

**Chemoselective Synthesis of Highly Substituted 1,2-Allenic Ketones, Furans, and
1-Alkynyl Ketones from Reaction of Lithium Selenolates with 1-(1-Alkynyl)
cyclopropyl Ketones and Electrophiles**

Jianfeng Xu,[†] Shugao Zhu,[†] Luling Wu^{*,†} and Xian Huang^{†,‡}

wululing@zju.edu.cn

^a *Department of Chemistry, Zhejiang University, Xi-xi Campus, Hangzhou 310028, Zhejiang, People's Republic of China*

^b *State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai 200032, People's Republic of China*

Supporting Information

Crystal structure of 6a	S2
¹ H NMR and ¹³ C NMR spectra of all the compounds	S3

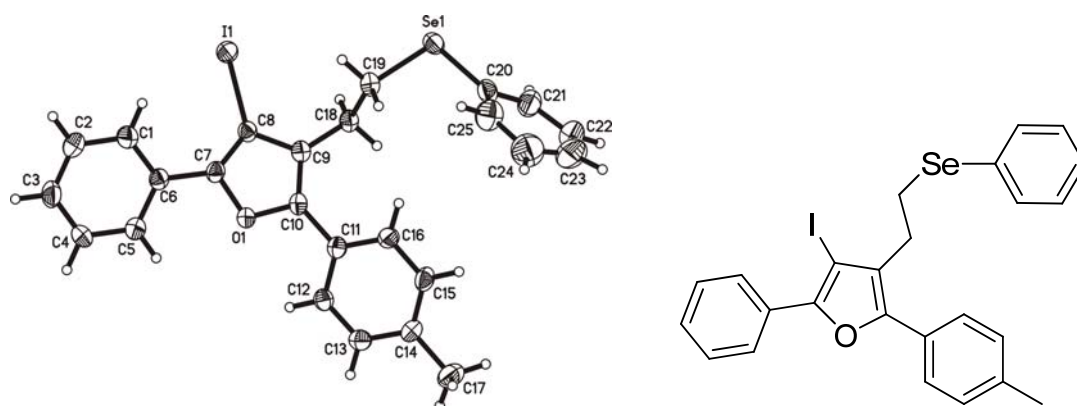
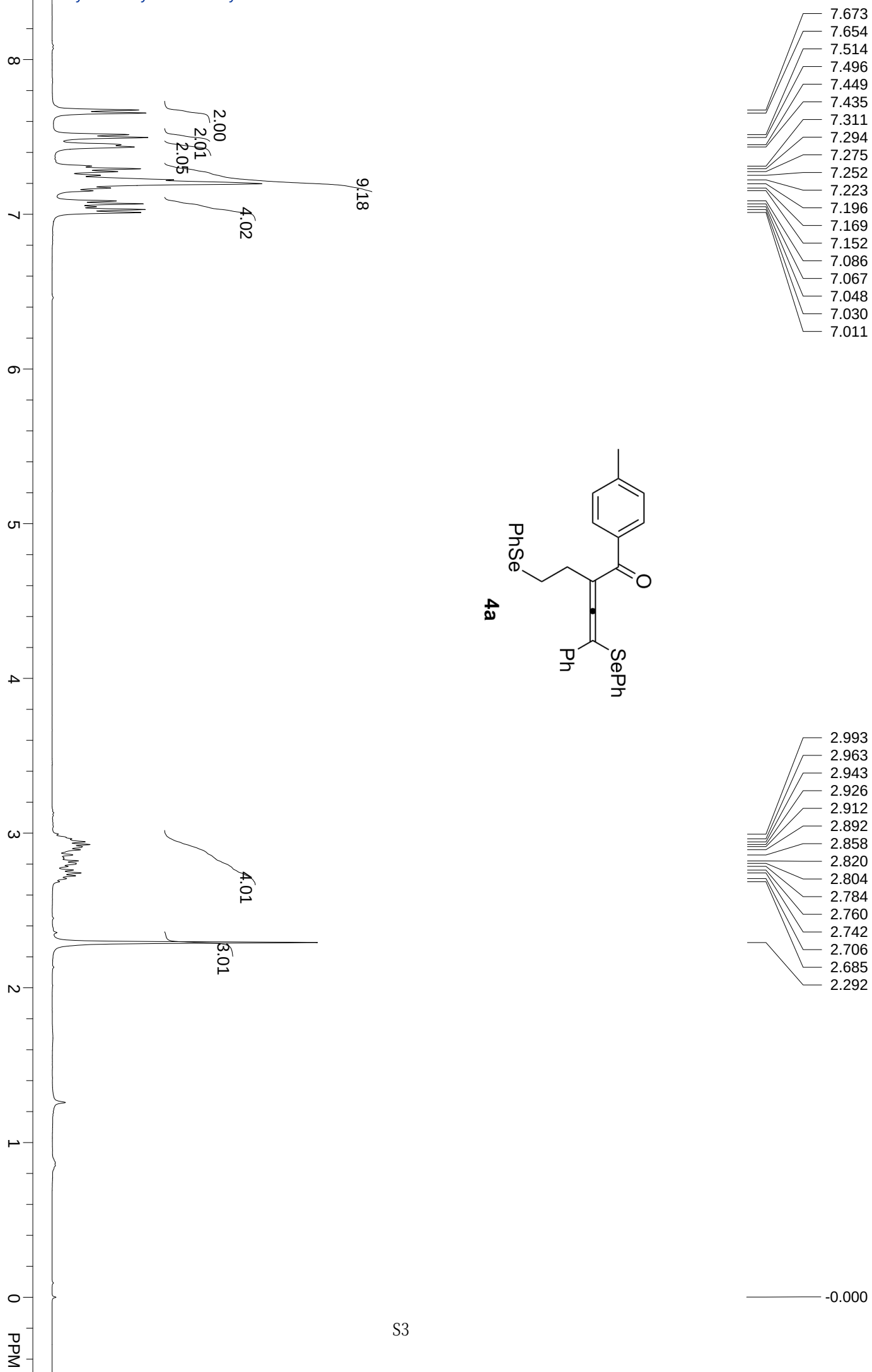
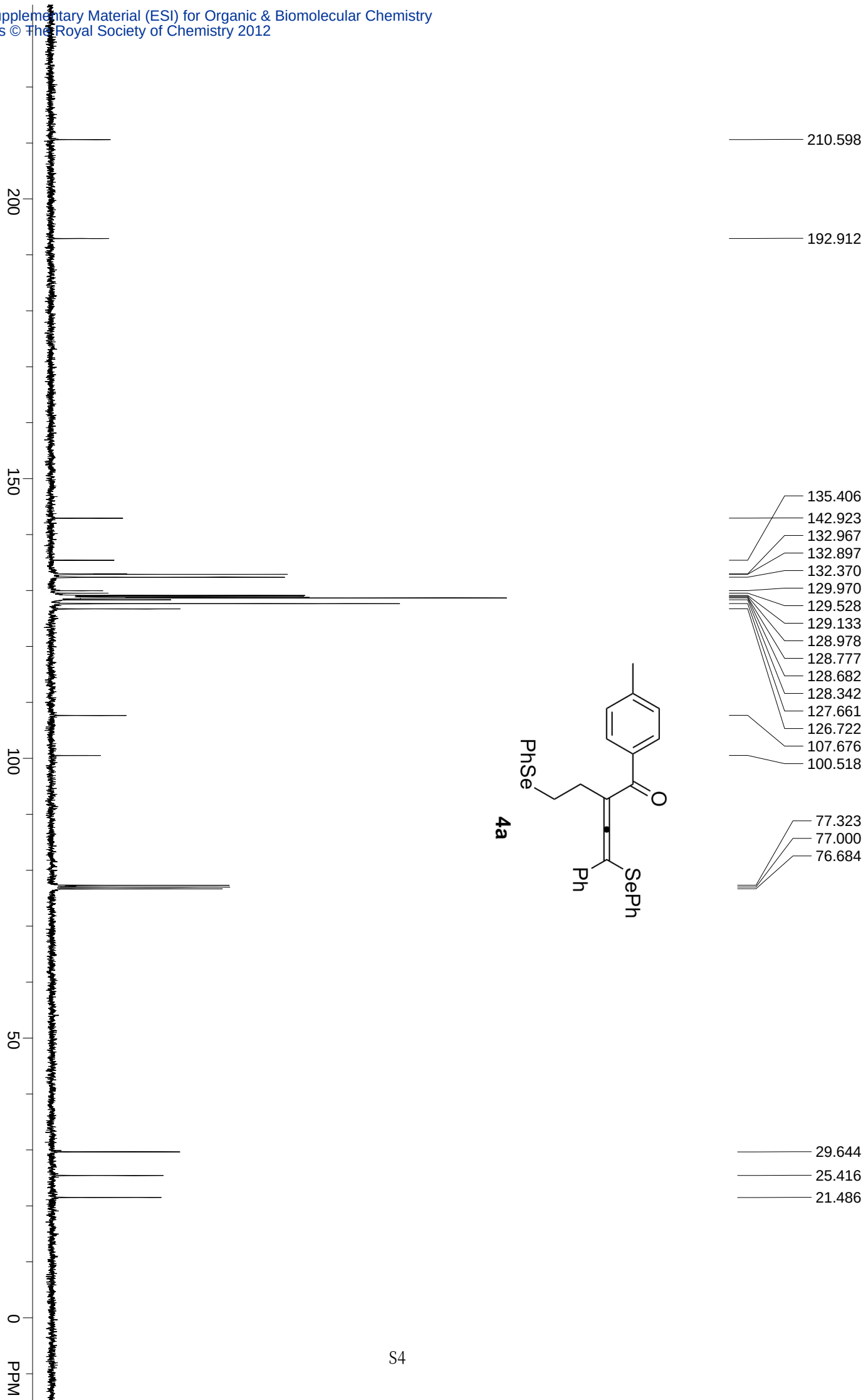
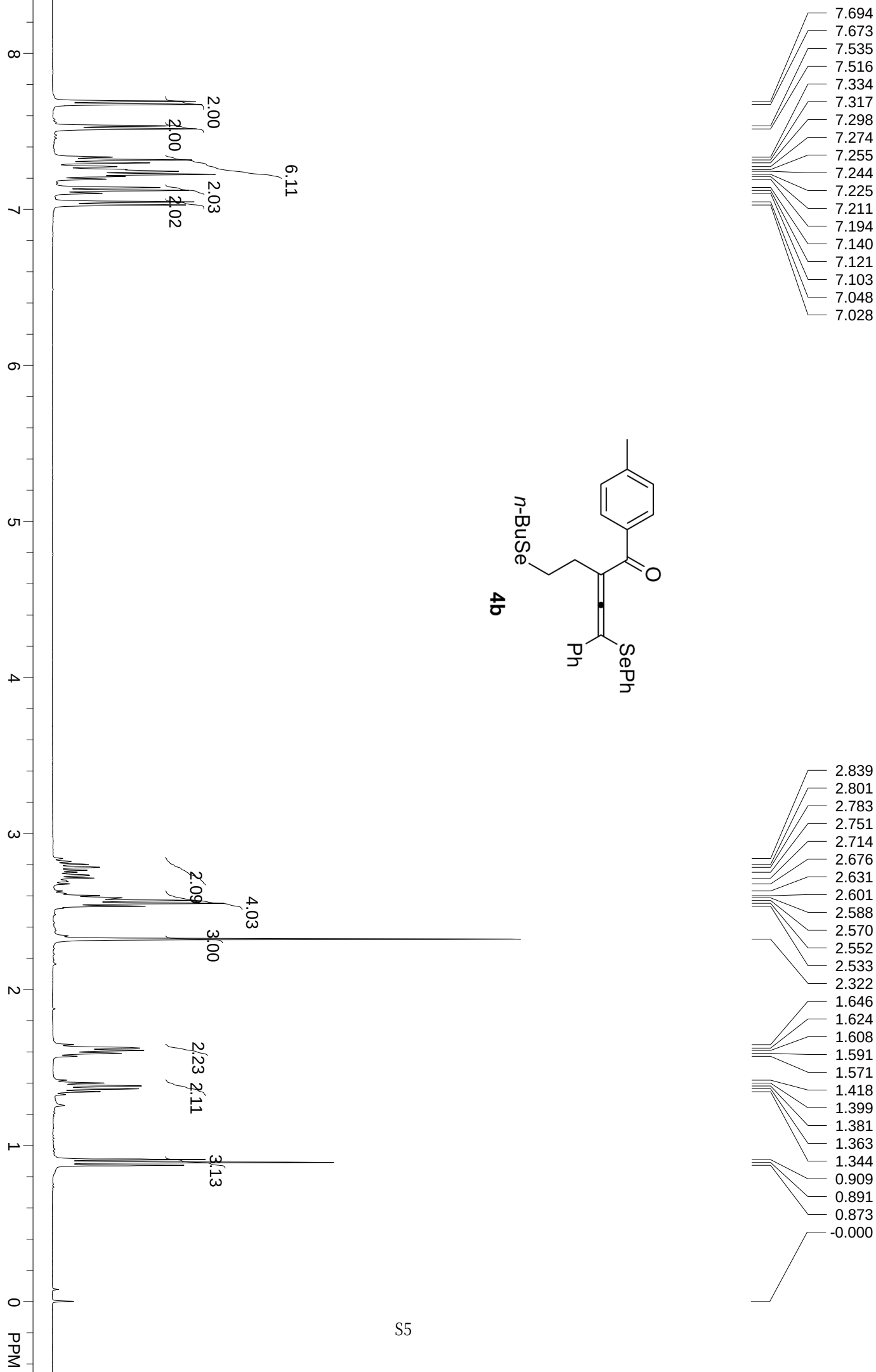
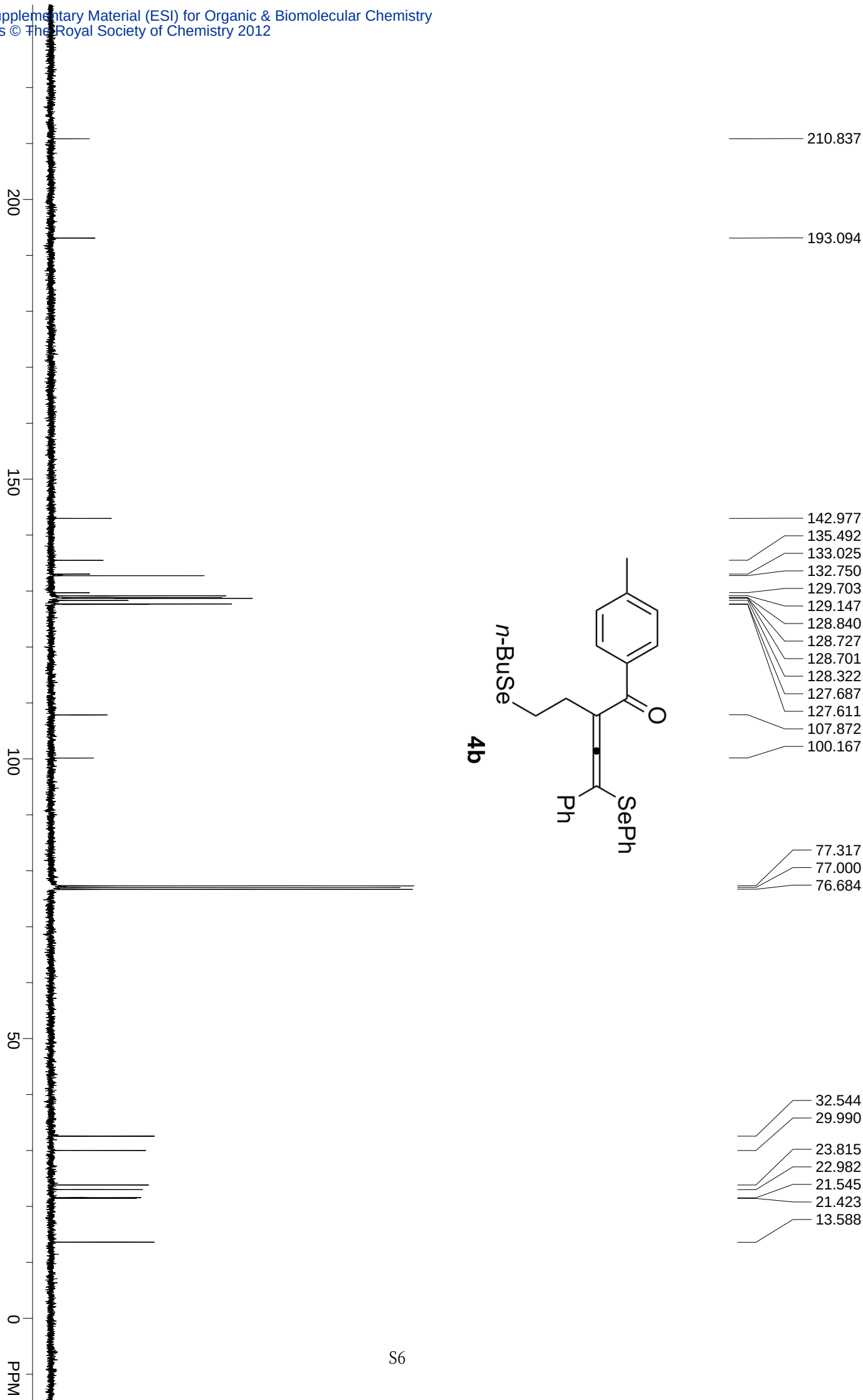


