

Palladium-Catalyzed *N*-Alkenylation of *N*-Aryl Phosphoramidates with Alkenes

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²Department of Neurology, First Affiliated Hospital of Wenzhou Medical University, Wenzhou, China.

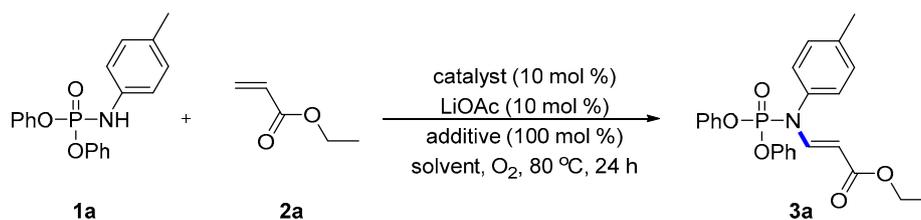
³School of Pharmaceutical Sciences, Wenzhou Medical University, Wenzhou, China.

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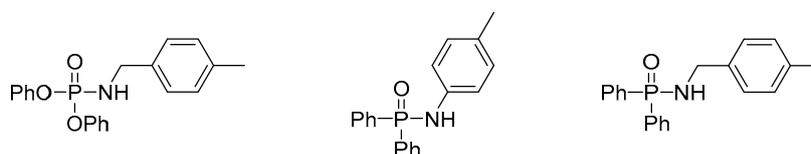
Reaction Optimization^a



entry	catalyst	additive	solvent	yield (%) ^b
1	Pd(OAc) ₂	Cu(OAc) ₂	DME	0
2	Pd(OAc) ₂	CuCl ₂	DME	0
3	Pd(OAc) ₂	BQ	DME	0
4	Pd(OAc) ₂	pyridine	DME	0
5	Pd(OAc) ₂	LiBr	DME	0
6	Pd(OAc) ₂	TBAF	DME	0
7	Pd(OAc) ₂	TBAC	DME	0
8	Pd(OAc) ₂	TBAB	DME	65
9	Pd(OAc) ₂	TBAI	DME	0
10	PdCl ₂	TBAB	DME	0
11	Pd(CH ₃ CN) ₂ Cl ₂	TBAB	DME	0
12	Pd(PhCN) ₂ Cl ₂	TBAB	DME	0
13	Pd(acac) ₂	TBAB	DME	0
14	Pd(OAc) ₂	TBAB	THF	45
15	Pd(OAc) ₂	TBAB	Dioxane	33
16	Pd(OAc) ₂	TBAB	toluene	21
17	Pd(OAc) ₂	TBAB	DMSO	0
18	Pd(OAc) ₂	TBAB	DMF	0
19	Pd(OAc) ₂	TBAB	TMBE	80
20	Pd(TFA) ₂	TBAB	TMBE	89
21 ^c	Pd(TFA) ₂	TBAB	TMBE	7
22 ^d	Pd(TFA) ₂	TBAB	TMBE	29
23 ^e	Pd(TFA) ₂	TBAB	TMBE	77
24 ^f	Pd(TFA) ₂	TBAB	TMBE	72
25 ^g	Pd(TFA) ₂	TBAB	TMBE	71
26		TBAB	TMBE	0

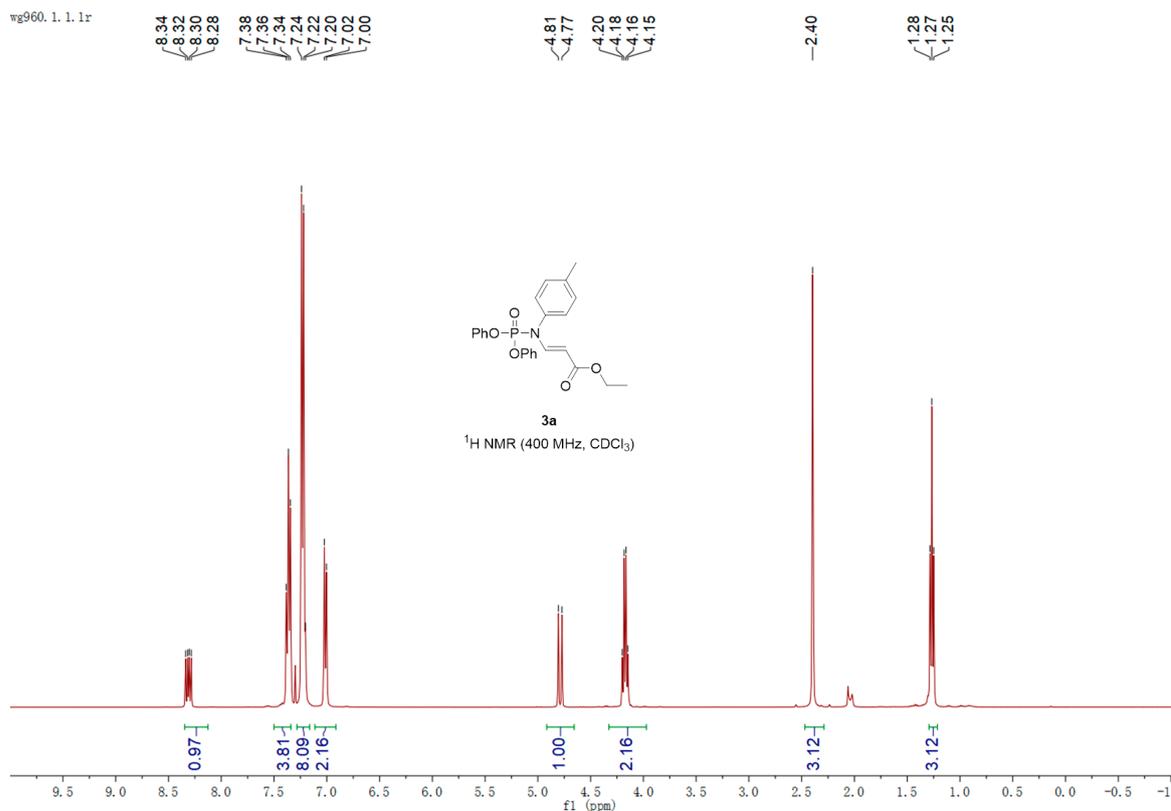
^a Reaction conditions: **1a** (0.2 mmol), **2a** (0.6 mmol), catalyst (0.02 mmol), LiOAc (0.02 mmol), additive (0.2 mmol), solvent (2 ml), under O₂, heated at 80 °C for 24 h. ^b Isolated yield. ^c Under N₂ atmosphere. ^d Under air atmosphere. ^e at 70 °C. ^f at 90 °C. ^g 80% TBAB.

Invalid substrate

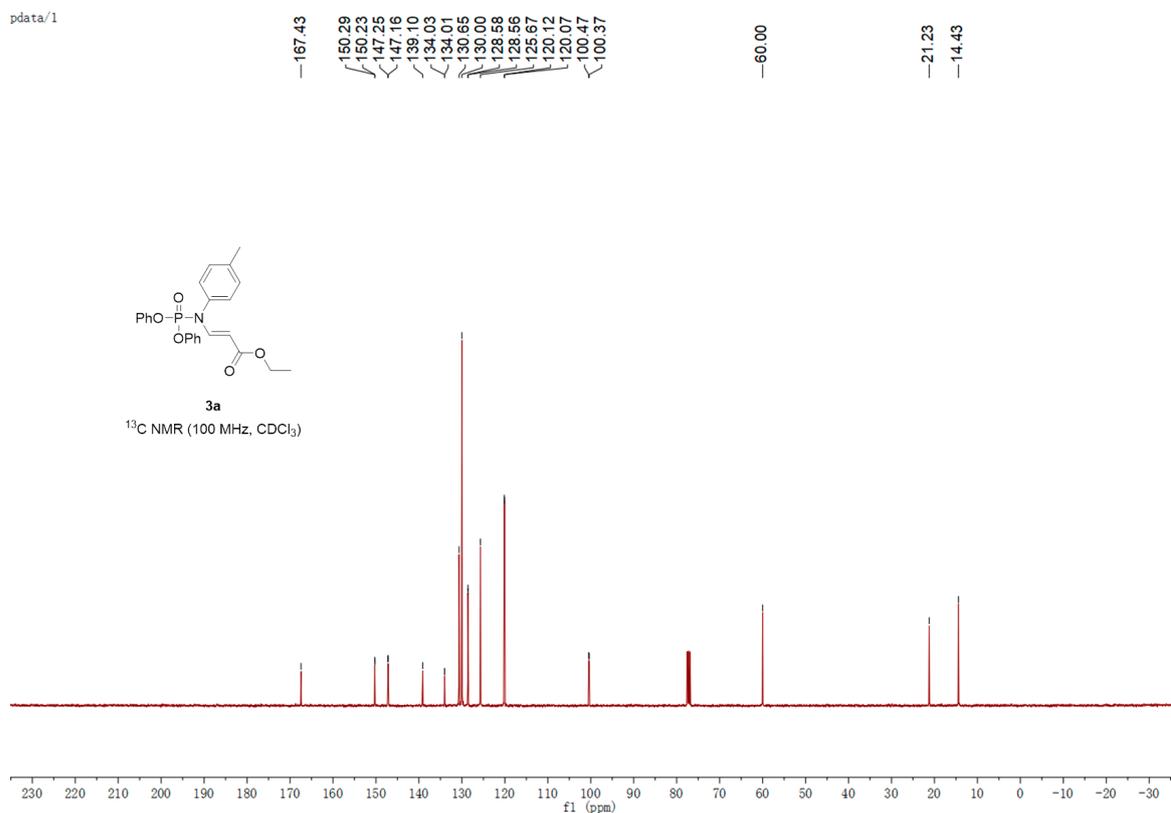


^1H , ^{13}C , ^{31}P and ^{19}F NMR spectra of products

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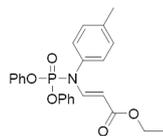


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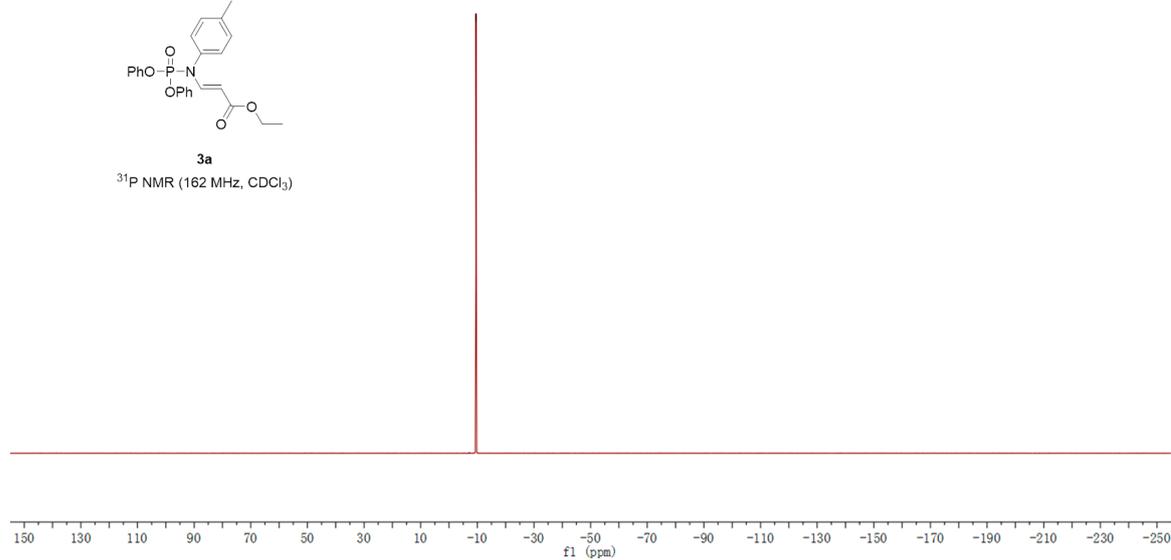
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-9.54



3a

³¹P NMR (162 MHz, CDCl₃)

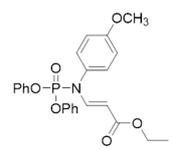


wg952.1.1.1r

8.23
8.21
8.19
8.17
7.31
7.29
7.27
7.16
7.14
7.12
6.86
6.83
6.86
6.84

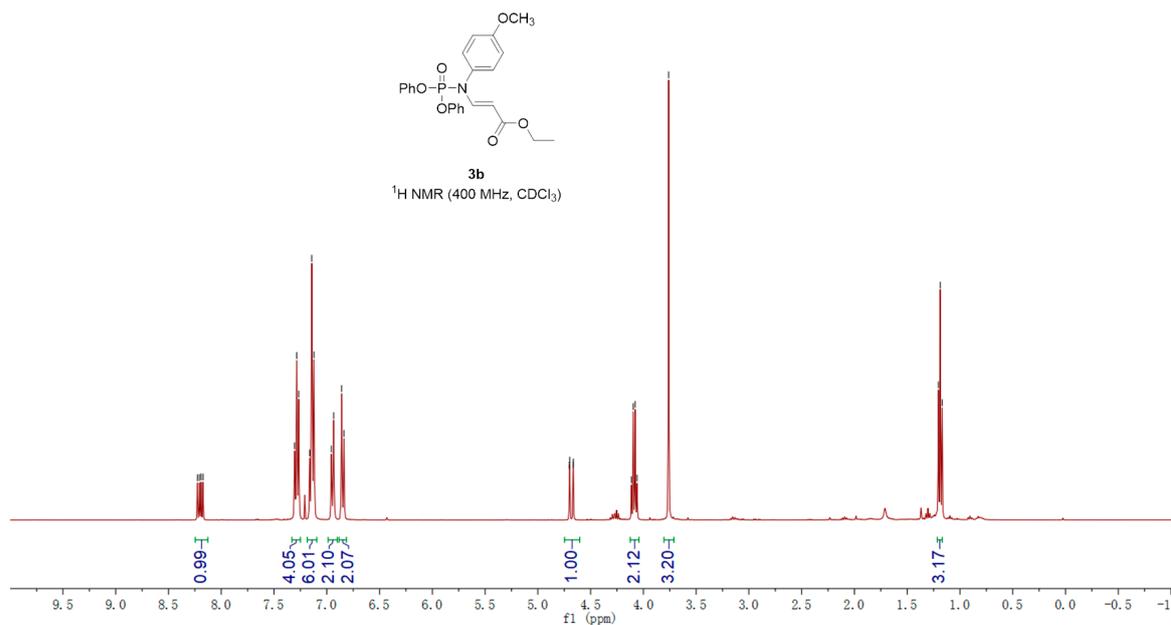
4.70
4.70
4.67
4.66
4.11
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4.08
4.06
3.76

1.20
1.19
1.17



3b

¹H NMR (400 MHz, CDCl₃)

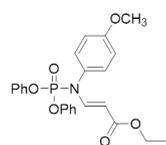


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— 167.45
— 159.81
— 150.29
— 150.22
— 147.48
— 147.38
— 130.00
— 129.96
— 129.93
— 129.06
— 129.03
— 125.67
— 120.10
— 120.05
— 115.17
— 100.42
— 100.32

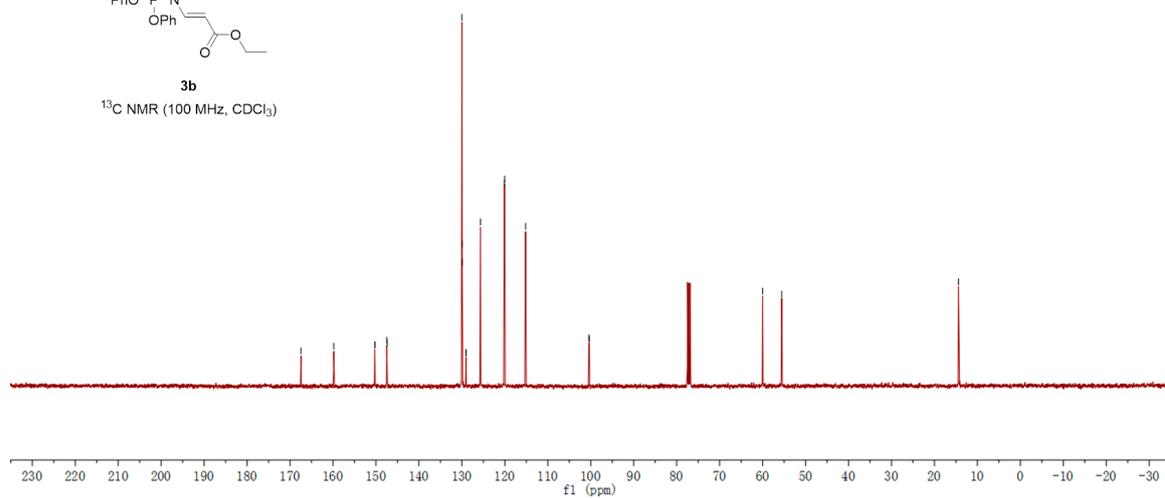
— 60.02
— 55.56

— 14.42



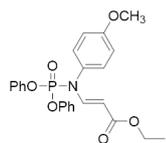
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¹³C NMR (100 MHz, CDCl₃)



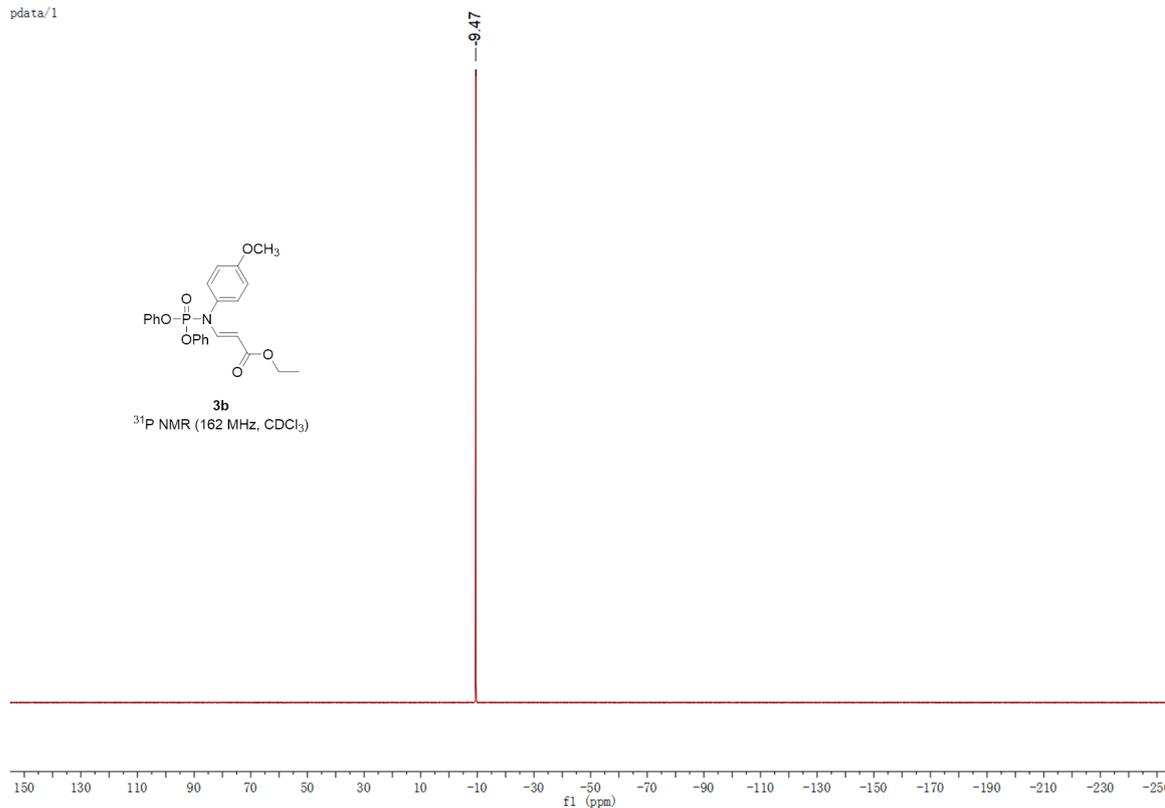
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— 9.47



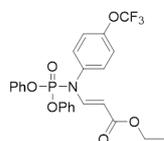
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³¹P NMR (162 MHz, CDCl₃)



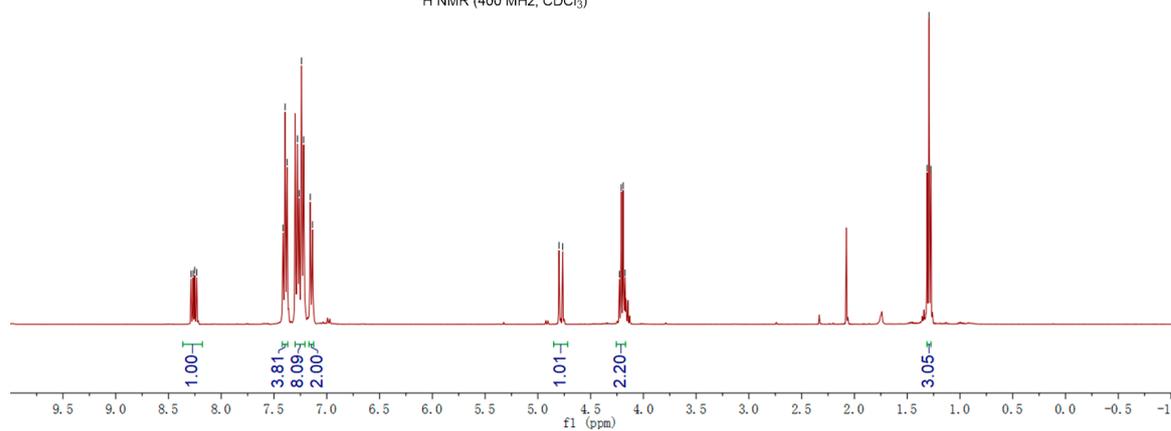
mg954.1.1.1r

8.29
8.07
8.55
8.23
7.41
7.40
7.38
7.28
7.26
7.24
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4.23
4.21
4.19
4.17
1.31
1.29
1.28



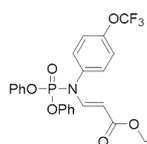
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¹H NMR (400 MHz, CDCl₃)



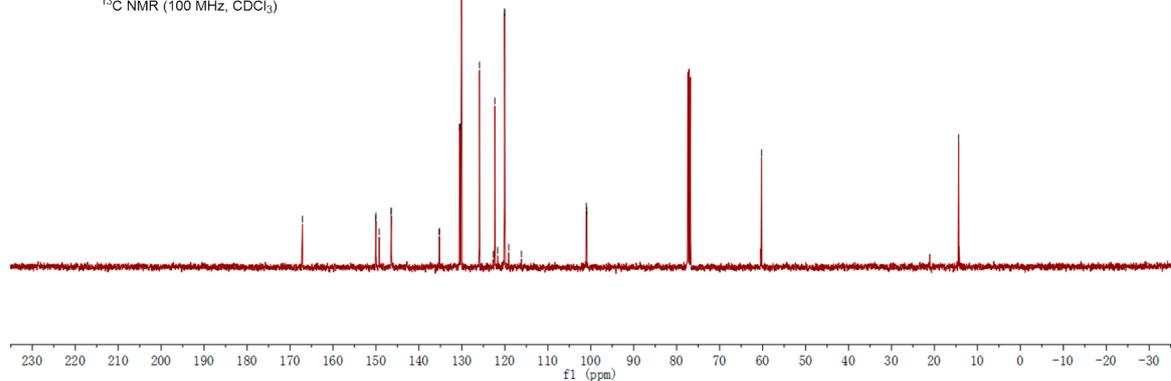
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167.10
150.07
150.00
149.25
146.51
146.42
135.26
135.23
130.51
130.48
130.11
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122.32
121.67
120.07
120.02
119.10
116.14
101.02
100.92
60.22
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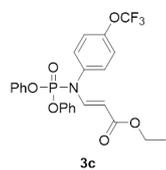


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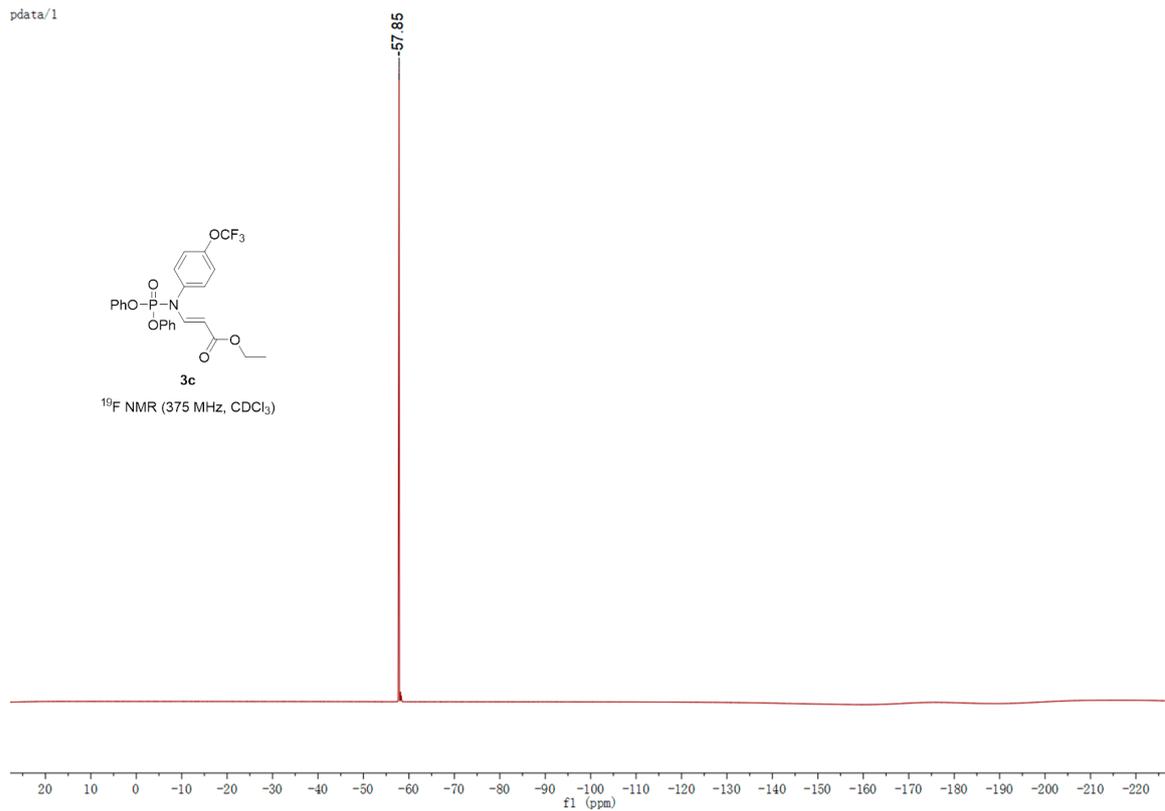
¹³C NMR (100 MHz, CDCl₃)



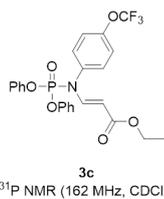
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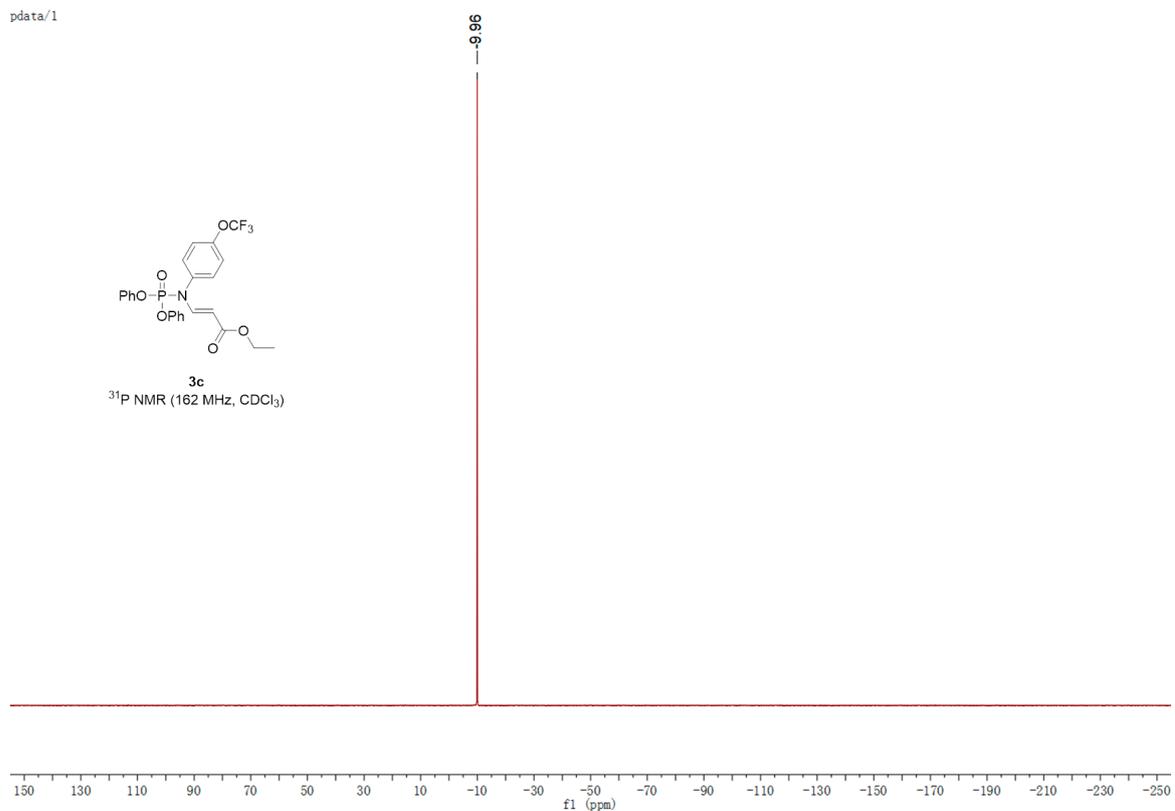
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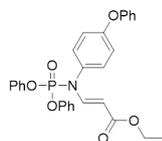
³¹P NMR (162 MHz, CDCl₃)



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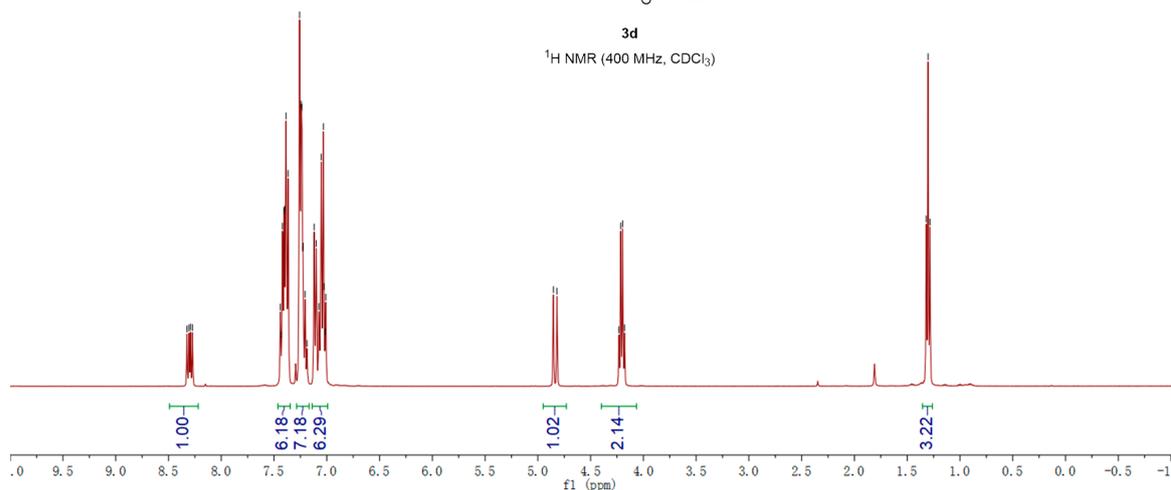
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8.27
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7.44
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7.41
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7.24
7.22
7.21
7.19
7.12
7.10
7.07
7.05
7.03
7.03
7.02
7.01
4.85
4.82
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4.21
4.20
4.18

1.32
1.30
1.28



3d

¹H NMR (400 MHz, CDCl₃)

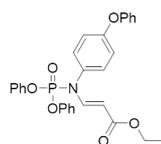


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158.15
156.09
150.24
150.17
147.19
147.10
131.08
131.06
130.25
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130.05
130.05
125.76
124.34
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120.06
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100.54

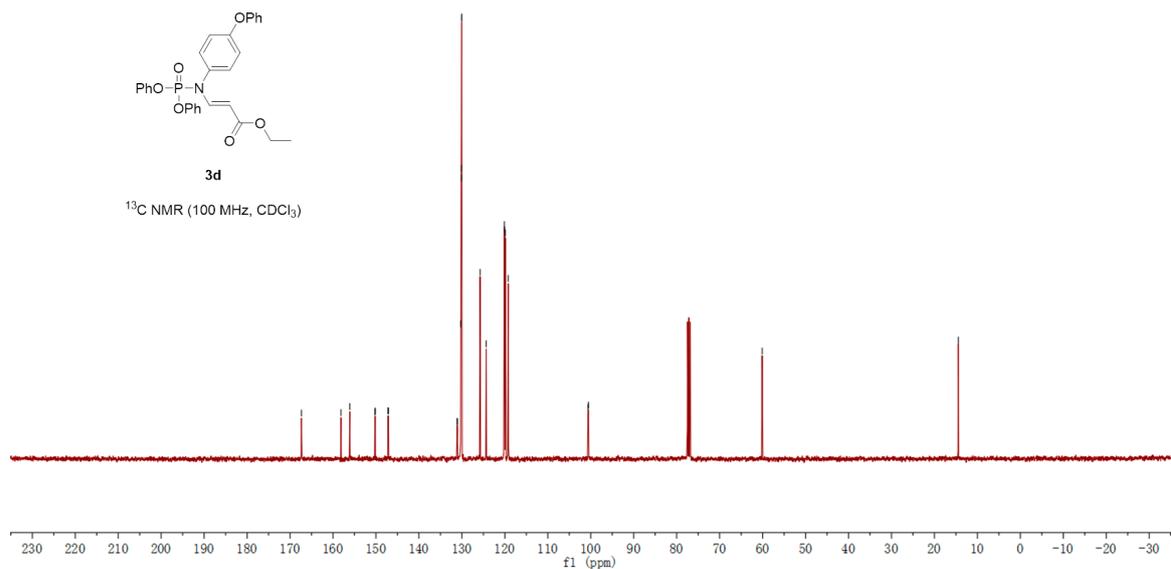
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14.46

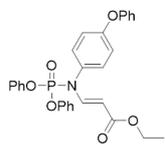


3d

¹³C NMR (100 MHz, CDCl₃)

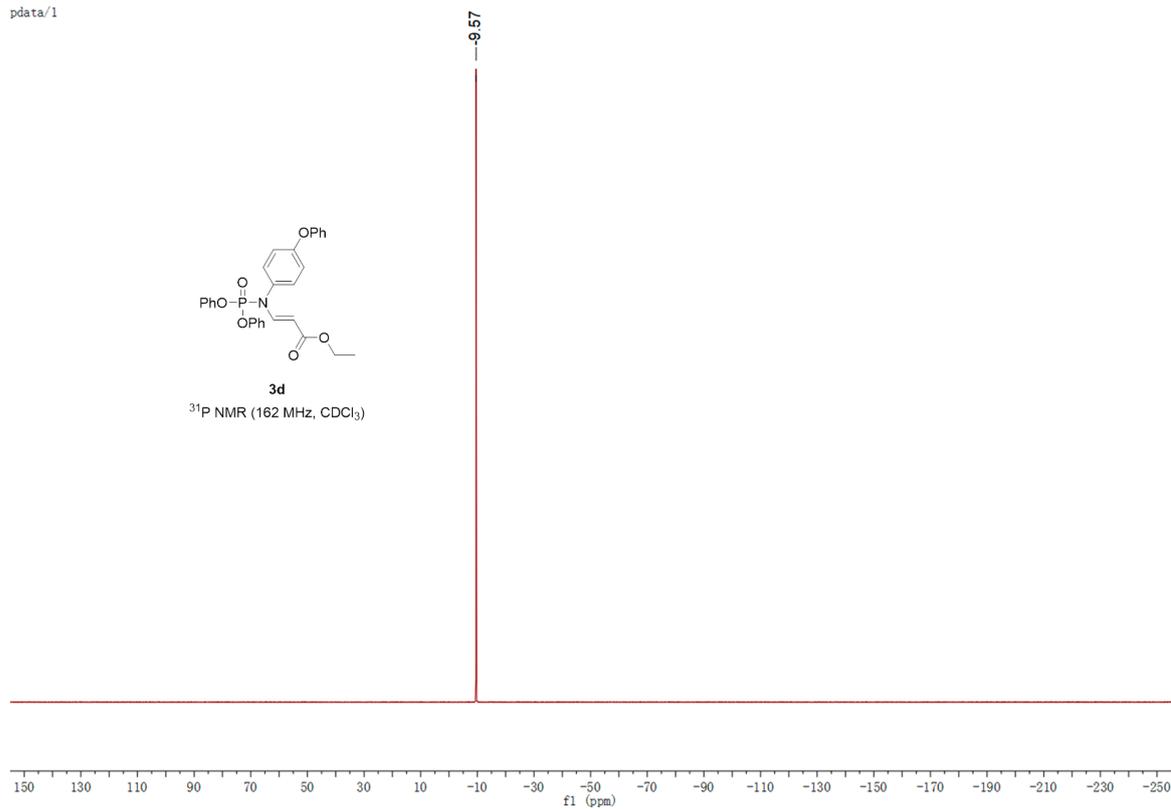


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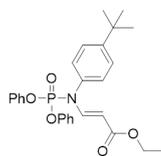
3d

³¹P NMR (162 MHz, CDCl₃)



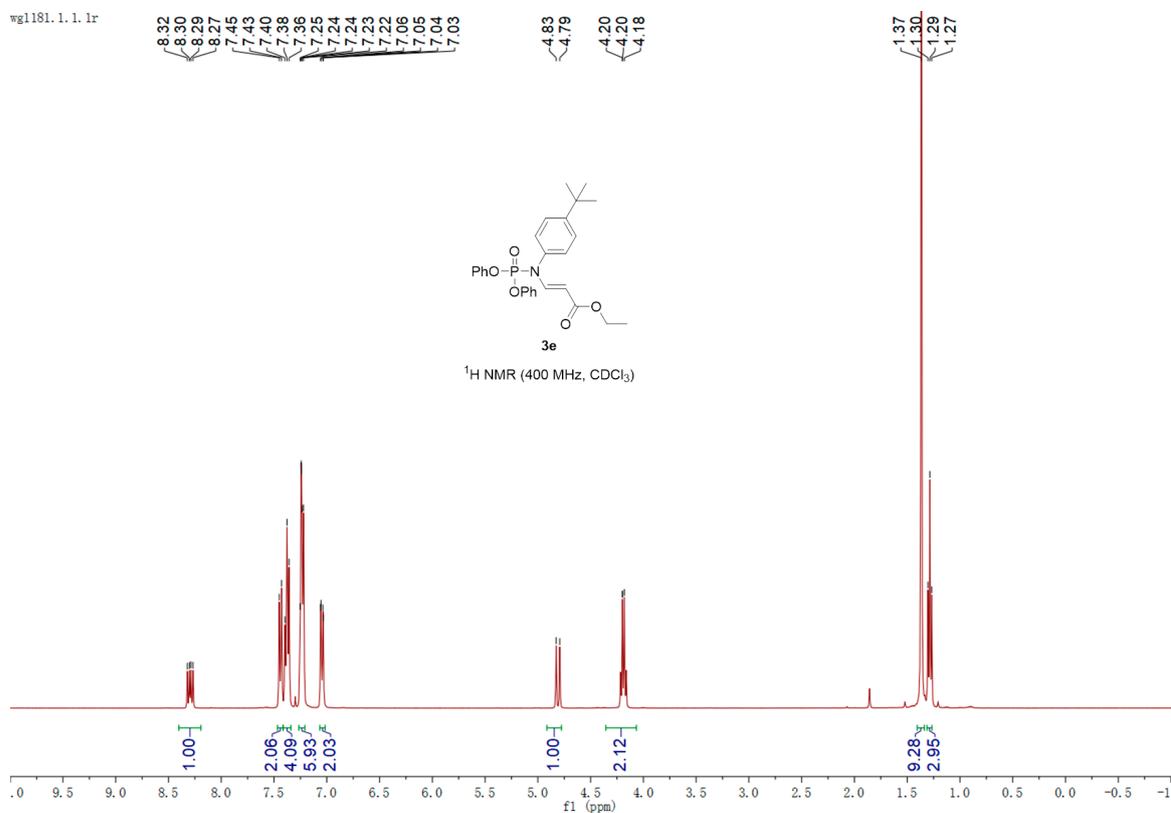
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8.32, 8.30, 8.29, 8.27, 7.45, 7.43, 7.40, 7.38, 7.36, 7.25, 7.24, 7.24, 7.23, 7.22, 7.06, 7.05, 7.04, 7.03, 4.83, 4.79, 4.20, 4.20, 4.18, 1.37, 1.30, 1.29, 1.27



3e

¹H NMR (400 MHz, CDCl₃)



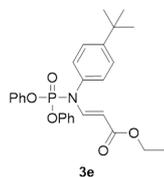
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150.29
150.22
147.23
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126.95
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120.11
100.44
100.34

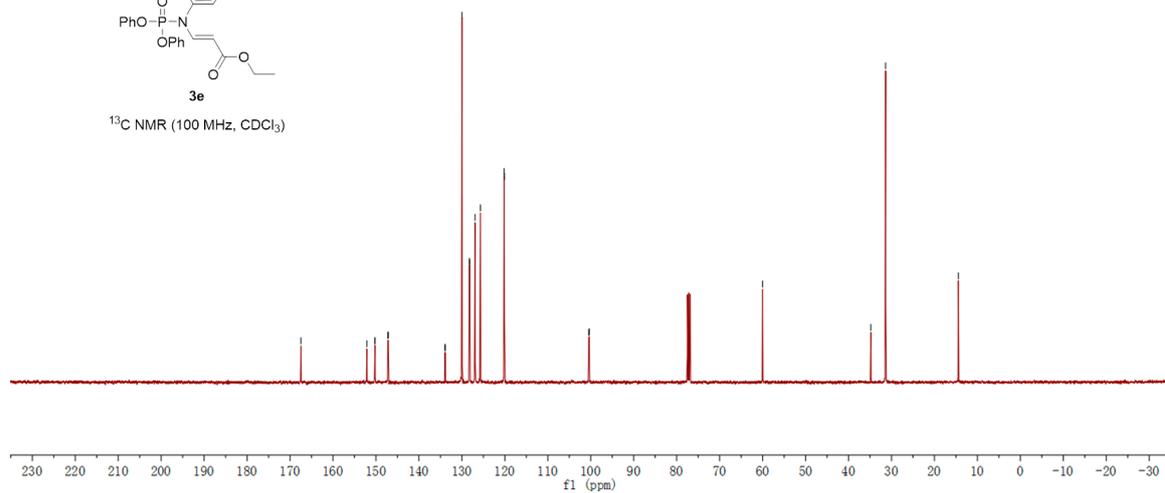
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14.45

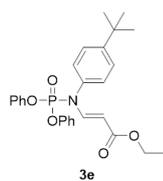


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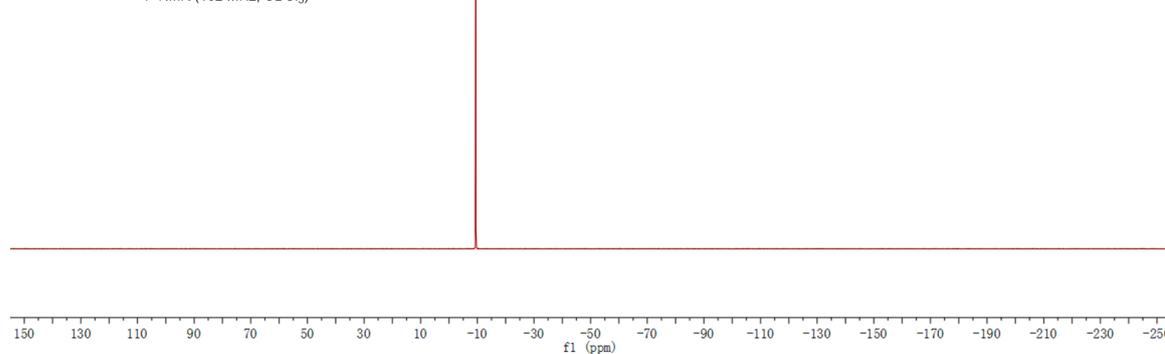


