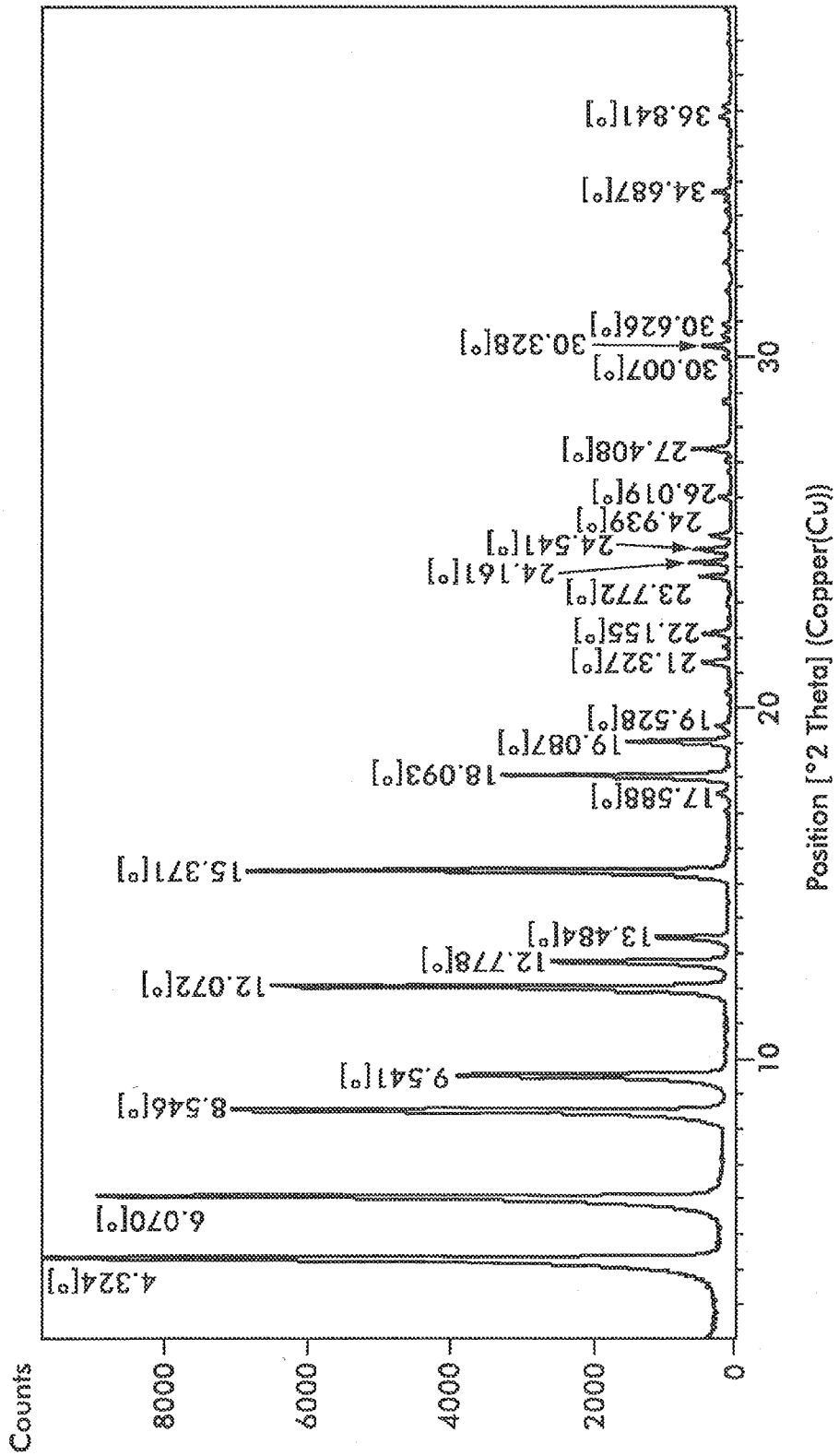

Counts
8000
6000
4000
2000
0
4.324[°]
6.070[°]
8.546[°]
9.541[°]
12.072[°]
12.778[°]
13.484[°]
15.371[°]
17.588[°]
18.093[°]
19.087[°]
19.528[°]
21.327[°]
22.155[°]
23.772[°]
24.161[°]
24.541[°]
24.939[°]
26.019[°]
27.408[°]
30.007[°]
30.328[°]
30.626[°]
34.687[°]
36.841[°]
10
20
30
Position [°2 Theta] (Copper(Cu))

FIG. 1

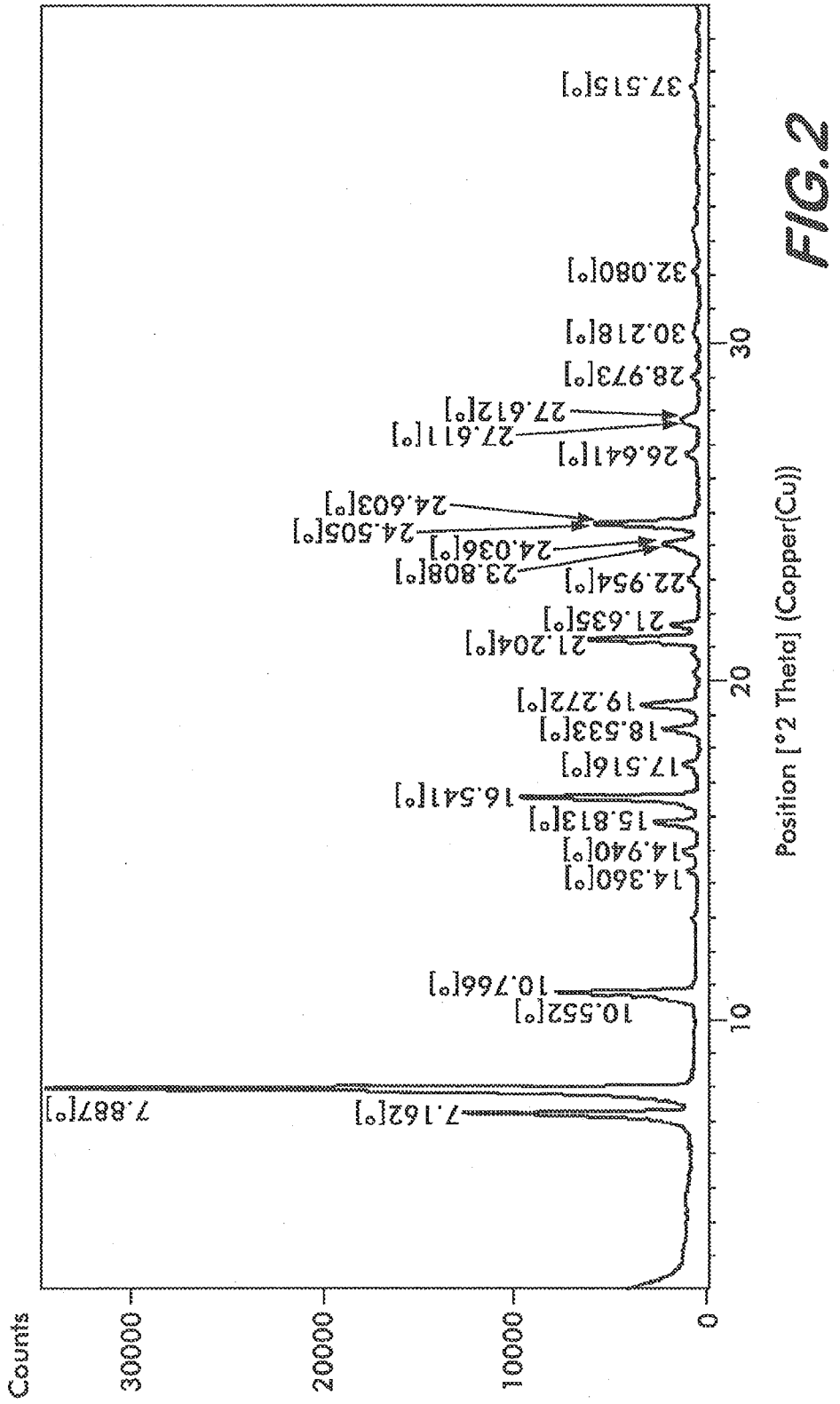

Counts
30000
20000
10000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
7.887[°]
7.162[°]
10.552[°]
10.766[°]
14.360[°]
14.940[°]
15.813[°]
16.541[°]
17.516[°]
18.533[°]
19.272[°]
21.204[°]
21.635[°]
22.954[°]
23.808[°]
24.036[°]
24.505[°]
24.603[°]
26.641[°]
27.611[°]
27.612[°]
28.973[°]
30.218[°]
32.080[°]
37.515[°]

FIG. 2

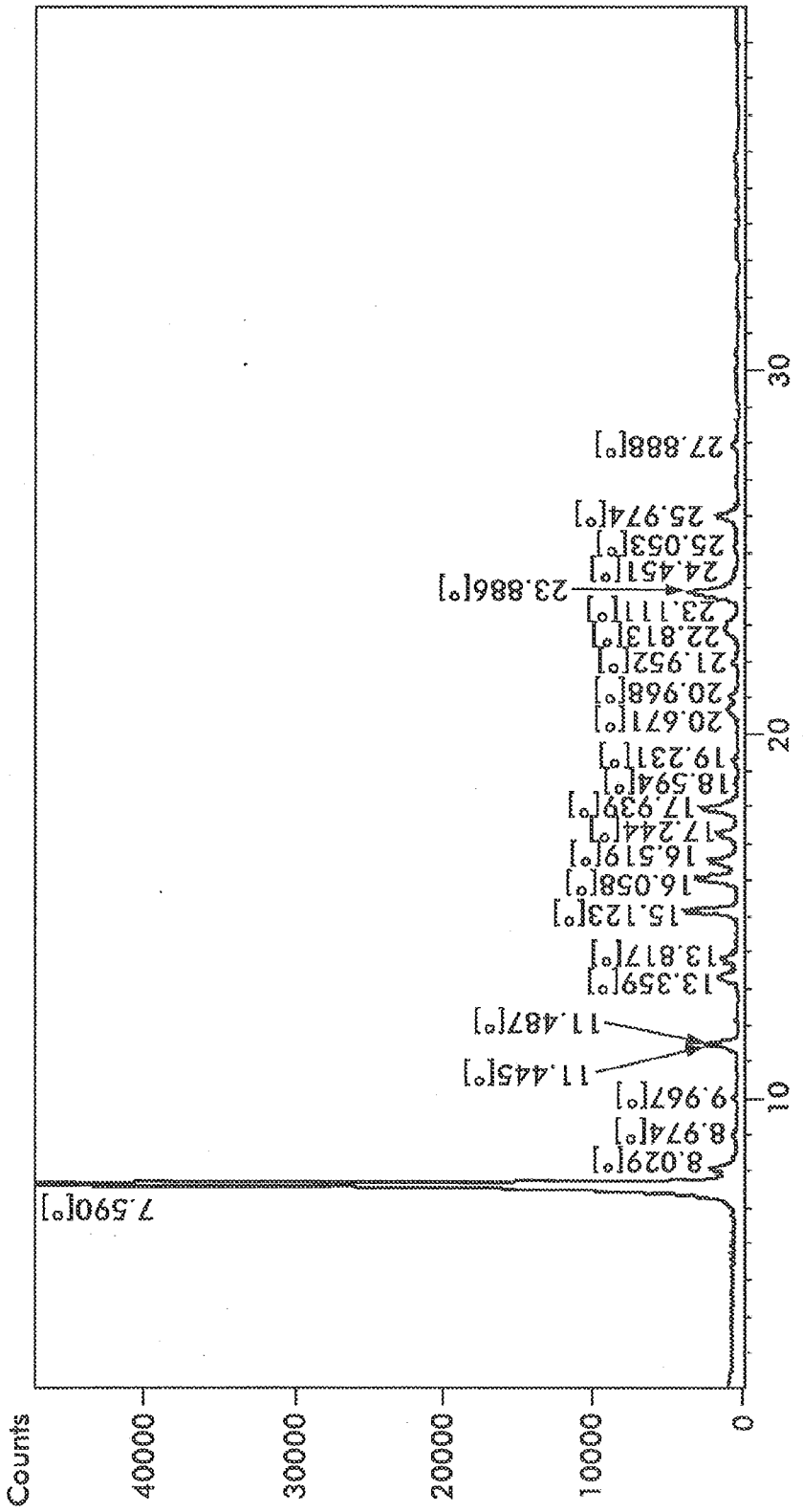

Counts
40000
30000
20000
10000
0
7.590[°]
8.029[°]
8.974[°]
9.967[°]
11.445[°]
11.487[°]
13.359[°]
13.817[°]
15.123[°]
16.058[°]
16.519[°]
17.244[°]
17.939[°]
18.594[°]
19.231[°]
20.671[°]
20.968[°]
21.952[°]
22.813[°]
23.111[°]
23.886[°]
24.451[°]
25.053[°]
25.974[°]
27.888[°]
10
20
30
Position [°2 Theta] (Copper(Cu))

FIG. 3

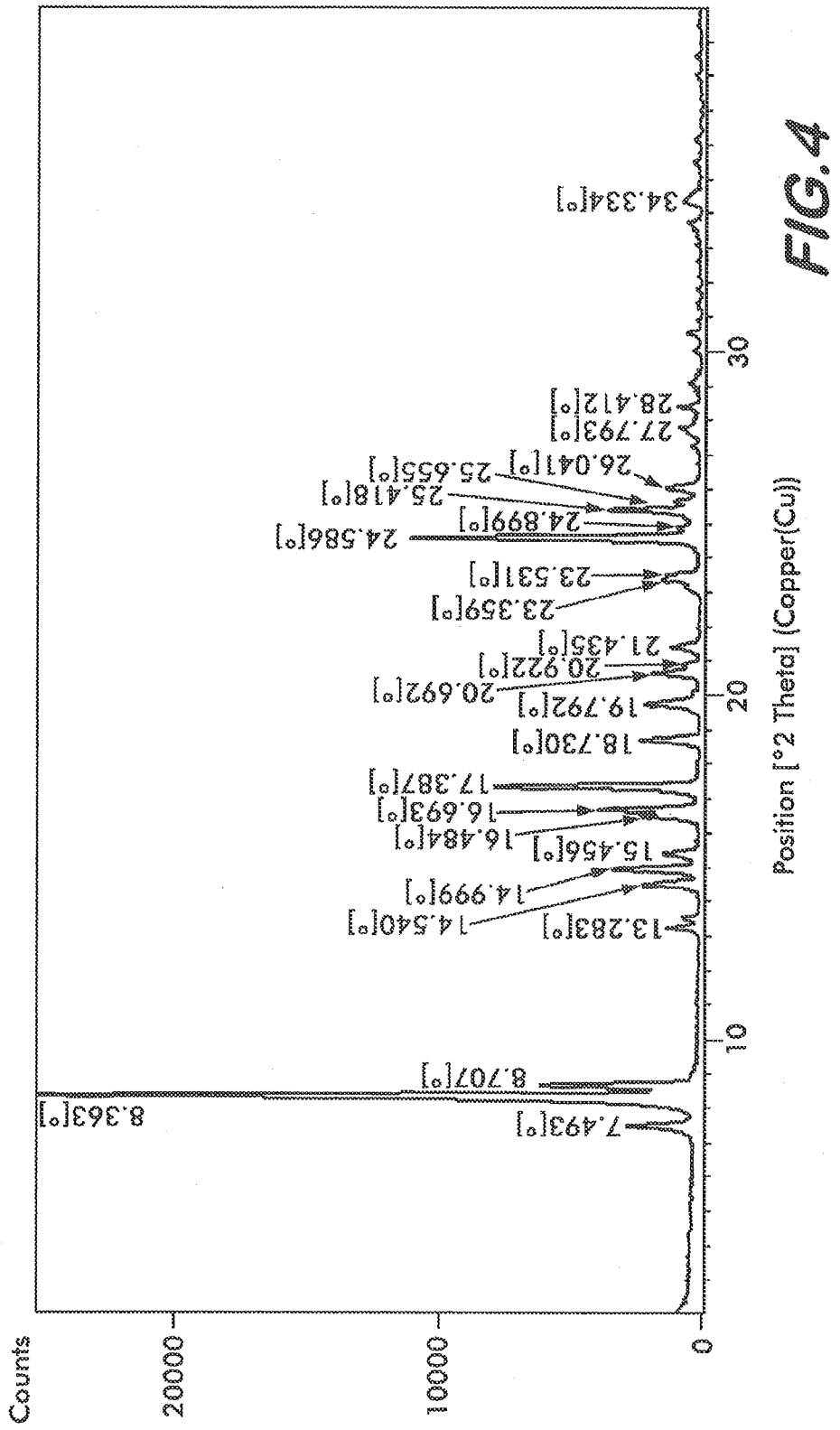

Counts
0
10000
20000
10
20
30
Position [°2 Theta] (Copper(Cu))
8.363[°]
7.493[°]
8.707[°]
13.283[°]
14.540[°]
14.999[°]
15.456[°]
16.484[°]
16.693[°]
17.387[°]
18.730[°]
19.792[°]
20.692[°]
20.922[°]
21.435[°]
23.359[°]
23.531[°]
24.586[°]
24.899[°]
25.418[°]
25.655[°]
26.041[°]
27.793[°]
28.412[°]
34.334[°]

FIG. 4

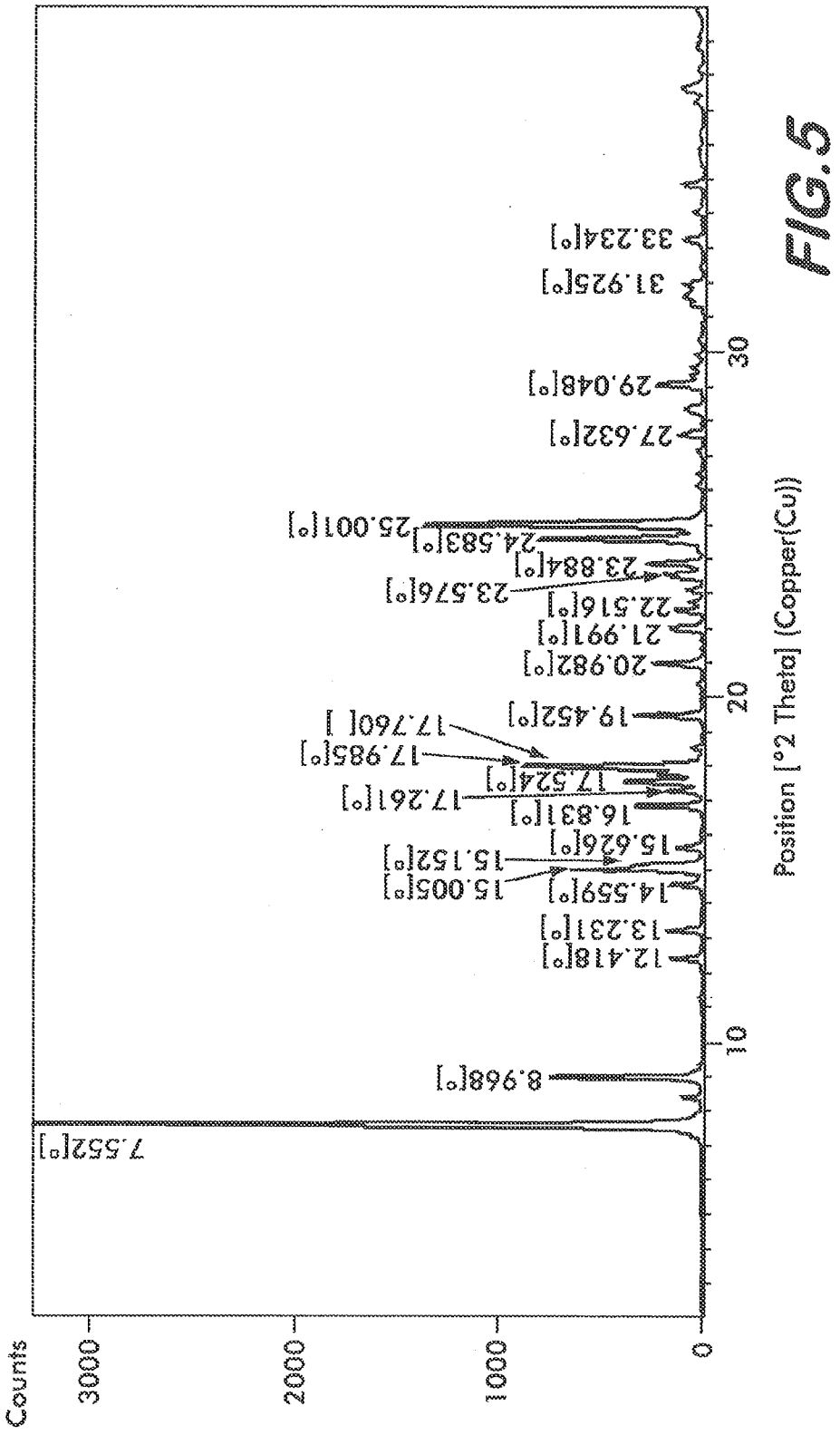

Counts
3000
2000
1000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
7.552[°]
8.968[°]
12.418[°]
13.231[°]
14.559[°]
15.005[°]
15.152[°]
15.626[°]
16.831[°]
17.261[°]
17.524[°]
17.985[°]
17.760[ ]
19.452[°]
20.982[°]
21.991[°]
22.516[°]
23.576[°]
23.884[°]
24.583[°]
25.001[°]
27.632[°]
29.048[°]
31.925[°]
33.234[°]

FIG.5

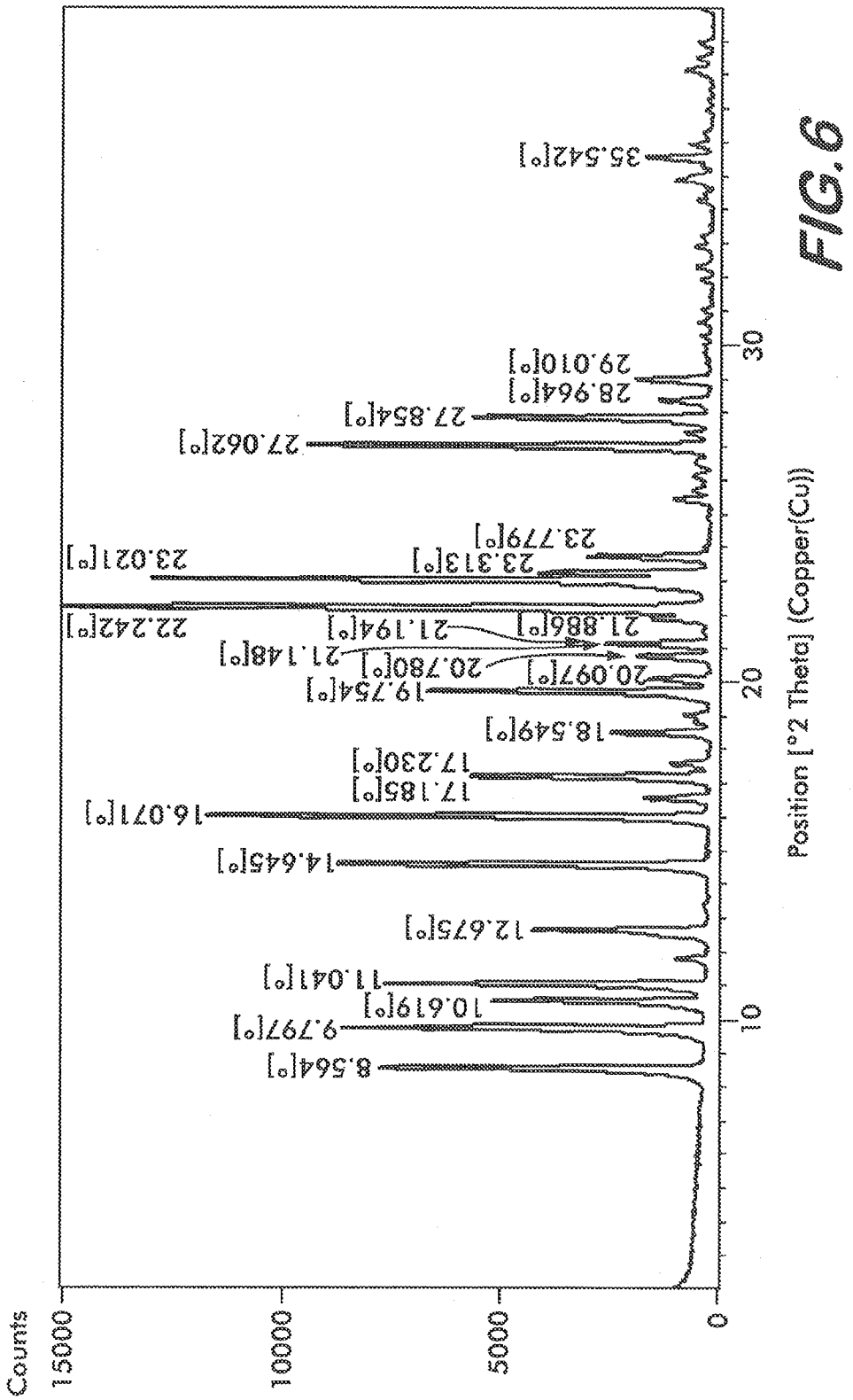

Counts
15000
10000
5000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
8.564[°]
9.797[°]
10.619[°]
11.041[°]
12.675[°]
14.645[°]
16.071[°]
17.185[°]
17.230[°]
18.549[°]
19.754[°]
20.097[°]
20.780[°]
21.148[°]
21.886[°]
21.194[°]
22.242[°]
23.313[°]
23.779[°]
23.021[°]
27.062[°]
27.854[°]
28.964[°]
29.010[°]
35.542[°]

