

7.418
7.403
7.402
7.365
7.357
7.349
7.342
7.326
7.309
7.307
7.294
7.292
7.291
7.290
7.288
7.270
7.252
6.528
6.497
6.443
6.430
6.416
6.398

3.612
3.599

S10

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

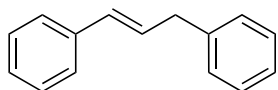
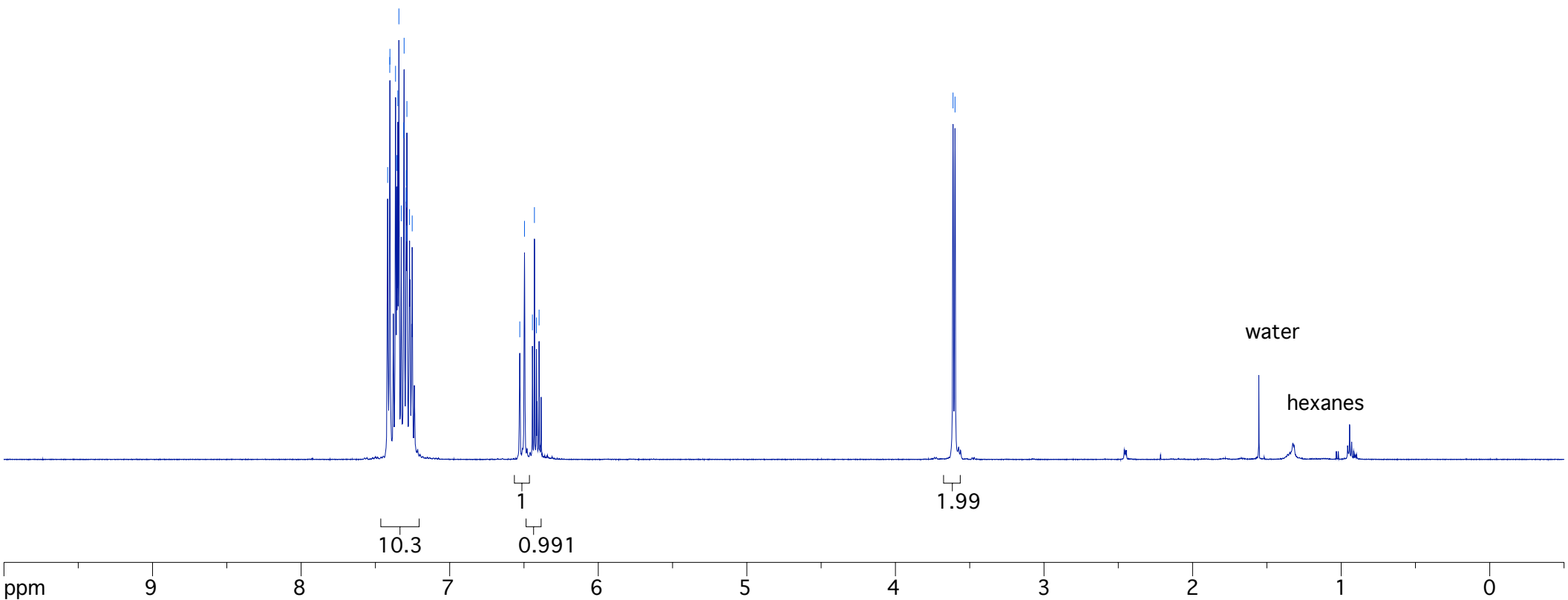


Table 2, Entry 1, 3a



S11

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 349
Relaxation Delay: 2.000 s

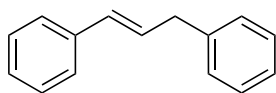
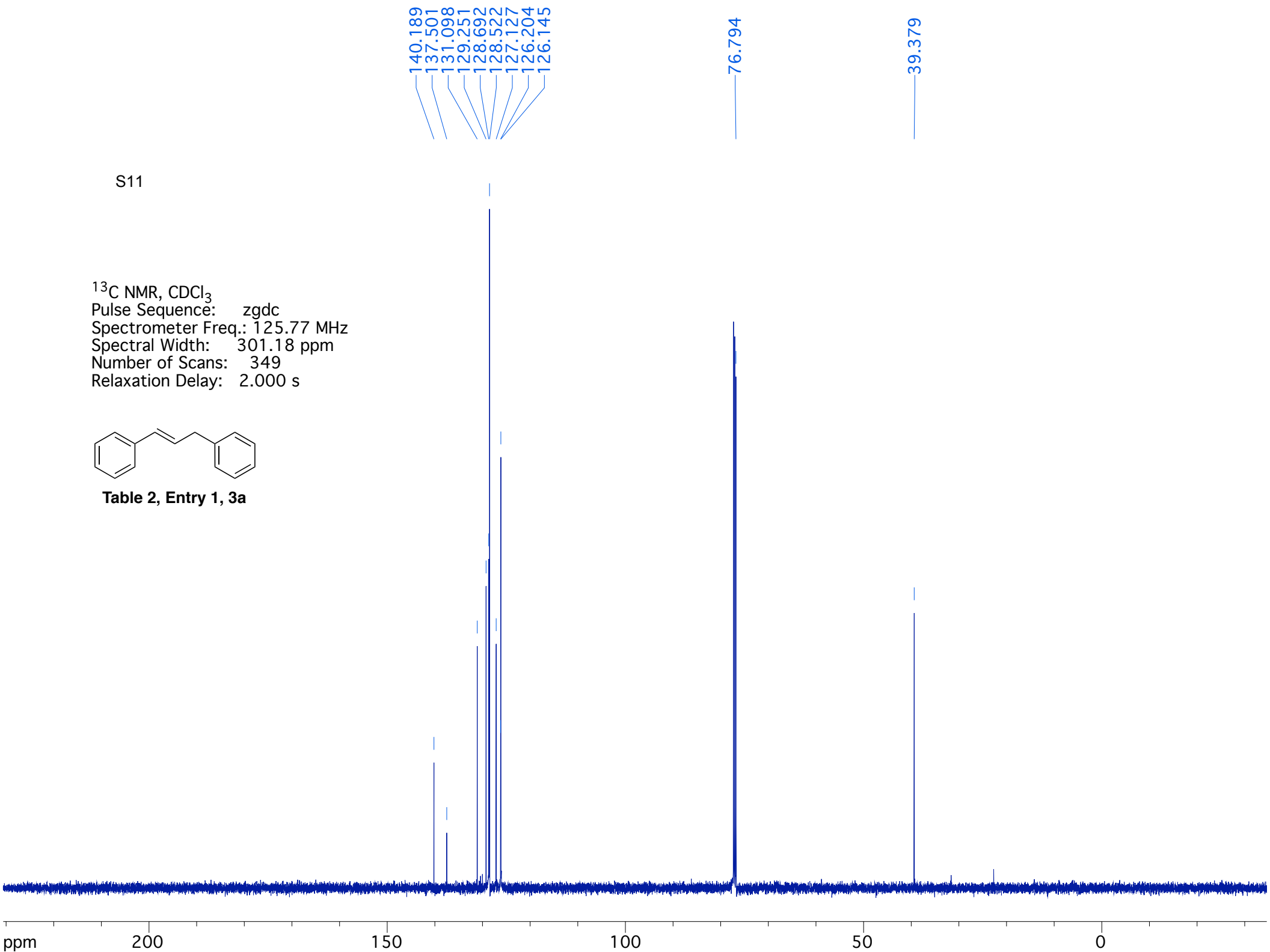


Table 2, Entry 1, 3a



7.410
7.406
7.388
7.387
7.370
7.366
7.351
7.349
7.347
7.342
7.338
7.332
7.328
7.309
7.294
7.289
7.284
7.278
7.276
7.256
7.243
7.238
7.220
6.520
6.480
6.435
6.419
6.402
6.379
6.362

3.600
3.584

S12

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

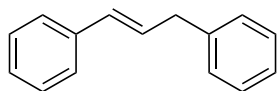
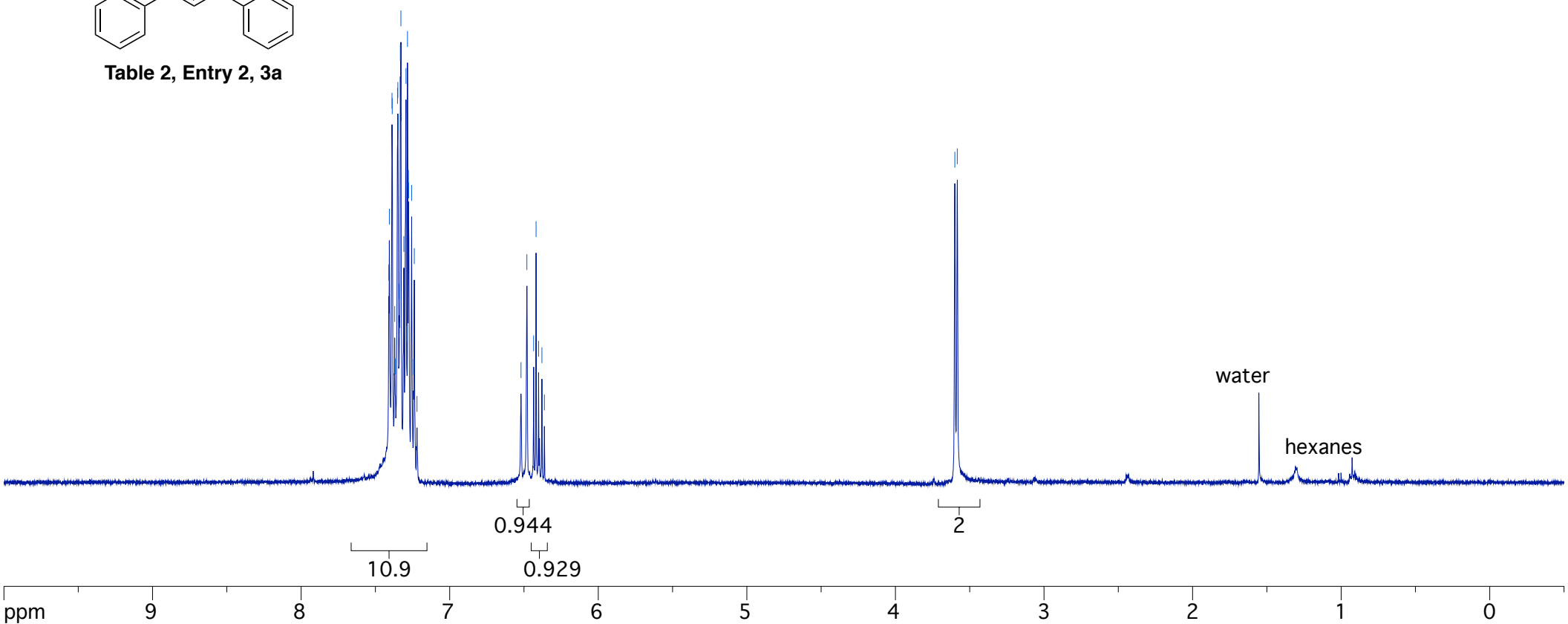


Table 2, Entry 2, 3a



S13

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 423
Relaxation Delay: 2.000 s

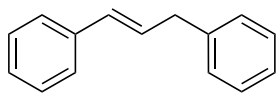
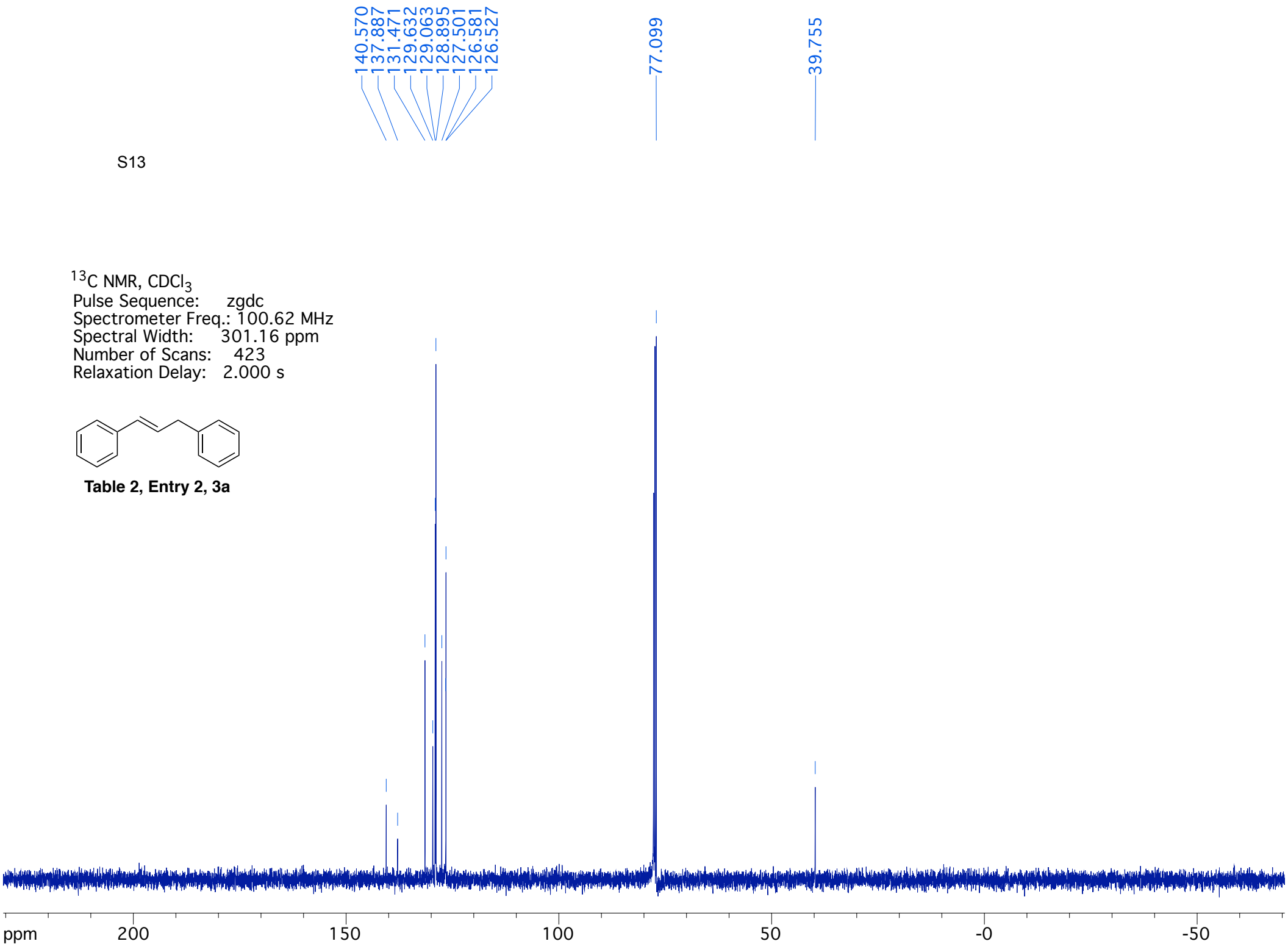


Table 2, Entry 2, 3a





S14

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

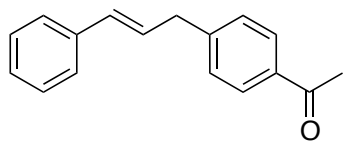
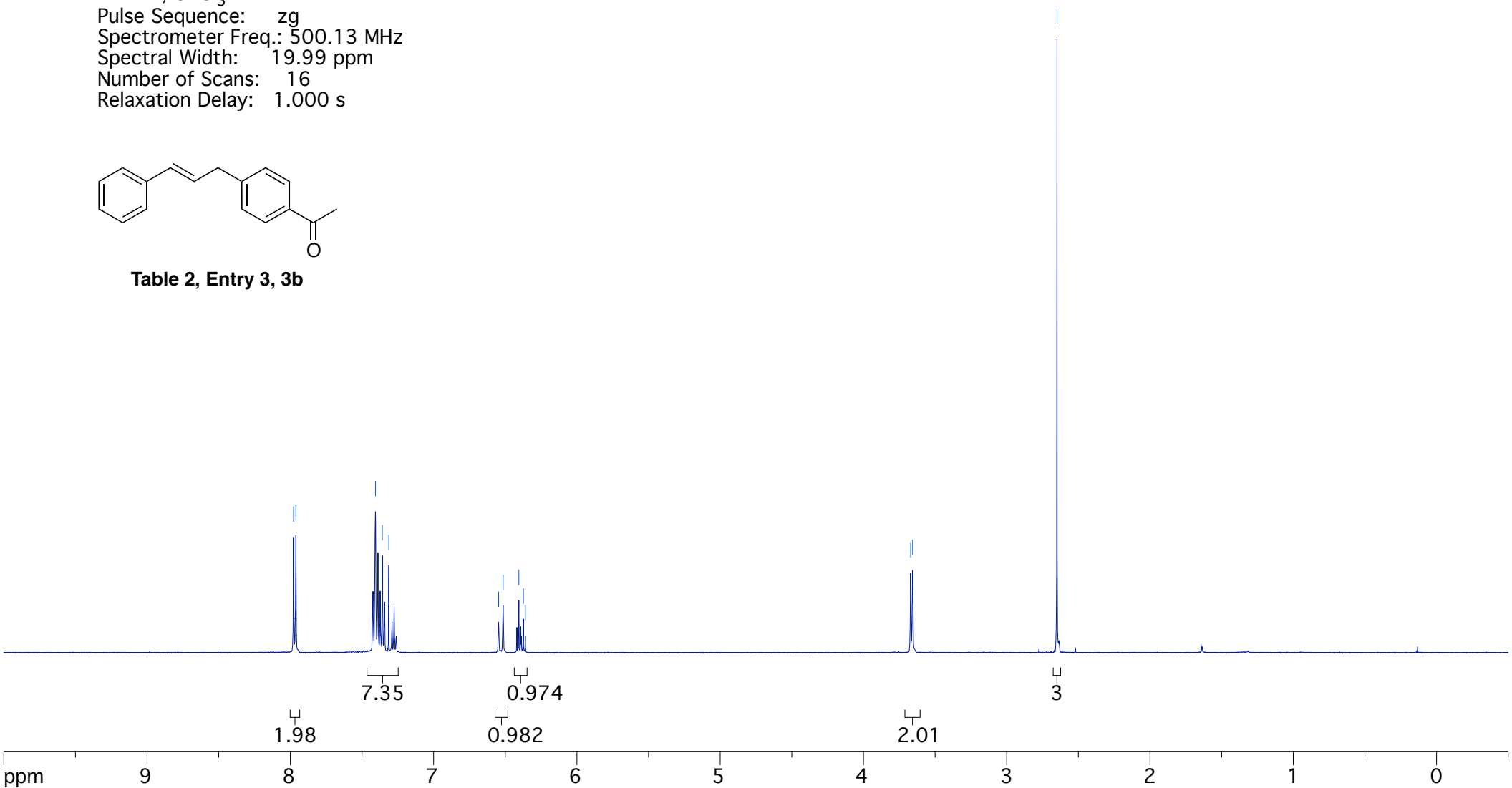


Table 2, Entry 3, 3b



198.212
S15
146.304
137.554
135.790
132.279
129.281
129.066
128.970
128.326
127.757
126.563
77.764
77.449
77.133
39.657
27.010

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 343
Relaxation Delay: 2.000 s

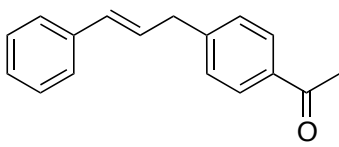
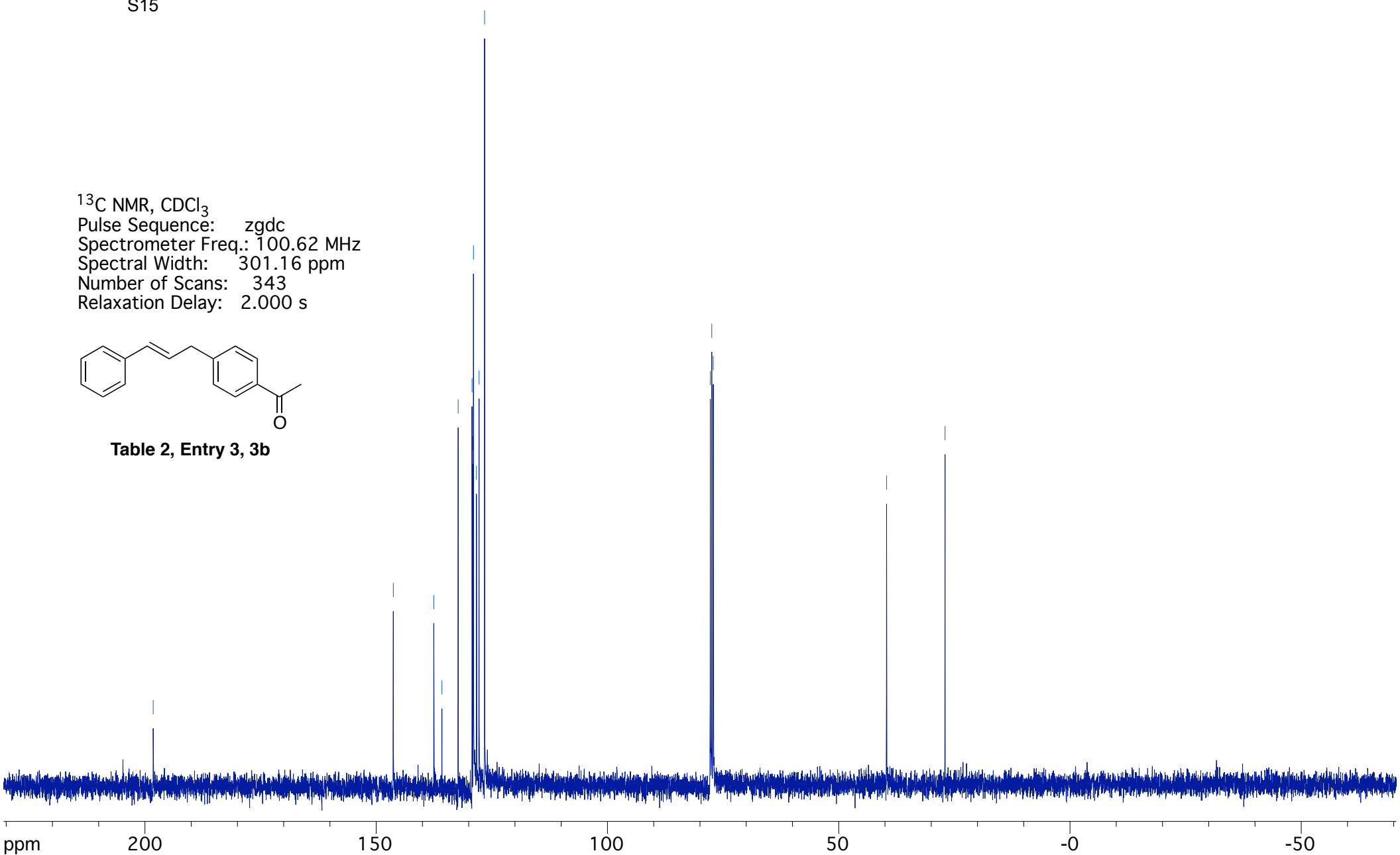


Table 2, Entry 3, 3b



7.898
7.881
7.479
7.463
7.429
7.426
7.423
7.412
7.411
7.407
7.376
7.372
7.362
7.359
7.346
7.313
7.298
7.295
7.293
7.285
7.281
7.277
7.266
6.559
6.528
6.420
6.406
6.393
6.389
6.375
6.361

3.695
3.682

S16

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

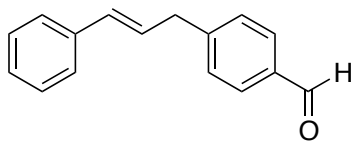
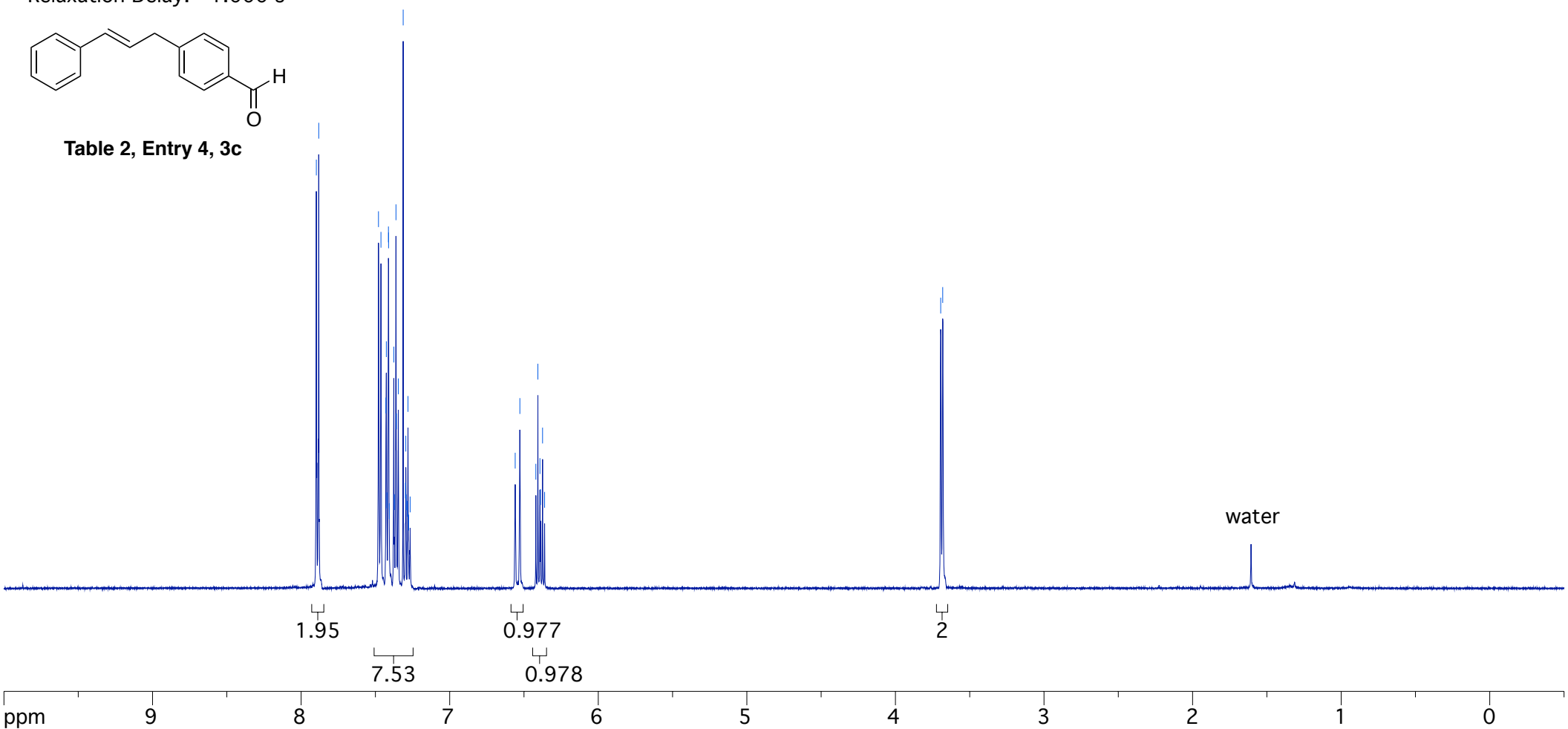


Table 2, Entry 4, 3c



S17

192.029

147.579
137.093
134.820
132.138
130.098
129.354
128.608
127.624
127.450
126.200

77.337
77.082
76.827

39.462

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 278
Relaxation Delay: 2.000 s

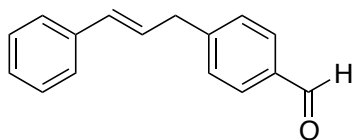
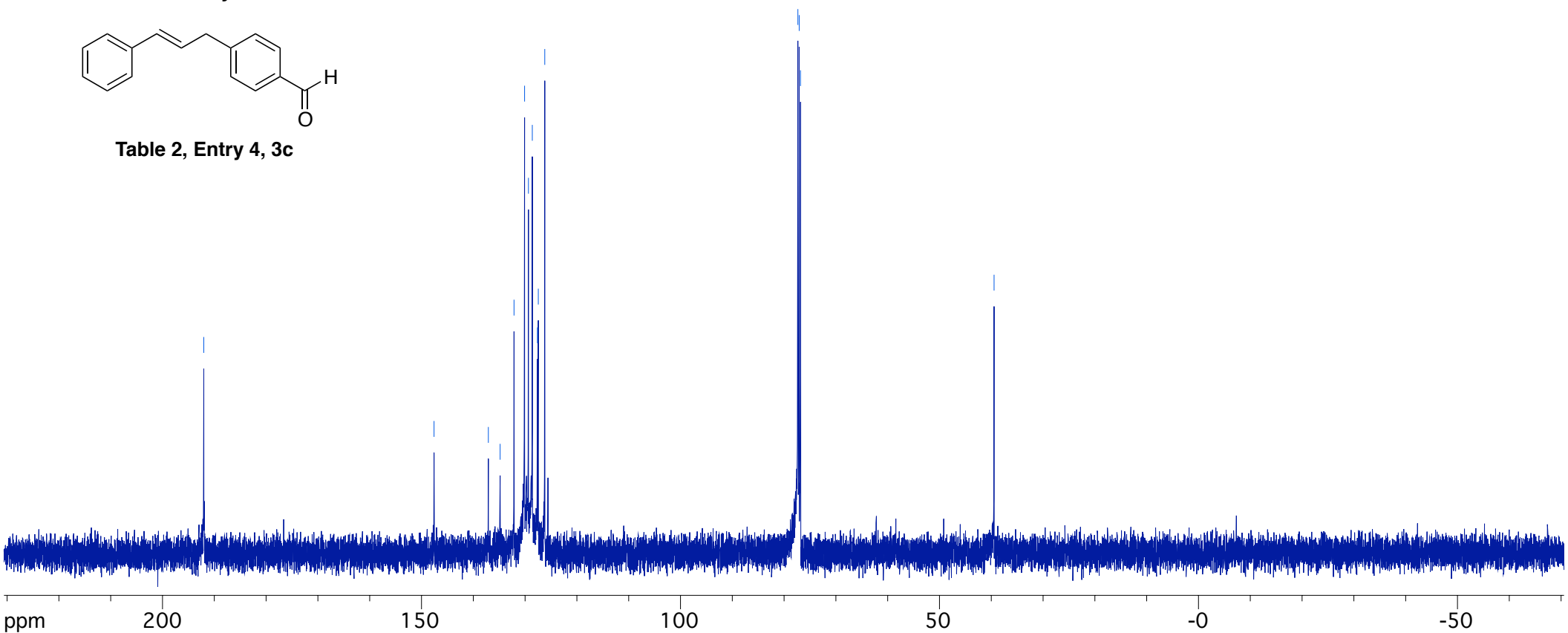


Table 2, Entry 4, 3c



S18

7.647
7.631
7.627
7.344
7.341
7.324
7.321
7.308
7.228
7.223
7.215
7.213
7.206
7.119
7.098
6.999
6.994
6.982
6.978
6.415
6.414
6.395
6.394
6.375
6.314
6.298
6.281
6.258

3.479
3.463

2.380

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

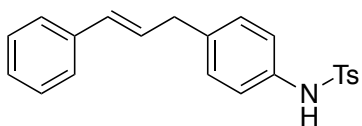
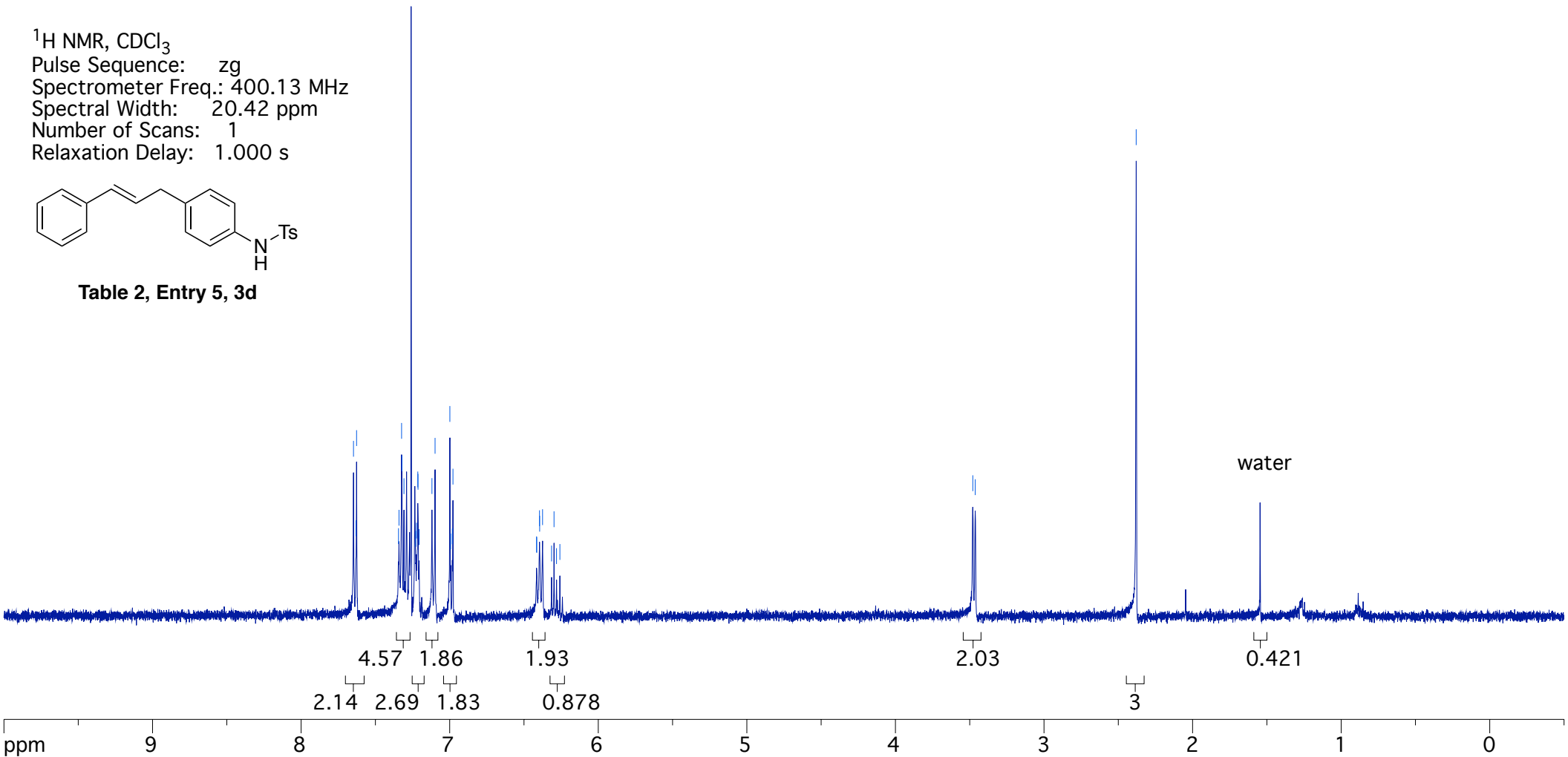


Table 2, Entry 5, 3d



S19

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 14925
Relaxation Delay: 2.000 s

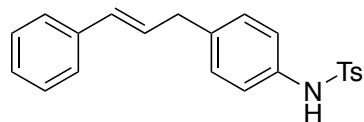
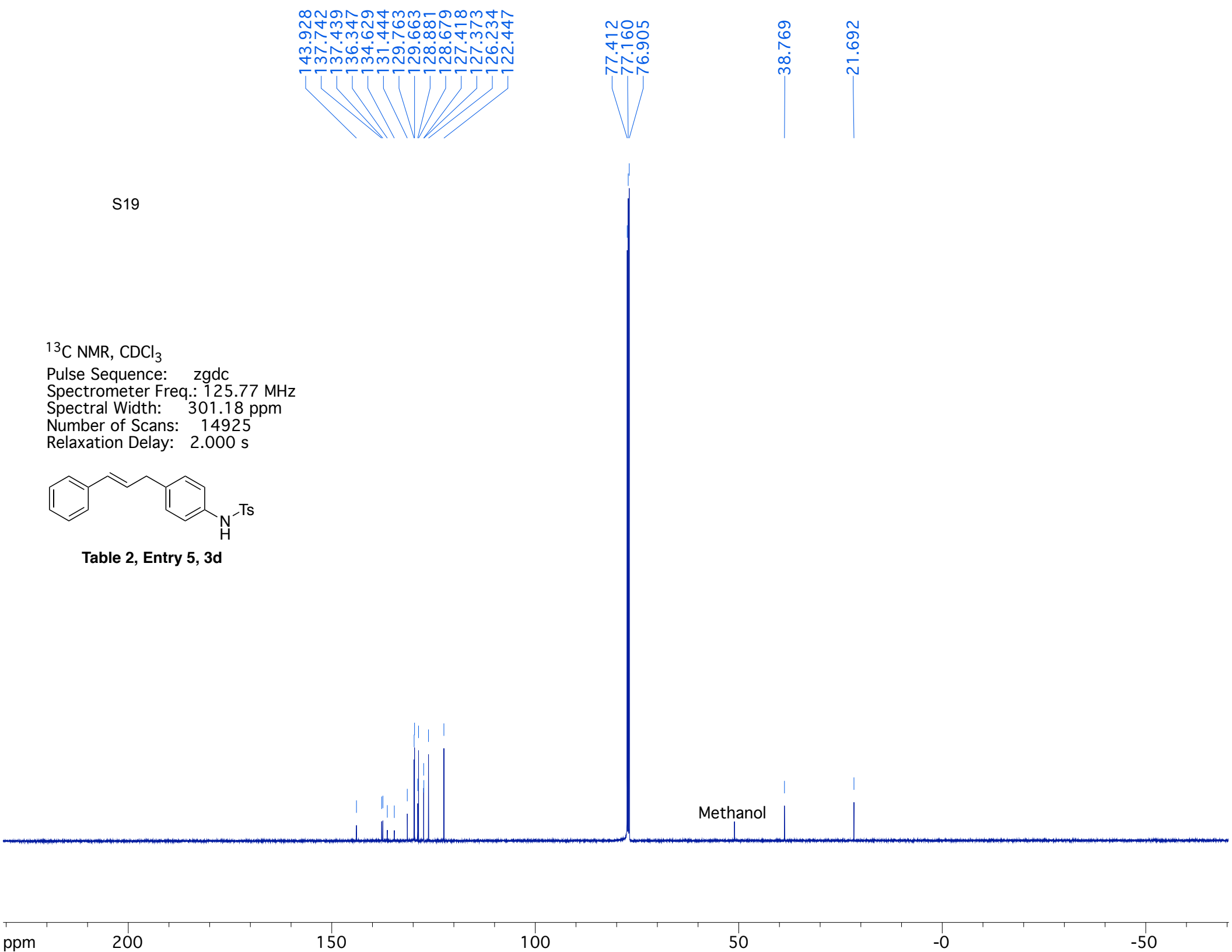


Table 2, Entry 5, 3d



7.842
7.541
7.537
7.528
7.524
7.397
7.394
7.380
7.345
7.330
7.313
7.296
7.288
7.260
7.246
7.231
6.497
6.465
6.383
6.370
6.356
6.352
6.338
6.324

