Supporting Information

for

A Facile and Practical Synthesis of *N*-Acetyl Enamides

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General Methods. All reactions were carried out under a nitrogen atomosphere. Actic anhydride and acetic acid were purchased from Aldrich and used directly. THF (<0.02% water content) was purchased from J. T. Baker and used directly without further purifications. Anhydrous ferrous acetate was purchased from Strem Chemicals, Inc. All the ketoximes substrates **1a-o** were prepared from corresponding ketones and hydroxylamine hydrochloride following reported procedures.[1,8] ^{1}H and ^{13}C NMR data were recorded on a Bruker-Biospin DRX500 or DRX400 NMR Spectrometer with DMSO-d_6 as the solvent. Melting points were determined on a Fisher-Johns melting-point apparatus.

General procedure for the synthesis of *N*-acetyl arylenamides: Acetic anhydride (8 mmol, 2 equiv) and acetic acid (12 mmol, 3 equiv) were added to a solution of ketoxime **1a-o** (4 mmol, 1 equiv, 0.2 M) in THF (20 mL). The solution was purged with nitrogen for 15 minutes. Iron (II) acetate (8 mmol, 2 equiv) was then added and the resulting mixture was stirred at reflux under nitrogen for 5-12 hours and then cooled to room temperature. The reaction mixture was diluted with water (20 mL) and neutralized with 10% $NaHCO_3$ solution (~ 10 mL) until the pH was approximately 5.0. The mixture was then extracted twice with EtOAc (2 × 20 mL). The combined organic solution was washed sequentially with 10% $NaHCO_3$ solution (20 mL) and brine (20 mL), dried over sodium sulfate, and concentrated. The pure desired compound **2a-o** was obtained by silica gel column chromatography (EtOAc/hexanes as eluent).

N-(1-(4-Bromophenyl)vinyl)acetamide (**2a**):[1] 90% yield; mp 112-113 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.38 (s, 1H), 7.57 (d, J = 8.3 Hz, 2H), 7.28 (d, J = 8.3 Hz, 2H), 5.56 (s, 1H), 5.03 (s, 1H), 2.00 (s, 3H); ^{13}C NMR (125 MHz, DMSO-d_6) δ 169.0, 140.6, 137.1, 131.1, 128.3, 121.3, 102.9, 23.6.

N-(1-Phenylvinyl)acetamide (**2b**):[2,3] 78% yield; mp 82-84 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.32 (s, 1H), 7.45-7.42 (m, 2H), 7.39-7.33 (m, 3H), 5.62 (s, 1H), 4.98 (s, 1H), 2.01 (s, 3H).

N-(1-(4-Methoxyphenyl)vinyl)acetamide (**2c**):[3,4] 82% yield; mp 94-95 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.22 (s, 1H), 7.37 (d, J = 8.7 Hz, 2H), 6.93 (d, J = 8.7 Hz, 2H), 5.52 (s, 1H), 4.90 (s, 1H), 3.77 (s, 3H), 2.00 (s, 3H).

N-(1-(4-(Trifluoromethyl)phenyl)vinyl)acetamide (**2d**): [3,4] 87% yield; mp 113-115 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.51 (s, 1H), 7.73 (d, J = 8.3 Hz, 2H), 7.64 (d, J = 8.3 Hz, 2H), 5.61 (s, 1H), 5.13 (s, 1H), 2.02 (s, 3H).

N-(1-(2-Methoxyphenyl)vinyl)acetamide (**2e**):[5] 77% yield; mp 124-125 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.15 (s, 1H), 7.33 (td, J = 8.0, 1.8 Hz, 1H), 7.19 (dd, J = 7.4, 1.8 Hz, 1H), 7.02 (d, ^3J = 8.2 Hz, 1H), 6.94 (t, J = 7.6 Hz, 1H), 5.82 (s, 1H), 4.54 (s, 1H), 3.77 (s, 3H), 1.92 (s, 3H).

N-(1-(4-Nitrophenyl)vinyl)acetamide (**2f**):[6] 45% yield; mp 148-149 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, J = 8.5 Hz, 2H), 7.58 (d, J = 8.5 Hz, 2H), 6.87 (brs, 1H), 5.83 (s, 1H), 5.26 (s, 1H), 2.17 (s, 3H).

N-(1-(Naphthalen-2-yl)vinyl)acetamide (**2g**):[2] 77% yield; mp 123-124 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87-7.82 (m, 5H), 7.52-7.48 (m, 2H), 6.91 (br s, 1H), 5.96 (s, 1H), 5.24 (s, 1H), 2.19 (s, 3H).

N-(1-(4-Methoxyphenyl)prop-1-enyl)acetamide (**2h**, 1/1.5 *E*/*Z* mixtures):[3] 80% yield; *Z* isomer: ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.03-8.99 (m, 1H), 7.19 (d, J = 8.5 Hz, 2H), 6.94 (d, J =8.5 Hz, 2H), 5.97 (q, J = 7.1 Hz, 1H), 3.77-3.73 (m, 3H), 1.89 (s, 3H), 1.65-

1.58 (m, 3H); *E* isomer: ^{1}H NMR (500 MHz, DMSO-D$_6$) δ 9.03-8.99 (m, 1H), 7.29 (d, *J* = 8.7 Hz, 2H), 6.87 (d, *J* = 8.7 Hz, 2H), 5.77 (q, *J* = 6.8 Hz, 1H), 3.77-3.73 (m, 3H), 1.99 (s, 3H), 1.65-1.58 (m, 3H).

N-(2-Methyl-1-phenylprop-1-enyl)acetamide (**2i**):[1,7] 66% yield; mp 82-83 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.00 (s, 1H), 7.33-7.29 (m, 2H), 7.24-7.19 (m, 3H), 1.89 (s, 3H), 1.71 (s, 3H), 1.69 (s, 3H).

N-(Cyclohexylidene(phenyl)methyl)acetamide (**2j**):[1,7] 67% yield; mp 130-131 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.98 (s, 1H), 7.31 (m, 2H), 7.22 (m, 1H), 7.18 (m, 2H), 2.17-2.11 (m, 4H), 1.87 (s, 3H), 1.57-1.52 (m, 4H), 1.50-1.46 (m, 2H).

N-(3,4-Dihydronaphthalen-1-yl)acetamide (**2k**):[1,7,8] 80% yield; mp 133-134 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.11 (s, 1H), 7.22-7.14 (m, 4H), 6.16 (t, *J* = 4.6 Hz, 1H), 2.69 (t, *J* = 7.9 Hz, 2H), 2.29-2.23 (m, 2H), 2.02 (s, 3H).

N-(1*H*-inden-3-yl)acetamide (**2l**):[1,7,8] 50% yield; mp 126-127 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.72 (s, 1H), 7.77 (d, *J* = 7.6 Hz, 1H), 7.47 (d, *J* = 7.4 Hz, 1H),7.33 (t, *J* = 7.3 Hz, 1H), 7.23 (t, *J* = 7.2 Hz, 1H), 6.75 (t, *J* = 2.2 Hz, 1H), 3.37 (d, *J* = 2.2 Hz, 2H), 2.13 (s, 3H).

N-(2-Methyl-3,4-dihydronaphthalen-1-yl)acetamide (**2m**):[7,8] 55% yield; mp 153-154 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.93 (s, 1H), 7.15-7.07 (m, 3H), 7.04 (d, *J* = 7.6 Hz, 1H), 2.73 (t, *J* = 8.1 Hz, 2H), 2.29 (t, *J* = 8.1 Hz, 2H), 2.03 (s, 3H), 1.77 (s, 3H).

N-(6-Methoxy-3,4-dihydronaphthalen-1-yl)acetamide (**2n**):[7] 82% yield; mp 126-128 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.03 (s, 1H), 7.13 (d, *J* = 8.4 Hz, 1H), 6.79-6.71 (m, 2H), 6.03 (t, *J* = 4.5 Hz, 1H), 3.74 (s, 3H), 2.68-2.63 (m, 2H), 2.26-2.20 (m, 2H), 2.00 (s, 3H).

N-(5,7-Dimethyl-3,4-dihydronaphthalen-1-yl)acetamide (**2o**):[7] 74% yield; mp 162-163 °C; ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.01 (s, 1H), 6.89 (s, 1H), 6.87 (s, 1H), 6.14 (t, *J* = 4.6 Hz, 1H), 2.57 (t, *J* = 7.8 Hz, 2H), 2.25-2.18 (m, 8H), 2.01 (s, 3H).

