FIG. 1

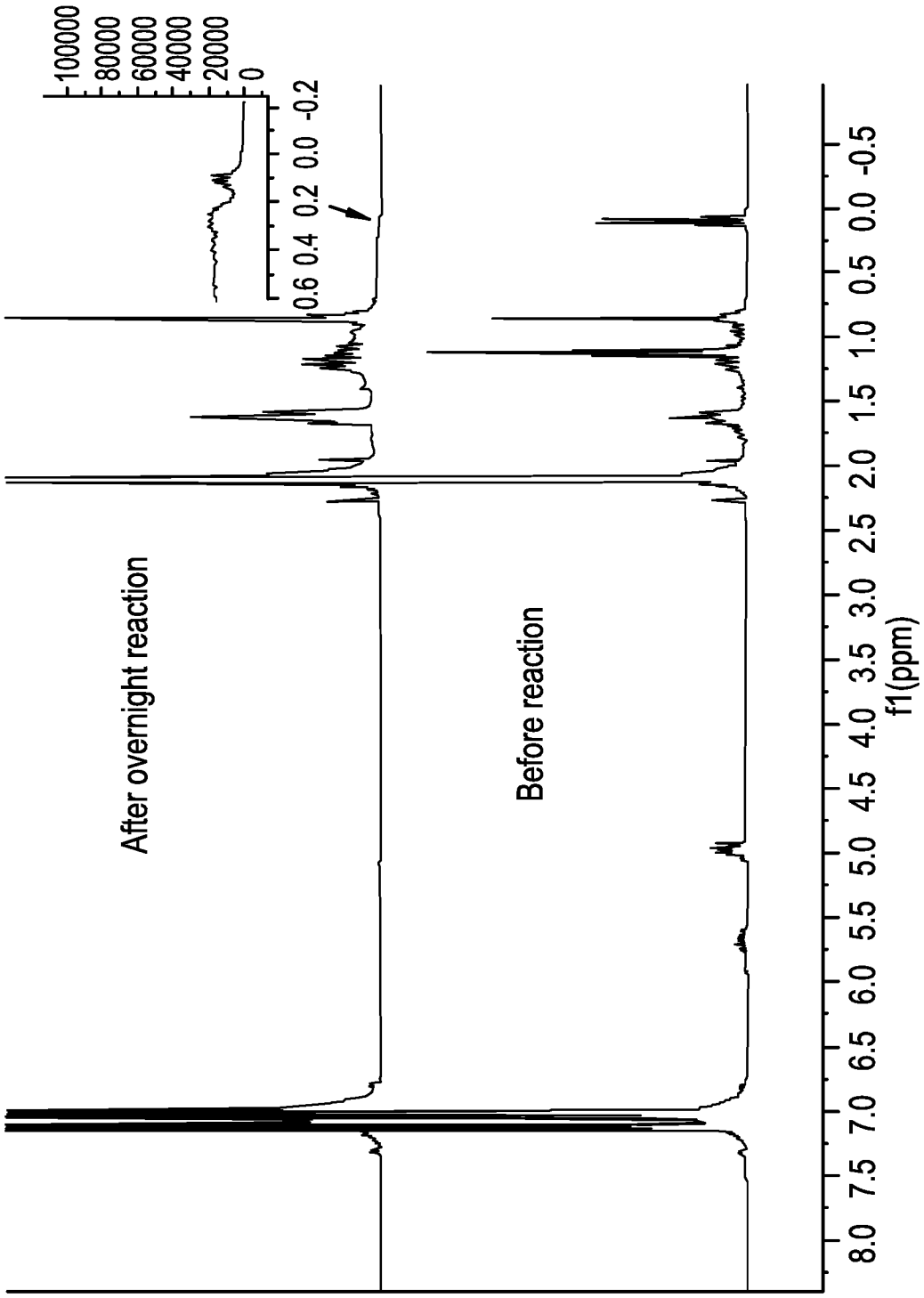
After overnight reaction
Before reaction
f1(ppm)
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
100000
80000
60000
40000
20000
0
0.6 0.4 0.2 0.0 -0.2

FIG. 2

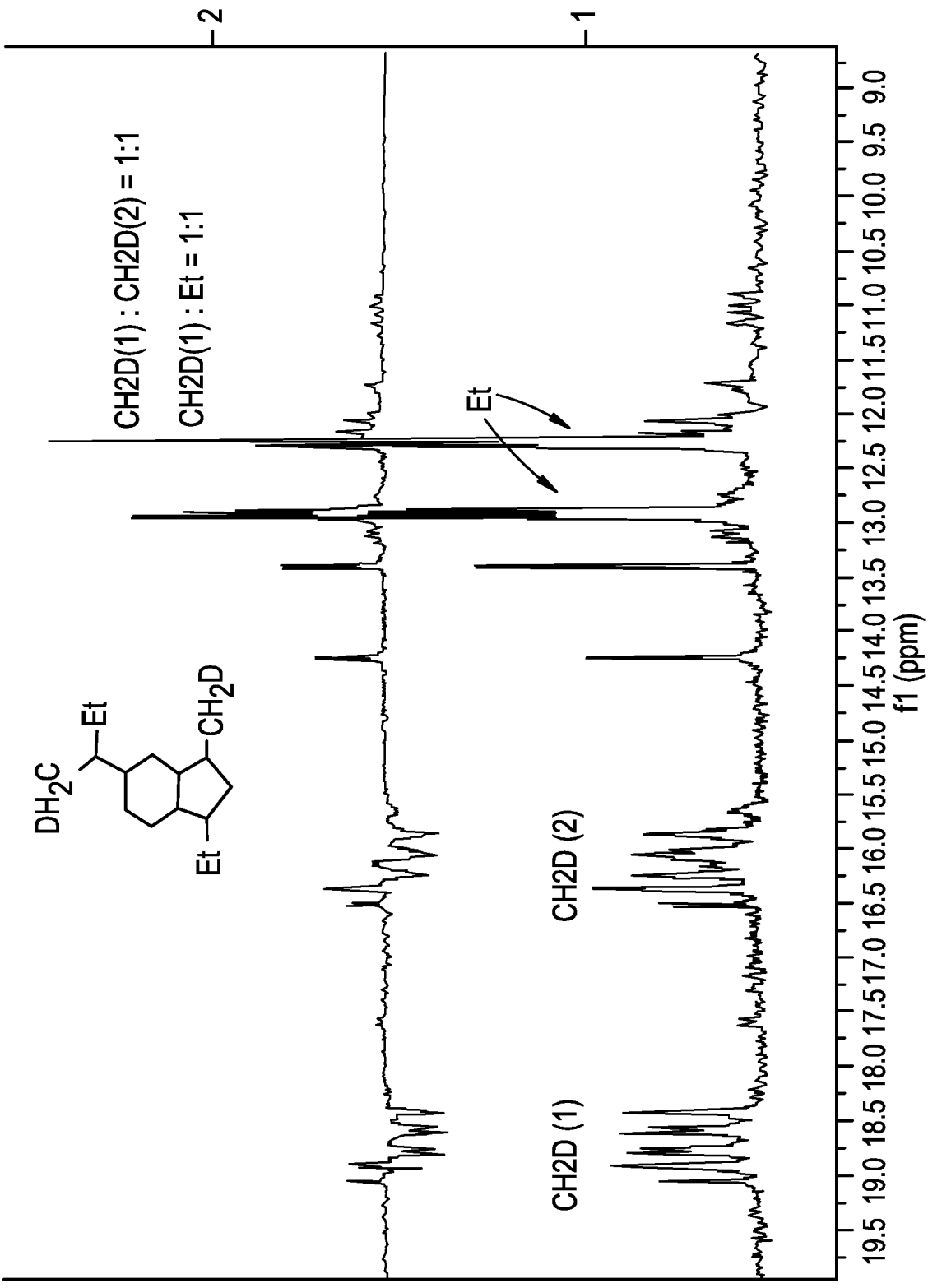
CH2D(1) : CH2D(2) = 1:1
CH2D(1) : Et = 1:1
Et
CH2D (2)
CH2D (1)
DH2C
Et
CH2D
Et
2
1
19.5 19.0 18.5 18.0 17.5 17.0 16.5 16.0 15.5 15.0 14.5 14.0 13.5 13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0
f1 (ppm)

