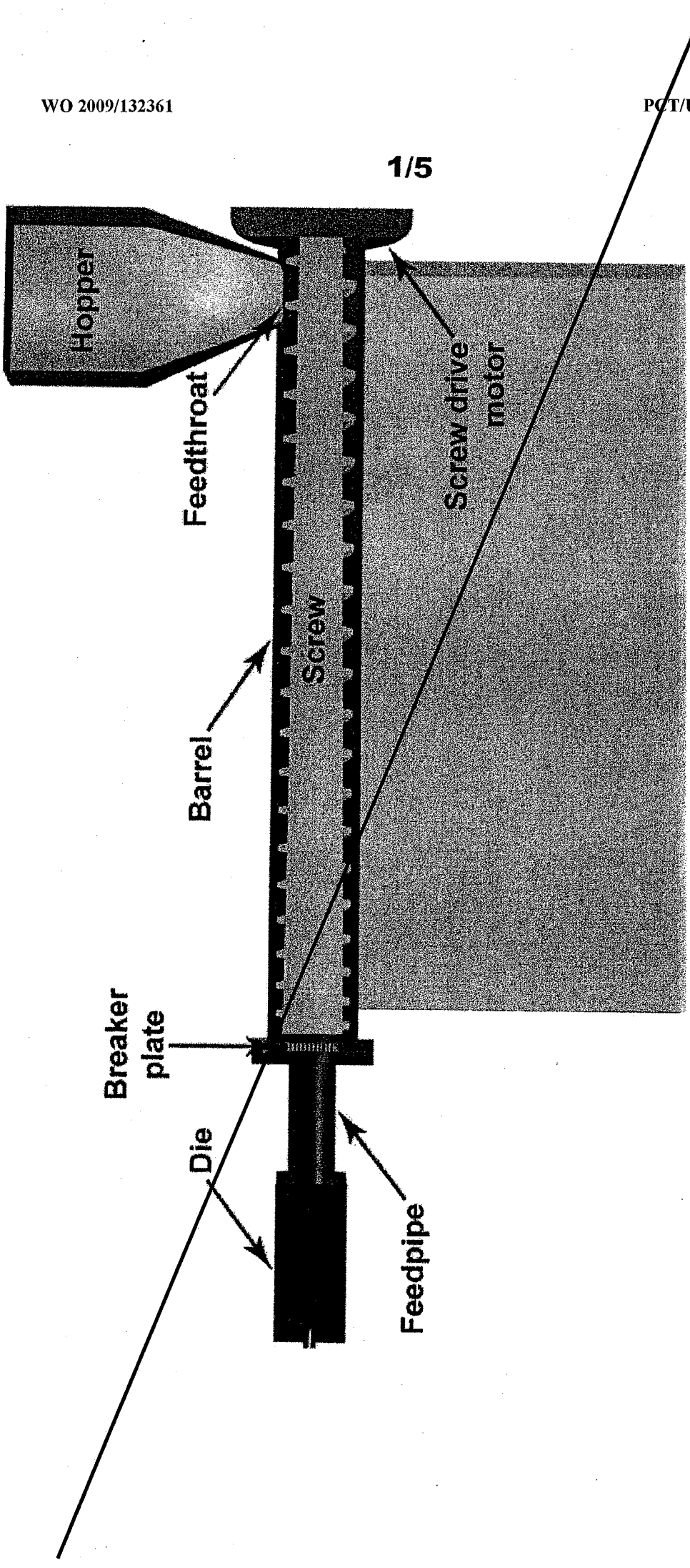

Hopper
Feedthroat
Screw drive motor
Screw
Barrel
Breaker plate
Die
Feedpipe

FIG. 1

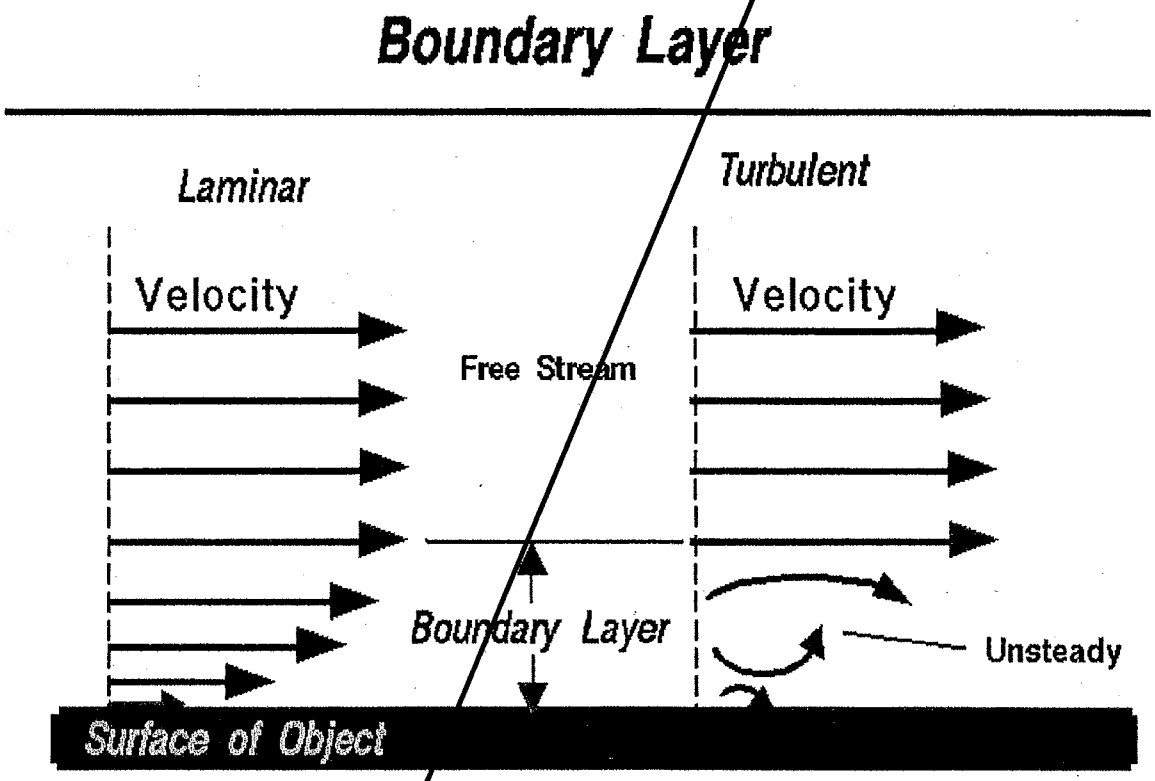

Boundary Layer
Laminar
Turbulent
Velocity
Velocity
Free Stream
Boundary Layer
Unsteady
Surface of Object
Velocity is zero at the surface (no – slip)

