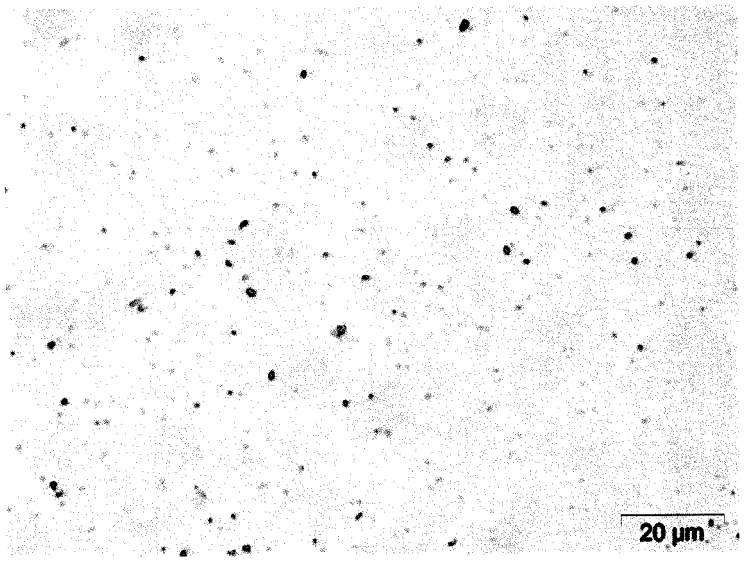

20 µm

FIG. 1a

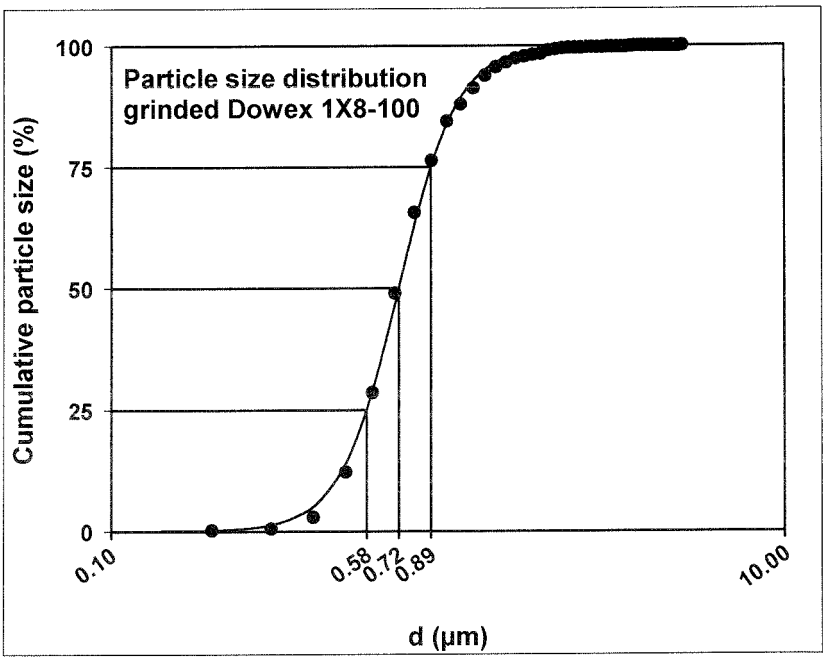

Particle size distribution
grinded Dowex 1X8-100
Cumulative particle size (%)
100
75
50
25
0
0.10
0.58
0.72
0.89
10.00
d (µm)

FIG. 1b

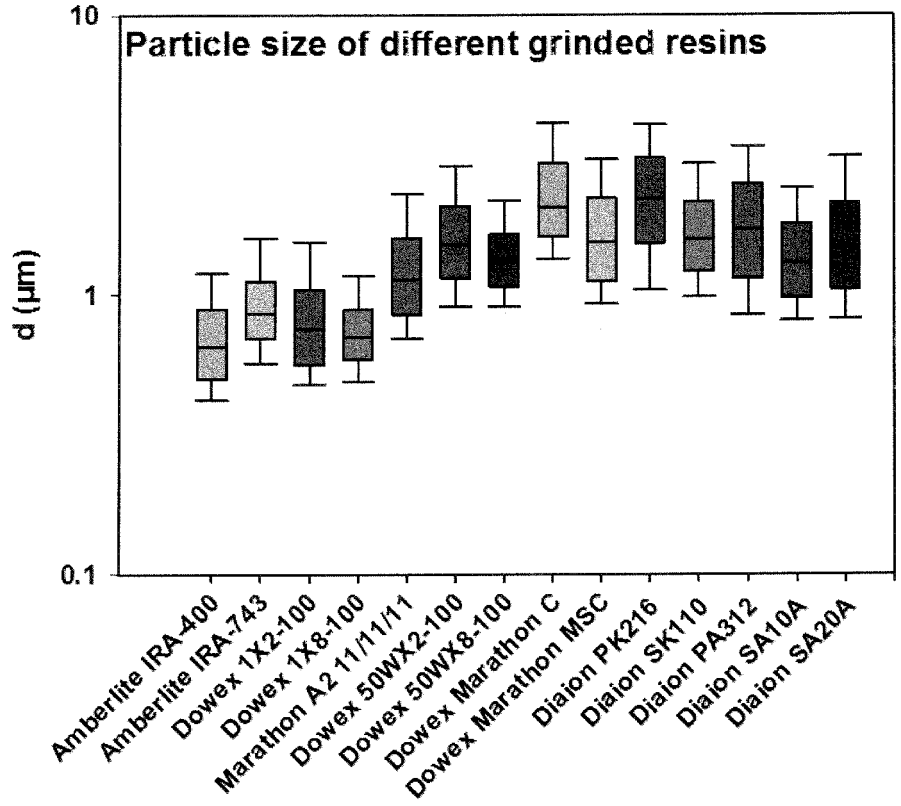

Particle size of different grinded resins
d (µm)
10
1
0.1
Amberlite IRA-400
Amberlite IRA-743
Dowex 1X2-100
Dowex 1X8-100
Marathon A2 11/11/11
Dowex 50WX2-100
Dowex 50WX8-100
Dowex Marathon C
Dowex Marathon MSC
Diaion PK216
Diaion SK110
Diaion PA312
Diaion SA10A
Diaion SA20A

