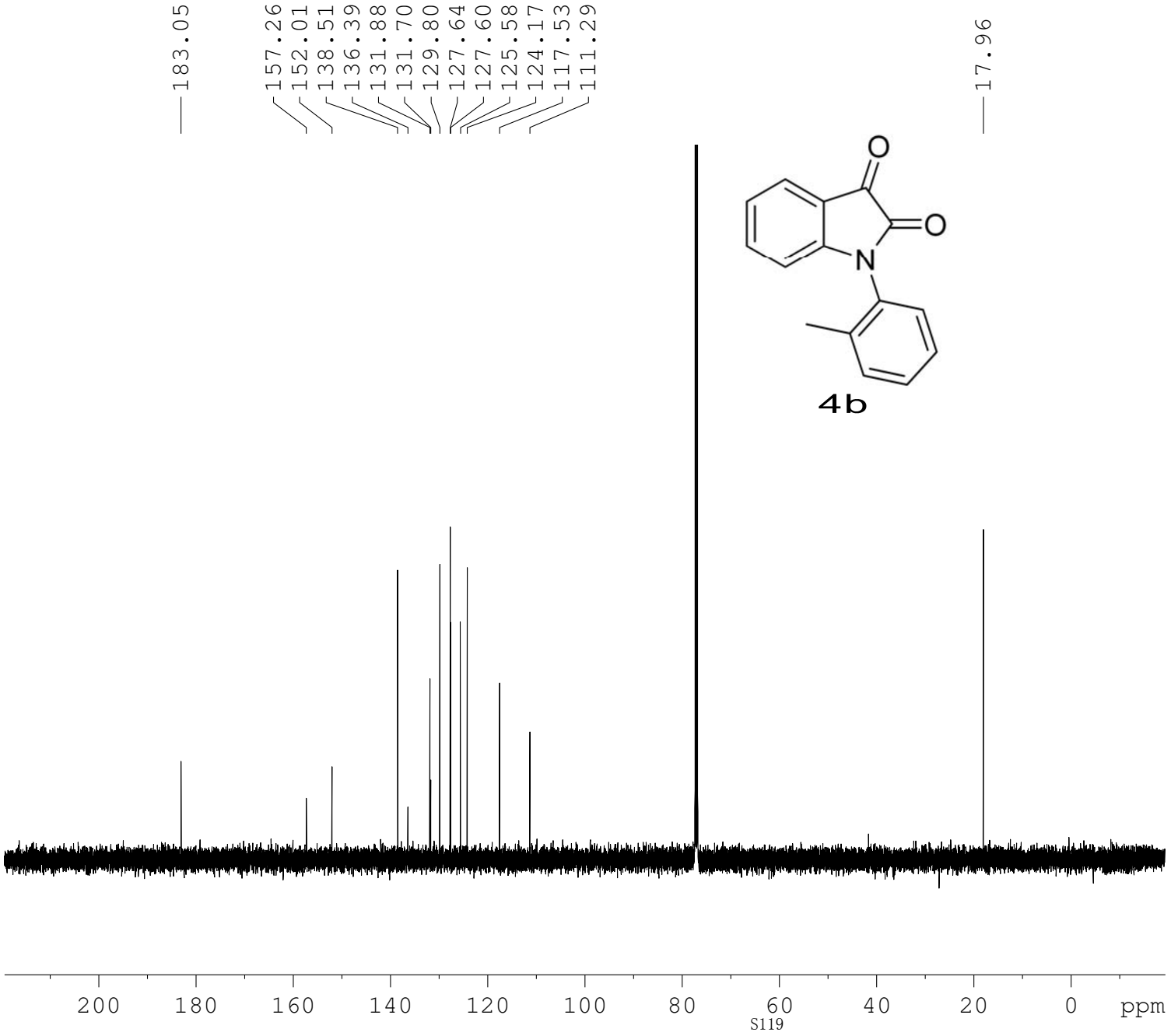
NAME	XB20071010
EXPNO	1
PROCNO	1
Date_	20071010
Time	13.54
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2200
DS	4
SWH	35211.270 Hz
FIDRES	0.537281 Hz
AQ	0.9306754 sec
RG	512
DW	14.200 usec
DE	6.00 usec
TE	295.5 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7716224 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



WSY-2-121
PROTON CDCl3 D:\\ deng 2

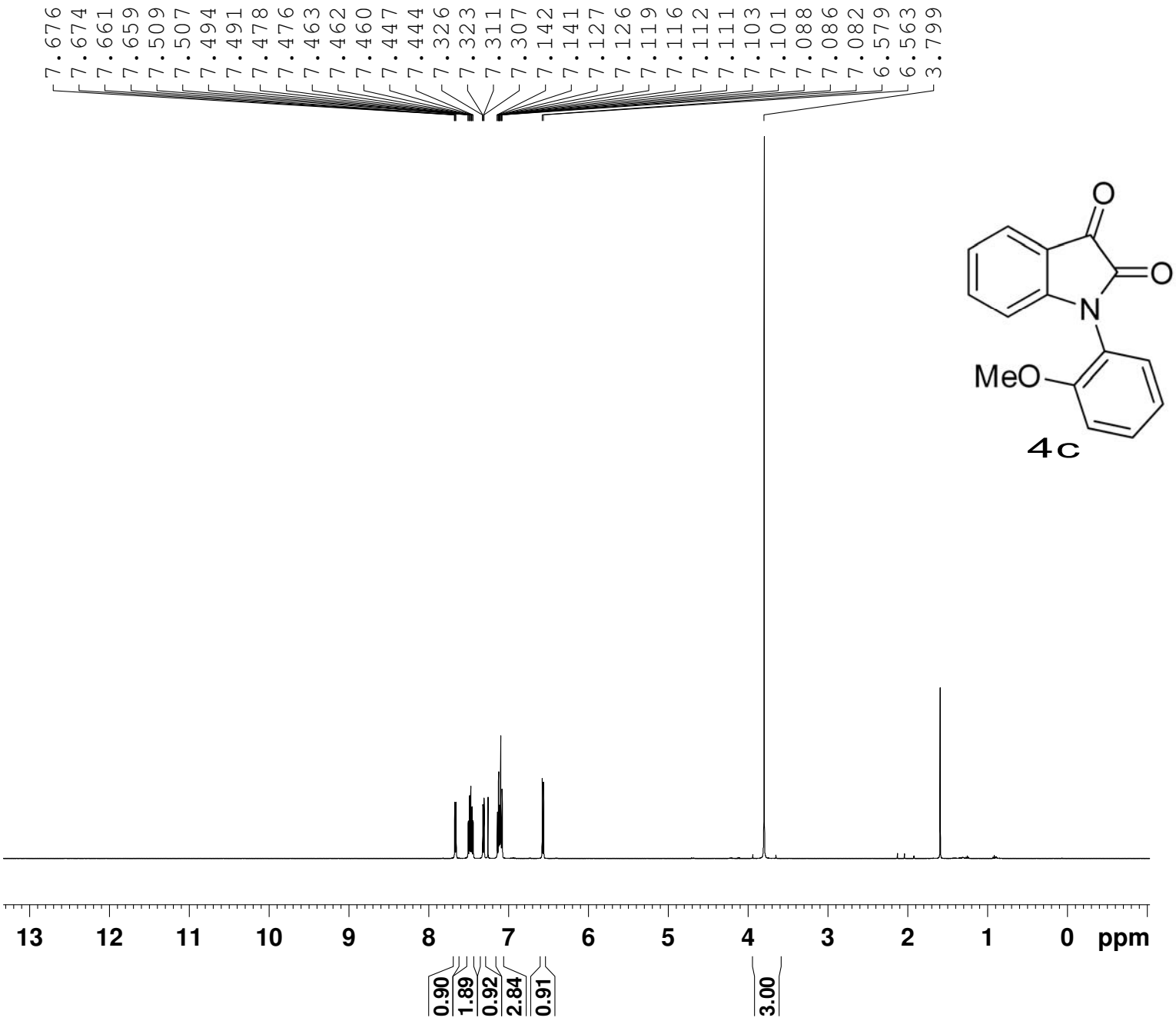
NAME	XB20071205
EXPNO	2
PROCNO	1
Date_	20071205
Time	14.02
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	362
DW	48.400 usec
DE	6.00 usec
TE	293.8 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



WSY-2-121
C13CPD CDCl3 D:\\ deng 43

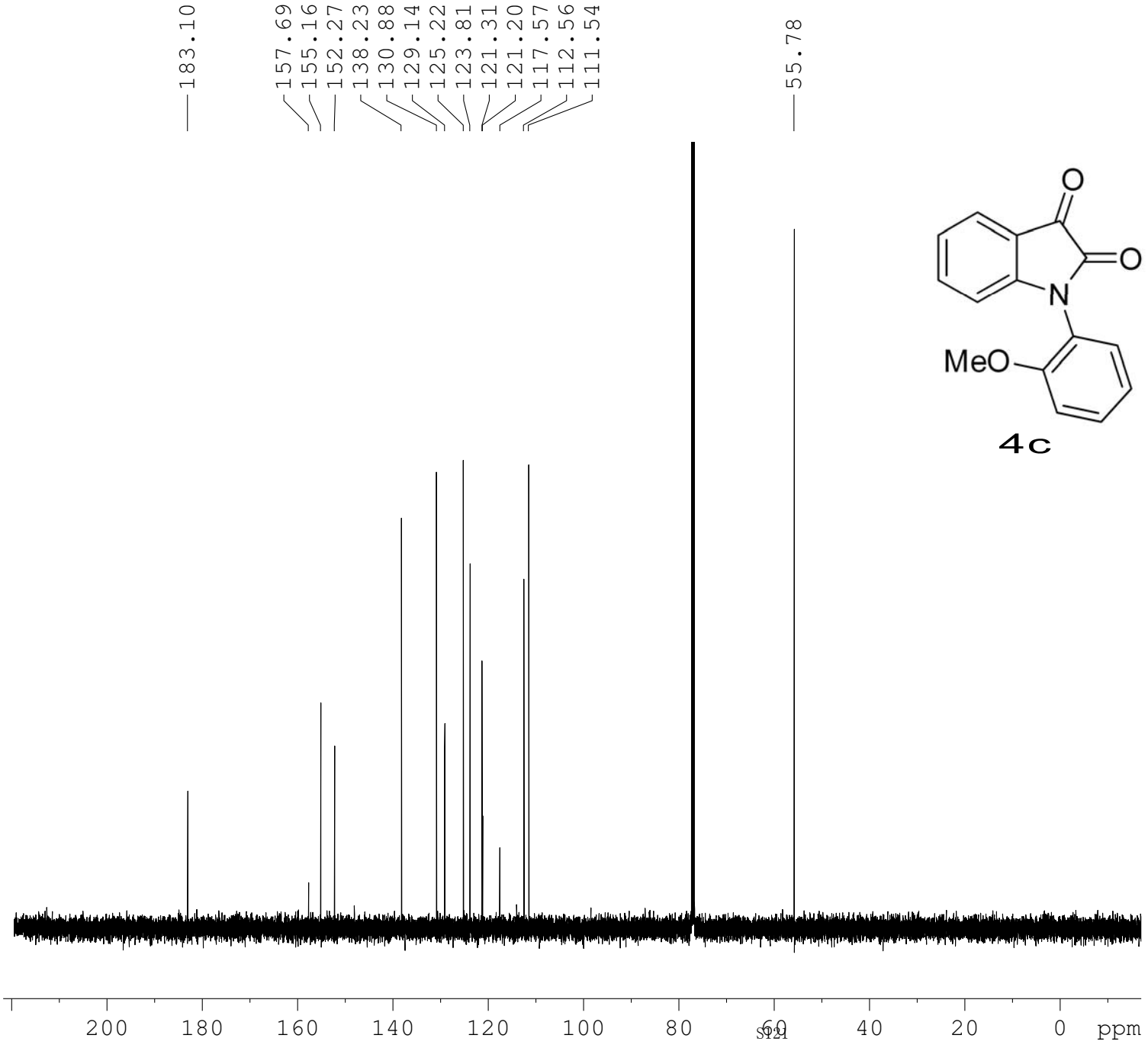
NAME	XB20071206
EXPNO	31
PROCNO	1
Date_	20071206
Time	20.32
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2048
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	645.1
DW	16.650 usec
DE	6.00 usec
TE	295.6 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



