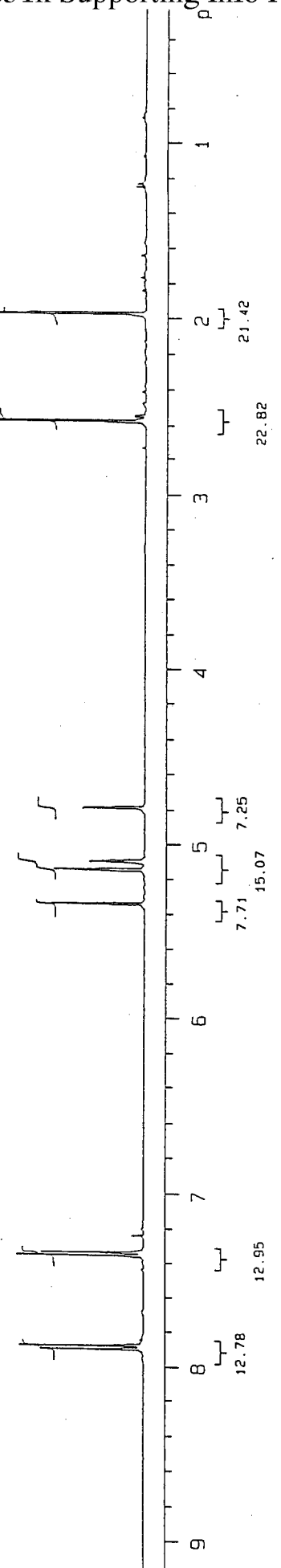
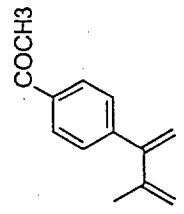


1 pulse sequence: stdin.

7.905
7.885
7.361
7.339
5.348
5.149
5.105
5.101
4.791

-2.583
-1.977

SAMPLE DEC. & VT H1
 e Dec 9 98 on H1
 vent COC13 dof 0
 e exp dm nnn
 ACQUISITION dmm c
 g 399.952 dmi 200
 H1 .dpmc 30
 1.365 PROCESSING
 16384 lb 0.10
 5999.7 wfile
 3300 proc ft
 4 in not used
 55 math f
 7.0
 1.000 werr
 0 nexp
 1000 mds
 32 int
 n DISPLAY
 not used sp -0.6
 FLAOS mp 3999.3
 n vs 151
 n sc 0
 y mc 400
 nn nzm 10.00
 15 129.00
 rf1 3477.1
 rfp 2895.7
 th g
 ins 100.000
 nm pn



08-31
 pulse sequence: stdin

SAMPLE Mar 5 99 dn

DEC. & VT

solvent CDCl3 dof 0

le exp dm nnn c

ACQUISITION dmm c

rg 399.952 dmi 200

H1 30

OPMR

PROCESSING

1.365

16384 lb

5999.7 wfile

3300 proc

4 fn

55 math

7.0

1.000 werr

0 wexp

1000 wds

100 wnt

not used

SD

not used

DISPLAY

-0.5

3999.3

150

0

400

10.00

347.08

3477.1

2895.7

B

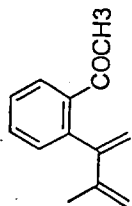
100.000

nm

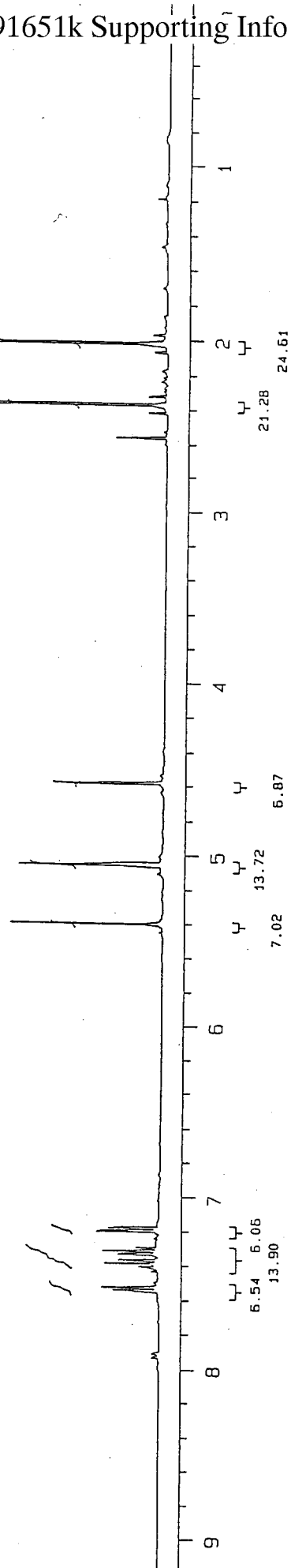
ph

7.550
 7.531
 7.392
 7.388
 7.374
 7.337
 7.317
 7.205
 7.187

7.550
 5.407
 5.052
 4.588
 2.566
 2.376
 2.024



3b



9
 8
 7
 6
 5
 4
 3
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 1

13.90
 6.54 6.05
 7.02
 13.72
 5.87
 21.28
 24.61

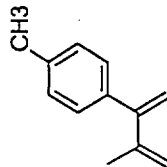
87-1

exp1 pulse sequence: std1h

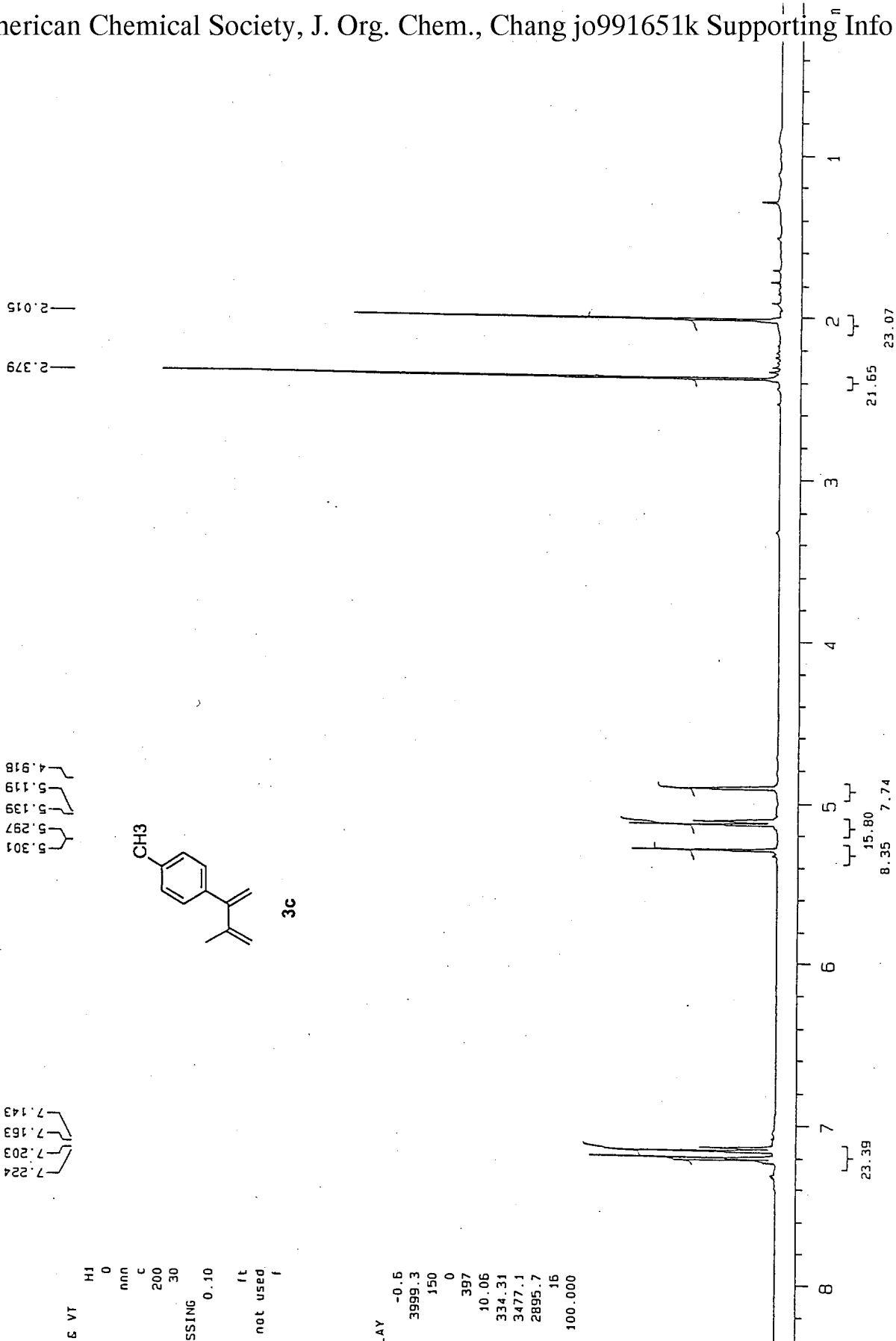
SAMPLE Dec 9 98 dn H1
 Solvent COCl3 dof 0
 file exp dm nnn
 ACQUISITION cmm c
 prog 399.952 dmf 200
 H1 0pwr 30
 1.365 PROCESSING
 16384 lb 0.10
 5999.7 wtfile
 3300 proc ft
 4 fn not used
 55 math f
 7.0
 1.000 werr
 0 nexp
 1000 wds
 52 nnt
 n DISPLAY
 n not used SD -0.6
 n 3999.3
 n VS 150
 n SC 0
 y MC 397
 nn n2mm 10.06
 ls 334.31
 rf1 3477.1
 rfp 2895.7
 th 16
 ins 100.000
 nm ph