Fig. 2

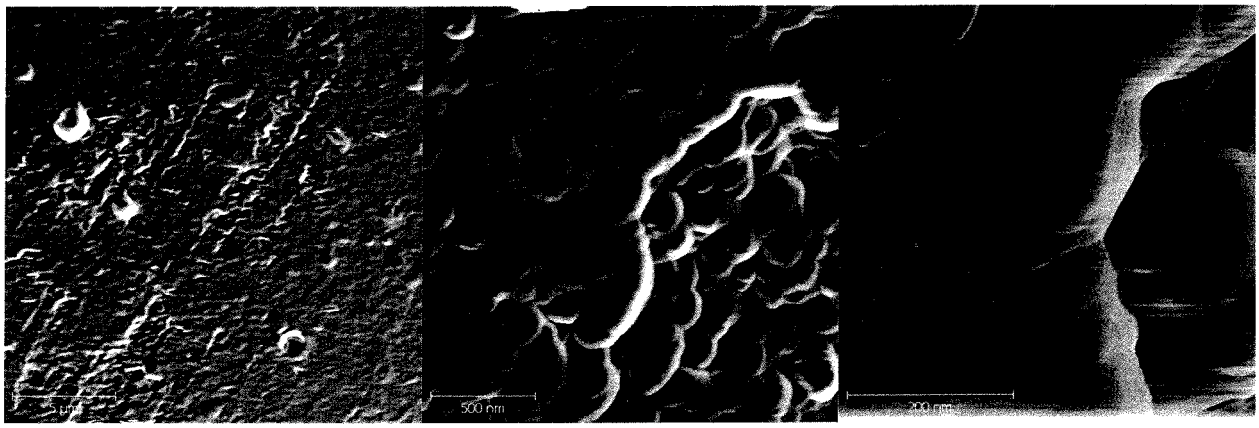


Fig. 3a



Fig. 3b

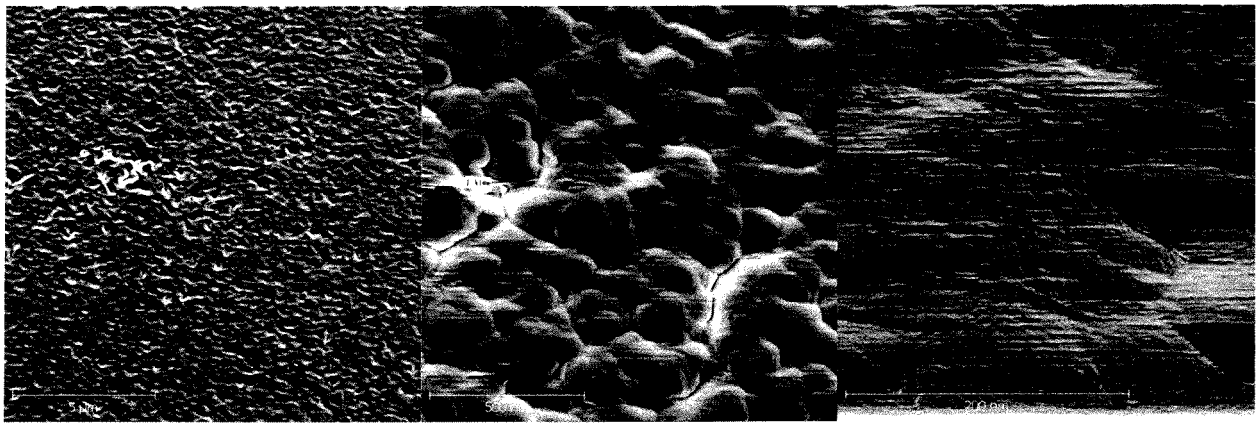


Fig. 3c

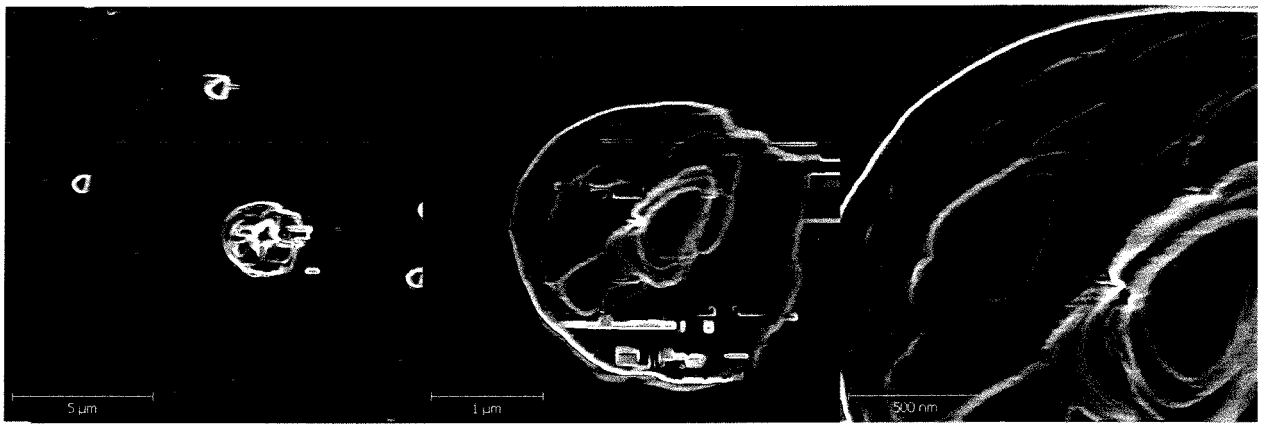


Fig. 3d

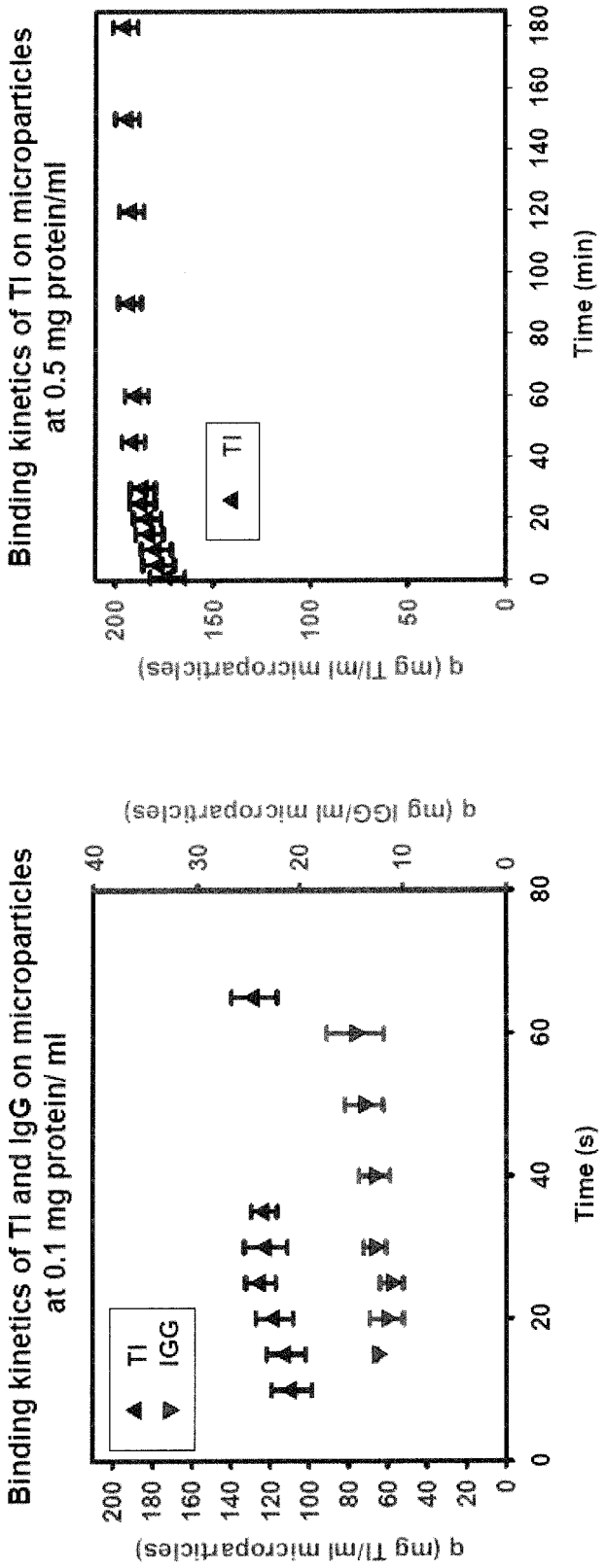

Binding kinetics of TI on microparticles
at 0.5 mg protein/ml
q (mg TI/ml microparticles)
Time (min)
TI
Binding kinetics of TI and IgG on microparticles
at 0.1 mg protein/ ml
q (mg TI/ml microparticles)
q (mg IGG/ml microparticles)
Time (s)
TI
IGG

Fig. 4

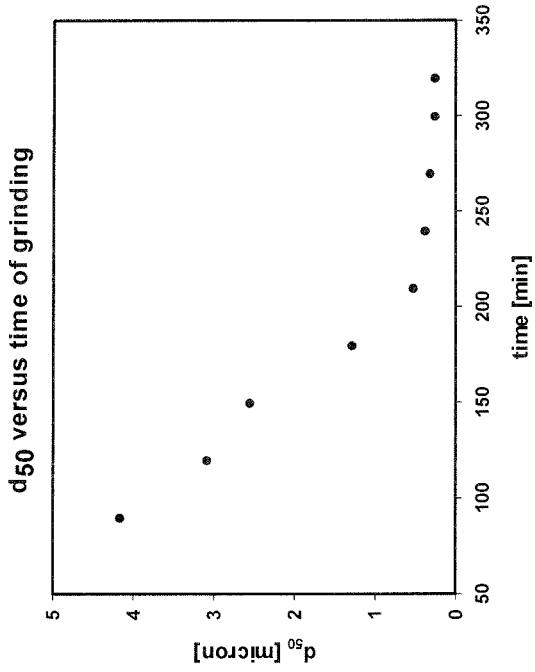

d_{50} versus time of grinding
d_{50} [micron]
time [min]
0
1
2
3
4
5
50
100
150
200
250
300
350