FIG. 6

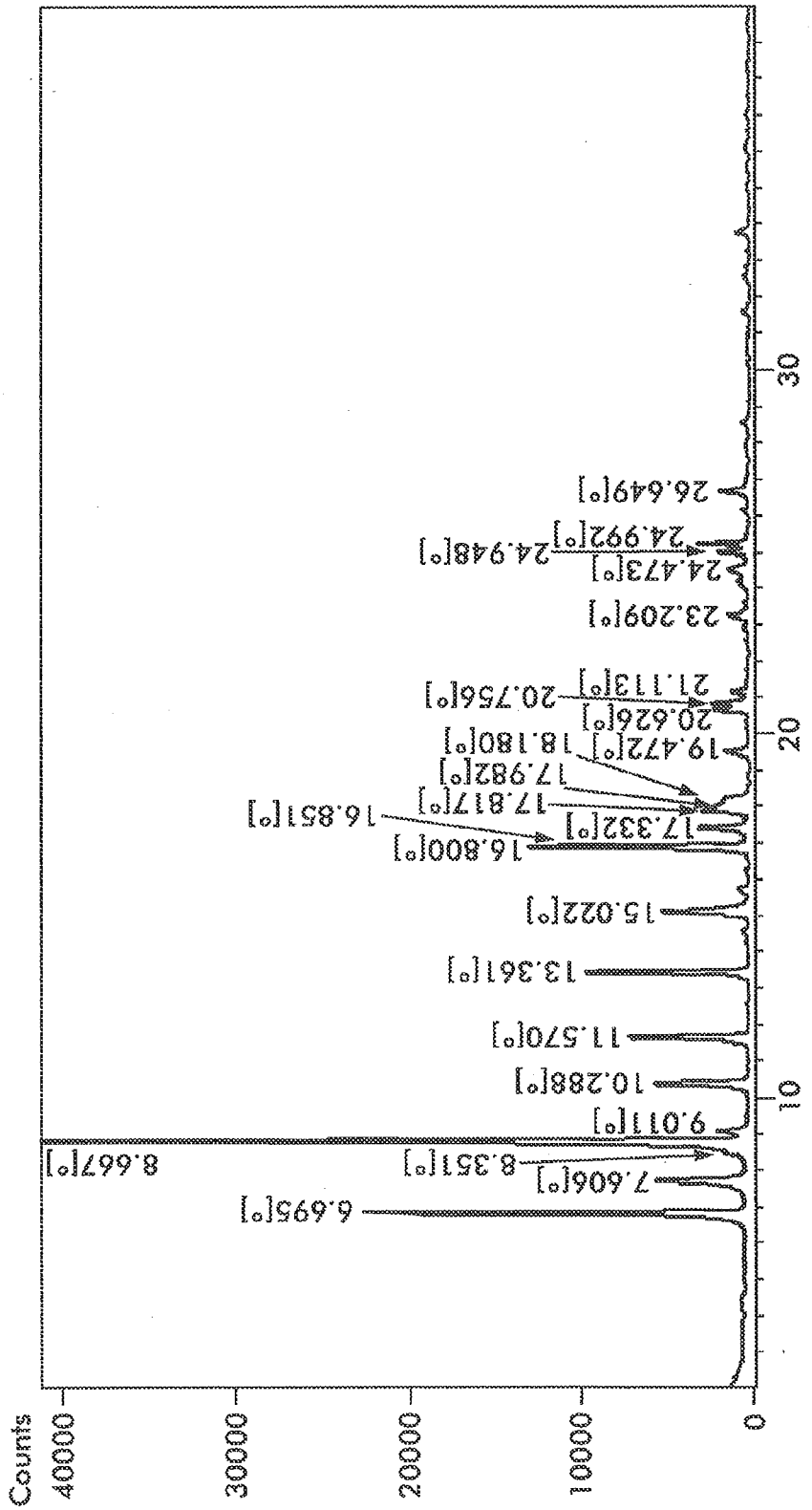

Counts
40000
30000
20000
10000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
6.695[°]
7.606[°]
8.351[°]
8.667[°]
9.011[°]
10.288[°]
11.570[°]
13.361[°]
15.022[°]
16.800[°]
16.851[°]
17.332[°]
17.817[°]
17.982[°]
18.180[°]
19.472[°]
20.626[°]
20.756[°]
21.113[°]
23.209[°]
24.473[°]
24.948[°]
24.992[°]
26.649[°]

FIG. 7

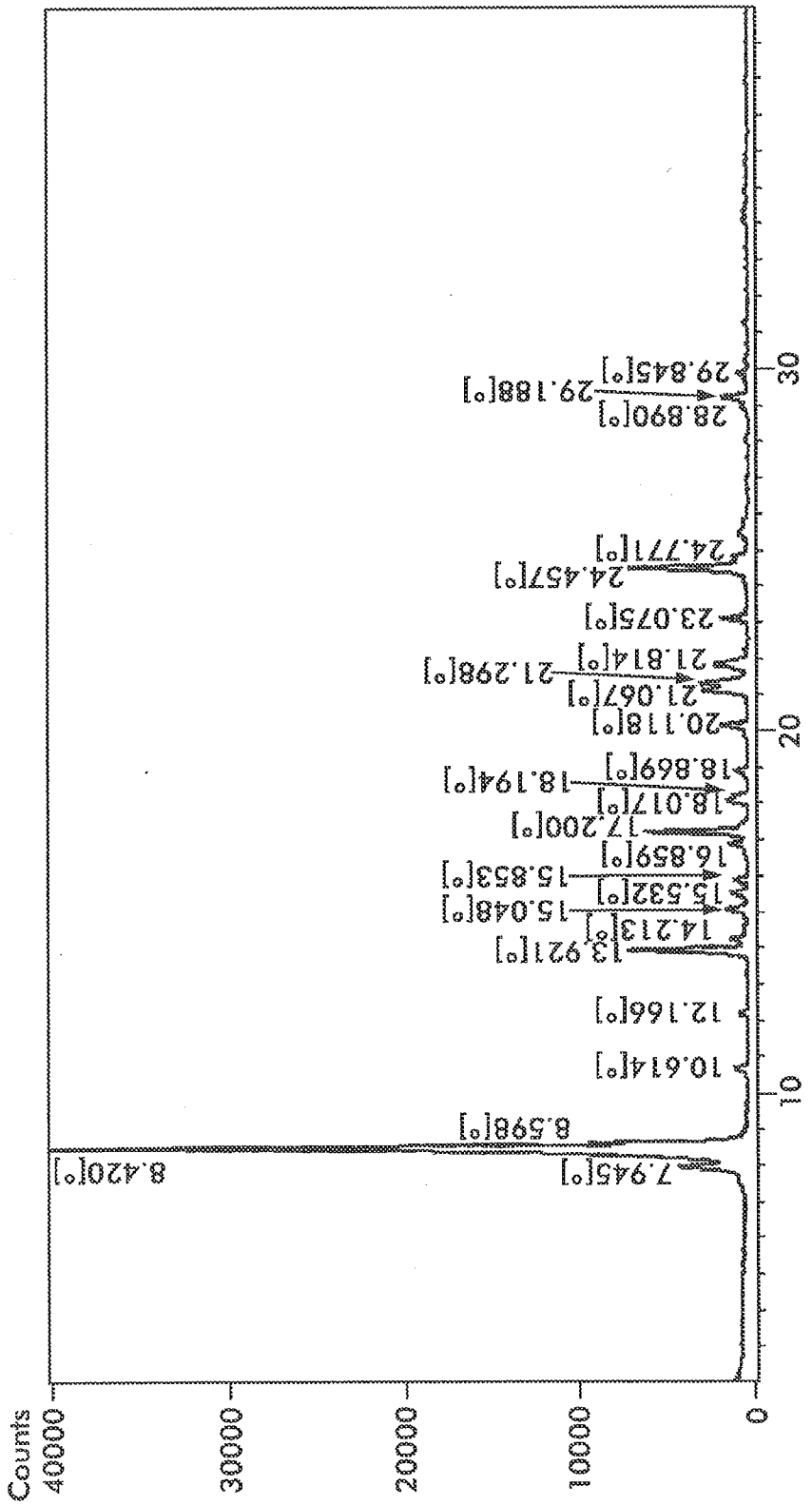

Counts
40000
30000
20000
10000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
7.945[°]
8.420[°]
8.598[°]
10.614[°]
12.166[°]
13.921[°]
14.213[°]
15.048[°]
15.532[°]
15.853[°]
16.859[°]
17.200[°]
18.017[°]
18.194[°]
18.869[°]
20.118[°]
21.067[°]
21.298[°]
21.814[°]
23.075[°]
24.457[°]
24.771[°]
28.890[°]
29.188[°]
29.845[°]

FIG.8

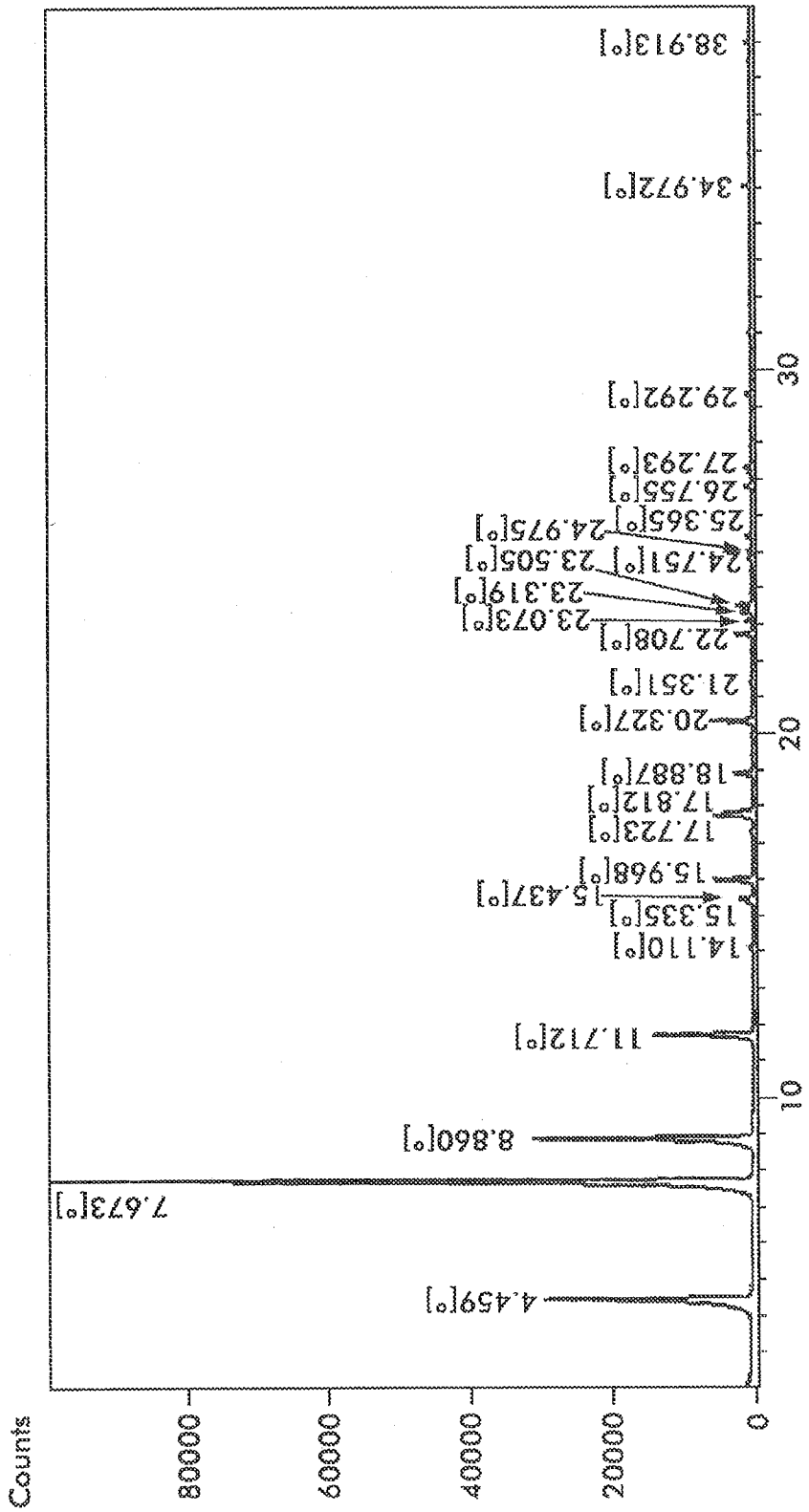

Counts
80000
60000
40000
20000
0
4.459[°]
7.673[°]
8.860[°]
11.712[°]
14.110[°]
15.335[°]
15.437[°]
15.968[°]
17.723[°]
17.812[°]
18.887[°]
20.327[°]
21.351[°]
22.708[°]
23.073[°]
23.319[°]
24.751[°]
23.505[°]
24.975[°]
25.365[°]
26.755[°]
27.293[°]
29.292[°]
34.972[°]
38.913[°]
10
20
30
Position [°2 Theta] (Copper(Cu))

FIG. 9

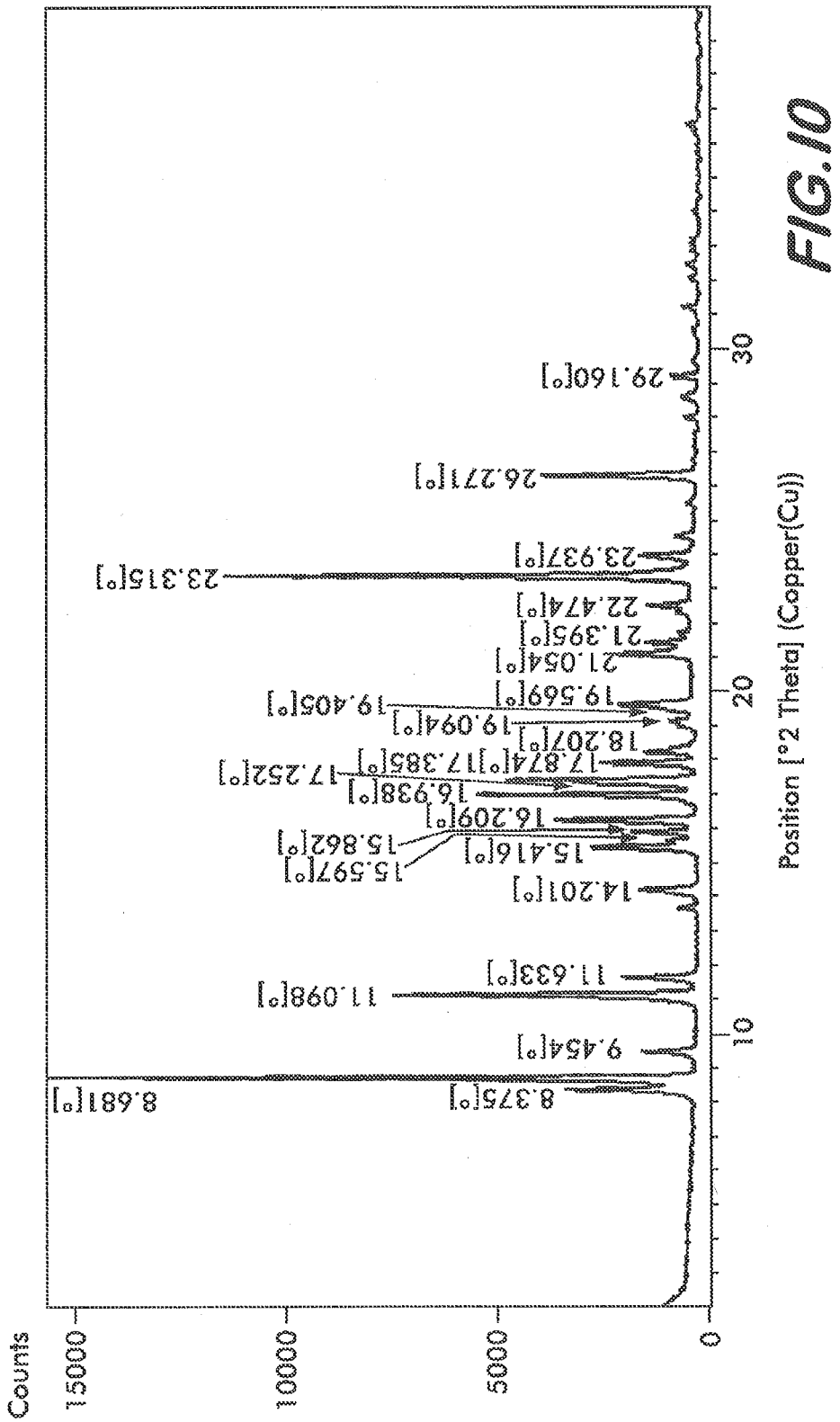

Counts
15000
10000
5000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
8.375[°]
8.681[°]
9.454[°]
11.098[°]
11.633[°]
14.201[°]
15.416[°]
15.597[°]
15.862[°]
16.209[°]
16.938[°]
17.252[°]
17.385[°]
17.874[°]
18.207[°]
19.094[°]
19.405[°]
19.569[°]
21.054[°]
21.395[°]
22.474[°]
23.315[°]
23.937[°]
26.271[°]
29.160[°]

FIG. 10

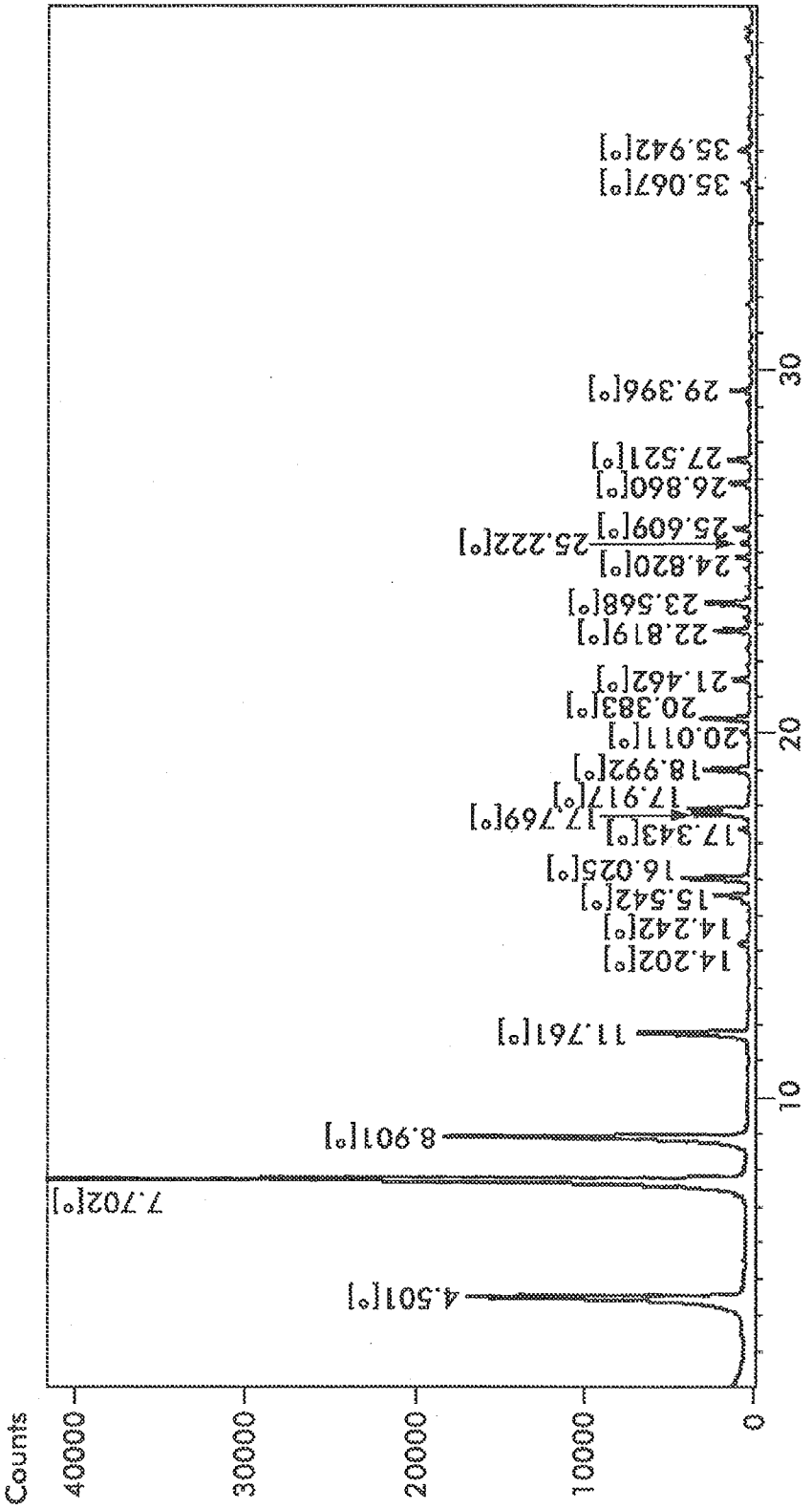

Counts
40000
30000
20000
10000
0
4.501[°]
7.702[°]
8.901[°]
11.761[°]
14.202[°]
14.242[°]
15.542[°]
16.025[°]
17.343[°]
17.769[°]
17.917[°]
18.992[°]
20.011[°]
20.383[°]
21.462[°]
22.819[°]
23.568[°]
24.820[°]
25.222[°]
25.609[°]
26.860[°]
27.521[°]
29.396[°]
35.067[°]
35.942[°]
10
20
30
Position [°2 Theta] (Copper(Cu))

FIG. 11

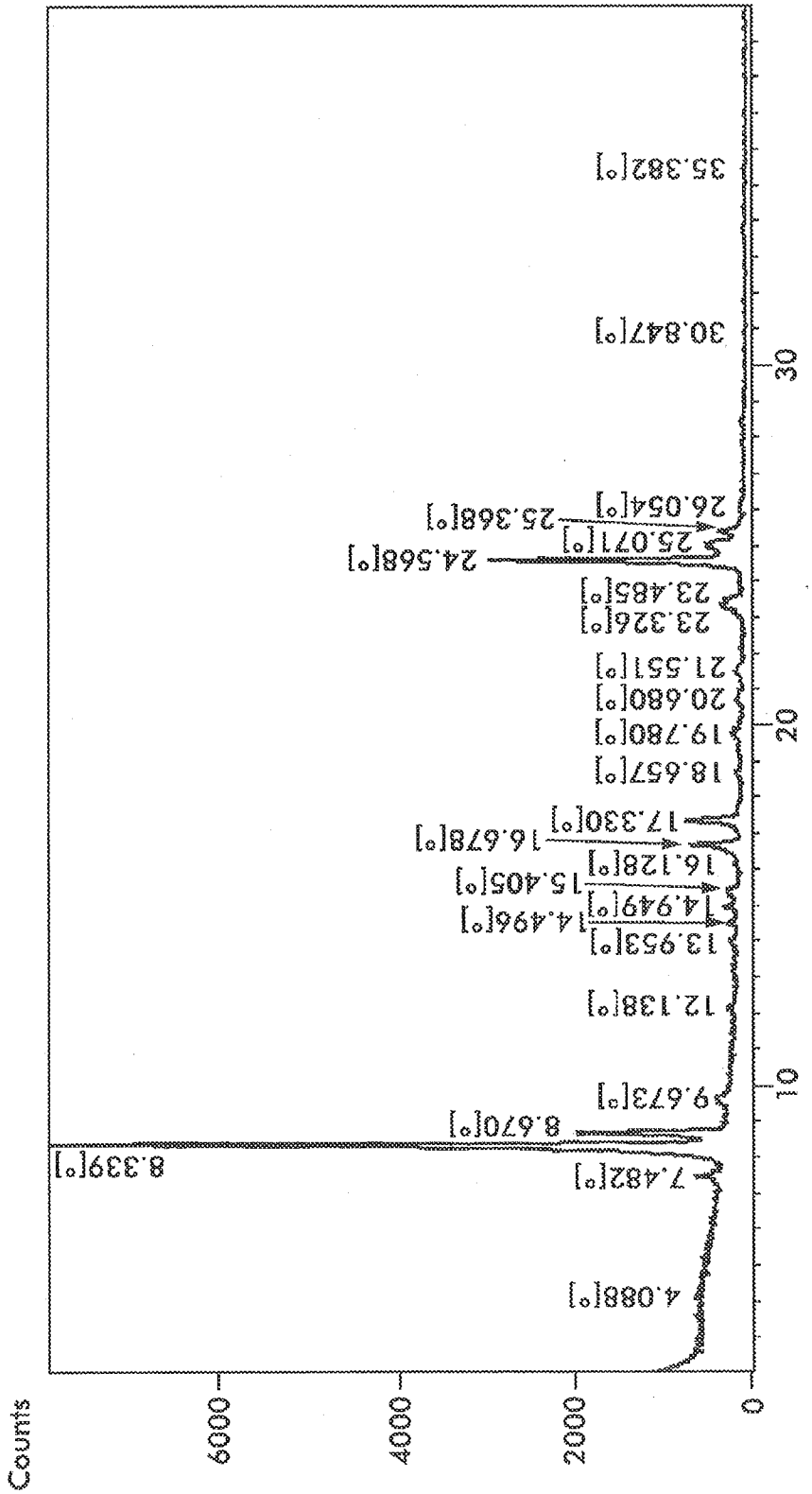

Counts
6000
4000
2000
0
4.088[°]
7.482[°]
8.339[°]
8.670[°]
9.673[°]
10
12.138[°]
13.953[°]
14.496[°]
14.949[°]
15.405[°]
16.128[°]
16.678[°]
17.330[°]
18.657[°]
19.780[°]
20.680[°]
21.551[°]
23.326[°]
23.485[°]
24.568[°]
25.071[°]
25.368[°]
26.054[°]
20
30
30.847[°]
35.382[°]
Position [°2 Theta] (Copper(Cu))