References for Supporting Information

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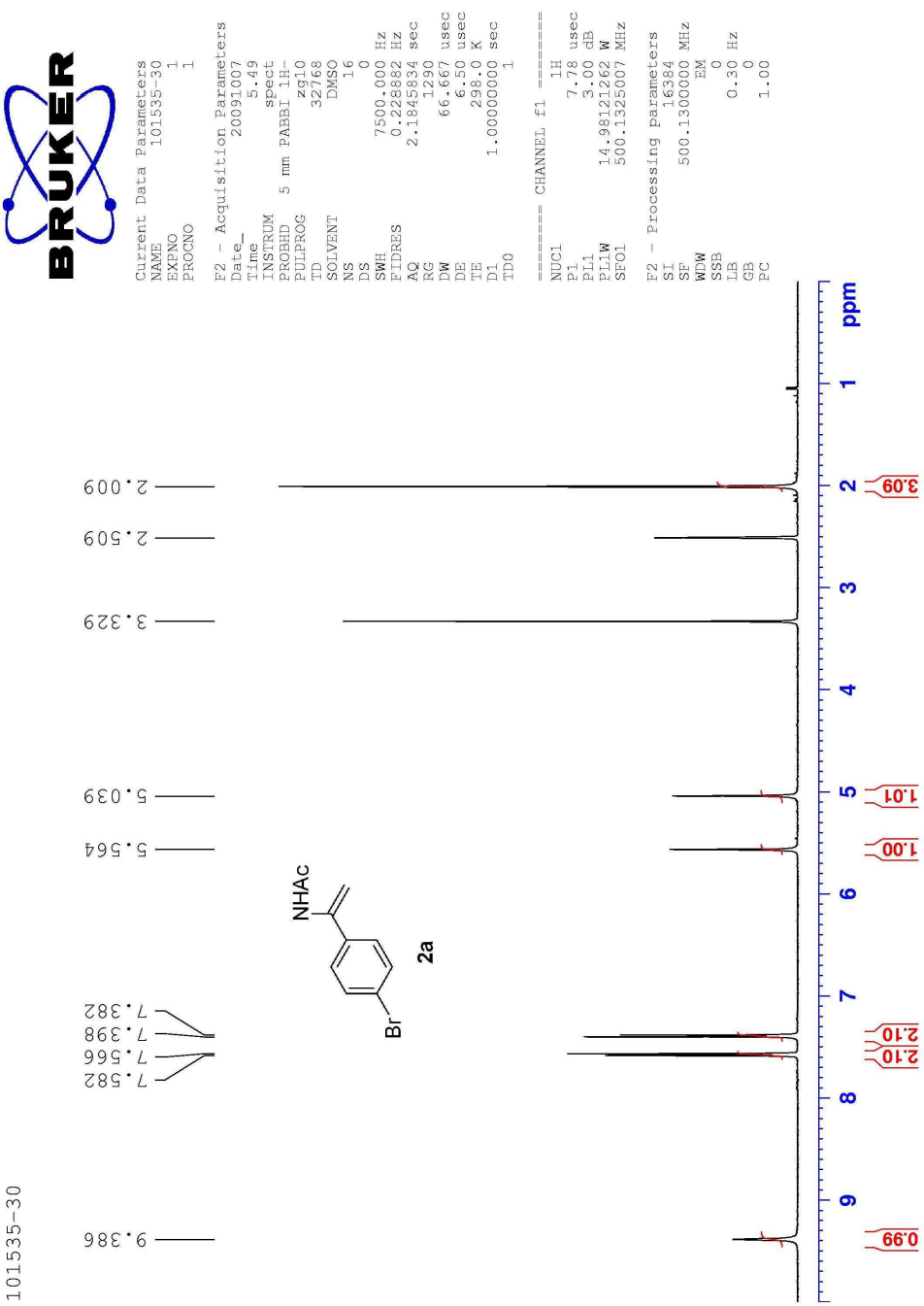
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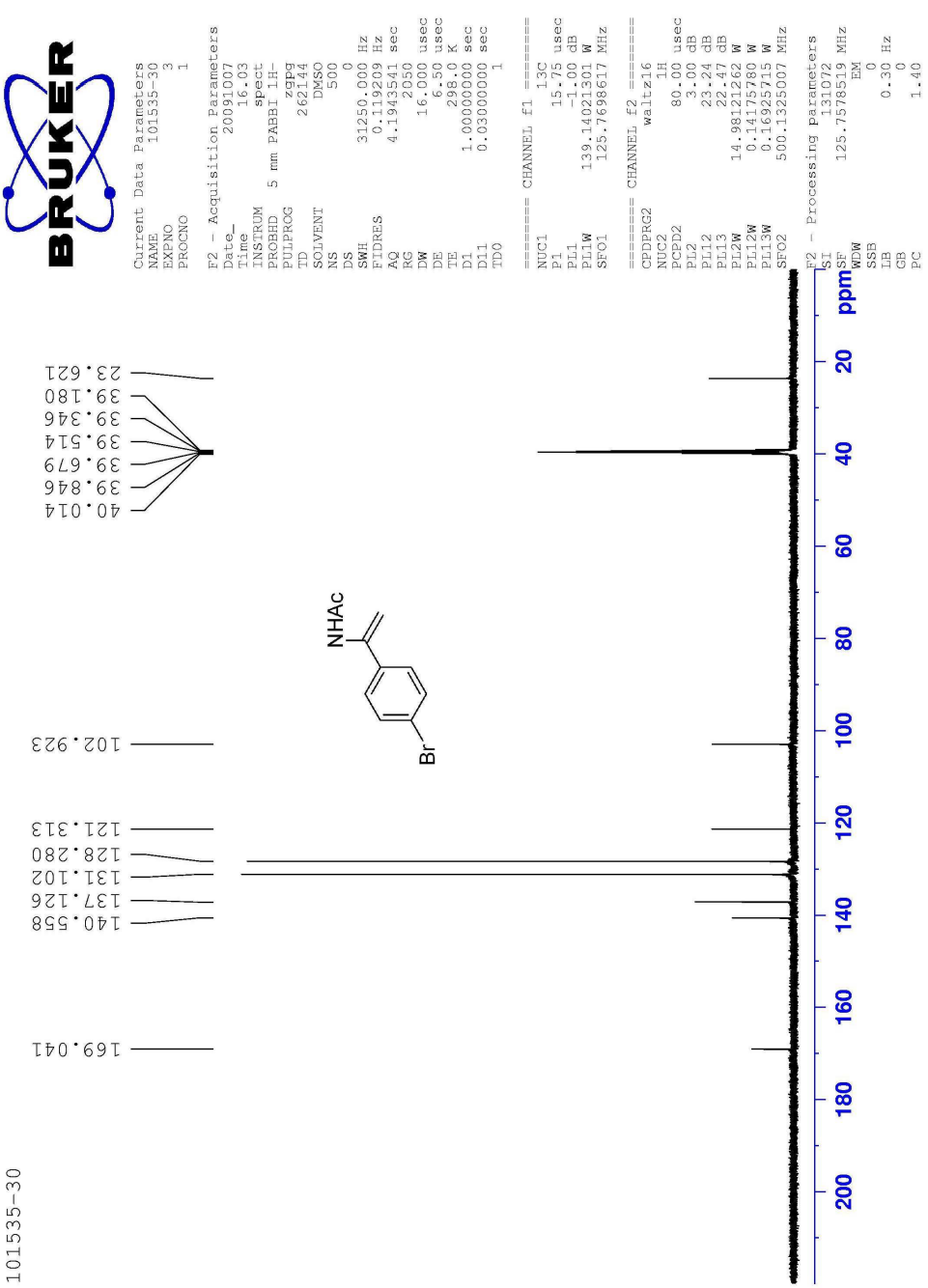
