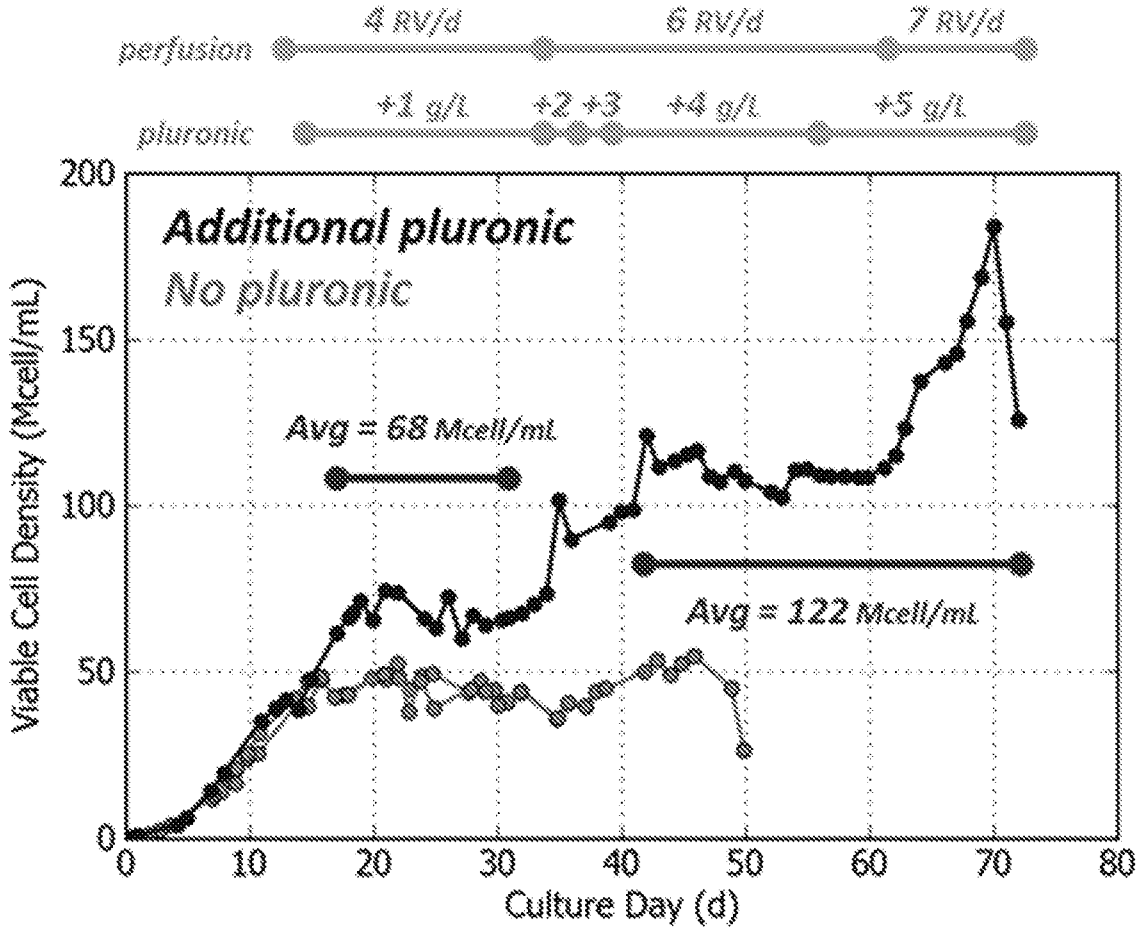

perfusion
4 RV/d
6 RV/d
7 RV/d
pluronic
+1 g/L
+2 +3
+4 g/L
+5 g/L
Additional pluronic
No pluronic
Avg = 68 Mcell/mL
Avg = 122 Mcell/mL
Viable Cell Density (Mcell/mL)
Culture Day (d)
0
50
100
150
200
0
10
20
30
40
50
60
70
80

FIG. 1

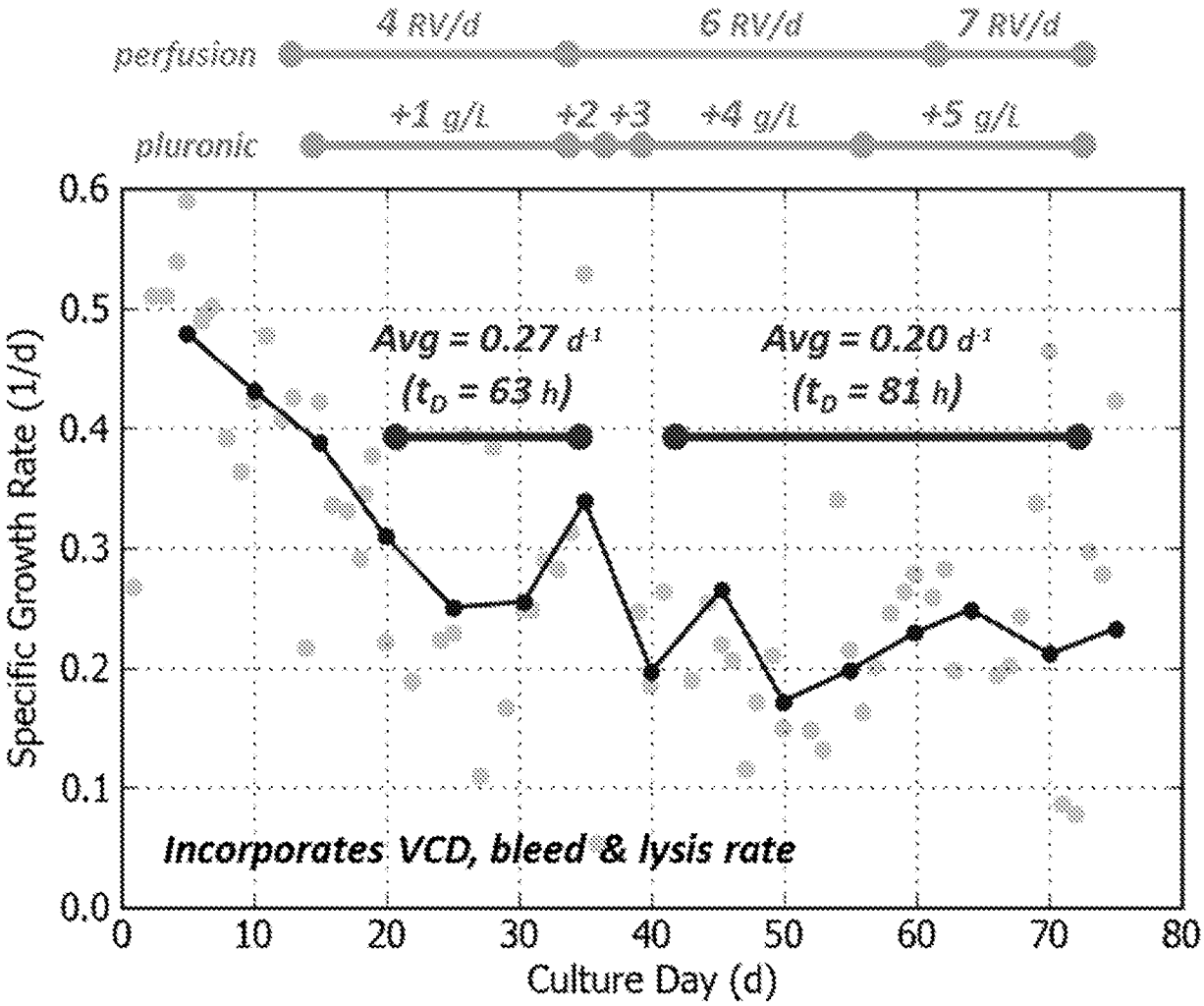

perfusion
4 RV/d
6 RV/d
7 RV/d
pluronic
+1 g/L
+2 +3
+4 g/L
+5 g/L
Avg = 0.27 d-1
(tD = 63 h)
Avg = 0.20 d-1
(tD = 81 h)
Incorporates VCD, bleed & lysis rate
Specific Growth Rate (1/d)
Culture Day (d)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
10
20
30
40
50
60
70
80