FIG. 3A

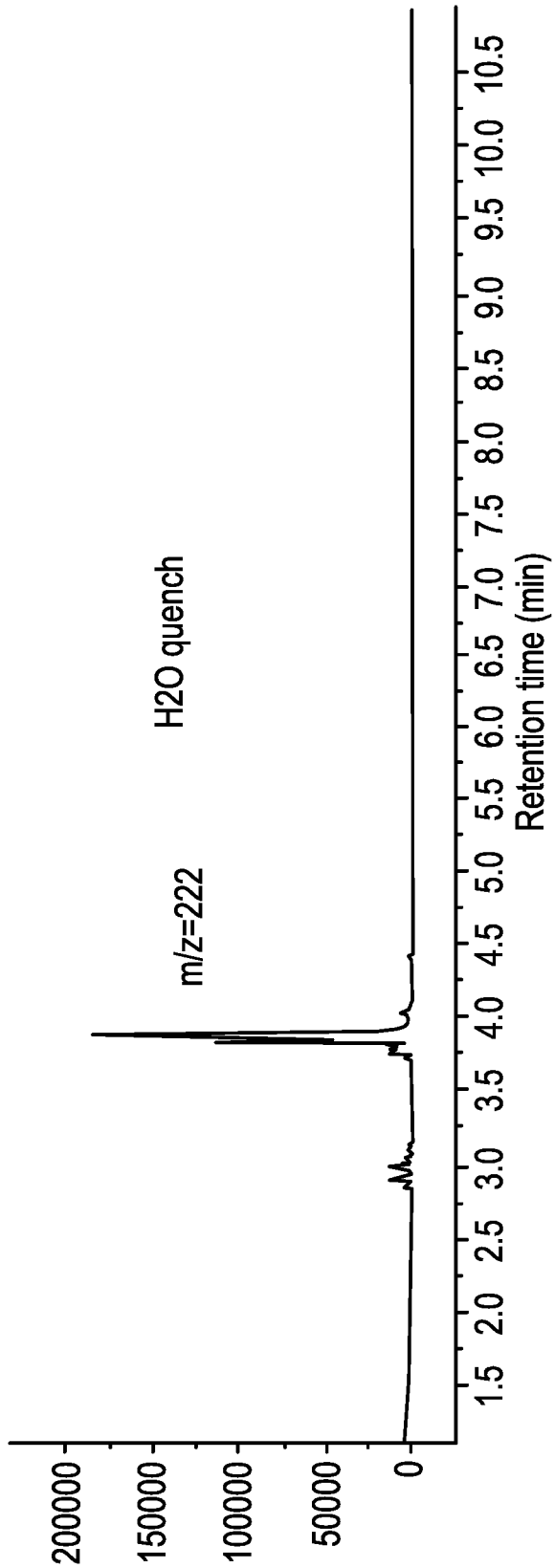
m/z=222
H2O quench
200000
150000
100000
50000
0
1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5
Retention time (min)

FIG. 3B


D2O quench
m/z=224
140000
120000
100000
80000
60000
40000
20000
0
1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 1.5
Retention time (min)

FIG. 4

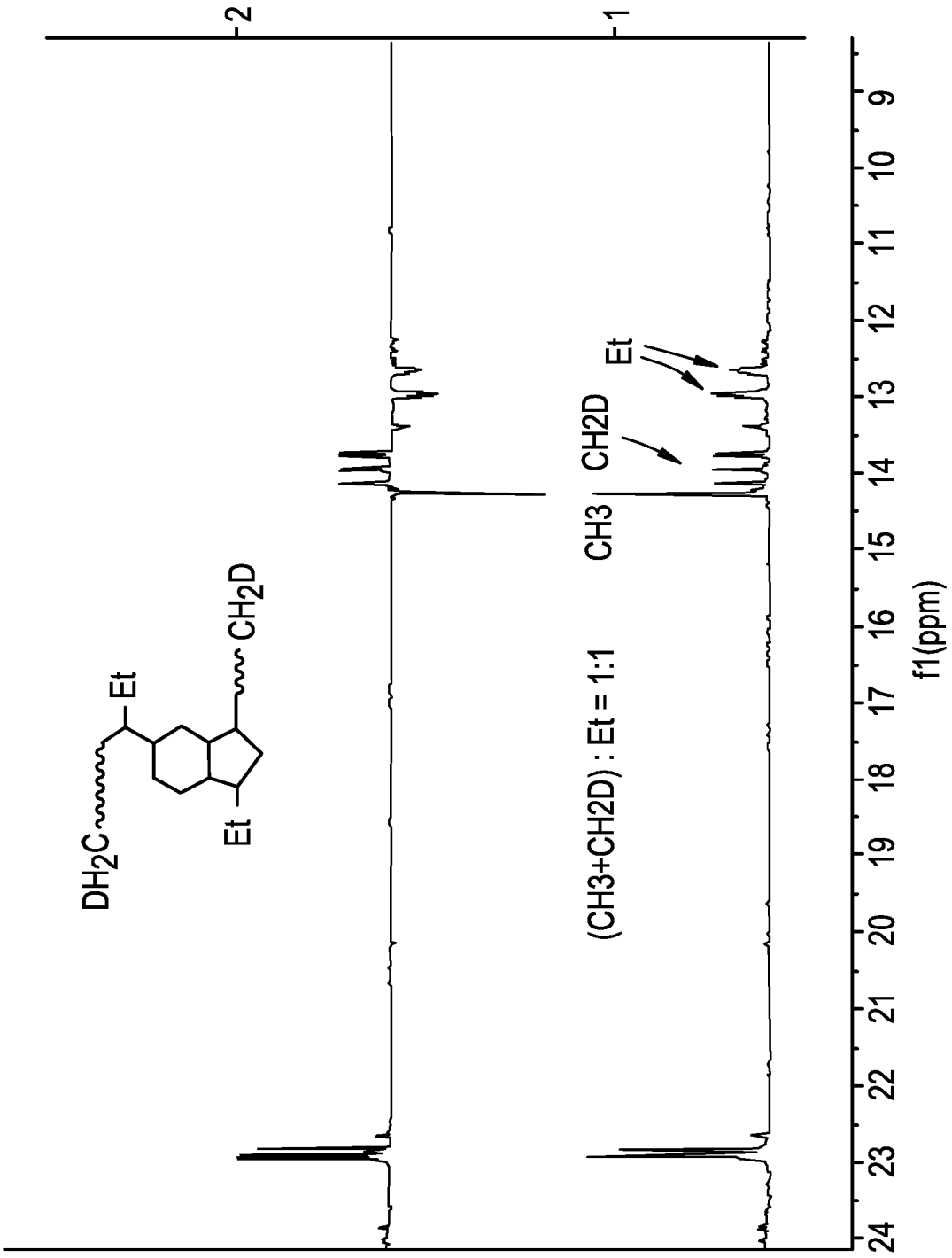
2
1
DH2C
Et
Et
CH2D
(CH3+CH2D) : Et = 1:1
CH3
CH2D
Et
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
f1(ppm)