Fig. 5b

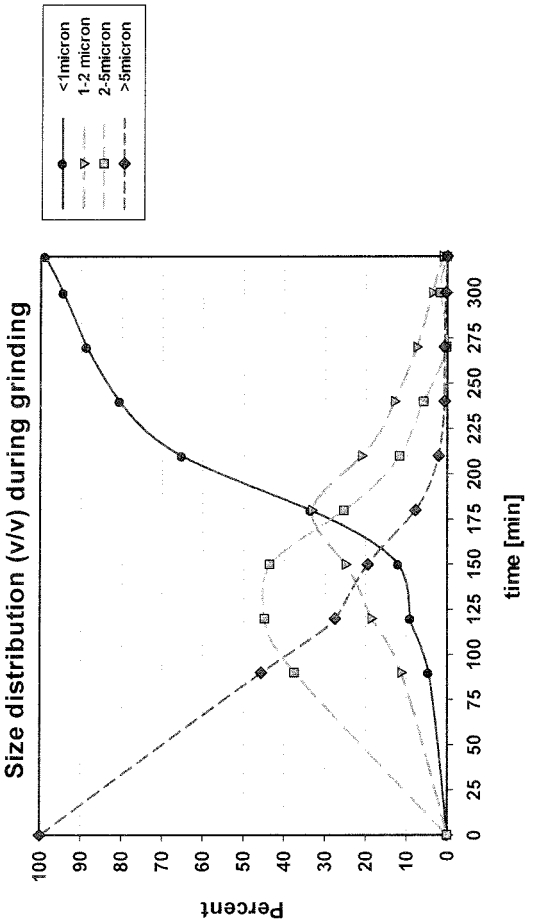

Size distribution (v/v) during grinding
Percent
time [min]
<1micron
1-2 micron
2-5micron
>5micron
0
10
20
30
40
50
60
70
80
90
100
0
25
50
75
100
125
150
175
200
225
250
275
300

Fig. 5a

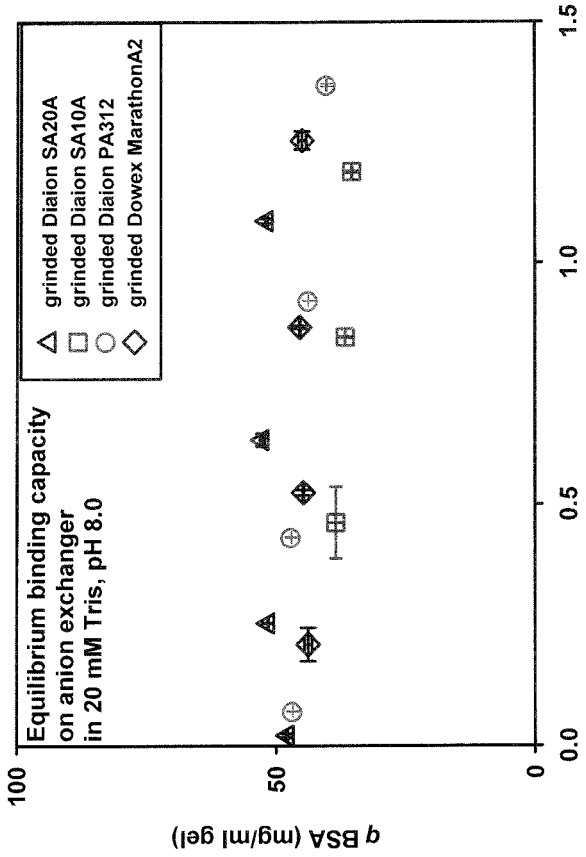

Equilibrium binding capacity
on anion exchanger
in 20 mM Tris, pH 8.0
grinded Diaion SA20A
grinded Diaion SA10A
grinded Diaion PA312
grinded Dowex MarathonA2
q BSA (mg/ml gel)
C BSA(mg/ml)
0
50
100
0.0
0.5
1.0
1.5

Fig. 6b

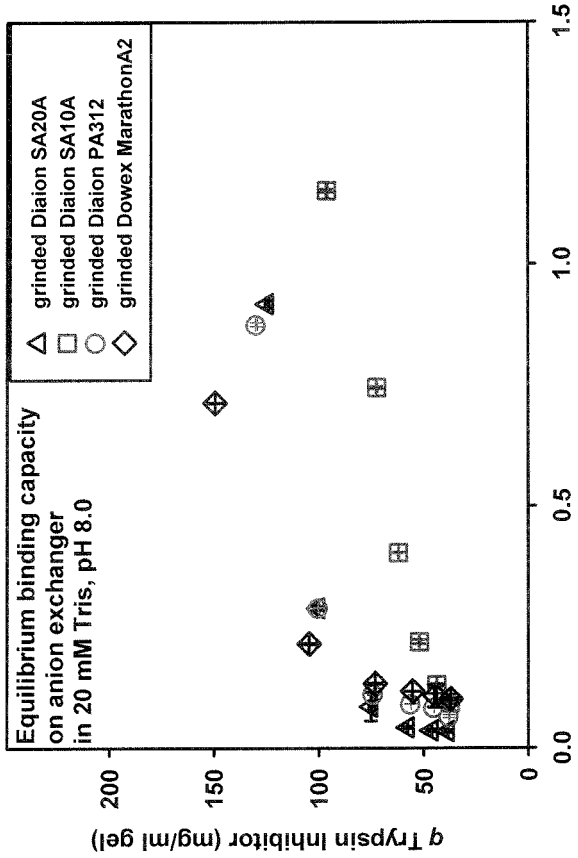

Equilibrium binding capacity
on anion exchanger
in 20 mM Tris, pH 8.0
grinded Diaion SA20A
grinded Diaion SA10A
grinded Diaion PA312
grinded Dowex MarathonA2
q Trypsin Inhibitor (mg/ml gel)
C Trypsin Inhibitor (mg/ml)
0
50
100
150
200
0.0
0.5
1.0
1.5

Fig. 6a

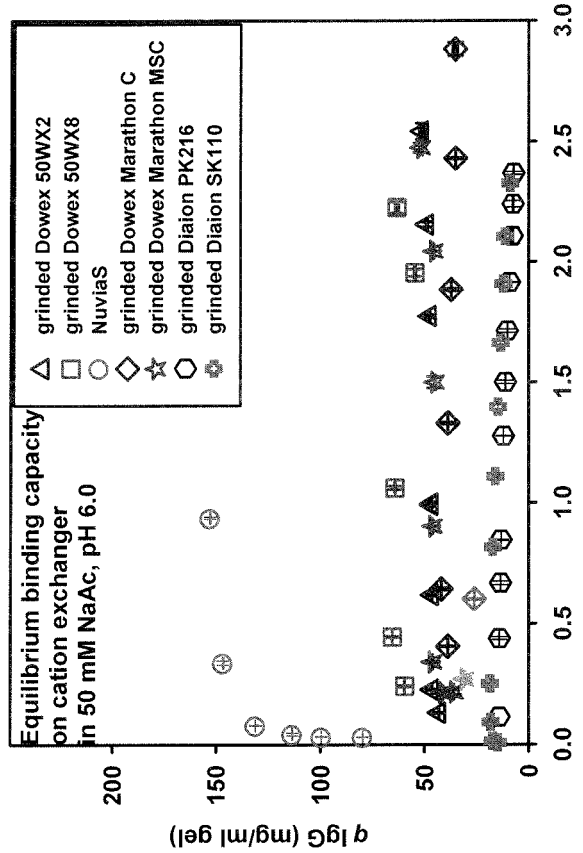

Equilibrium binding capacity
on cation exchanger
in 50 mM NaAc, pH 6.0
grinded Dowex 50WX2
grinded Dowex 50WX8
NuviaS
grinded Dowex Marathon C
grinded Dowex Marathon MSC
grinded Diaion PK216
grinded Diaion SK110
q IgG (mg/ml gel)
C IgG (mg/ml)
0
50
100
150
200
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Fig. 7b