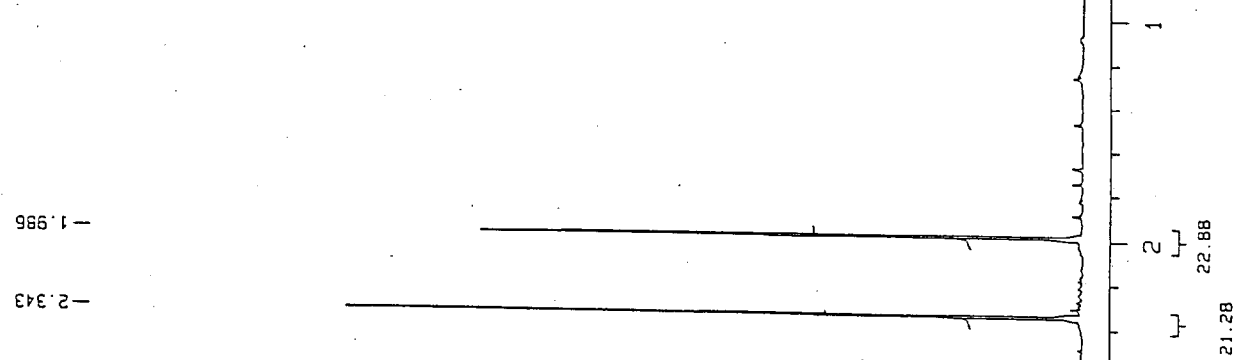
7.224
7.209
7.169
7.143

5.304
5.297
5.139
5.119
4.918



3c





7.218
7.202
7.180
7.097
7.079
7.073

5.284
5.260
5.112
5.092
5.088
4.876
4.872

2.343
1.986

8.03
7.72
15.71

18.19

22.88

1

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3

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5

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7

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9

19-1

pt pulse sequence: stoin

SAMPLE DEC. & VT

ite Dec 9 98 dn H1

lvent CDC13 dof 0

le exp dm nnn

ACQUISITION c

rcq 399.952 dmf 200

H1 dmwr 30

1.365 PROCESSING

16384 lb 0.10

5999.7 wtfile

3300 proc ft

4 in not used

55 math f

7.0

1.000 werr

0 WEXD

1000 WDS

60 wnt

DISPLAY

n not used 50 -0.5

XP 3999.3

n VS 134

n SC 0

Y WC 400

nn hzmm 10.00

IS 417.92

rfl 3491.7

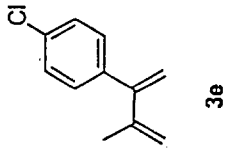
rfd 2895.7

tn 6

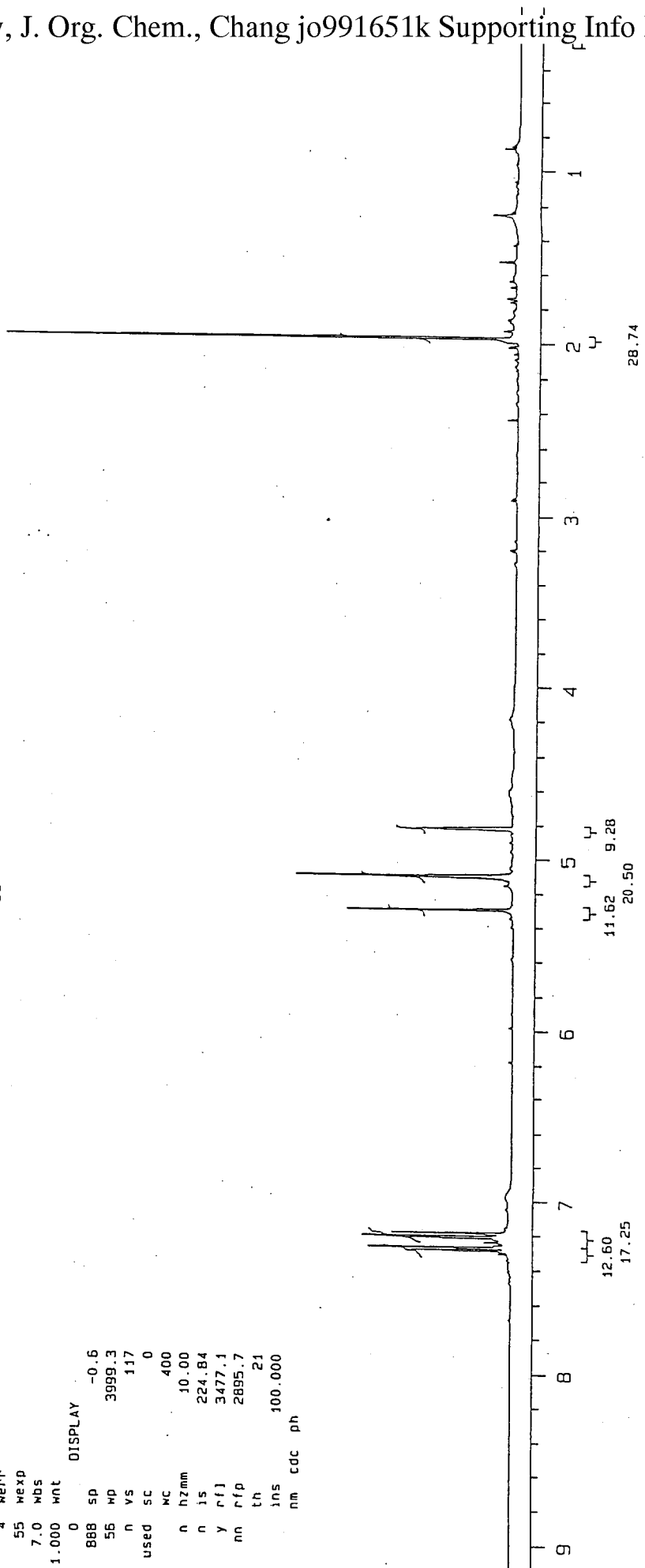
ins 100.000

nm ph

5
 pulse sequence: stdjh
 SAMPLE DEC. & VT
 Date Dec 20 98 dn H1
 solvent COCl3 dof 0
 file /home/vnmr/dm nnn
 /vnmr/sys/chem/ch c
 cheng/hmc/215-H dmf 200
 ACQUISITION dpmc 30
 q 399.952
 H1 wtfile
 1.355 proc ft
 16384 fn not used
 5999.7 math f
 3300
 4 kern
 55 wexp
 7.0 wbs
 1.000 wnt
 0 DISPLAY
 888 sp -0.6
 56 wp 3999.3
 n vs 117
 n not used sc 0
 n not used sc 400
 n hzmm 10.00
 n is 224.84
 y rfj 3477.1
 nn rfp 2895.7
 th 21
 ins 100.000
 nm cdc ph



7.291
 7.269
 7.213
 7.192
 5.301
 5.105
 4.824
 1.977



9
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 4
 3
 2
 1

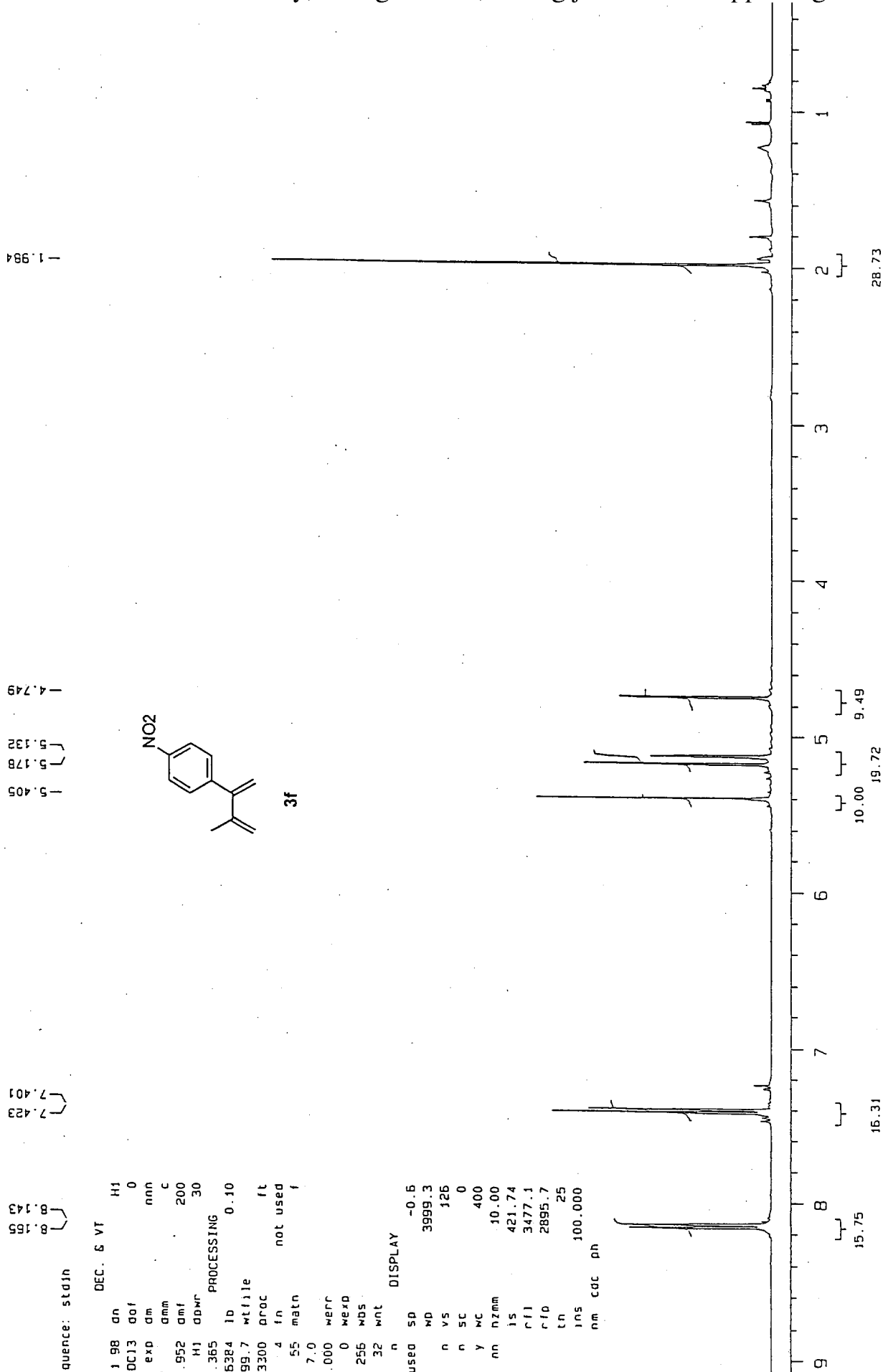
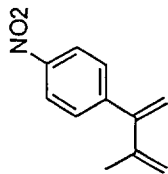
p1 pulse sequence: stdin
 8.143
 8.155

7.423
 7.401

5.405
 5.178
 5.132
 4.749

1.984

SAMPLE DEC. & VT H1
 te Dec 11 98 an
 lvent COC13 00f 0
 le exp dm nm
 ACQUISITION nm c
 ra 399.952 200
 H1 30
 ddwr
 1.365 PROCESSING
 16384 lb 0.10
 5999.7 title
 3200 proc ft
 4 fn not used
 55 matn f
 7.0
 1.000 werr
 0 wexp
 256 wds
 32 wnt
 n DISPLAY
 not used 5D -0.5
 3999.3 WD 3999.3
 n VS 125
 n SC 0
 y MC 400
 nn nzmm 10.00
 15 421.74
 r11 3477.1
 r10 2895.7
 tn 25
 ins 100.000
 nm cdc ph



9 8 7 6 5 4 3 2 1

16.31
 15.75
 9.49
 10.00
 19.72
 28.73

-2.031

-4.442

-4.960

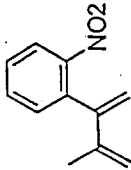
-5.125

-5.427

7.319
7.333
7.337
7.412
7.430
7.434
7.451
7.454
7.540
7.544
7.559
7.562
7.686
7.907

DEC. & VT
H1

SAMPLE
te Mar 5 99 dn
lvent COC13 dof 0
le exp dm nnn
ACQUISITION: c
pro 399.952 dmi 200
H1 odwr 30
1.365 PROCESSING
16384 lb 0.10
5999.7 wtfile
3300 proc ft
4 in not used
55 math i
7.0
1.000 xerr
0 wexd
1000 wds
100 wnt
n n
not used sd
WD 3999.3
n vs 120
n sc 0
y mc 400
nn hzmm 10.00
ls 603.55
rl 3477.8
rfd 2895.7
:n 5
lrs 100.000
nm dn



3g

8.65

31.45

8.93

8.80

9.03

8

7.04

8.23

9.73

8.15

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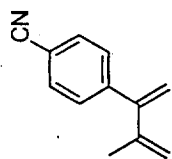
262