3.585
3.571

S20

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

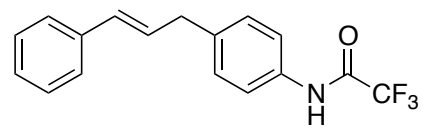
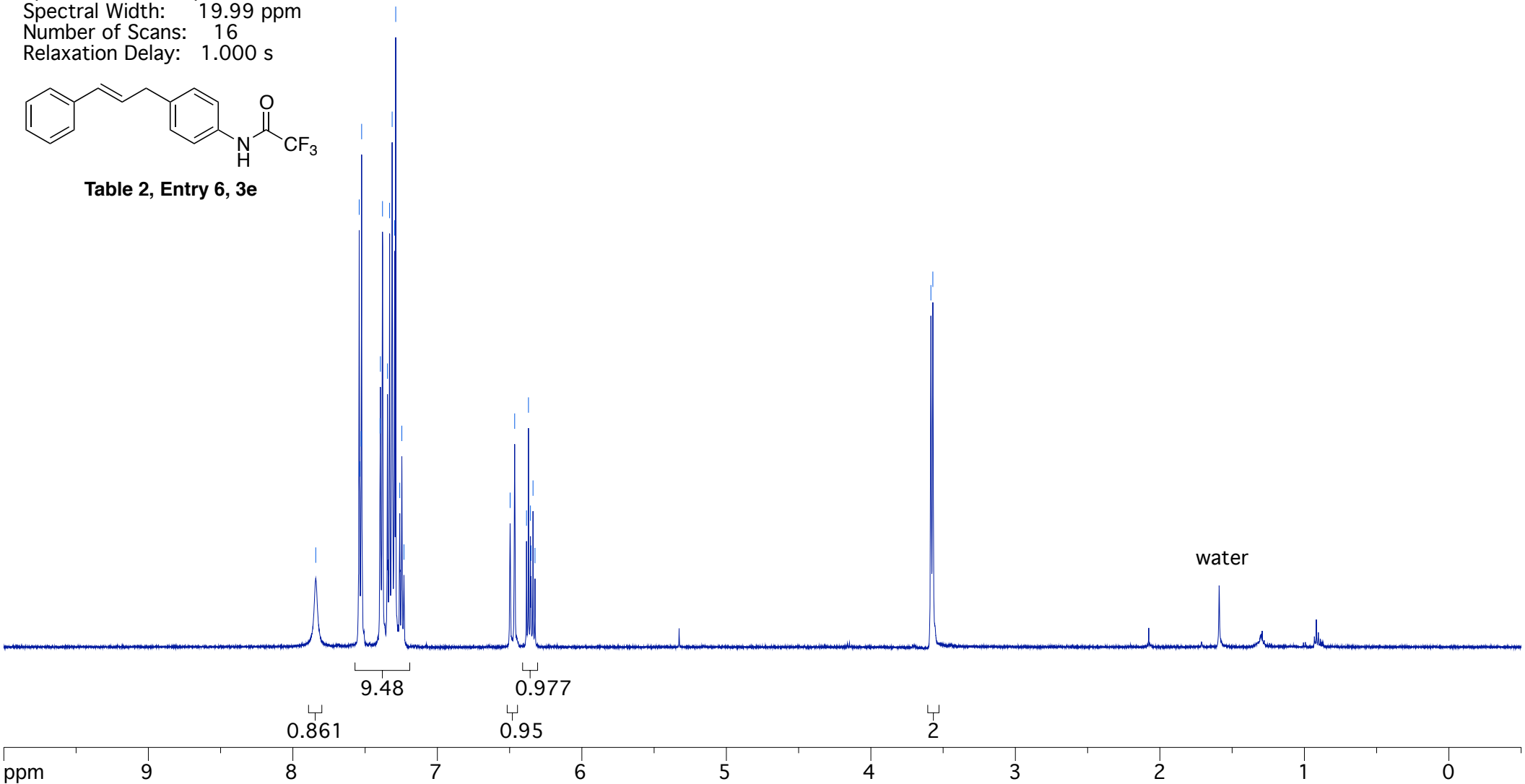


Table 2, Entry 6, 3e



S21

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 933
Relaxation Delay: 2.000 s

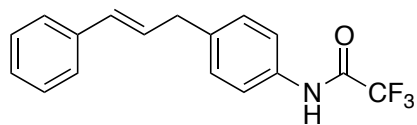
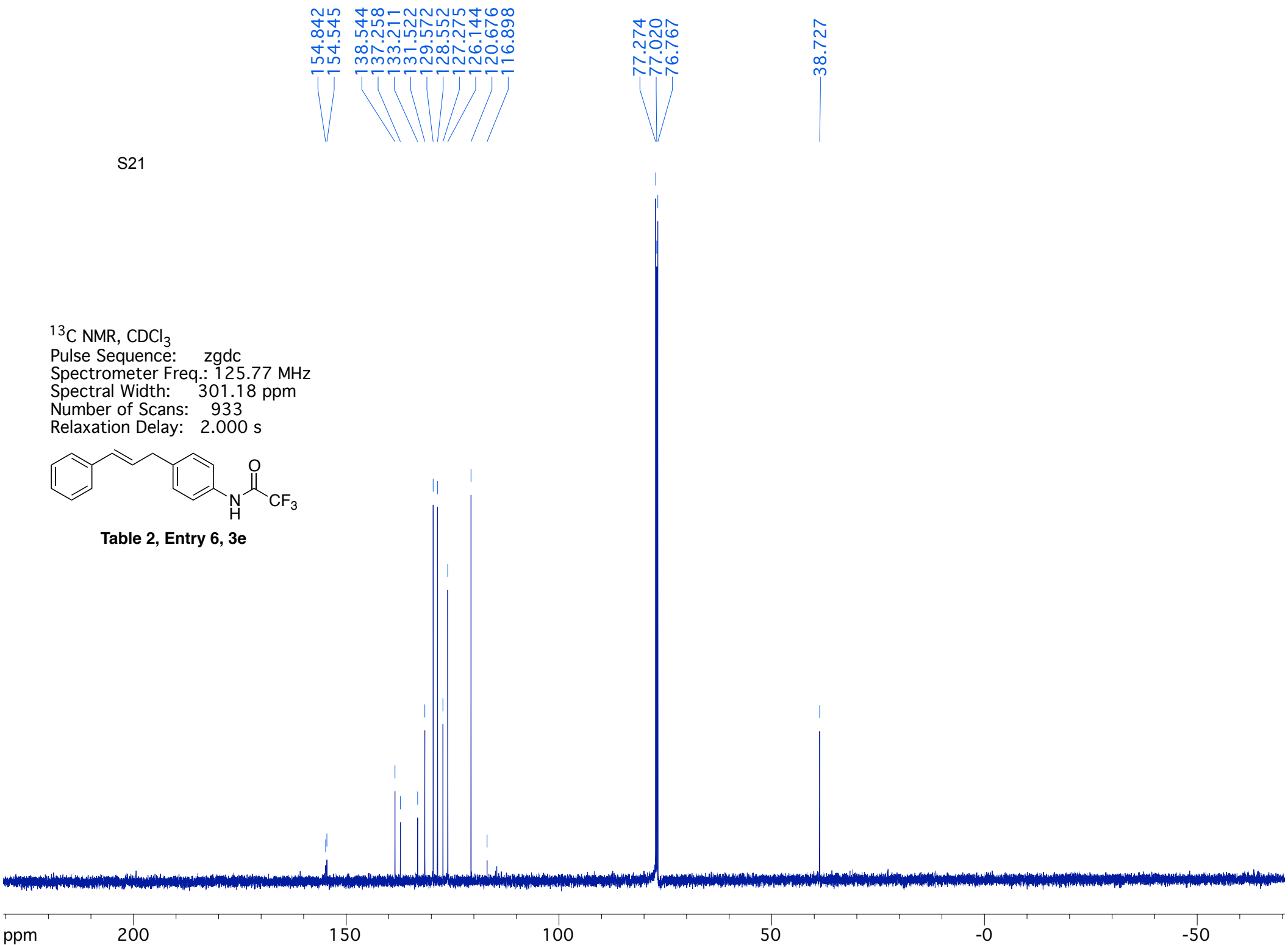


Table 2, Entry 6, 3e



-76.152

S22

^{19}F NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 376.50 MHz
Spectral Width: 199.70 ppm
Number of Scans: 4
Relaxation Delay: 1.000 s

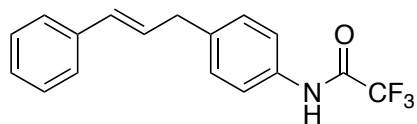


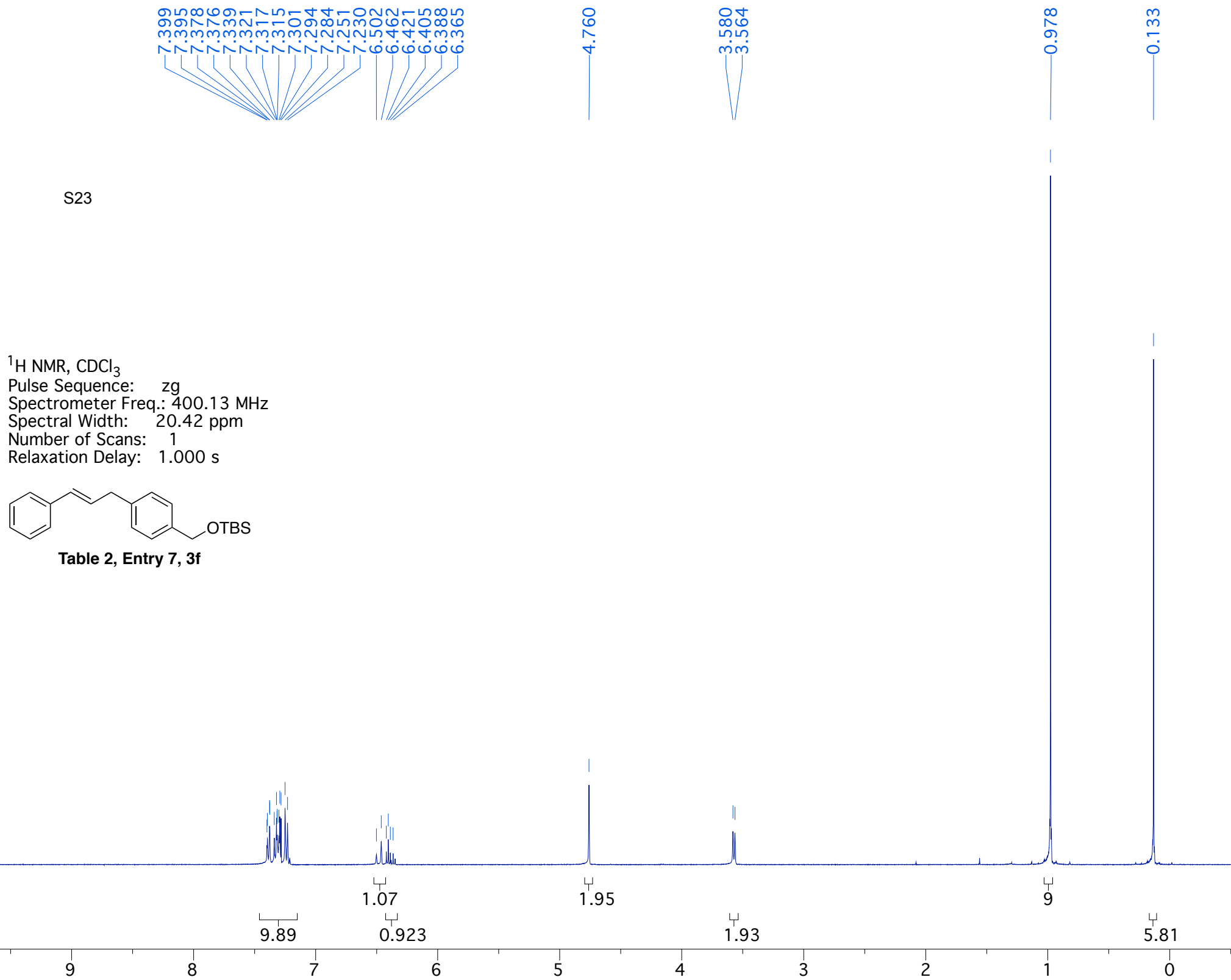
Table 2, Entry 6, 3e

ppm

50

-0

-50



S24

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 342
Relaxation Delay: 2.000 s

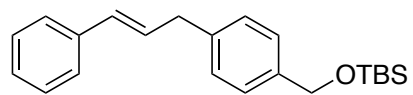
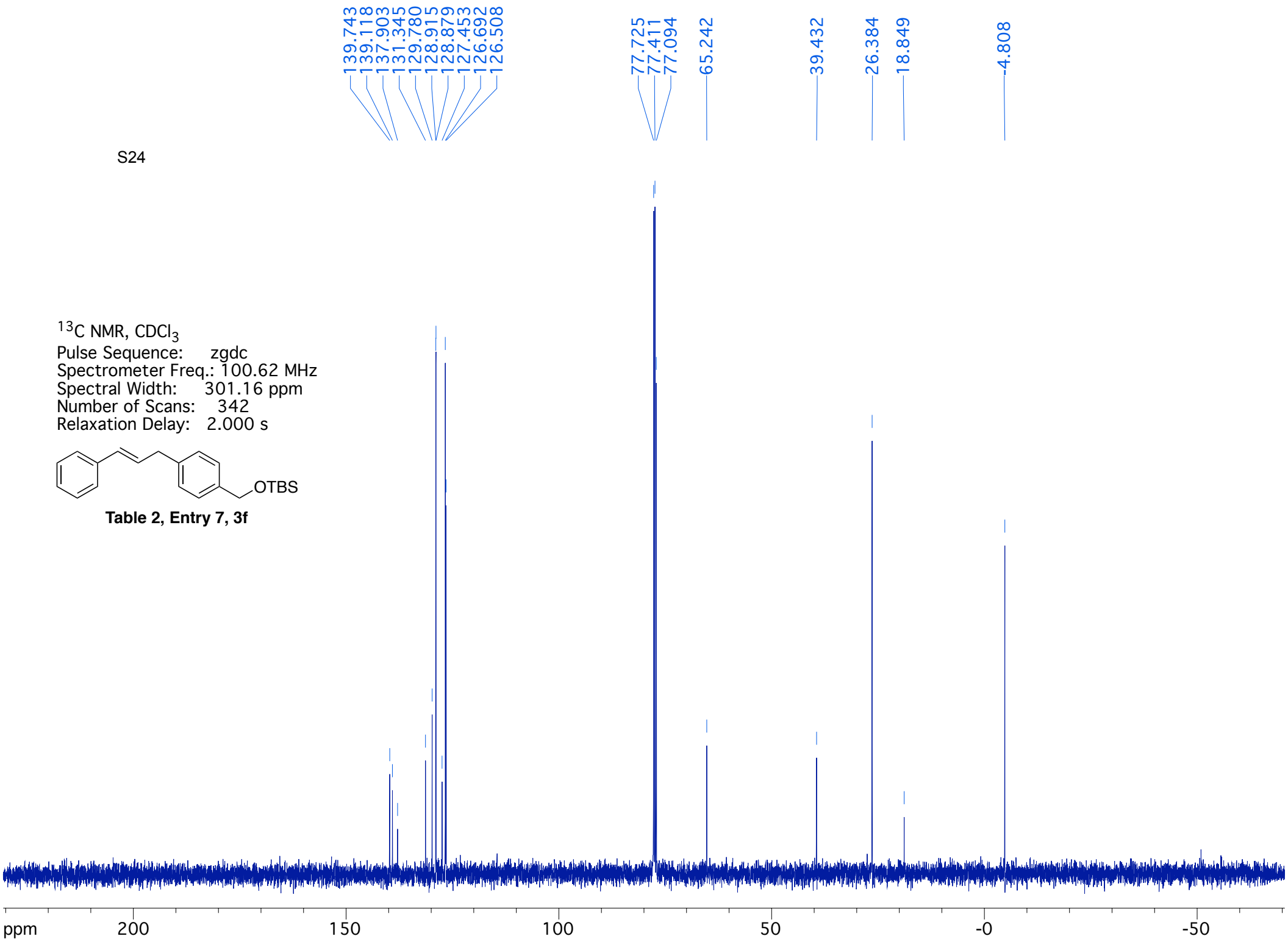


Table 2, Entry 7, 3f



S25

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

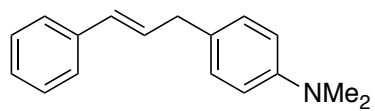
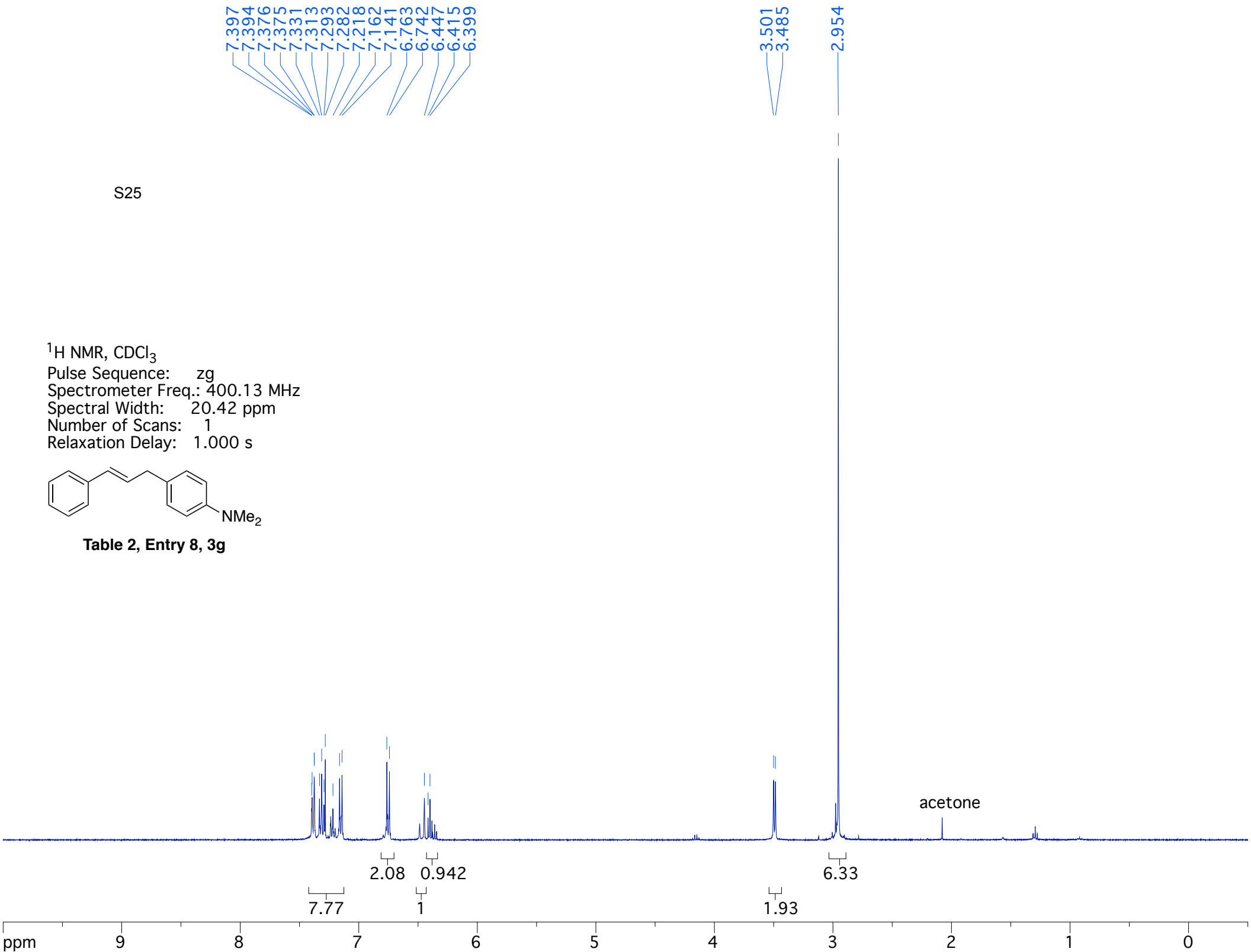


Table 2, Entry 8, 3g



S26

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 284
Relaxation Delay: 2.000 s

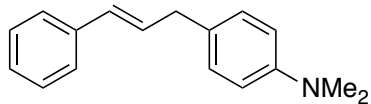
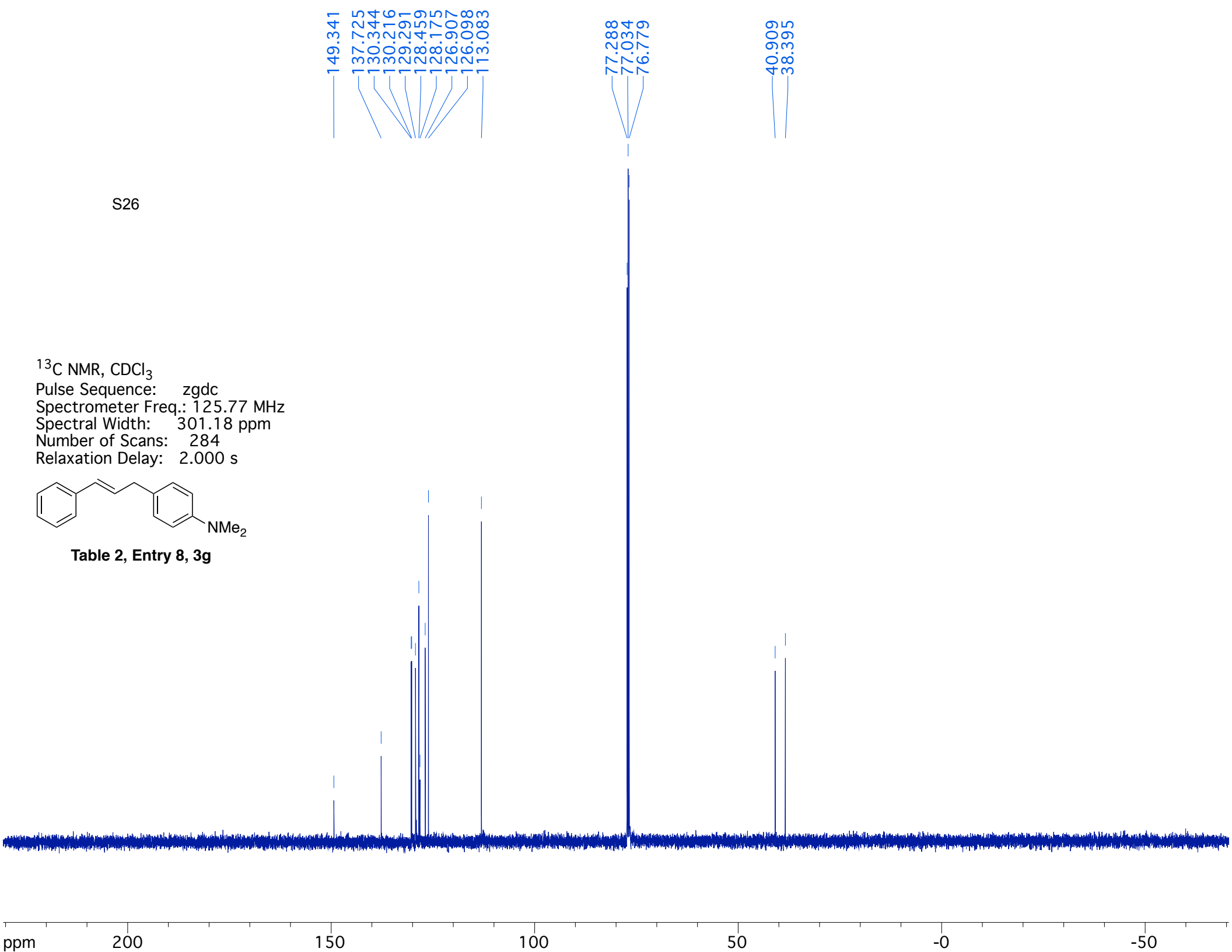


Table 2, Entry 8, 3g



S27

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

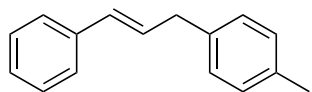
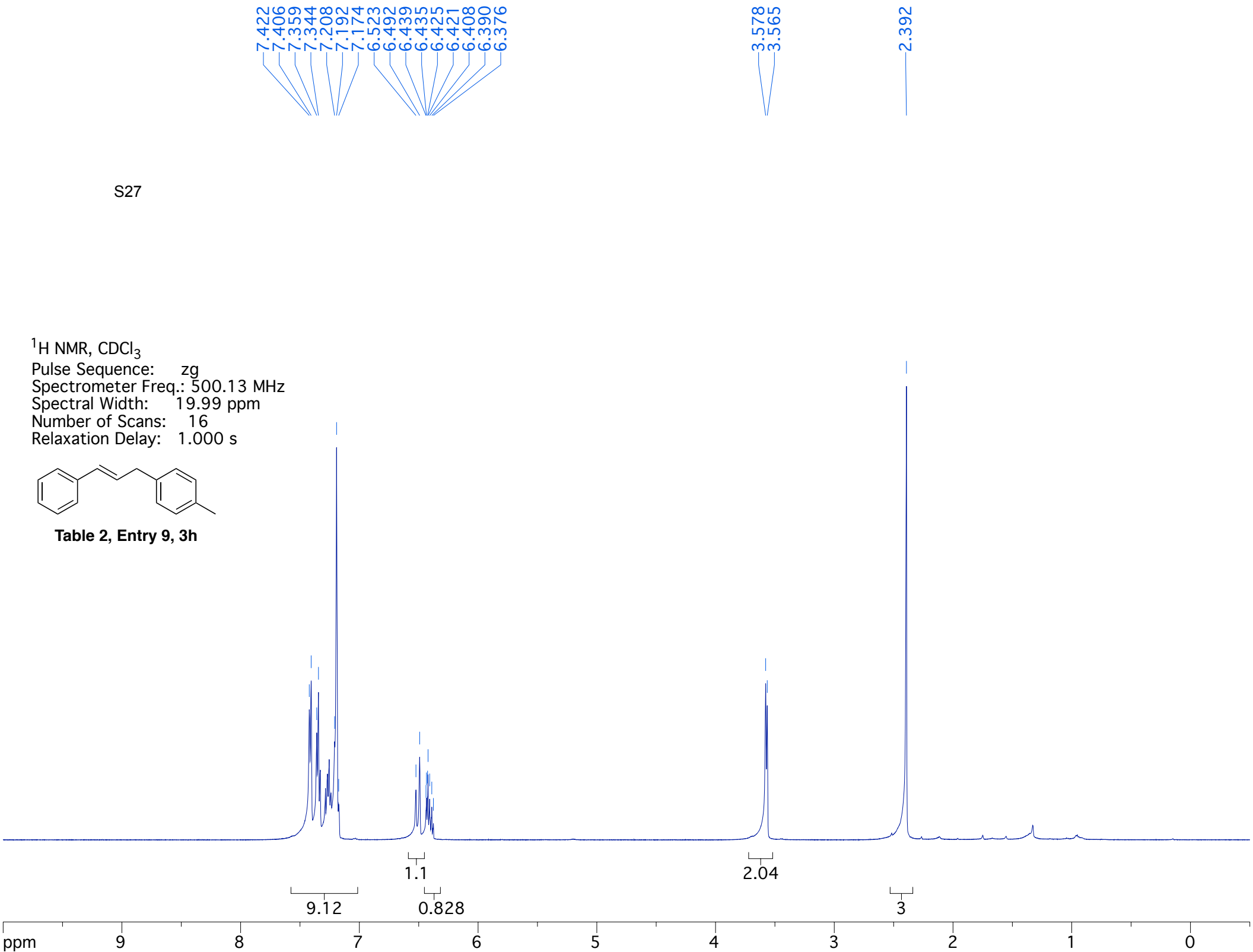


Table 2, Entry 9, 3h



S28

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 74
Relaxation Delay: 2.000 s

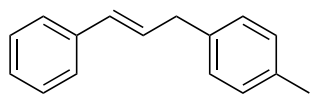
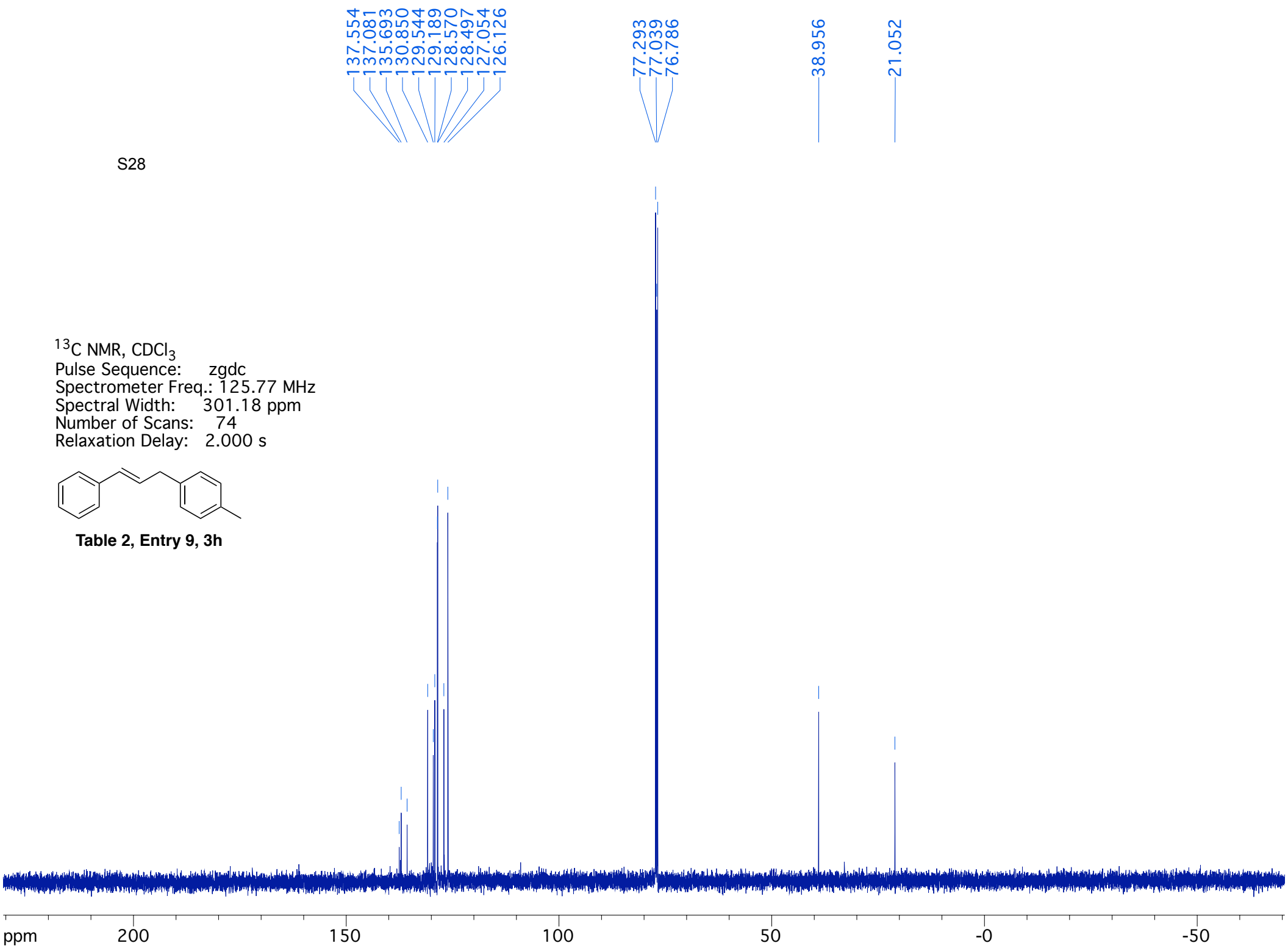


Table 2, Entry 9, 3h



S29

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.05 MHz
Spectral Width: 20.03 ppm
Number of Scans: 1
Relaxation Delay: 1.500 s

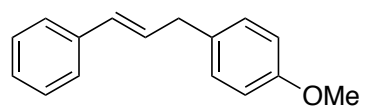
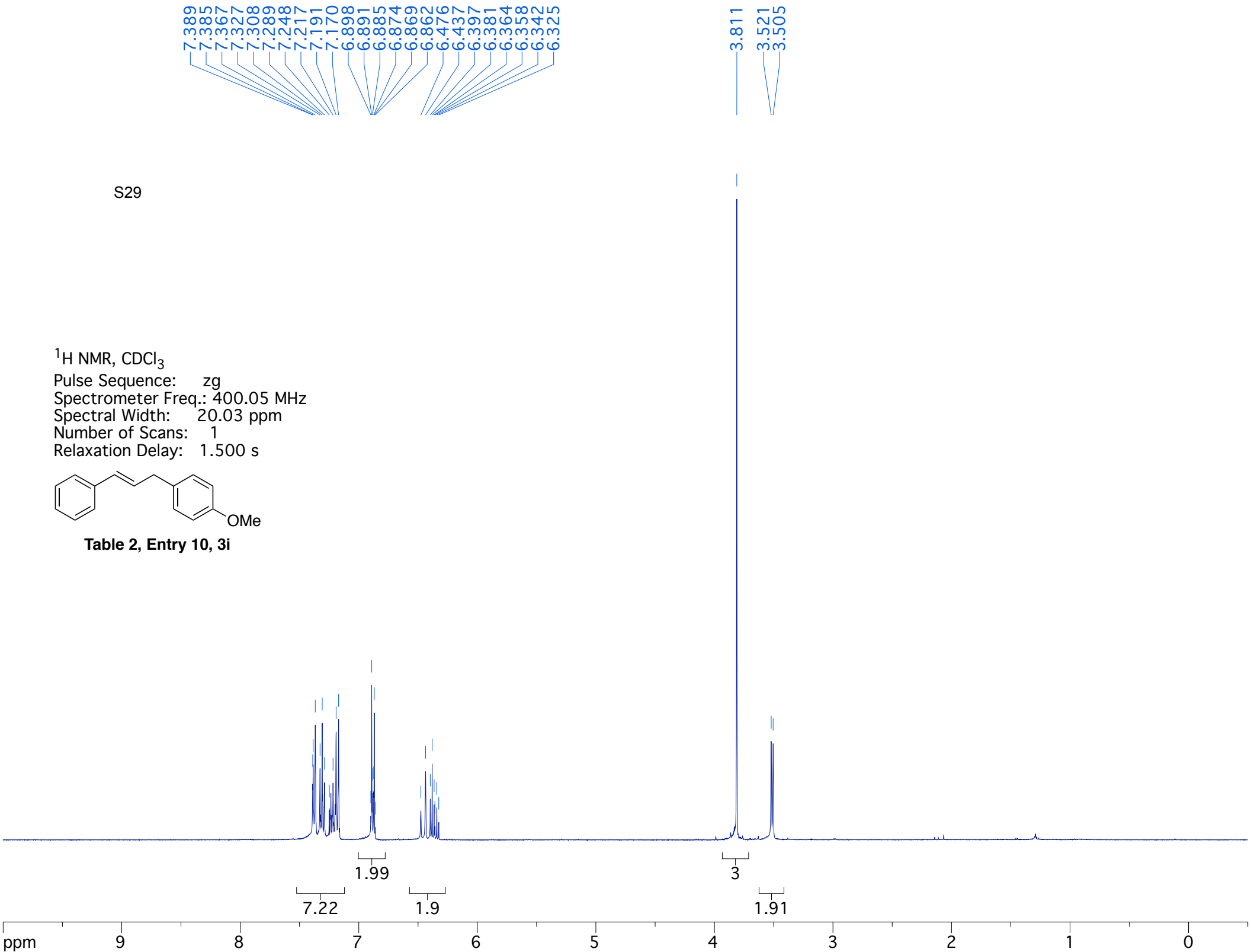


Table 2, Entry 10, 3i



S30

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.60 MHz
Spectral Width: 299.41 ppm
Number of Scans: 90
Relaxation Delay: 2.000 s

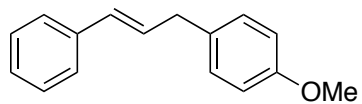
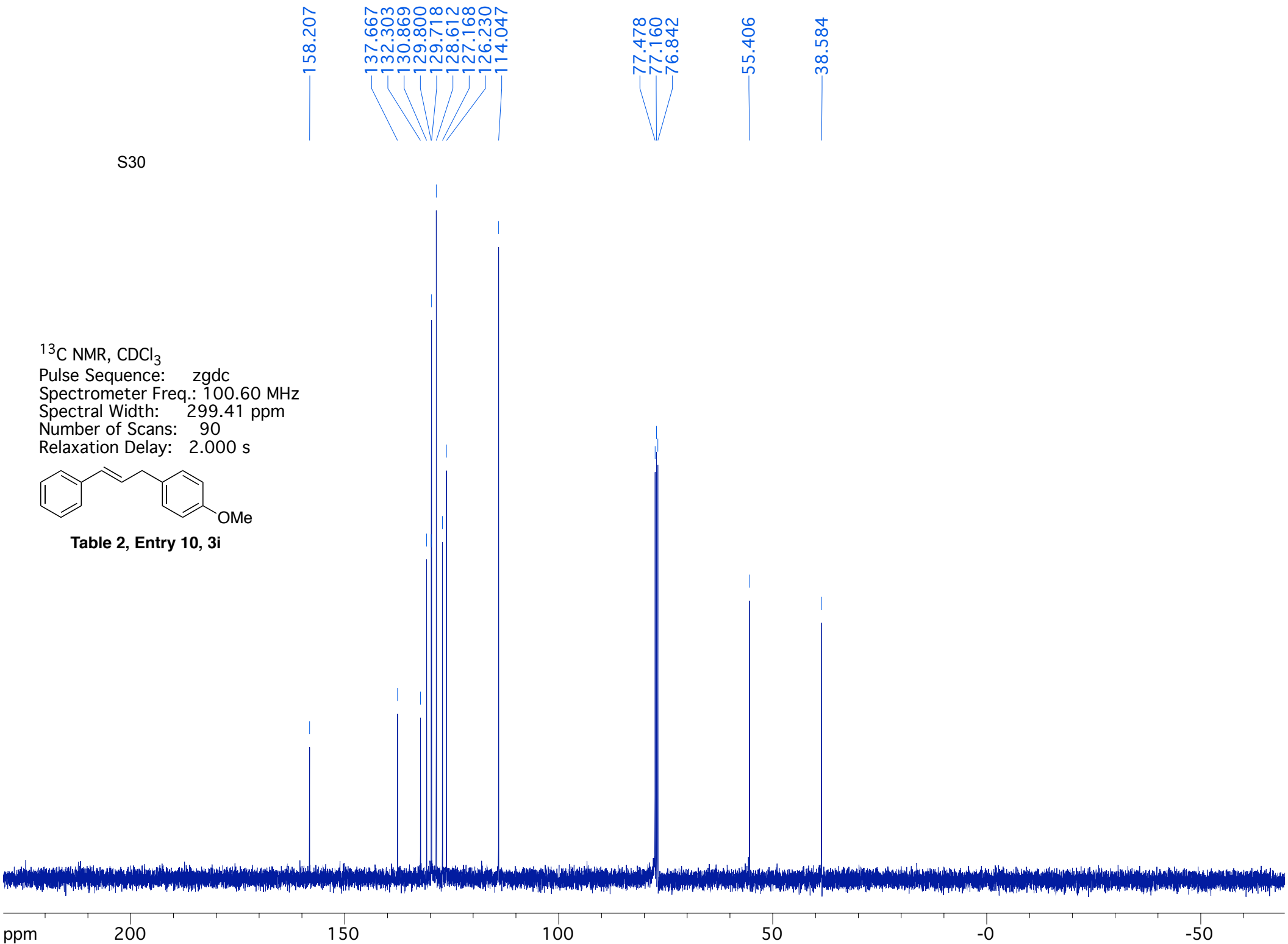