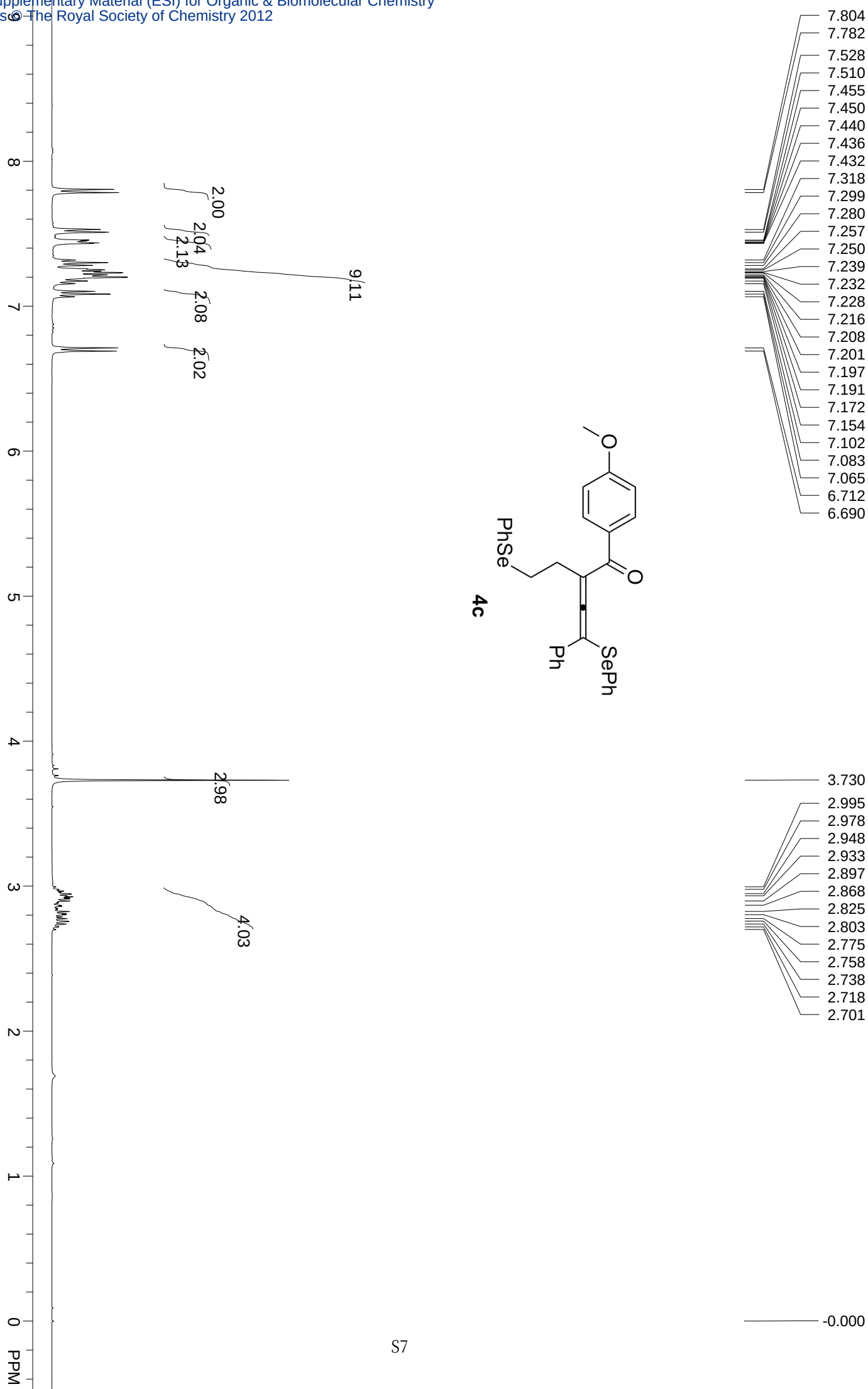
Figure S1 Crystal structure of 6a

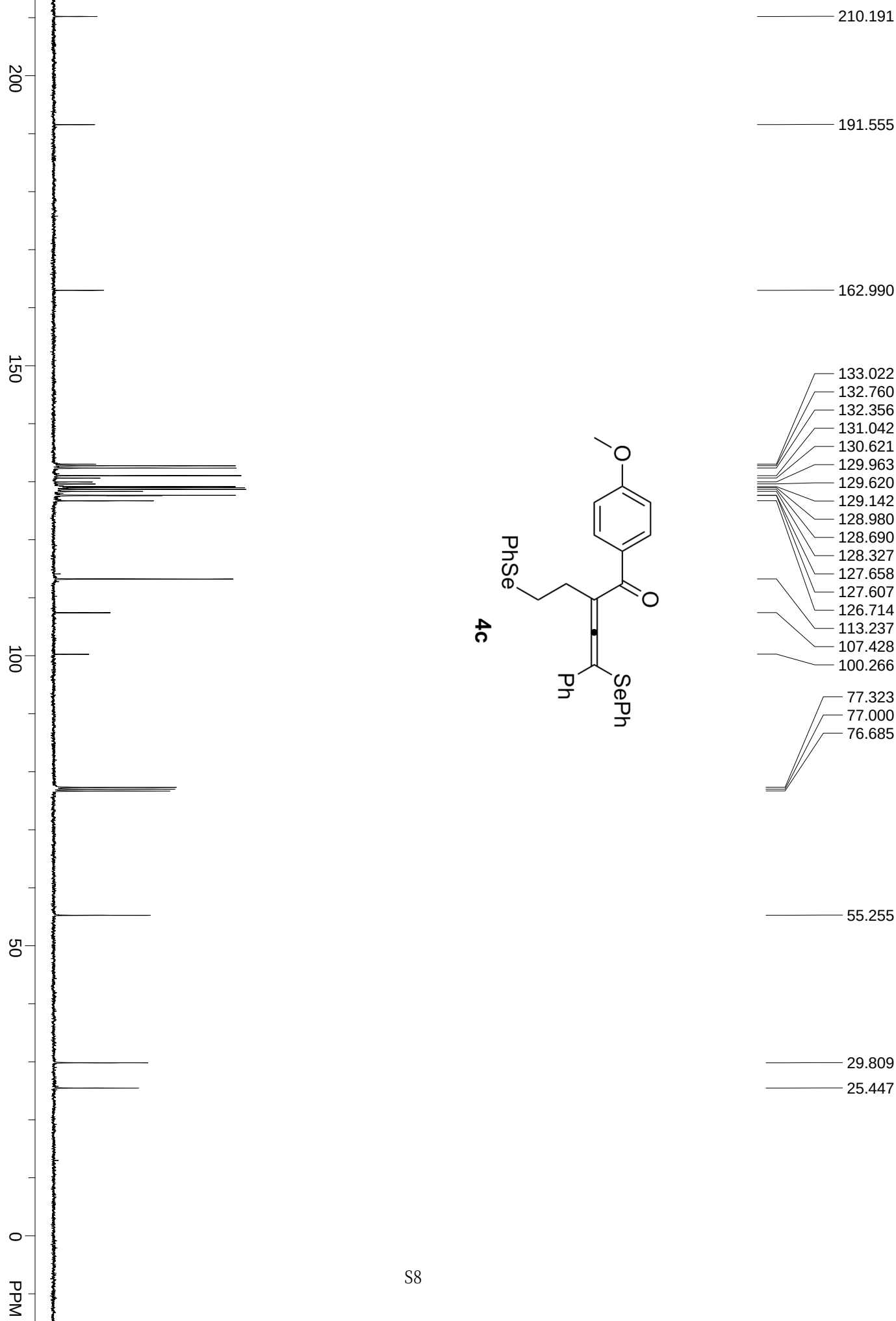


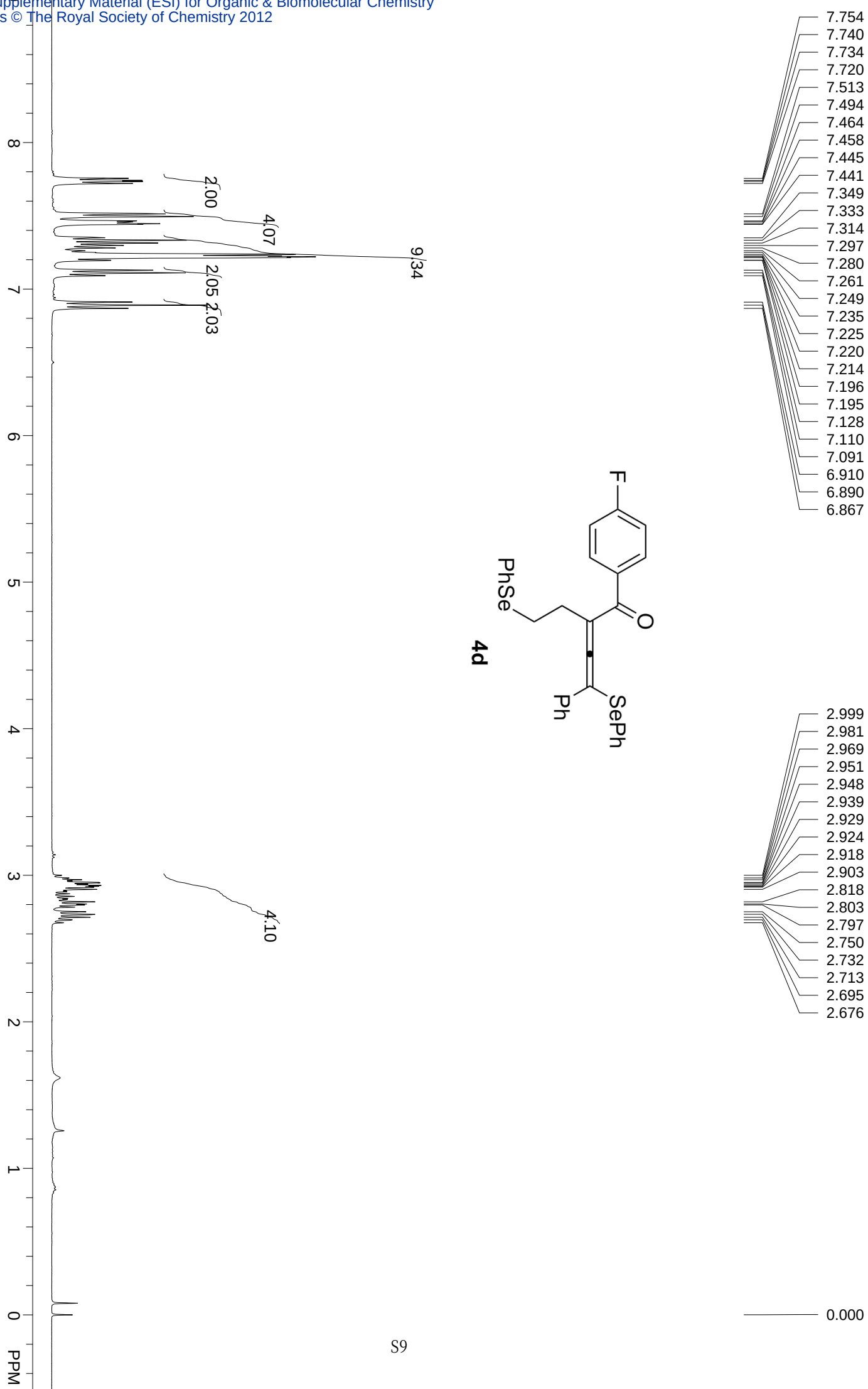




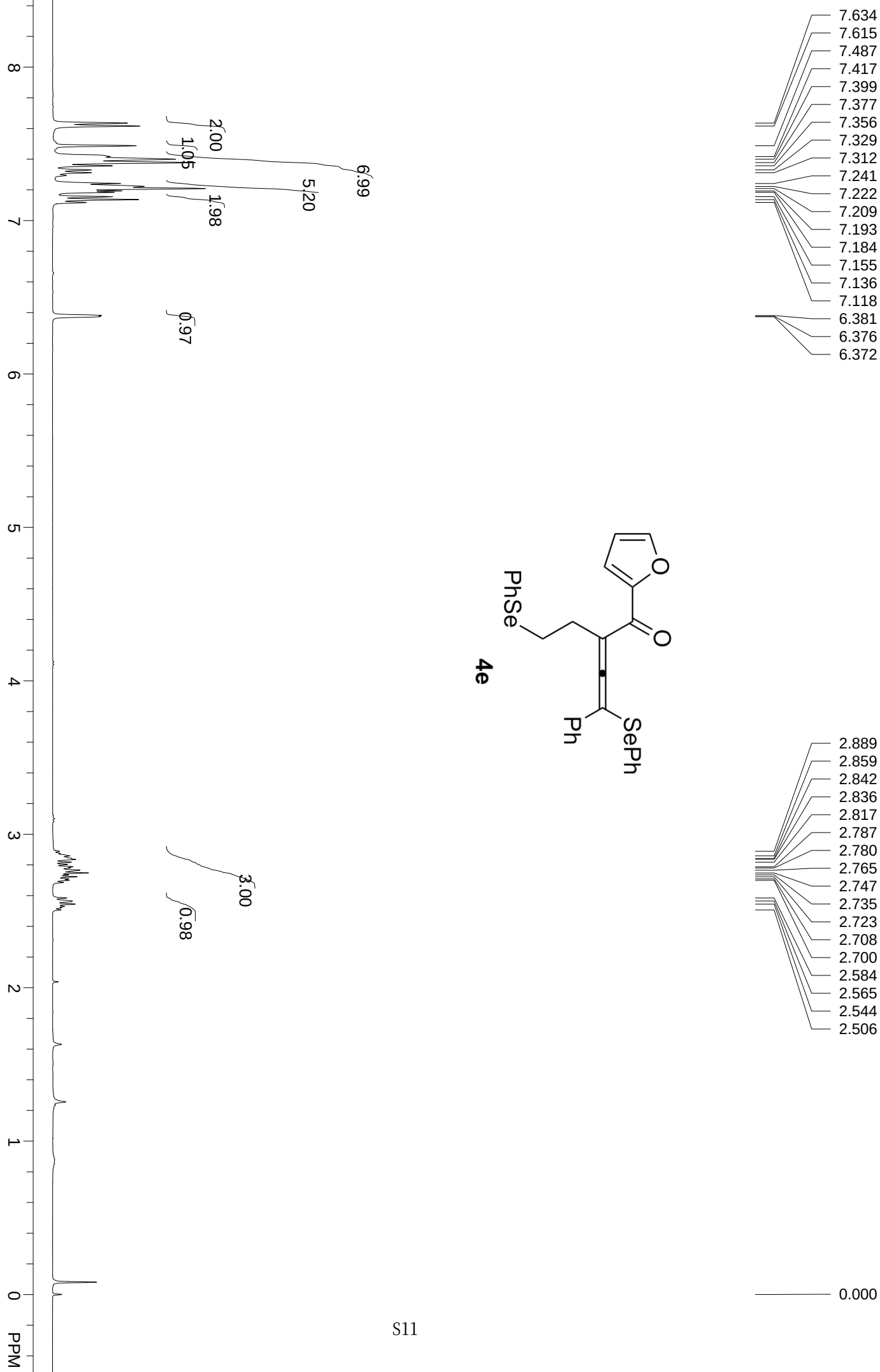




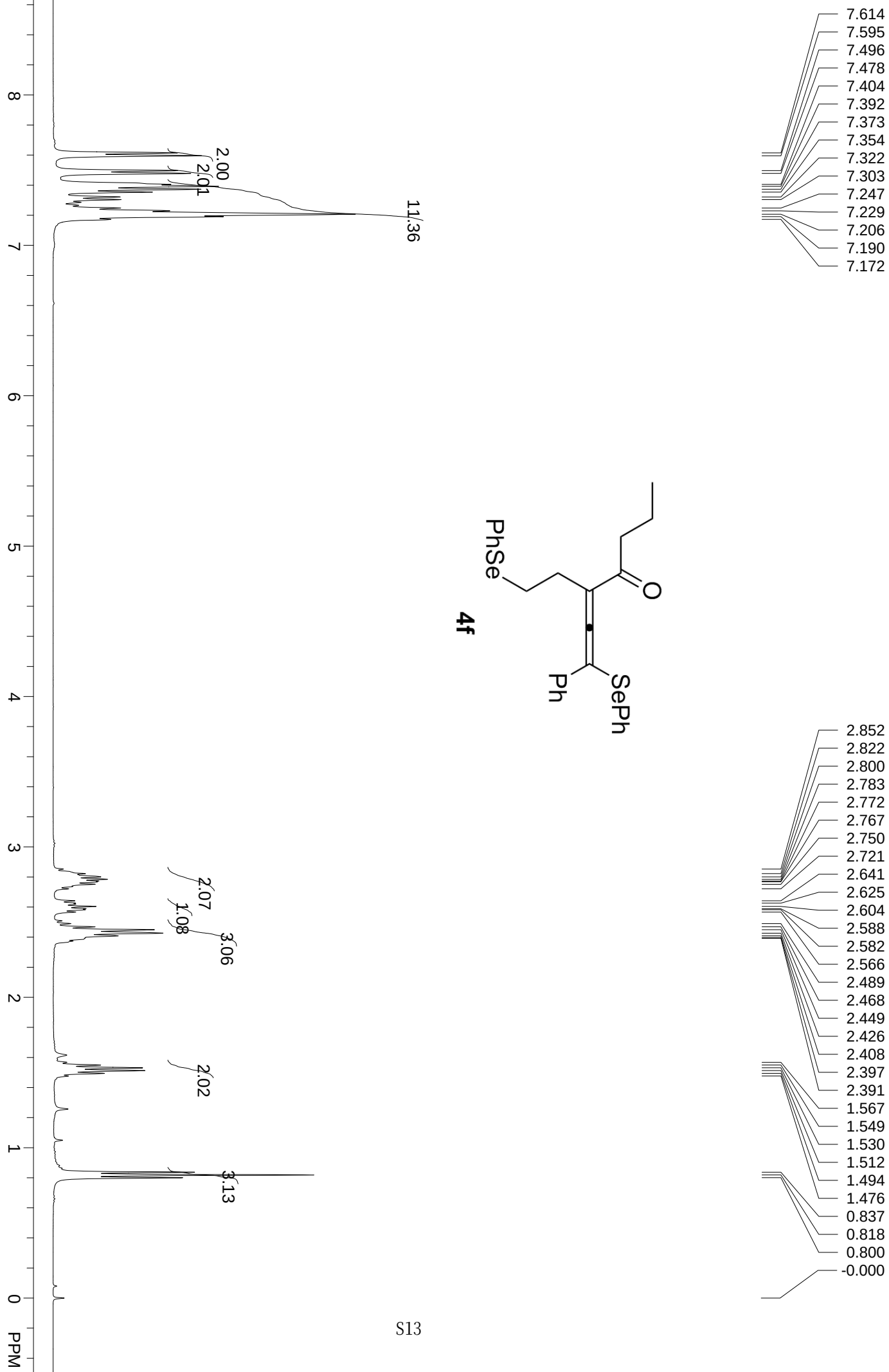




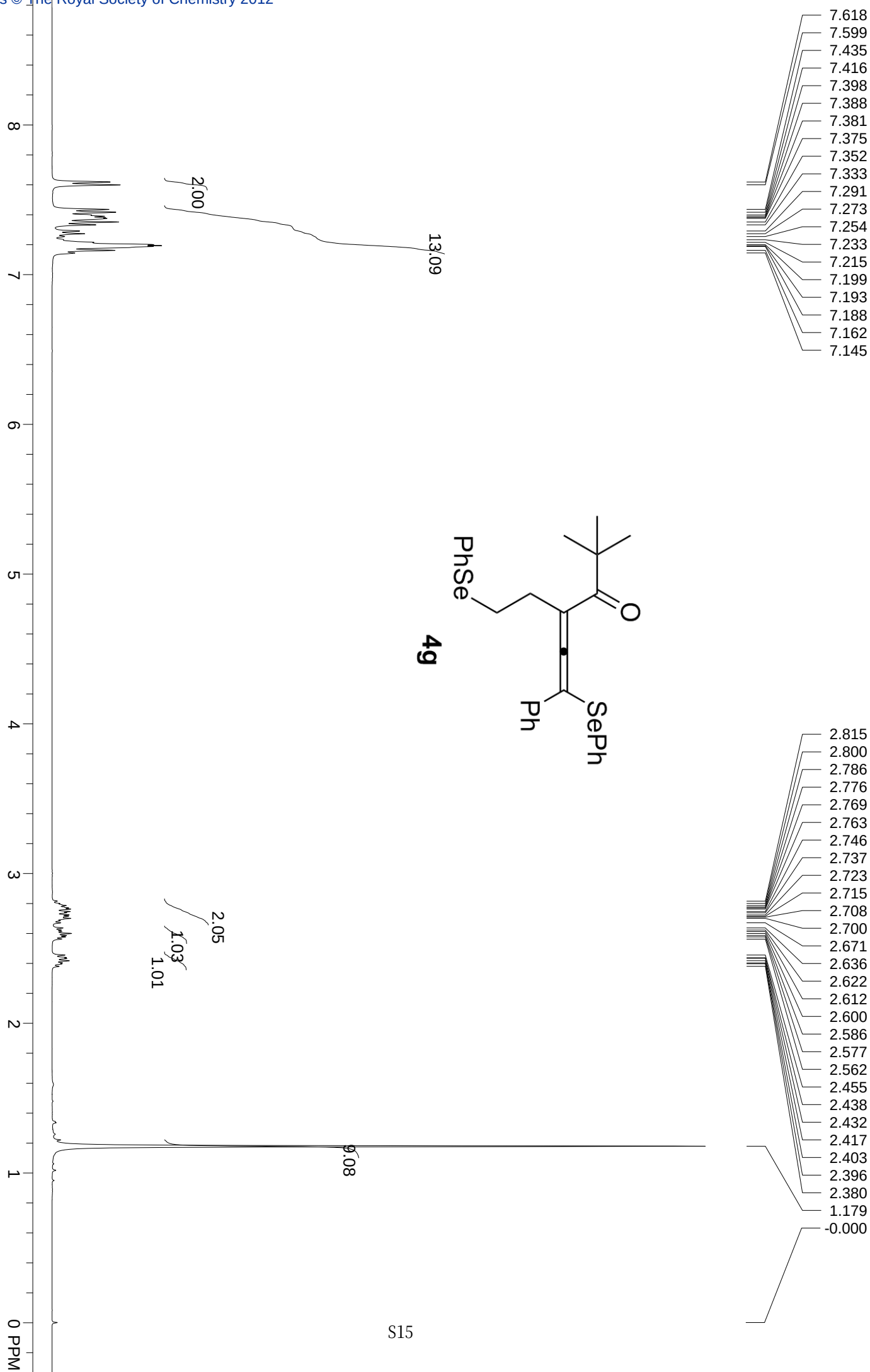


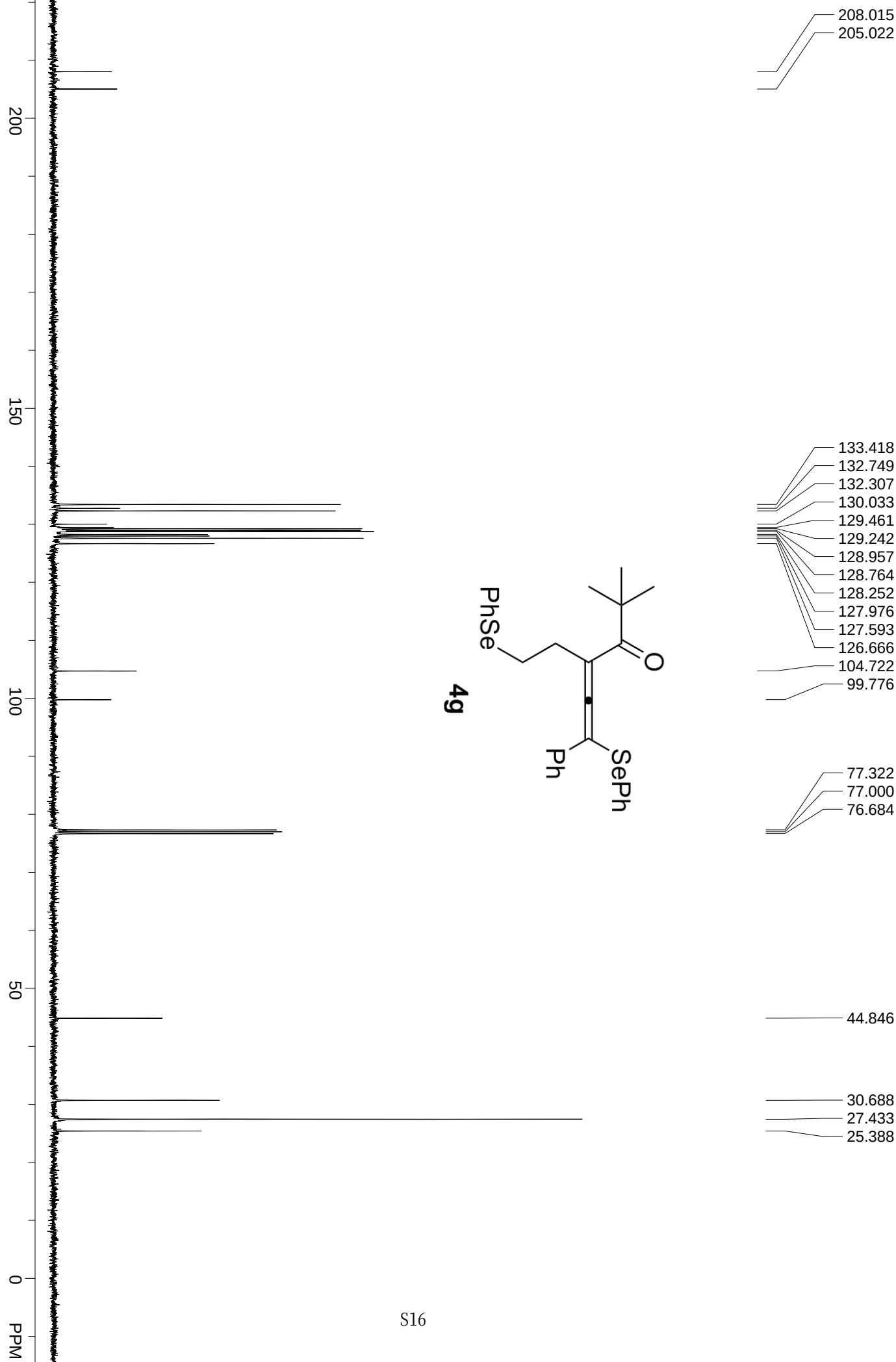


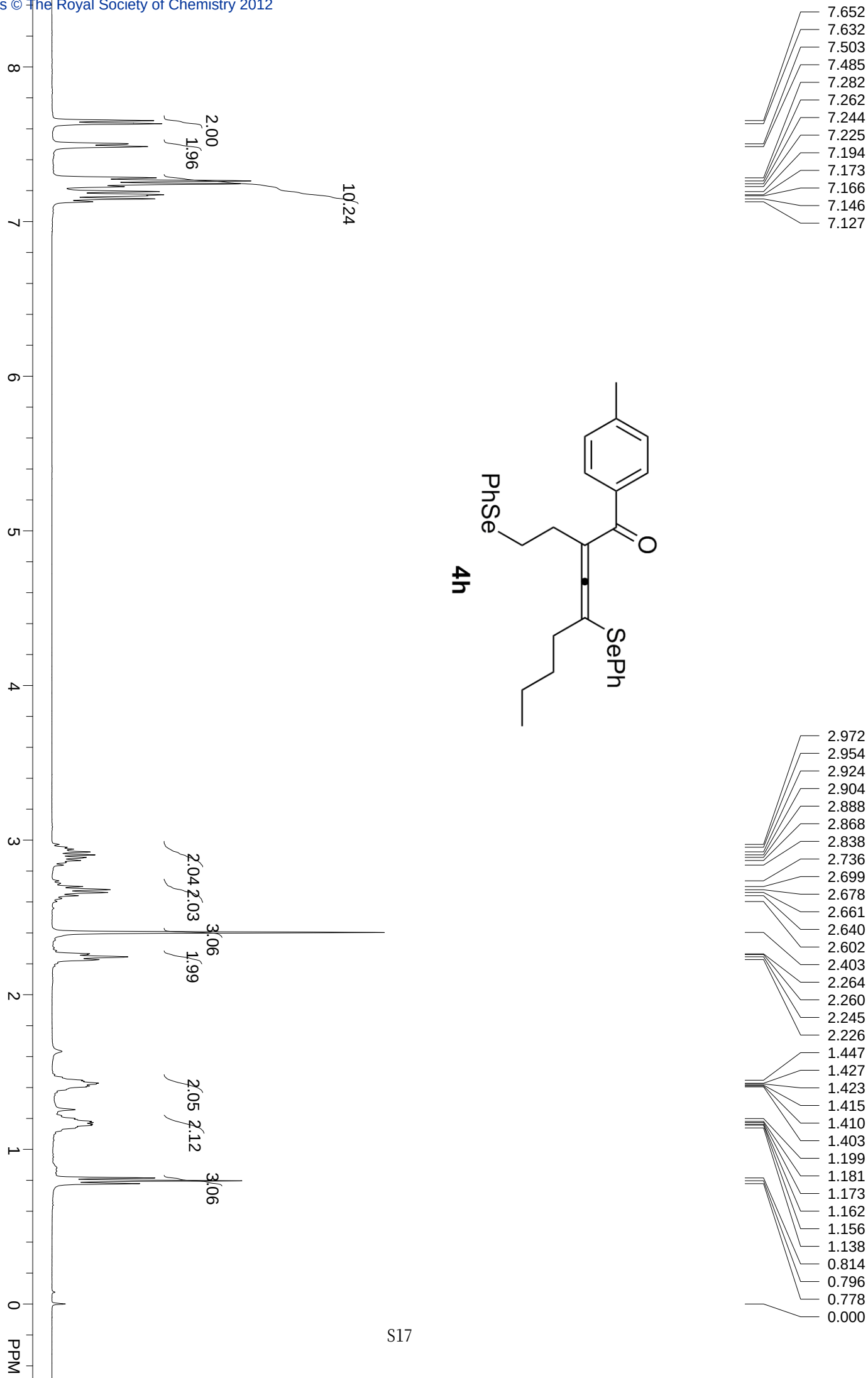




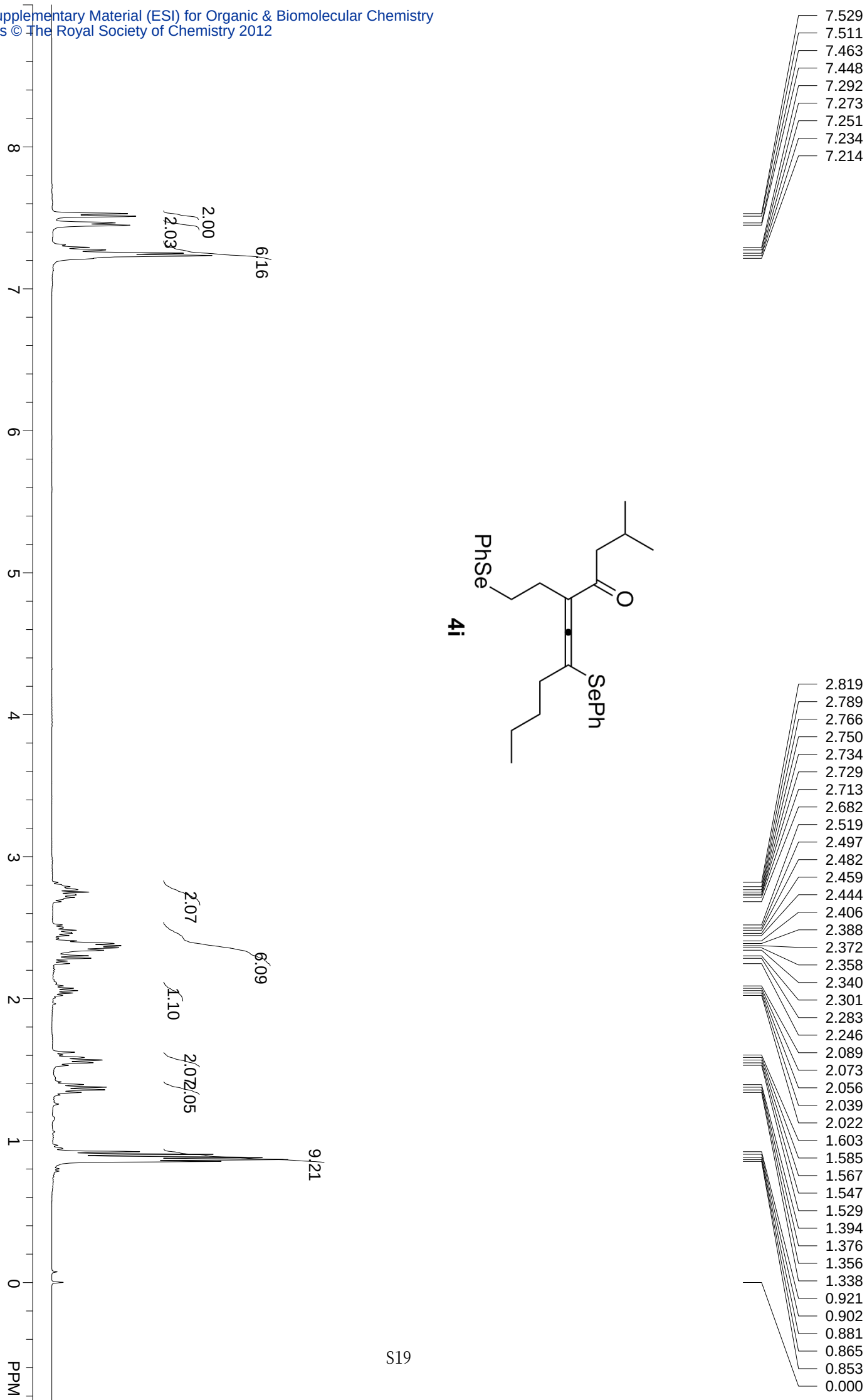


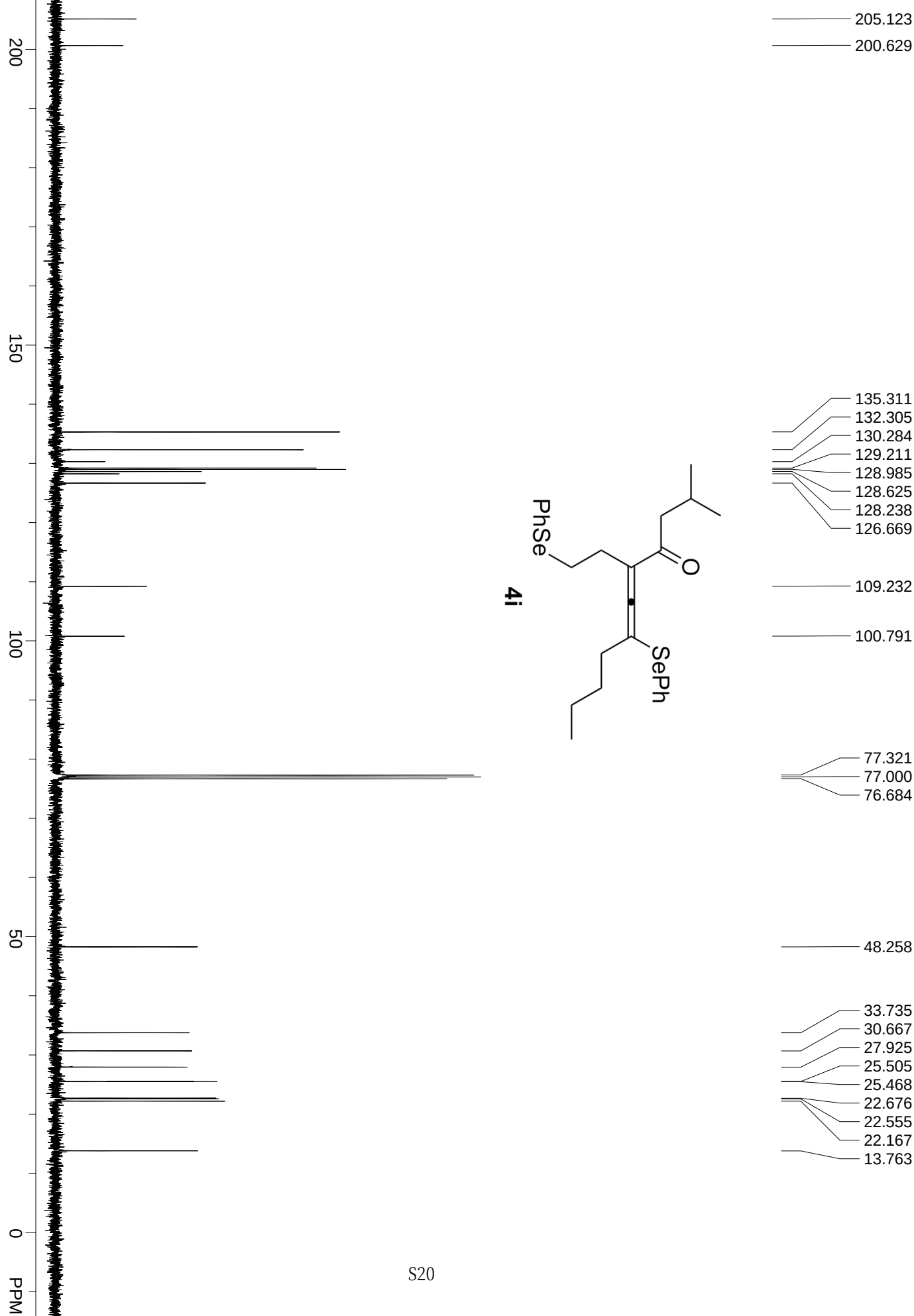


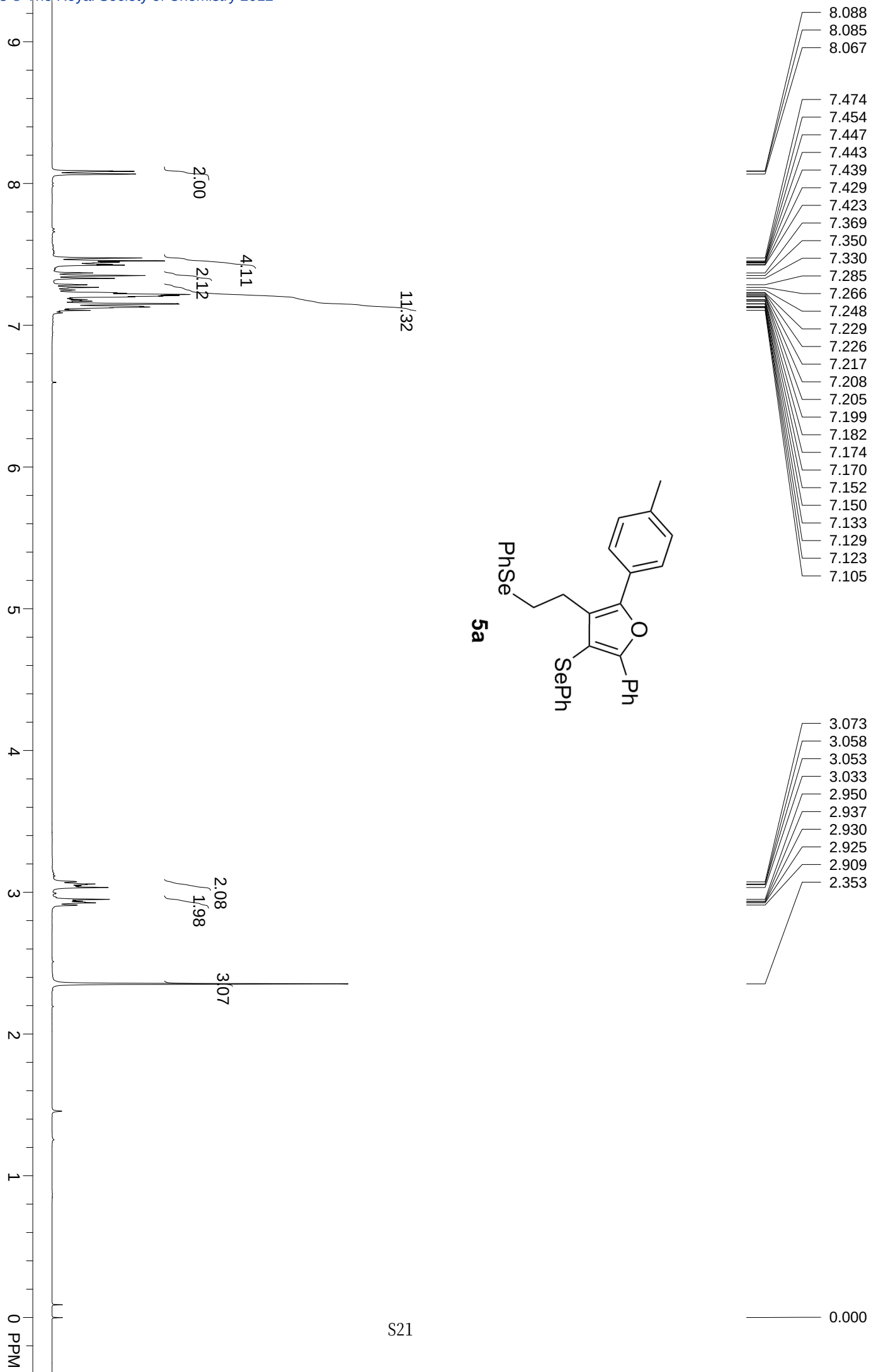












200

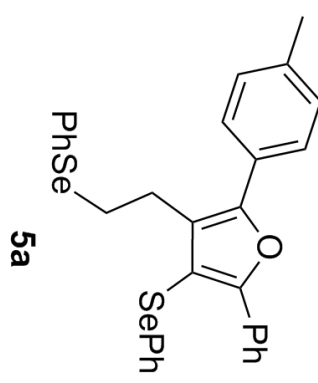
150

100

50

0

PPM



154.322

148.946

133.202

132.393

130.303

137.484

129.613

129.424

129.344

128.930

128.426

128.334

128.209

127.924

126.920

126.492

126.046

125.430

124.968

106.823

77.315

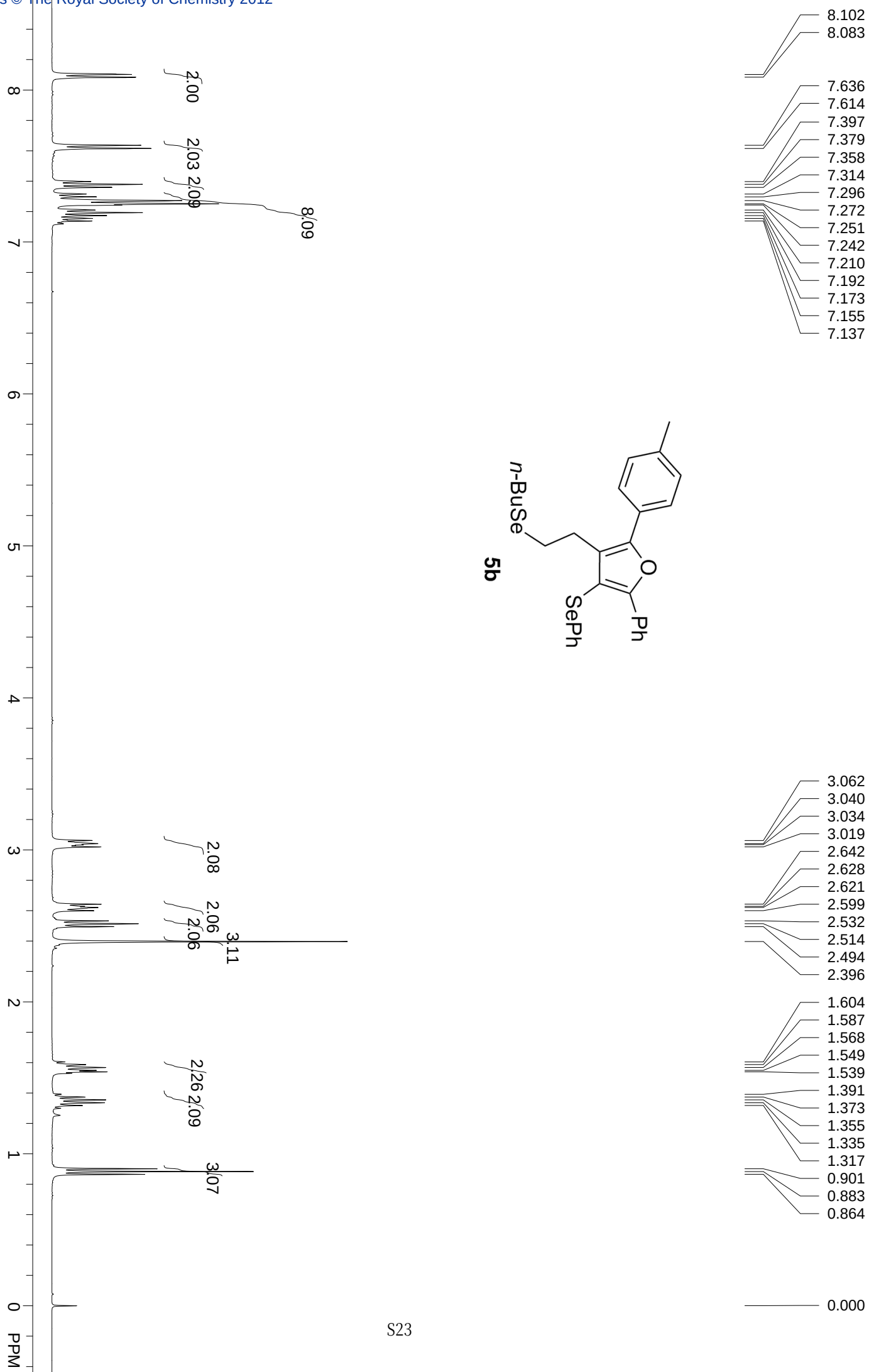
77.000

76.677

26.991

26.569

21.279



200

150

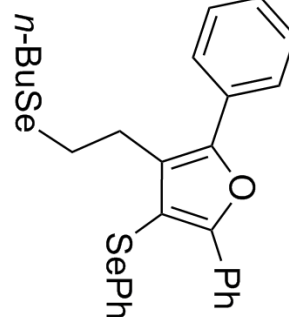
100

50

0

PPM

5b



154.384

148.932

132.482

137.620

130.369

129.484

129.366

128.349