FIG. 2A

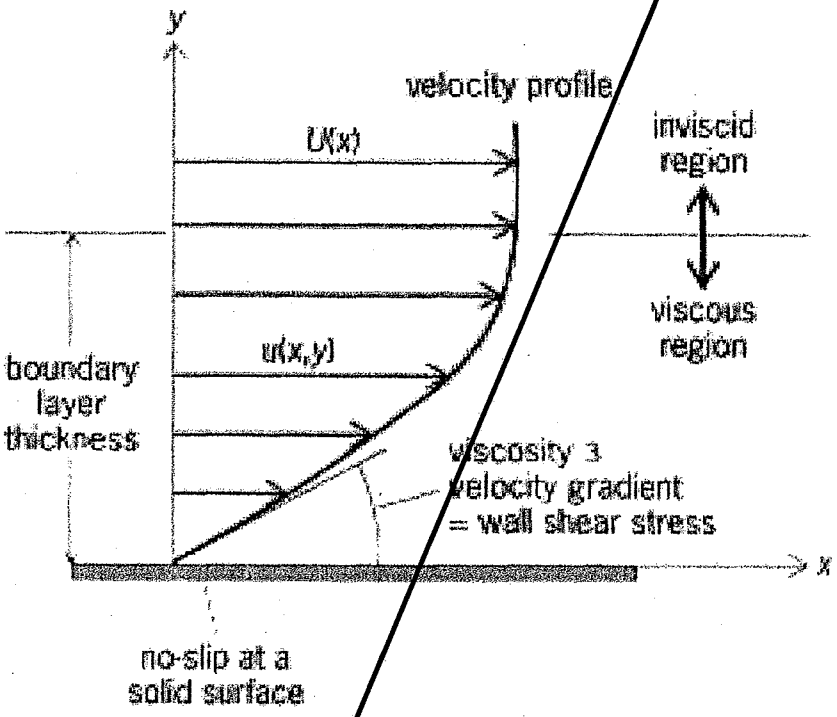

y
velocity profile
U(x)
inviscid
region
viscous
region
u(x,y)
boundary
layer
thickness
viscosity 3
velocity gradient
= wall shear stress
x
no-slip at a
solid surface

FIG. 2B

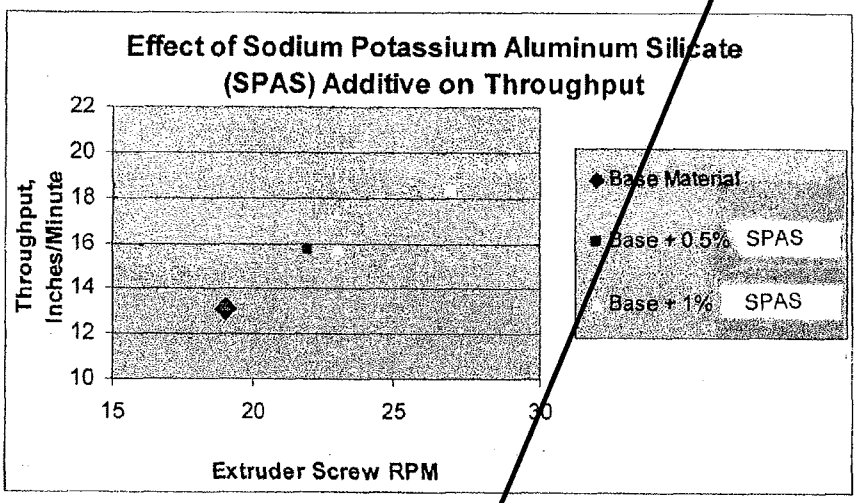

Effect of Sodium Potassium Aluminum Silicate (SPAS) Additive on Throughput
Throughput, Inches/Minute
22
20
18
16
14
12
10
15
20
25
30
Extruder Screw RPM
Base Material
Base + 0.5% SPAS
Base + 1% SPAS

FIG. 3

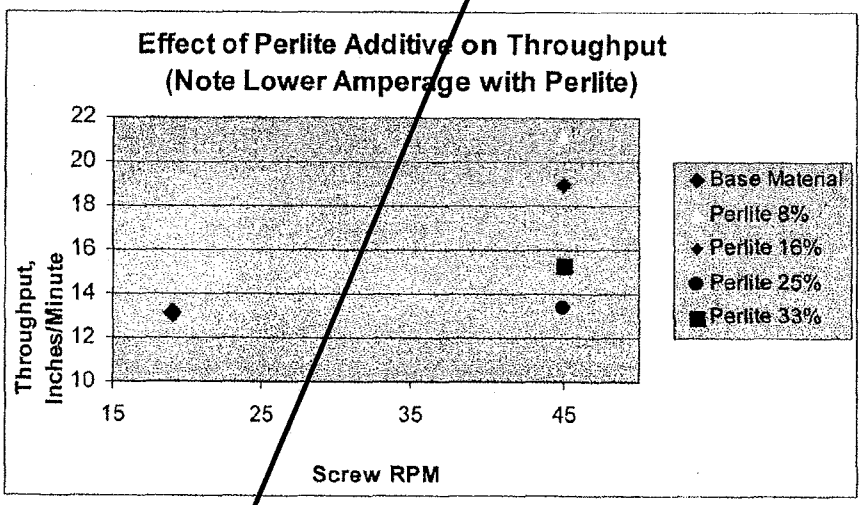

Effect of Perlite Additive on Throughput (Note Lower Amperage with Perlite)
Throughput, Inches/Minute
22
20
18
16
14
12
10
15
25
35
45
Screw RPM
Base Material
Perlite 8%
Perlite 16%
Perlite 25%
Perlite 33%

FIG. 4

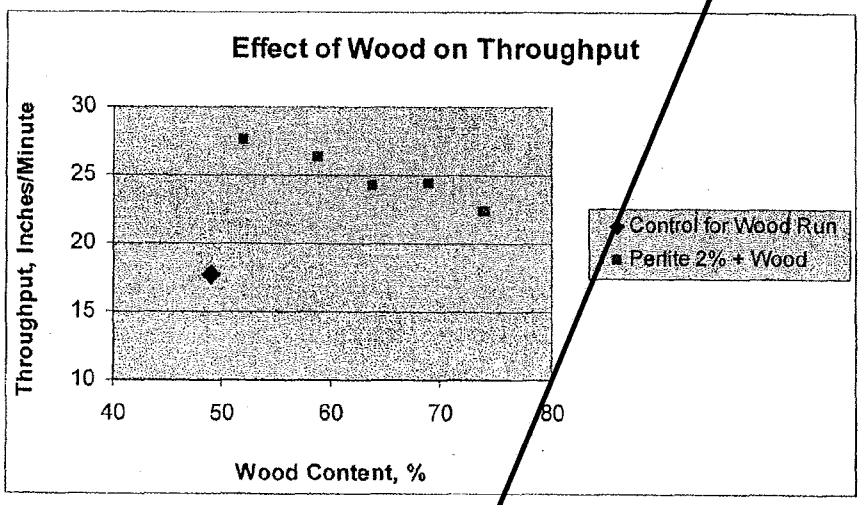

Effect of Wood on Throughput
Throughput, Inches/Minute
30
25
20
15
10
40
50
60
70
80
Wood Content, %
Control for Wood Run
Perlite 2% + Wood