FIG. 5

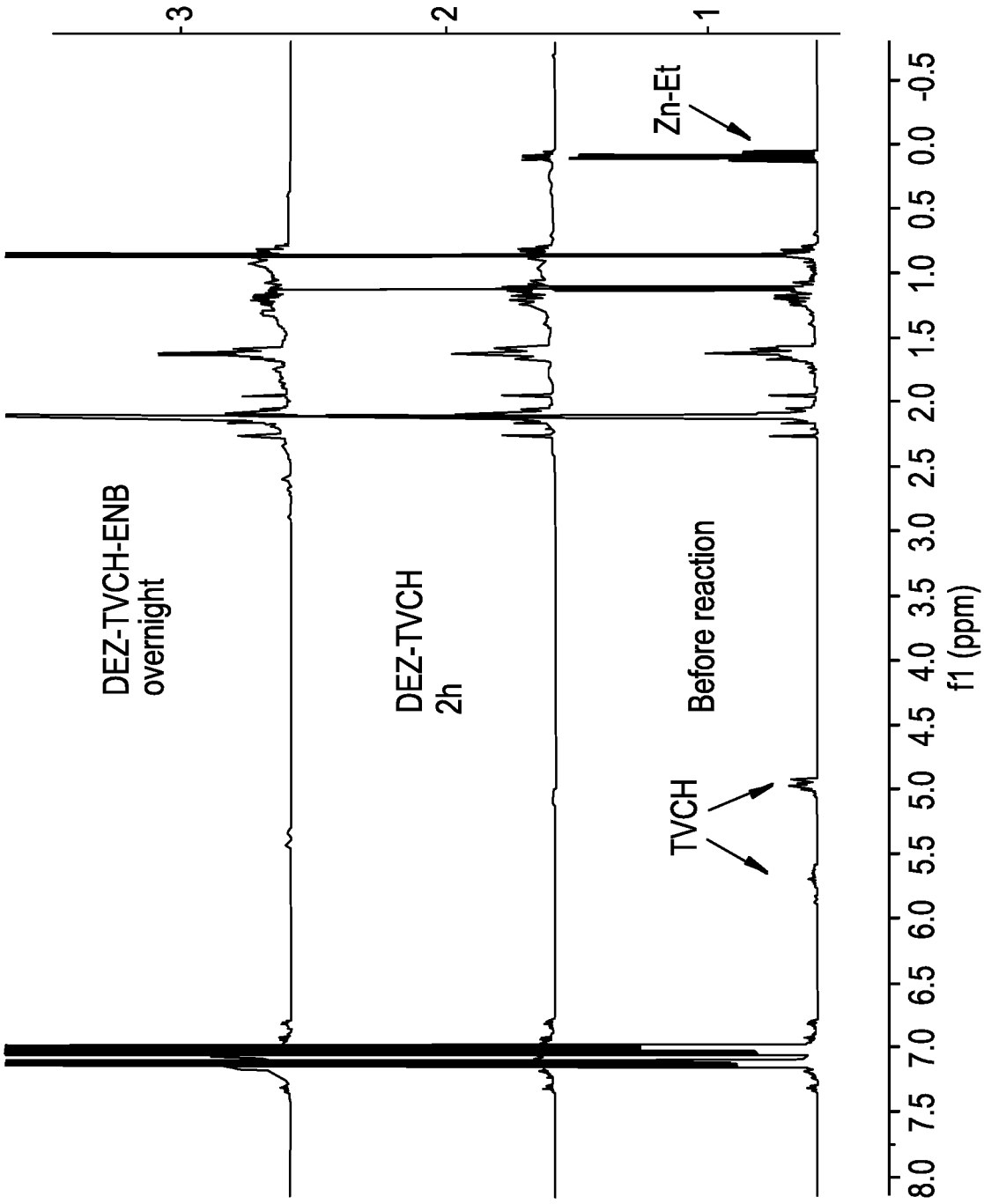
DEZ-TVCH-ENB
overnight
DEZ-TVCH
2h
Before reaction
TVCH
Zn-Et
3
2
1
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)

FIG. 6

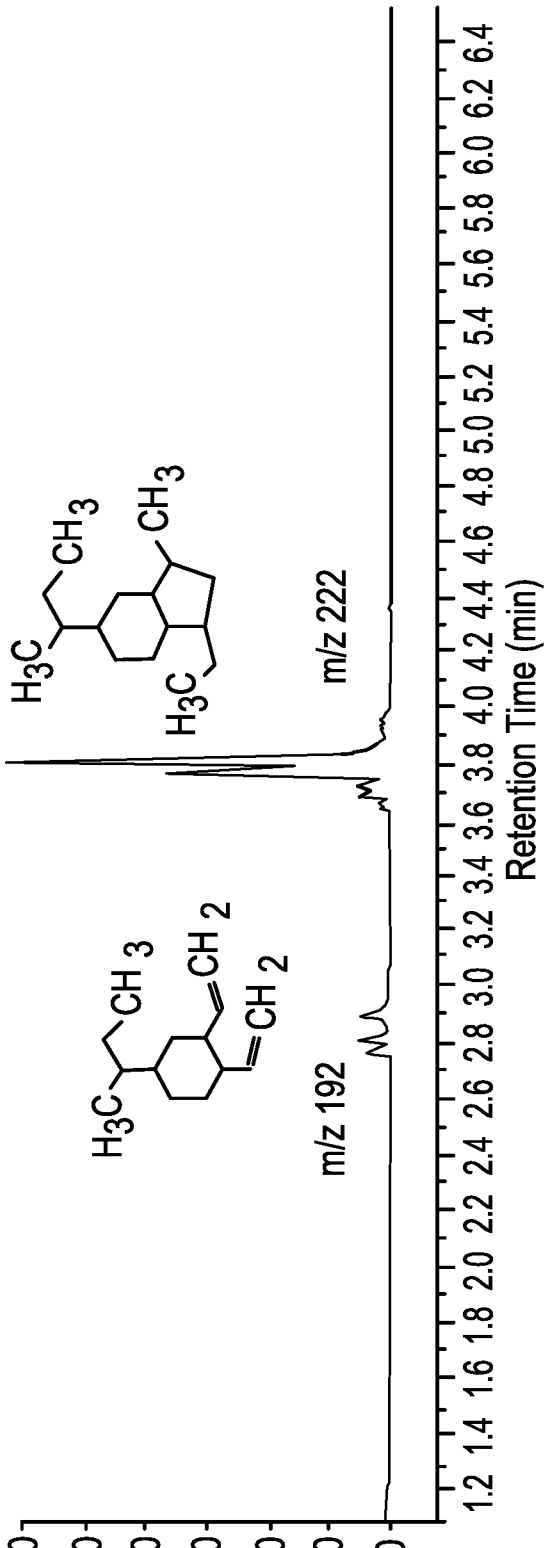
300000
250000
200000
150000
100000
5000
0
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4
Retention Time (min)
m/z 192
m/z 222
H3C
CH3
CH2
CH2
CH3
H3C
CH3
H3C

FIG. 7

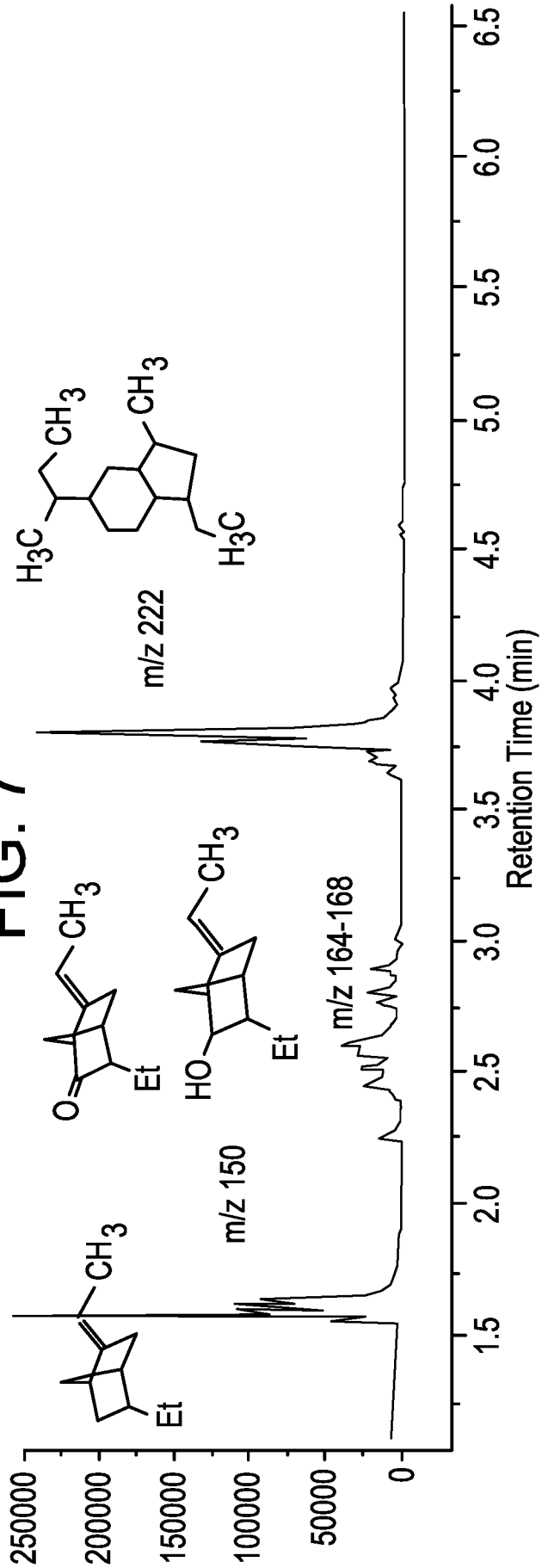
250000
200000
150000
100000
50000
0
1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5
Retention Time (min)
m/z 150
m/z 164-168
m/z 222
Et
CH3
O
Et
HO
CH3
Et
H3C
CH3
CH3
H3C