128.313

128.221

128.103

126.519

126.026

125.545

125.303

106.794

77.316

77.000

76.675

32.771

27.388

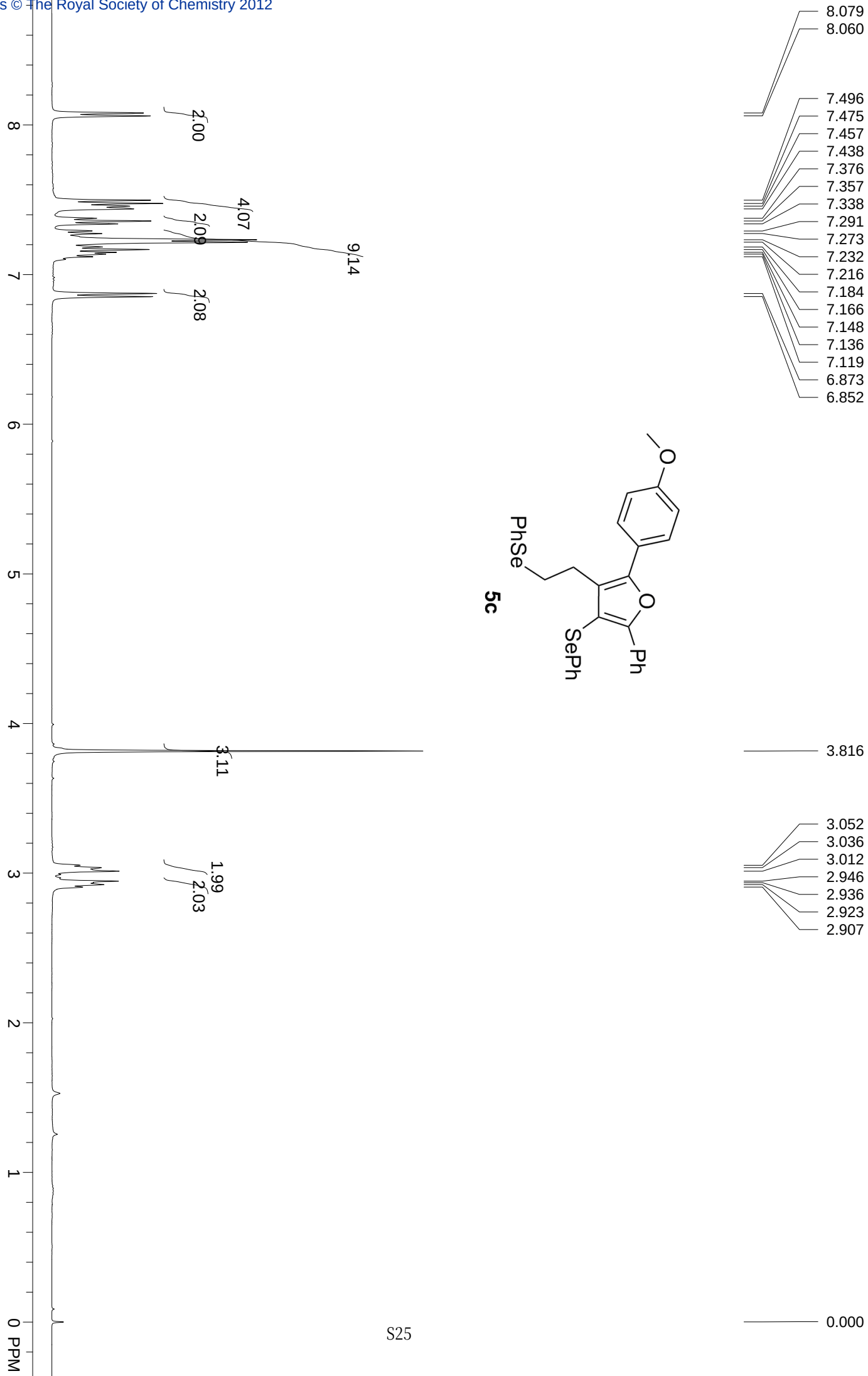
23.675

23.069

22.532

21.278

13.588



200

150

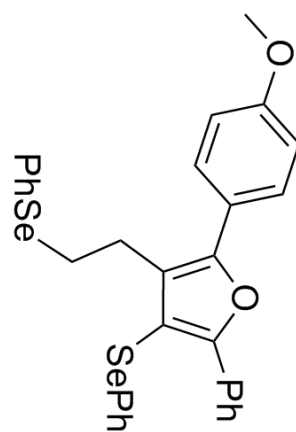
100

50

0

PPM

5c



159.039

154.054

148.840

133.294

132.411

130.313

129.597

129.329

128.940

128.391

128.324

128.124

126.942

126.400

126.033

124.117

123.493

114.163

106.704

77.315

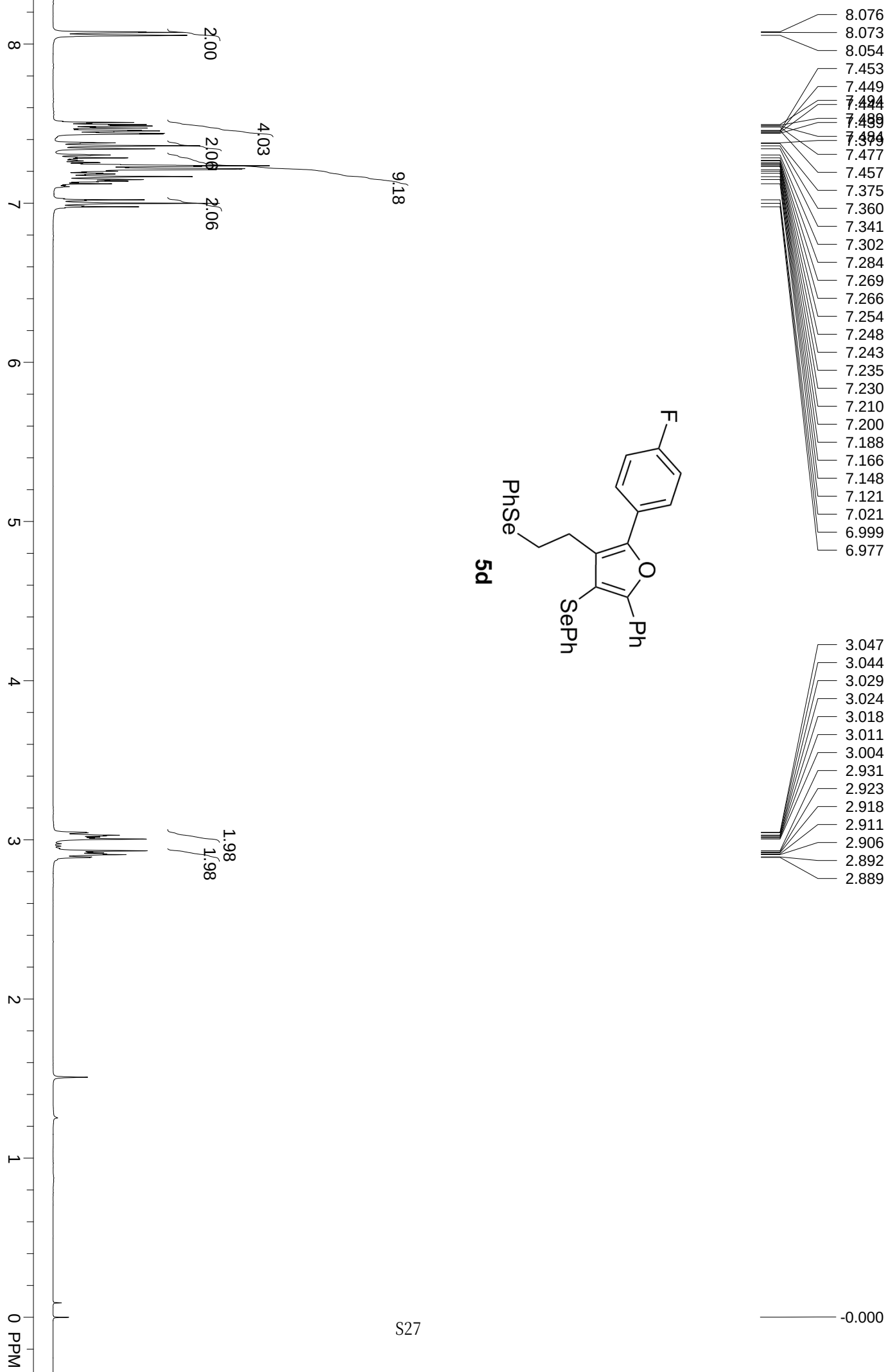
77.000

76.684

55.252

26.961

26.662



200

150

100

50

0

PPM

5d

PhSe

SePh

Ph

F

163.239

160.766

154.639

147.896

133.475

132.236

130.097

129.384

128.986

128.451

128.380

127.335

127.248

127.123

126.947

126.915

126.513

126.148

125.281

115.856

115.644

106.874

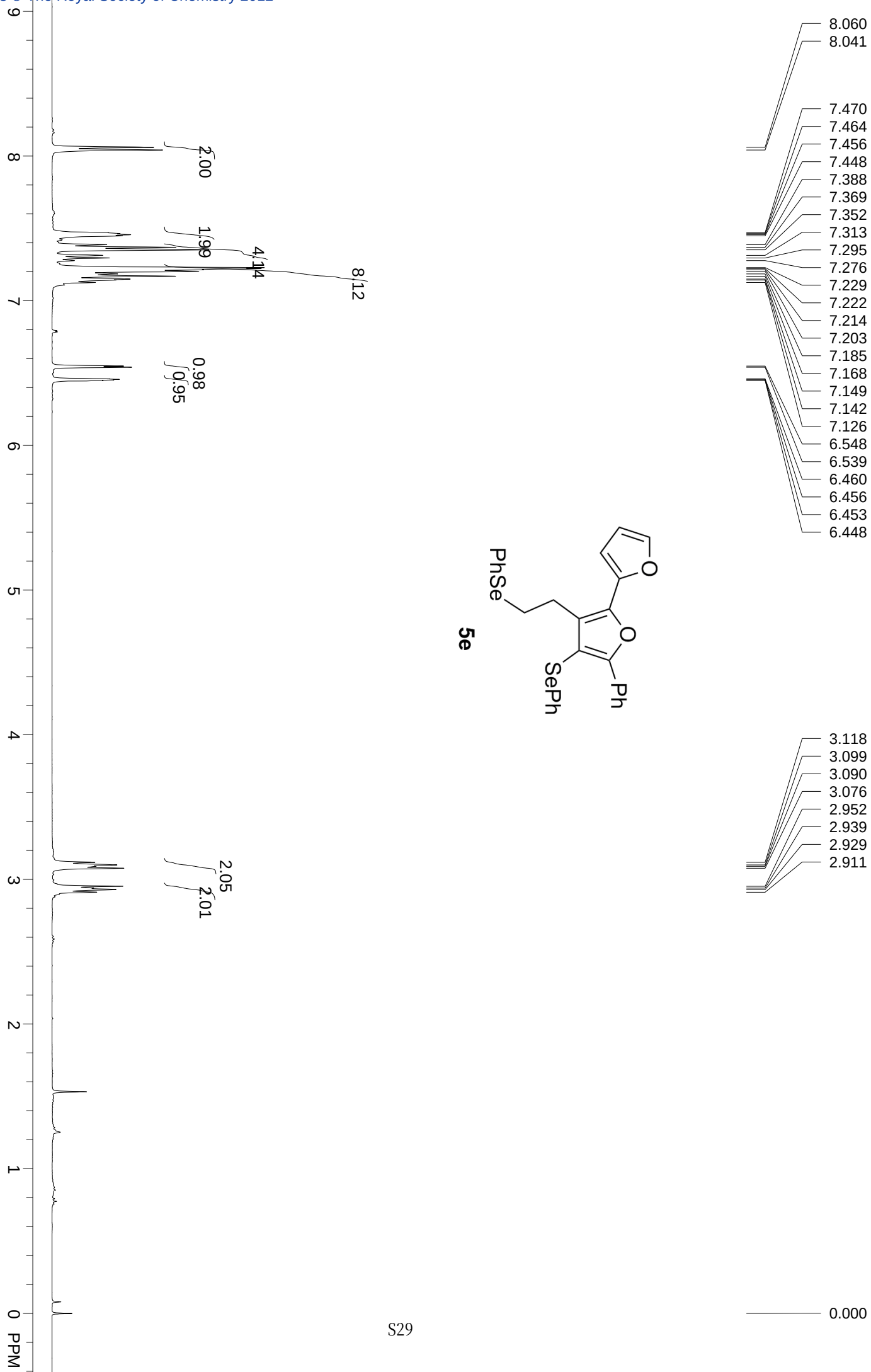
77.325

77.000

76.690

26.951

26.623



200

150

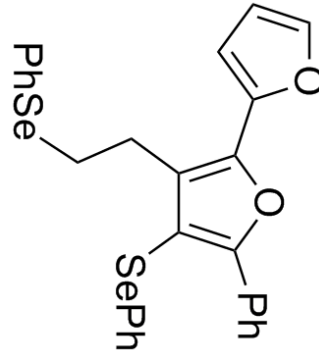
100

50

0

PPM

5e



154.504

142.120

142.027

146.166

132.722

132.099

130.021

129.949