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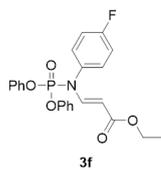


³¹P NMR (162 MHz, CDCl₃)

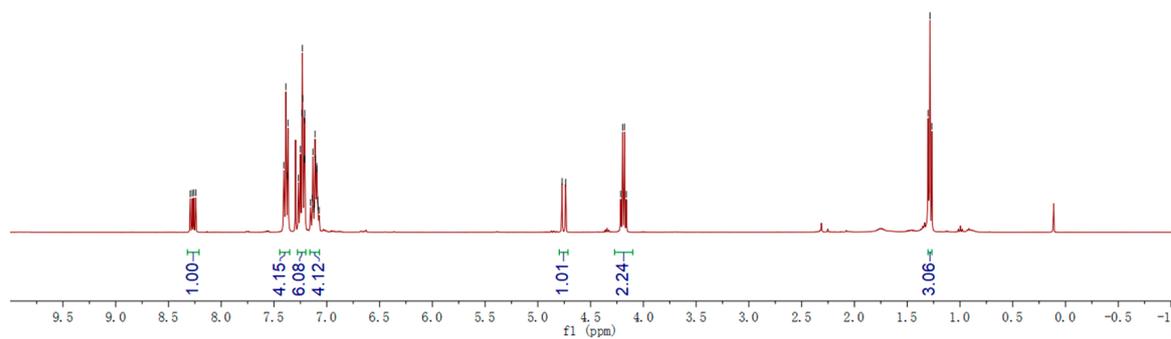


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 7.23
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 7.21
 7.21
 7.21
 7.15
 7.14
 7.13
 7.12
 7.11
 7.11
 7.10
 7.09
 7.09
 7.07
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 4.20
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 4.16

1.30
 1.28
 1.27



¹H NMR (400 MHz, CDCl₃)

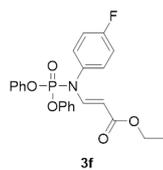


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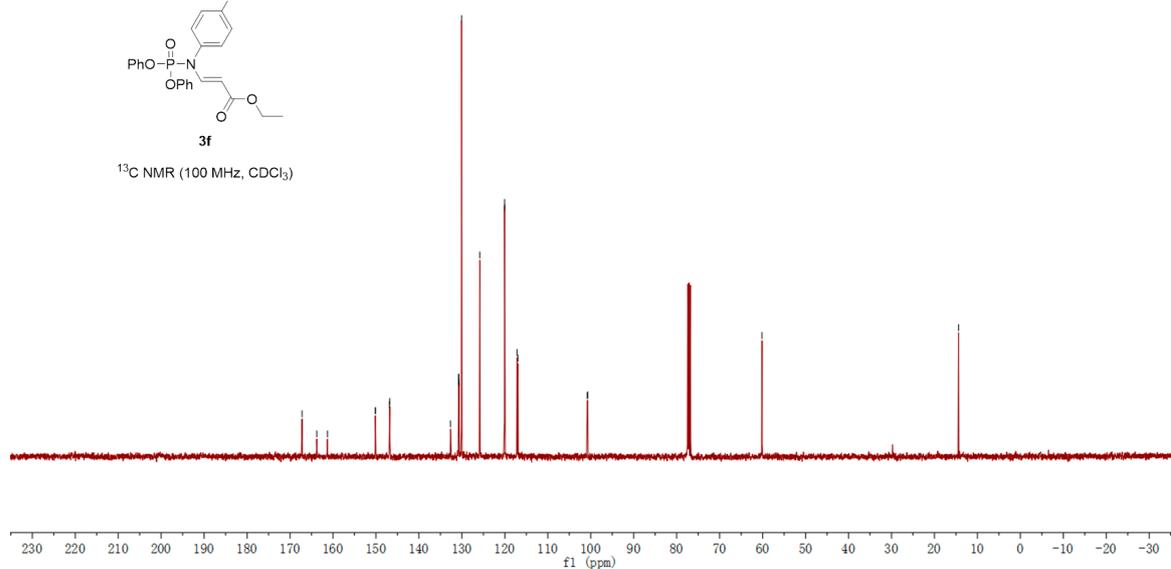
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 100.81
 100.71

60.14

14.40

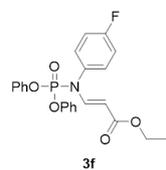


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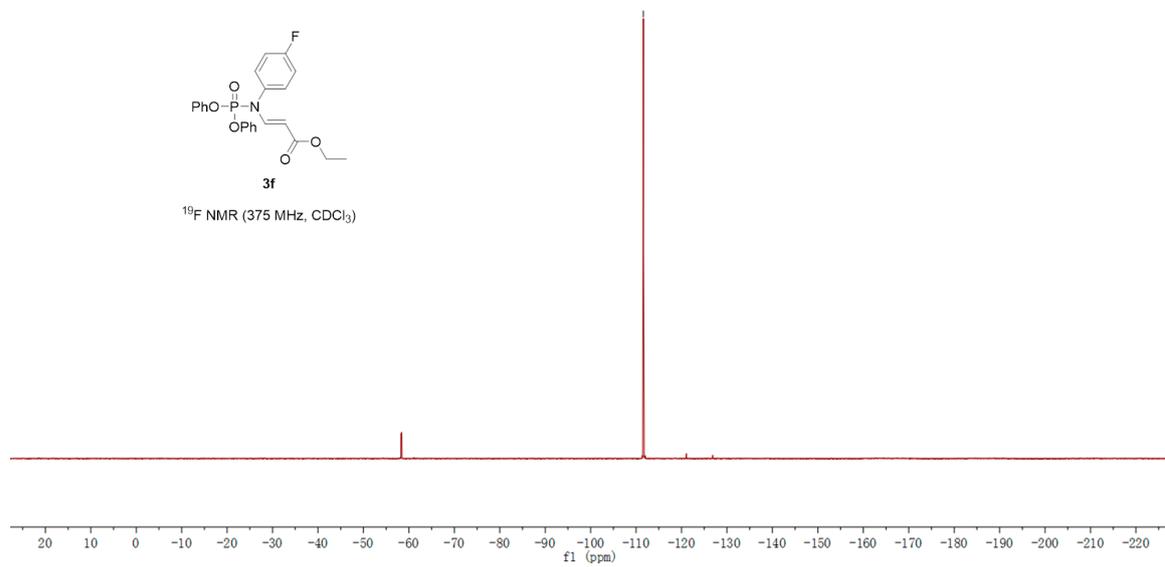


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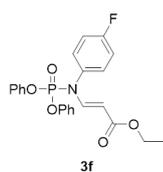


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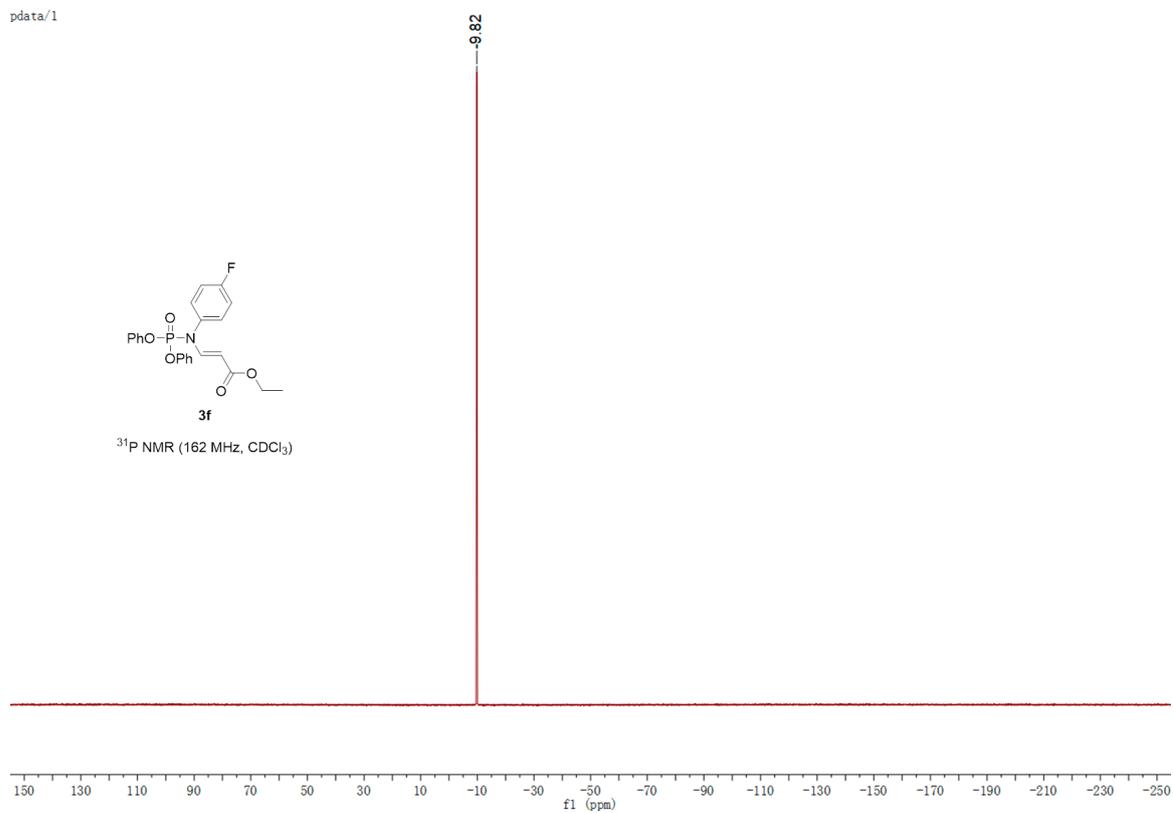


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---9.82



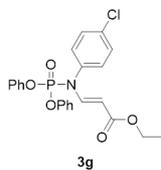
³¹P NMR (162 MHz, CDCl₃)



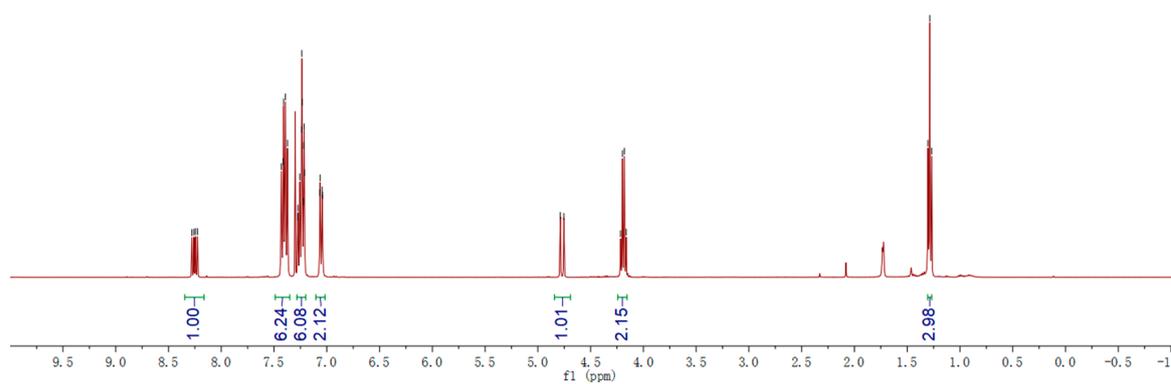
wg961.1.1.1r

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7.24
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7.21
7.21
7.07
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7.04
7.04
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1.30
1.29
1.27



¹H NMR (400 MHz, CDCl₃)

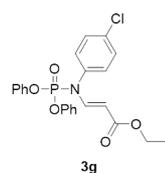


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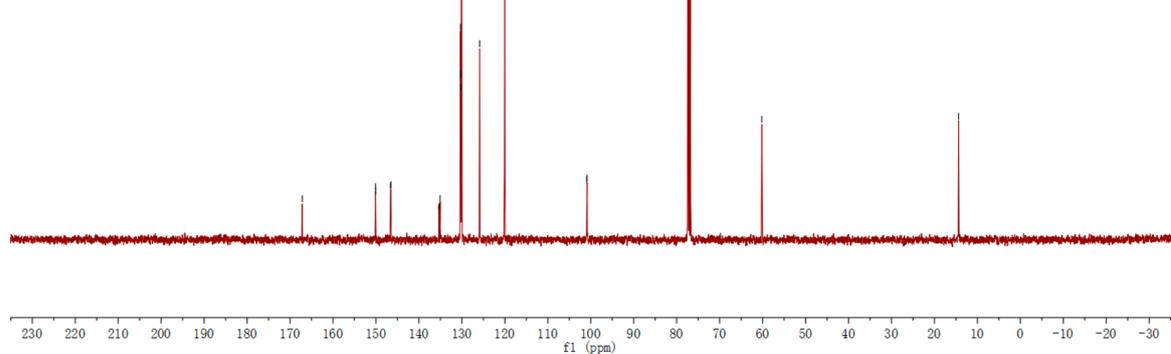
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100.94
100.85

60.17

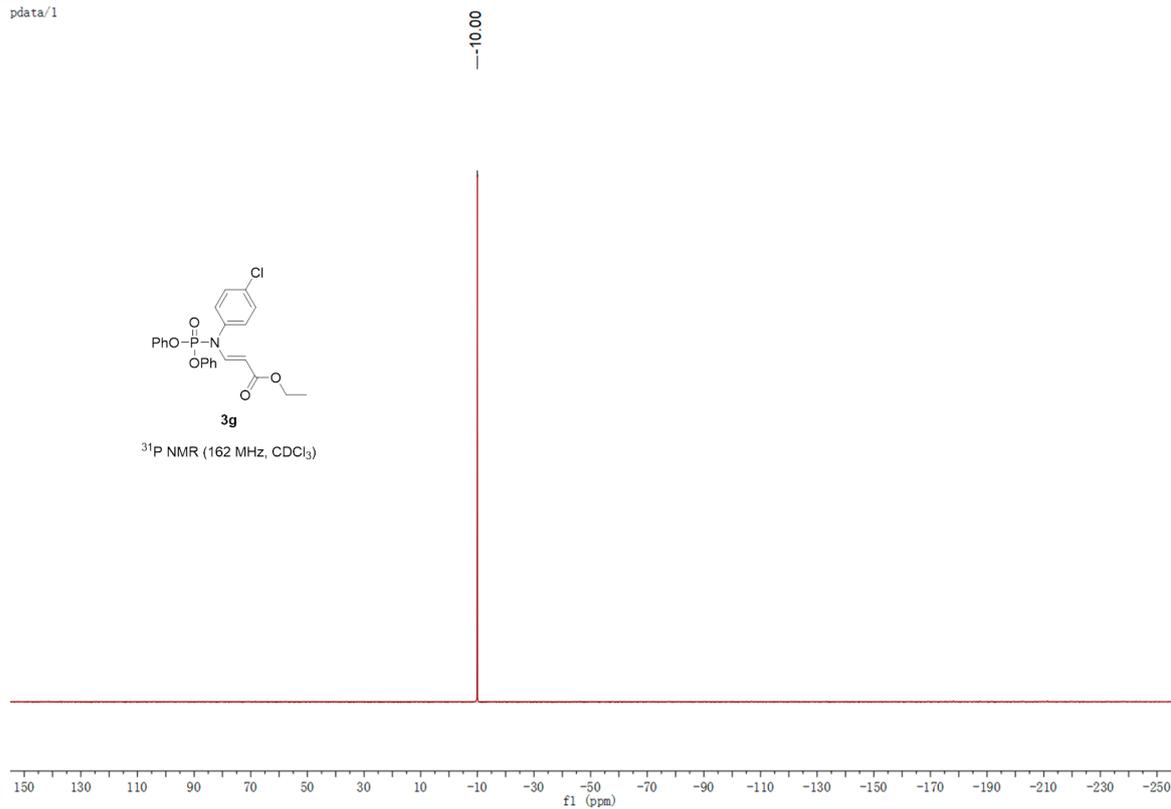
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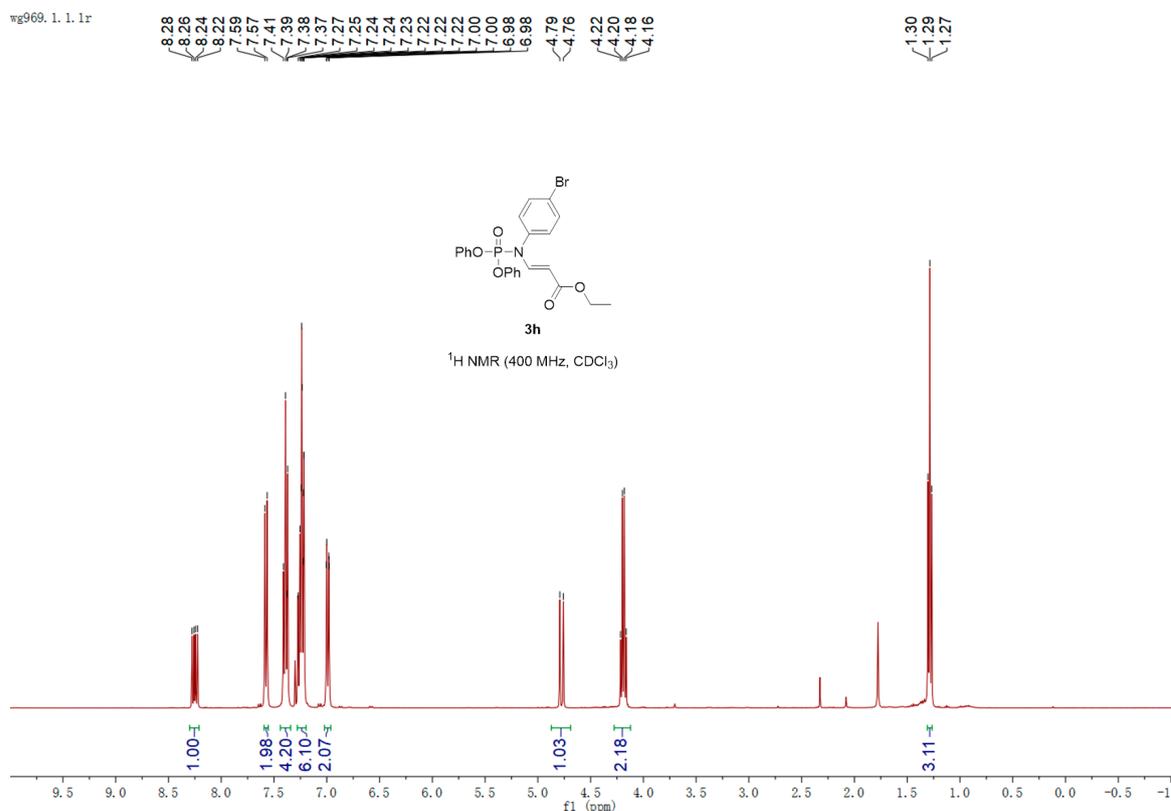
¹³C NMR (100 MHz, CDCl₃)



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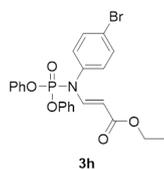


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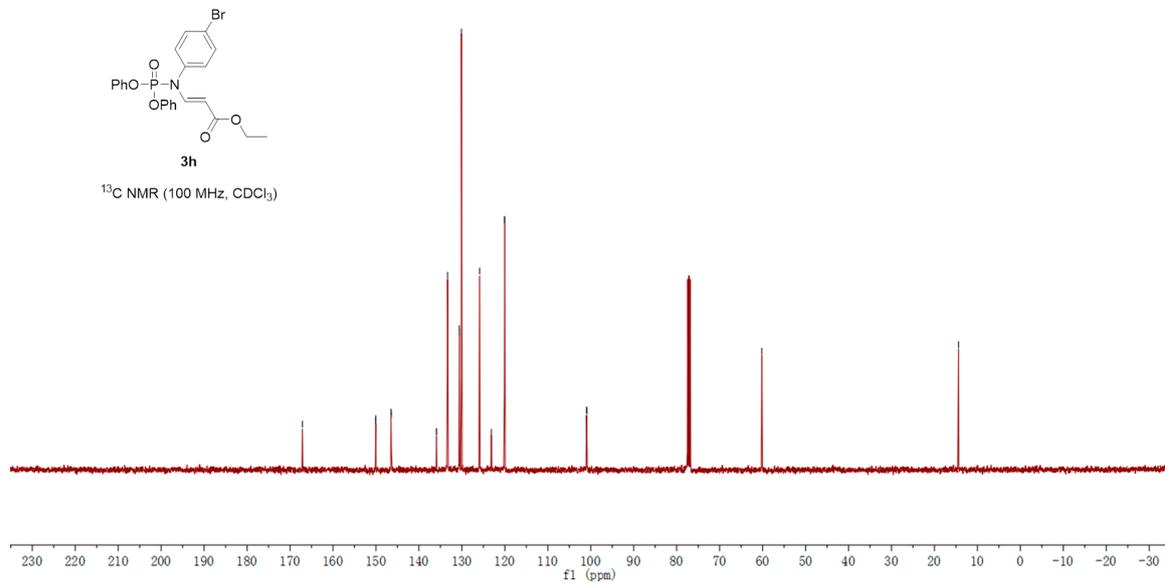
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100.88

60.18

14.41

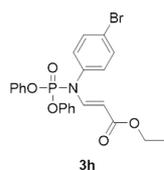


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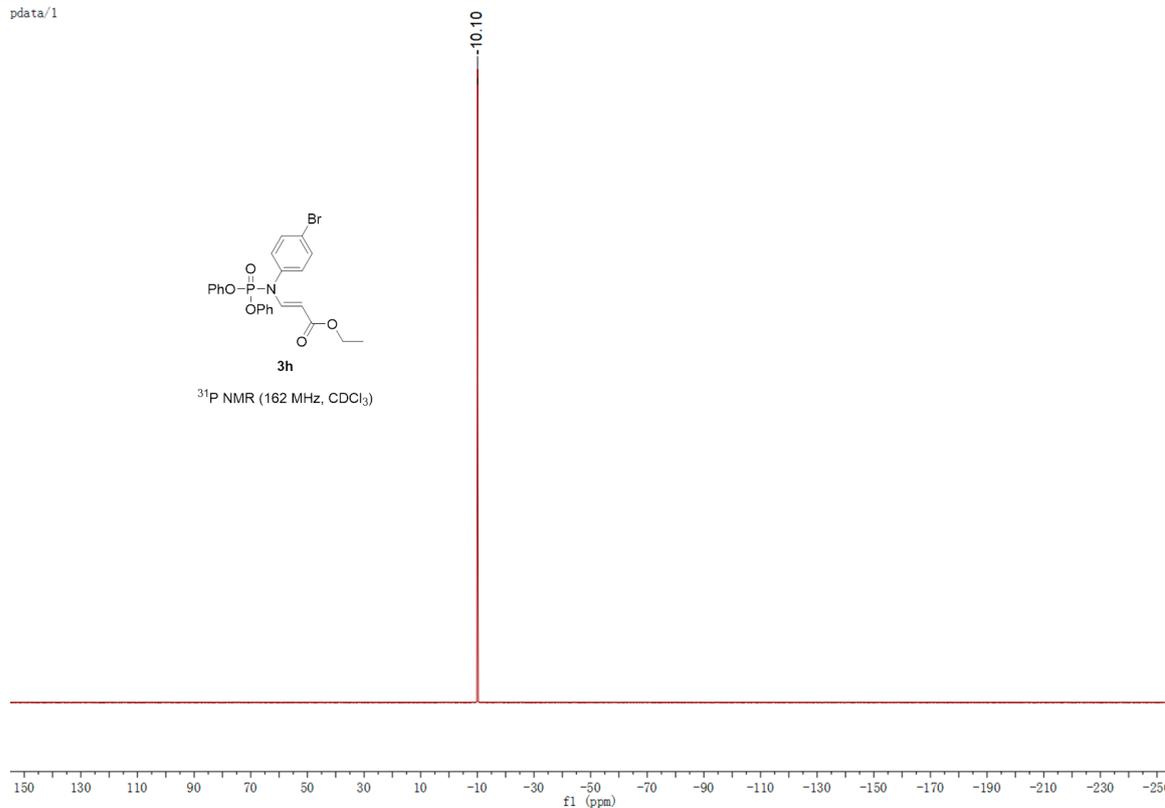


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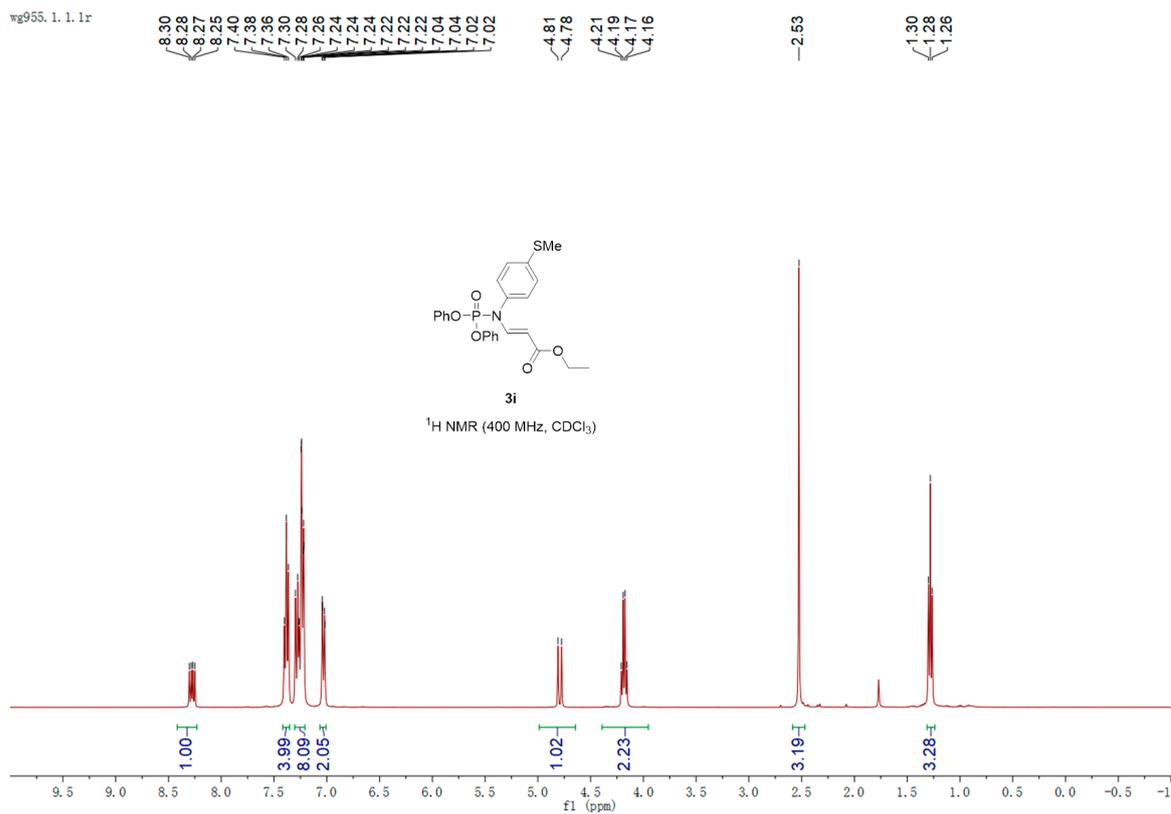
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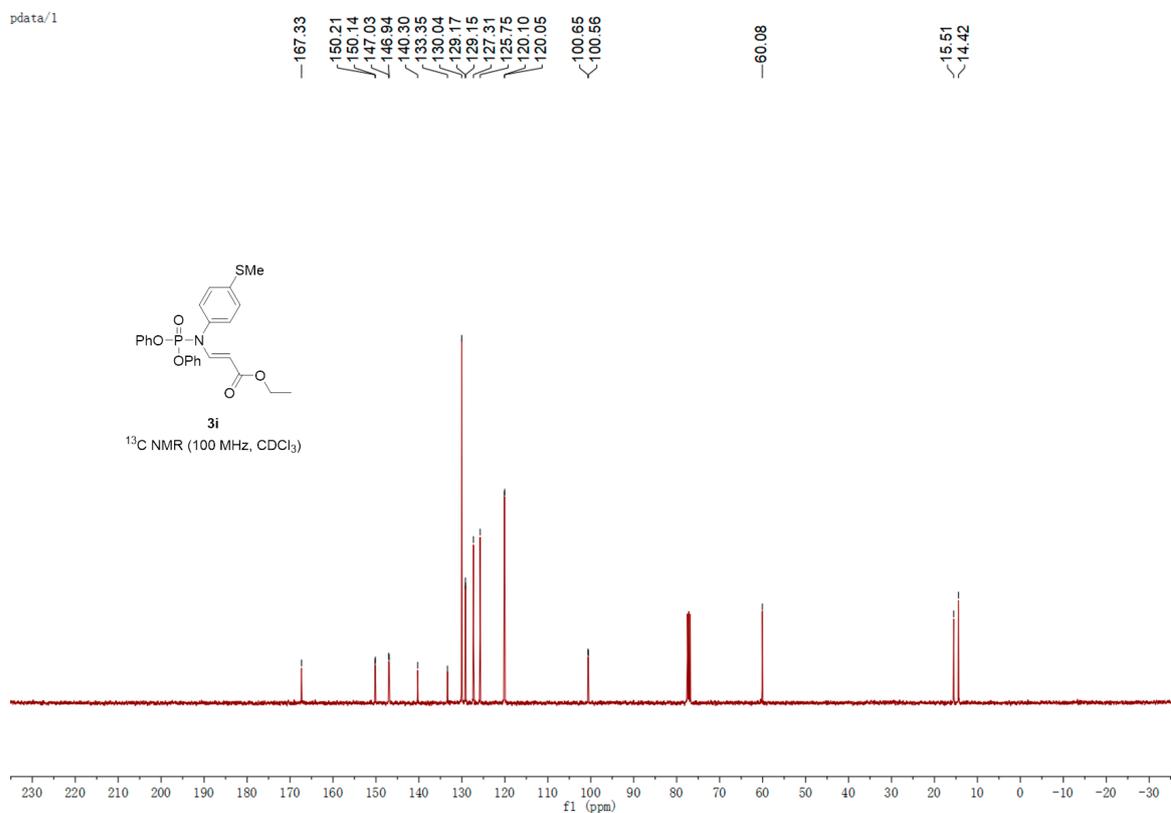
³¹P NMR (162 MHz, CDCl₃)



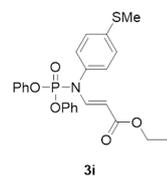
mg955. 1. 1. 1r



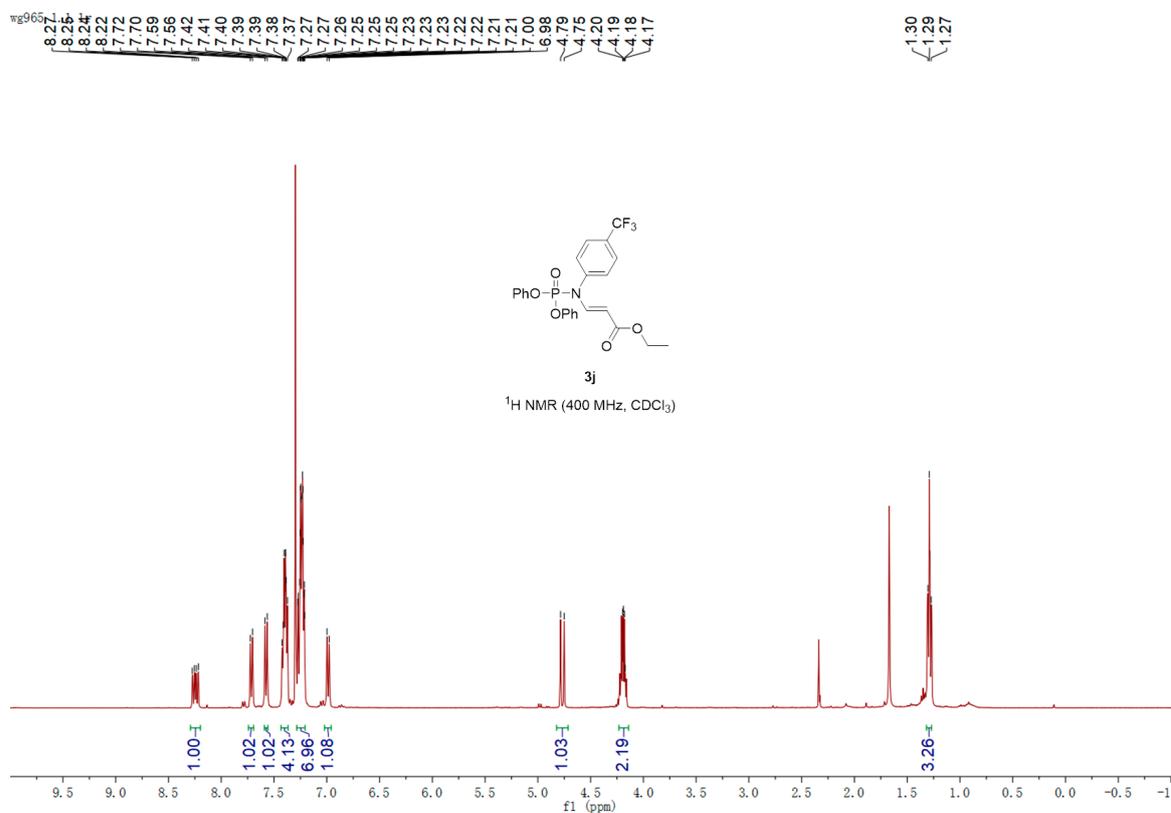
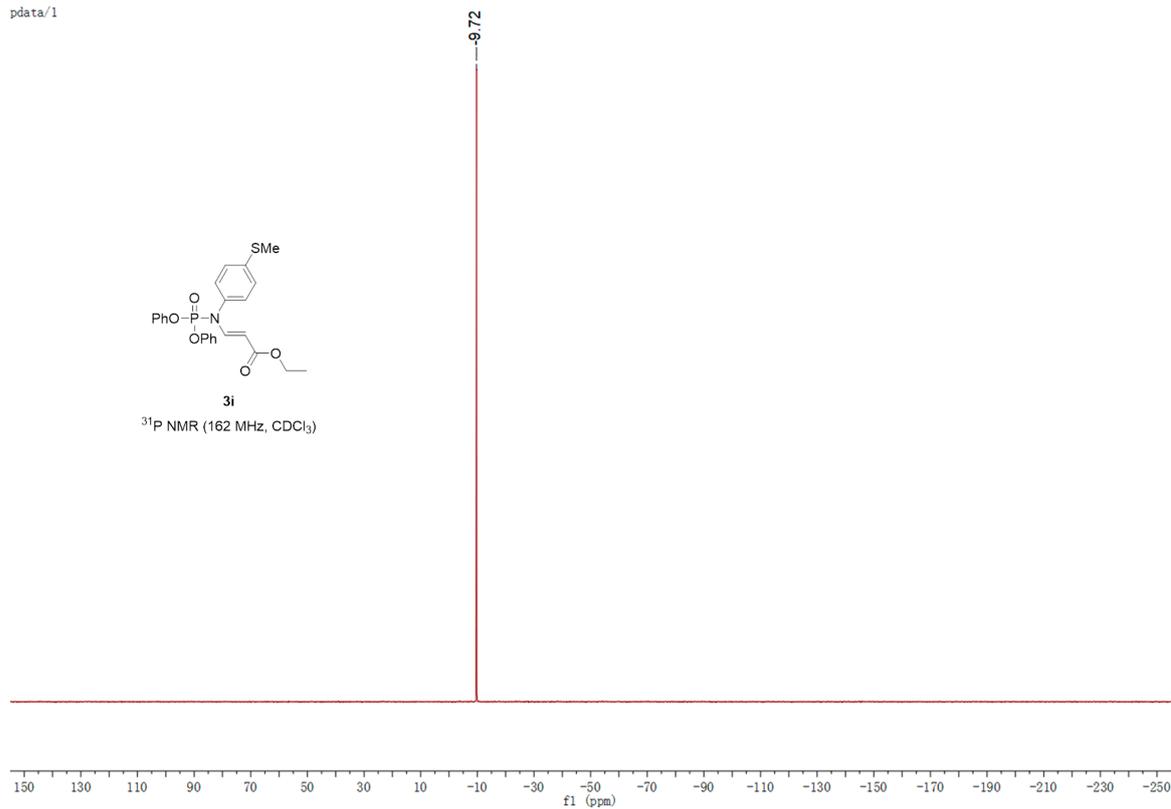
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pdata/1



³¹P NMR (162 MHz, CDCl₃)

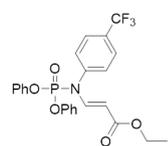


pdata/1

167.01
150.01
149.94
146.50
146.41
146.12
146.04
140.32
133.33
130.58
130.15
130.09
129.46
129.44
127.25
126.00
125.87
120.10
120.05
101.29
101.19

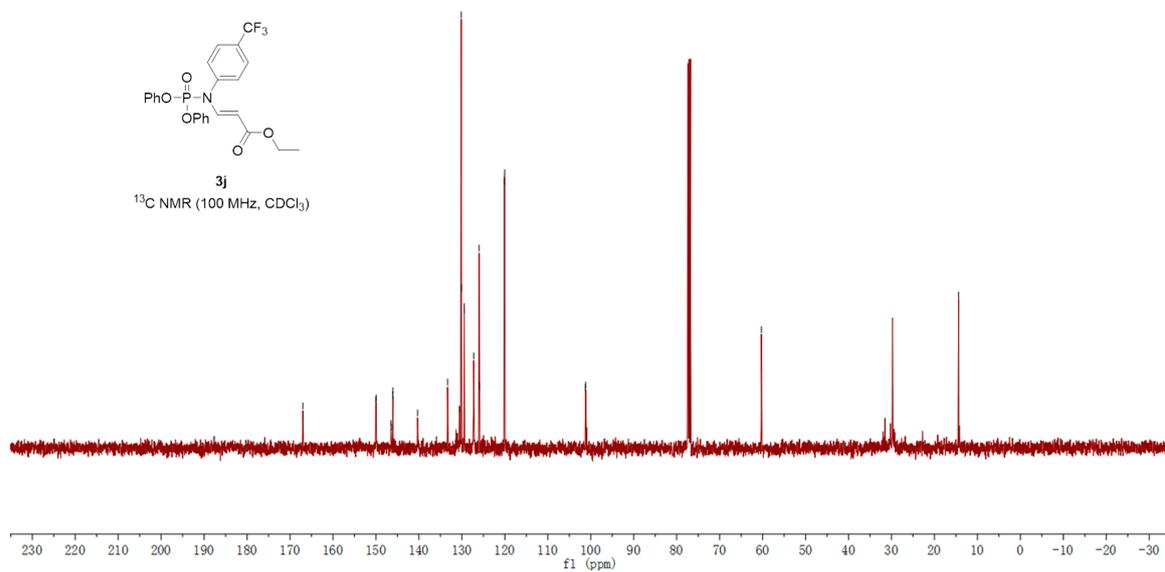
—60.28

—14.38



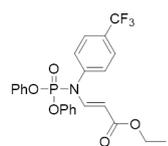
3j

¹³C NMR (100 MHz, CDCl₃)



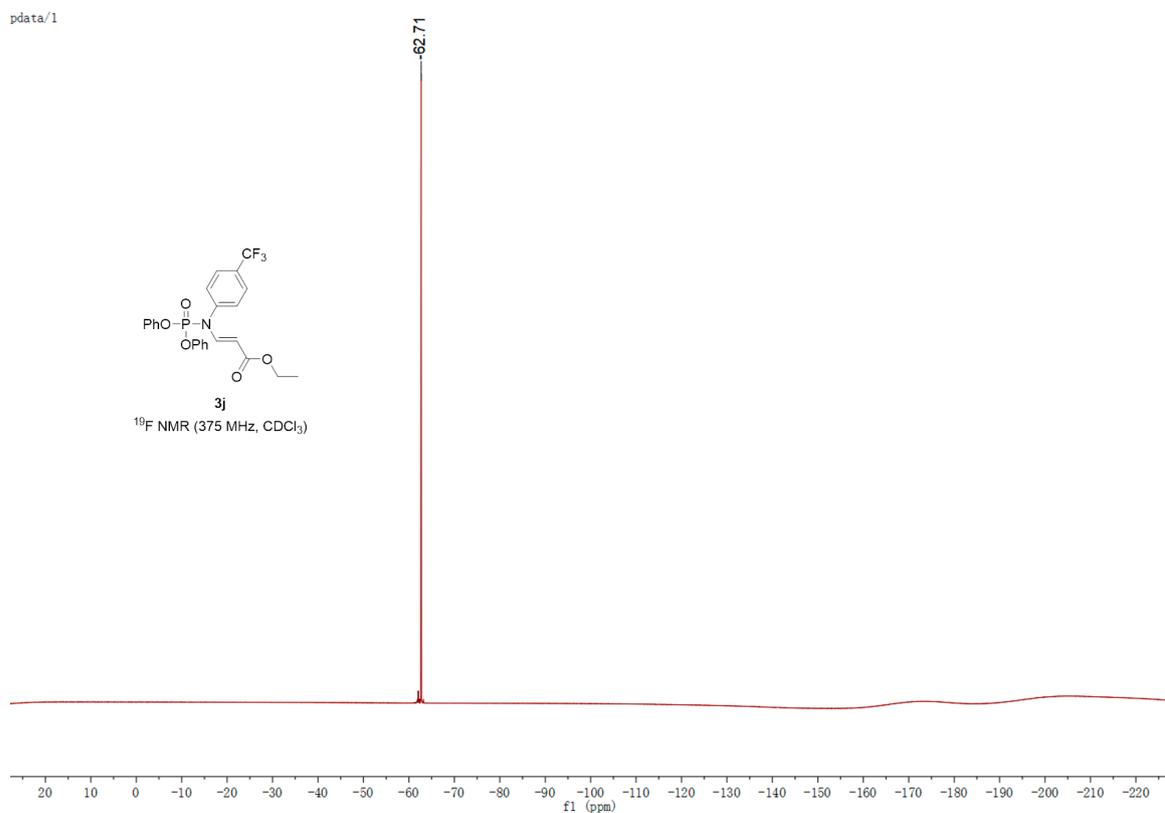
pdata/1

-62.71

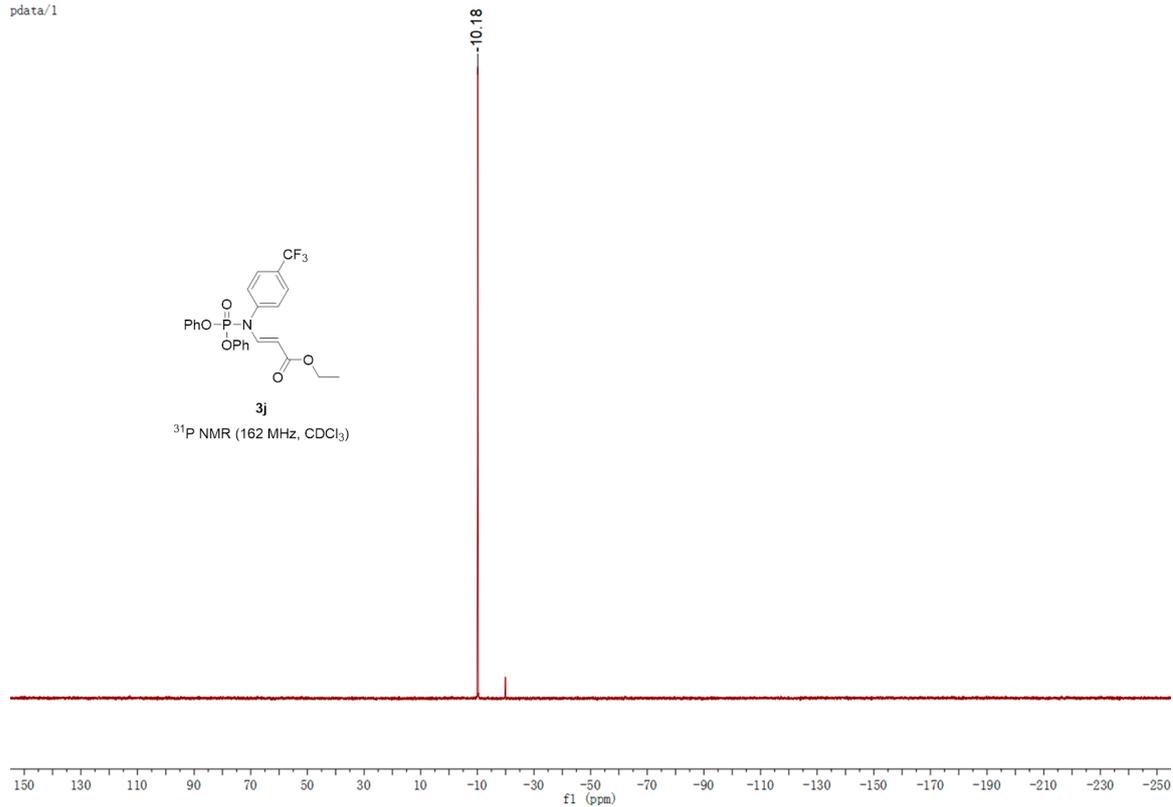
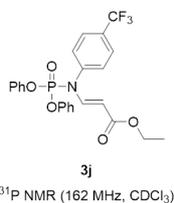