FIG. 8

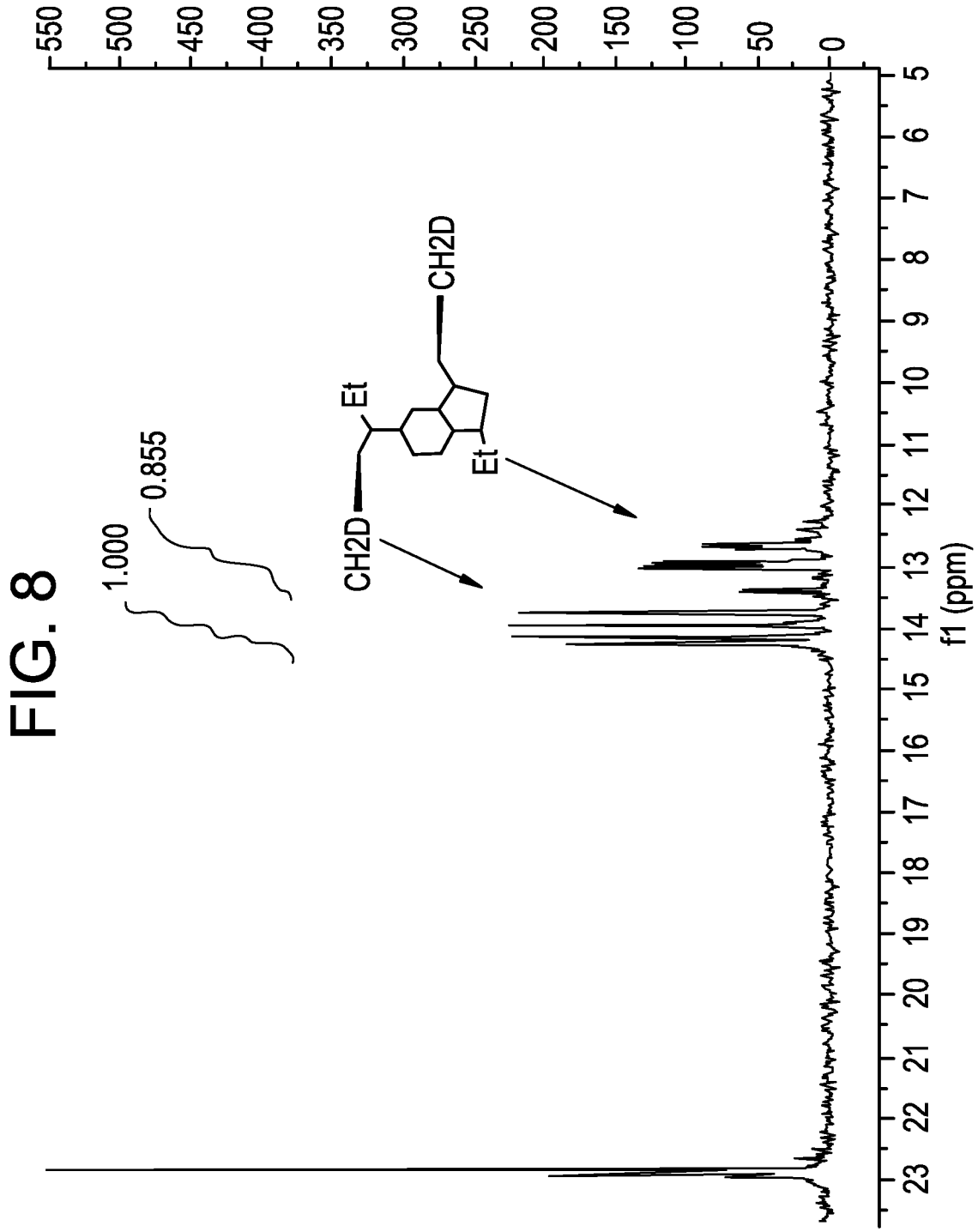

FIG. 9

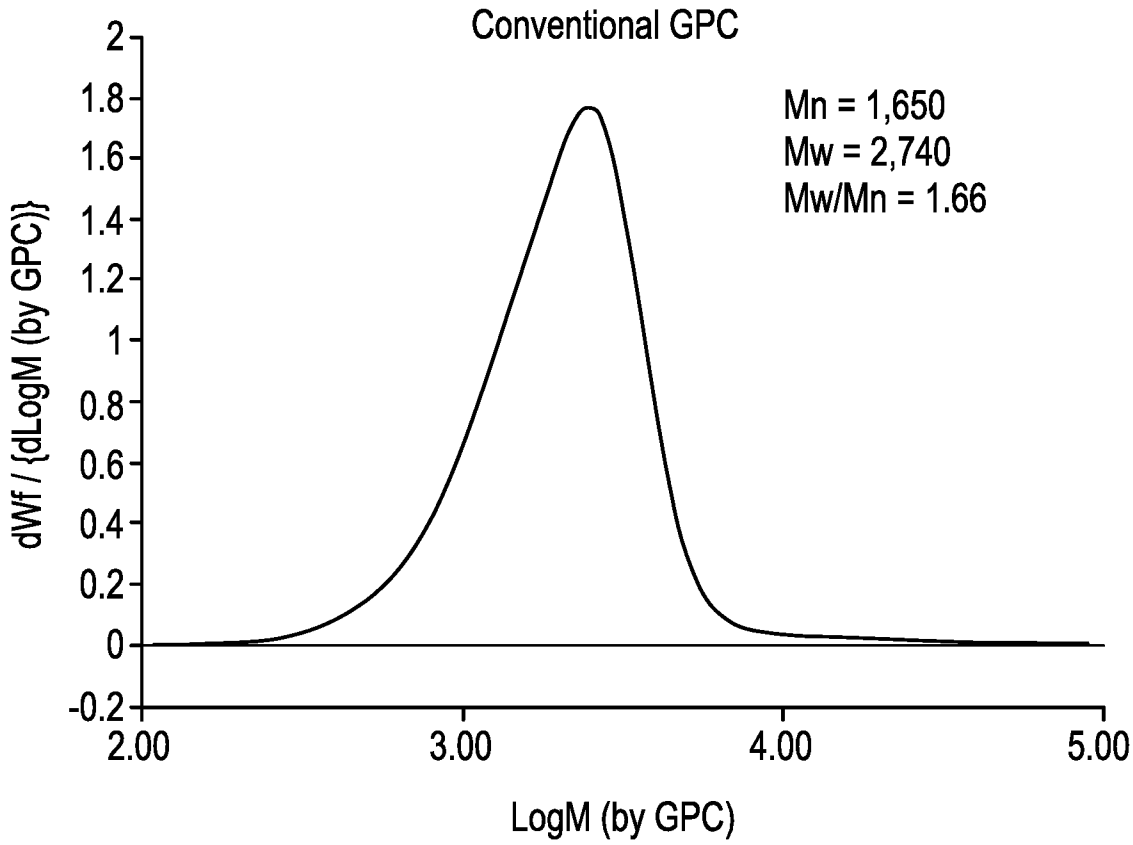
Conventional GPC
Mn = 1,650
Mw = 2,740
Mw/Mn = 1.66
dWf / {dLogM (by GPC)}
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
2.00
3.00
4.00
5.00
LogM (by GPC)