129.364

128.856

128.501

128.412

128.351

126.646

126.531

126.150

125.427

111.348

106.556

106.381

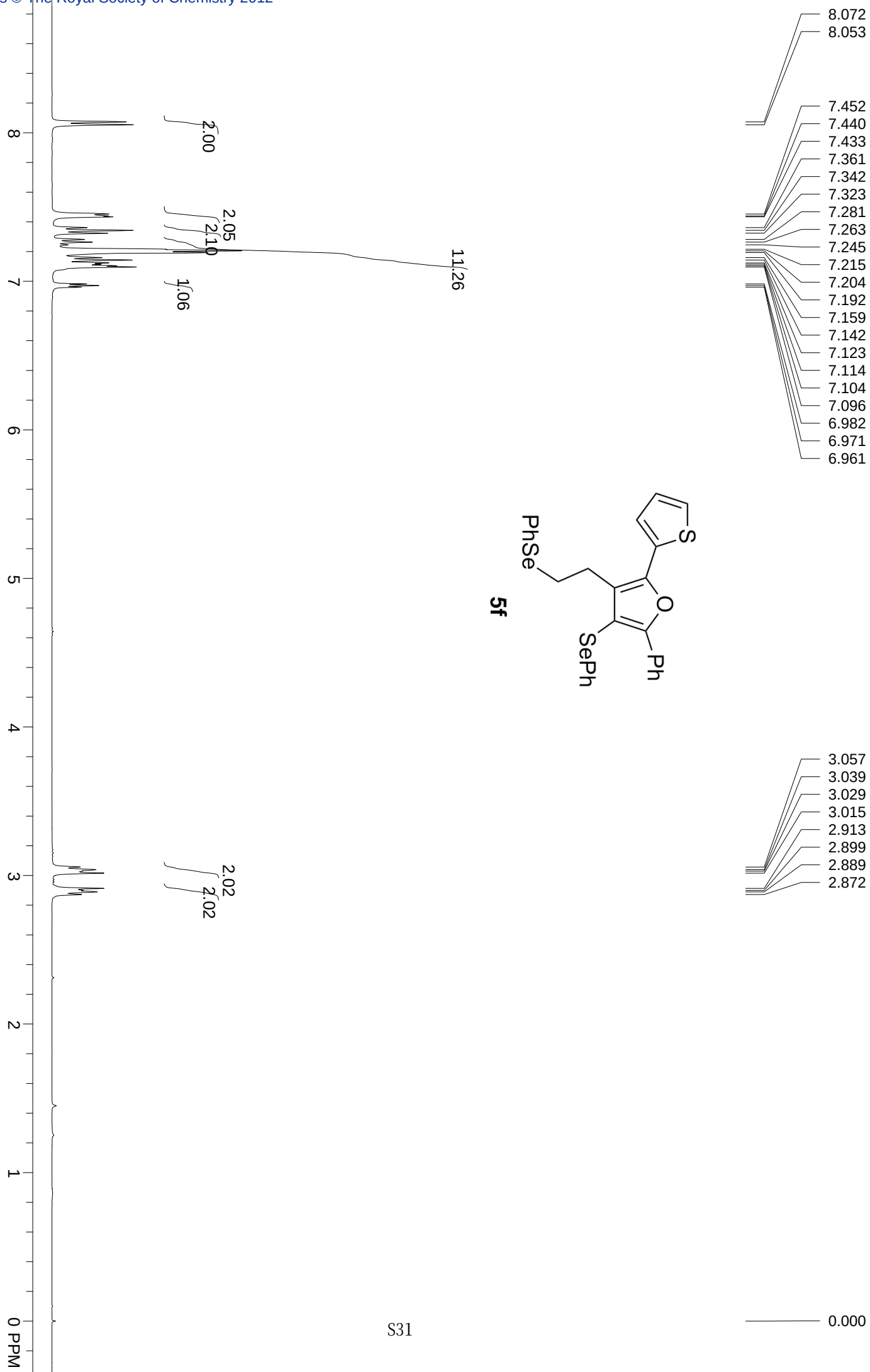
77.316

77.000

76.679

26.796

26.307



200

150

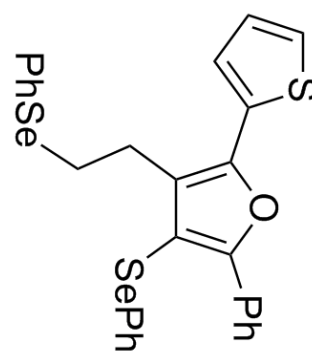
100

50

0

PPM

5f



154.186

133.283

144.967

132.551

132.074

129.903

129.597

129.325

128.887

128.467

128.334

127.577

126.895

126.432

126.124

124.927

124.701

123.418

106.733

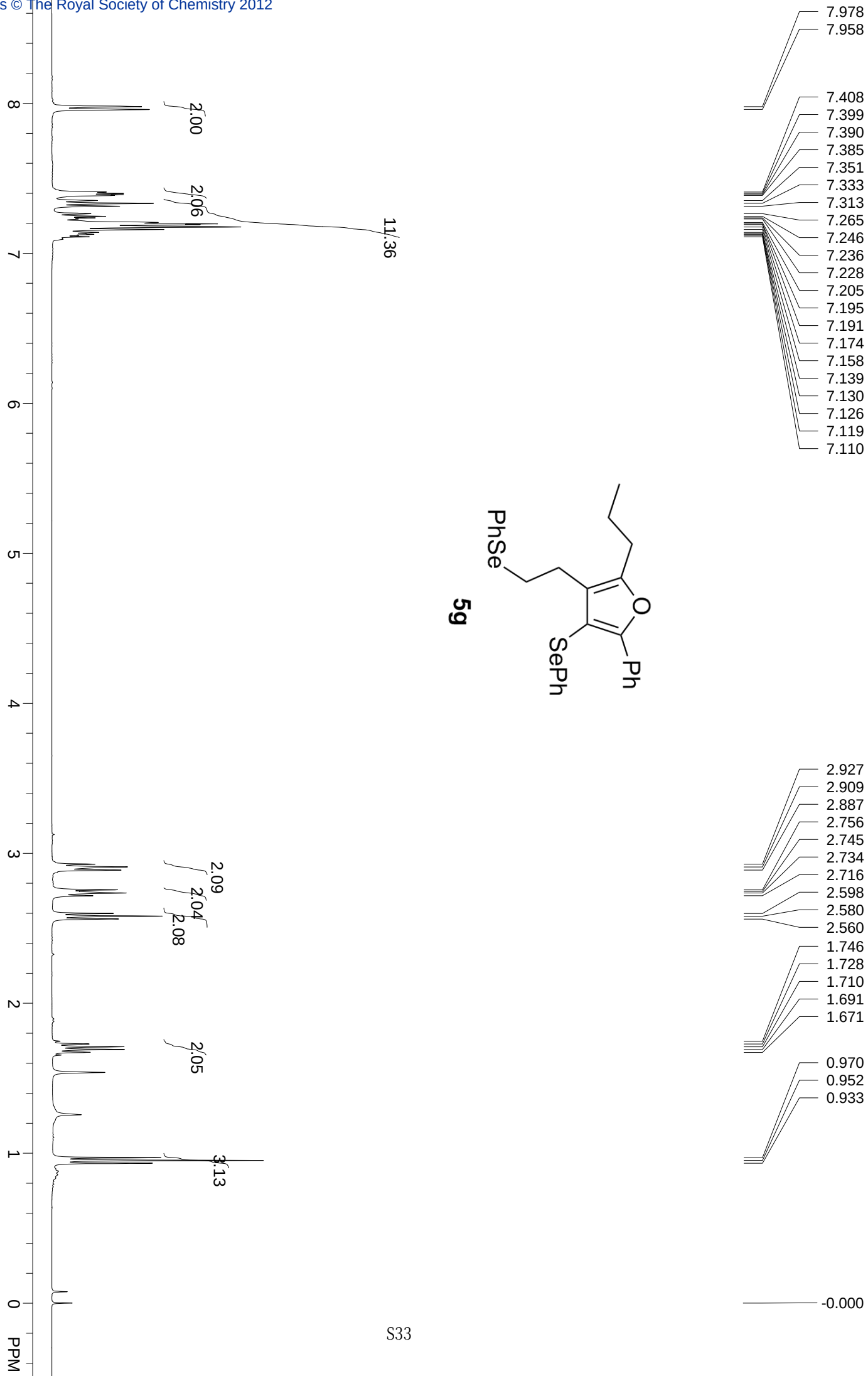
77.310

77.000

76.683

26.873

26.207



200

150

100

50

0

PPM

5g

PhSe

SePh

Ph

153.924

152.185

132.687

132.242

130.623

130.186

129.275

128.915

128.251

128.218

127.797

126.559

126.159

125.858

123.560

104.244

77.317

77.000

76.675

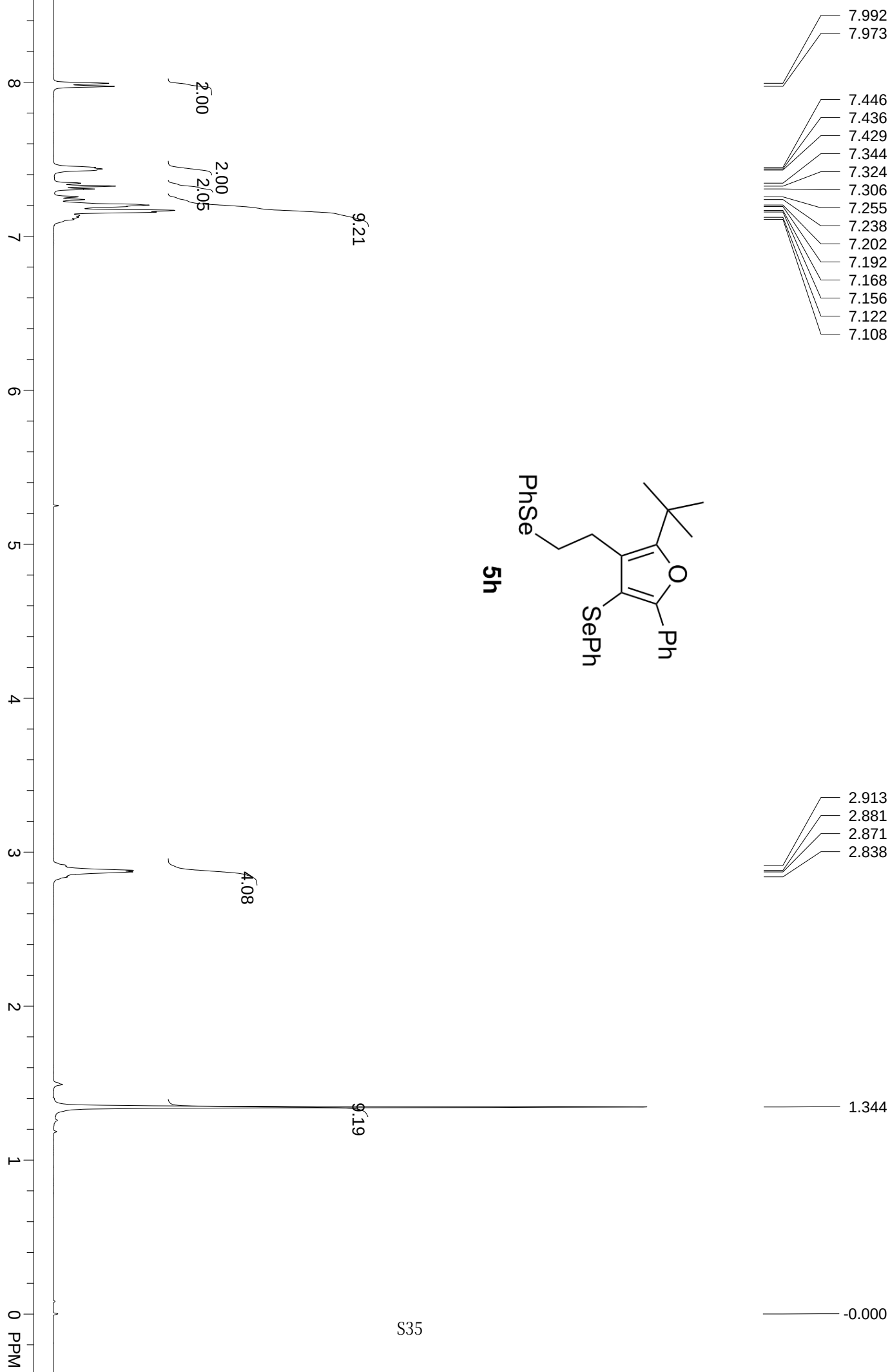
28.539

27.606

25.712

21.846

13.829



200

150

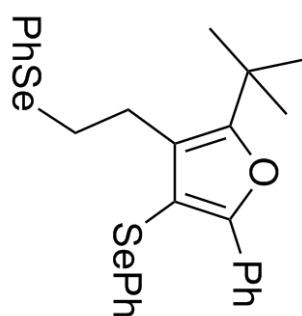
100

50

0

PPM

5h



157.404

152.811

133.060

132.733

130.638

129.802

129.263

128.861

128.257

128.237

127.808

126.789

126.122

125.853