4c

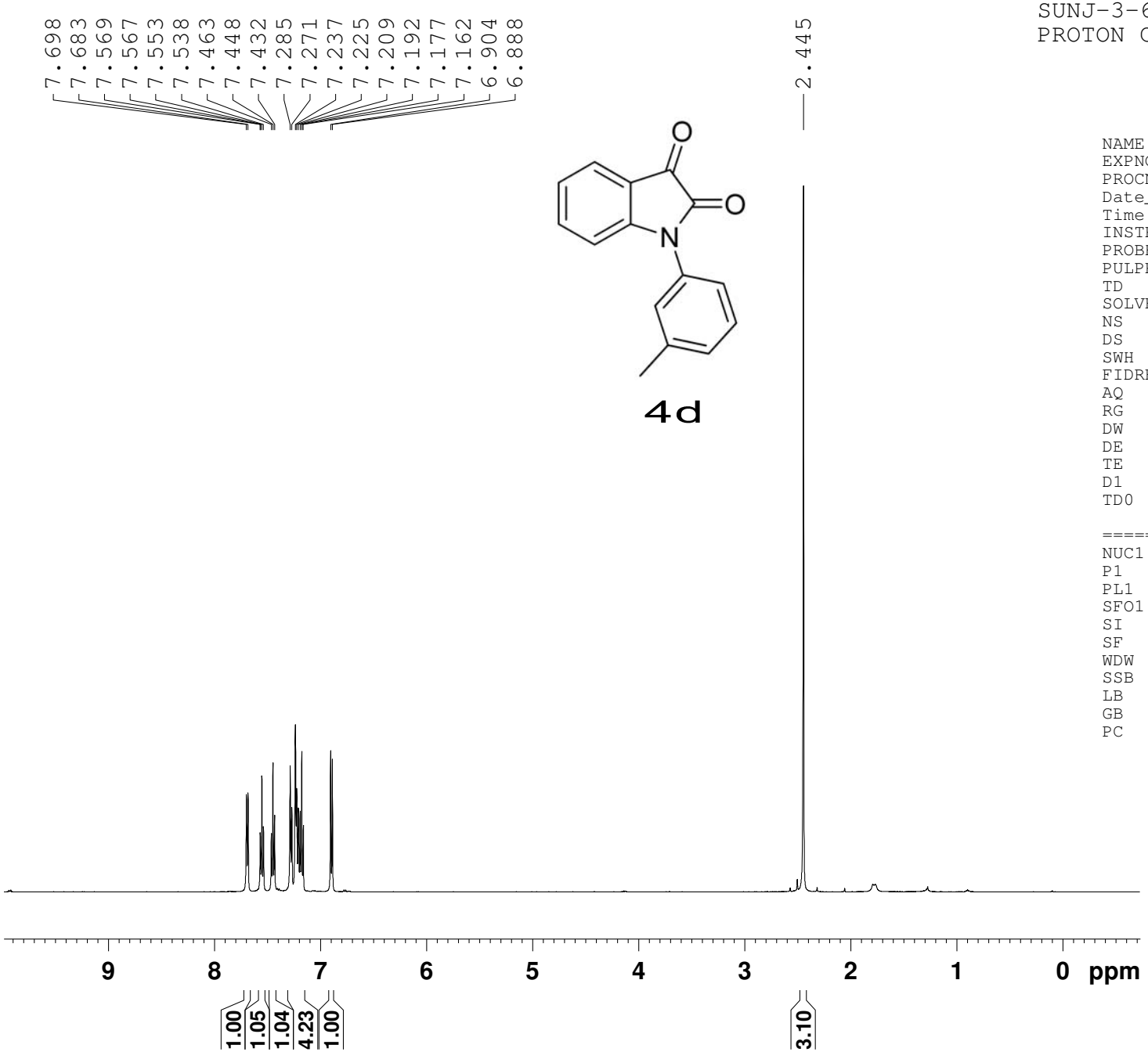
WSY-2-157-7
PROTON CDCl3 D:\\ deng 3

NAME	XB20080222
EXPNO	2
PROCNO	1
Date_	20080222
Time	13.55
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	362
DW	48.400 usec
DE	6.00 usec
TE	295.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300133 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



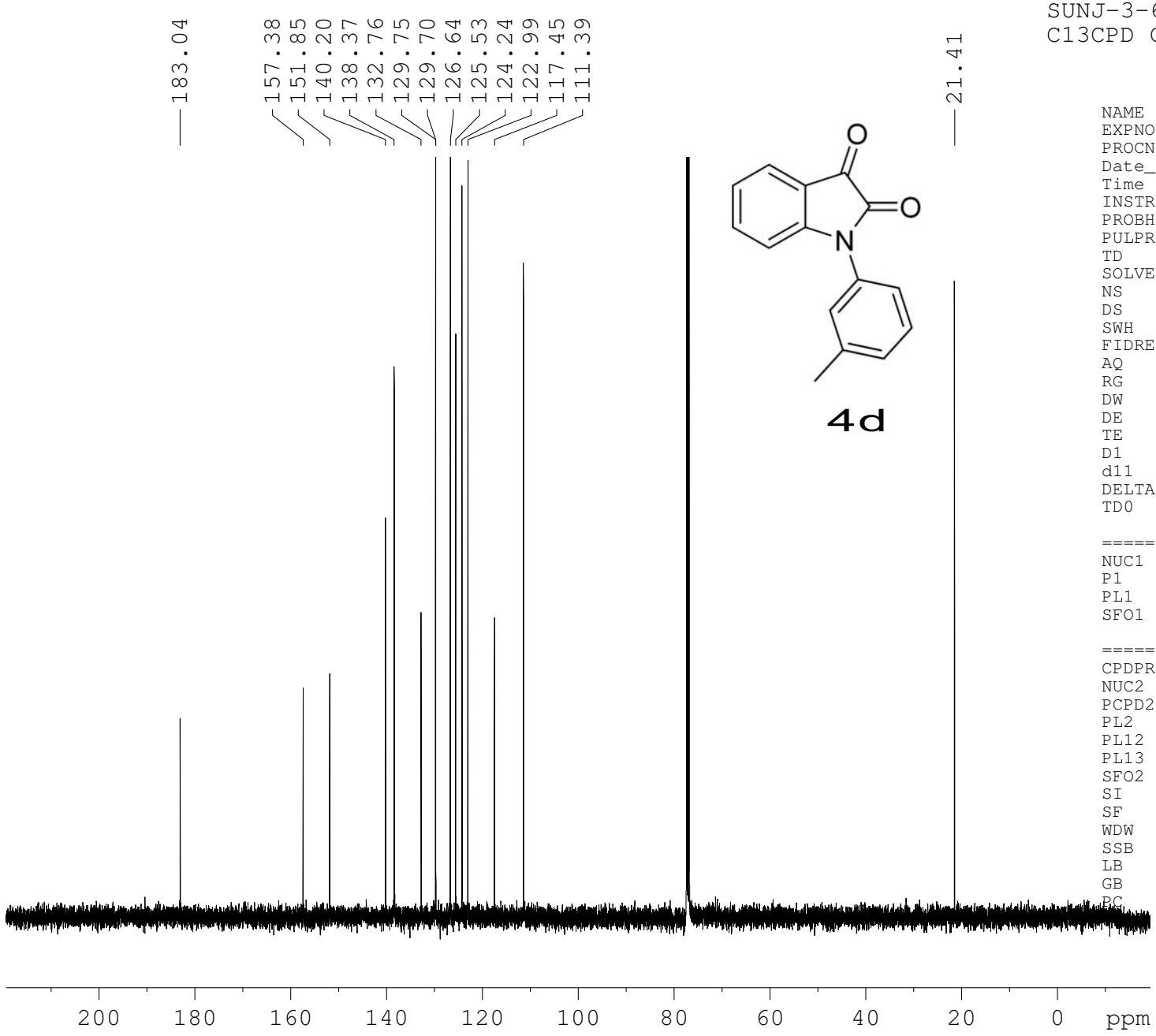
WSY-2-157-7
C13CPD CDCl3 D:\\ deng 4

NAME	XB20080222
EXPNO	6
PROCNO	1
Date_	20080222
Time	16.31
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	322.5
DW	16.650 usec
DE	6.00 usec
TE	296.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40



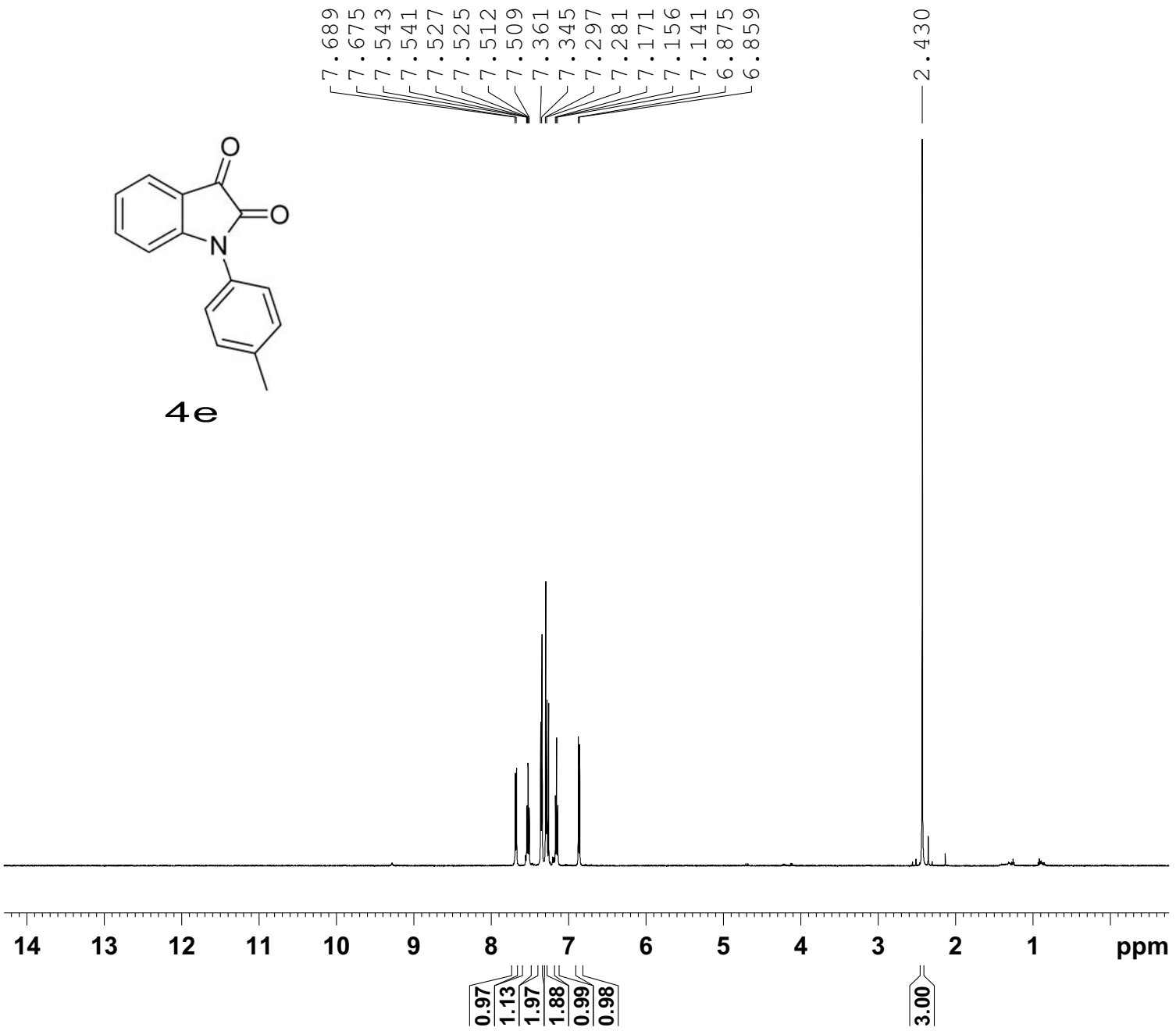
SUNJ-3-61
PROTON CDCl3 D:\\ deng 28

NAME	XB20120613	
EXPNO	1	
PROCNO	1	
Date_	20120613	
Time	12.40	
INSTRUM	spect	
PROBHD	5 mm PATXO 19F	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	16	
DS	2	
SWH	10330.578	Hz
FIDRES	0.157632	Hz
AQ	3.1720407	sec
RG	128	
DW	48.400	usec
DE	6.00	usec
TE	296.2	K
D1	1.00000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	1H	
P1	13.72	usec
PL1	1.00	dB
SFO1	500.1330885	MHz
SI	32768	
SF	500.1300000	MHz
WDW	no	
SSB	0	
LB	0.00	Hz
GB	0	
PC	1.00	



