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SUPPORTING INFORMATION

Title: One-Pot Dual Substitutions of Bromobenzyl Chloride, 2-Chloromethyl-6-halogenoimidazo[1,2-*a*]pyridine and -[1,2-*b*]pyridazine by Suzuki–Miyaura Cross-Coupling Reactions

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Method A.

Into a dried sealed-tube were introduced, under argon, benzylchloride (0,5 mmol), Na_2CO_3 (1,05 mmol), the corresponding boronic acid (0,6 mmol), *tetrakis*(triphenylphosphine)palladium (0,01 mmol), 2 mL of 1,2-dimethoxyethane and 1 mL of water. The tube was sealed and heated at 100°C for 4 h. After cooling, the resulting mixture was diluted in water and the aqueous layer extracted with CH_2Cl_2. The organic layers were dried with $MgSO_4$, filtered, and evaporated to dryness. The residue was purified by column chromatography.

Method B.

The reaction was carried out as described in Method A using 0,5 mmol of boronic acid.

Method C.

Into a dried sealed-tube were introduced, under argon, (ar)alkyl halide (0,5 mmol), Na_2CO_3 (1,05 mmol), the boronic acid 1 (0,5 mmol), *tetrakis*(triphenylphosphine)palladium (0,01 mmol), 2 mL of 1,2-dimethoxyethane and 1 mL of water. The tube was sealed and heated at 100°C for 4 h. Reaction was followed by TLC. After cooling, the boronic acid 2 (0,5 mmol), and Na_2CO_3 (1,05 mmol) were introduced. The tube was sealed and the mixture refluxed at 100°C for 4h. Reaction was followed by TLC. After cooling, the resulting mixture was diluted in water and the aqueous layer extracted with CH_2Cl_2. The organic layers were dried with $MgSO_4$, filtered, and evaporated to dryness. The residue was purified by column chromatography.

1-benzyl-3-bromobenzene (1). Method A. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a colorless oil (91%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,02 (s, 2H, CH_2), 7,19-7,43 (m, 9H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 42,2 (CH_2), 123,2 (C), 127,0 (CH), 128,2 (CH), 129,3 (2CH), 129,6 (2CH), 129,9 (CH), 130,6 (CH), 132,6 (CH), 140,8 (C), 144,1 (C). Anal. Calcd for $C_{13}H_{11}Br$: C, 63,18; H, 4,49. Found: C, 63,35; H, 4,28.

1-benzyl-4-methoxybenzene (2). Method A. Silica gel, eluting with CH_2Cl_2 to afford a colorless oil (84%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,89 (s, 3H, CH_3), 4,05 (s, 2H, CH_2), 6,96 (d, *J*=8,6 Hz, 2H), 7,23 (d, *J*=8,6 Hz, 2H), 7,25-7,41 (m, 5H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 41,6 (CH_2), 55,7 (CH_3), 114,4 (2CH), 126,5 (CH), 128,9 (2CH), 129,3 (2CH), 130,4 (2CH), 133,8 (C), 142,1 (C), 158,5 (C). In agreement with references [1], [2] and [4].

1-benzyl-3-methoxybenzene (3). Method A. Silica gel, eluting with CH_2Cl_2 to afford a colorless oil (93%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,87 (s, 3H, CH_3), 4,08 (s, 2H, CH_2), 6,86-6,93 (m, 3H), 7,28-7,45 (m, 6H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 42,6 (CH_2), 55,8 (CH_3), 112,0 (CH), 115,5 (CH), 122,1 (CH), 126,8 (CH), 129,2 (2CH), 129,6 (2CH), 130,1 (CH), 141,6 (C), 143,4 (C), 160,4 (C). Anal. Calcd for $C_{14}H_{14}O$: C, 84,81; H, 7,12. Found: C, 84,73; H, 7,01.

1-benzyl-2-methoxybenzene (4). Method A. Silica gel, eluting with CH_2Cl_2 to afford a colorless oil (99%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,89 (s, 3H, CH_3), 4,07 (s, 2H, CH_2), 6,93-7,00 (m, 2H), 7,16 (m, 1H), 7,25-7,41 (m, 6H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,5 (CH_2), 55,9 (CH_3), 111,0 (CH), 121,1 (CH), 126,4 (CH), 128,0 (CH), 128,9 (2CH), 129,6 (2CH), 130,3 (C), 131,0 (CH), 141,7 (C), 158,0 (C). In agreement with references [2] and [3].

1-benzyl-3-nitrobenzene (5). Method A. Silica gel, eluting with petroleum ether to afford a yellow oil (93%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,13 (s, 2H, CH_2), 7,22-7,26 (m, 2H), 7,29-7,35 (m, 2H), 7,38-7,42 (m, 1H), 7,45-7,53 (m, 1H), 7,55-7,59 (m, 1H), 8,10-8,13 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 42,1 (CH_2), 122,0 (CH), 124,3 (CH), 127,4 (CH), 129,5 (2CH), 129,6 (2CH), 130,0 (CH), 135,8 (CH), 140,0 (C), 143,9 (C), 149,0 (C). In agreement with reference [4].

2-benzyl-1,3,5-trimethylbenzene (6). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (99%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 2,39 (s, 6H, CH_3), 2,47 (s, 3H, CH_3), 4,20 (s, 2H, CH_2), 7,07 (s, 2H), 7,18-7,22 (m, 2H), 7,30-7,44 (m, 3H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 20,7 ($2CH_3$), 21,5 (CH_3), 35,3 (CH_2), 126,2 (CH), 128,4 (2CH), 128,9 (2CH), 129,4 (2CH), 134,3 (C), 136,2 (C), 137,5 (2C), 140,6 (C). In agreement with reference [2].

3-benzylthiophene (7). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (95%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,05 (s, 2H, CH_2), 6,97-6,99 (m, 2H), 7,25-7,40 (m, 6H). ^{13}C

NMR ($CDCl_3$, 50 MHz) δ 36,9 (CH_2), 121,7 (CH), 126,1 (CH), 126,6 (CH), 128,9 (3CH), 129,2 (2CH), 141,0 (C), 141,9 (C). In agreement with reference [7].

2-benzylthiophene (8). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (95%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,24 (s, 2H, CH_2), 6,88 (d, *J*=3,4 Hz, 1H), 7,01 (dd, *J*=4,1-3,4 Hz, 1H), 7,22 (m, 1H), 7,28-7,55 (m, 5H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,5 (CH_2), 124,4 (CH), 125,6 (CH), 127,0 (CH), 127,3 (CH), 129,0 (2CH), 129,1 (2CH), 140,9 (C), 144,5 (C). Anal. Calcd for $C_{11}H_{10}S$: C, 75,82; H, 5,78. Found: C, 75,71; H, 5,81.

3-benzylfuran (9). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (87%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,84 (s, 2H, CH_2), 6,30 (m, 1H), 7,23-7,28 (m, 2H), 7,29-7,30 (m, 2H), 7,32-7,36 (m, 2H), 7,42 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 31,8 (CH_2), 111,9 (CH), 124,9 (C), 126,8 (CH), 129,1 (2CH), 129,2 (2CH), 140,2 (CH), 141,0 (C), 143,7 (CH). In agreement with references [5] and [6].

2-benzylfuran (10). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (83%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,05 (s, 2H, CH_2), 6,09 (dd, *J*=3,1-0,8 Hz, 1H), 6,37 (dd, *J*=3,1-1,9 Hz, 1H), 7,30-7,42 (m, 6H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 35,1 (CH_2), 106,9 (CH), 110,9 (CH), 127,1 (CH), 129,1 (2CH), 129,3 (2CH), 138,8 (C), 142,1 (CH), 155,2 (C). In agreement with reference [8].

4-benzylpyridine (11). Method A. Silica gel, eluting with petroleum ether to afford a yellow oil (99%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,99 (s, 2H, CH_2), 7,13 (d, *J*=5,0 Hz, 2H), 7,18-7,21 (m, 1H), 7,22-7,25 (m, 1H), 7,27-7,40 (m, 3H), 8,53 (bs, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 41,8 (CH_2), 124,9 (2CH), 127,3 (CH), 129,3 (2CH), 129,6 (2CH), 139,4 (C), 150,3 (2CH), 150,7 (C). In agreement with references [9] and [10].

3-benzylpyridine (12). Method A. Silica gel, eluting with petroleum ether to afford a yellow oil (94%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,01 (s, 2H, CH_2), 7,19-7,39 (m, 6H), 7,50 (d, *J*=7,8 Hz, 1H), 8,49-8,55 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 39,6 (CH_2), 124,1 (CH), 127,1 (CH), 129,3 (2CH), 129,5 (2CH), 137,0 (CH), 137,1 (C), 140,4 (C), 148,2 (CH), 150,7 (CH). In agreement with reference [4].

3-(4-methylbenzyl)thiophene (13). Method A. Silica gel, eluting with petroleum ether to afford a colorless oil (93%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 2,43 (s, 3H, CH_3), 4,04 (s, 2H, CH_2), 7,04 (m, 2H), 7,25 (bs, 4H), 7,36 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 21,7 (CH_3), 36,8 (CH_2), 121,7 (CH), 126,2 (CH), 129,1 (CH), 129,3 (2CH), 129,8 (2CH), 136,3 (C), 138,2 (C), 142,5 (C). Anal. Calcd for $C_{12}H_{12}S$: C, 76,55; H, 6,42. Found: C, 76,37; H, 6,38.

3-(3-methybenzyl)thiophene (14). Method A. Silica gel, eluting with petroleum ether to afford a yellow oil (90%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 2,46 (s, 3H, CH_3), 4,07 (s, 2H, CH_2), 7,04 (m, 2H), 7,12-7,17 (m, 3H), 7,29-7,34 (m, 1H), 7,35-7,38 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 22,1 (CH_3), 37,2 (CH_2), 121,9 (CH), 126,3 (CH), 126,5 (CH), 127,6 (CH), 129,1 (CH), 129,2 (CH), 130,2 (CH), 138,7 (C), 141,2 (C), 142,3 (C). Anal. Calcd for $C_{12}H_{12}S$: C, 76,55; H, 6,42. Found: C, 76,63; H, 6,35.

3-(2-methybenzyl)thiophene (15). Method A. Silica gel, eluting with petroleum ether to afford a yellow oil (99%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 2,38 (s, 3H, CH_3), 4,07 (s, 2H, CH_2), 6,91 (m, 1H), 7,00 (dd, *J*=4,9-1,3 Hz, 1H), 7,23-7,30 (m, 4H), 7,34 (dd, *J*=4,9-2,9 Hz 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 20,2 (CH_3), 35,0 (CH_2), 121,8 (CH), 126,1 (CH), 126,8 (CH), 127,2 (CH), 129,1 (CH), 130,2 (CH), 131,0 (CH), 137,1 (C), 139,4 (C), 141,5 (C). Anal. Calcd for $C_{12}H_{12}S$: C, 76,55; H, 6,42. Found: C, 76,34; H, 6,50.

3-(4-methoxybenzyl)thiophene (16). Method A. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a colorless oil (93%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,84 (s, 3H, CH_3), 3,98 (s, 2H, CH_2), 6,89 (d, *J*=8,8 Hz, 2H), 6,94-6,97 (m, 2H), 7,18 (d, *J*=8,8 Hz, 2H), 7,28-7,32 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,2 (CH_2), 55,9 (CH_3), 114,5 (2CH), 121,6 (CH), 126,2 (CH), 129,0 (CH), 130,3 (2CH), 133,3 (C), 142,7 (C), 158,6 (C). Anal. Calcd for $C_{12}H_{12}OS$: C, 70,55; H, 5,92. Found: C, 70,80; H, 5,83.

3-(3-methoxybenzyl)thiophene (17). Method A. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a colorless oil (98%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,87 (s, 3H, CH_3), 4,06 (s, 2H, CH_2), 6,86-6,93 (m, 3H), 7,00-7,04 (m, 2H), 7,28-7,36 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 37,2 (CH_2), 55,8 (CH_3), 112,1 (CH), 115,3 (CH), 121,9 (CH), 122,0 (CH), 126,3 (CH), 129,1 (CH), 130,1

(CH), 141,9 (C), 142,9 (C), 160,4 (C). Anal. Calcd for $C_{12}H_{12}OS$: C, 70,55; H, 5,92. Found: C, 70,67; H, 6,04.

3-(2-methoxybenzyl)thiophene (18). Method A. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a colorless oil (92%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,91 (s, 3H, CH_3), 4,06 (s, 2H, CH_2), 6,93-6,97 (m, 2H), 7,01-7,05 (m, 2H), 7,16-7,20 (m, 1H), 7,25-7,34 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 31,2 (CH_2), 56,0 (CH_3), 111,0 (CH), 121,1 (CH), 121,7 (CH), 125,8 (CH), 128,1 (CH), 129,4 (CH), 129,9 (C), 130,7 (CH), 141,9 (C), 157,8 (C). Anal. Calcd for $C_{12}H_{12}OS$: C, 70,55; H, 5,92. Found: C, 70,54, H, 5,69.

3-(4-bromobenzyl)thiophene (19). Method B**.** Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a yellow oil (94%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,00 (s, 2H, CH_2), 6,94-7,00 (m, 2H), 7,13-7,18 (d, *J*=8,2 Hz, 2H), 7,33 (dd, *J*=4,9-3,0 Hz, 1H), 7,46-7,52 (d, *J*=8,3 Hz, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,6 (CH_2), 120,7 (C), 122,1 (CH), 126,6 (CH), 128,9 (CH), 131,2 (2CH), 132,2 (2CH), 140,2 (C), 141,4 (C). Anal. Calcd for $C_{11}H_9BrS$: C, 52,19; H, 3,58. Found: C, 52,37; H, 3,64.

3-(3-bromobenzyl)thiophene (20). Method B. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a yellow oil (93%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,02 (s, 2H, CH_2), 6,97 (dd, *J*=4,9-1,3 Hz, 1H), 7,00 (m, 1H), 7,20-7,24 (m, 2H), 7,34 (dd, *J*=4,9-2,9 Hz, 1H), 7,40-7,44 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,8 (CH_2), 122,3 (CH), 123,2 (C), 126,6 (CH), 128,1 (CH), 129,0 (CH), 130,0 (CH), 130,7 (CH), 132,4 (CH), 141,1 (C), 143,6 (C). Anal. Calcd for $C_{11}H_9BrS$: C, 52,19; H, 3,58. Found: C, 52,01; H, 3,75.

3-(2-bromobenzyl)thiophene (21). Method B. Silica gel, eluting with a mixture of CH_2Cl_2/petroleum ether (50/50) to afford a yellow oil (90%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,17 (s, 2H, CH_2), 7,00-7,02 (m, 2H), 7,10-7,14 (m, 1H), 7,17-7,21 (dd, *J*=6,4-2,3 Hz, 1H), 7,25 (dd, *J*=3,1-1,3 Hz, 1H), 7,30-7,34 (m, 1H), 7,62 (dd, *J*=7,9-1,3 Hz, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 37,3 (CH_2), 122,4 (CH), 125,2 (C), 126,2 (CH), 128,2 (CH), 128,6 (CH), 129,0 (CH), 131,3 (CH), 133,5 (CH), 140,3 (C), 140,7 (C). Anal. Calcd for $C_{11}H_9BrS$: C, 52,19; H, 3,58. Found: C, 52,31; H, 3,49.

6-bromo-2-(thien-3-ylmethyl)imidazo[1,2-*a*]pyridine (22). Method B. Silica gel, eluting with CH_2Cl_2 to afford a white solid (66%). mp 96-97 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,17 (s, 2H, CH_2), 7,05 (dd, *J*=4,9-1,3 Hz, 1H), 7,12 (m, 1H), 7,18 (dd, *J*=9,5-1,9 Hz, 1H), 7,23 (d, *J*=0,6 Hz, 1H), 7,30 (dd, *J*=4,9-2,9 Hz, 1H), 7,44 (d, *J*=9,5 Hz, 1H), 8,15 (dd, *J*=1,9-0,9 Hz, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 30,6 (CH_2), 106,9 (C), 110,5 (CH), 118,2 (CH), 122,2 (CH), 125,9 (CH), 126,2 (CH), 128,0 (CH), 128,9 (CH), 139,7 (C), 144,0 (C), 148,0 (C). Anal. Calcd for $C_{12}H_9BrN_2S$: C, 49,16; H, 3,09; N, 9,55. Found: C, 49,29; H, 3,15; N, 9,75.

6-chloro-2-(thien-3-ylmethyl)imidazo[1,2-*b*]pyridazine (23). Method B. Silica gel, eluting with CH_2Cl_2 to afford a yellow solid (95%). mp 95-96 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,21 (s, 2H, CH_2), 7,02 (d, *J*=9,4 Hz, 1H), 7,05 (dd, *J*=4,9-1,3 Hz, 1H), 7,13 (m, 1H), 7,31 (dd, *J*=4,9-3,0 Hz, 1H), 7,69 (s, 1H), 7,84 (d, *J*=9,4 Hz, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 31,0 (CH_2), 115,4 (CH), 119,1 (CH), 122,5 (CH), 126,5 (CH), 126,8 (CH), 128,9 (CH), 138,0 (C), 139,4 (C), 146,8 (C), 148,4 (C). Anal. Calcd for $C_{11}H_8ClN_3S$: C, 52,91; H, 3,23; N, 16,83. Found: C, 53,02; H, 3,09; N, 16,59.

3-(4-phenylbenzyl)thiophene (24). Method C. Silica gel, eluting with petroleum ether to afford a white solid (76%). mp 65-66 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,13 (s, 2H, CH_2), 7,06 (m, 2H), 7,35-7,72 (m, 10H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,7 (CH_2), 121,8 (CH), 126,2 (CH), 127,5 (2CH), 127,6 (CH), 127,7 (2CH), 129,0 (CH), 129,3 (2CH), 129,7 (2CH), 139,6 (CH), 140,2 (C), 141,5 (C), 141,8 (C). Anal. Calcd for $C_{17}H_{14}S$: C, 81,56; H, 5,64. Found: C, 81,71; H, 5,66.

3-(4-(4-methoxybenzyl)phenyl)thiophene (25). Method C. Silica gel, eluting with CH_2Cl_2/petroleum ether (10/90) to afford a white solid (58%). mp 107-108 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,86 (s, 3H, CH_3), 4,02 (s, 2H, CH_2), 6,92 (d, *J*=8,6 Hz, 2H), 7,21 (d, *J*=8,6 Hz, 2H), 7,28 (d, *J*=8,2 Hz, 2H), 7,44 (m, 2H), 7,47 (dd, *J*=4,3-2,1 Hz, 1H), 7,59 (d, *J*=8,2 Hz, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 41,2 (CH_2), 55,7 (CH_3), 114,4 (2CH), 120,3 (CH), 126,6 (CH), 126,8 (CH), 127,0 (2CH), 129,7 (2CH), 130,3 (2CH), 133,6 (C), 134,1 (C), 141,0 (C), 142,6 (C), 158,5 (C). Anal. Calcd for $C_{18}H_{16}OS$: C, 77,11; H, 5,75. Found: C, 77,18; H, 5,59.

3-(trifluoromethyl)-4'-(2,4,6-trimethylbenzyl)biphenyl (26). Method C. Silica gel, eluting with petroleum ether to afford a yellow oil (68%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 2,35 (s, 6H, $2CH_3$), 2,42 (s, 3H, CH_3), 4,18 (s, 2H, CH_2), 7,04 (s, 2H), 7,22 (d, *J*=8,4 Hz, 2H), 7,55 (d, *J*=8,4 Hz, 2H), 7,62-7,70 (m, 2H), 7,82 (m, 1H), 7,92 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 20,6 ($2CH_3$), 21,4 (CH_3), 34,9 (CH_2), 122,0-127,4 (q, *J*=270-31 Hz, CF_3), 124,2 (m, 2CH), 127,6 (2CH), 129,0 (2CH), 129,5 (2CH), 129,6 (CH), 130,7 (CH), 131,6 (d, *J*=32 Hz, C), 134,0 (C), 136,3 (C), 137,5 (2C), 137,7 (C), 140,7 (C), 142,3 (C). Anal. Calcd for $C_{23}H_{21}F_3$: C, 77,95; H, 5,97. Found: C, 78,08; H, 5,97.