263

264

265

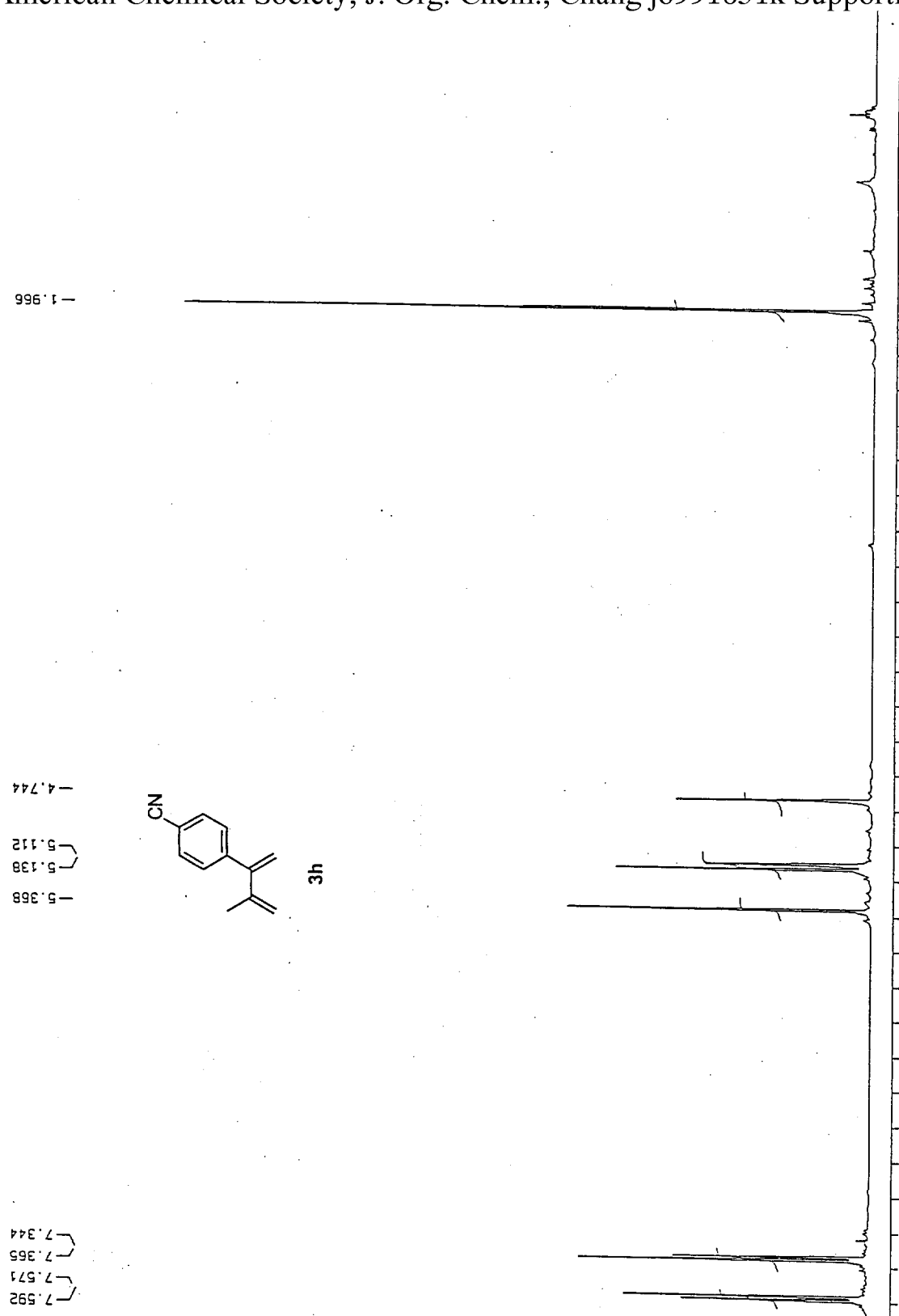
4
 pulse sequence: stah1
 SAMPLE DEC. & VT
 Date Dec 20 98 dn H1
 solvent CDCl3 dof 0
 exp dm nm
 ACQUISITION c
 q 399.952 dmf 200
 H1 dpmr 30
 1.365 PROCESSING
 16384 kfile
 5999.7 proc ft
 3300 fn not used
 4 math f
 55
 7.0 werr
 1.000 wexp
 0 NDS
 888 wnt
 36 DISPLAY
 n sp -0.6
 n not used mp 3999.3
 vs 155
 n sc 0
 n wc 400
 y hzmm 10.00
 nu is 224.84
 rfi 3477.1
 rfd 2895.7
 th 17
 ins 100.000
 nm cdc ph



7.592
 7.571
 7.365
 7.344
 5.368
 5.138
 5.112
 4.744

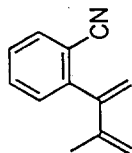
1.966

9 8 7 6 5 4 3 2 1
 15.16 15.98
 10.48 20.31
 9.53 9.53
 28.53

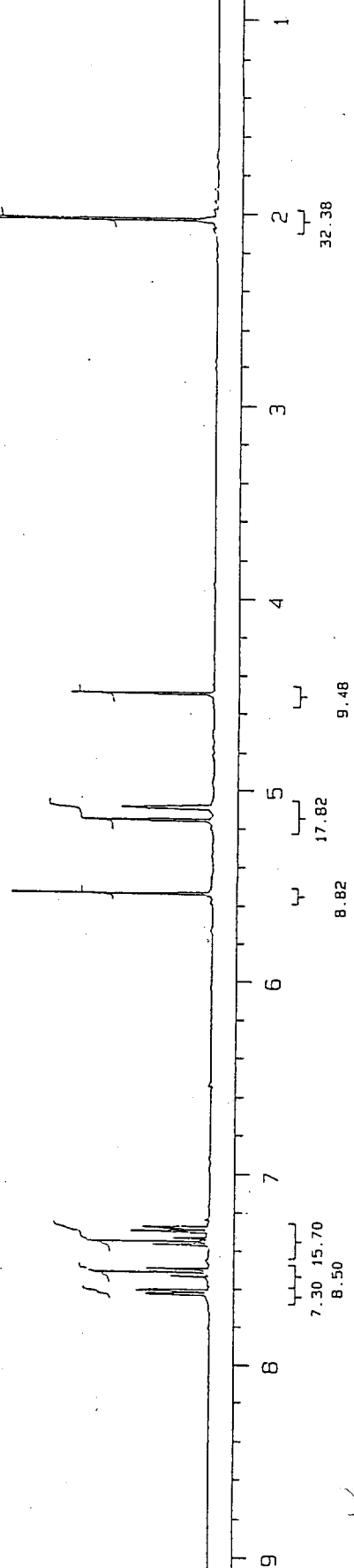


5-1H
 pulse sequence: stoin
 te Mar 4 99 dn
 solvent CDCl3 dof 0
 le exp dm nnn c
 ACQUISITION
 pro 399.952 dmf 200
 HI dmw 30
 1.355 PROCESSING
 16384 lb 0.10
 5999.7 wfile
 3200 proc ft
 3 fn not used
 55 matn i
 7.0
 1.000 werr
 0 wexp
 1000 wos
 80 wnt
 n DISPLAY
 not used 50 -0.6
 FLGGS 3999.3
 n v5 108
 n SC 0
 y WC 400
 nn hzmm 10.00
 ls 366.42
 rfi 3477.1
 rfd 2895.7
 th 5
 ins 100.000
 nm ph

7.637
 7.634
 7.615
 7.542
 7.539
 7.522
 7.518
 7.504
 7.500
 7.377
 7.359
 7.355
 7.339
 7.302
 7.299
 7.282
 5.544
 5.158
 5.099
 4.498
 2.035



31



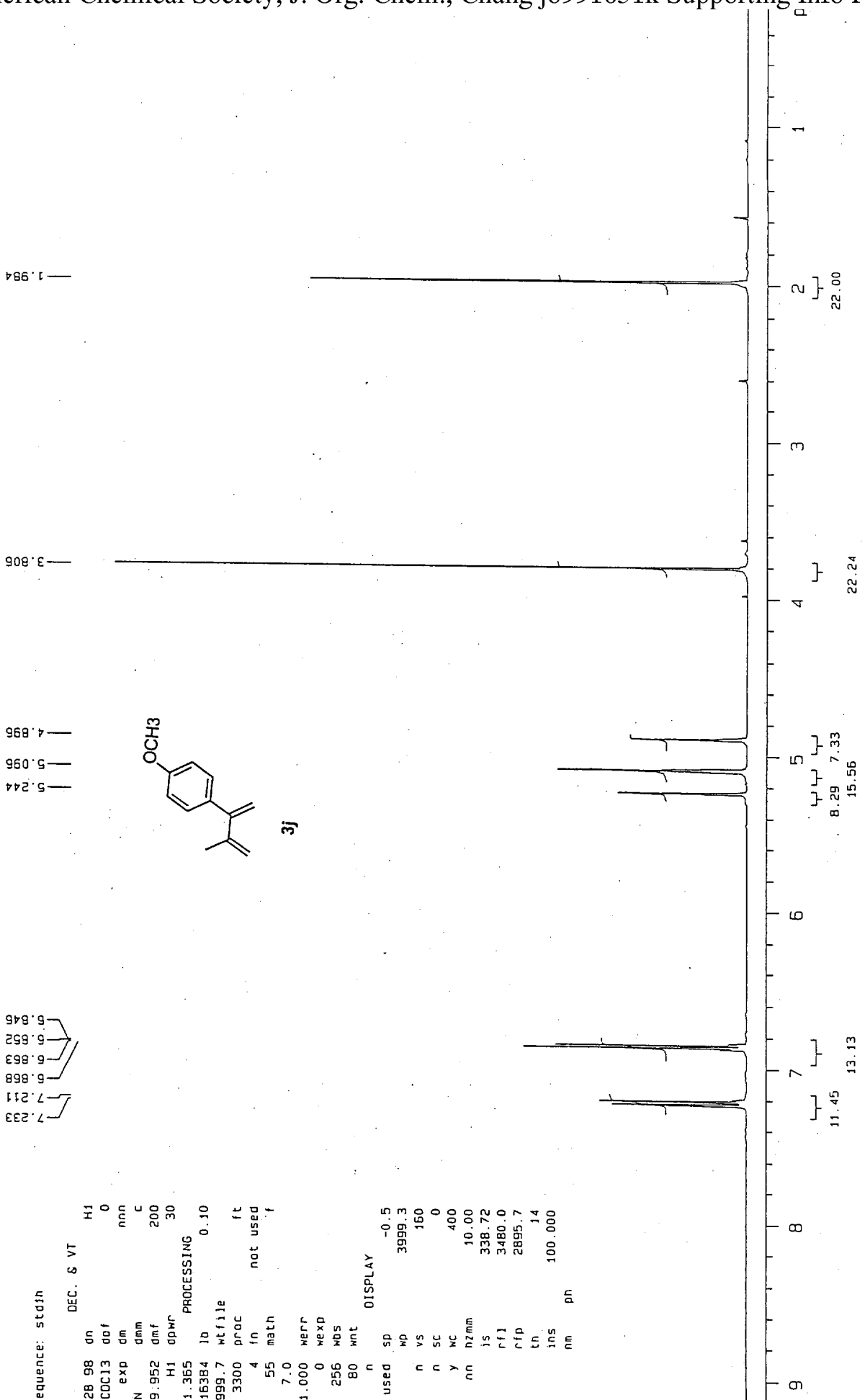
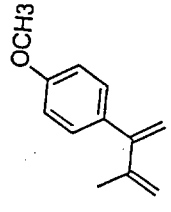
1 pulse sequence: stdh

SAMPLE DEC. & VT H1
 e Oct 28 98 dn H1 0
 vent COC13 dof 0
 e exp dm nnn
 ACQUISITION dmm c
 q 399.952 dmf 200
 H1 dpwr 30
 PROCESSING
 1.355 lb 0.10
 16384 lb
 5999.7 wfile
 3300 proc ft
 4 fn not used f
 55 math f
 7.0
 1.000 werr
 0 wexp
 256 wds
 80 wnt
 n OISPLAY
 not used sp -0.5
 wd 3999.3
 n vs 160
 n sc 0
 y nc 400
 nn hzmm 10.00
 is 338.72
 rfi 3480.0
 rfp 2895.7
 th 14
 ins 100.000
 nm pn