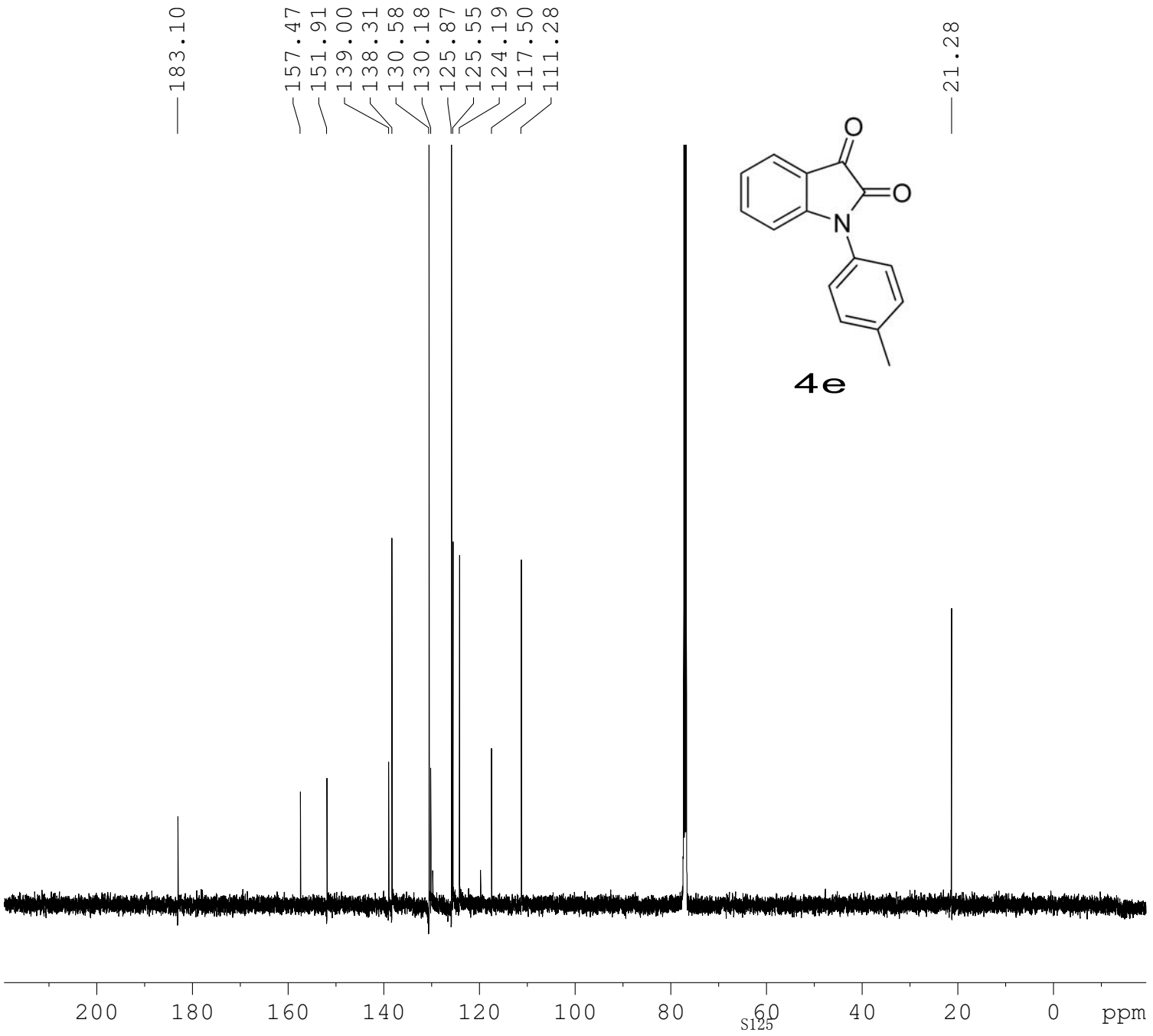
SUNJ-3-61
C13CPD CDCl3 D:\\ deng 28

NAME	XB20120613
EXPNO	3
PROCNO	1
Date_	20120613
Time	12.57
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	1290.2
DW	16.650 usec
DE	6.00 usec
TE	297.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



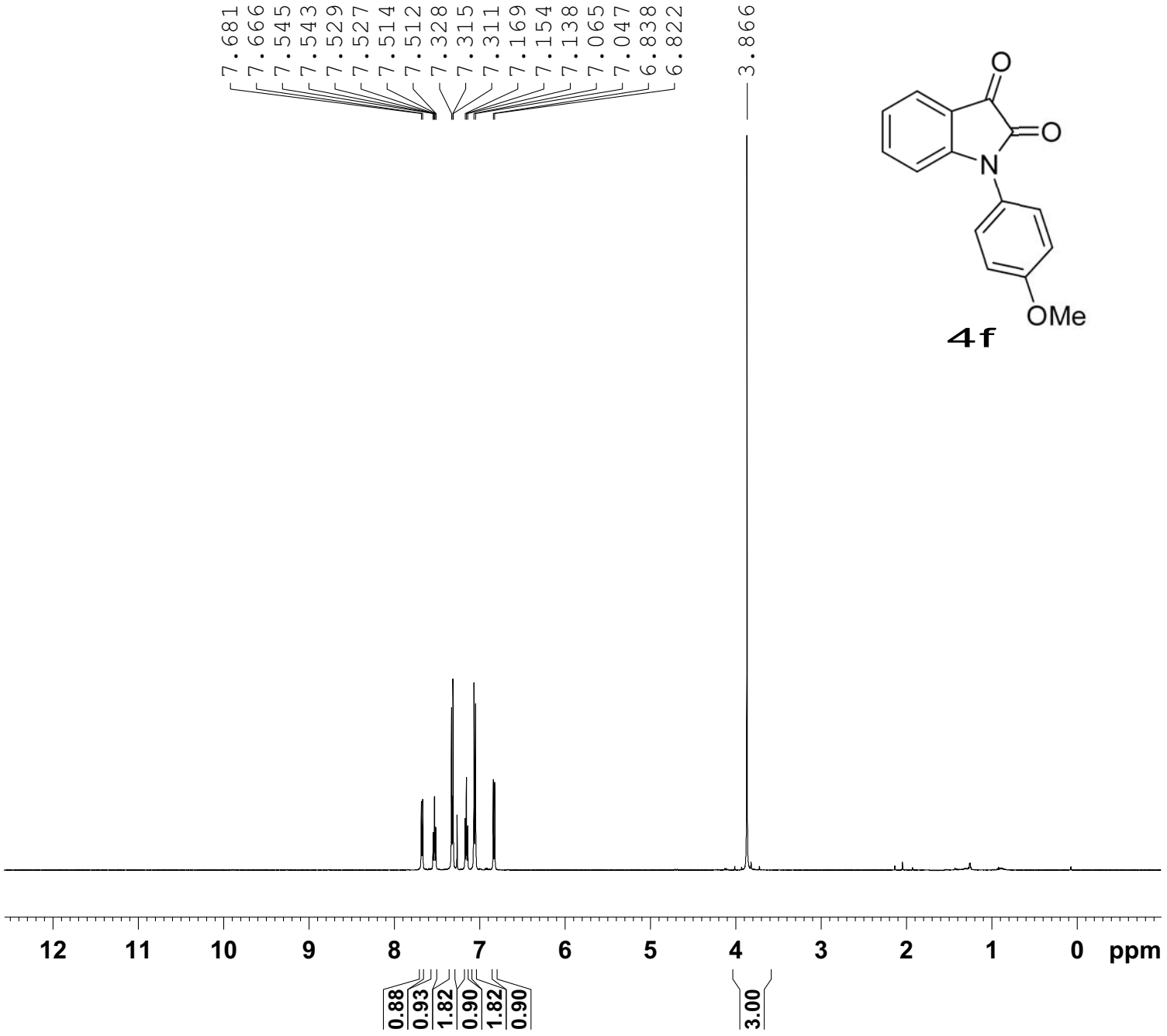
WSY-2-138
PROTON CDCl3 D:\\ deng 21

NAME	XB20071219
EXPNO	4
PROCNO	1
Date_	20071219
Time	16.39
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	3.1720407 sec
RG	406.4
DW	48.400 usec
DE	6.00 usec
TE	293.4 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	3.50 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300132 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



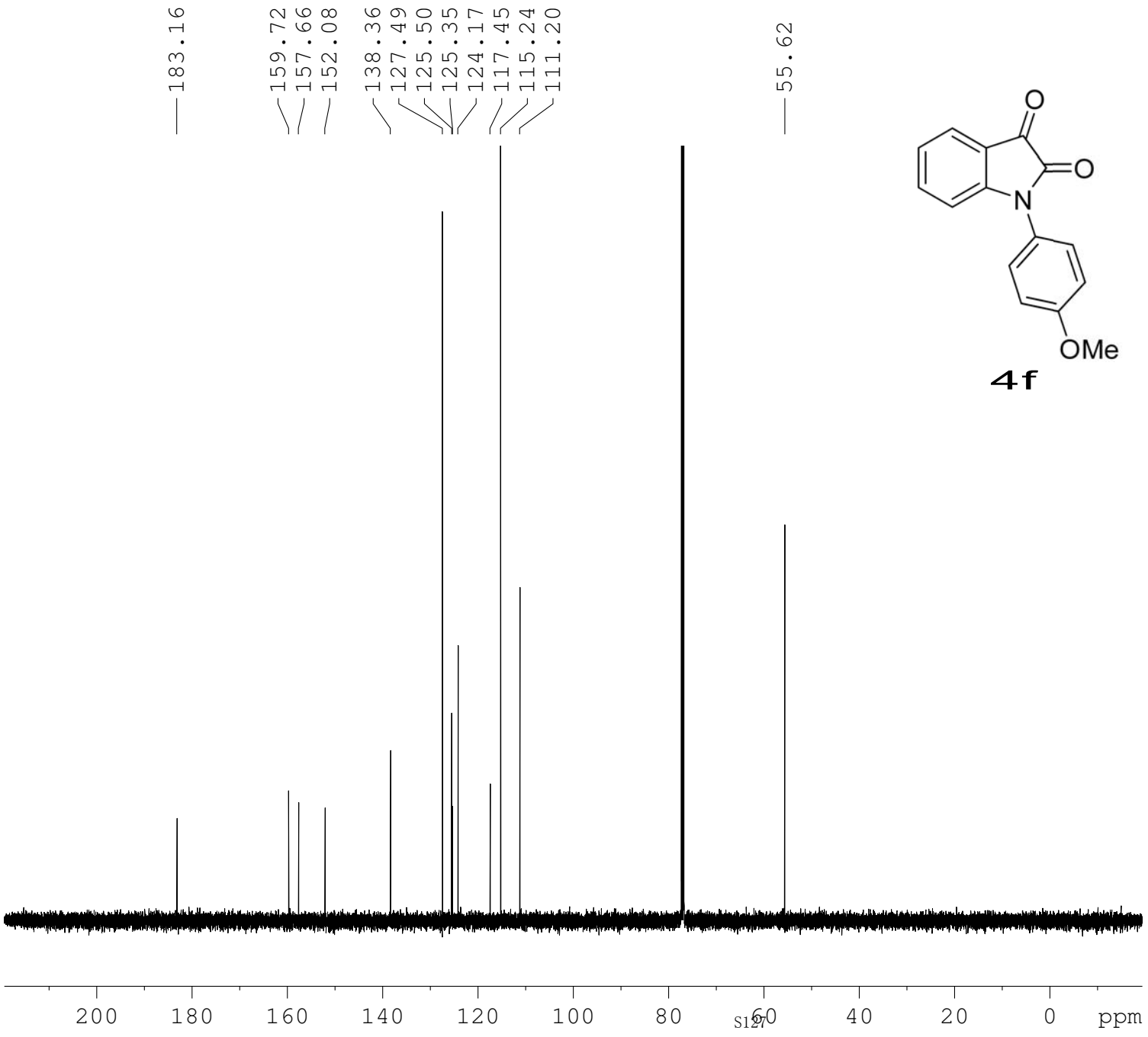
WSY-2-138
C13CPD CDCl3 D:\\ deng 3

NAME	XB20071219
EXPNO	8
PROCNO	1
Date_	20071220
Time	4.01
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2048
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	228.1
DW	16.650 usec
DE	6.00 usec
TE	295.9 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	1.00 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