FIG. 2

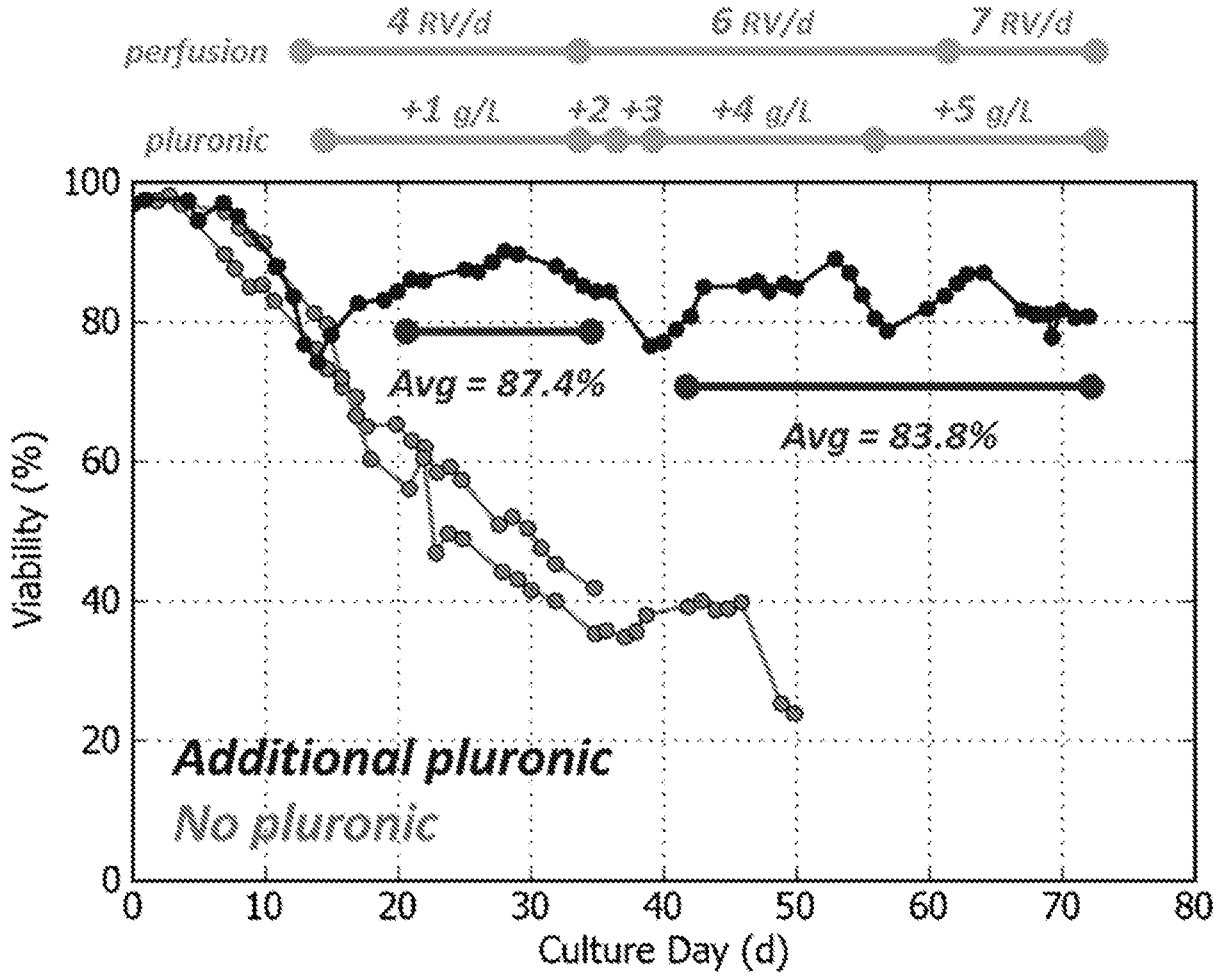

perfusion
4 RV/d
6 RV/d
7 RV/d
pluronic
+1 g/L
+2 +3
+4 g/L
+5 g/L
Viability (%)
100
80
60
40
20
0
Avg = 87.4%
Avg = 83.8%
Additional pluronic
No pluronic
0
10
20
30
40
50
60
70
80
Culture Day (d)