FIG. 12

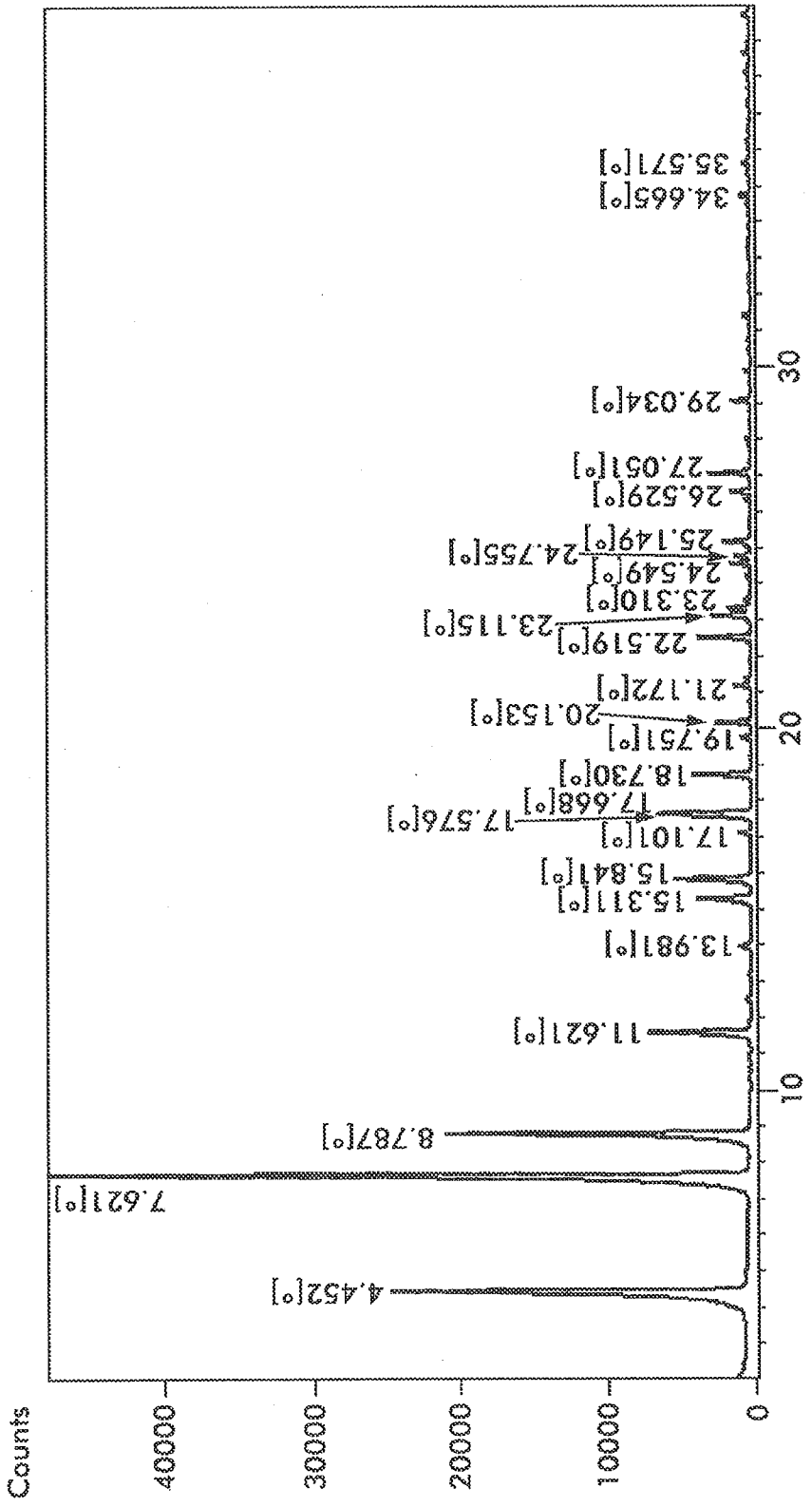

Counts
40000
30000
20000
10000
0
4.452[°]
7.621[°]
8.787[°]
11.621[°]
13.981[°]
15.311[°]
15.841[°]
17.101[°]
17.576[°]
17.668[°]
18.730[°]
19.751[°]
20.153[°]
21.172[°]
22.519[°]
23.115[°]
23.310[°]
24.549[°]
24.755[°]
25.149[°]
26.529[°]
27.051[°]
29.034[°]
34.665[°]
35.571[°]
10
20
30
Position [°2 Theta] (Copper(Cu))

FIG. 13

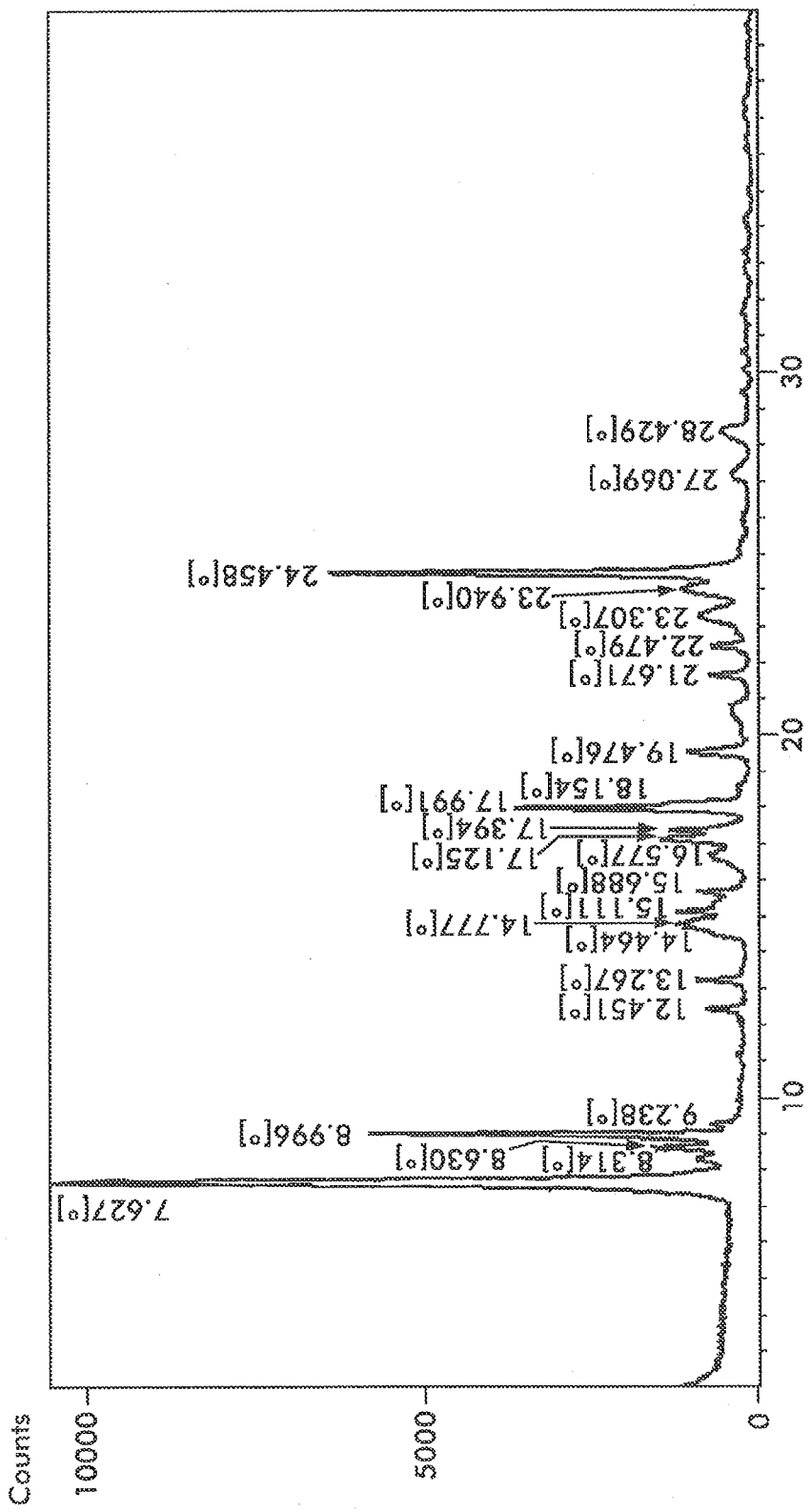
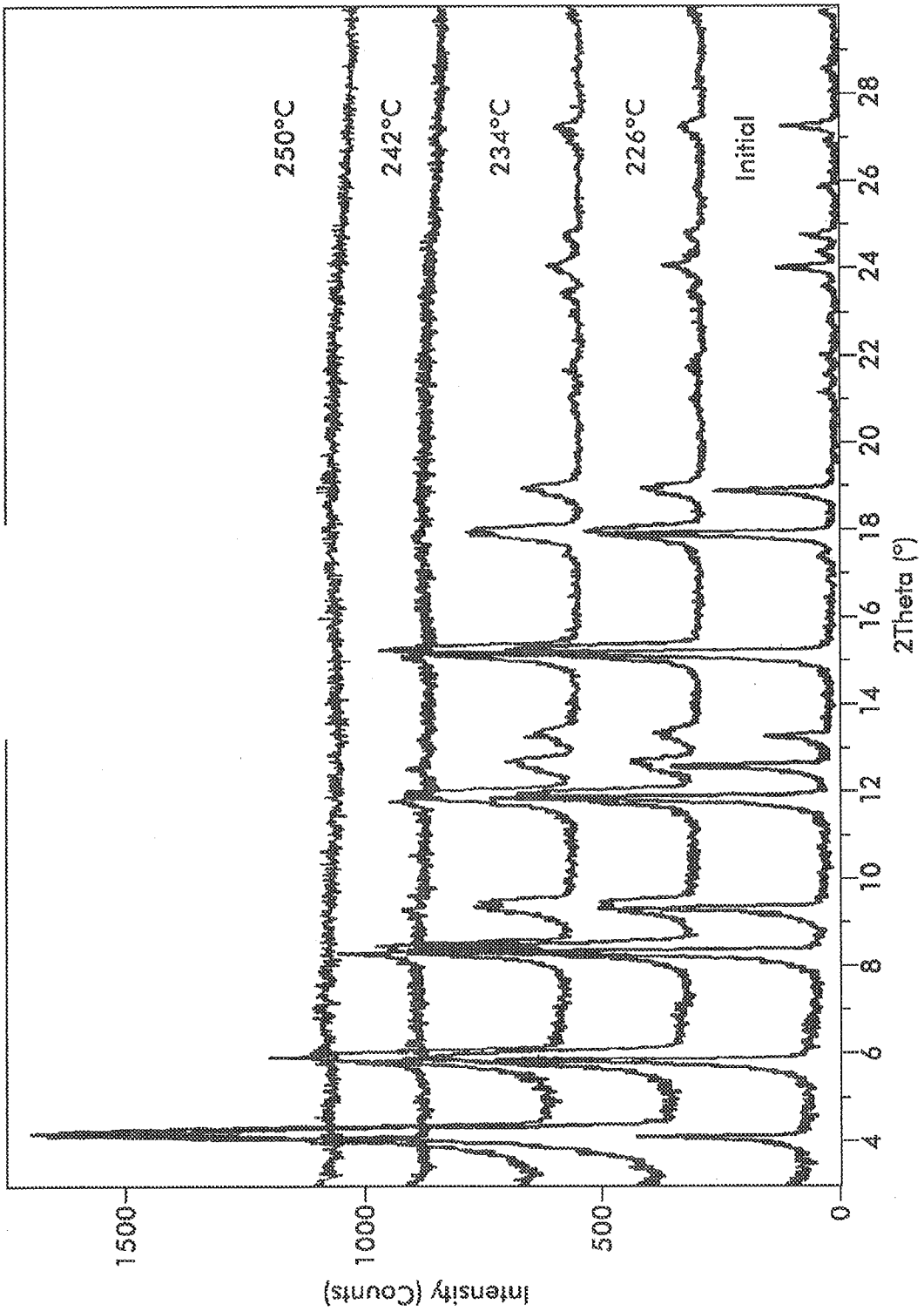

Counts
10000
5000
0
10
20
30
Position [°2 Theta] (Copper(Cu))
7.627[°]
8.314[°]
8.630[°]
8.996[°]
9.238[°]
12.451[°]
13.267[°]
14.464[°]
14.777[°]
15.111[°]
15.688[°]
16.577[°]
17.125[°]
17.394[°]
17.991[°]
18.154[°]
19.476[°]
21.671[°]
22.479[°]
23.307[°]
23.940[°]
24.458[°]
27.069[°]
28.429[°]

FIG. 14

FIG. 15


250°C
242°C
234°C
226°C
Initial
Intensity (Counts)
1500
1000
500
0
4
6
8
10
12
14
16
18
20
22
24
26
28
2Theta (°)

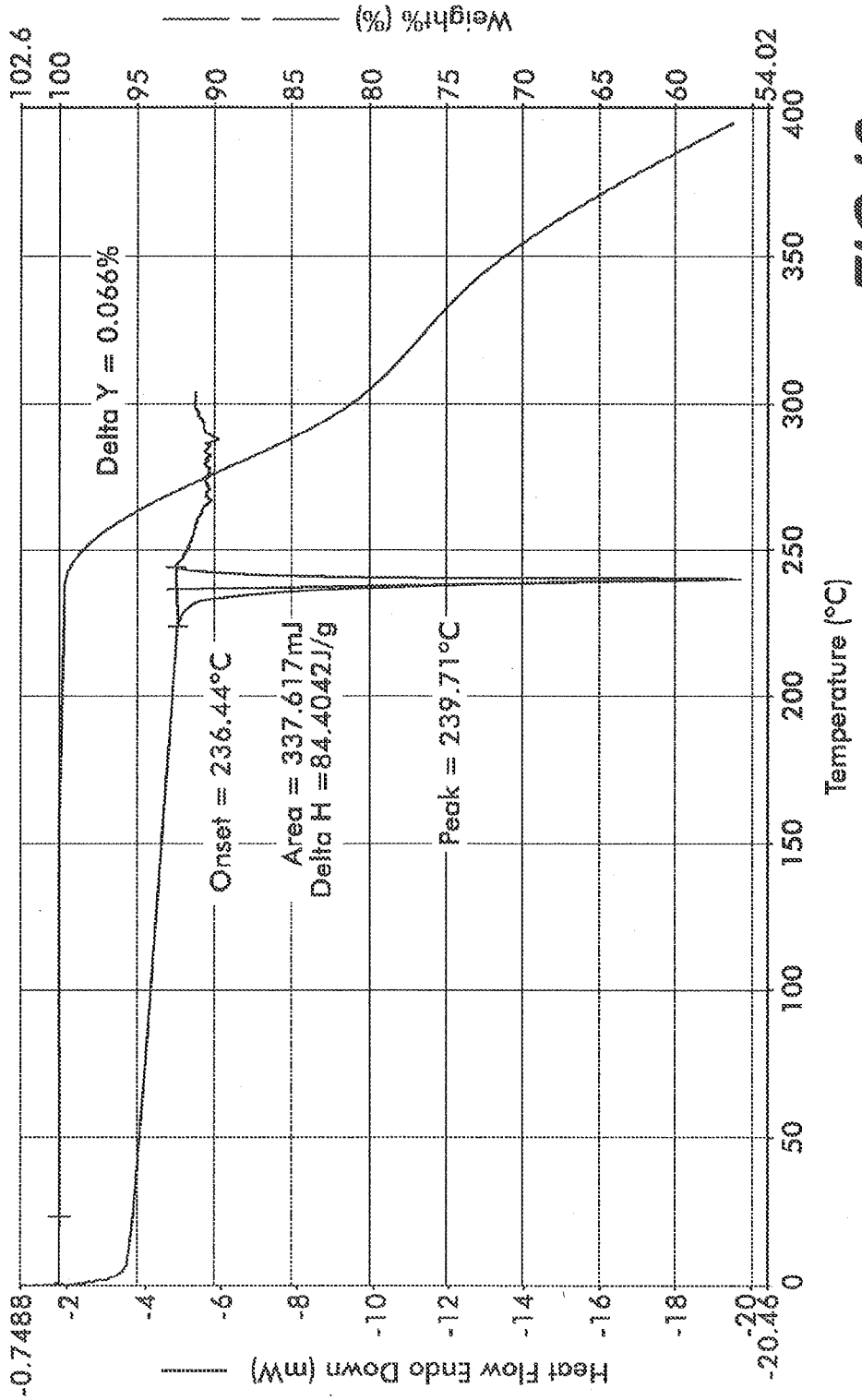

Weight% (%)
102.6
100
95
90
85
80
75
70
65
60
54.02
Delta Y = 0.066%
Onset = 236.44°C
Area = 337.617mJ
Delta H = 84.4042J/g
Peak = 239.71°C
Heat Flow Endo Down (mW)
-0.7488
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-20.46
0
50
100
150
200
250
300
350
400
Temperature (°C)

FIG. 16

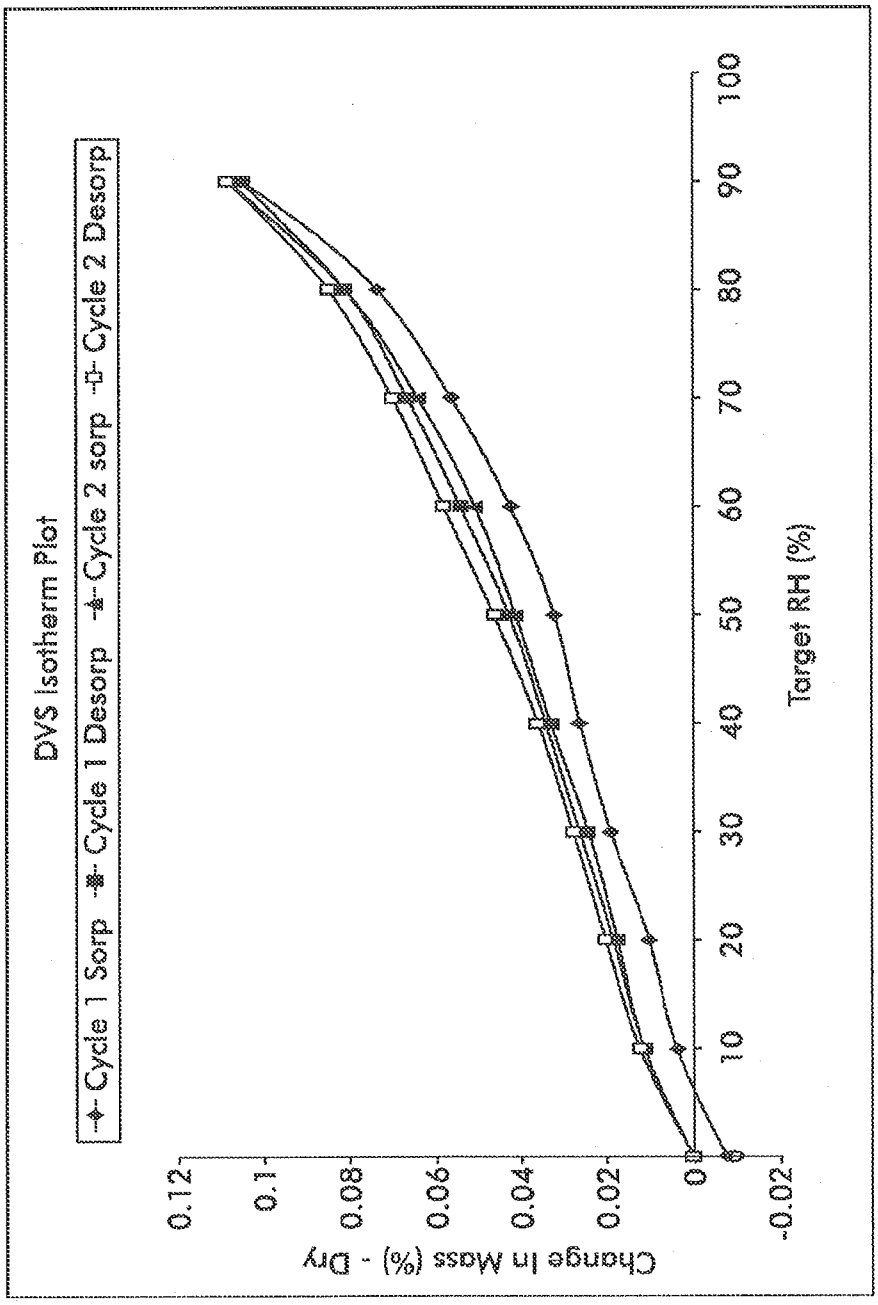
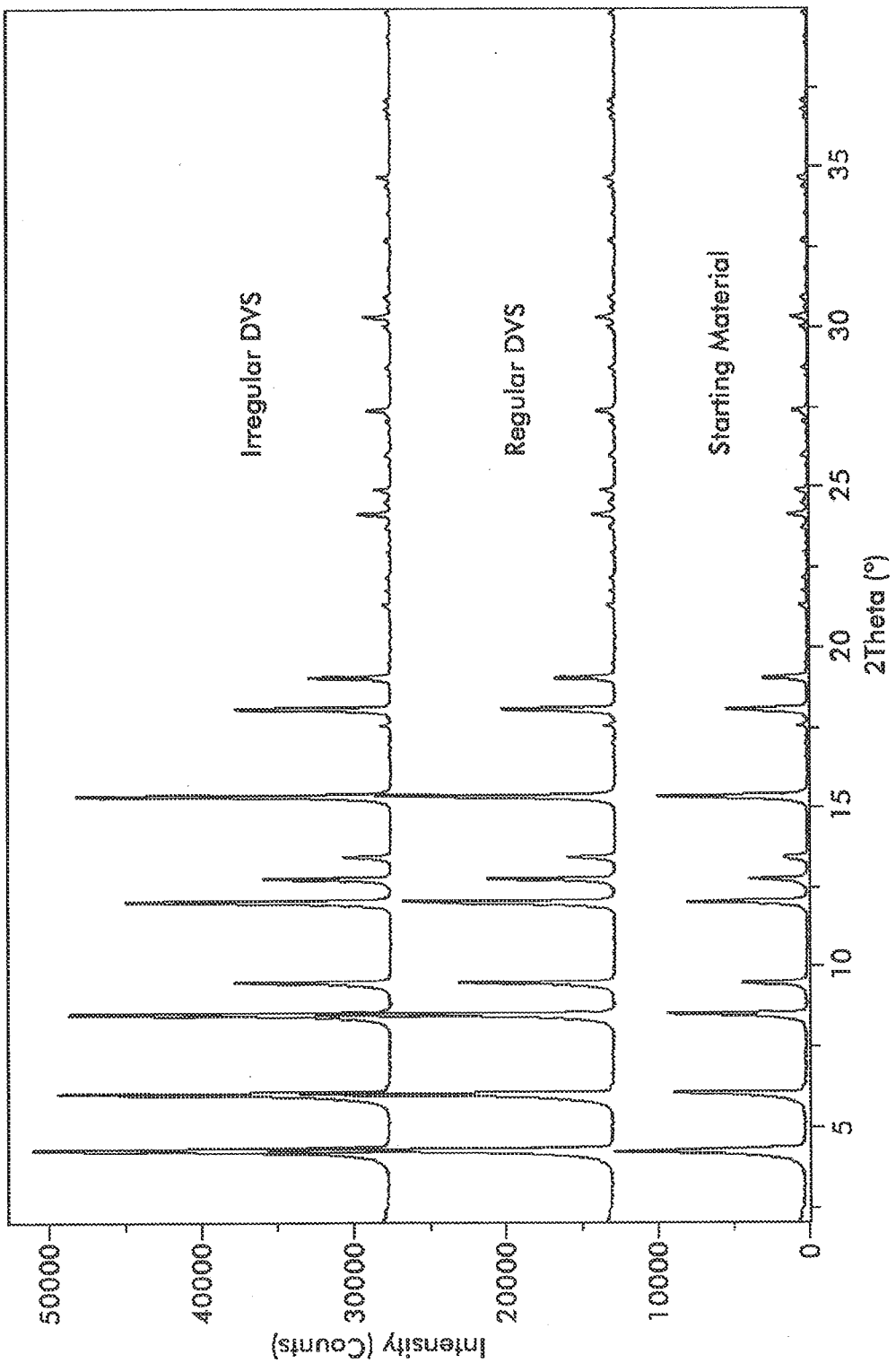

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Change In Mass (%) - Dry
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.02
0
10
20
30
40
50
60
70
80
90
100
Target RH (%)

FIG. 17

FIG.18


Irregular DVS
Regular DVS
Starting Material
Intensity (Counts)
50000
40000
30000
20000
10000
0
5
10
15
20
25
30
35
2Theta (°)

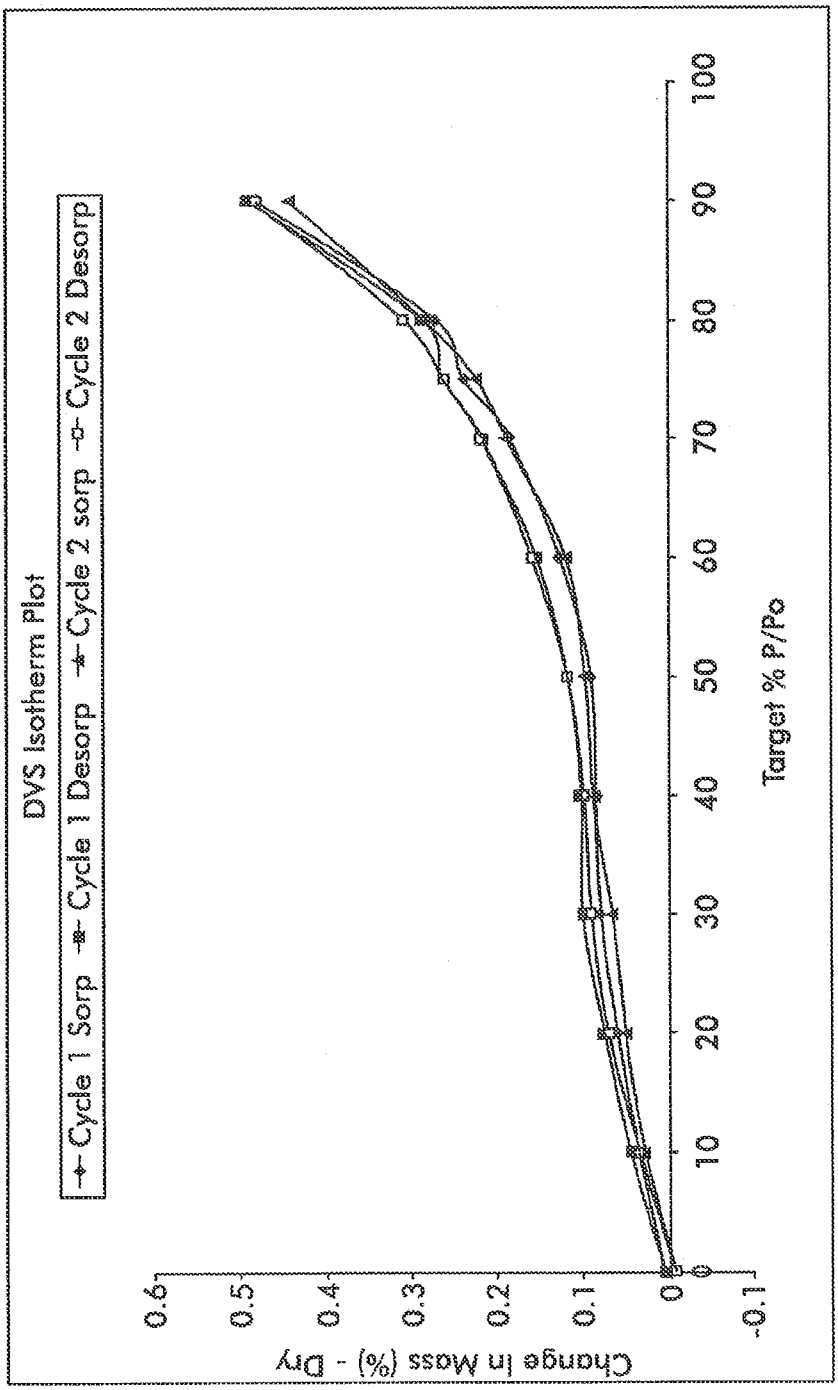

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Change in Mass (%) - Dry
Target % P/Po
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
0
10
20
30
40
50
60
70
80
90
100