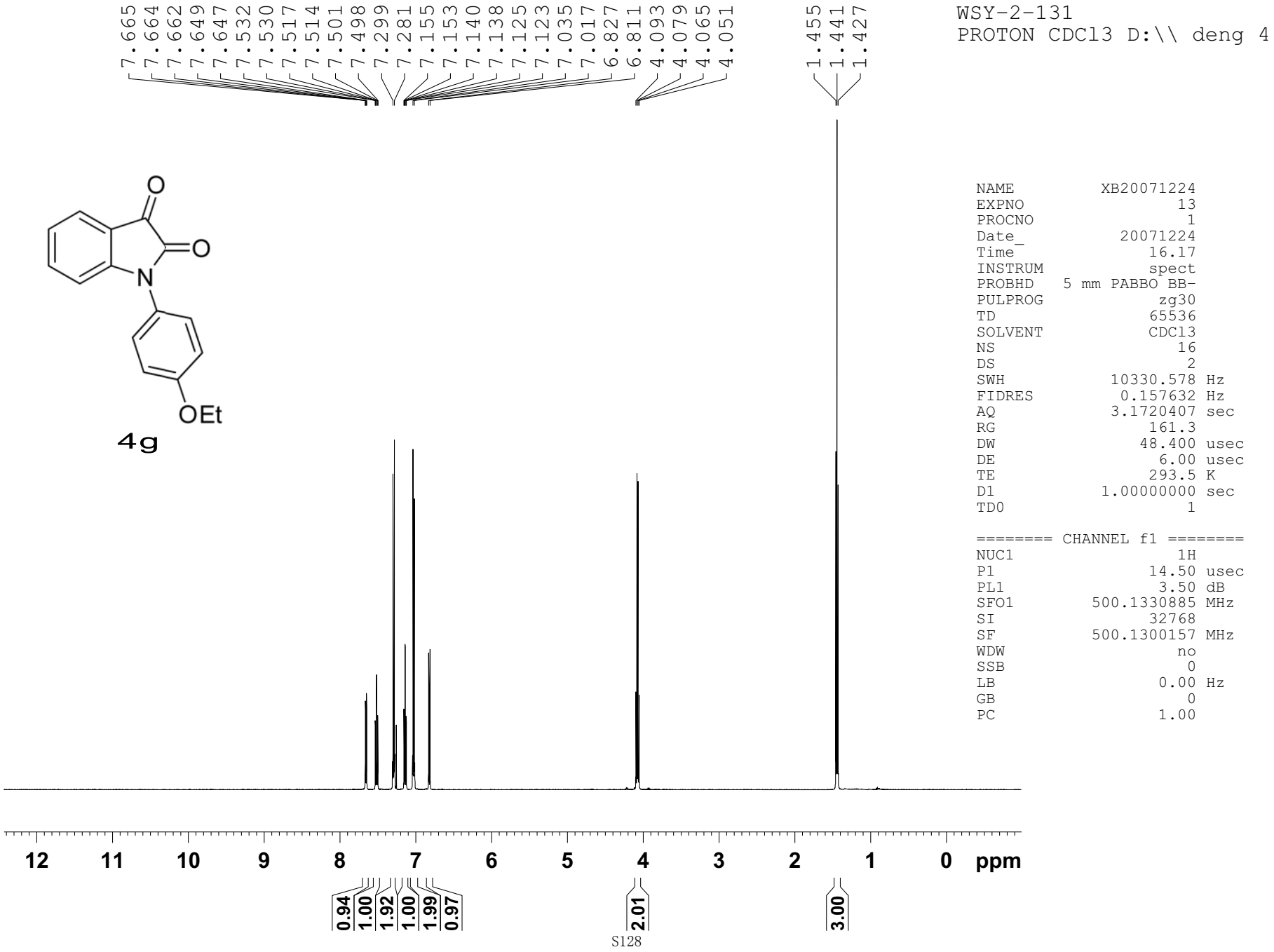
WSY-2-116
PROTON CDCl3 D:\\ deng 33

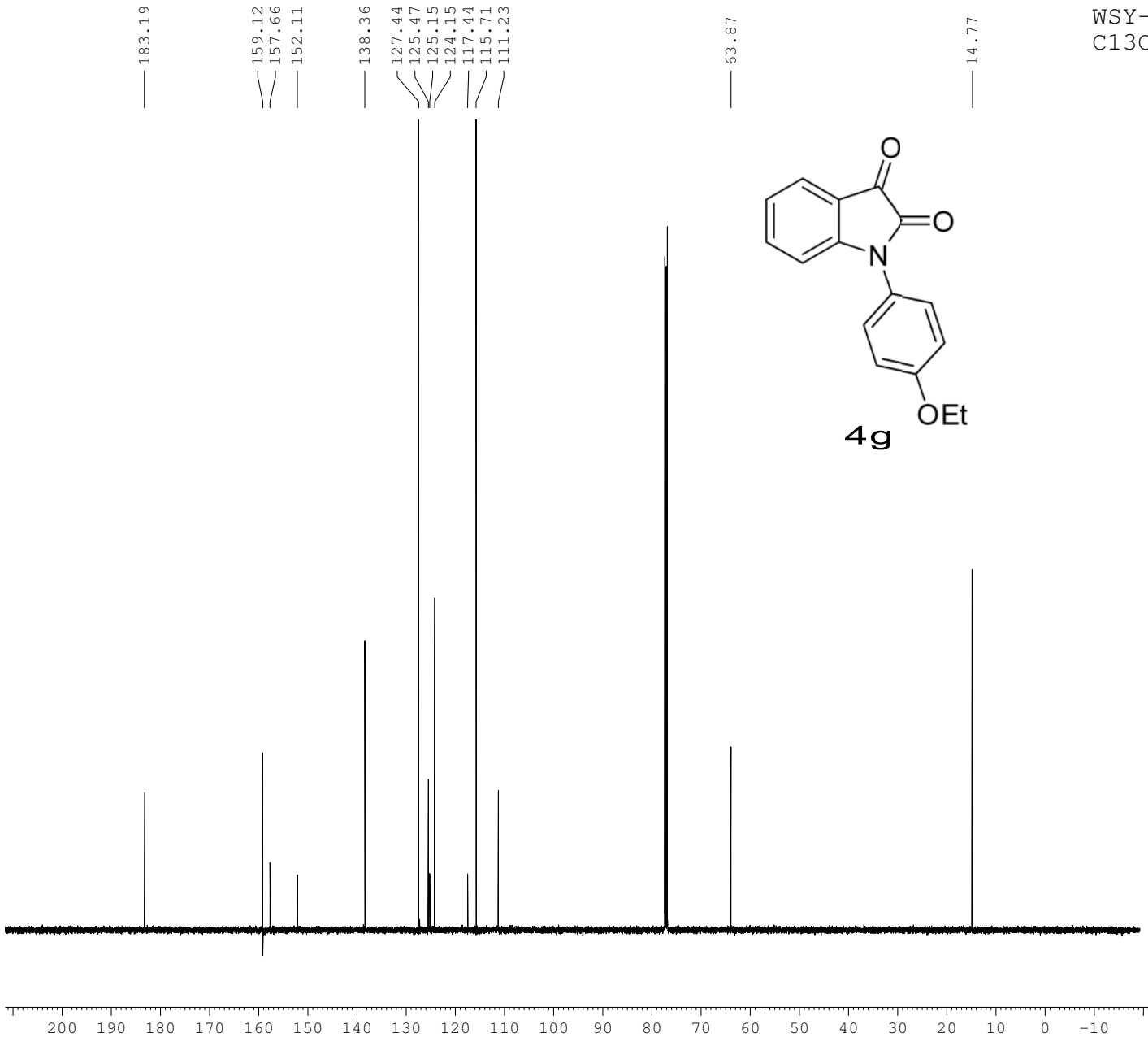
NAME	XB20071203
EXPNO	1
PROCNO	1
Date_	20071203
Time	10.15
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	287.4
DW	48.400 usec
DE	6.00 usec
TE	293.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300116 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



WSY-2-116
C13CPD CDCl3

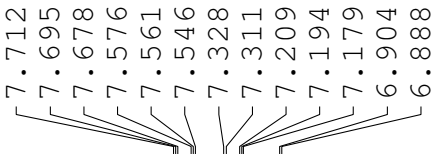
NAME	XB20071203
EXPNO	2
PROCNO	1
Date_	20071203
Time	22.20
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	322.5
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	2.00 dB
PL12	16.50 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

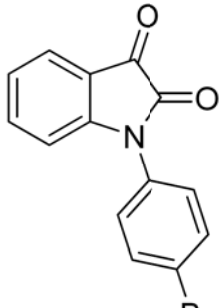




WSY-2-131
C13CPD CDCl3 D:\\ deng 8

NAME	XB20071224
EXPNO	17
PROCNO	1
Date_	20071224
Time	17.57
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	287.4
DW	16.650 usec
DE	6.00 usec
TE	295.8 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	1.00 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	3.50 dB
PL12	18.30 dB
PL13	18.30 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

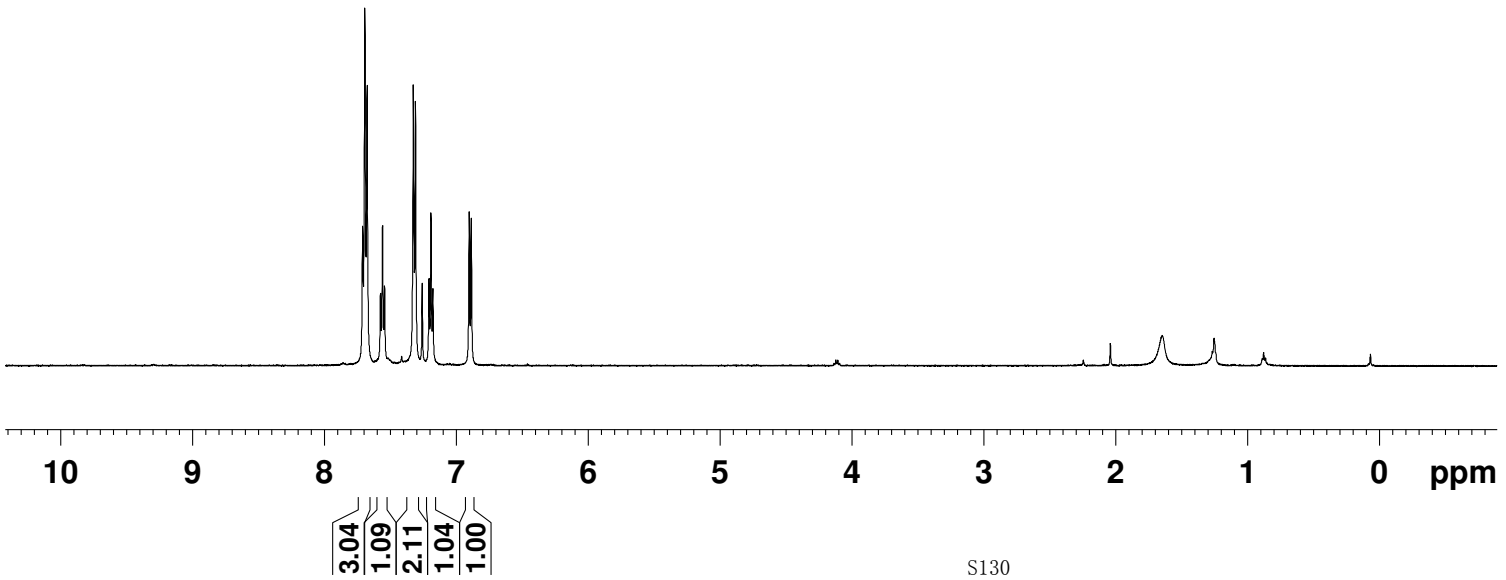


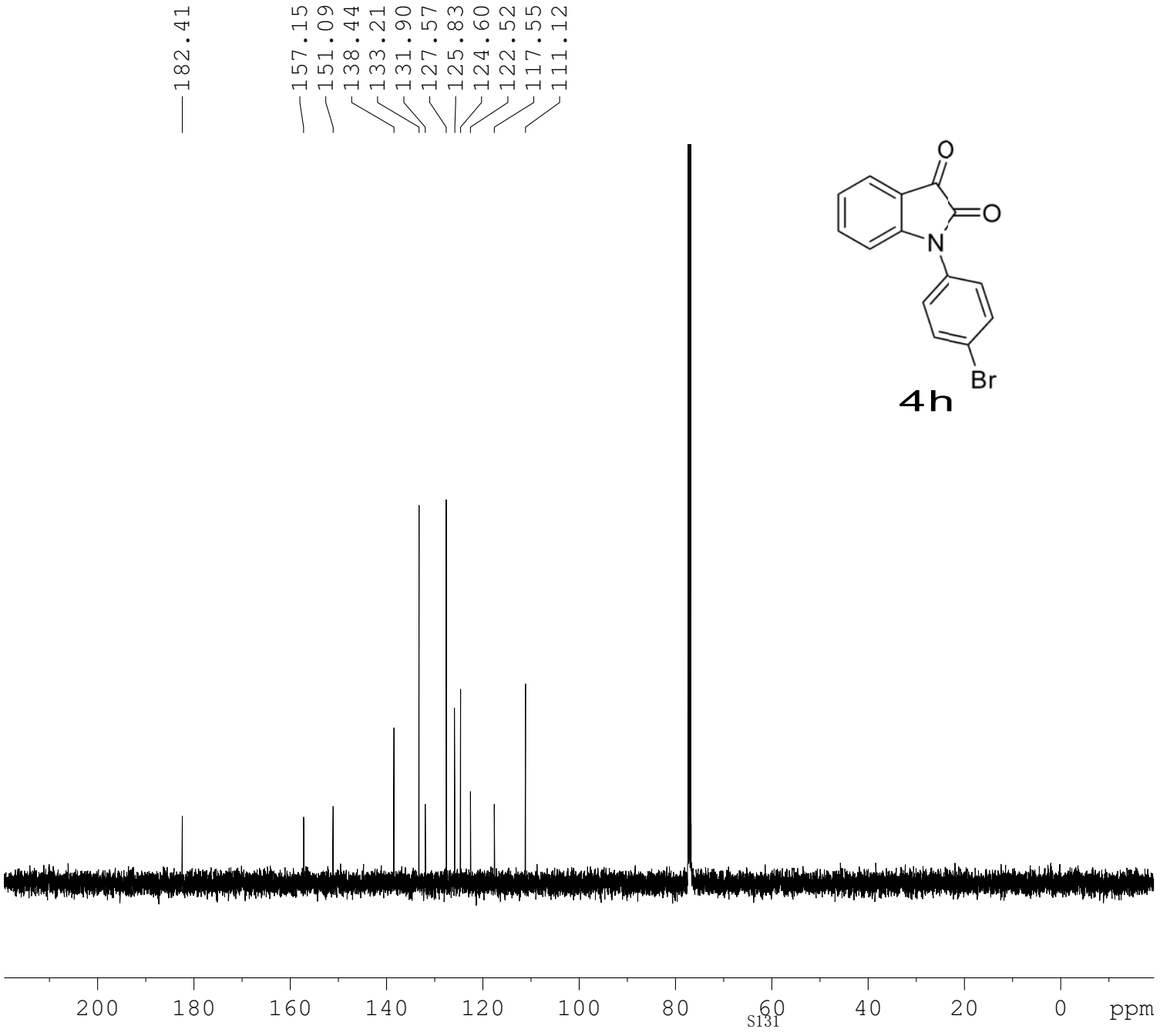


4h

SUNJ-3-49A
PROTON CDCl3 D:\\ deng 25

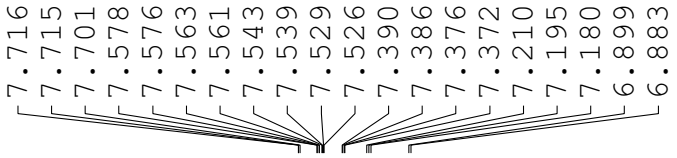
NAME	XB20120605
EXPNO	1
PROCNO	1
Date_	20120605
Time	12.07
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	362
DW	48.400 usec
DE	6.00 usec
TE	295.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300128 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