FIG. 10

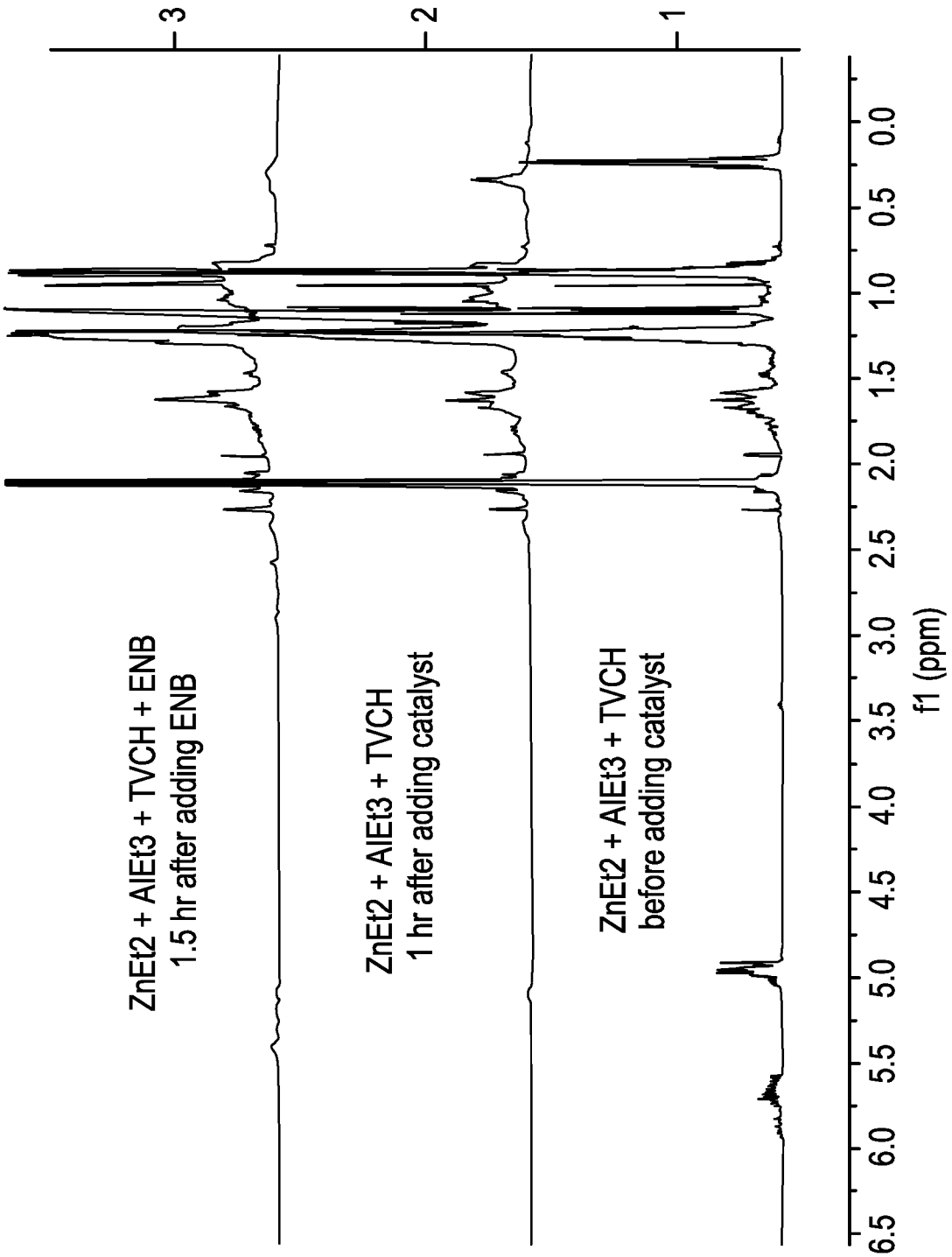
ZnEt2 + AlEt3 + TVCH + ENB
1.5 hr after adding ENB
ZnEt2 + AlEt3 + TVCH
1 hr after adding catalyst
ZnEt2 + AlEt3 + TVCH
before adding catalyst
3
2
1
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

FIG. 11

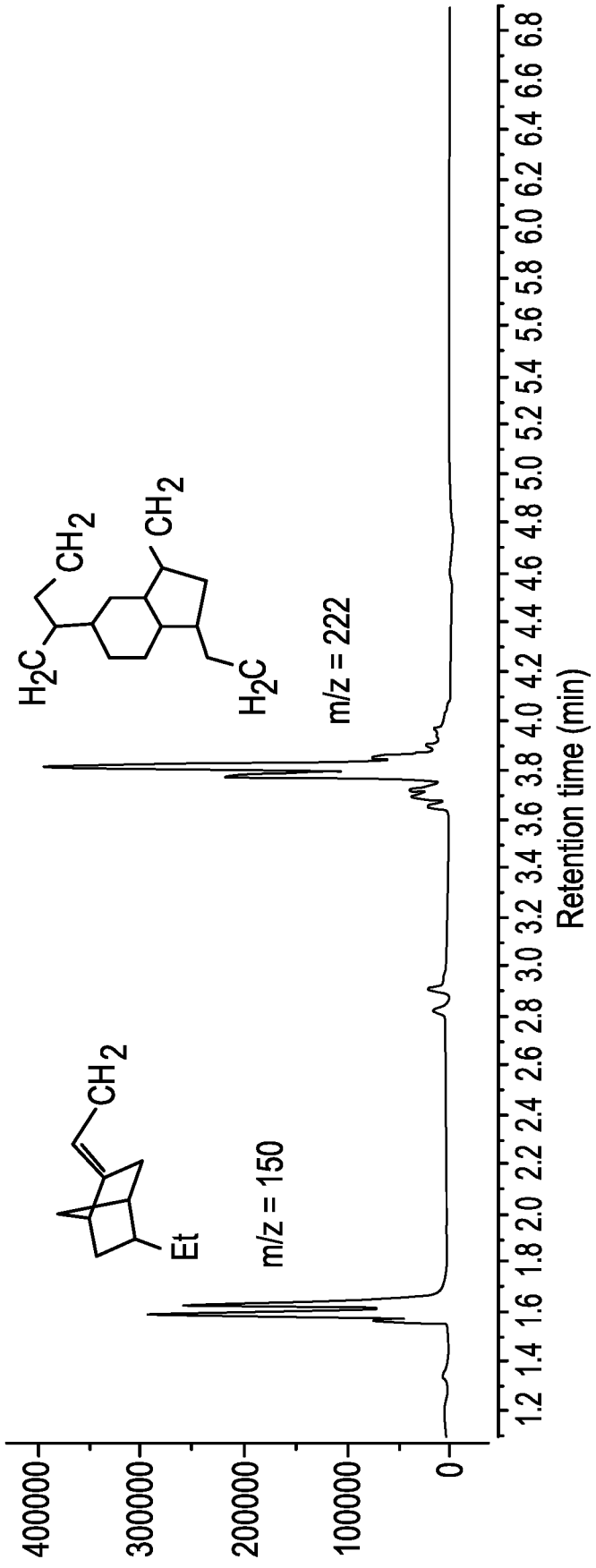
400000
300000
200000
100000
0
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8
Retention time (min)
m/z = 150
m/z = 222
Et
CH2
H2C
CH2
CH2
H2C