7.233
 7.211
 6.868
 6.863
 6.852
 6.846

5.244
 5.096
 4.896

3.806
 1.984



1.290
1.271
1.255

-2.035

4.450
4.244
4.226
4.209
4.191

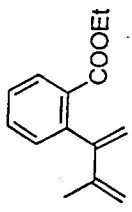
5.344
5.022
4.958

7.830
7.826
7.811
7.808
7.436
7.432
7.330
7.326
7.225
7.222
7.207
7.203

DEC. & VT

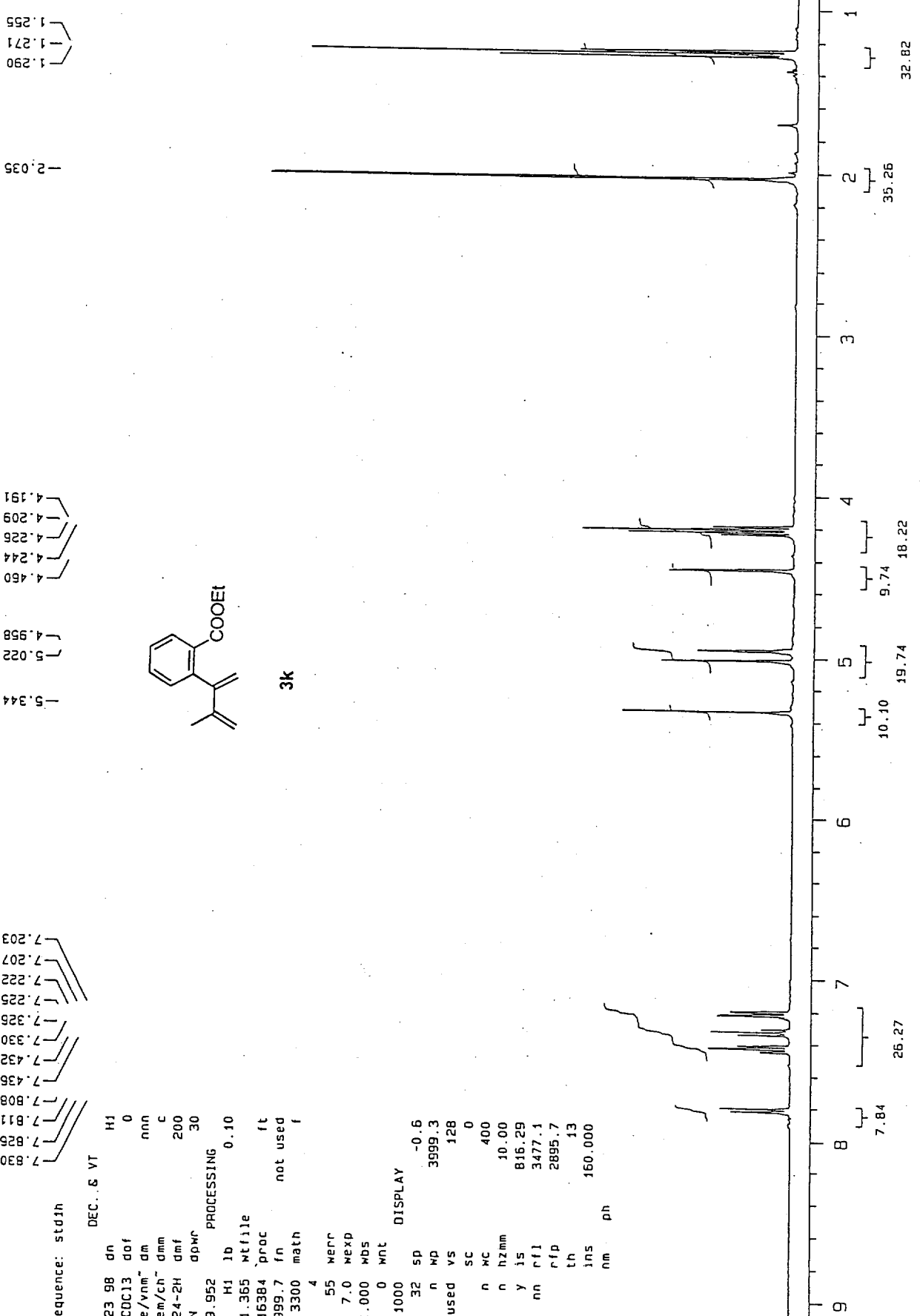
SAMPLE

Dec 23 98 dn H1
 CDC13 dof 0
 /home/vnm dm
 /vnmryst/chem/ch dmm c
 cheng/hmc/224-2H dmf 200
 ACQUISITION dpmr 30
 q 399.952 PROCESSING
 H1 lb 0.10
 1.365 rtf file
 16384 proc ft
 5999.7 fn not used
 3300 math f



3k

4
 55 werr
 7.0 mexd
 1.000 wds
 0 wnt
 1000 DISPLAY
 32 sp -0.6
 n mp 3999.3
 128
 0
 n wc 400
 n hzmm 10.00
 y is 816.29
 nn rfi 3477.1
 rfp 2895.7
 th 13
 ins 160.000
 nm ph



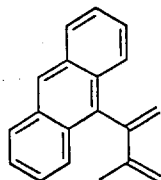
7 pulse sequence: sghh
 7.441
 7.447
 7.452
 7.450
 7.457
 7.473
 7.475
 9.006
 8.024
 8.031
 8.049
 8.436

SAMPLE DEC. & VT H1

2 Dec 22 98 dn H1
 3 Coc13 dof 0
 4 /home/vnm dm
 5 rnmssys/chem/ch dmm c
 6 leng/hmc/219-2H dmf 200
 7 ACQUISITION dpwr 30
 8 399.952 PROCESSING
 9 H1 lb 0.10
 10 1.365 wfile
 11 16384 proc ft
 12 5999.7 fn not used
 13 3300 math f
 14 4

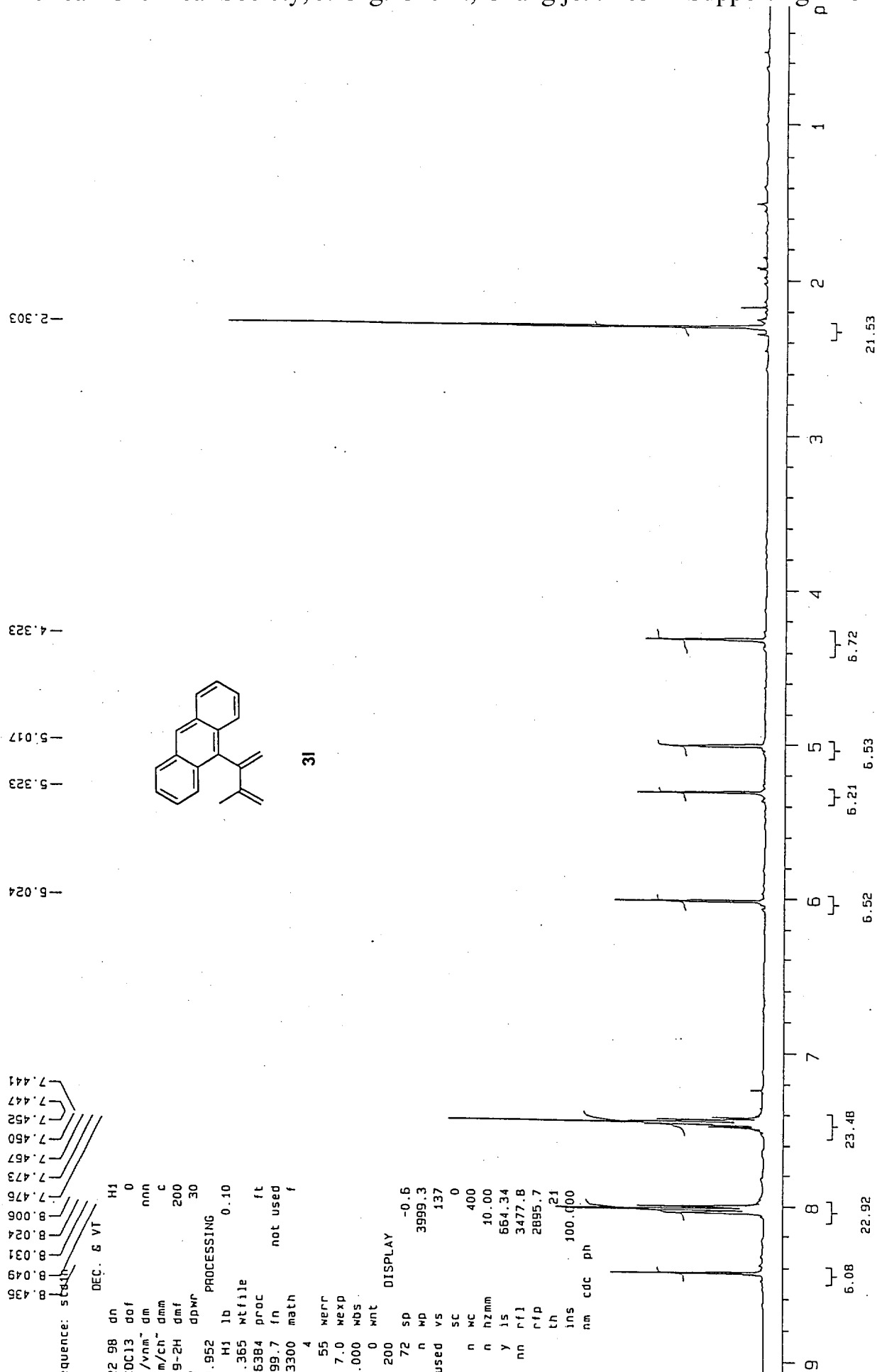
15 55 werr
 16 7.0 wexp
 17 1.000 nds
 18 0 wnt
 19 200 DISPLAY

20 72 sp -0.6
 21 n hp 3999.3
 22 not used vs 137
 23 SC 0
 24 n mc 400
 25 n hzmm 10.00
 26 y l5 664.34
 27 nn rfl 3477.8
 28 rfp 2895.7
 29 ch 21
 30 ins 100.000
 31 nm cdc ph



3I

8.024
 5.323
 5.017
 4.323
 2.303



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 4
 3
 2
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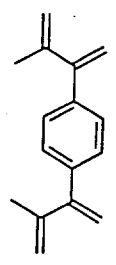
6.08
 22.92
 23.48
 6.52
 6.72
 5.53
 6.53
 21.53

61-JH

exp pulse sequence: stqjh

SAMPLE	Mar 30 99	dn	H1
date	477.9	dof	477.9
solvent	COC13	dm	n
file	exp	dmm	c
ACQUISITION	399.952	dmf	200
dir	H1	opwr	30
1.365	PROCESSING		
16384	0.10		
5999.7	wtfile		
3300	proc	ft	
4	fn	not used	
55	math	f	
7.0			
1.000	werr		
0	wexp		
1024	mos		
92	wnt		
0	not used	SD	-0.6
0	not used	WD	3999.3
0	not used	VS	152
0	not used	SC	0
400	not used	YC	400
10.00	not used	nzmm	10.00
508.69	not used	ls	508.69
3477.1	not used	rfj	3477.1
2895.7	not used	rip	2895.7
17	not used	th	17
100.000	not used	ins	100.000
	not used	nm	cdc
	not used	ph	

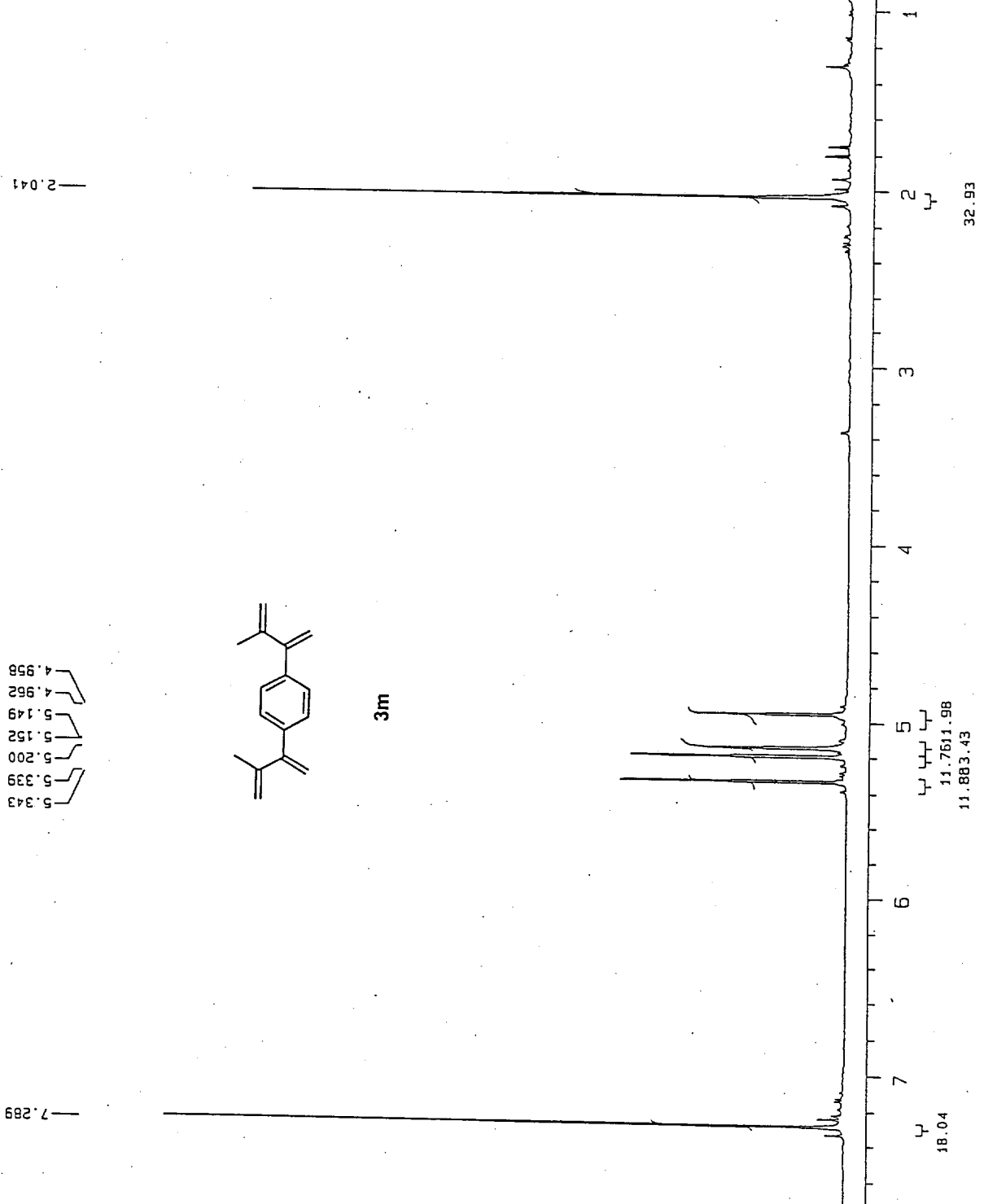
5.343
5.339
5.200
5.152
5.149
4.962
4.958