Table 2, Entry 10, 3i



7.473
7.469
7.456
7.399
7.397
7.382
7.350
7.335
7.320
7.289
7.266
7.251
7.162
7.146
6.494
6.463
6.374
6.360
6.346
6.342
6.329
6.315

3.541
3.528

S31

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

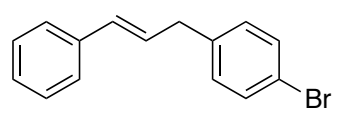
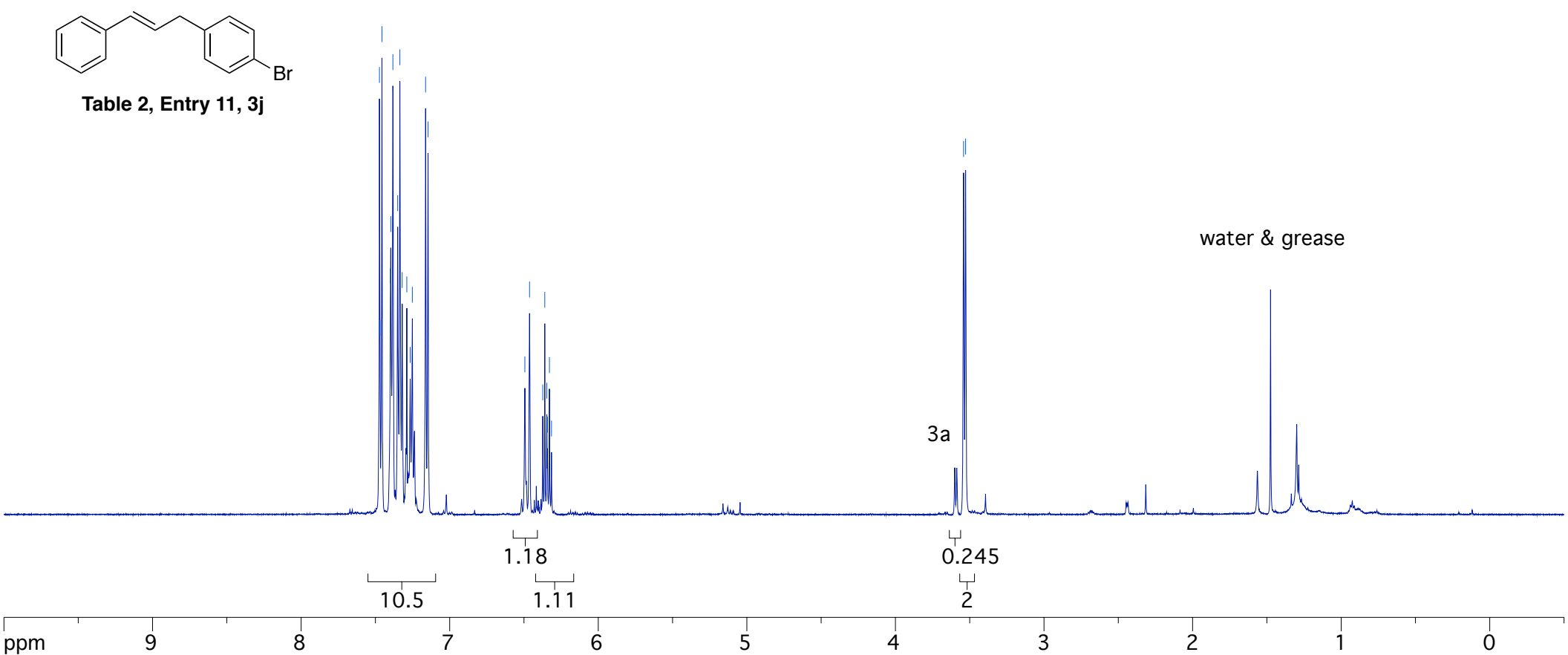


Table 2, Entry 11, 3j



S32

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 366
Relaxation Delay: 2.000 s

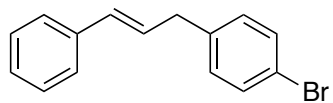
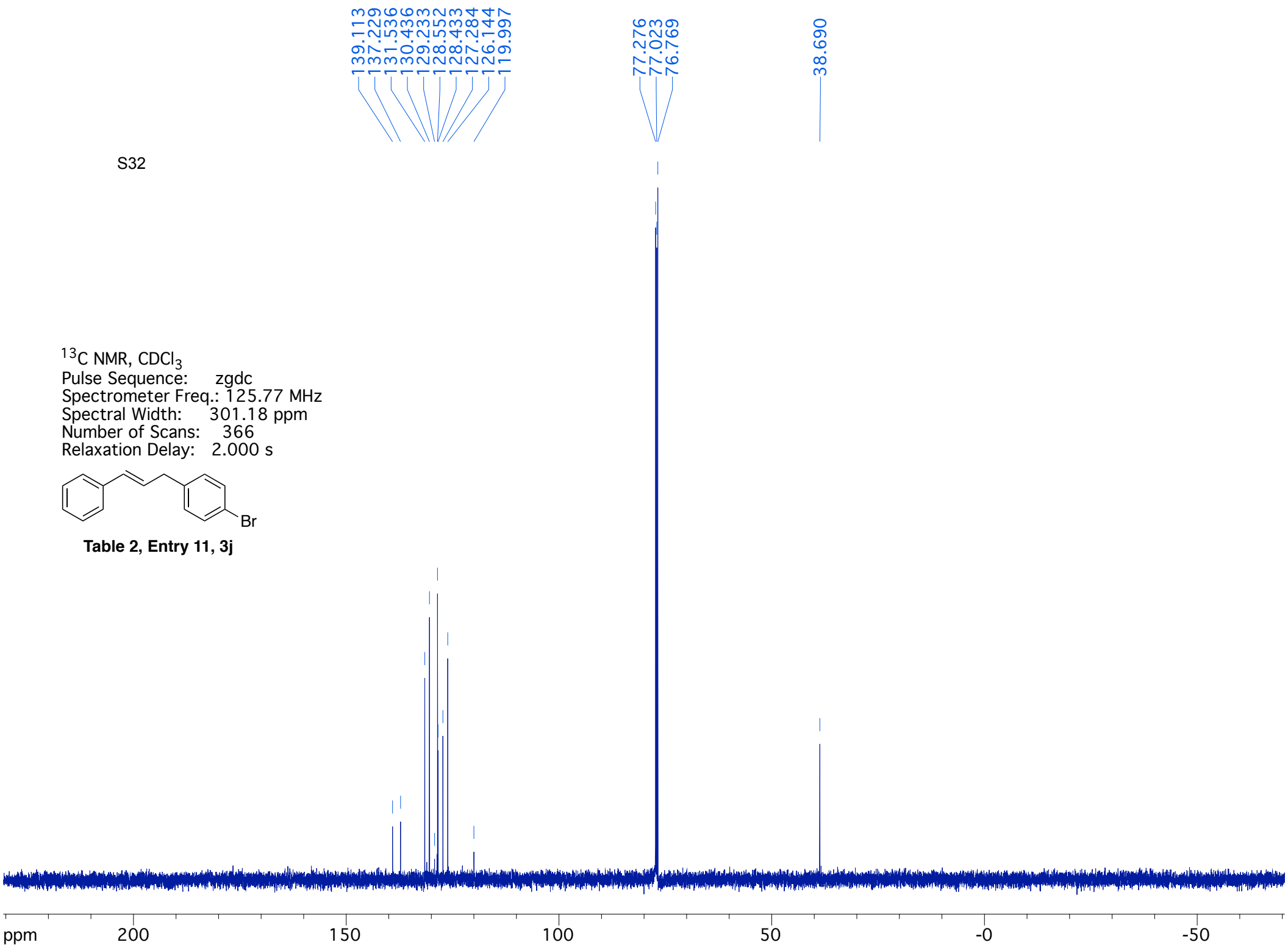


Table 2, Entry 11, 3j



8.016
8.011
8.006
7.995
7.990
7.986
7.422
7.401
7.383
7.379
7.374
7.362
7.359
7.354
7.335
7.329
7.324
7.313
7.311
7.307
7.295
7.291
7.260
7.248
7.245
7.241
7.232
7.227
7.221
7.212
7.209
6.498
6.459
6.381
6.364
6.347
6.341
6.324
6.307

3.918
3.617
3.600

S33

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

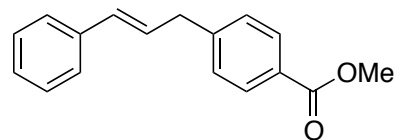
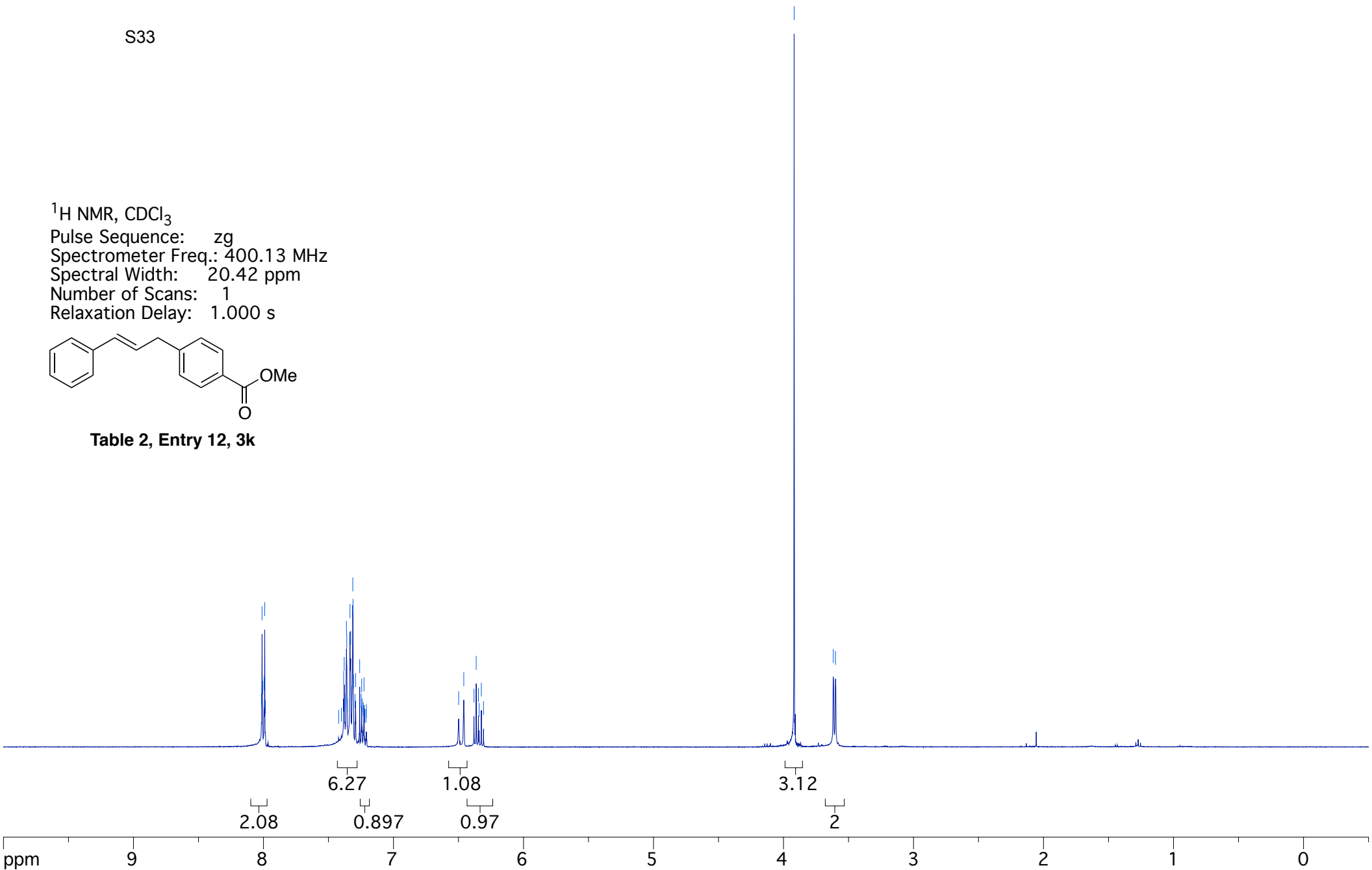


Table 2, Entry 12, 3k



S34

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 112
Relaxation Delay: 2.000 s

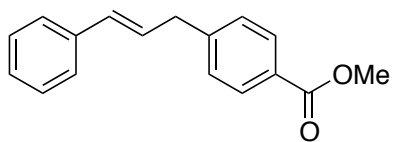
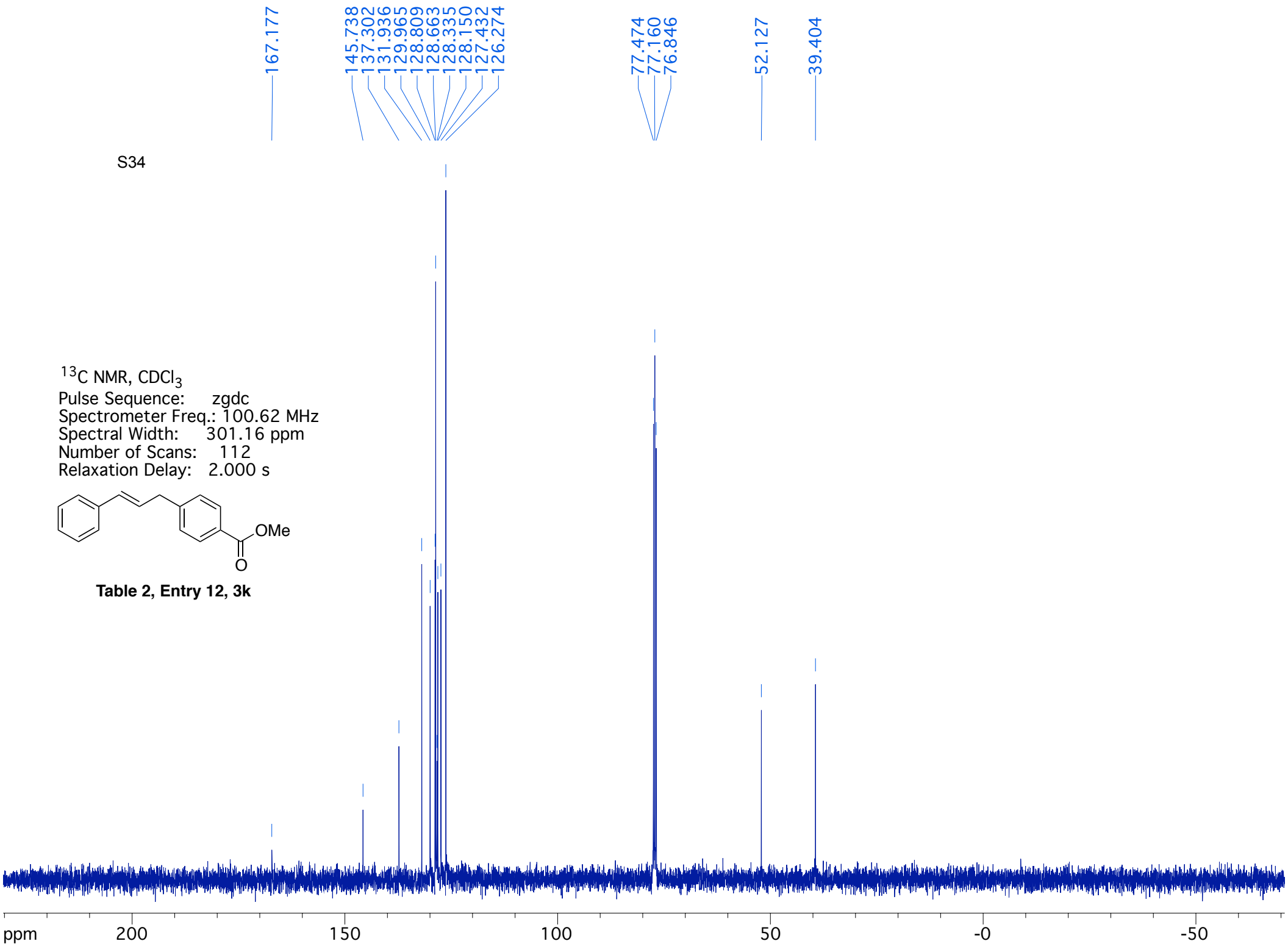


Table 2, Entry 12, 3k



S35

¹H NMR, CDCl₃

Pulse Sequence: zg

Spectrometer Freq.: 400.13 MHz

Spectral Width: 20.42 ppm

Number of Scans: 1

Relaxation Delay: 1.000 s

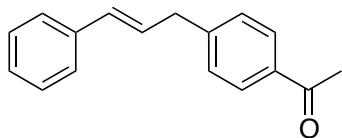
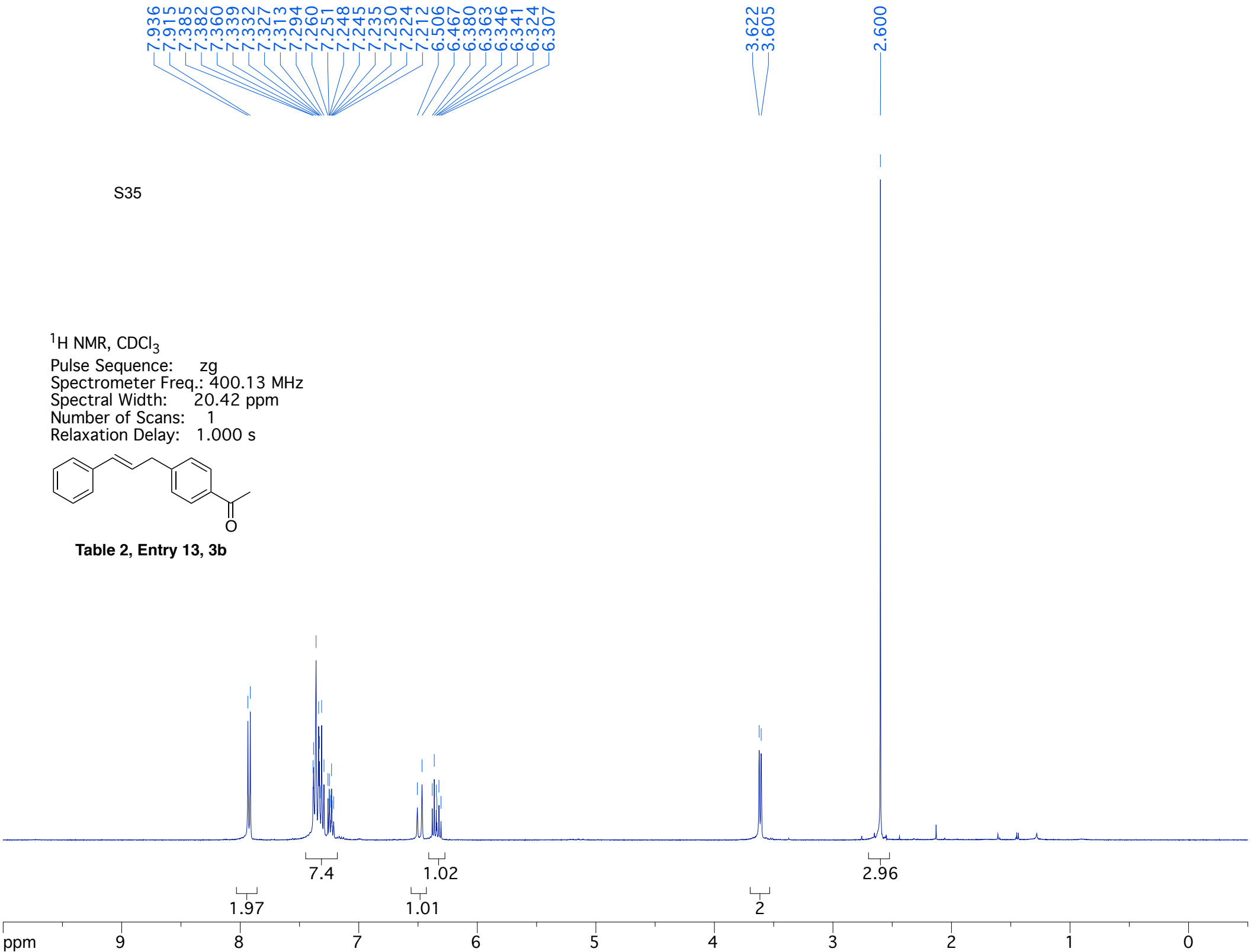


Table 2, Entry 13, 3b



197.944
S36

146.018
137.249
135.484
131.973
128.977
128.775
128.665
128.021
127.451
126.256

77.474
77.160
76.843

39.355

26.704

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 112
Relaxation Delay: 2.000 s

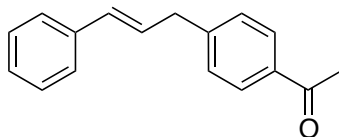
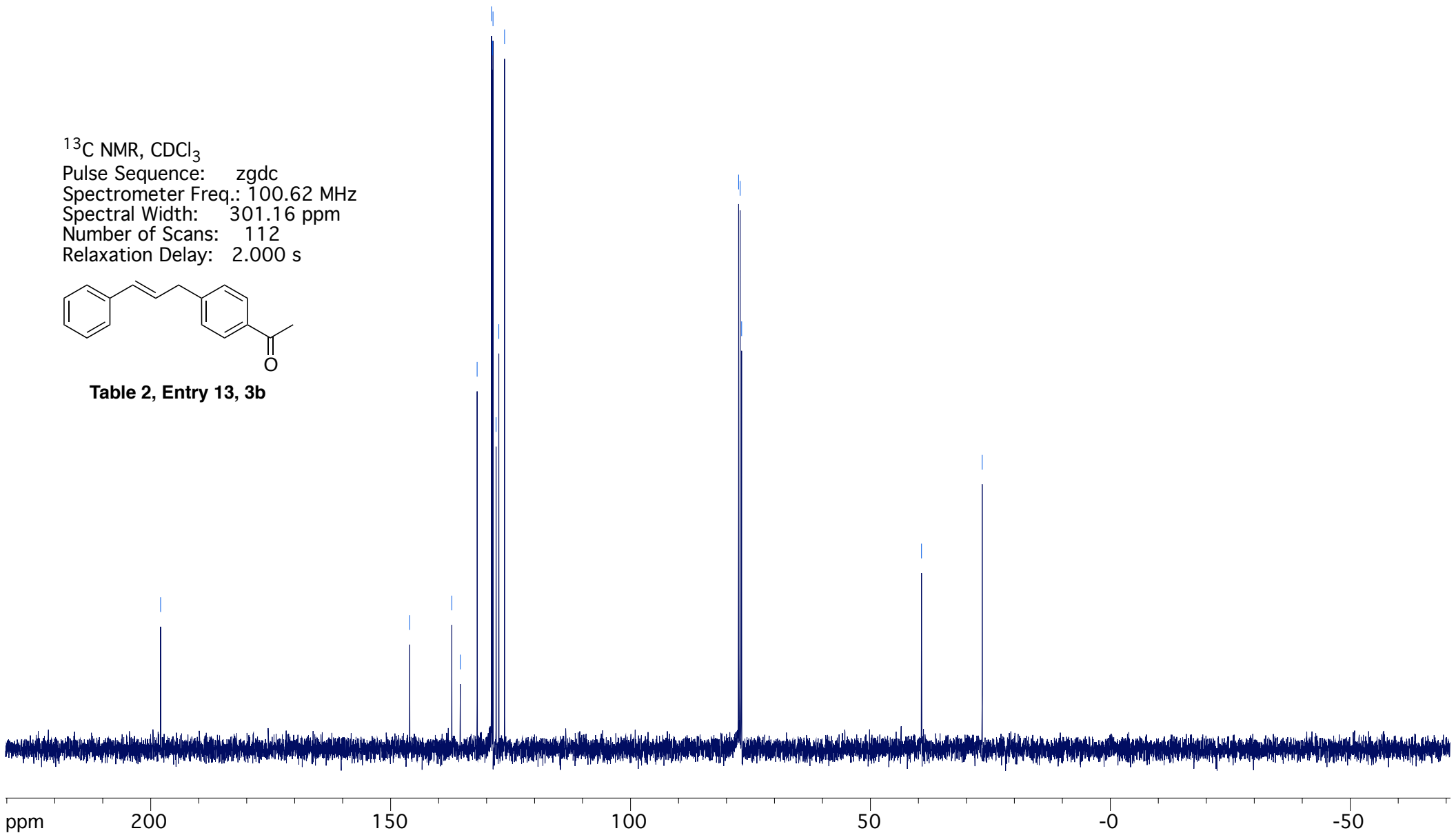


Table 2, Entry 13, 3b



7.550
7.529
7.350
7.347
7.337
7.329
7.327
7.317
7.297
7.293
7.289
7.279
7.276
7.260
7.218
7.215
7.212
7.202
7.197
7.179
7.179
6.471
6.431
6.335
6.332
6.318
6.315
6.301
6.296
6.279
6.275
6.262

3.582
3.565

S37

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

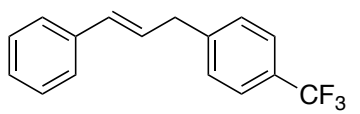
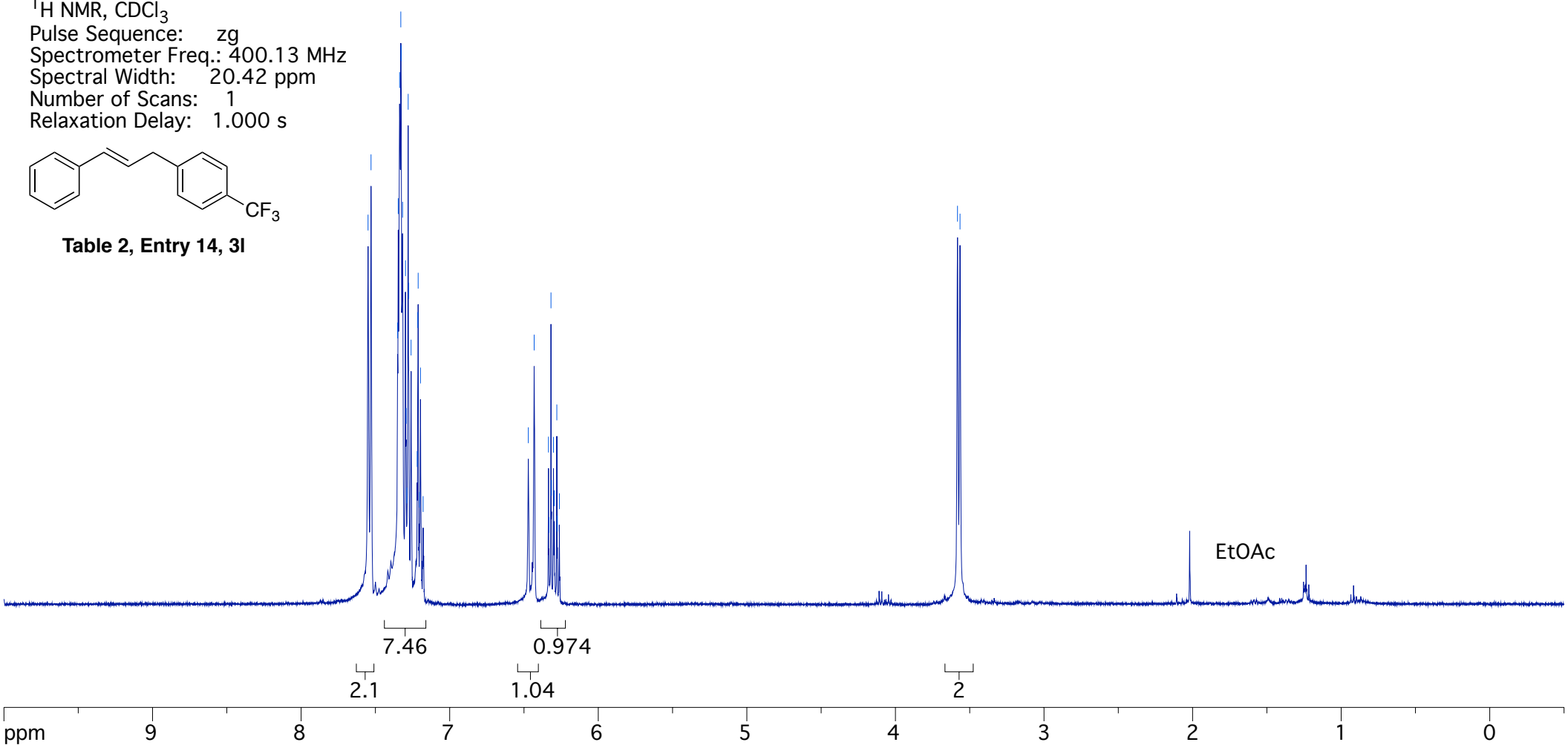


Table 2, Entry 14, 3I



S38

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 209
Relaxation Delay: 2.000 s

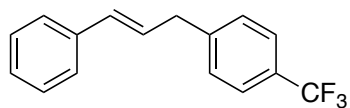
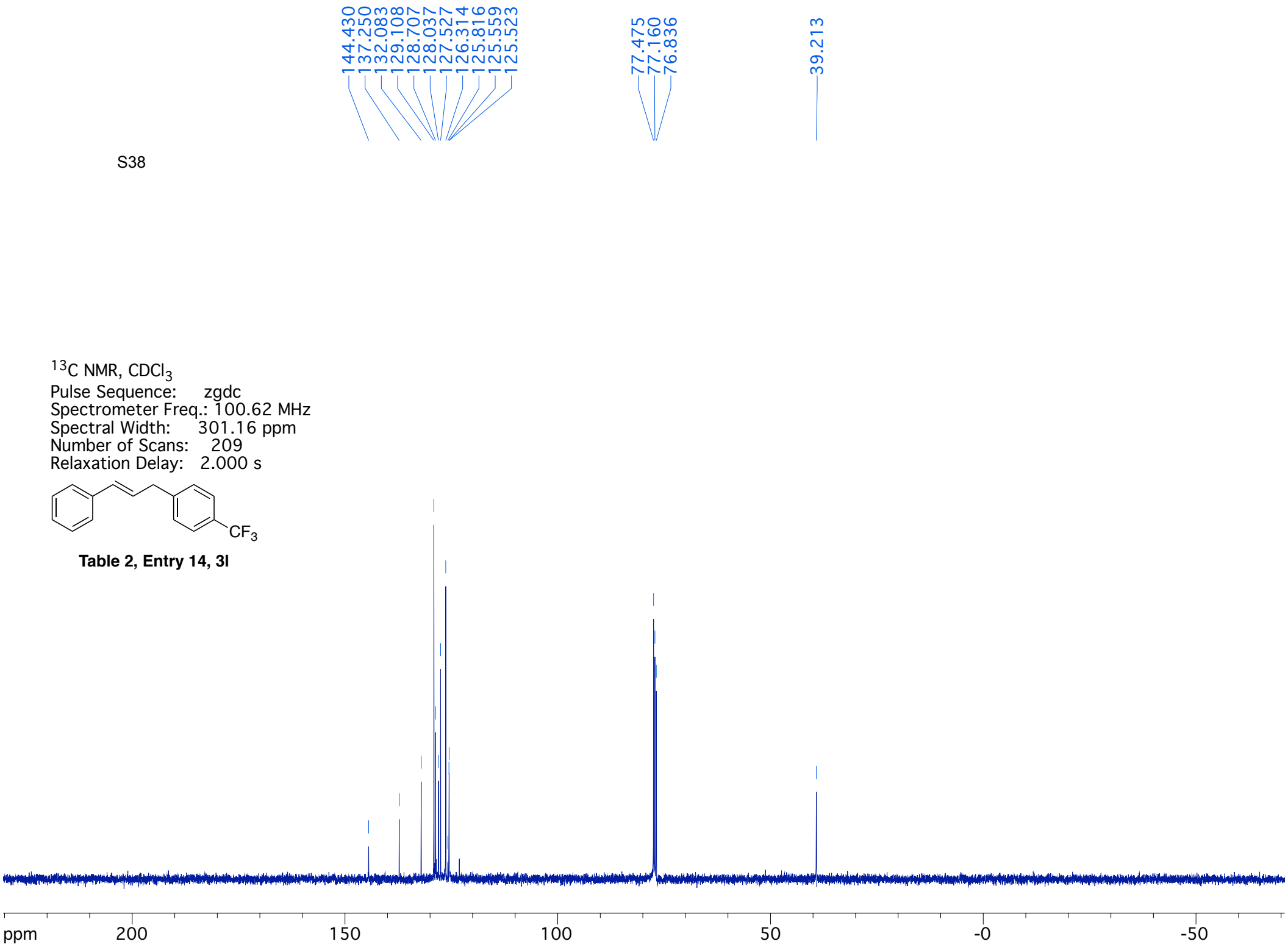


Table 2, Entry 14, 3I



-62.748

S39

^{19}F NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 376.50 MHz
Spectral Width: 199.70 ppm
Number of Scans: 4
Relaxation Delay: 1.000 s

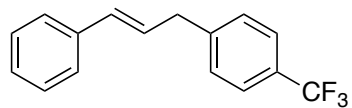


Table 2, Entry 14, 3I

ppm

50

-0

-50

7.578
7.574
7.570
7.558
7.553
7.549
7.343
7.339
7.326
7.322
7.306
7.298
7.293
7.280
7.276
7.271
7.269
7.260
7.220
7.215
7.207
7.201
7.195
7.187
7.183
7.180
6.467
6.427
6.301
6.284
6.267
6.262
6.245
6.227

3.579
3.562

S40

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

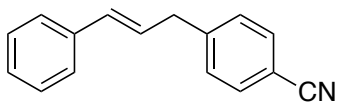
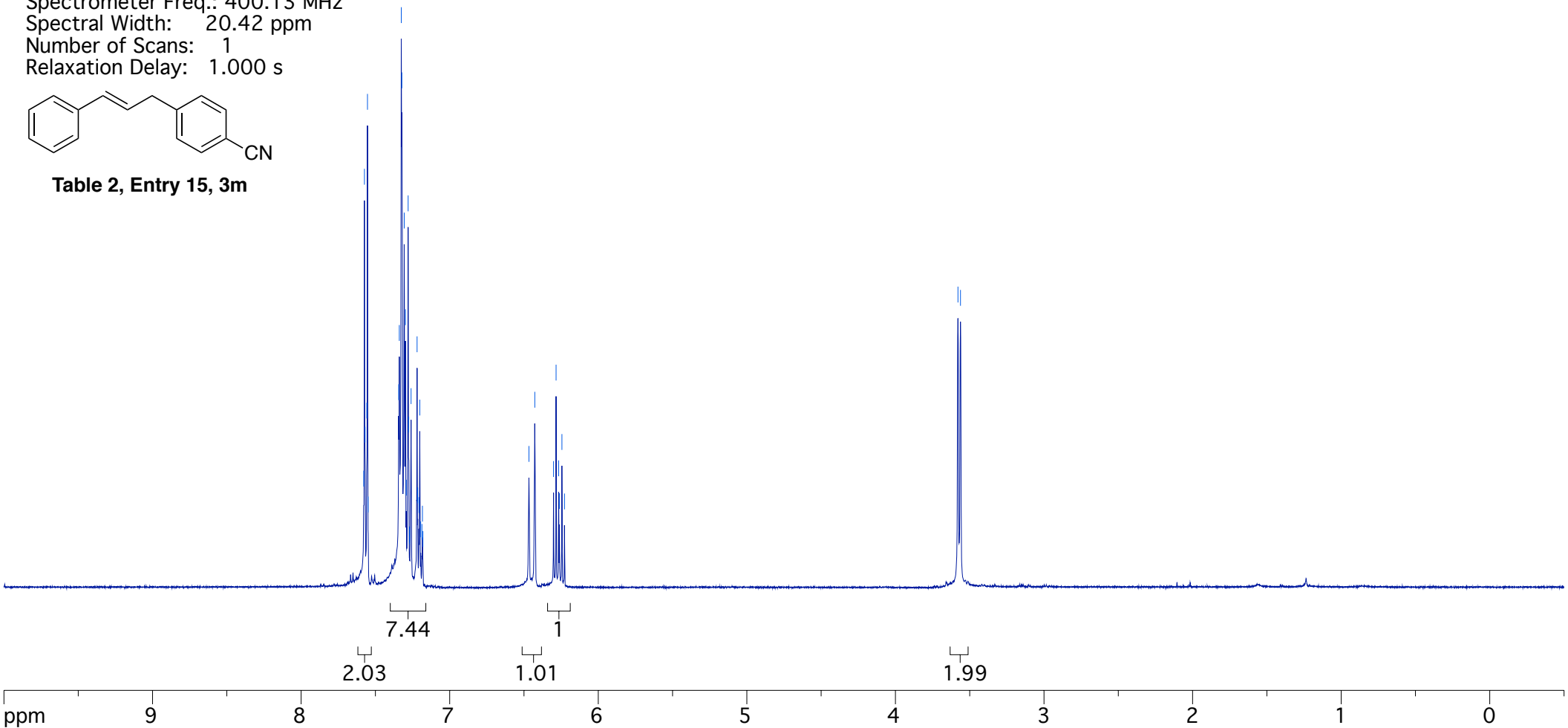


Table 2, Entry 15, 3m



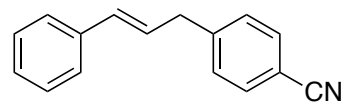
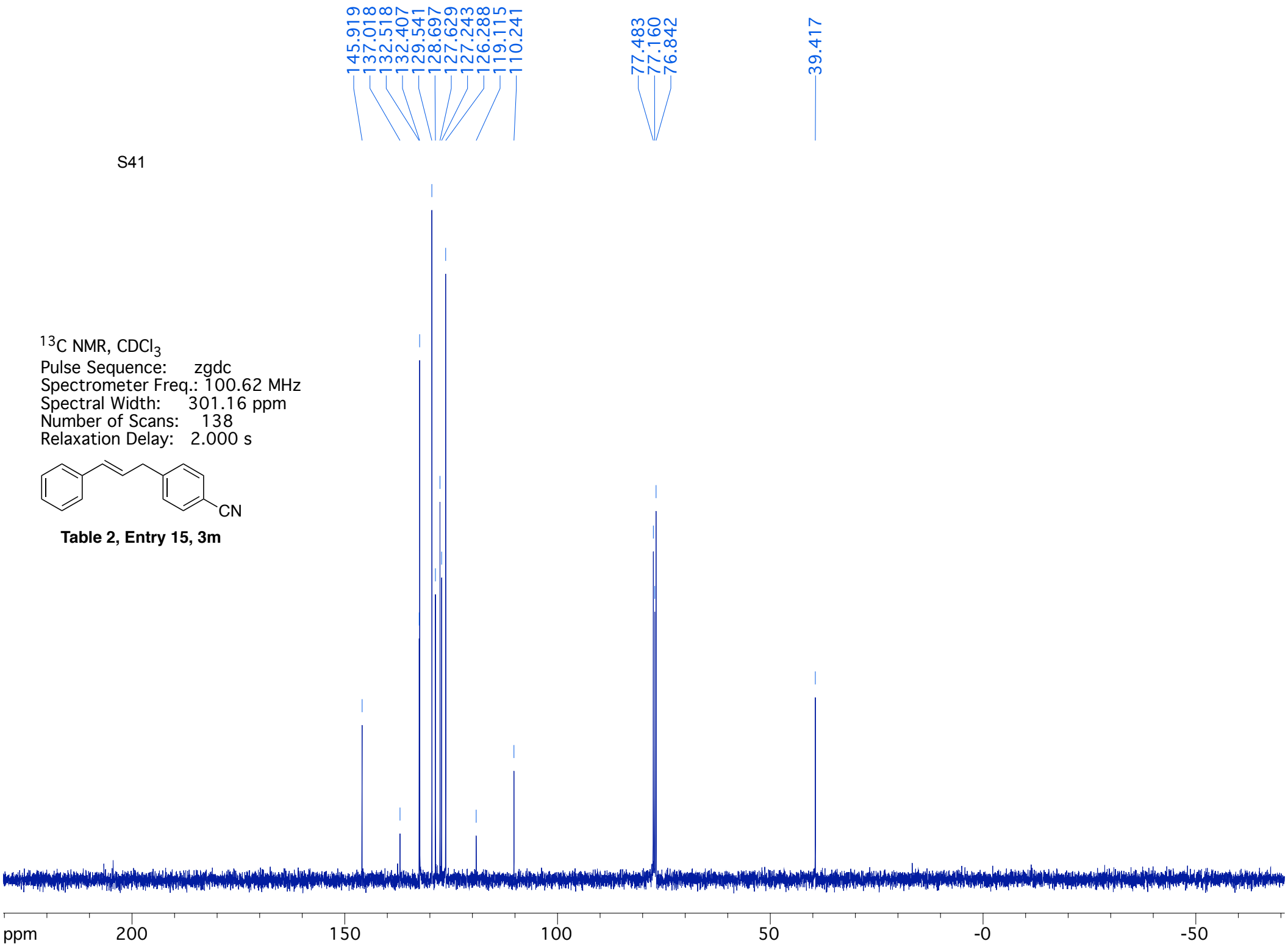