3j

¹⁹F NMR (375 MHz, CDCl₃)

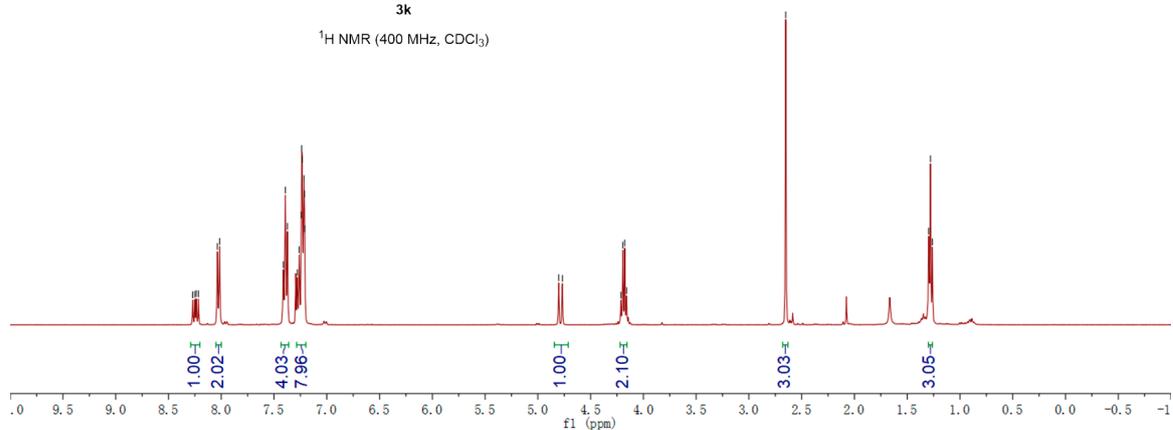
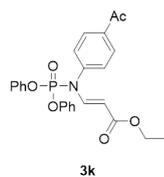


pdata/1



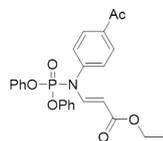
wg1185.1.1.1r

8.27 8.25 8.24 8.22 8.04 8.02 7.41 7.39 7.37 7.28 7.26 7.24 7.23 7.22 7.21 7.21 4.80 4.77 4.21 4.19 4.18 4.16 -2.65 1.30 1.28 1.26

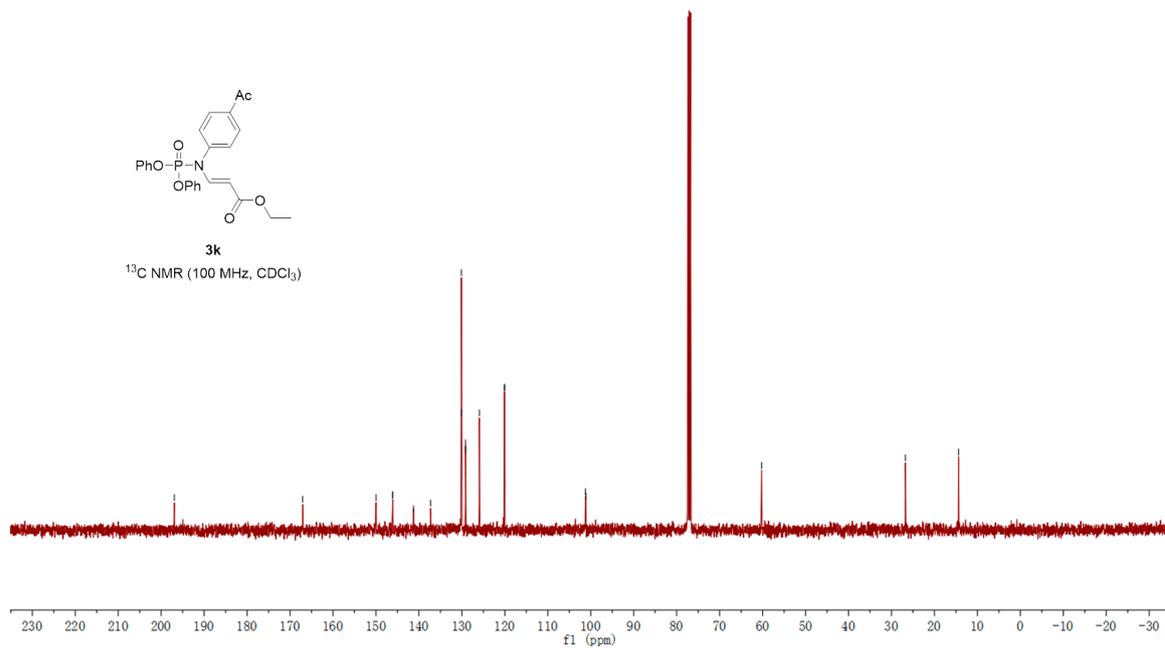


pdata/1

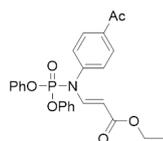
— 196.83 — 167.06 — 149.98 — 146.15 — 141.26 — 137.29 — 130.11 — 130.06 — 129.15 — 129.13 — 125.93 — 120.10 — 120.05 — 101.23 — 101.14 — 60.21 — 26.77 — 14.39



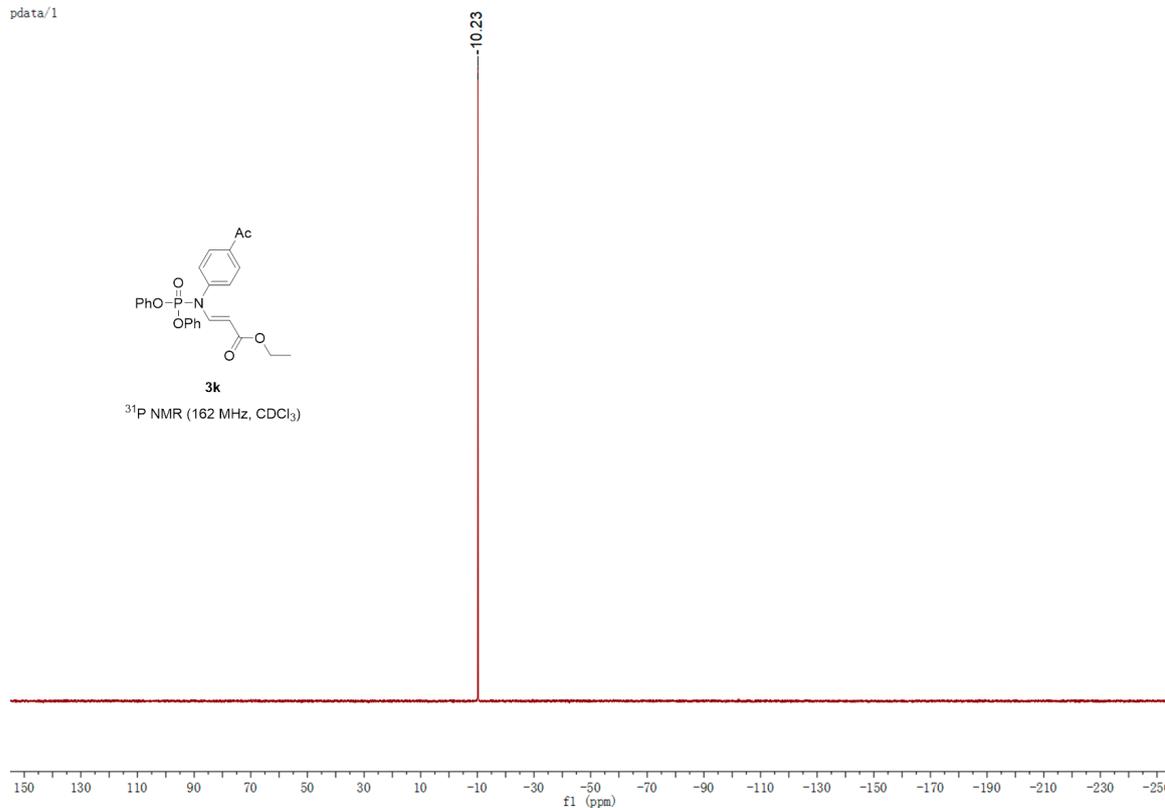
3k
¹³C NMR (100 MHz, CDCl₃)



pdata/1

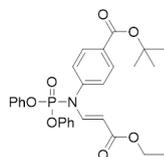


3k
³¹P NMR (162 MHz, CDCl₃)



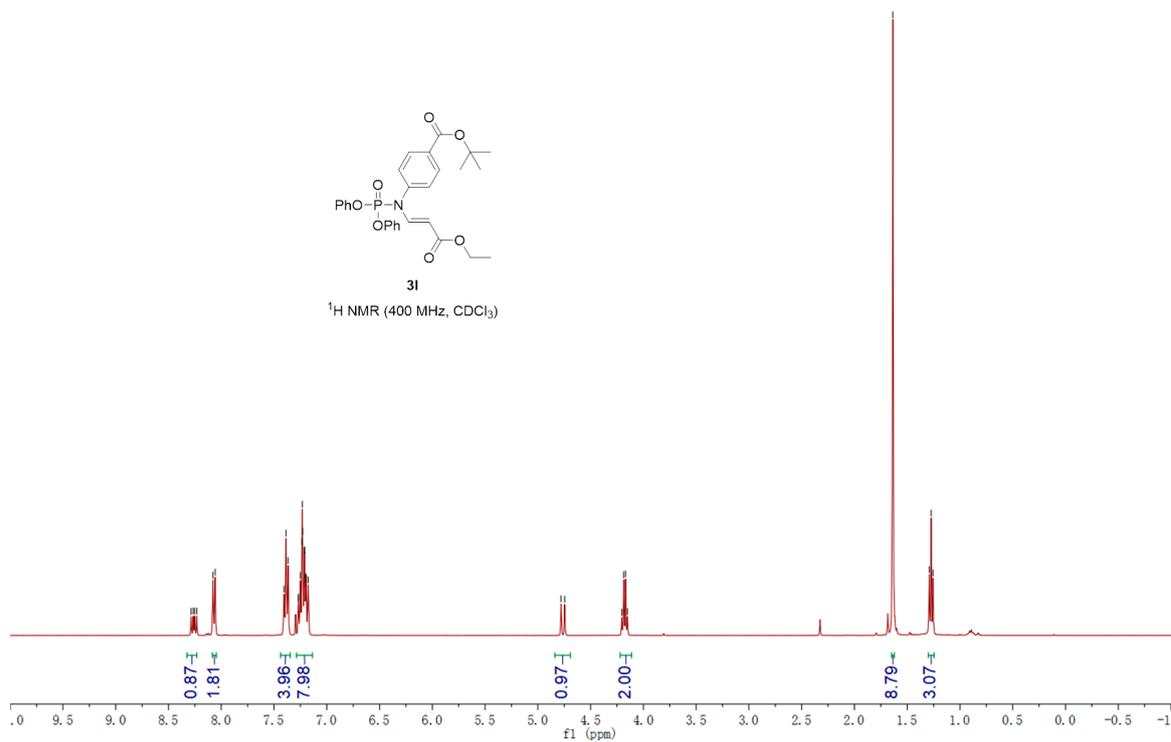
wg1191.1.1.1r

8.29
8.27
8.25
8.23
8.08
8.06
7.41
7.39
7.37
7.27
7.25
7.24
7.23
7.23
7.21
7.21
7.20
7.20
7.18
4.78
4.75
4.20
4.19
4.17
4.15



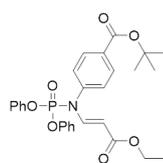
3I

¹H NMR (400 MHz, CDCl₃)



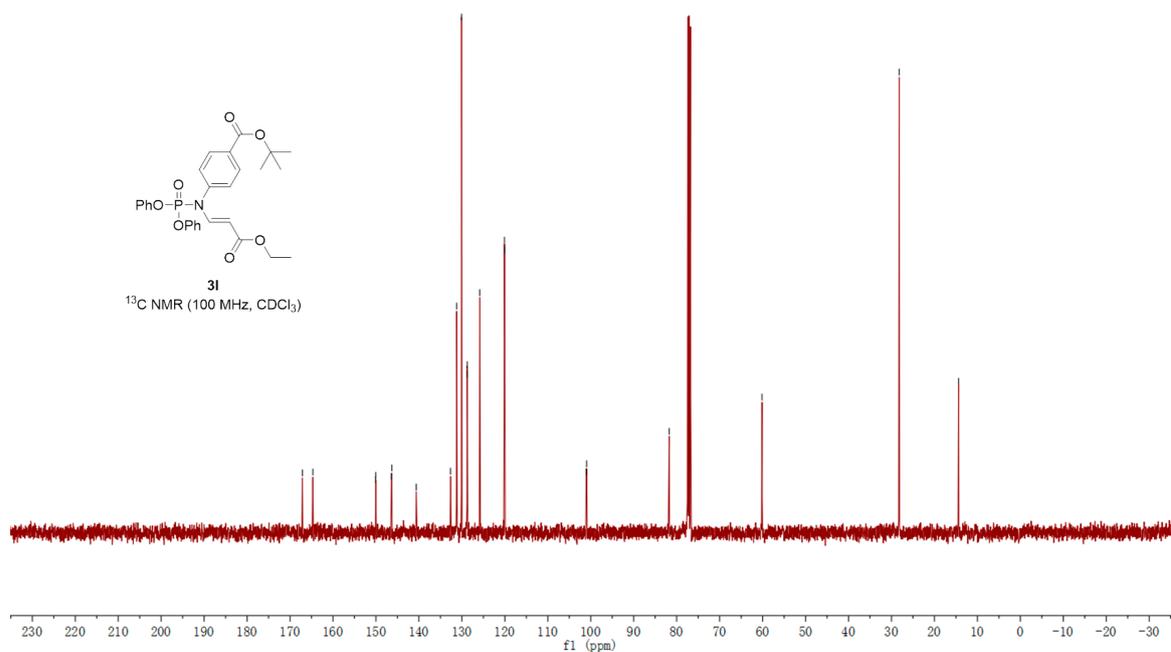
pdata/1

167.12
164.70
150.11
150.04
146.40
146.32
140.82
132.84
131.22
130.08
128.76
128.74
125.85
120.09
120.04
101.05
100.96
81.74
60.13
28.21
14.39

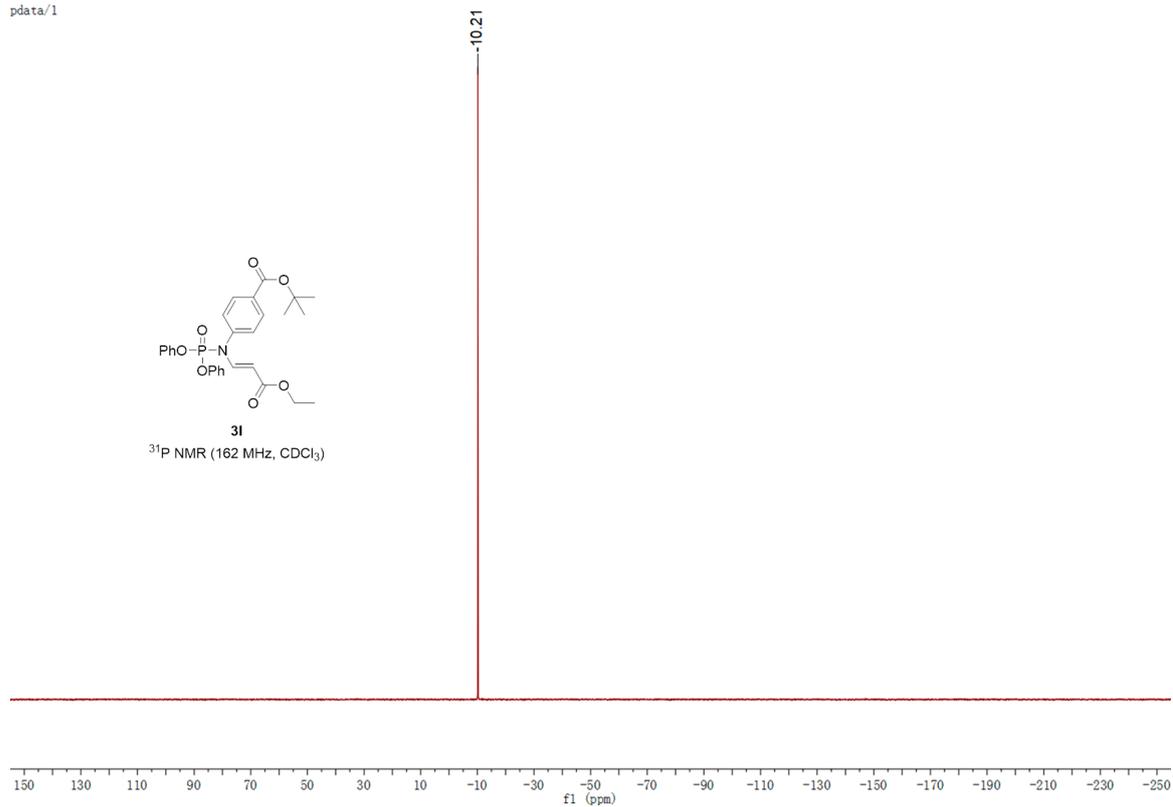


3I

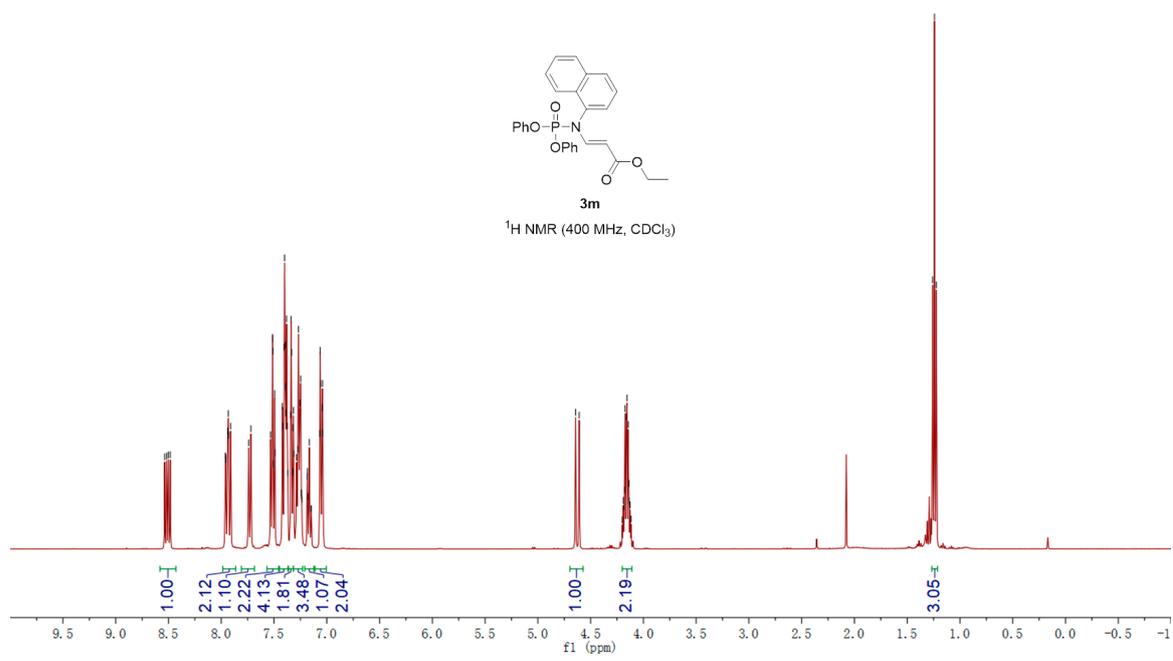
¹³C NMR (100 MHz, CDCl₃)



pdata/1



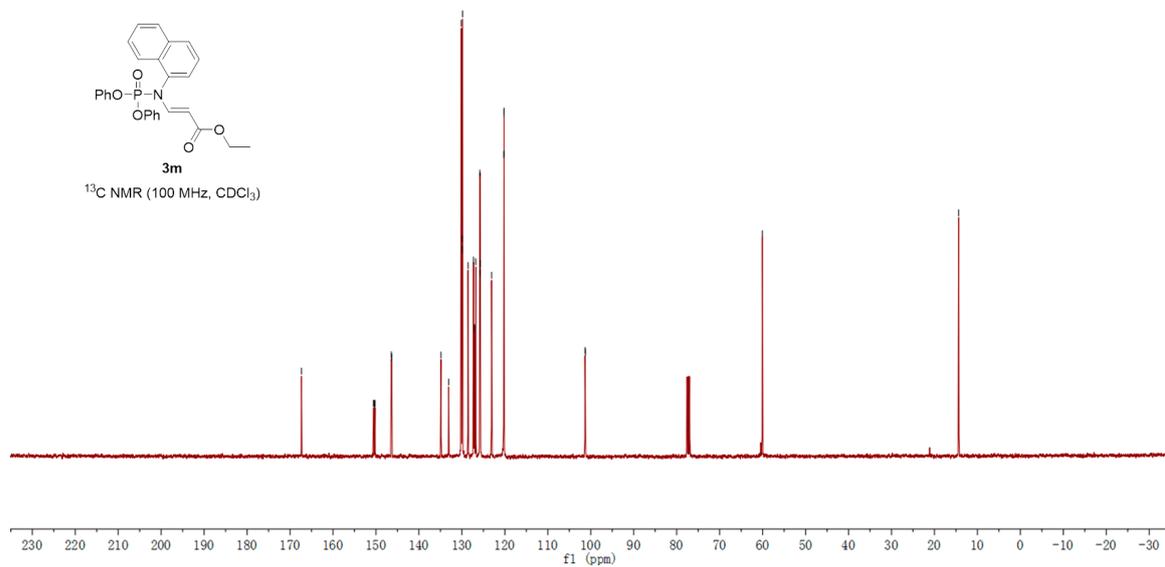
8.54
8.52
8.50
8.48
7.96
7.94
7.93
7.91
7.74
7.72
7.53
7.52
7.51
7.51
7.49
7.49
7.42
7.42
7.40
7.40
7.40
7.39
7.39
7.38
7.37
7.37
7.34
7.34
7.33
7.32
7.32
7.32
7.31
7.28
7.28
7.27
7.25
7.25
7.24
7.24
7.24
7.19
7.18
7.18
7.17
7.07
7.06
7.06
7.04
7.04
7.04
4.64
4.61
4.19
4.18
4.18
4.17
4.17
4.16
4.16
4.14
4.14
4.13
4.13
4.26
4.24
4.22



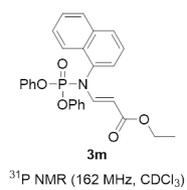
pdata/1

167.34
150.56
150.49
150.28
150.21
146.42
146.34
134.87
133.08
130.14
129.93
129.91
129.85
128.57
127.29
127.11
127.09
126.77
125.81
125.78
125.71
123.09
120.24
120.22
120.19
120.17
101.33
101.23
60.07

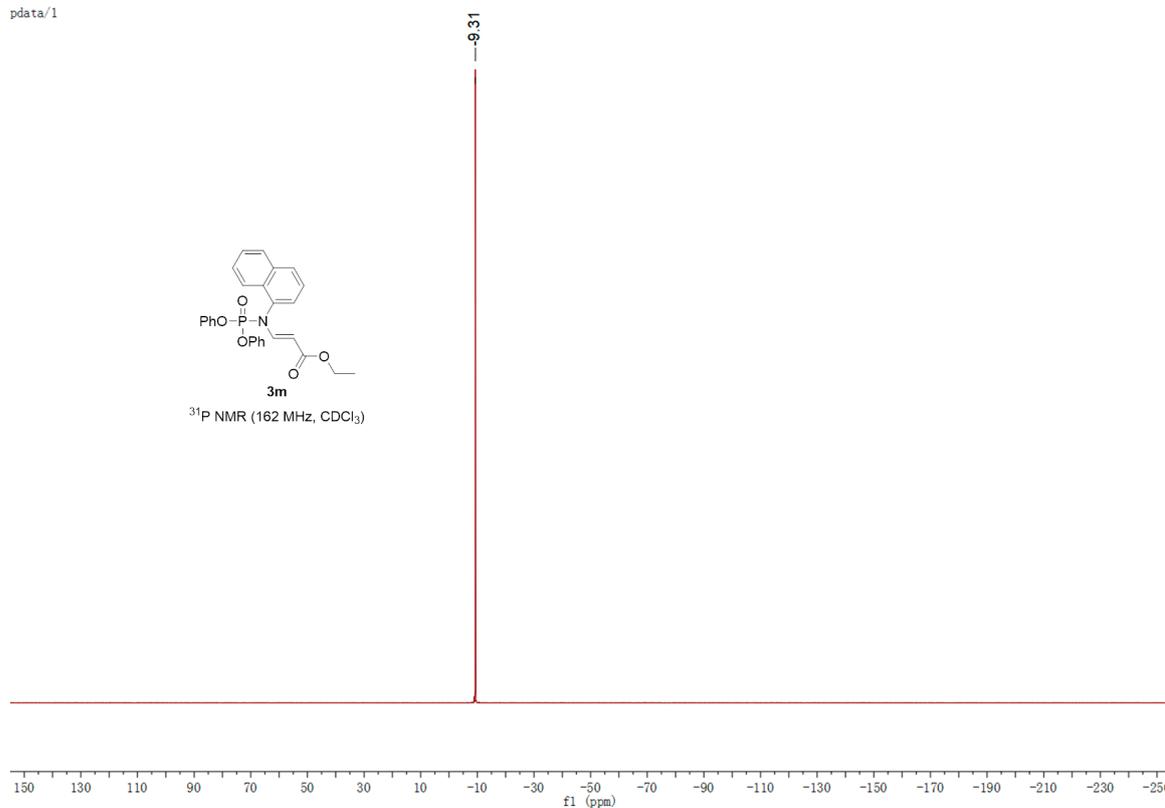
14.38

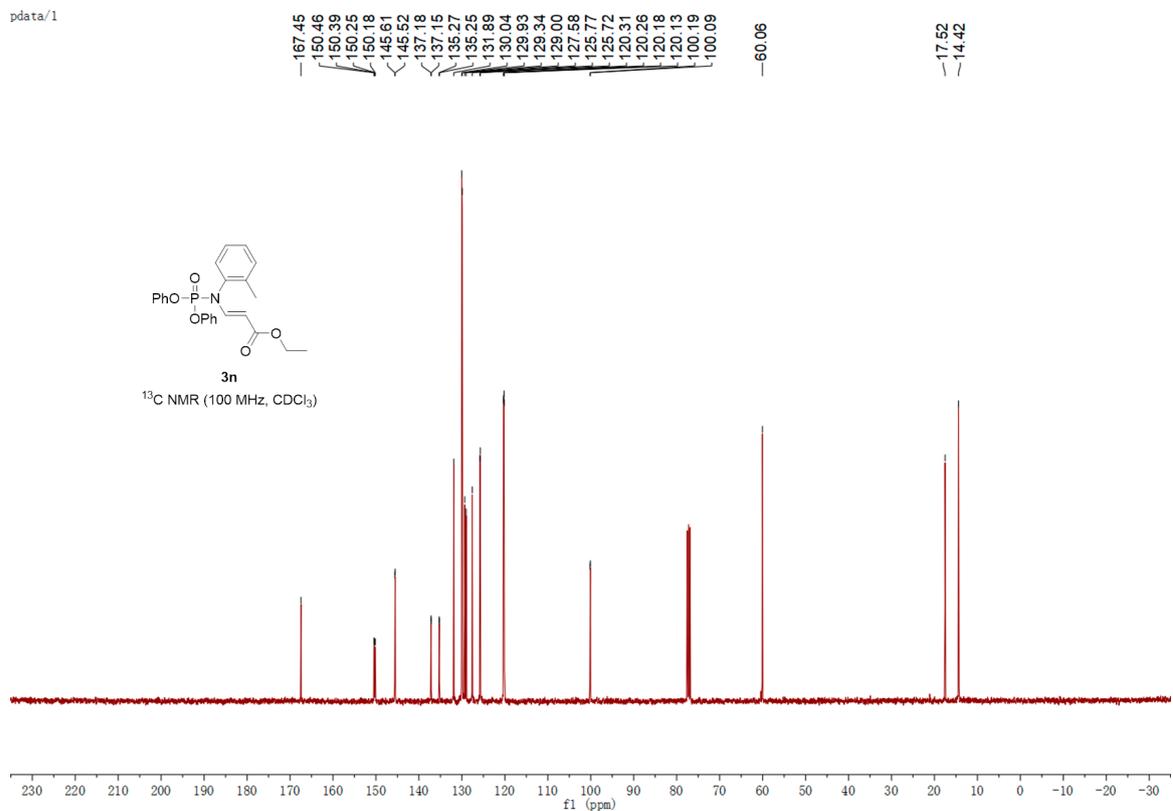
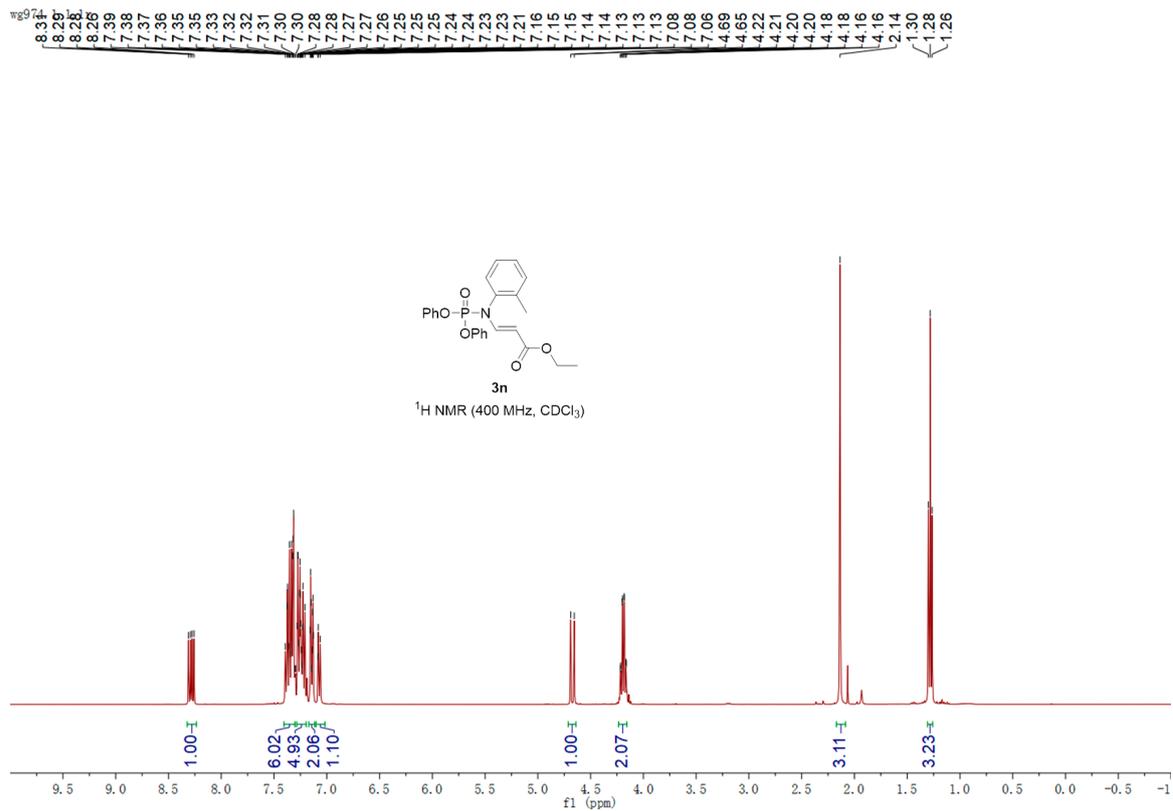


pdata/1

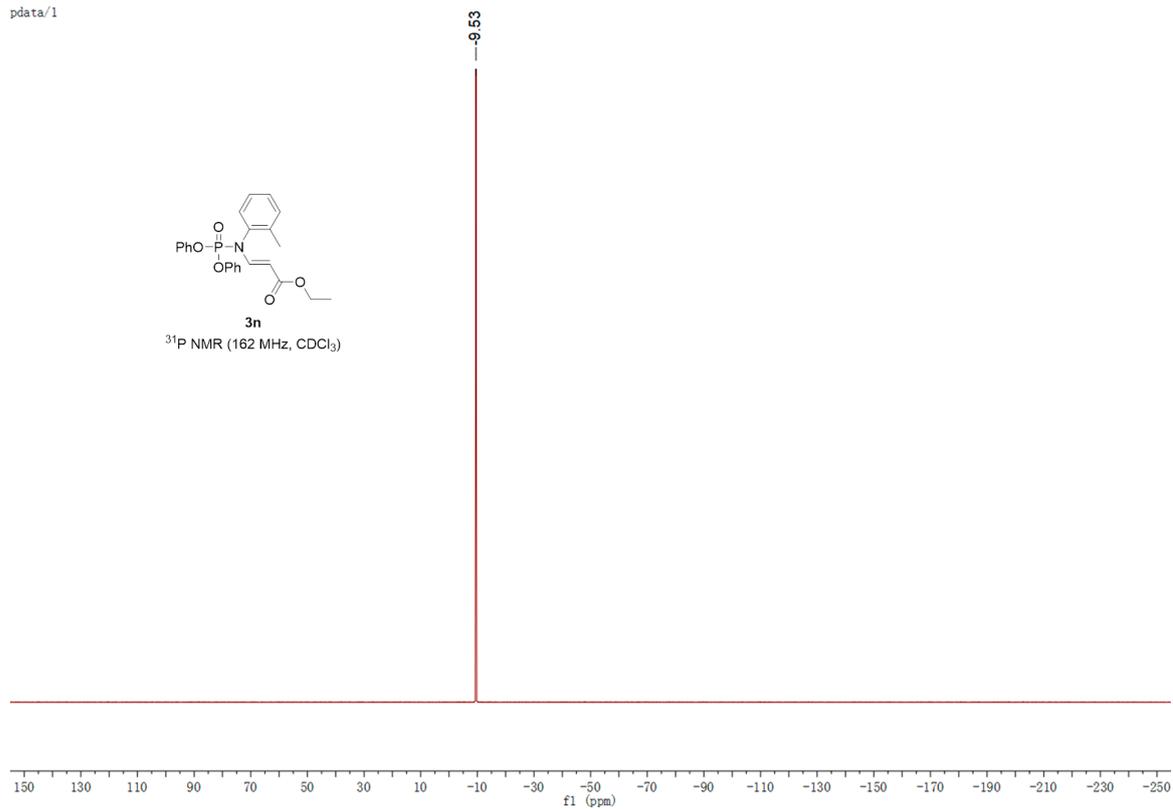
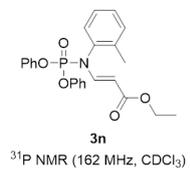


9.31



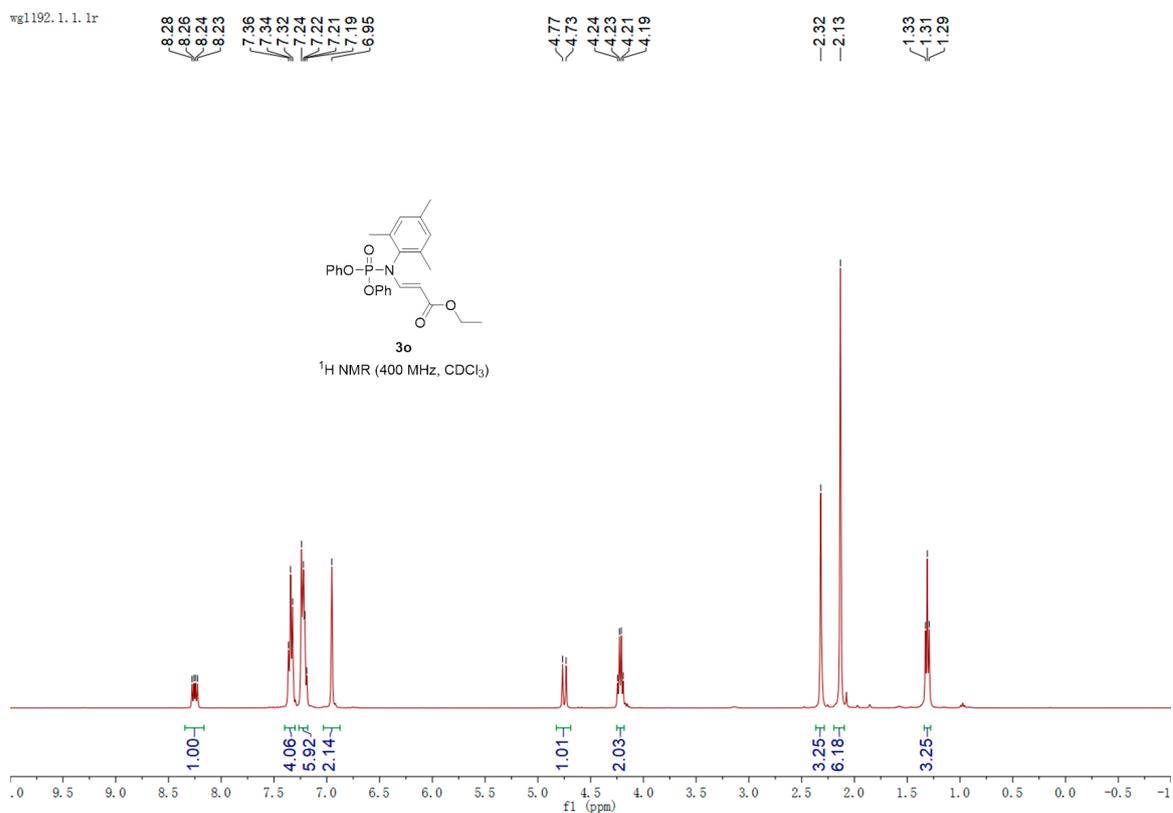
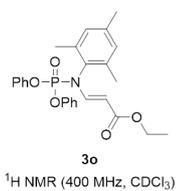


pdata/1



wg1192.1.1.1r

8.28
8.06
8.04
8.23
7.96
7.94
7.92
7.92
7.24
7.22
7.21
7.19
6.95
4.77
4.73
4.24
4.23
4.21
4.19
-2.32
-2.13
1.33
1.31
1.29

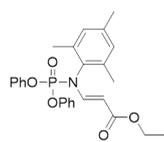


pdata/1

167.74
150.56
150.49
144.72
144.63
138.72
136.78
136.75
131.67
131.64
130.12
129.89
125.68
120.47
120.42
66.37
66.27

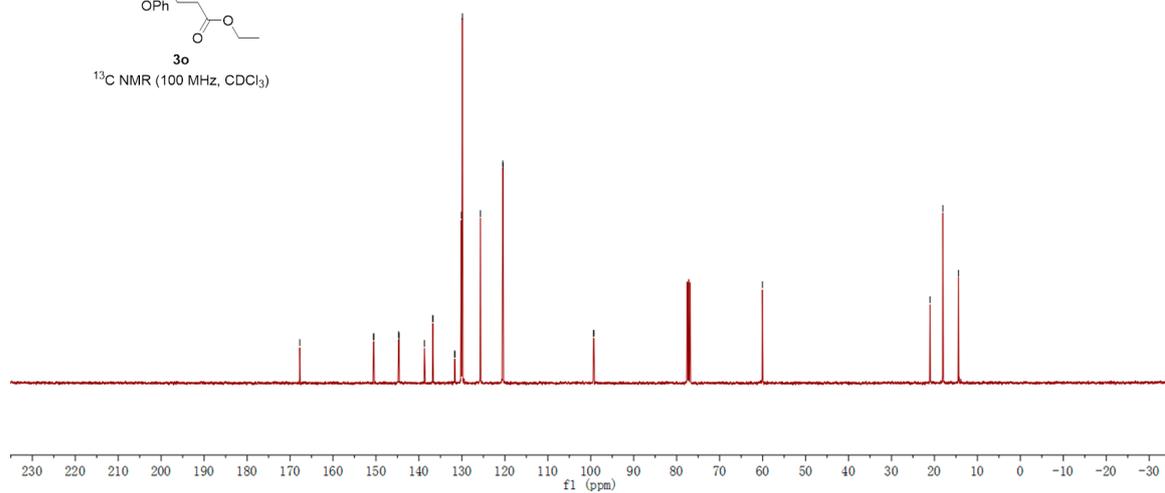
60.06

21.02
18.04
14.42



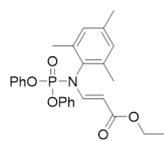
3o

¹³C NMR (100 MHz, CDCl₃)



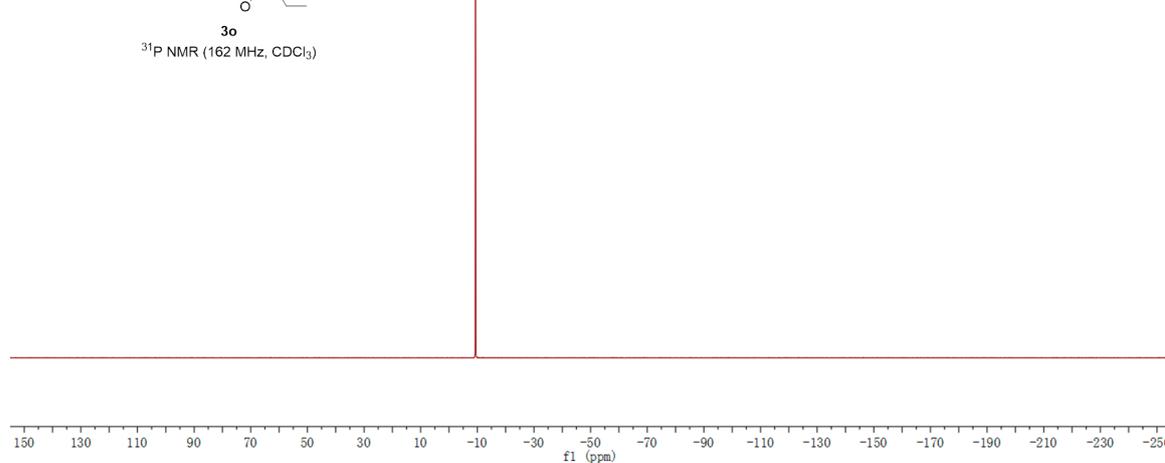
pdata/1

9.34



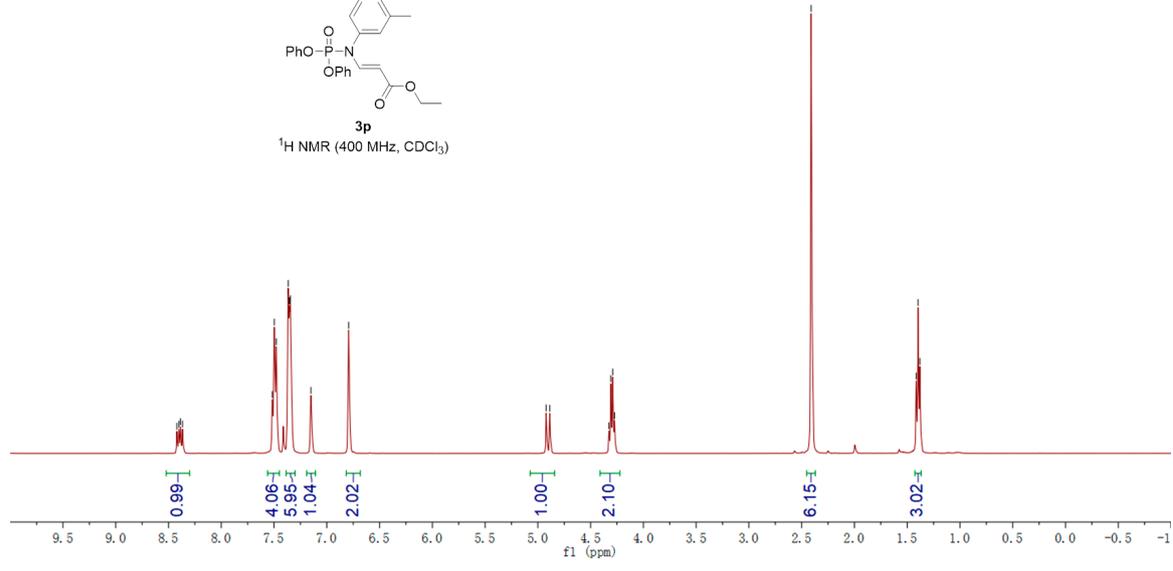
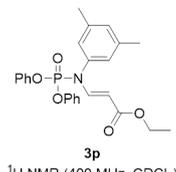
3o