FIG. 19

FIG. 20

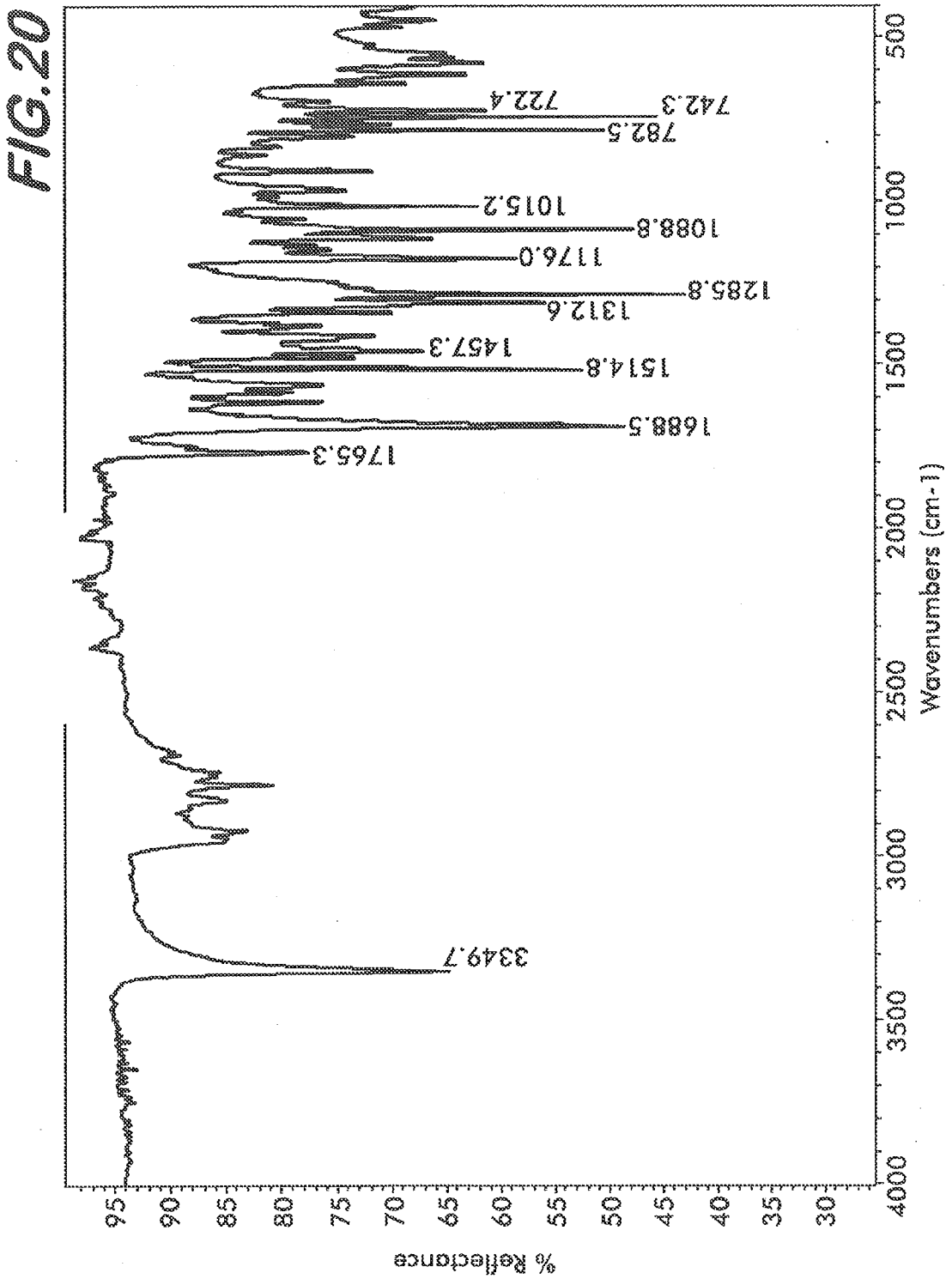

% Reflectance
Wavenumbers (cm-1)
3349.7
1765.3
1688.5
1514.8
1457.3
1312.6
1285.8
1176.0
1088.8
1015.2
782.5
742.3
722.4

FIG. 21

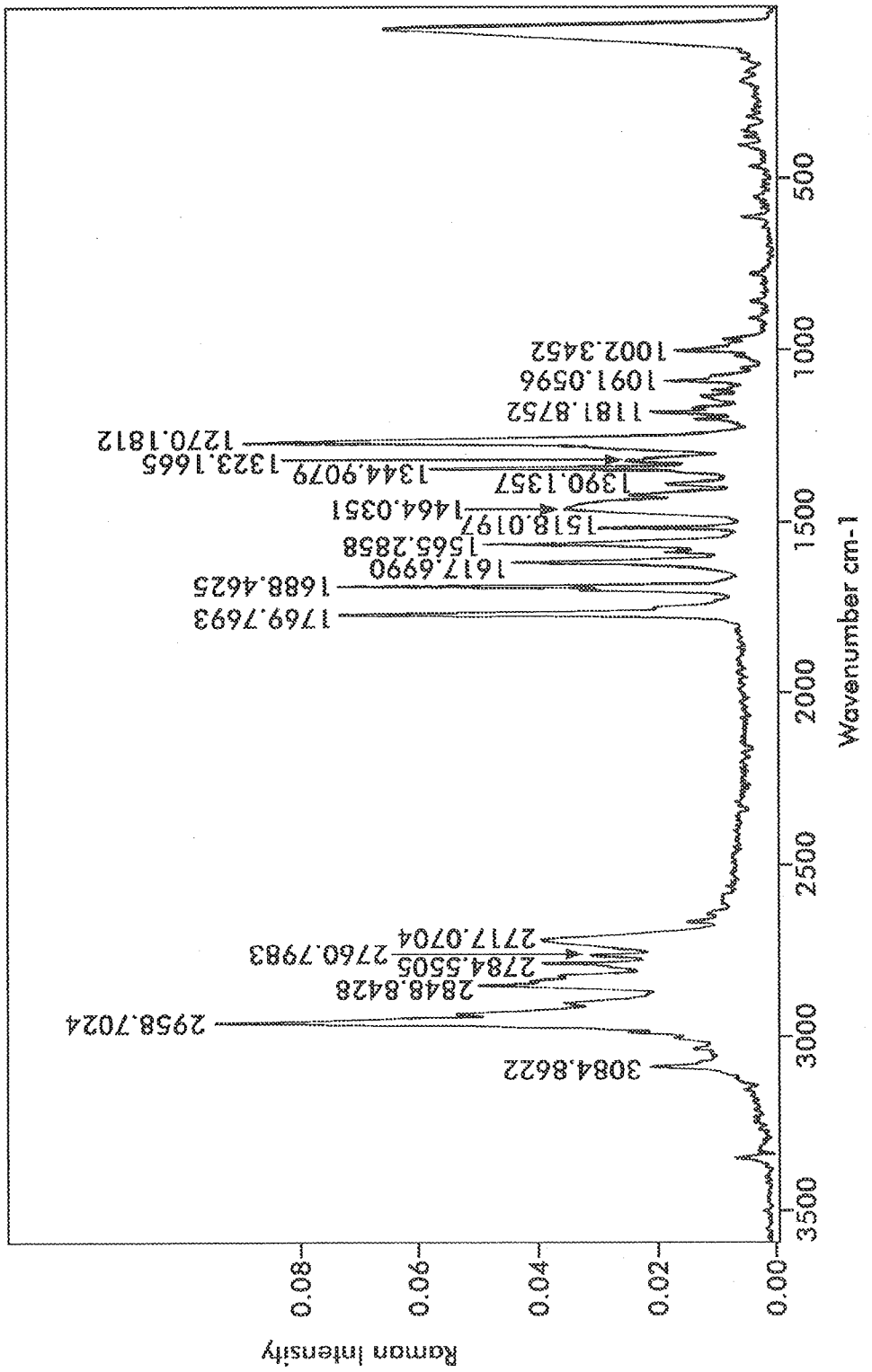
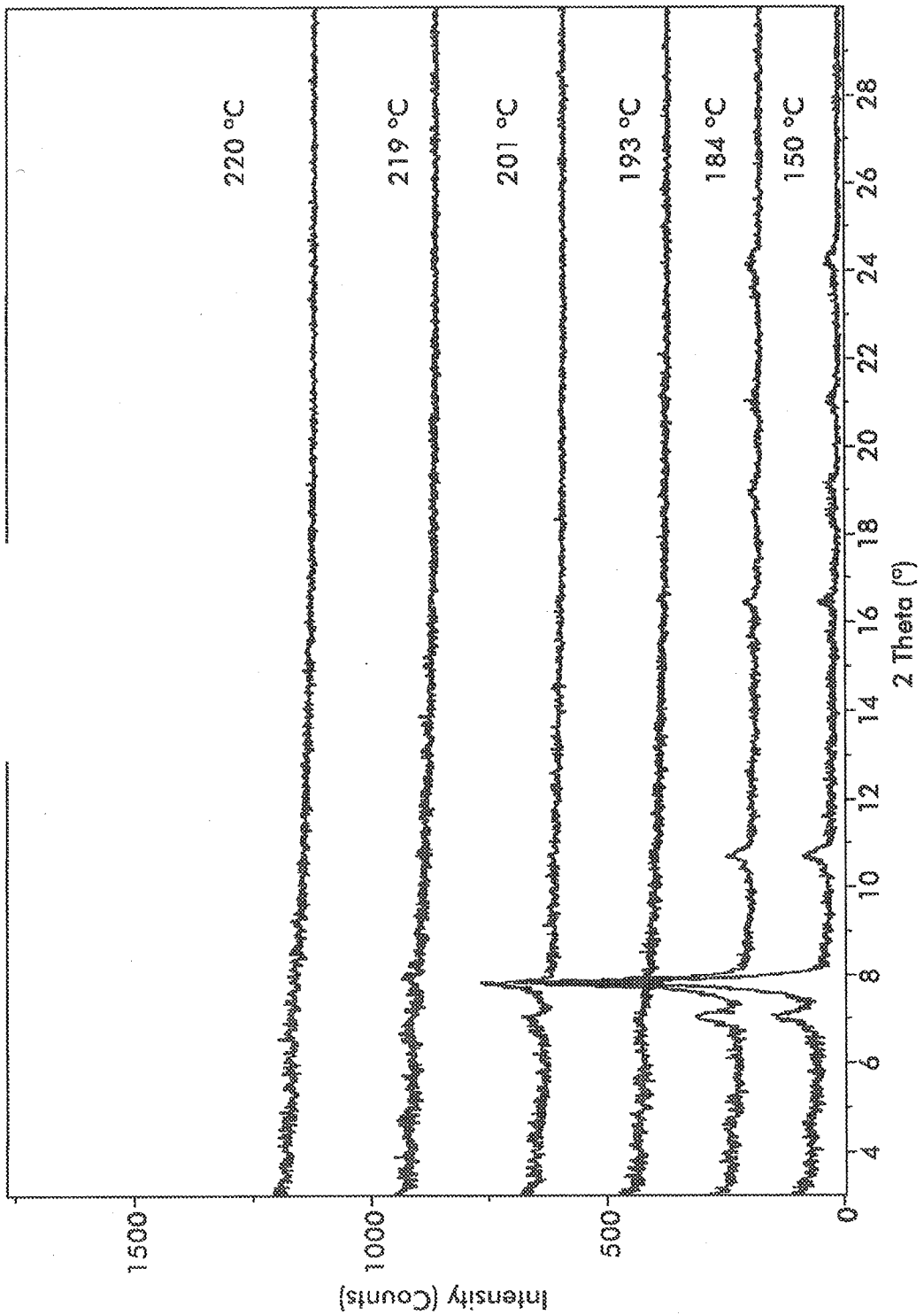

Raman Intensity
0.00
0.02
0.04
0.06
0.08
Wavenumber cm-1
3500
3000
2500
2000
1500
1000
500
3084.8622
2958.7024
2848.8428
2784.5505
2760.7983
2717.0704
1769.7693
1688.4625
1617.6990
1565.2858
1518.0197
1464.0351
1390.1357
1344.9079
1323.1665
1270.1812
1181.8752
1091.0596
1002.3452

FIG. 22


220 °C
219 °C
201 °C
193 °C
184 °C
150 °C
Intensity (Counts)
1500
1000
500
0
4
6
8
10
12
14
16
18
20
22
24
26
28
2 Theta (°)

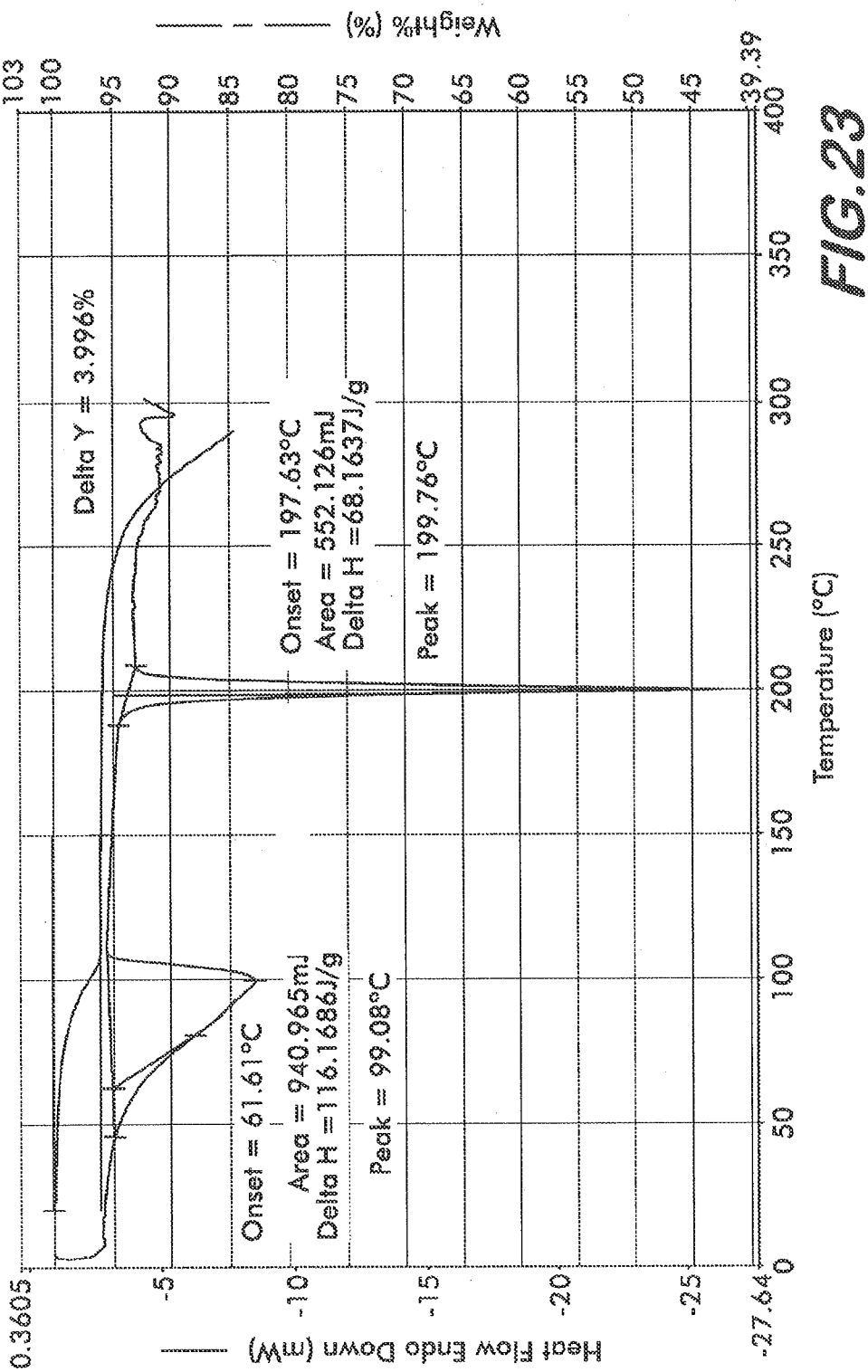

Weight% (%)
103
100
95
90
85
80
75
70
65
60
55
50
45
39.39
Delta Y = 3.996%
Onset = 197.63°C
Area = 552.126mJ
Delta H =68.1637J/g
Peak = 199.76°C
Onset = 61.61°C
Area = 940.965mJ
Delta H =116.1686J/g
Peak = 99.08°C
0.3605
-5
-10
-15
-20
-25
-27.64
Heat Flow Endo Down (mW)
0
50
100
150
200
250
300
350
400
Temperature (°C)

FIG. 23

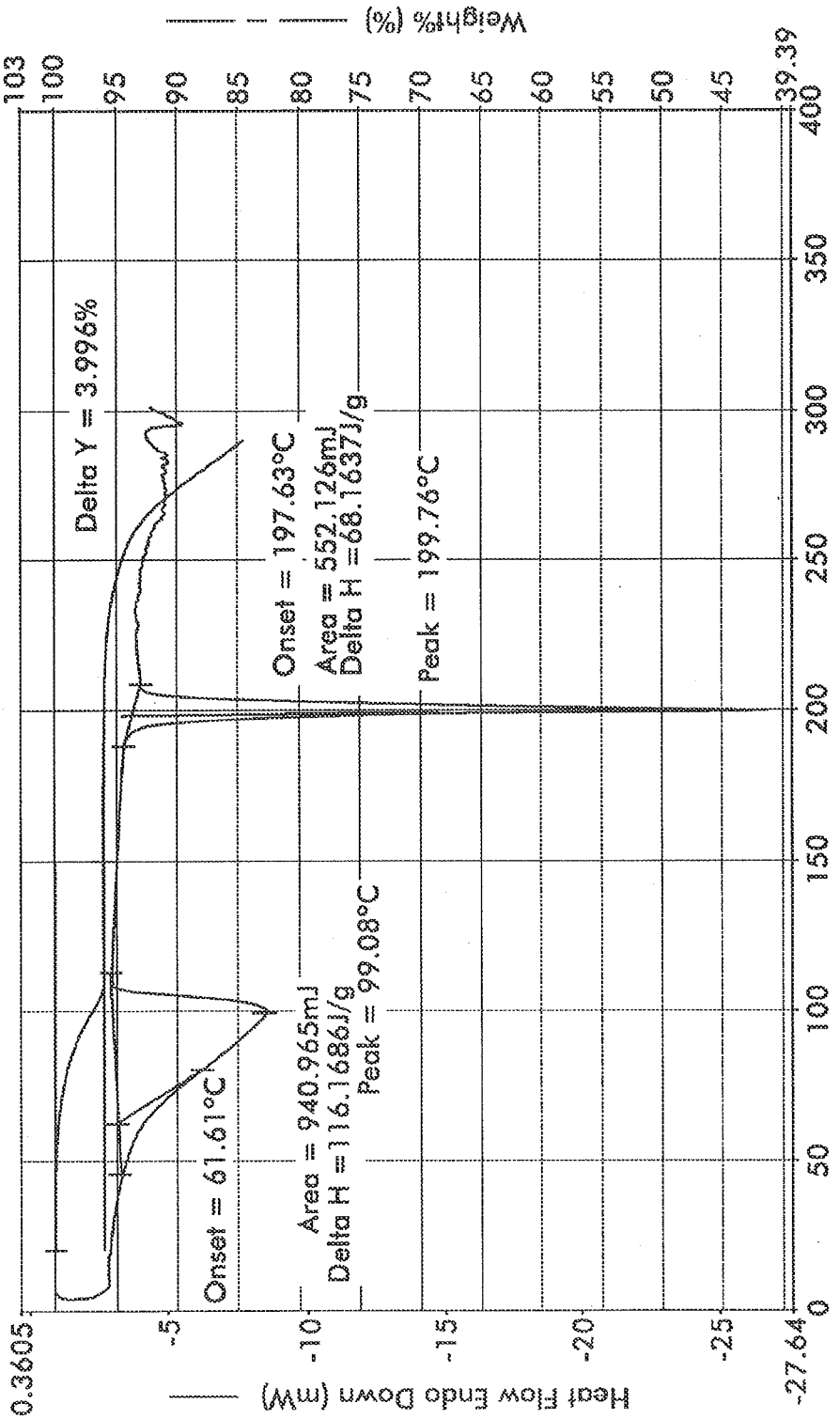

Weight% (%)
103
100
95
90
85
80
75
70
65
60
55
50
45
39.39
Delta Y = 3.996%
Onset = 197.63°C
Area = 552.126mJ
Delta H = 68.1637J/g
Peak = 199.76°C
Onset = 61.61°C
Area = 940.965mJ
Delta H = 116.1686J/g
Peak = 99.08°C
0.3605
-5
-10
-15
-20
-25
-27.64
Heat Flow Endo Down (mW)
0
50
100
150
200
250
300
350
400
Temperature (°C)

FIG. 24

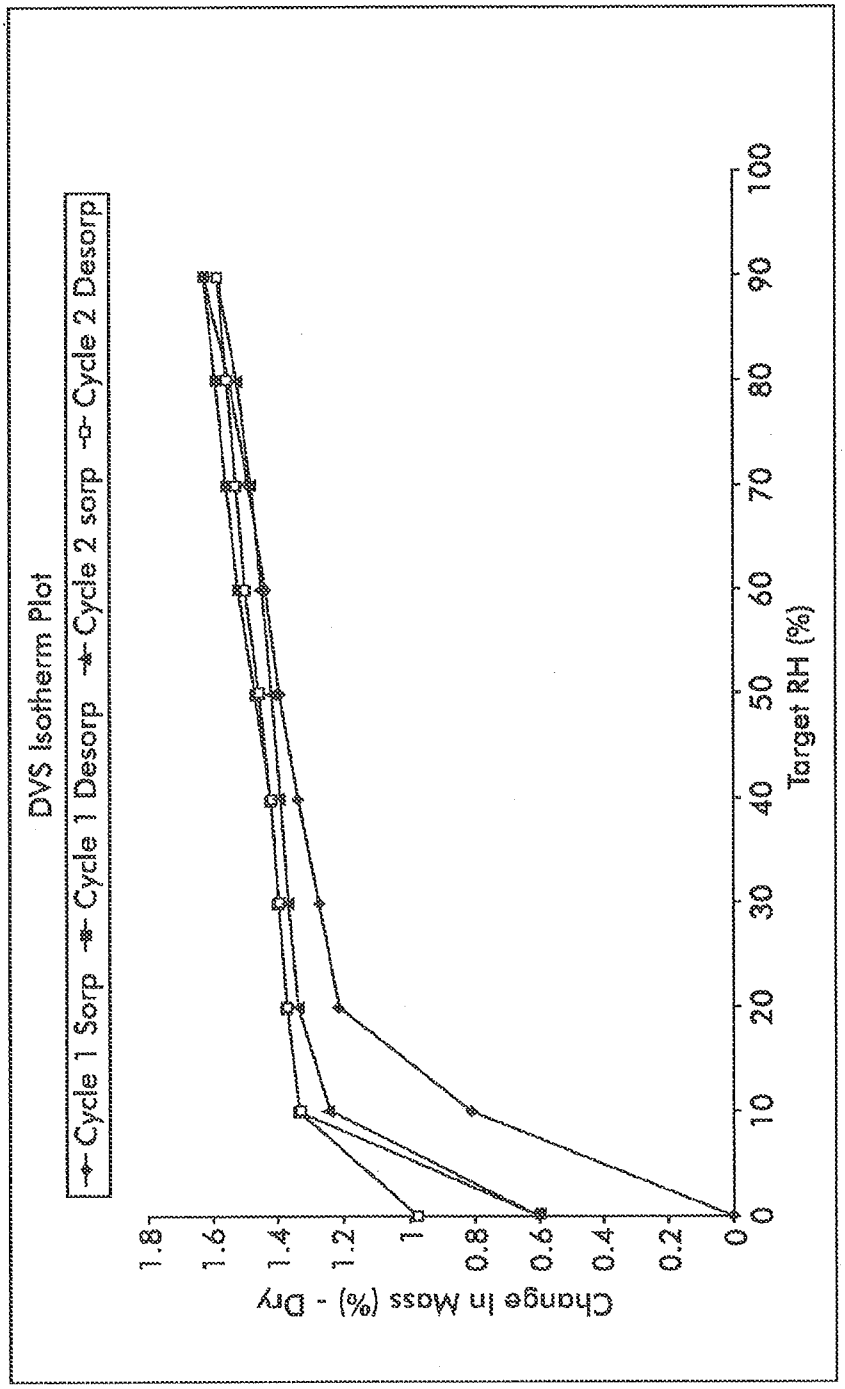

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Change in Mass (%) - Dry
Target RH (%)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
0
10
20
30
40
50
60
70
80
90
100