Table 2, Entry 15, 3m

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 138
Relaxation Delay: 2.000 s

S41



7.416
7.413
7.399
7.397
7.349
7.334
7.319
7.287
7.261
7.258
7.245
7.231
7.106
7.104
7.103
7.101
7.100
7.099
7.086
7.085
7.084
7.072
7.071
6.518
6.487
6.426
6.413
6.399
6.395
6.381
6.368

3.567
3.553

2.382

S42

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

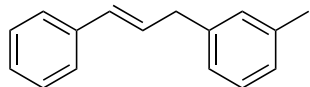
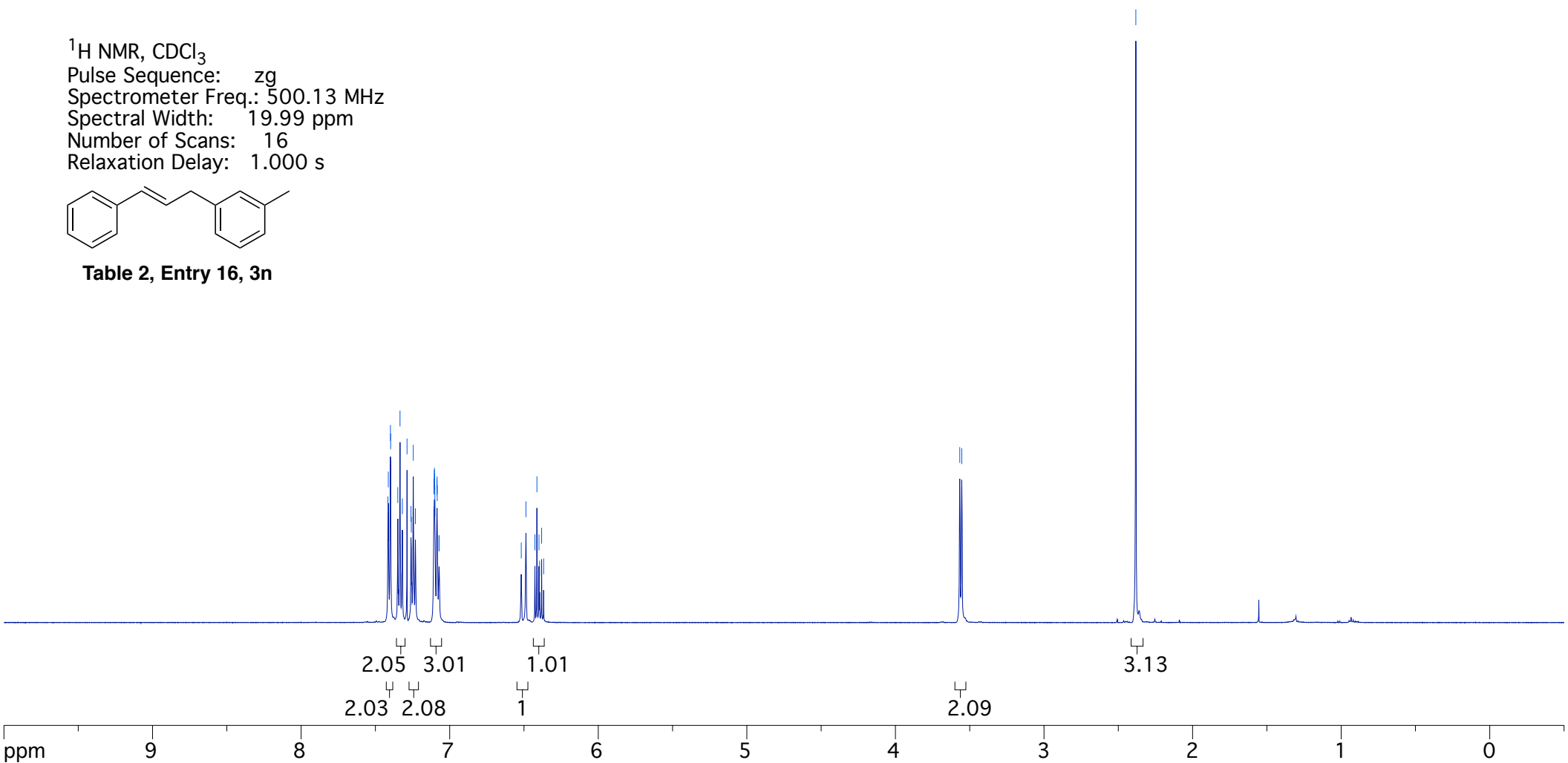


Table 2, Entry 16, 3n



¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 222
Relaxation Delay: 2.000 s

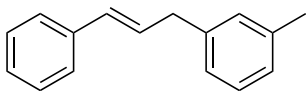
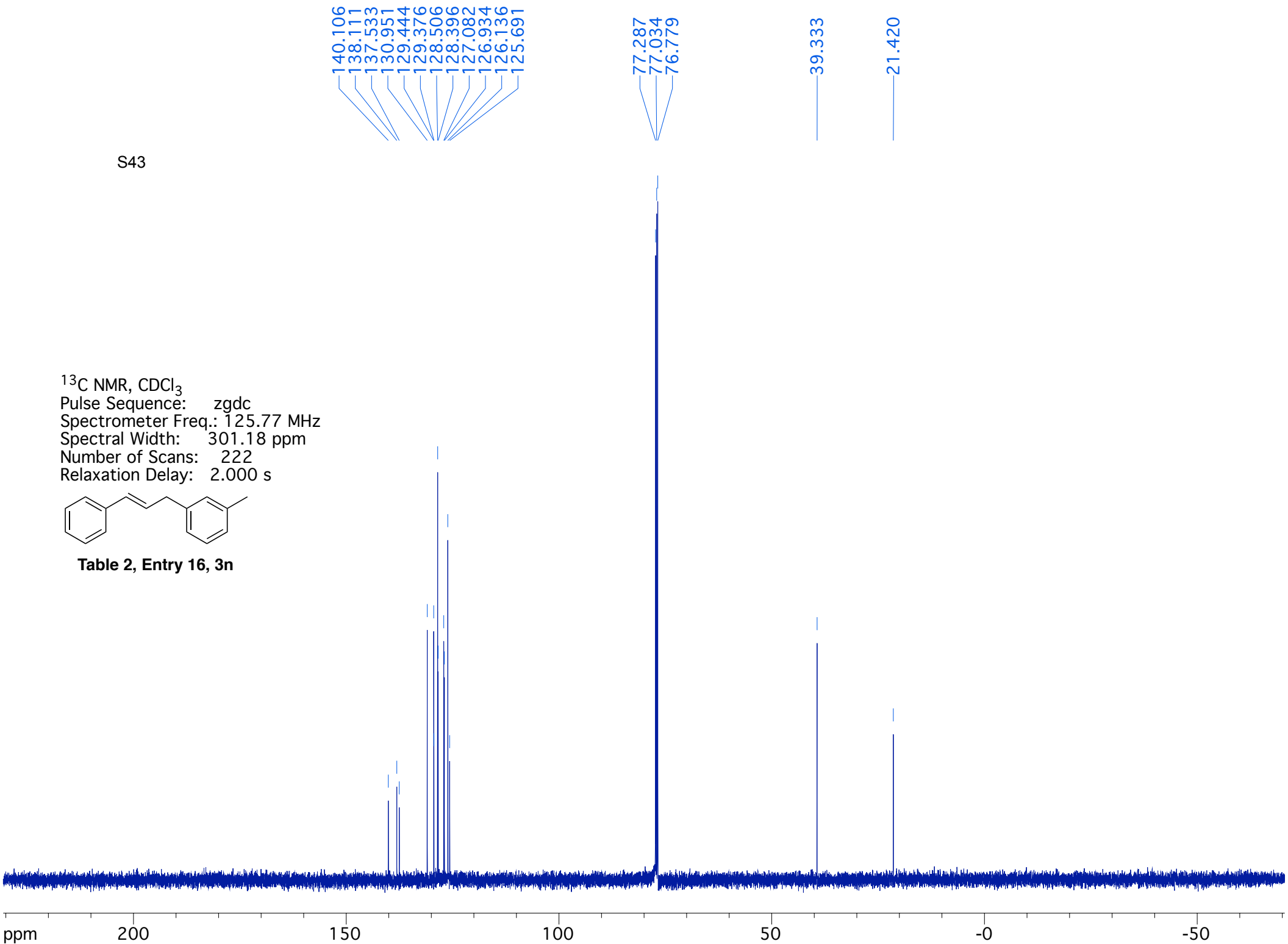


Table 2, Entry 16, 3n

S43



7.712
7.711
7.710
7.697
7.696
7.694
7.611
7.609
7.596
7.594
7.581
7.578
7.463
7.462
7.461
7.447
7.446
7.445
7.429
7.426
7.422
7.412
7.411
7.395
7.394
7.380
7.371
7.366
7.365
7.364
7.356
7.340
7.314
7.313
7.292
7.278
7.274
7.263
6.596
6.564
6.403
6.389
6.375
6.371
6.358
6.344
3.838
3.825

1.604

S44

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

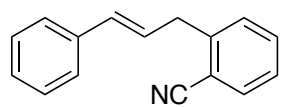
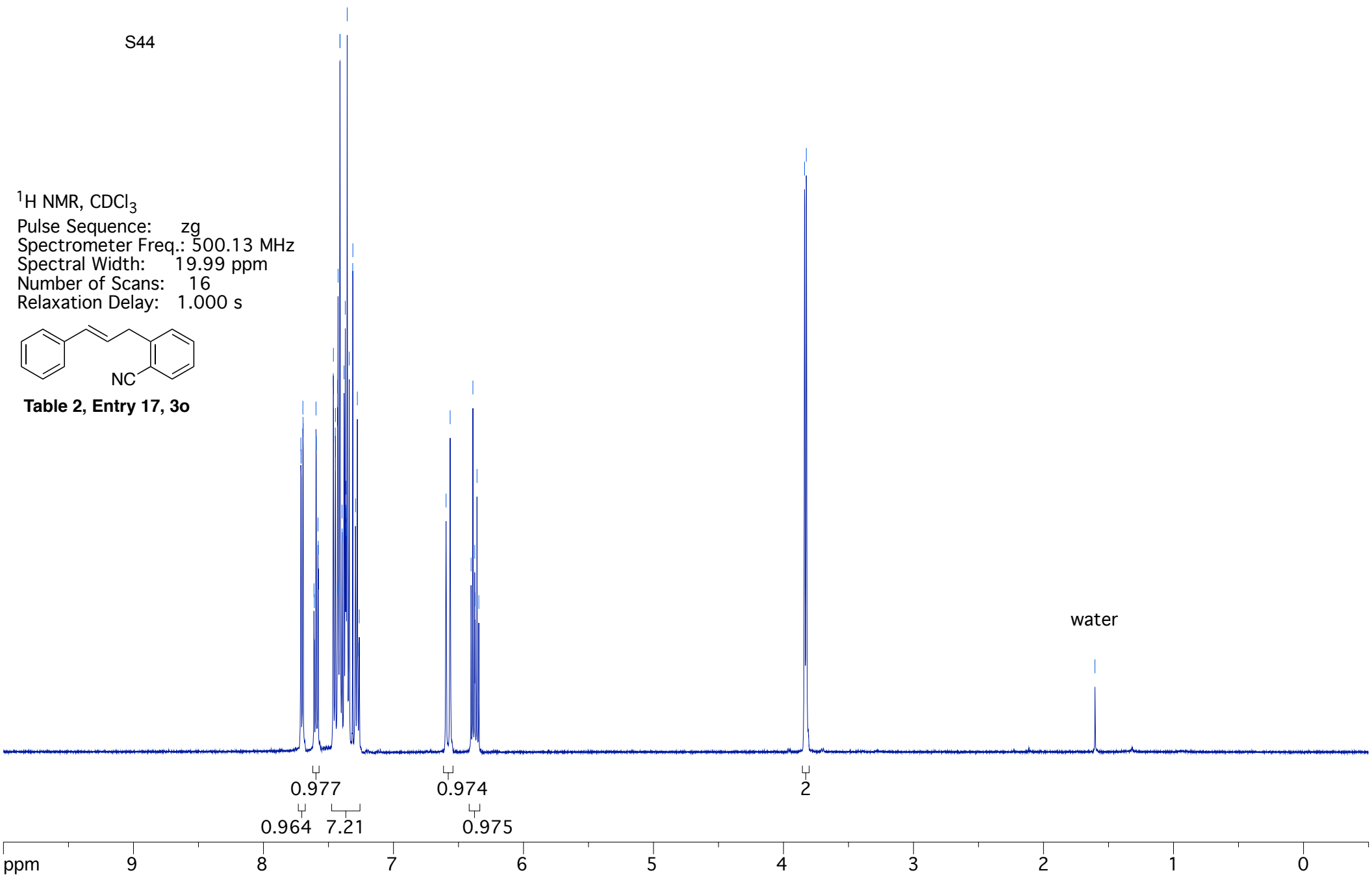


Table 2, Entry 17, 3o



¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 263
Relaxation Delay: 2.000 s

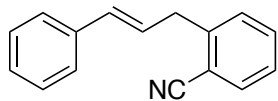
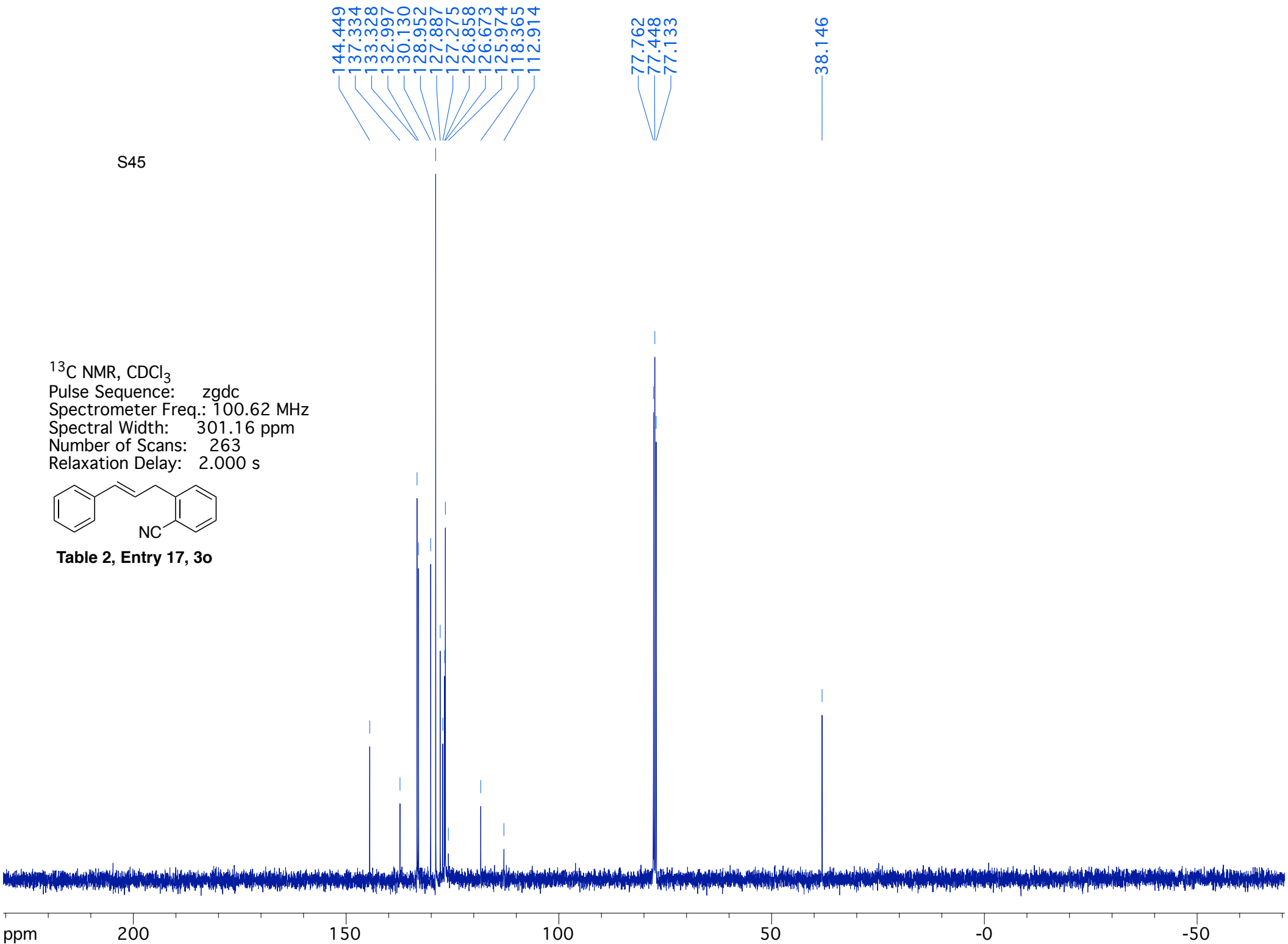


Table 2, Entry 17, 3o

S45



7.405
7.391
7.389
7.338
7.324
7.308
7.290
7.288
7.256
7.245
7.243
7.241
7.233
7.232
7.232
7.230
7.229
7.229
6.971
6.958
6.956
6.942
6.930
6.914
6.499
6.468
6.456
6.445
6.443
6.432

3.894
3.596
3.584

S46

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

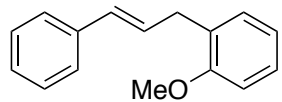
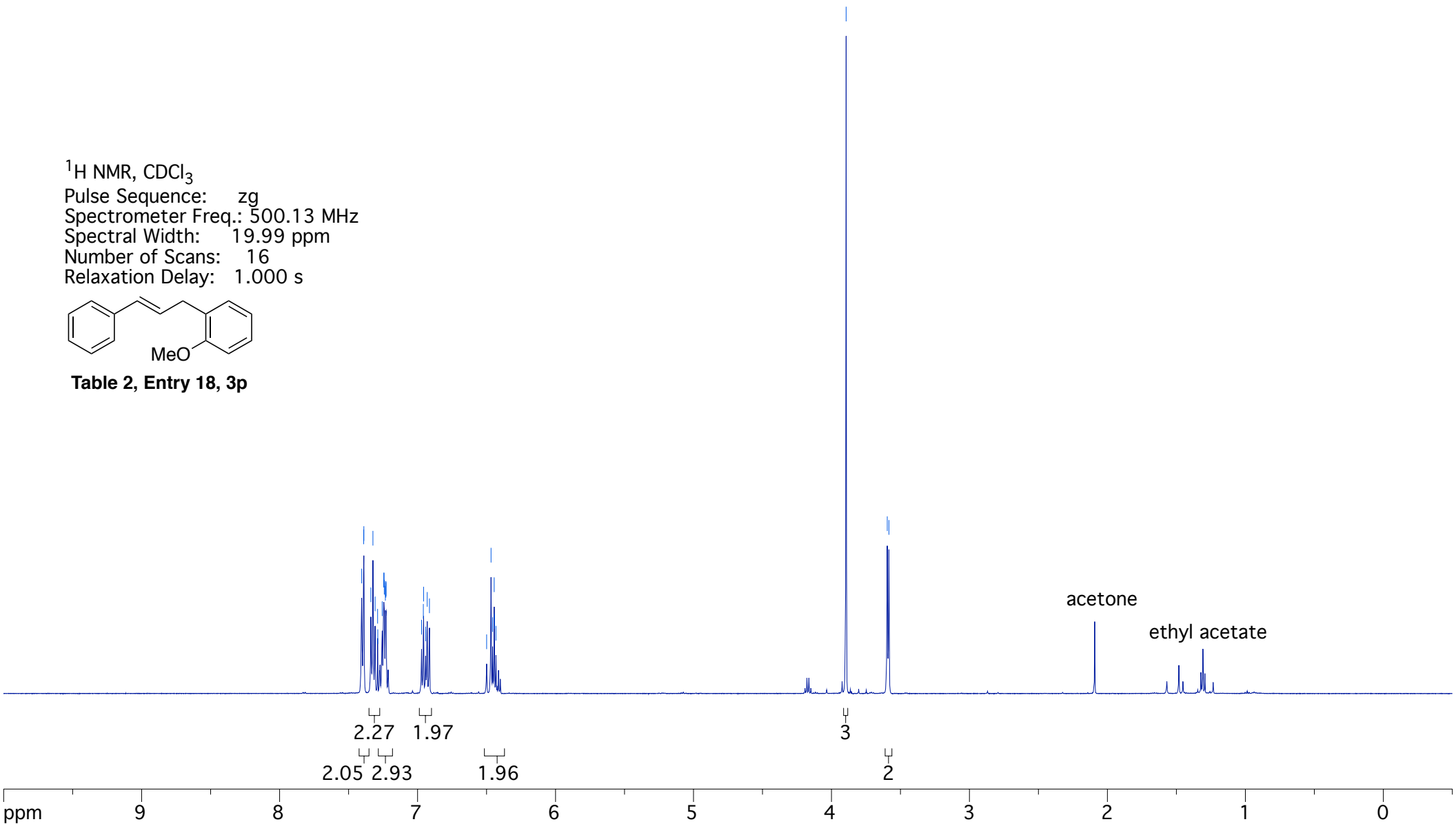


Table 2, Entry 18, 3p



S47

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 236
Relaxation Delay: 2.000 s

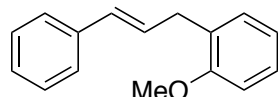
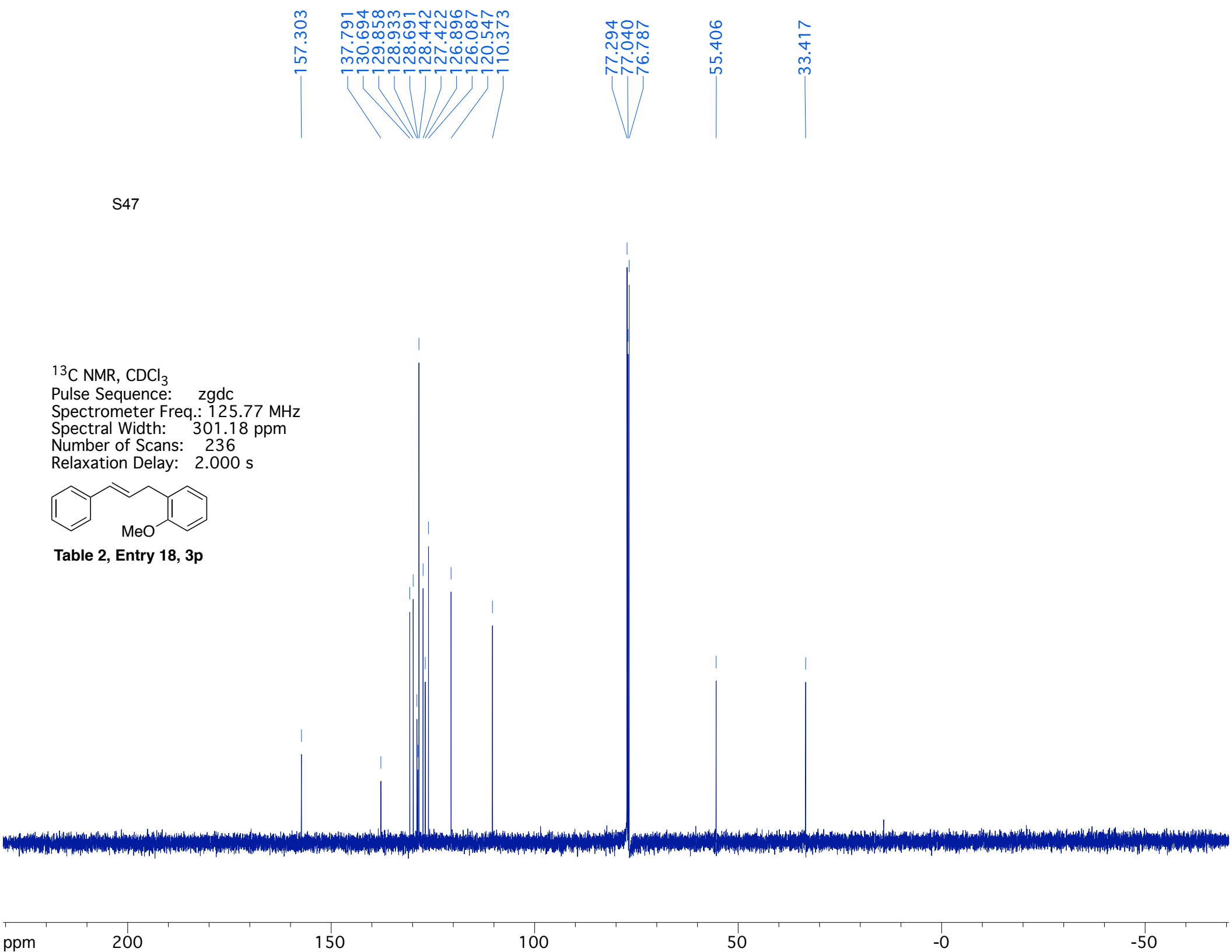
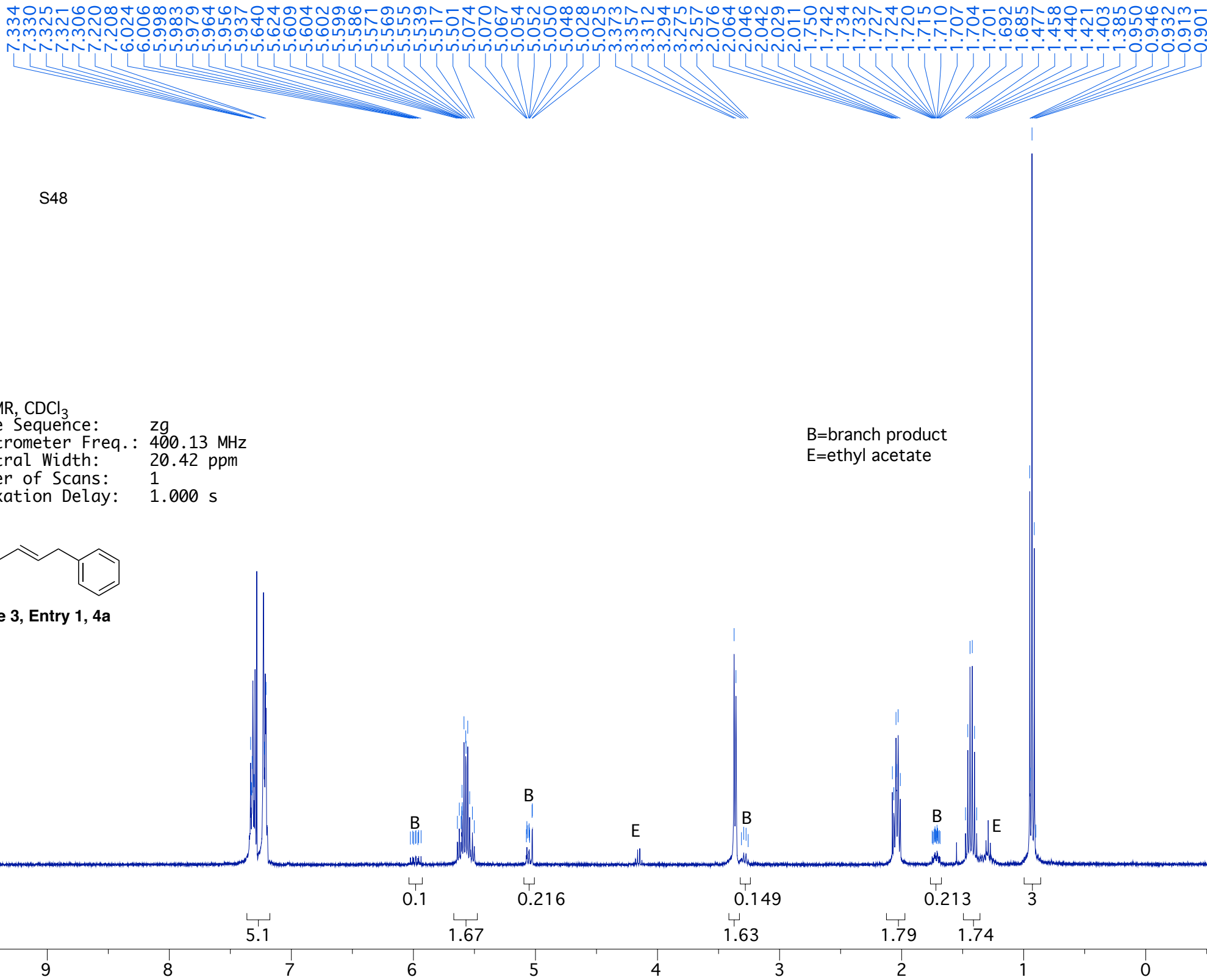
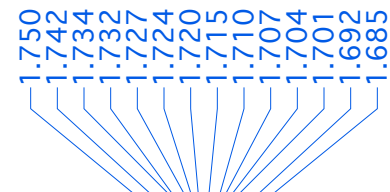
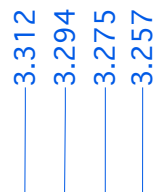
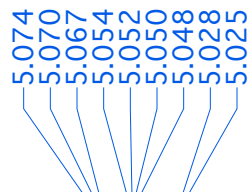
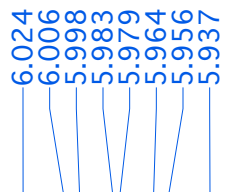


Table 2, Entry 18, 3p



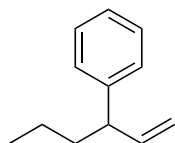




S49

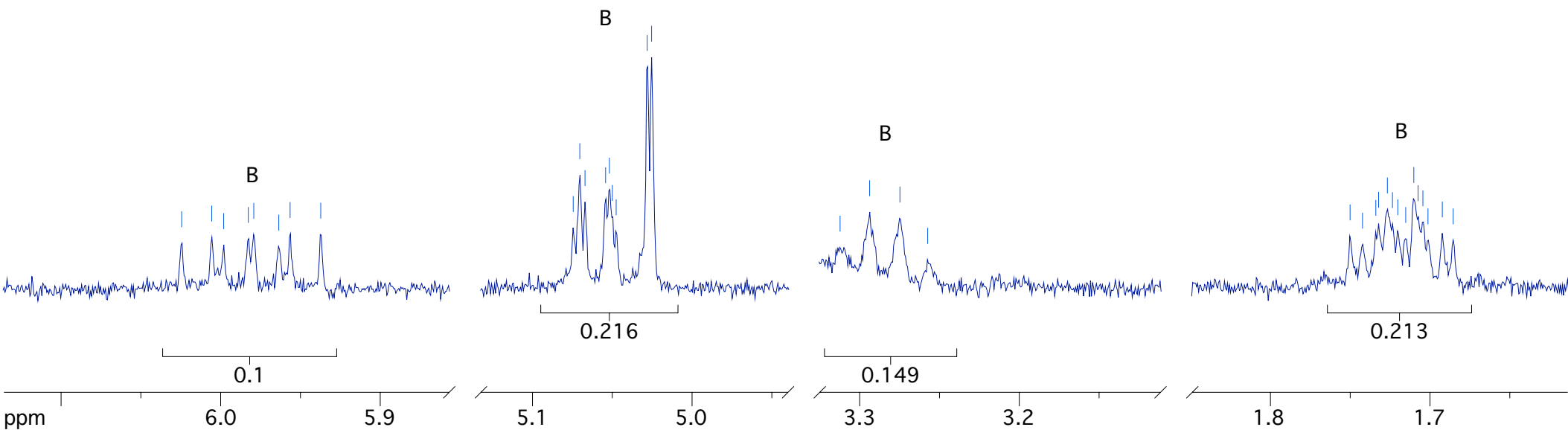
¹H NMR, CDCl₃ - Expanded from Table 3, Entry 1

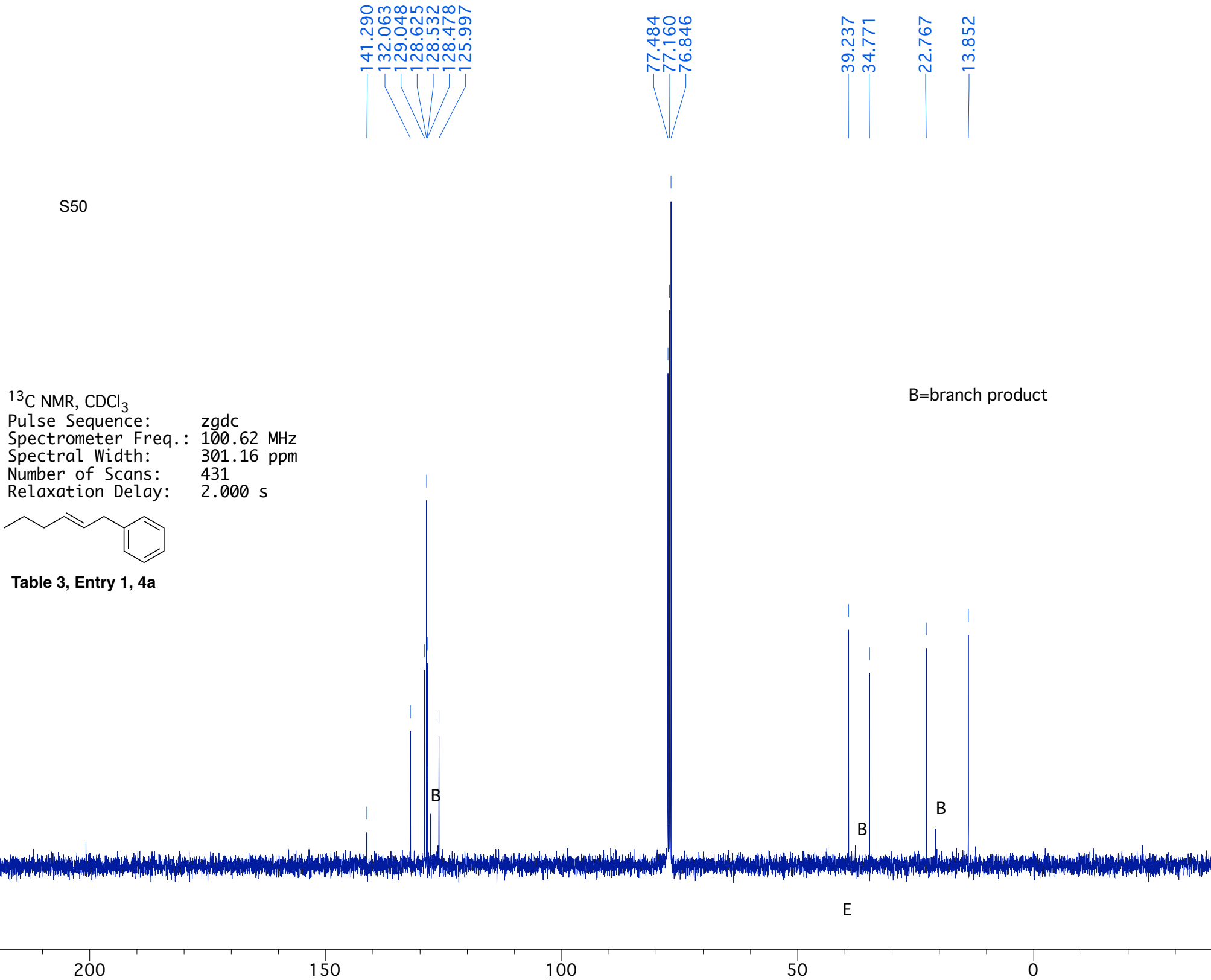
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s



Branched Product

B=branch product





7.412
7.408
7.404
7.391
7.388
7.383
7.372
7.368
7.353
7.351
7.344
7.340
7.335
7.331
7.327
7.315
7.311
7.300
7.297
7.291
7.282
7.279
7.259
7.255
7.245
7.241
6.522
6.482
6.437
6.420
6.404
6.381
6.364

3.603
3.586

S51

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

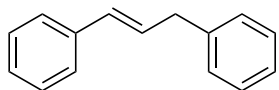
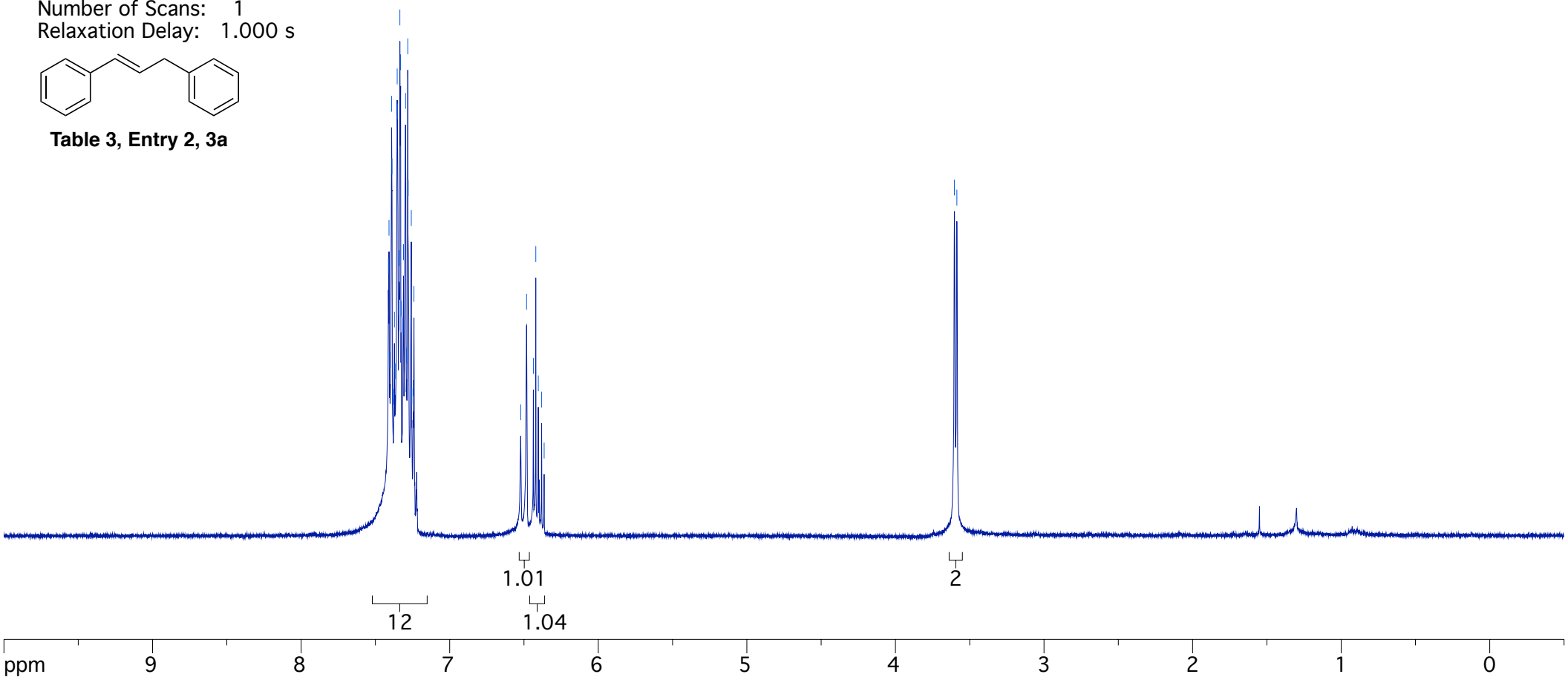