3-(4-benzylphenyl)furan (27). Method C. Silica gel, eluting with petroleum ether to afford a colorless oil (53%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,06 (s, 2H, CH_2), 6,74 (dd, *J*=1,9-0,9 Hz, 1H), 7,24-7,36 (m, 7H), 7,48 (d, *J*=8,2 Hz, 2H), 7,52 (dd, *J*=1,9-1,5 Hz, 1H), 7,76 (dd, *J*=1,5-0,9 Hz, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 42,1 (CH_2), 109,3 (CH), 126,4 (2CH), 126,6 (CH), 126,7 (C), 129,0 (2CH), 129,4 (2CH), 129,8 (2CH), 130,7 (C), 138,7 (CH), 140,4 (C), 141,5 (C), 144,0 (CH). Anal. Calcd for $C_{17}H_{14}O$: C, 87,15; H, 6,02. Found: C, 87,10; H, 6,23.

3-(4-(fur-2-yl)benzyl)thiophene (28). Method C. Silica gel, eluting with petroleum ether to afford a white solid (58%). mp 88-89 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,04 (s, 2H, CH_2), 6,51 (dd, *J*=3,4-1,8 Hz, 1H), 6,66 (dd, *J*=3,4-0,7 Hz, 1H), 6,95-7,00 (m, 2H), 7,25-7,30 (m, 2H), 7,31 (dd, *J*=4,9-3,1, 1H); 7,50 (dd, *J*=1,8-0,7 Hz, 1H), 7,62-7,69 (d, *J*=8,4 Hz, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,7 (CH_2), 105,0 (CH), 112,0 (CH), 121,7 (CH), 124,4 (2CH), 126,1 (CH), 128,8 (CH), 129,4 (C), 129,5 (2CH), 140,2 (C), 141,7 (C), 142,3 (CH), 154,4 (C). Anal. Calcd for $C_{15}H_{12}OS$: C, 74,97; H, 5,03. Found: C, 74,87; H, 4,99.

3-(3-(3-methoxybenzyl)phenyl)thiophene (29). Method C. Silica gel, eluting with petroleum ether to afford a colorless oil (81%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,82 (s, 3H, CH_3), 4,04 (s, 2H, CH_2), 6,78-6,82 (m, 2H), 6,86 (m, 1H), 7,16 (m, 1H), 7,24 (m, 1H), 7,33 (m, 1H), 7,40-7,42 (m, 2H), 7,44-7,51 (m, 3H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 42,6 (CH_2), 55,8 (CH_3), 111,9 (CH), 115,4 (CH), 120,9 (CH), 122,0 (CH), 125,0 (CH), 126,7 (CH), 127,0 (CH), 127,7 (CH), 128,4 (CH), 129,5 (CH), 130,1 (CH), 136,6 (C), 142,0 (C), 142,9 (C), 143,1 (C), 160,3 (C). Anal. Calcd for $C_{18}H_{16}OS$: C, 77,11; H, 5,75. Found: C, 77,08; H, 5,87.

3-(3-(4-fluorophenyl)benzyl)furan (30). Method C. Silica gel, eluting with petroleum ether to afford a yellow oil (78%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,88 (s, 2H, CH_2), 6,32 (m, 1H), 7,16 (t, J=8,9 Hz, 2H), 7,22-7,30 (m, 2H), 7,40-7,43 (m, 4H), 7,56 (q, *J*=8,9 Hz, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 31,8 (CH_2), 111,8 (CH), 116,2 (d, *J*=21 Hz, 2CH), 125,5 (CH), 127,9 (CH), 128,1 (CH), 129,3 (d, *J*=8 Hz, 2CH), 129,5 (CH), 132,1 (C), 137,8 (C), 140,2 (CH), 141,0 (C), 141,5 (C), 143,8 (CH), 163,0 (d, *J*=245 Hz, C). Anal. Calcd for $C_{17}H_{13}FO$: C, 80,93; H, 5,19. Found: C, 80,76; 5,24.

6-phenyl-2-(thien-3-ylmethyl)imidazo[1,2-*a*]pyridine (31). Method C. Silica gel, eluting with CH_2Cl_2 to afford a white solid (74%). mp 83-84 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,22 (s, 2H, CH_2), 7,10 (dd, *J*=4,9-1,3 Hz, 1H), 7,16 (m, 1H), 7,29-7,33 (m, 2H), 7,38-7,58 (m, 6H), 7,63 (d, *J*=9,3 Hz, 1H), 8,18 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 30,9 (CH_2), 110,8 (CH), 117,6 (CH), 122,3 (CH), 123,4 (CH), 125,6 (CH), 126,2 (CH), 127,0 (C), 127,5 (2CH), 128,4 (CH), 129,2 (CH), 129,7 (2CH), 138,0 (C), 140,3 (C), 145,1 (C), 147,8 (C). Anal. Calcd for $C_{18}H_{14}N_2S$: C, 74,45; H, 4,86; N, 9,65. Found: C, 74,51; H, 4,79; N, 9,72.

2-(fur-3-ylmethyl)-6-(thien-3-yl)imidazo[1,2-*a*]pyridine (32). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a colorless oil (65%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,00 (s, 2H, CH_2), 6,42 (m, 1H), 7,31 (dd, *J*=3,9-2,1 Hz, 1H), 7,33 (m, 1H), 7,38-7,47 (m, 5H), 7,59 (d, *J*=9,3 Hz, 1H), 8,24 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 25,6 (CH_2), 110,6 (CH), 112,0 (CH), 117,6 (CH), 121,2 (CH), 122,1 (C), 122,7 (CH), 123,1 (C), 125,2 (CH), 126,3 (CH), 127,6 (CH), 138,8 (C), 140,5 (CH), 143,6 (CH), 145,0 (C), 147,6 (C). Anal. Calcd for $C_{16}H_{12}N_2OS$: C, 68,55; H, 4,31; N, 9,99. Found: C, 68,51; H, 4,25; N, 10,12.

2-benzyl-6-(thien-3-yl)imidazo[1,2-*a*]pyridine (33). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a colorless oil (62%). ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,19 (s, 2H, CH_2), 7,23 (s, 1H), 7,26-7,48 (m, 9H), 7,58 (d, *J*=9,3 Hz, 1H), 8,18 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,3 (CH_2), 110,9 (CH), 117,6 (CH), 121,1 (CH), 122,1 (C), 122,7 (CH), 125,1 (CH), 126,3 (CH), 127,0 (CH), 127,6 (CH), 129,2

(2CH), 129,6 (2CH), 138,8 (C), 140,1 (C), 145,0 (C), 148,3 (C). Anal. Calcd for $C_{18}H_{14}N_2S$: C, 74,45; H, 4,86; N, 9,65. Found: C, 74,36; H, 4,90; N, 9,70.

2-(4-fluorobenzyl)-6-(4-methoxyphenyl)imidazo[1,2-*a*]pyridine (34). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a white solid (48%). mp 116-117 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,87 (s, 3H, OCH_3), 4,15 (s, 2H, CH_2), 6,99-7,07 (m, 4H), 7,26 (s, 1H), 7,29-7,39 (m, 3H), 7.46 (d, *J*=8.5 Hz, 2H), 7,59 (d, *J*=9,2 Hz, 1H), 8,13 (m, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 35,4 (CH_2), 56,0 (CH_3) 110,8 (CH), 115,1 (2CH), 115,8 (d, *J*=21 Hz, 2CH), 117,4 (CH), 122,7 (CH), 125,7 (CH), 126,8 (C), 128,5 (2CH), 130,3 (C), 131,0 (d, *J*=8 Hz, 2CH), 135,9 (d, *J*=3 Hz, C), 145,0 (C), 147,9 (C), 160,1 (C), 162,1 (d, *J*=242 Hz, C). Anal. Calcd for $C_{21}H_{17}FN_2O$: C, 75,89; H, 5,16; N, 8,43. Found: C, 75,93; H, 5,07; N, 8,43.

2-(fur-3-ylmethyl)-6-(thien-3-yl)imidazo[1,2-*b*]pyridazine (35). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a white solid (48%). mp 83-84 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,01 (s, 2H, CH_2), 6,41 (s, 1H), 7,35 (d, *J*=9,5 Hz, 1H), 7,41-7,47 (m, 3H), 7,67 (dt, *J*=5-0.9 Hz, 1H), 7,72 (s, 1H), 7,82-7,88 (m, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 25,9 (CH_2), 111,9 (CH), 115,0 (CH), 116,5 (CH), 122,8 (C), 125,1 (CH), 125,4 (CH), 126,5 (CH), 127,6 (CH), 138,5 (C), 138,6 (C), 140,5 (CH), 143,7 (CH), 147,5 (C), 148,1 (C). Anal. Calcd for $C_{15}H_{11}N_3OS$: C, 64,04; H, 3,94; N, 14,94. Found: C, 64,20; H, 3,89; N, 14,86.

2-benzyl-6-(thien-3-yl)imidazo[1,2-*b*]pyridazine (36). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a white solid (49%). mp 109-110 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,23 (s, 2H, CH_2), 7,27-7,41 (m, 6H), 7,46 (dd, *J*=5,1-2,9 Hz, 1H), 7.68 (s, 1H), 7,69 (dd, *J*=5.1-1.3 Hz, 1H), 7,86 (dd, *J*=2,9-1,3 Hz, 1H), 7,90 (d, *J*=9,4 Hz, 1H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 36,6 (CH_2), 115,3 (CH), 116,5 (CH), 125,0 (CH), 125,4 (CH), 126,5 (CH), 127,1 (CH), 127,5 (CH), 129,2 (2CH), 129,6 (2CH), 138,6 (C), 138,7 (C), 139,8 (C), 148,1 (C), 148,3 (C). Anal. Calcd for $C_{17}H_{13}N_3S$: C, 70,08; H, 4,50; N, 14,42. Found: C, 70,18; H, 4,53; N, 14,27.

2-(4-fluorobenzyl)-6-(4-methoxyphenyl)imidazo[1,2-*b*]pyridazine (37). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a white solid (62%). mp 123-124 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 3,88 (s, 3H, CH_3), 4,17 (s, 2H, CH_2), 7.03 (t, *J*=8.6 Hz, 2H), 7.02 (d, *J*=8.9 Hz, 2H), 7.32 (d, *J*=8.6-5.5 Hz, 2H), 7,40 (d, *J*=9,5 Hz, 1H), 7,69 (s, 1H), 7.87 (m, 1H), 7,88 (d, *J*=8.9 Hz, 2H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 35,7 (CH_2), 56,0 (CH_3) 115,0 (2CH), 115,1 (CH), 115,9 (d, *J*=21 Hz, 2CH), 116,4 (CH), 125,3 (CH), 128,6 (C), 128,8 (2CH), 131,0 (d, *J*=8 Hz, 2CH), 135,6 (d, *J*=3 Hz, C), 138,7 (C), 147,8 (C), 151,6 (C), 161,7 (C), 162,2 (d, *J*=242 Hz, C). Anal. Calcd for $C_{20}H_{16}FN_3O$: C, 72,06; H, 4,84; N, 12,61. Found: C, 72,10; H, 4,79; N, 12,80.

2-(fur-3-ylmethyl)-6-phenylimidazo[1,2-*b*]pyridazine (38). Method C. Neutral alumina, eluting with CH_2Cl_2 to afford a white solid (58%). mp 84-85 °C. ^{1}H NMR ($CDCl_3$, 200 MHz) δ 4,05 (s, 2H, CH_2), 6,44 (s, 1H), 7,44 (m, 1H), 7,48 (d, *J*=9,6 Hz, 1H), 7,52-7,59 (m, 4H), 7,81 (s, 1H), 7,94-7,98 (m, 3H). ^{13}C NMR ($CDCl_3$, 50 MHz) δ 25,9 (CH_2), 111,9 (CH), 115,1 (CH), 116,6 (CH), 122,8 (C), 125,4 (CH), 127,5 (2CH), 129,6 (2CH), 130,5 (CH), 136,3 (C), 138,7 (C), 140,5 (CH), 143,7 (CH), 147,7 (C), 152,0 (C). Anal. Calcd for $C_{17}H_{13}N_3O$: C, 74,17; H, 4,76; N, 15,26. Found: C, 74,22; H, 4,69; N, 15,27.

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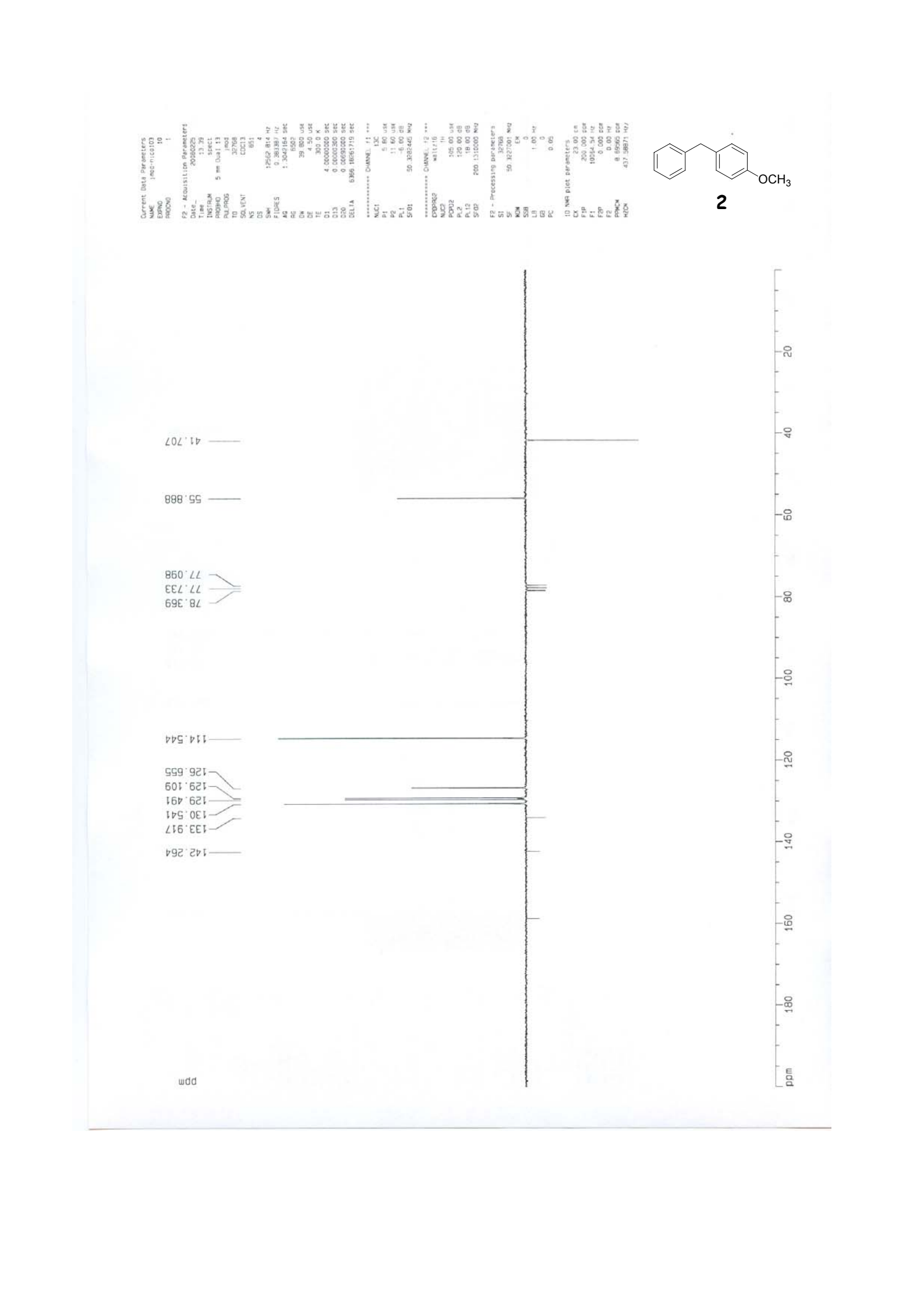
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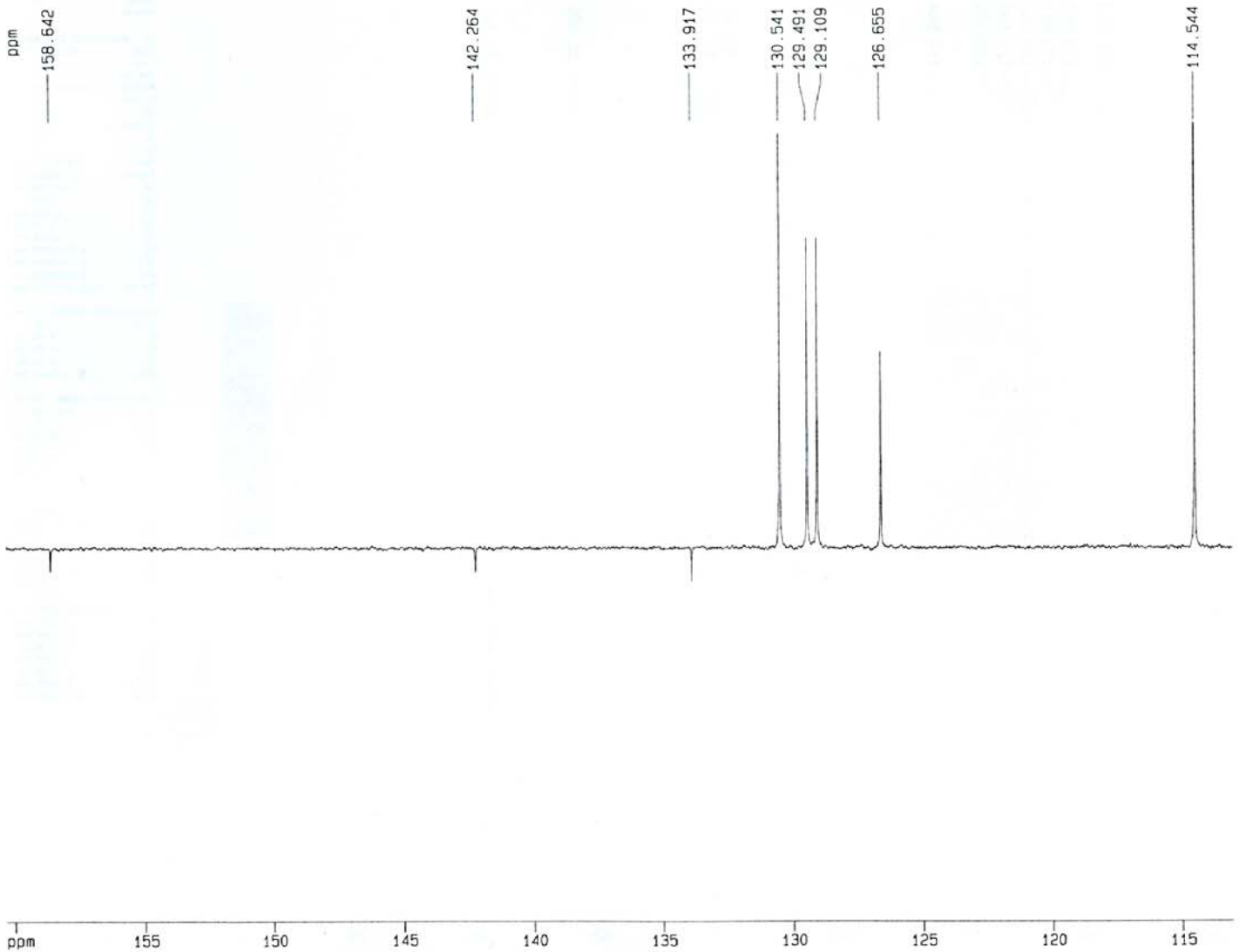


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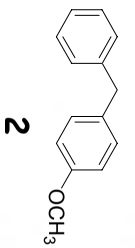