FIG. 25

FIG. 26

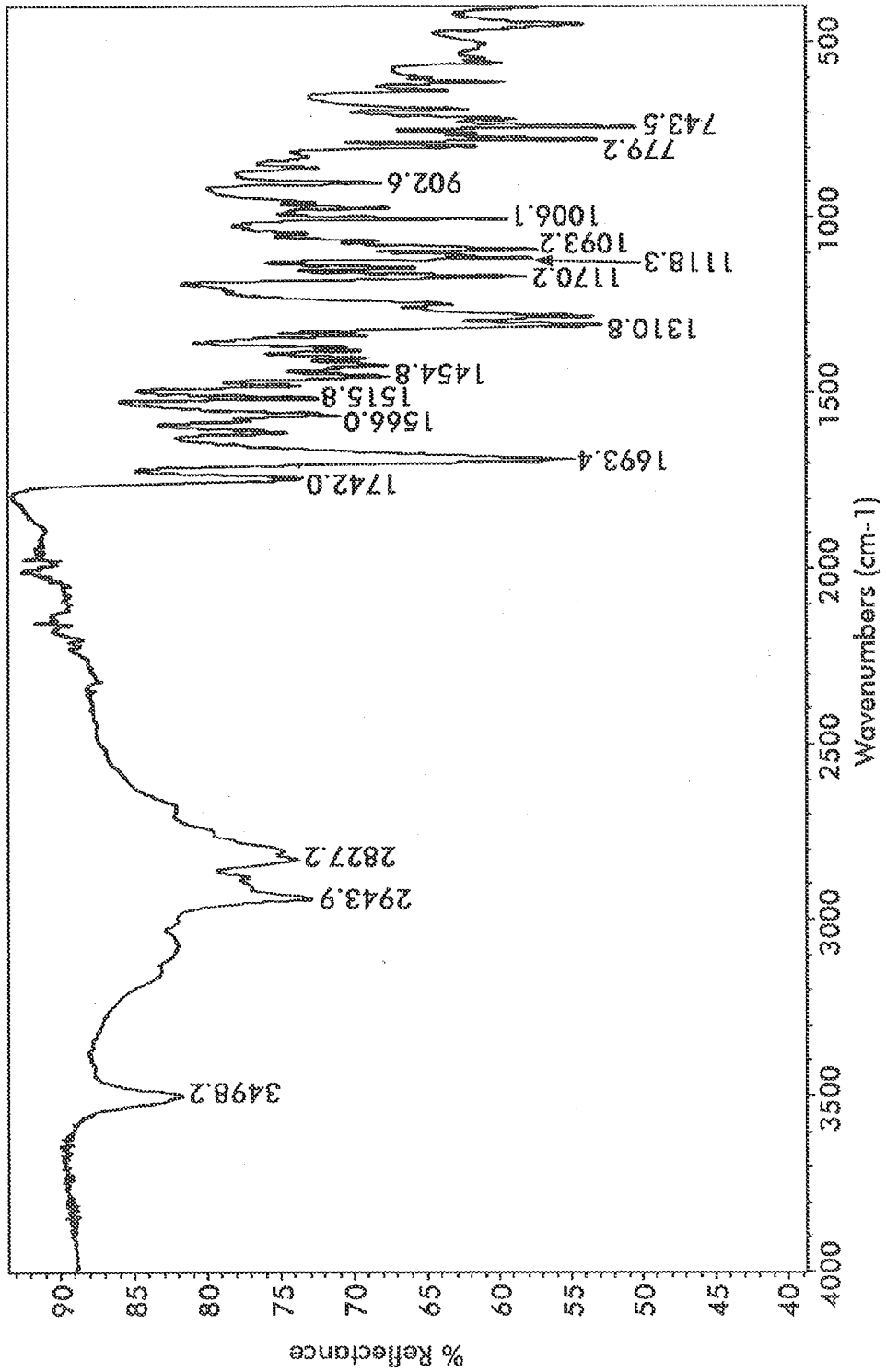
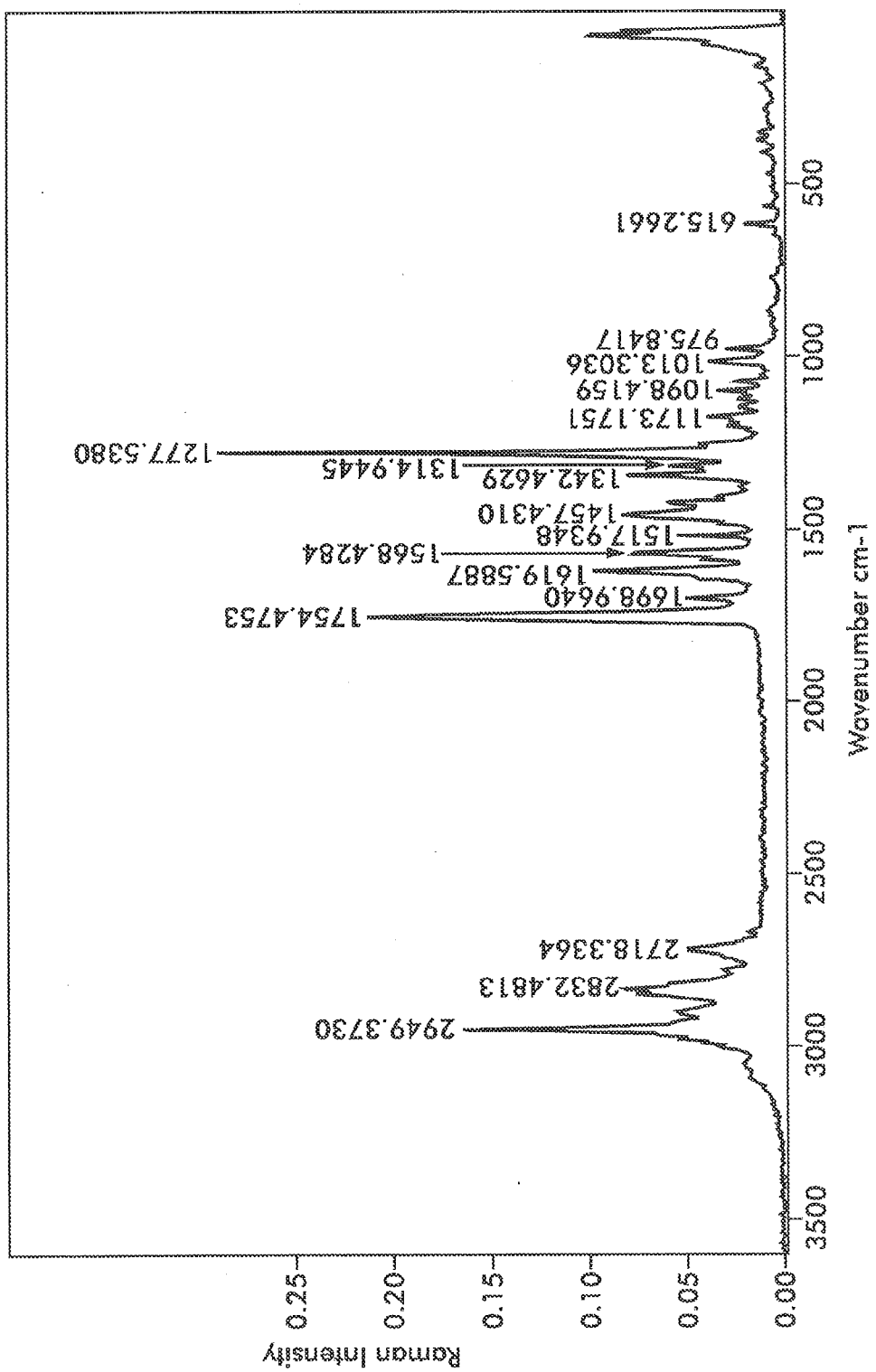

% Reflectance
90
85
80
75
70
65
60
55
50
45
40
4000
3500
3000
2500
2000
1500
1000
500
Wavenumbers (cm-1)
3498.2
2943.9
2827.2
1742.0
1693.4
1566.0
1515.8
1454.8
1310.8
1170.2
1118.3
1093.2
1006.1
902.6
779.2
743.5

FIG. 27


615.2661
975.8417
1013.3036
1098.4159
1173.1751
1277.5380
1314.9445
1342.4629
1457.4310
1517.9348
1568.4284
1619.5887
1698.9640
1754.4753
2718.3364
2832.4813
2949.3730
Raman Intensity
0.25
0.20
0.15
0.10
0.05
0.00
3500
3000
2500
2000
1500
1000
500
Wavenumber cm-1

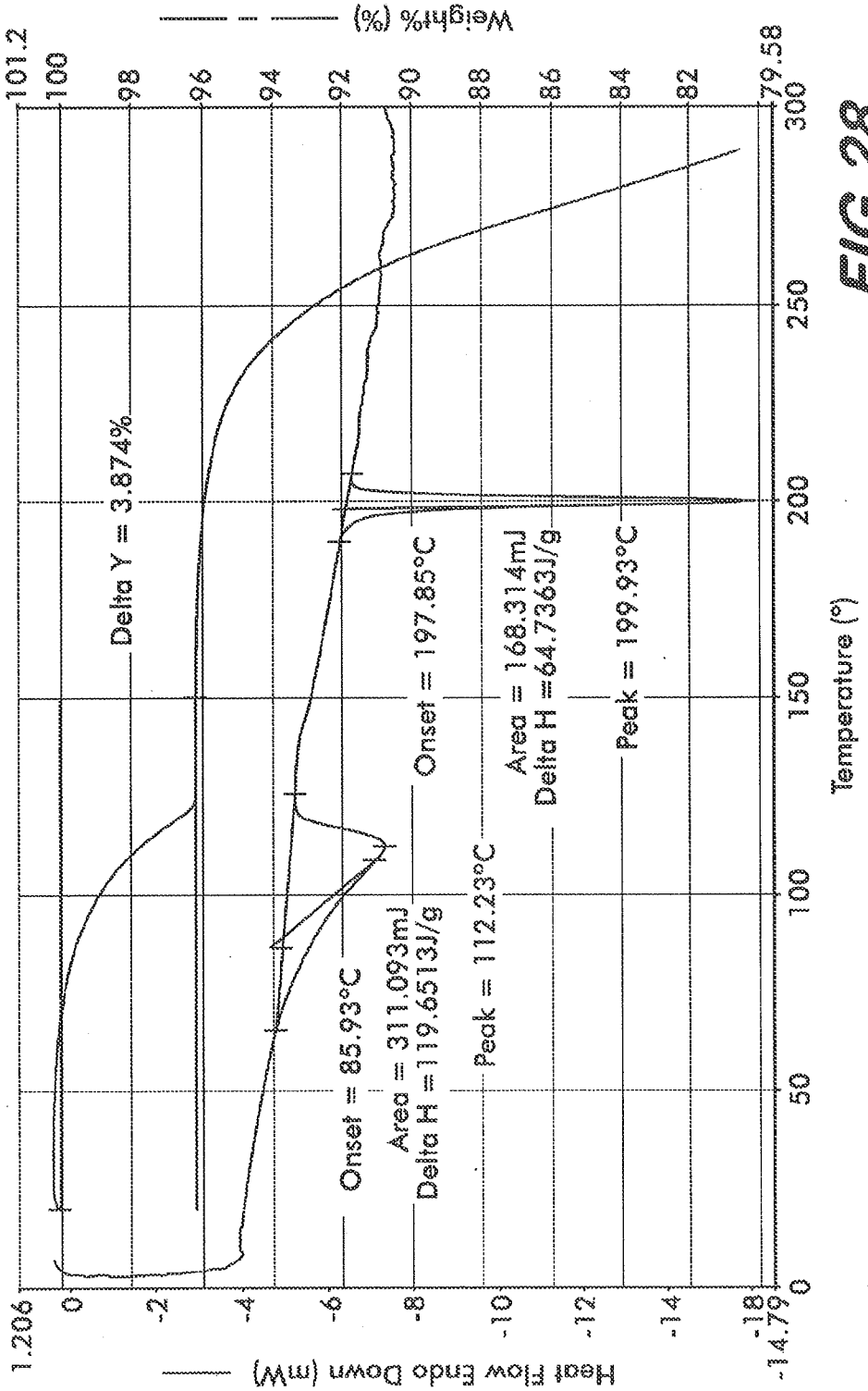

Weight% (%)
101.2
100
98
96
94
92
90
88
86
84
82
79.58
Delta Y = 3.874%
Onset = 85.93°C
Area = 311.093mJ
Delta H =119.6513J/g
Peak = 112.23°C
Onset = 197.85°C
Area = 168.314mJ
Delta H =64.7363J/g
Peak = 199.93°C
Heat flow Endo Down (mW)
1.206
0
-2
-4
-6
-8
-10
-12
-14
-14.79
-18
0
50
100
150
200
250
300
Temperature (°)

FIG. 28

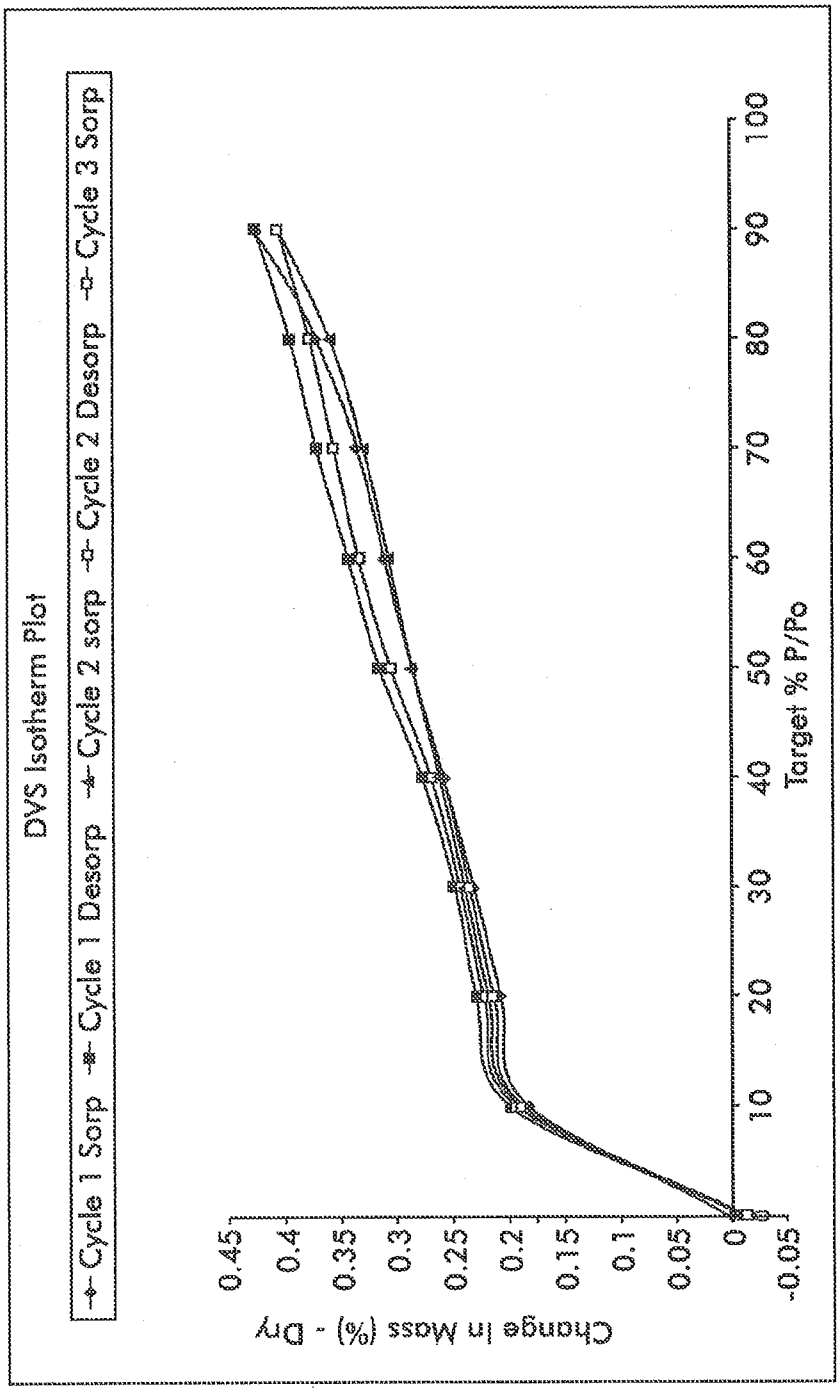
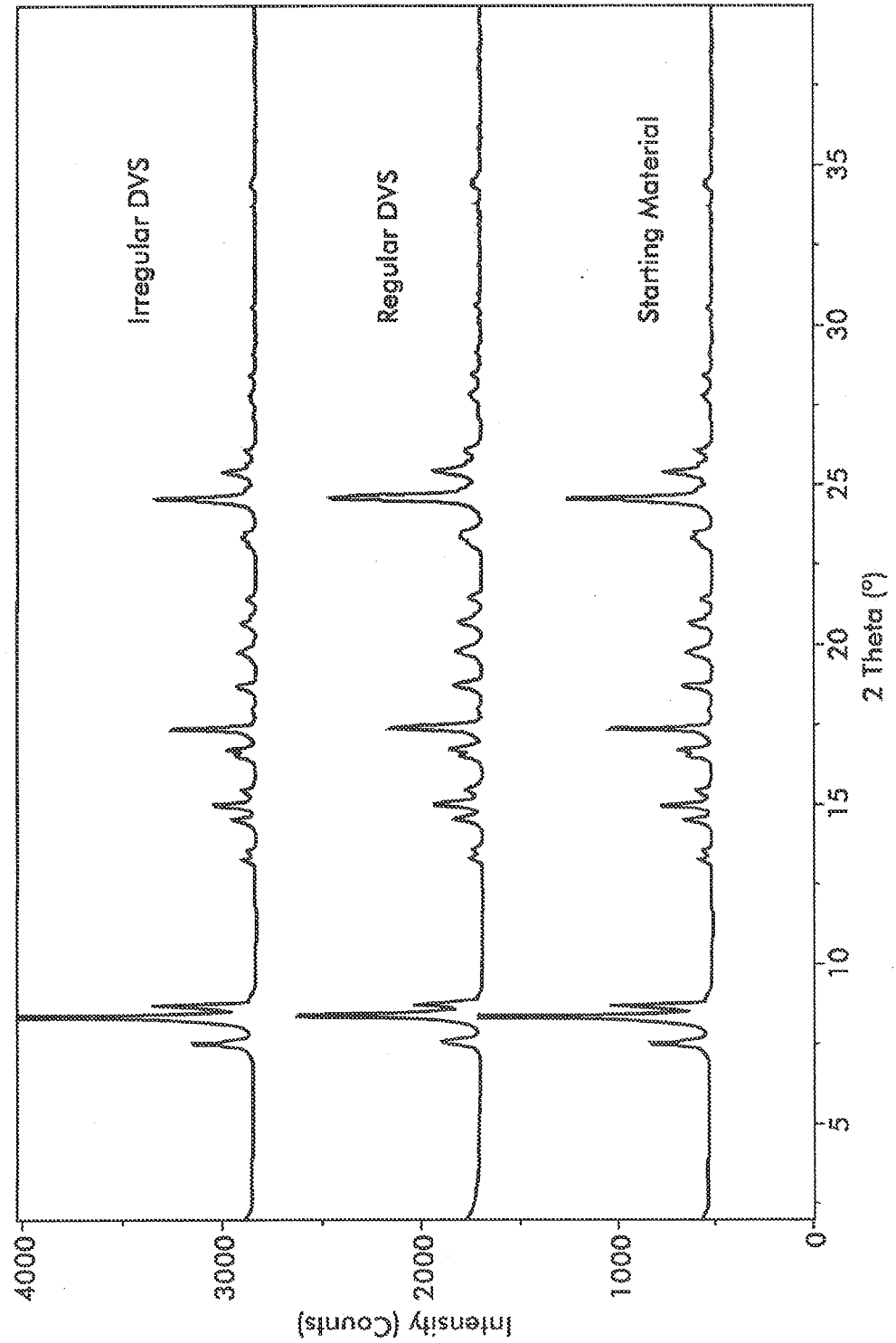

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Cycle 3 Sorp
Change in Mass (%) - Dry
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
10
20
30
40
50
60
70
80
90
100
Target % P/Po

FIG. 29

FIG. 30


Irregular DVS
Regular DVS
Starting Material
Intensity (Counts)
4000
3000
2000
1000
0
5
10
15
20
25
30
35
2 Theta (°)

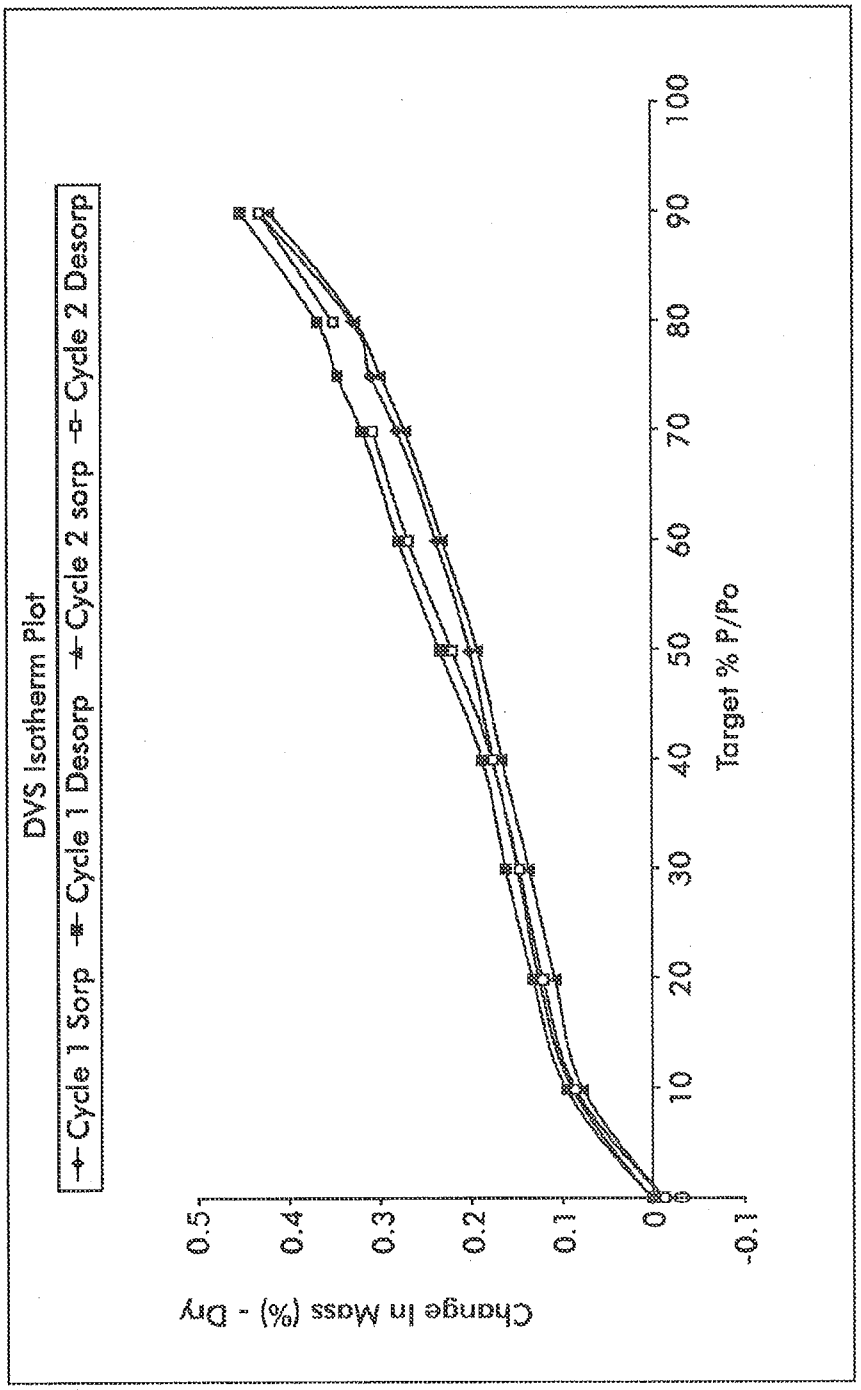

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Change in Mass (%) - Dry
0.5
0.4
0.3
0.2
0.1
0
-0.1
10
20
30
40
50
60
70
80
90
100
Target % P/Po

FIG. 31

FIG. 32

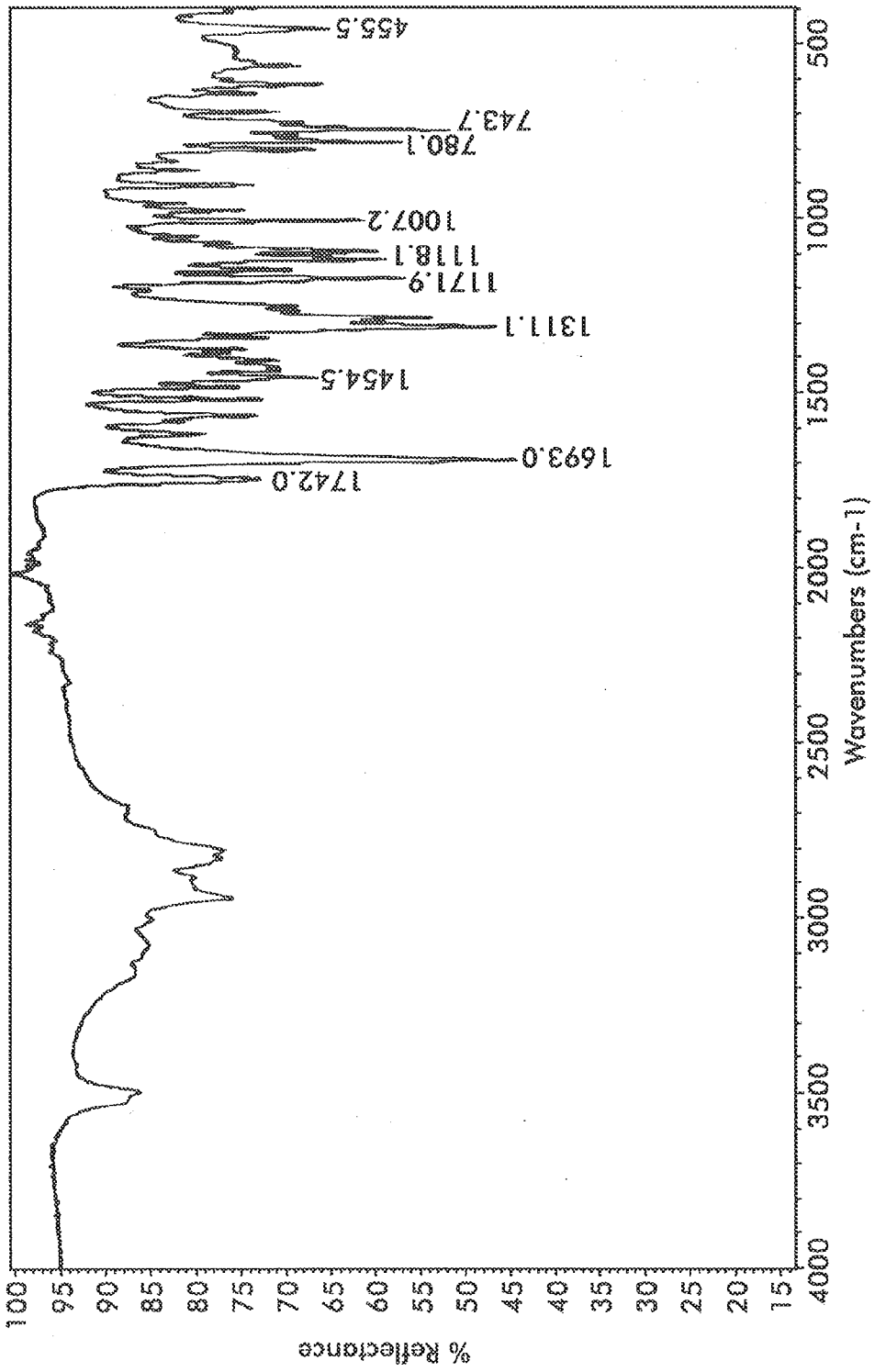
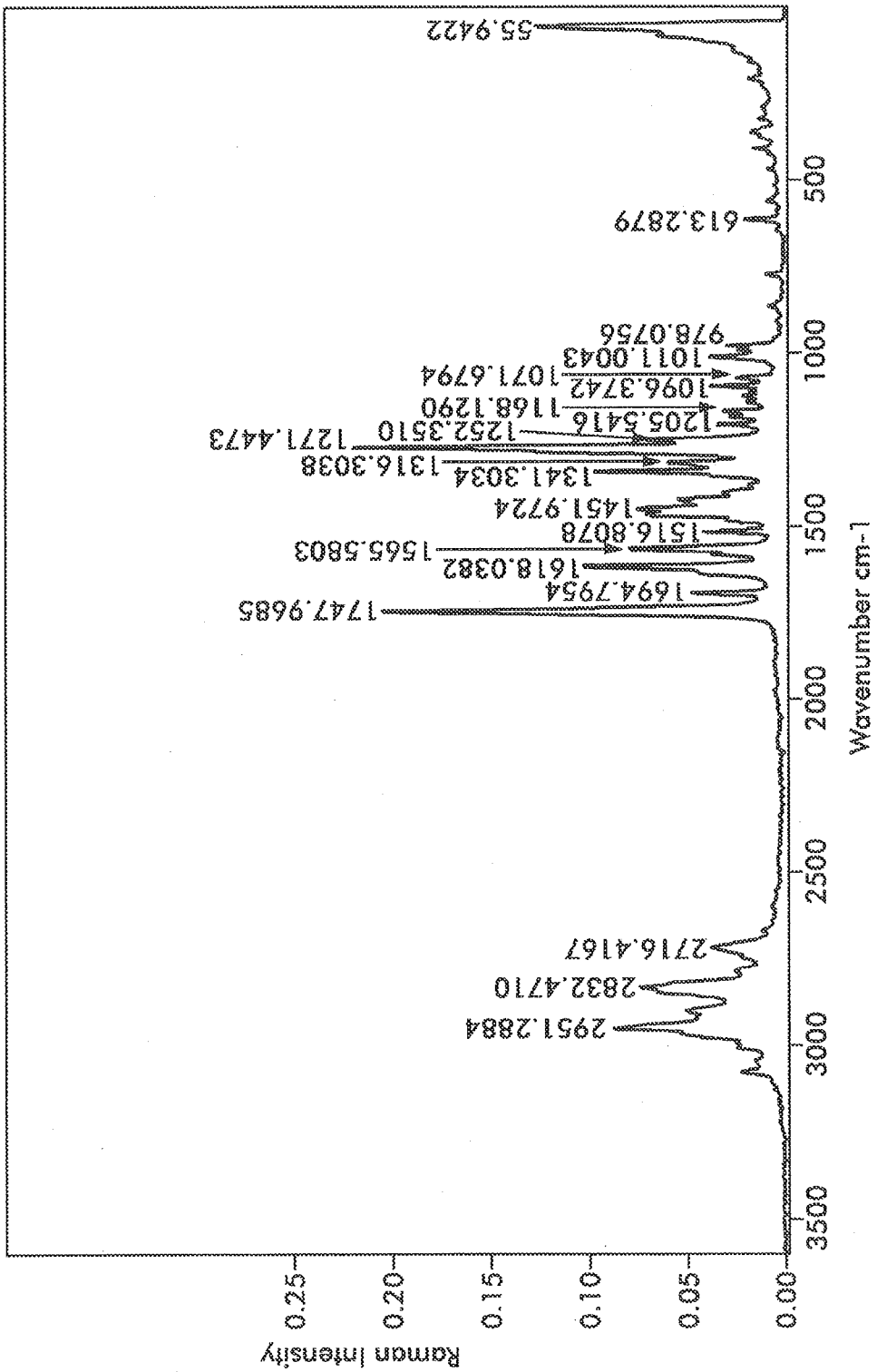