Table 3, Entry 2, 3a



S52

140.571
137.885
131.472
129.634
129.082
128.899
127.502
126.582
126.527

77.744
77.430
77.115

39.767

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 202
Relaxation Delay: 2.000 s

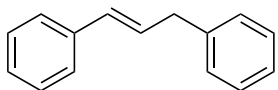
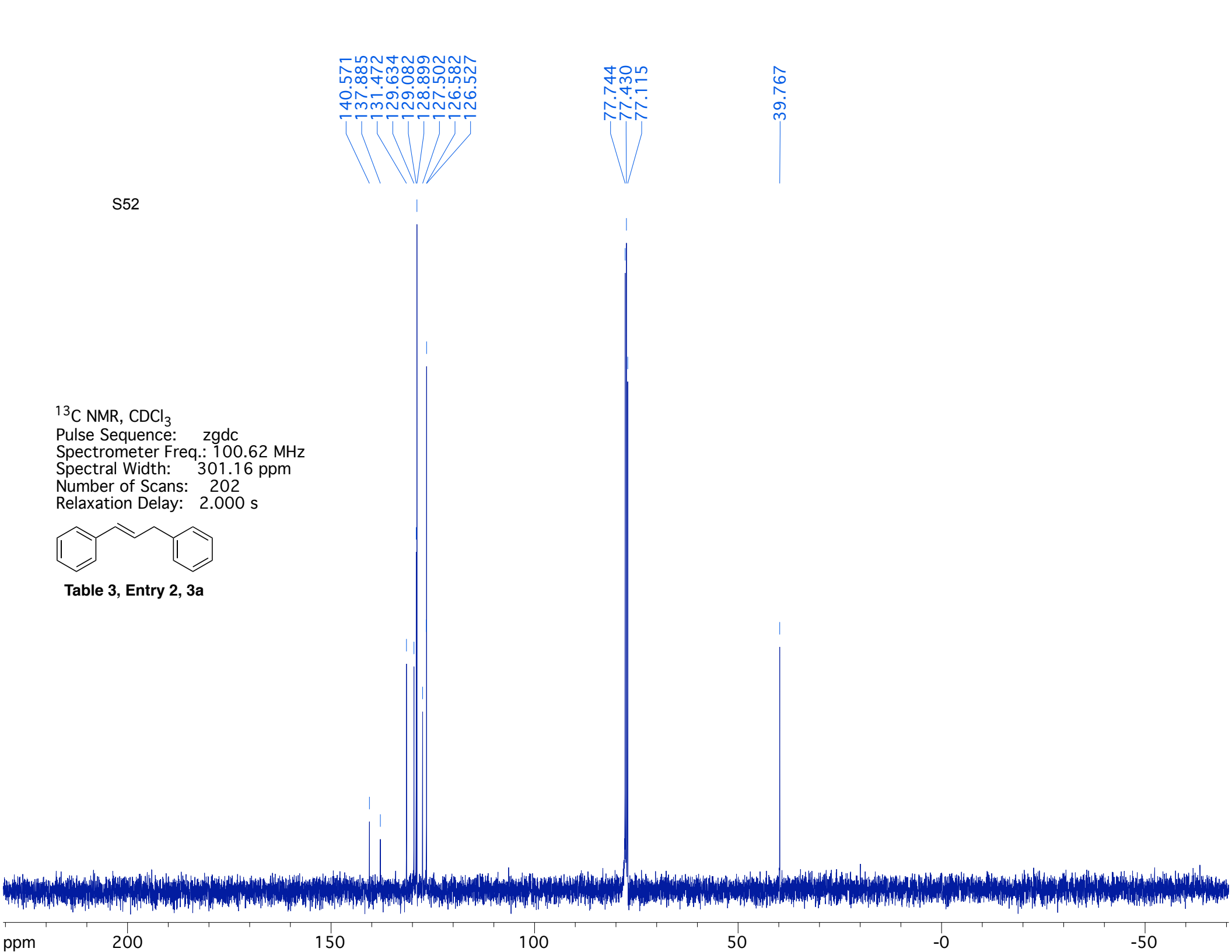


Table 3, Entry 2, 3a

ppm 200 150 100 50 -0 -50



7.413
7.410
7.392
7.390
7.376
7.373
7.355
7.352
7.350
7.337
7.332
7.312
7.302
7.298
7.283
7.279
7.260
7.224
7.220
6.523
6.484
6.438
6.422
6.405
6.399
6.383
6.366

3.604
3.587

S53

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

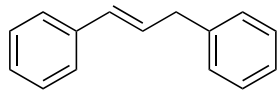
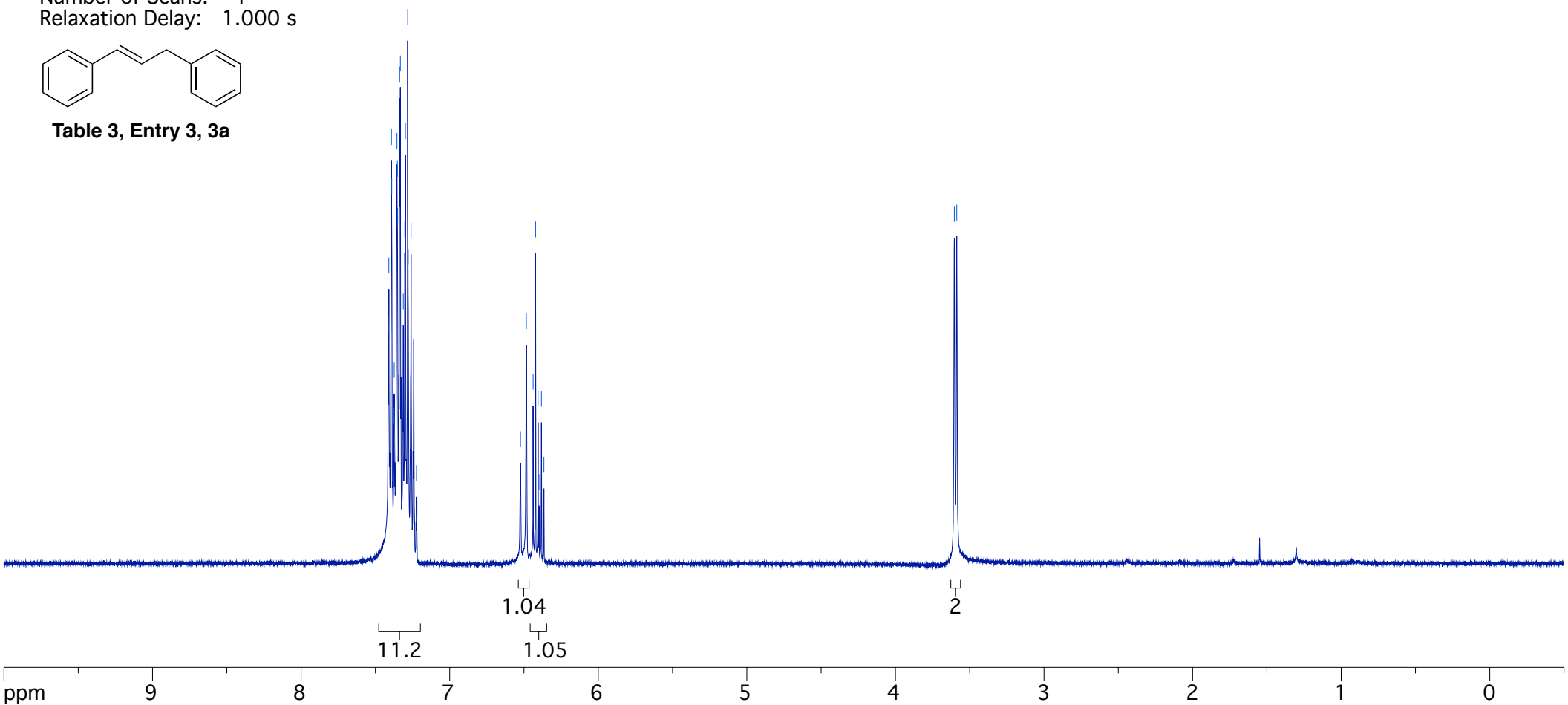


Table 3, Entry 3, 3a



S54

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 1297
Relaxation Delay: 2.000 s

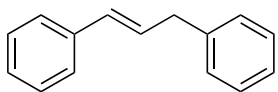
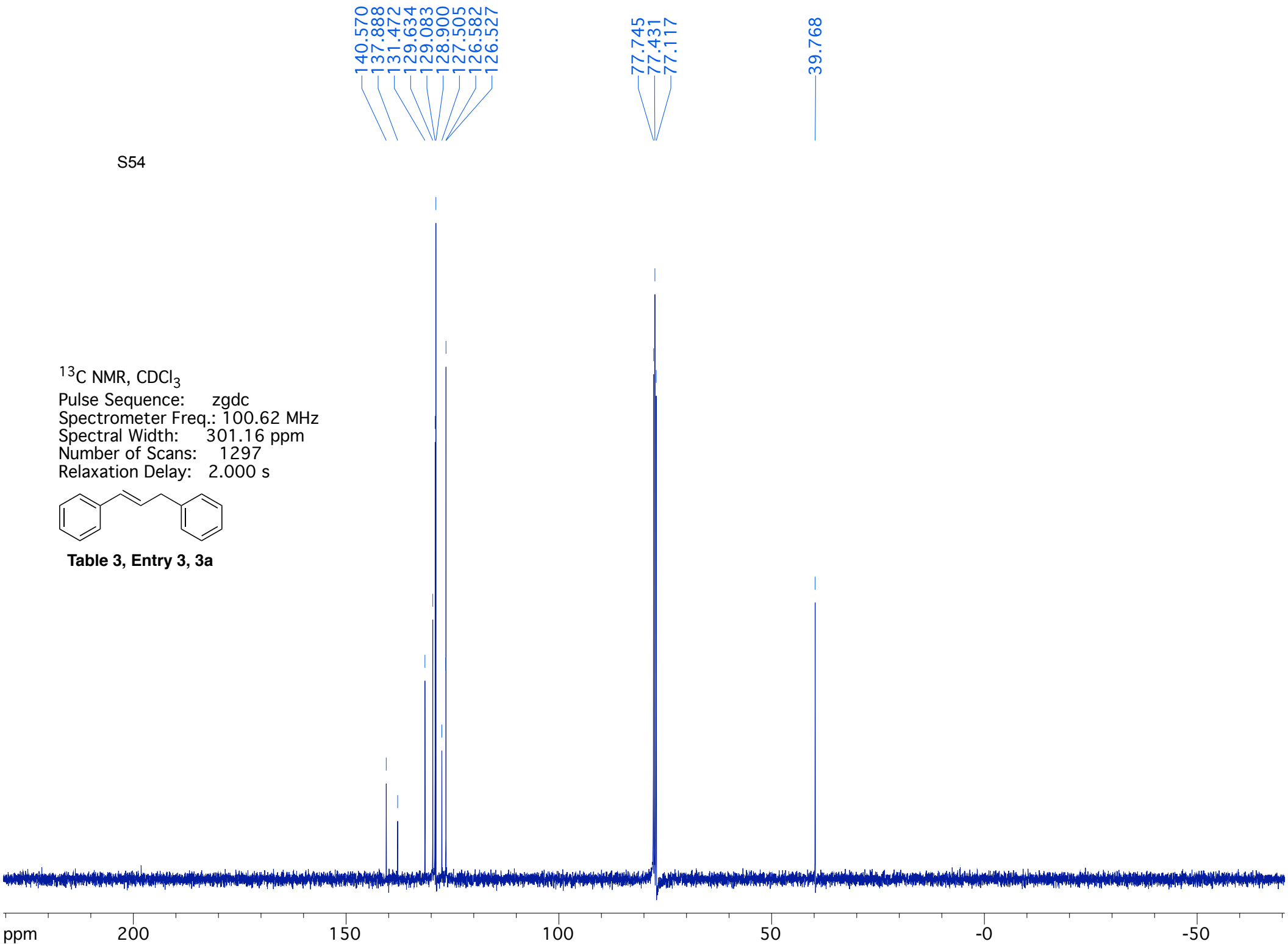
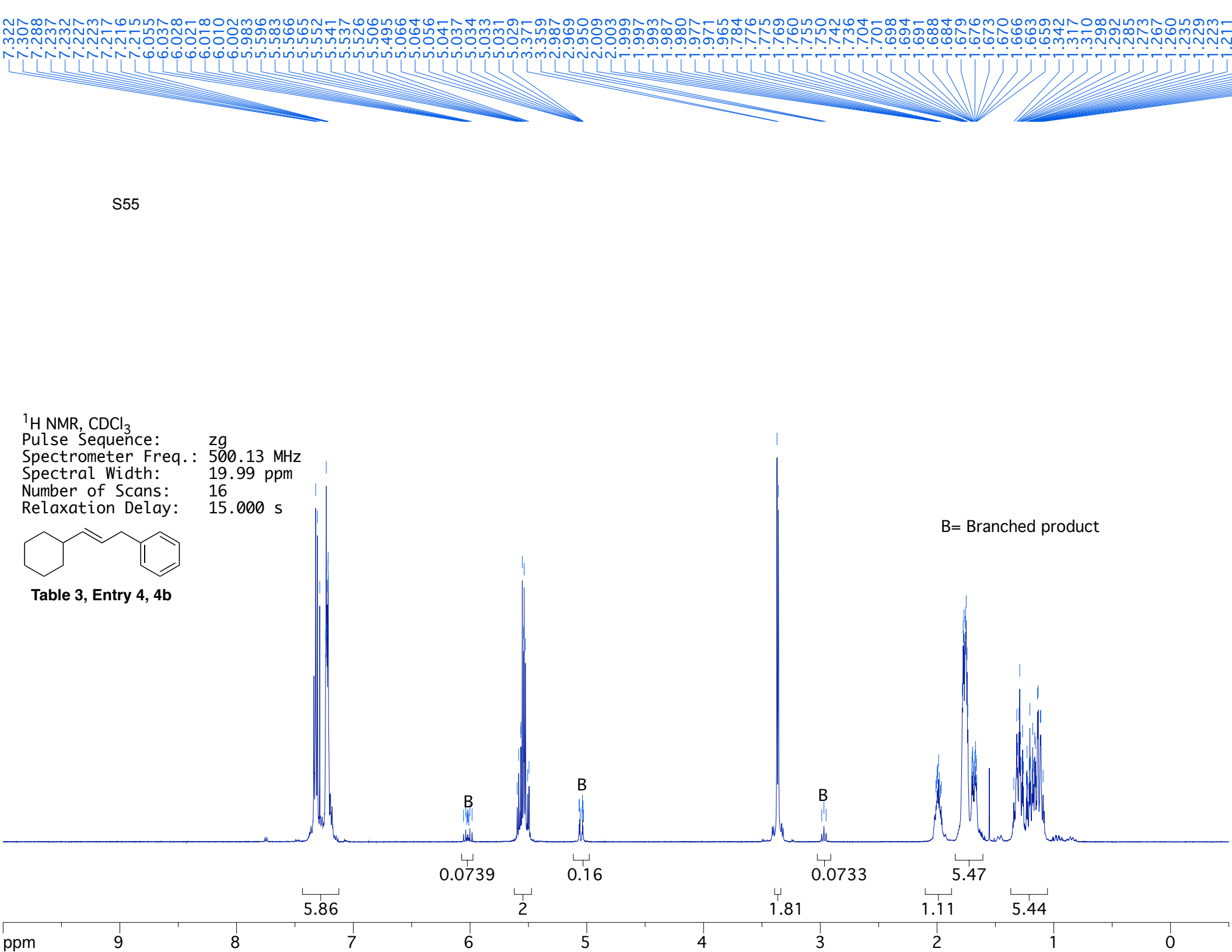


Table 3, Entry 3, 3a





6.055
6.037
6.028
6.021
6.018
6.010
6.002
5.983

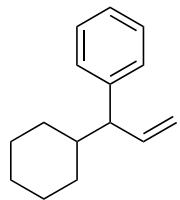
5.066
5.064
5.060
5.056
5.041
5.037
5.034
5.033
5.031
5.029

2.987
2.969
2.950

S56

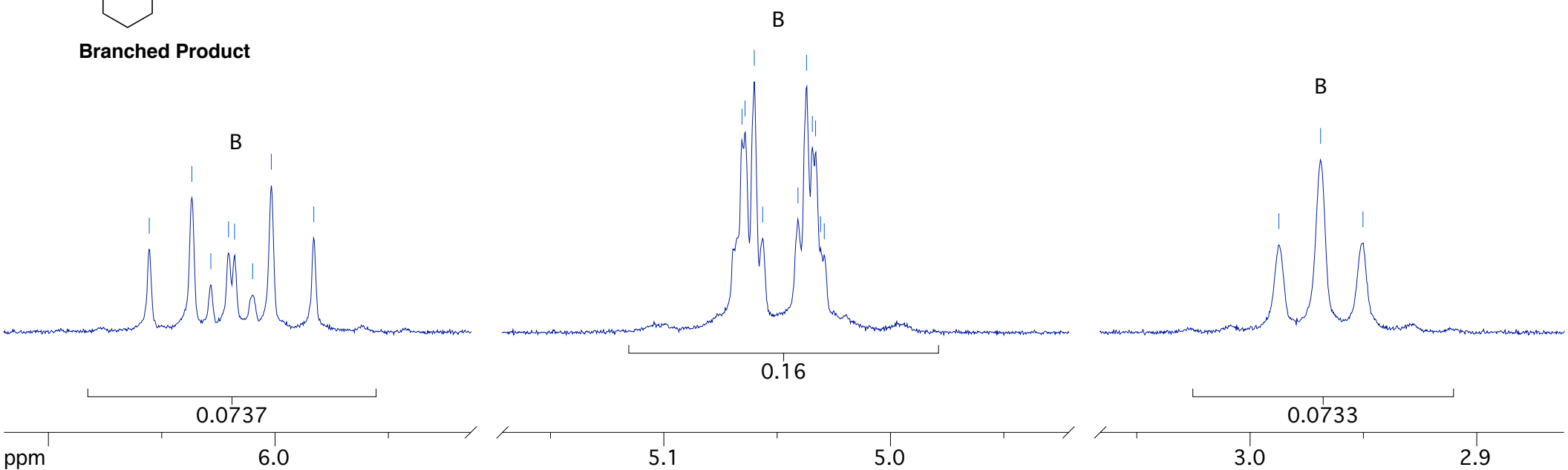
¹H NMR, CDCl₃ - Expanded from Table 3, Entry 4

Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 15.000 s



Branched Product

B= Branched product



S57

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 330
Relaxation Delay: 2.000 s

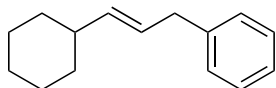


Table 3, Entry 4, 4b

141.246
138.129
128.467
128.305
126.135
125.830
77.283
77.028
76.775
40.656
39.112
33.147
26.244
26.118

B= Branched product

ppm 200 150 100 50 -0 -50

B

B

B

S58

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

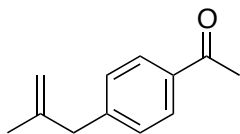
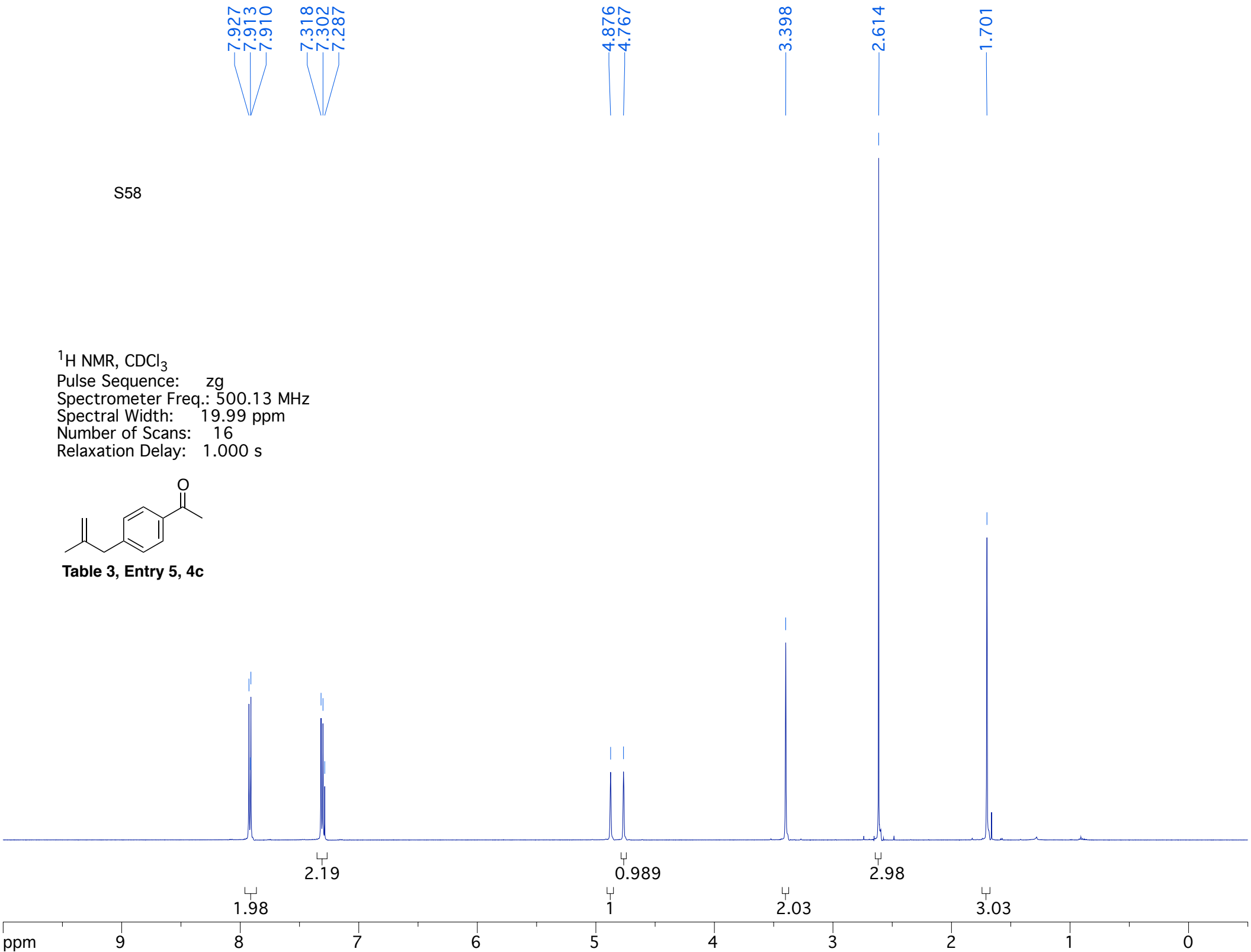


Table 3, Entry 5, 4c



197.845

S59

145.546

144.122

135.344

129.122

128.469

112.688

77.279

77.025

76.770

44.571

26.577

22.082

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 175
Relaxation Delay: 2.000 s

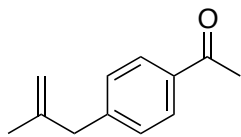
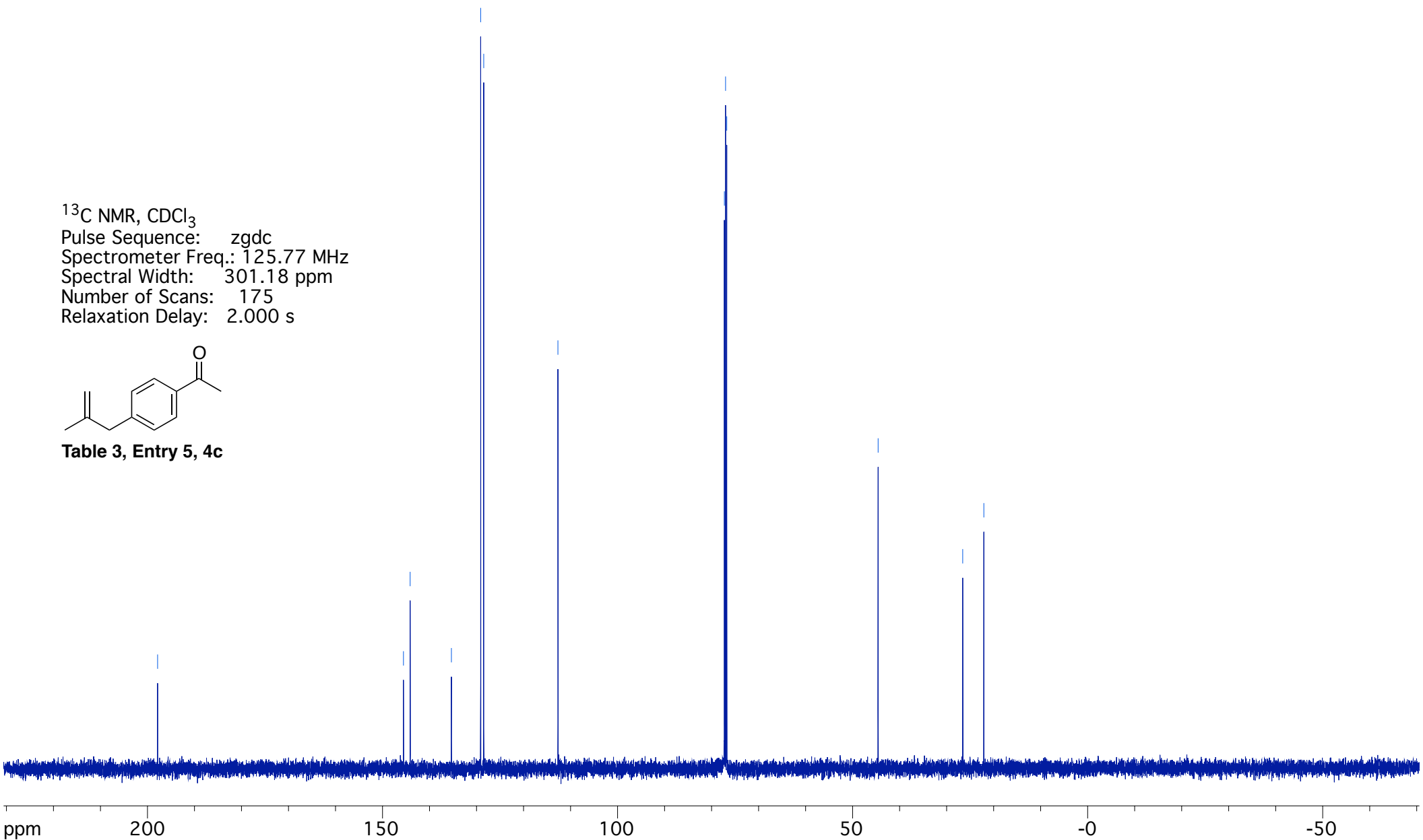


Table 3, Entry 5, 4c



7.349
7.340
7.336
7.324
7.310
7.289
7.247
7.231
7.215
6.132
6.130
6.114
6.112
6.110
6.103
6.101
6.098
6.096
6.094
6.091
6.085
6.083
6.073
6.070
6.068
6.065
6.062
5.763
5.760
5.749
5.748
5.747
5.734
5.721
5.707
5.704
5.702
5.688
5.675
5.662
5.661
5.650
5.647
3.443
3.429

1.799
1.795
1.785
1.773

S60

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

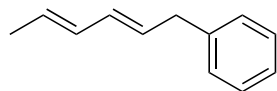
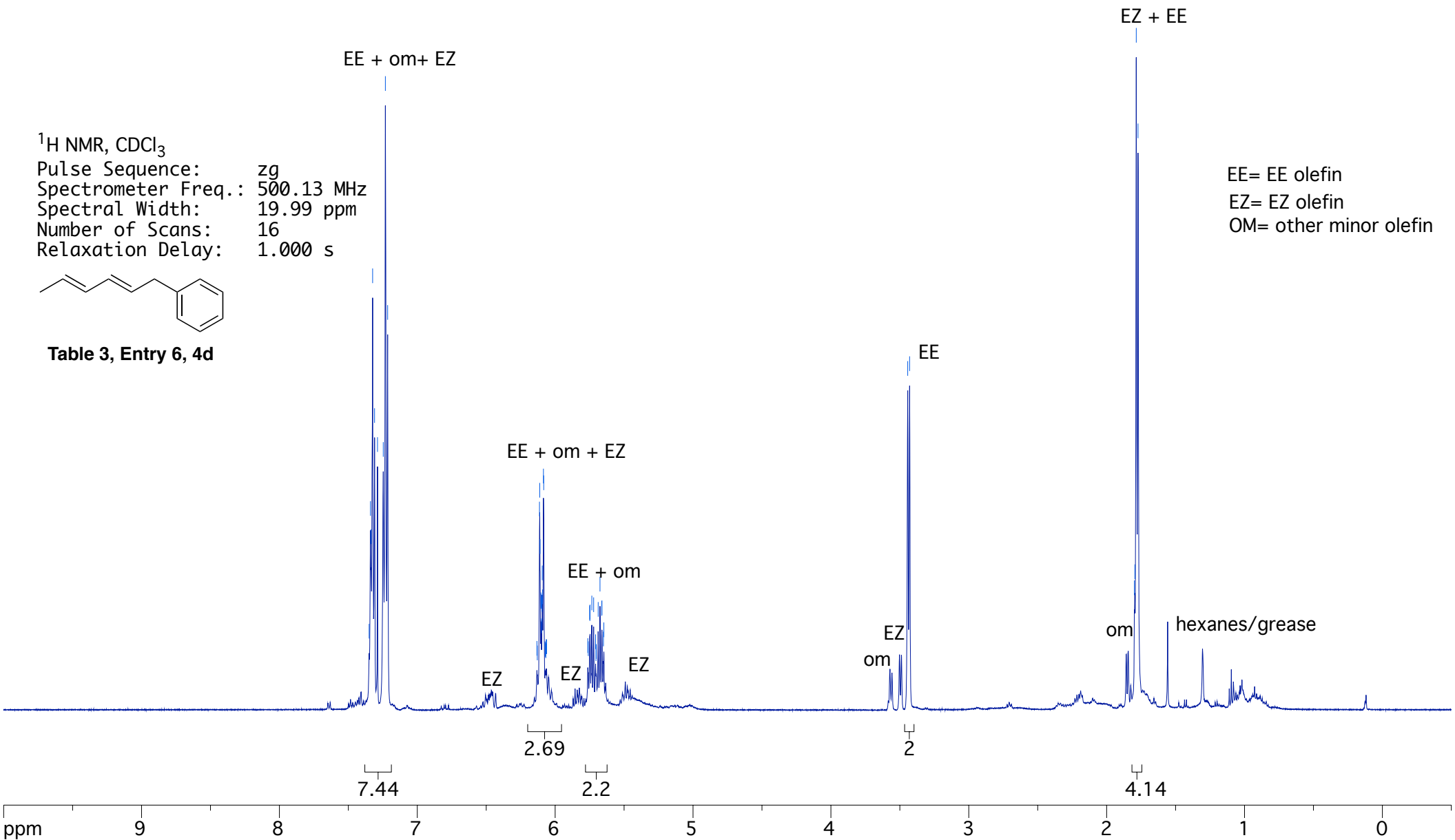


Table 3, Entry 6, 4d

EE= EE olefin
EZ= EZ olefin
OM= other minor olefin



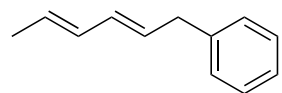
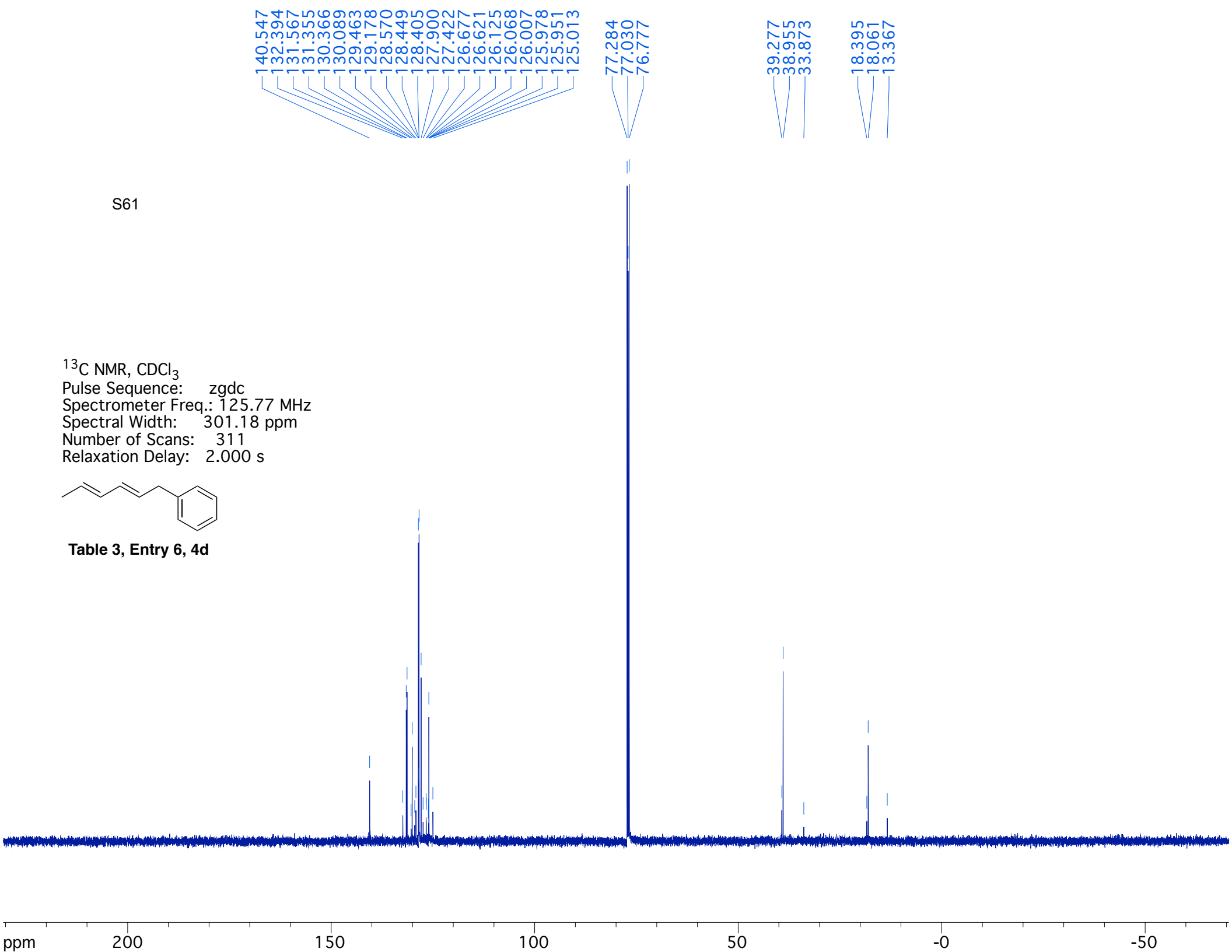


Table 3, Entry 6, 4d

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 311
Relaxation Delay: 2.000 s

S61



7.356
7.353
7.349
7.329
7.313
7.298
7.289
7.228
7.213

3.408
3.393

2.183
2.151
2.149
2.109
1.787
1.749
1.724
1.695
1.658
1.640
1.552
1.424

S62

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 500.13 MHz
Spectral Width: 19.99 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

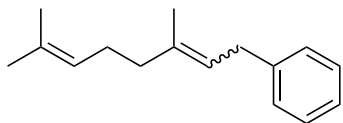
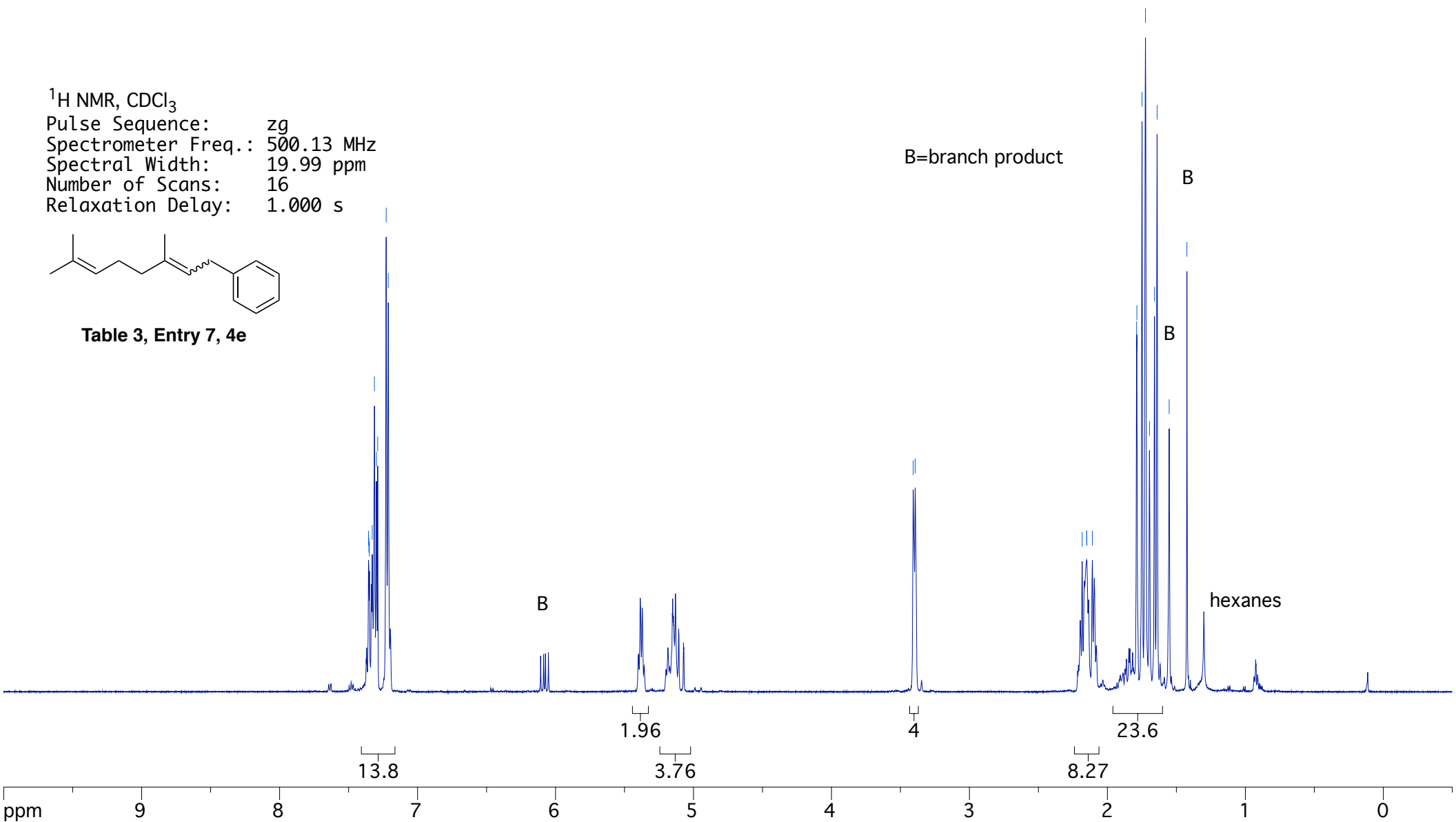