FIG. 5

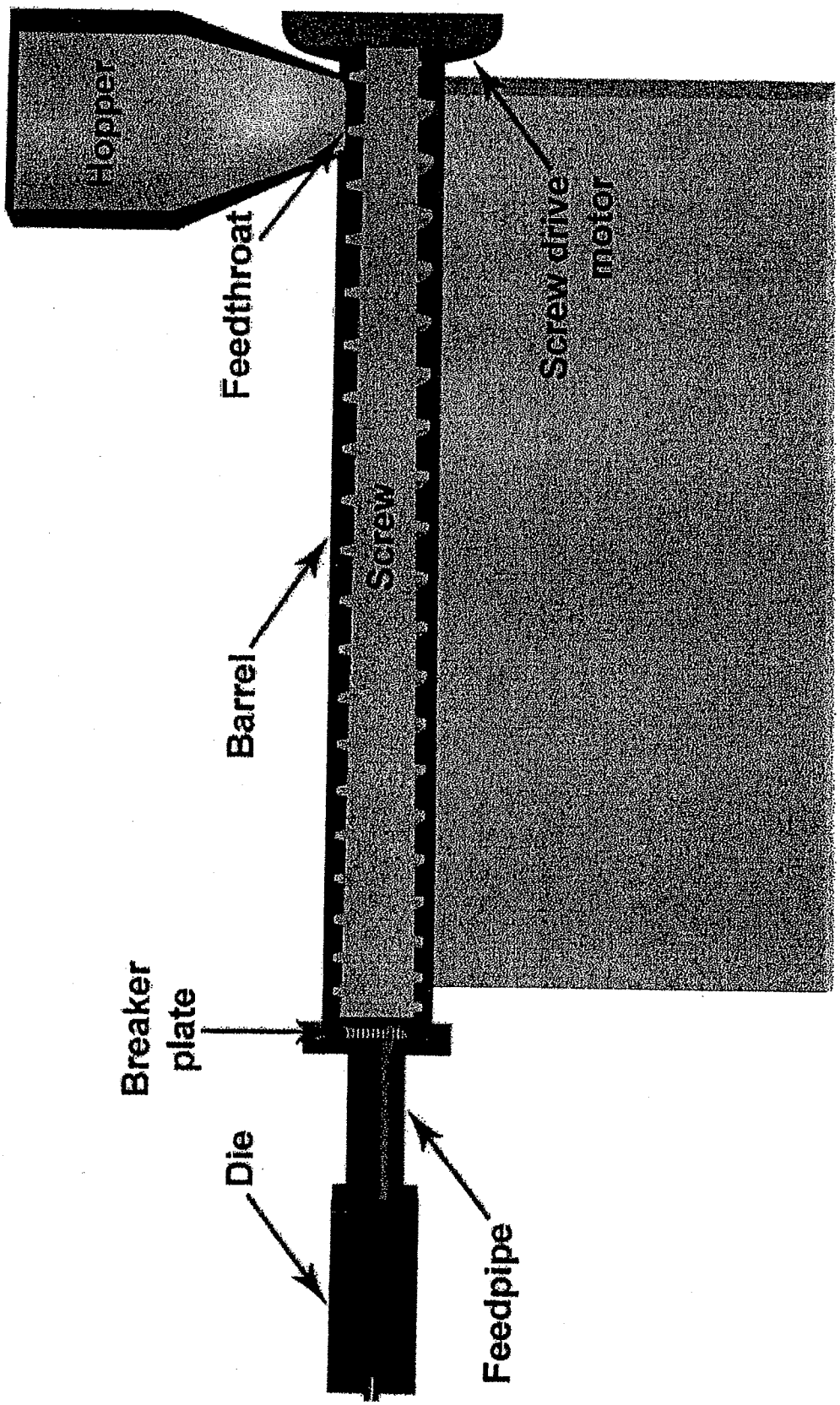

Hopper
Feedthroat
Screw drive motor
Screw
Barrel
Breaker plate
Die
Feedpipe

FIG. 1

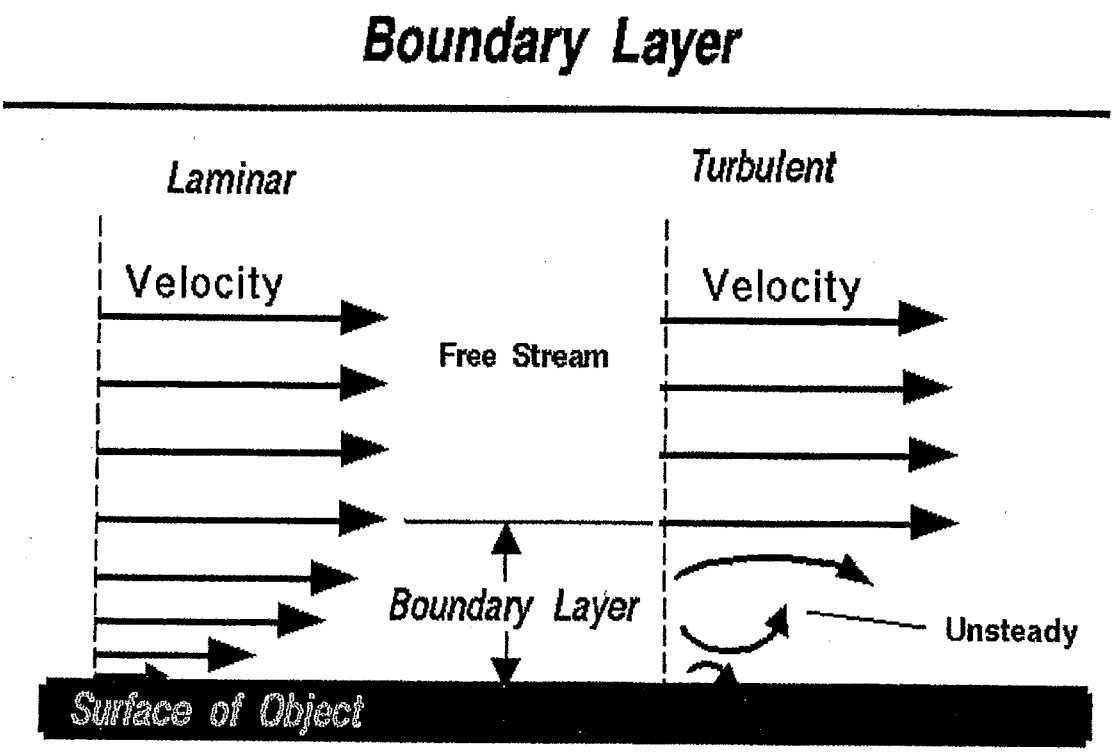

Boundary Layer
Laminar
Turbulent
Velocity
Velocity
Free Stream
Boundary Layer
Unsteady
Surface of Object
Velocity is zero at the surface (no – slip)

FIG. 2A

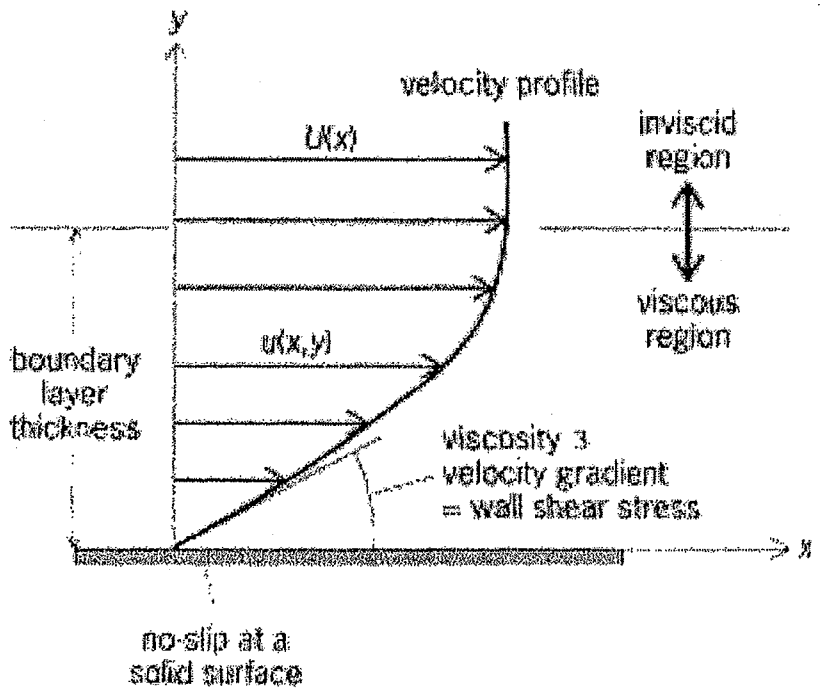

y
velocity profile
U(x)
inviscid
region
viscous
region
u(x,y)
boundary
layer
thickness
viscosity 3
velocity gradient
= wall shear stress
x
no-slip at a
solid surface