FIG. 3

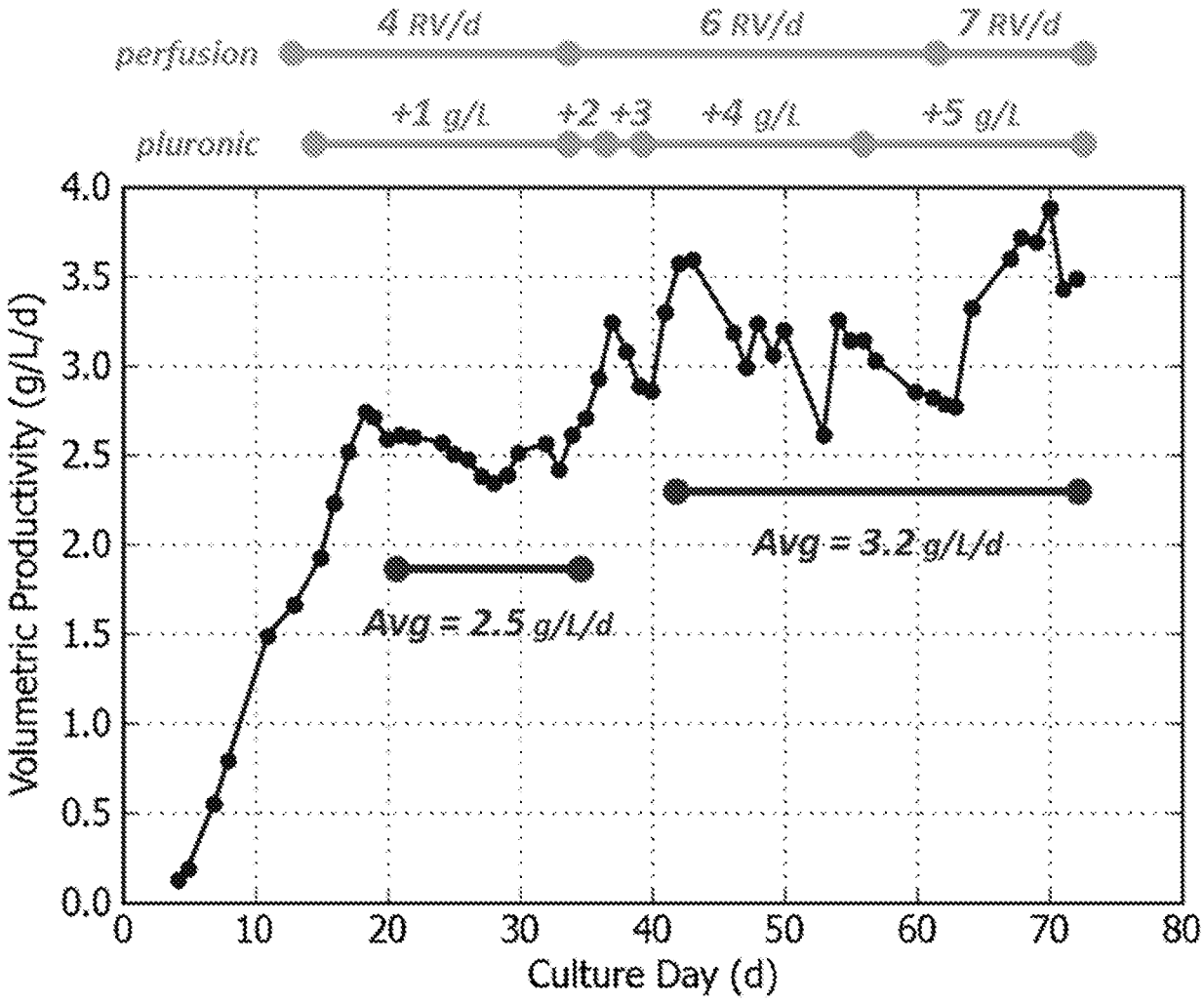

perfusion
4 RV/d
6 RV/d
7 RV/d
pluronic
+1 g/L
+2 +3
+4 g/L
+5 g/L
Volumetric Productivity (g/L/d)
Culture Day (d)
Avg = 2.5 g/L/d
Avg = 3.2 g/L/d
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
10
20
30
40
50
60
70
80

FIG. 4

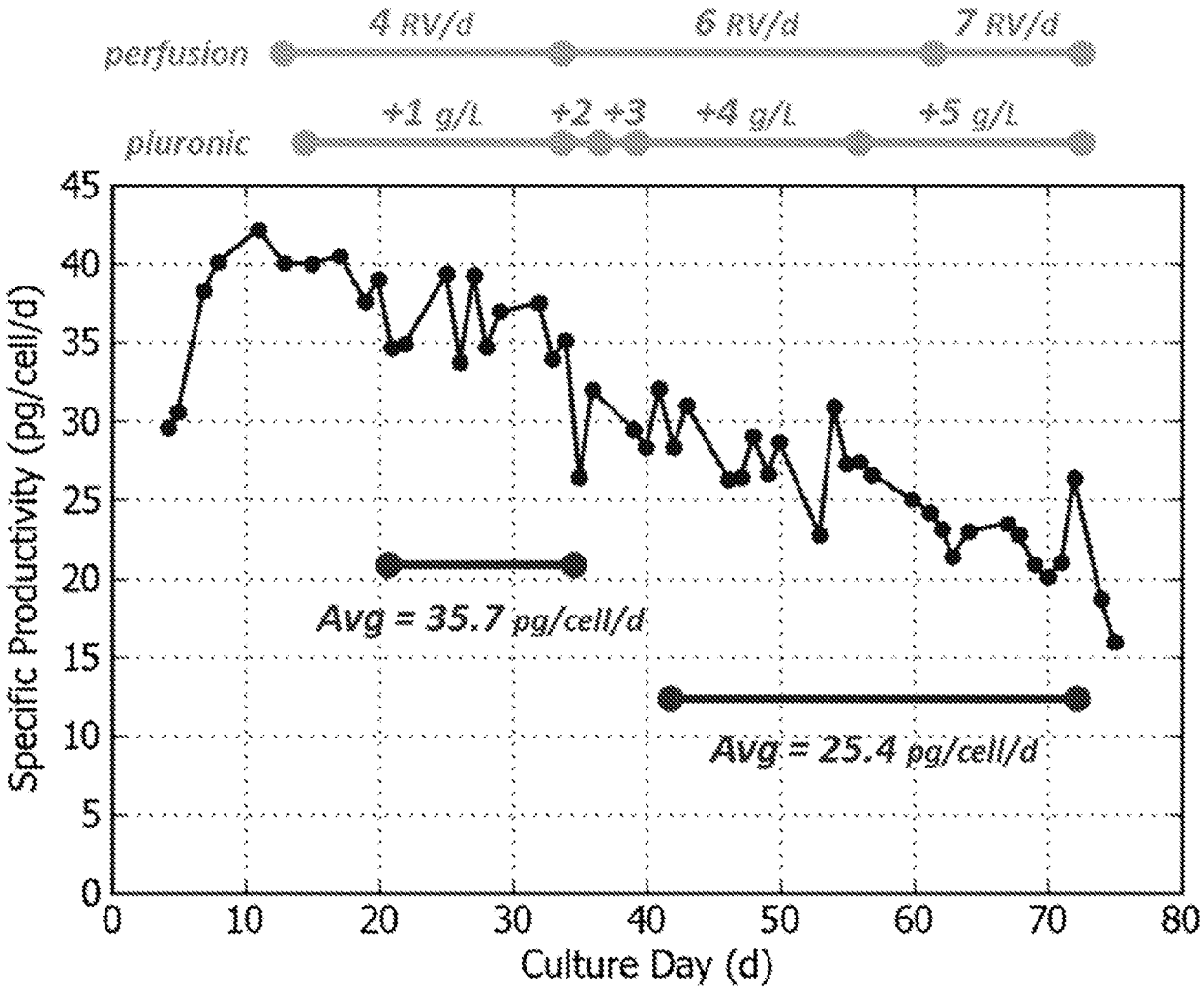

perfusion
4 RV/d
6 RV/d
7 RV/d
pluronic
+1 g/L
+2 +3
+4 g/L
+5 g/L
Specific Productivity (pg/cell/d)
Culture Day (d)
Avg = 35.7 pg/cell/d
Avg = 25.4 pg/cell/d
0
5
10
15
20
25
30
35
40
45
0
10
20
30
40
50
60
70
80