121.994

105.644

77.319

77.000

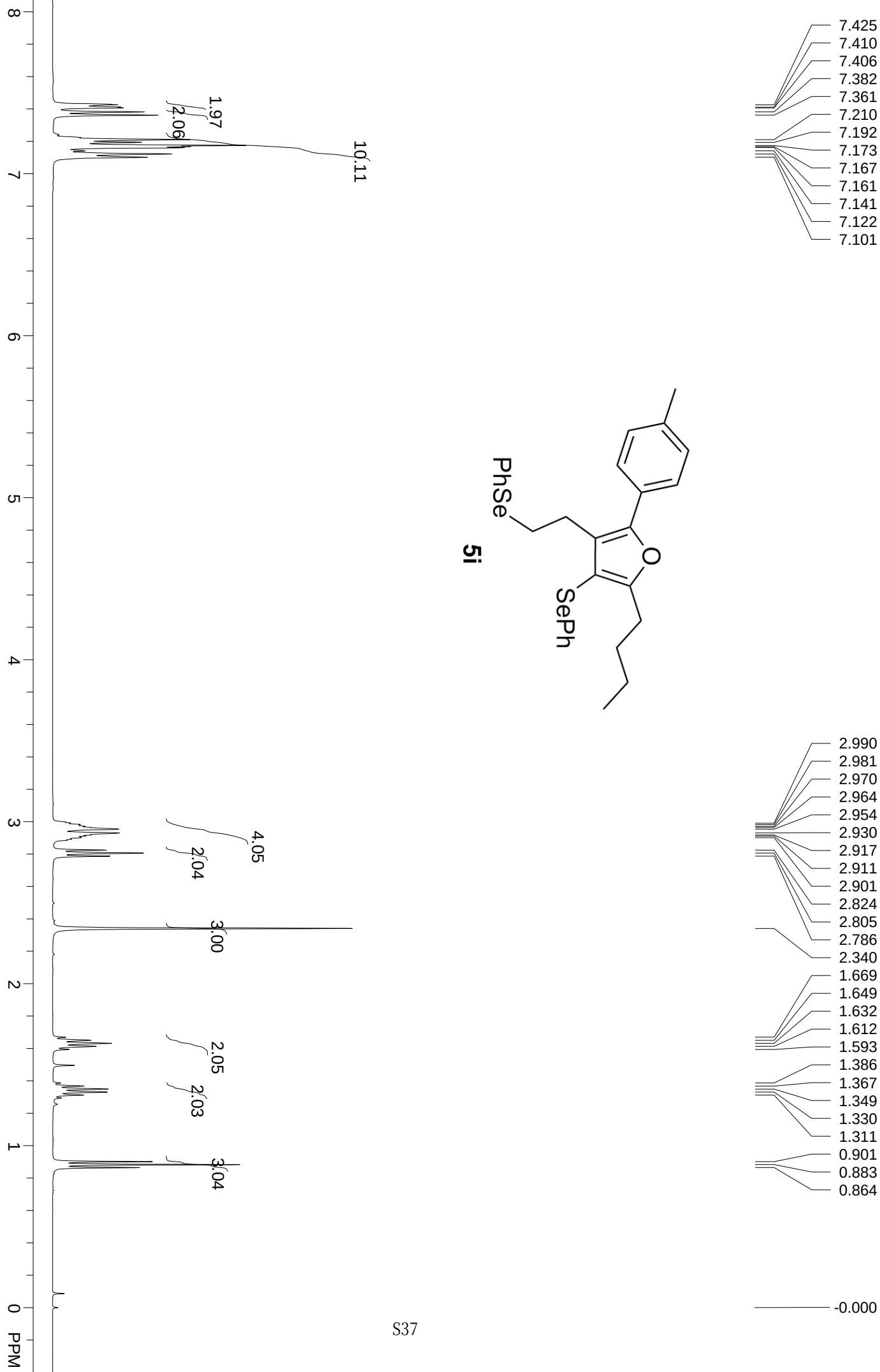
76.676

34.315

29.675

27.870

26.719



200

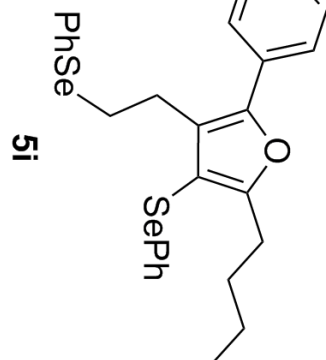
150

100

50

0

PPM



160.074

148.216

132.994

132.878

136.870

129.730

129.304

129.111

128.889

128.477

128.342

126.785

125.841

125.092

122.617

106.559

77.325

77.000

76.687

30.619

27.054

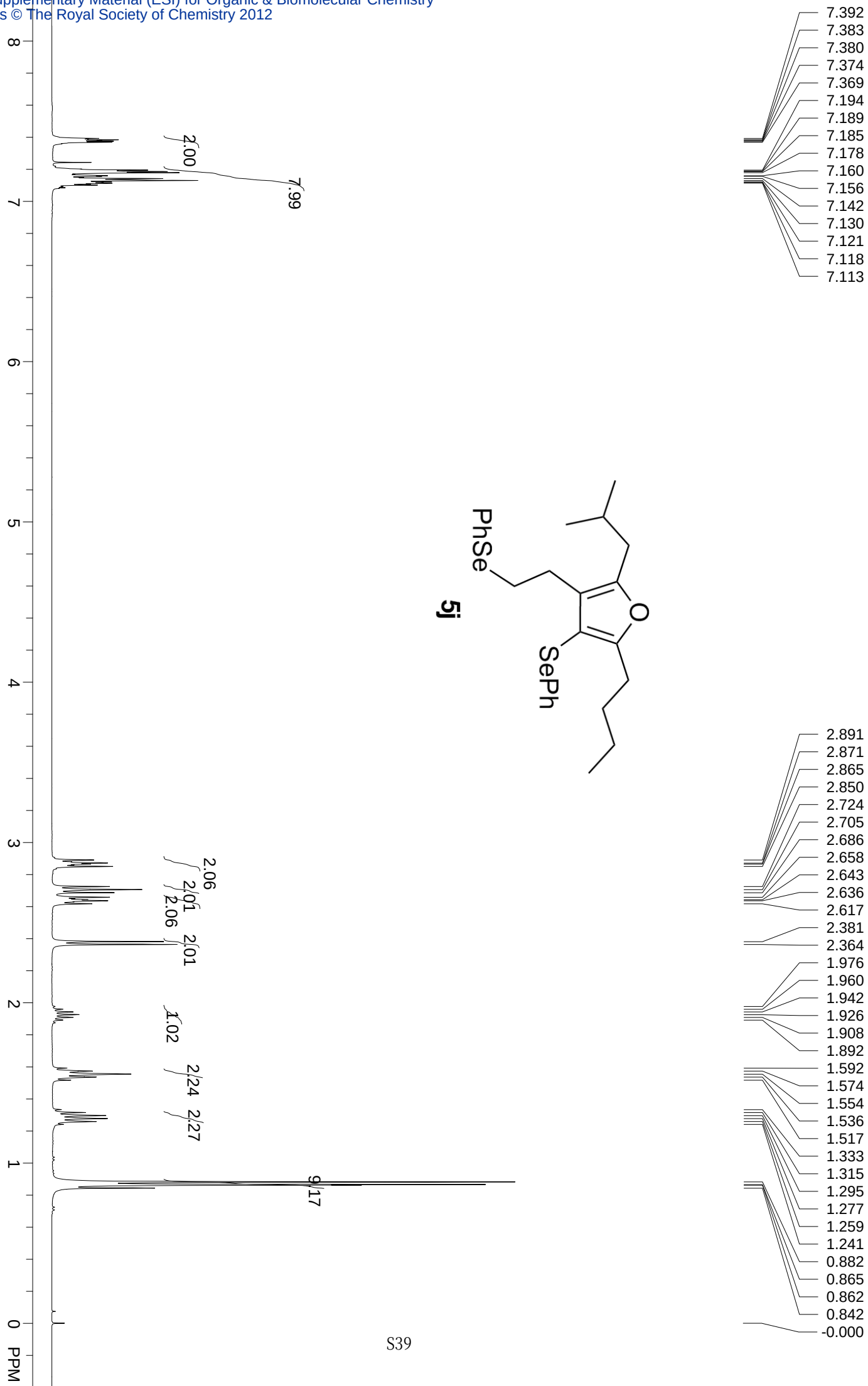
26.872

26.576

22.282

21.216

13.757



200

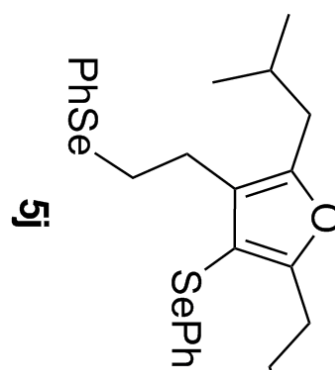
150

100

50

0

PPM



159.296

150.356

133.286

132.151

130.241

129.010

128.842

128.104

126.420

125.572

121.632

103.586

77.315

77.000

76.676

35.418

30.638

28.187

27.434

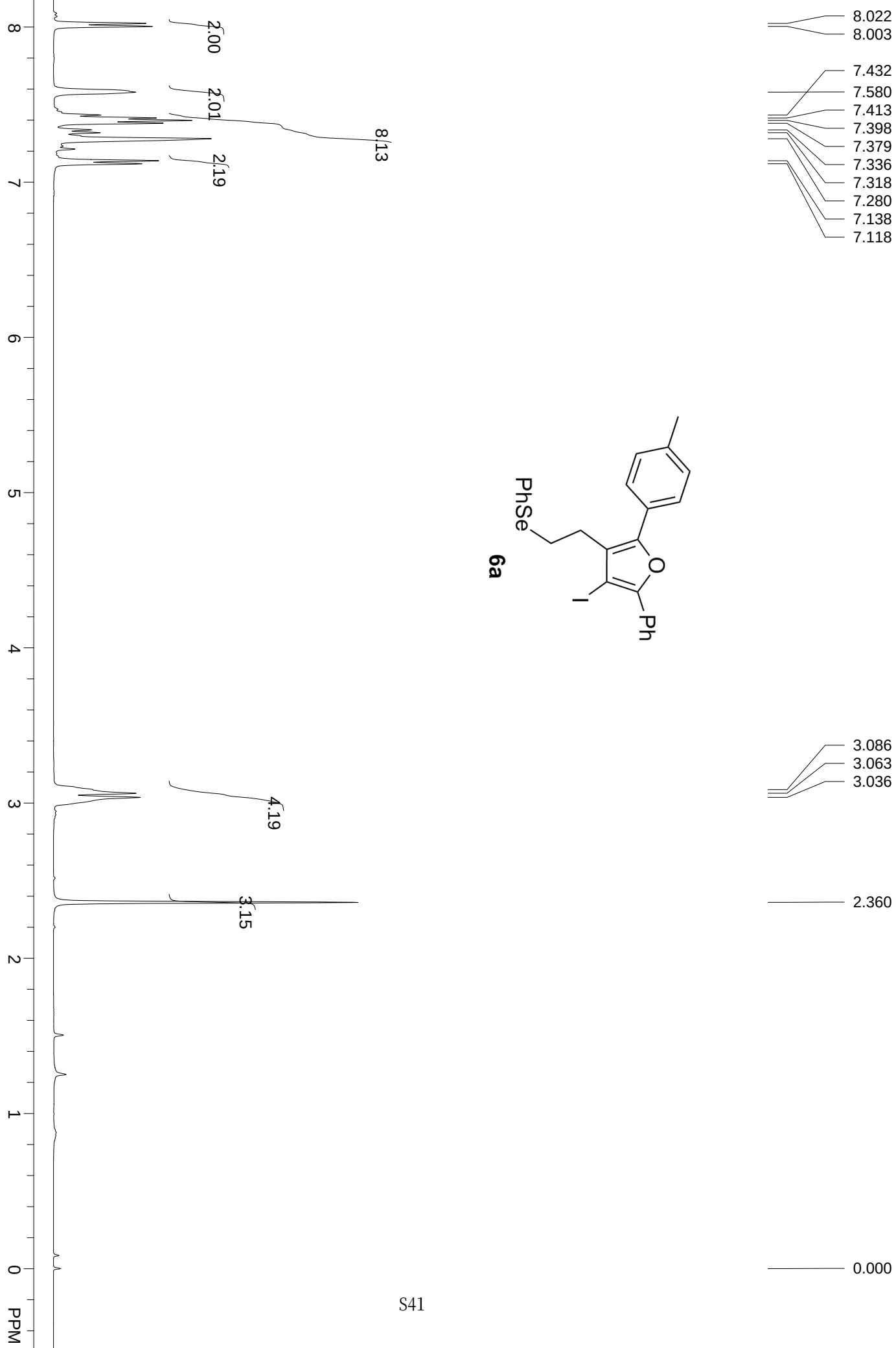
26.628

25.848

22.313

22.171

13.740



200

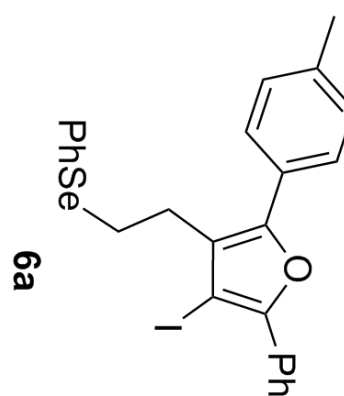
150

100

50

0

PPM



6a

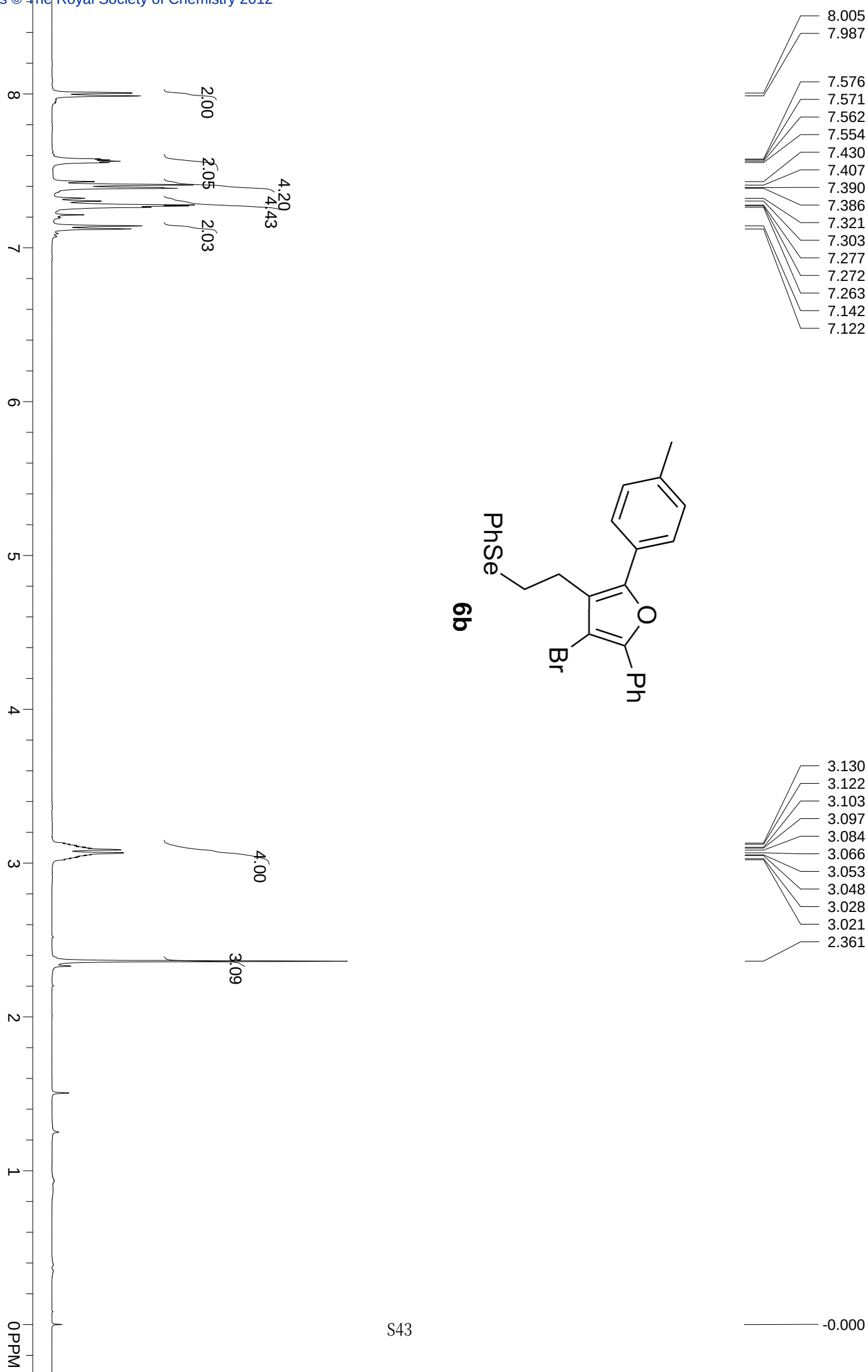
149.979
148.903

137.689
133.698
130.205
129.384
129.339
129.023
128.309
128.086
127.583
127.215
126.270
125.499
123.895