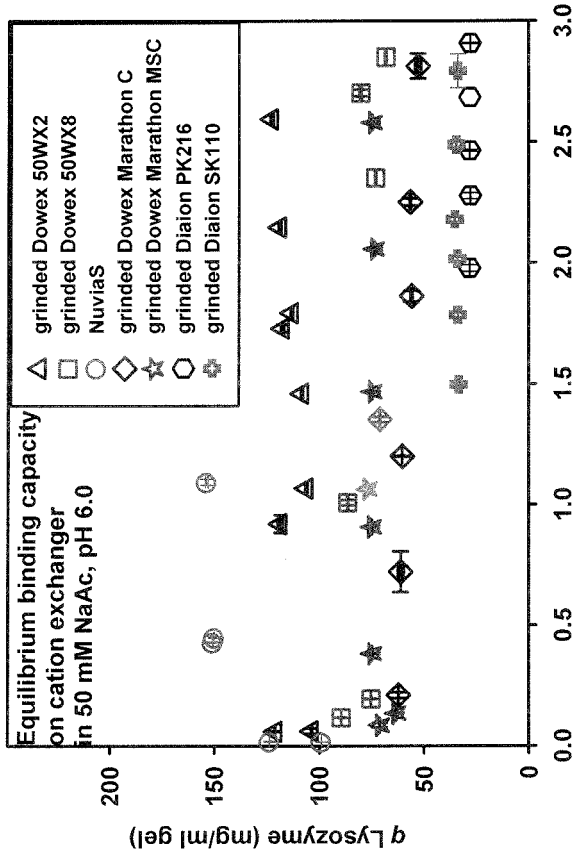

Equilibrium binding capacity
on cation exchanger
in 50 mM NaAc, pH 6.0
grinded Dowex 50WX2
grinded Dowex 50WX8
NuviaS
grinded Dowex Marathon C
grinded Dowex Marathon MSC
grinded Diaion PK216
grinded Diaion SK110
q Lysozyme (mg/ml gel)
C Lysozyme (mg/ml)
0
50
100
150
200
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Fig. 7a

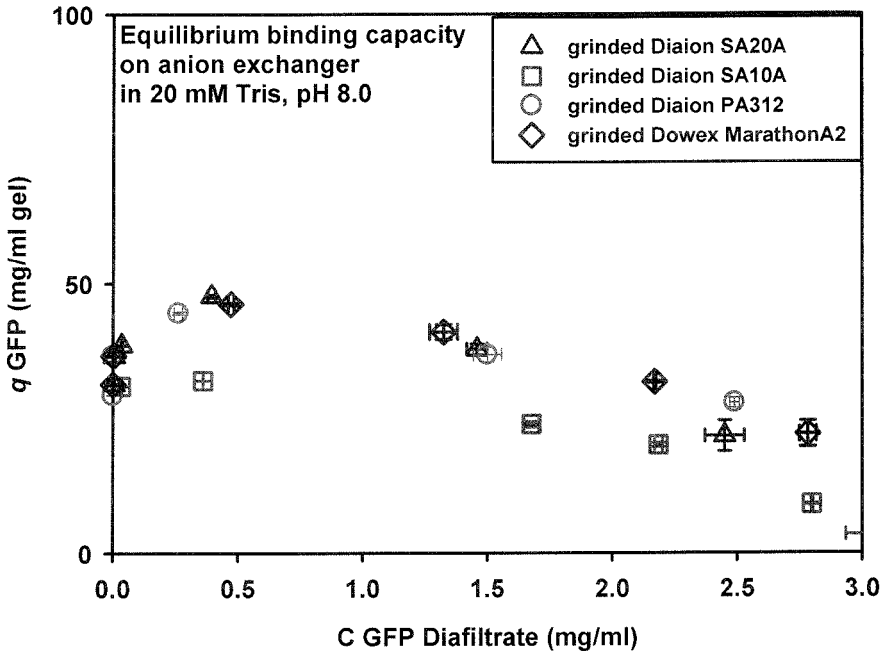

Equilibrium binding capacity
on anion exchanger
in 20 mM Tris, pH 8.0
grinded Diaion SA20A
grinded Diaion SA10A
grinded Diaion PA312
grinded Dowex MarathonA2
q GFP (mg/ml gel)
C GFP Diafiltrate (mg/ml)
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Fig. 8

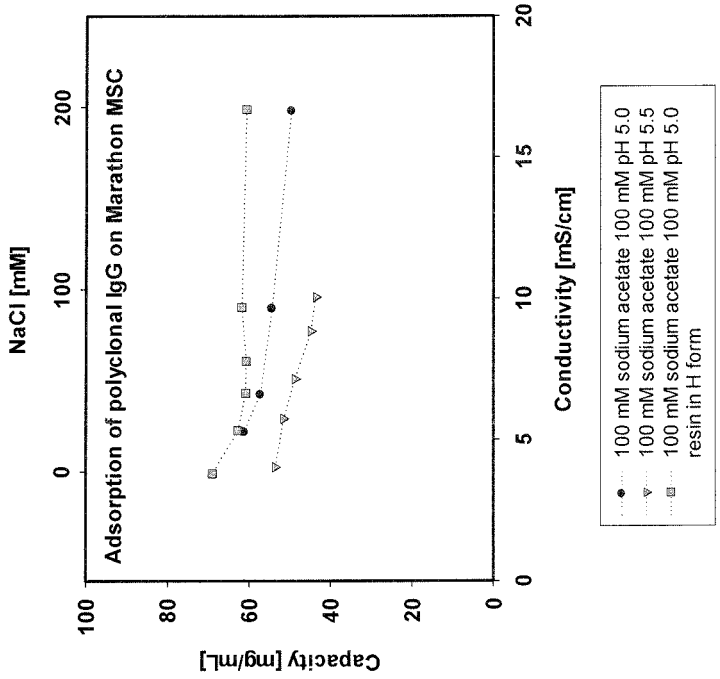

Adsorption of polyclonal IgG on Marathon MSC
NaCl [mM]
Capacity [mg/mL]
Conductivity [mS/cm]
100 mM sodium acetate 100 mM pH 5.0
100 mM sodium acetate 100 mM pH 5.5
100 mM sodium acetate 100 mM pH 5.0 resin in H form

Fig. 9b

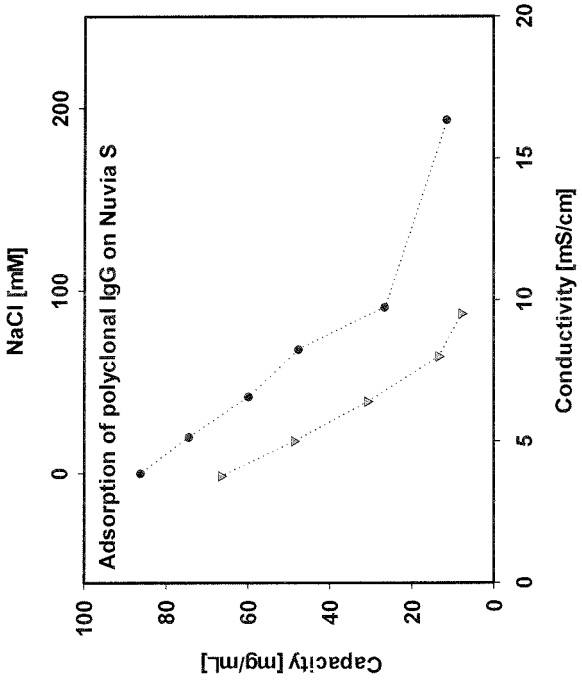

Adsorption of polyclonal IgG on Nuvia S
NaCl [mM]
Capacity [mg/mL]
Conductivity [mS/cm]