FIG. 5

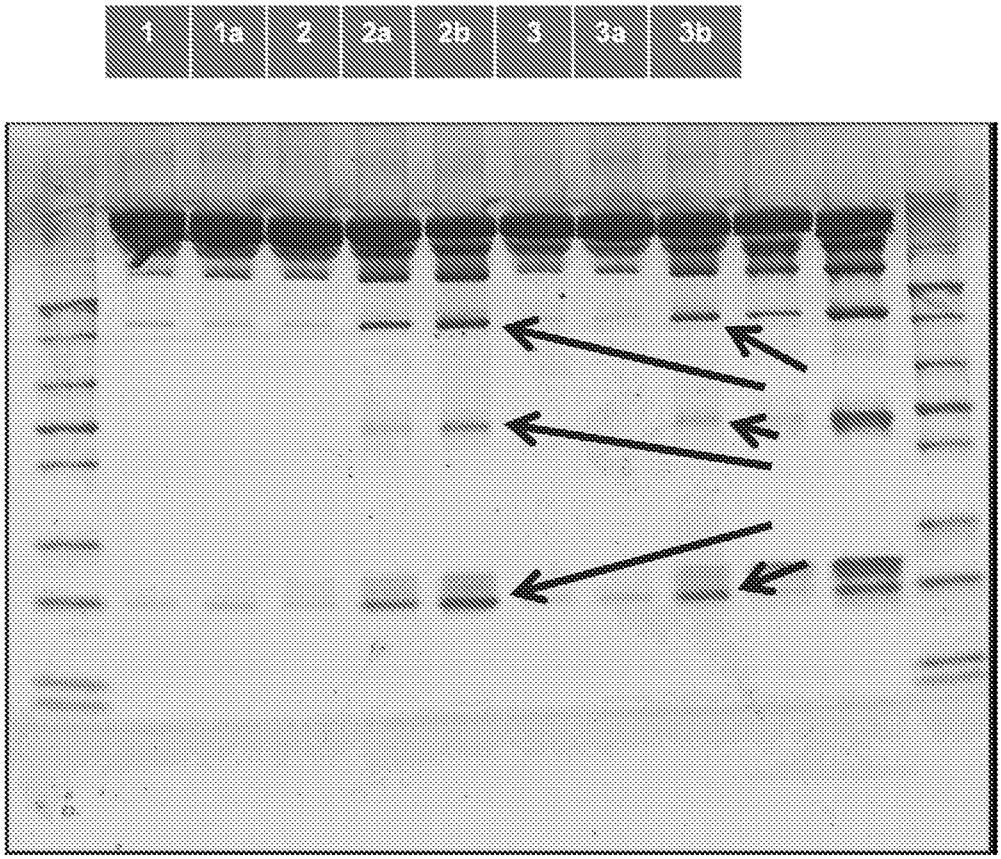


FIG. 6

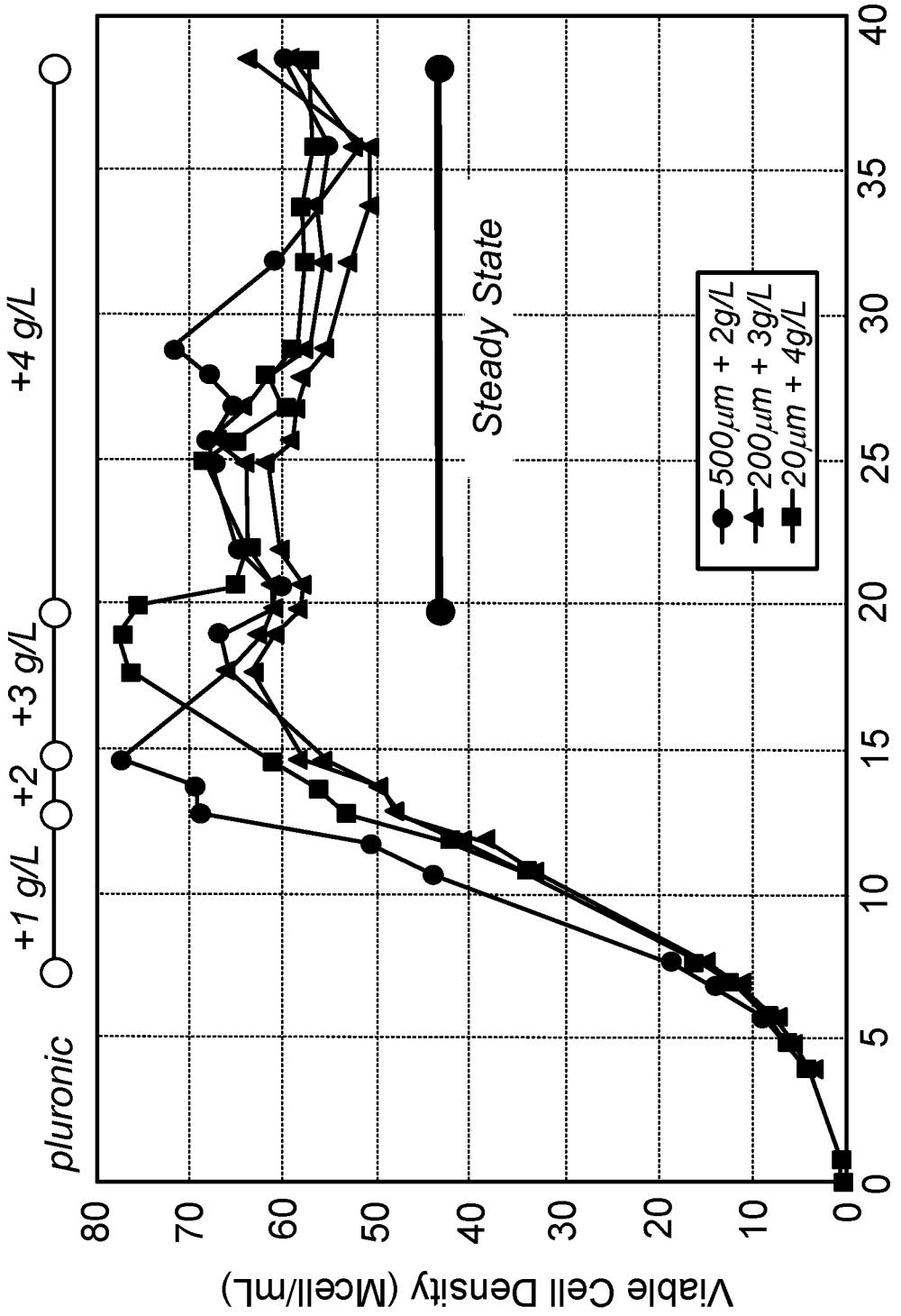

Viable Cell Density (Mcell/mL)
0
10
20
30
40
50
60
70
80
Culture Day (d)
0
5
10
15
20
25
30
35
40
pluronic
+1 g/L
+2
+3 g/L
+4 g/L
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L