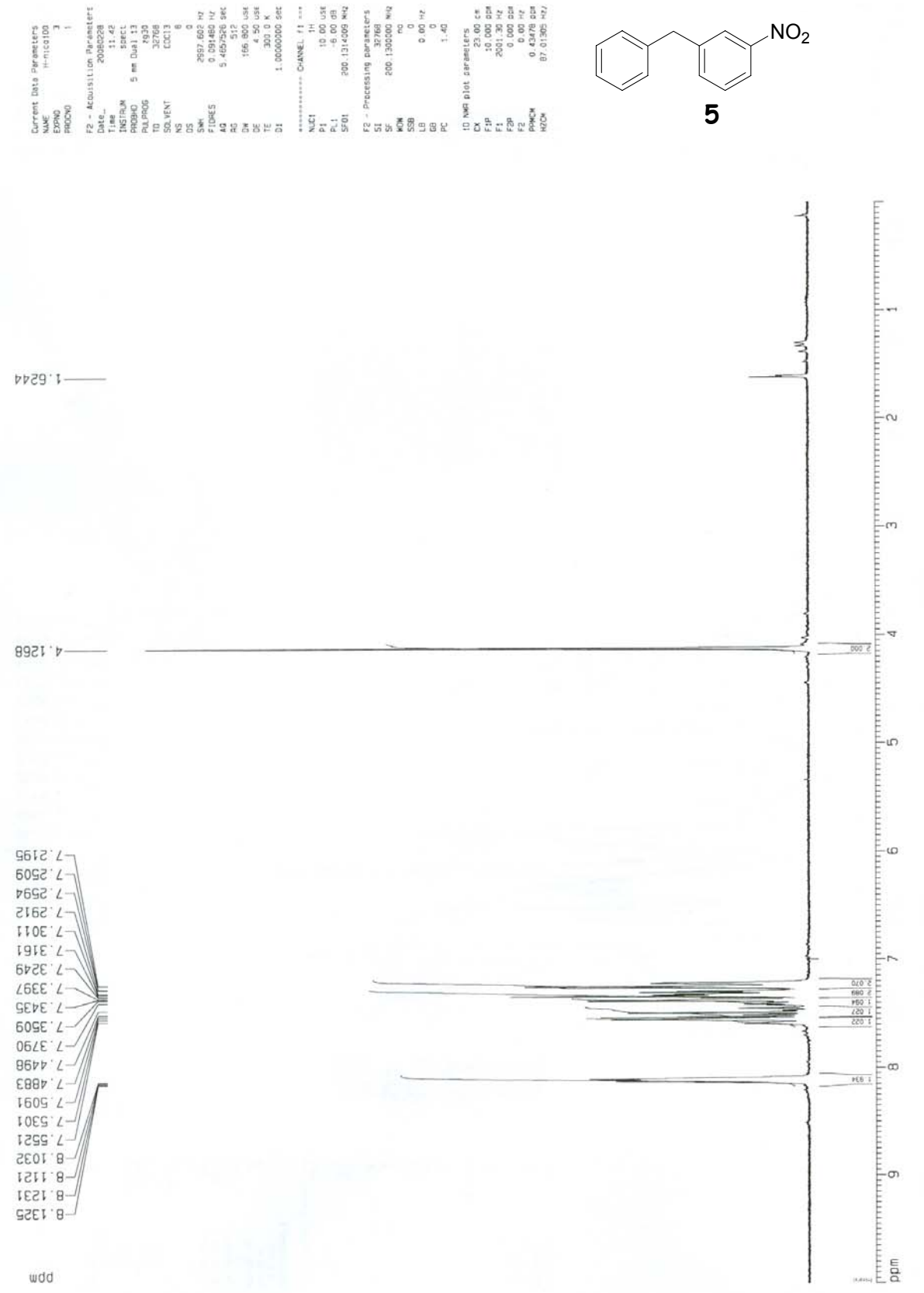
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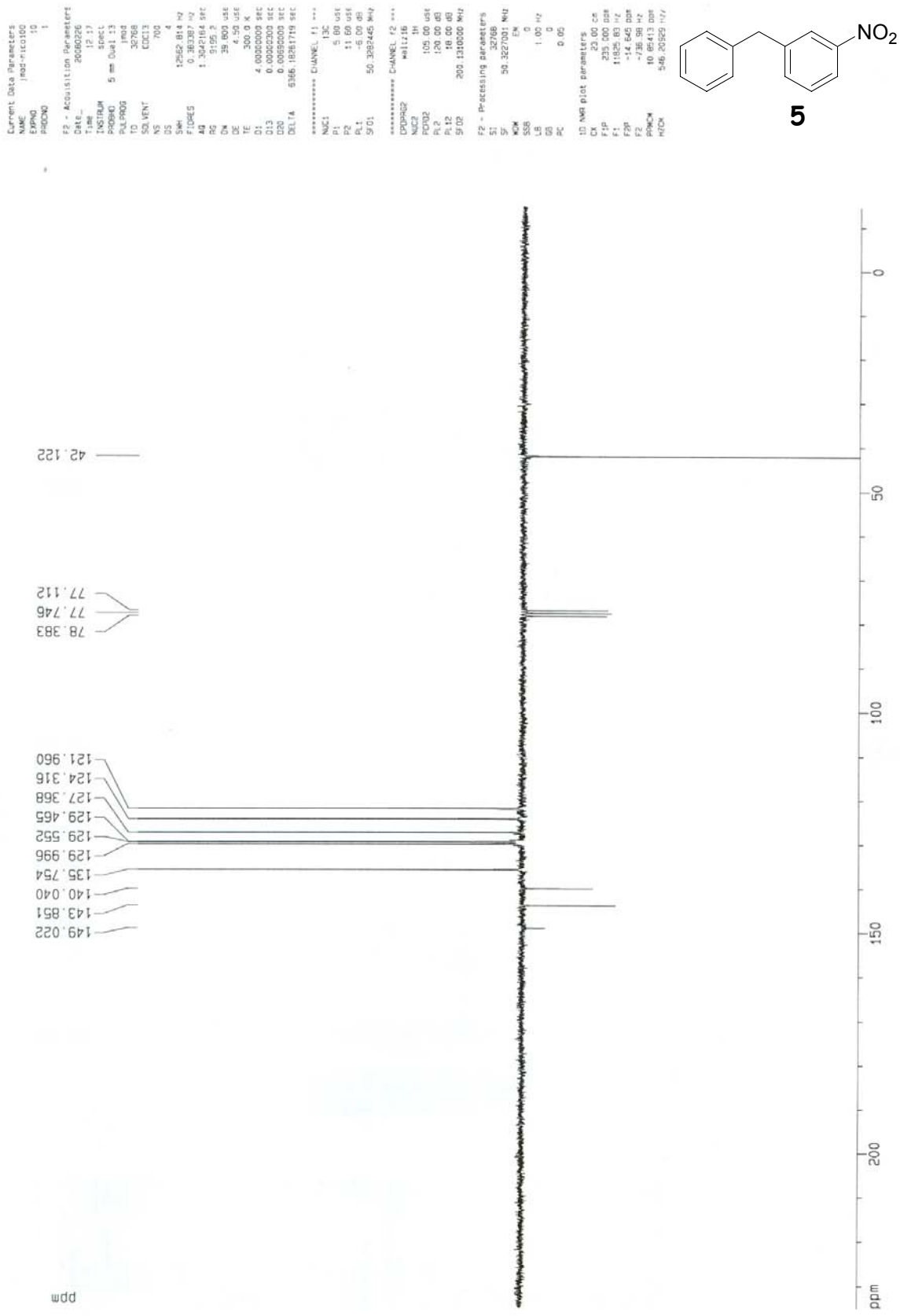
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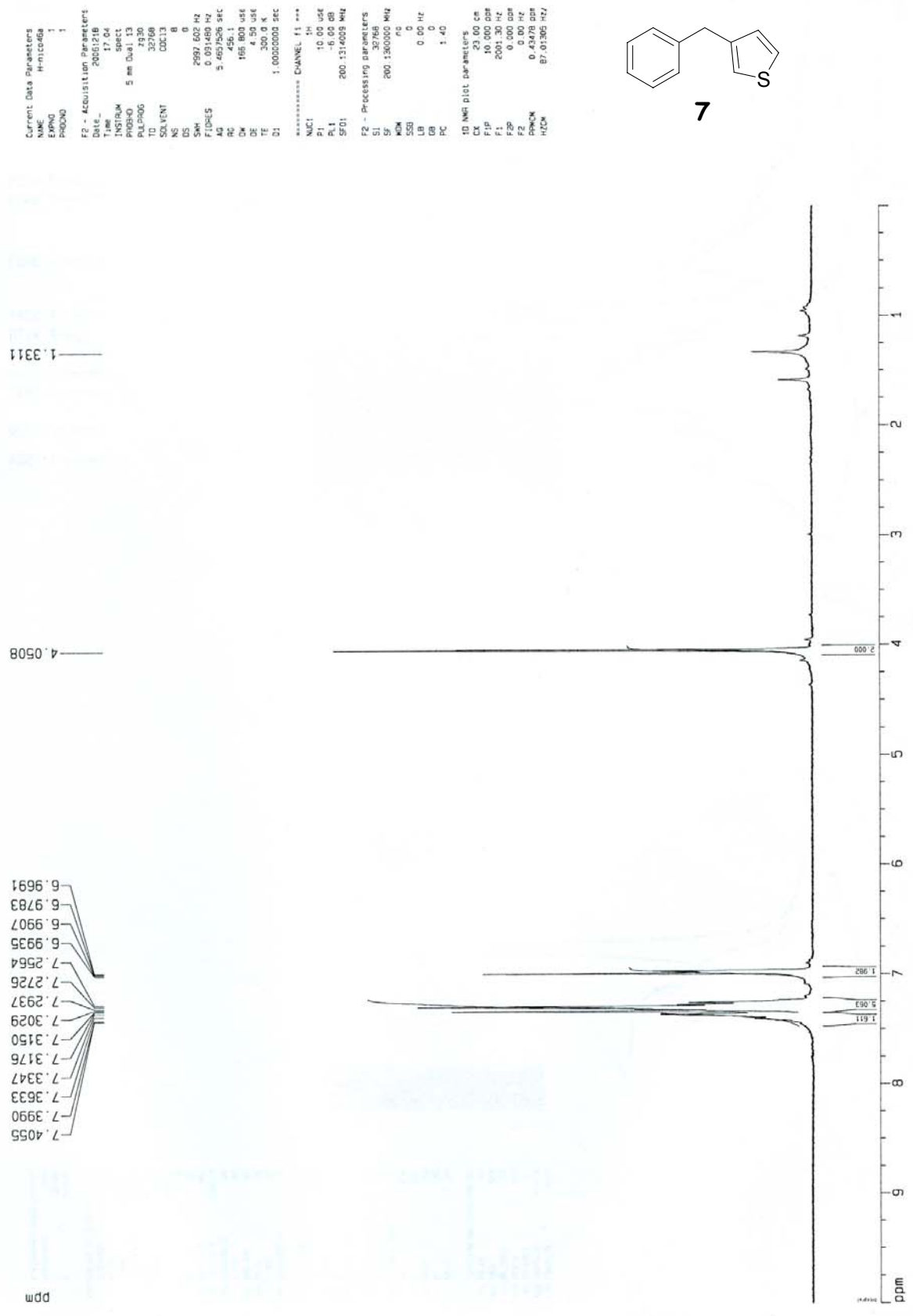
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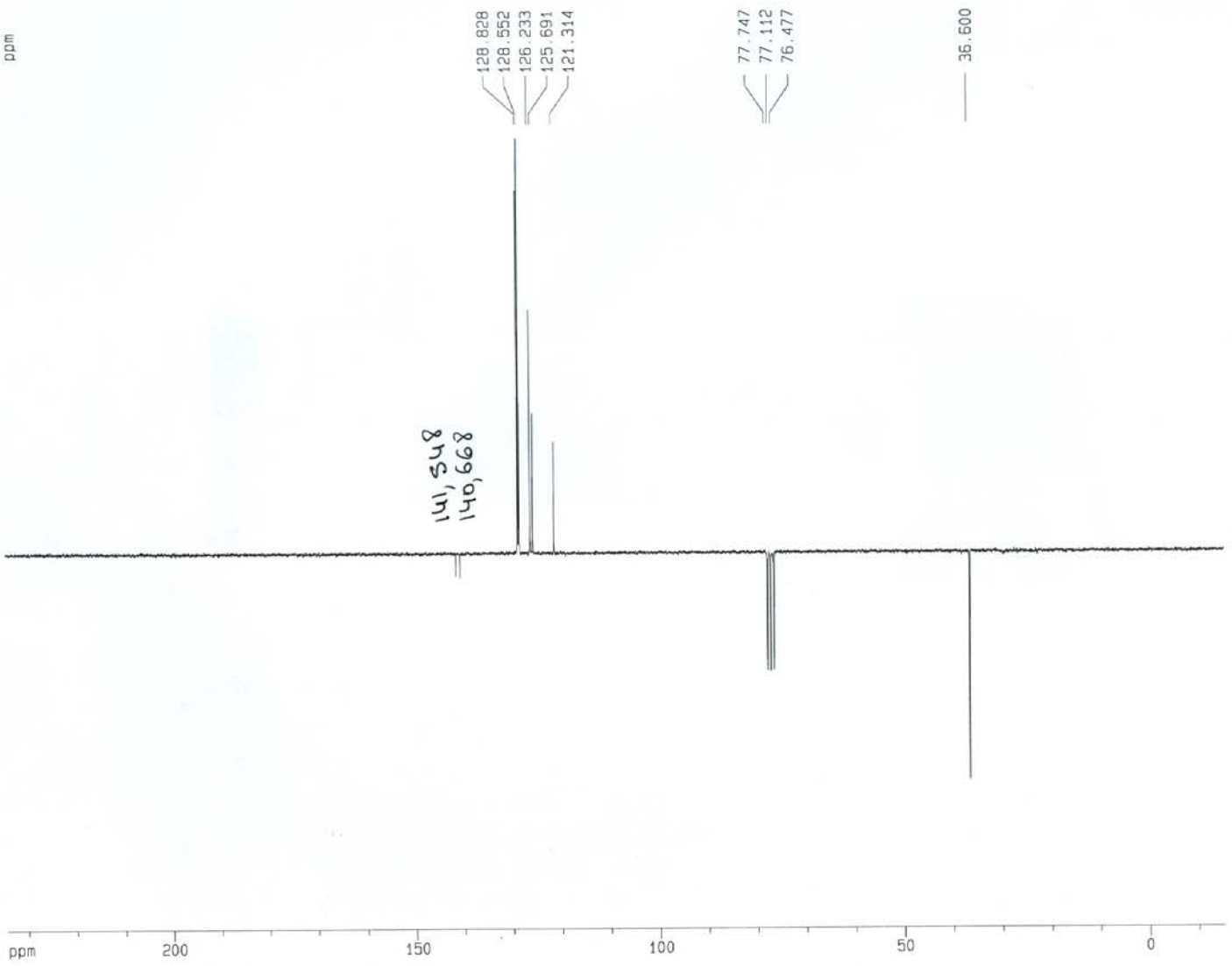


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F2 - Processing parameters
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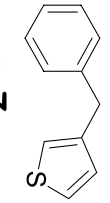
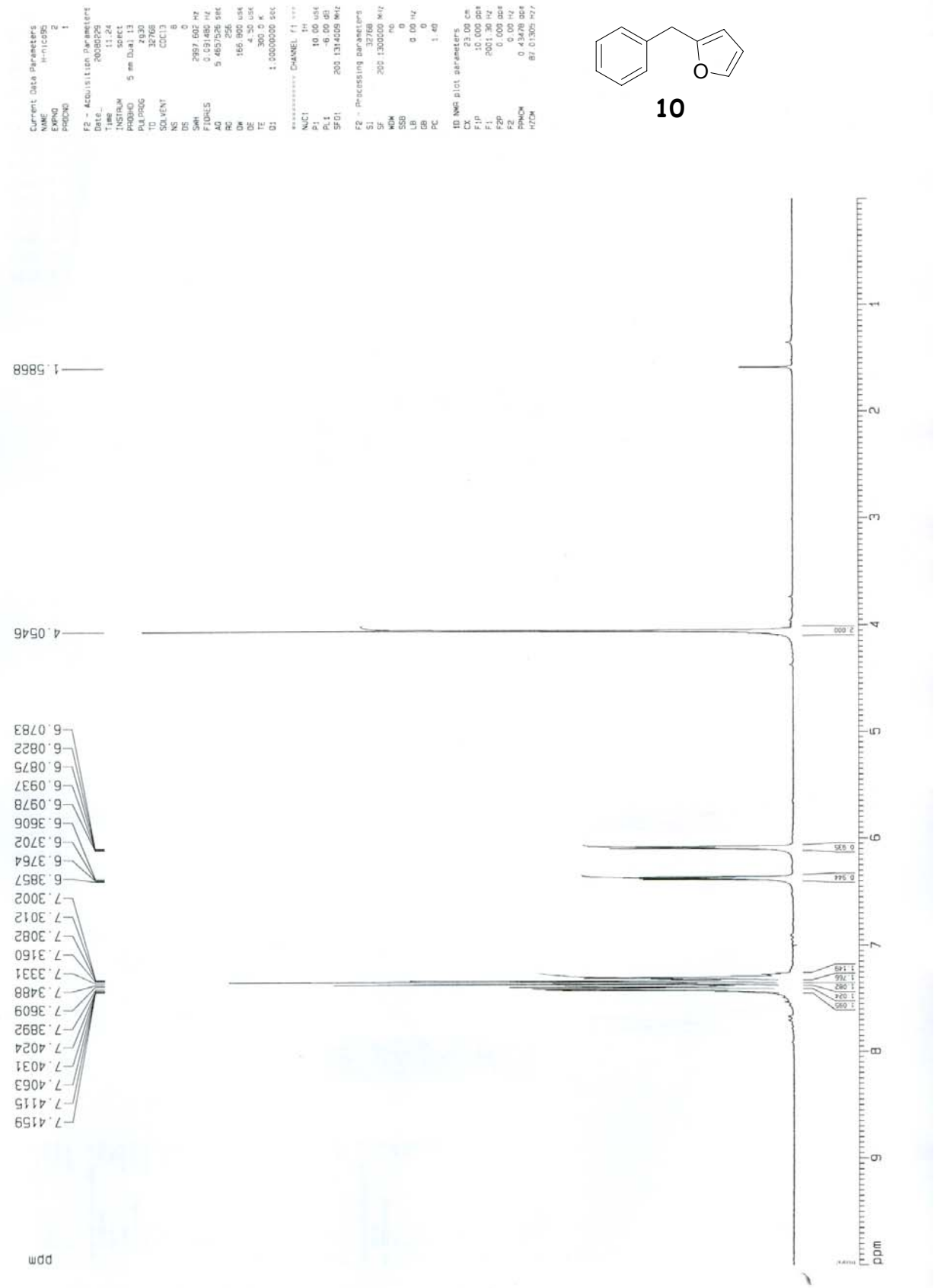
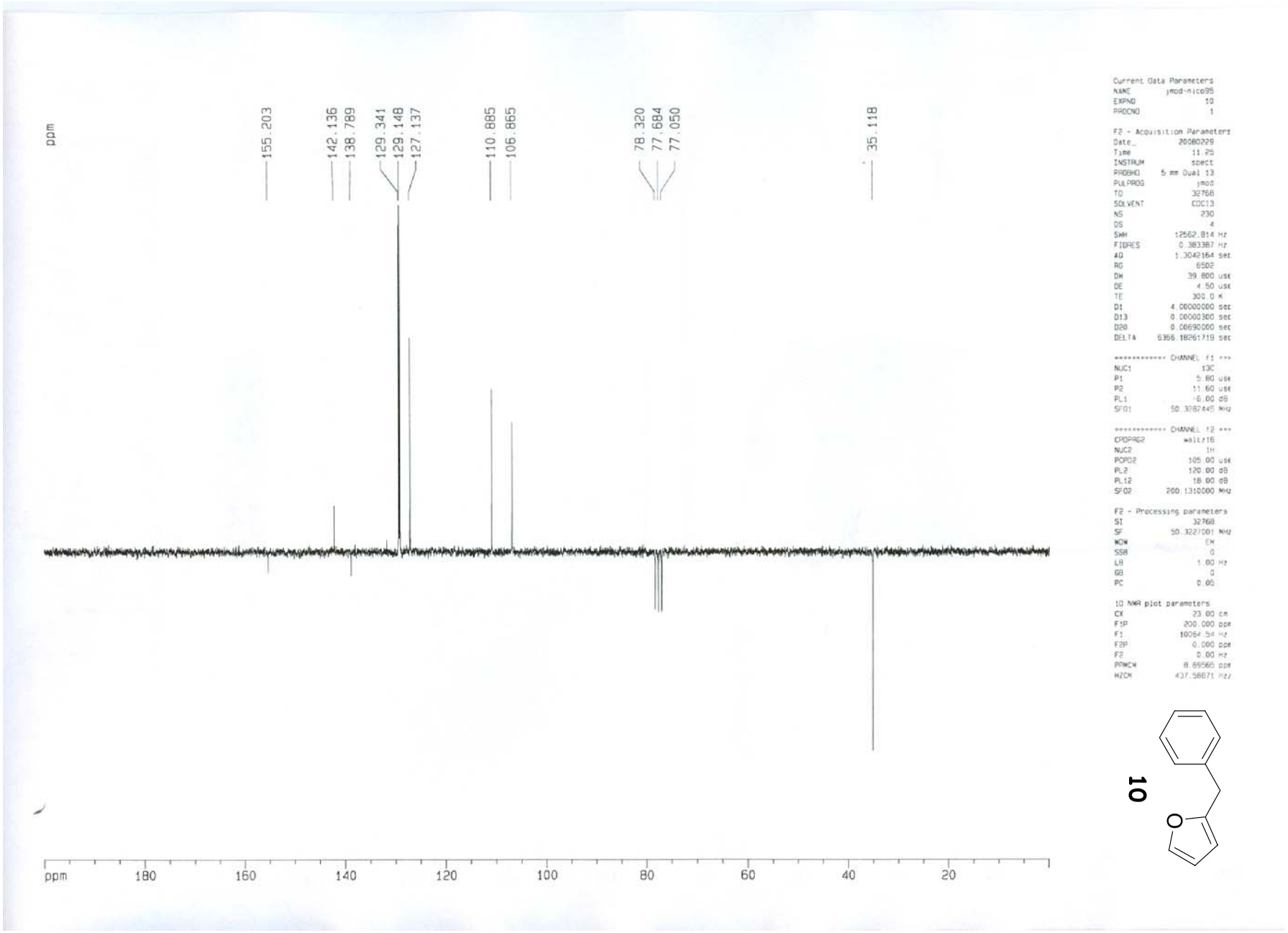
SF                50.3227279 MHz
WDW                         EM
SSB                          0
LB                    1.00 Hz
GB                           0
PC                        0.50