Fig. 9a

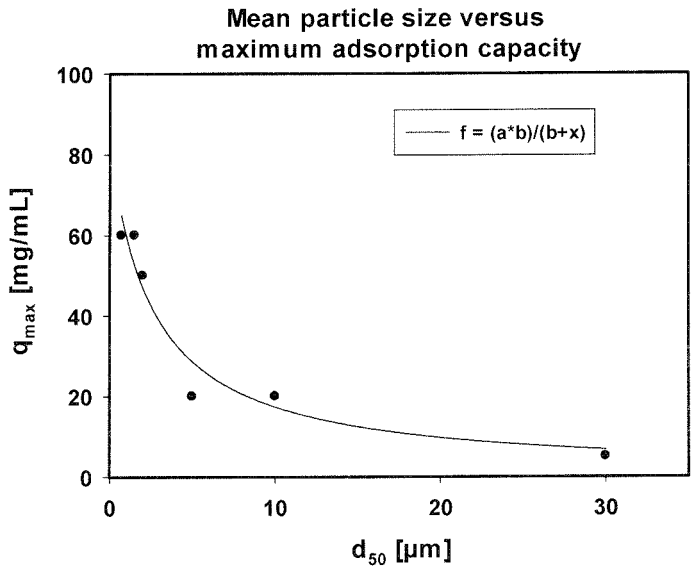

Mean particle size versus
maximum adsorption capacity
f = (a*b)/(b+x)
q_{max} [mg/mL]
d_{50} [µm]
0
20
40
60
80
100
0
10
20
30