³¹P NMR (162 MHz, CDCl₃)



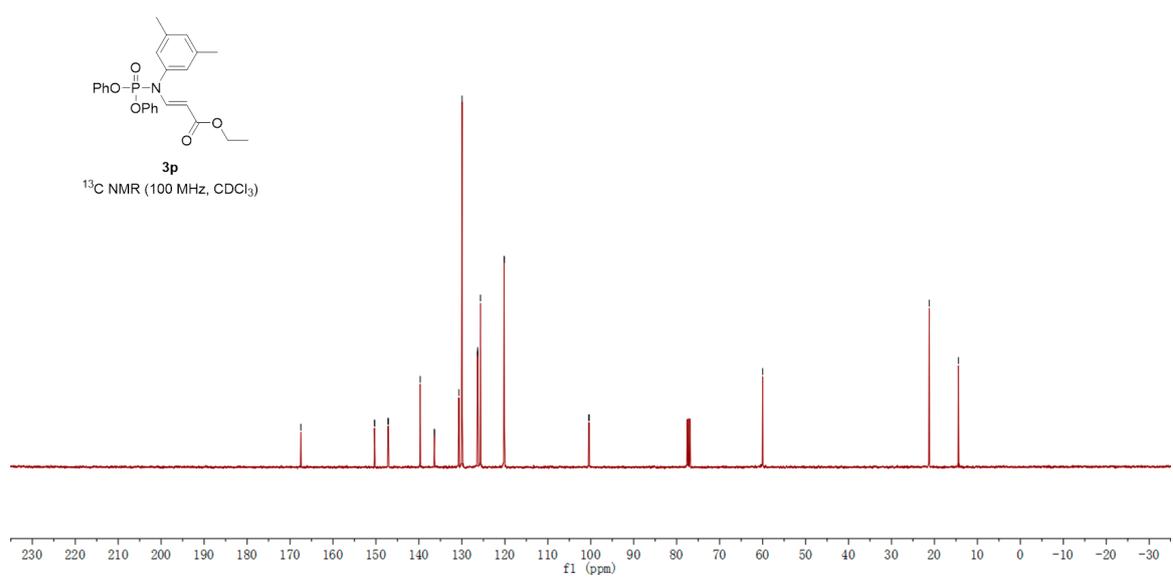
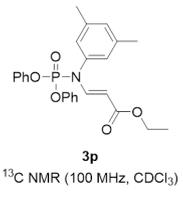
mg957.1.1.1r

8.42
8.40
8.39
8.37
7.52
7.50
7.48
7.37
7.35
7.34
7.15
6.79
4.92
4.89
4.33
4.31
4.29
4.27
-2.41
1.41
1.40
1.38

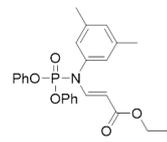


pdata/1

167.49
150.95
150.28
147.19
147.10
139.71
136.41
136.38
130.68
129.96
126.34
126.31
125.66
120.17
120.12
100.46
100.37
60.00
21.22
14.44

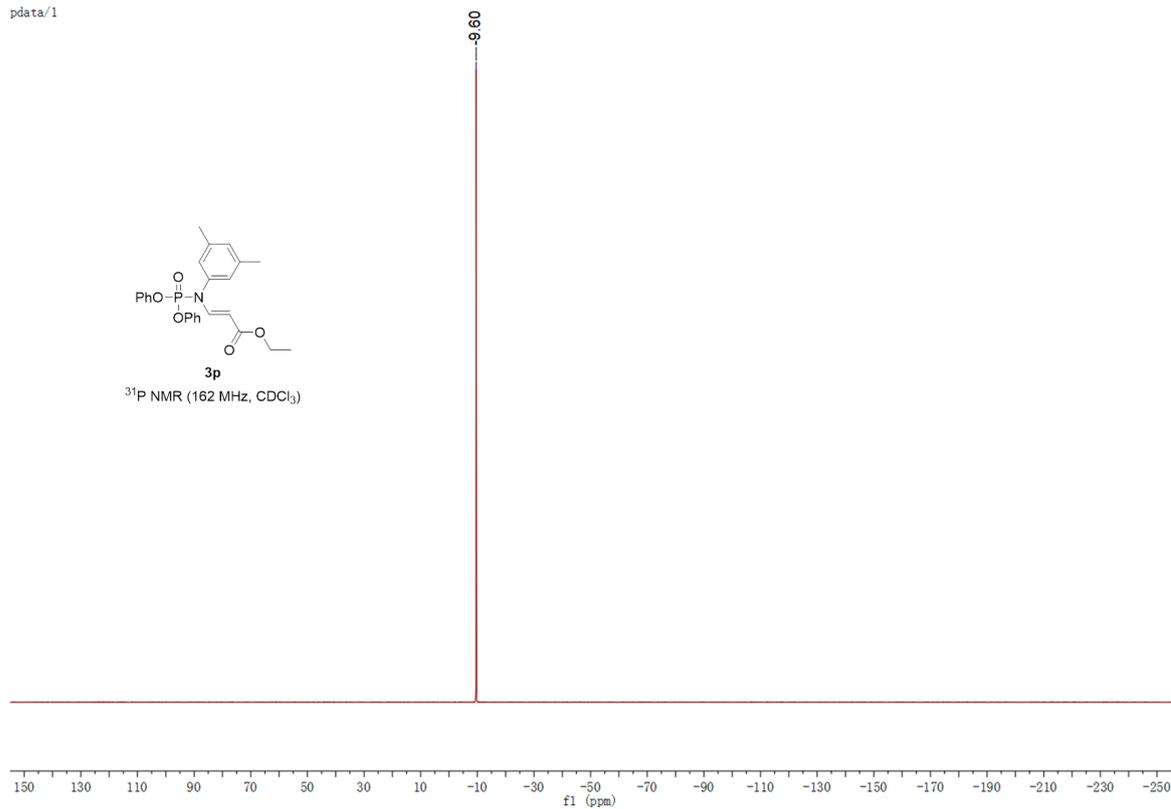


pdata/1

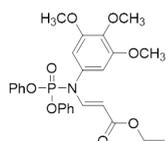


3p

³¹P NMR (162 MHz, CDCl₃)

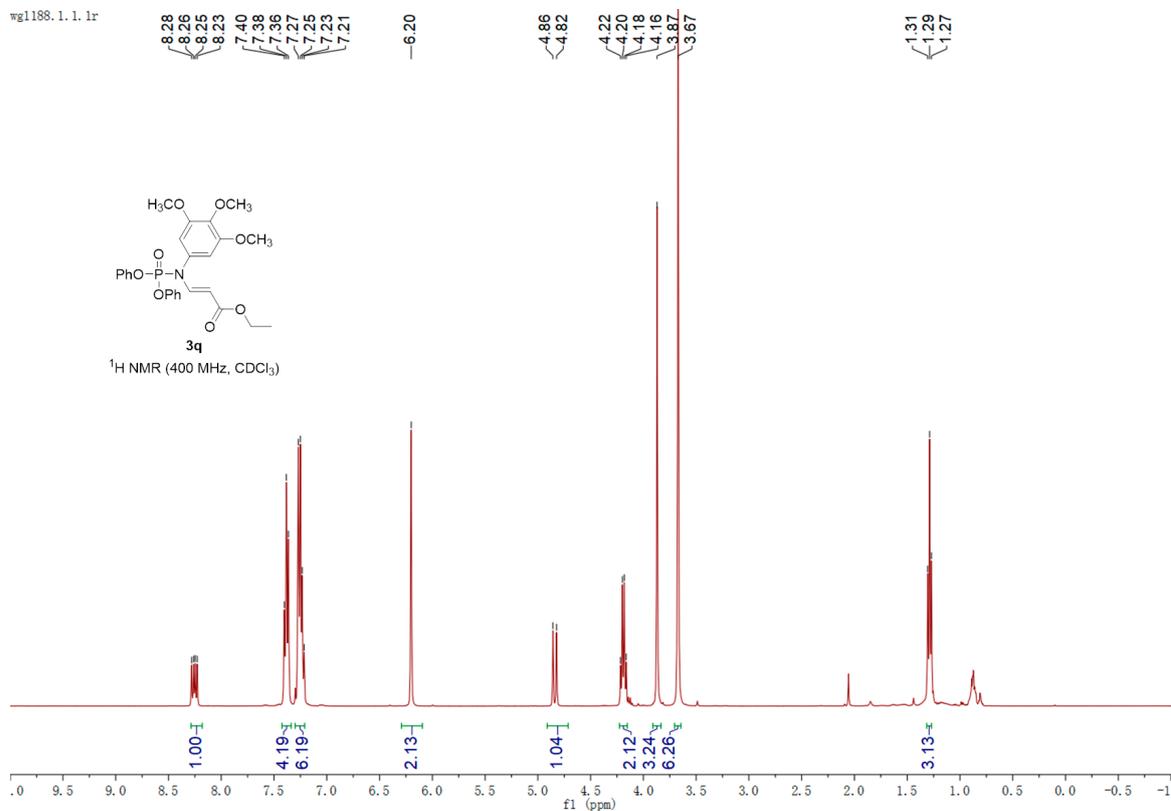


wg1188.1.1.1r



3q

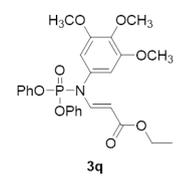
¹H NMR (400 MHz, CDCl₃)



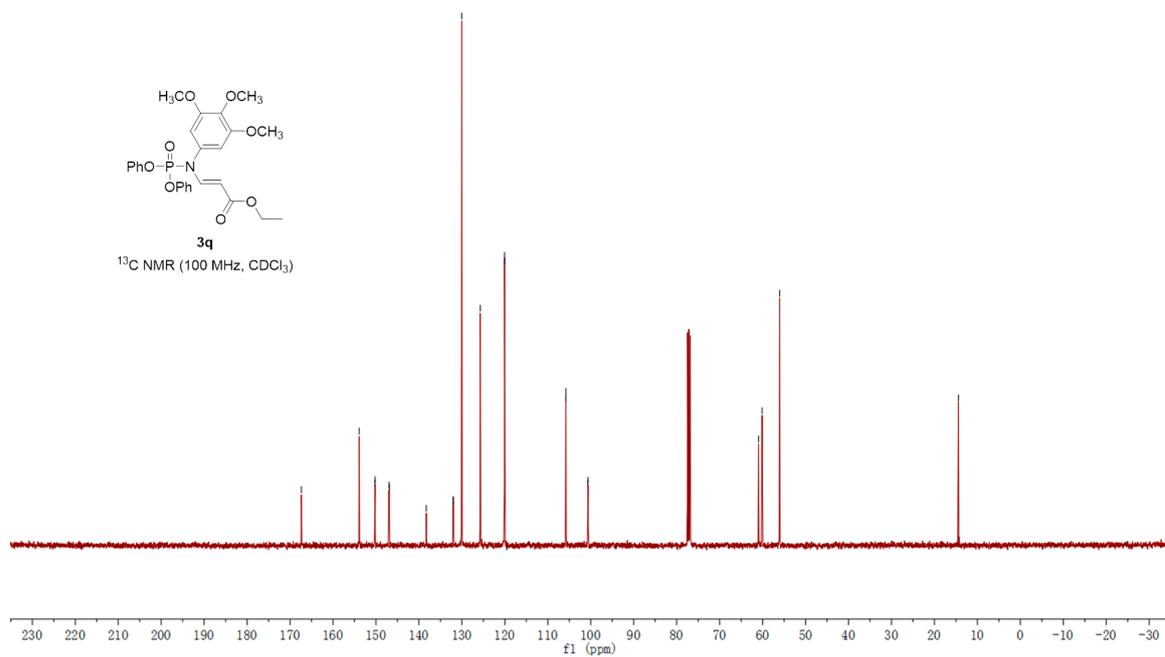
pdata/1

167.37
153.90
150.27
150.20
146.96
146.87
138.29
132.02
131.99
130.04
125.72
120.07
120.02
105.80
105.78
100.72
100.63
60.96
60.12
56.05

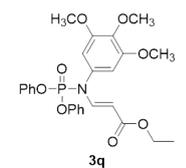
14.43



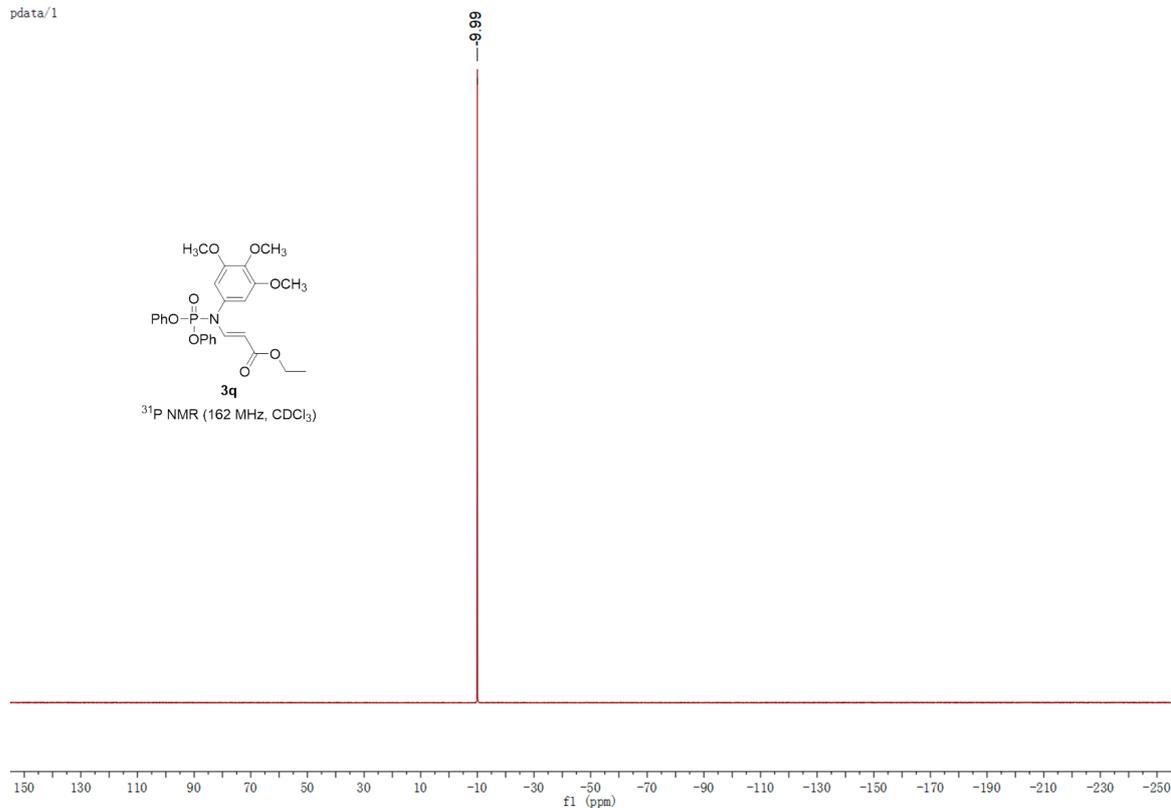
¹³C NMR (100 MHz, CDCl₃)



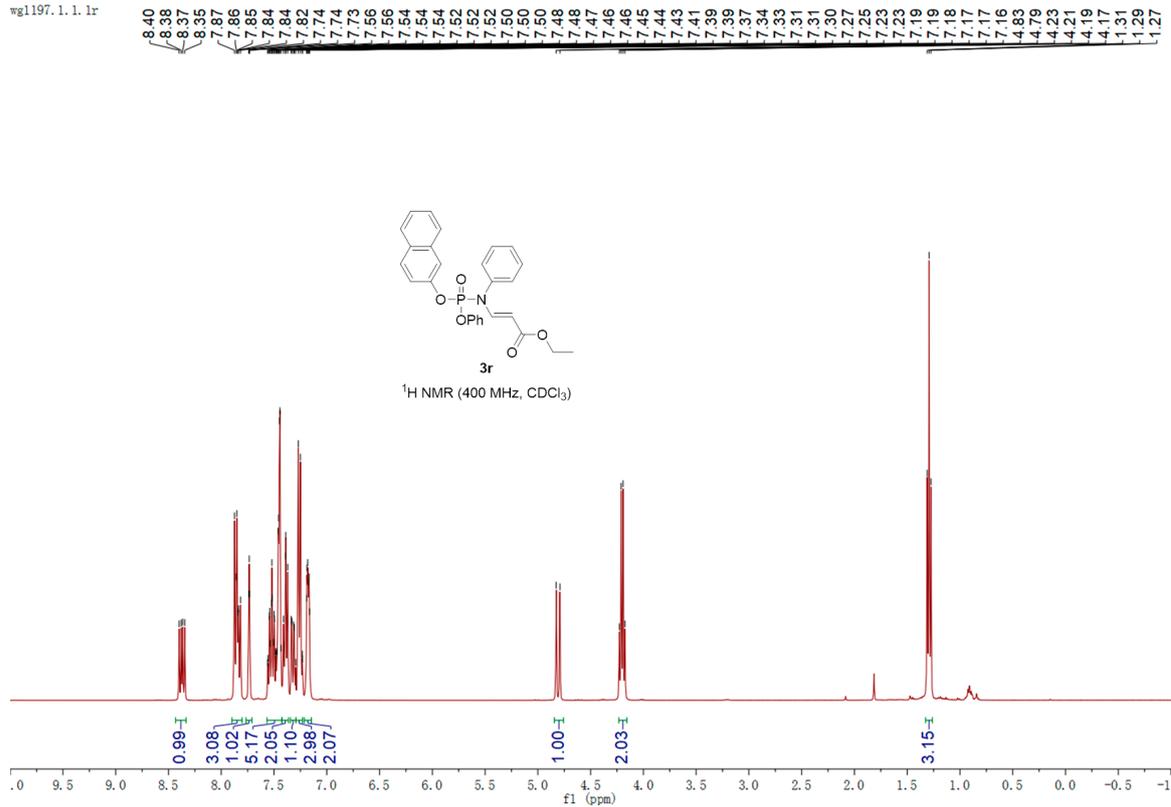
pdata/1



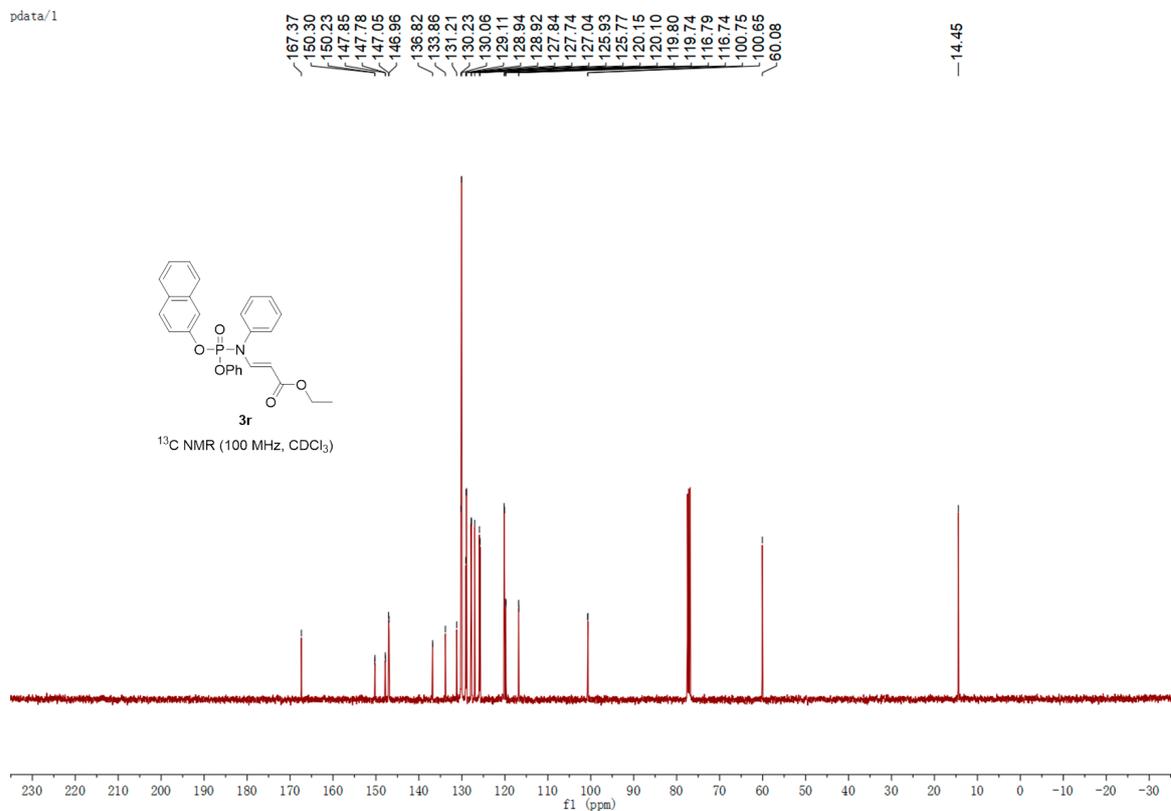
³¹P NMR (162 MHz, CDCl₃)



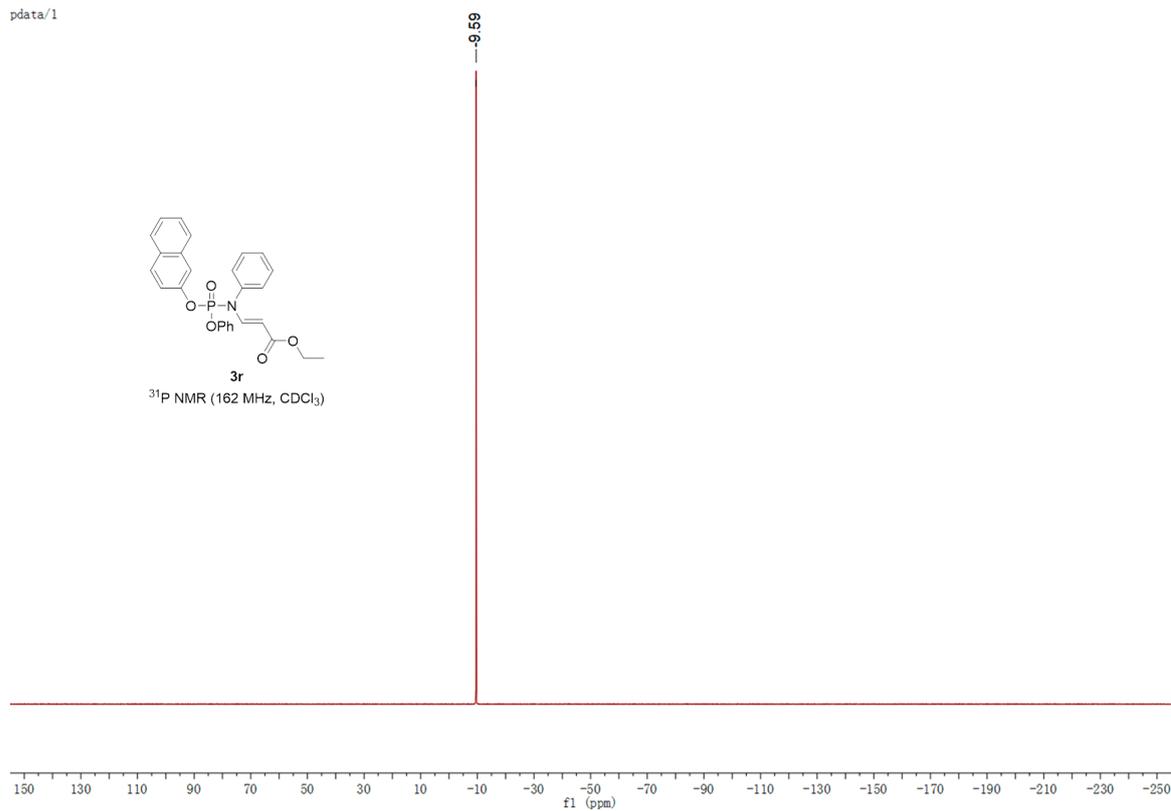
wg1197.1.1.1r



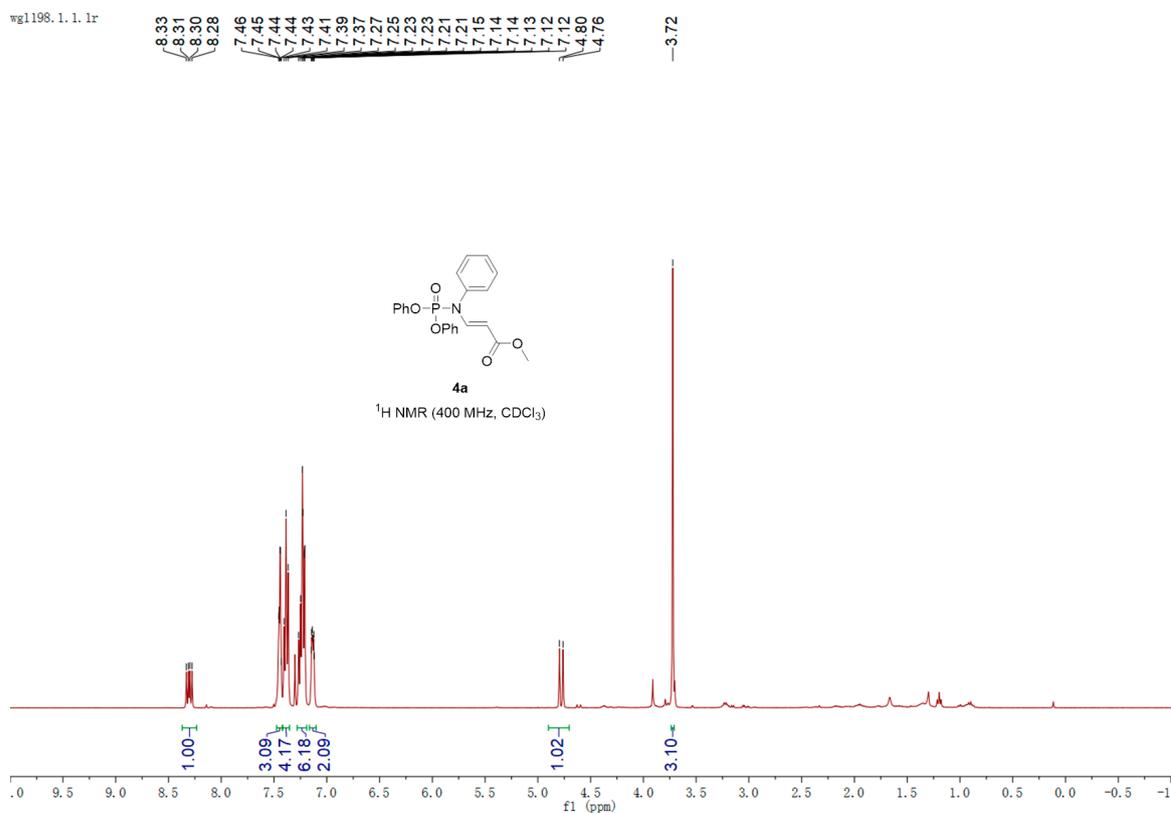
pdata/1



pdata/1



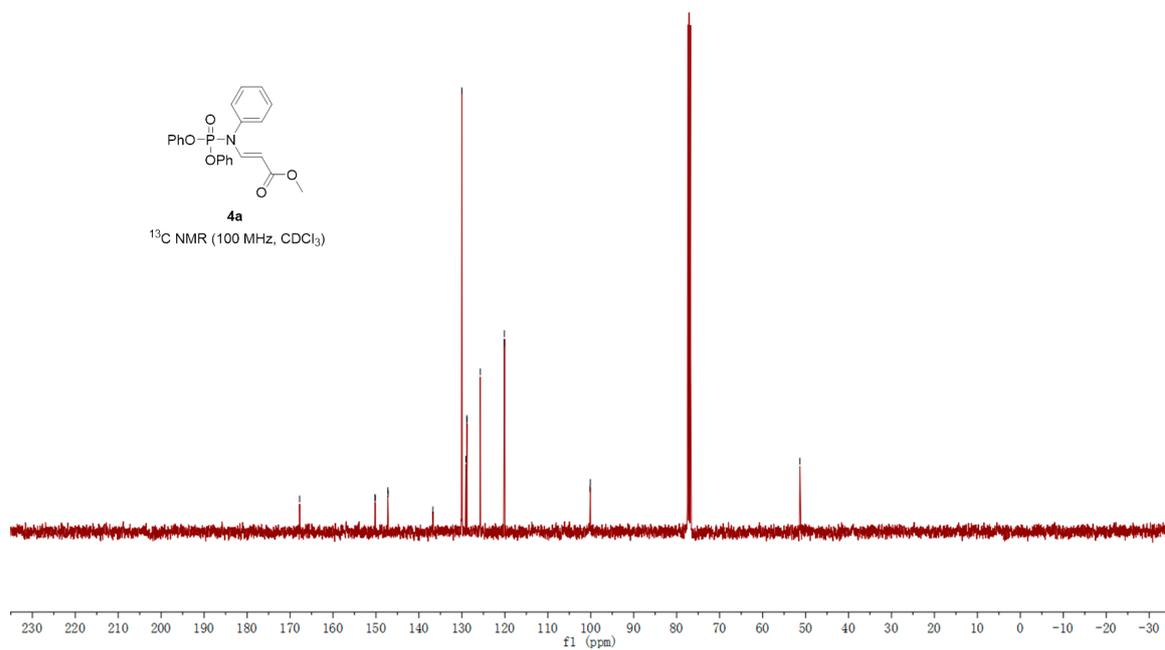
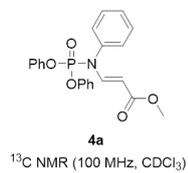
wg1198.1.1.1r



pdata/1

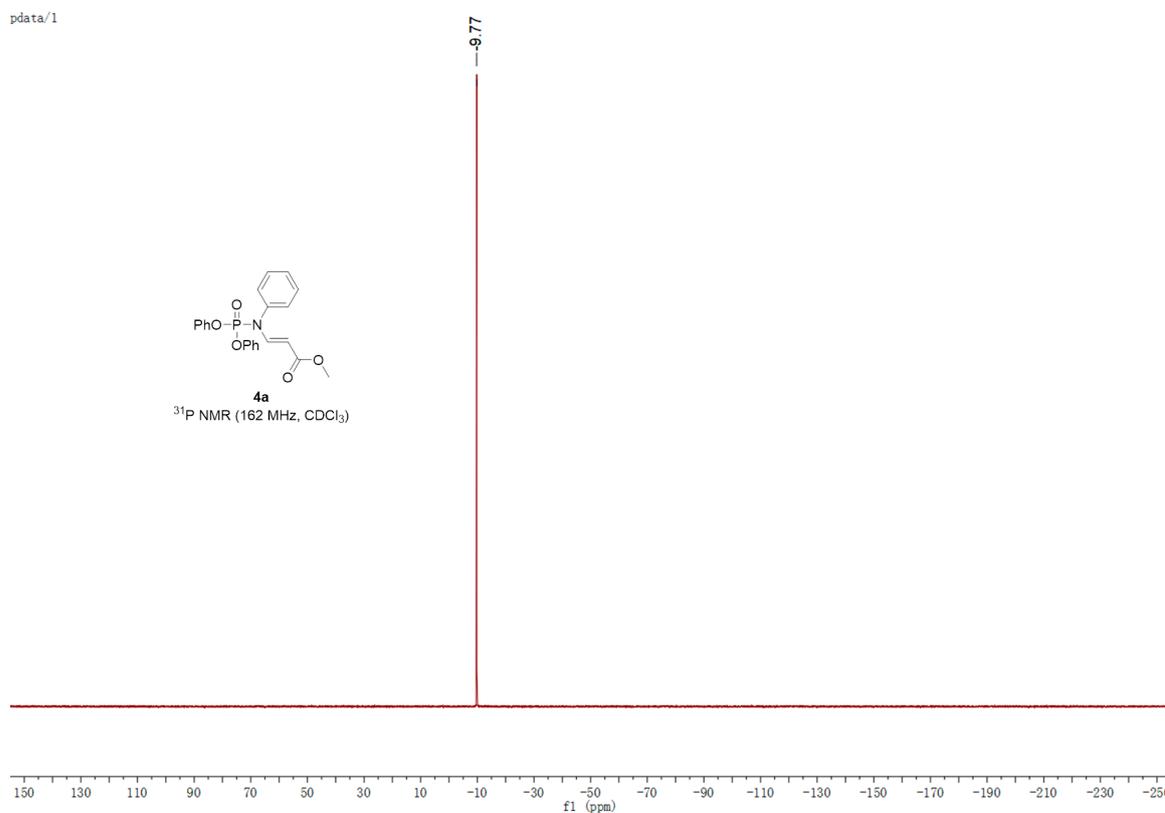
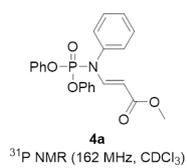
167.77
150.23
150.17
147.25
147.17
136.75
130.02
129.07
128.85
128.83
125.72
120.11
120.06
100.20
100.10

51.31



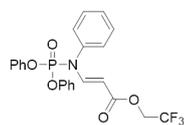
pdata/1

9.77



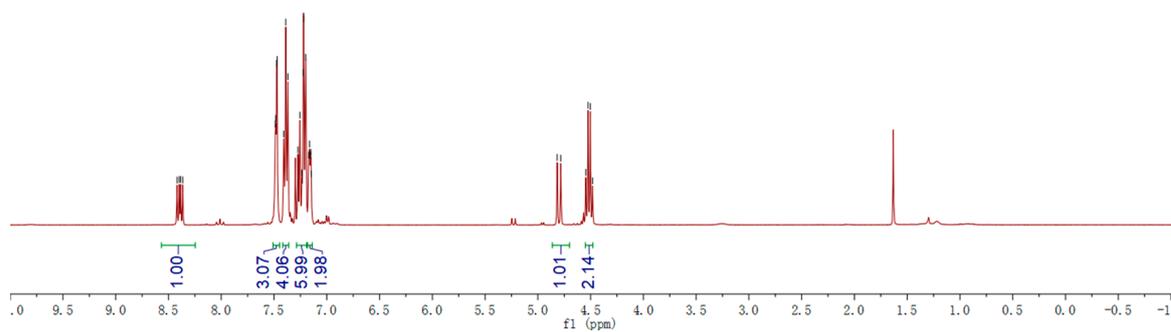
wg1200.1.1.1r

8.42
8.40
8.39
8.36
7.49
7.48
7.48
7.47
7.41
7.39
7.37
7.27
7.26
7.24
7.22
7.22
7.20
7.17
7.16
7.15
7.15
7.15
4.82
4.78
4.55
4.52
4.50
4.48



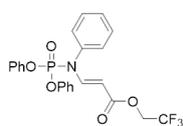
4b

¹H NMR (400 MHz, CDCl₃)



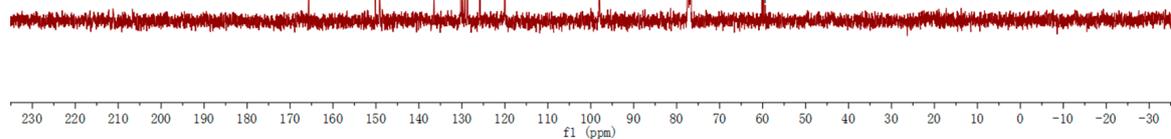
pdata/1

165.63
150.16
150.09
149.20
149.10
136.46
130.16
130.06
129.82
129.33
128.72
125.83
120.04
119.99
88.06
87.96
60.12
59.76
59.40

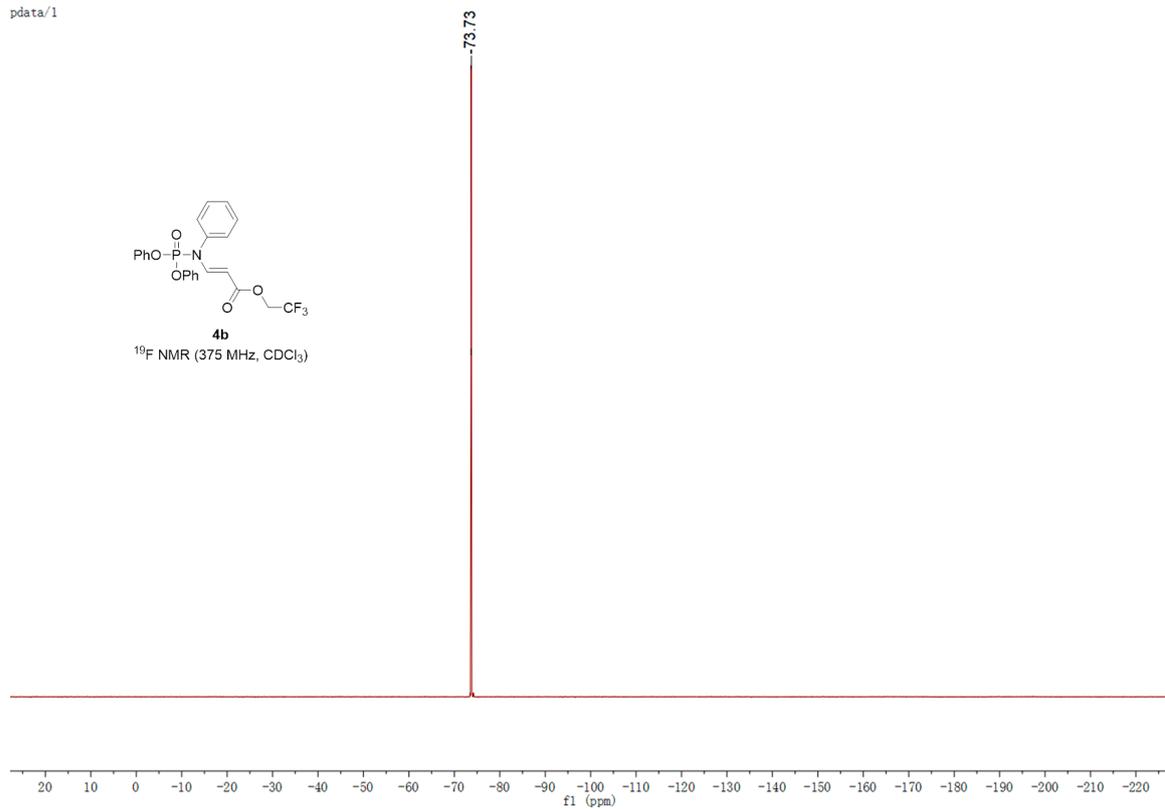
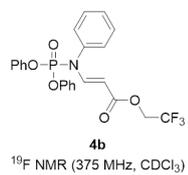


4b

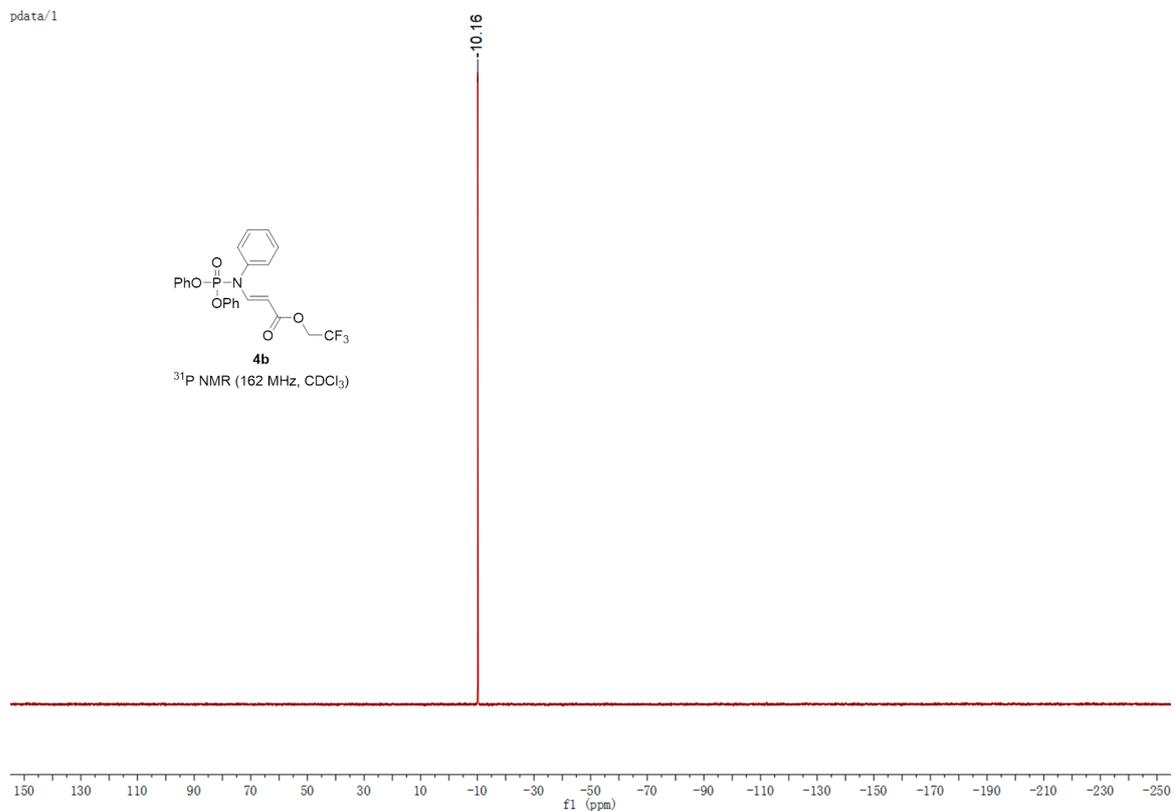
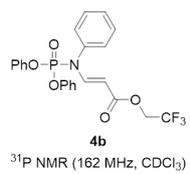
¹³C NMR (100 MHz, CDCl₃)