1D NMR plot parameters
CX                    23.00 cm
F1P                 234.446 ppm
F1                11797.97 Hz
F2P                 -15.199 ppm
F2                 -764.85 Hz
PPMCM              10.65413 ppm
HZCM              546.20935 Hz
```




Current Data Parameters
NAME H-nic95
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080229
Time 11.24
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091486 Hz
AQ 5.465526 sec
RG 256
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ===
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm/
HZCM 87.01305 Hz/
1.5868
4.0546
6.0783
6.0822
6.0875
6.0937
6.0978
6.3606
6.3702
6.3764
6.3857
7.3002
7.3012
7.3082
7.3160
7.3331
7.3488
7.3609
7.3892
7.4024
7.4031
7.4063
7.4115
7.4159
2.000
0.935
0.944
1.149
1.266
1.282
1.024
0.980
ppm
1
2
3
4
5
6
7
8
9

10




```
Current Data Parameters
NAME                  jmod-nico95
EXPNO                          10
PROCNO                          1

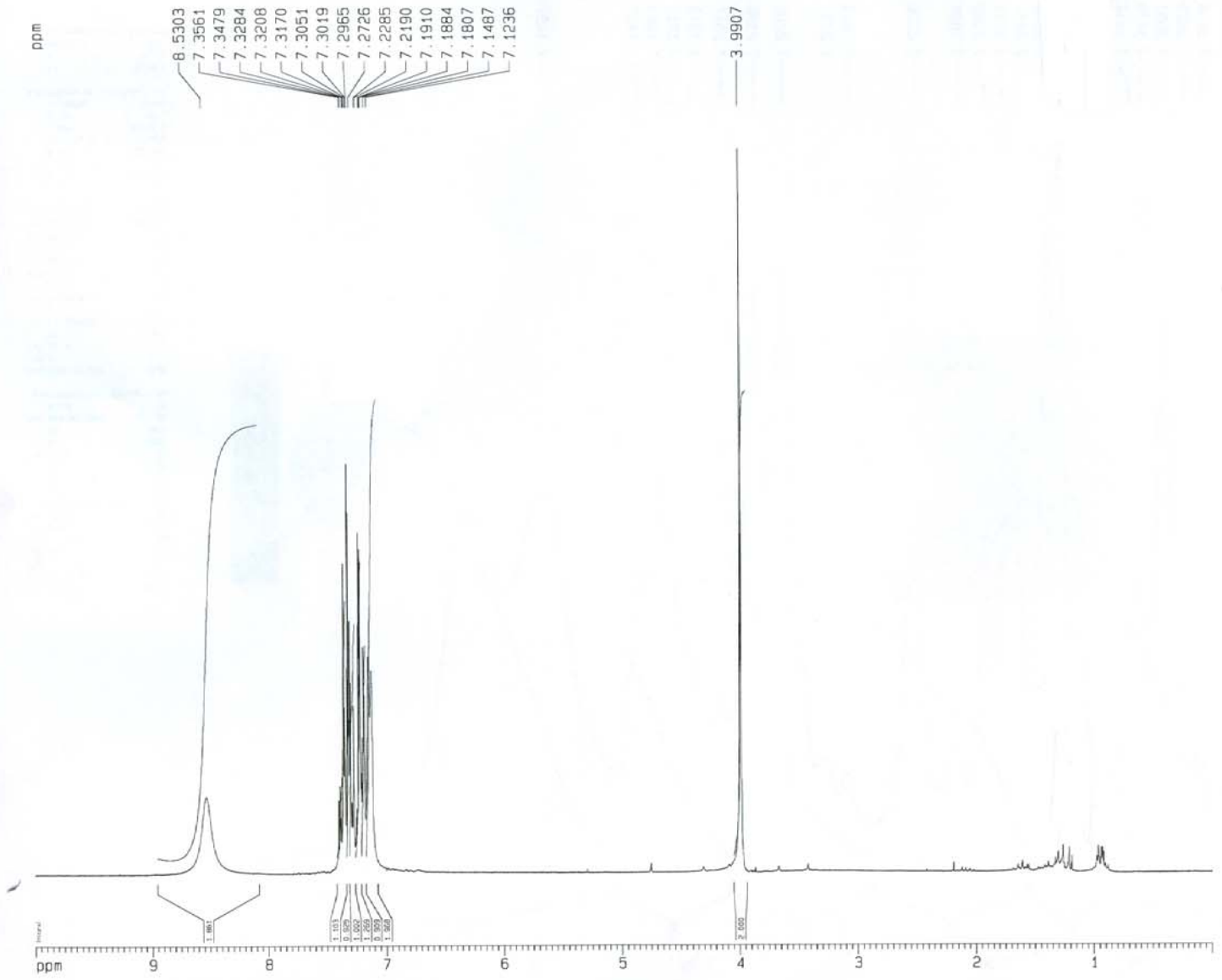
F2 - Acquisition Parameters
Date_                    20080229
Time                        11.25
INSTRUM                      spect
PROBHD          5 mm Dual 13
PULPROG                      jmod
TD                          32768
SOLVENT                     CDCl3
NS                            230
DS                              4
SWH                     12562.814 Hz
FIDRES                   0.383367 Hz
AQ                       1.3042164 sec
RG                            6502
DW                          39.800 use
DE                           4.50 use
TE                          300.0 K
D1                       4.00000000 sec
D13                      0.00000300 sec
D20                      0.00690000 sec
DELTA                 6356.18261719 sec

============ CHANNEL f1 ===
NUC1                          13C
P1                           5.80 use
P2                          11.60 use
PL1                         -6.00 dB
SFO1                   50.3282445 MHz

============ CHANNEL f2 ===
CPDPRG2                   waltz16
NUC2                           1H
PCPD2                       105.00 use
PL2                         120.00 dB
PL12                         18.00 dB
SFO2                  200.1310000 MHz

F2 - Processing parameters
SI                            32768
SF                     50.3227001 MHz
WDW                            EM
SSB                             0
LB                           1.00 Hz
GB                              0
PC                           0.05

1D NMR plot parameters
CX                           23.00 cm
F1P                        200.000 ppm
F1                       10064.56 Hz
F2P                          0.000 ppm
F2                           0.00 Hz
PPMCM                     8.69565 ppm
HZCM                    437.58871 Hz/
```



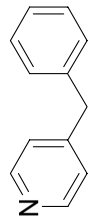

```
Current Data Parameters
NAME                 H-nico98
EXPNO                       3
PROCNO                      1

F2 - Acquisition Parameters
Date_               20080229
Time                   10.19
INSTRUM                spect
PROBHD     5 mm Dual 13
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                         8
DS                         0
SWH                2997.602 Hz
FIDRES            0.091480 Hz
AQ                 5.4657526 sec
RG                       256
DW                   166.800 use
DE                     4.50 use
TE                   300.0 K
D1                 1.00000000 sec

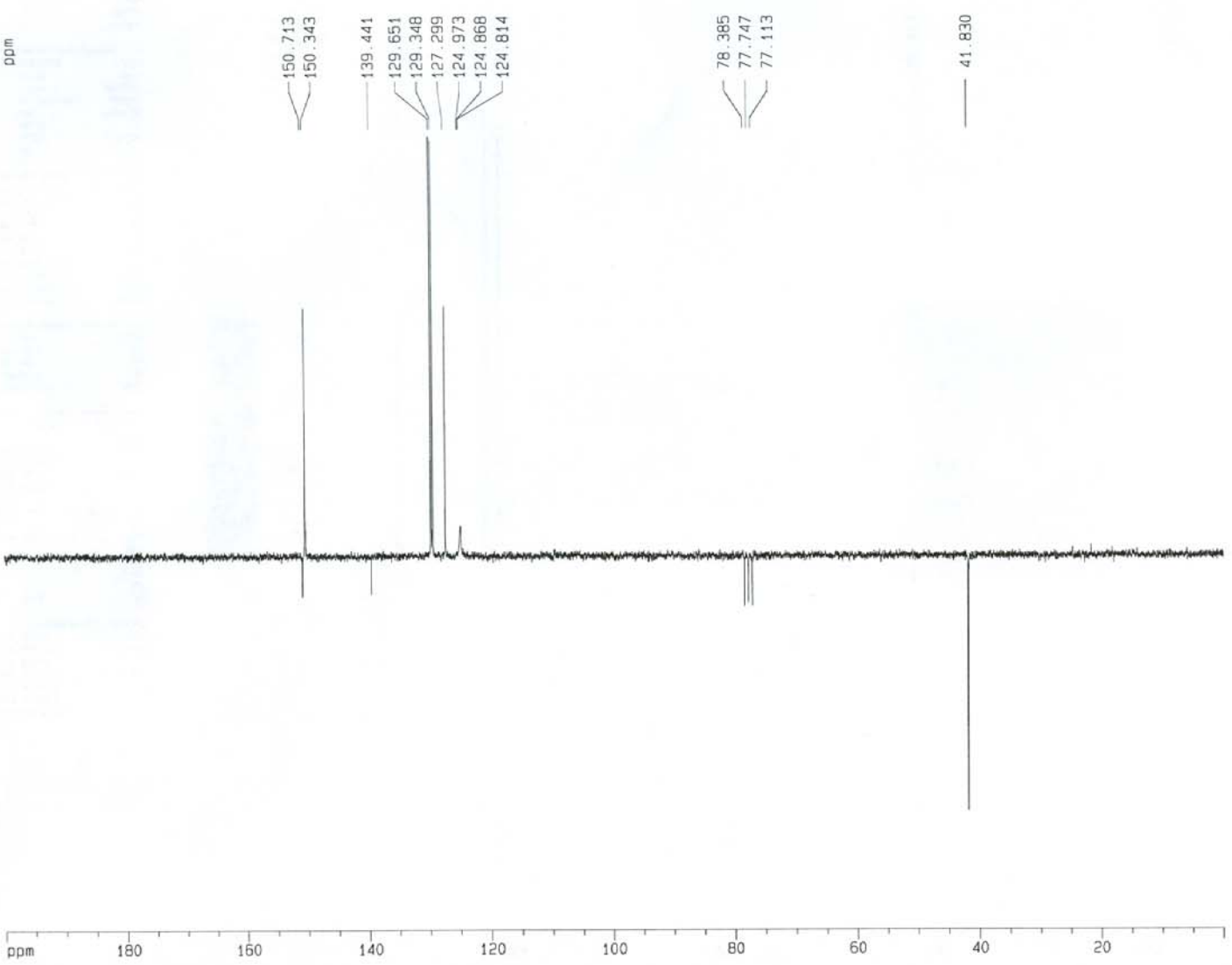
========== CHANNEL f1 ===
NUC1                      1H
P1                     10.00 use
PL1                    -6.00 dB
SFO1            200.1314009 MHz

F2 - Processing parameters
SI                     32768
SF              200.1300000 MHz
WDW                       no
SSB                        0
LB                    0.00 Hz
GB                         0
PC                      1.40

1D NMR plot parameters
CX                    23.00 cm
F1P                  10.000 ppm
F1                 2001.30 Hz
F2P                   0.000 ppm
F2                    0.00 Hz
PPMCM              0.43478 ppm
HZCM              87.01305 Hz/
```



11




```
Current Data Parameters
NAME            jmod-nico98
EXPNO                    11
PROCNO                    1

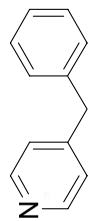
F2 - Acquisition Parameters
Date_          20080229
Time              10.24
INSTRUM           spect
PROBHD     5 mm Dual 13
PULPROG           jmod
TD                32768
SOLVENT           CDCl3
NS                  220
DS                    4
SWH           12562.814 Hz
FIDRES        0.383387 Hz
AQ            1.3042164 sec
RG                 6502
DW               39.800 use
DE                4.50 use
TE              300.0 K
D1            4.00000000 sec
D13           0.00000300 sec
D20           0.00690000 sec
DELTA      6366.18261719 sec

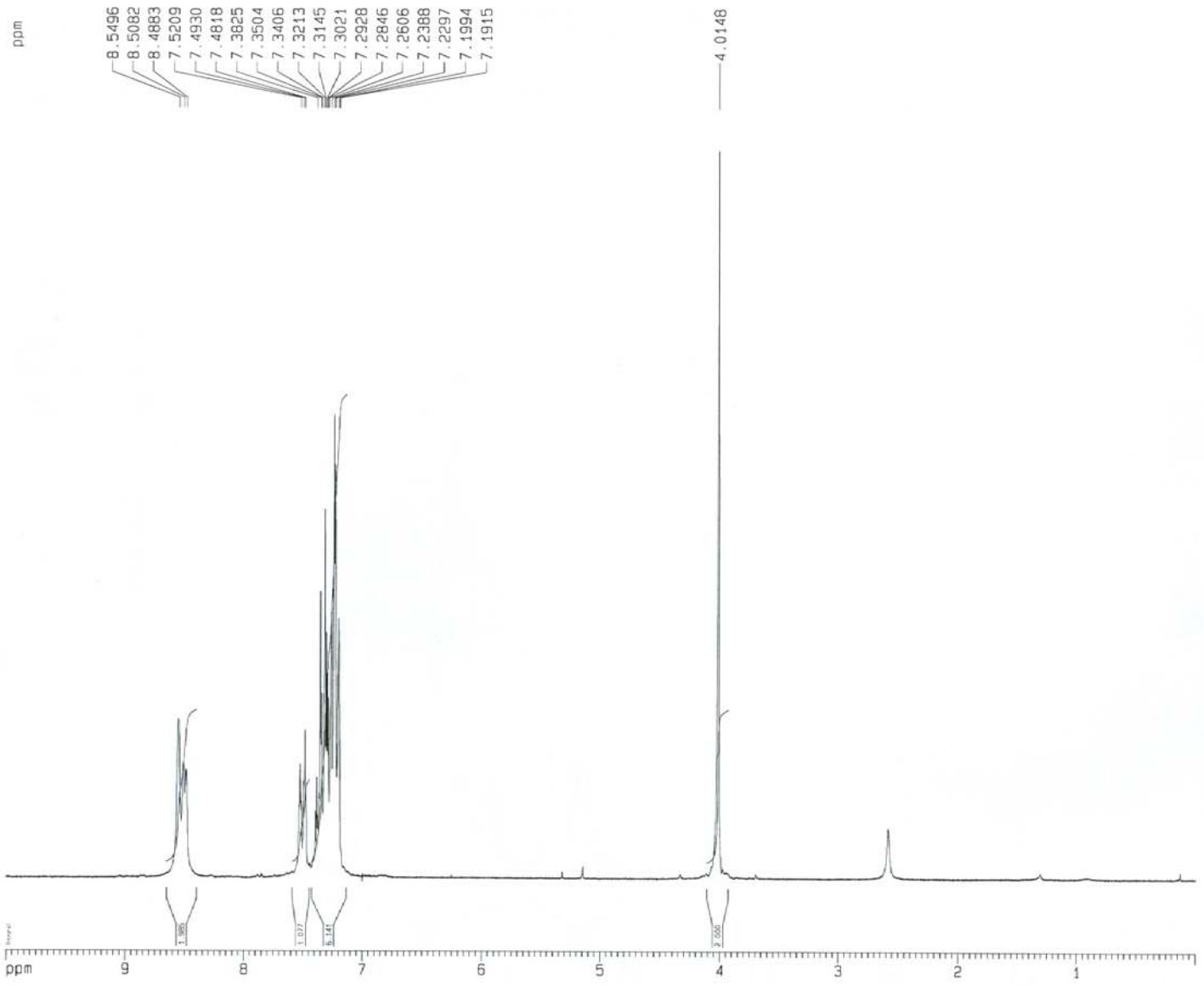
========== CHANNEL f1 ===
NUC1               13C
P1                5.80 use
P2               11.60 use
PL1              -6.00 dB
SFO1        50.3282445 MHz

========== CHANNEL f2 ===
DPOPRG2         waltz16
NUC2                1H
PCPD2            105.00 use
PL2              120.00 dB
PL12              18.00 dB
SFO2       200.1310000 MHz

F2 - Processing parameters
SI                32768
SF          50.3227001 MHz
WDW                  EM
SSB                   0
LB                1.00 Hz
GB                    0
PC                 0.05

1D NMR plot parameters
CX               23.00 cm
F1P             200.000 ppm
F1             10064.54 Hz
F2P              0.000 ppm
F2               0.00 Hz
PPMCM          8.69565 ppm/
HZCM         437.58871 Hz/
```





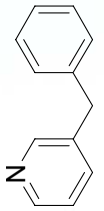

```
Current Data Parameters
NAME              H-nico99
EXPNO                    2
PROCNO                   1

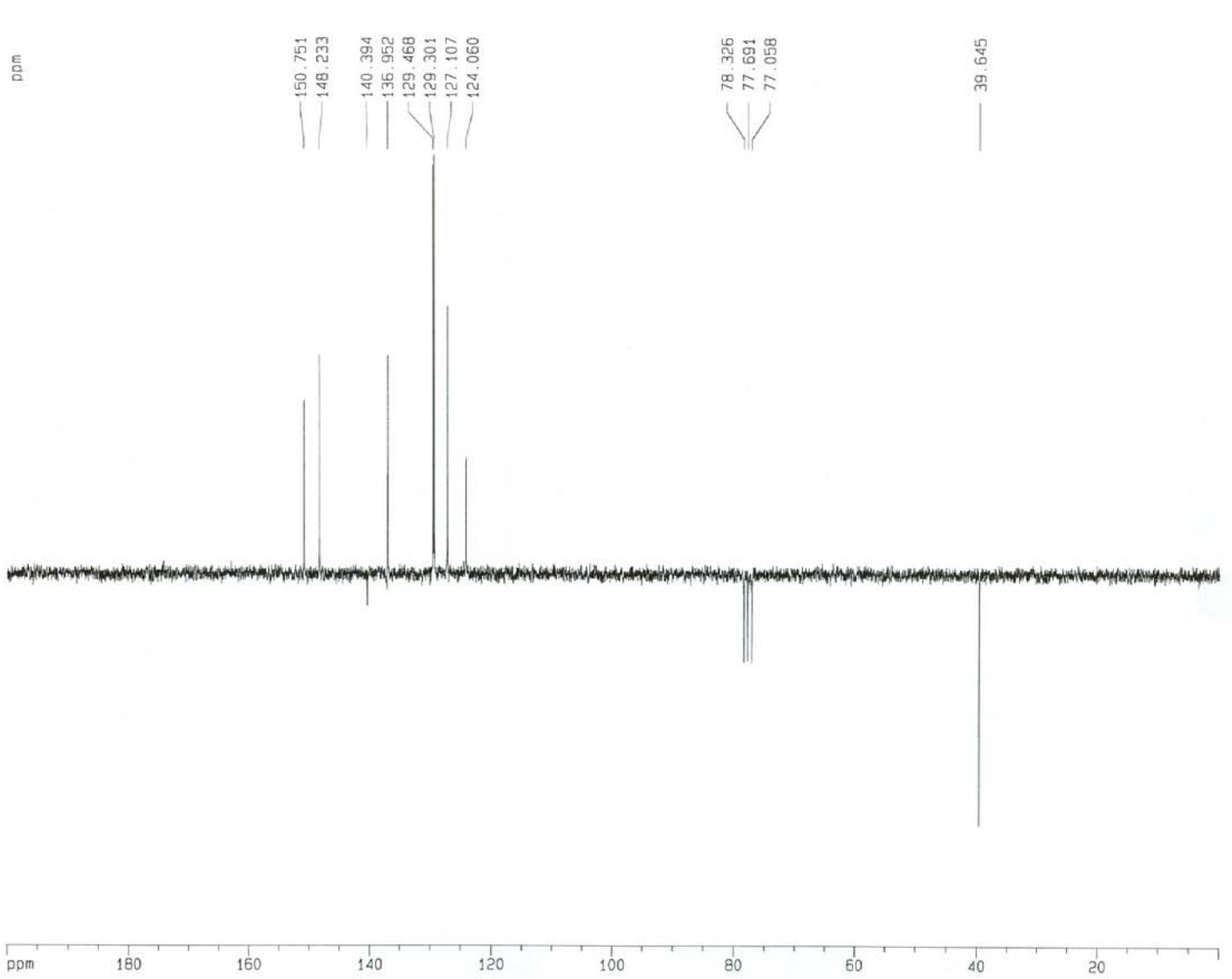
F2 - Acquisition Parameters
Date_              20080226
Time                 10.11
INSTRUM              spect
PROBHD     5 mm Dual 13
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                       8
DS                       0
SWH              2997.602 Hz
FIDRES           0.091480 Hz
AQ               5.4657526 sec
RG                   406.4
DW                 166.800 use
DE                   4.50 use
TE                  300.0 K
D1               1.00000000 sec