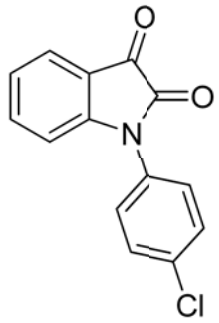




SUNJ-3-49A
C13CPD CDCl3 D:\\ deng 25

NAME	XB20120605
EXPNO	2
PROCNO	1
Date_	20120605
Time	12.22
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	203.2
DW	16.650 usec
DE	6.00 usec
TE	297.1 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

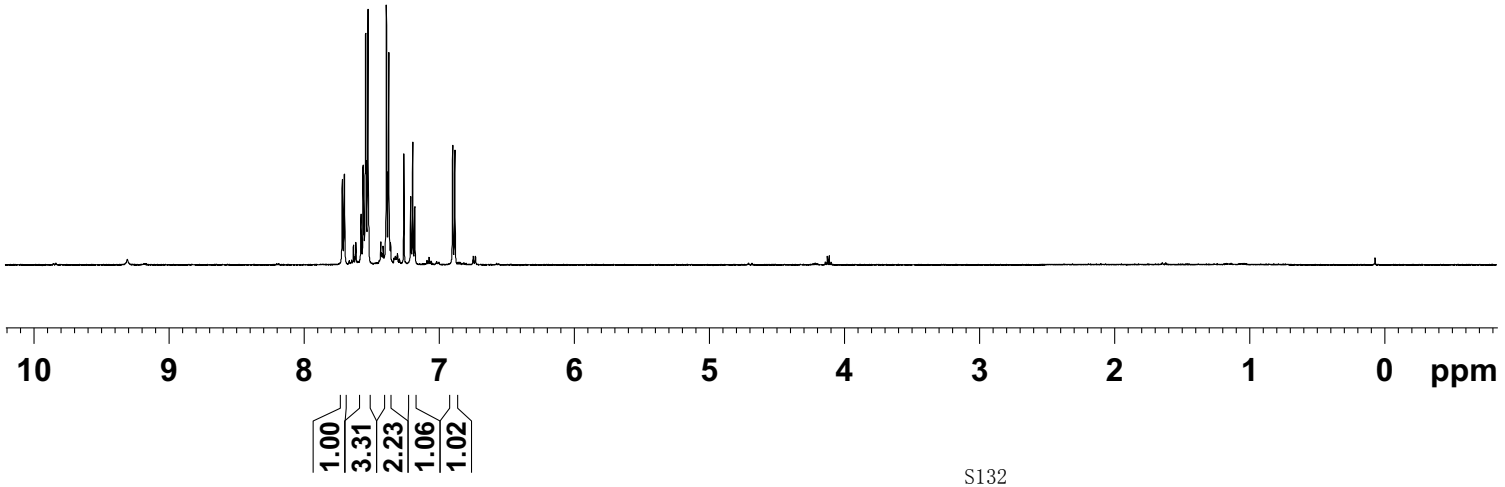


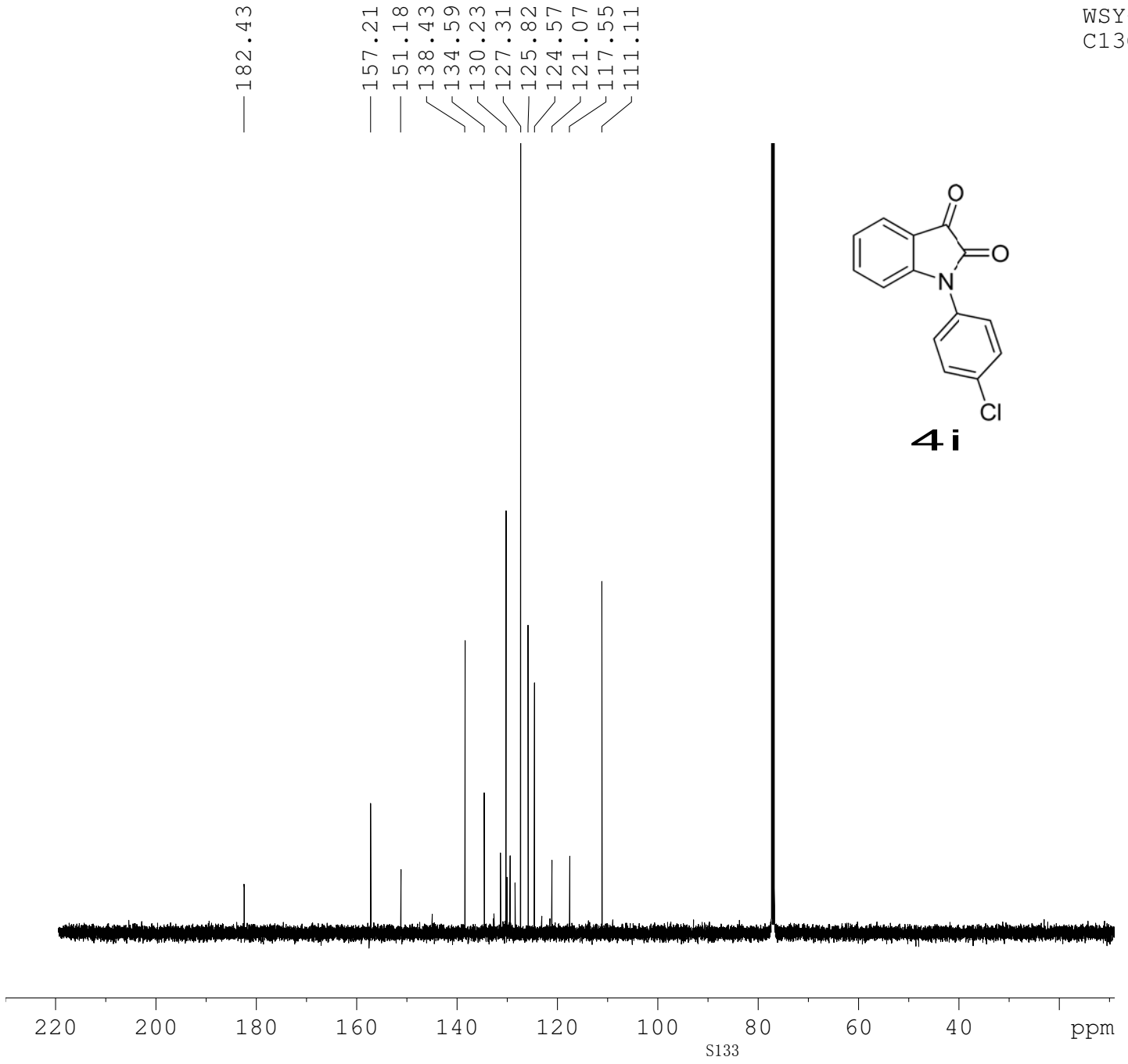


4i

WSY-2-157-6
PROTON CDCl3 D:\\ deng 33

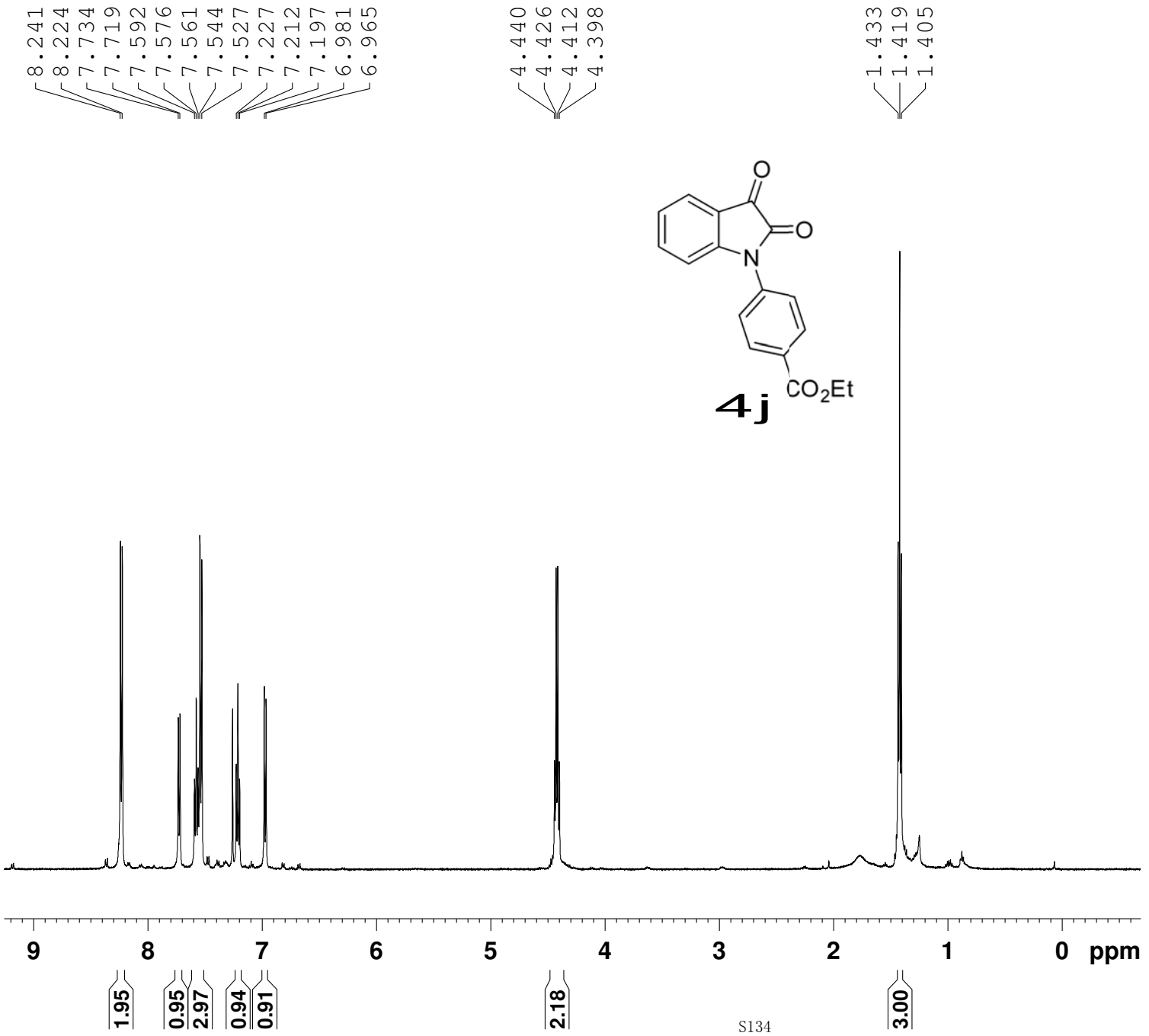
NAME	XB20080222
EXPNO	3
PROCNO	1
Date_	20080222
Time	14.01
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	406.4
DW	48.400 usec
DE	6.00 usec
TE	295.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	14.50 usec
PL1	2.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300130 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