Fig. 10

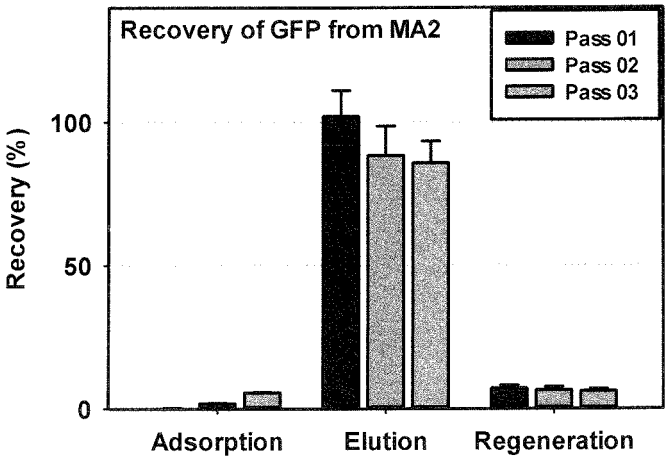


Fig. 11a

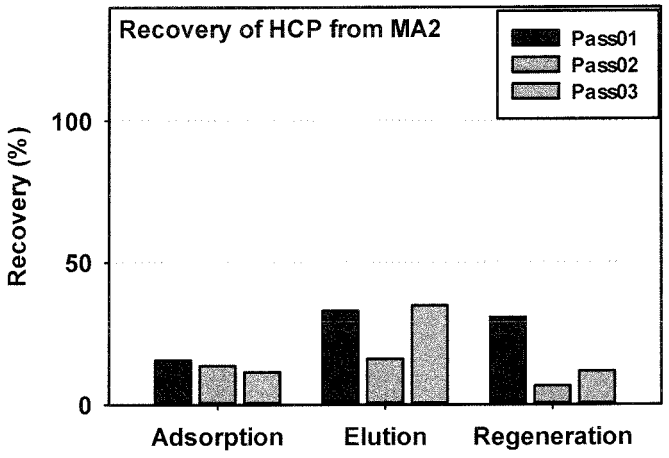


Fig. 11b

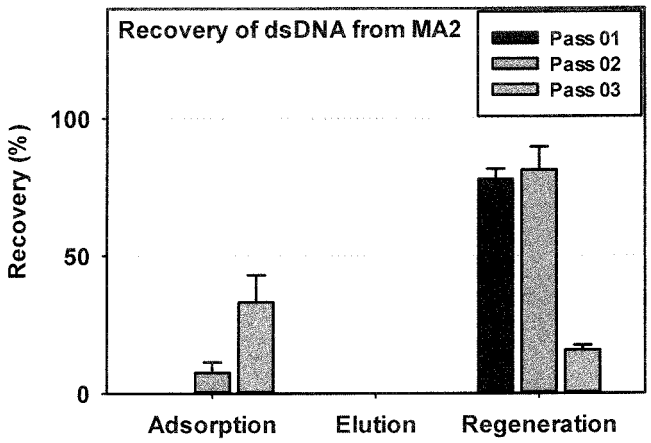


Fig. 11c

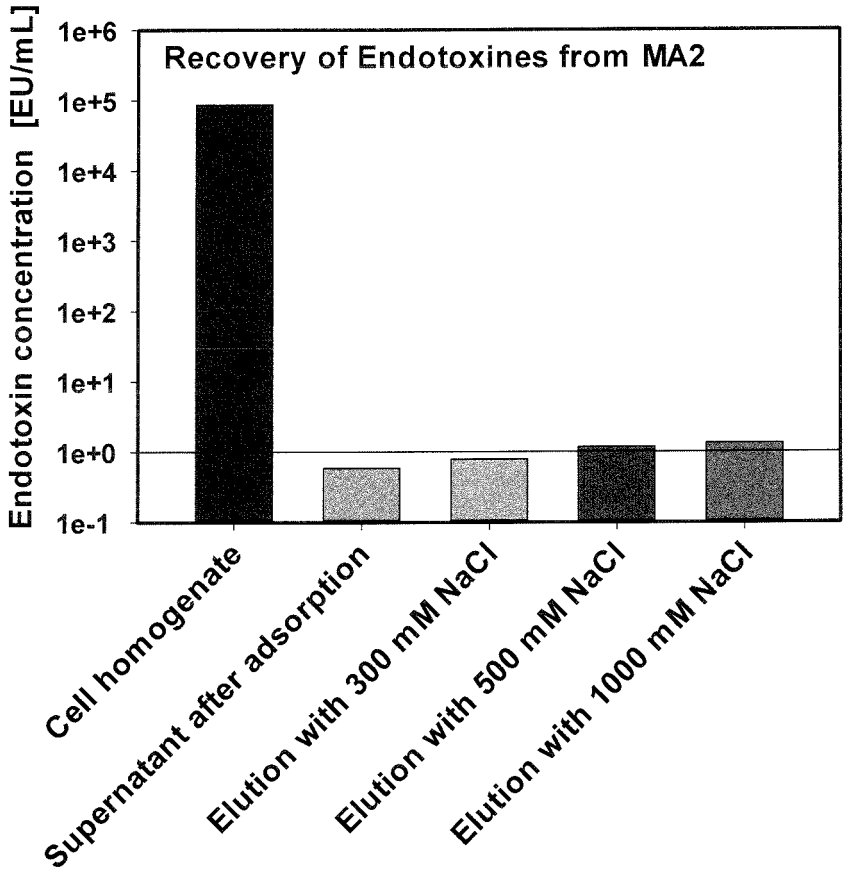


Fig. 12

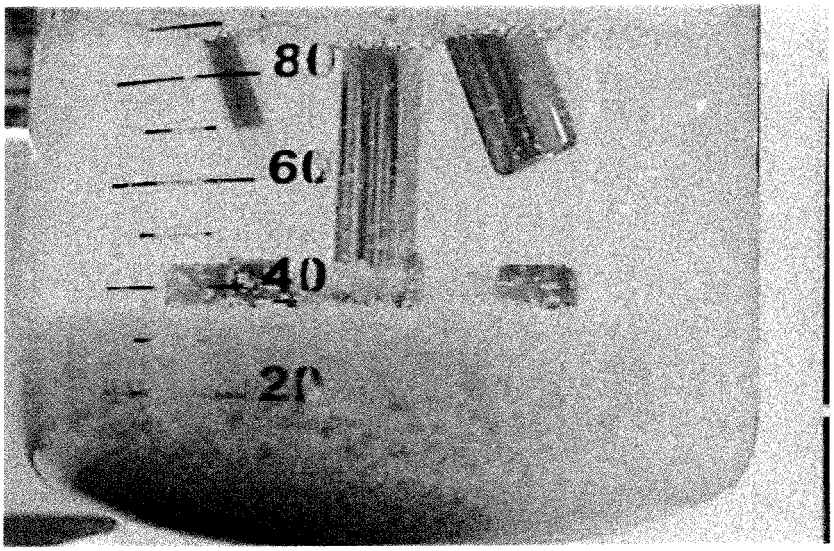


Fig. 13.1

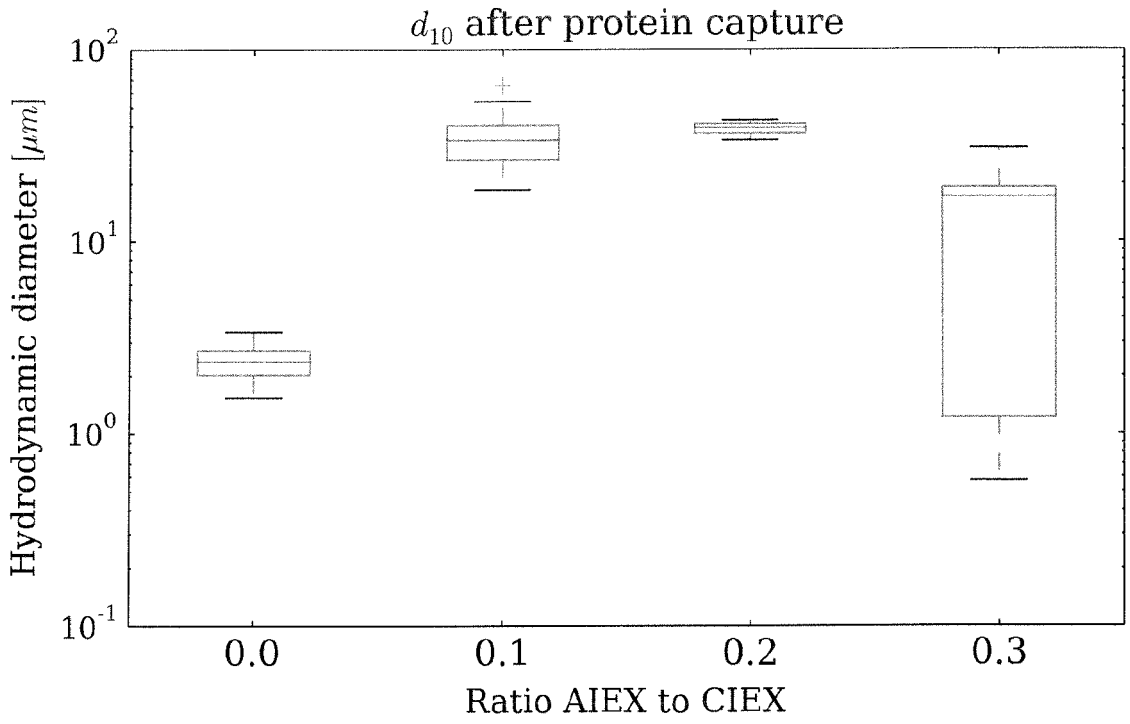


Fig. 13.2

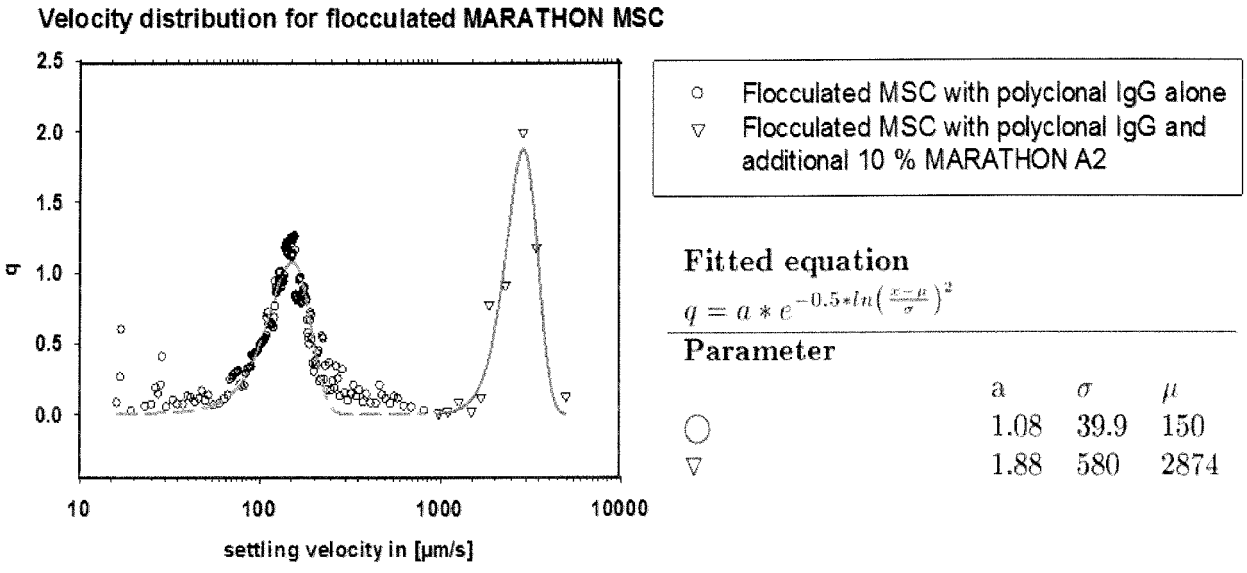


Fig. 14.1

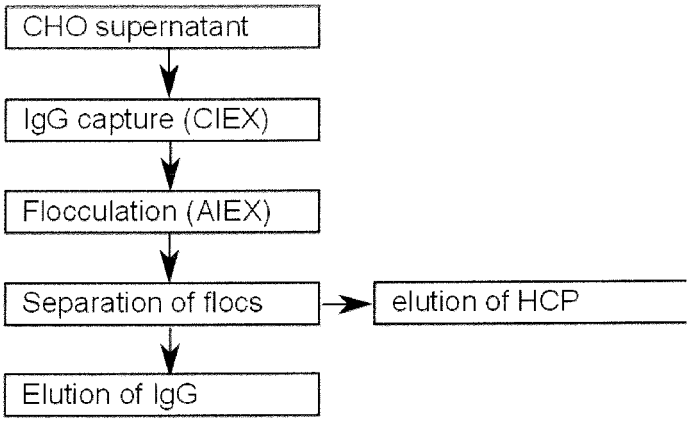


Fig. 14.2

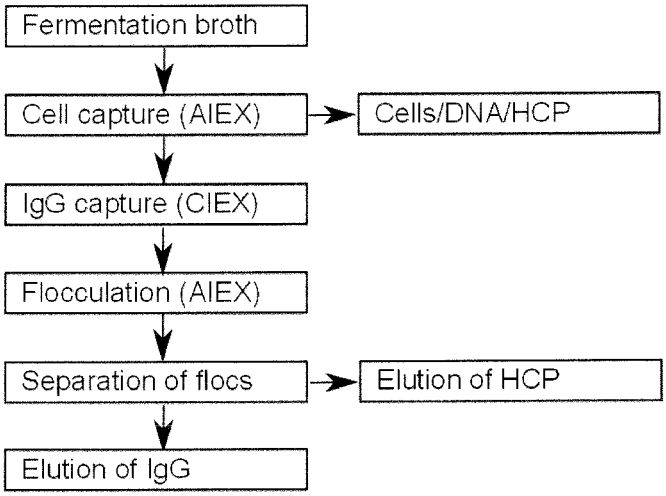


Fig. 14.3

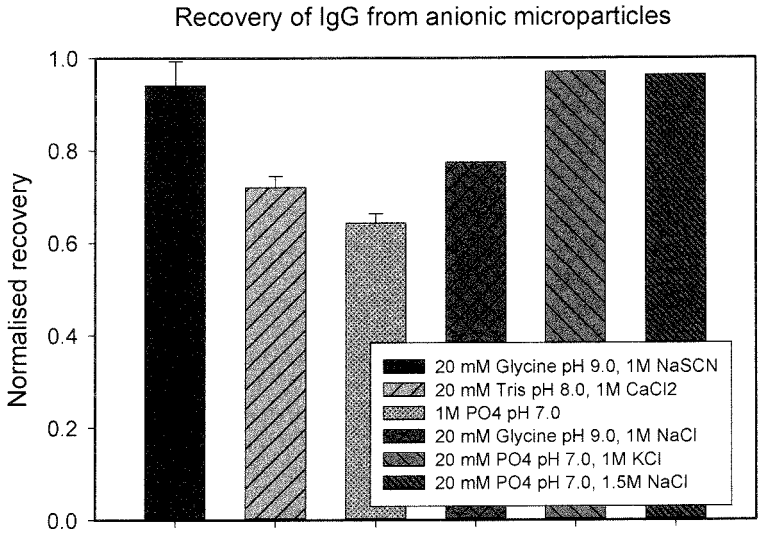


Fig. 14.4