FIG. 7

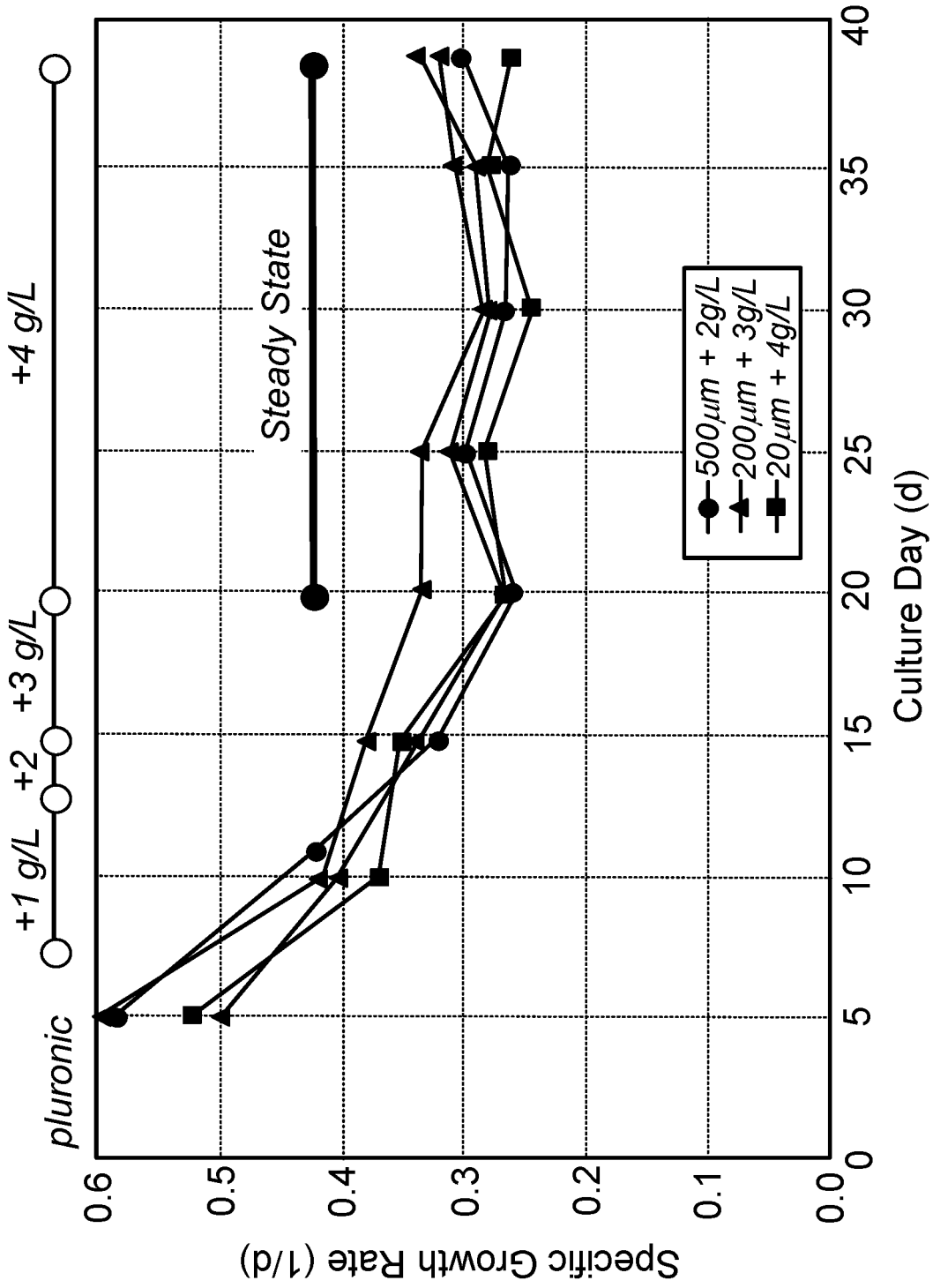

Specific Growth Rate (1/d)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Culture Day (d)
0
5
10
15
20
25
30
35
40
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L
pluronic
+1 g/L
+2
+3 g/L
+4 g/L

FIG. 8

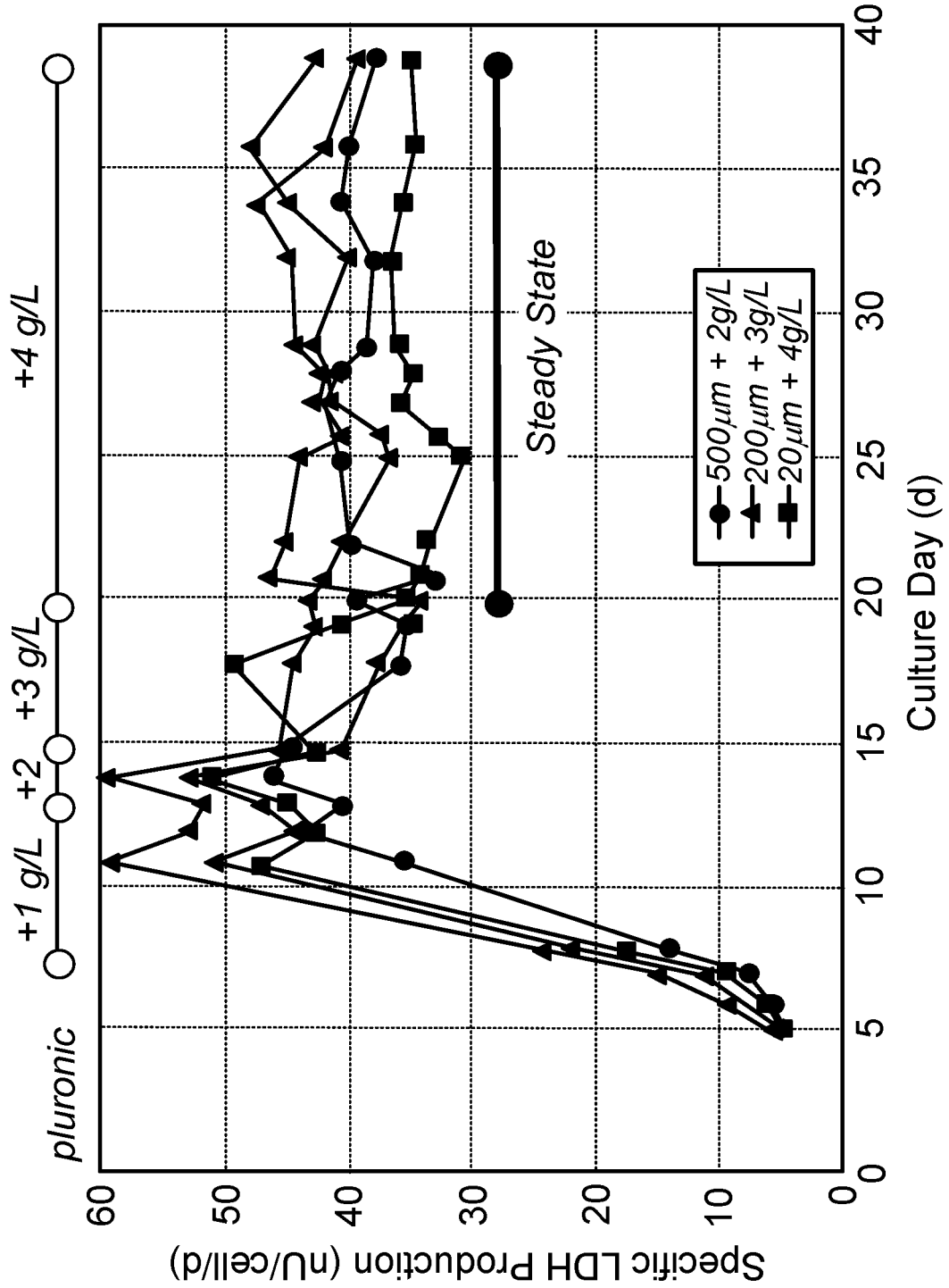

pluronic
+1 g/L
+2
+3 g/L
+4 g/L
Specific LDH Production (nU/cell/d)
0
10
20
30
40
50
60
Culture Day (d)
0
5
10
15
20
25
30
35
40
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L

