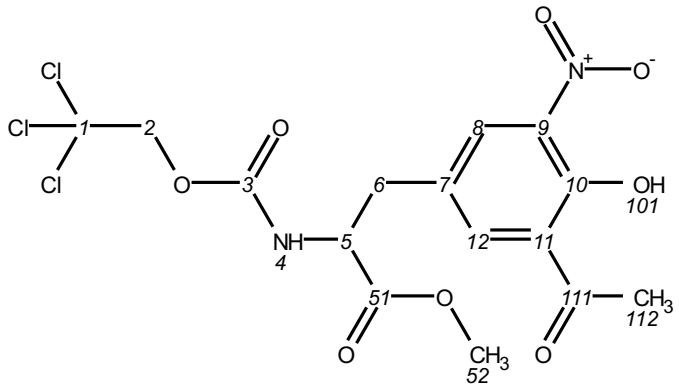
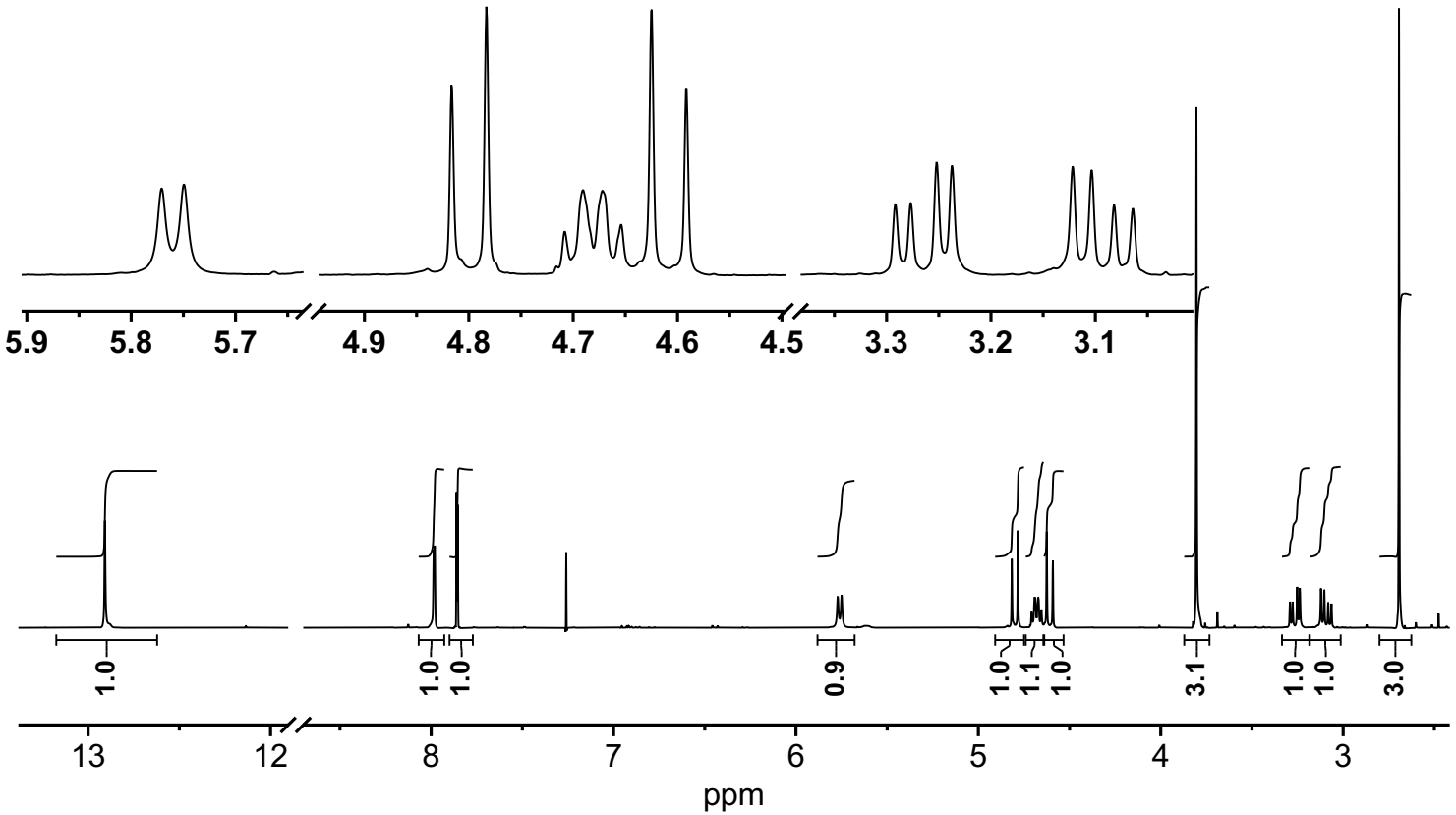
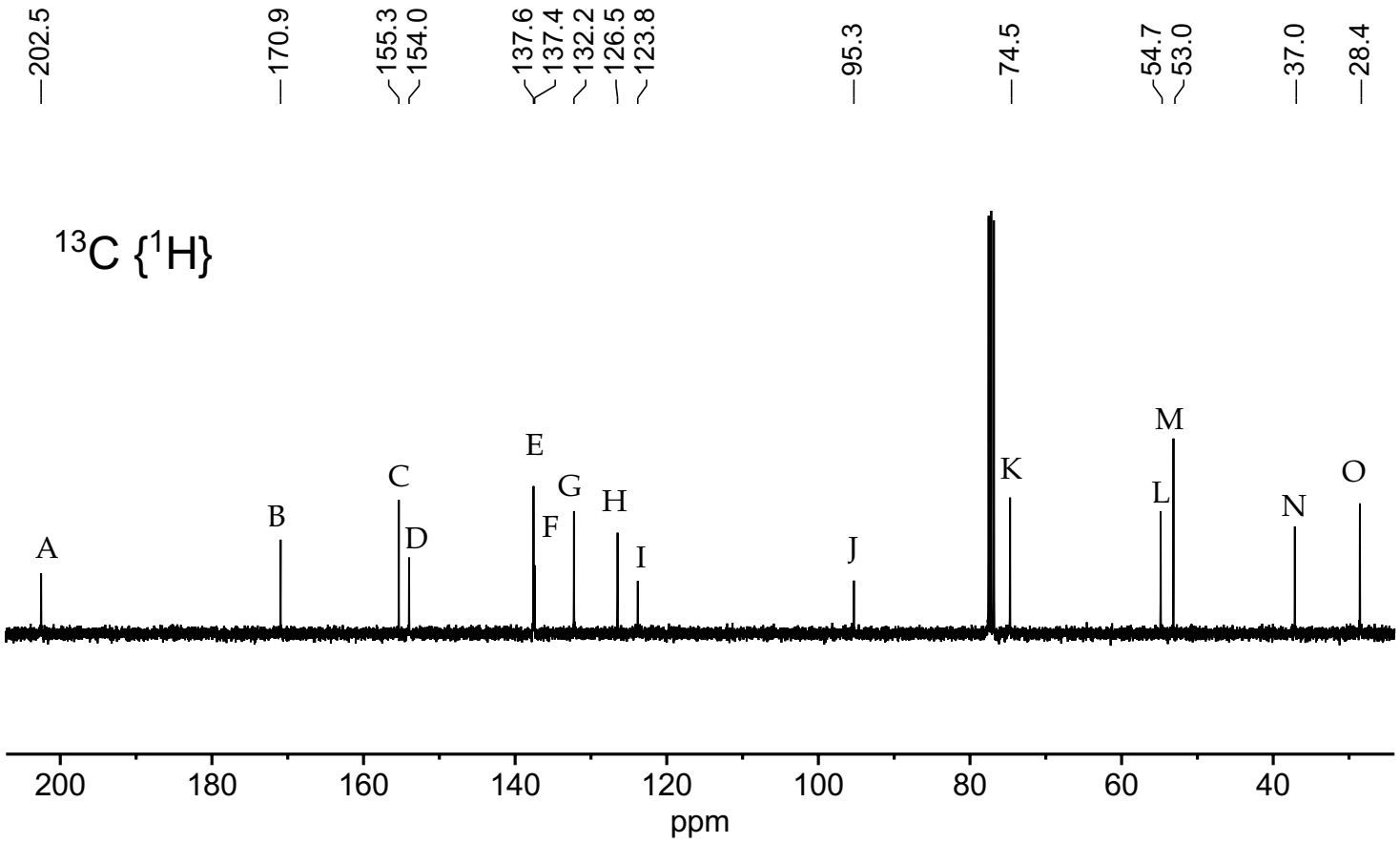
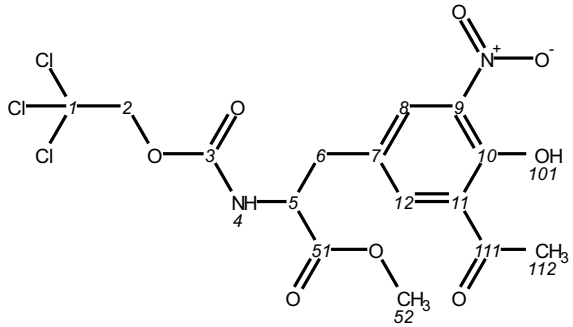
Beispiel

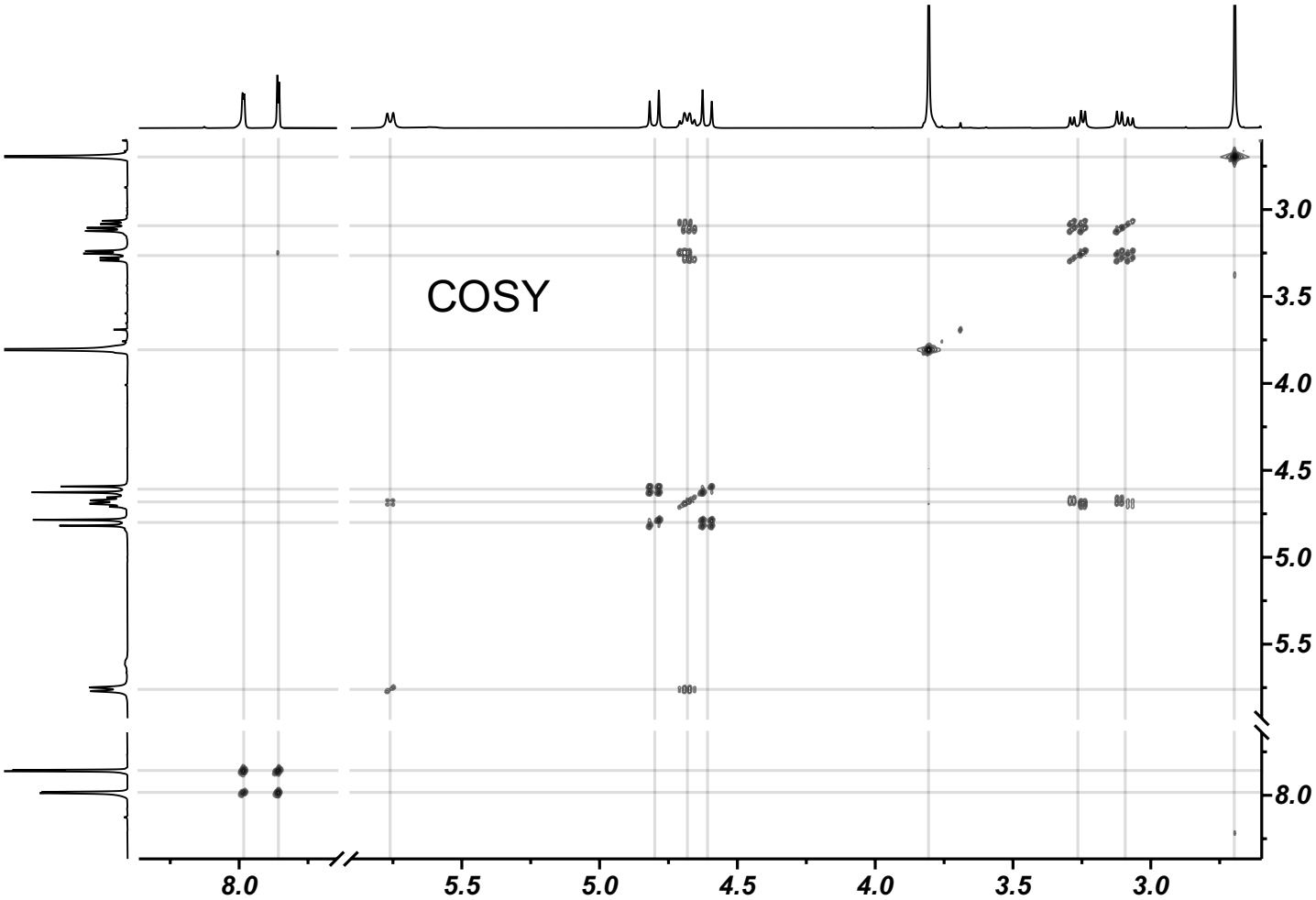