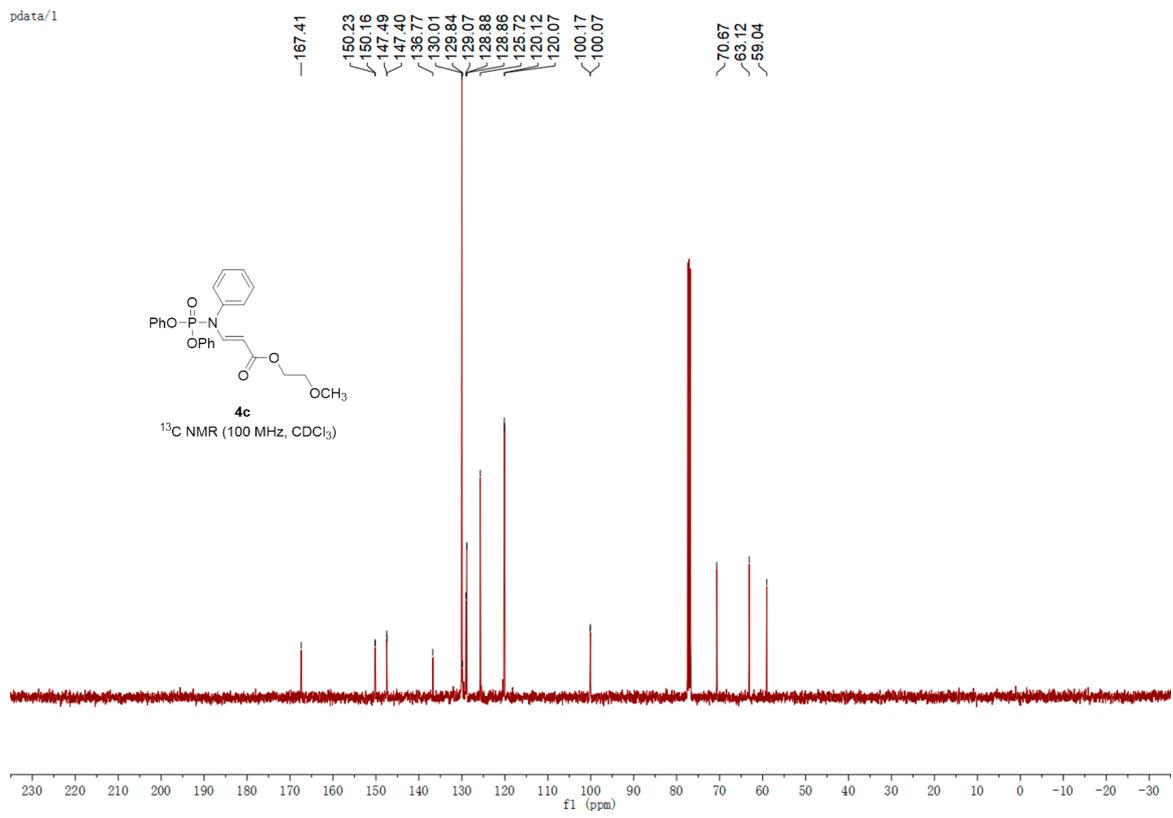
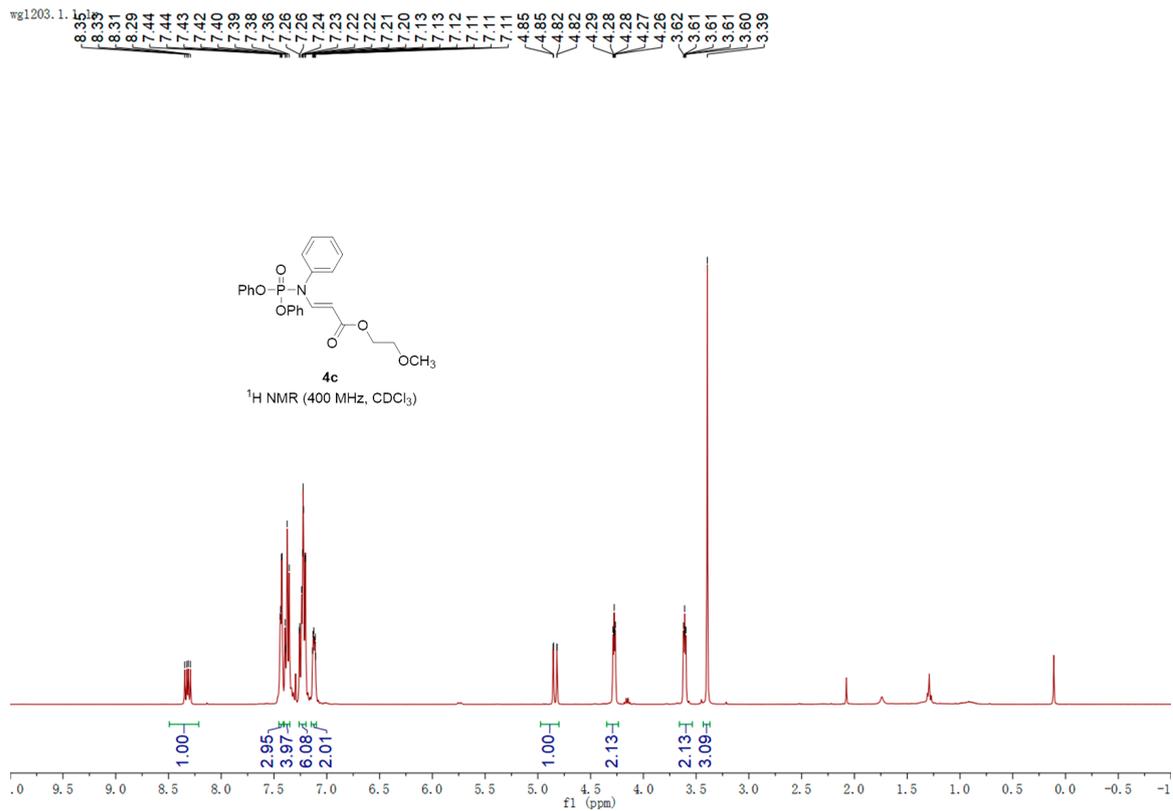


pdata/1

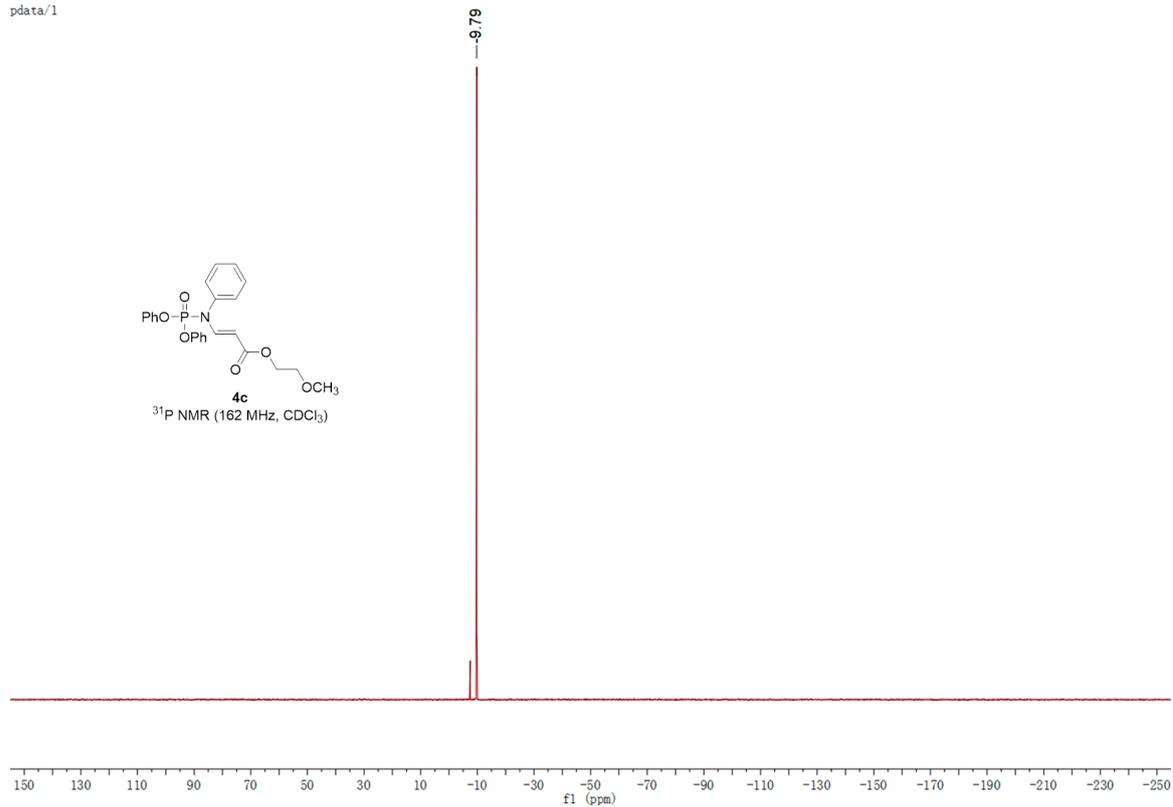


pdata/1

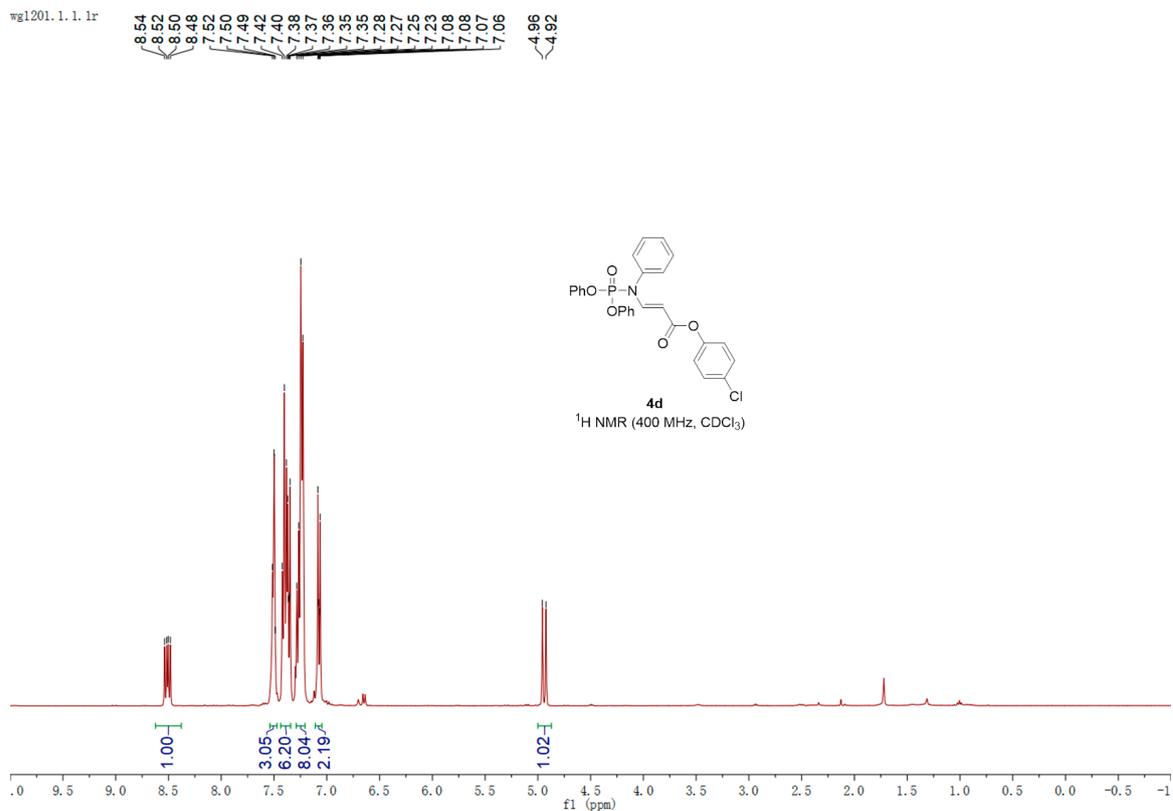




pdata/1

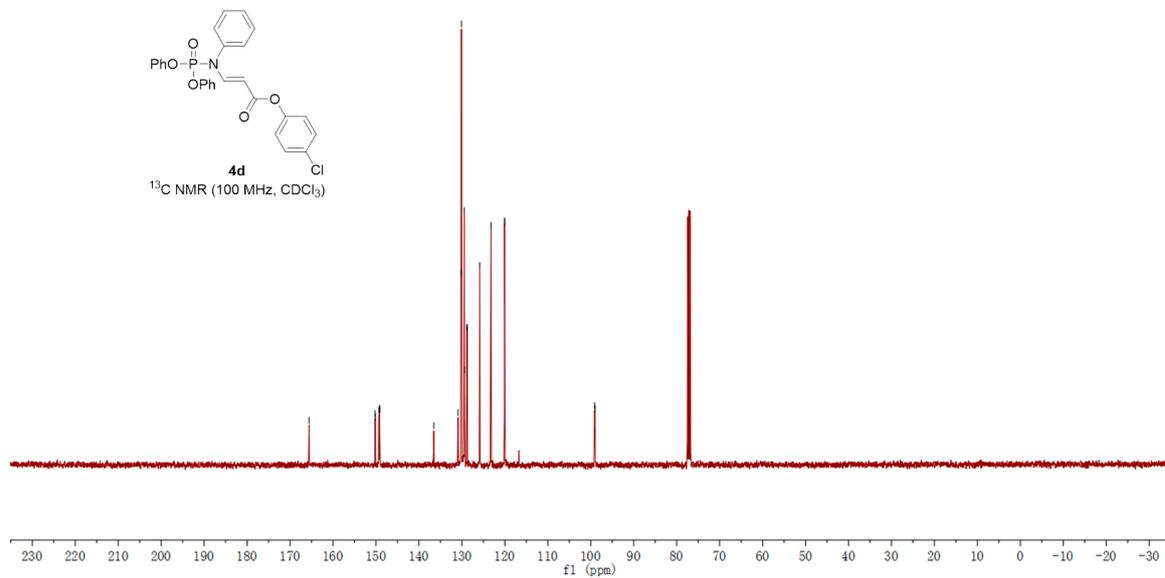
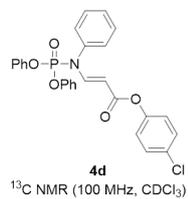


wg1201.1.1.1r

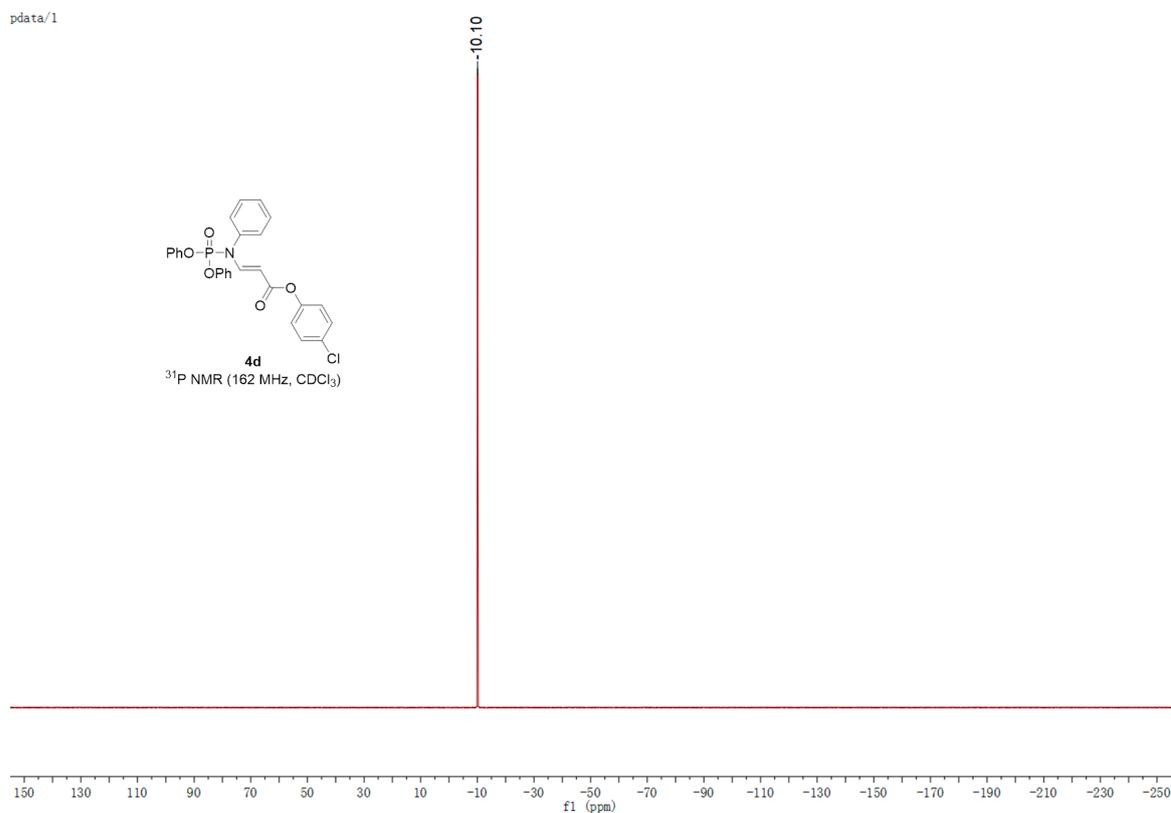
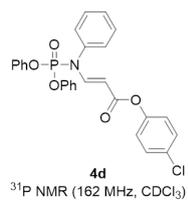


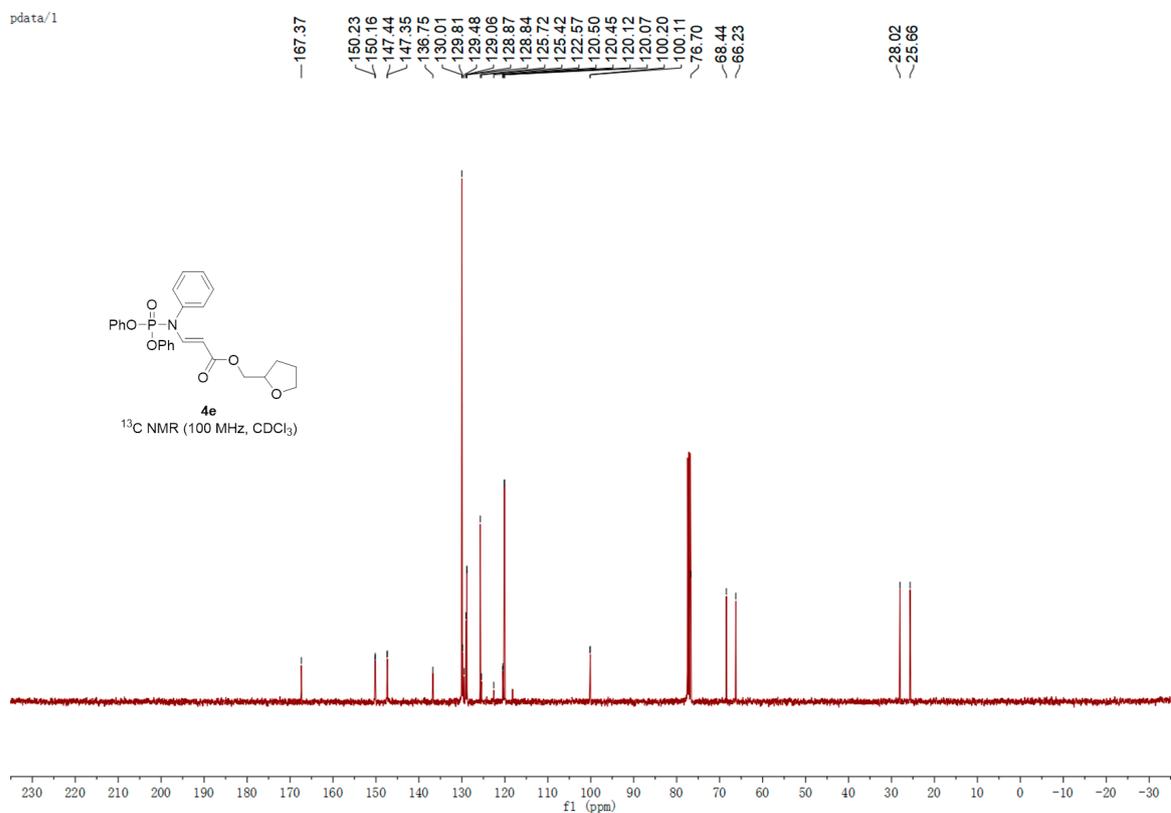
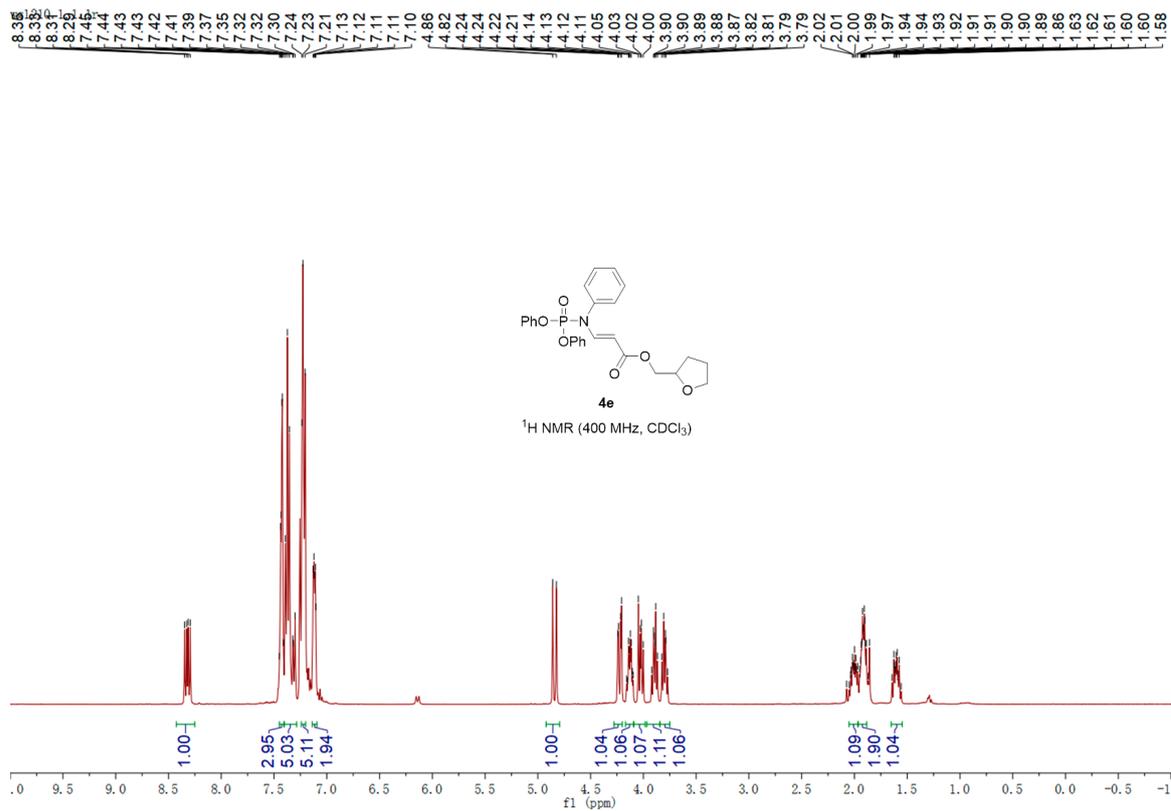
pdata/1

165.58
150.20
150.14
149.34
149.17
149.08
136.54
130.91
130.20
130.10
129.44
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128.82
128.79
125.97
123.20
120.07
99.11
99.01



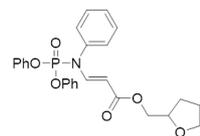
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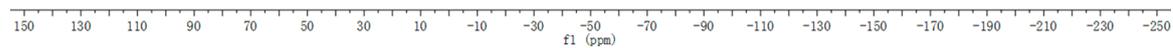


pdata/1

-9.77



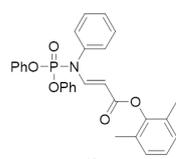
4e
³¹P NMR (162 MHz, CDCl₃)



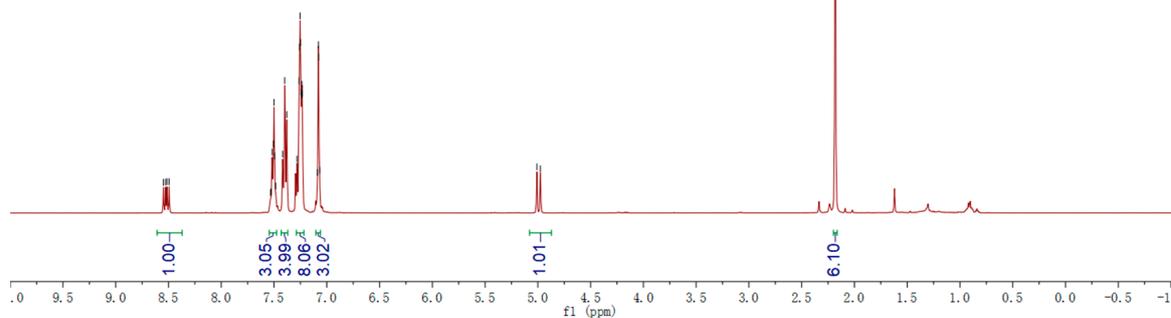
wg1207.1.1.1r

8.55
8.53
8.51
8.49
7.53
7.52
7.50
7.50
7.48
7.48
7.42
7.40
7.38
7.28
7.26
7.25
7.25
7.24
7.24
7.23
7.09
7.08
7.07
5.01
4.98

-2.18



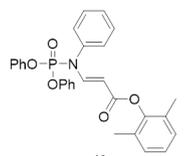
4f
¹H NMR (400 MHz, CDCl₃)



pdata/1

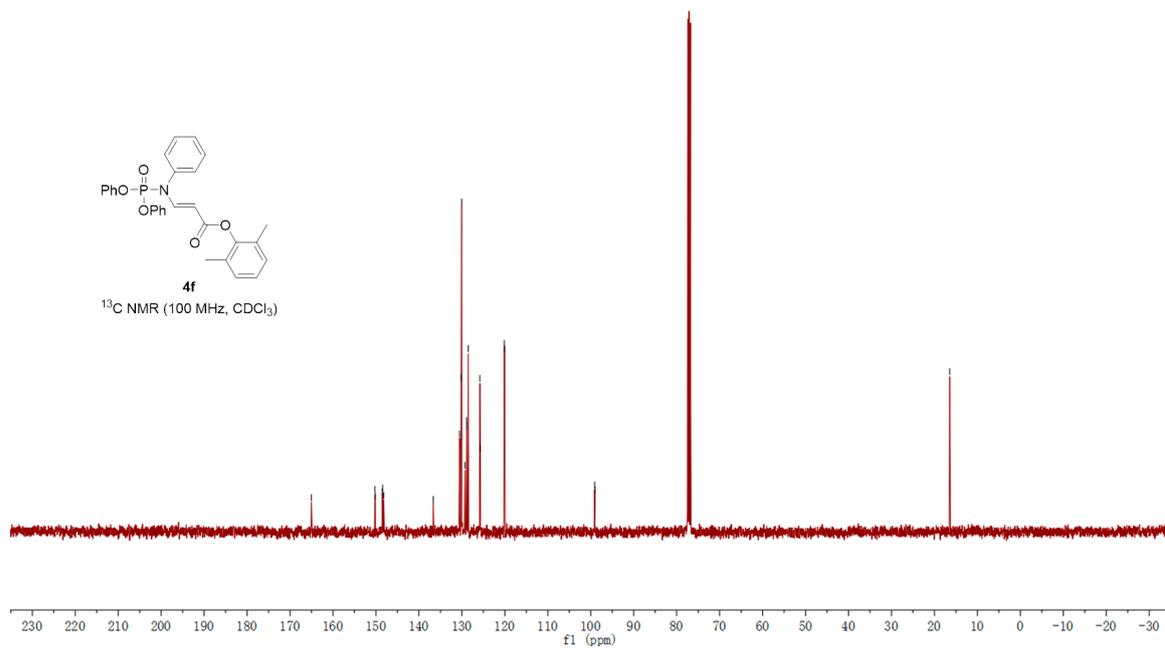
165.03
150.25
150.18
148.54
148.45
148.20
136.65
130.52
130.16
130.05
129.26
128.90
128.87
128.82
128.61
125.71
120.12
120.07
99.09
98.99

16.45

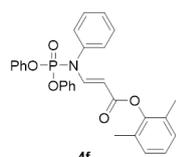


4f

¹³C NMR (100 MHz, CDCl₃)

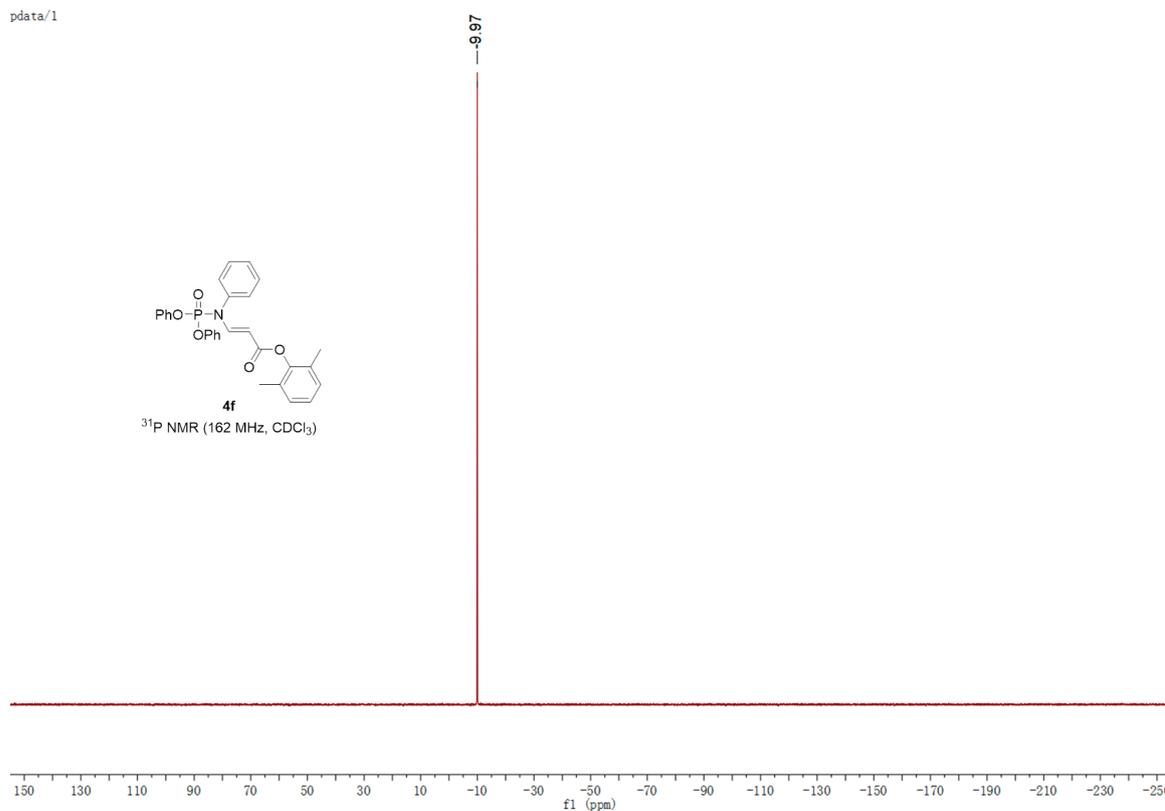


pdata/1

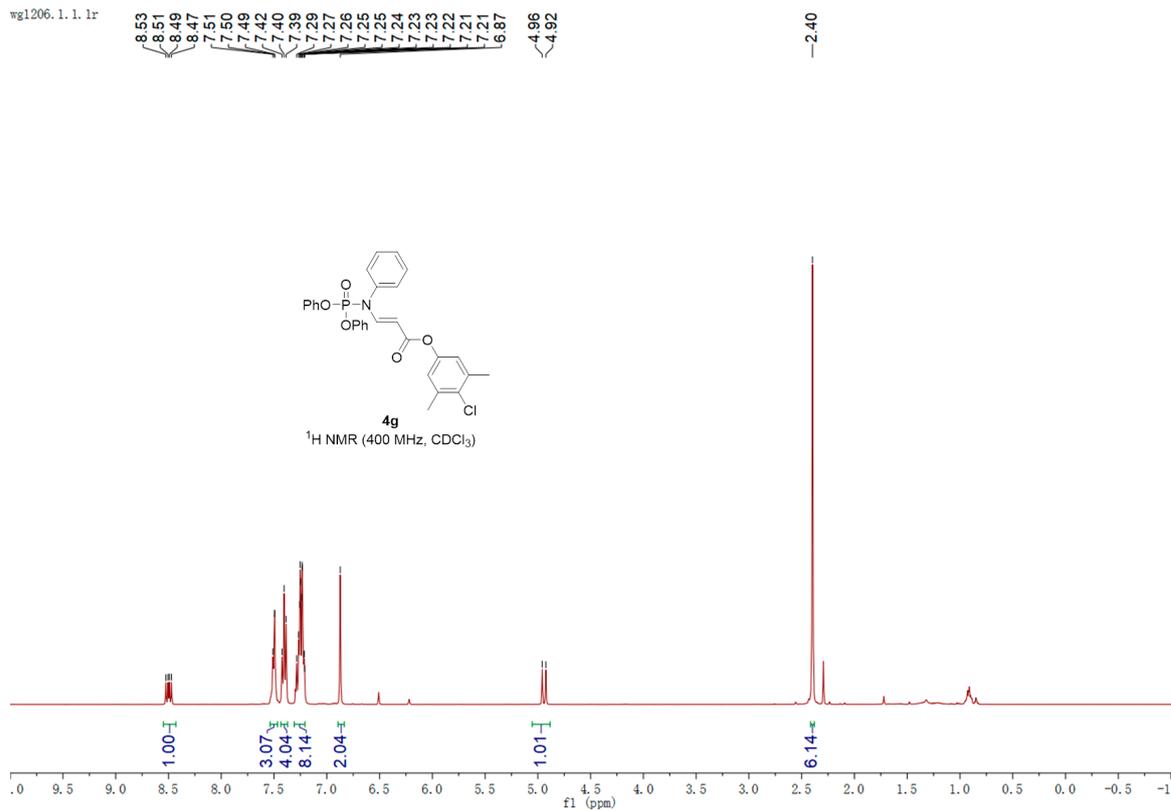


4f

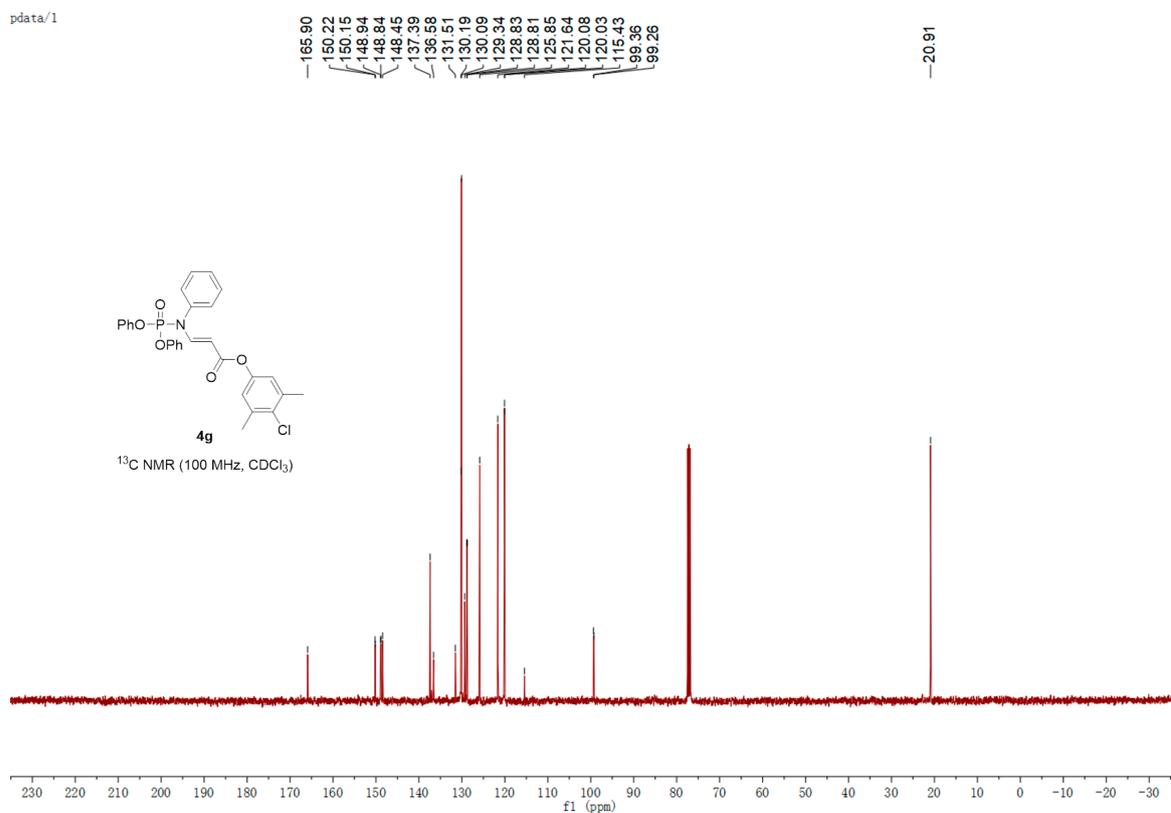
³¹P NMR (162 MHz, CDCl₃)



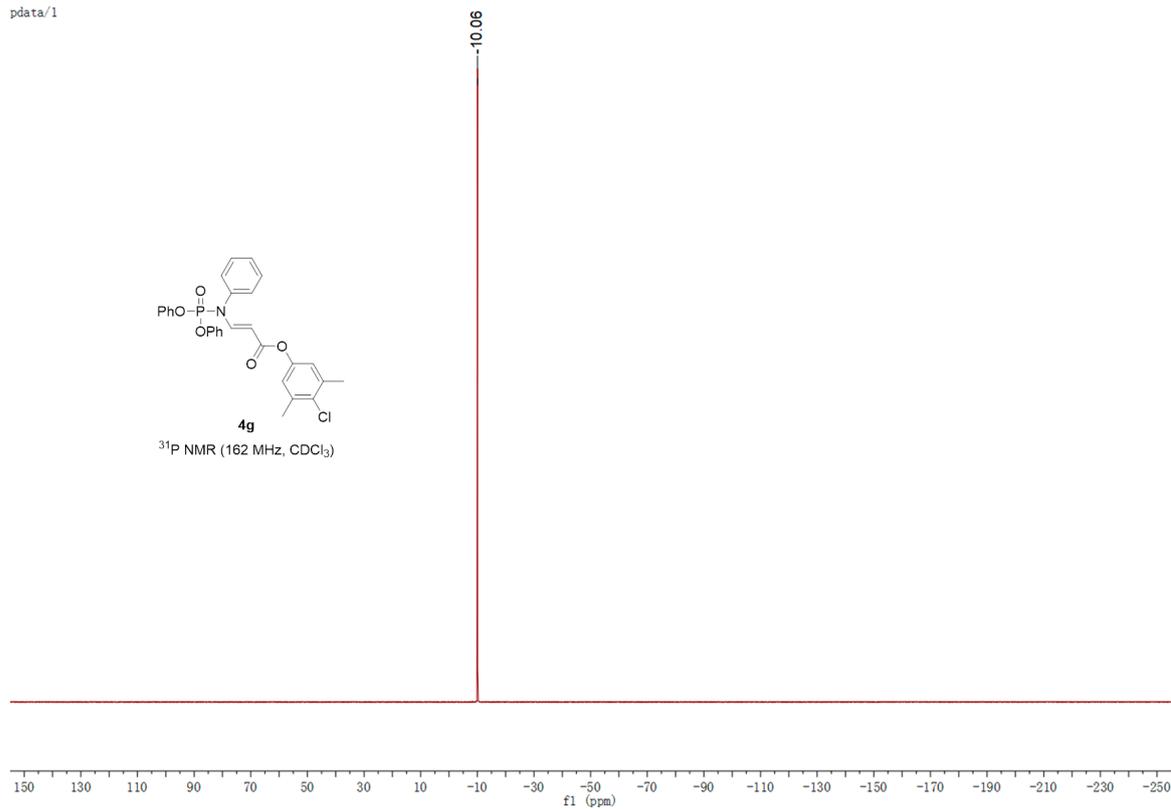
wg1206.1.1.1r



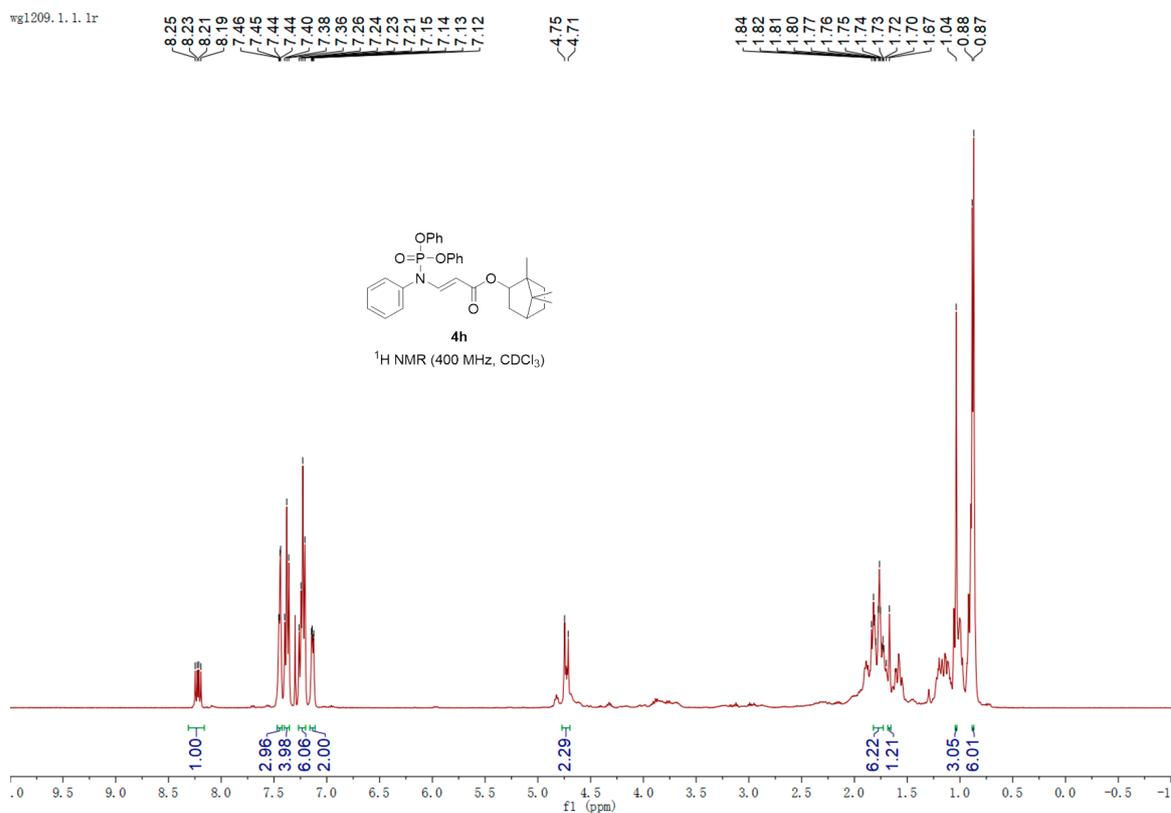
pdata/1



pdata/1

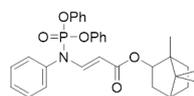


wg1209.1.1.1r



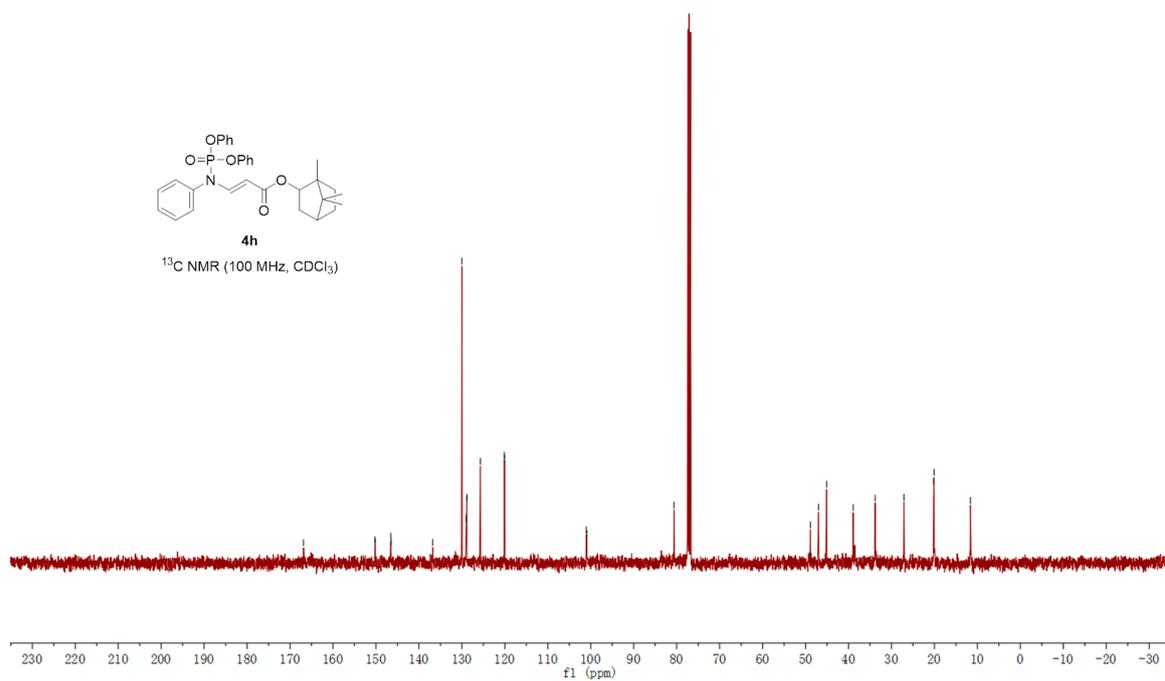
pdata/1

166.86
150.25
150.18
146.54
146.45
136.79
130.00
128.99
128.86
128.84
128.69
120.12
120.07
101.03
100.93
80.62
48.87
46.99
45.11
38.91
33.80
27.11
20.18
20.09
11.61