455.5
743.7
780.1
1007.2
1118.1
1171.9
1311.1
1454.5
1693.0
1742.0
% Reflectance
Wavenumbers (cm-1)

FIG. 33


55.9422
613.2879
978.0756
1011.0043
1071.6794
1096.3742
1168.1290
1205.5416
1252.3510
1271.4473
1316.3038
1341.3034
1451.9724
1516.8078
1565.5803
1618.0382
1694.7954
1747.9685
2716.4167
2832.4710
2951.2884
Raman Intensity
0.25
0.20
0.15
0.10
0.05
0.00
3500
3000
2500
2000
1500
1000
500
Wavenumber cm-1

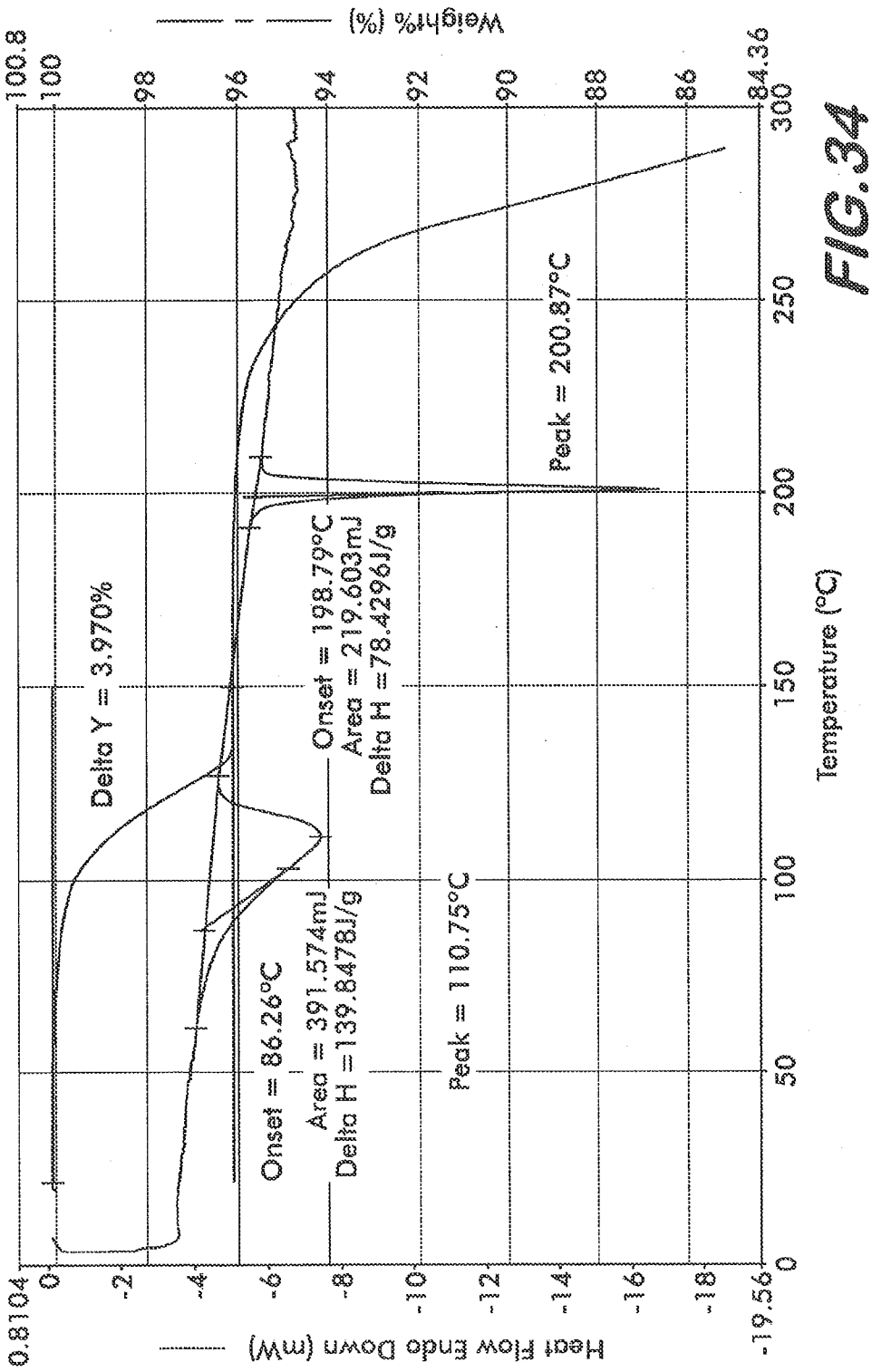

Weight% (%)
100.8
100
98
96
94
92
90
88
86
84.36
Heat Flow Endo Down (mW)
0.8104
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-19.56
Temperature (°C)
0
50
100
150
200
250
300
Delta Y = 3.970%
Onset = 86.26°C
Area = 391.574mJ
Delta H = 139.8478J/g
Peak = 110.75°C
Onset = 198.79°C
Area = 219.603mJ
Delta H = 78.4296J/g
Peak = 200.87°C

FIG. 34

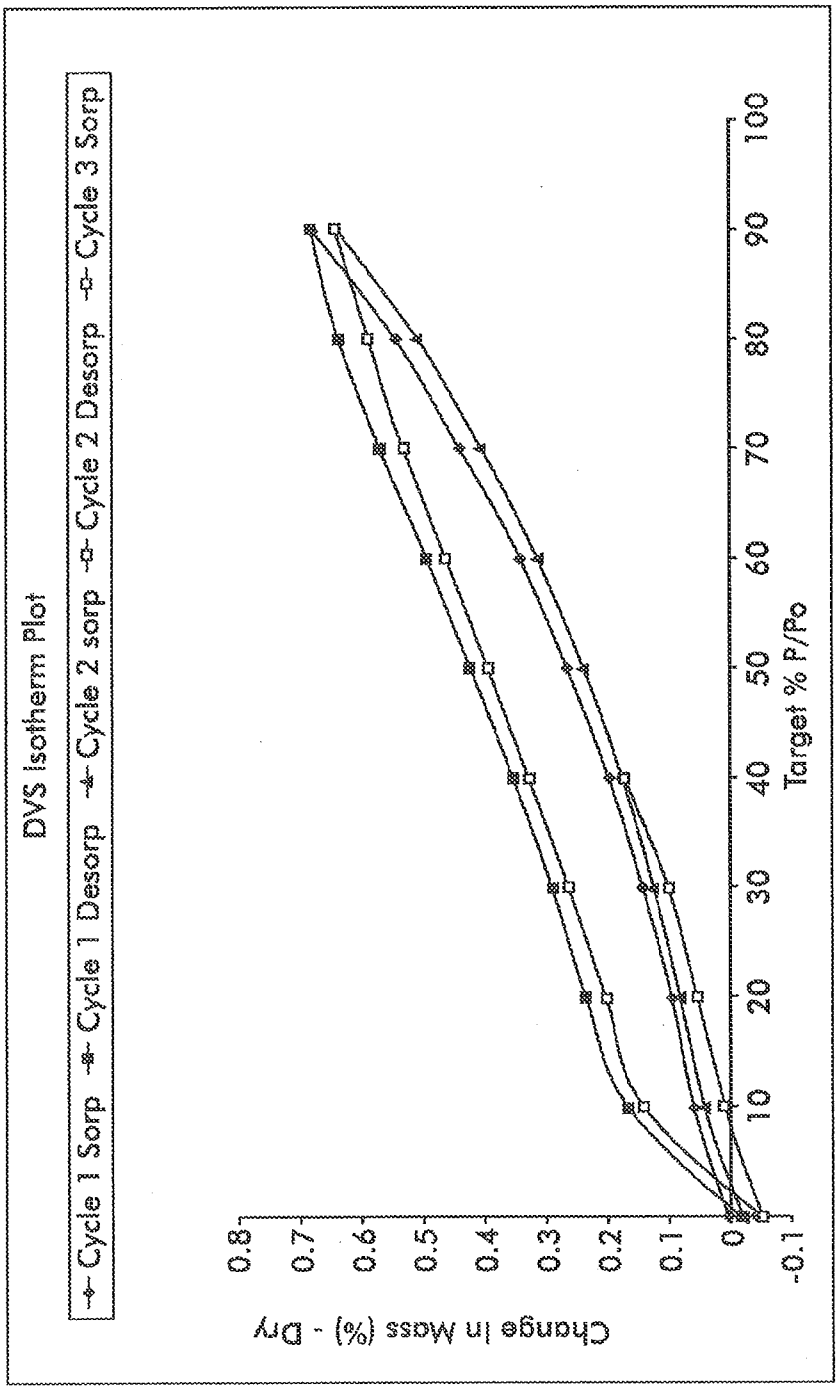
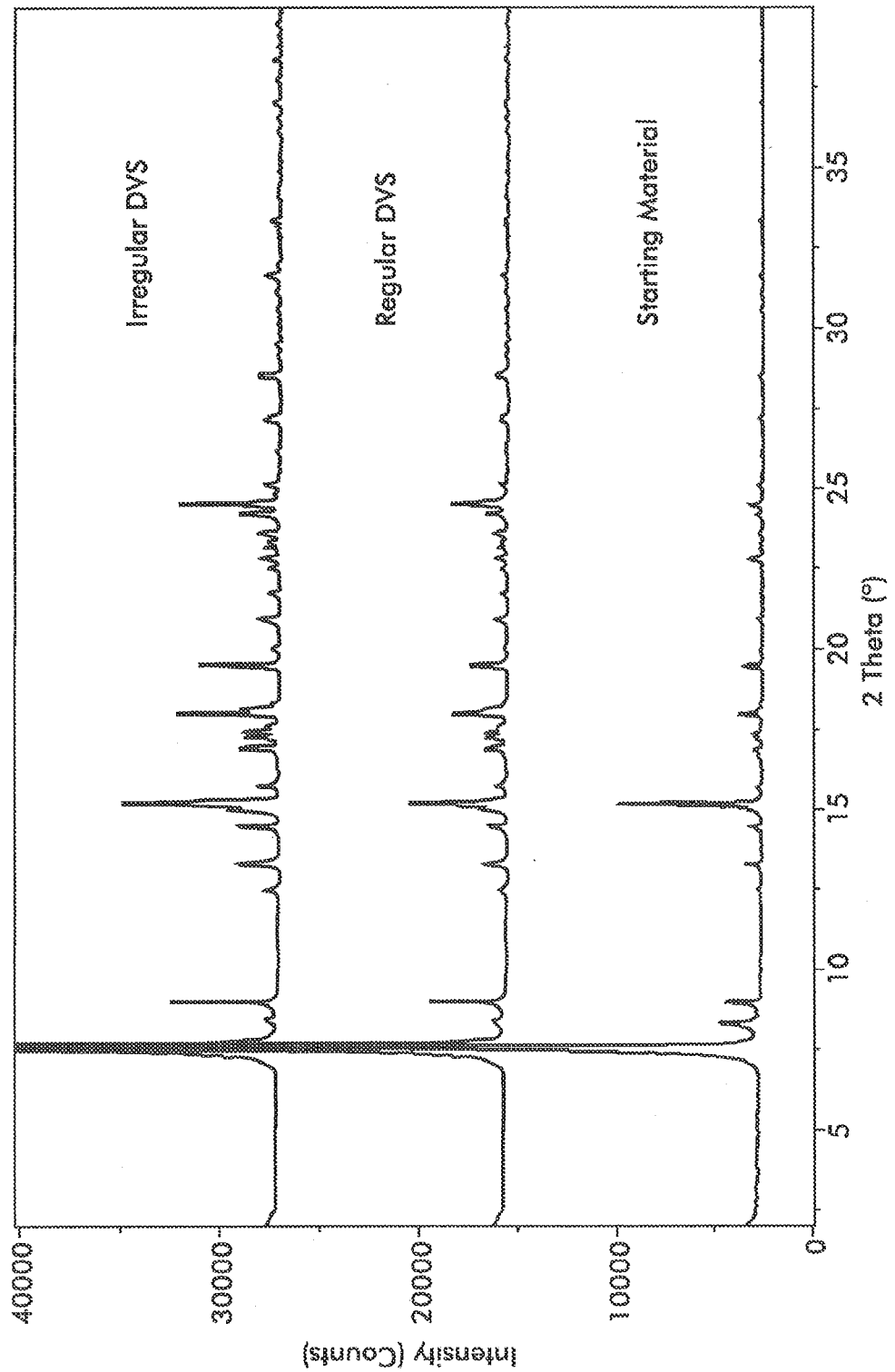

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Cycle 3 Sorp
Change in Mass (%) - Dry
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
Target % P/Po
0
10
20
30
40
50
60
70
80
90
100

FIG. 35

FIG. 36


Irregular DVS
Regular DVS
Starting Material
Intensity (Counts)
40000
30000
20000
10000
0
5
10
15
20
25
30
35
2 Theta (°)

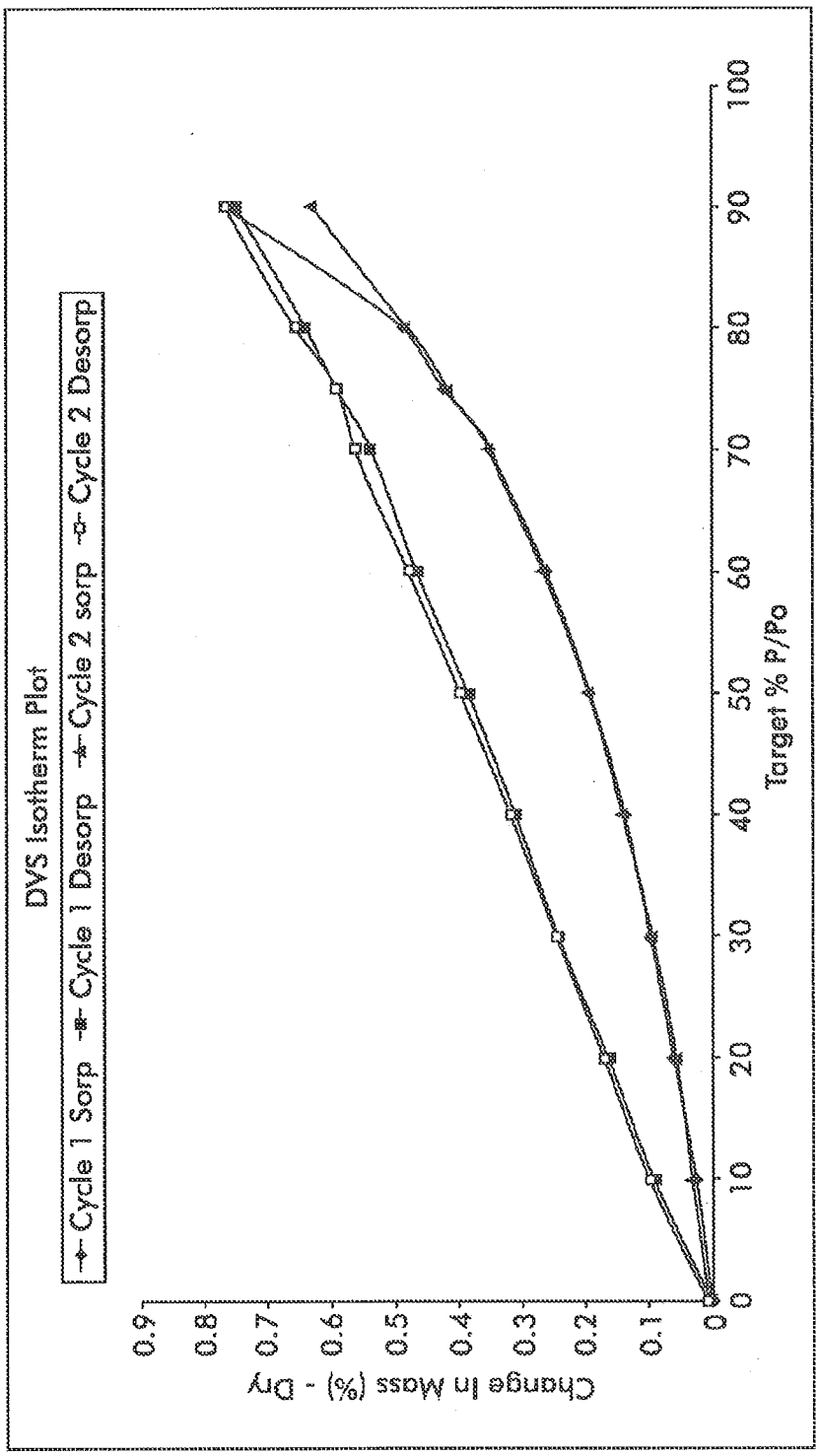

DVS Isotherm Plot
Cycle 1 Sorp
Cycle 1 Desorp
Cycle 2 sorp
Cycle 2 Desorp
Change In Mass (%) - Dry
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60
70
80
90
100
Target % P/Po

FIG. 37

FIG. 38

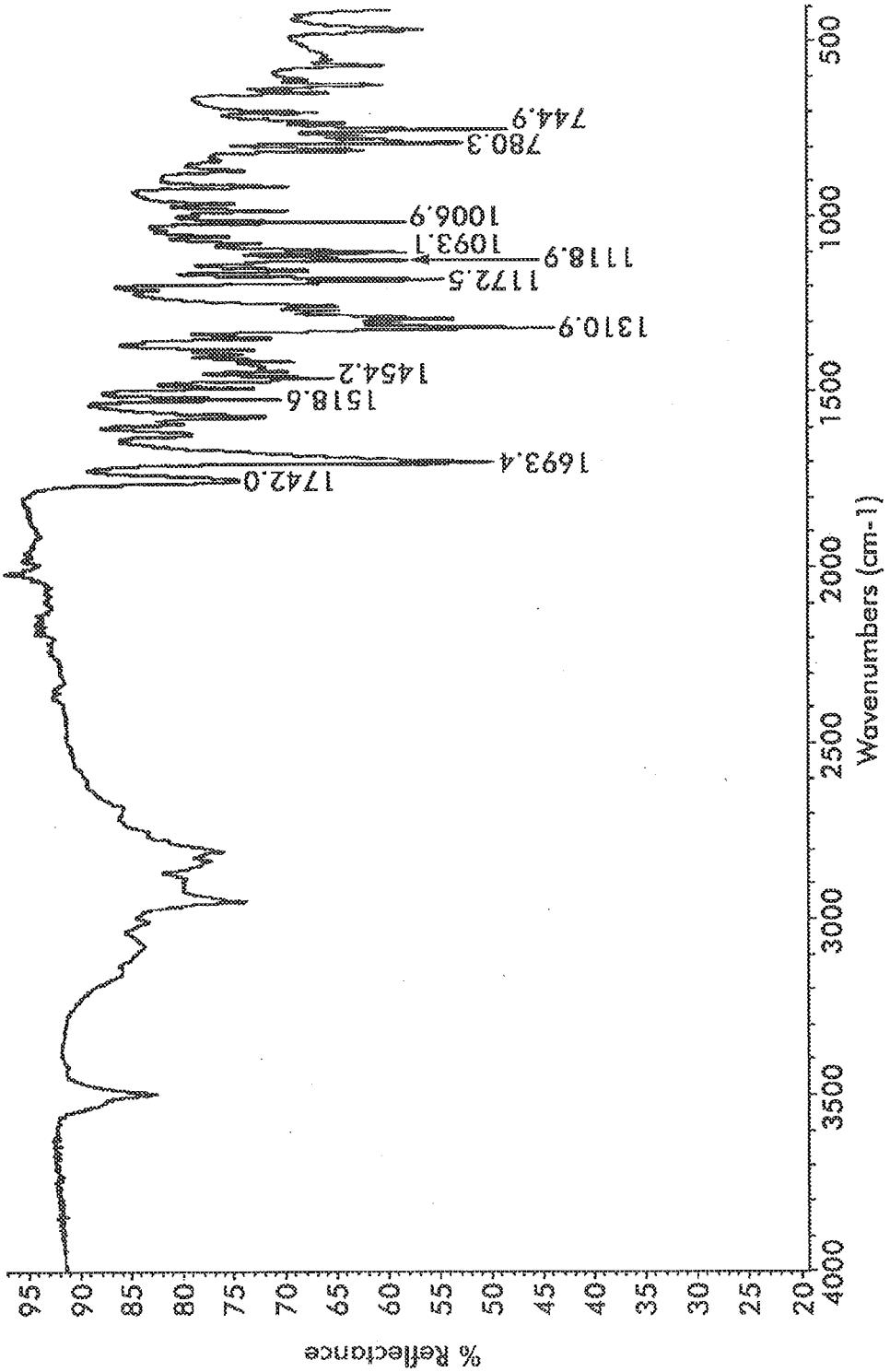
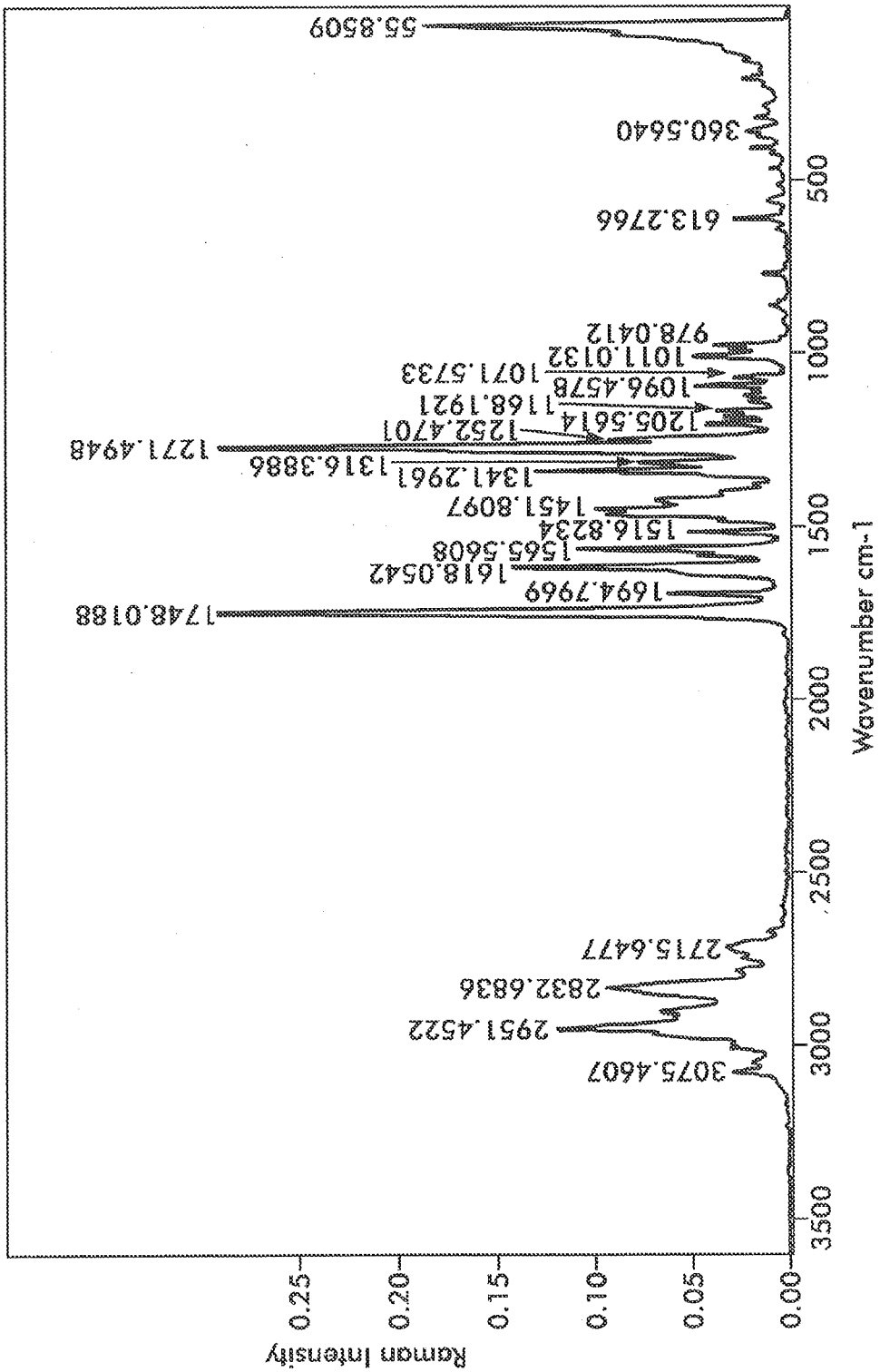