FIG. 2B

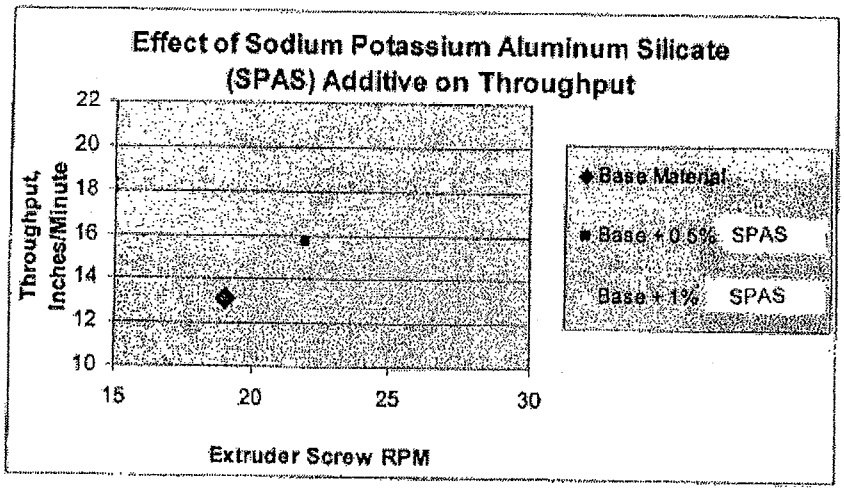

Effect of Sodium Potassium Aluminum Silicate (SPAS) Additive on Throughput
Throughput, Inches/Minute
22
20
18
16
14
12
10
15
20
25
30
Extruder Screw RPM
Base Material
Base + 0.5% SPAS
Base + 1% SPAS

FIG. 3

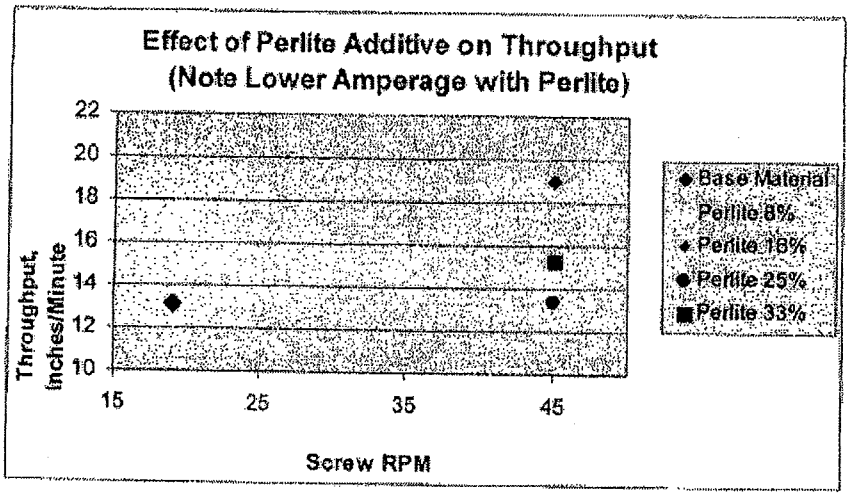