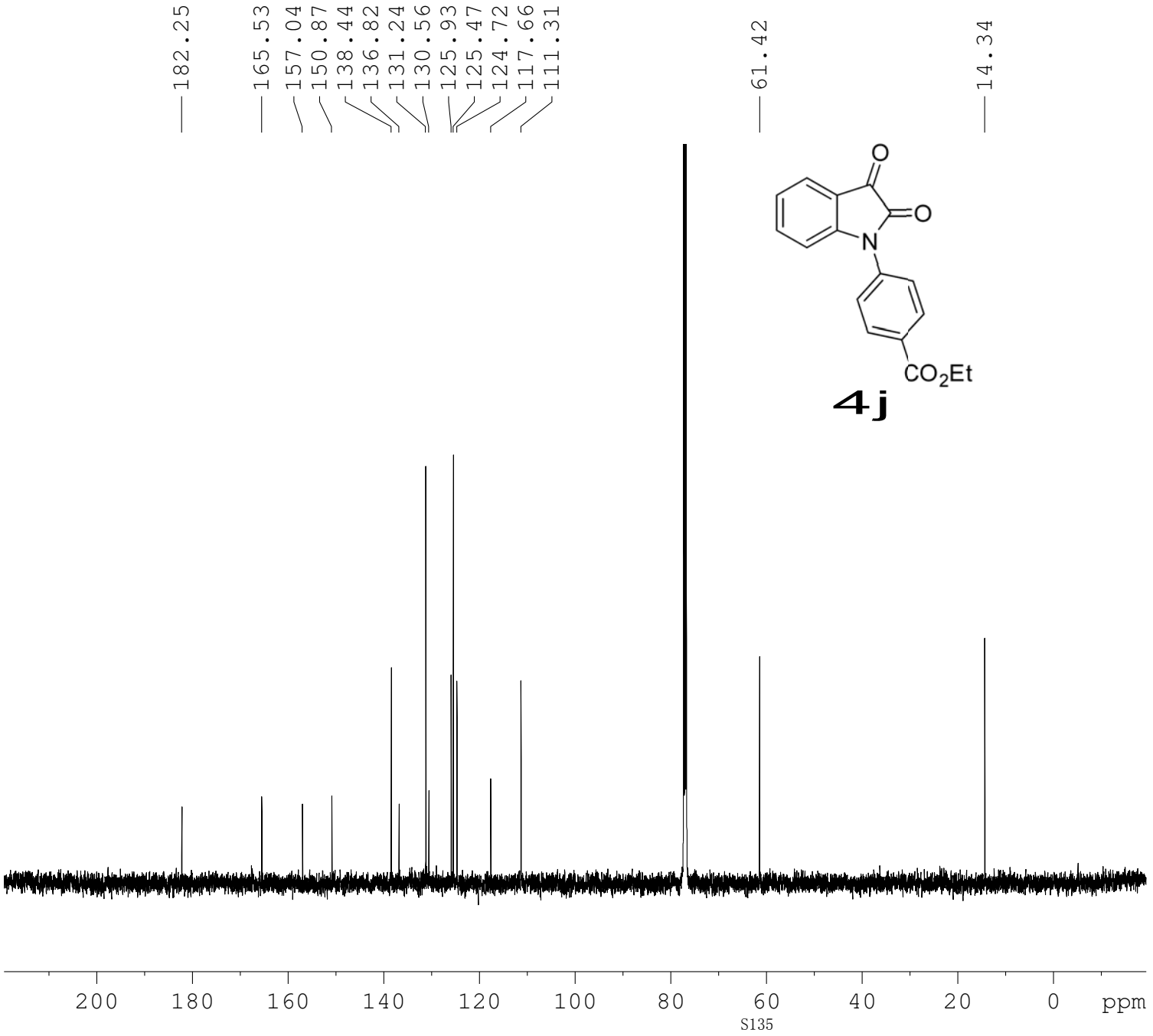
WSY-2-157-6
C13CPD CDCl3 D:\\ deng 4

NAME	XB20080222	
EXPNO	9	
PROCNO	1	
Date_	20080222	
Time	22.10	
INSTRUM	spect	
PROBHD	5 mm PATXO 19F	
PULPROG	zgpg30	
TD	65536	
SOLVENT	CDCl3	
NS	4096	
DS	4	
SWH	30030.029	Hz
FIDRES	0.458222	Hz
AQ	1.0912410	sec
RG	161.3	
DW	16.650	usec
DE	6.00	usec
TE	296.3	K
D1	2.00000000	sec
d11	0.03000000	sec
DELTA	1.89999998	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	13C	
P1	9.50	usec
PL1	-0.50	dB
SFO1	125.7703643	MHz
======== CHANNEL f2 ========		
CPDPRG2	waltz16	
NUC2	1H	
PCPD2	80.00	usec
PL2	2.00	dB
PL12	16.50	dB
PL13	16.50	dB
SFO2	500.1320005	MHz
SI	32768	
SF	125.7577890	MHz
WDW	no	
SSB	0	
LB	0.00	Hz
GB	0	
PC	1.40	



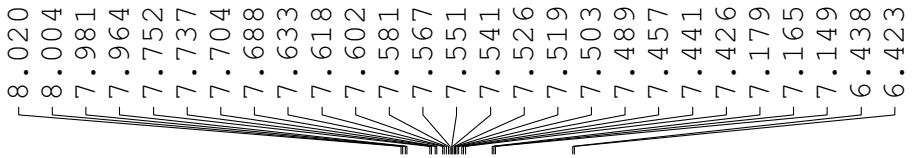
SUNJ-2-166
PROTON CDCl3 D:\\ deng 43

NAME	xb20120331
EXPNO	1
PROCNO	1
Date_	20120331
Time	12.42
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	362
DW	48.400 usec
DE	6.00 usec
TE	294.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300136 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

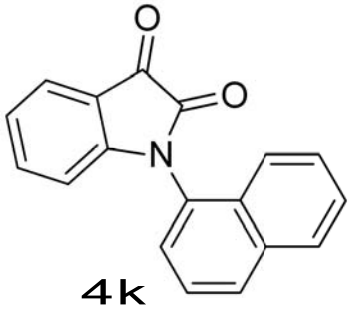


SUNJ-2-166
C13CPD CDCl3 D:\\ deng 2

NAME	SUNJ-2-166
EXPNO	11
PROCNO	1
Date_	20120331
Time	21.02
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	143.7
DW	16.650 usec
DE	6.00 usec
TE	295.9 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	2.00 Hz
GB	0
PC	0.20