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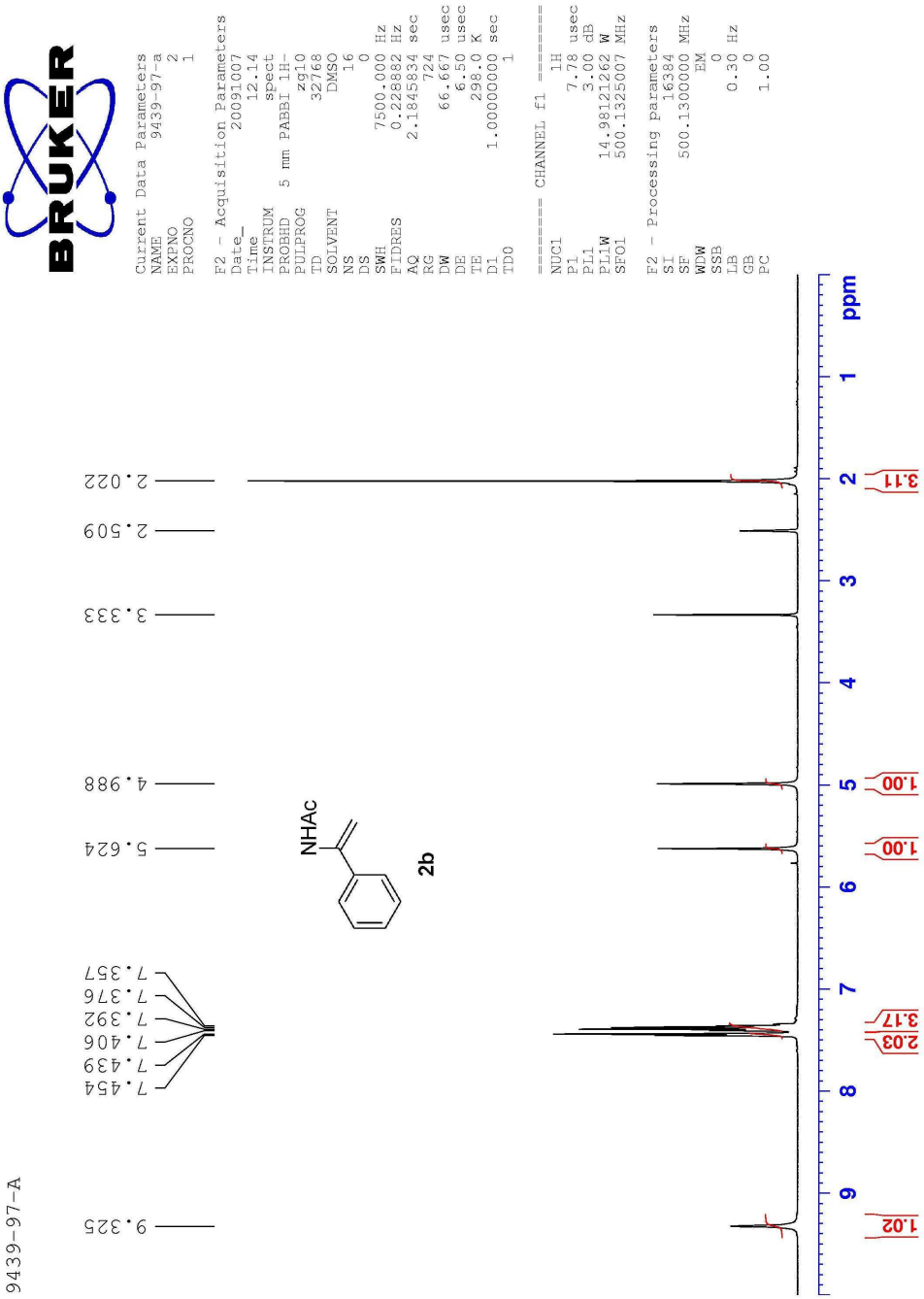
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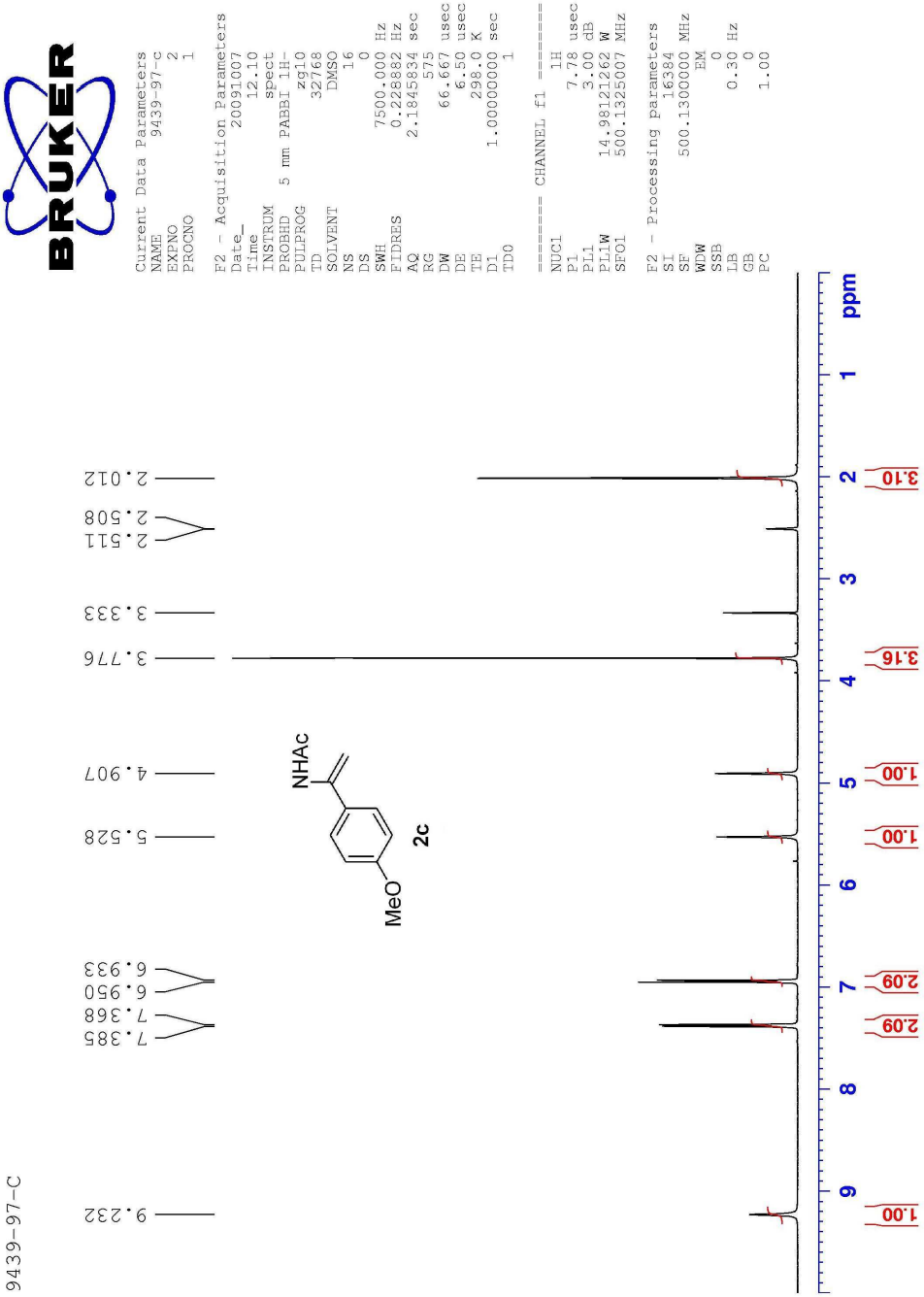
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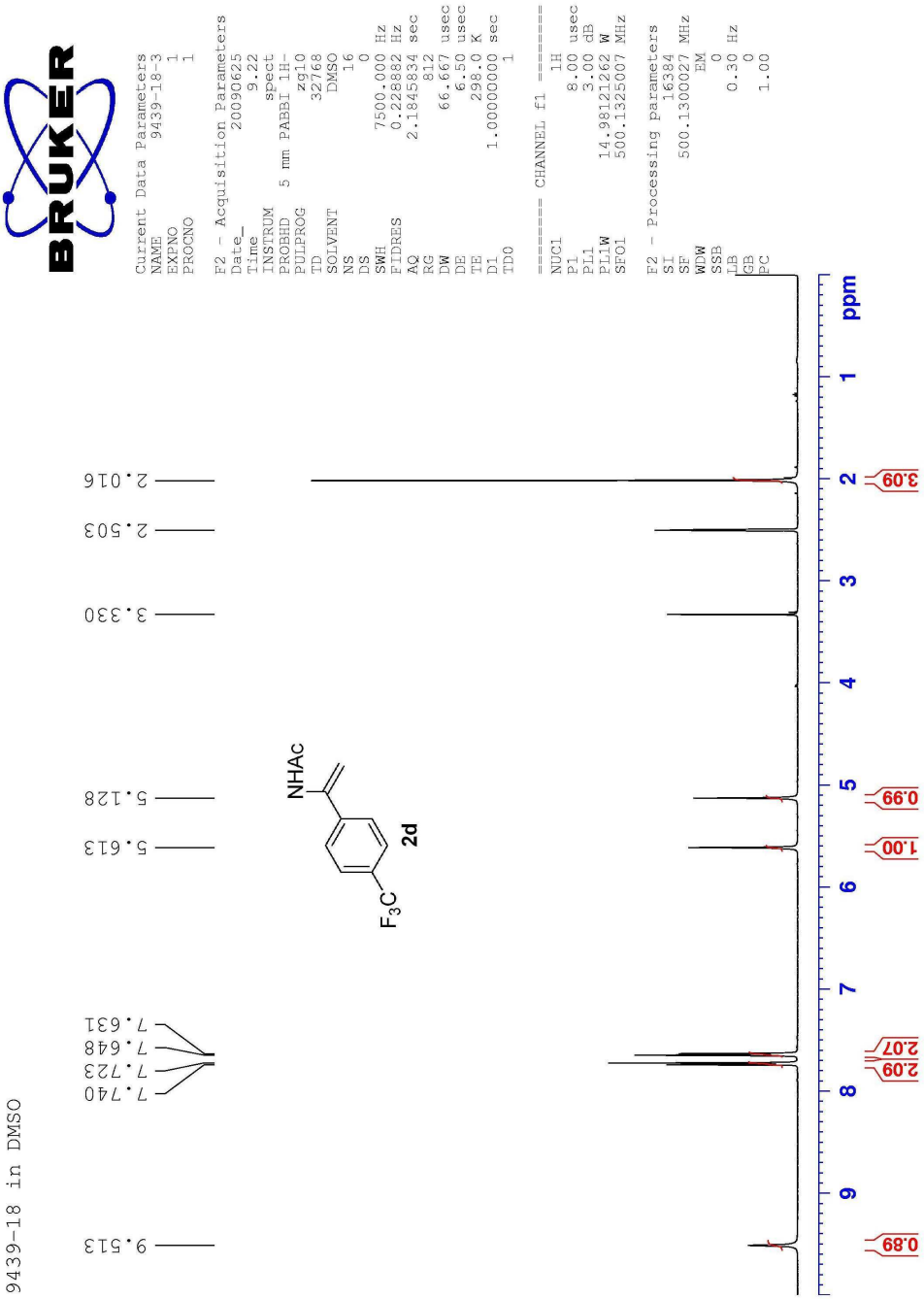