FIG. 12

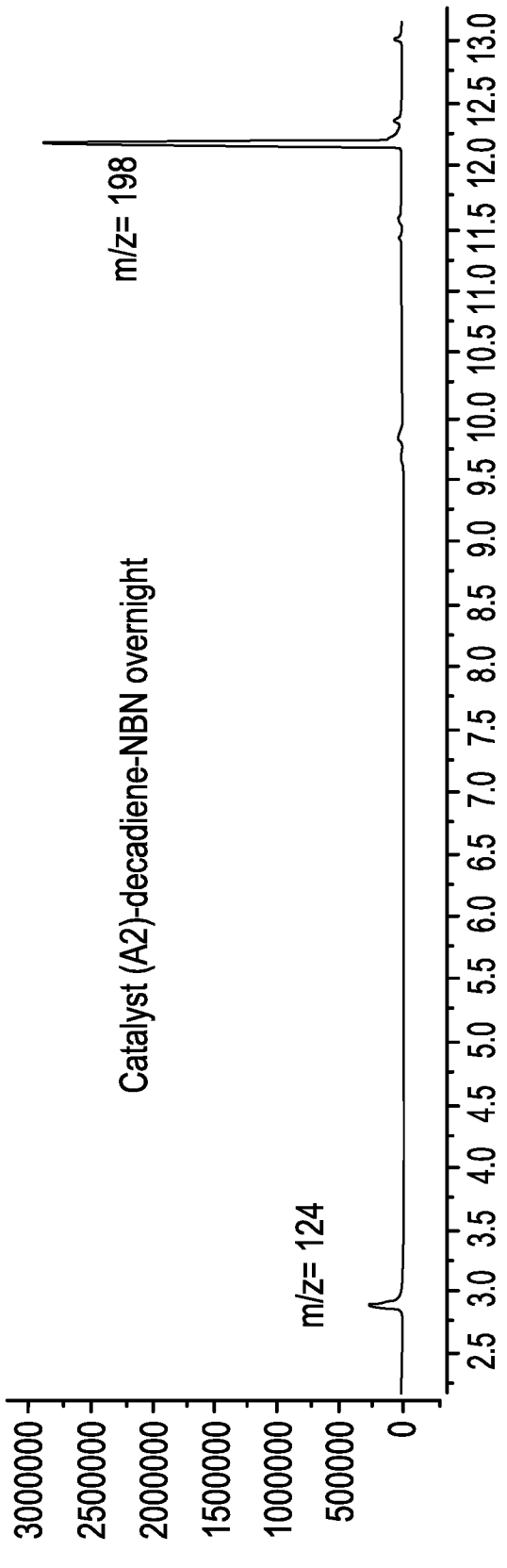
m/z= 198
Catalyst (A2)-decadiene-NBN overnight
m/z= 124
70.100
Retention time (min)
3000000
2500000
2000000
1500000
1000000
500000
0
2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0

FIG. 13

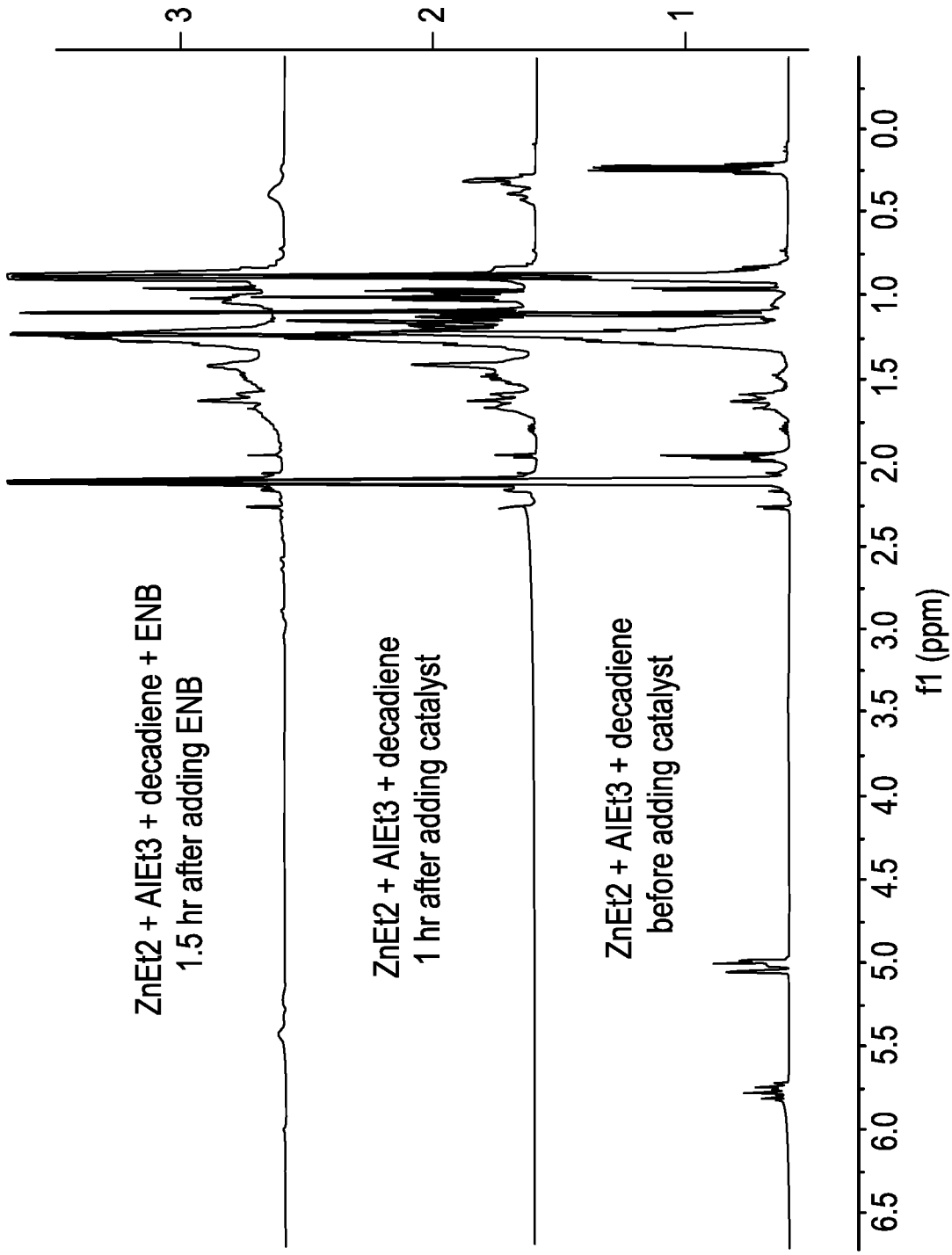
ZnEt2 + AlEt3 + decadiene + ENB
1.5 hr after adding ENB
ZnEt2 + AlEt3 + decadiene
1 hr after adding catalyst
ZnEt2 + AlEt3 + decadiene
before adding catalyst
3
2
1
6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)

FIG. 14

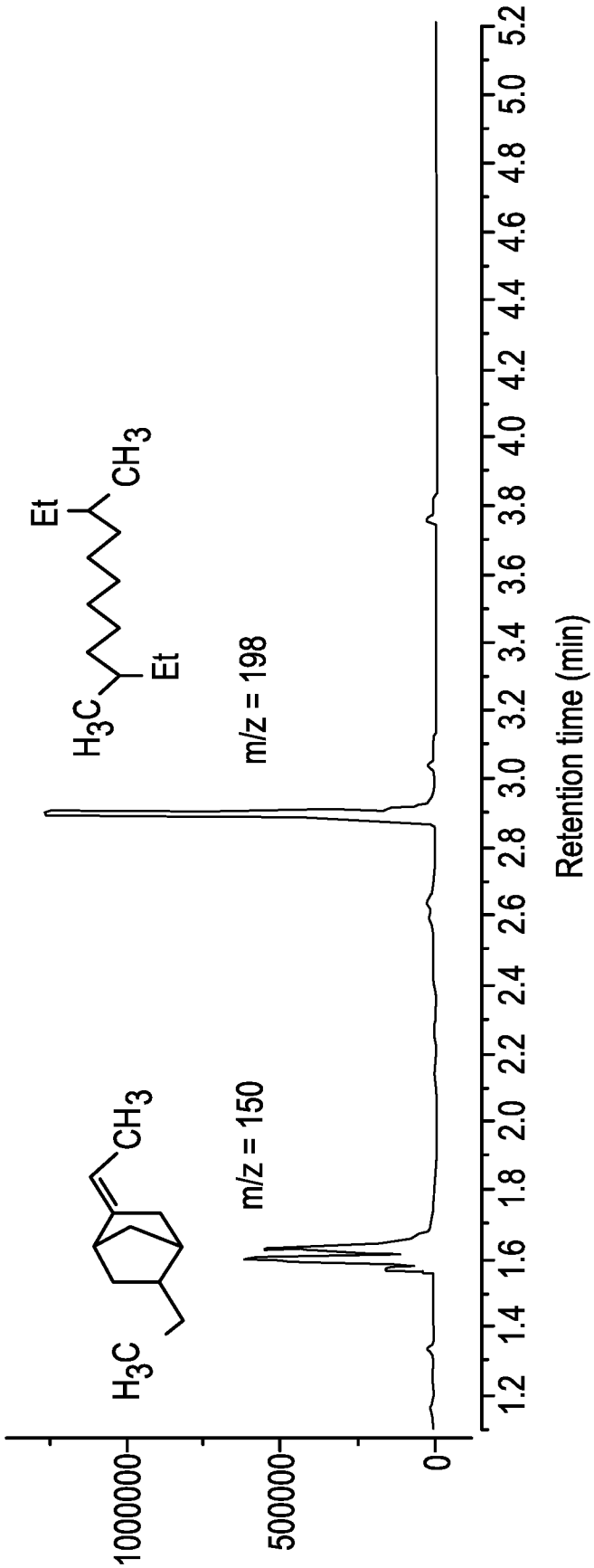
1000000
500000
0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
3.2
3.4
3.6
3.8
4.0
4.2
4.4
4.6
4.8
5.0
5.2
Retention time (min)
m/z = 150
m/z = 198
H3C
CH3
Et
Et
H3C
CH3