3m

2.041

7.282



1
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32.93
11.7611.98
11.883.43
18.04

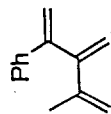
1 pulse sequence: stdin

```

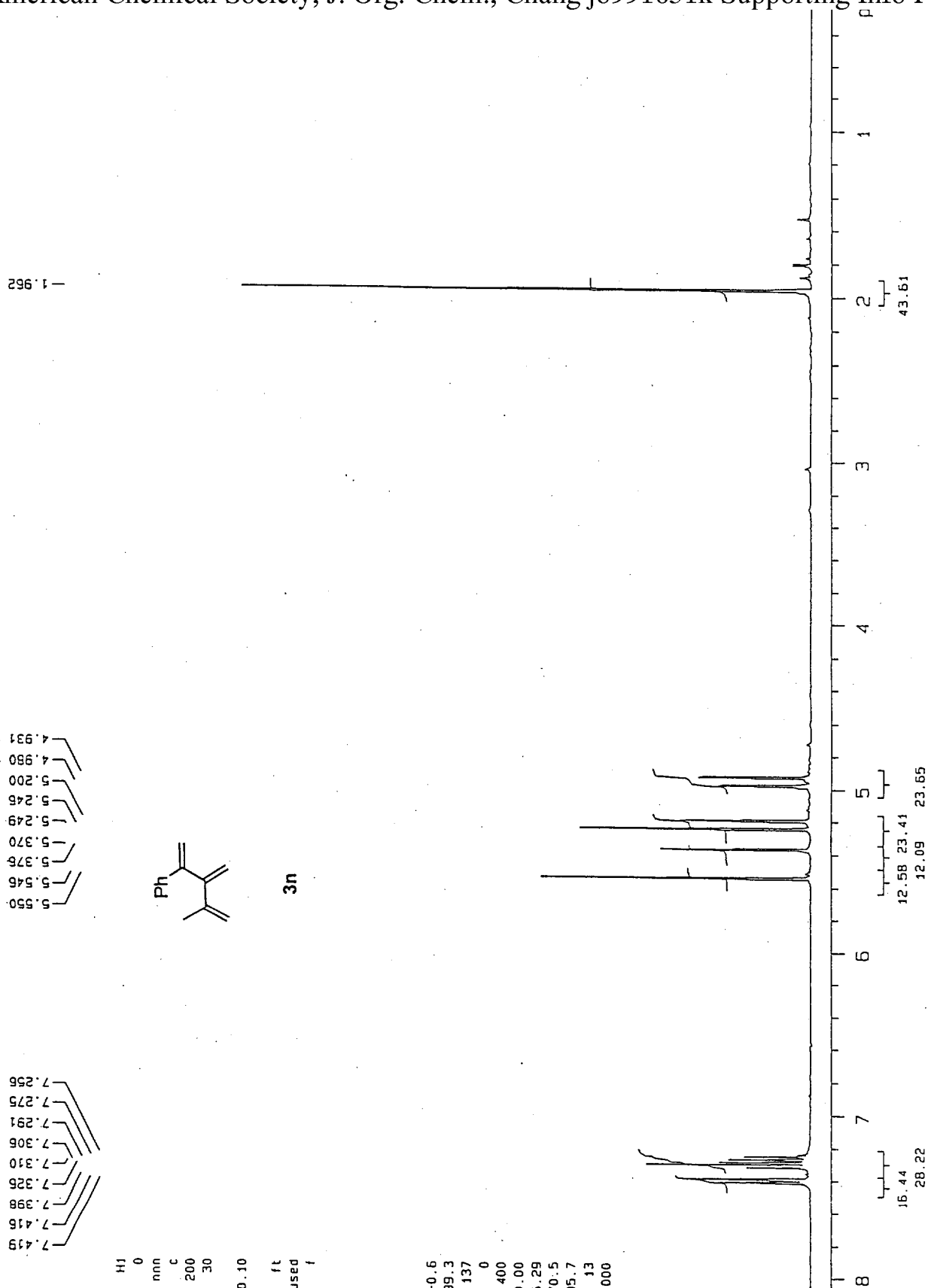
SAMPLE          DEC. & VT
e  Dec 23 98   dn      H1
e  event      CDC13   dof      0
e  exp       dm      nnn
e  ACQUISITION dm      c
g  399.952   dmf      200
g  H1       dDWC     30
      1.365   PROCESSING
      16384   lb      0.10
      5999.7  wfile
      3300   proc   ft
      4     fn    not used
      55    math   f
      7.0
      1.000  werr
      0     wexp
      1000  mbs
      40    mt
      n     n     DISPLAY
      not used sp   -0.6
      FLAGS      wp   3999.3
      n vs      137
      n sc      0
      y wc      400
      nn hzmm   10.00
      is      816.29
      rfi     3470.5
      rfp     2895.7
      th      13
      ins     150.000
      nm      ph
    
```