FIG. 9

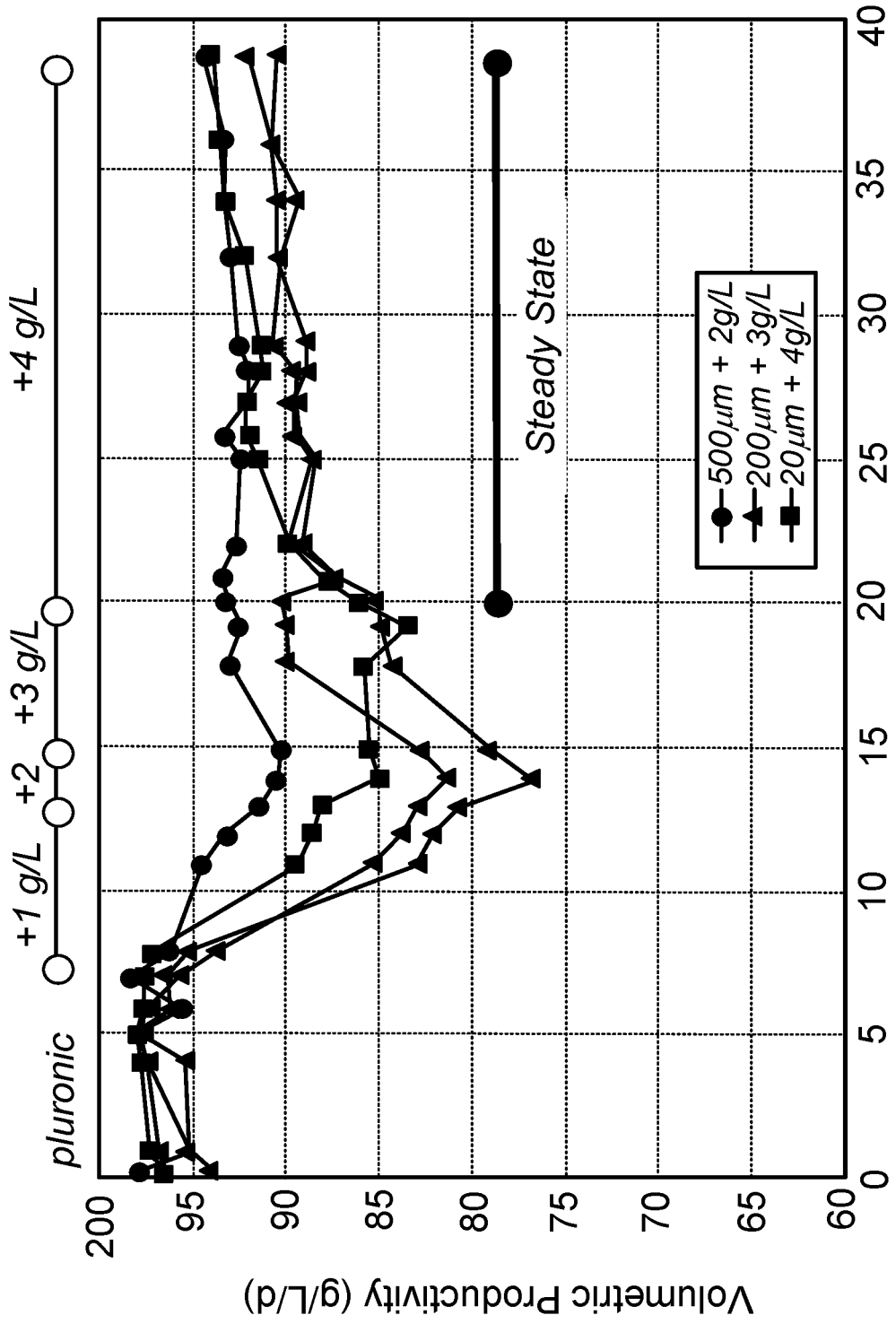

Volumetric Productivity (g/L/d)
200
95
90
85
80
75
70
65
60
0
5
10
15
20
25
30
35
40
Culture Day (d)
pluronic
+1 g/L
+2
+3 g/L
+4 g/L
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L

FIG. 10

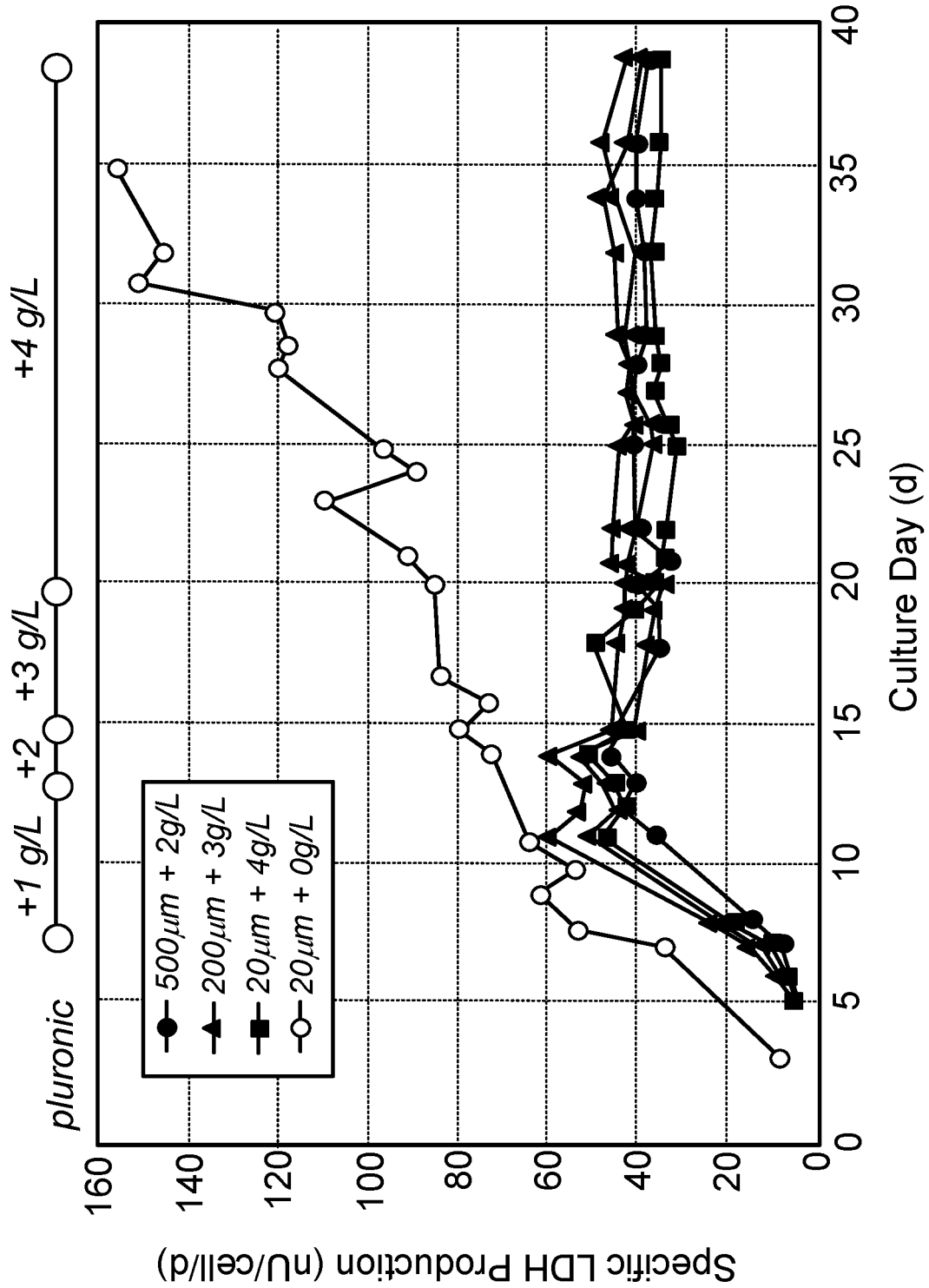

Specific LDH Production (nU/cell/d)
Culture Day (d)
0
20
40
60
80
100
120
140
160
0
5
10
15
20
25
30
35
40
pluronic
+1 g/L
+2
+3 g/L
+4 g/L
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L
20μm + 0g/L