Effect of Perlite Additive on Throughput (Note Lower Amperage with Perlite)
Throughput, Inches/Minute
22
20
18
16
14
12
10
15
25
35
45
Screw RPM
Base Material
Perlite 8%
Perlite 18%
Perlite 25%
Perlite 33%

FIG. 4

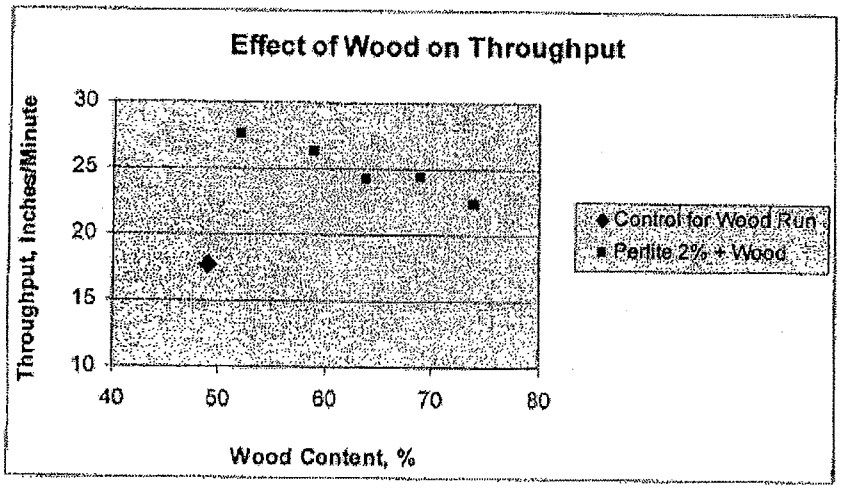
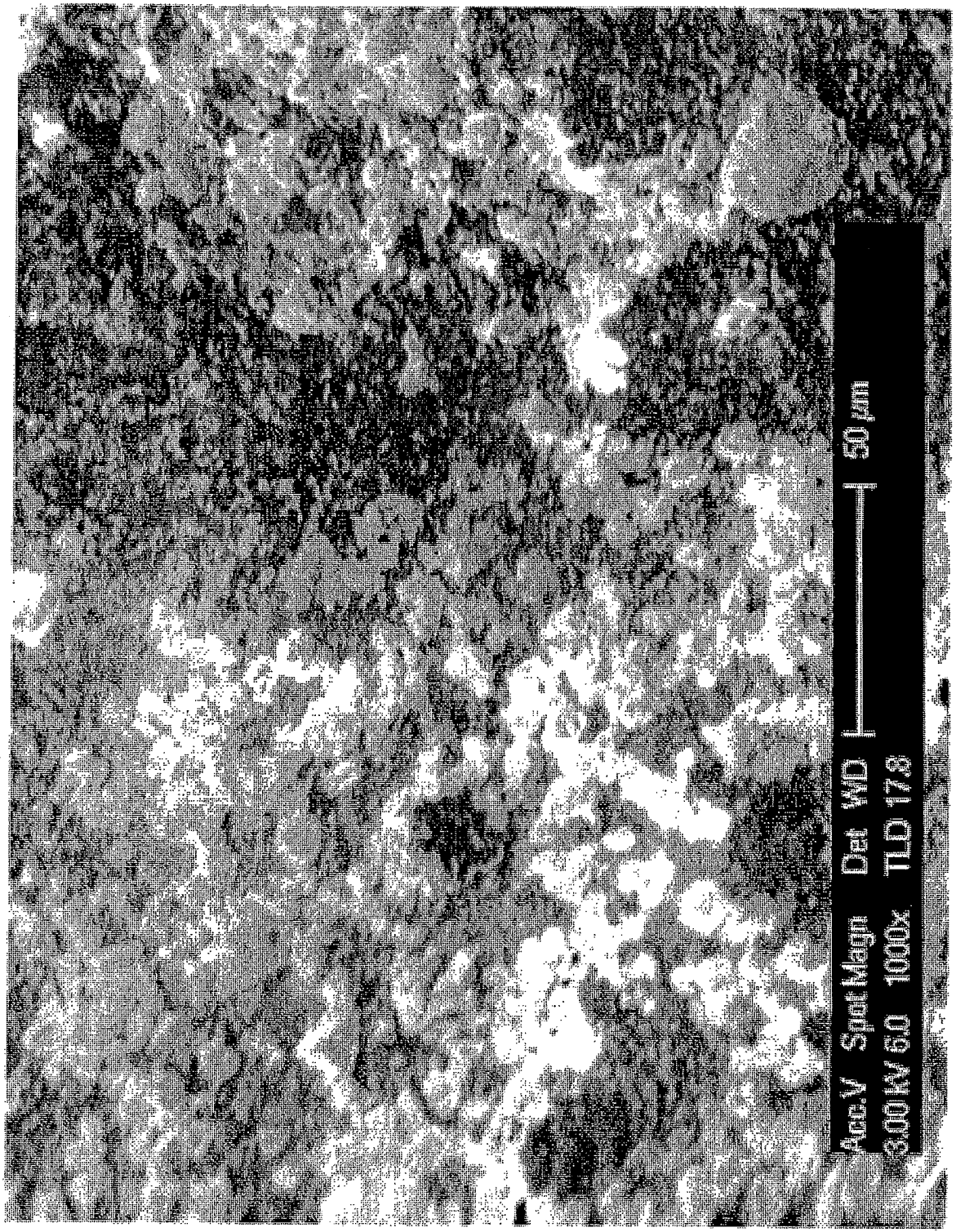
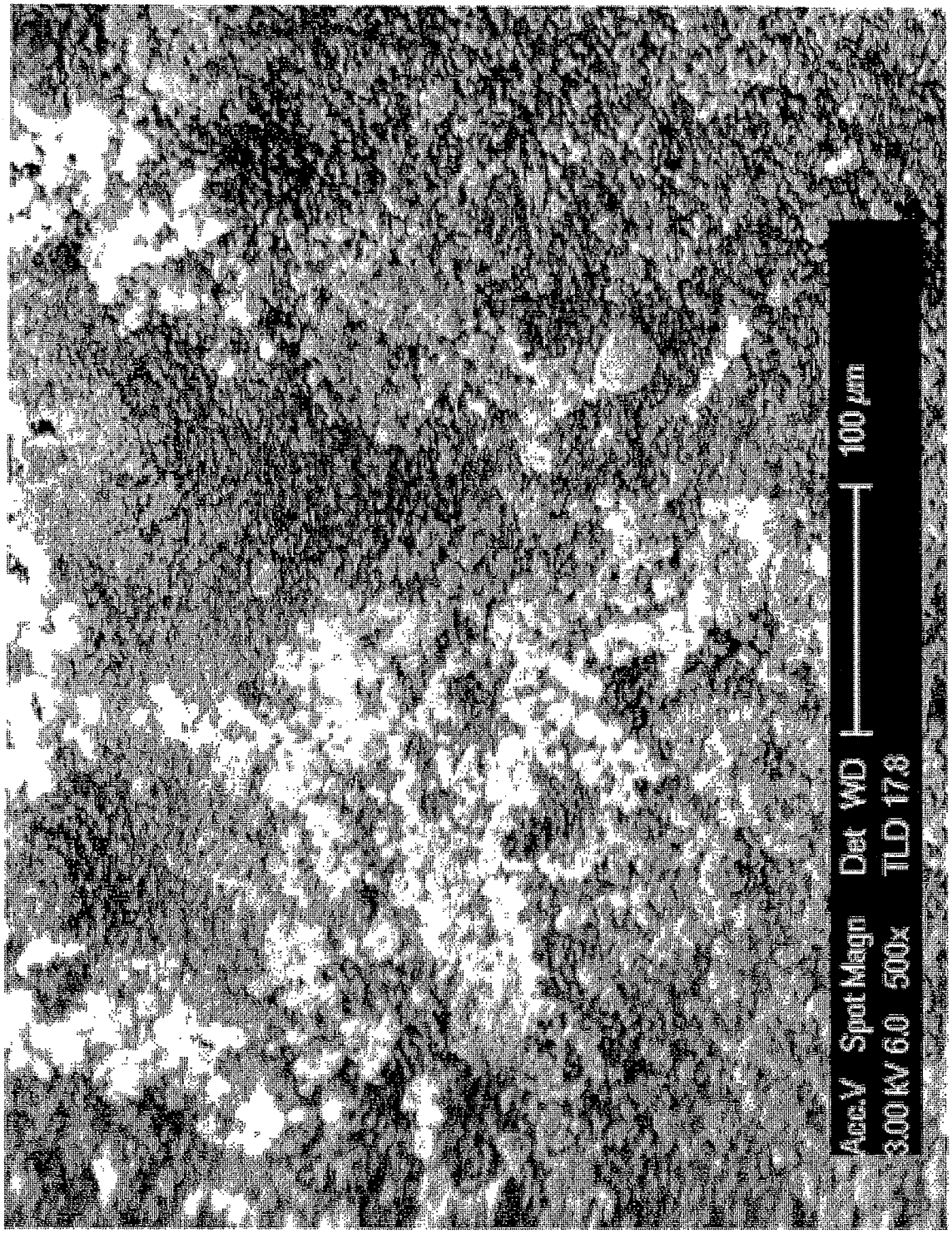