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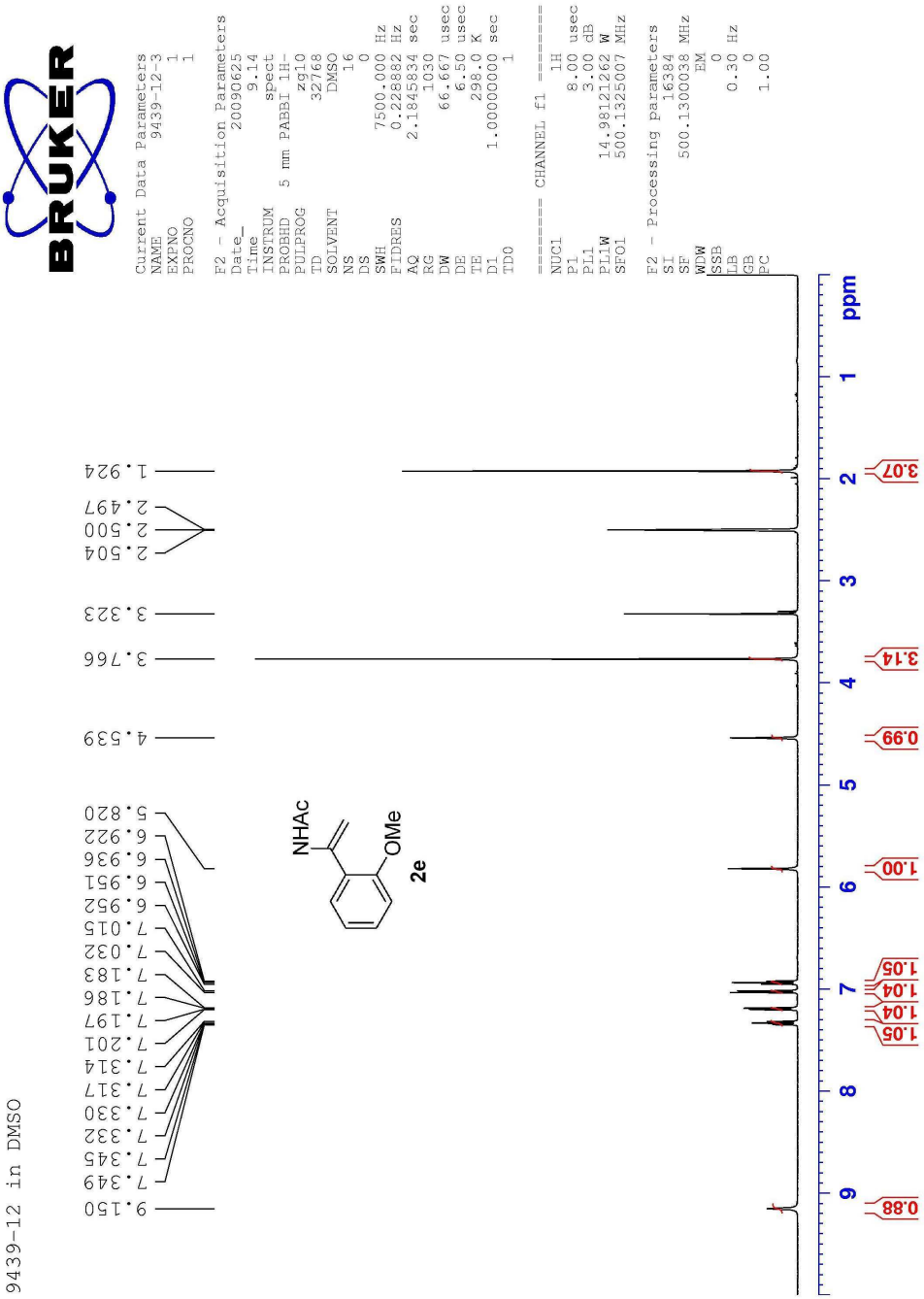
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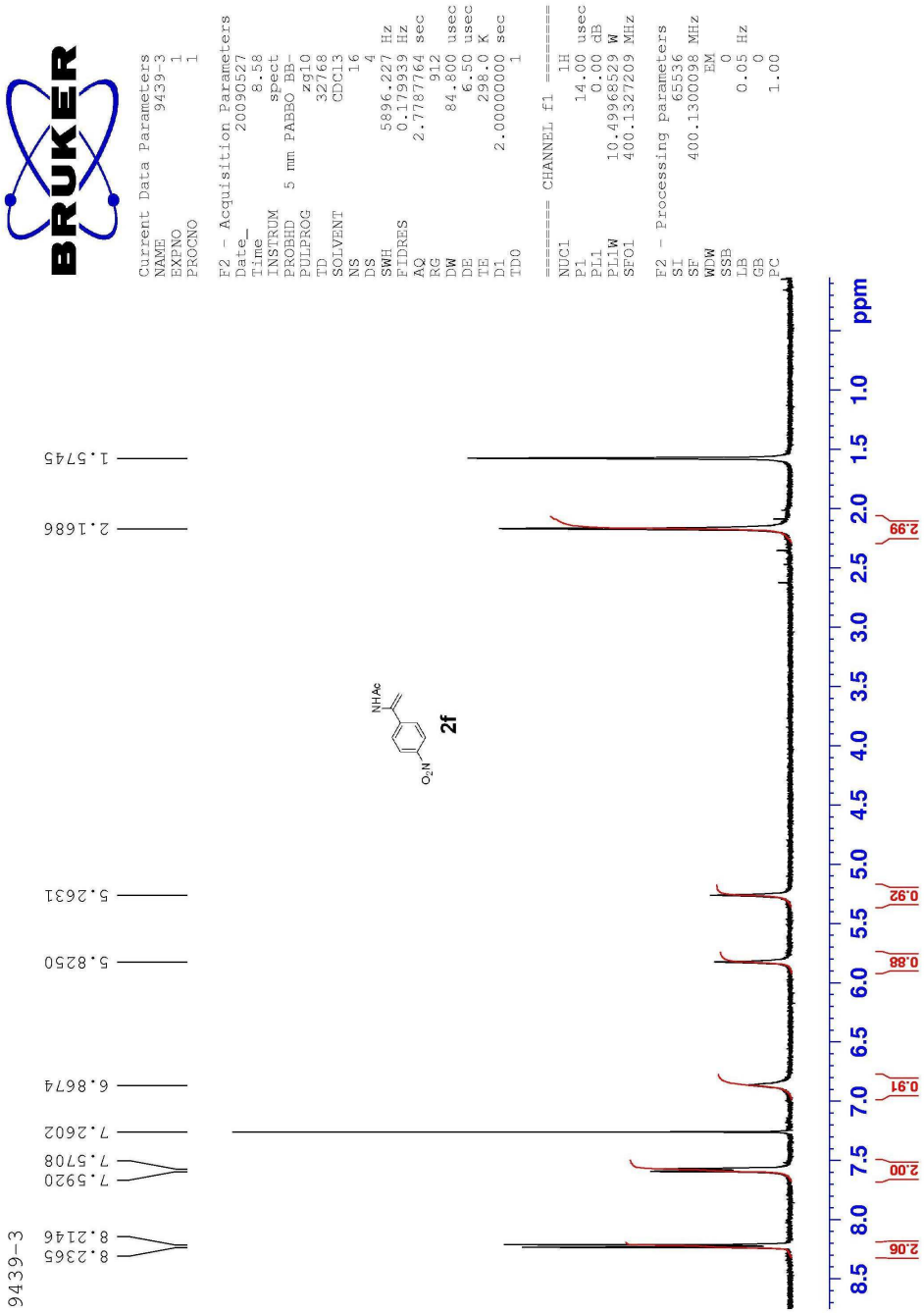