Table 3, Entry 7, 4e



¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 816
Relaxation Delay: 2.000 s

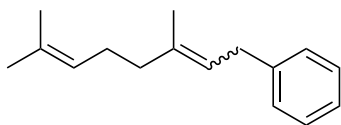
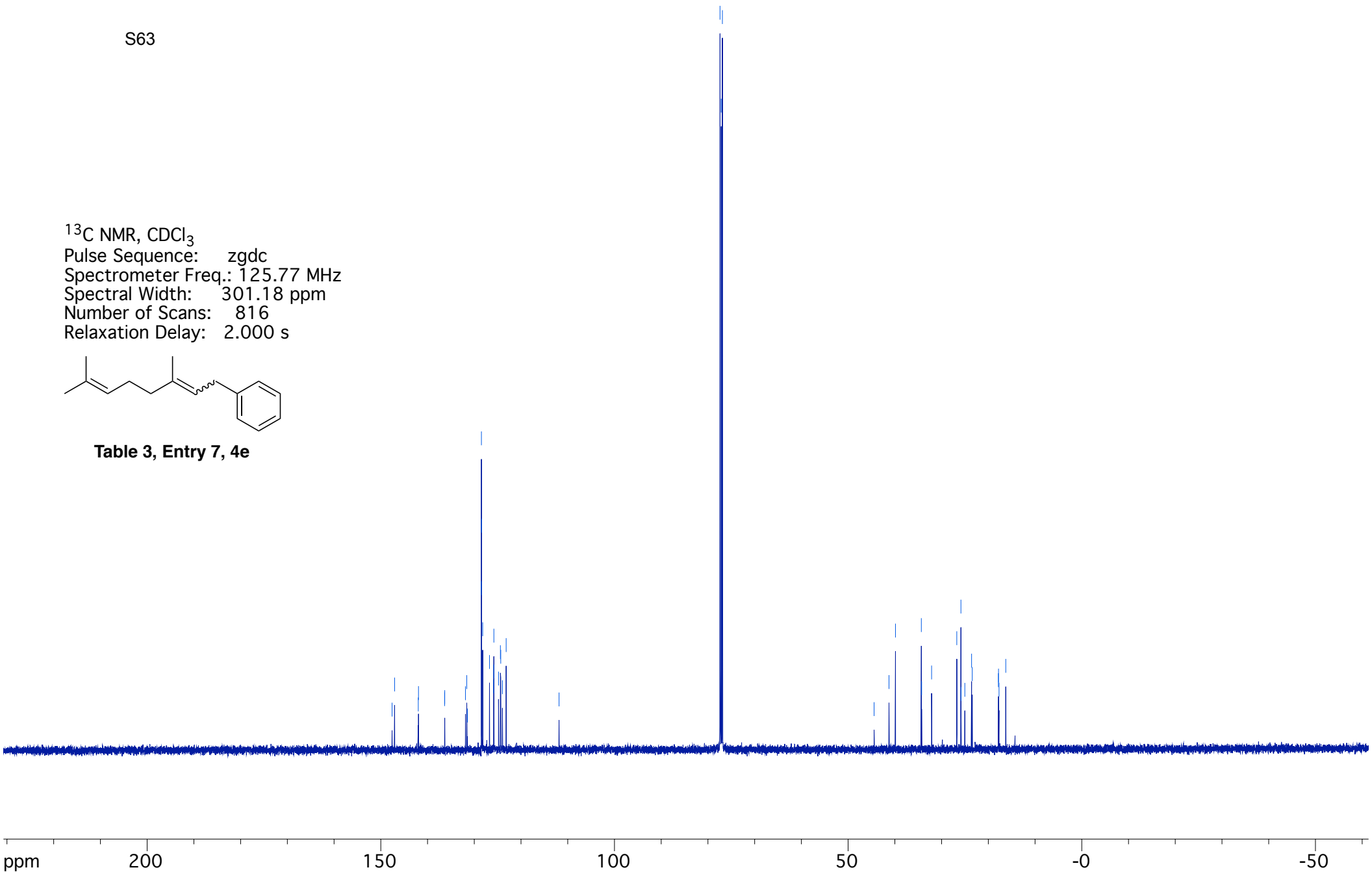
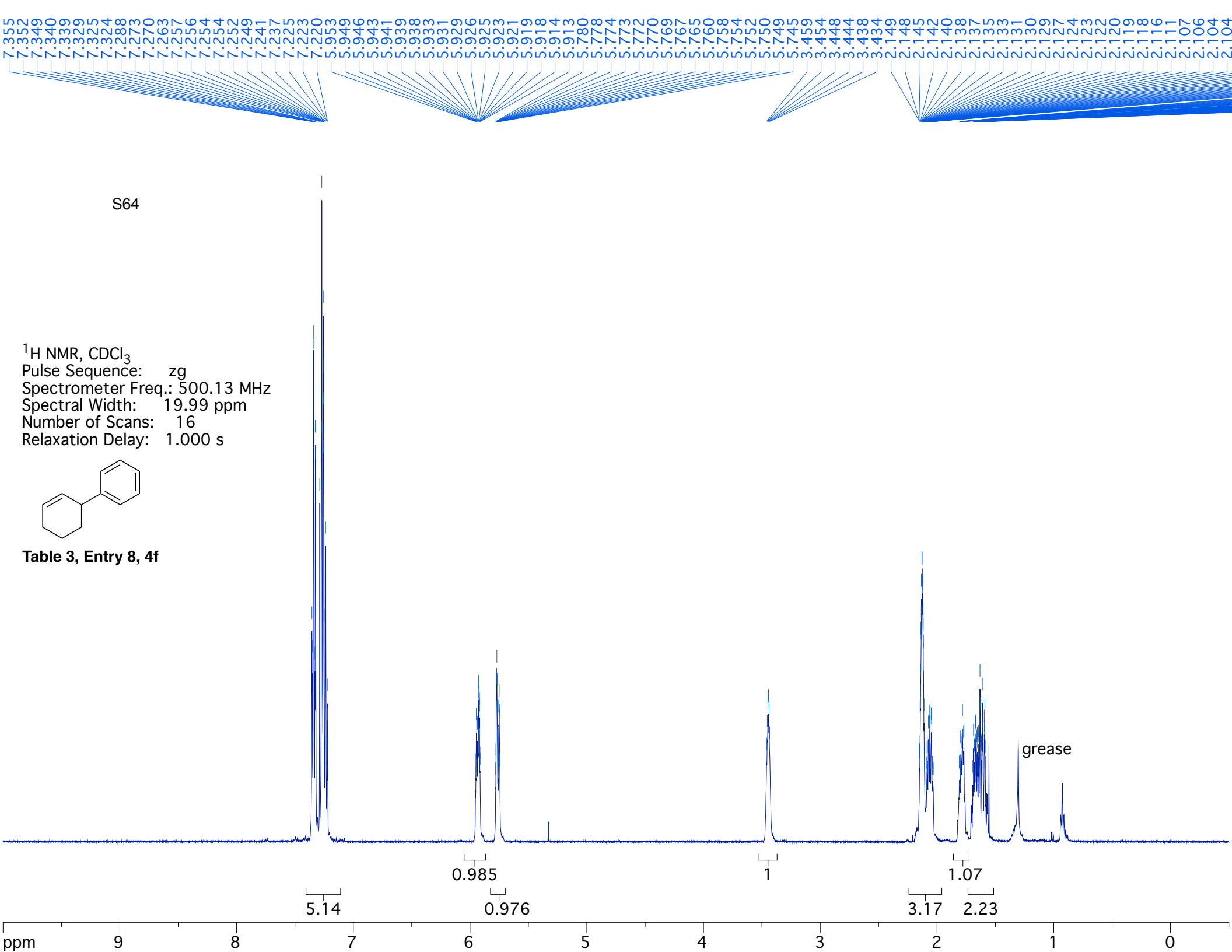


Table 3, Entry 7, 4e

S63

147.588
147.046
141.982
141.936
136.349
136.320
131.881
131.605
131.485
128.498
128.471
128.453
128.195
126.742
125.870
125.832
125.805
124.813
124.409
124.335
123.978
123.176
111.858
77.414
77.160
76.907
44.443
41.255
39.867
34.334
34.267
32.138
26.745
25.862
25.831
25.025
23.580
23.443
17.851
17.817
17.707
16.263





S65

146.669
130.190
128.360
128.269
127.745
125.960
77.275
77.020
76.768
41.880
32.635
25.040
21.217

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 435
Relaxation Delay: 2.000 s

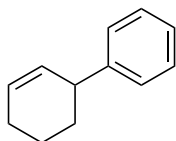
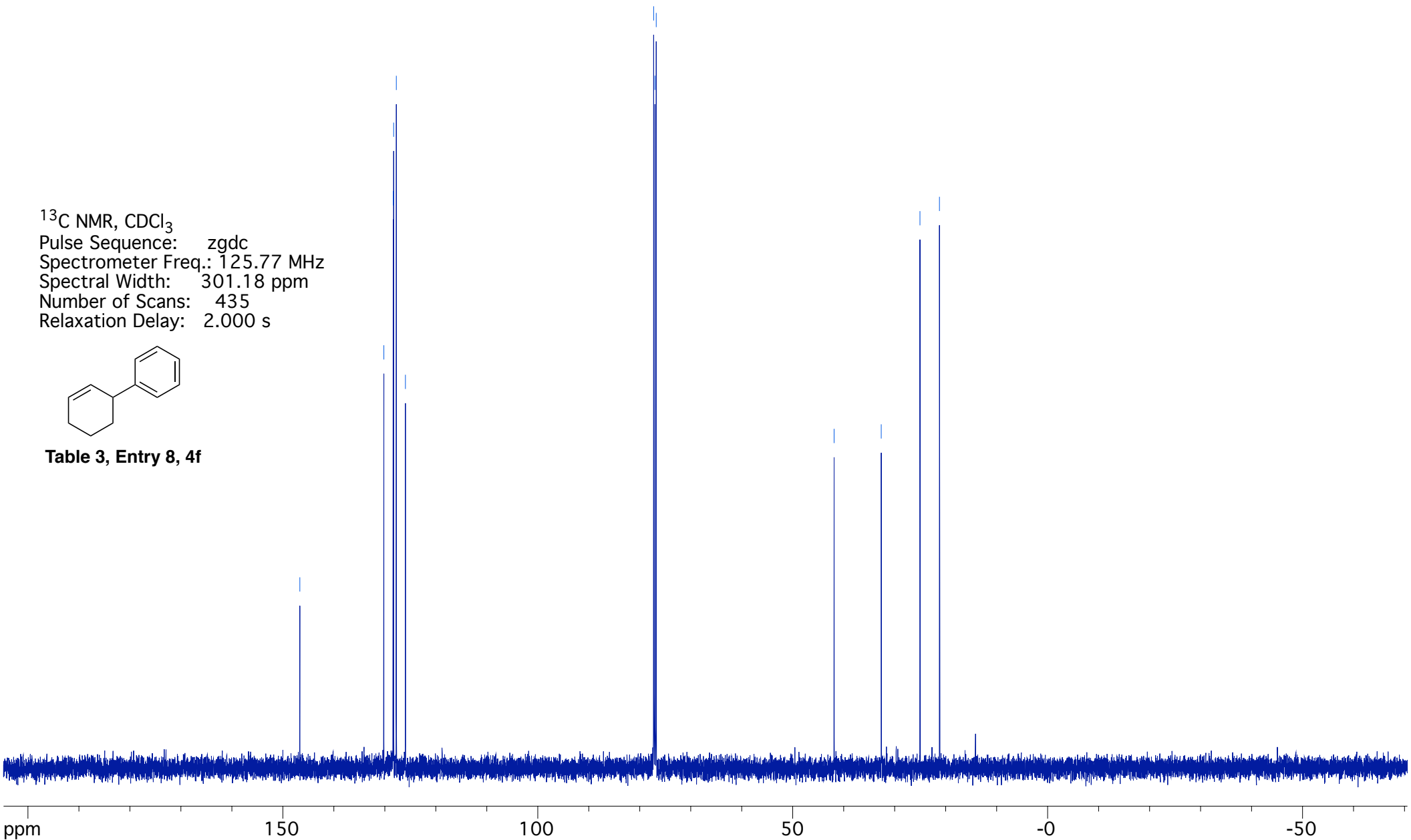


Table 3, Entry 8, 4f



S66

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 16
Relaxation Delay: 1.000 s

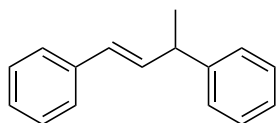
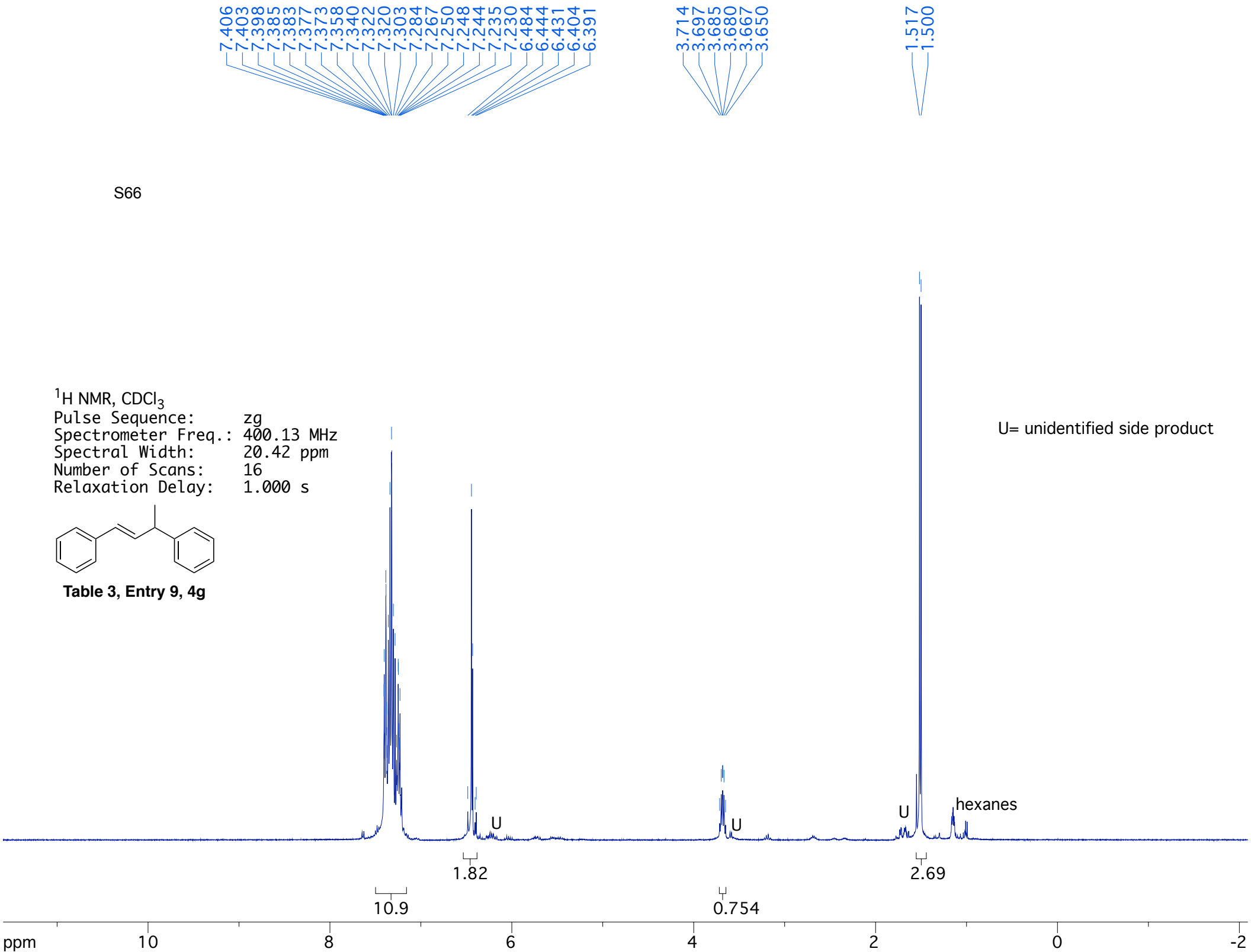


Table 3, Entry 9, 4g



S67

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 125.77 MHz
Spectral Width: 301.18 ppm
Number of Scans: 400
Relaxation Delay: 2.000 s

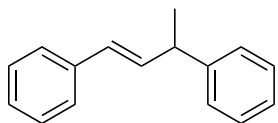
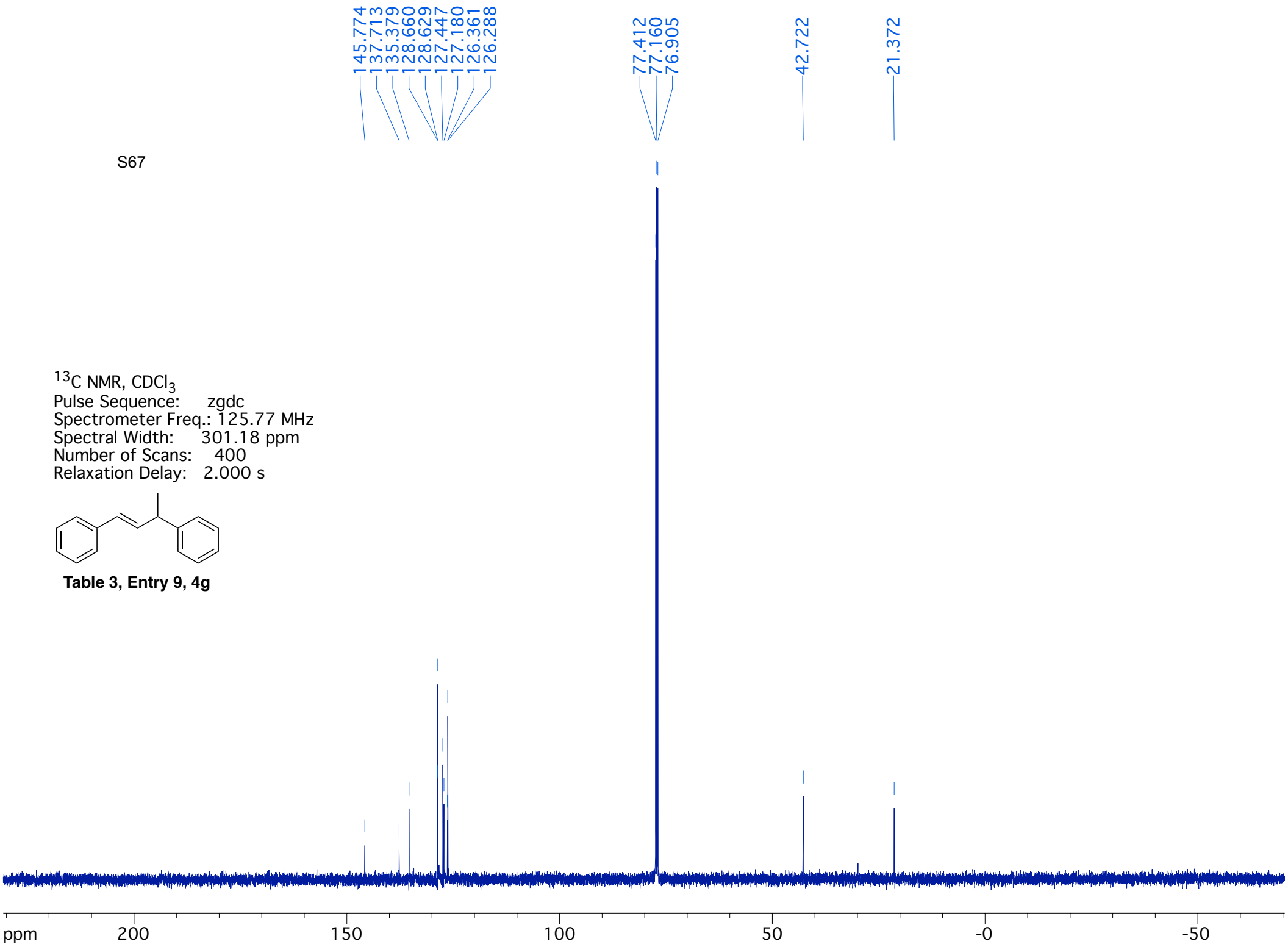


Table 3, Entry 9, 4g



7.380
7.376
7.358
7.357
7.327
7.322
7.309
7.306
7.289
7.260
7.227
7.223
7.220
7.210
7.205
7.200
7.190
7.187
7.184
6.407
6.368
6.269
6.251
6.233
6.212
6.194
2.272
2.269
2.265
2.257
2.254
2.251
2.237
2.235
2.220
2.217
2.205
2.202
2.185
2.183
2.180
2.177
2.098
2.095
2.080
2.077
2.070
2.061
2.058
2.051
2.045
2.042
2.037
2.034
2.027
2.024
2.021
1.621
1.605
1.603
1.590
1.577
1.560
1.522
1.374
1.344
1.328
1.311
1.301
1.298
1.288
1.282
1.202
1.200
1.179
1.179
1.165
1.161
1.141
0.946
0.929
0.923
0.913
0.896

S68

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

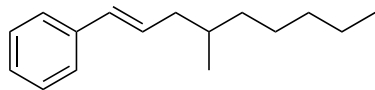
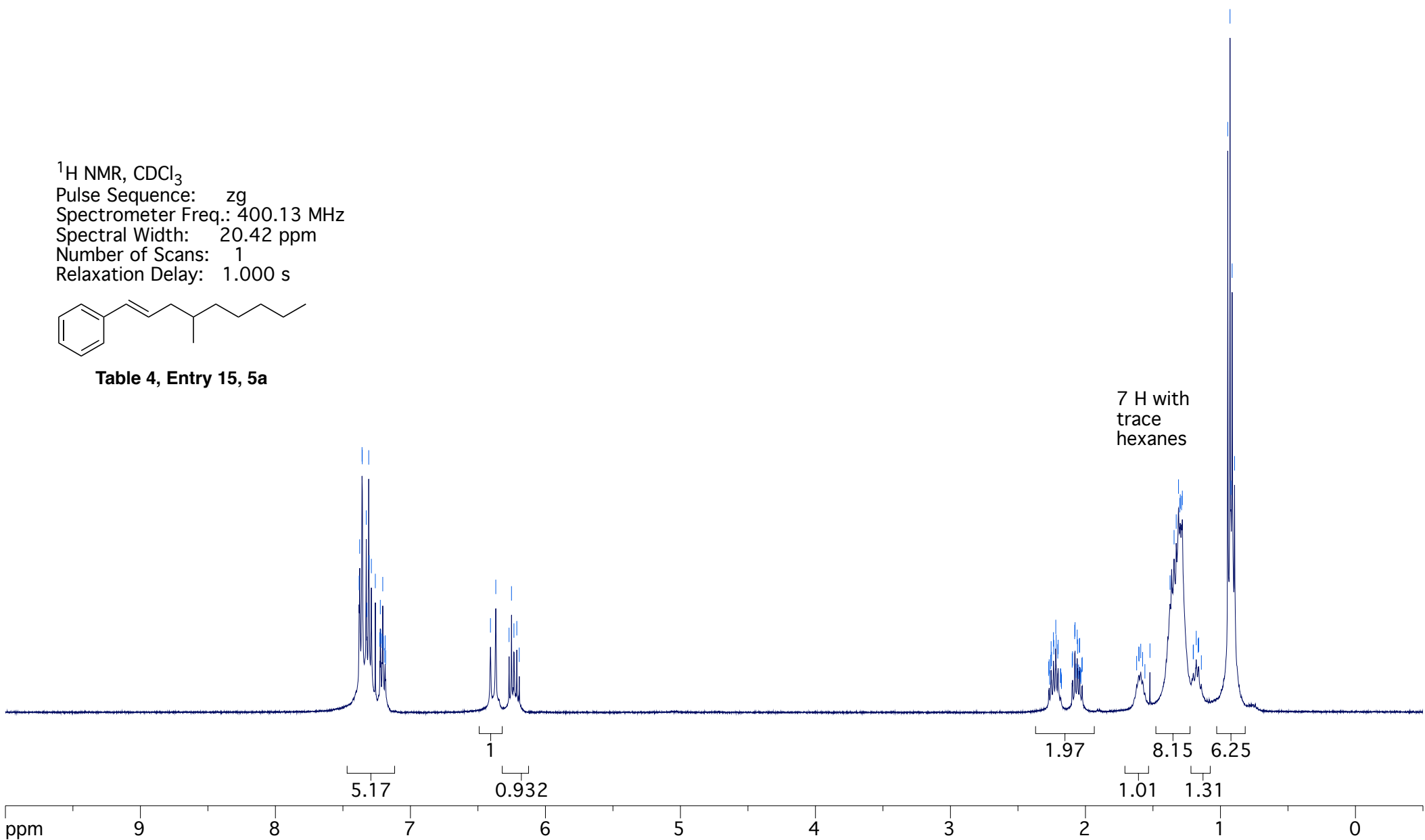


Table 4, Entry 15, 5a



S69

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 84
Relaxation Delay: 2.000 s

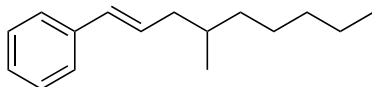


Table 4, Entry 15, 5a

138.130
130.979
129.990
128.608
126.881
126.070

77.483
77.160
76.845

40.755
36.811
33.497
32.326
26.964
22.878
19.790
14.276

ppm

200

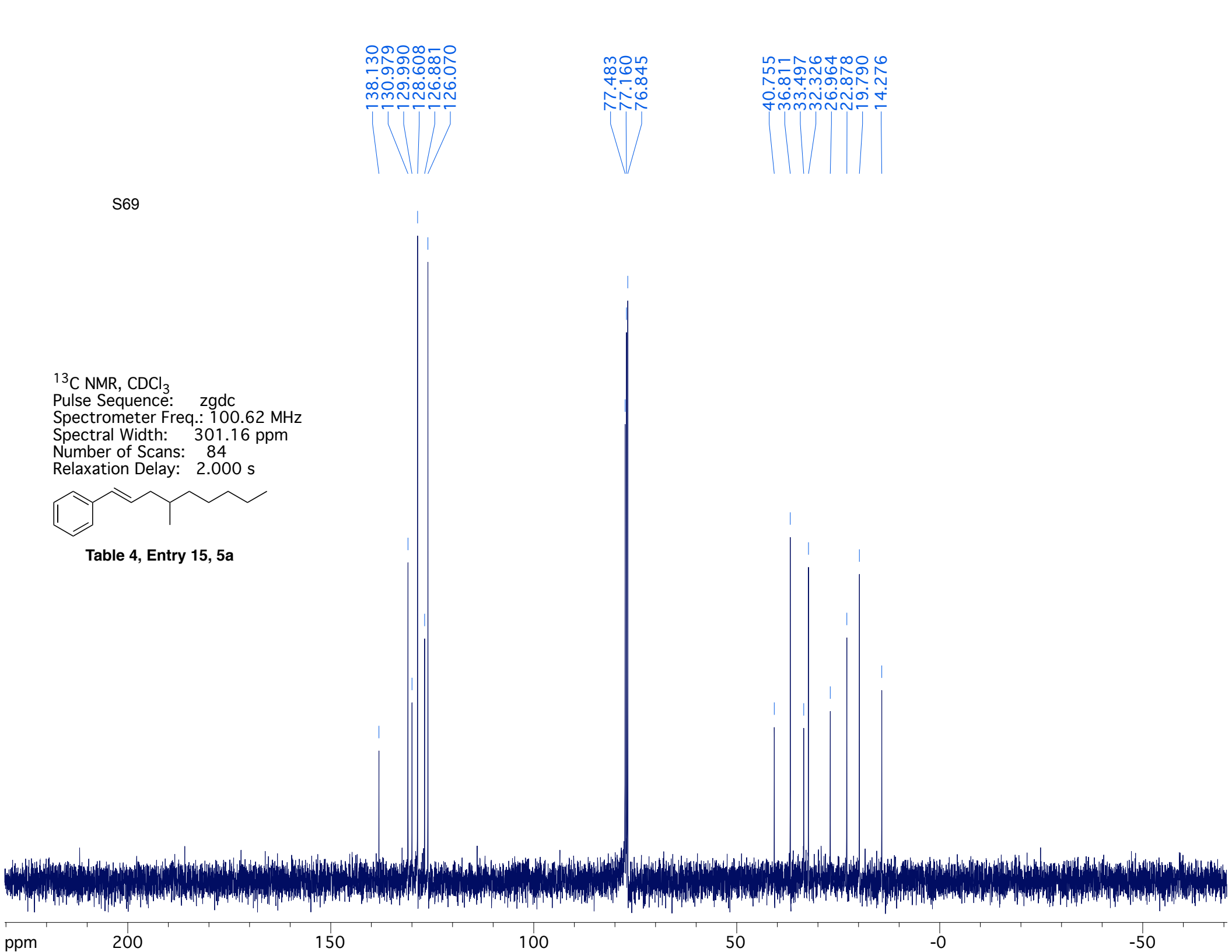
150

100

50

-0

-50



7.388
7.384
7.367
7.335
7.330
7.317
7.297
7.260
7.234
7.231
7.228
7.218
7.213
7.195
6.408
6.369
6.292
6.274
6.256
6.235
6.216
6.156
2.154
2.138
2.121
2.119
1.816
1.811
1.799
1.774
1.769
1.761
1.752
1.736
1.729
1.710
1.708
1.704
1.700
1.677
1.485
1.477
1.469
1.460
1.450
1.441
1.432
1.424
1.414
1.404
1.396
1.388
1.379
1.323
1.300
1.292
1.286
1.285
1.269
1.262
1.255
1.238
1.212
1.205
1.197
1.174
1.151
1.143
1.039
1.032
1.025
1.007
1.002
0.979
0.972
0.948
0.943

S70

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

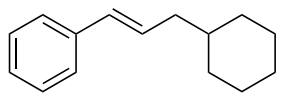
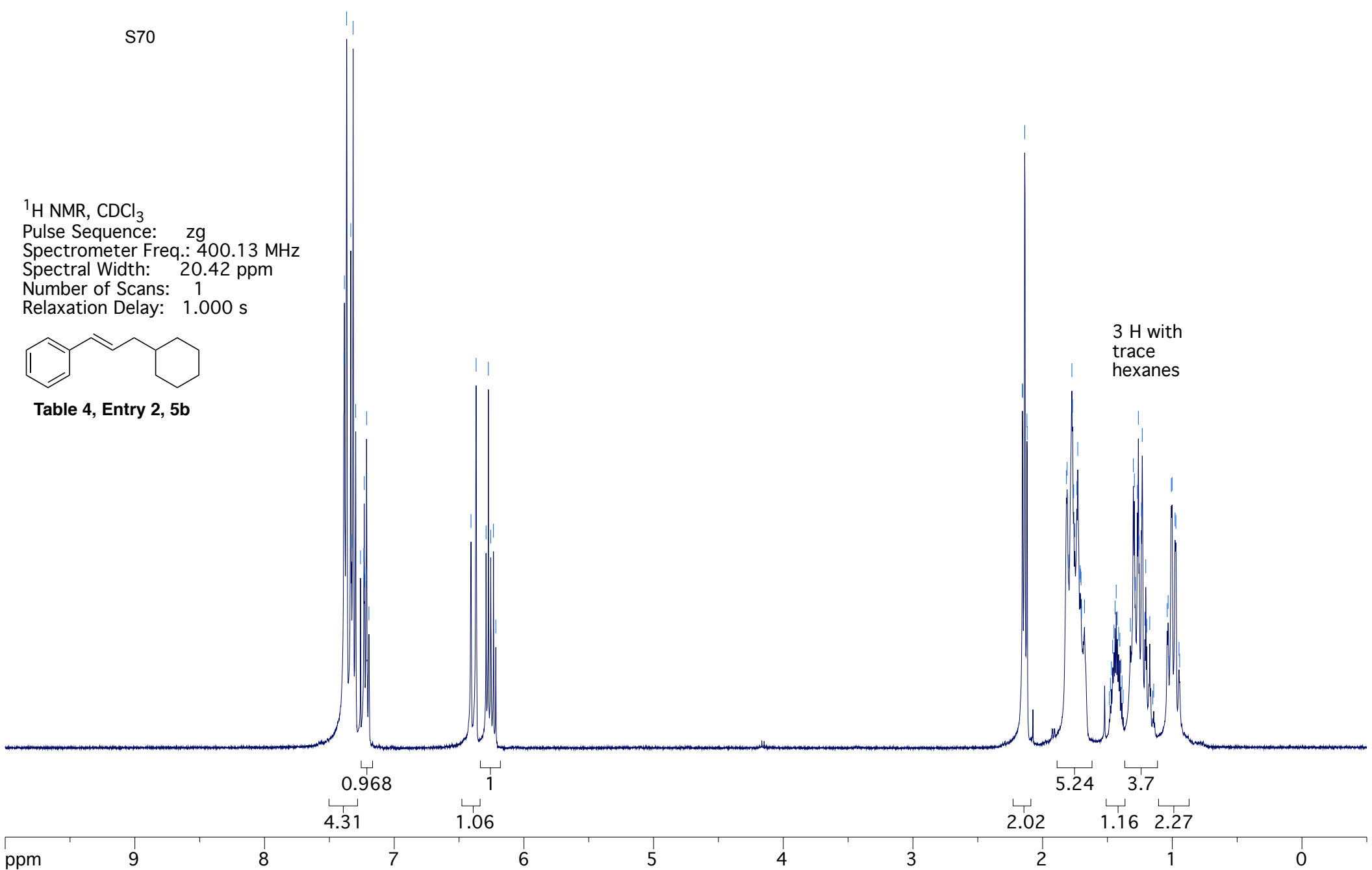


Table 4, Entry 2, 5b

3 H with trace hexanes



S71

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 98
Relaxation Delay: 2.000 s

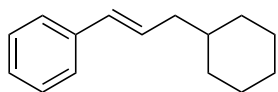
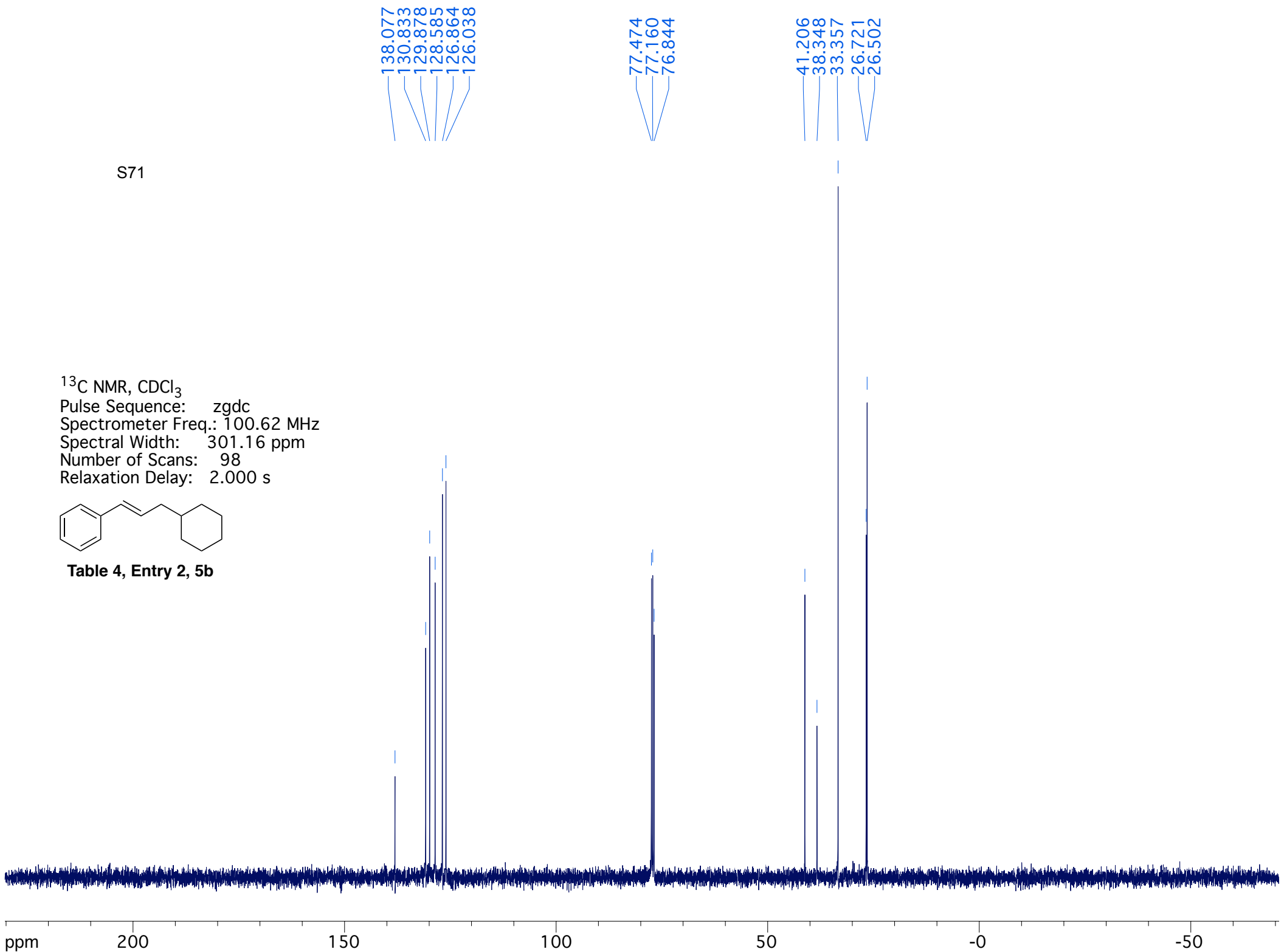
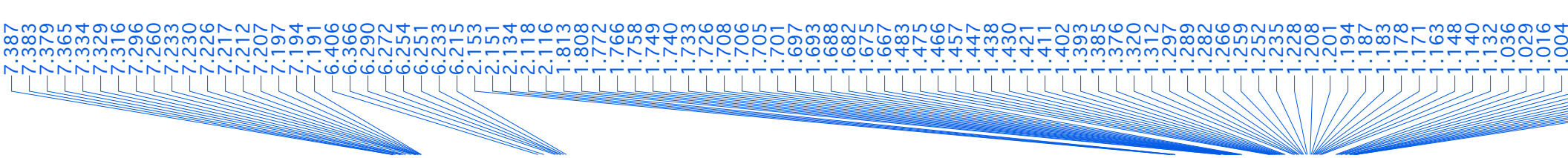