77.318
77.000
76.675
70.430

28.624
26.096

21.285



200

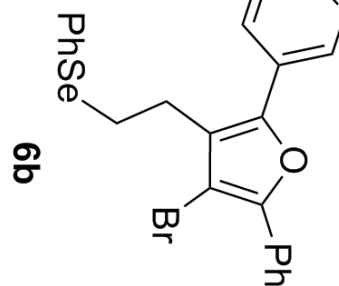
150

100

50

0

PPM



148.419
146.993

137.769

133.519

129.747

129.439

129.410

129.019

128.430

127.847

127.646

127.167

125.498

125.434

121.680

101.084

77.307

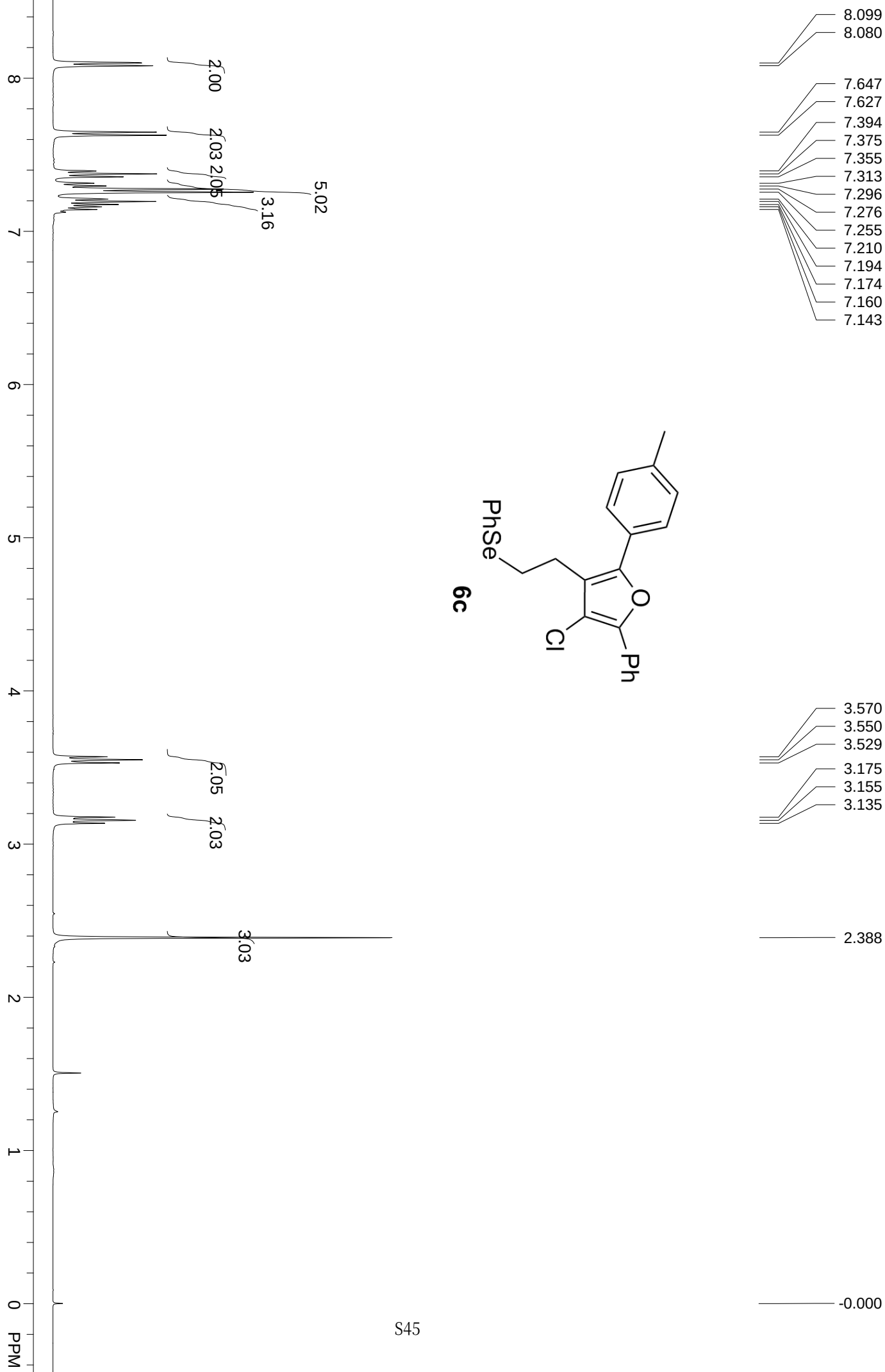
77.000

76.679

26.515

25.972

21.280



200

150

100

50

0

PPM

6c

PhSe

Cl

Ph

154.589

149.962

132.110

137.973

130.178

129.550

129.444

128.497

128.376

127.729

126.531

126.240

125.697

121.831

106.700

77.316

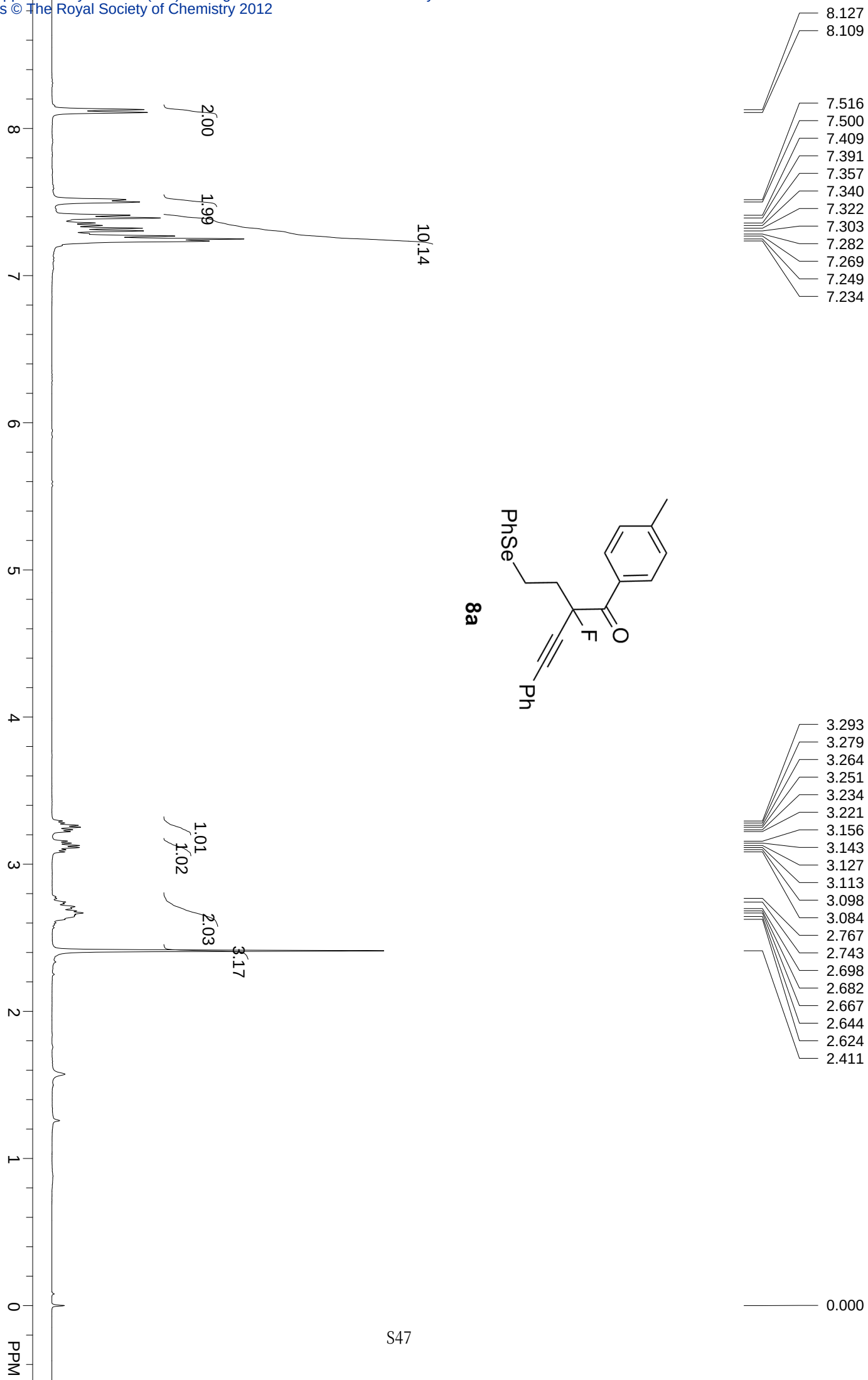
77.000

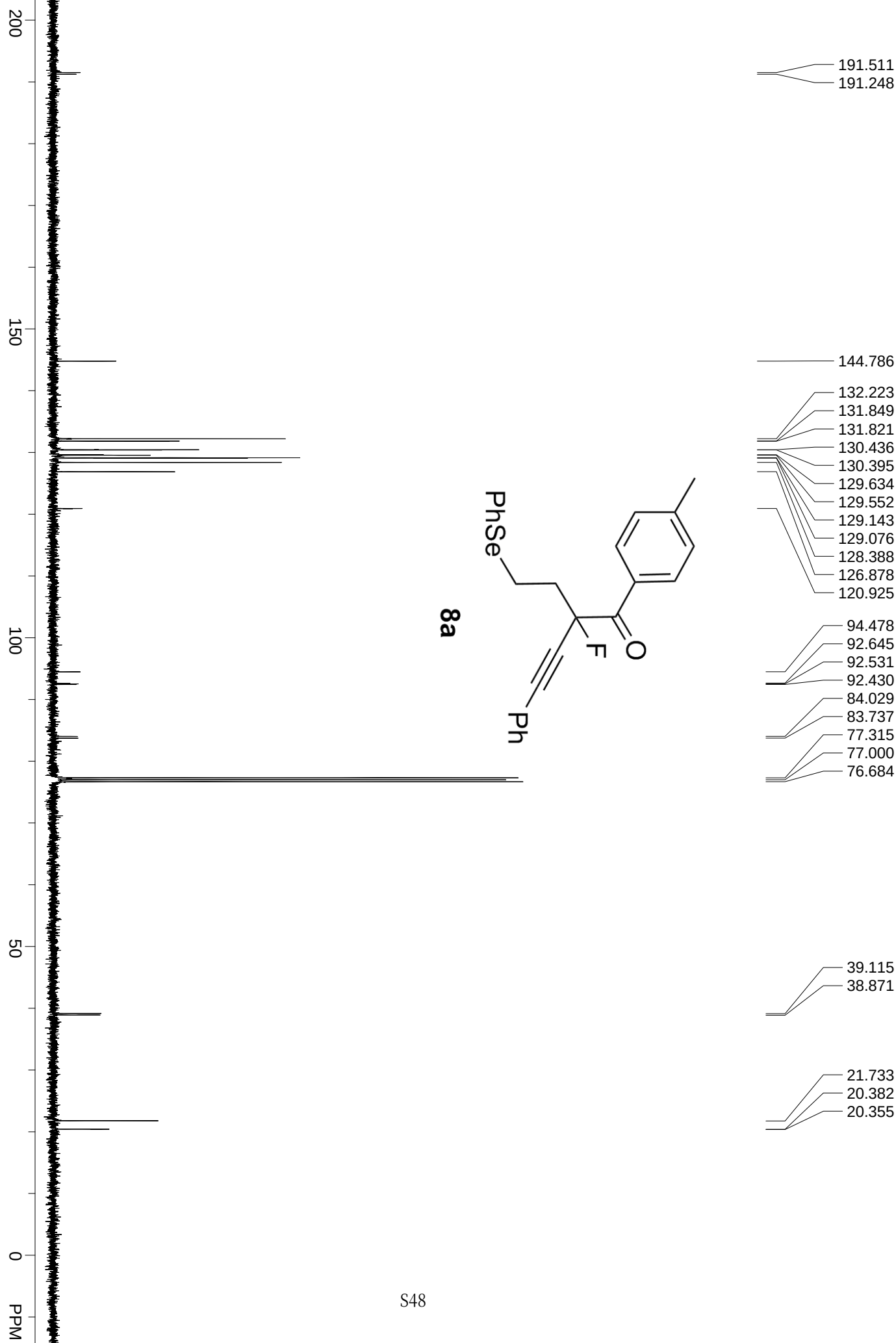
76.684

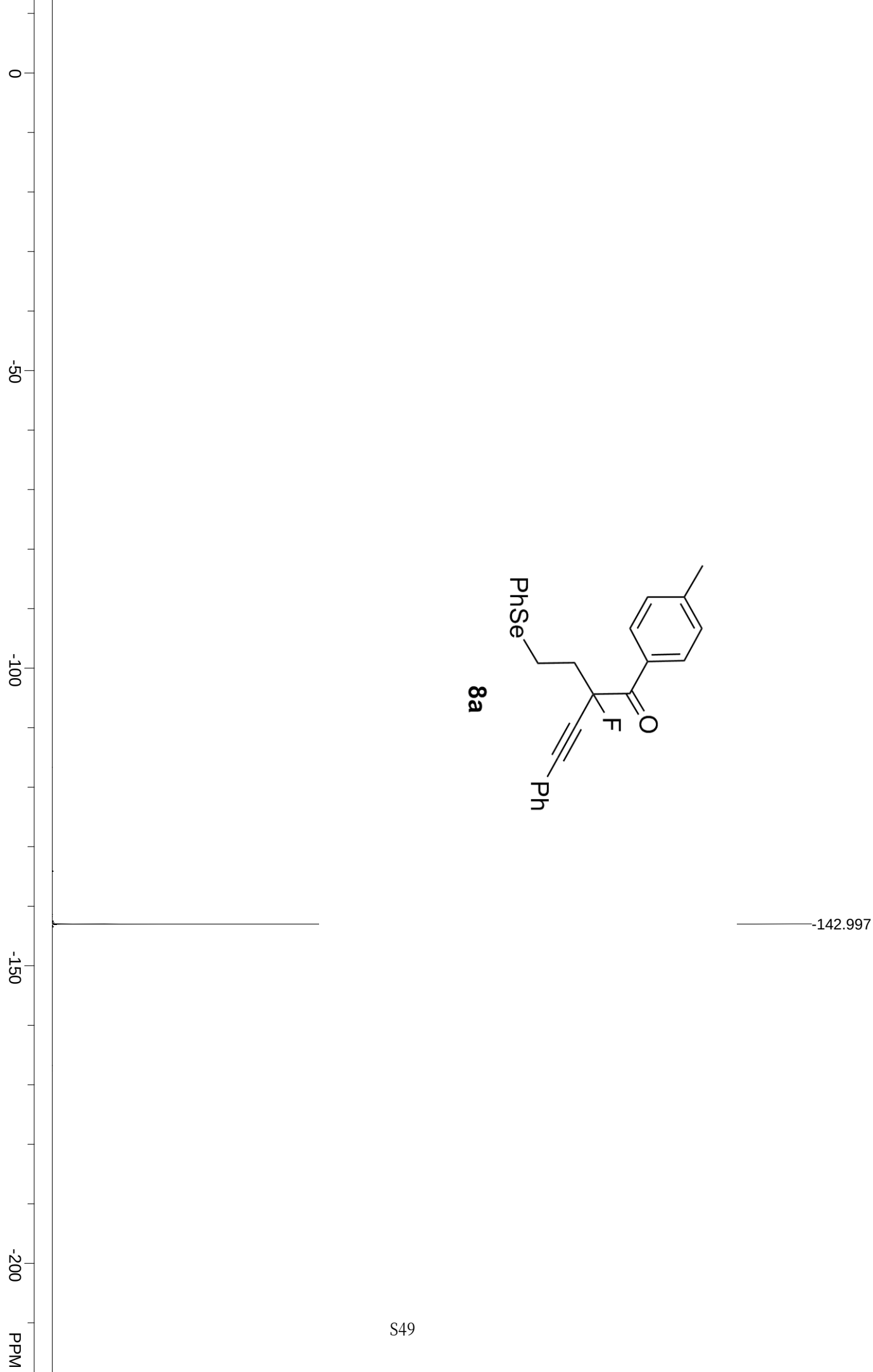
42.941

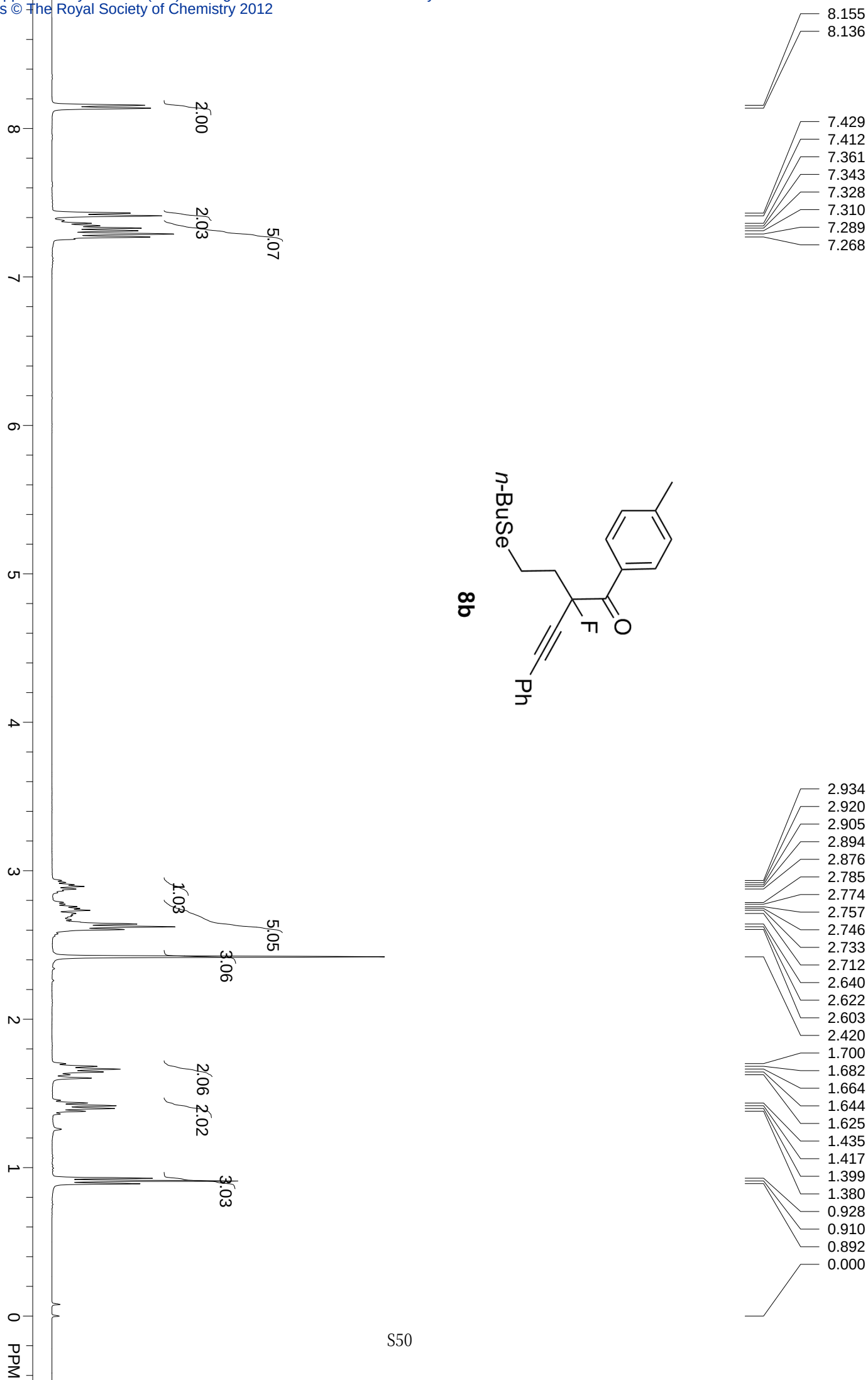
29.221

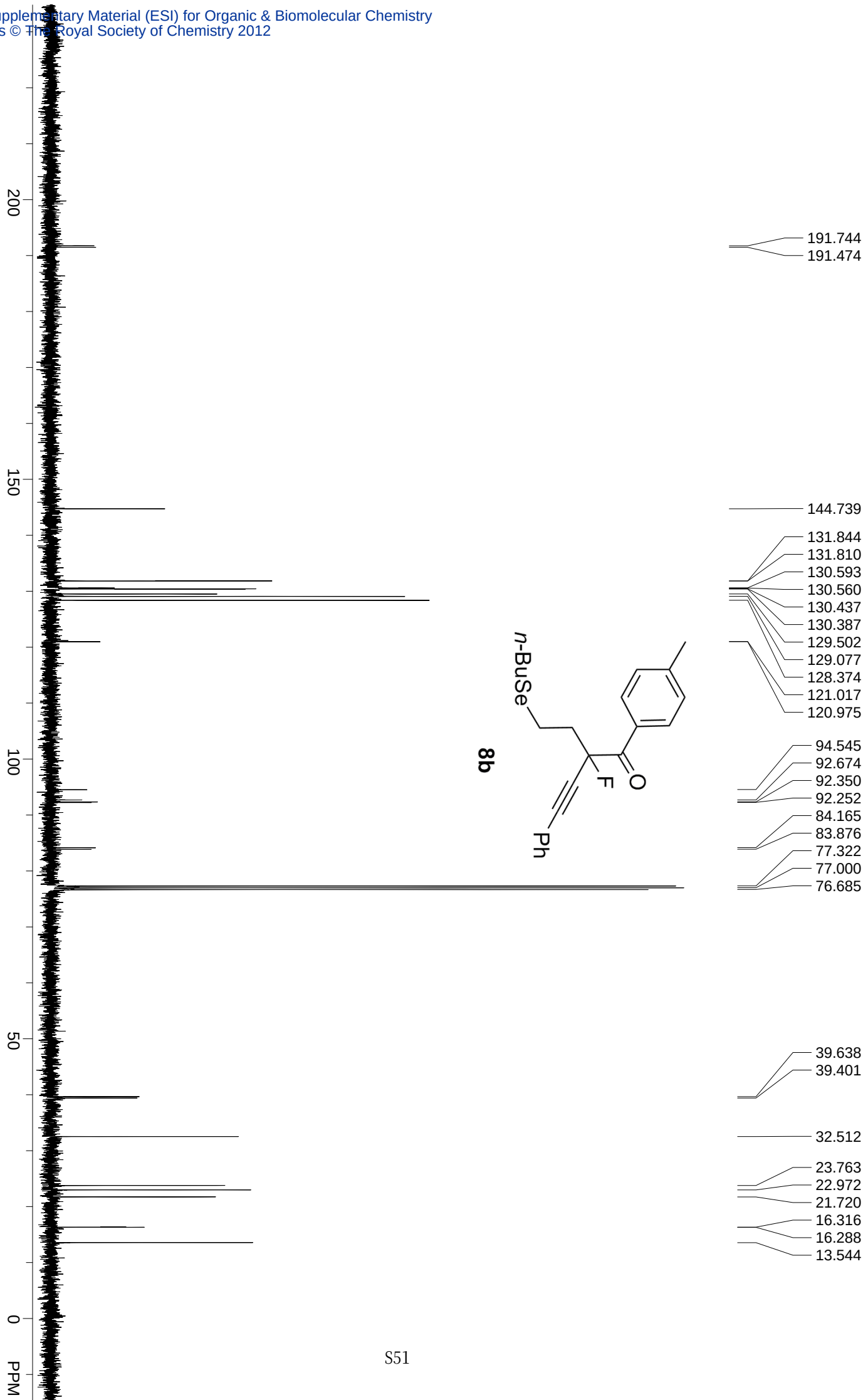
21.286











0

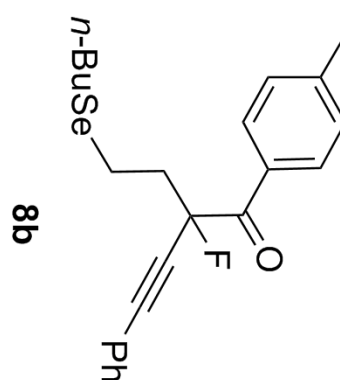
-50

-100

-150

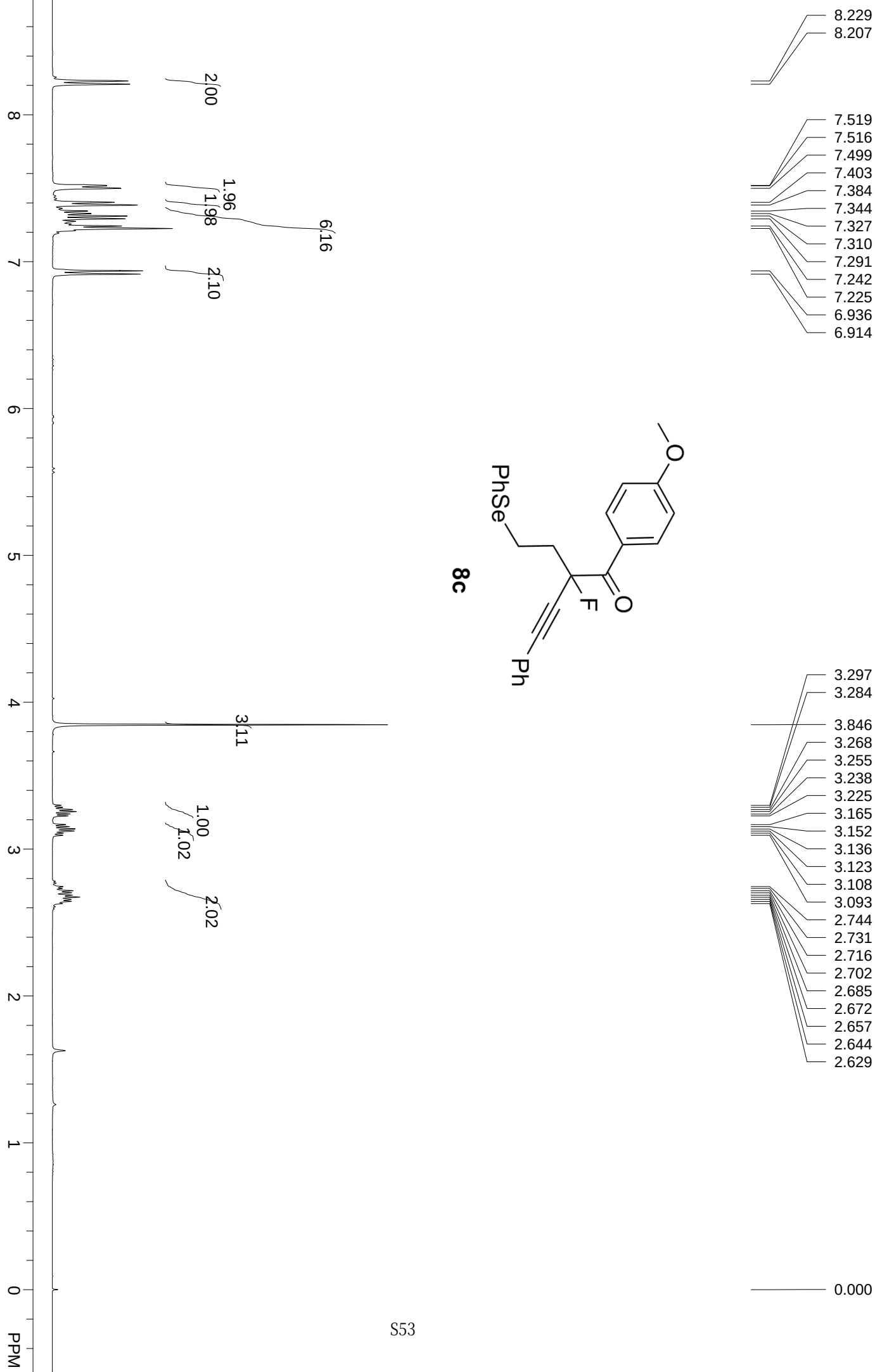
-200

PPM



8b

-143.164



200

150

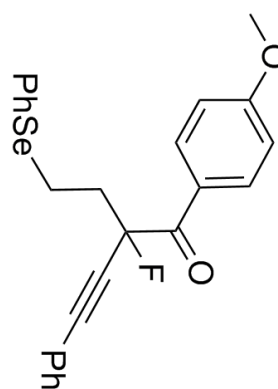
100

50

0

PPM

8c



190.218
189.951

163.961

132.775

132.728

132.163

131.805

131.785

129.654

129.507

129.097

128.354