744.9
780.3
1006.9
1093.1
1118.9
1172.5
1310.9
1454.2
1518.6
1693.4
1742.0
% Reflectance
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
4000
3500
3000
2500
2000
1500
1000
500
Wavenumbers (cm-1)

FIG. 39


55.8509
360.5640
613.2766
978.0412
1011.0132
1071.5733
1096.4578
1168.1921
1205.5614
1252.4701
1271.4948
1316.3886
1341.2961
1451.8097
1516.8234
1565.5608
1618.0542
1694.7969
1748.0188
2715.6477
2832.6836
2951.4522
3075.4607
Raman Intensity
0.00
0.05
0.10
0.15
0.20
0.25
3500
3000
2500
2000
1500
1000
500
Wavenumber cm-1

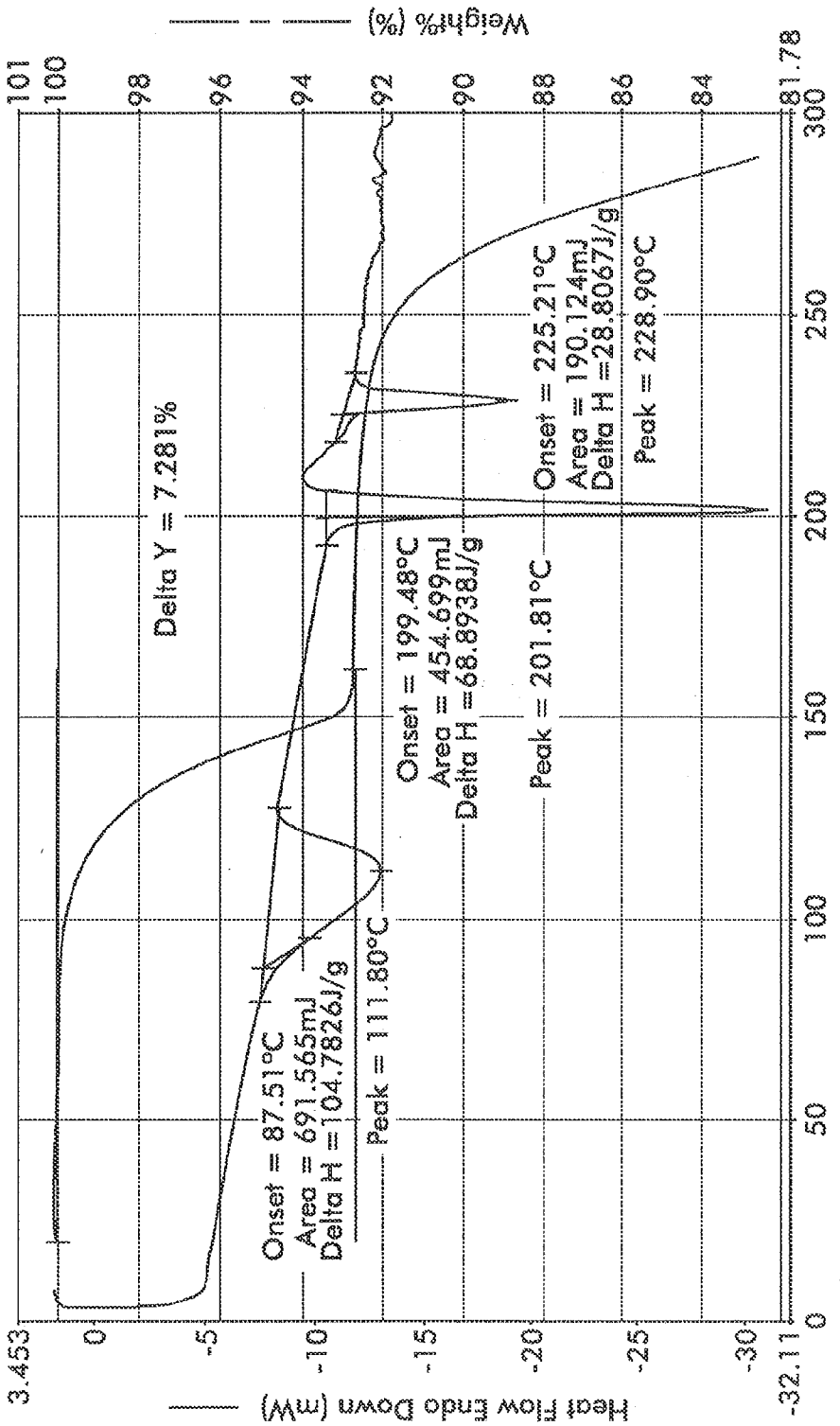

Weight% (%)
101
100
98
96
94
92
90
88
86
84
81.78
Delta Y = 7.281%
Onset = 87.51°C
Area = 691.565mJ
Delta H =104.7826J/g
Peak = 111.80°C
Onset = 199.48°C
Area = 454.699mJ
Delta H =68.8938J/g
Peak = 201.81°C
Onset = 225.21°C
Area = 190.124mJ
Delta H =28.8067J/g
Peak = 228.90°C
3.453
0
-5
-10
-15
-20
-25
-30
-32.11
Heat Flow Endo Down (mW)
0
50
100
150
200
250
300
Temperature (°C)

FIG. 40

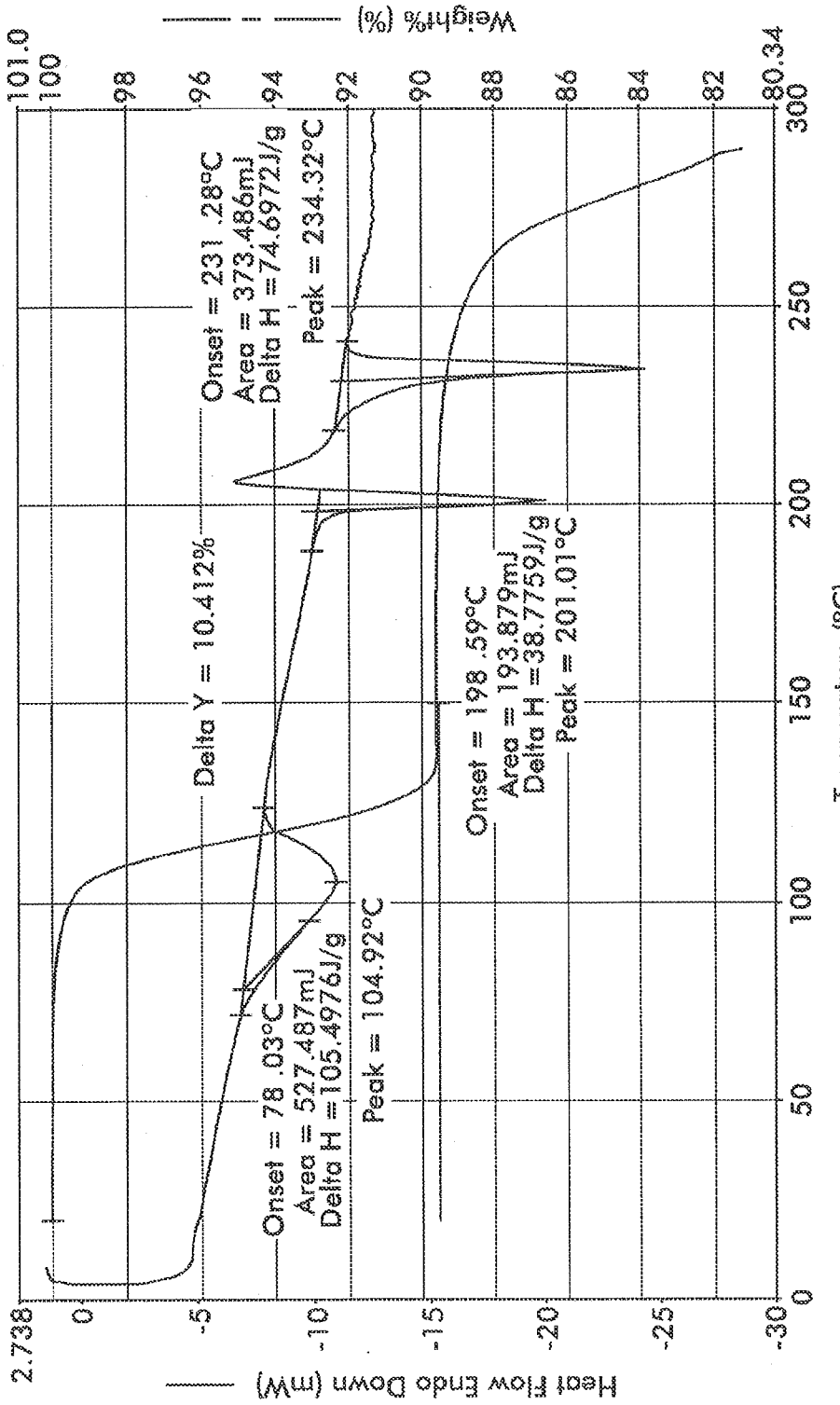

Weight% (%)
101.0
100
98
96
94
92
90
88
86
84
82
80.34
Onset = 231 .28°C
Area = 373.486mJ
Delta H =74.6972J/g
Peak = 234.32°C
Delta Y = 10.412%
Onset = 198 .59°C
Area = 193.879mJ
Delta H =38.7759J/g
Peak = 201.01°C
Onset = 78 .03°C
Area = 527.487mJ
Delta H =105.497δJ/g
Peak = 104.92°C
Heat flow Endo Down (mW)
2.738
0
-5
-10
-15
-20
-25
-30
0
50
100
150
200
250
300
Temperature (°C)

FIG. 41

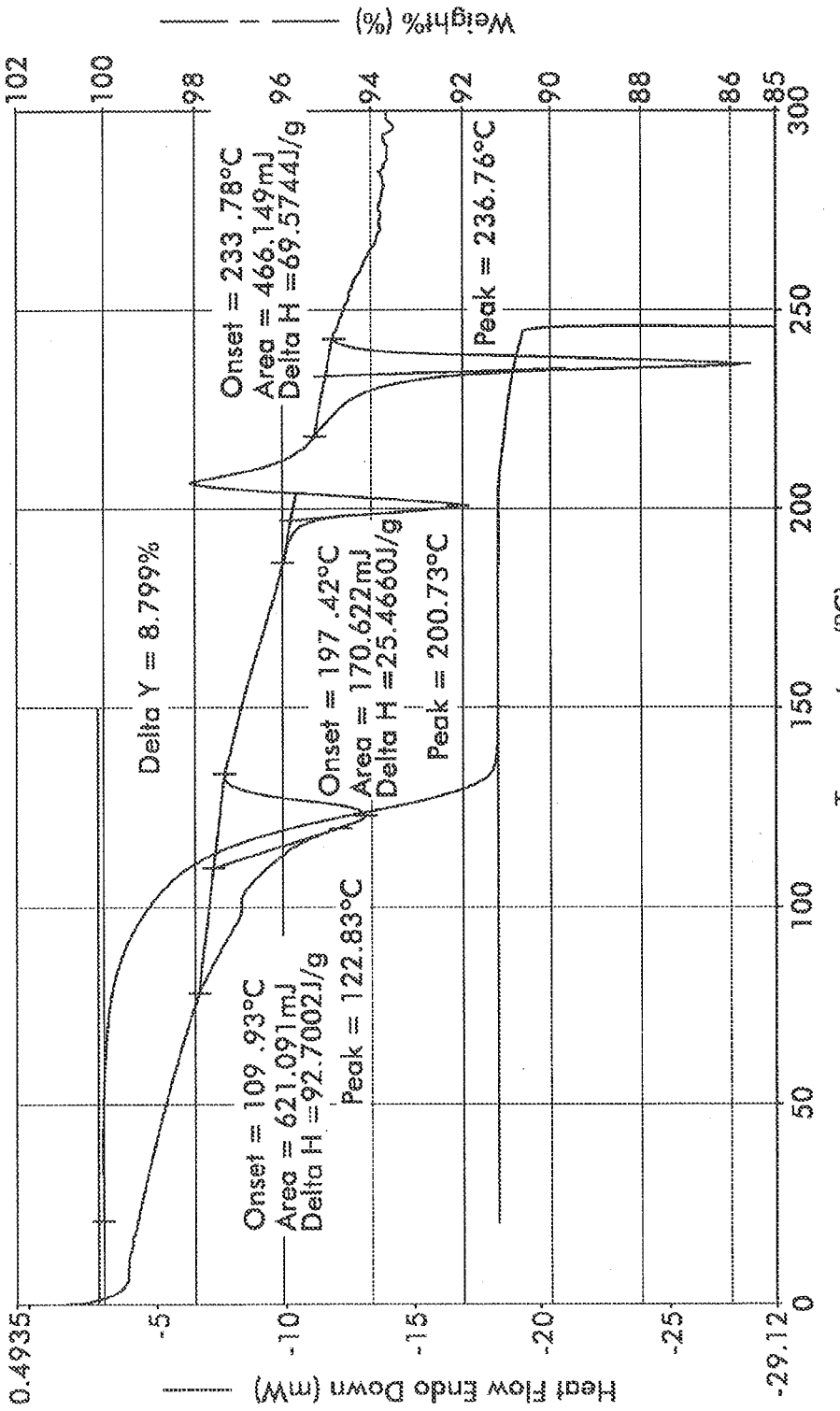

Weight% (%)
Heat flow Endo Down (mW)
Temperature (°C)
Onset = 233 .78°C
Area = 466.149mJ
Delta H =69.5744J/g
Peak = 236.76°C
Delta Y = 8.799%
Onset = 197 .42°C
Area = 170.622mJ
Delta H =25.4660J/g
Peak = 200.73°C
Onset = 109 .93°C
Area = 621.091mJ
Delta H =92.7002J/g
Peak = 122.83°C

FIG. 42

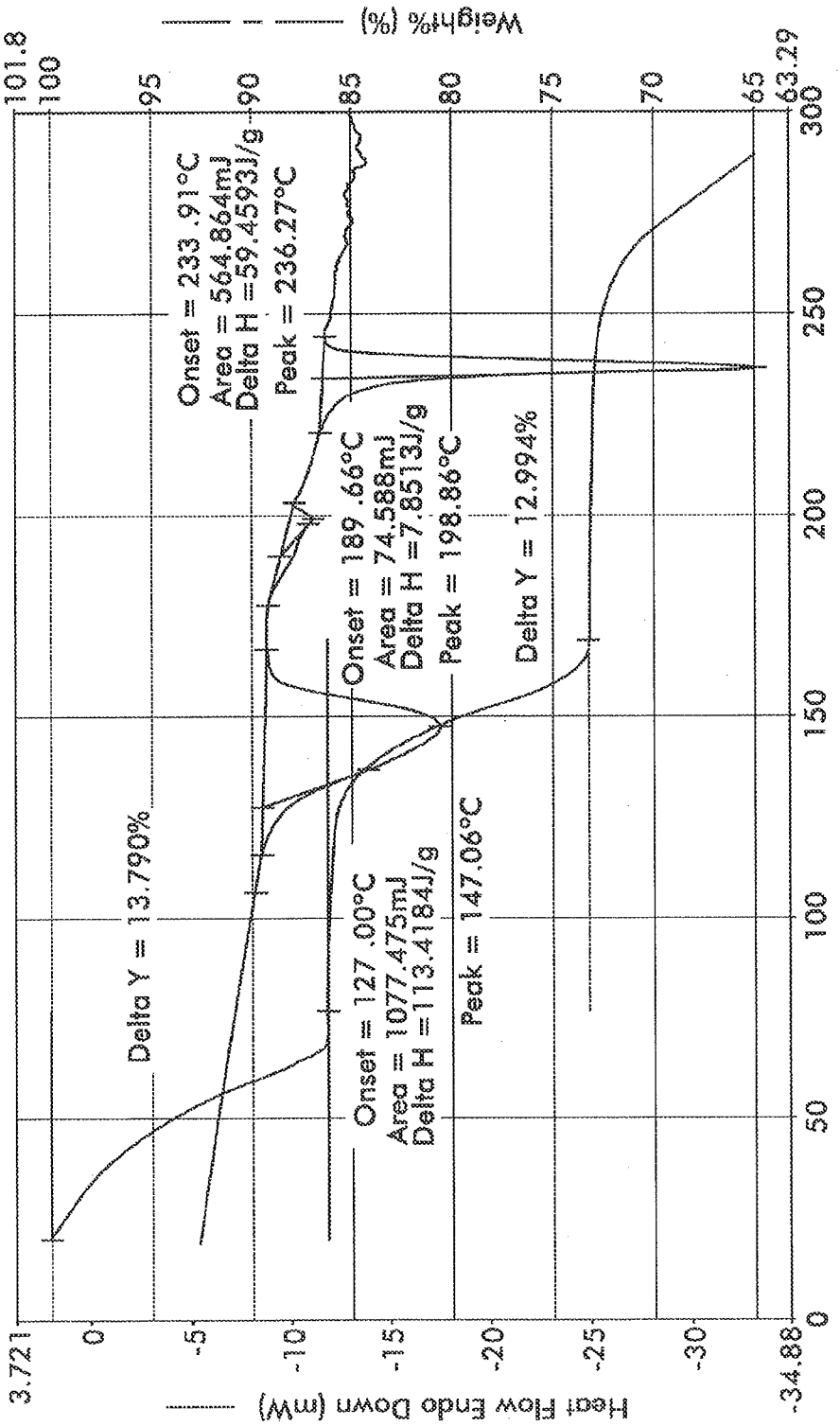

Weight% (%)
101.8
100
95
90
85
80
75
70
65
63.29
Onset = 233.91°C
Area = 564.864mJ
Delta H = 59.4593J/g
Peak = 236.27°C
Onset = 189.66°C
Area = 74.588mJ
Delta H = 7.8513J/g
Peak = 198.86°C
Delta Y = 12.994%
Onset = 127.00°C
Area = 1077.475mJ
Delta H = 113.4184J/g
Peak = 147.06°C
Delta Y = 13.790%
3.721
0
-5
-10
-15
-20
-25
-30
-34.88
Heat Flow Endo Down (mW)
0
50
100
150
200
250
300
Temperature (°C)

FIG. 43

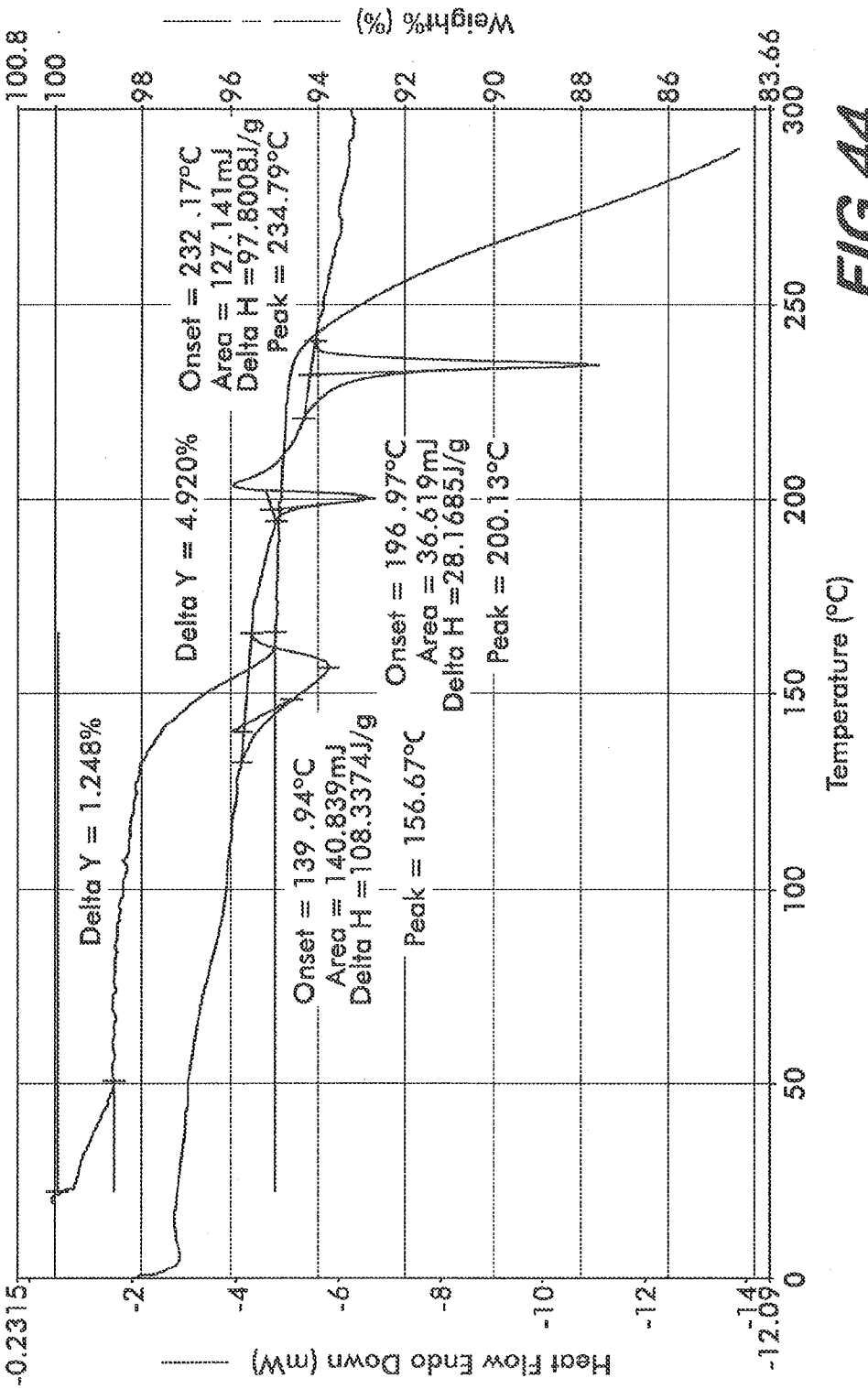

Weight% (%)
100.8
100
98
96
94
92
90
88
86
83.66
Heat Flow Endo Down (mW)
-0.2315
-2
-4
-6
-8
-10
-12
-14
-12.09
Temperature (°C)
0
50
100
150
200
250
300
Delta Y = 1.248%
Onset = 139 .94°C
Area = 140.839mJ
Delta H =108.3374J/g
Peak = 156.67°C
Delta Y = 4.920%
Onset = 196 .97°C
Area = 36.619mJ
Delta H =28.1685J/g
Peak = 200.13°C
Onset = 232 .17°C
Area = 127.141mJ
Delta H =97.8008J/g
Peak = 234.79°C

FIG. 44

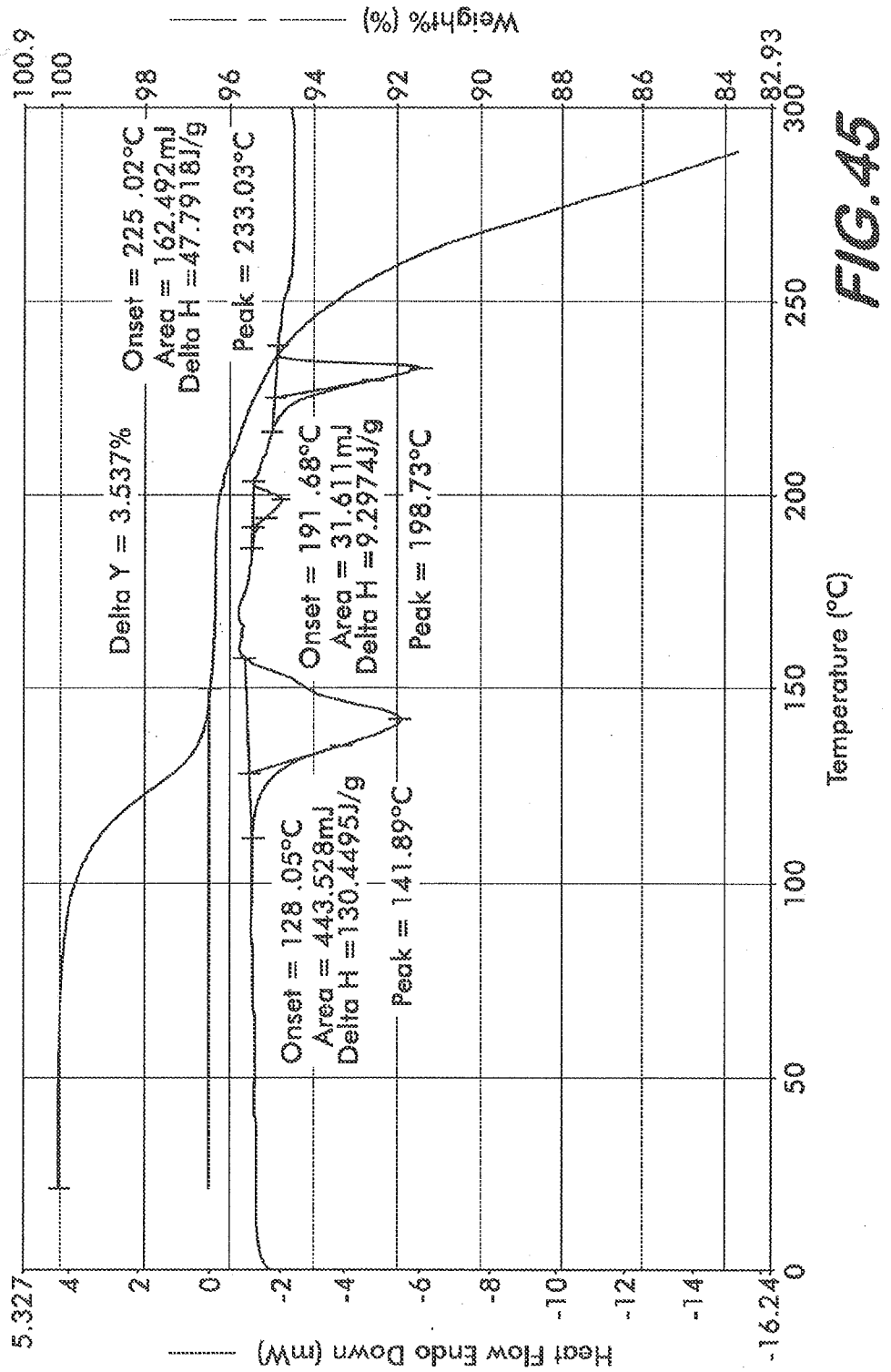

Weight% (%)
100.9
100
98
96
94
92
90
88
86
84
82.93
Heat Flow Endo Down (mW)
5.327
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16.24
Temperature (°C)
0
50
100
150
200
250
300
Delta Y = 3.537%
Onset = 225 .02°C
Area = 162.492mJ
Delta H = 47.79181J/g
Peak = 233.03°C
Onset = 191 .68°C
Area = 31.611mJ
Delta H = 9.2974J/g
Peak = 198.73°C
Onset = 128 .05°C
Area = 443.528mJ
Delta H = 130.4495J/g
Peak = 141.89°C