Effect of Wood on Throughput
Throughput, Inches/Minute
30
25
20
15
10
40
50
60
70
80
Wood Content, %
Control for Wood Run
Perlite 2% + Wood

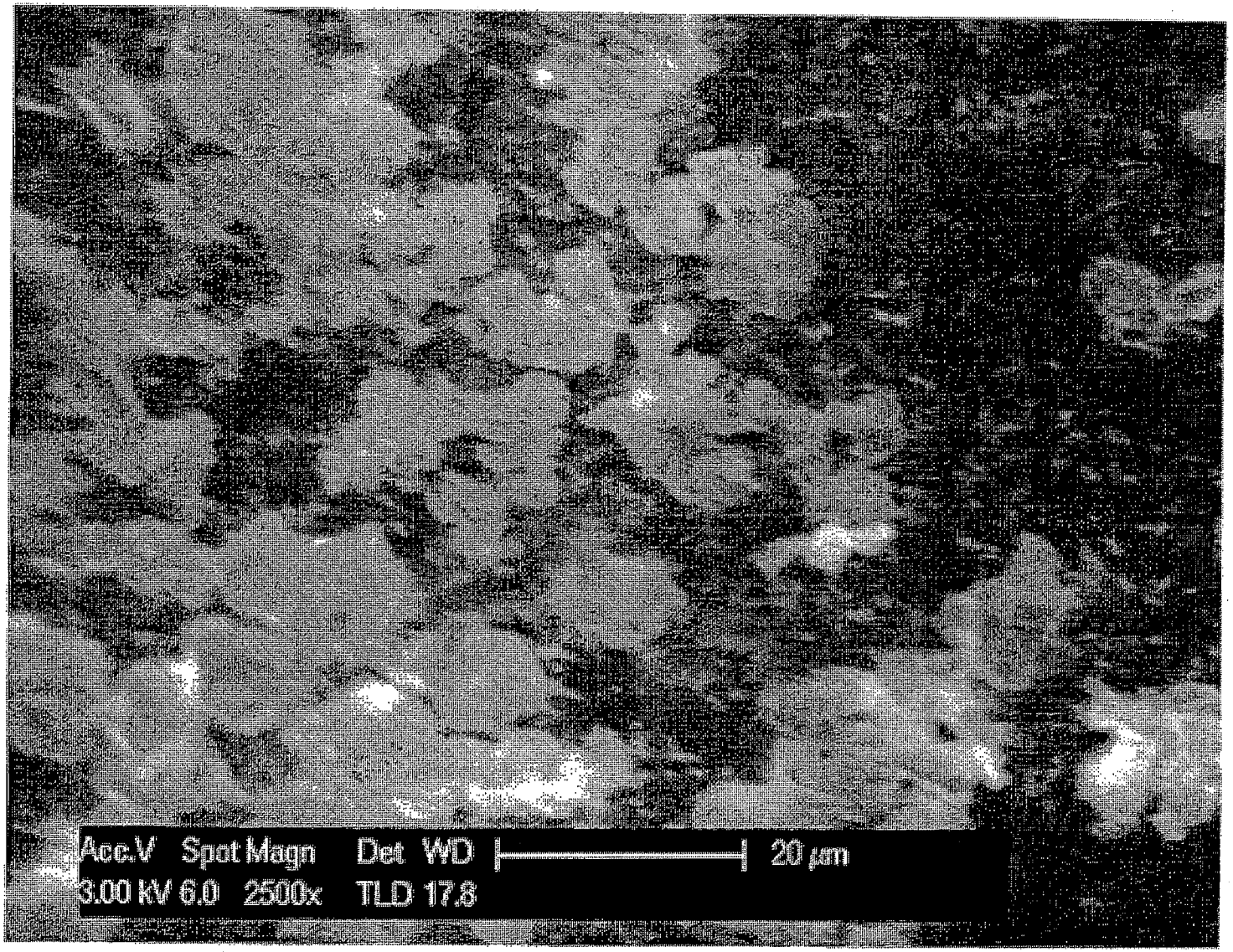
FIG. 5