126.827

125.775

125.743

120.909

120.875

113.604

94.466

92.643

92.413

92.311

84.195

83.905

77.325

77.000

76.686

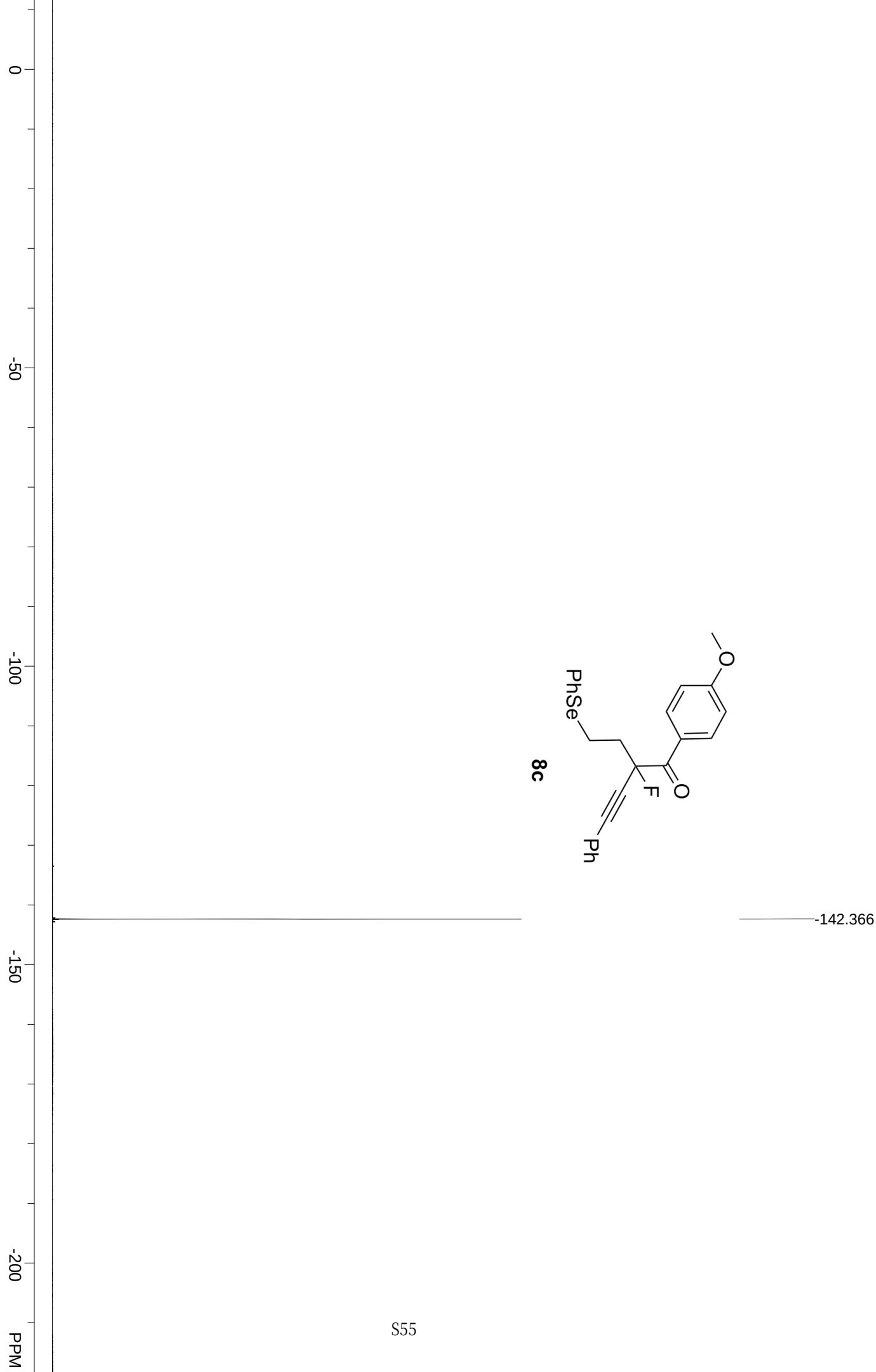
55.426

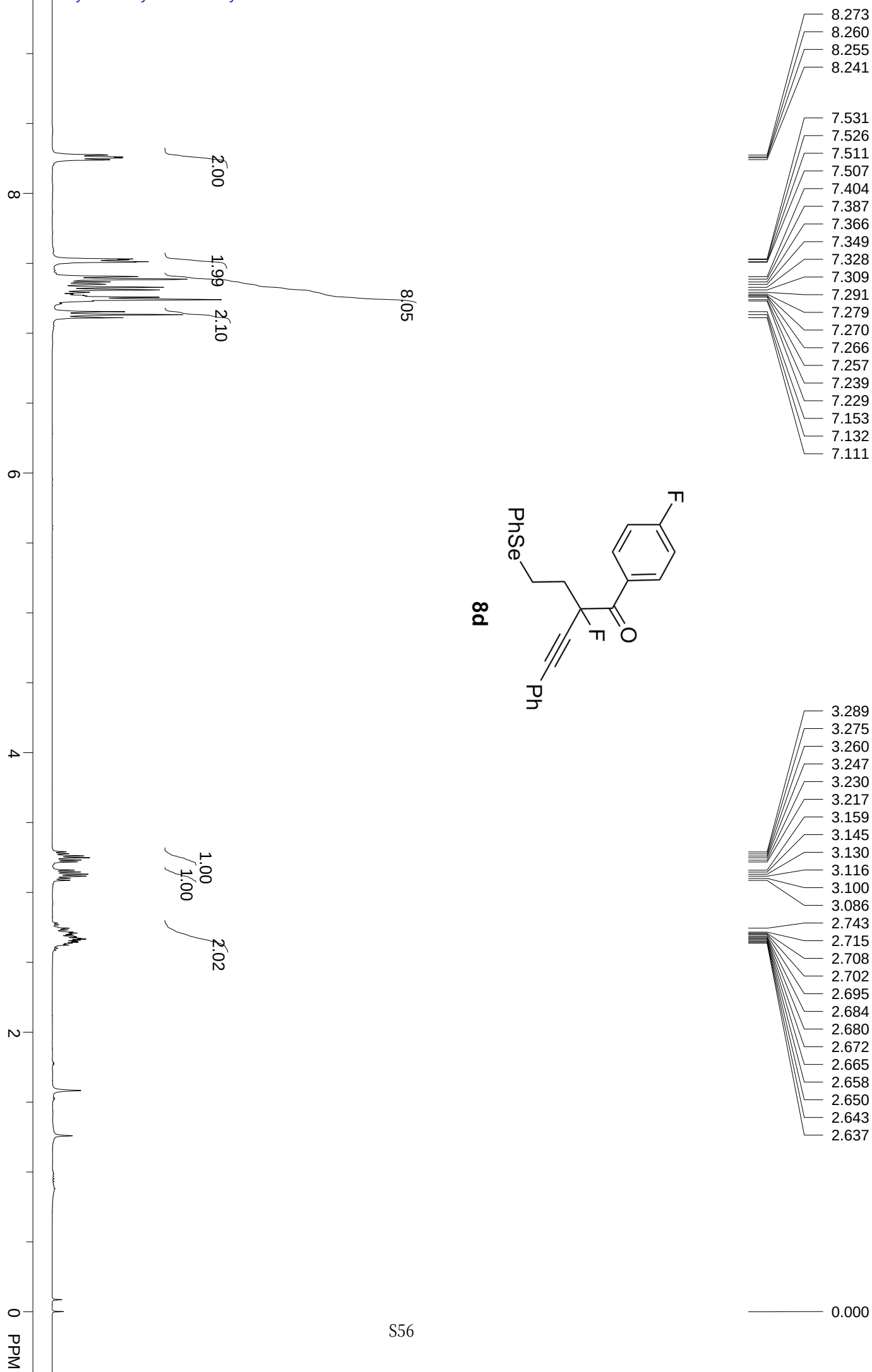
39.107

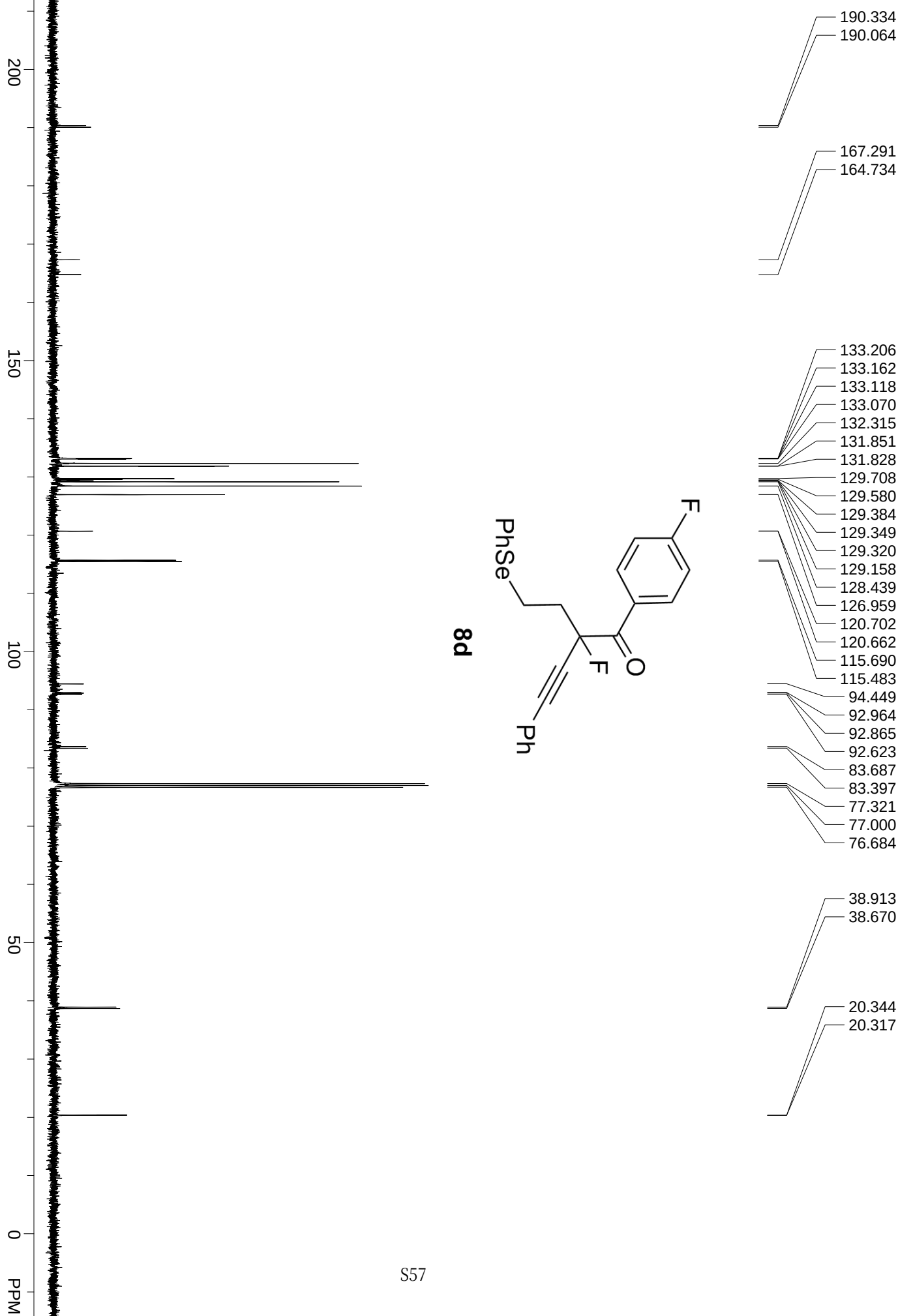
38.864

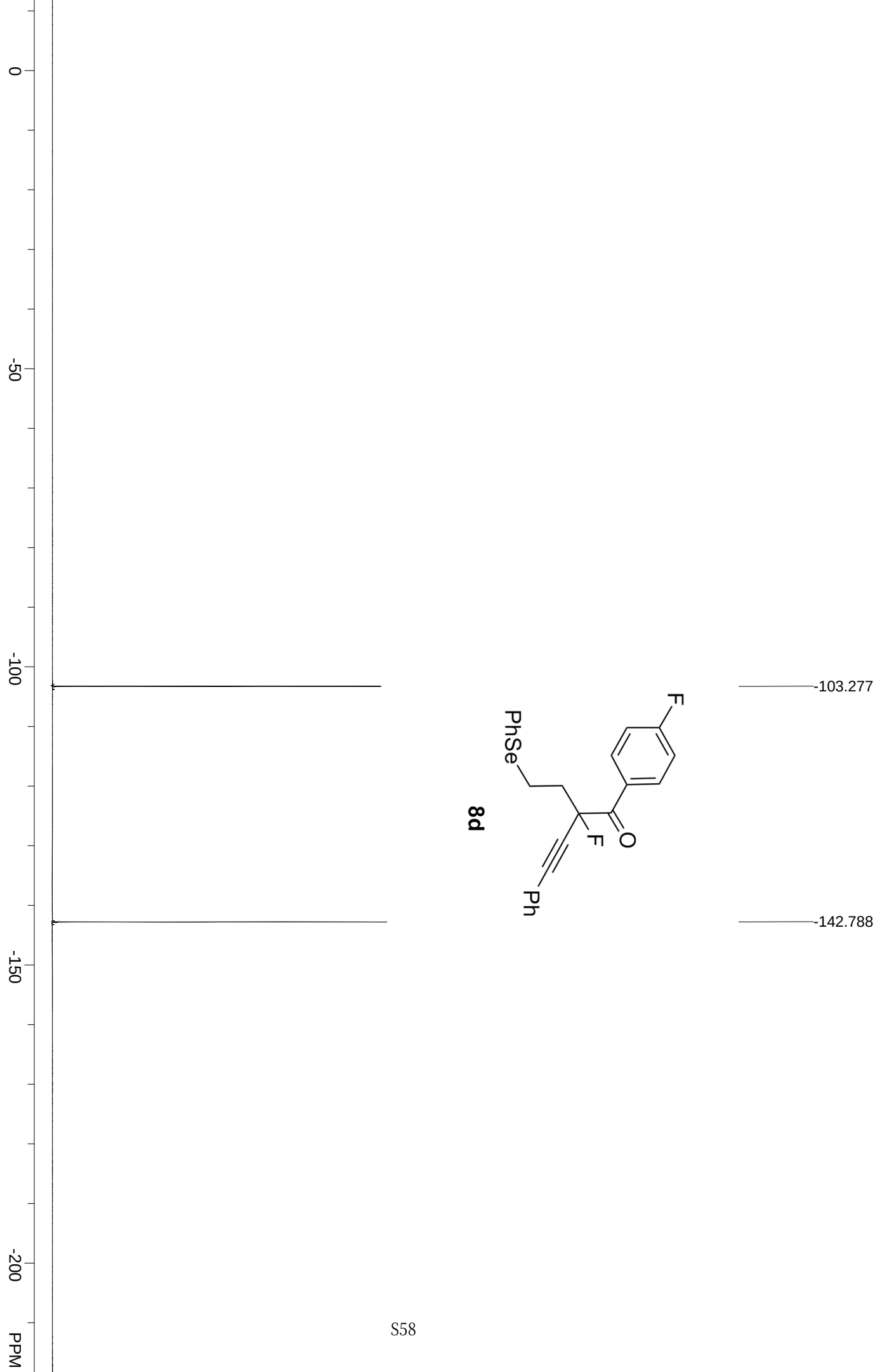
20.404

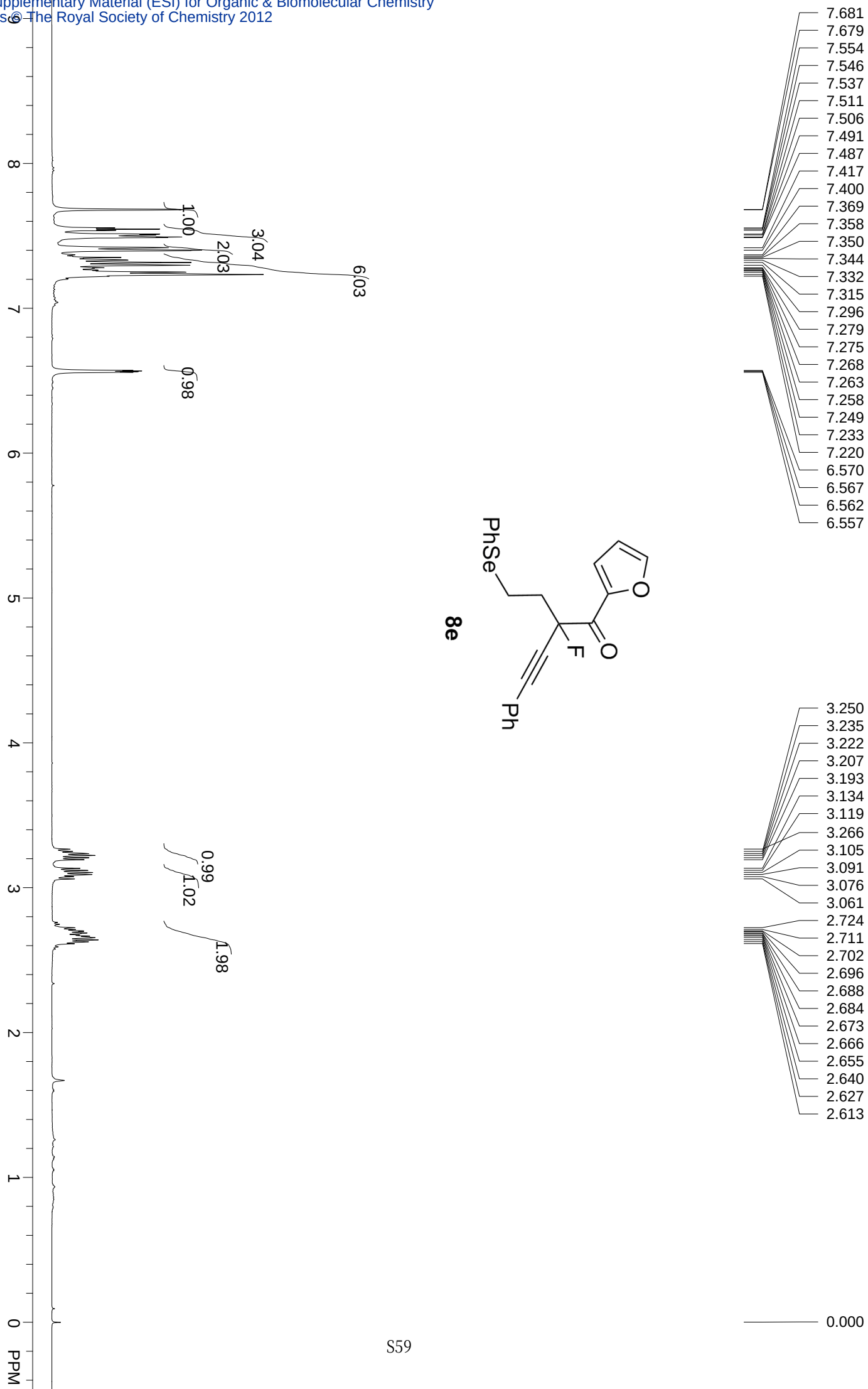
20.382











200

150

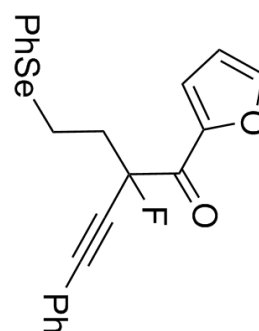
100

50

0

PPM

8e



180.533

180.258

148.492

148.464

148.041

132.257

131.859

131.822

129.498

129.405

129.102

128.301

126.914

122.433

122.338

120.749

120.714

112.410

94.320

92.485

91.199

91.104

83.397

83.105

77.316

77.000

76.678

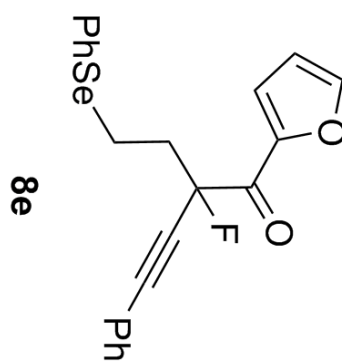
39.083

38.844

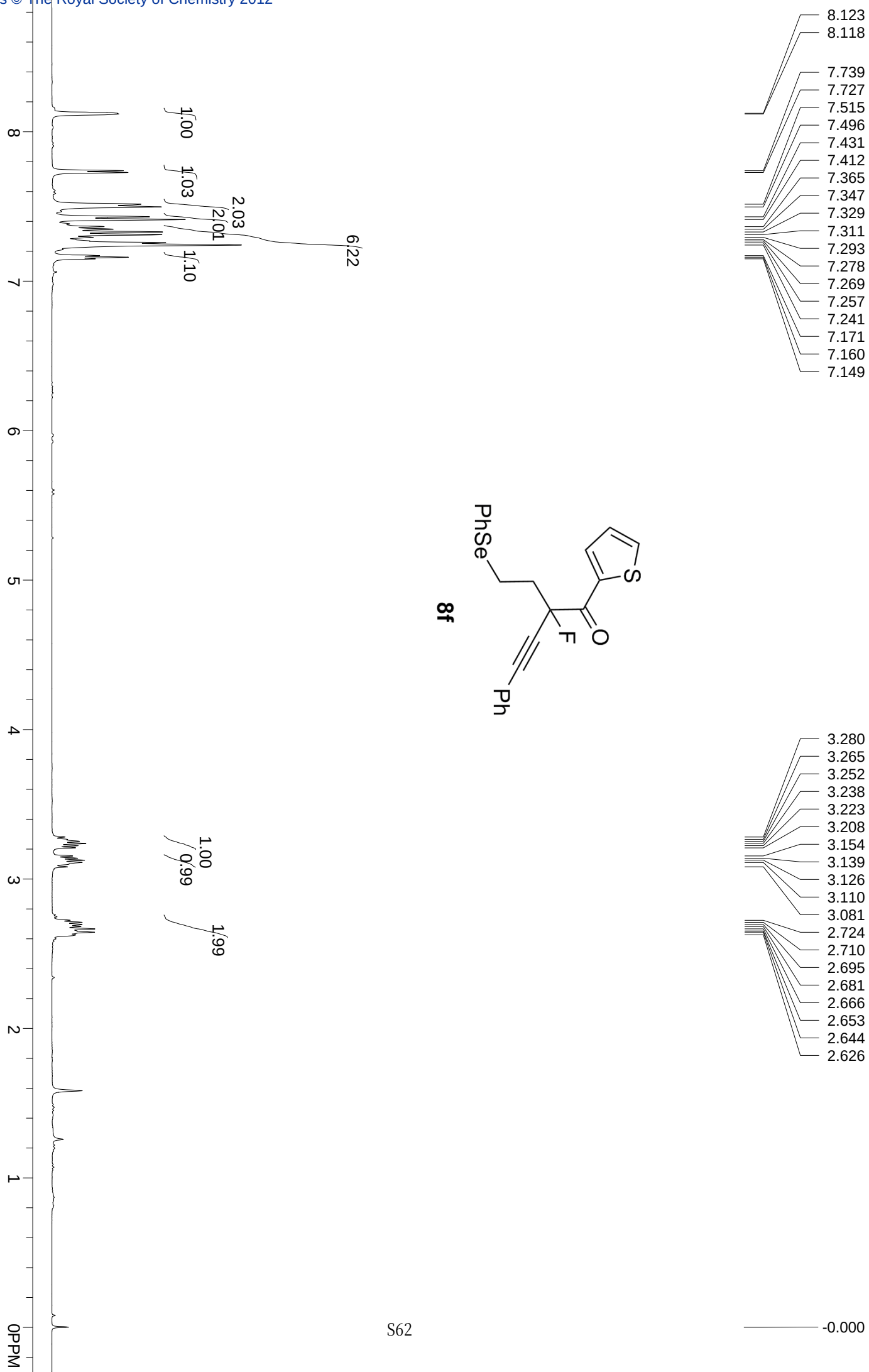
20.107

20.083

20
0
-20
-40
-60
-80
-100
-120
-140
PPM



-146.225



200

150

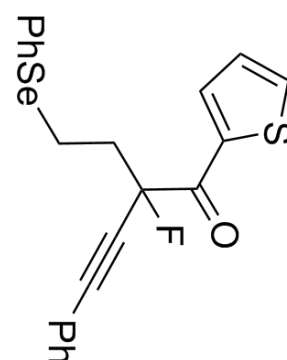
100

50

0

PPM

8f



185.370

185.085

138.802

138.761

135.644

135.567

132.293

131.915

131.894

129.584

129.457

129.178

128.378

126.977

120.815

120.790

94.942

93.109

91.674

91.580