FIG. 11

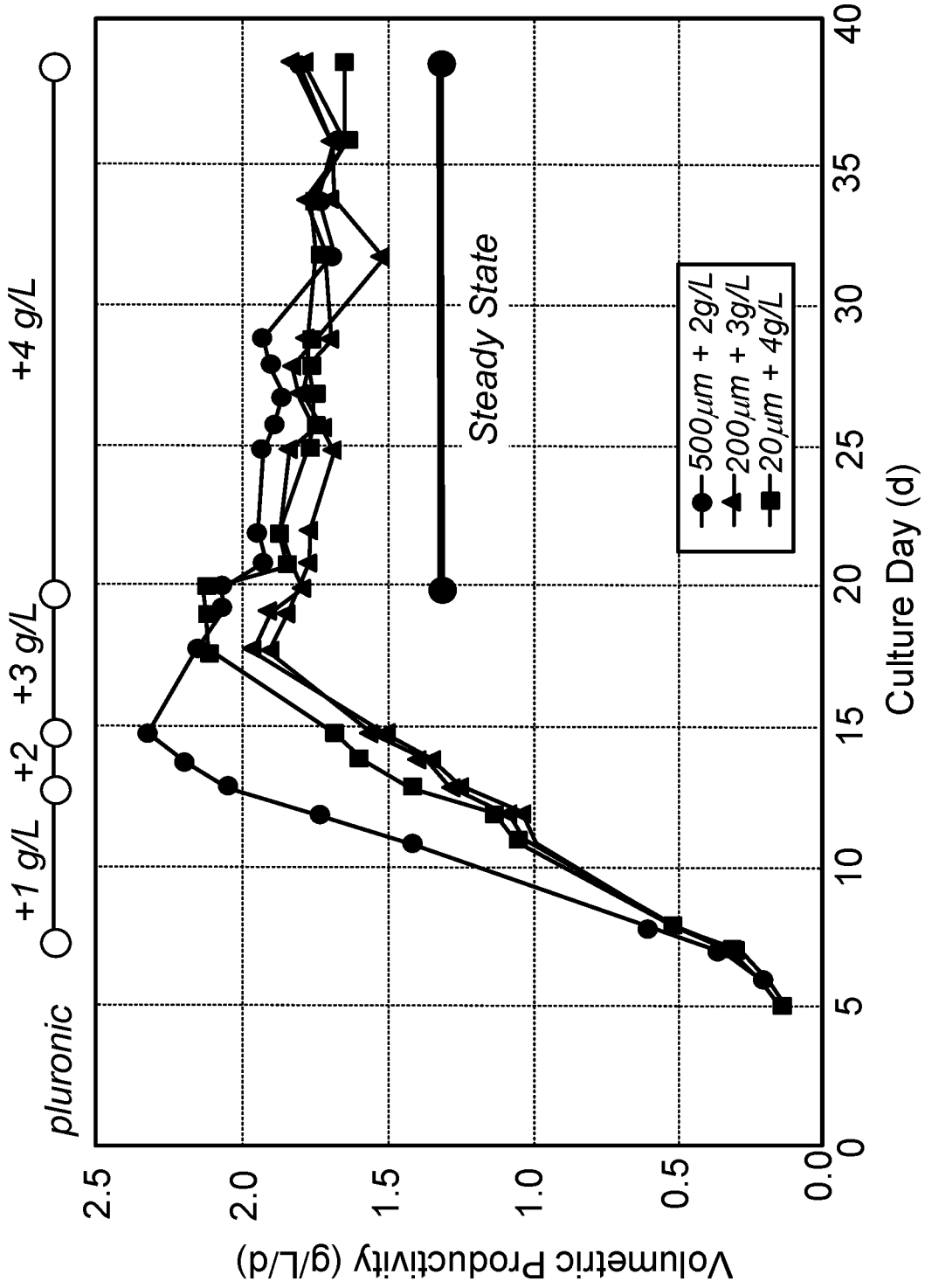

Volumetric Productivity (g/L/d)
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30
35
40
Culture Day (d)
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L
pluronic
+1 g/L
+2
+3 g/L
+4 g/L

FIG. 12

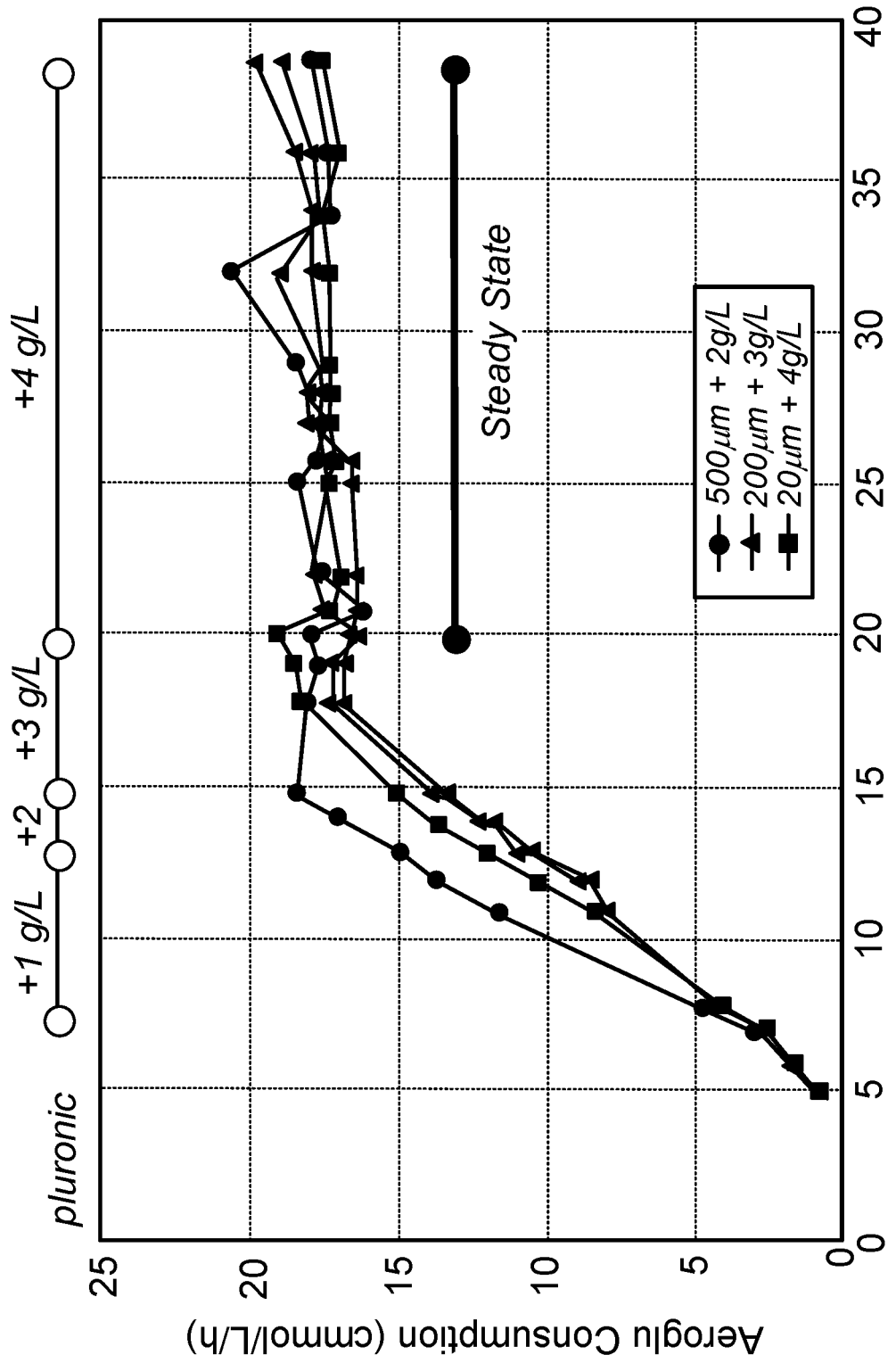

Aeroglu Consumption (cmmol/L/h)
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
Culture Day (d)
Steady State
500μm + 2g/L
200μm + 3g/L
20μm + 4g/L
pluronic
+1 g/L
+2
+3 g/L
+4 g/L