Table 4, Entry 2, 5b





S72

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

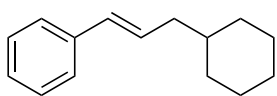
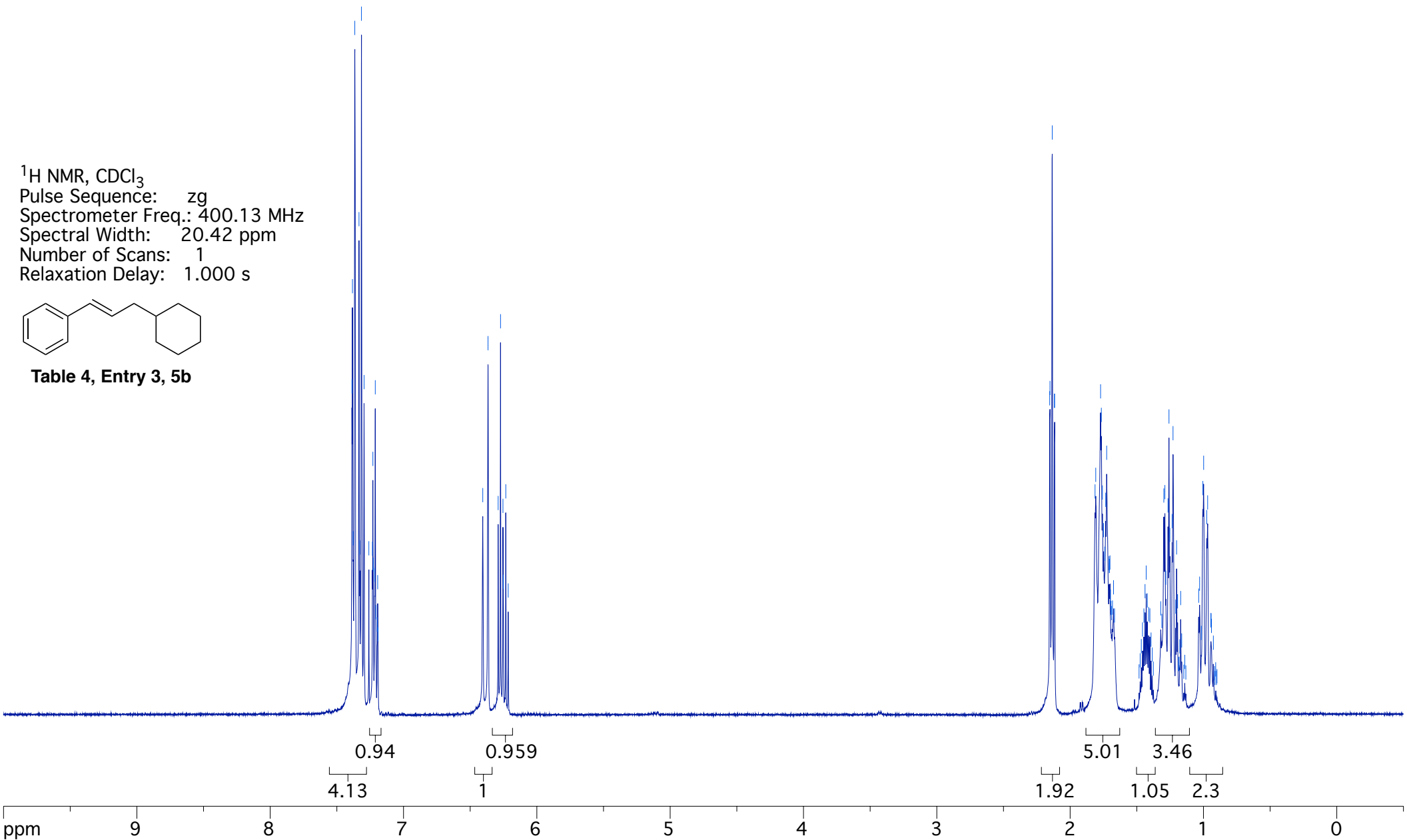


Table 4, Entry 3, 5b



S73

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 66
Relaxation Delay: 2.000 s

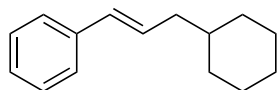
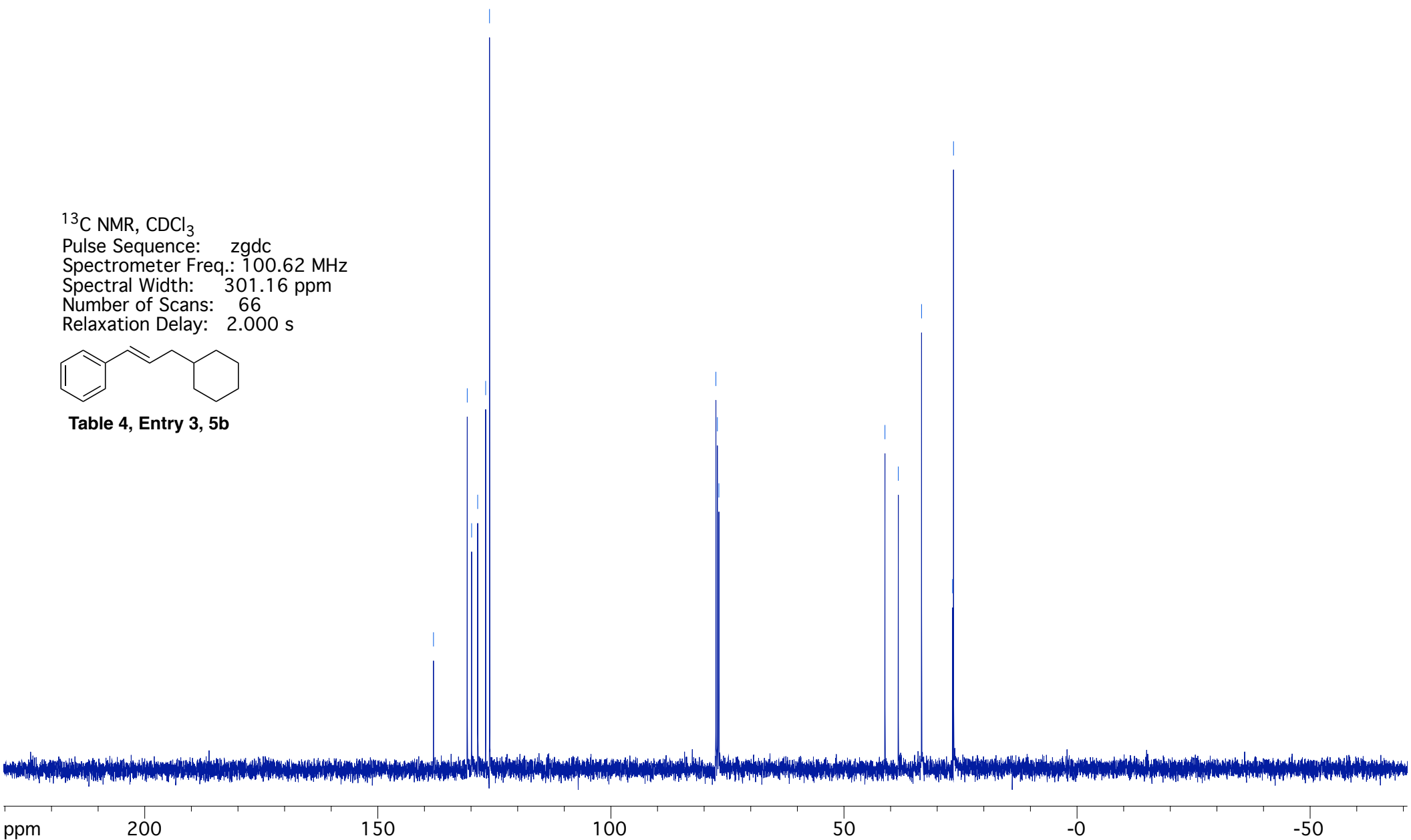
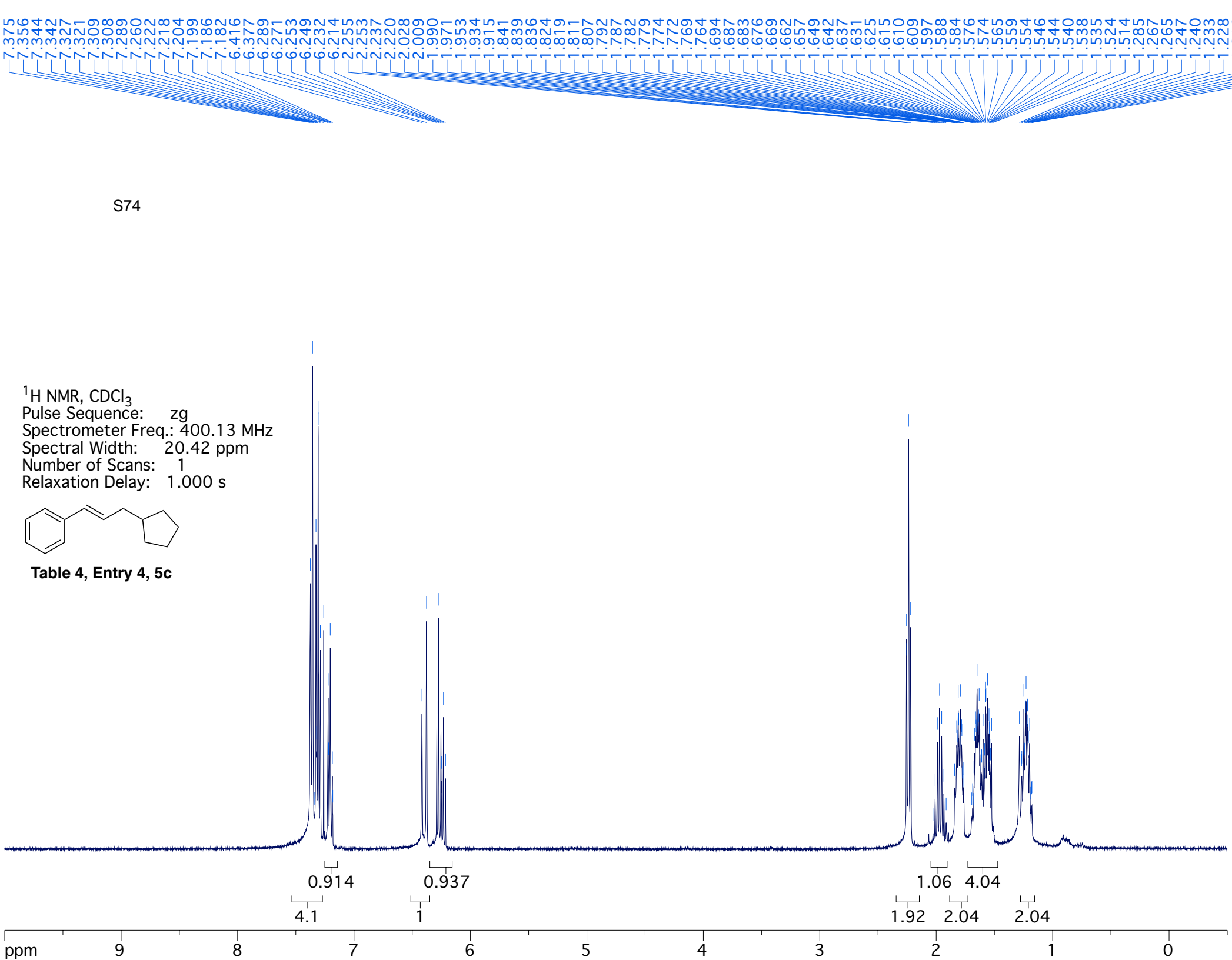


Table 4, Entry 3, 5b

138.058
130.817
129.880
128.581
126.865
126.037
77.474
77.160
76.836
41.208
38.340
33.358
26.719
26.502





S75

138.133
130.673
130.265
128.593
126.864
126.055

77.474
77.160
76.840

40.160
39.577
32.476
25.327

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 75
Relaxation Delay: 2.000 s

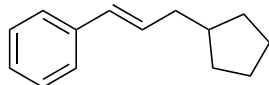


Table 4, Entry 4, 5c

ppm

200

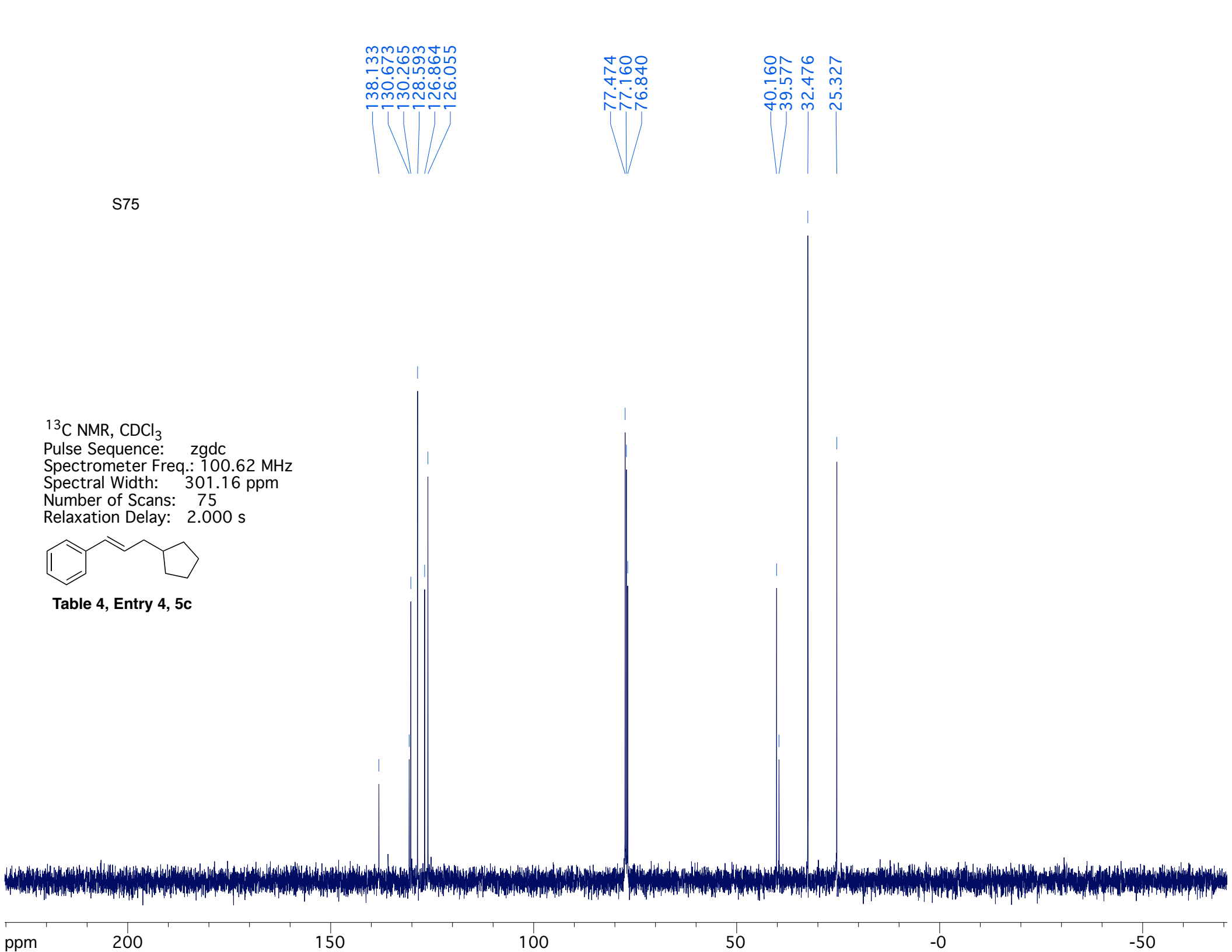
150

100

50

-0

-50



7.377
7.374
7.357
7.327
7.308
7.289
7.260
7.226
7.223
7.220
7.205
7.190
7.187
7.184
6.398
6.359
6.239
6.222
6.204
6.200
6.182
6.165

2.242
2.219
2.216
2.200
2.183
2.164
2.146
2.143
2.072
2.069
2.059
2.041
2.038
2.023
2.005
2.002

S76

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

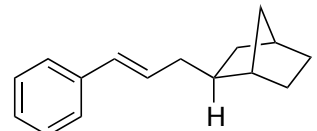
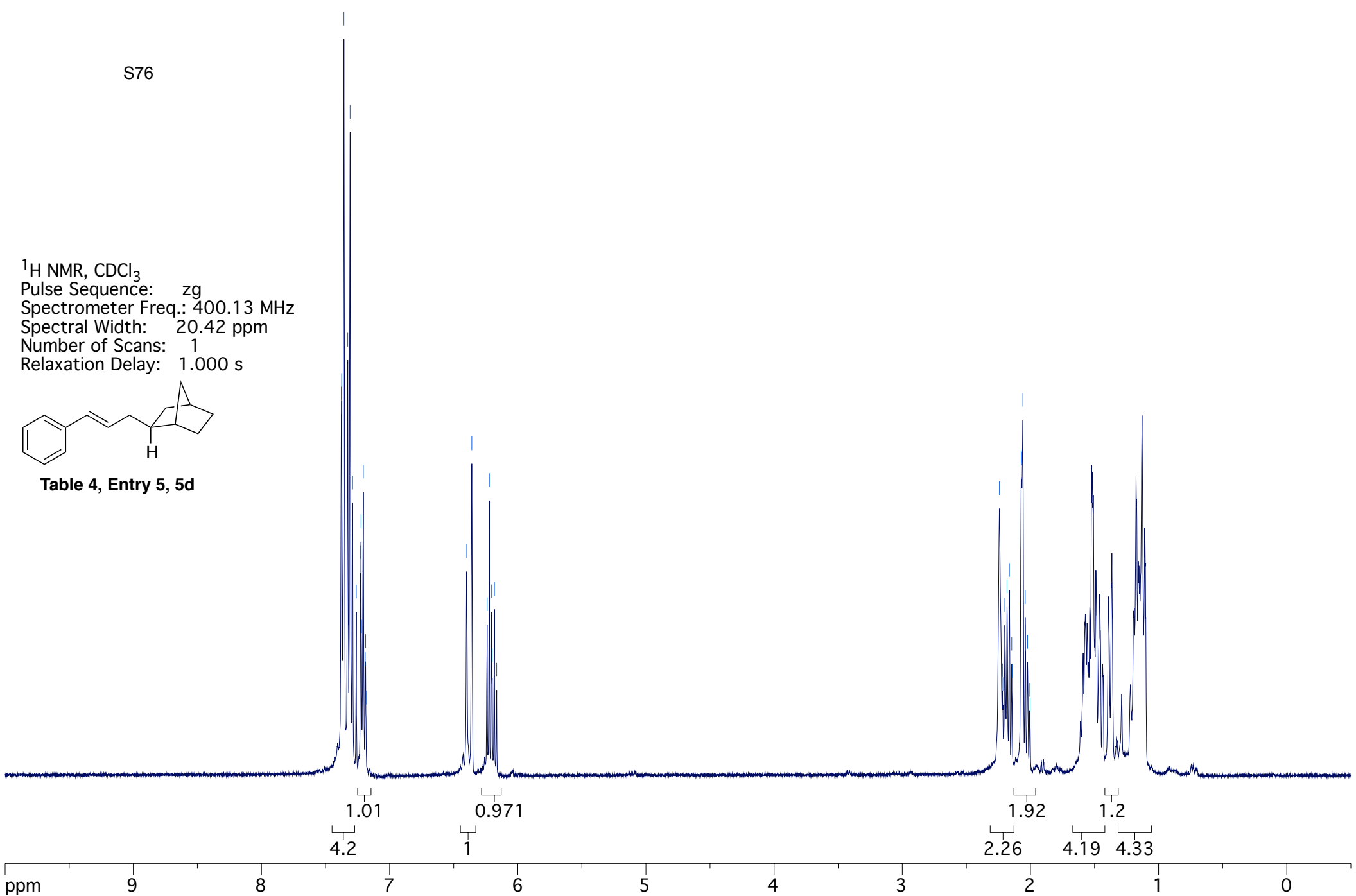


Table 4, Entry 5, 5d



S77

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 148
Relaxation Delay: 2.000 s

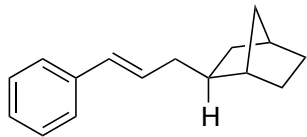


Table 4, Entry 5, 5d

138.095
130.413
130.264
128.591
126.881
126.054

77.474
77.160
76.846

42.180
40.856
40.396
38.013
36.868
35.342
30.195
29.001

ppm

200

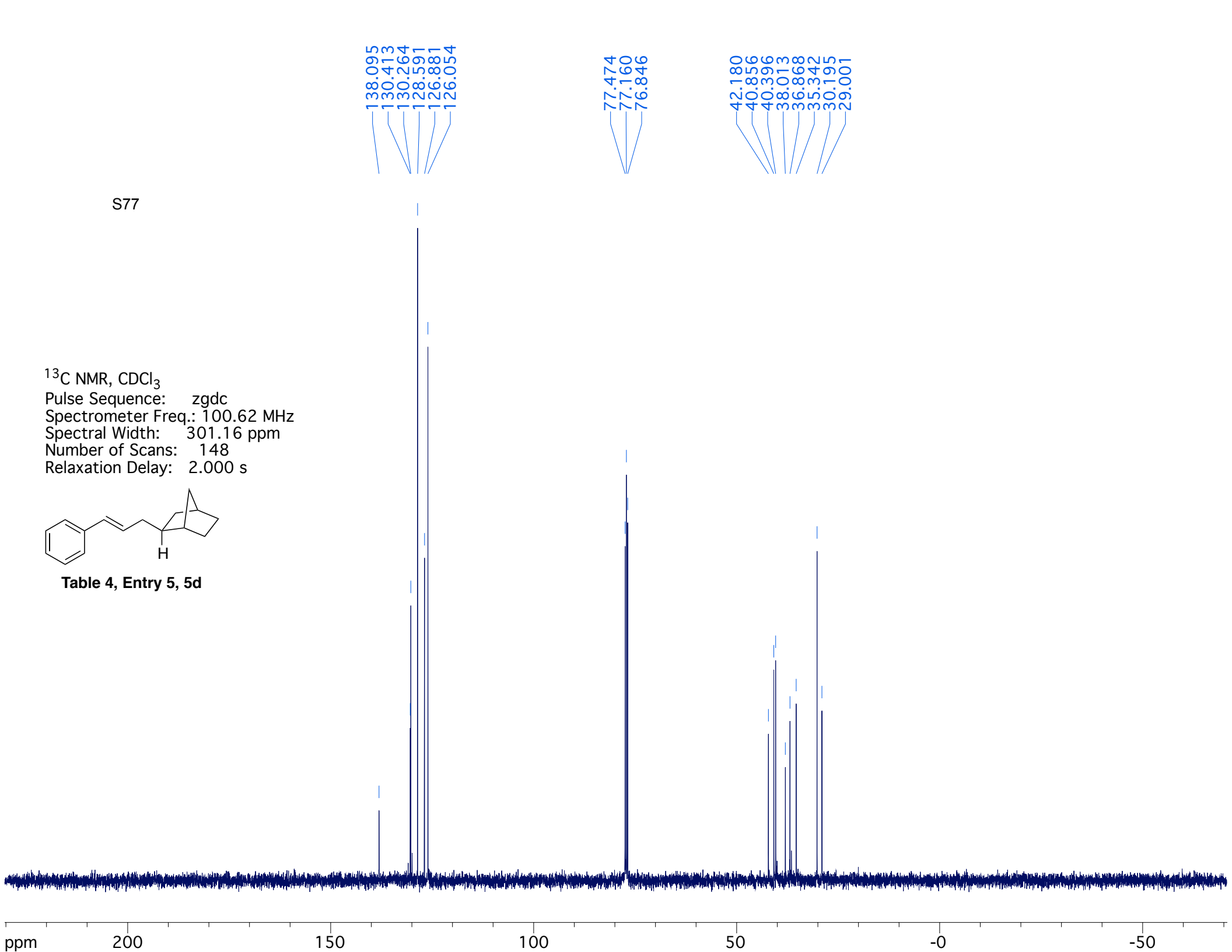
150

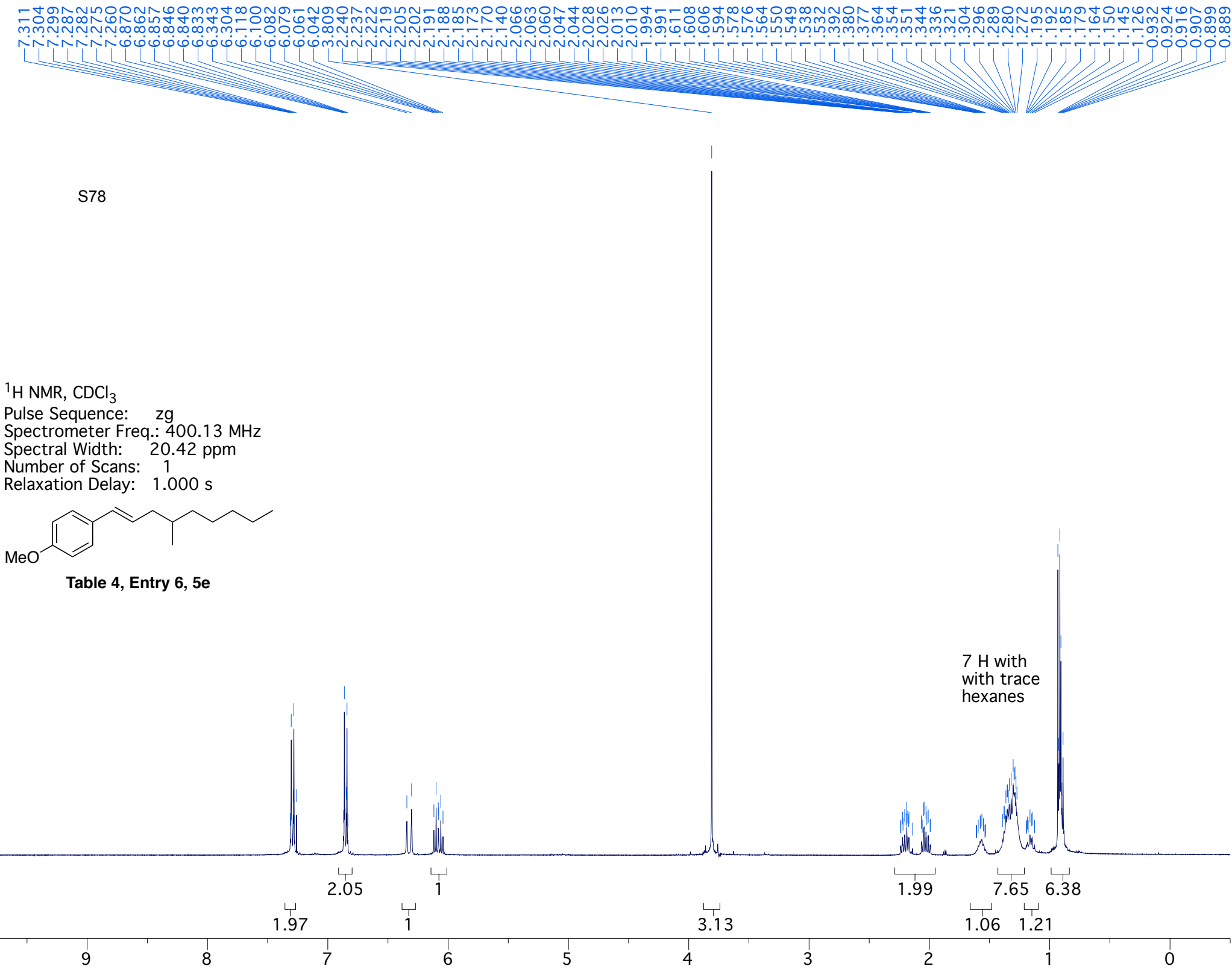
100

50

-0

-50





S79

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 159
Relaxation Delay: 2.000 s

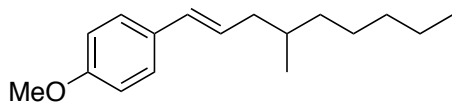
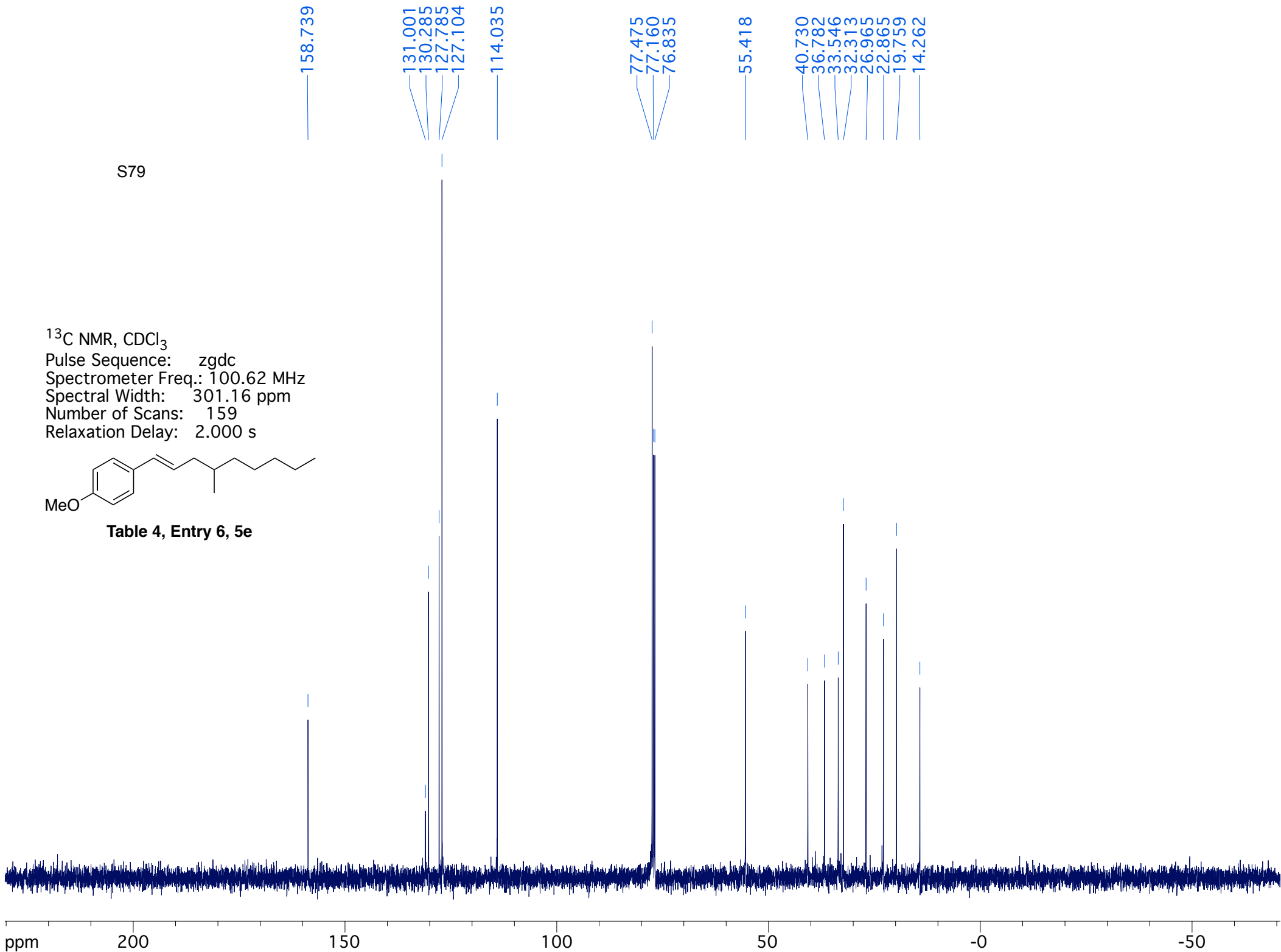


Table 4, Entry 6, 5e



7.551
7.530
7.440
7.420
7.260
6.422
6.382
6.356
6.340
6.322
6.300
6.283
2.281
2.266
2.265
2.248
2.231
2.216
2.106
2.088
2.070
2.051
2.035
2.035
1.645
1.643
1.642
1.626
1.610
1.597
1.582
1.581
1.571
1.565
1.563
1.561
1.560
1.558
1.545
1.375
1.366
1.364
1.358
1.345
1.340
1.327
1.311
1.295
1.284
1.276
1.265
1.252
1.249
1.247
1.191
1.190
1.186
1.174
1.166
1.163
1.155
1.135
0.934
0.917
0.905
0.897
0.879

S80

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

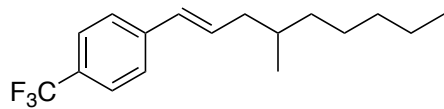
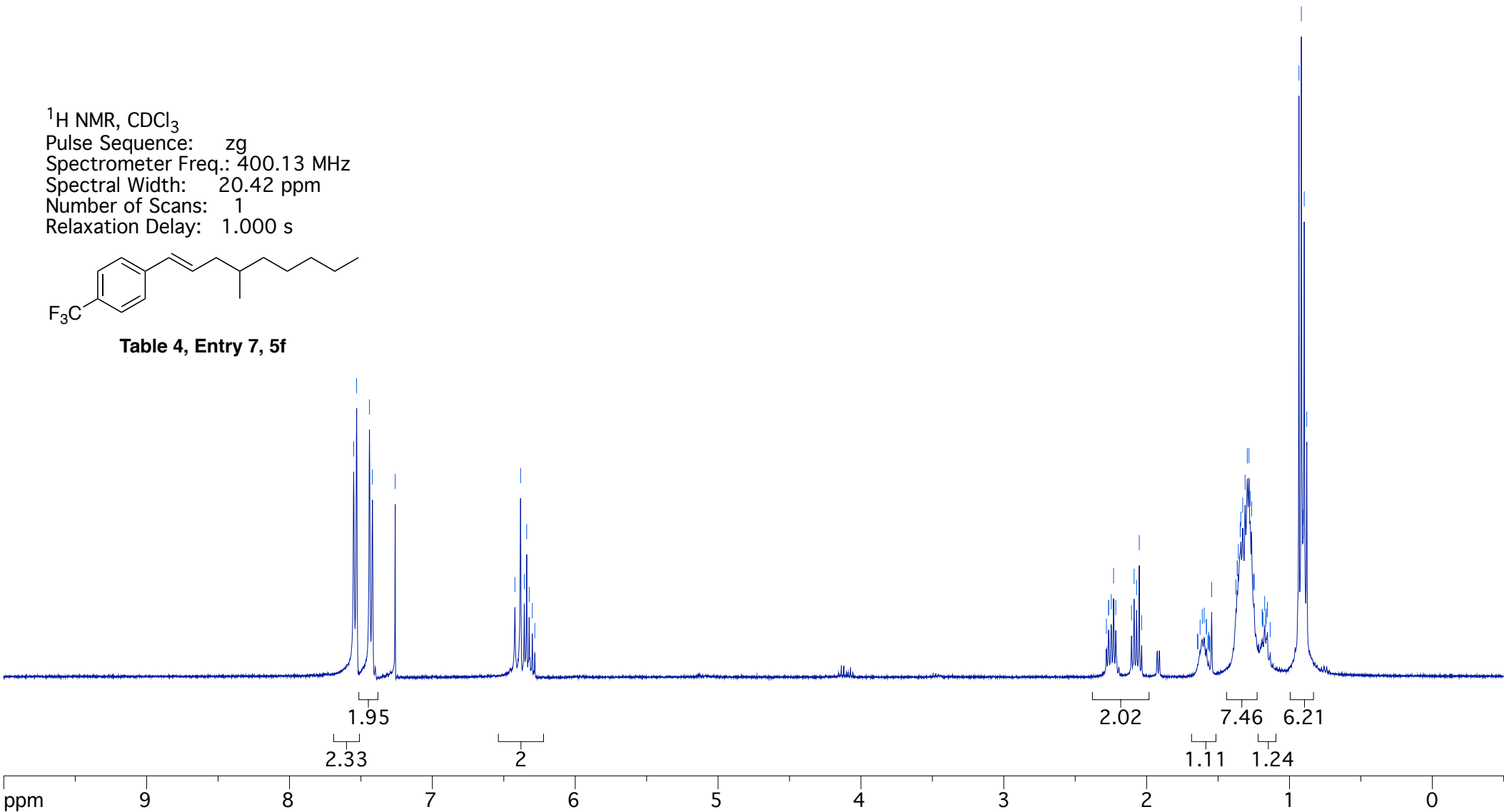
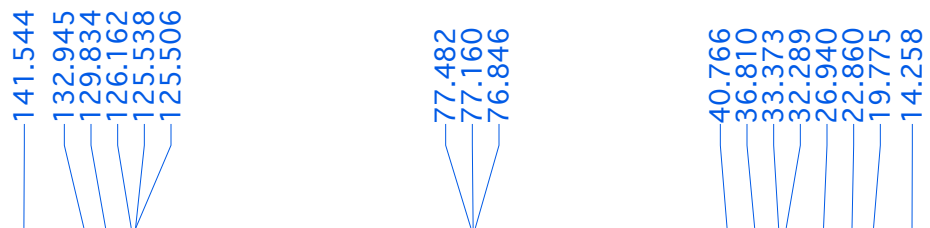


Table 4, Entry 7, 5f



S81



¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 215
Relaxation Delay: 2.000 s

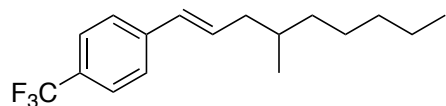
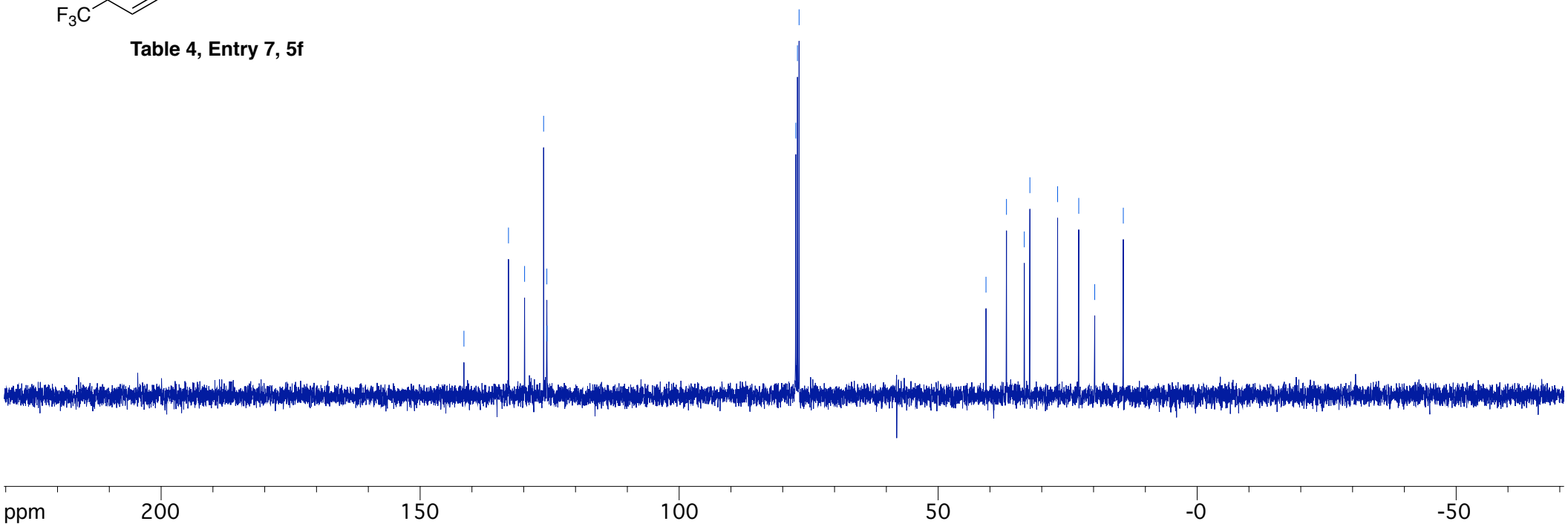