7.439
7.416
7.398
7.326
7.310
7.306
7.291
7.275
7.256

5.550
5.546
5.376
5.370
5.249
5.246
5.200
4.980
4.931



3n

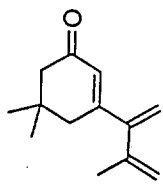


7-2

07 pulse sequence: stdh

```

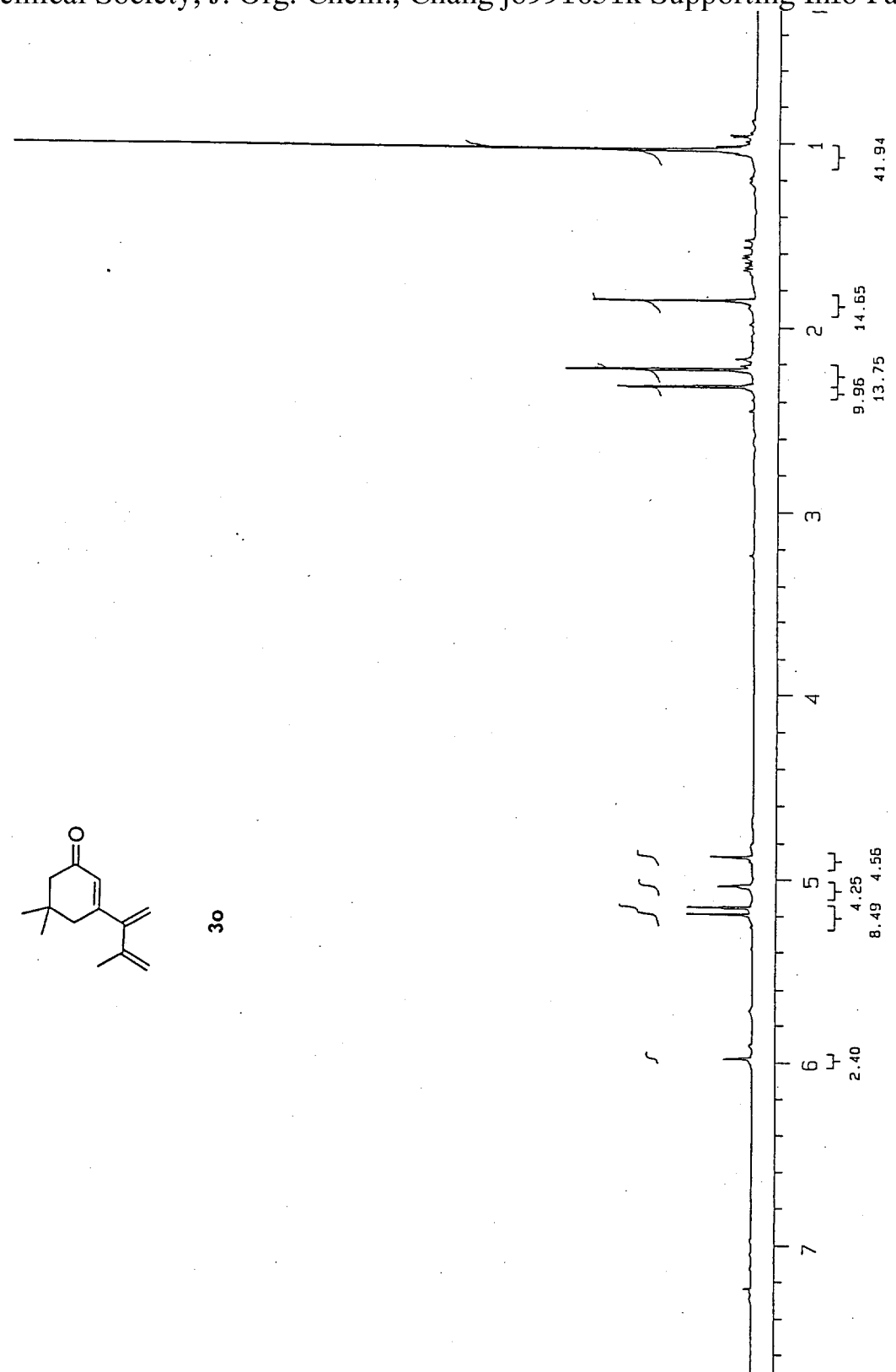
SAMPLE          DEC. & VT
  Date   Jan 5 99   dn
  Solvent COCl3     dof 0
  File   /home/vnm- dm
  Name   /vnmrsys/chem/Ch- dnm c
  Cheng/hmc/227-2H dmf 200
  ACQUISITION    30
  P1      399.952
  P2      HI
  P3      lb 0.10
  P4      1.365
  P5      mtfile
  P6      16384
  P7      proc ft
  P8      5999.7
  P9      fn not used
  P10     3300
  P11     math f
  P12     4
  P13     55
  P14     werr
  P15     7.0
  P16     wexp
  P17     1.000
  P18     wds
  P19     0
  P20     wnt
  P21     1000
  P22     sp
  P23     -0.6
  P24     n
  P25     wp 3999.3
  P26     vs 159
  P27     SC 0
  P28     n
  P29     WC 400
  P30     n
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  P38     ins 100.000
  P39     nm
  P40     ph
  
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9.96
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-2.572

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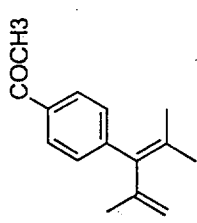
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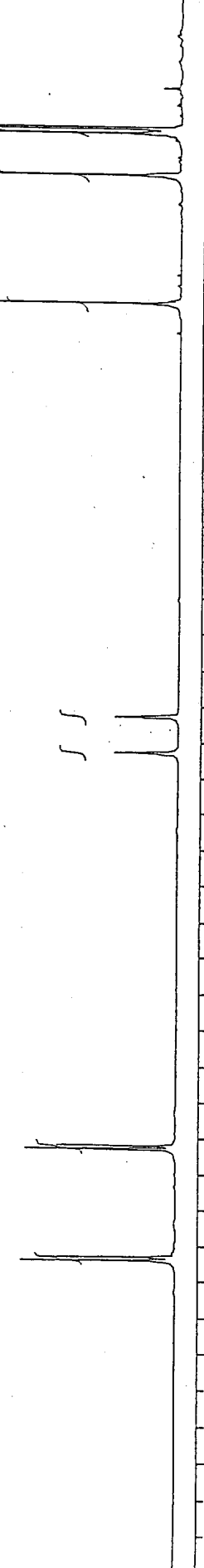
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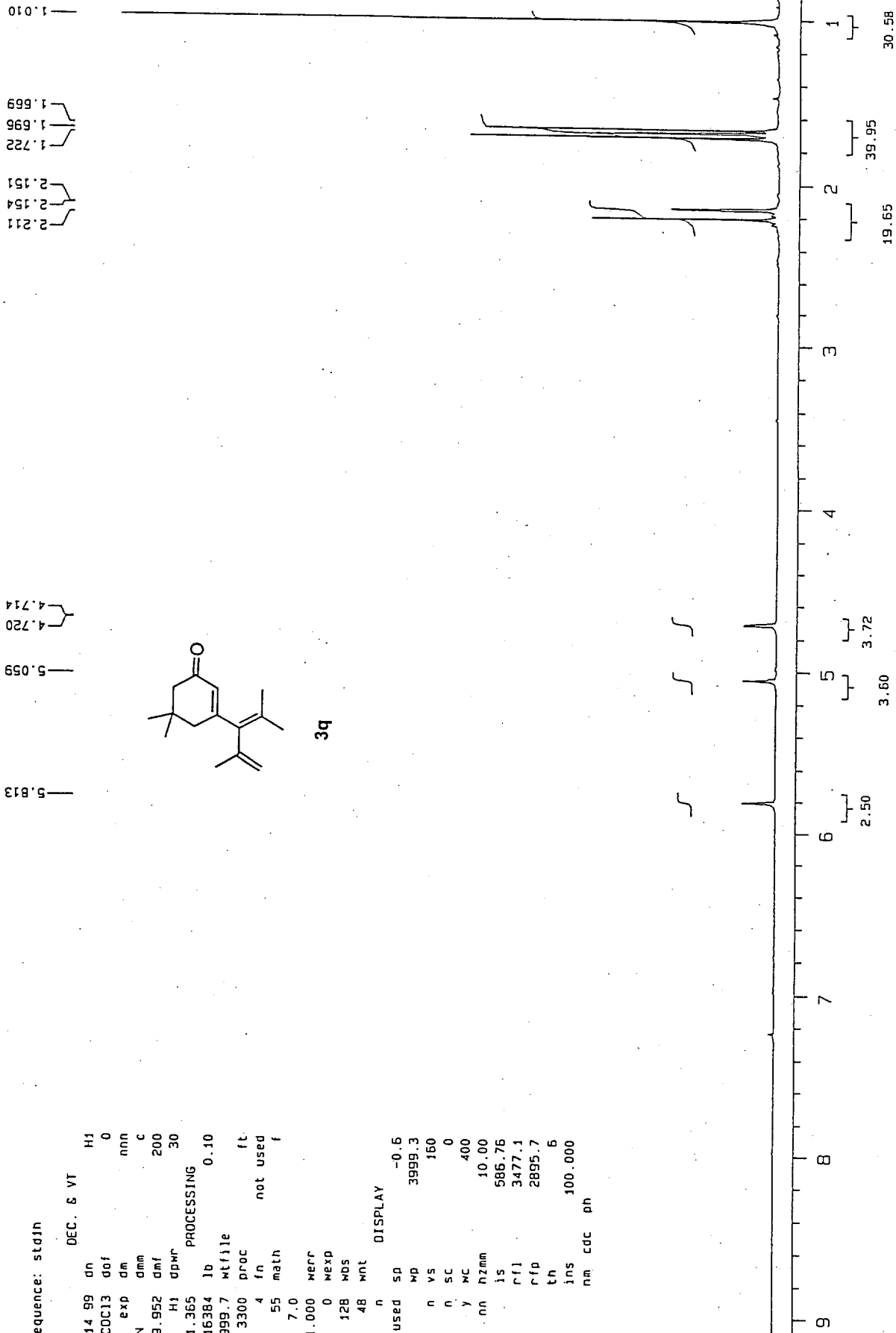
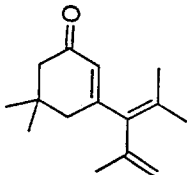
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79-1H

101 pulse sequence: std1h

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 H1 dpmr 30
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 5999.7 wfile
 3300 proc ft
 4 fn not used f
 55 math f
 7.0
 1.000 werr
 0 mexp
 128 wds
 48 mnt
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 nn Hzmm 10.00
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 rfd 2895.7
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 ins 100.000
 nm cdc dh



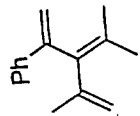
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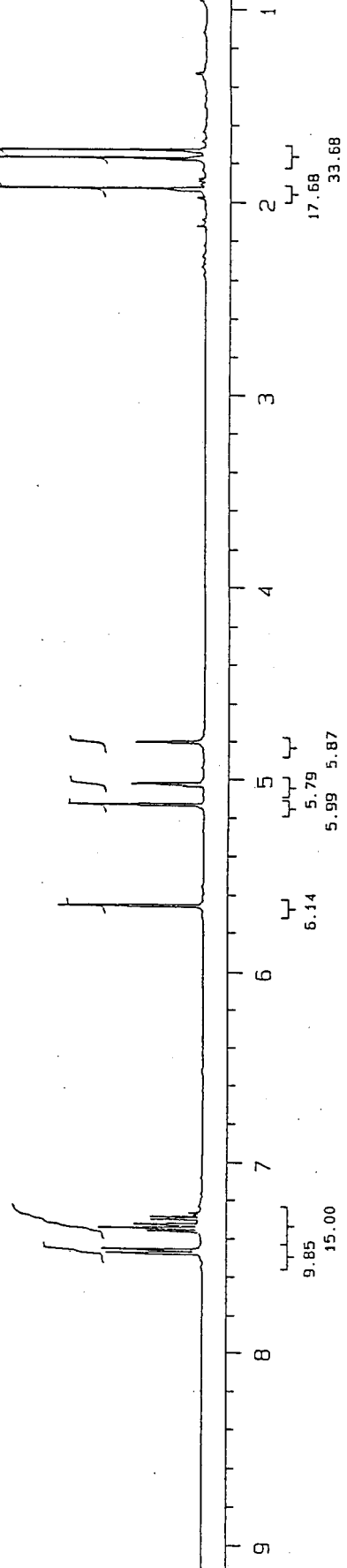
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 J 1.000 Kerr
 P 0 Wexp
 F 10.0 WDS
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 rfj 3477.8
 rfd 2895.7
 th 5
 ins 100.000
 nm pH



3r



9 8 7 6 5 4 3 2 1

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5.99 5.87
5.79

6.14

9.85
15.00

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7.839
7.833
7.474
7.454
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7.374
7.355
7.258
7.240
7.231

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5.638
5.586
5.583
5.447
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5.341
5.337

13-2
p1 pulse sequence: stdin

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lvent CDCl3 dof 0

le exp dm nnn

ACQUISITION dmm c

rg 399.952 dmi 200

H1 dpwr 30

1.365 PROCESSING

16384: wfile

5999.7 proc ft

3300 fn not used

4 math f

55

7.0 werr

0 wexp

0 wds

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nn is 10.00

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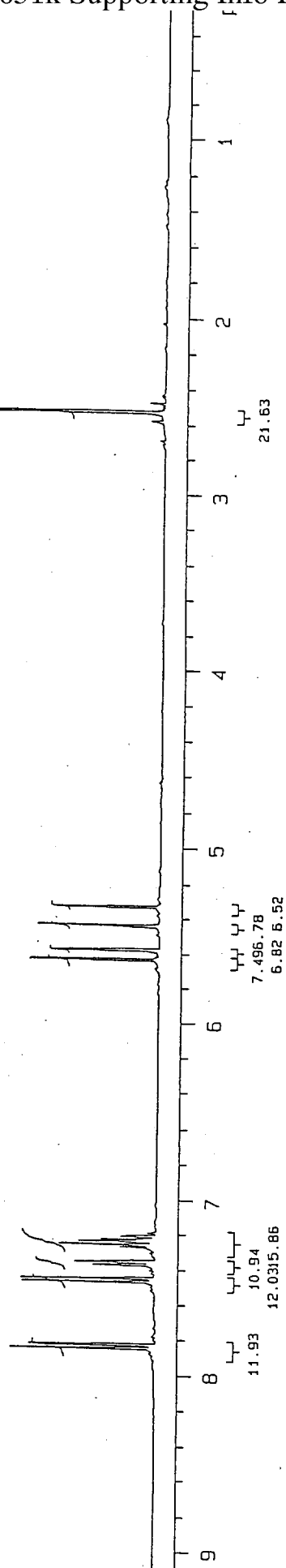
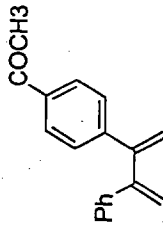
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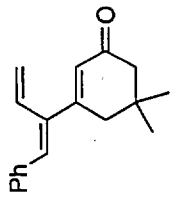
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9 8 7 6 5 4 3 2 1

1 pulse sequence: std1h

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 ACQUISITION dmm c
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 1000 mbs
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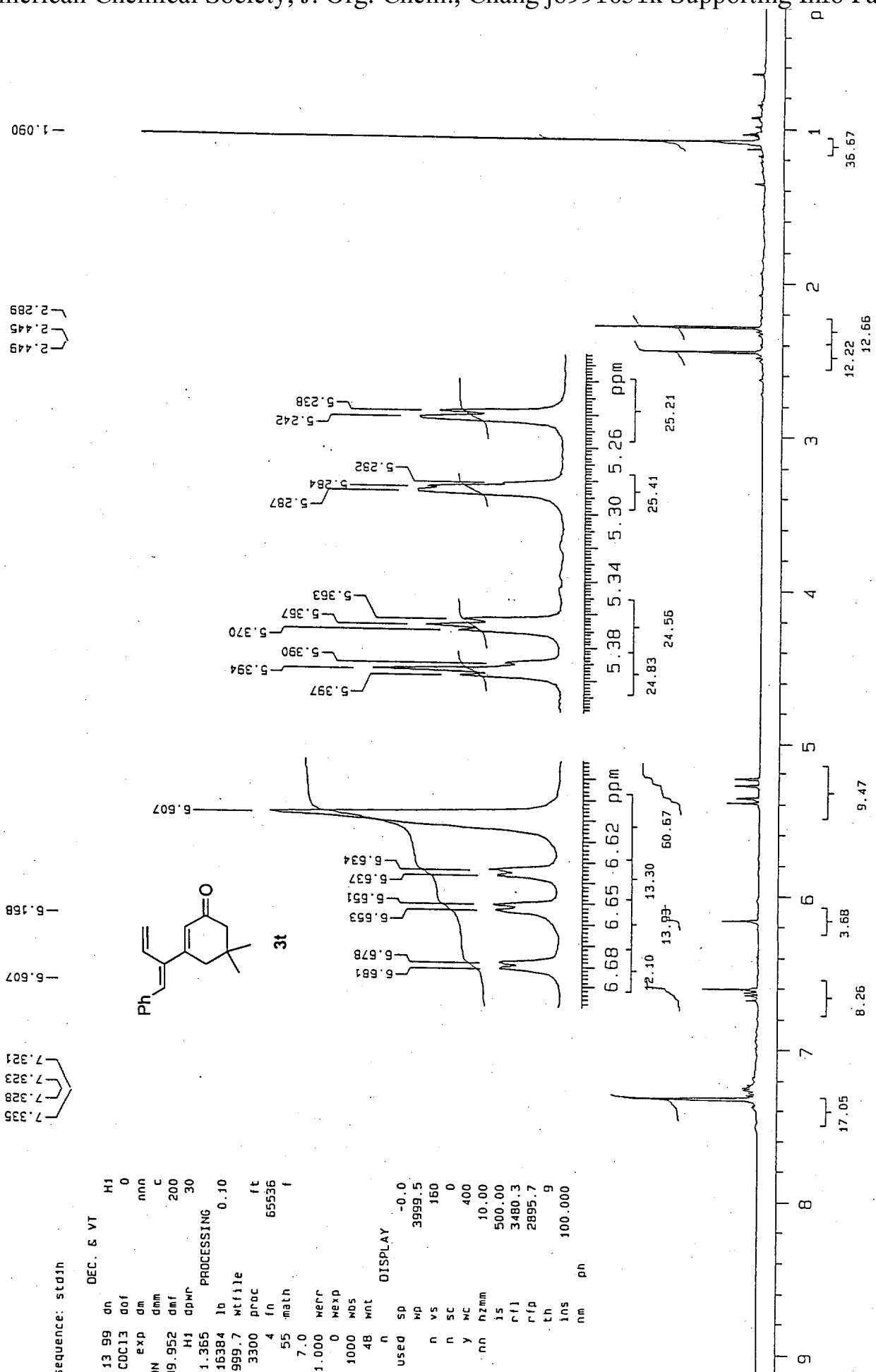


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2.289

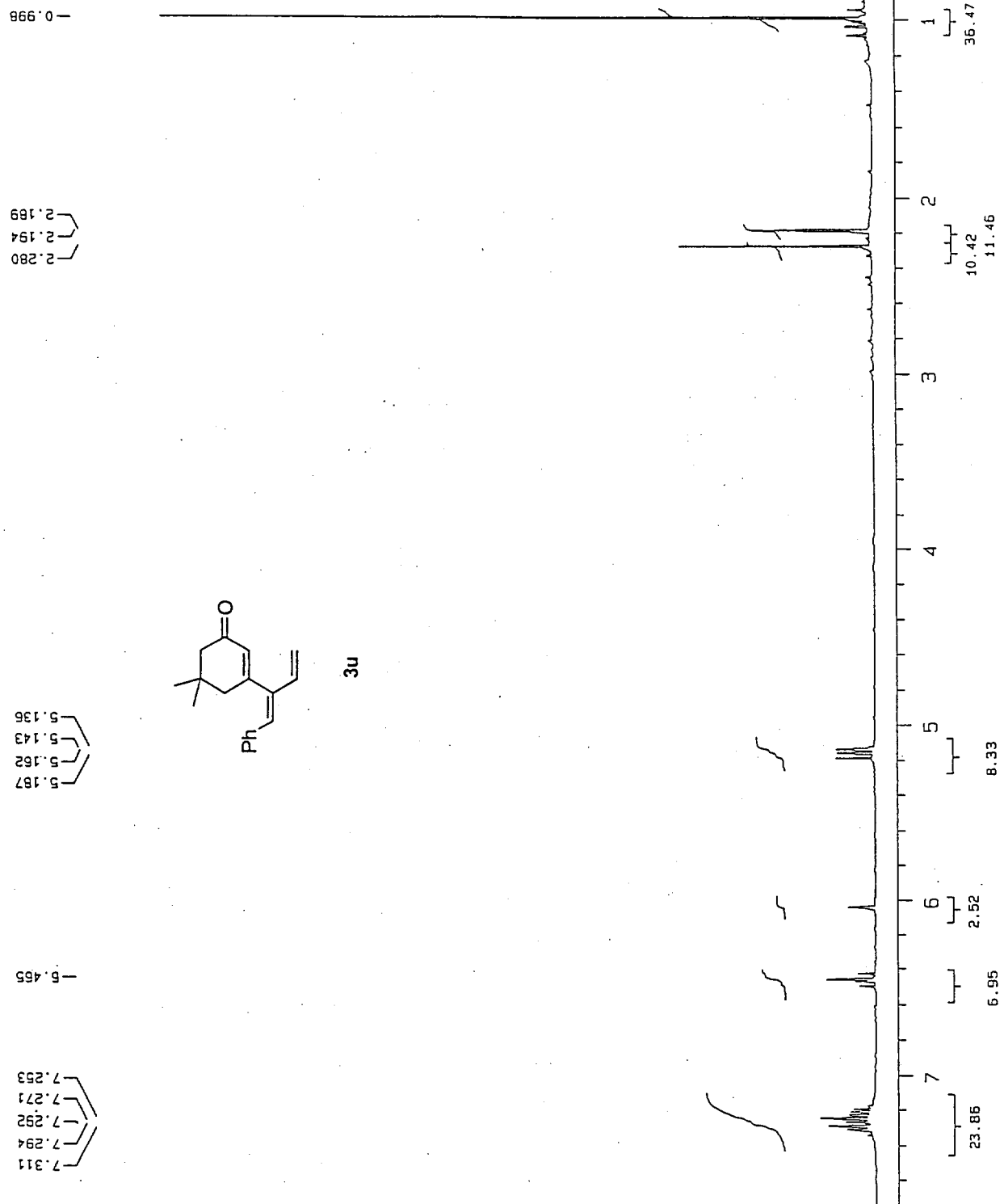
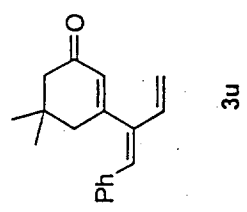