83.722

83.439

77.324

77.000

76.690

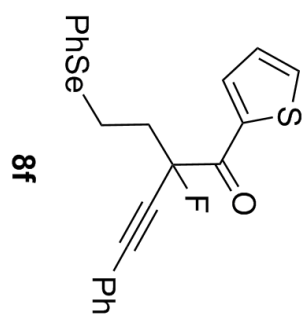
39.331

39.091

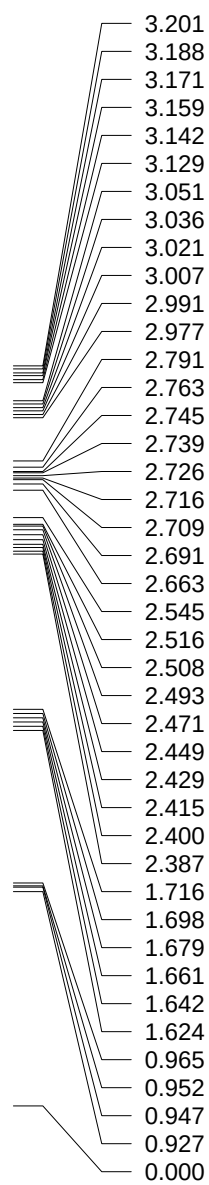
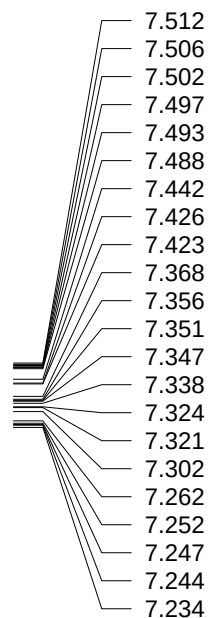
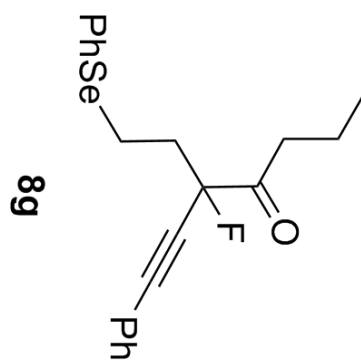
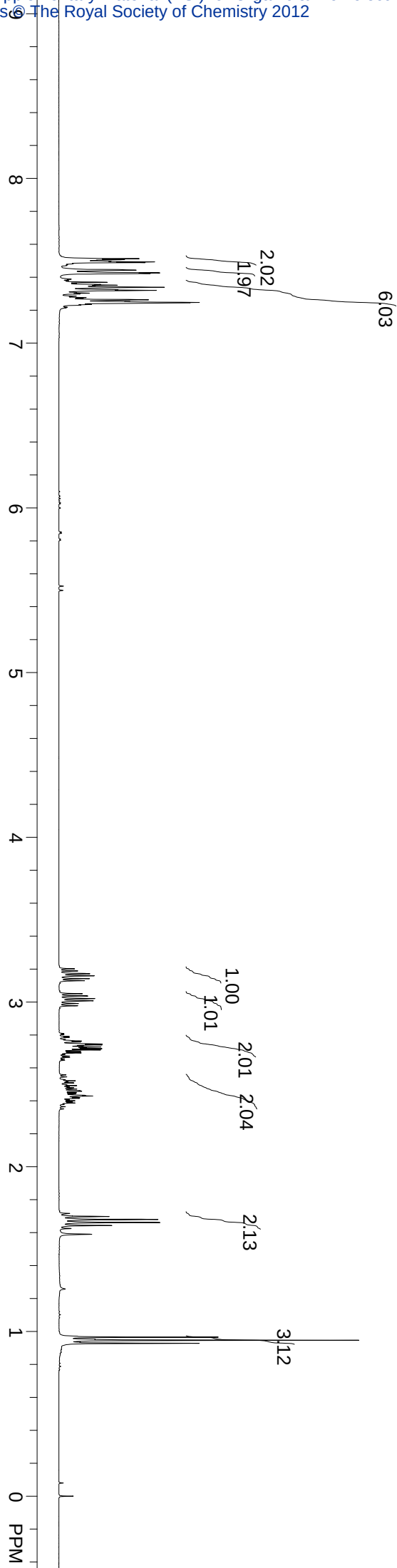
20.246

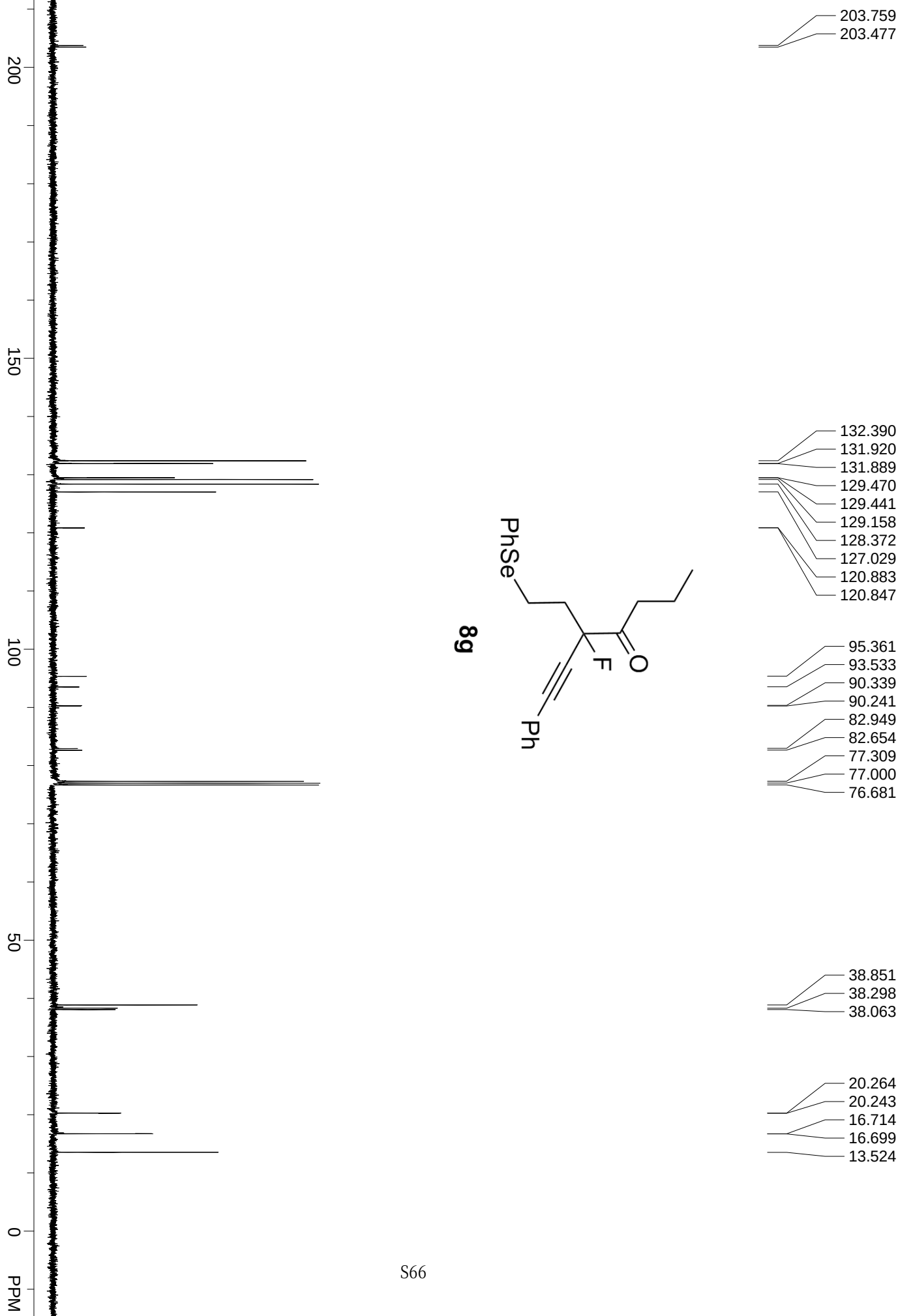
20.226

20
0
-20
-40
-60
-80
-100
-120
-140
PPM

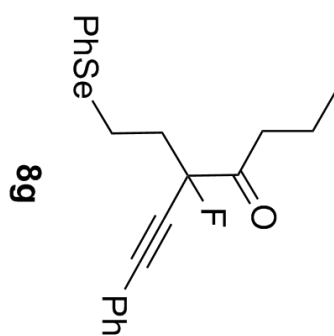


-142.922

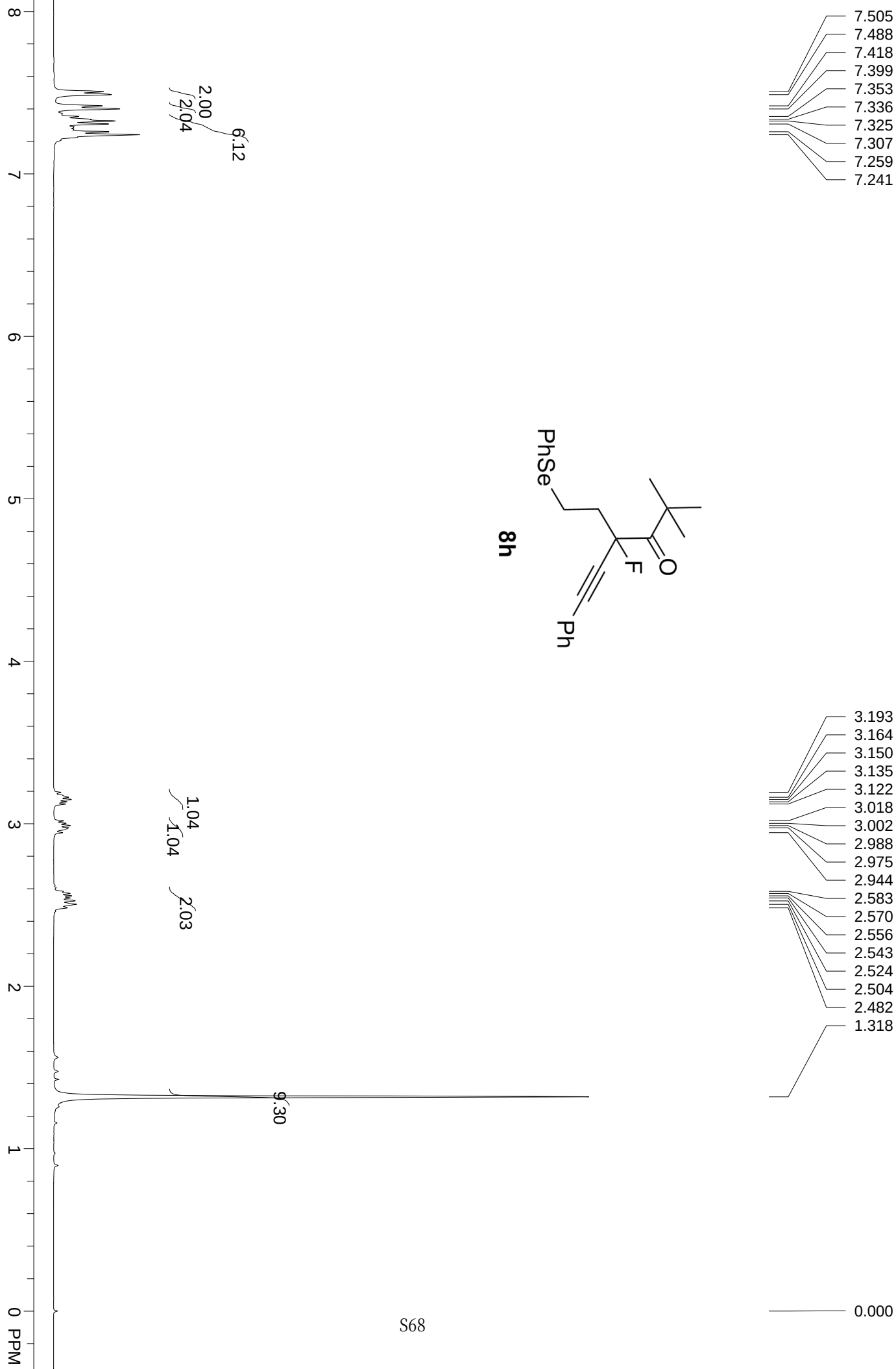


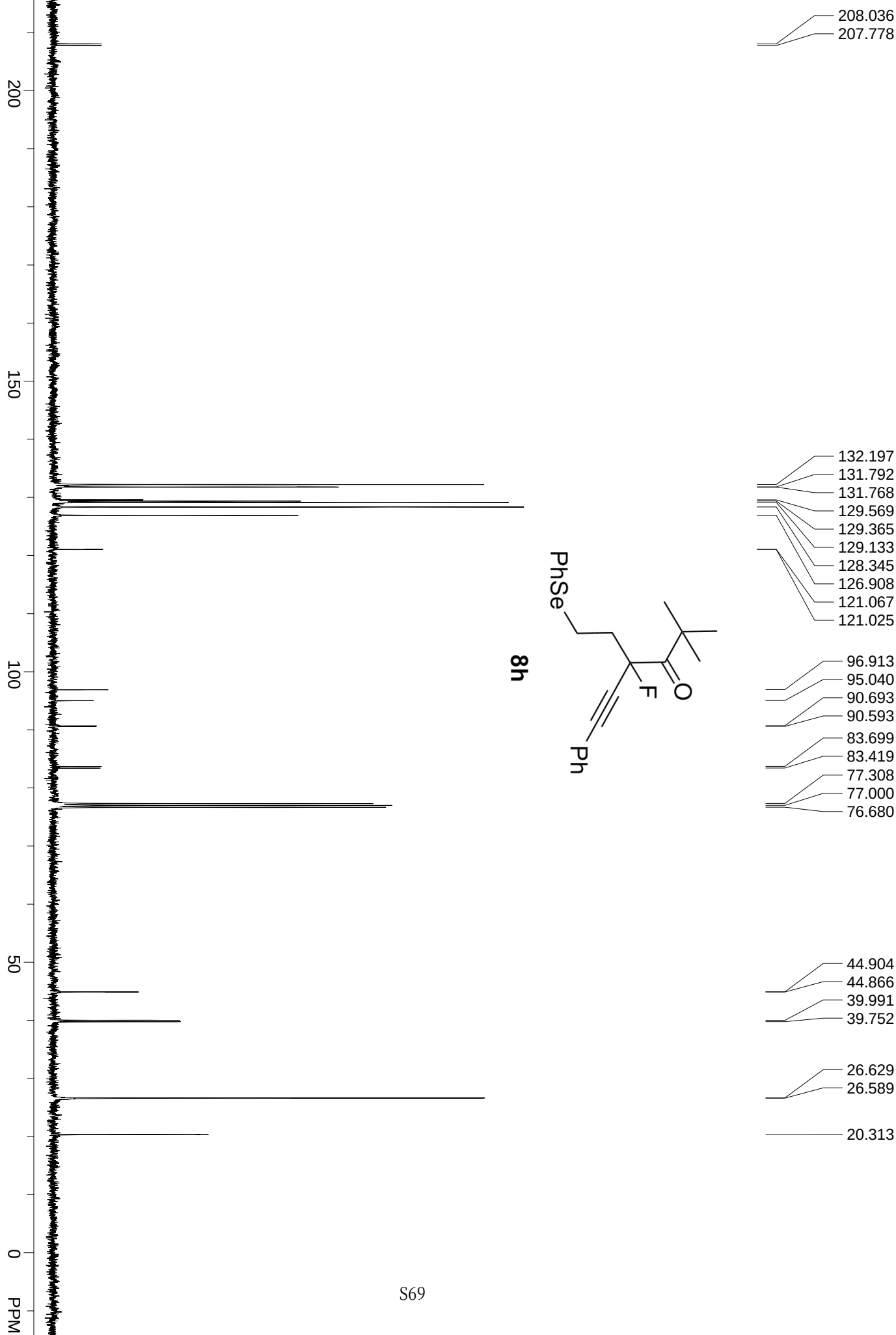


0
-50
-100
-150
-200
PPM



-150.230





20

0

-20

-40

-60

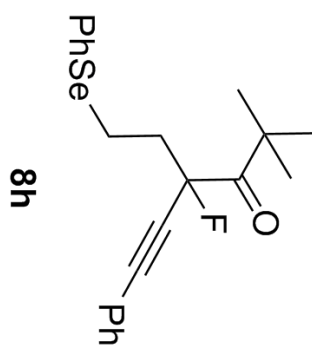
-80

-100

-120

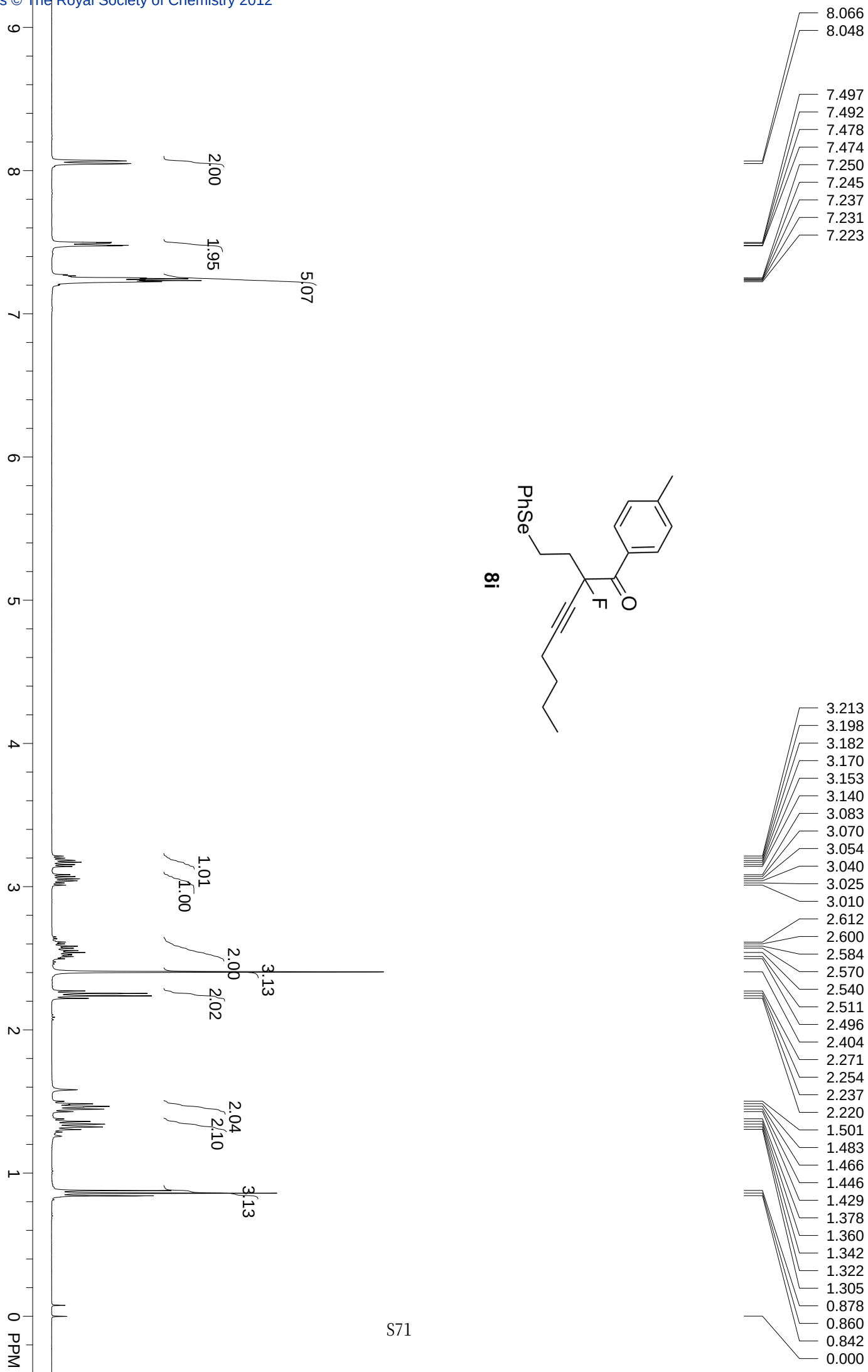
-140

PPM



8h

-149.492



200

150

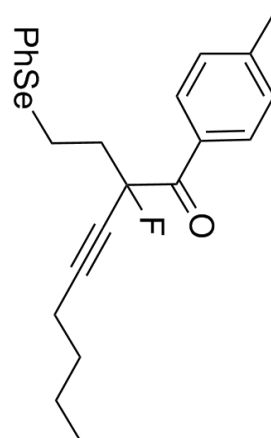
100

50

0

PPM

8i



192.094
191.820

144.504

132.166
130.558
130.529
130.443
130.402
129.777
129.088
128.928
126.800

94.624
94.524
94.399
92.581

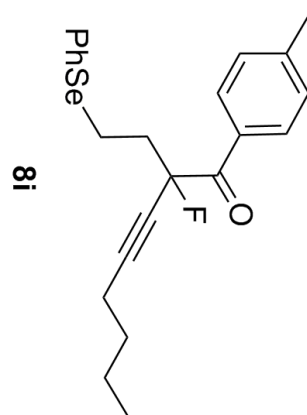
77.325
77.000
76.690
75.935
75.647

39.169
38.916

29.962
29.948

21.824
21.691
20.456
20.420
18.558
18.524
13.424

20
0
-20
-40
-60
-80
-100
-120
-140
PPM



8i

-142.913