Table 4, Entry 7, 5f



62.845

S82

^{19}F NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 376.50 MHz
Spectral Width: 199.70 ppm
Number of Scans: 4
Relaxation Delay: 1.000 s

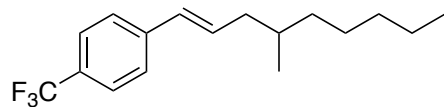


Table 4, Entry 7, 5f

ppm

50

-0

-50

S83

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

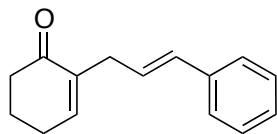
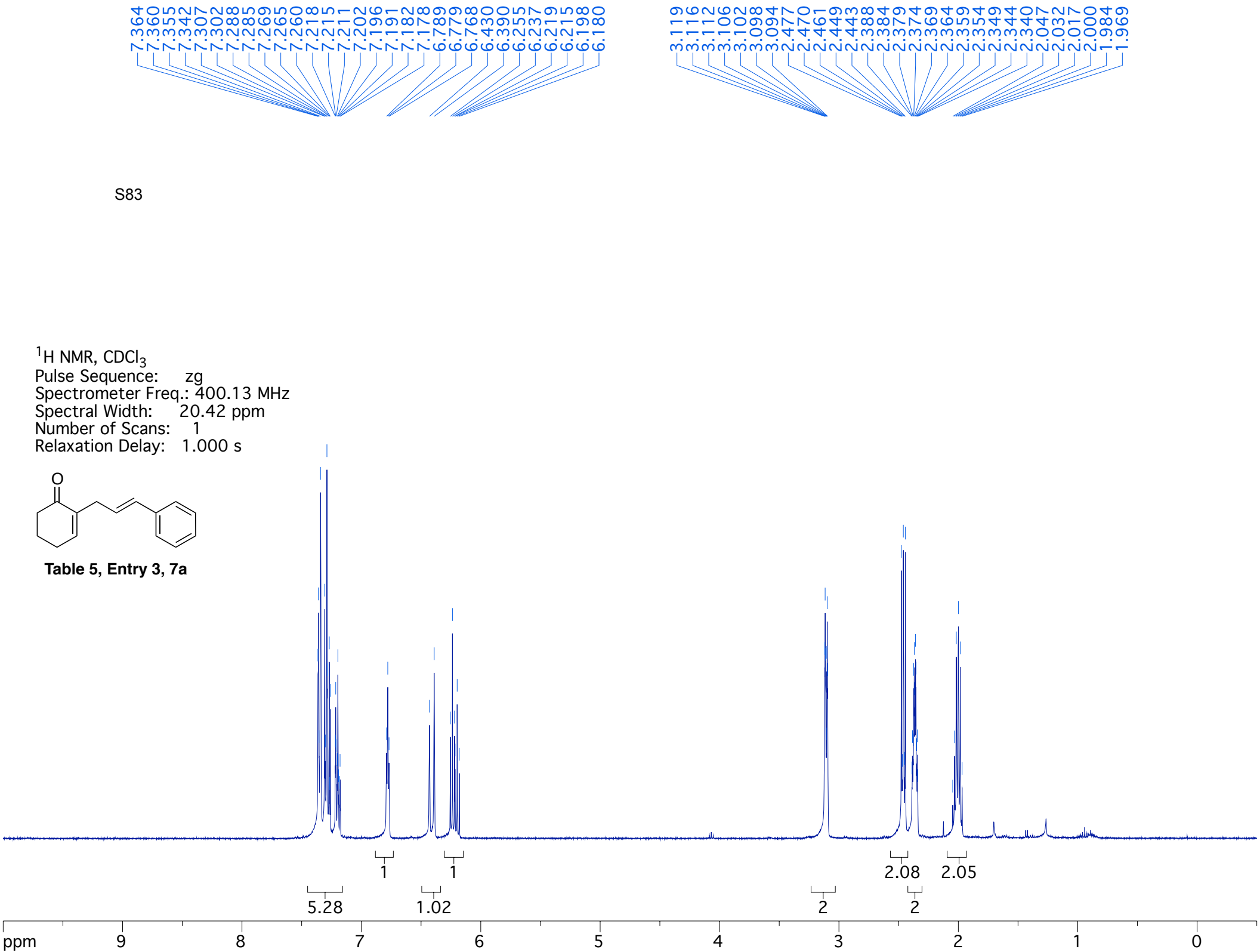


Table 5, Entry 3, 7a



^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 166
Relaxation Delay: 2.000 s

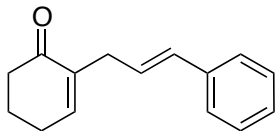


Table 5, Entry 3, 7a

199.114
S84

146.083
138.418
137.573
131.709
128.584
127.738
127.168
126.158

77.482
77.160
76.841

38.570
32.854
26.218
23.204

ppm

200

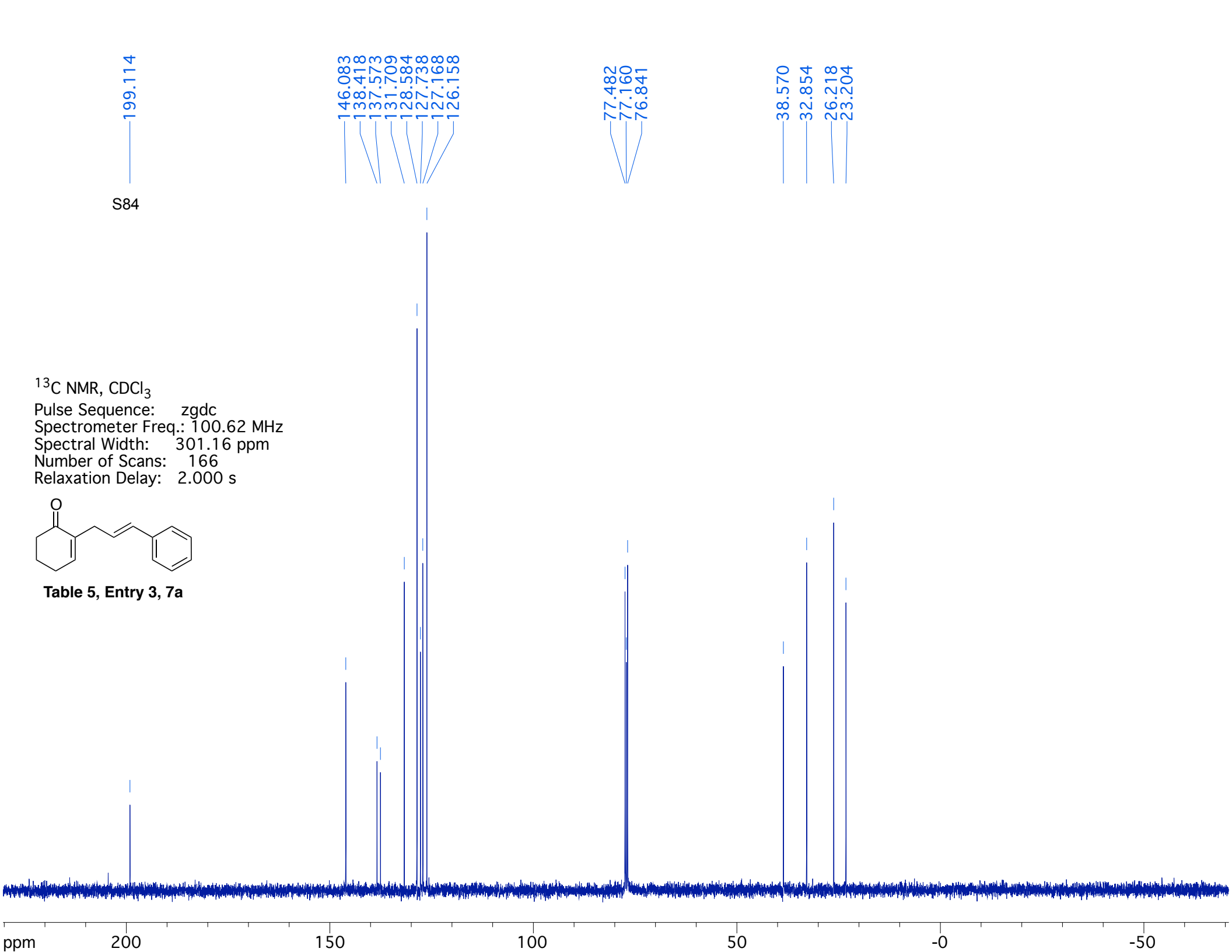
150

100

50

-0

-50



S85

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

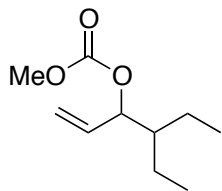
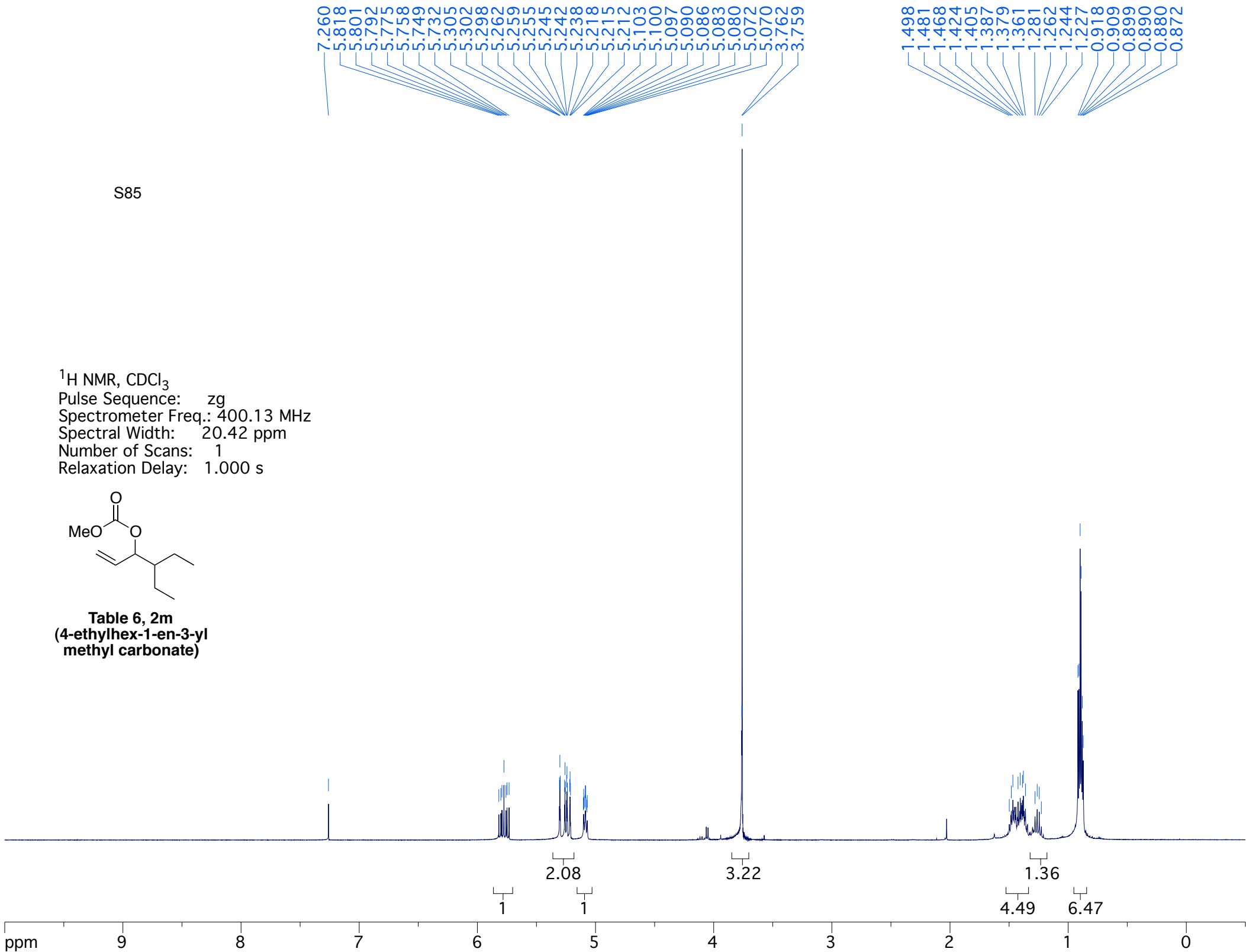


Table 6, 2m
(4-ethylhex-1-en-3-yl
methyl carbonate)



S86

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 88
Relaxation Delay: 2.000 s

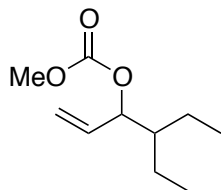
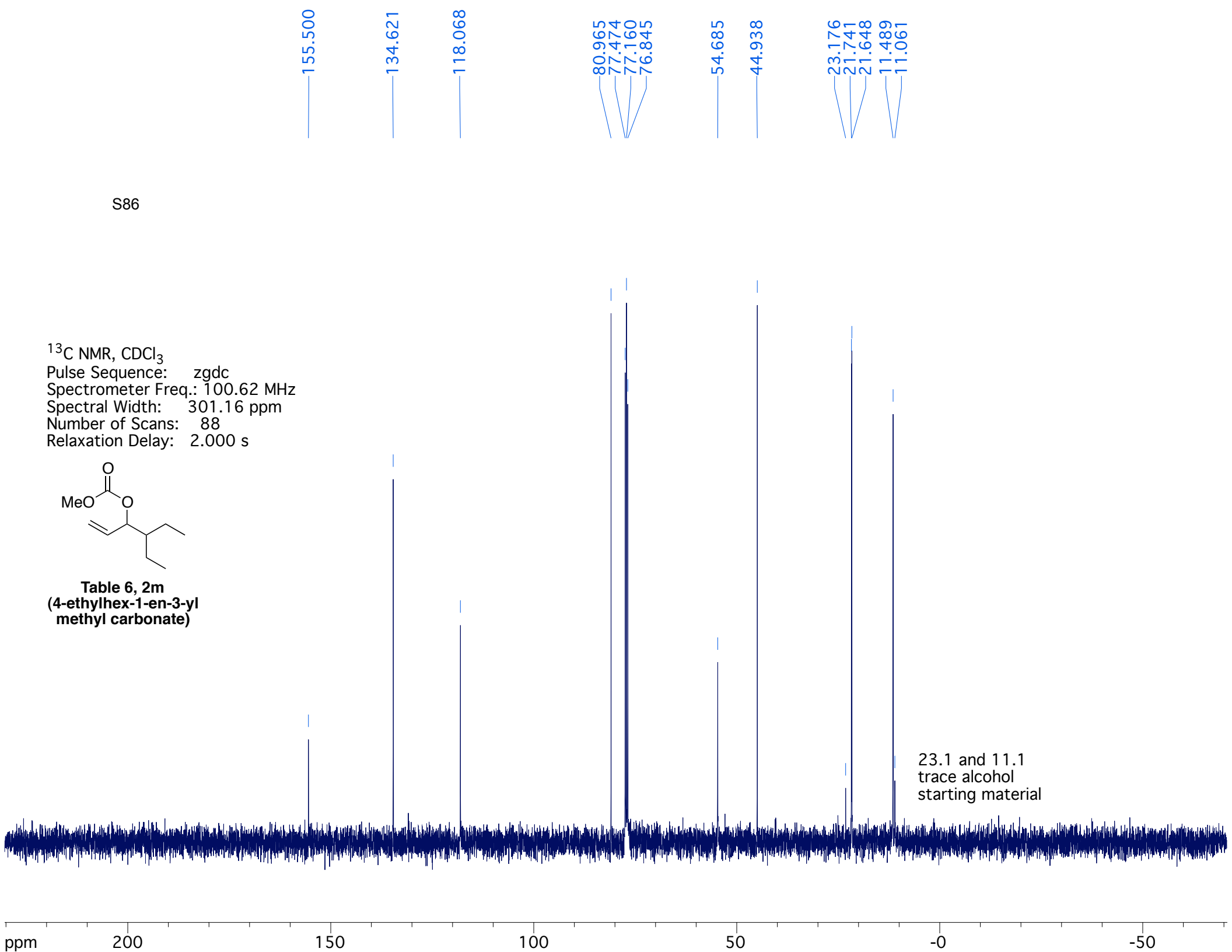


Table 6, 2m
(4-ethylhex-1-en-3-yl
methyl carbonate)



7.313
7.309
7.299
7.294
7.280
7.276
7.260
7.220
7.217
7.199
7.196
7.179
5.890
5.873
5.863
5.847
5.830
5.820
5.804
5.363
5.360
5.357
5.320
5.317
5.314
5.272
5.270
5.267
5.246
5.243
5.241
5.127
5.110
5.094
5.077
3.795
2.765
2.749
2.742
2.730
2.725
2.714
2.710
2.706
2.693
2.690
2.687
2.670
2.659
2.651
2.635
2.110
2.092
2.076
2.051
2.033
2.017
1.987
1.972
1.947
1.932
1.898

S87

^1H NMR, CDCl_3
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

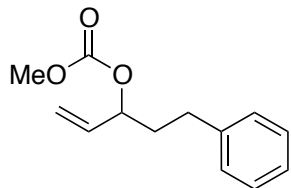
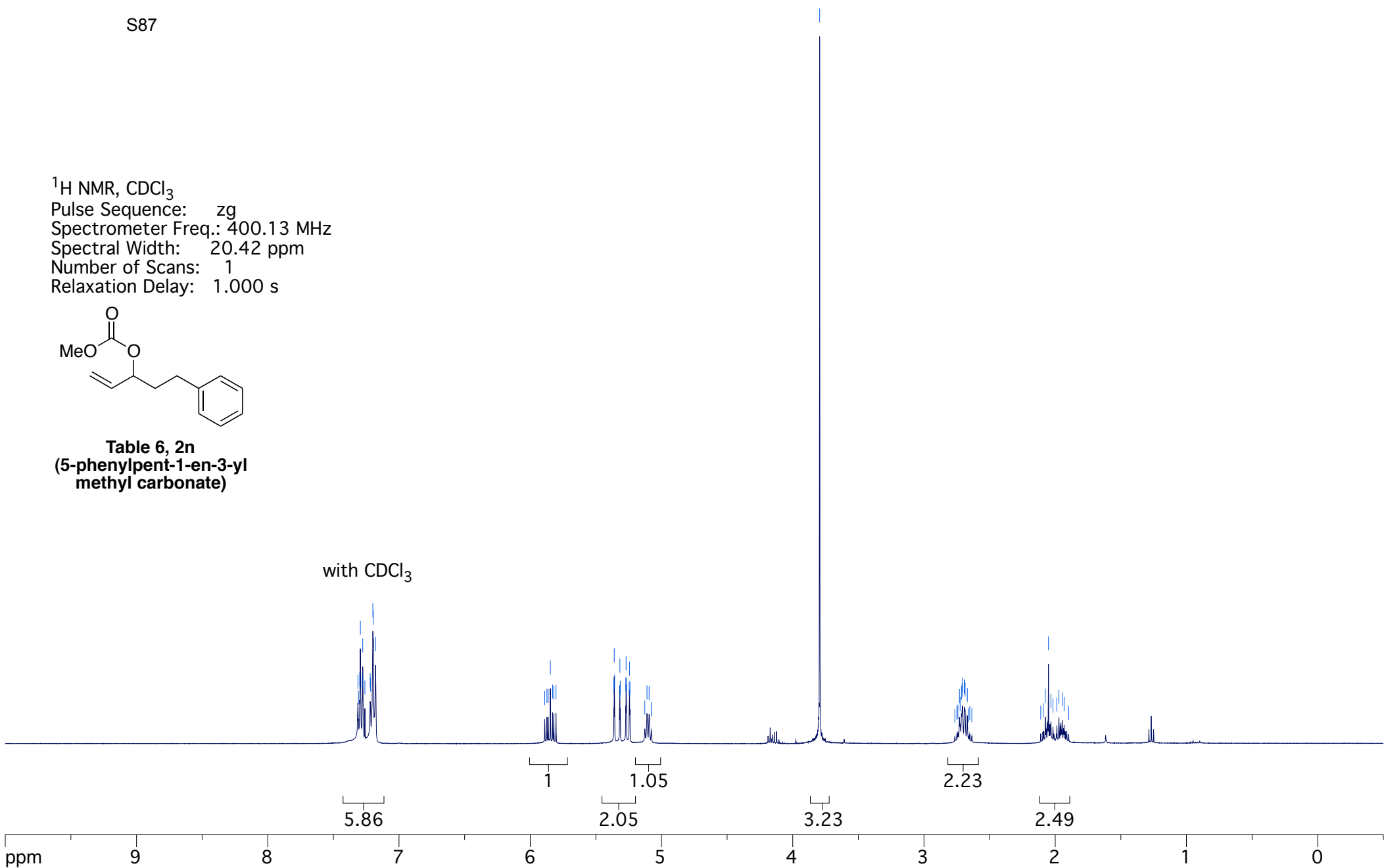


Table 6, 2n
(5-phenylpent-1-en-3-yl
methyl carbonate)

with CDCl_3



S88

^{13}C NMR, CDCl_3
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 102
Relaxation Delay: 2.000 s

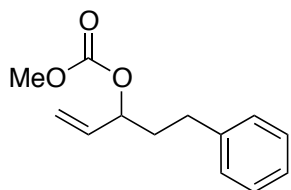
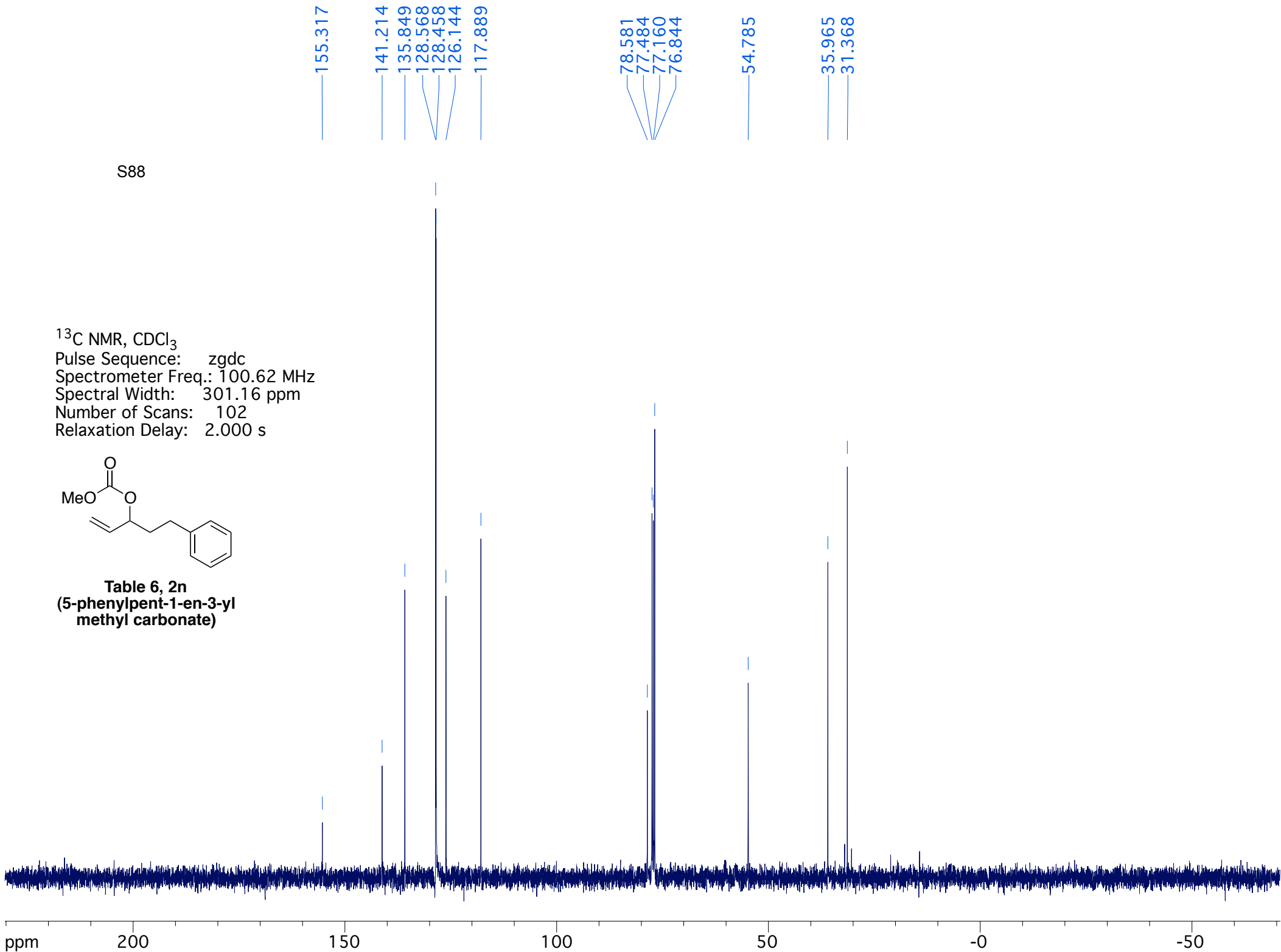


Table 6, 2n
(5-phenylpent-1-en-3-yl
methyl carbonate)



7.260
6.710
6.700
6.689
5.358
5.341
5.320
5.303
5.286
5.173
5.152
5.135
5.114
2.899
2.882
2.435
2.418
2.401
2.368
2.363
2.358
2.353
2.348
2.343
2.338
2.334
2.328
2.323
2.318
2.033
2.002
1.986
1.969
1.953
1.938
1.770
1.757
1.748
1.736
1.725
1.715
1.703
1.693
1.680
1.430
1.418
1.412
1.399
1.398
1.393
1.378
1.366
1.360
1.347
1.341
1.329
1.245
1.233
1.214
1.212
1.199
1.196
1.193
1.180
1.159
1.141
0.835
0.817
0.798

S89

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

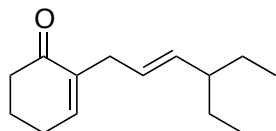
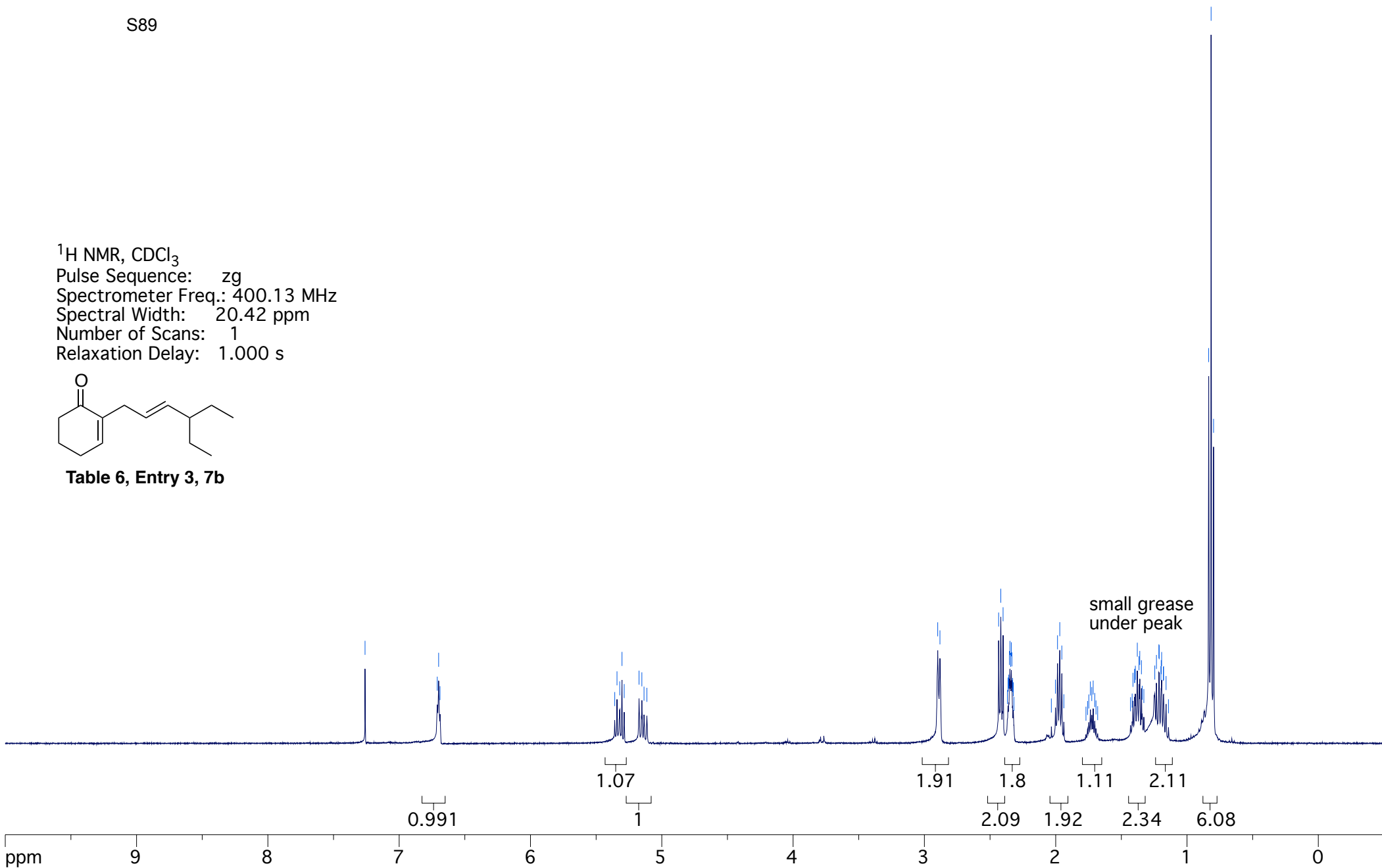


Table 6, Entry 3, 7b



S90

¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 155
Relaxation Delay: 2.000 s

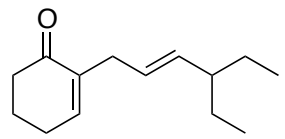
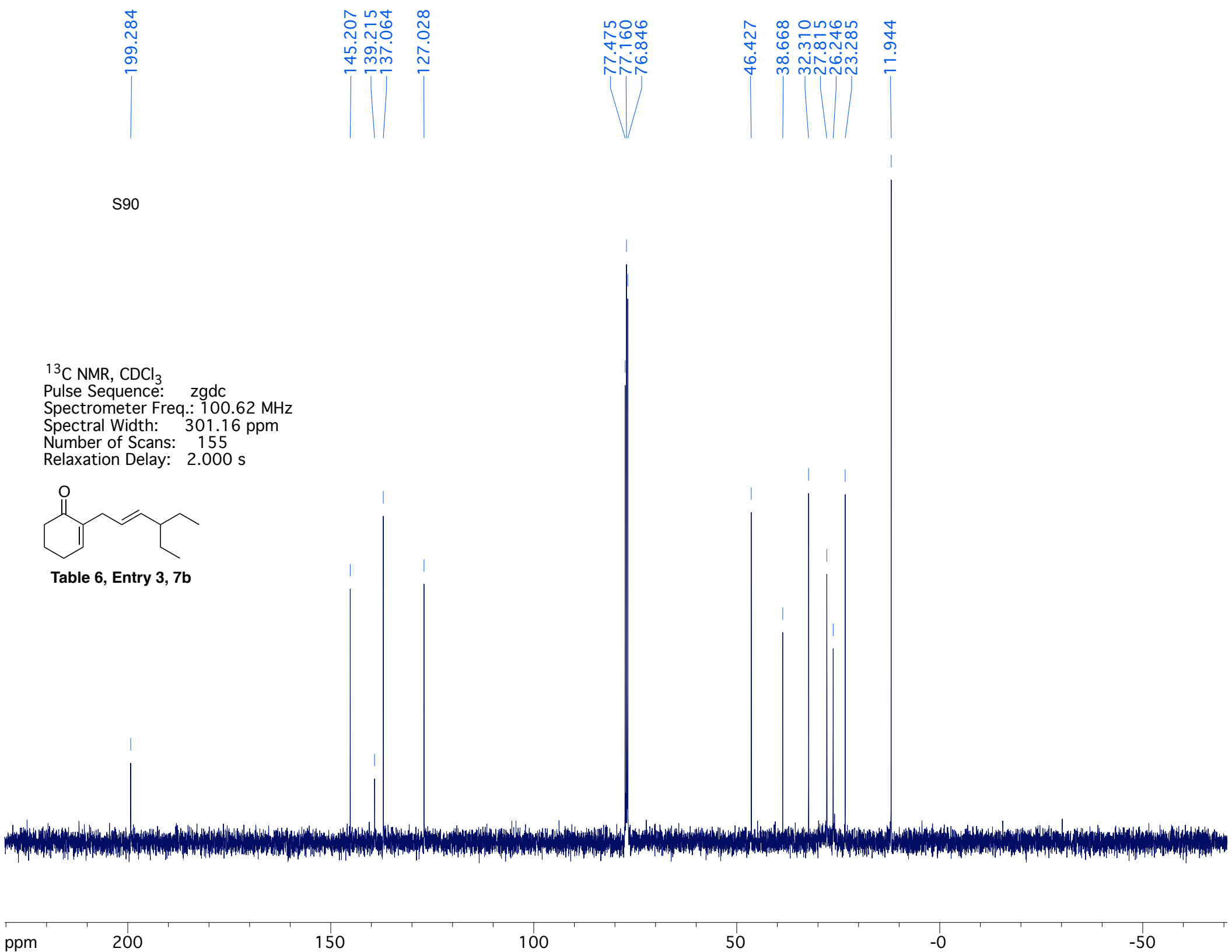


Table 6, Entry 3, 7b



7.291
7.286
7.275
7.271
7.260
7.254
7.253
7.249
7.194
7.191
7.178
7.174
7.158
6.534
6.524
6.513
5.513
5.510
5.494
5.479
5.472
5.456
5.440
5.422
5.409
5.406
5.404
5.393
5.390
5.387
5.384
5.370
5.368
5.366
5.352
2.872
2.857
2.706
2.688
2.668
2.440
2.433
2.426
2.417
2.405
2.400
2.369
2.367
2.350
2.331
2.328
2.322
2.316
2.312
2.307
2.302
2.297
2.292
2.287
2.282
1.995
1.979
1.962
1.946
1.931

S91

with CDCl₃

¹H NMR, CDCl₃
Pulse Sequence: zg
Spectrometer Freq.: 400.13 MHz
Spectral Width: 20.42 ppm
Number of Scans: 1
Relaxation Delay: 1.000 s

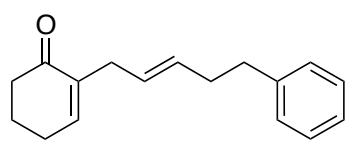
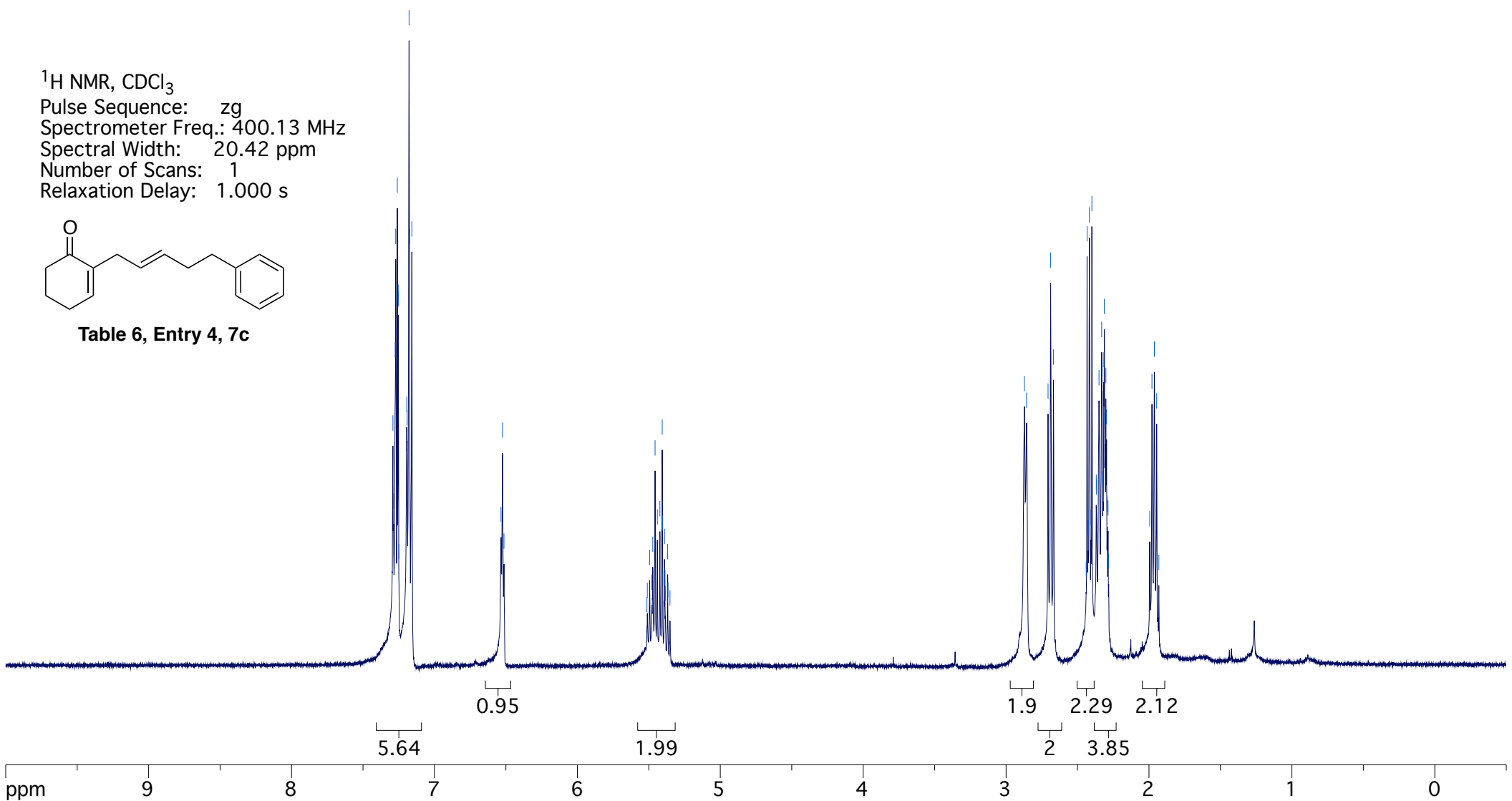


Table 6, Entry 4, 7c



¹³C NMR, CDCl₃
Pulse Sequence: zgdc
Spectrometer Freq.: 100.62 MHz
Spectral Width: 301.16 ppm
Number of Scans: 119
Relaxation Delay: 2.000 s

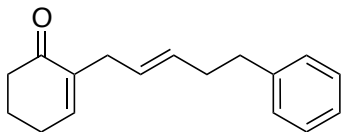


Table 6, Entry 4, 7c

199.285
S92

145.593
142.083
138.738
131.680
128.666
128.335
127.945
125.816

77.478
77.160
76.841

38.602
35.969
34.442
32.206
26.209
23.229

ppm

200

150

100

50

-0

-50