============ CHANNEL f1 ===
NUC1                    1H
P1                   10.00 use
PL1                  -6.00 dB
SFO1          200.1314009 MHz

F2 - Processing parameters
SI                   32768
SF            200.1300000 MHz
WDW                     no
SSB                      0
LB                    0.00 Hz
GB                       0
PC                    1.40

1D NMR plot parameters
CX                   23.00 cm
F1P                 10.000 ppm
F1                2001.30 Hz
F2P                 0.000 ppm
F2                   0.00 Hz
PPMCM             0.43478 ppm
HZCM             87.01305 Hz/
```






```
Current Data Parameters
NAME          jmod-nico99
EXPNO                  10
PROCNO                  1

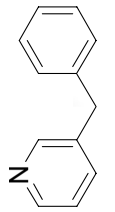
F2 - Acquisition Parameters
Date_            20080226
Time                11.24
INSTRUM             spect
PROBHD     5 mm Dual 13
PULPROG             jmod
TD                 32768
SOLVENT            CDCl3
NS                   205
DS                     4
SWH            12562.814 Hz
FIDRES         0.383387 Hz
AQ             1.3042164 sec
RG                10321.3
DW                39.800 use
DE                 4.50 use
TE                300.0 K
D1             4.00000000 sec
D13            0.00000300 sec
D20            0.00690000 sec
DELTA       6366.18261719 sec

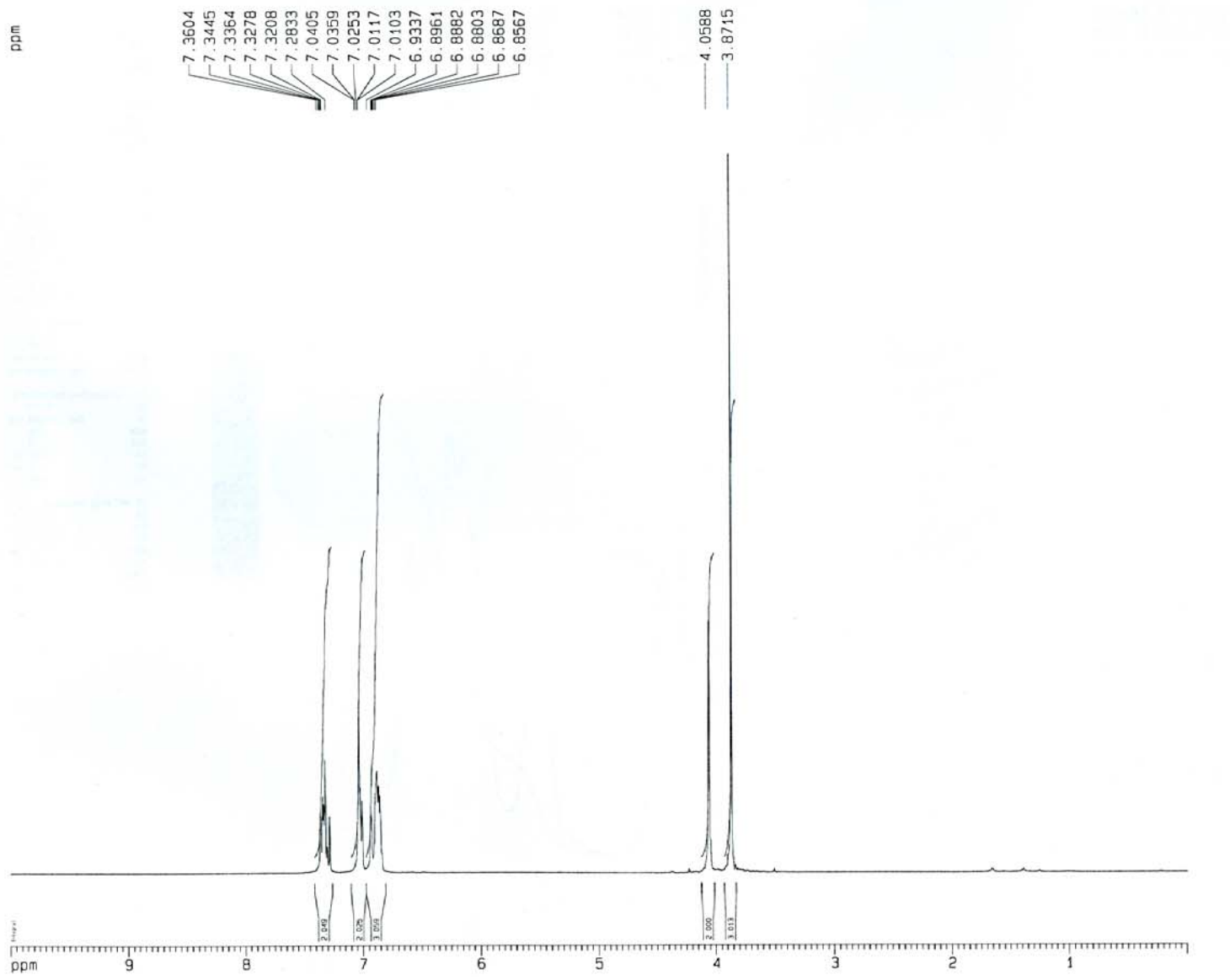
============ CHANNEL f1 ===
NUC1                 13C
P1                  5.80 use
P2                 11.60 use
PL1                -6.00 dB
SFO1          50.3282445 MHz

============ CHANNEL f2 ===
CPDPRG2          waltz16
NUC2                 1H
PCPD2             105.00 use
PL2               120.00 dB
PL12               18.00 dB
SFO2          200.1310000 MHz

F2 - Processing parameters
SI                 32768
SF            50.3227001 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 0.05

1D NMR plot parameters
CX                23.00 cm
F1P              200.000 ppm
F1             10064.54 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM          8.69565 ppm
HZCM           437.58871 Hz/
```





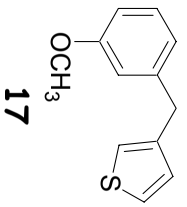

```
Current Data Parameters
NAME                 H-nico110
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_               20080227
Time                   10.58
INSTRUM                spect
PROBHD     5 mm Dual 13
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                         8
DS                         0
SWH                2997.602 Hz
FIDRES             0.091480 Hz
AQ                 5.4657526 sec
RG                       181
DW                 166.800 use
DE                   4.50 use
TE                   300.0 K
D1                 1.00000000 sec

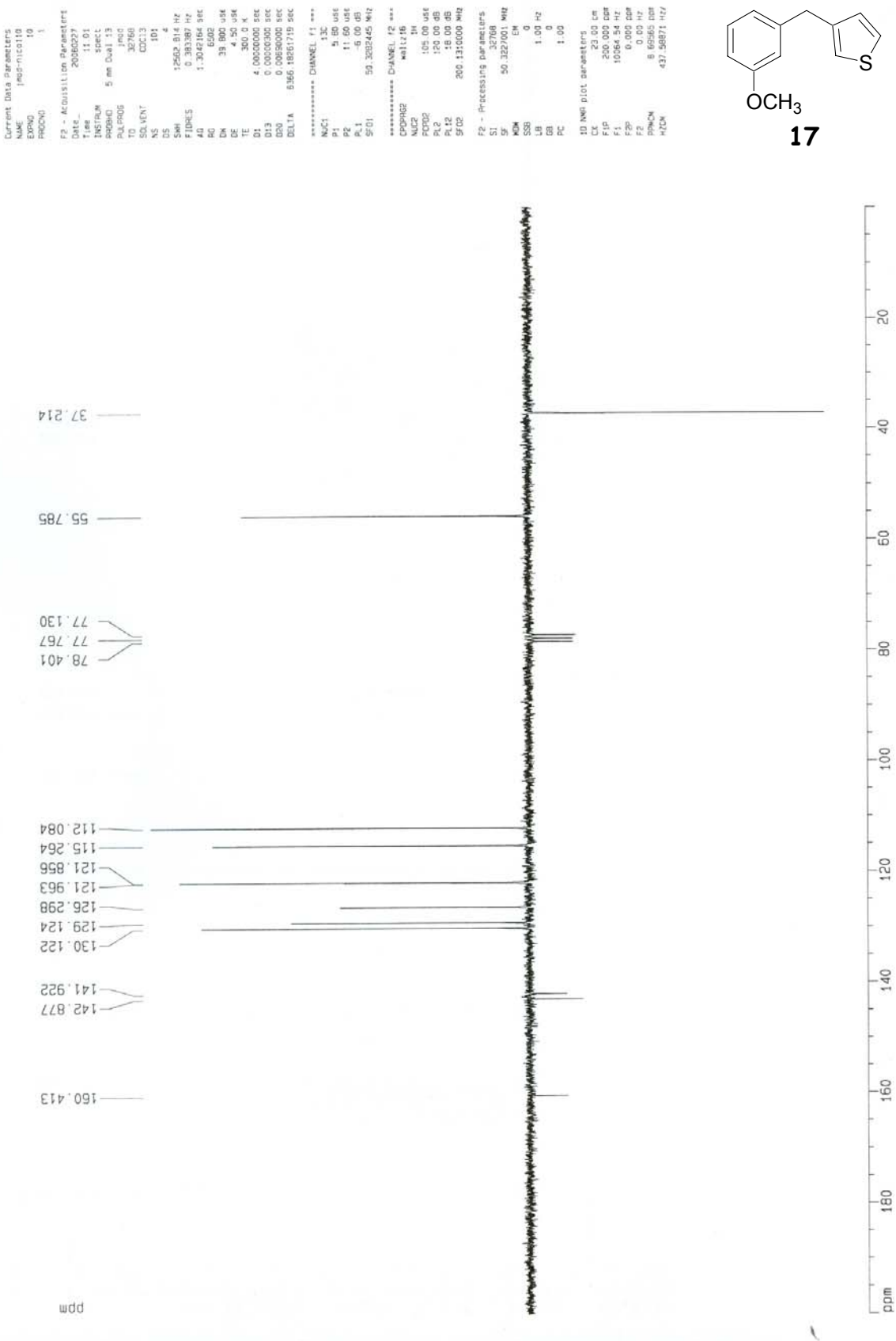
========== CHANNEL f1 ===
NUC1                     1H
P1                   10.00 use
PL1                  -6.00 dB
SFO1             200.1314009 MHz

F2 - Processing parameters
SI                     32768
SF               200.1300000 MHz
WDW                       no
SSB                        0
LB                    0.00 Hz
GB                         0
PC                      1.40