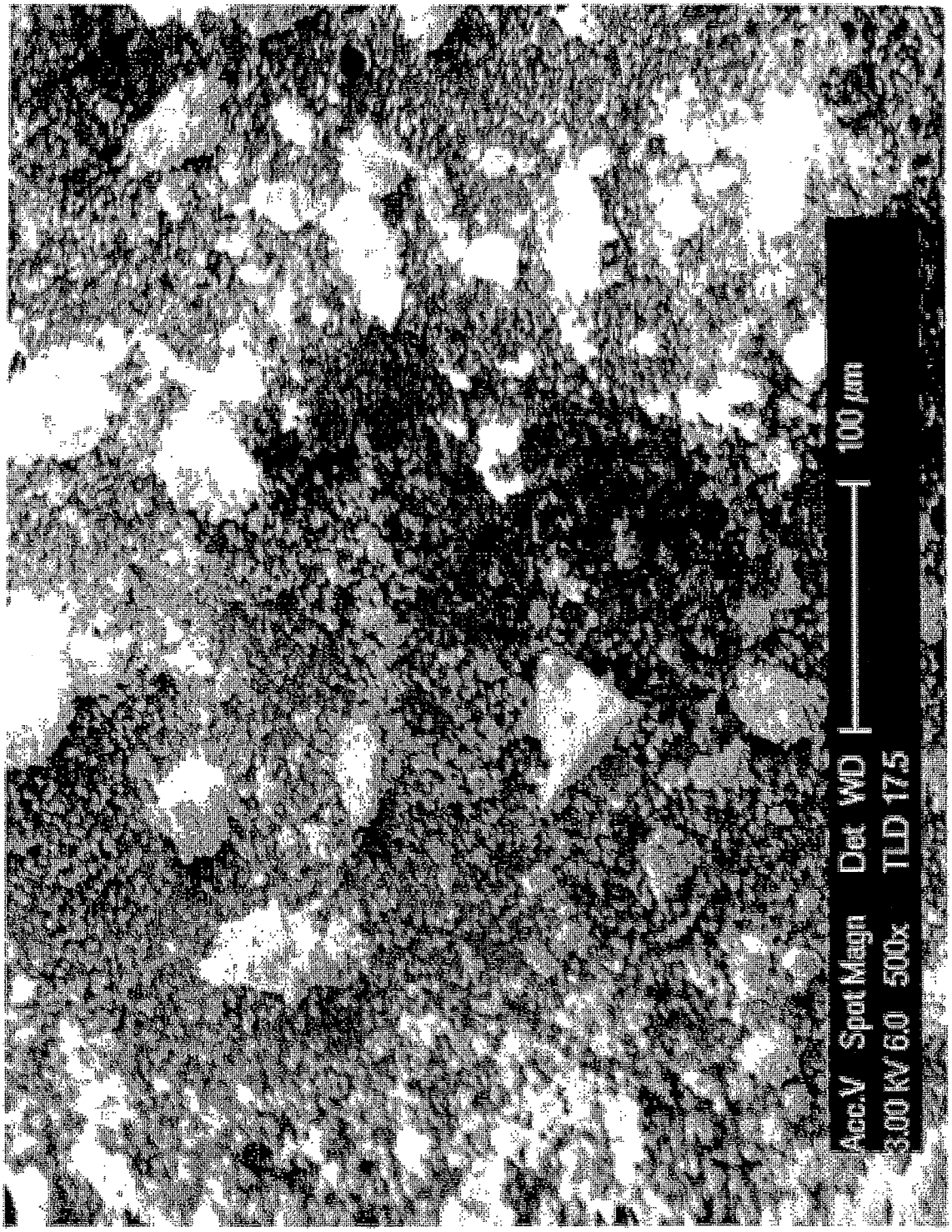
Appendix 1 – Image 1



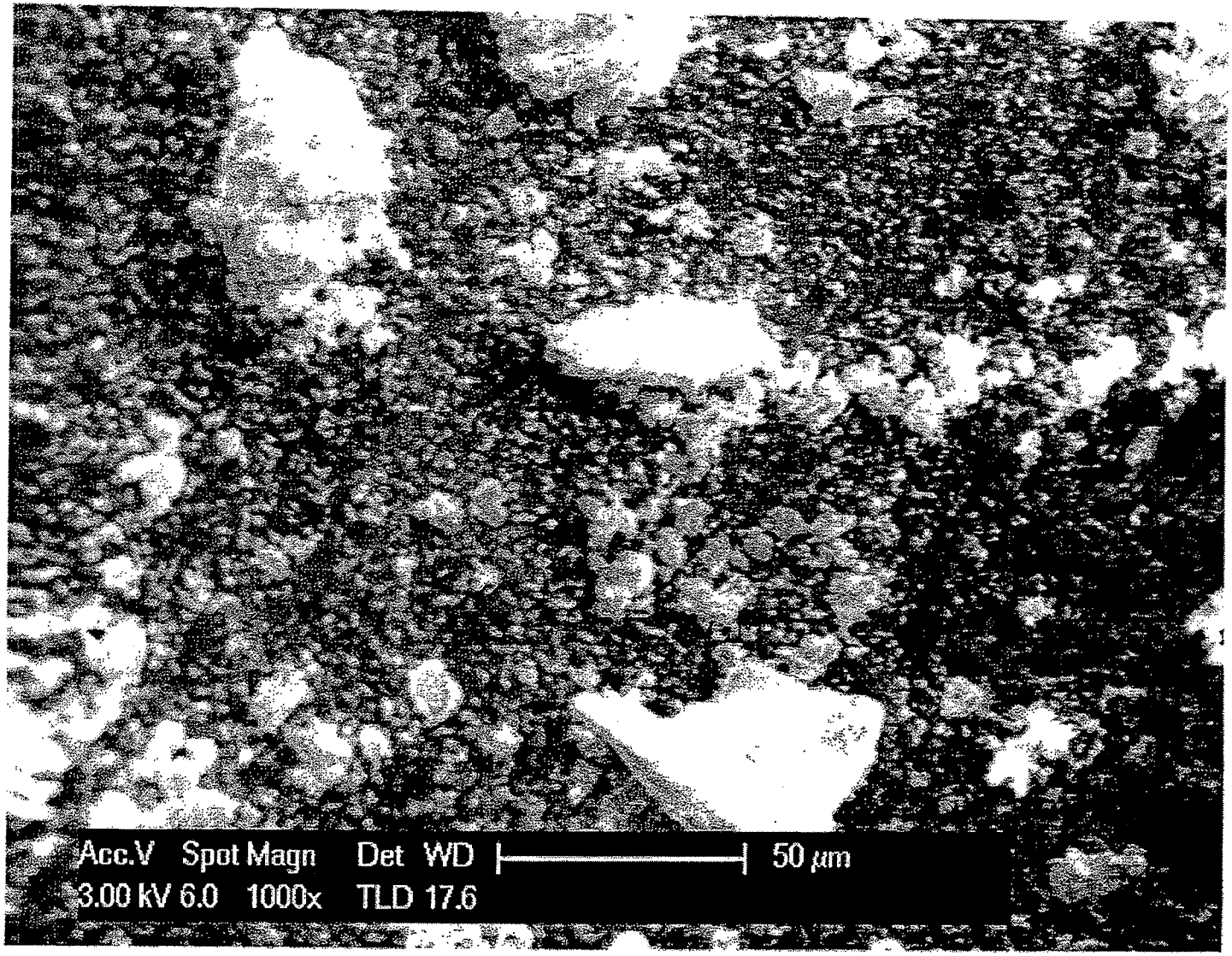
Appendix 1 – Image 2



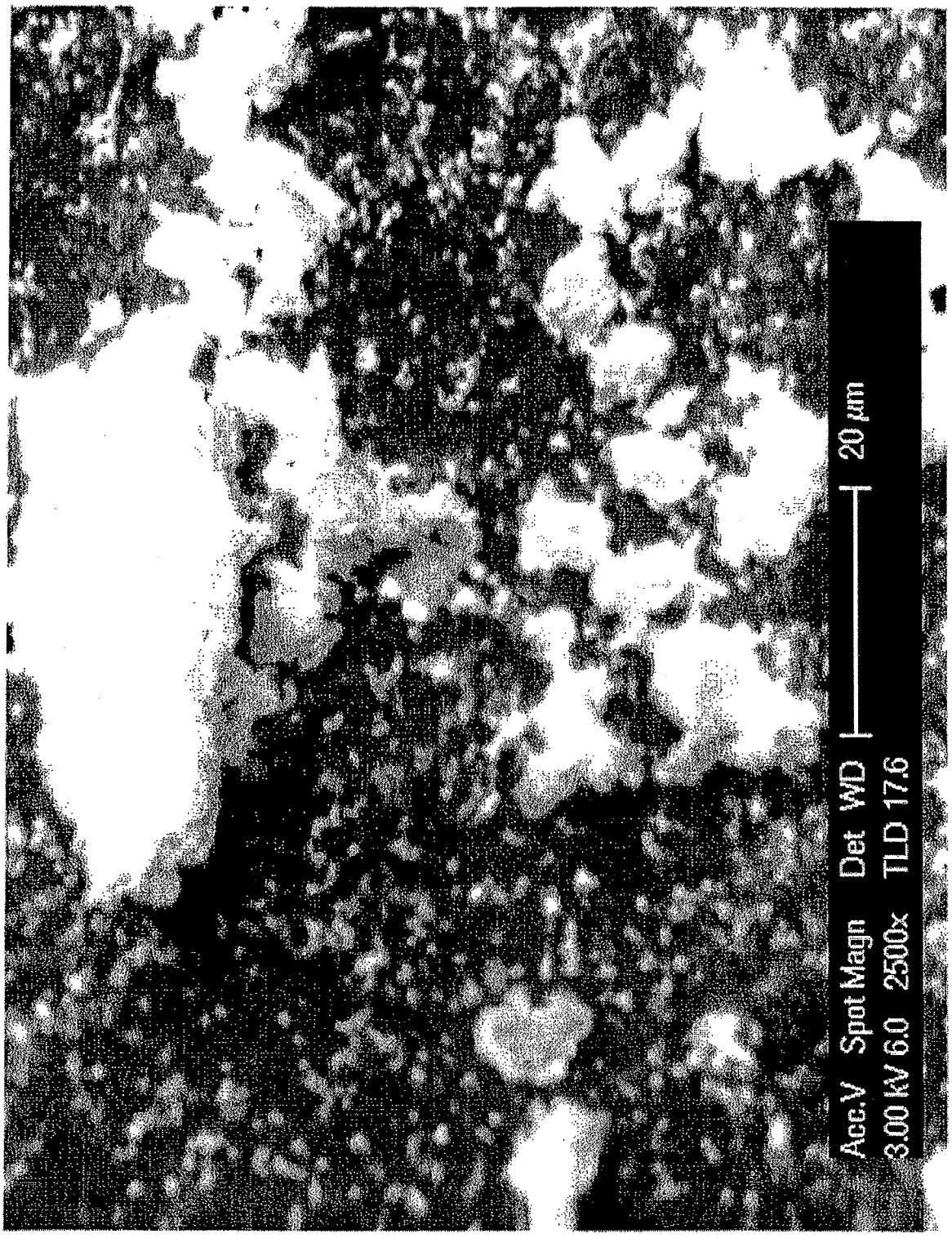
Appendix 1 – Image 3