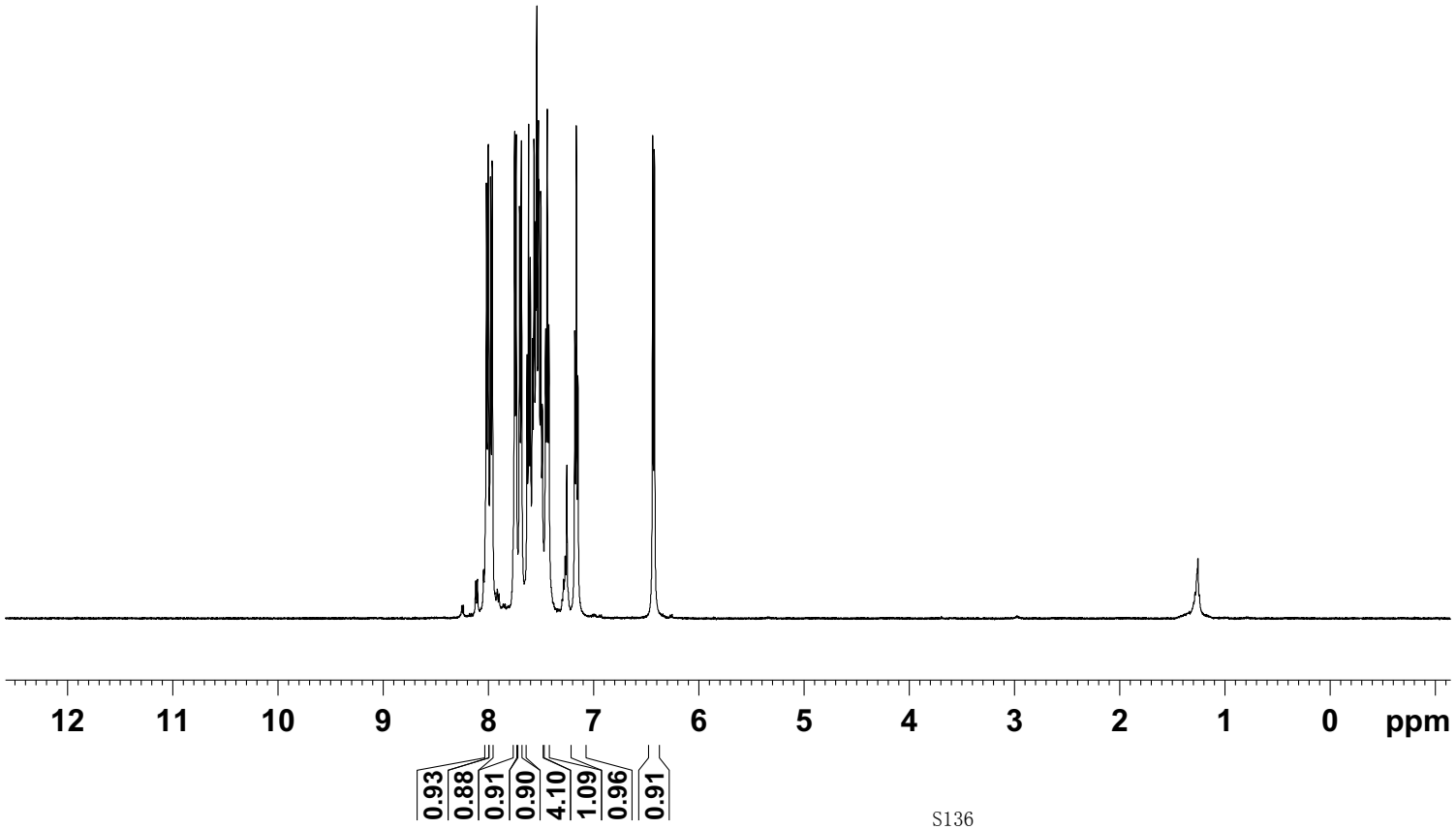


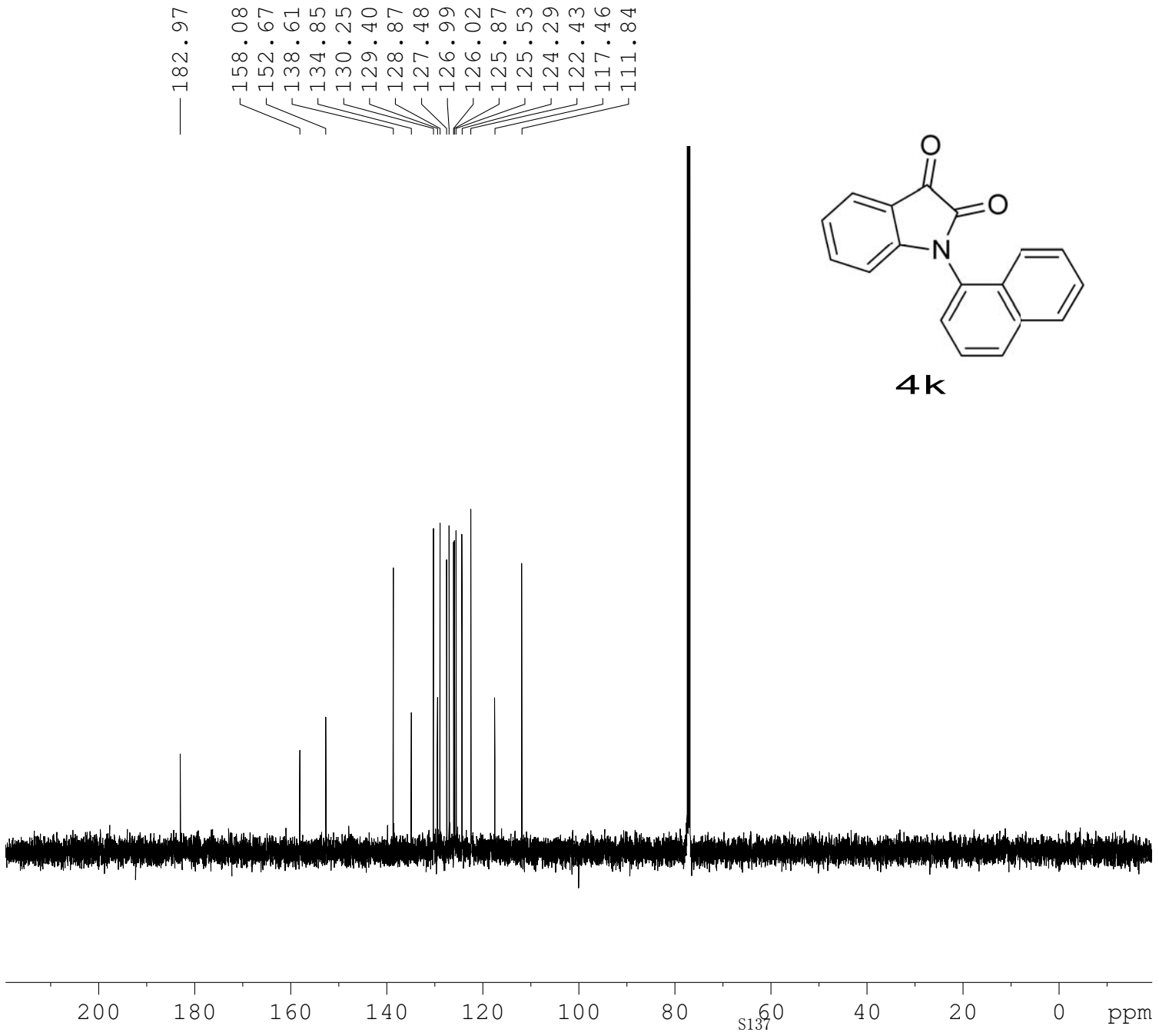
SUNJ-2-165
PROTON CDCl3 D:\\ deng 19



4k

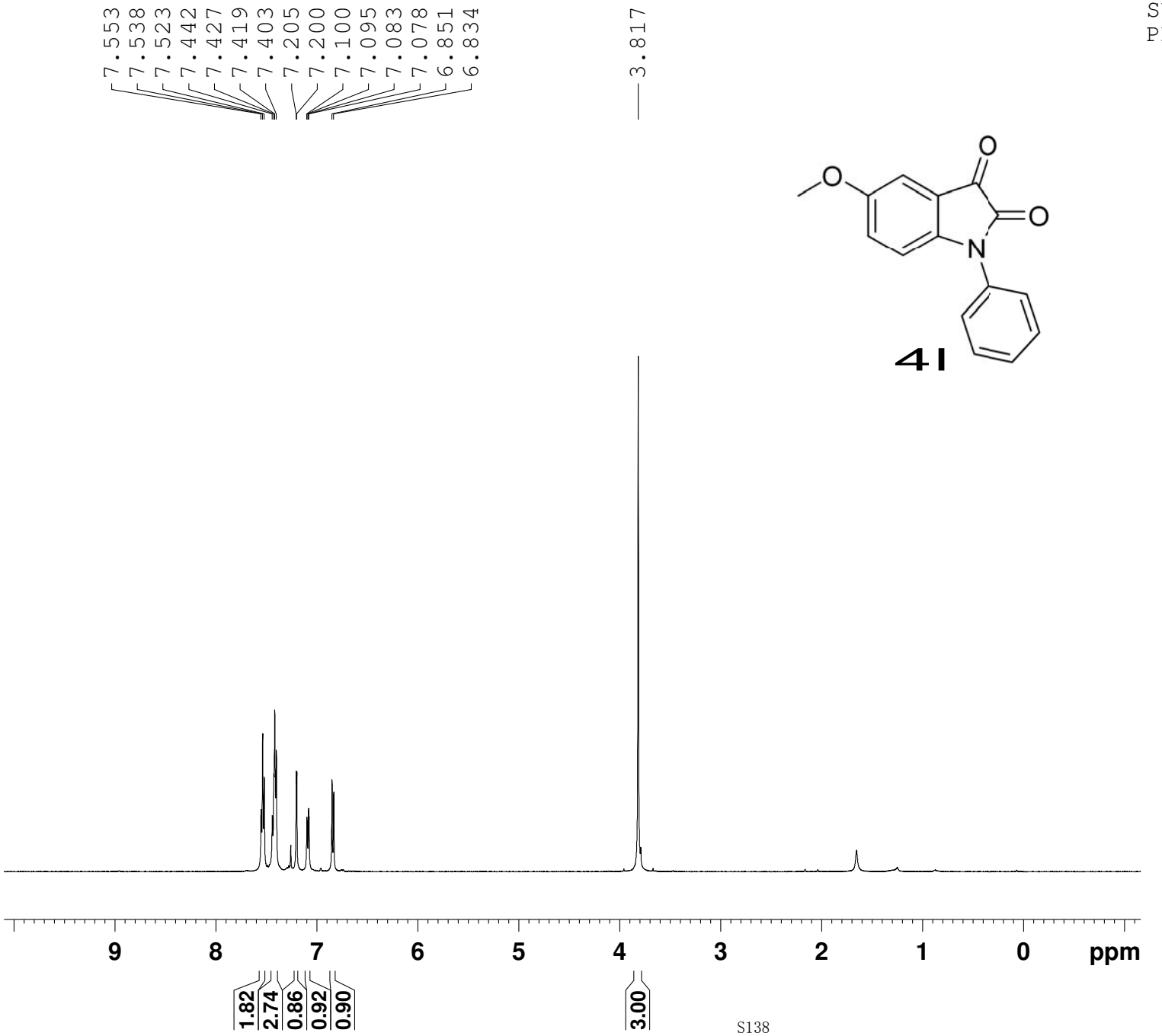
NAME	xb20120401
EXPNO	1
PROCNO	1
Date_	20120401
Time	16.12
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	203.2
DW	48.400 usec
DE	6.00 usec
TE	294.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300147 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





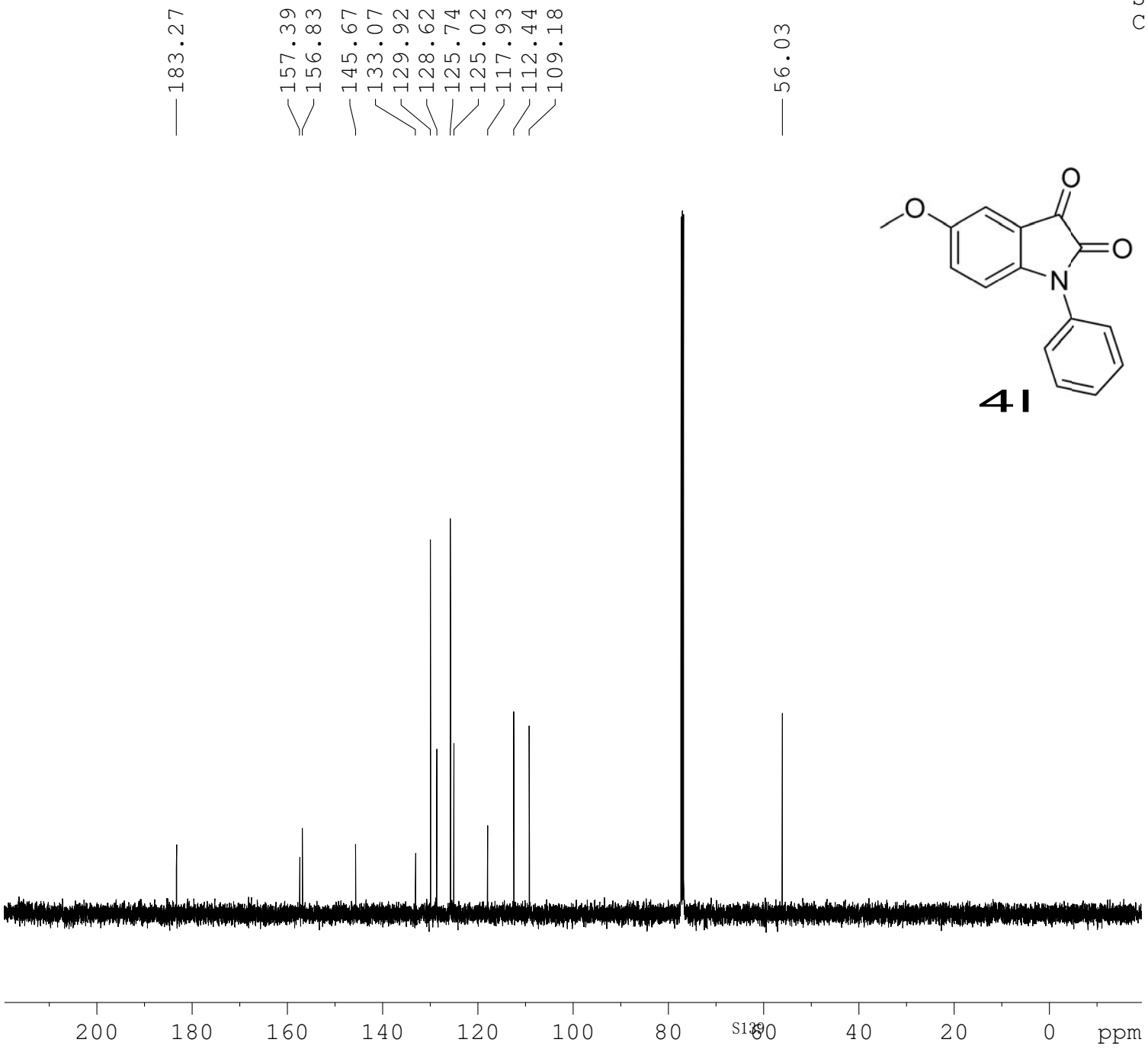
SUNJ-2-165
C13CPD CDCl3 D:\\ deng 19

NAME	xb20120401
EXPNO	3
PROCNO	1
Date_	20120401
Time	16.23
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	322.5
DW	16.650 usec
DE	6.00 usec
TE	295.8 K
D1	2.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



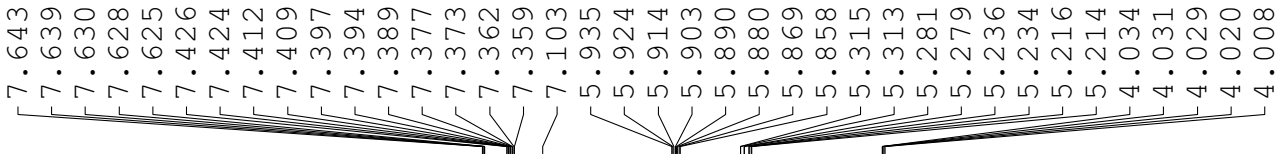
SUNJ-2-153-2
PROTON CDCl3 D:\\ deng 16

NAME	XB20120319
EXPNO	4
PROCNO	1
Date_	20120319
Time	16.45
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	256
DW	48.400 usec
DE	6.00 usec
TE	293.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.70 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300129 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

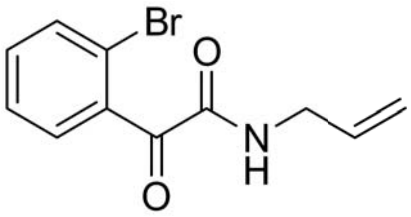


SUNJ-2-153-2
C13CPD CDCl3 D:\\ deng 16

NAME	XB20120319
EXPNO	5
PROCNO	1
Date_	20120319
Time	16.54
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	114
DW	16.650 usec
DE	6.00 usec
TE	568.3 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.33 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