FIG. 13

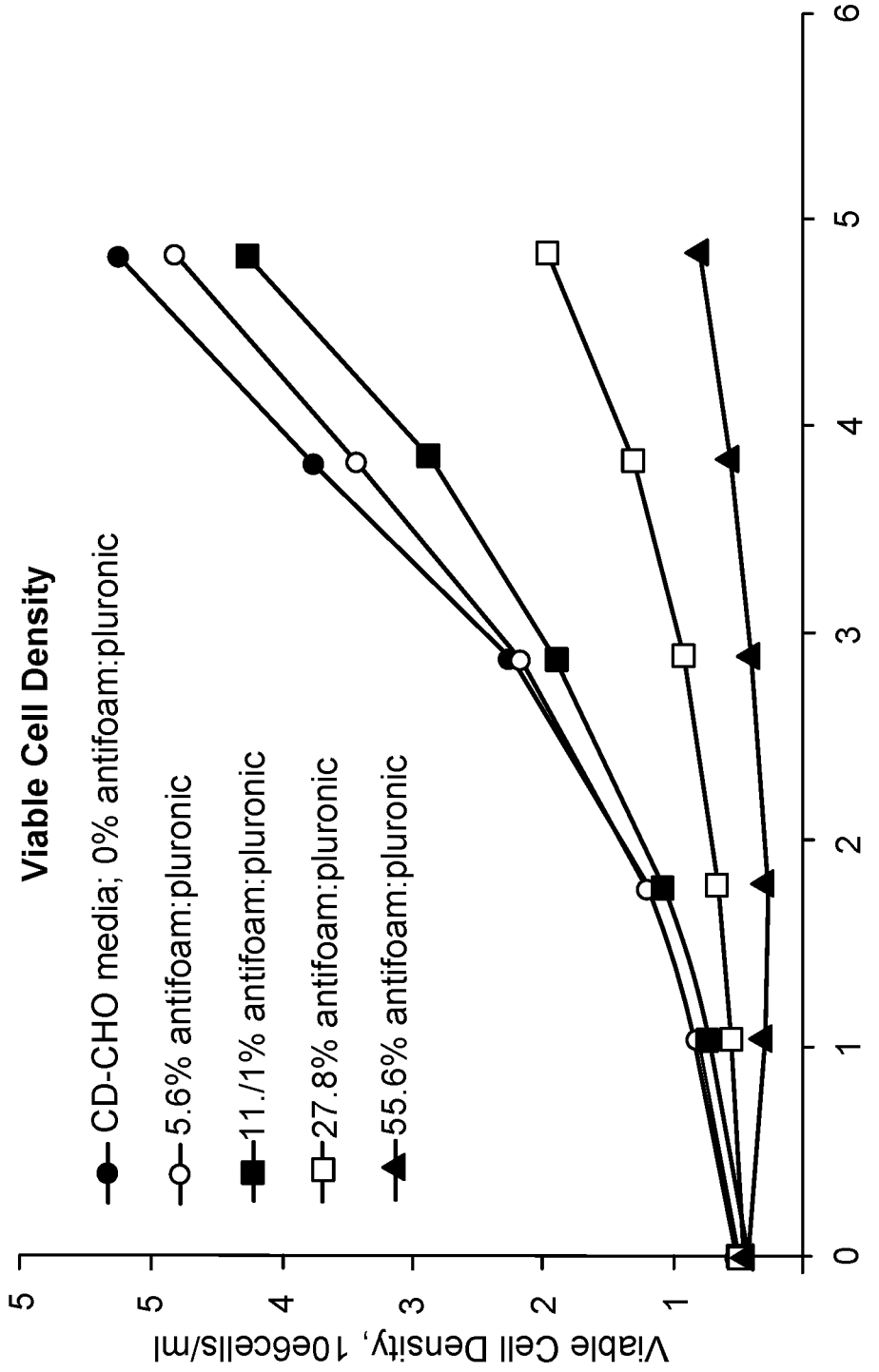

Viable Cell Density
CD-CHO media; 0% antifoam:pluronic
5.6% antifoam:pluronic
11./1% antifoam:pluronic
27.8% antifoam:pluronic
55.6% antifoam:pluronic
Viable Cell Density, 10e6cells/ml
Culture Day
0
1
2
3
4
5
6
1
2
3
4
5
5

FIG. 14

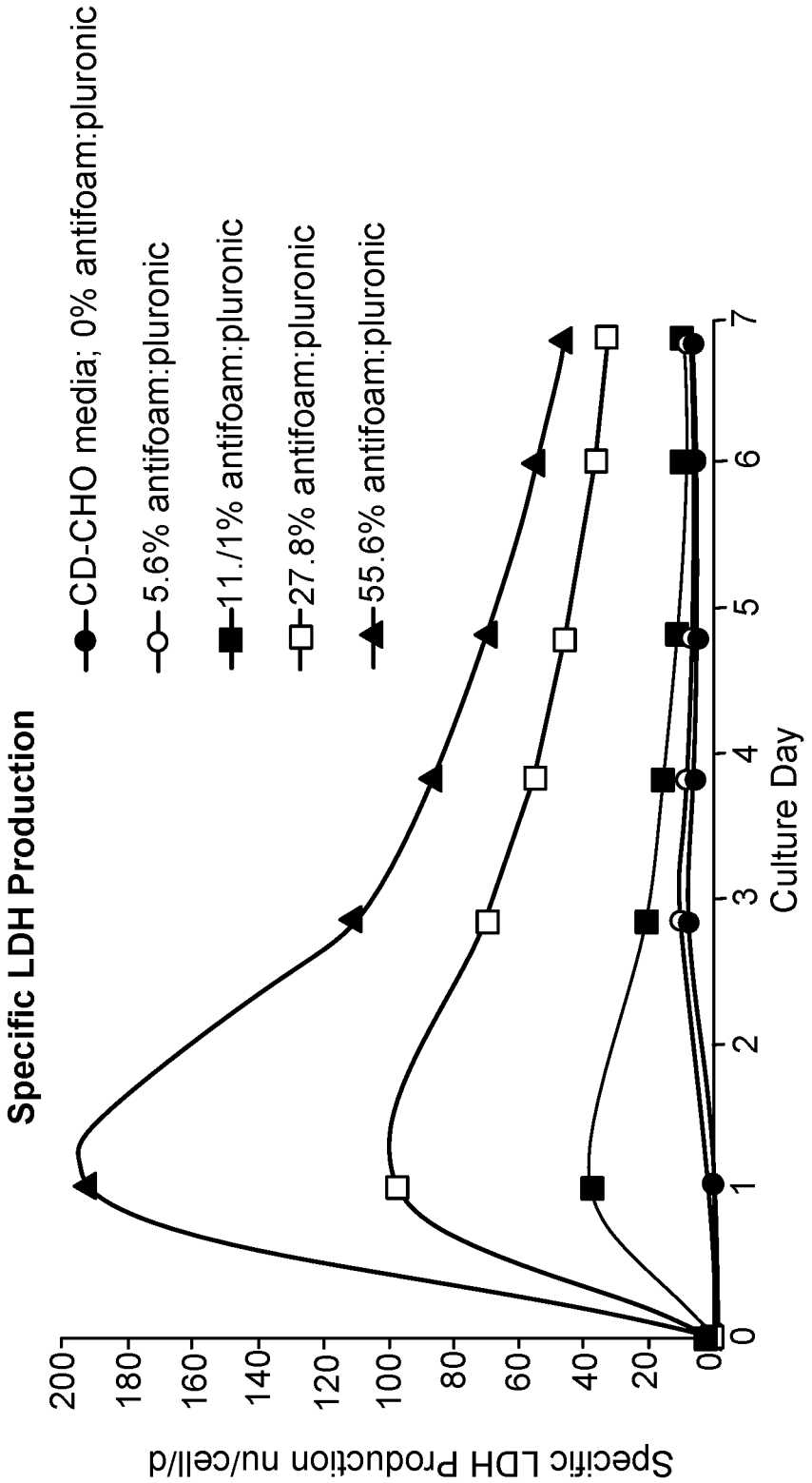

Specific LDH Production
CD-CHO media; 0% antifoam:pluronic
5.6% antifoam:pluronic
11./1% antifoam:pluronic
27.8% antifoam:pluronic
55.6% antifoam:pluronic
Specific LDH Production nu/cell/d
Culture Day
0
20
40
60
80
100
120
140
160
180
200
0
1
2
3
4
5
6
7

FIG. 15