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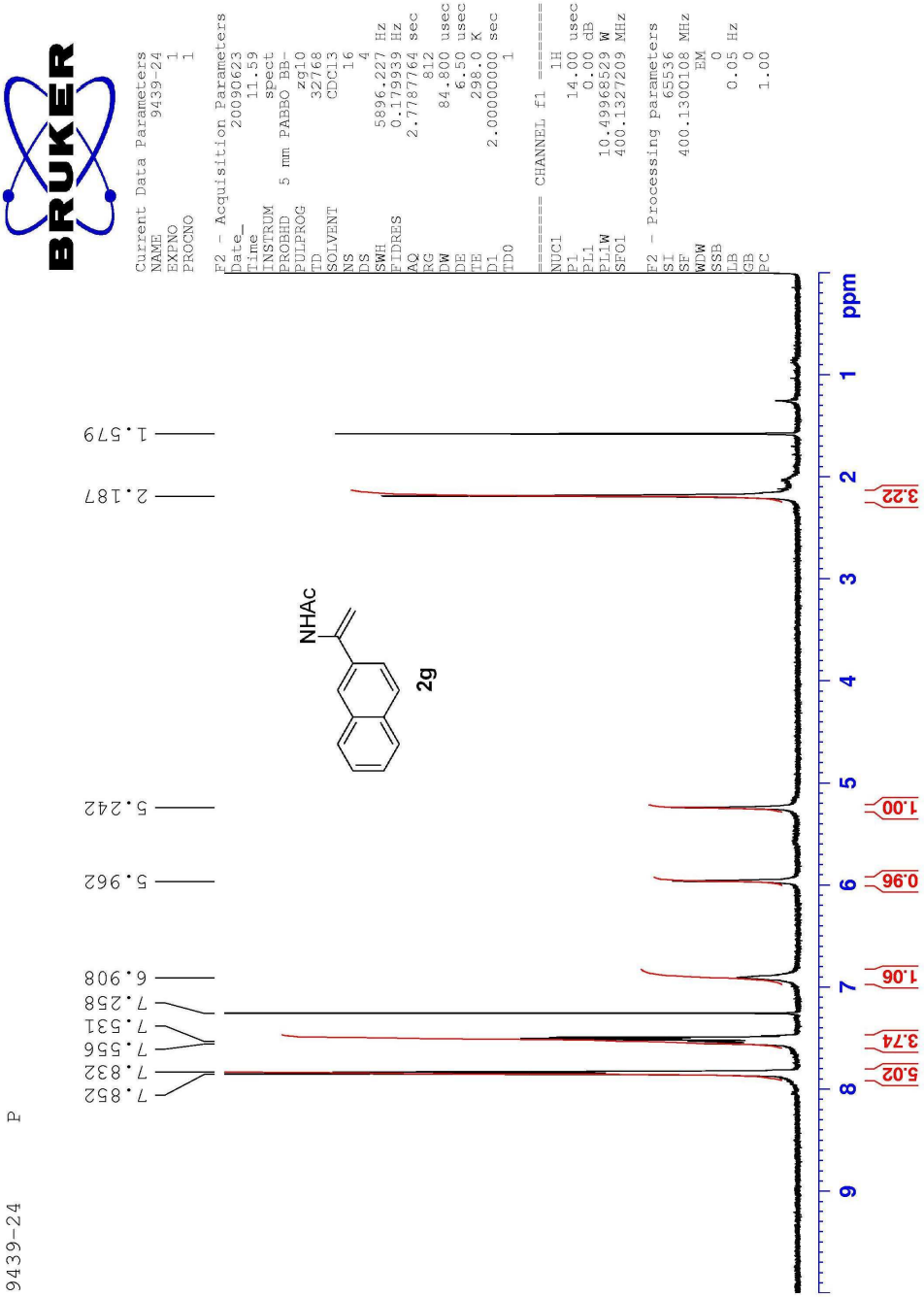
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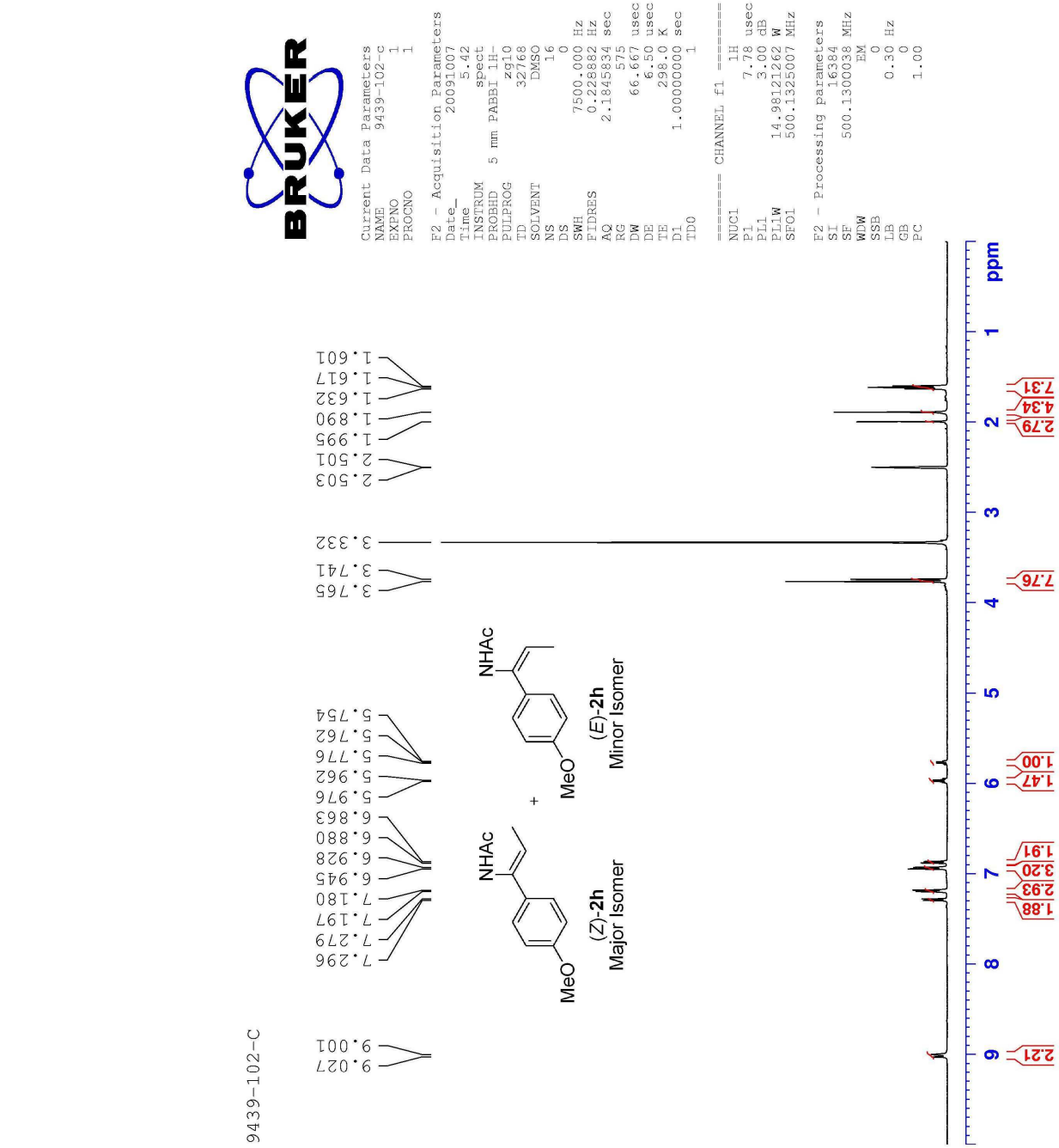
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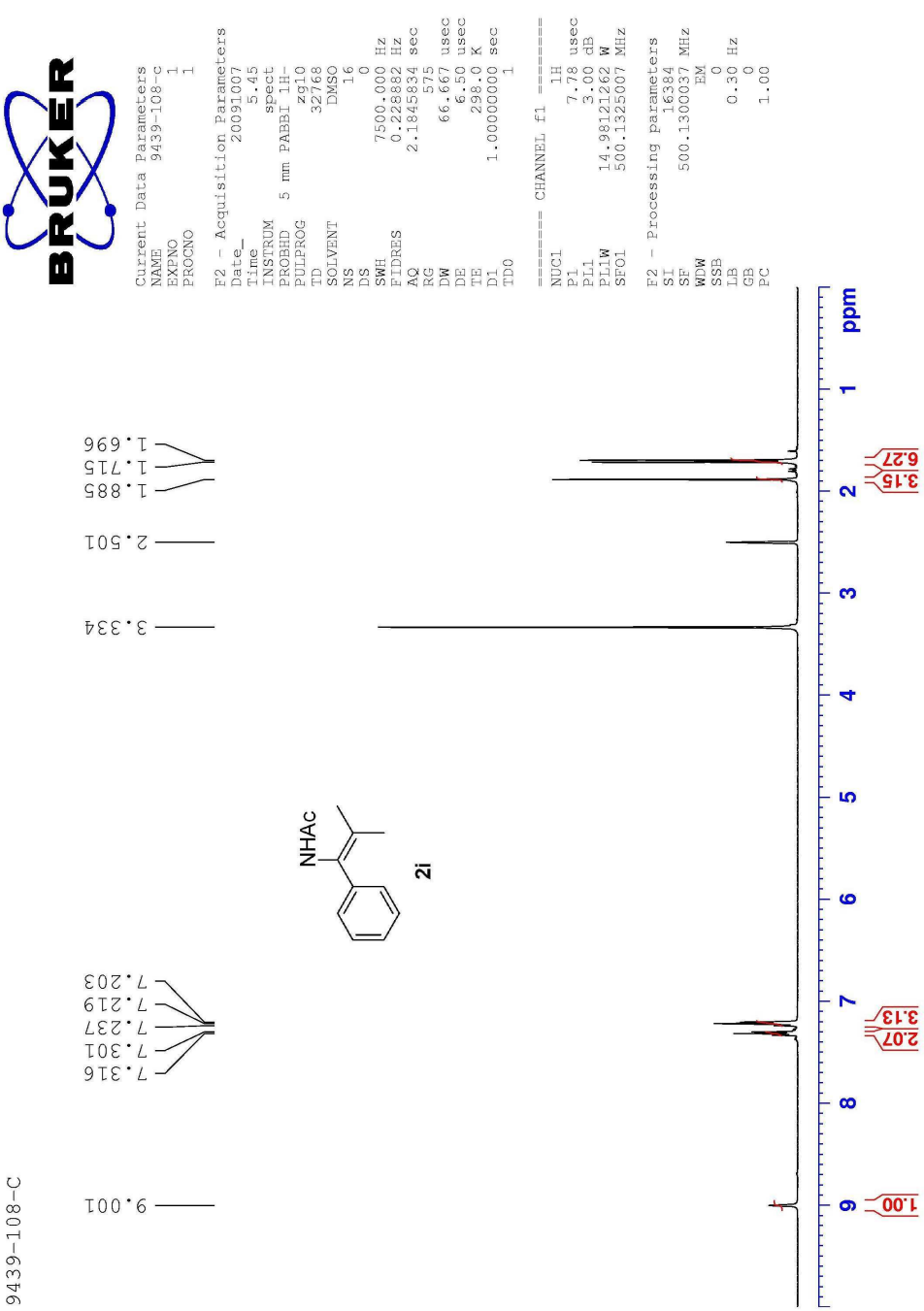