FIG. 45

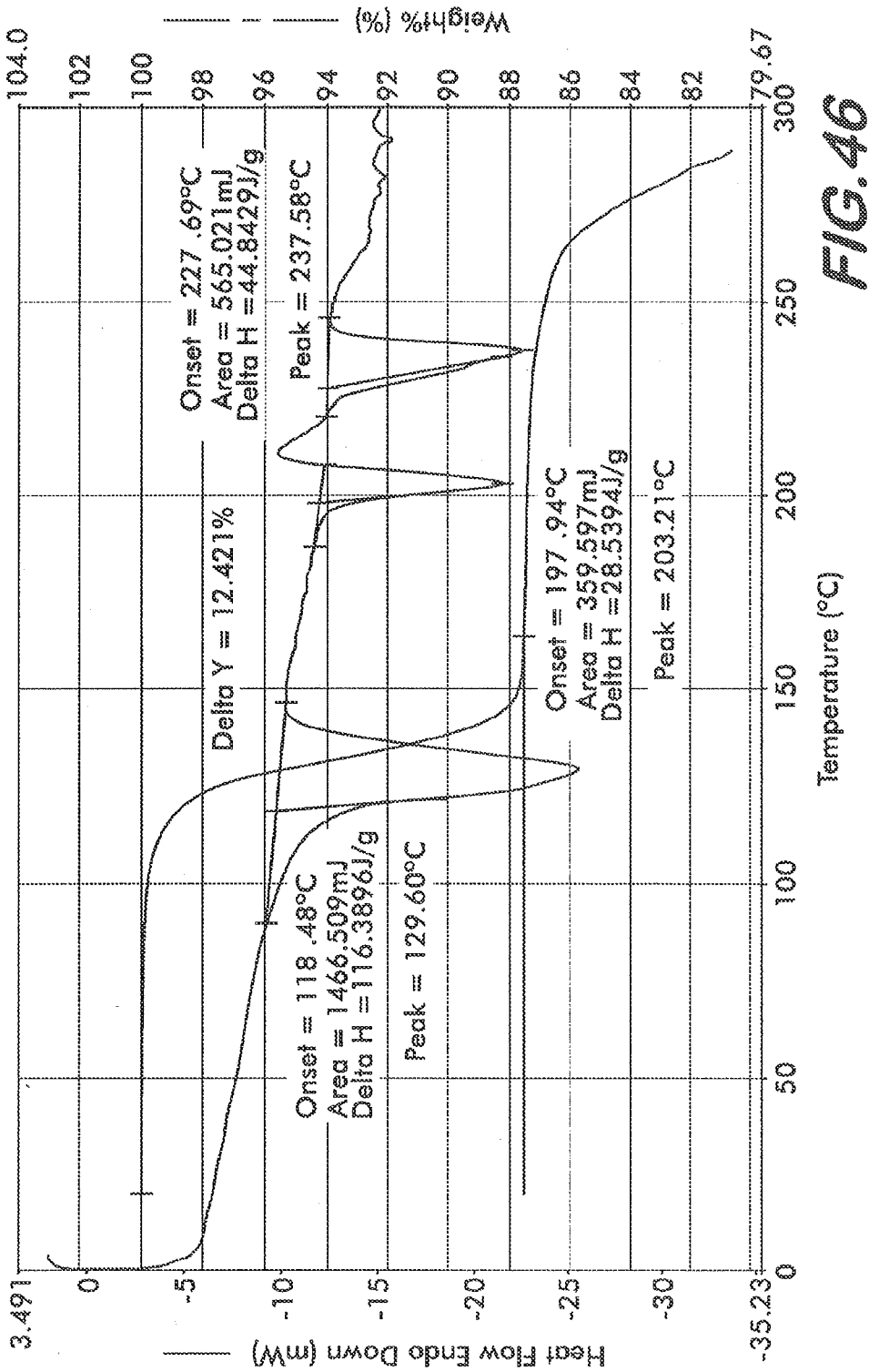

Weight% (%)
104.0
102
100
98
96
94
92
90
88
86
84
82
79.67
Onset = 227.69°C
Area = 565.021mJ
Delta H = 44.8429J/g
Peak = 237.58°C
Delta Y = 12.421%
Onset = 197.94°C
Area = 359.597mJ
Delta H = 28.5394J/g
Peak = 203.21°C
Onset = 118.48°C
Area = 1466.509mJ
Delta H = 116.3896J/g
Peak = 129.60°C
3.491
0
-5
-10
-15
-20
-25
-30
-35.23
Heat flow Endo Down (mW)
0
50
100
150
200
250
300
Temperature (°C)

FIG. 46

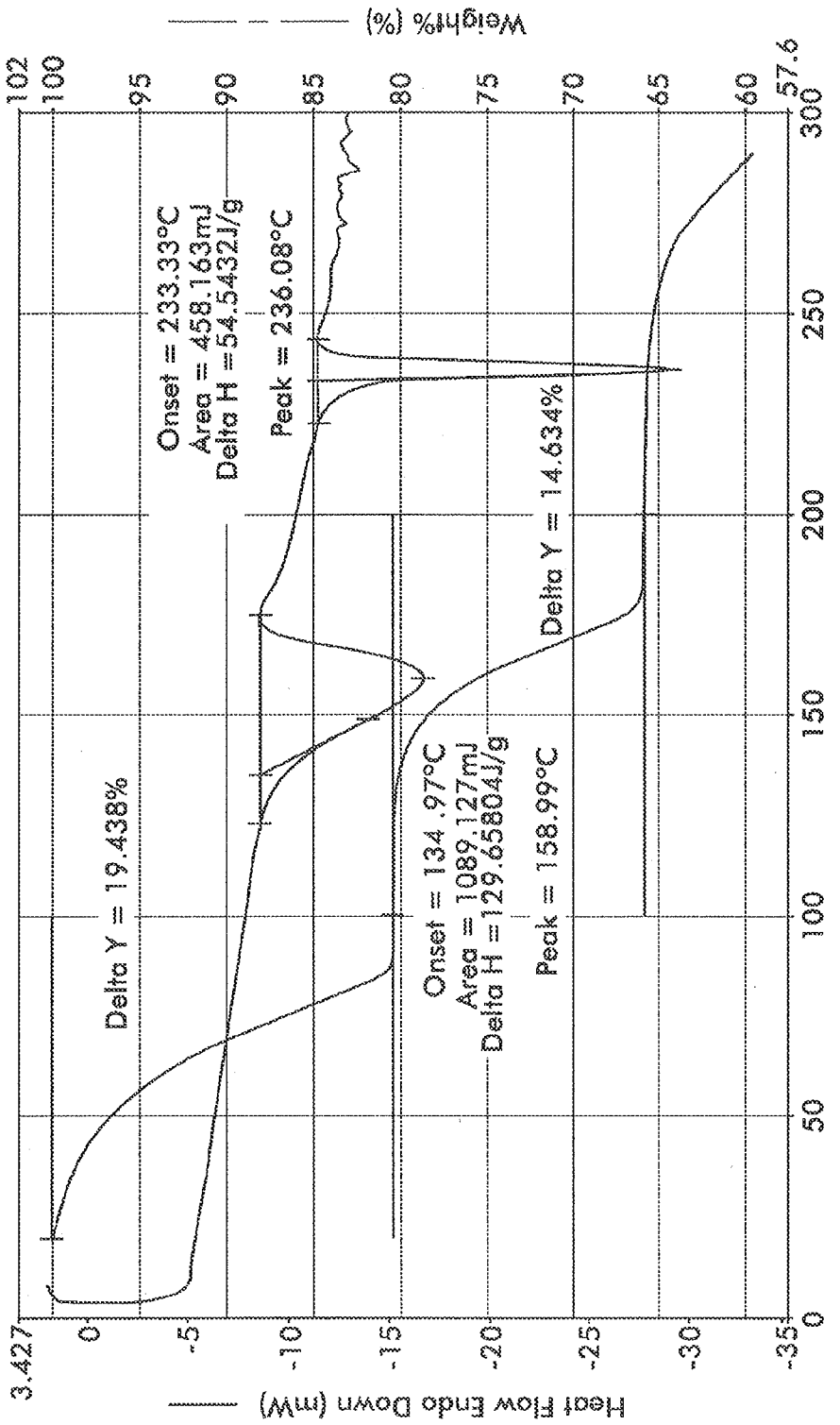

Weight% (%)
Heat Flow Endo Down (mW)
Temperature (°C)
Onset = 233.33°C
Area = 458.163mJ
Delta H = 54.5432J/g
Peak = 236.08°C
Delta Y = 19.438%
Onset = 134.97°C
Area = 1089.127mJ
Delta H = 129.65804J/g
Peak = 158.99°C
Delta Y = 14.634%

FIG. 47

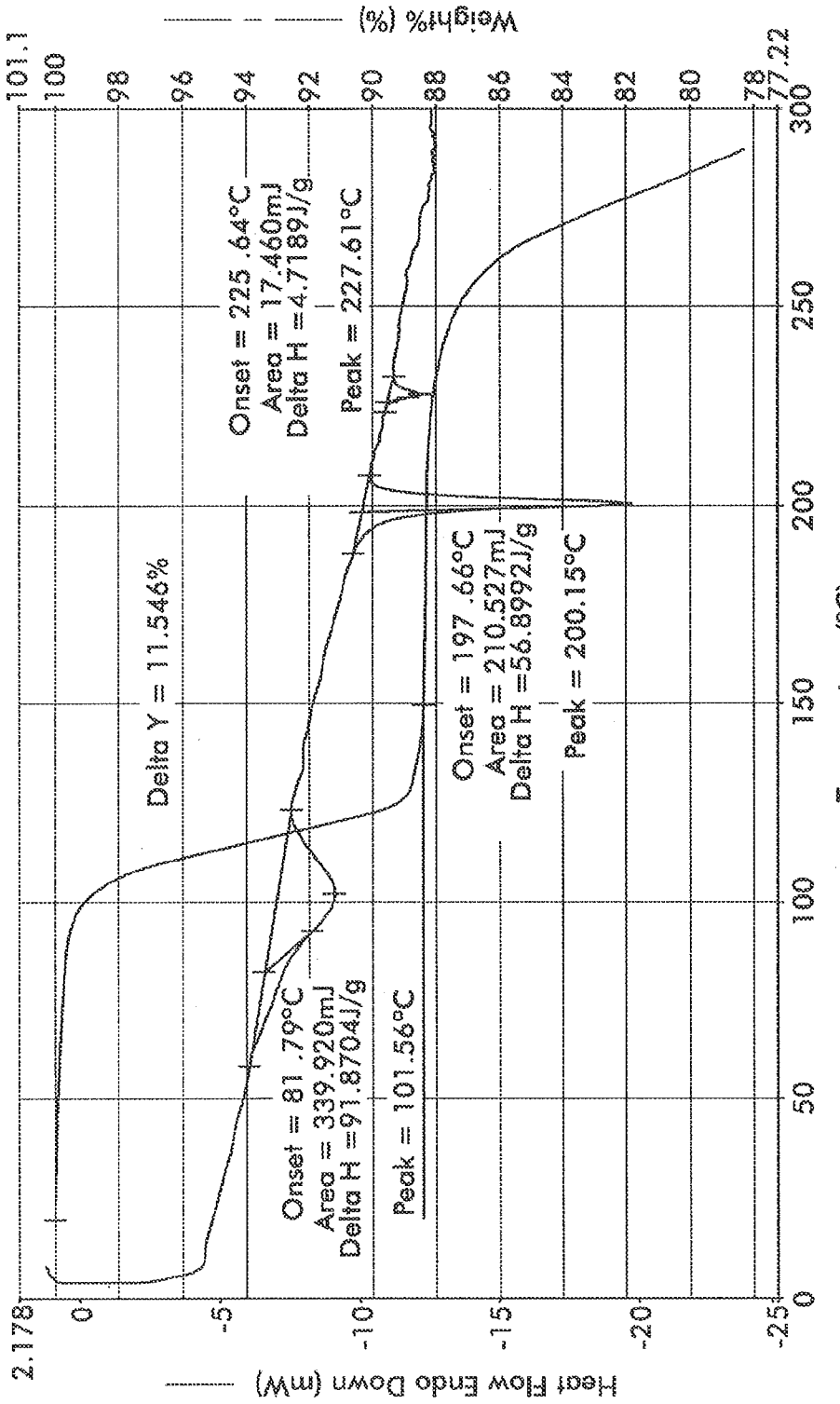

Weight% (%)
Heat Flow Endo Down (mW)
Temperature (°C)
Delta Y = 11.546%
Onset = 225.64°C
Area = 17.460mJ
Delta H = 4.7189J/g
Peak = 227.61°C
Onset = 197.66°C
Area = 210.527mJ
Delta H = 56.8992J/g
Peak = 200.15°C
Onset = 81.79°C
Area = 339.920mJ
Delta H = 91.8704J/g
Peak = 101.56°C

FIG. 48

FIG. 49

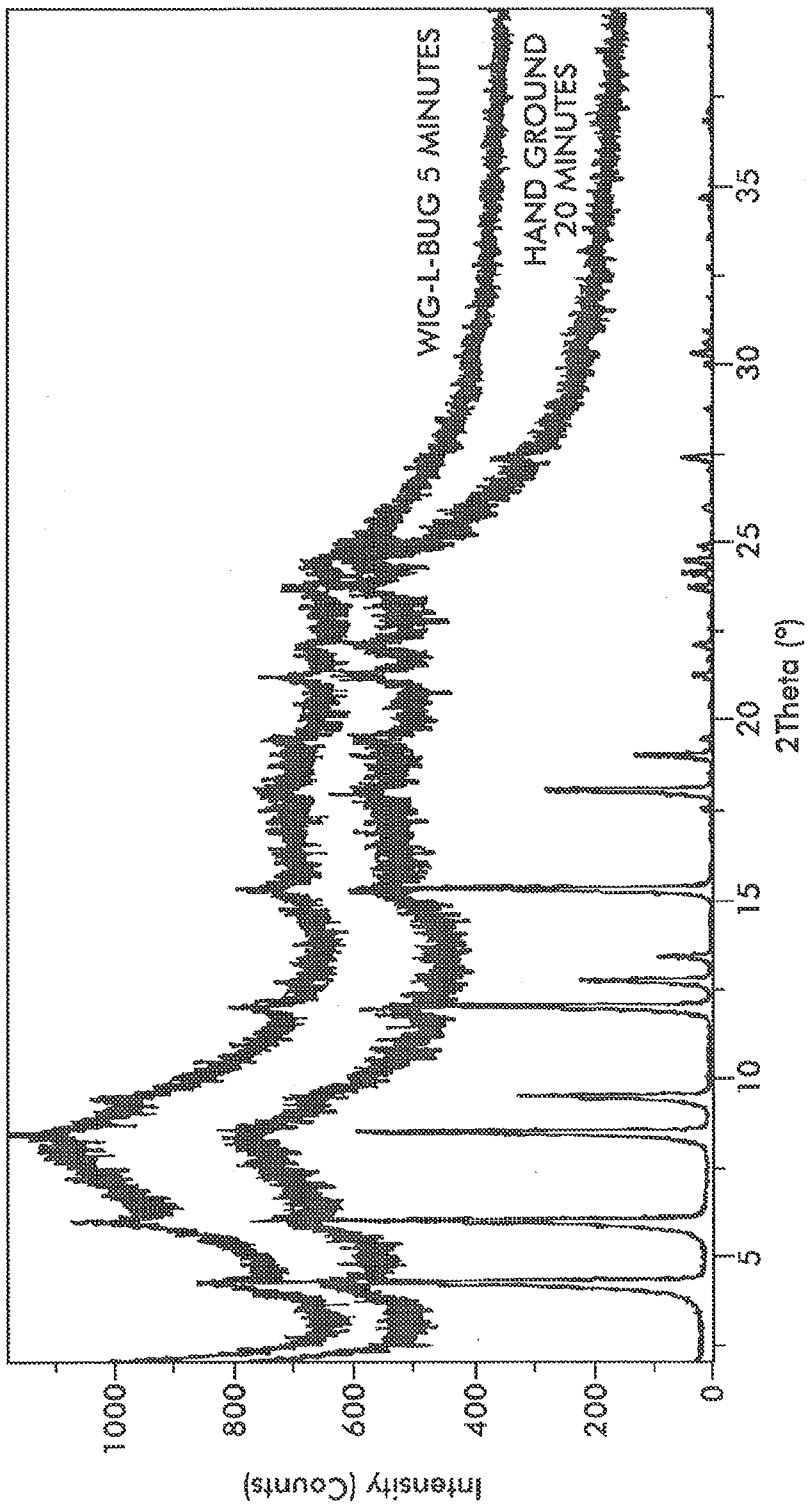
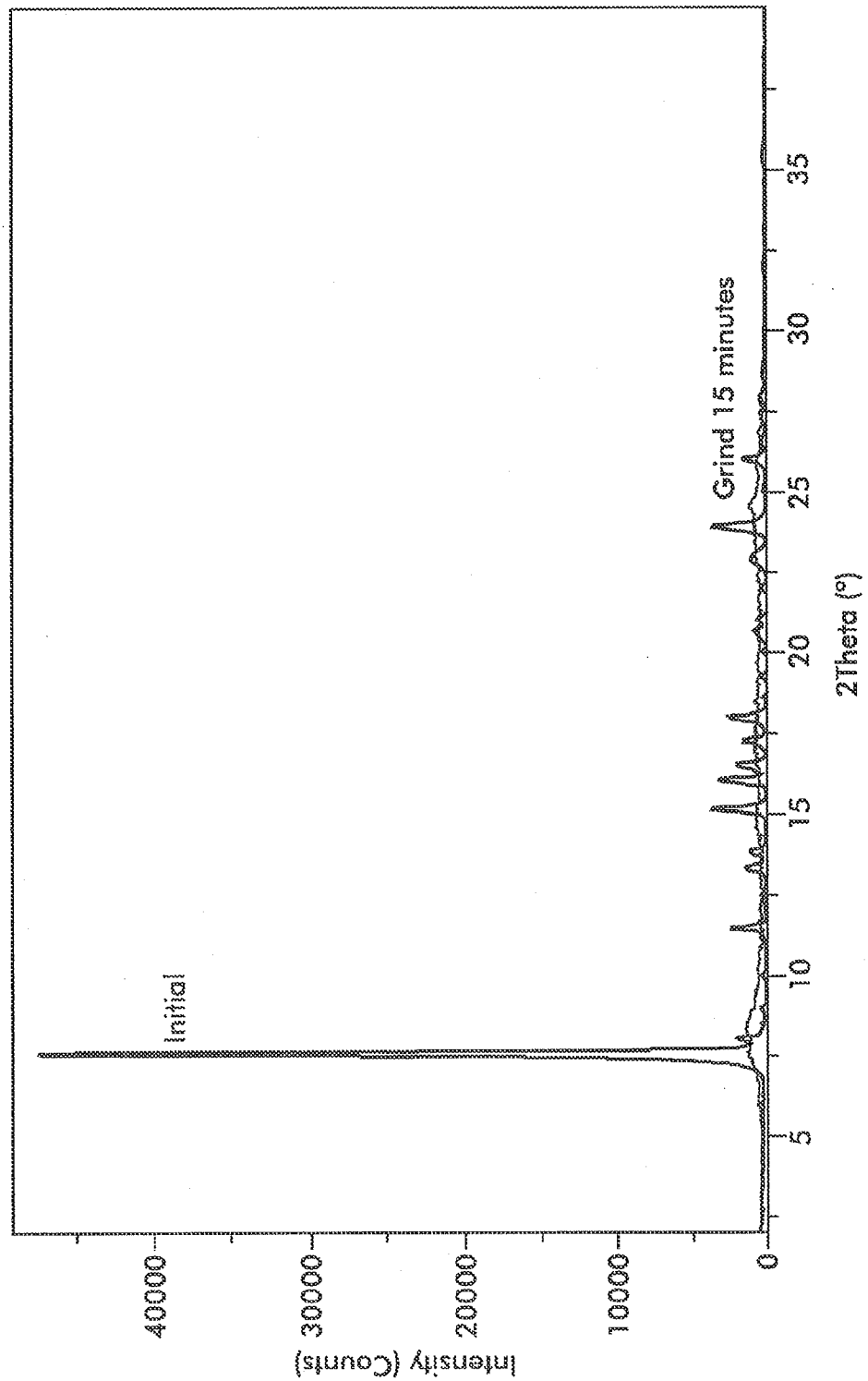

WIG-L-BUG 5 MINUTES
HAND GROUND 20 MINUTES
Intensity (Counts)
2Theta (°)
0
200
400
600
800
1000
5
10
15
20
25
30
35

FIG. 50


Initial
Grind 15 minutes
Intensity (Counts)
40000
30000
20000
10000
0
5
10
15
20
25
30
35
2Theta (°)

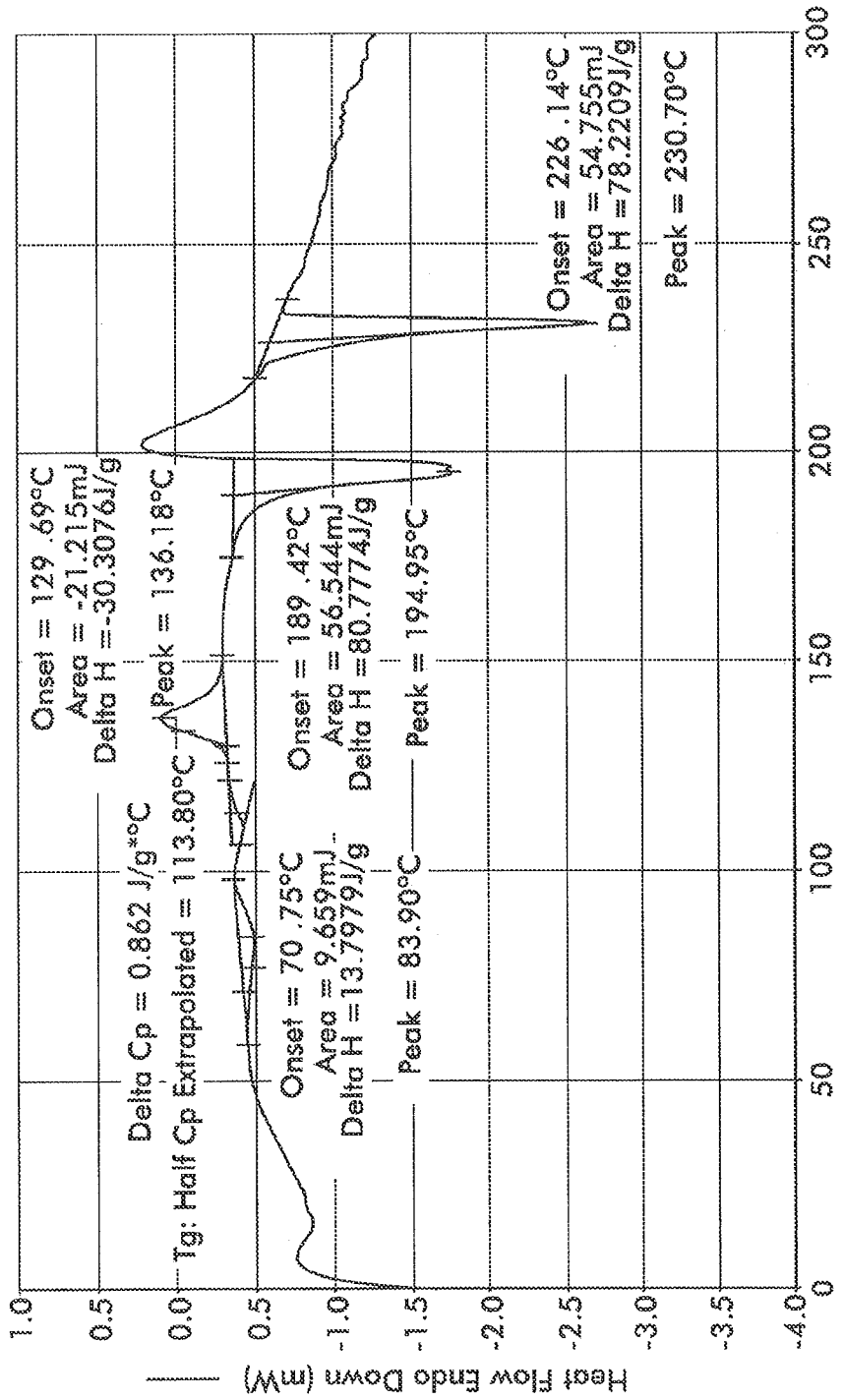

Onset = 129 .69°C
Area = -21.215mJ
Delta H =-30.3076J/g
Peak = 136.18°C
Delta Cp = 0.862 J/g*°C
Tg: Half Cp Extrapolated = 113.80°C
Onset = 70 .75°C
Area = 9.659mJ
Delta H =13.7979J/g
Peak = 83.90°C
Onset = 189 .42°C
Area = 56.544mJ
Delta H =80.7774J/g
Peak = 194.95°C
Onset = 226 .14°C
Area = 54.755mJ
Delta H =78.2209J/g
Peak = 230.70°C
Heat Flow Endo Down (mW)
Temperature (°C)
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
0
50
100
150
200
250
300

FIG. 51