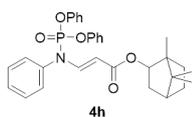
4h

¹³C NMR (100 MHz, CDCl₃)



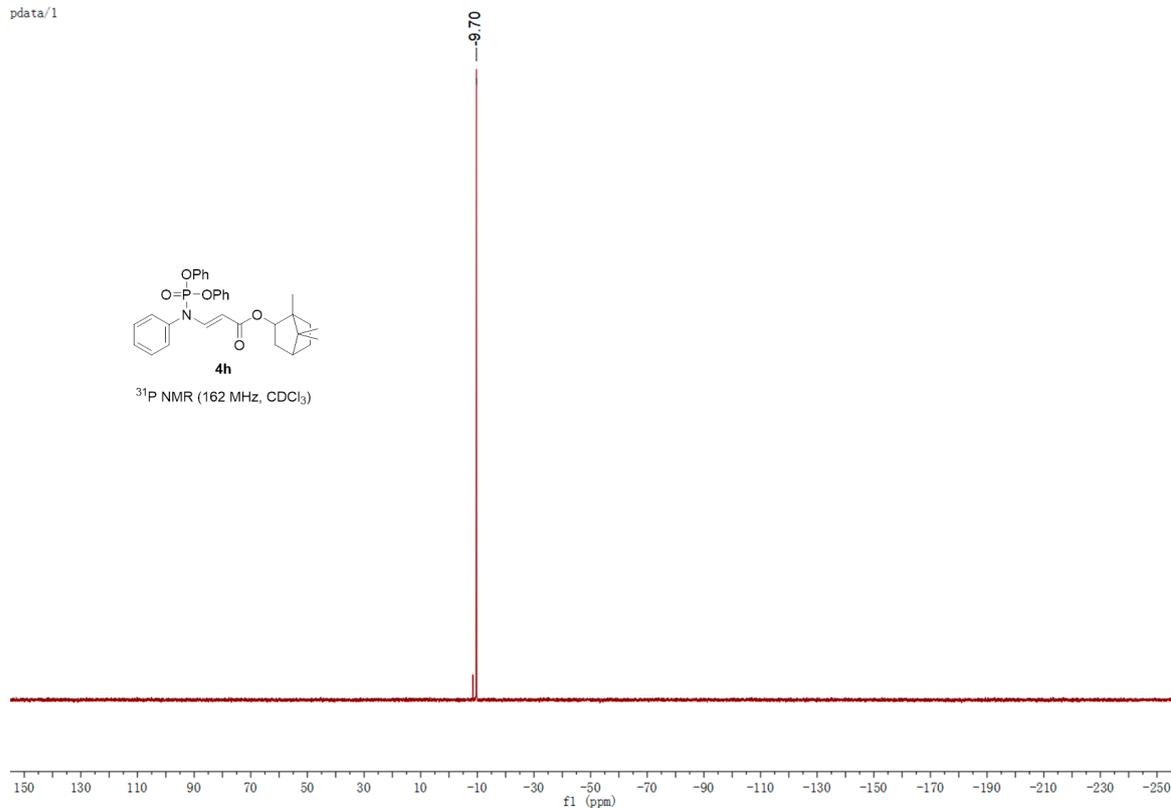
pdata/1

9.70

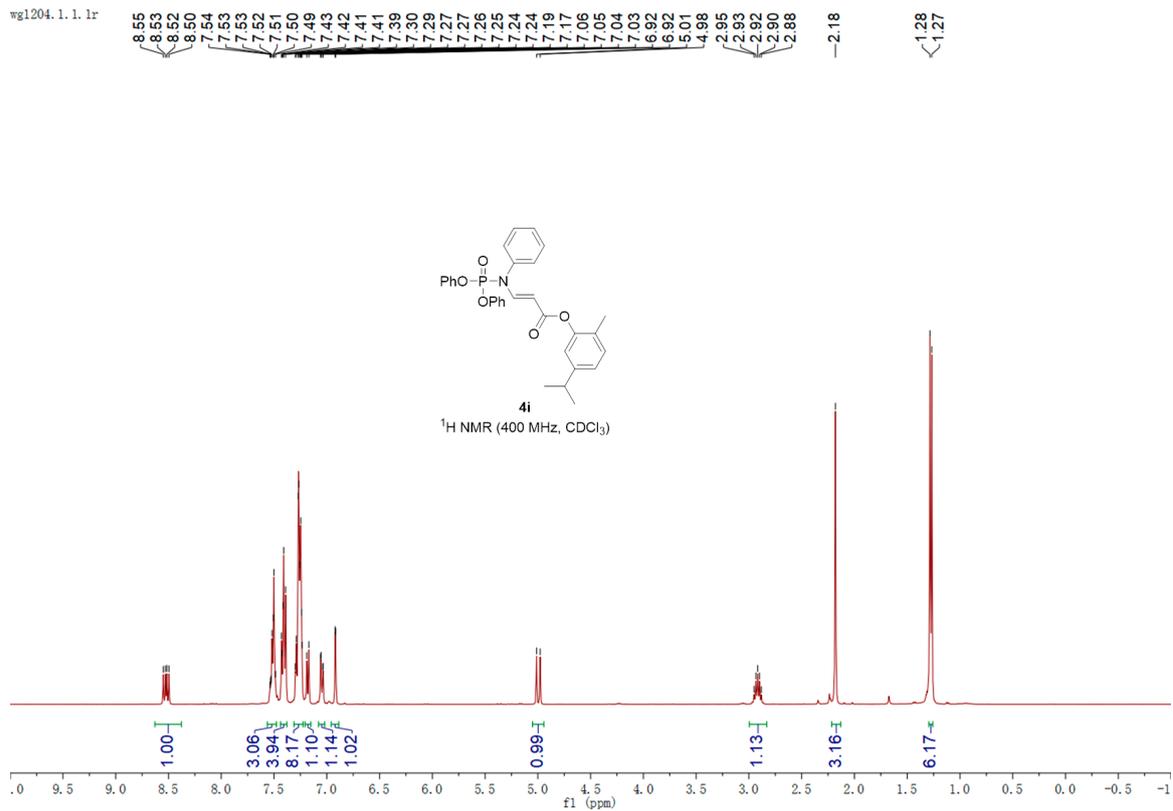


4h

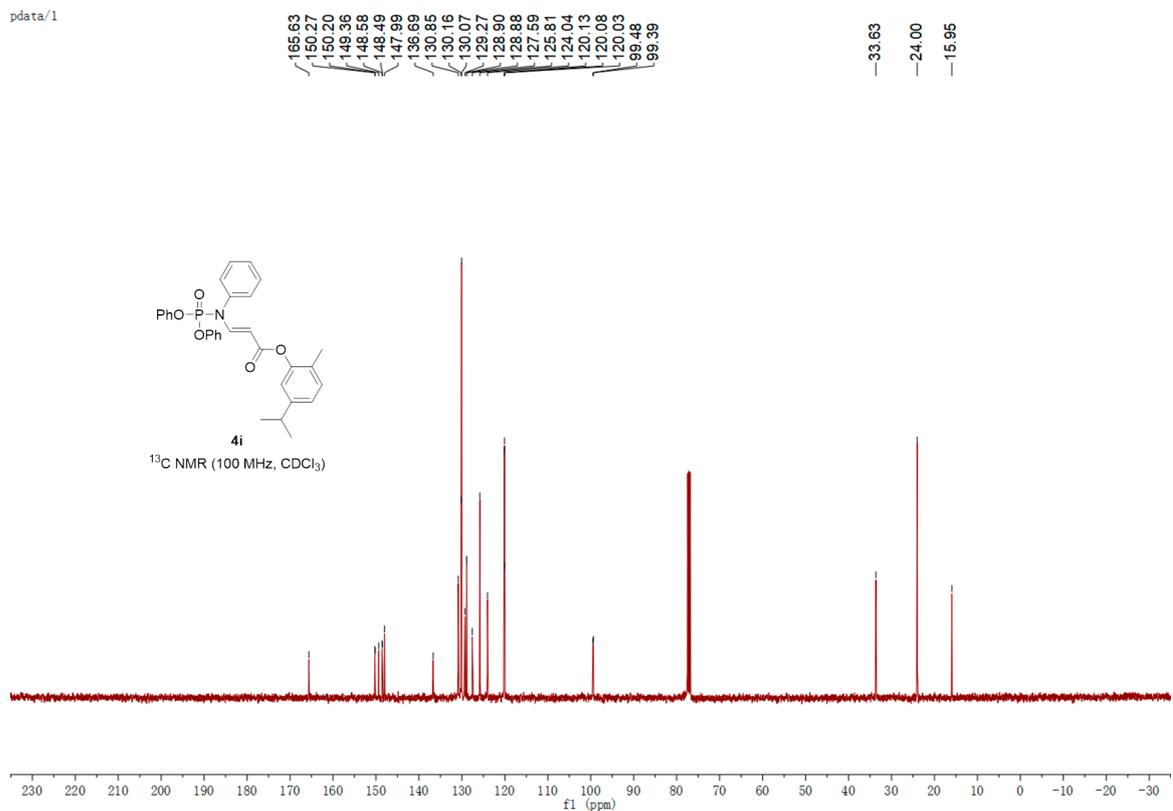
³¹P NMR (162 MHz, CDCl₃)



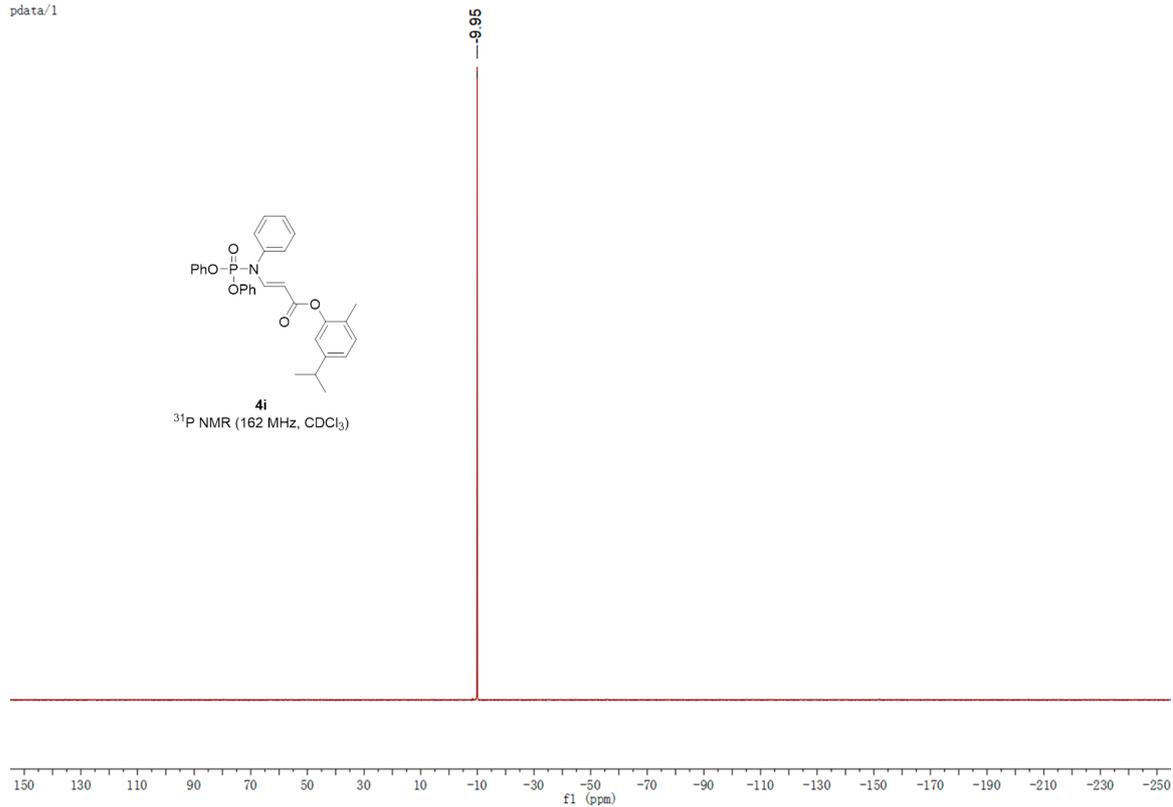
wg1204.1.1.1r



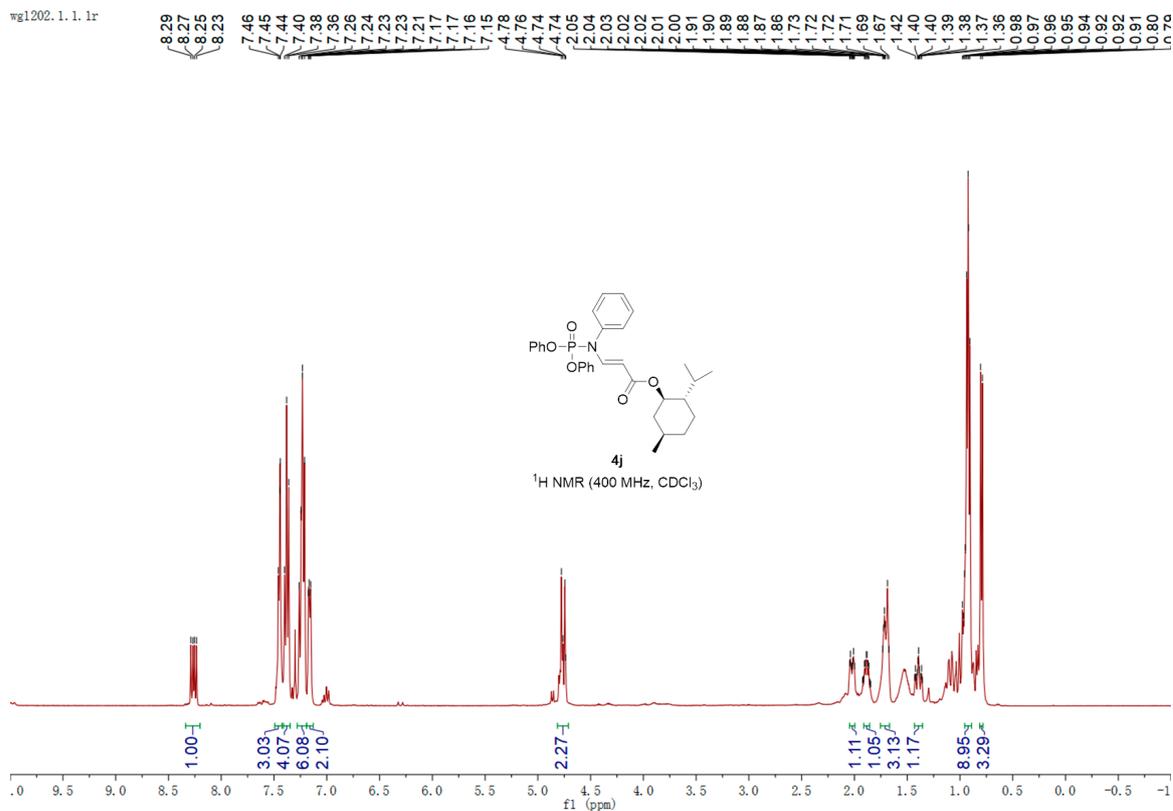
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pdata/1

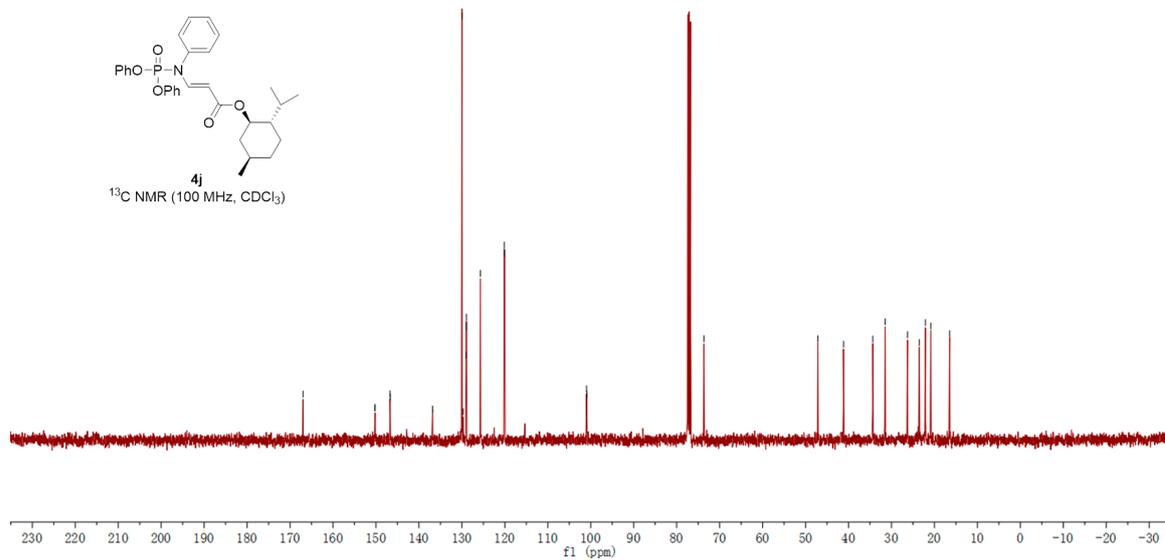
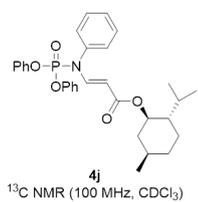


wg1202.1.1.1r



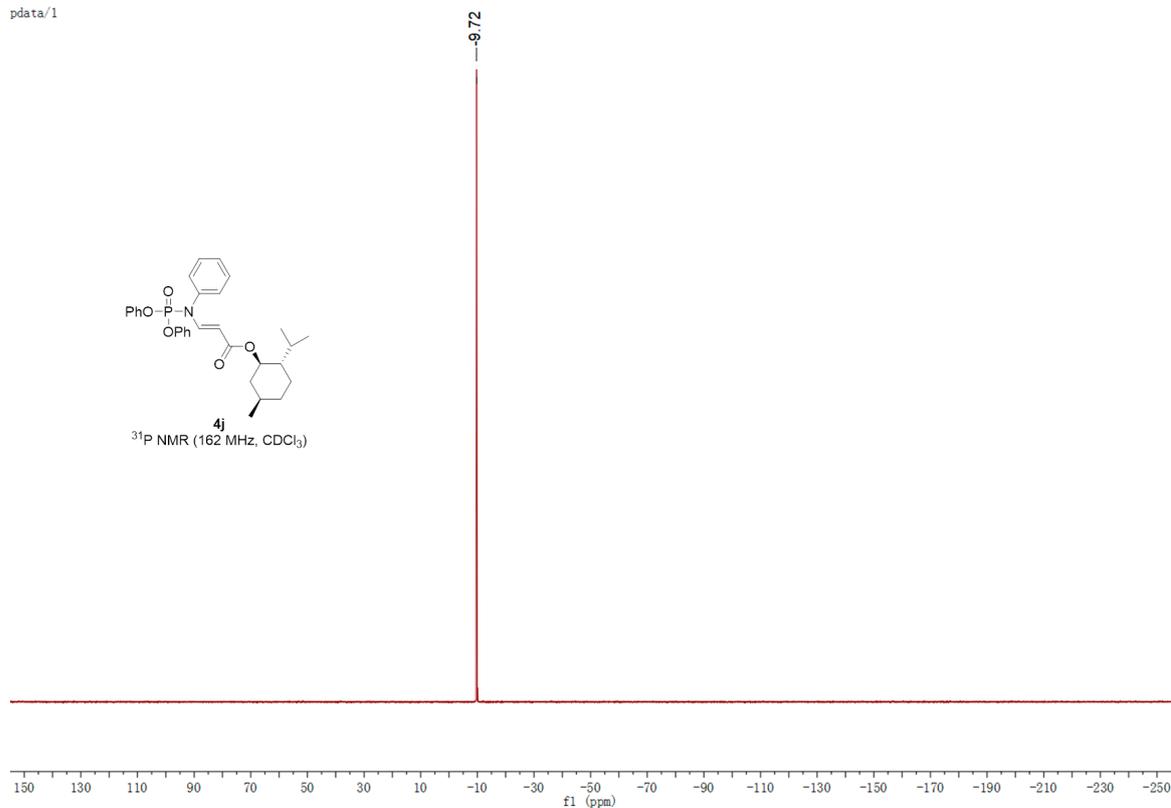
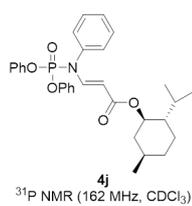
pdata/1

166.96
150.28
150.21
146.74
146.65
136.83
129.99
129.71
129.00
128.95
128.83
125.68
120.13
100.98
100.88
73.67
47.15
41.17
34.35
31.45
26.27
23.53
22.10
20.85
16.45

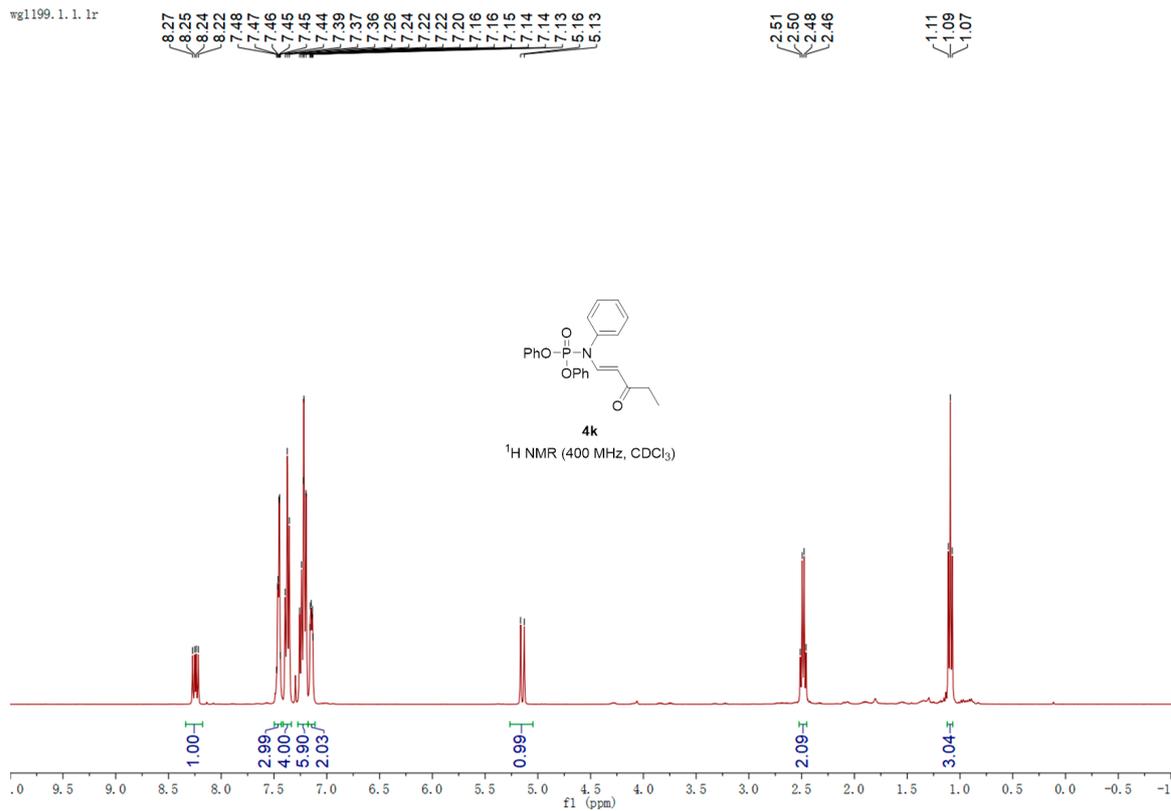


pdata/1

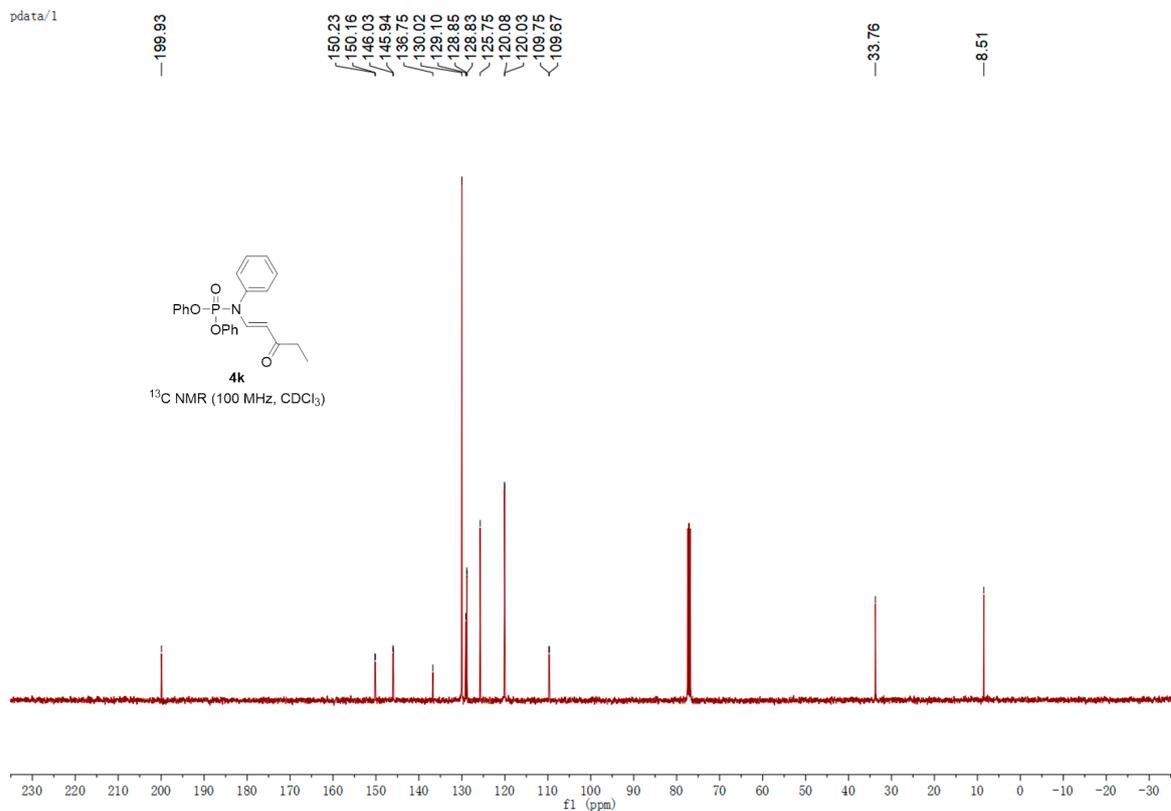
9.72



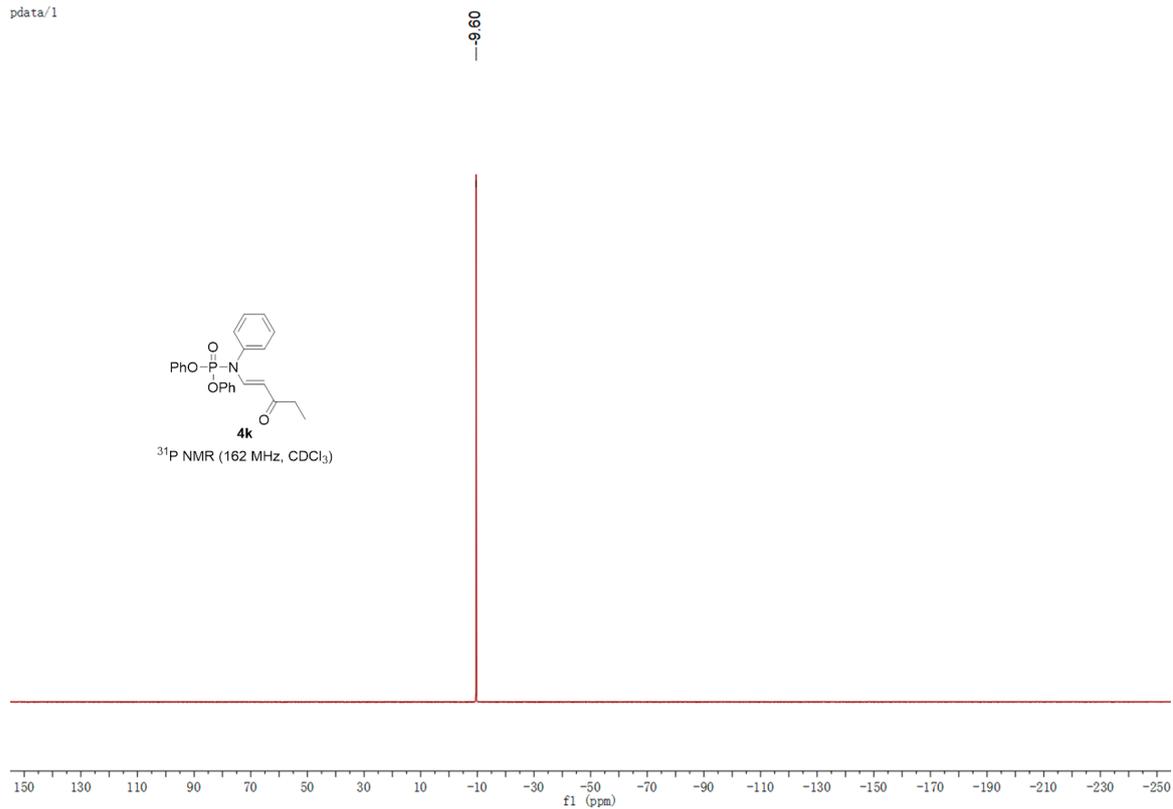
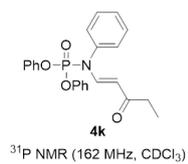
wg1199.1.1.1r



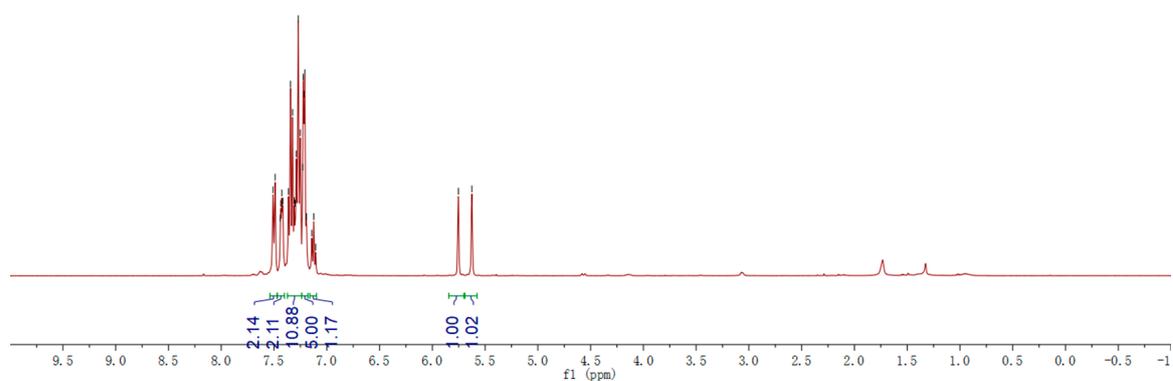
pdata/1



pdata/1

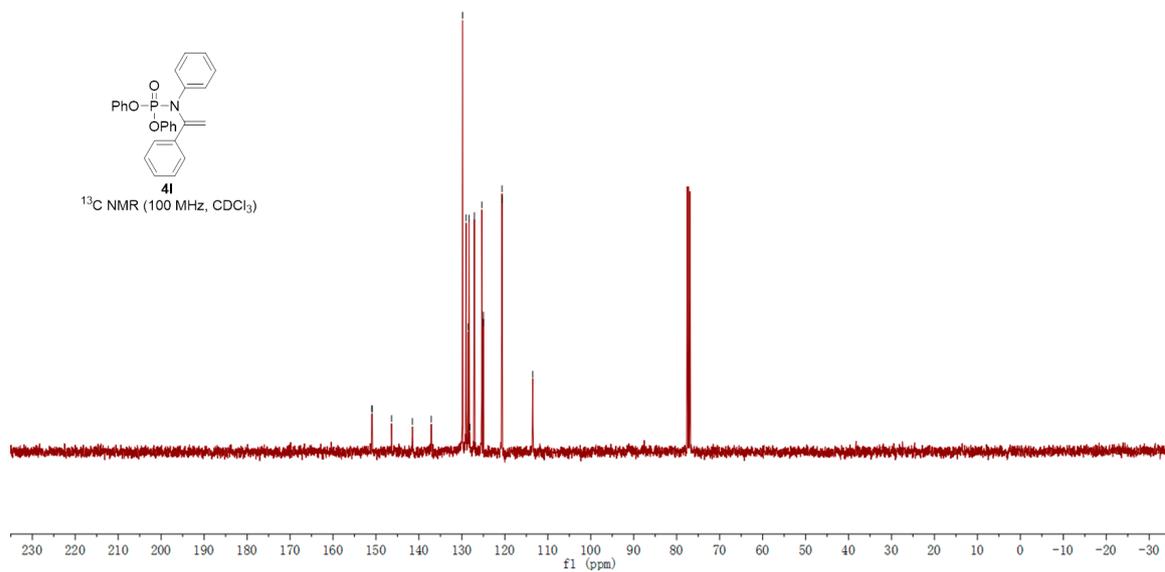


mg968. 1. 1
7.51
7.49
7.44
7.44
7.43
7.42
7.36
7.34
7.32
7.31
7.30
7.29
7.27
7.25
7.23
7.22
7.22
7.21
7.19
7.14
7.12
7.11
5.75
5.62



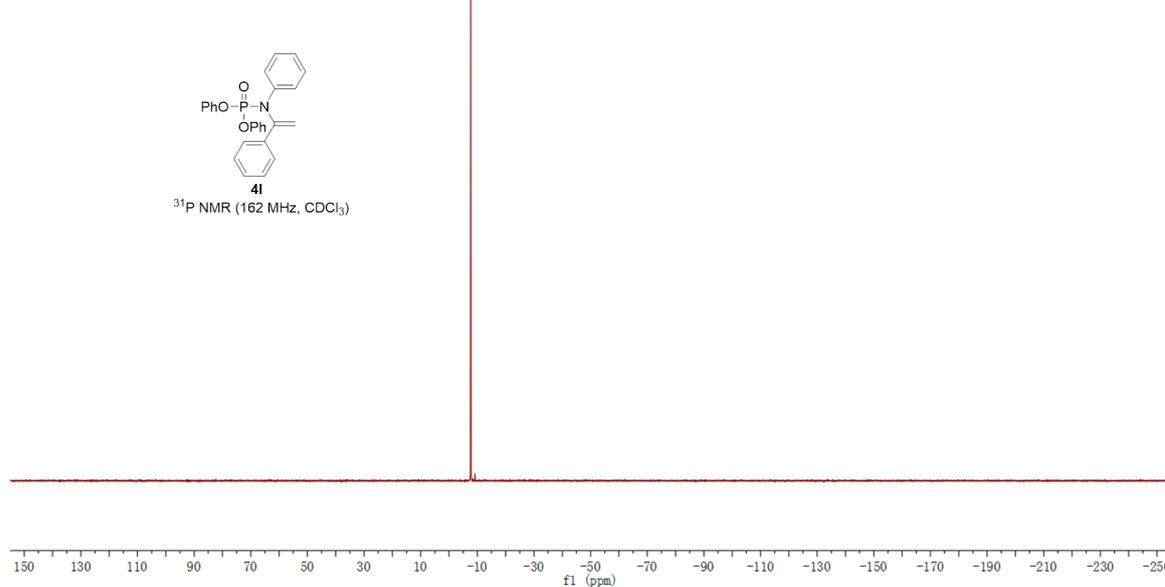
pdata/1

150.95
150.88
146.37
141.52
137.13
129.84
129.02
128.54
128.34
128.15
127.09
125.95
125.00
124.97
120.86
120.81
113.51