^1H in $CDCl_3$

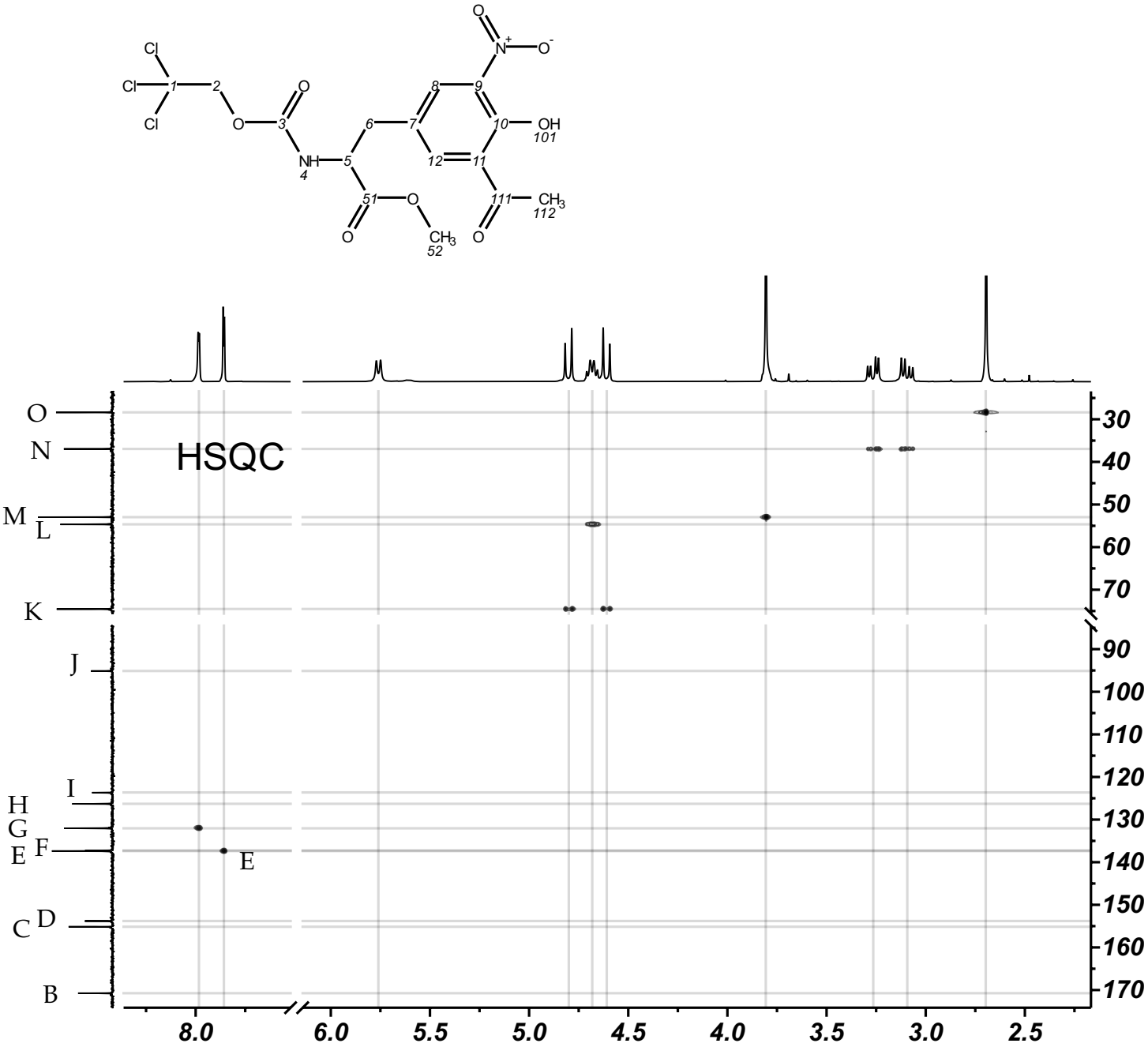


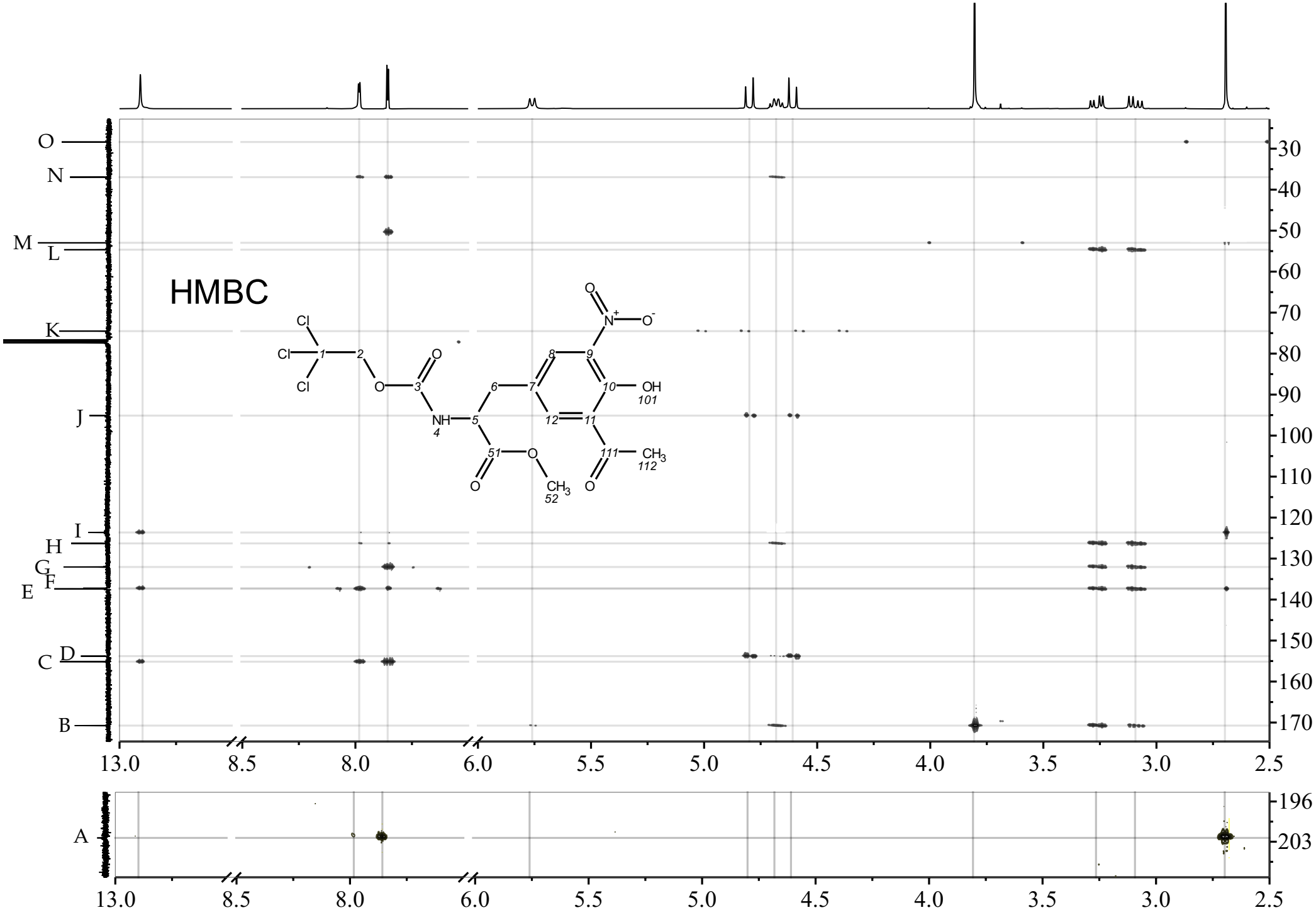



202.5
170.9
155.3
154.0
137.6
137.4
132.2
126.5
123.8
95.3
74.5
54.7
53.0
37.0
28.4
13C {1H}
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
200
180
160
140
120
100
80
60
40
ppm


Cl
Cl
Cl
1
2
O
O
3
NH
4
5
6
7
8
9
10
OH
101
12
11
51
O
O
CH3
52
111
CH3
112
O
O
N+
O-
O


COSY
3.0
3.5
4.0
4.5
5.0
5.5
8.0
8.0
5.5
5.0
4.5
4.0
3.5
3.0


HSQC
O
N
M
L
K
J
I
H
G
E
F
E
C
D
B
30
40
50
60
70
90
100
110
120
130
140
150
160
170
8.0
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5


HMBC
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
196
203
13.0
8.5
8.0
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
Cl
Cl
Cl
1
2
O
3
O
NH
4
5
6
7
8
9
10
OH
101
11
12
51
O
O
CH3
52
111
CH3
112
O
O
N+
O-