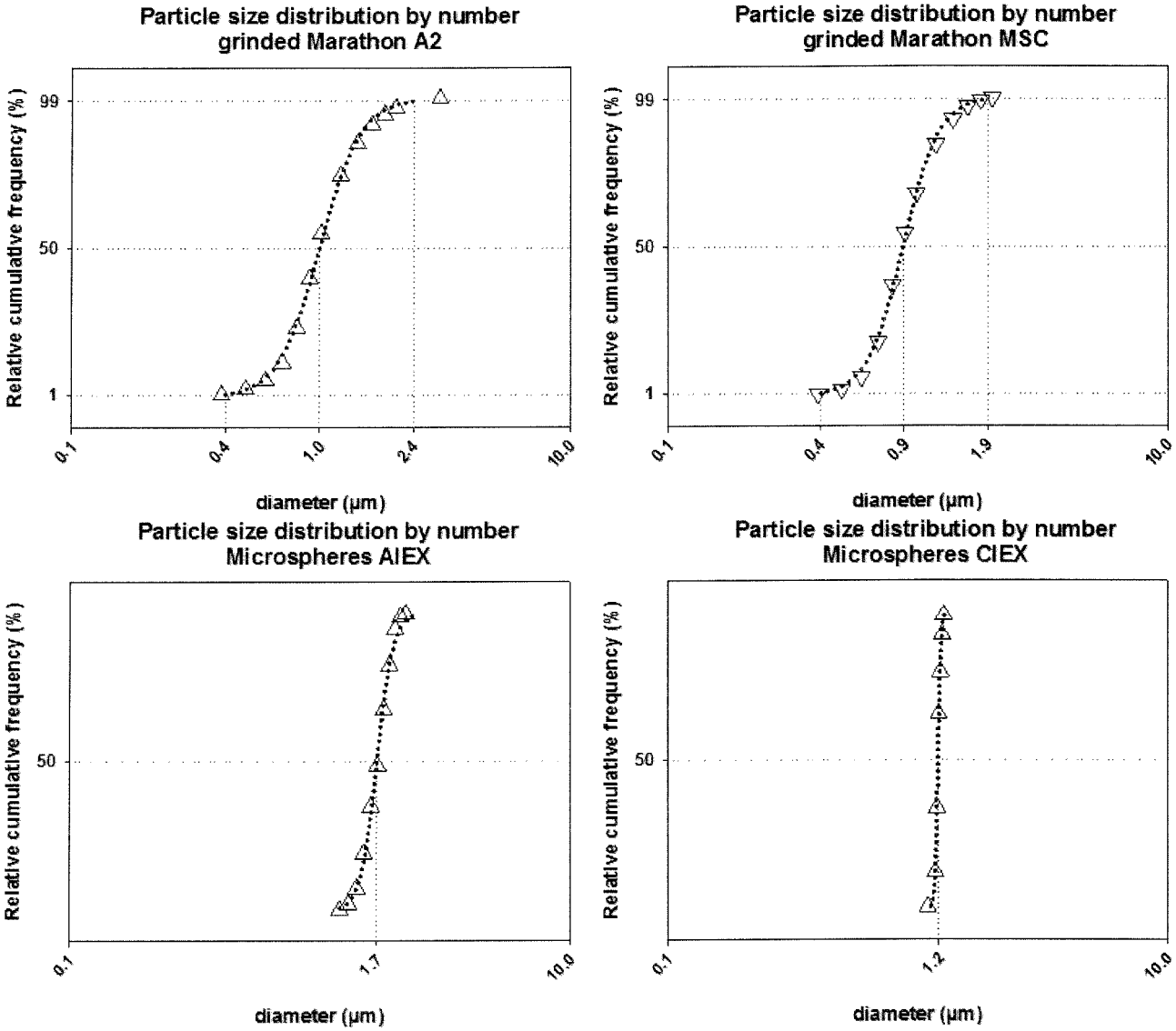

Particle size distribution by number
grinded Marathon A2
Relative cumulative frequency (%)
99
50
1
0.1
0.4
1.0
2.4
10.0
diameter (µm)
Particle size distribution by number
grinded Marathon MSC
Relative cumulative frequency (%)
99
50
1
0.1
0.4
0.9
1.9
10.0
diameter (µm)
Particle size distribution by number
Microspheres AIEX
Relative cumulative frequency (%)
50
0.1
1.7
10.0
diameter (µm)
Particle size distribution by number
Microspheres CIEX
Relative cumulative frequency (%)
50
0.1
1.2
10.0
diameter (µm)