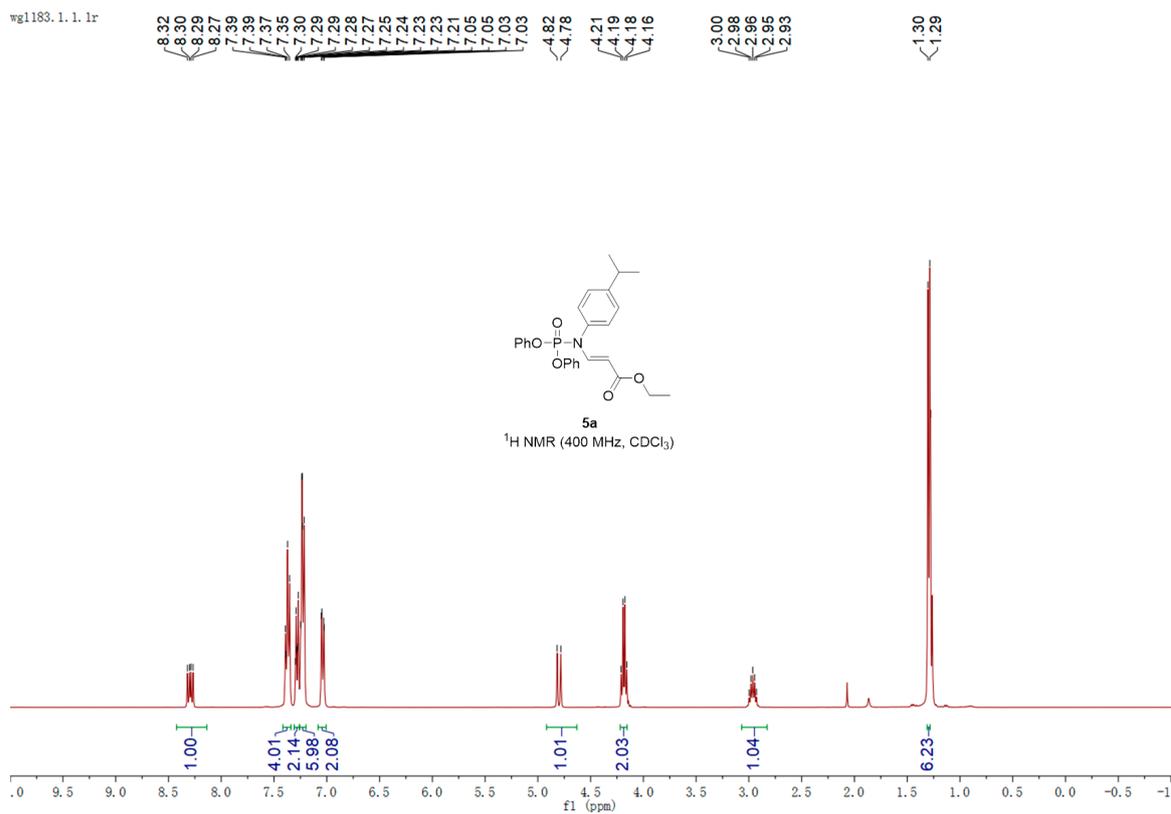


pdata/1

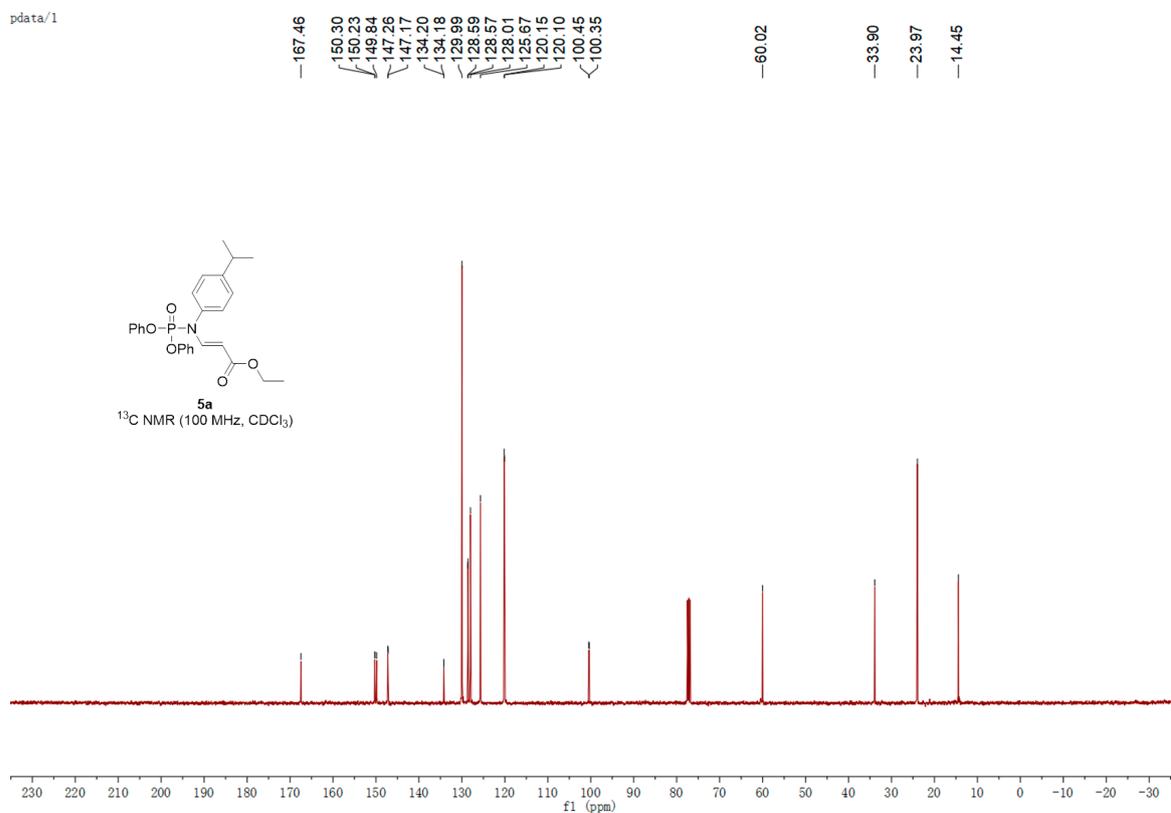
-7.65



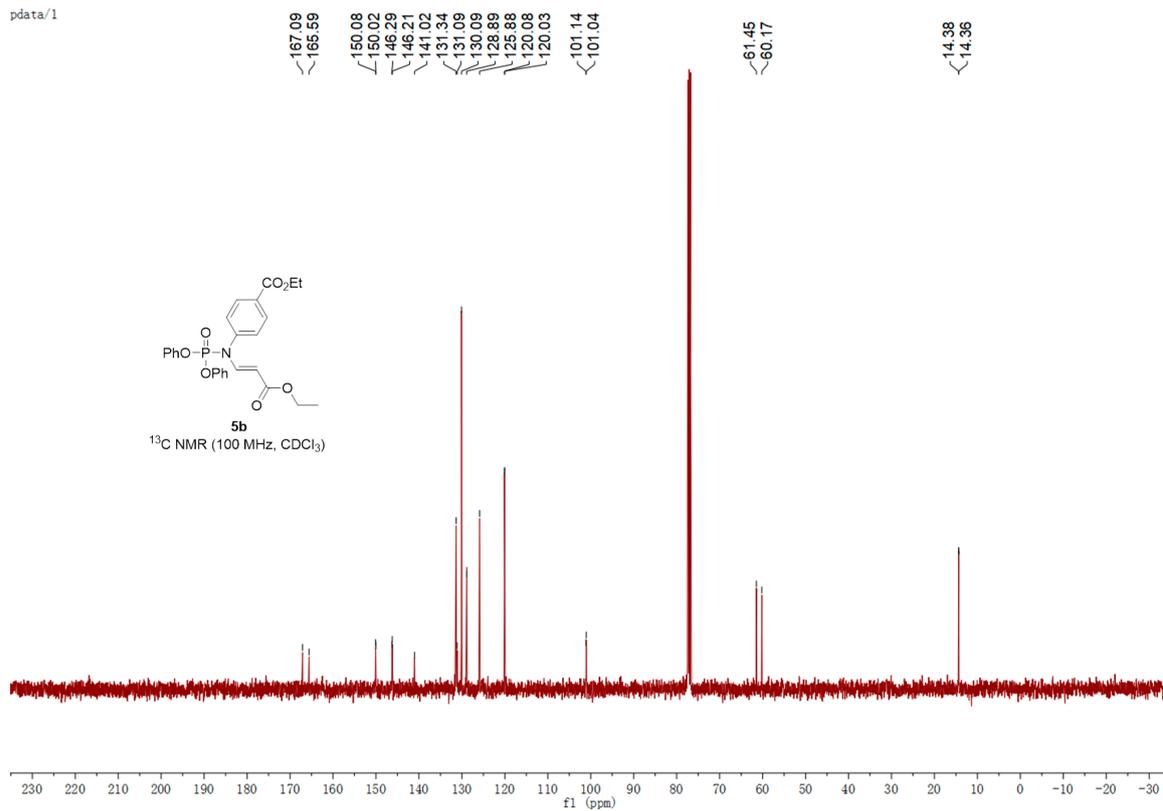
wg1183.1.1.1r



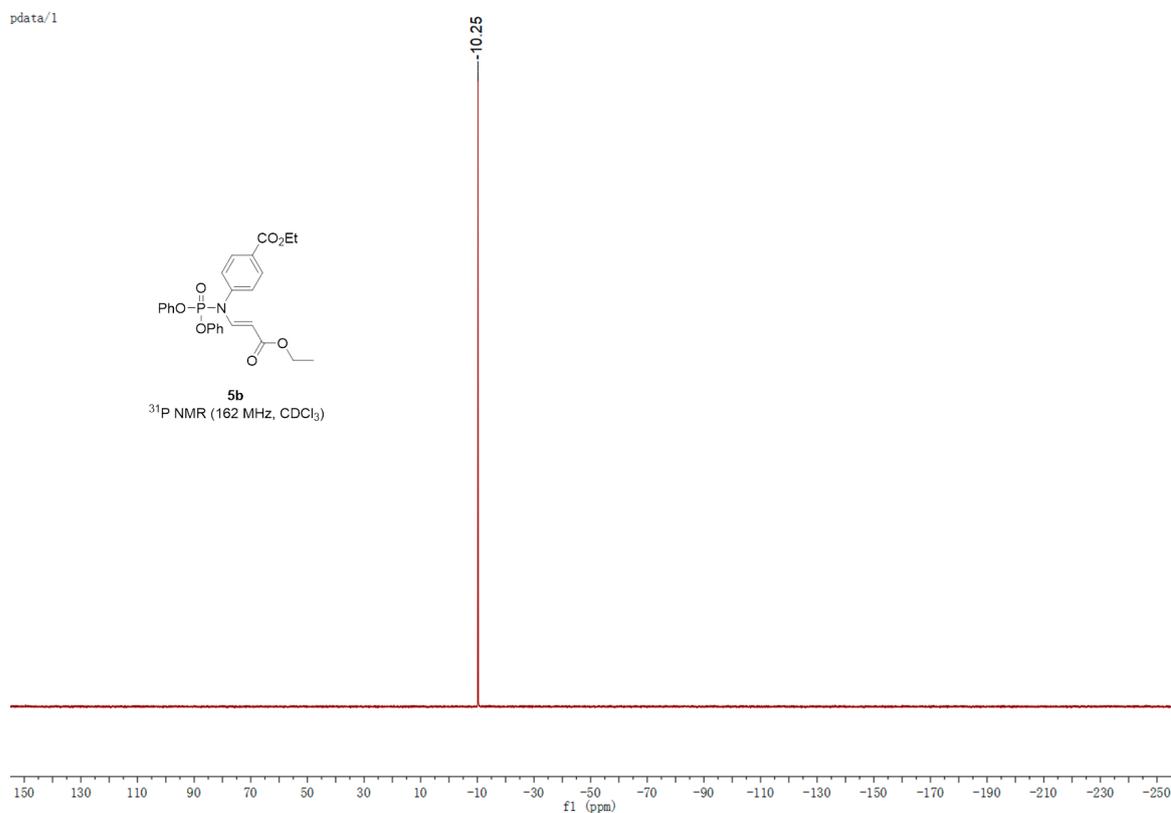
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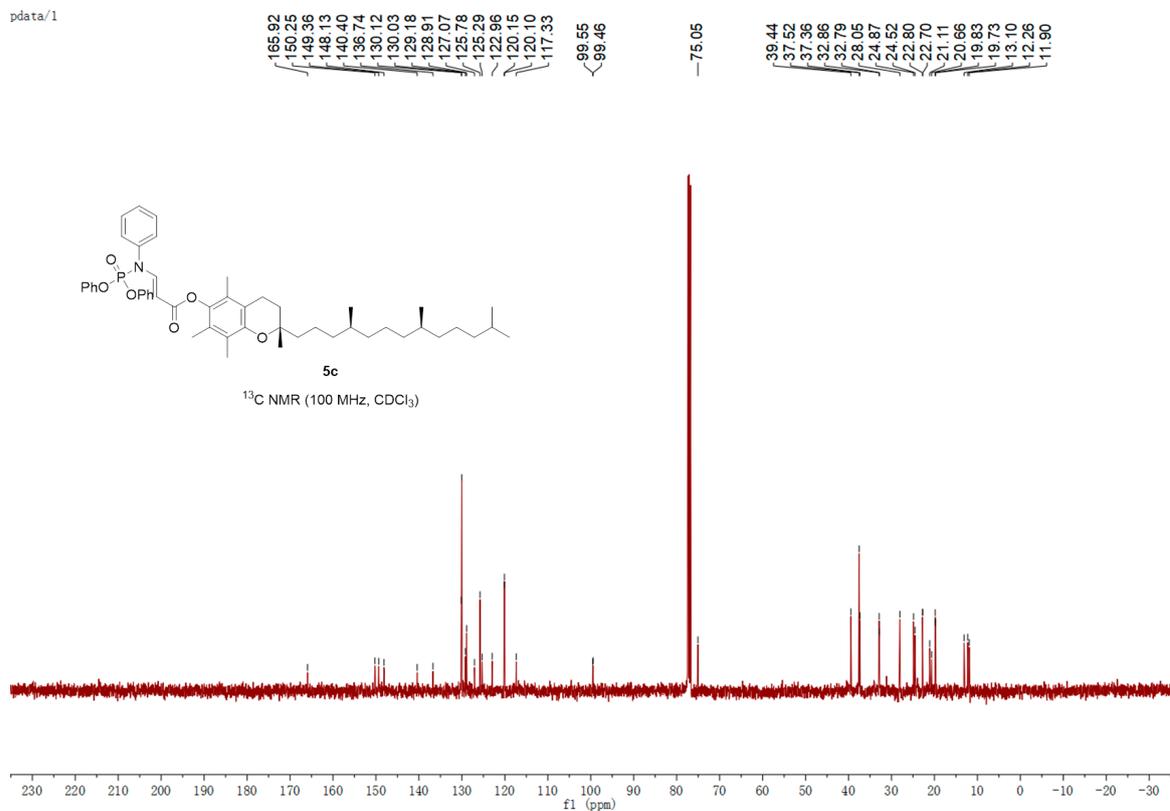
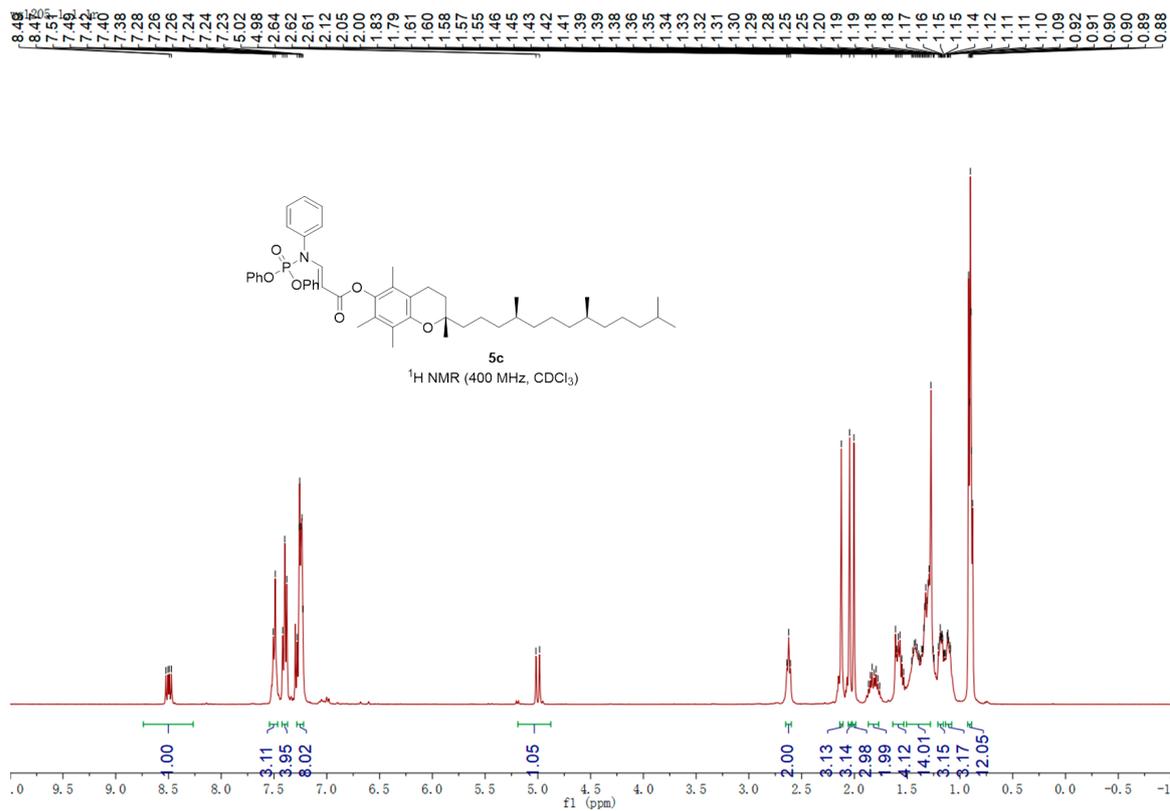


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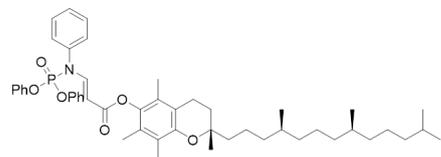


pdata/1

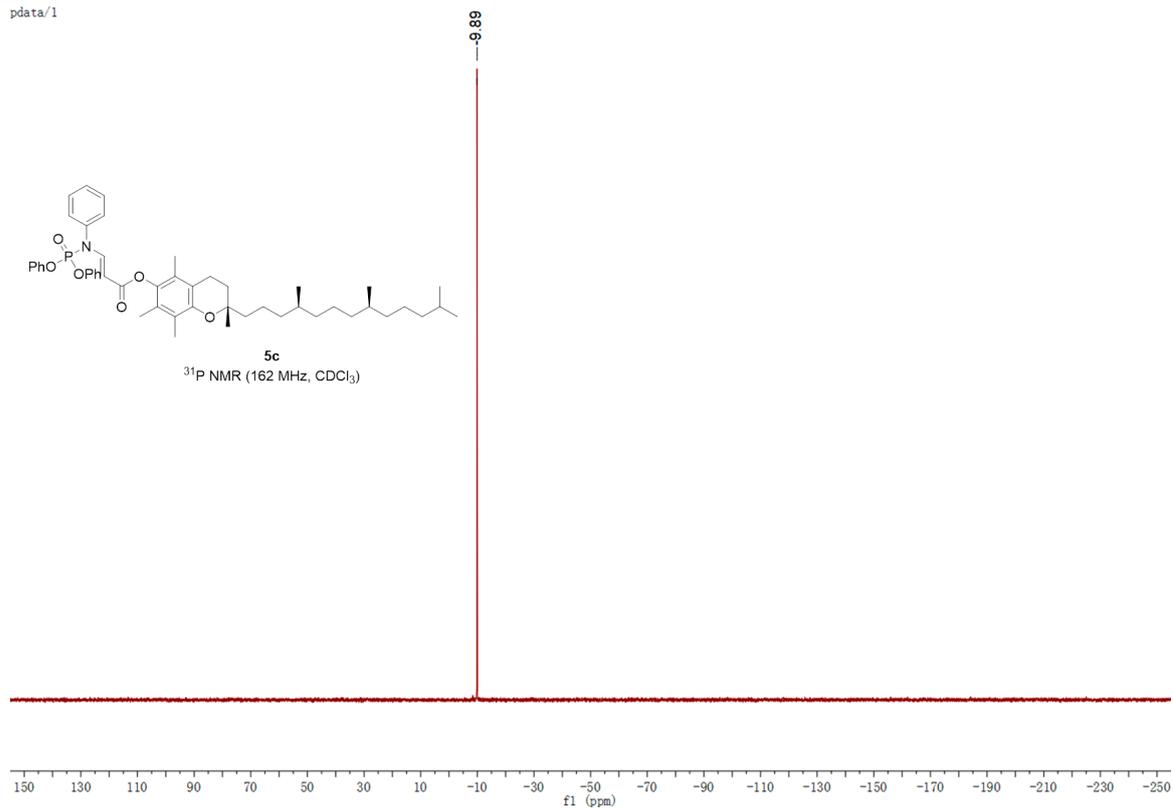




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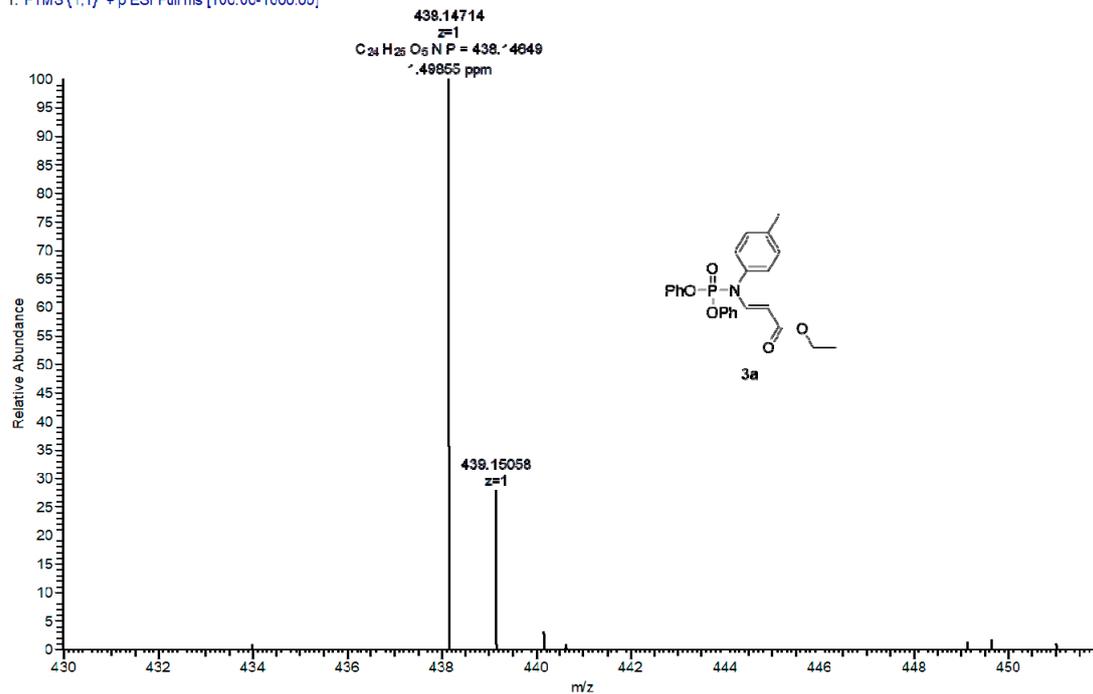


5c
³¹P NMR (162 MHz, CDCl₃)

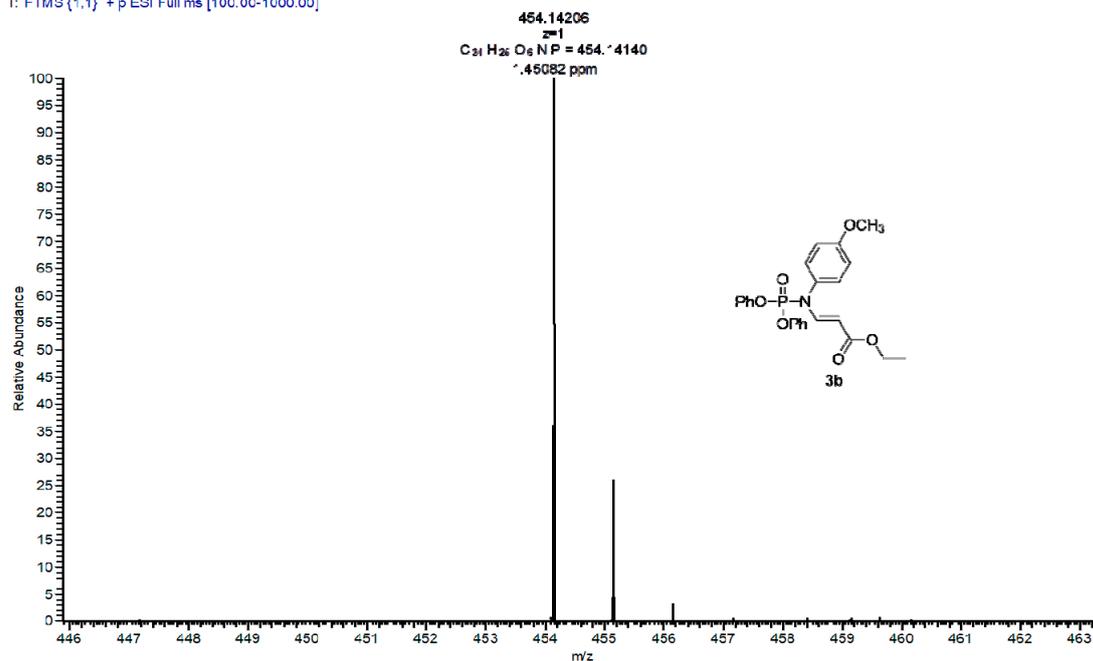


HRMS spectra of products

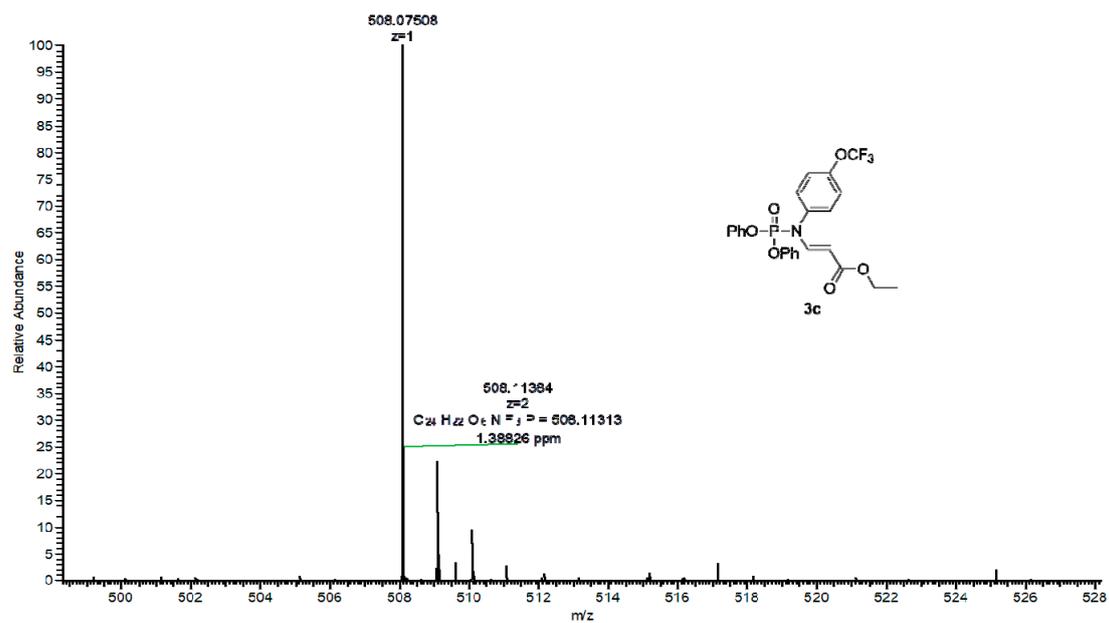
960 #51 RT: 0.74 AV: 1 SB: 24 0.01-0.09 0.77-1.02 NL: 2.07E5
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



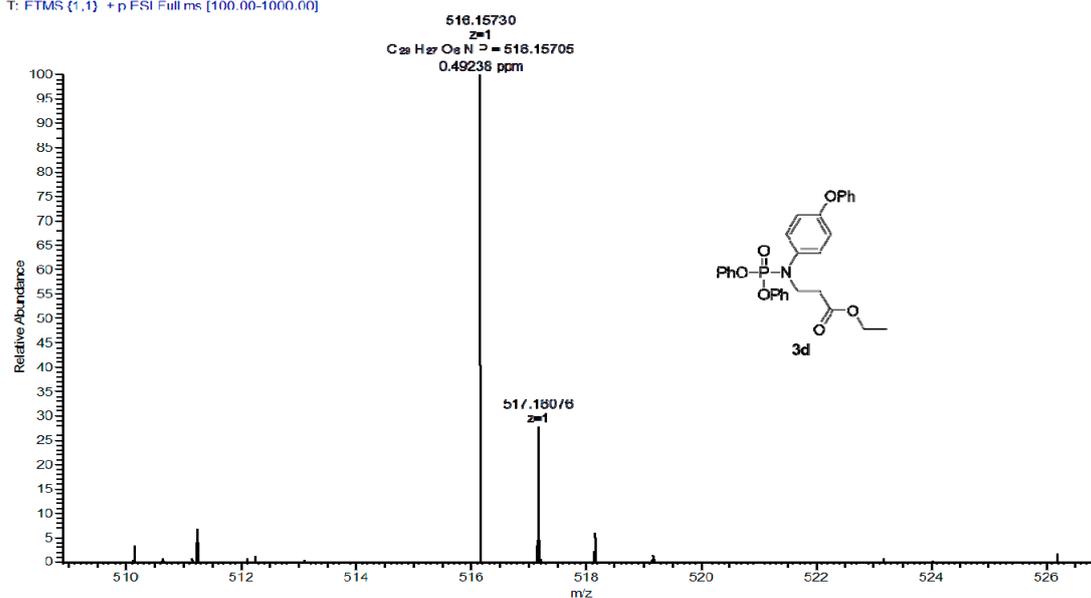
952 #31 RT: 0.45 AV: 1 NL: 1.21E6
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



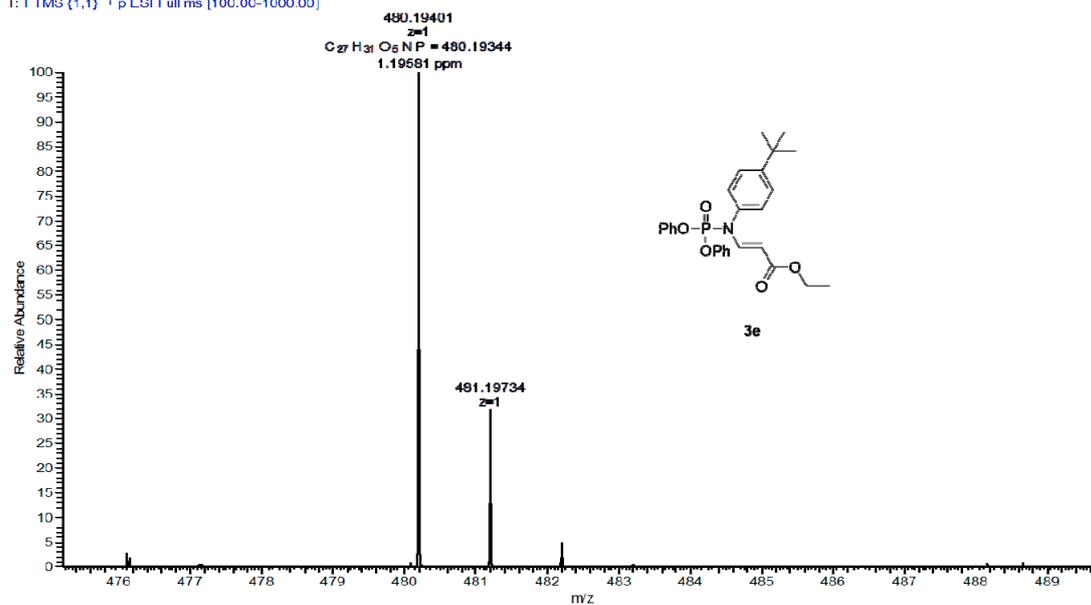
954 #33 RT: 0.48 AV: 1 SB: 24 0.01-0.09 0.78-1.03 NL: 7.24E5
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



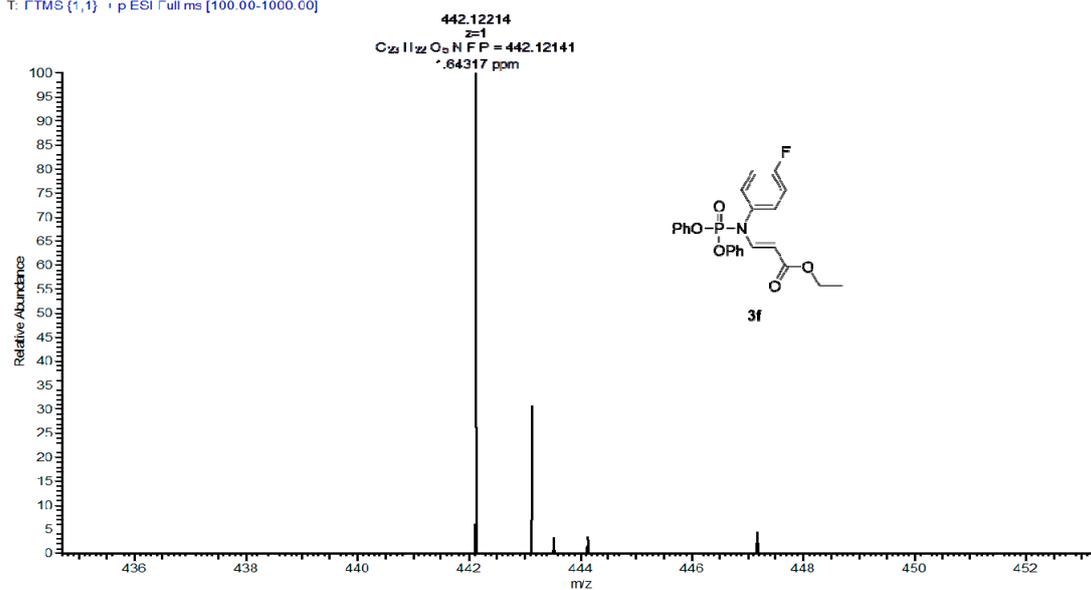
1184 #43 RT: 0.62 AV: 1 SB: 6 0.00-0.08 NL: 3.95E5
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



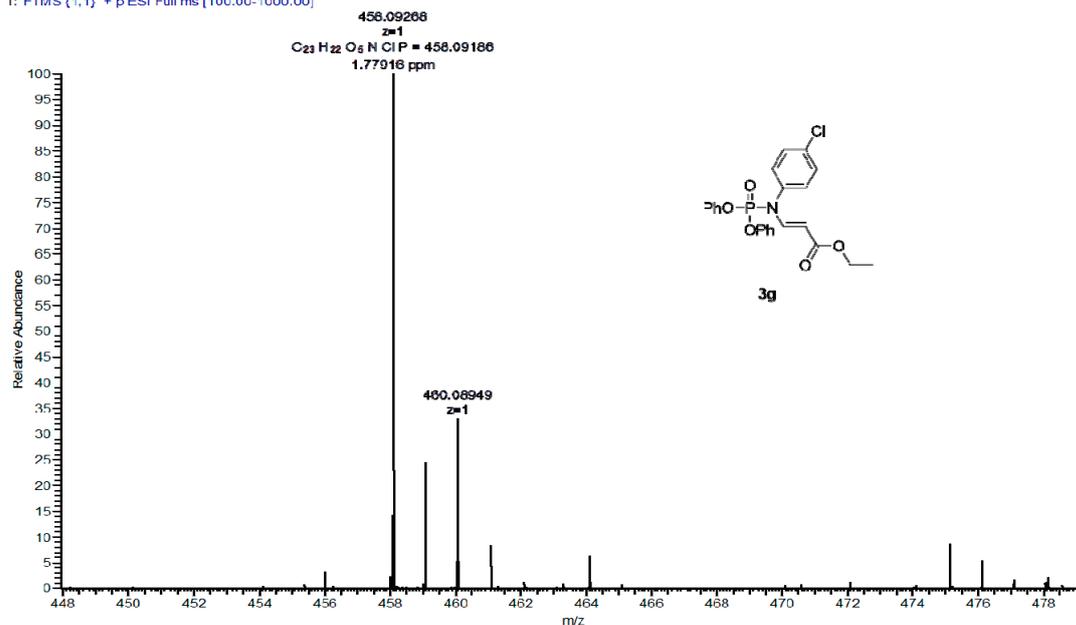
1181 #43 RT: 0.63 AV: 1 SB: 6 0.01-0.09 NL: 7.38E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



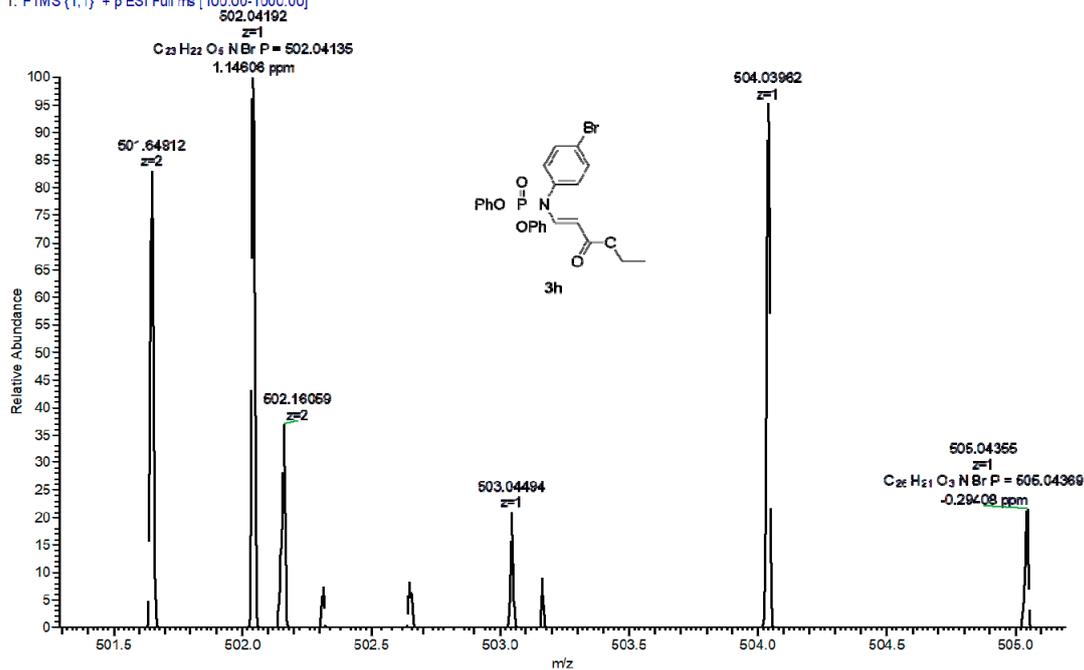
951 #85 RT: 0.95 AV: 1 SB: 24 0.01-0.09, 0.73-1.03 NL: 4.09E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



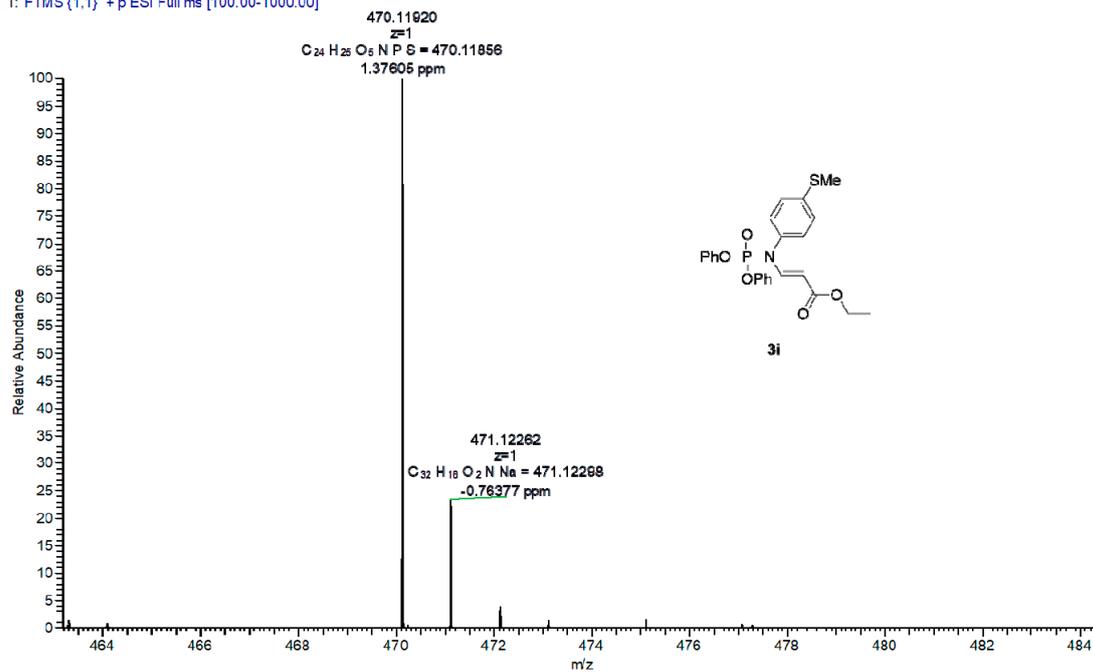
961 #13 RT: 0.20 AV: 1 SB: 24 0.01-0.09 0.78-1.03 NL: 7.03E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



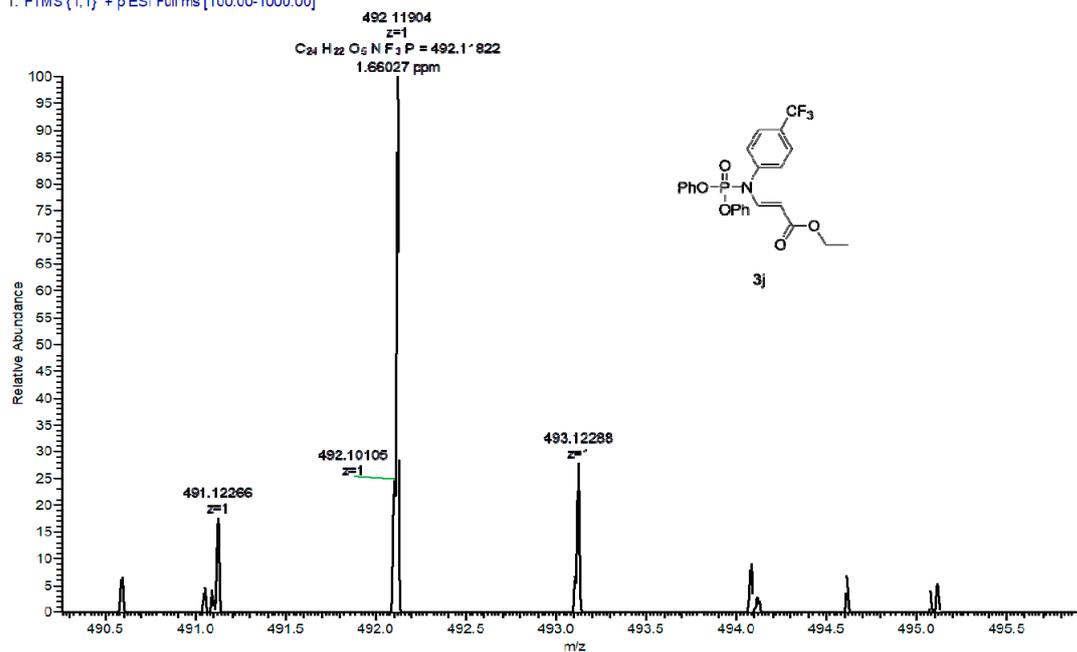
969 #11 RT: 0.17 AV: 1 SB: 6 0.01-0.09 NL: 5.64E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



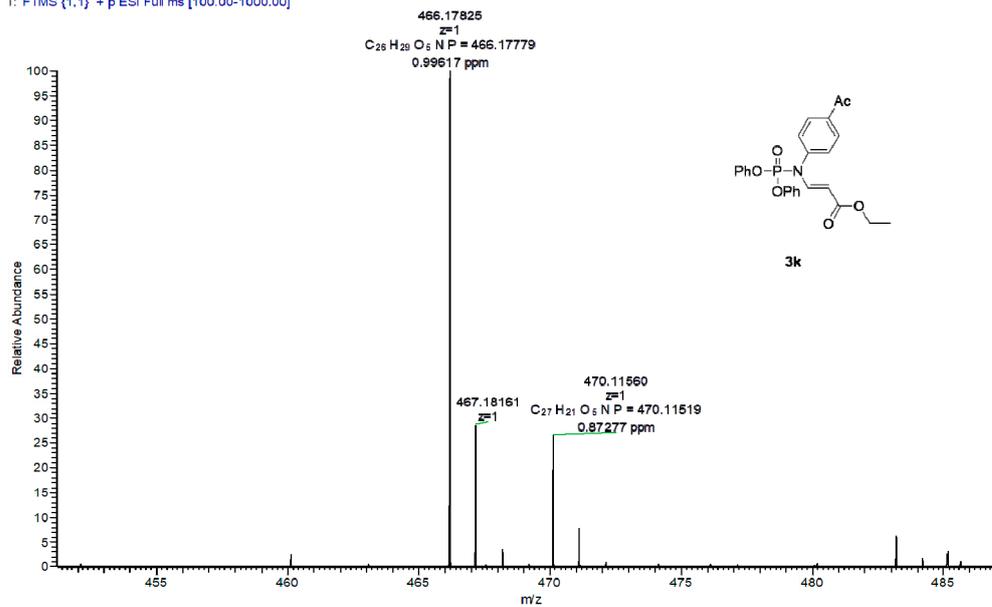
955 #13 RT: 0.20 AV: 1 SB: 24 0.01-0.09 0.78-1.03 NL: 5.41E5
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



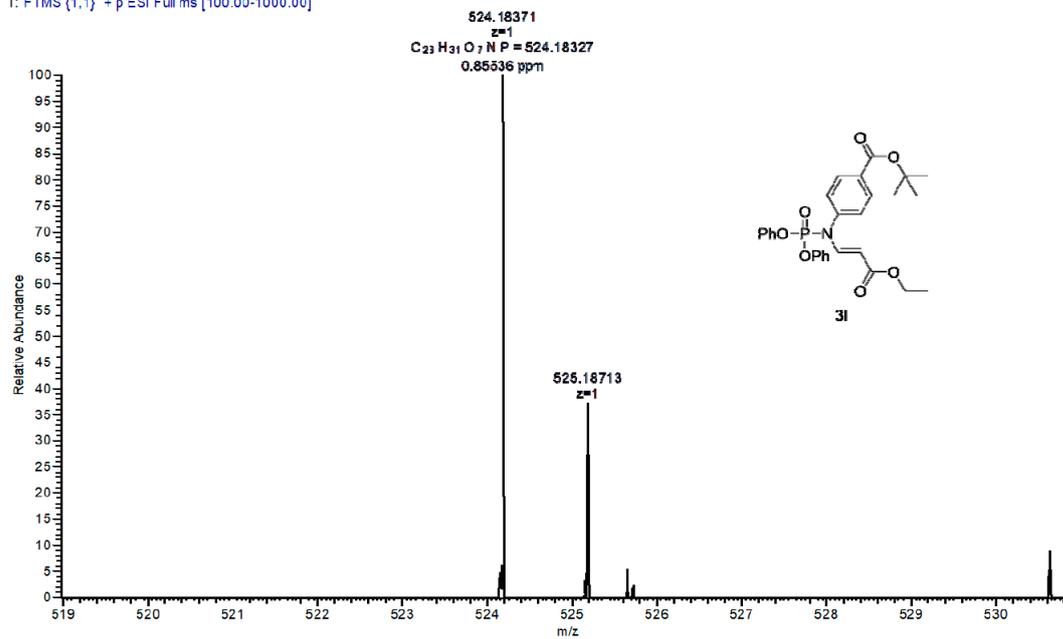
965 #47 RT: 0.71 AV: 1 SB: 6 0.01-0.09 NL: 1.63E4
T: FTMS (1,1) +p ESI Full ms [100.00-1000.00]



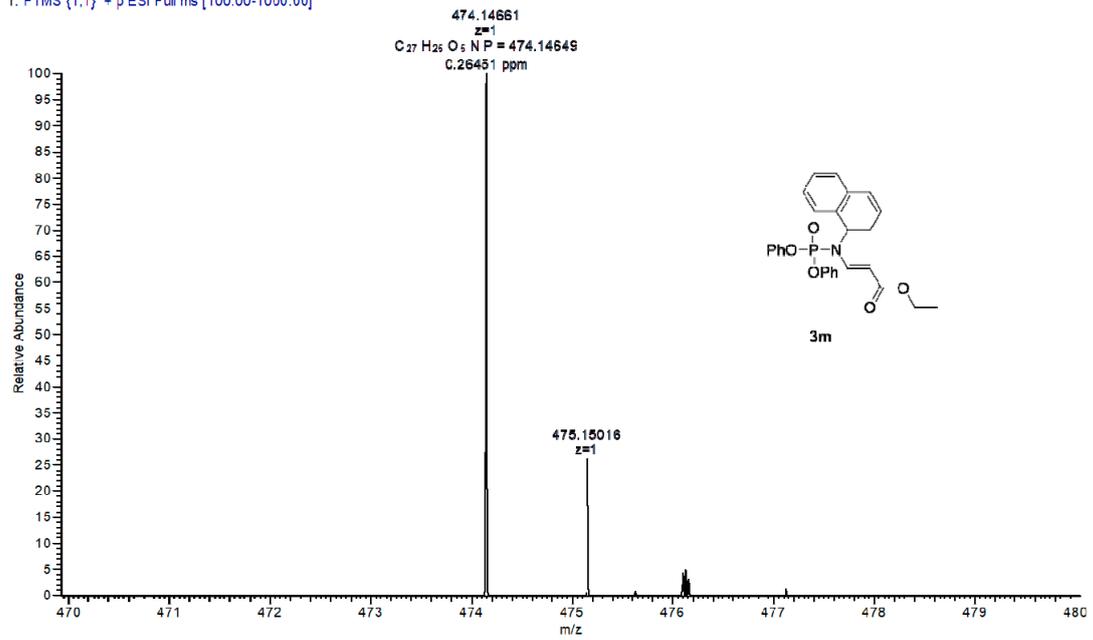
1185 #47 RT: 0.68 AV: 1 SB: 6 0.01-0.09 NL: 3.69E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