1D NMR plot parameters
CX                    23.00 cm
F1P                  10.000 ppm
F1                  2001.30 Hz
F2P                   0.000 ppm
F2                    0.00 Hz
PPMCM                0.43478 ppm
HZCM                87.01305 Hz/
```

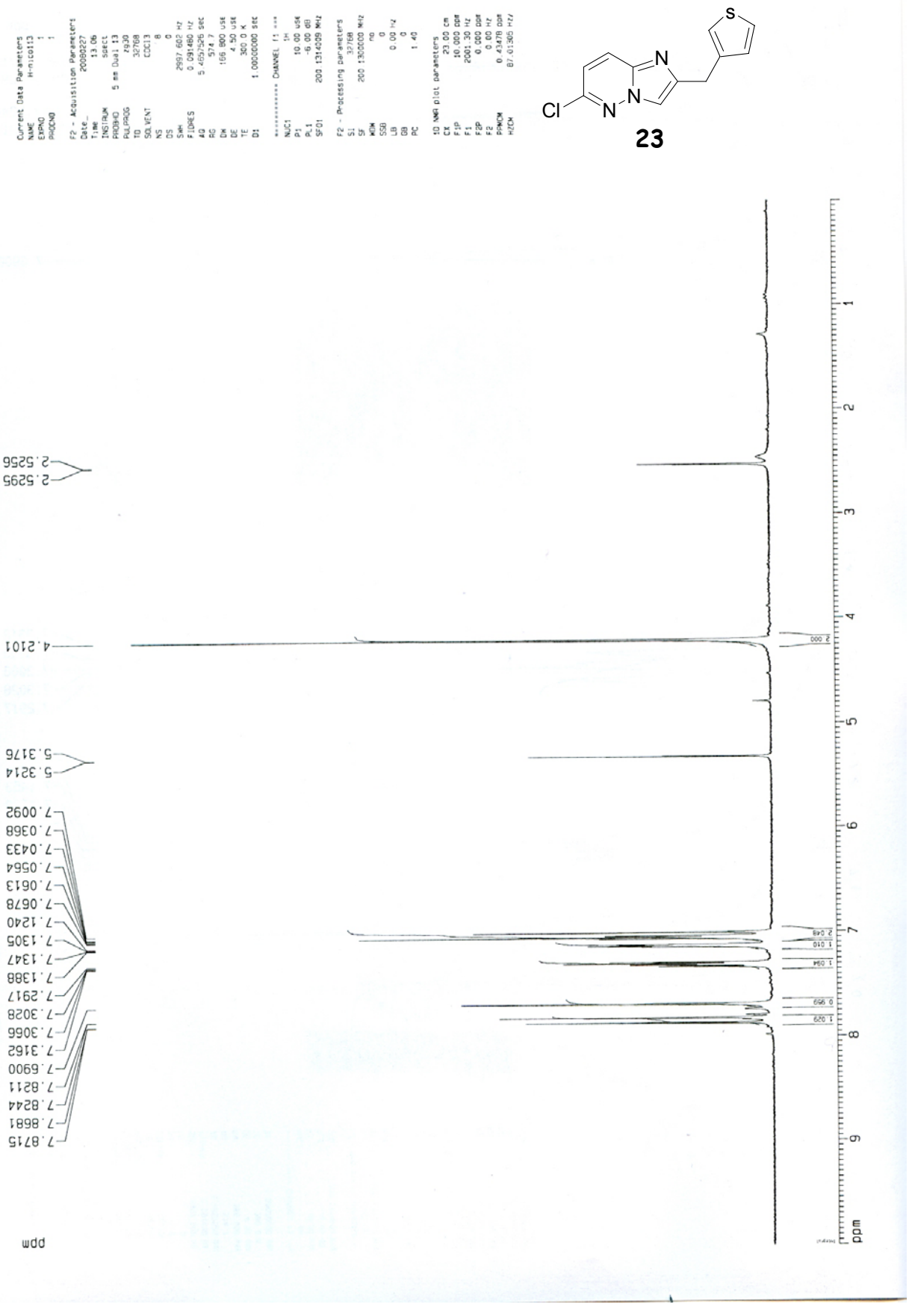


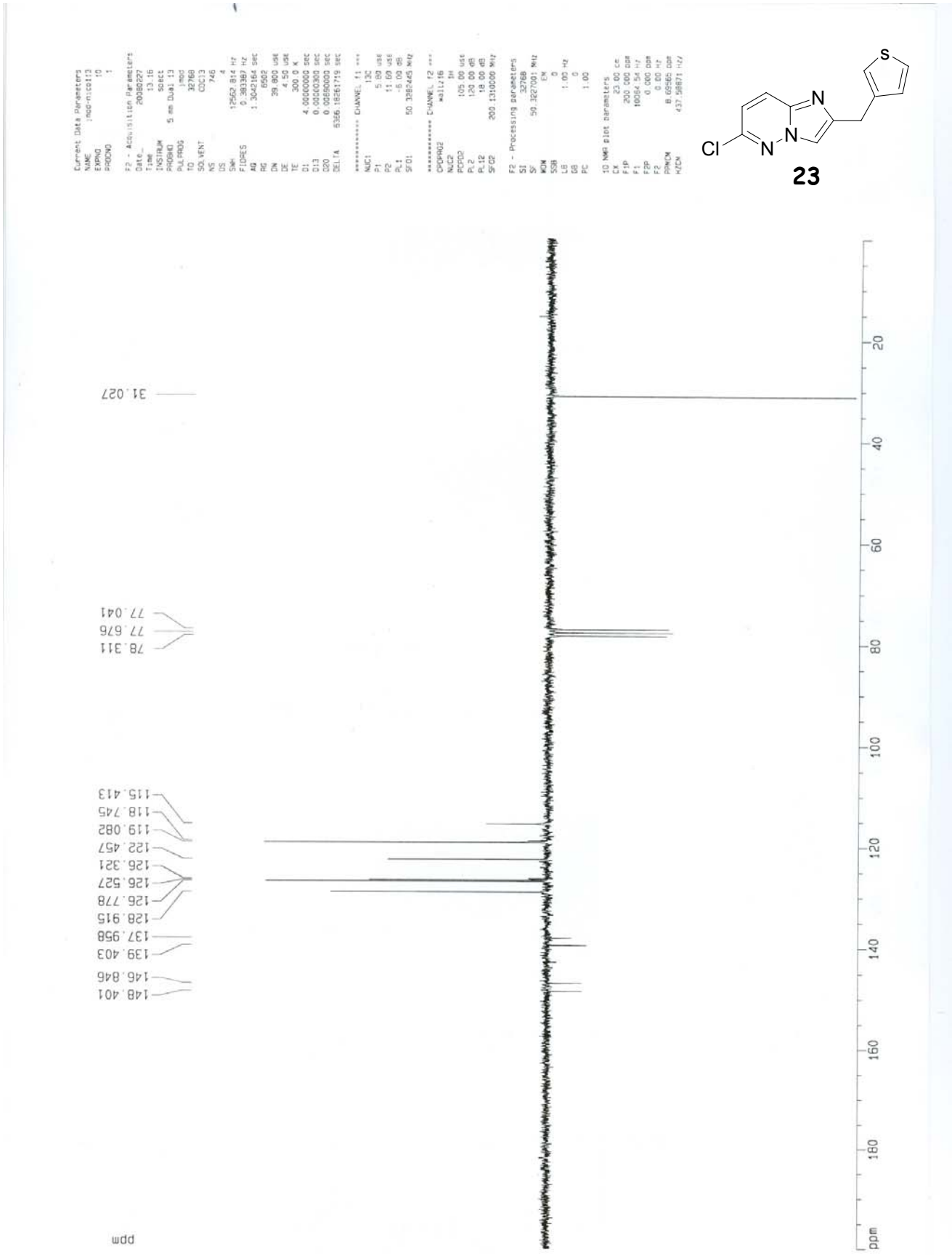
17


Current Data Parameters
NAME jmod-nico110
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080227
Time 11.01
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG jmod
TD 32768
SOLVENT CDCl3
NS 101
DS 4
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3042164 sec
RG 6502
DW 39.800 usec
DE 4.50 usec
TE 300.0 K
D1 4.00000000 sec
D13 0.00003000 sec
D20 0.00850000 sec
DELTA 5.866.18261719 sec
========== CHANNEL f1 ===
NUC1 13C
P1 5.80 usec
P2 11.60 usec
PL1 -6.00 dB
SFO1 50.3282445 MHz
========== CHANNEL f2 ===
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 200.1350000 MHz
F2 - Processing parameters
SI 32768
SF 50.3227001 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 23.00 cm
F1P 200.000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.69565 ppm
HZCM 437.58871 Hz
37.214
55.785
77.130
77.767
78.401
112.084
115.264
121.856
121.963
126.298
129.124
130.122
141.922
142.877
160.413
ppm
20
40
60
80
100
120
140
160
180
ppm

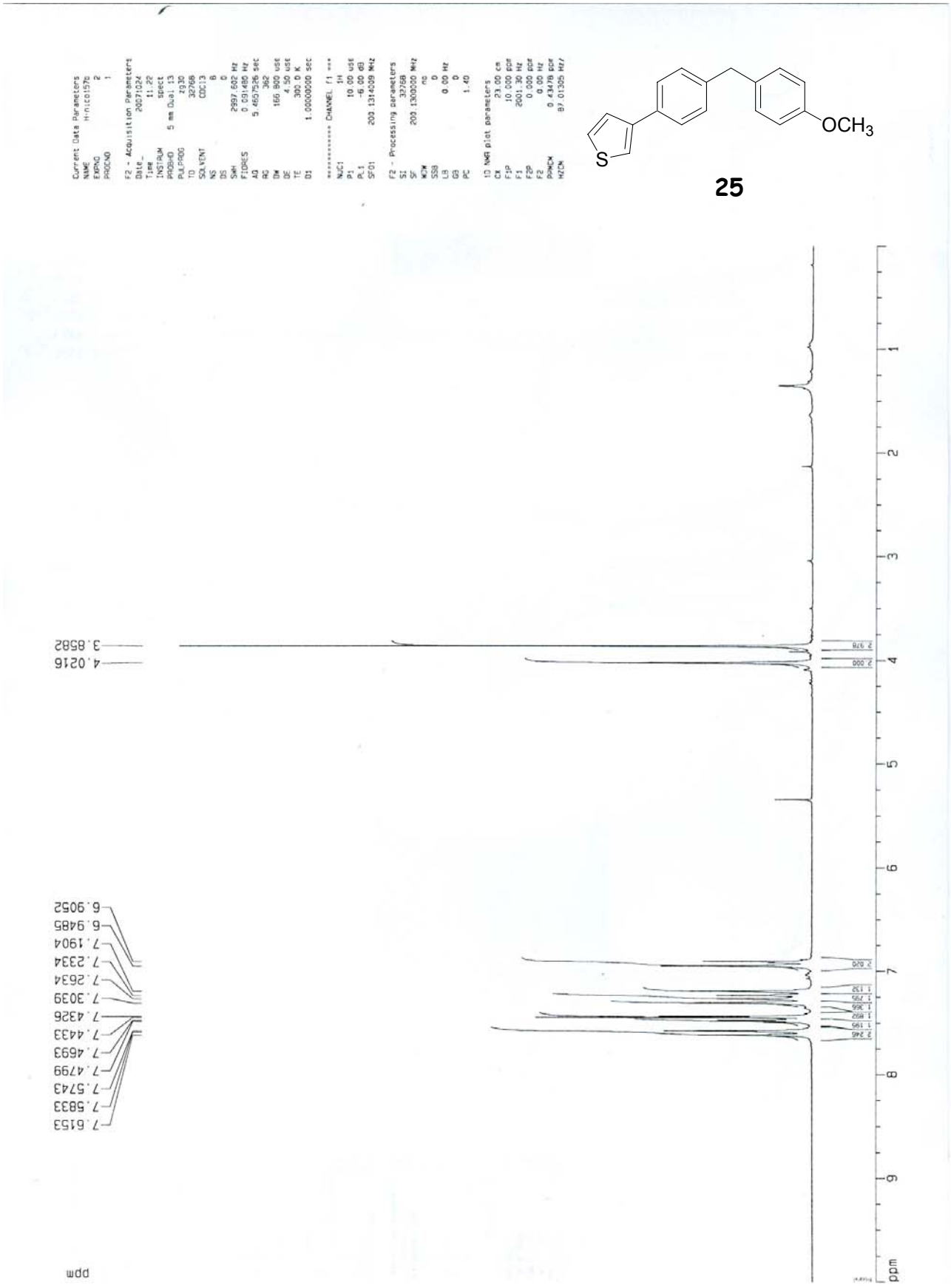
S
OCH3

17


Current Data Parameters
NAME H-nicol13
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080227
Time 13.06
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091480 Hz
AQ 5.4557526 sec
RG 574.7
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ===
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm
HZCM 87.01365 Hz
S
N
N
N
Cl
23
2.5256
2.5295
4.2101
5.3176
5.3214
7.0092
7.0368
7.0433
7.0564
7.0613
7.0678
7.1240
7.1305
7.1347
7.1388
7.2917
7.3028
7.3066
7.3162
7.6900
7.8211
7.8244
7.8681
7.8715
2.000
2.048
1.010
1.084
0.966
1.029
ppm


Current Data Parameters
NAME mod-nicol13
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080227
Time 13.16
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG jmod
TD 32768
SOLVENT CDCl3
NS 746
DS 4
SWH 12562.814 Hz
FIDRES 0.383367 Hz
AQ 1.3042164 sec
RG 6502
DW 39.800 usec
DE 4.50 usec
TE 300.0 K
D1 4.00000000 sec
D13 0.00500300 sec
D20 0.00690000 sec
DELTA 6366.16561719 sec
========== CHANNEL f1 ===
NUC1 13C
P1 5.00 usec
P2 11.00 usec
PL1 -6.00 dB
SFO1 50.3282445 MHz
========== CHANNEL f2 ===
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 200.1310000 MHz
F2 - Processing parameters
SI 32768
SF 50.3227091 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 23.00 cm
F1P 200.000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.69566 ppm
HZCM 437.58871 Hz
31.027
77.041
77.676
78.311
115.413
118.745
119.082
122.457
126.321
126.527
126.778
128.915
137.958
139.403
146.846
148.401
ppm
20
40
60
80
100
120
140
160
180
ppm
S
N
N
N
Cl

23


Current Data Parameters
NAME Hrnic157c
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071024
Time 11.22
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091486 Hz
AQ 5.4657526 sec
RG 362
DW 166.800 use
DE 4.50 use
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ===
NUC1 1H
P1 10.00 use
PL1 -6.00 dB
SFO1 200.1314099 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm/
HZCM 87.01305 Hz/
OCH3
S
25
3.8582
4.0216
6.9052
6.9485
7.1904
7.2334
7.2634
7.3039
7.4326
7.4433
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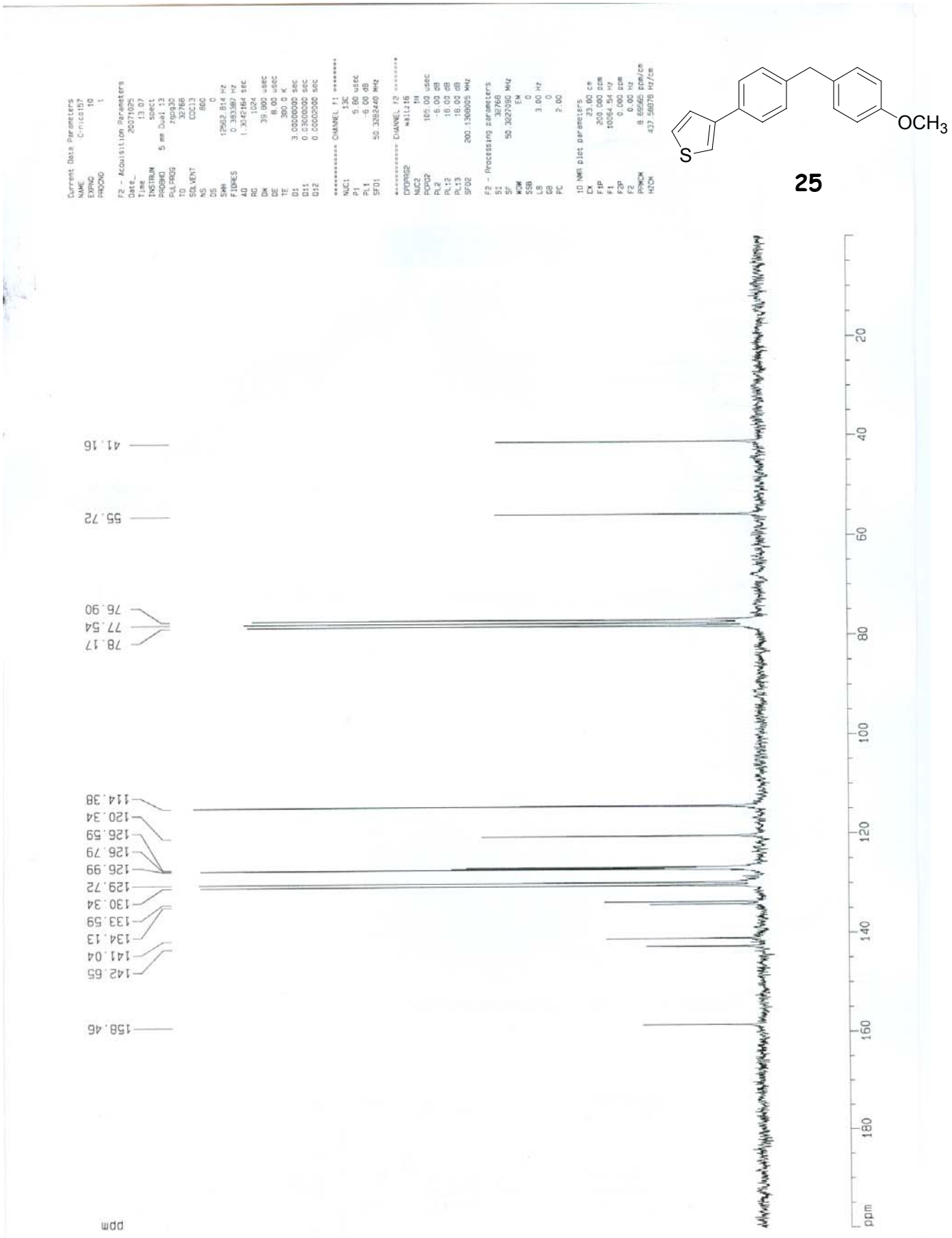
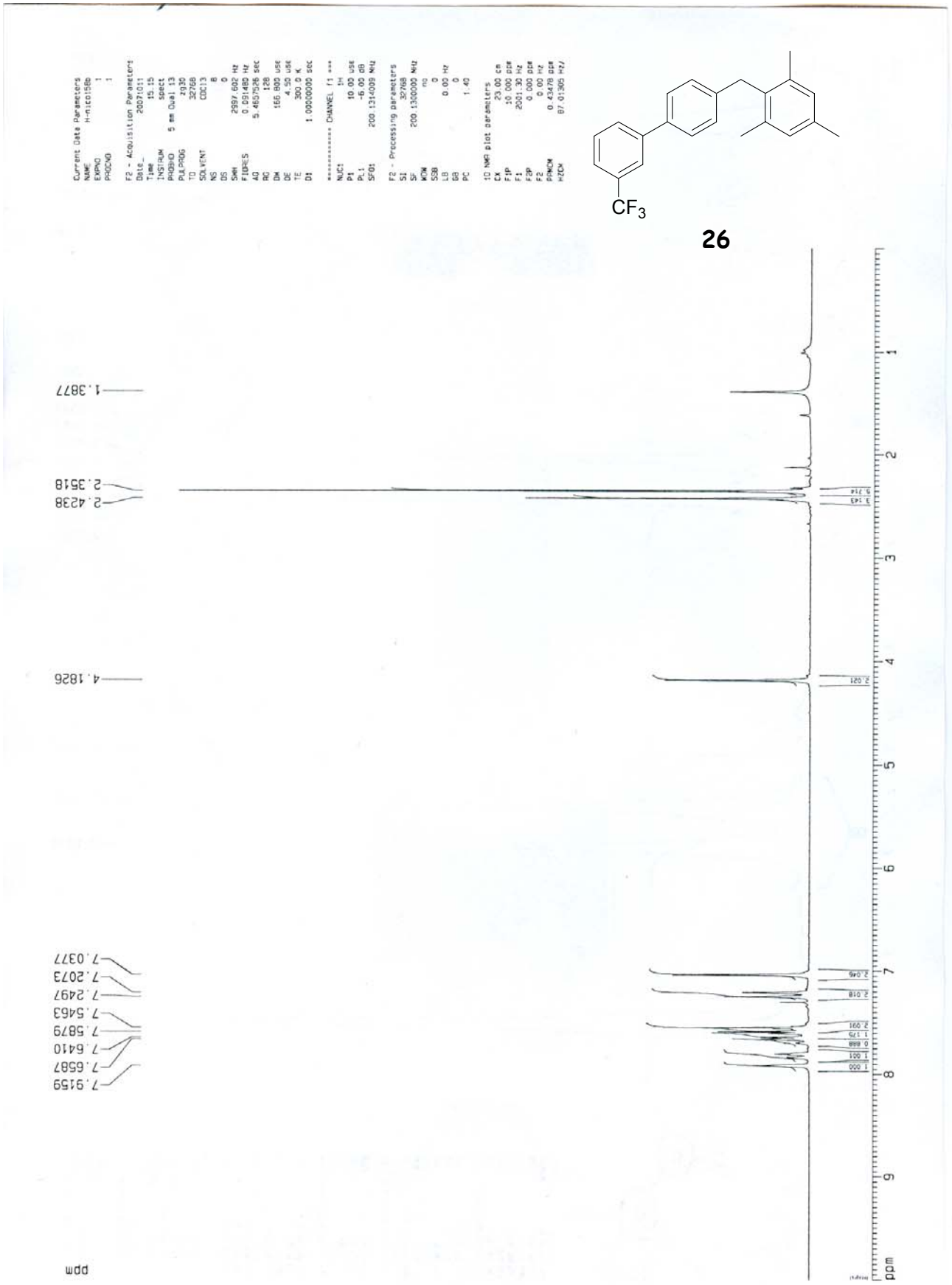
7.4799
7.5743
7.5833
7.6153
ppm

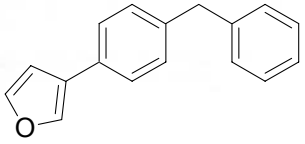

OCH3
S
25
Current Data Parameters
NAME C-nicol57
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071025
Time 13.07
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 800
DS 0
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3041664 sec
RG 1024
DW 39.800 usec
DE 6.00 usec
TE 300.0 K
D1 3.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.60 usec
PL1 -6.00 dB
SFO1 50.3282440 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 -6.00 dB
PL12 18.00 dB
PL13 18.00 dB
SFO2 200.1300005 MHz
F2 - Processing parameters
SI 32768
SF 50.3227990 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 2.00
1D NMR plot parameters
CX 23.00 cm
F1P 200.000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.69565 ppm/cm
HZCM 437.58876 Hz/cm
41.16
55.72
76.90
77.54
78.17
114.38
120.34
126.59
126.79
126.99
129.72
130.34
133.59
134.13
141.04
142.65
158.46
ppm
20
40
60
80
100
120
140
160
180
ppm


Current Data Parameters
NAME H-nitro156b
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071011
Time 15.15
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091480 Hz
AQ 5.4653526 sec
RG 128
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ===
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm
HZCM 87.01305 Hz
CF3
26
1.3877
2.3518
2.4238
4.1826
7.0377
7.2073
7.2497
7.5463
7.5879
7.6410
7.6587
7.9159
ppm

CF3

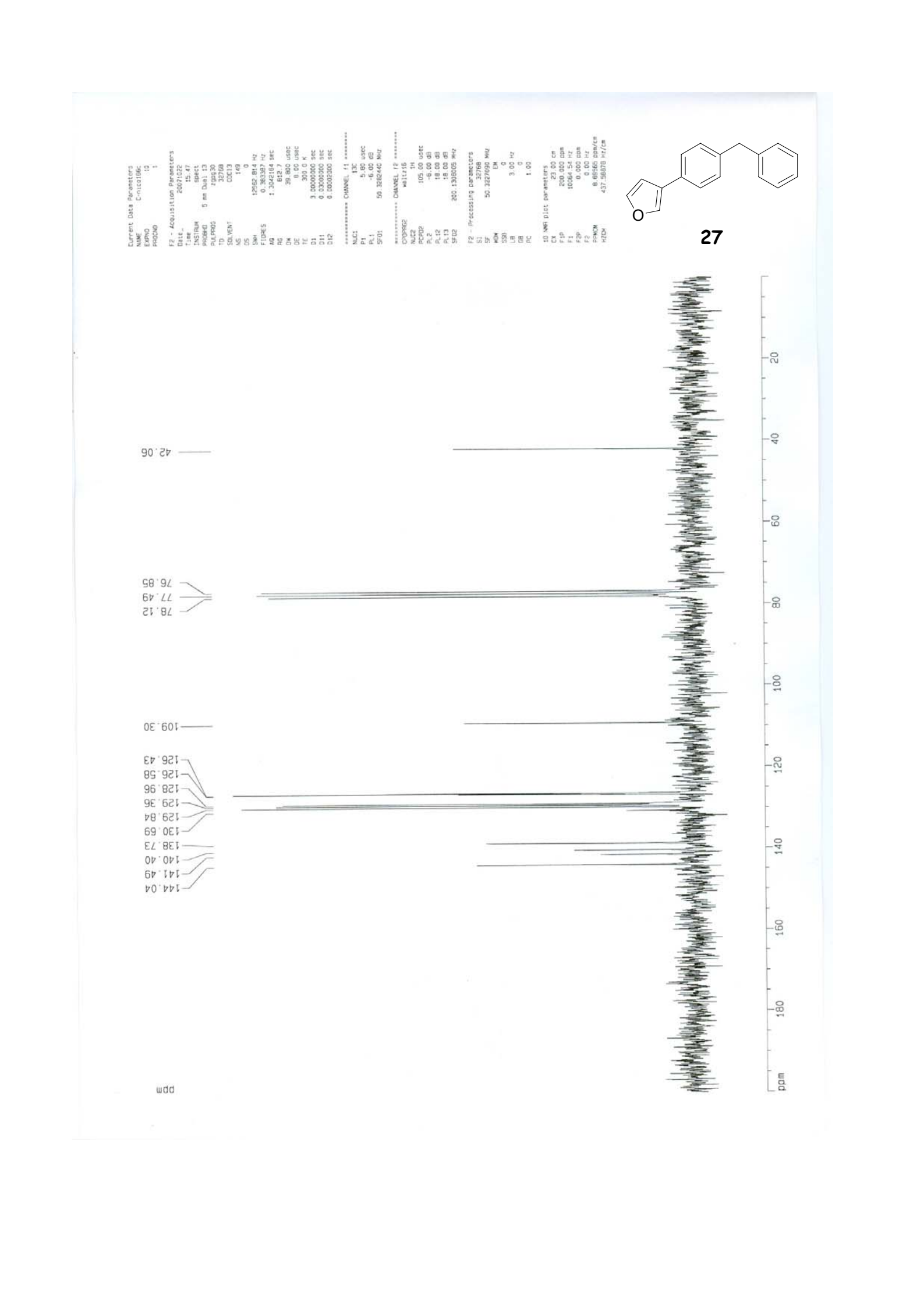
26

20.65
21.42
34.88
76.89
77.52
78.16
124.17
127.63
128.99
129.48
129.65
130.68
131.25
131.89
133.97
136.35
137.48
137.68
140.71
142.33
ppm

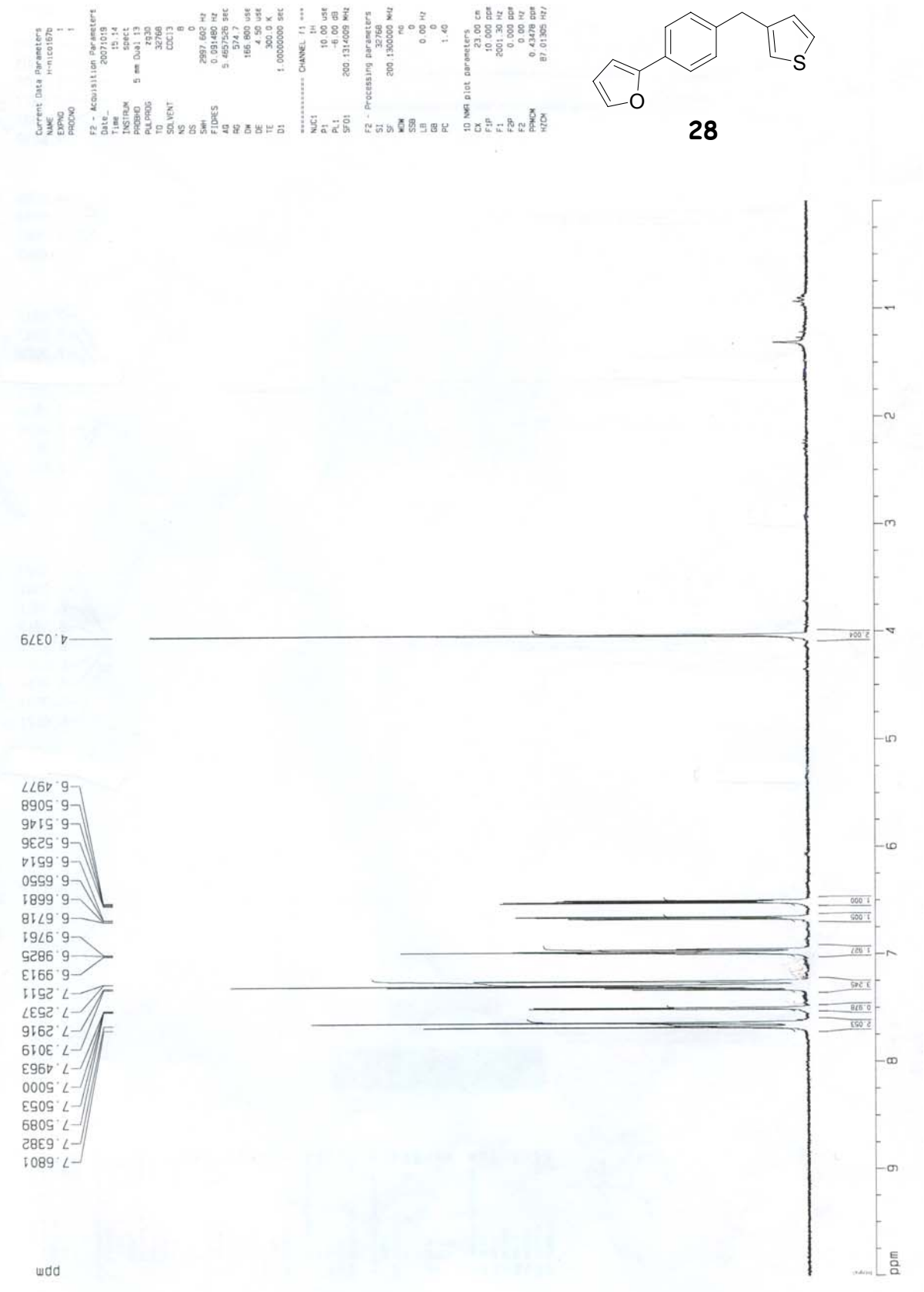


27

Current Data Parameters
NAME H-nic0166c
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071022
Time 15.30
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091490 Hz
AQ 5.4657526 sec
RG 574.7
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ===
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm/cm
HZCM 87.01305 Hz
4.0578
7.7672
7.5334
7.5257
7.5243
7.5006
7.4594
7.3359
7.3337
7.3025
7.3008
7.2925
7.2898
7.2876
7.2496
7.2476
7.2450
6.7514
6.7468
6.7420
6.7374
ppm

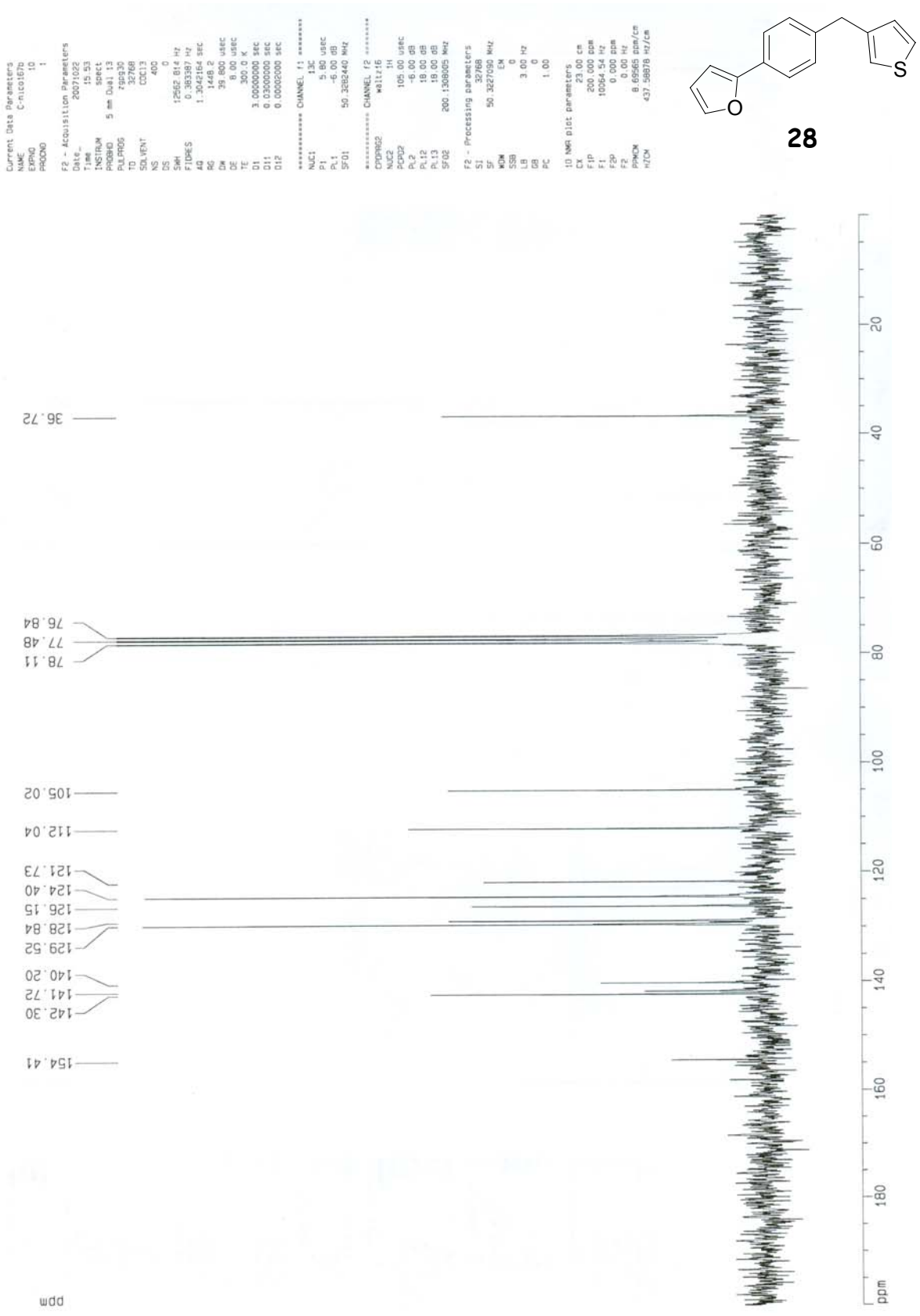

Current Data Parameters
NAME C-nicol06c
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071022
Time 15.47
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 149
DS 0
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3042164 sec
RG 812.7
DW 39.800 usec
DE 6.00 usec
TE 300.0 K
D1 3.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.80 usec
PL1 -6.00 dB
SFO1 50.3282440 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 -6.00 dB
PL12 18.00 dB
PL13 18.00 dB
SFO2 200.1308605 MHz
F2 - Processing parameters
SI 32768
SF 50.3227090 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 23.00 cm