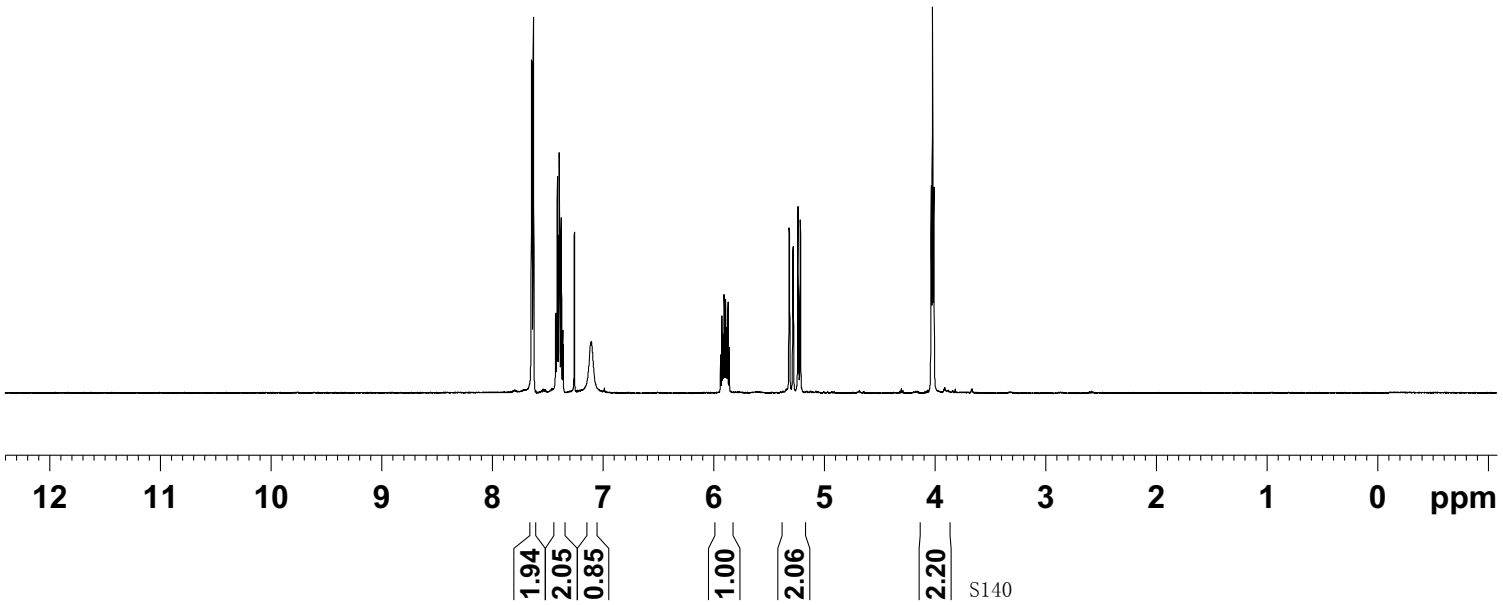


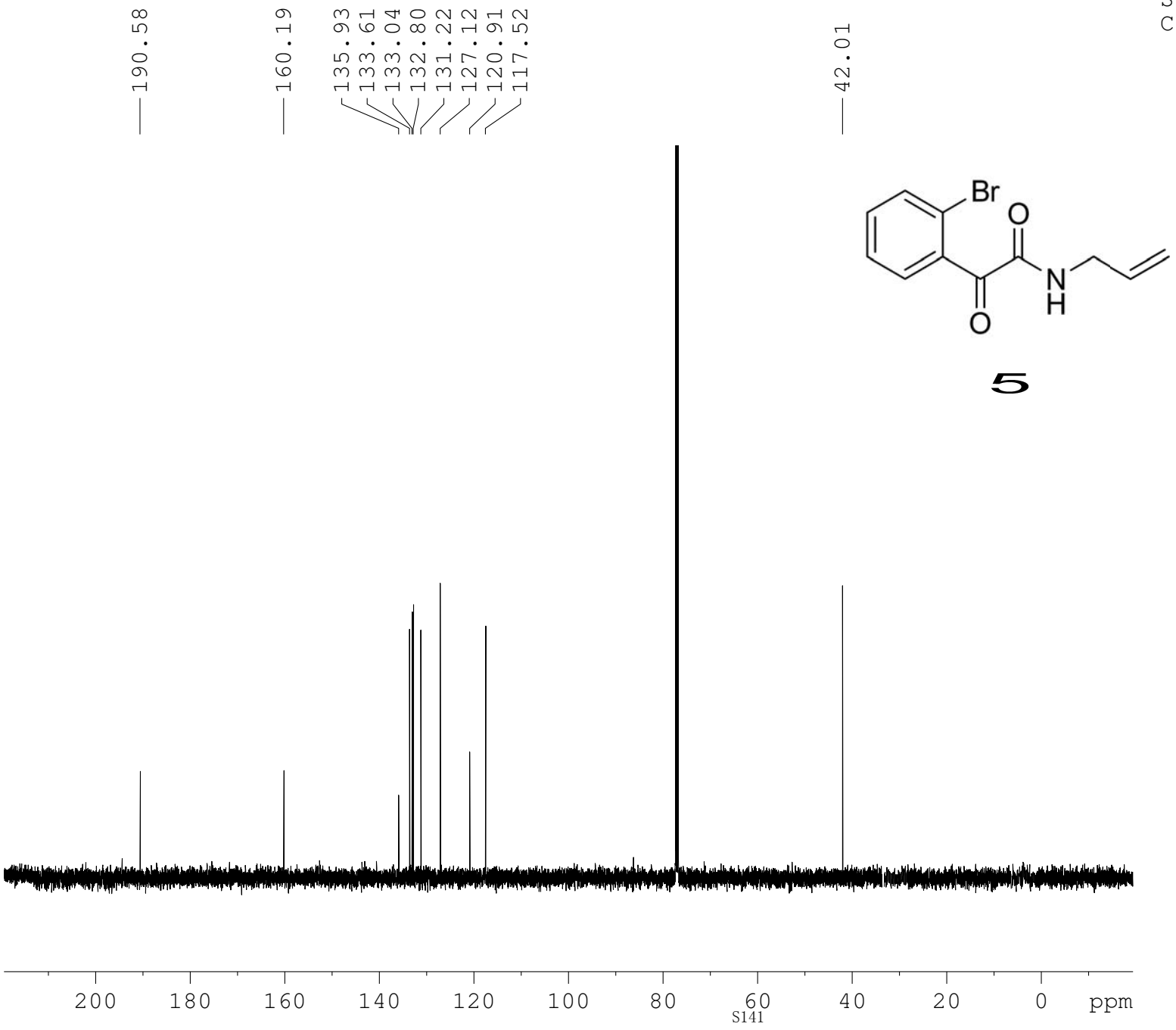
SUNJ-3-36
PROTON CDCl3 D:\\ deng 3



5

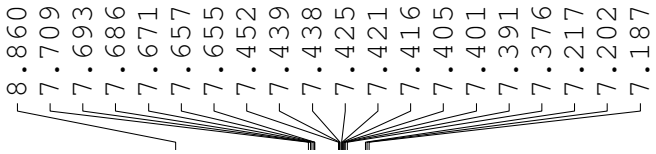
NAME	XB20120518
EXPNO	2
PROCNO	1
Date_	20120518
Time	16.42
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	32
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	228.1
DW	48.400 usec
DE	6.00 usec
TE	296.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300140 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



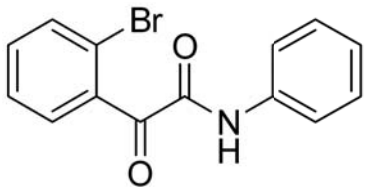


SUNJ-3-43-2
C13CPD CDCl3 D:\\ deng 5

NAME	xb20120525
EXPNO	3
PROCNO	1
Date_	20120525
Time	9.51
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	128
DW	16.650 usec
DE	6.00 usec
TE	295.4 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

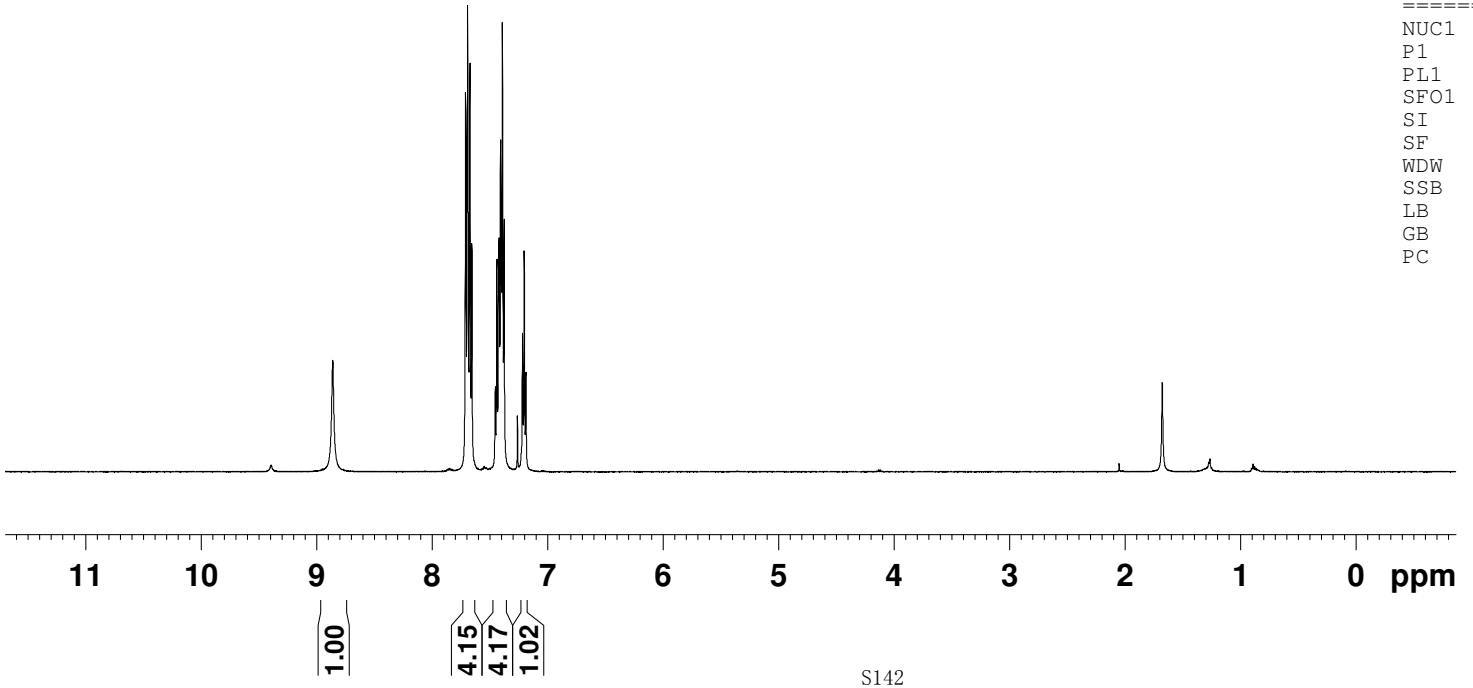


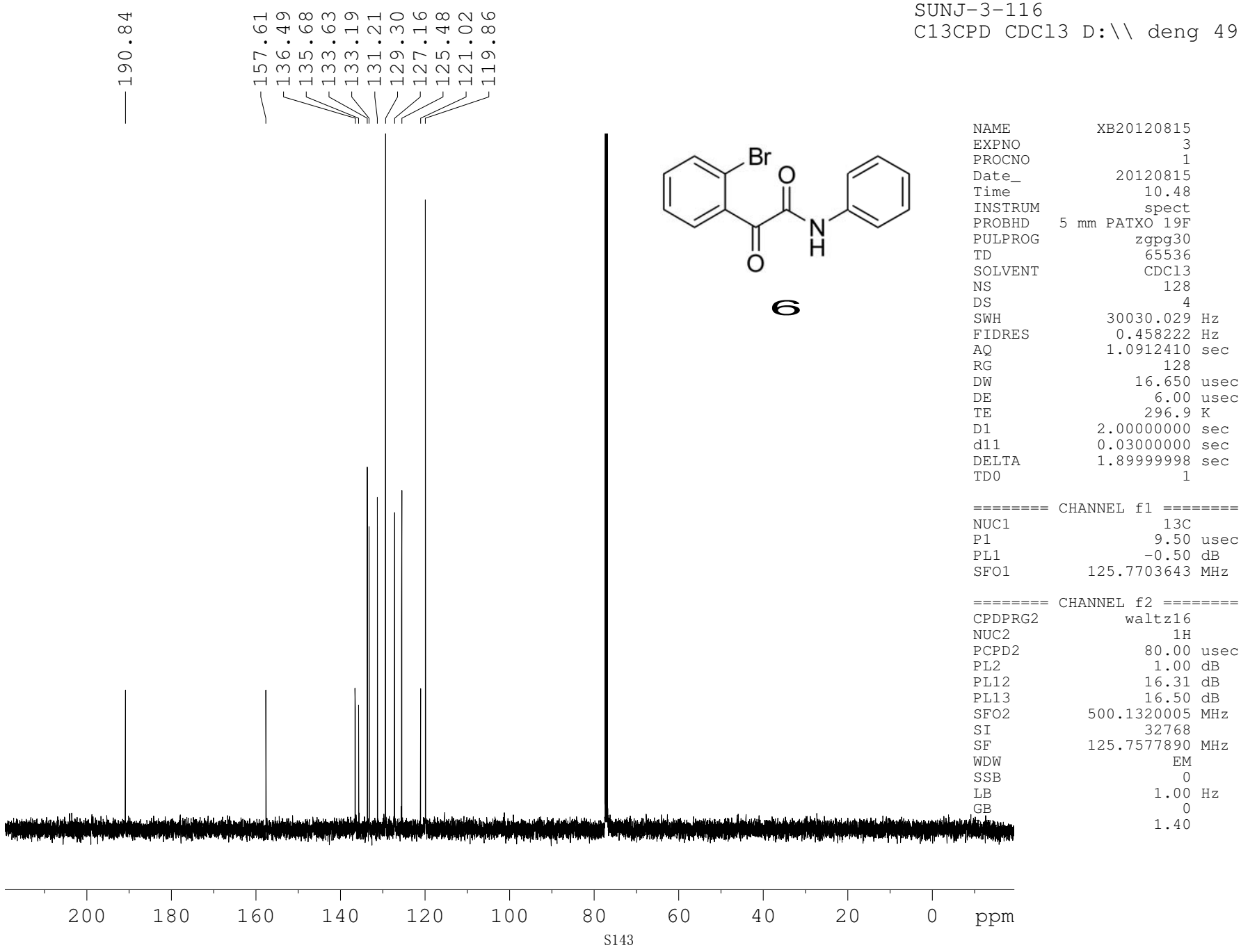
SUNJ-3-116
PROTON CDCl3 D:\\ deng 49



6

NAME	XB20120815
EXPNO	1
PROCNO	1
Date_	20120815
Time	10.39
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	143.7
DW	48.400 usec
DE	6.00 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.72 usec
PL1	1.00 dB
SFO1	500.1330885 MHz
SI	32768
SF	500.1300128 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00





SUNJ-3-116
C13CPD CDCl3 D:\\ deng 49

NAME	XB20120815
EXPNO	3
PROCNO	1
Date_	20120815
Time	10.48
INSTRUM	spect
PROBHD	5 mm PATXO 19F
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	128
DS	4
SWH	30030.029 Hz
FIDRES	0.458222 Hz
AQ	1.0912410 sec
RG	128
DW	16.650 usec
DE	6.00 usec
TE	296.9 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.50 usec
PL1	-0.50 dB
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	1.00 dB
PL12	16.31 dB
PL13	16.50 dB
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
	1.40