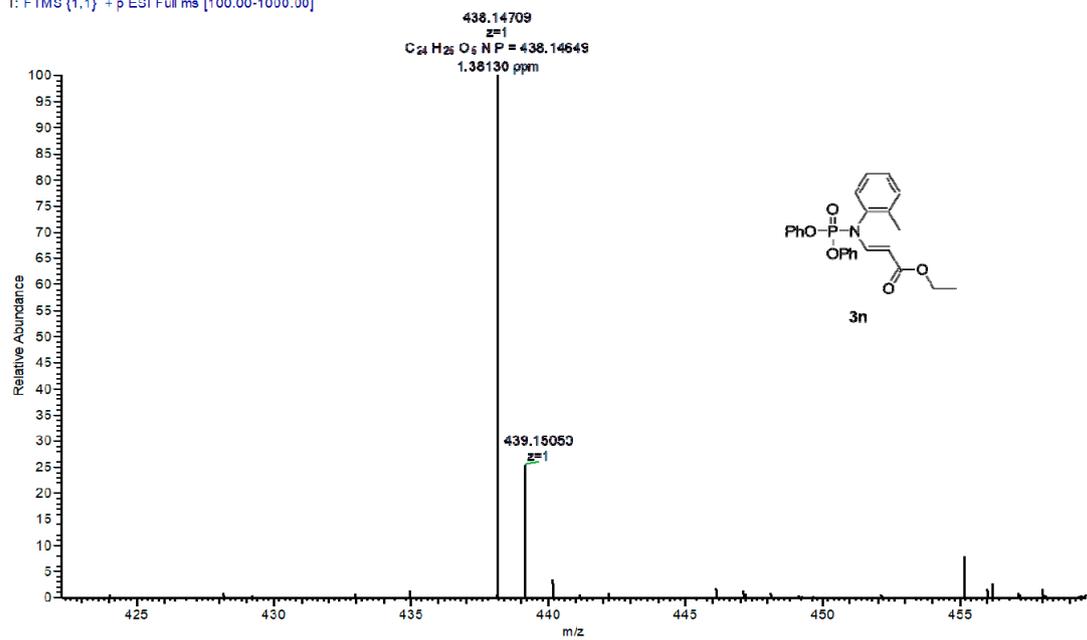
1191 #13 RT: 0.20 AV: 1 SB: 6 0.01-0.09 NL: 9.38E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



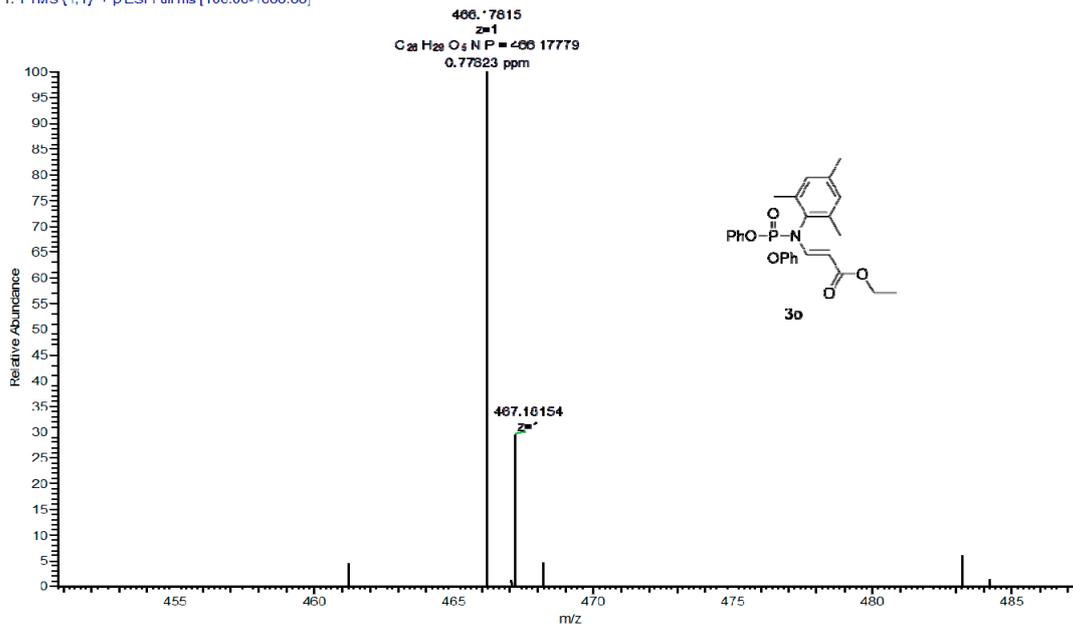
978 #43 RT: 0.63 AV: 1 SB: 6 0.01-0.09 NL: 4.44E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



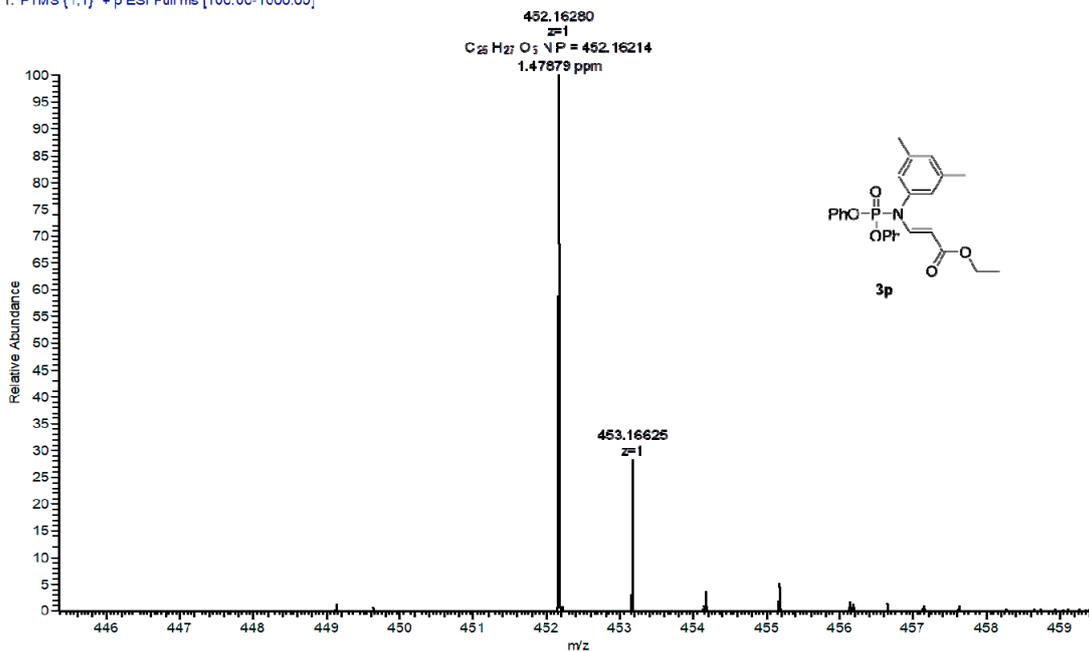
974 #21 RT: 0.31 AV: 1 SB: 6 0.01-0.09 NL: 1.22E6
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



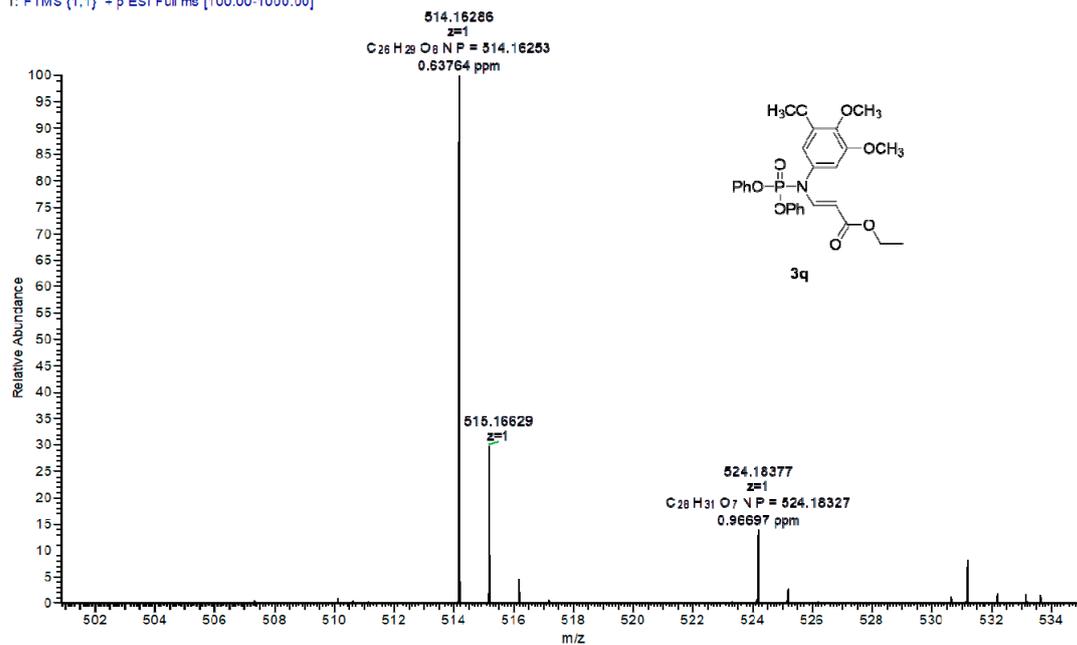
1192 #13 RT: 0.20 AV: 1 SB: 6 0.01-0.09 NL: 3.06E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



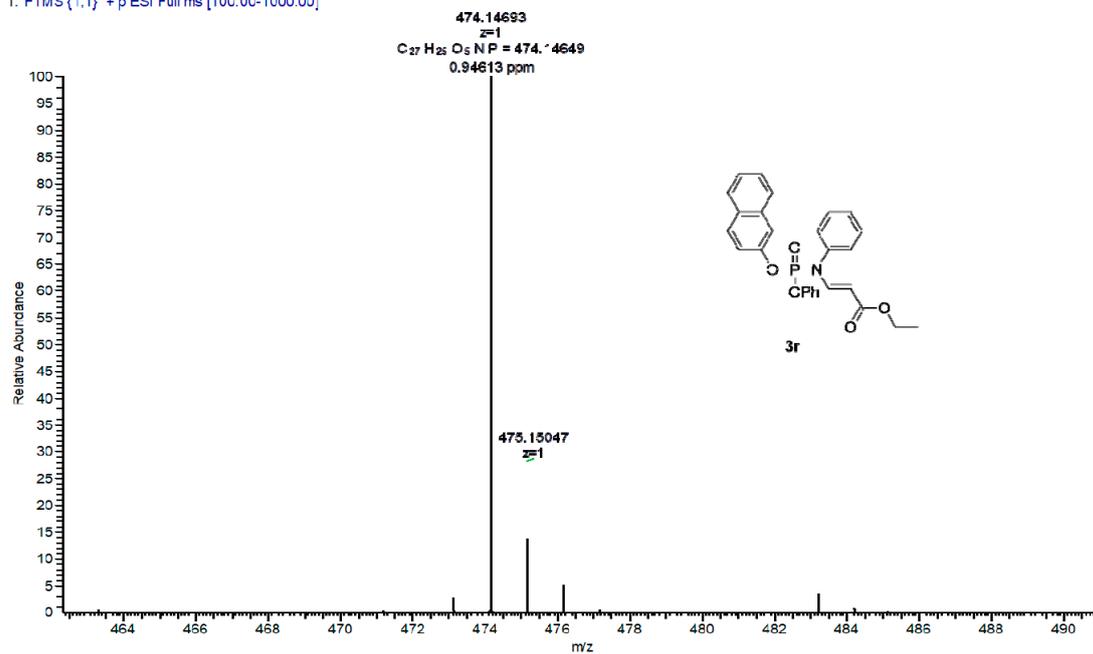
957 #51 RT: 0.75 AV: 1 SB: 24 0.01-0.09 0.78-1.03 NL: 3.78E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



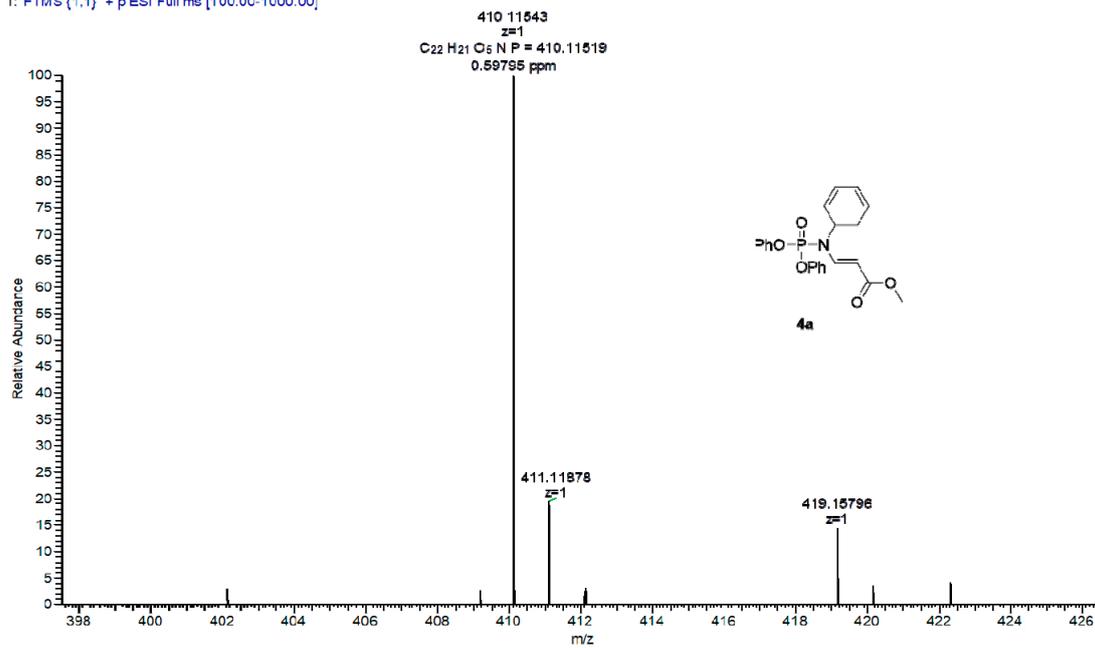
1188 #13 RT: 0.20 AV: 1 SB: 6 0.01-0.09 NL: 6.71E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



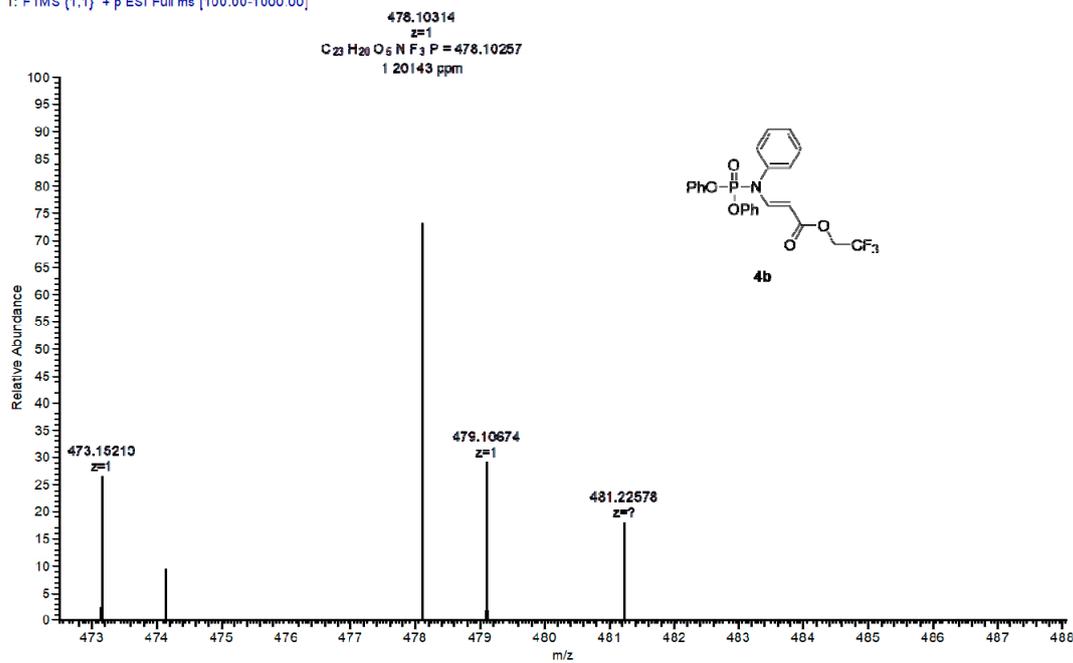
1197 #15 RT: 0.22 AV: 1 SB: 6 0.00-0.08 NL: 5.17E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



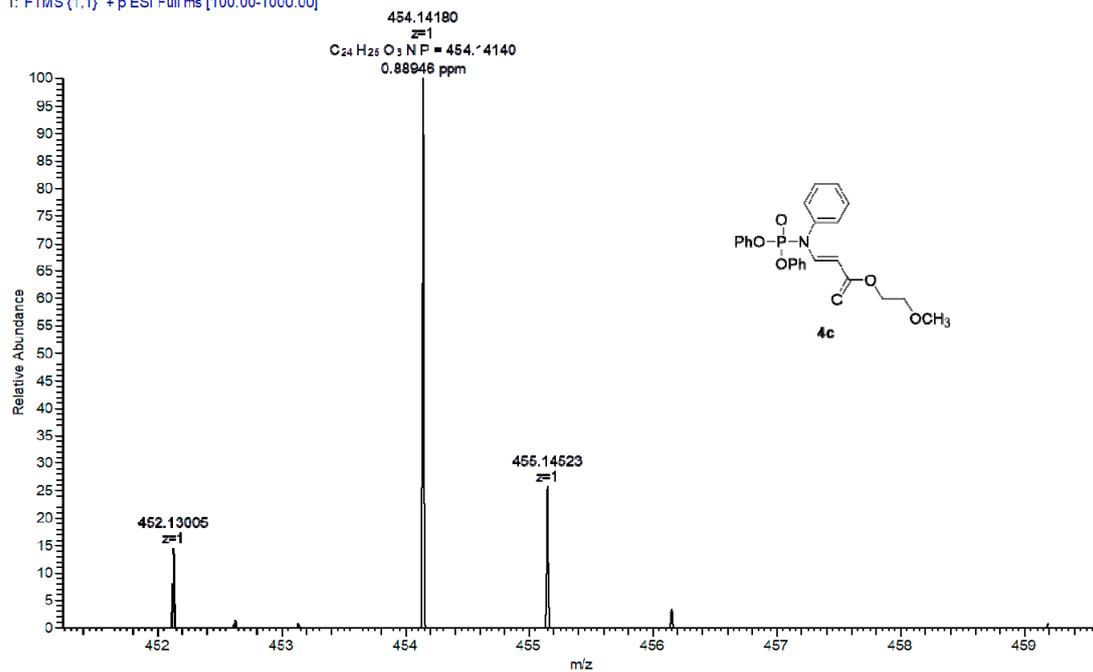
1198 #15 RT: 0.22 AV: 1 SB: 6 0.00-0.09 NL: 8.19E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



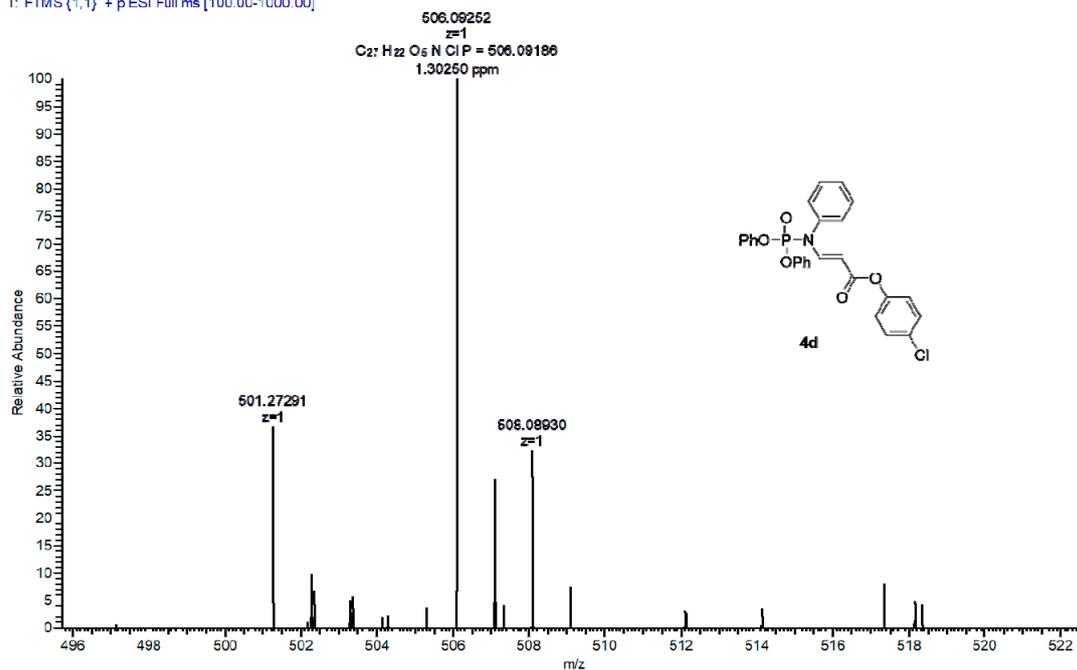
1200 #13 RT: 0.19 AV: 1 SB: 6 0.01-0.09 NL: 6.85E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



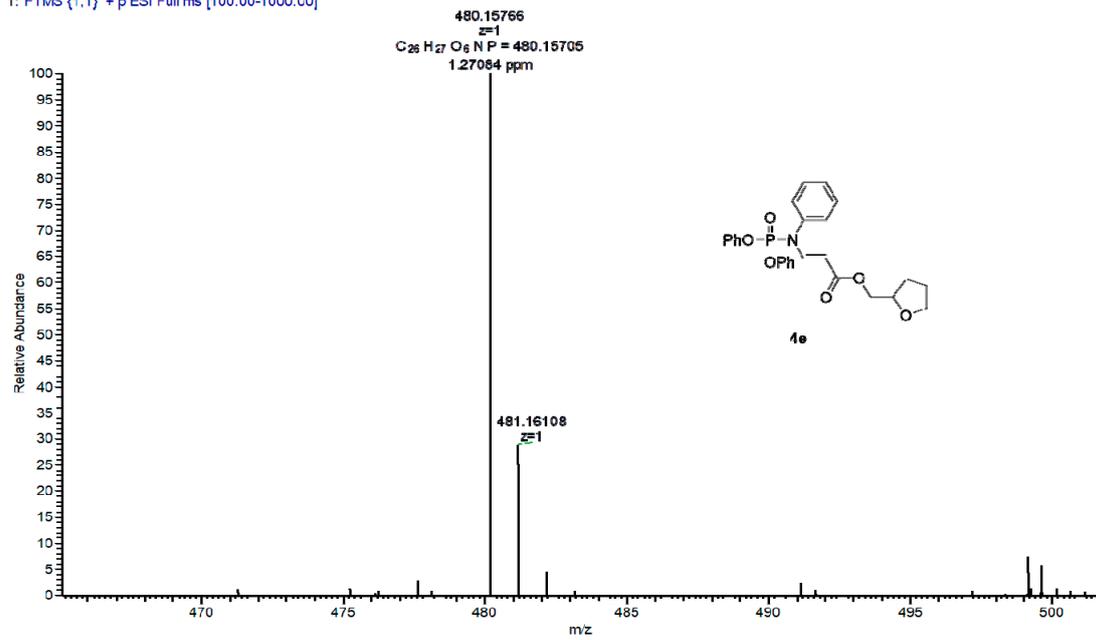
1203 #17 RT: 0.24 AV: 1 SB: 6 0.01-0.09 NL: 1.78E6
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



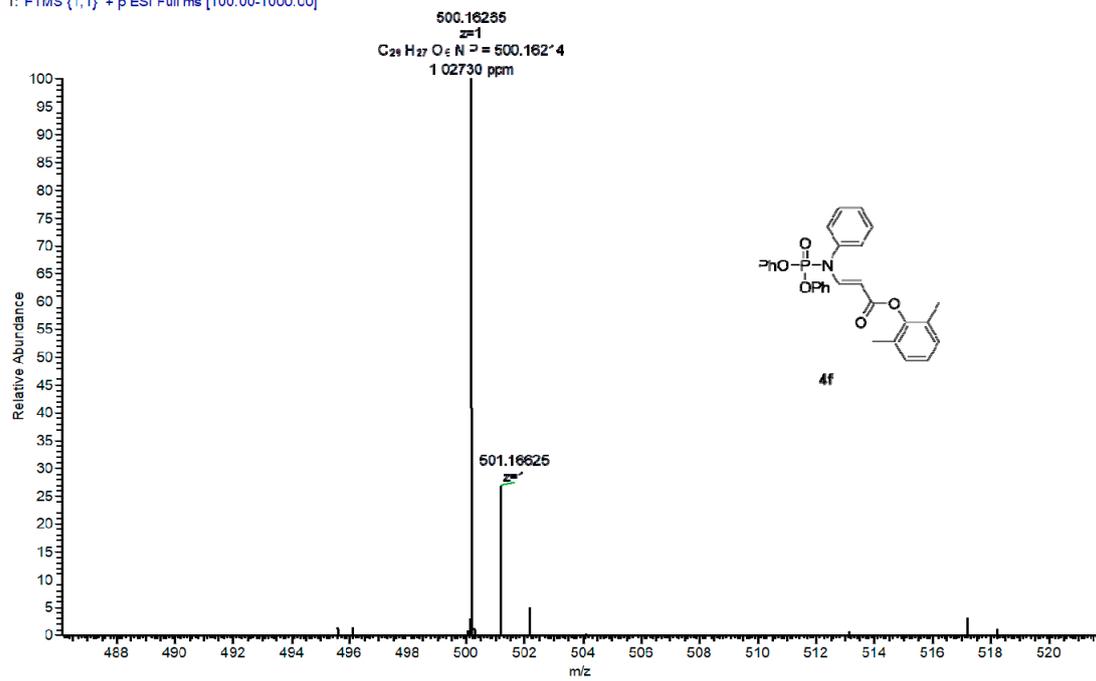
1201 #13 RT: 0.20 AV: 1 SB: 6 0.01-0.09 NL: 8.25E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



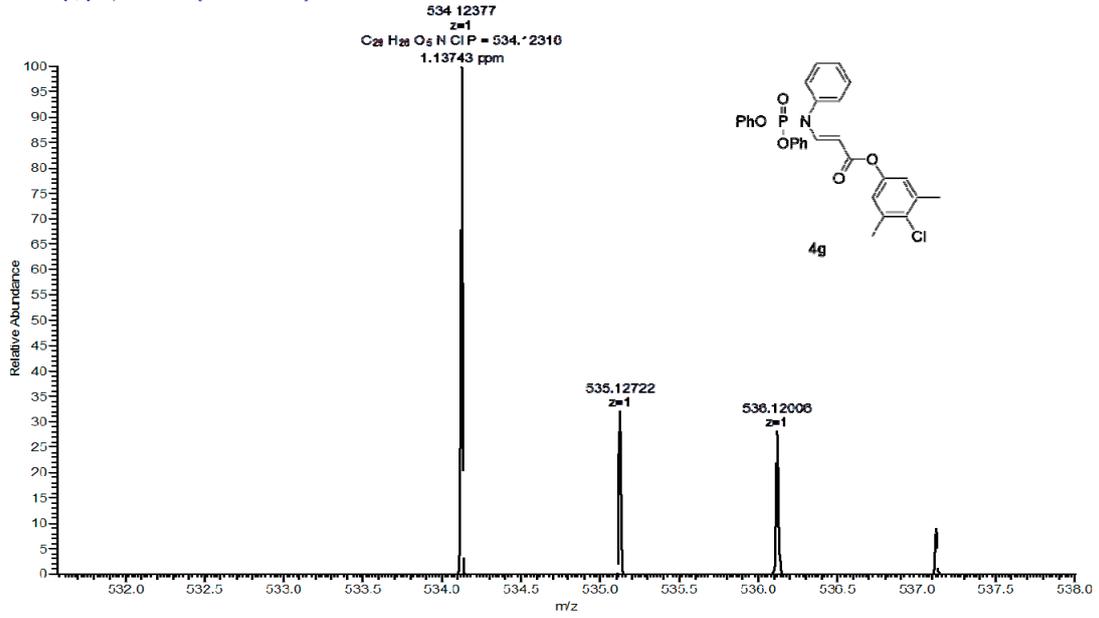
1210 #33 RT: 0.49 AV: 1 SB: 6 0.01-0.09 NL: 5.82E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



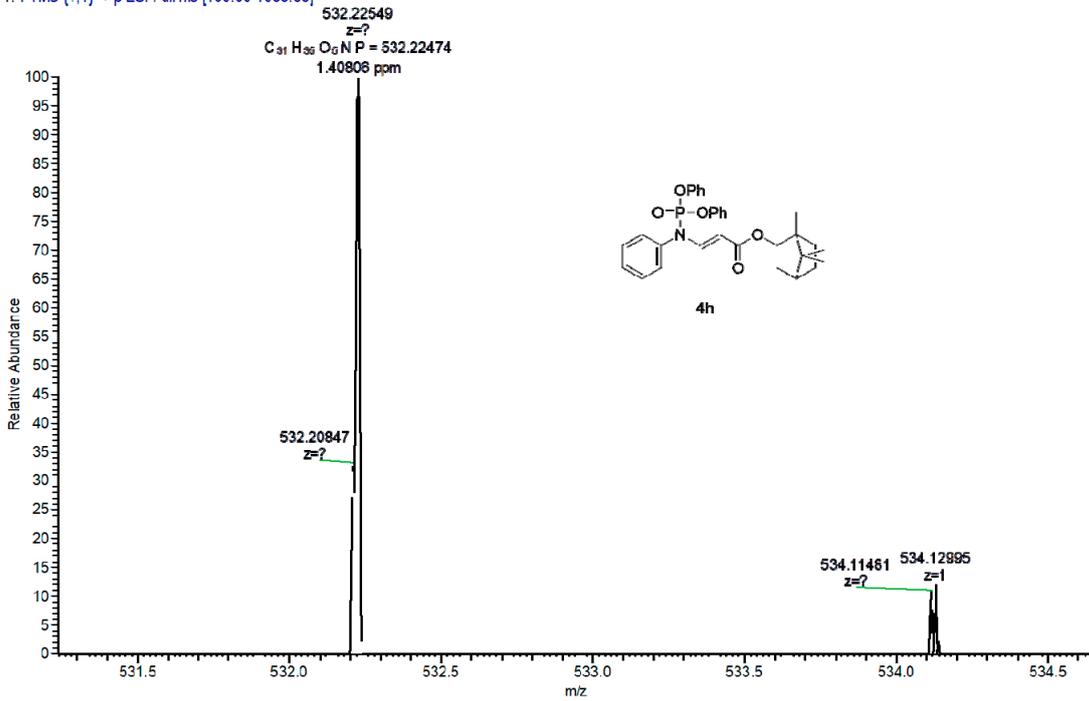
1207 #41 RT: 0.61 AV: 1 SB: 6 0.01-0.09 NL: 2.48E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



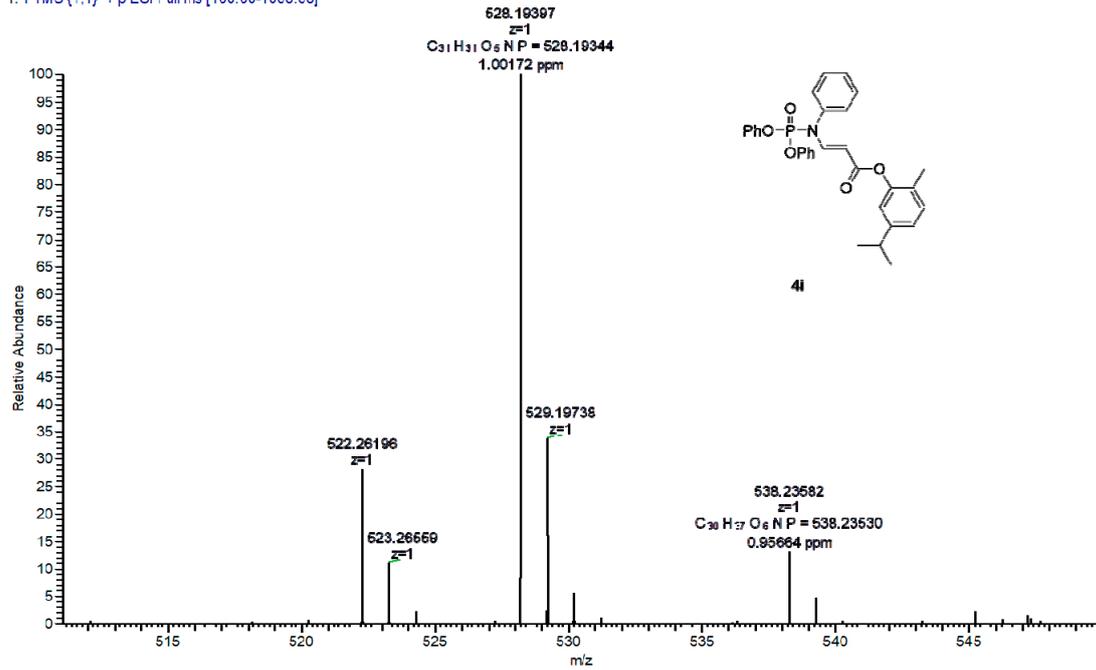
1206 #41 RT: 0.61 AV: 1 SB: 6 0.01-0.09 NL: 2.05E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



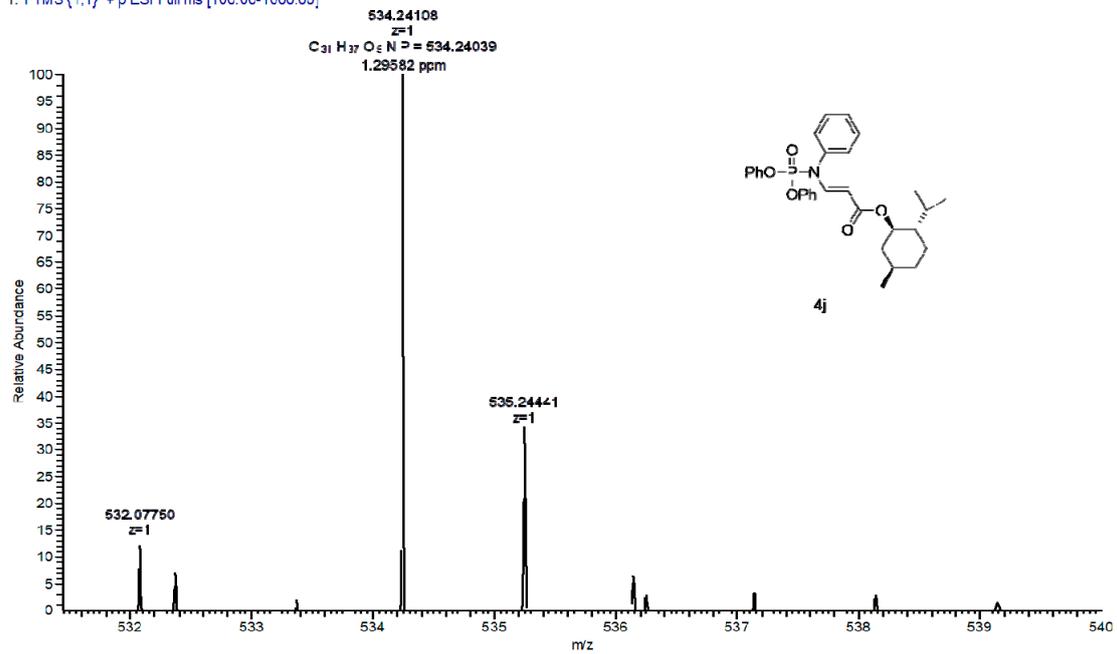
1209 #33 RT: 0.49 AV: 1 SB: 6 0.01-0.09 NL: 7.42E3
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



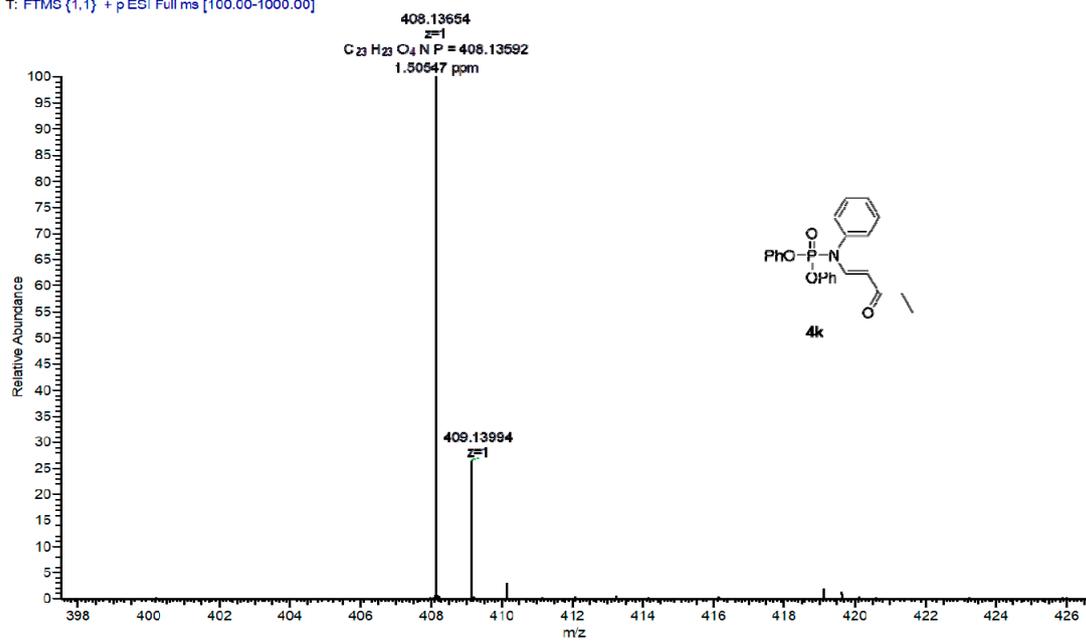
1204 #21 RT: 0.32 AV: 1 SB: 6 0.01-0.09 NL: 7.01E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



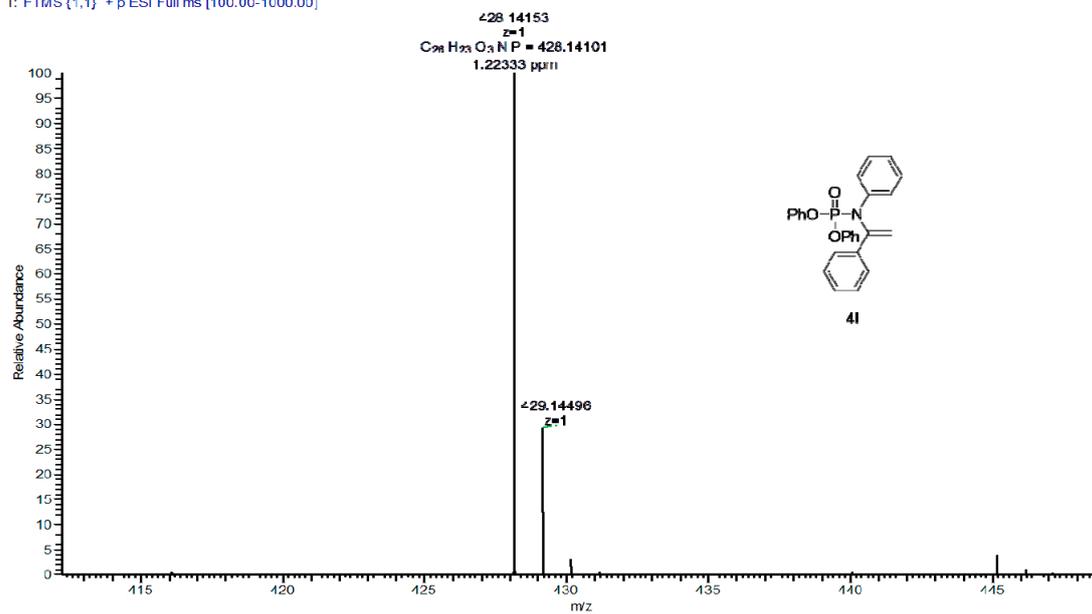
1202 #51 RT: 0.76 AV: 1 SB: 6 0.01-0.09 NL: 9.18E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



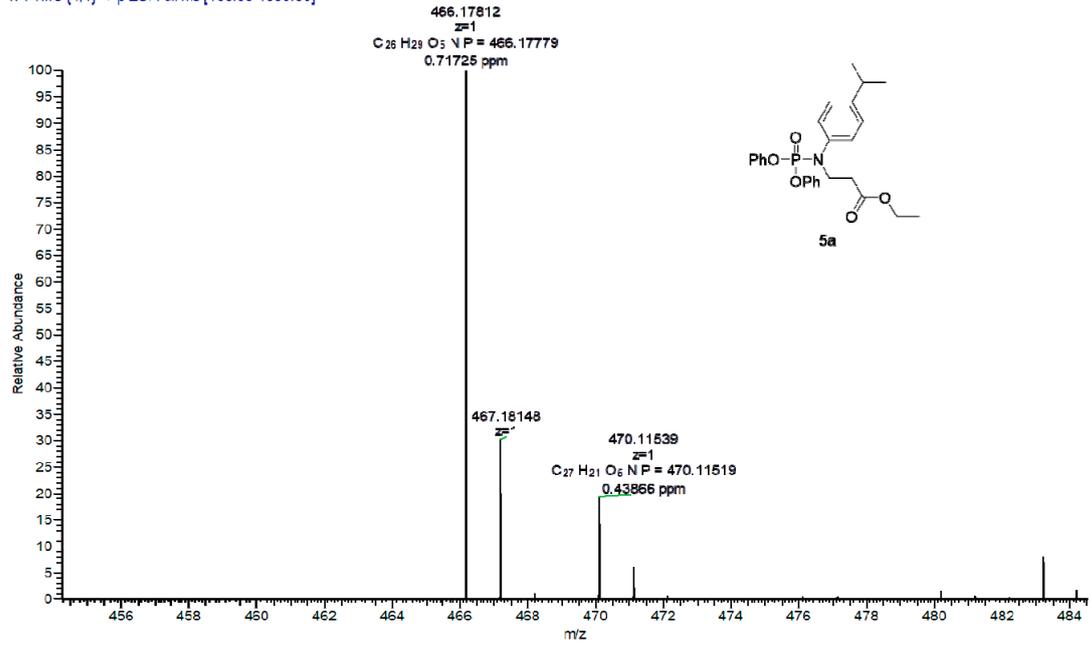
1199 #11 RT: 0.16 AV: 1 SB: 6 0.00-0.09 NL: 2.79E6
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



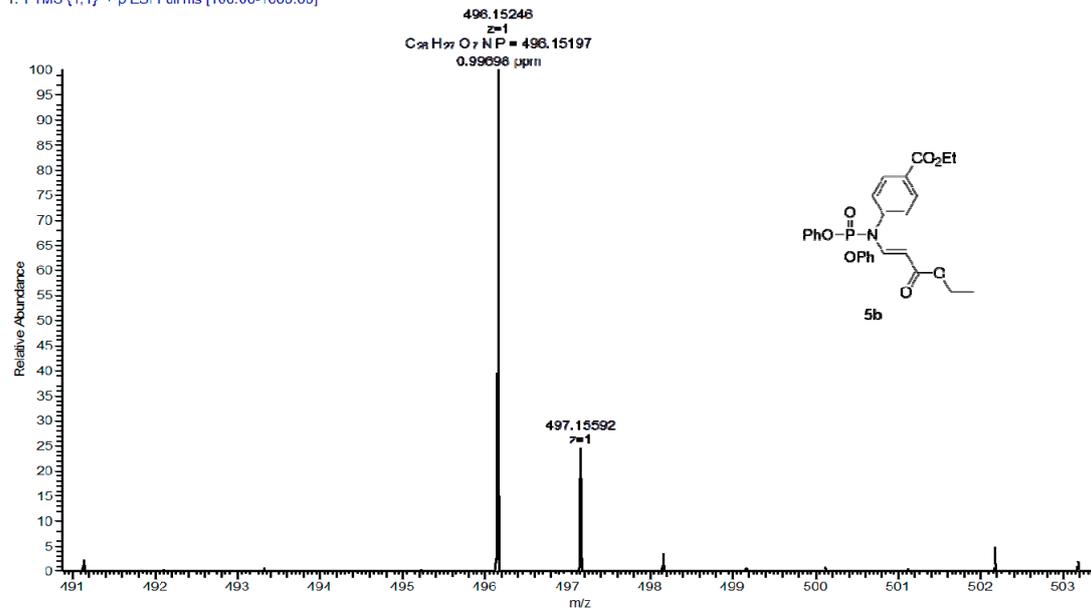
968 #21 RT: 0.20 AV: 1 SB: 6 0.01 0.09 NL: 1.21E6
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



1183 #43 RT: 0.63 AV: 1 SB: 6 0.00-0.08 NL: 1.06E6
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



1187 #13 RT: 0.20 AV: 1 SB: 6 0.01 0.09 NL: 6.76E5
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]



1205 #11 RT: 0.17 AV: 1 SB: 6 0.01-0.09 NL: 3.20E4
T: FTMS (1,1) + p ESI Full ms [100.00-1000.00]