F1P 200.000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.66566 ppm/cm
HZCM 437.38878 Hz/cm
42.06
76.85
77.49
78.12
109.30
126.43
126.58
128.96
129.36
129.84
130.69
138.73
140.40
141.49
144.04
ppm
20
40
60
80
100
120
140
160
180
O

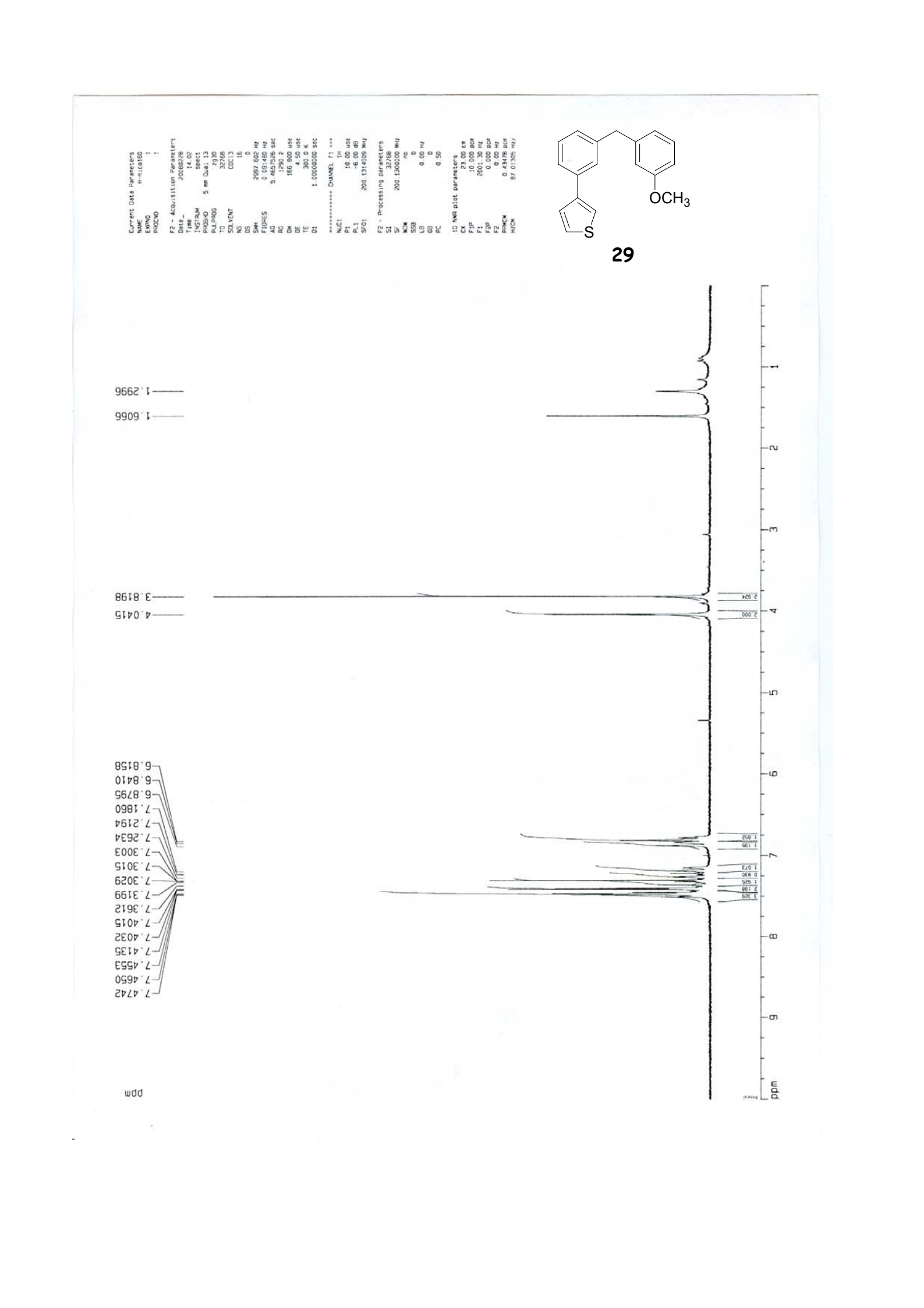
27

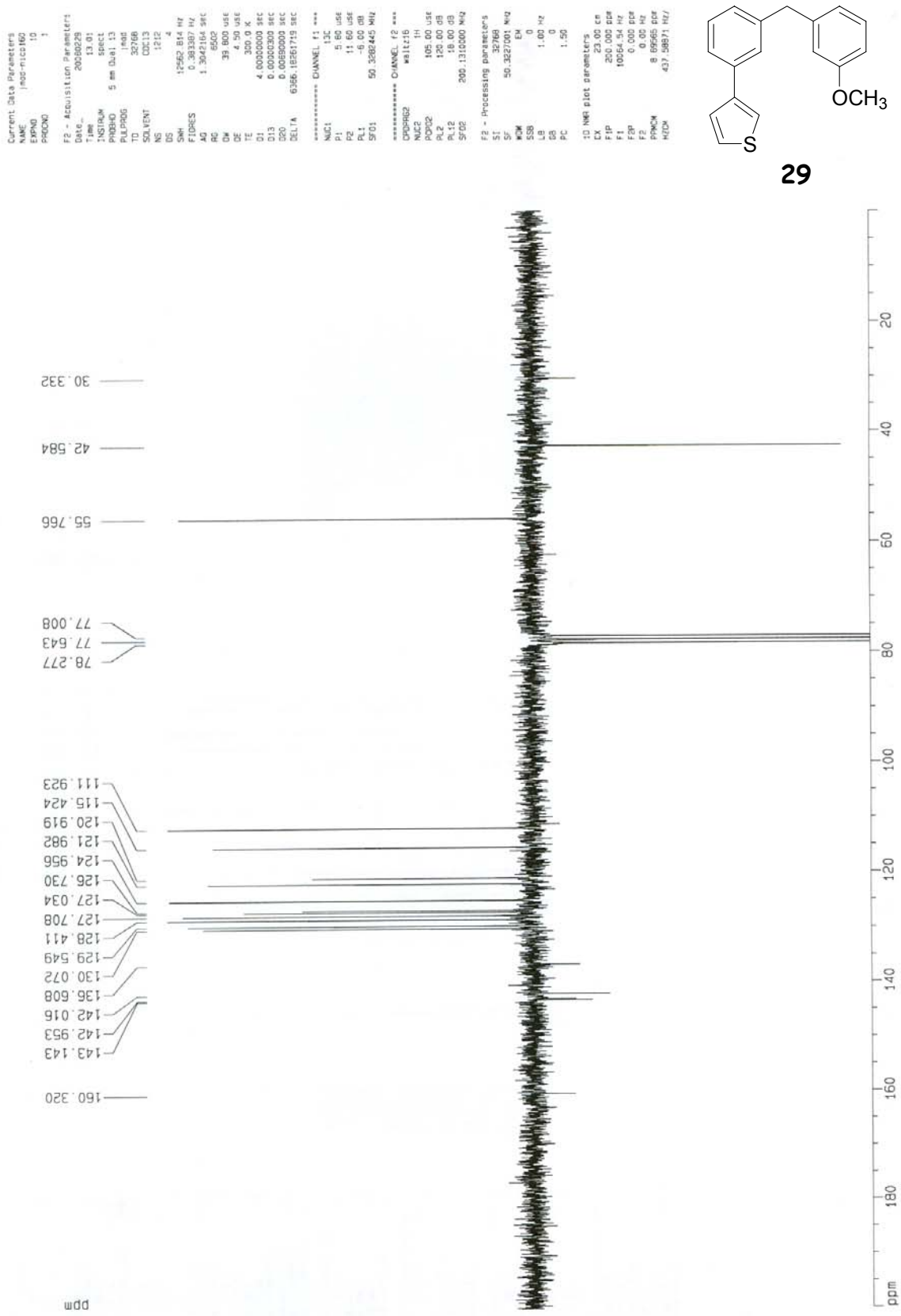

Current Data Parameters
NAME H-nic0167b
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071019
Time 15.14
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG 2g30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2997.602 Hz
FIDRES 0.091480 Hz
AQ 5.4657526 sec
RG 574.7
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm
HZCM 87.01305 Hz
4.0379
6.4977
6.5068
6.5146
6.5236
6.5514
6.5550
6.6681
6.6718
6.9761
6.9825
6.9913
7.2511
7.2537
7.2916
7.3019
7.4963
7.5000
7.5053
7.5089
7.6382
7.6801
2.004
1.000
1.005
1.927
3.245
0.978
2.053
ppm

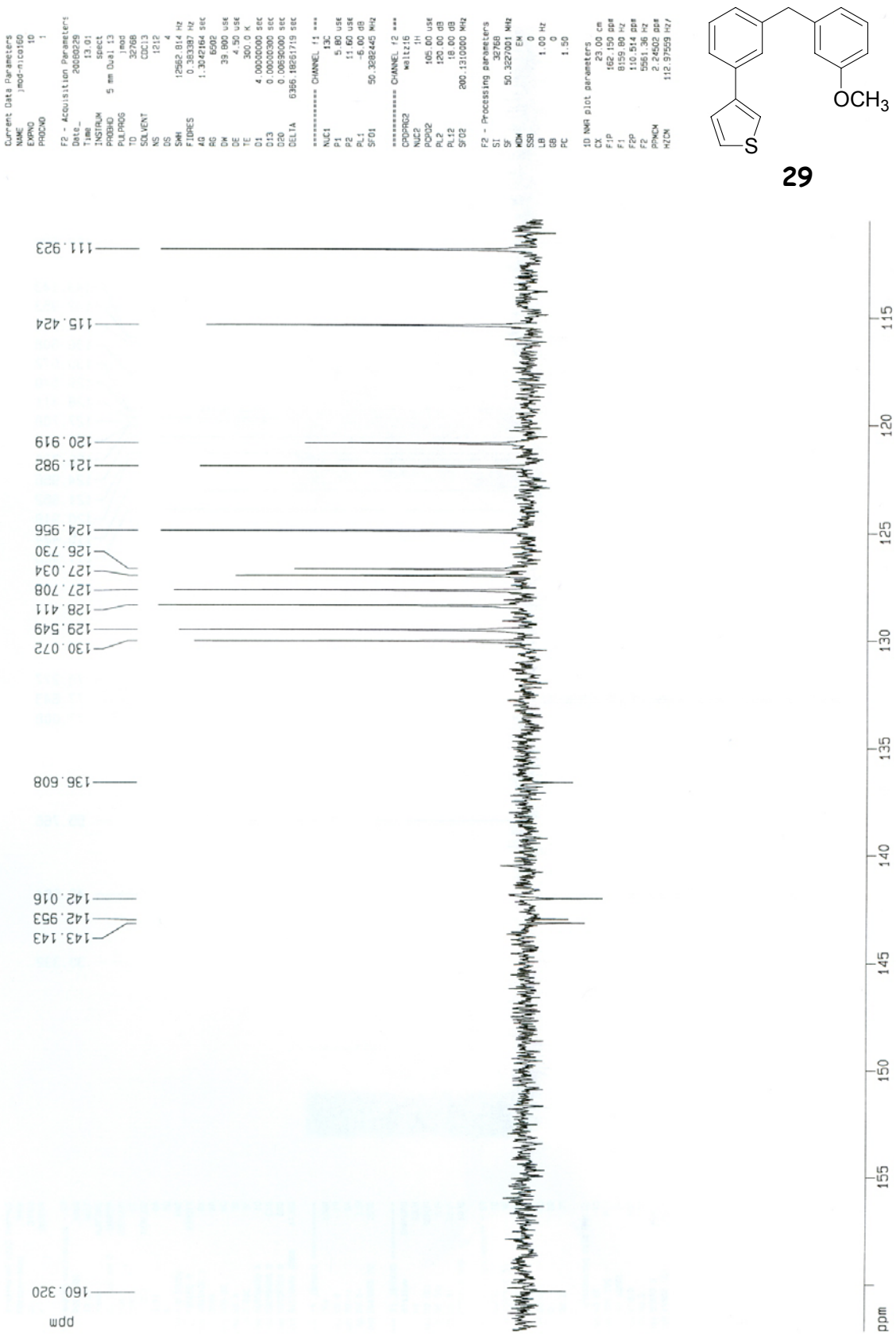
O
S

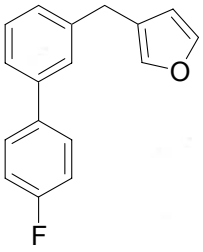
28


Current Data Parameters
NAME C-nico167b
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071022
Time 15.53
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 0
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3042164 sec
RG 1448.2
DW 39.800 usec
DE 6.00 usec
TE 300.0 K
D1 3.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 5.80 usec
PL1 -6.00 dB
SFO1 50.3262440 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 -6.00 dB
PL12 18.00 dB
PL13 18.00 dB
SFO2 200.1308005 MHz
F2 - Processing parameters
SI 32768
SF 50.3227090 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 23.00 cm
F1P 200.000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.69565 ppm/cm
HZCM 437.58878 Hz/cm
O
S
28
36.72
76.84
77.48
78.11
105.02
112.04
121.73
124.40
126.15
128.84
129.52
140.20
141.72
142.30
154.41
ppm
20
40
60
80
100
120
140
160
180
ppm

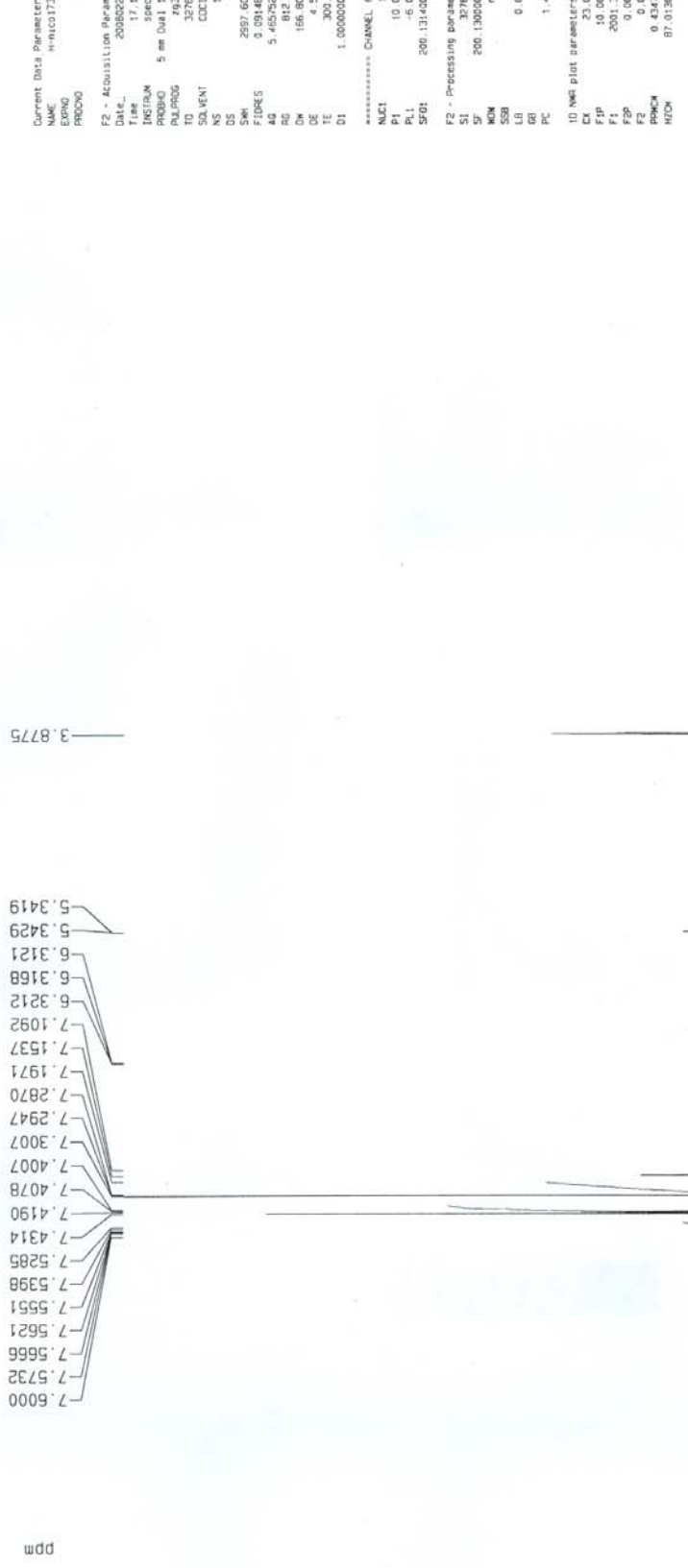

Current Data Parameters
NAME H-nico160
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060228
Time 14.02
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 2997.602 Hz
FIDRES 0.091480 Hz
AQ 5.465526 sec
RG 1290.2
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm/cm
HZCM 87.01305 Hz
OCH3
S
29
1.2996
1.6066
3.8198
4.0415
6.8158
6.8410
6.8795
7.1860
7.2194
7.2634
7.3003
7.3015
7.3029
7.3199
7.3612
7.4015
7.4032
7.4135
7.4553
7.4650
7.4742
2.924
2.000
1.852
1.199
1.073
0.990
1.505
2.198
3.309
ppm

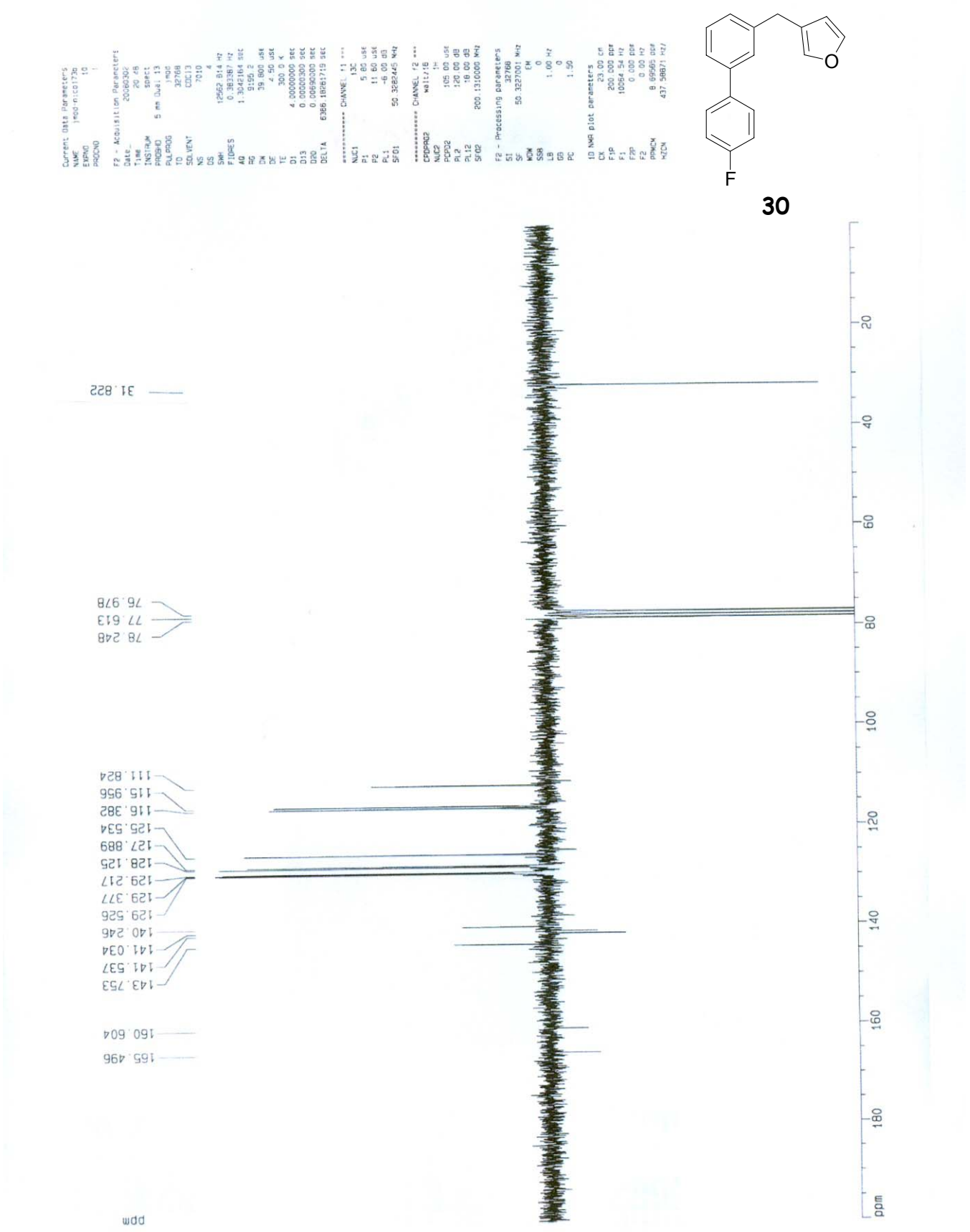

Current Data Parameters
NAME jmdc-ric160
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20050629
Time 13.01
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG jmod
TD 32768
SOLVENT CDCl3
NS 1212
DS 4
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3042164 sec
RG 8503
DW 39.800 usec
DE 4.50 usec
TE 300.9 K
D1 4.00000009 sec
D13 0.00000309 sec
D20 0.00690009 sec
DELTA 6366.18261719 sec
======== CHANNEL f1 ========
NUC1 13C
P1 5.60 usec
P2 11.60 usec
PL1 -6.00 dB
SFO1 50.3082445 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 200.1310000 MHz
F2 - Processing parameters
SI 32768
SF 50.3227001 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.50
1D NMR plot parameters
CX 23.00 cm
F1P 250.0000 ppm
F1 10064.54 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 8.69966 ppm
HZCM 437.98871 Hz/cm
OCH3
S
29
30.332
42.584
55.766
77.008
77.643
78.277
111.923
115.424
120.919
121.982
124.956
126.730
127.034
127.708
128.411
129.549
130.072
136.608
142.016
142.953
143.143
160.320
ppm
20
40
60
80
100
120
140
160
180
ppm

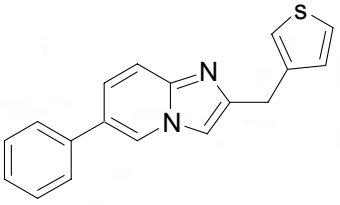

Current Data Parameters
NAME jmod-nico160
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060229
Time 13.01
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG jmod
TD 32768
SOLVENT CDCl3
NS 1212
DS 4
SWH 12562.814 Hz
FIDRES 0.383387 Hz
AQ 1.3042164 sec
RG 6502
DW 39.800 usec
DE 4.50 usec
TE 300.0 K
D1 4.00000000 sec
D13 0.00000300 sec
D20 0.00690000 sec
DELTA 6366.18261719 sec
CHANNEL f1
NUC1 13C
P1 5.80 usec
P2 11.60 usec
PL1 -6.00 dB
SFO1 50.3282445 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 105.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 200.1310000 MHz
F2 - Processing parameters
SI 32768
SF 50.3227001 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.50
1D NMR plot parameters
CX 23.00 cm
F1P 162.150 ppm
F1 8159.89 Hz
F2P 110.514 ppm
F2 5561.36 Hz
PPMCM 2.24502 ppm
HZCM 112.97559 Hz
OCH3
S
29
111.923
115.424
120.919
121.982
124.956
126.730
127.034
127.708
128.411
129.549
130.072
136.608
142.016
142.953
143.143
160.320
ppm
115
120
125
130
135
140
145
150
155


O
F

30


Current Data Parameters
NAME H-nico173b
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080227
Time 17.16
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 2597.602 Hz
FIDRES 0.091480 Hz
AQ 5.4657926 sec
RG 812.7
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ===
NUC1 1H
P1 10.00 usec
PL1 -5.00 dB
SFO1 200.1314009 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.43478 ppm
HZCM 87.01385 Hz
3.8775
5.3419
5.3429
6.3121
6.3168
6.3212
7.1092
7.1537
7.1971
7.2870
7.2947
7.3007
7.4007
7.4078
7.4190
7.4314
7.5285
7.5398
7.5551
7.5621
7.5666
7.5732
7.6000
2.000
0.973
2.636
3.276
4.032
2.229
ppm


O
F
30
31.822
76.978
77.613
78.248
111.824
115.956
116.382
125.534
127.889
128.125
129.217
129.377
129.526
140.246
141.034
141.537
143.753
160.604
165.496
ppm


S
N
N

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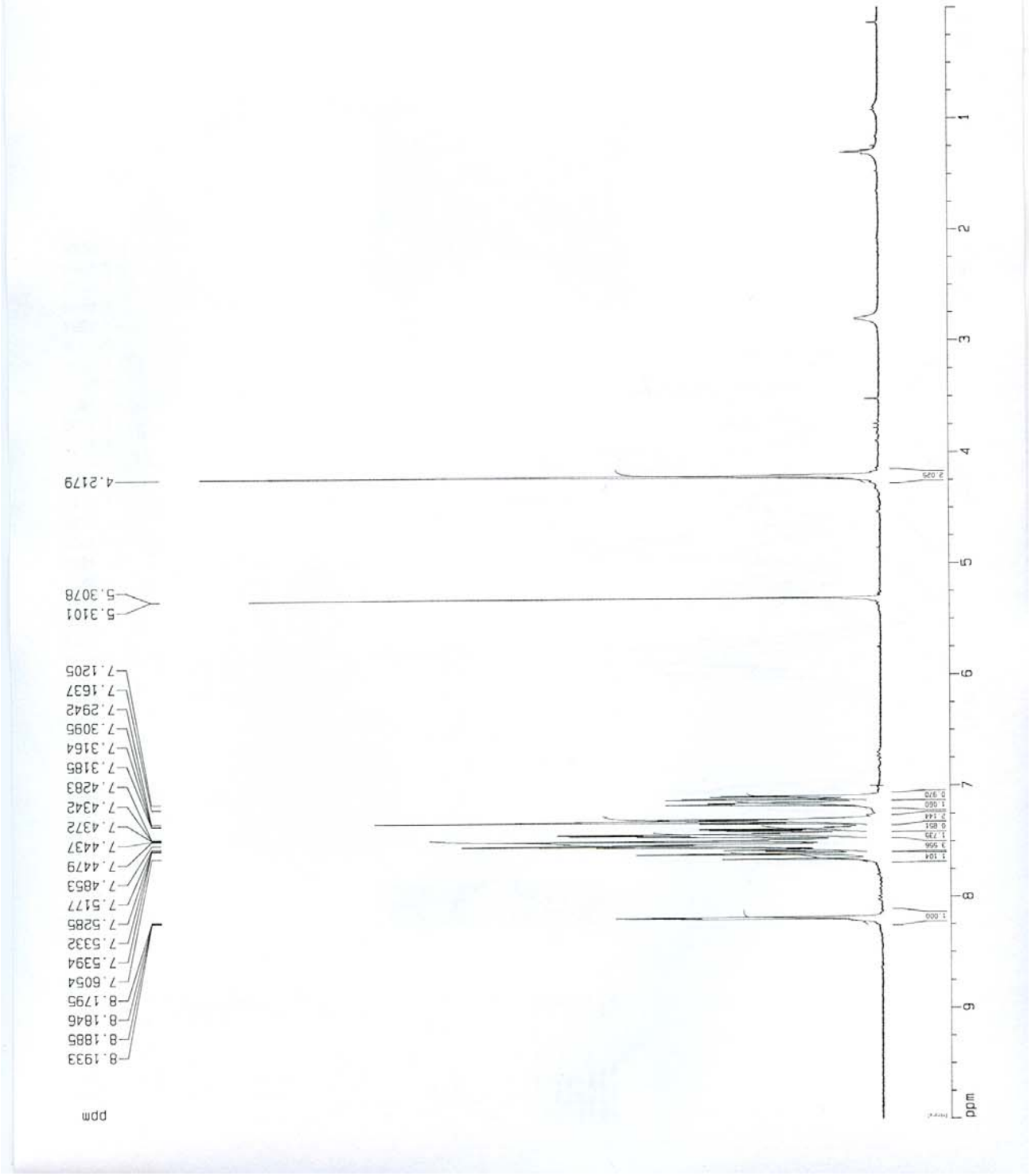
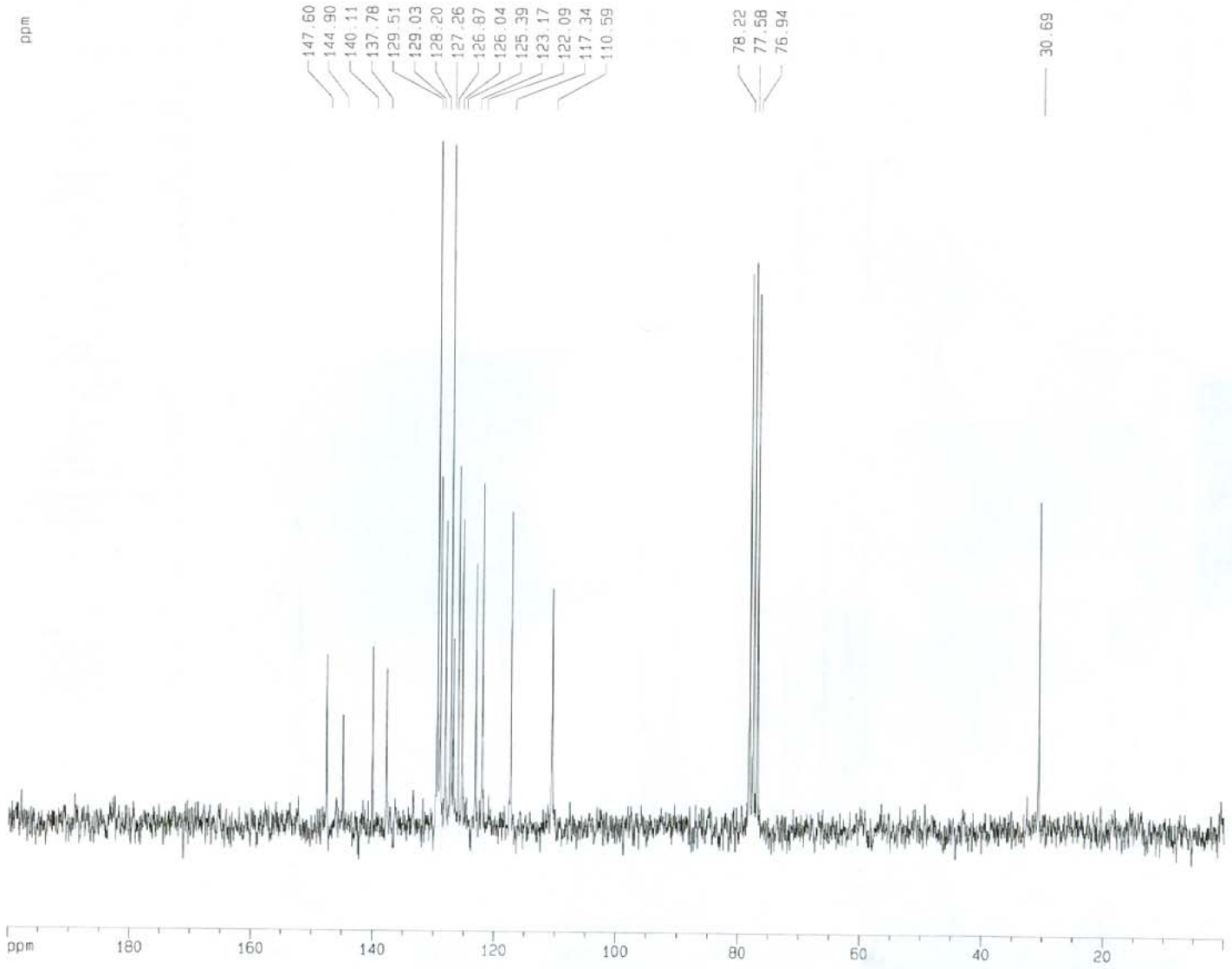

Current Data Parameters
NAME H-nic028
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080227
Time 14.35
INSTRUM spect
PROBHD 5 mm Dual 13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 2597.602 Hz
FIDRES 0.079183 Hz
AQ 5.4657926 sec
RG 228.1
DW 166.800 usec
DE 4.50 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -6.00 dB
SF01 200.1314099 MHz
F2 - Processing parameters
SI 32768
SF 200.1300000 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 23.00 cm
F1P 10.000 ppm
F1 2001.30 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 0.23478 ppm/cm
HZCM 47.01303 Hz
4.2179
5.3078
5.3101
7.1205
7.1637
7.2942
7.3095
7.3164
7.3185
7.4283
7.4342
7.4372
7.4437
7.4479
7.4853
7.5177
7.5285
7.5332
7.5394
7.6054
8.1795
8.1846
8.1885
8.1933
ppm