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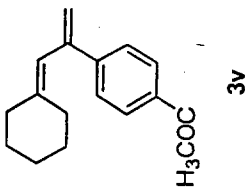
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 H1 gdmr 30
 PROCESSING
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 16384 lb
 5999.7 wfile
 3300 proc ft
 4 fn 65536 f
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 7.0
 1.000 werr
 0 wexp
 1000 wds
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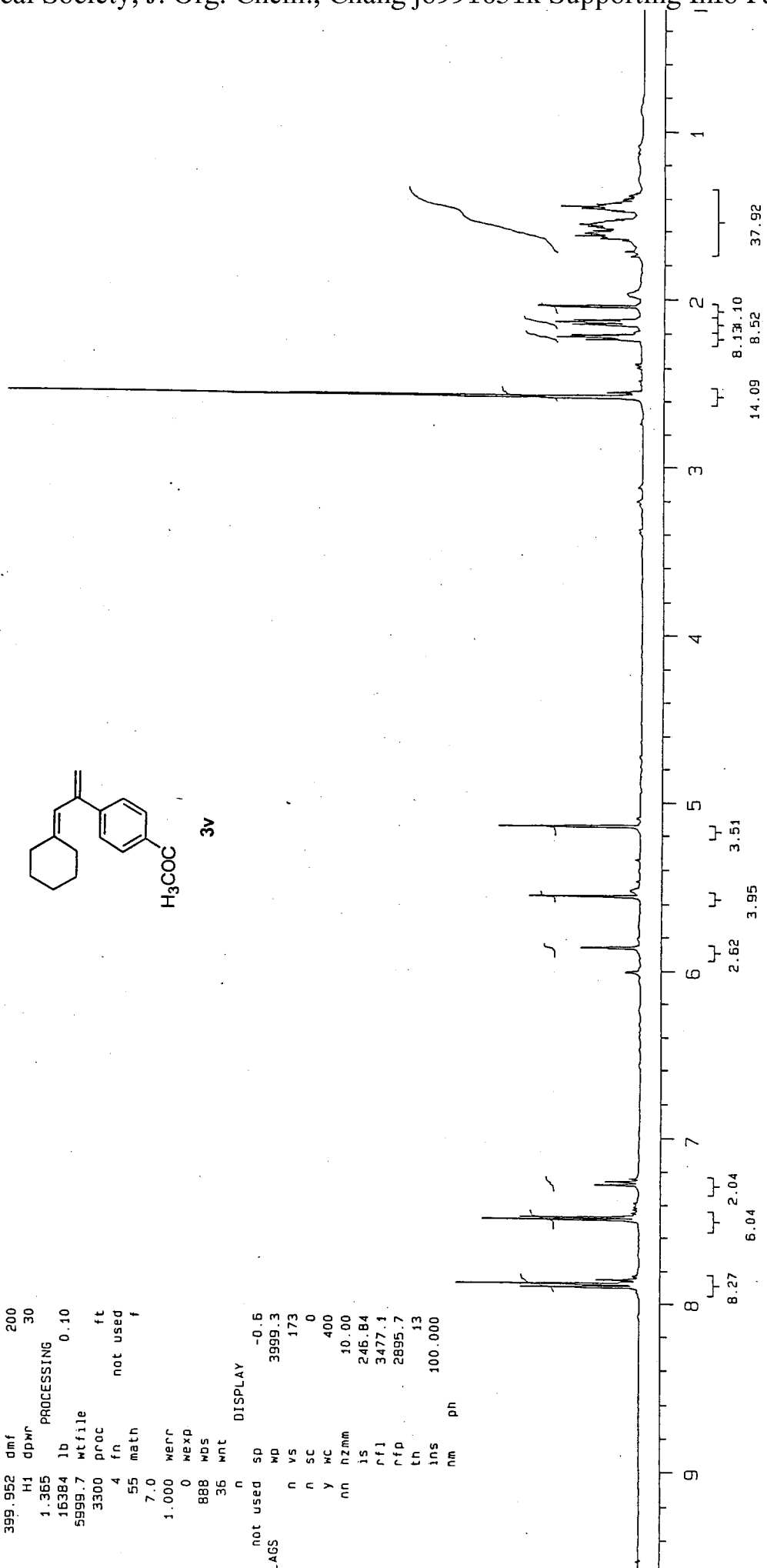
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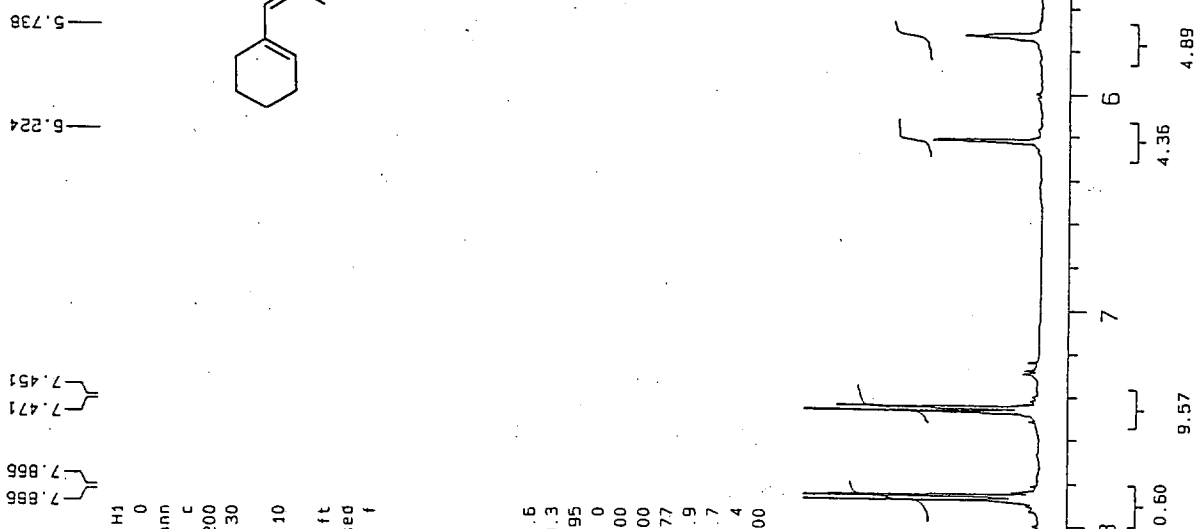
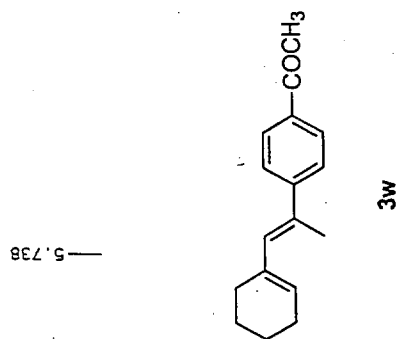
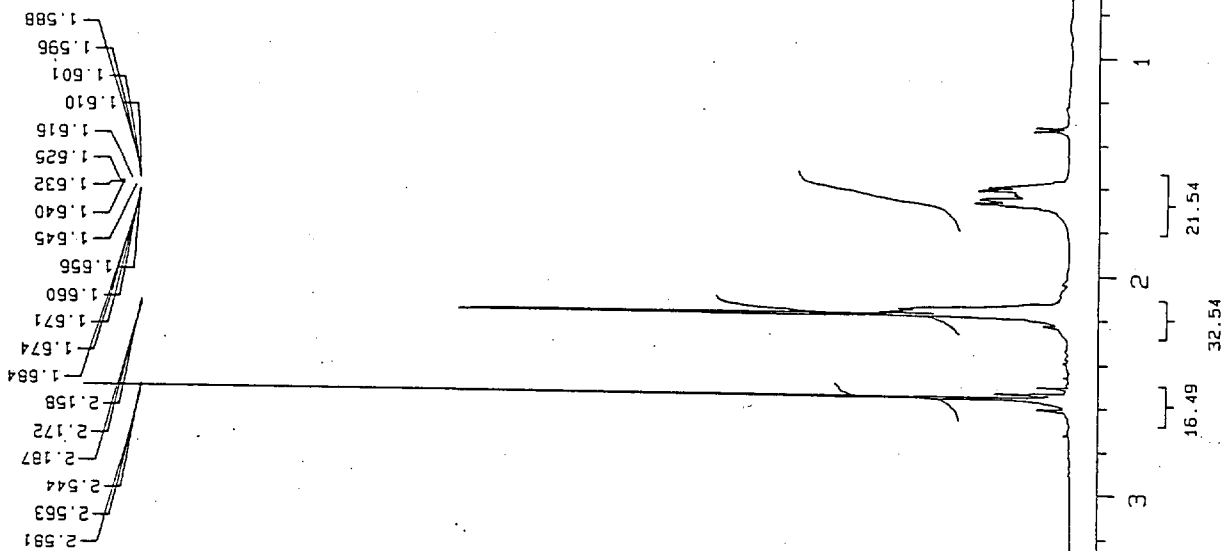
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 7
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 37.92
 14.09
 8.13
 8.52



1 pulse sequence: std1h

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tn 4

ins 100.000

nm cdc ph

9

10.60

8

9.57

7

6

4.36

4.89

5

4

3

2

1

Spectral data for compounds **3c**, **3f-l**, **3q-r** follow.

1-Methyl-4-(2-methyl-1-methylenallyl)benzene (3c). The reaction mixture was chromatographed using hexane as eluent to yield a light yellow liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.21 (d, $J = 8.2$ Hz, 2 H), 7.15 (d, $J = 8.2$ Hz, 2 H), 5.30 (s, 1 H), 5.14 (s, 1 H), 5.12 (s, 1 H), 4.92 (s, 1 H), 2.38 (s, 3 H), 2.02 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 150.92 (s), 143.78 (s), 138.59 (s), 136.79 (s), 128.57 (d), 128.45 (d), 116.74 (t), 113.48 (t), 21.22 (q), 21.13 (q); IR (neat) 2991, 1510, 897 cm^{-1} ; HRMS calcd for $\text{C}_{12}\text{H}_{14}$ 158.1096, found 158.1091.

1-(2-methyl-1-methylenallyl)-4-nitrobenzene (3f). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:100) as eluent to yield a yellow liquid. ^1H NMR (400 MHz, CDCl_3) δ 8.15 (d, $J = 8.8$ Hz, 2 H), 7.41 (d, $J = 8.8$ Hz, 2 H), 5.41 (s, 1 H), 5.18 (s, 1 H), 5.13 (s, 1 H), 4.75 (s, 1 H), 1.98 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 149.19 (s), 148.37 (s), 147.02 (s), 142.68 (s), 129.42 (d), 123.20 (d), 117.65 (t), 115.99 (t), 20.94 (q); IR (neat) 2956, 1519, 1348, 862 cm^{-1} ; HRMS calcd for $\text{C}_{11}\text{H}_{11}\text{NO}_2$ 189.0790, found 189.0793.

1-(2-Methyl-1-methylenallyl)-2-nitrobenzene (3g). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:100) as eluent to yield a deep green liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.92-7.88 (m, 1 H), 7.59-7.52 (m, 1 H), 7.46-7.40 (m, 1 H), 7.35-7.30 (m, 1 H), 5.43 (s, 1 H), 5.13 (s, 1 H), 4.96 (s, 1 H), 4.44 (s, 1 H), 2.03 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 147.20 (s), 142.64 (s), 136.93 (s), 134.53 (s), 132.68 (d), 132.08 (d), 128.27 (d), 124.02 (d), 115.64 (t), 114.87 (t), 20.56 (q); IR (neat) 2938, 1528, 1351, 900 cm^{-1} ; HRMS calcd for $\text{C}_{11}\text{H}_{11}\text{NO}_2$ 189.0790, found 189.0799.

4-(2-Methyl-1-methylenallyl)benzotrile (3h). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:50) as eluent to yield a

pale yellow liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.58 (d, $J = 8.4$ Hz, 2 H), 7.35 (d, $J = 8.4$ Hz, 2 H), 5.37 (s, 1 H), 5.14 (s, 1 H), 5.11 (s, 1 H), 4.74 (s, 1 H), 1.97 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 149.55 (s), 146.31 (s), 142.71 (s), 131.73 (d), 129.27 (d), 118.80 (s), 117.48 (t), 115.61 (t), 110.95 (s), 20.93 (q); IR (neat) 3094, 2976, 2228, 903 cm^{-1} ; HRMS calcd for $\text{C}_{12}\text{H}_{11}\text{N}$ 169.0892, found 169.0886.