FIG. 15

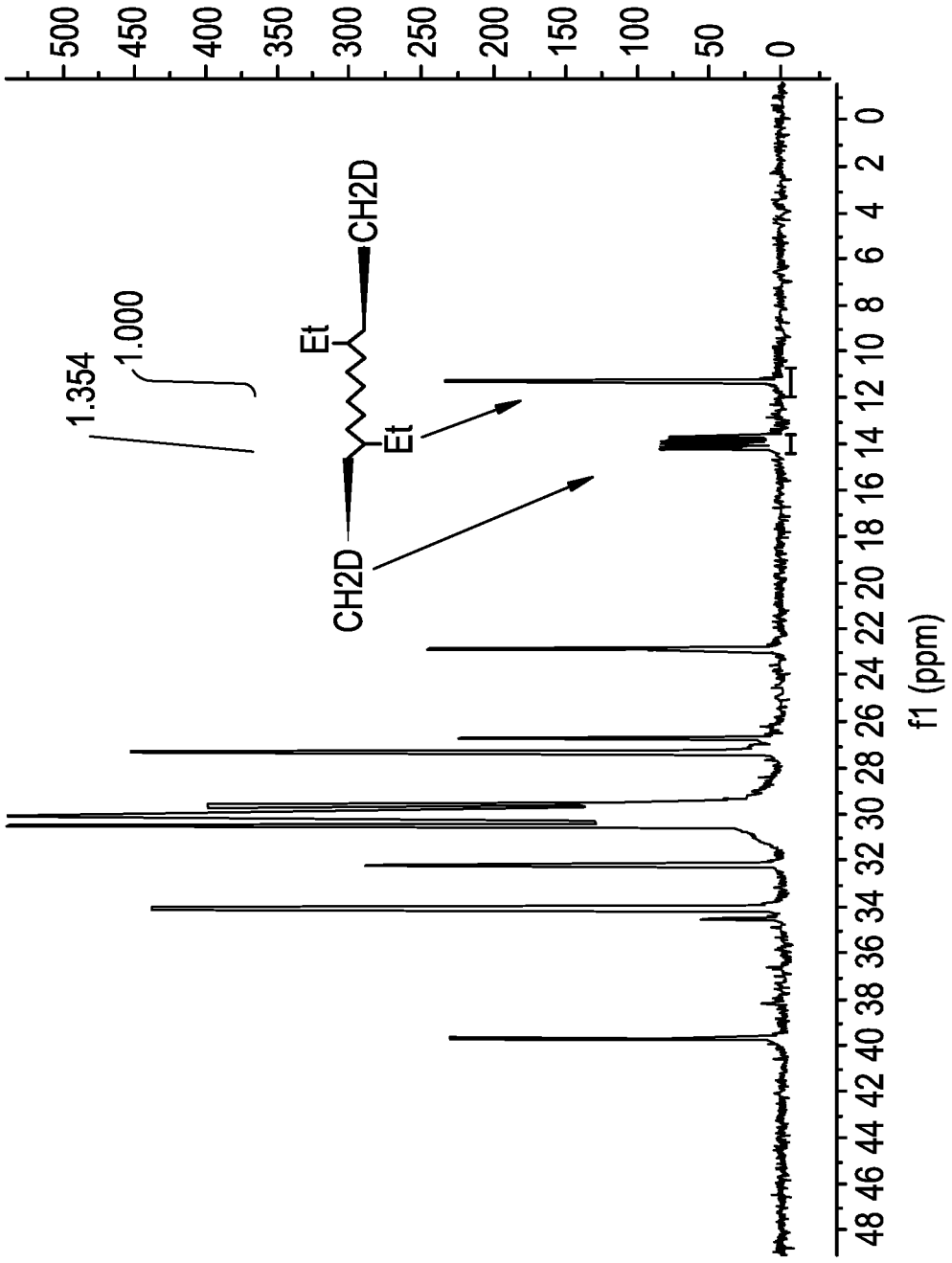

FIG. 16

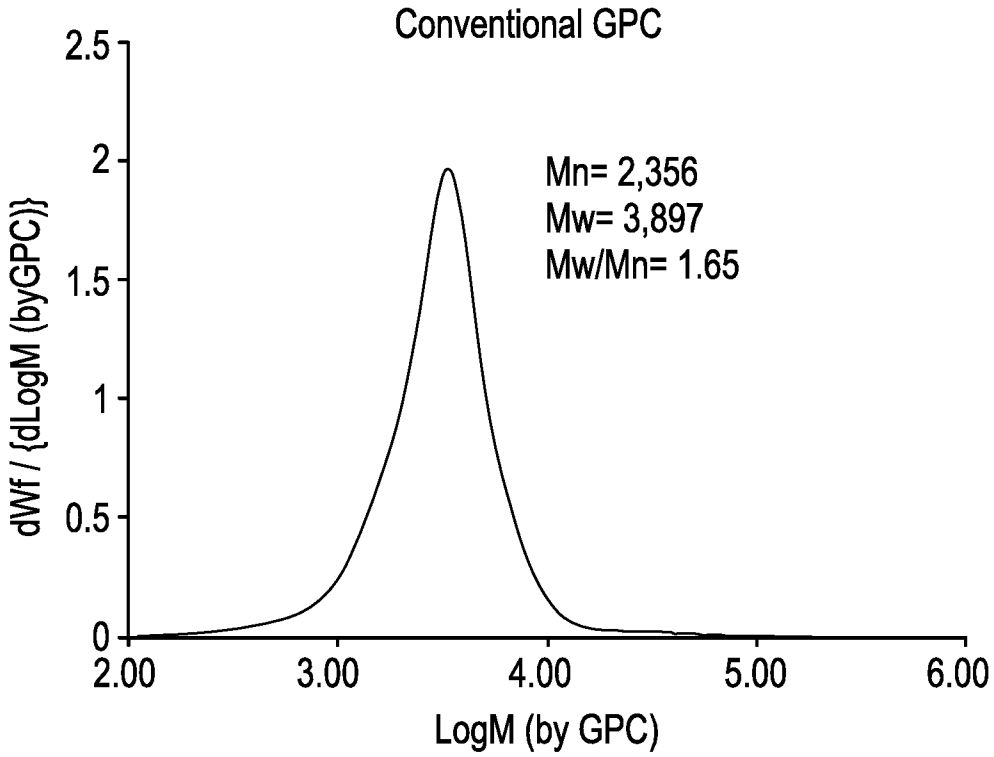
Conventional GPC
Mn= 2,356
Mw= 3,897
Mw/Mn= 1.65
dWf / {dLogM (byGPC)}
LogM (by GPC)
2.5
2
1.5
1
0.5
0
2.00
3.00
4.00
5.00
6.00