```
Current Data Parameters
NAME            C-nico126a
EXPNO                   10
PROCNO                   1

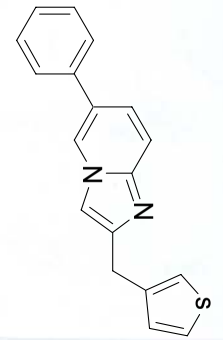
F2 - Acquisition Parameters
Date_            20070719
Time                 9.35
INSTRUM              spect
PROBHD     5 mm Dual 13
PULPROG          zgpg30
TD                  32768
SOLVENT             CDCl3
NS                    101
DS                      0
SWH              12562.814 Hz
FIDRES           0.383387 Hz
AQ               1.3042164 sec
RG                    102
DW                39.800 usec
DE                 6.00 usec
TE                 300.0 K
D1              3.00000000 sec
D11             0.03000000 sec
D12             0.00002000 sec

********** CHANNEL f1 ********
NUC1                  13C
P1                  5.80 usec
PL1                -6.00 dB
SFO1           50.3282440 MHz

********** CHANNEL f2 ********
CPDPRG2           waltz16
NUC2                   1H
PCPD2              105.00 usec
PL2                -6.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2          200.1300005 MHz

F2 - Processing parameters
SI                  32768
SF             50.3227090 MHz
WDW                   EM
SSB                    0
LB                  3.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 23.00 cm
F1P              200.000 ppm
F1               10064.54 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM           8.69565 ppm/cm
HZCM            437.58878 Hz/cm
```



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