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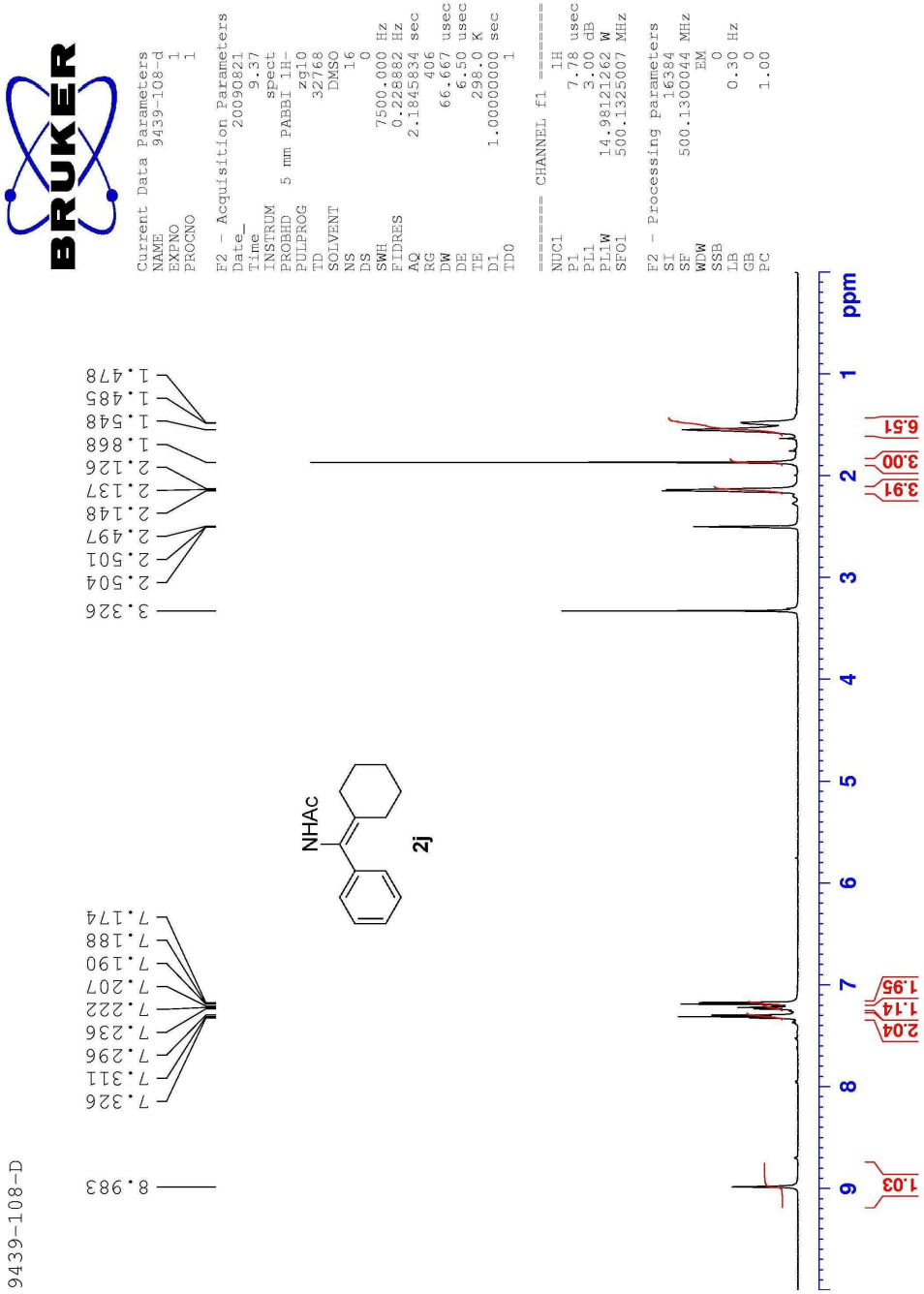
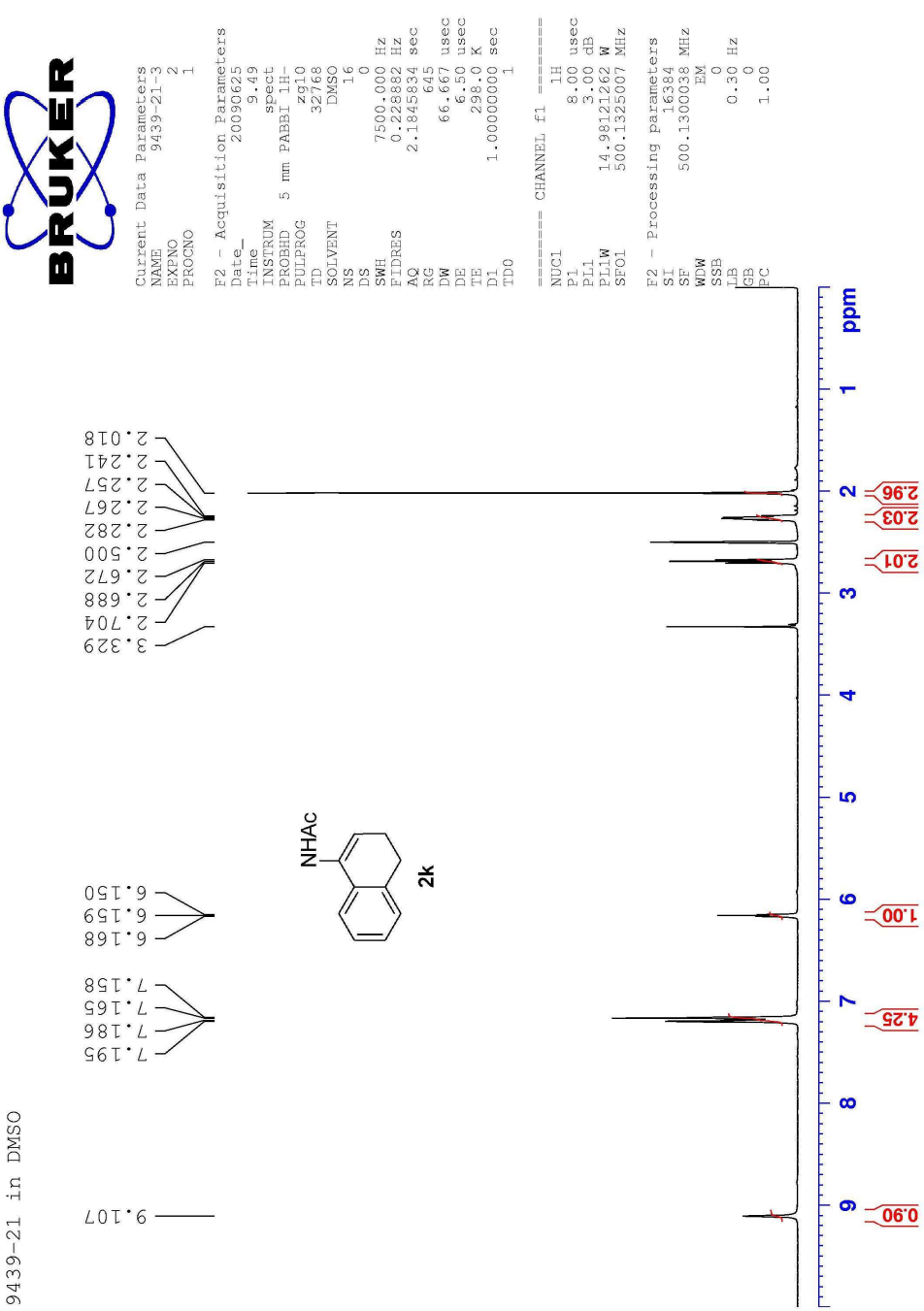
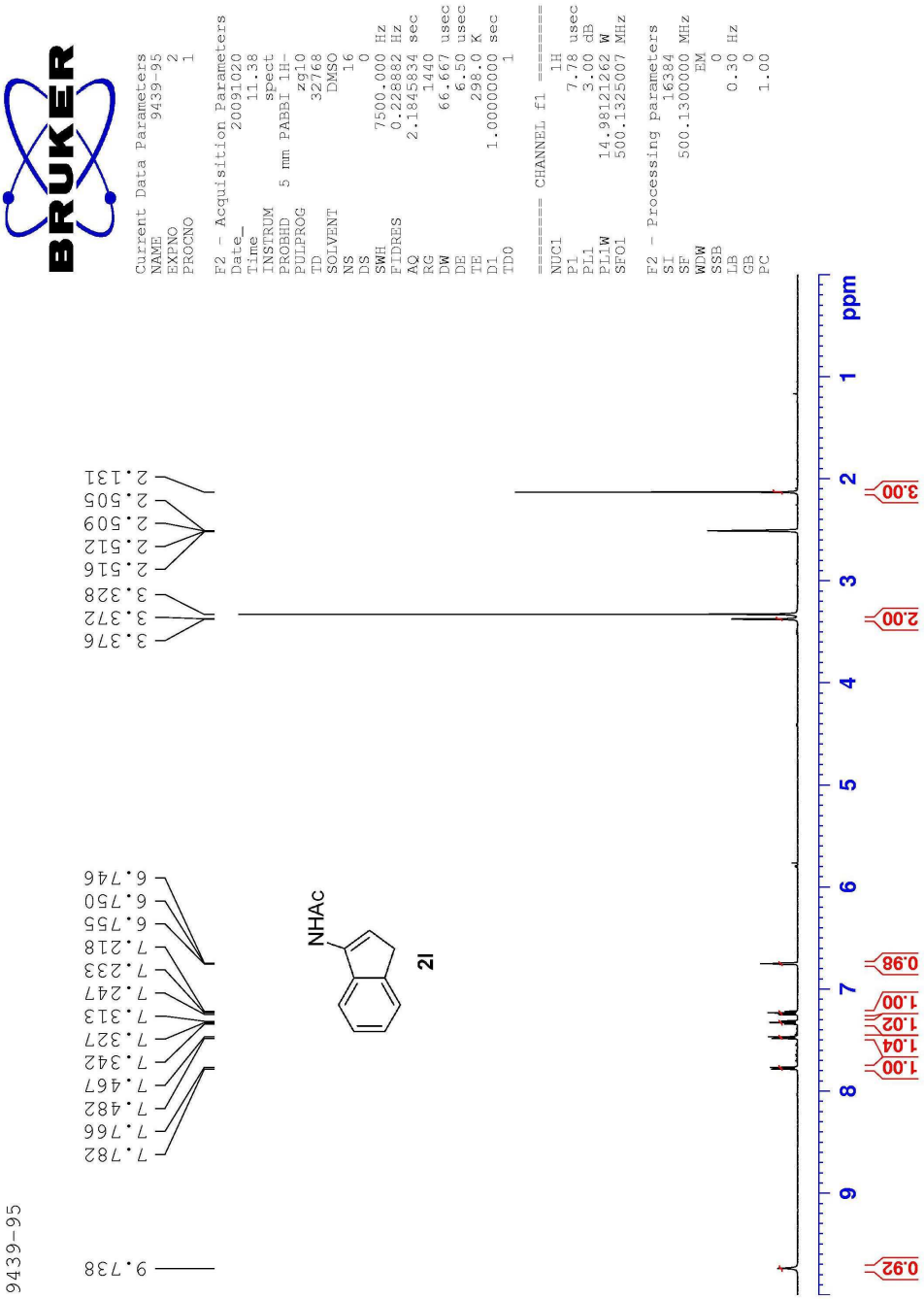
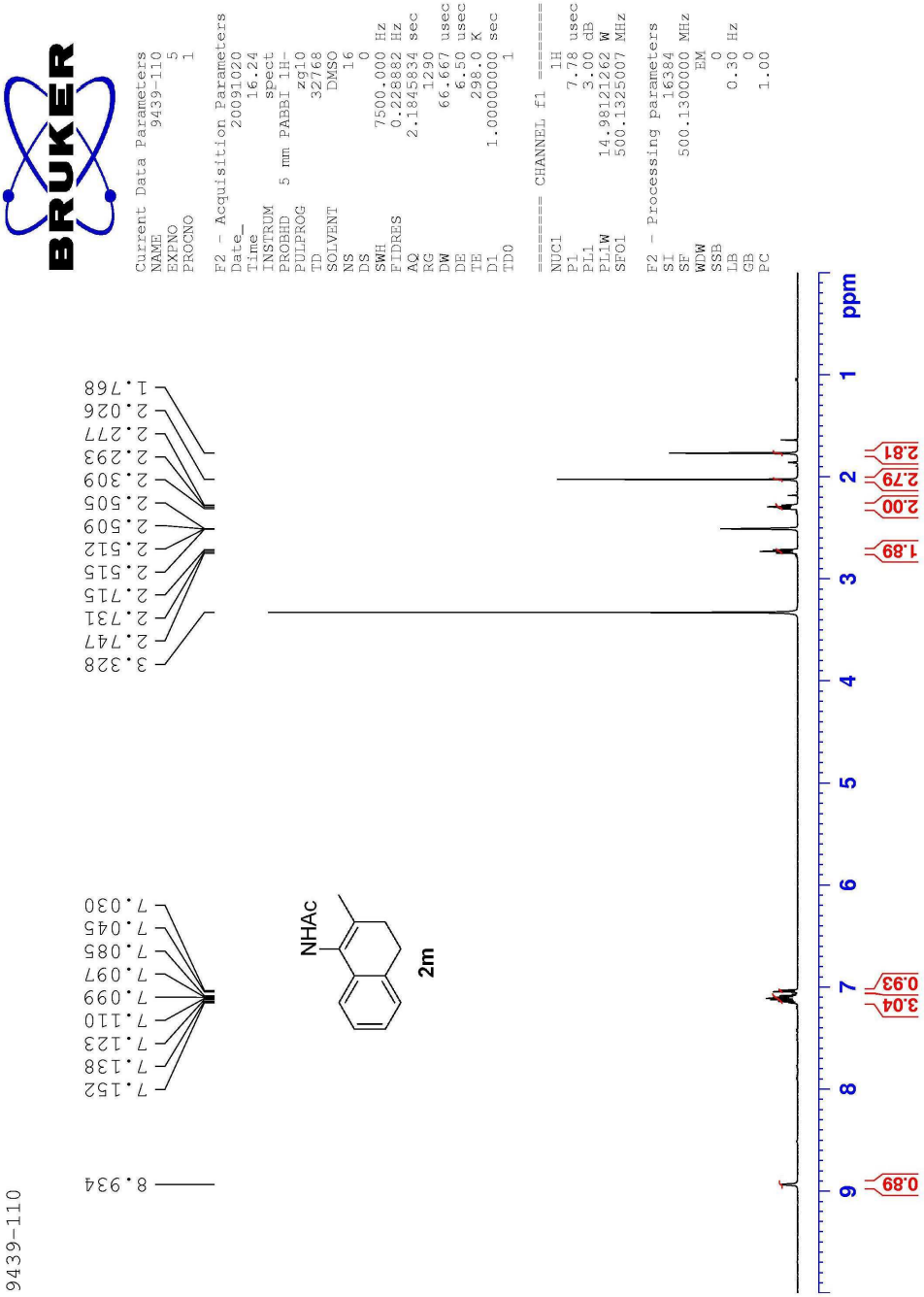
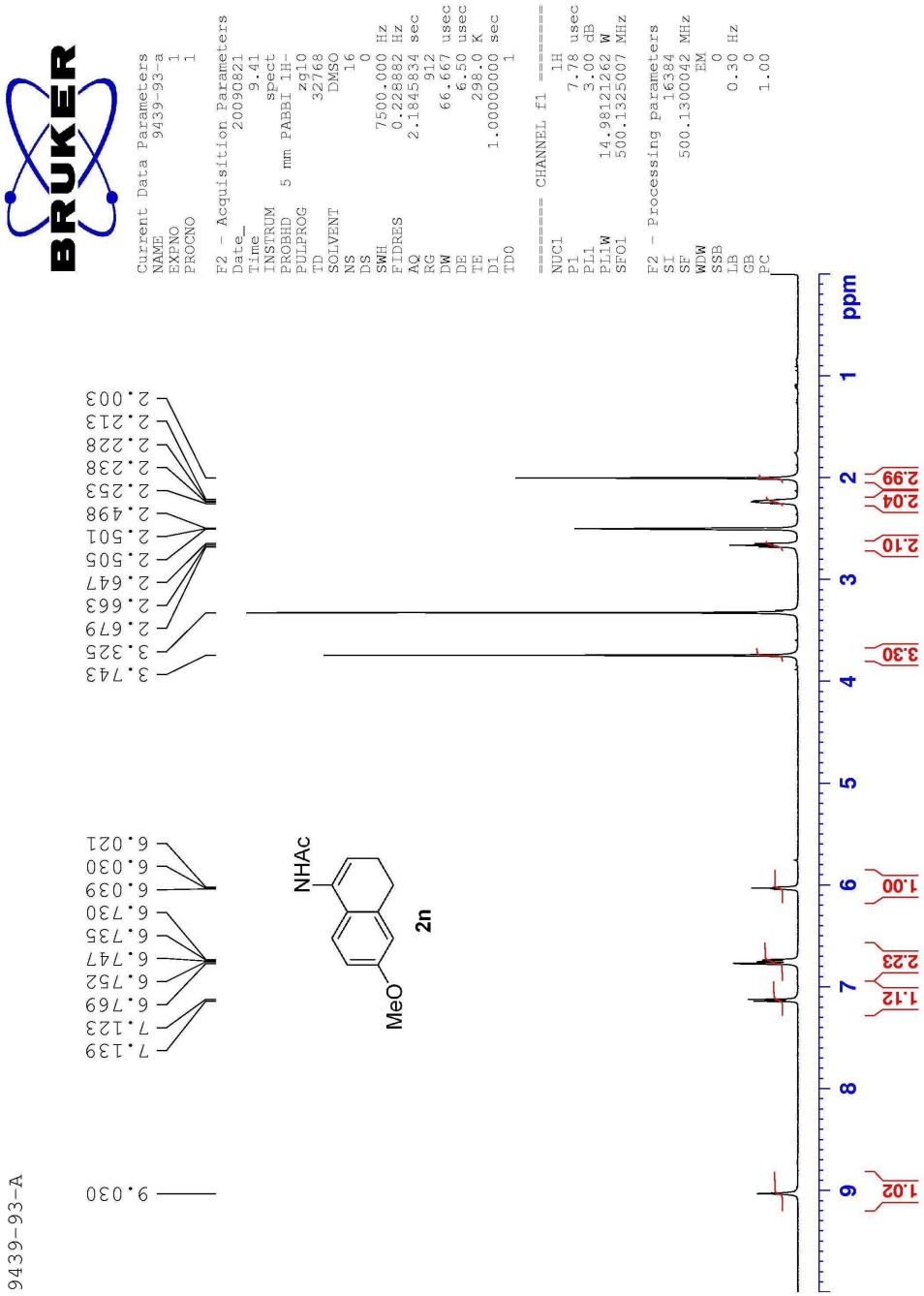
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300037 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.001
7.316
7.301
7.237
7.219
7.203
3.334
2.501
1.885
1.715
1.696
NHAc
2i
9439-108-C
ppm
1.00
2.07
3.13
6.27
3.15