2-(2-Methyl-1-methyleneallyl)benzonitrile (3i). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:50) as eluent to yield a pale yellow liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.65-7.61 (m, 1 H), 7.55-7.49 (m, 1 H), 7.39-7.33 (m, 1 H), 7.31-7.27 (m, 1 H), 5.54 (s, 1 H), 5.16 (s, 1 H), 5.10 (s, 1 H), 4.50 (s, 1 H), 2.04 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 147.25 (s), 145.82 (s), 142.42 (s), 132.55 (d), 132.00 (d), 130.09 (d), 127.42 (d), 117.87 (s), 117.63 (t), 116.98 (t), 112.53 (s), 20.26 (q); IR (neat) 2981, 2227, 1626, 765 cm^{-1} ; HRMS calcd for $\text{C}_{12}\text{H}_{11}\text{N}$ 169.0892, found 169.0888.

1-Methoxy-4-(2-methyl-1-methyleneallyl)benzene (3j). The reaction mixture was chromatographed using hexane as eluent to yield a light liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.24 (d, $J = 8.4$ Hz, 2 H), 6.87 (d, $J = 8.4$ Hz, 2 H), 5.26 (s, 1 H), 5.11 (s, 2 H), 4.91 (s, 1 H), 3.82 (s, 3 H), 2.00 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 158.86 (s), 150.56 (s), 143.96 (s), 133.89 (s), 129.59 (d), 116.61 (t), 113.28 (d), 113.06 (t), 56.17 (q), 21.26 (q); IR (neat) 2945, 1512, 1248 cm^{-1} ; HRMS calcd for $\text{C}_{12}\text{H}_{14}\text{O}$ 174.1045, found 174.1039.

Ethyl 2-(2-methyl-1-methyleneallyl)benzoate (3k). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:200) as eluent to yield a colorless liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.75 (dd, $J = 7.4$ Hz, 1.4 Hz, 1 H), 7.36 (dt, $J = 7.4$ Hz, 1.4 Hz, 1 H), 7.26 (dt, $J = 7.4$ Hz, 1.4 Hz, 1 H), 7.14 (dd, $J = 7.4$ Hz, 1.4 Hz, 1 H), 5.34 (s, 1 H), 5.02 (s, 1 H), 4.96 (s, 1 H), 4.46 (s, 1 H), 4.21 (q, $J =$

7.4 Hz, 2 H), 2.04 (s, 3 H), 1.27 (t, $J = 7.4$ Hz, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 167.60 (s), 150.34 (s), 143.71 (s), 142.63 (s), 131.25 (d), 130.96 (s), 130.87 (d), 129.56 (d), 127.08 (d), 115.90 (t), 113.44 (t), 60.76 (t), 20.53 (q), 13.99 (q); IR (neat) 2967, 1720, 1289 cm^{-1} ; HRMS calcd for $\text{C}_{14}\text{H}_{16}\text{O}_2$ 216.1146, found 216.1146.

9-(2-Methyl-1-methylenallyl)anthracene (3l). The reaction mixture was chromatographed using hexane as eluent to yield a orange liquid. ^1H NMR (400 MHz, CDCl_3) δ 8.44 (s, 1 H), 8.03 (m, 4 H), 7.46 (m, 4 H), 6.02 (s, 1 H), 5.32 (s, 1 H), 5.02 (s, 1 H), 4.32 (s, 1 H), 2.30 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 146.77 (s), 143.00 (s), 136.73 (s), 131.32 (s), 129.81 (s), 128.28 (d), 126.74 (d), 126.12 (d), 125.21 (d), 125.04 (d), 118.18 (t), 118.01 (t), 20.16 (q); IR (neat) 3052, 2924, 1442, 734 cm^{-1} ; HRMS calcd for $\text{C}_{19}\text{H}_{16}$ 244.1253, found 244.1248.

3-(1-Isopropenyl-2-methyl-1-propenyl)-5,5-dimethyl-2-cyclohexen-1-one (3q). The reaction mixture was chromatographed using a mixture of ethyl acetate/hexane (1:50) as eluent to yield a light yellow liquid. ^1H NMR (400 MHz, CDCl_3) δ 5.81 (d, $J = 1.2$ Hz, 1 H), 5.05 (d, $J = 2.4$ Hz, 1 H), 4.72 (d, $J = 2.4$ Hz, 1 H), 2.21 (s, 2 H), 2.15 (d, $J = 1.2$ Hz, 2 H), 1.72 (s, 3 H), 1.70 (s, 3 H), 1.67 (s, 3 H), 1.01 (s, 6 H); ^{13}C NMR (100 MHz, CDCl_3) δ 200.20 (s), 161.08 (s), 143.18 (s), 138.50 (s), 129.59 (s), 127.26 (d), 116.12 (t), 51.07 (t), 43.09 (t), 33.53 (s), 28.21 (q), 22.80 (q), 21.64 (q), 21.47 (q); IR (neat) 2941, 1670, 1369, 903 cm^{-1} ; HRMS calcd for $\text{C}_{15}\text{H}_{22}\text{O}$ 218.1671, found 218.1668.

1-(2-Isopropenyl-3-methyl-1-methylene-2-butenyl)benzene (3r). The reaction mixture was chromatographed using hexane as eluent to yield a lime-green liquid. ^1H NMR (400 MHz, CDCl_3) δ 7.49-7.45 (m, 2 H), 7.38-7.26 (m, 3 H), 5.66 (d, $J = 2$ Hz, 1 H), 5.14 (d, $J = 2$ Hz, 1 H), 5.03 (m, 1 H), 4.81 (m, 1 H), 1.94 (s, 3 H), 1.78 (s, 3 H), 1.74 (s, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 148.19 (s), 144.80 (s), 140.25 (s),

138.21 (s), 129.92 (s), 128.15 (d), 127.28 (d), 126.57 (d), 114.99 (t), 114.73 (t), 22.61 (q), 22.03 (q), 21.64 (q); IR (neat) 3080, 2920, 1444, 899, 780 cm^{-1} ; HRMS calcd for $\text{C}_{15}\text{H}_{18}$ 198.1409, found 198.1396.