FIG. 17

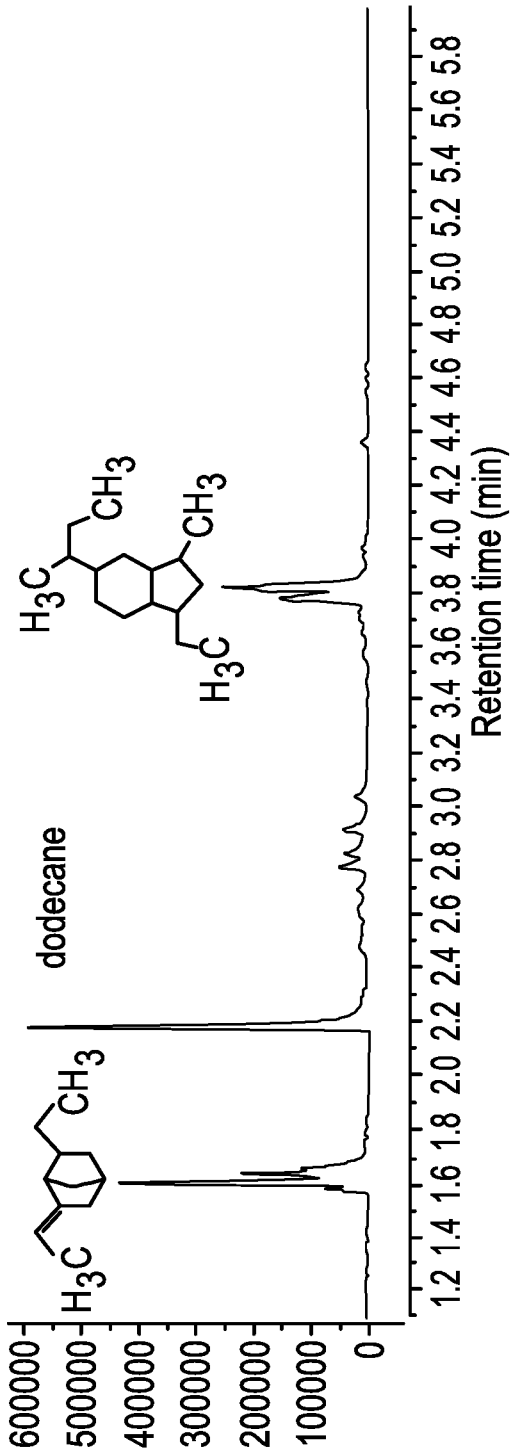
dodecane
H3C
CH3
H3C
CH3
CH3
600000
500000
400000
300000
200000
100000
0
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8
Retention time (min)

FIG. 18

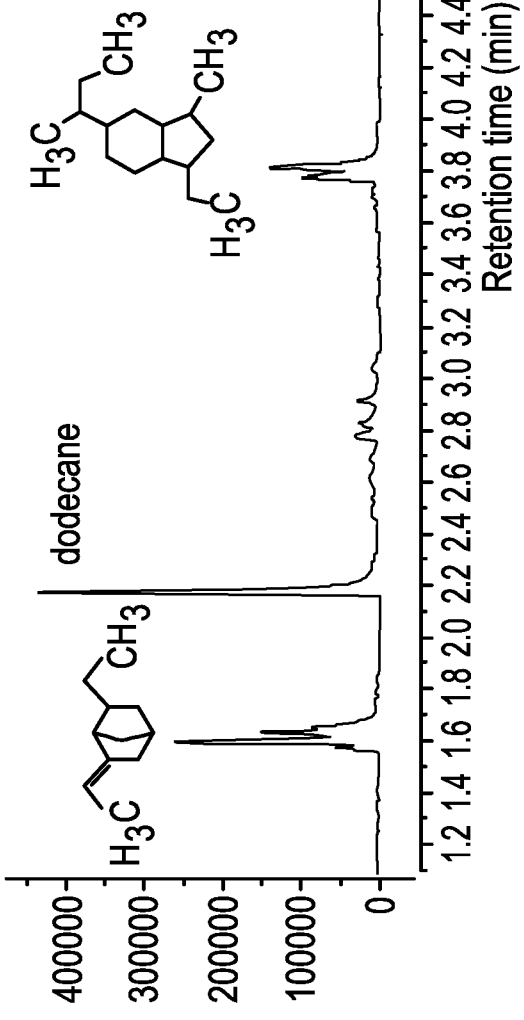
dodecane
H3C
CH3
H3C
CH3
CH3
400000
300000
200000
100000
0
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0
Retention time (min)

FIG. 19

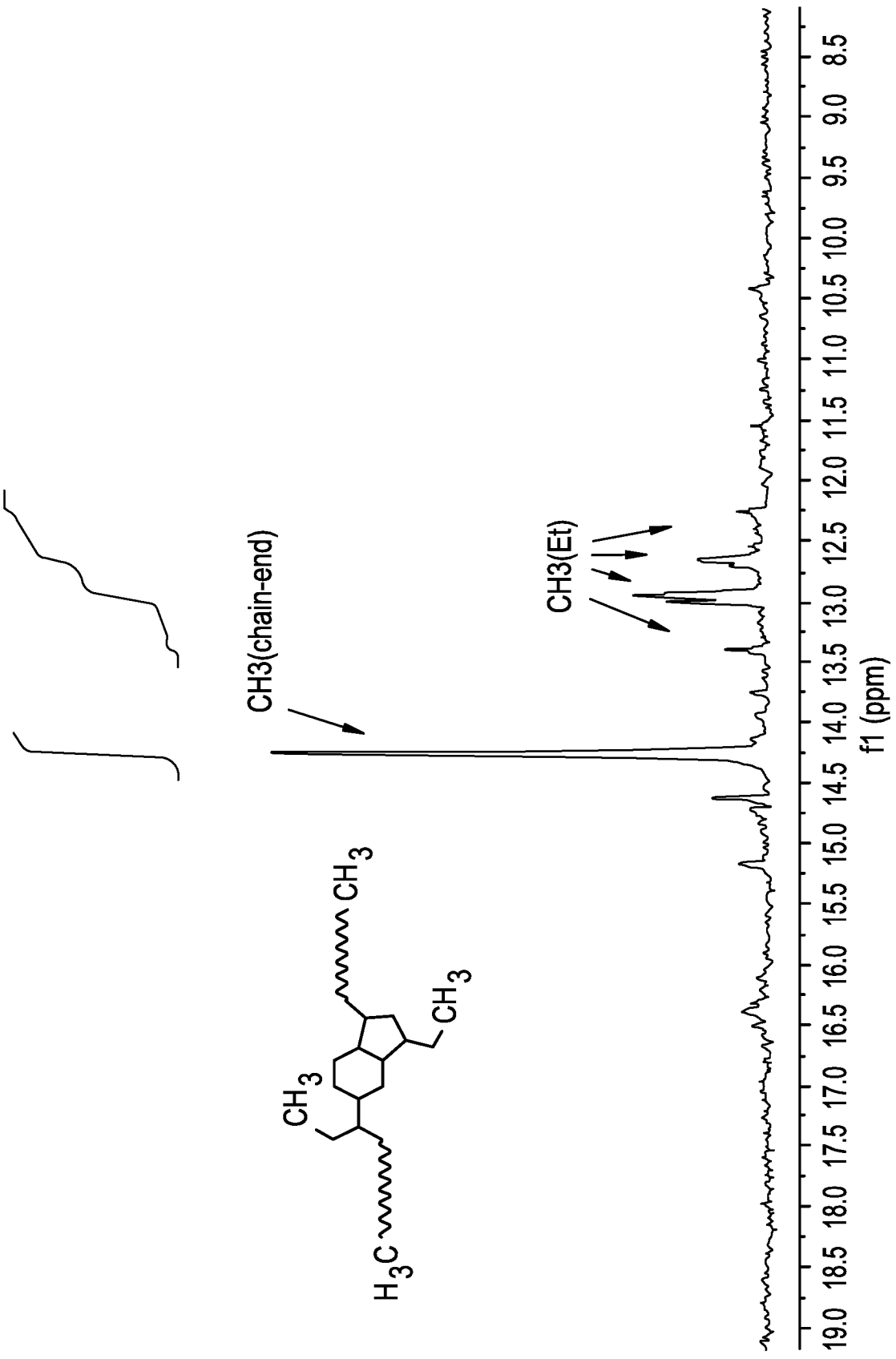
CH3(chain-end)
CH3(Et)
CH3
CH3
CH3
H3C
19.0 18.5 18.0 17.5 17.0 16.5 16.0 15.5 15.0 14.5 14.0 13.5 13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5
f1 (ppm)

FIG. 20

TGIG Curves