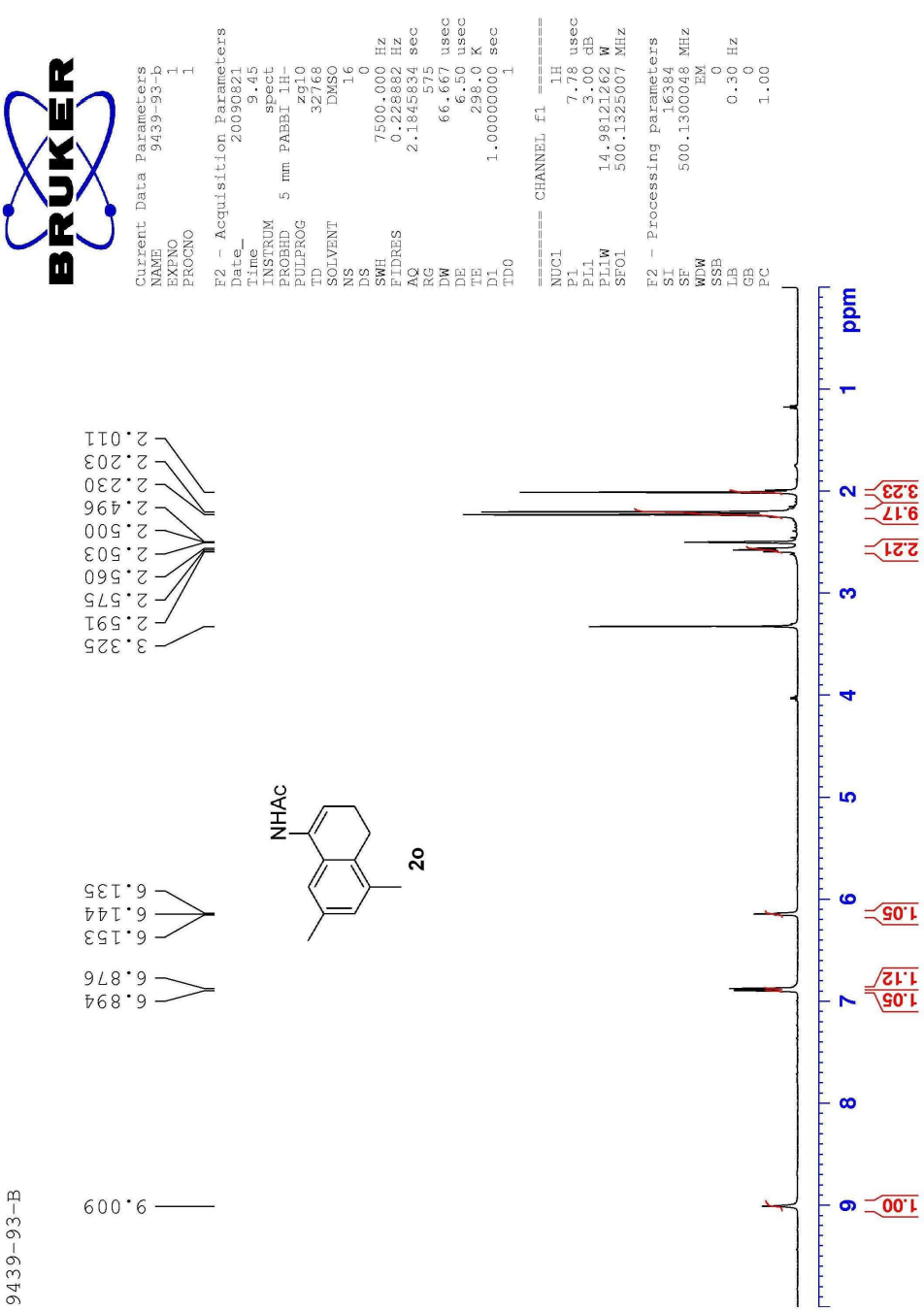

BRUKER
Current Data Parameters
NAME 9439-108-d
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090821
Time 9.37
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 406
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 7.78 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300044 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9439-108-D
8.983
7.326
7.311
7.296
7.236
7.222
7.207
7.190
7.188
7.174
3.326
2.504
2.501
2.497
2.148
2.137
2.126
1.868
1.548
1.485
1.478
NHAc
2j
1.03
2.04
1.14
1.95
3.91
3.00
6.51
ppm


9439-21 in DMSO
9.107
7.195
7.186
7.165
7.158
6.168
6.159
6.150
3.329
2.704
2.688
2.672
2.500
2.282
2.267
2.257
2.241
2.018
NHAc
2k
Current Data Parameters
NAME 9439-21-3
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090625
Time 9.49
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 645
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 8.00 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300038 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
ppm
0.90
4.25
1.00
2.01
2.03
2.96


BRUKER
Current Data Parameters
NAME 9439-95
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20091020
Time 11.38
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 1440
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 7.78 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9439-95
9.738
7.782
7.766
7.482
7.467
7.342
7.327
7.313
7.247
7.233
7.218
6.755
6.750
6.746
3.376
3.372
3.328
2.516
2.512
2.509
2.505
2.131
NHAc
2l
ppm
0.92
3.00
2.00
1.00
1.04
1.02
1.00
0.98


BRUKER
Current Data Parameters
NAME 9439-110
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20091020
Time 16.24
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 1290
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 7.78 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9439-110
8.934
7.152
7.138
7.123
7.110
7.099
7.097
7.085
7.045
7.030
3.328
2.747
2.731
2.715
2.515
2.512
2.509
2.505
2.309
2.293
2.277
2.026
1.768
NHAc
2m
0.89
3.04
0.93
1.89
2.00
2.79
2.81
ppm


BRUKER
Current Data Parameters
NAME 9439-93-a
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090821
Time 9.41
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 912
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 7.78 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300042 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9439-93-A
9.030
7.139
7.123
6.769
6.752
6.747
6.735
6.730
6.039
6.030
6.021
3.743
3.325
2.679
2.663
2.647
2.505
2.501
2.498
2.253
2.238
2.228
2.213
2.003
NHAc
MeO
2n
ppm
1.02
1.12
2.23
1.00
3.30
2.10
2.04
2.99


BRUKER
Current Data Parameters
NAME 9439-93-b
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090821
Time 9.45
INSTRUM spect
PROBHD 5 mm PABBI 1H-
PULPROG zg10
TD 32768
SOLVENT DMSO
NS 16
DS 0
SWH 7500.000 Hz
FIDRES 0.228882 Hz
AQ 2.1845834 sec
RG 575
DW 66.667 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 7.78 usec
PL1 3.00 dB
PL1W 14.98121262 W
SFO1 500.1325007 MHz
F2 - Processing parameters
SI 16384
SF 500.1300048 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9439-93-B
9.009
6.894
6.876
6.153
6.144
6.135
3.325
2.591
2.575
2.560
2.503
2.500
2.496
2.230
2.203
2.011
NHAc
2o
ppm
1.00
1.05
1.12
1.05
2.21
9.17
3.23