Fig. 15

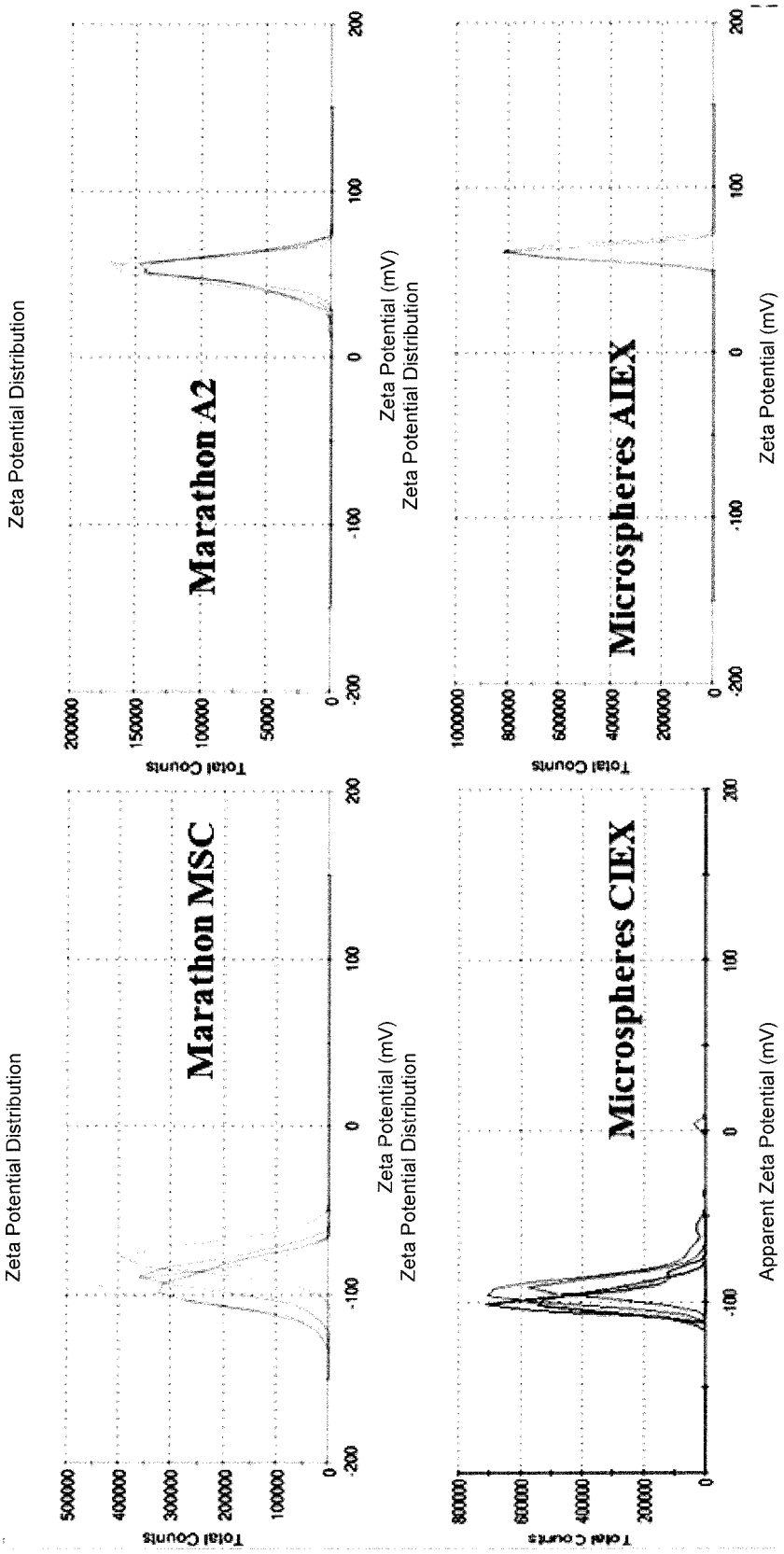

Zeta Potential Distribution
Marathon A2
Total Counts
Zeta Potential (mV)
Zeta Potential Distribution
Microspheres AIEX
Total Counts
Zeta Potential (mV)
Zeta Potential Distribution
Marathon MSC
Total Counts
Zeta Potential (mV)
Zeta Potential Distribution
Microspheres CIEX
Total Counts
Apparent Zeta Potential (mV)

Fig. 16

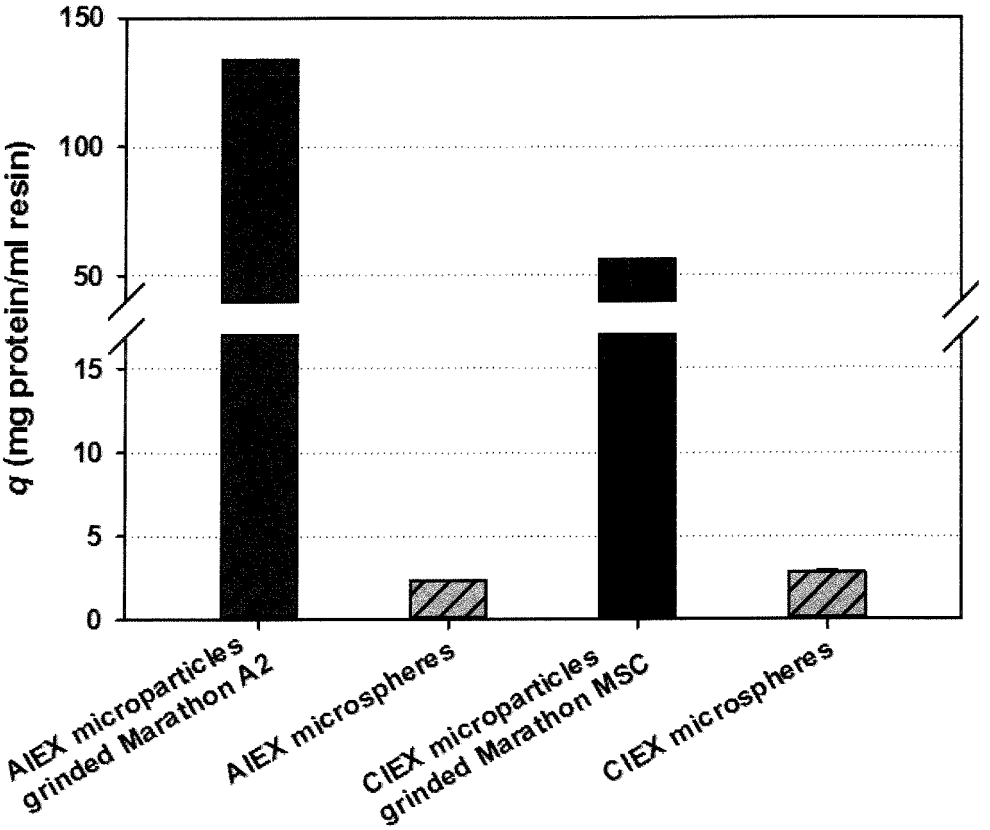

150
100
50
15
10
5
0
q (mg protein/ml resin)
AIEX microparticles grinded Marathon A2
AIEX microspheres
CIEX microparticles grinded Marathon MSC
CIEX microspheres

Fig. 17

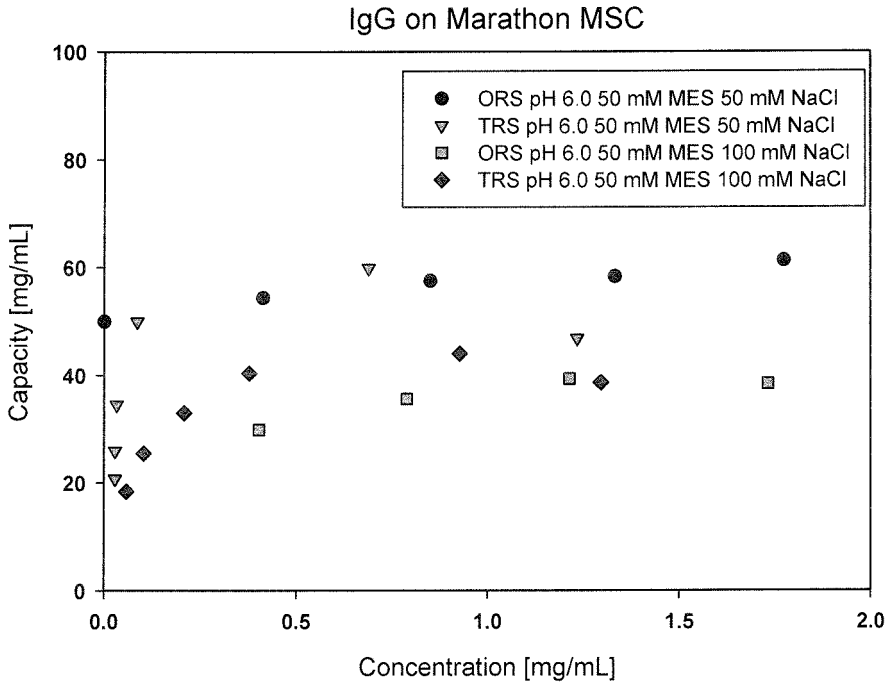

IgG on Marathon MSC
ORS pH 6.0 50 mM MES 50 mM NaCl
TRS pH 6.0 50 mM MES 50 mM NaCl
ORS pH 6.0 50 mM MES 100 mM NaCl
TRS pH 6.0 50 mM MES 100 mM NaCl
Capacity [mg/mL]
Concentration [mg/mL]
0
20
40
60
80
100
0.0
0.5
1.0
1.5
2.0

Fig. 18