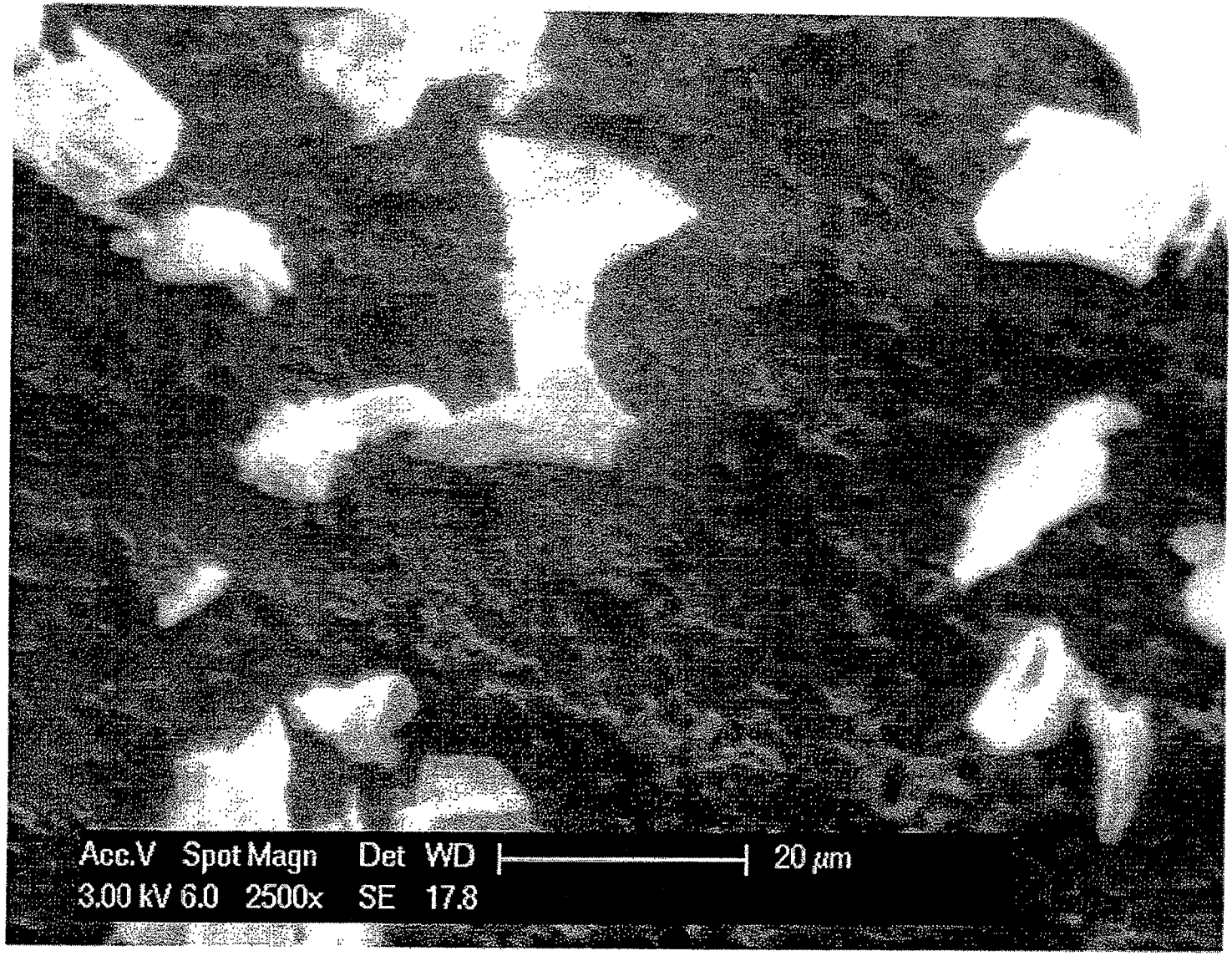
Appendix 1 – Image 4



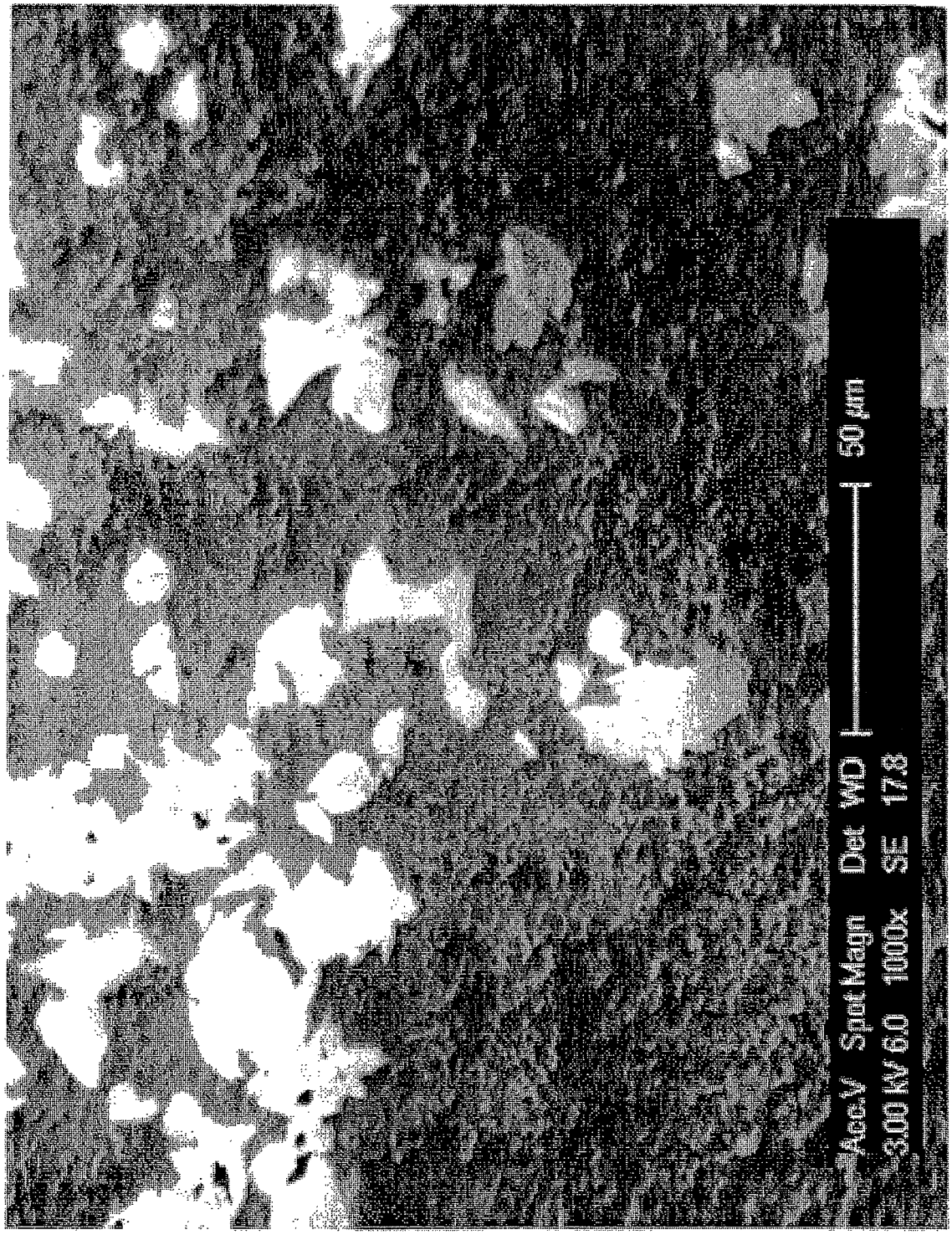
Appendix 1 – Image 5



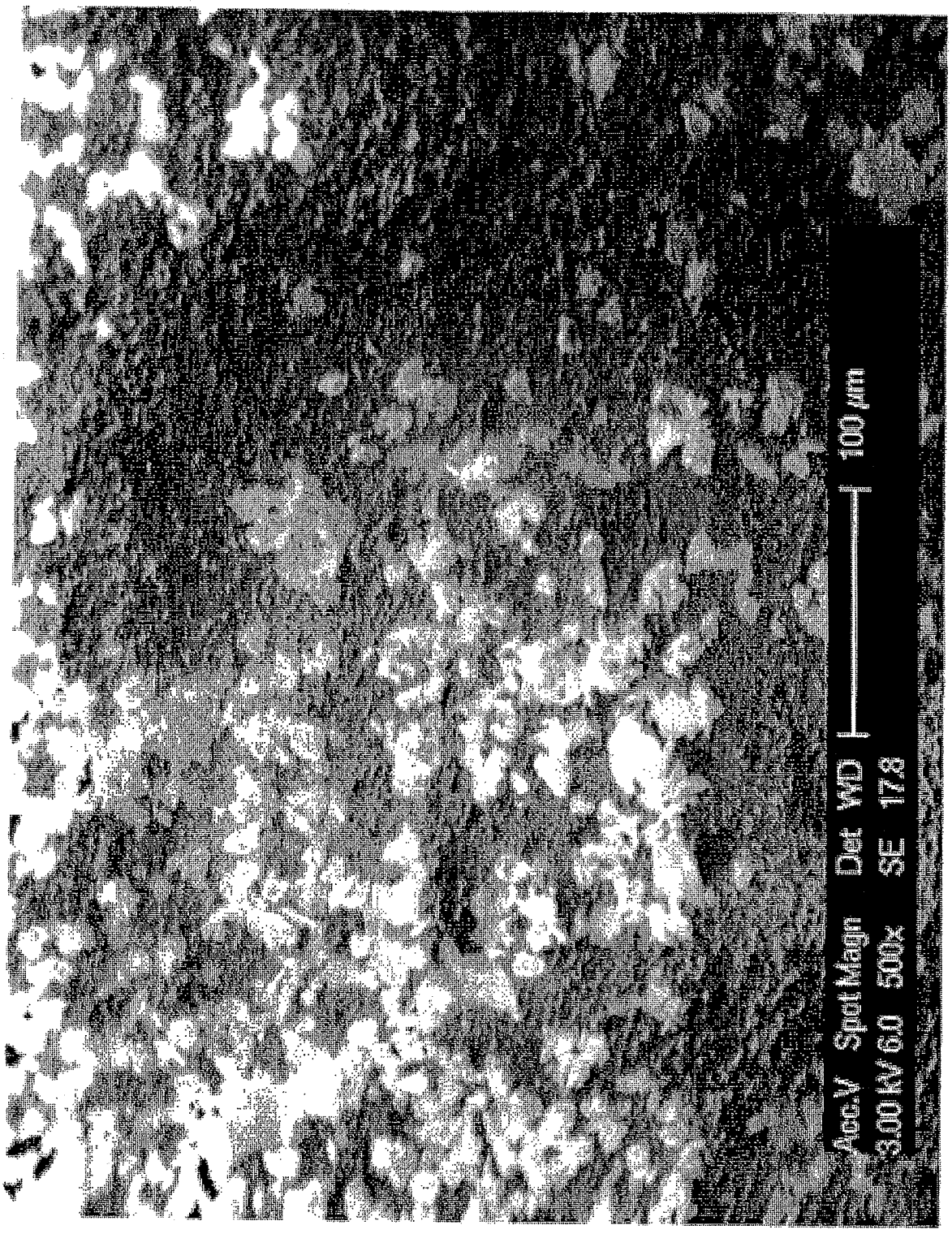
Appendix 1 – Image 6



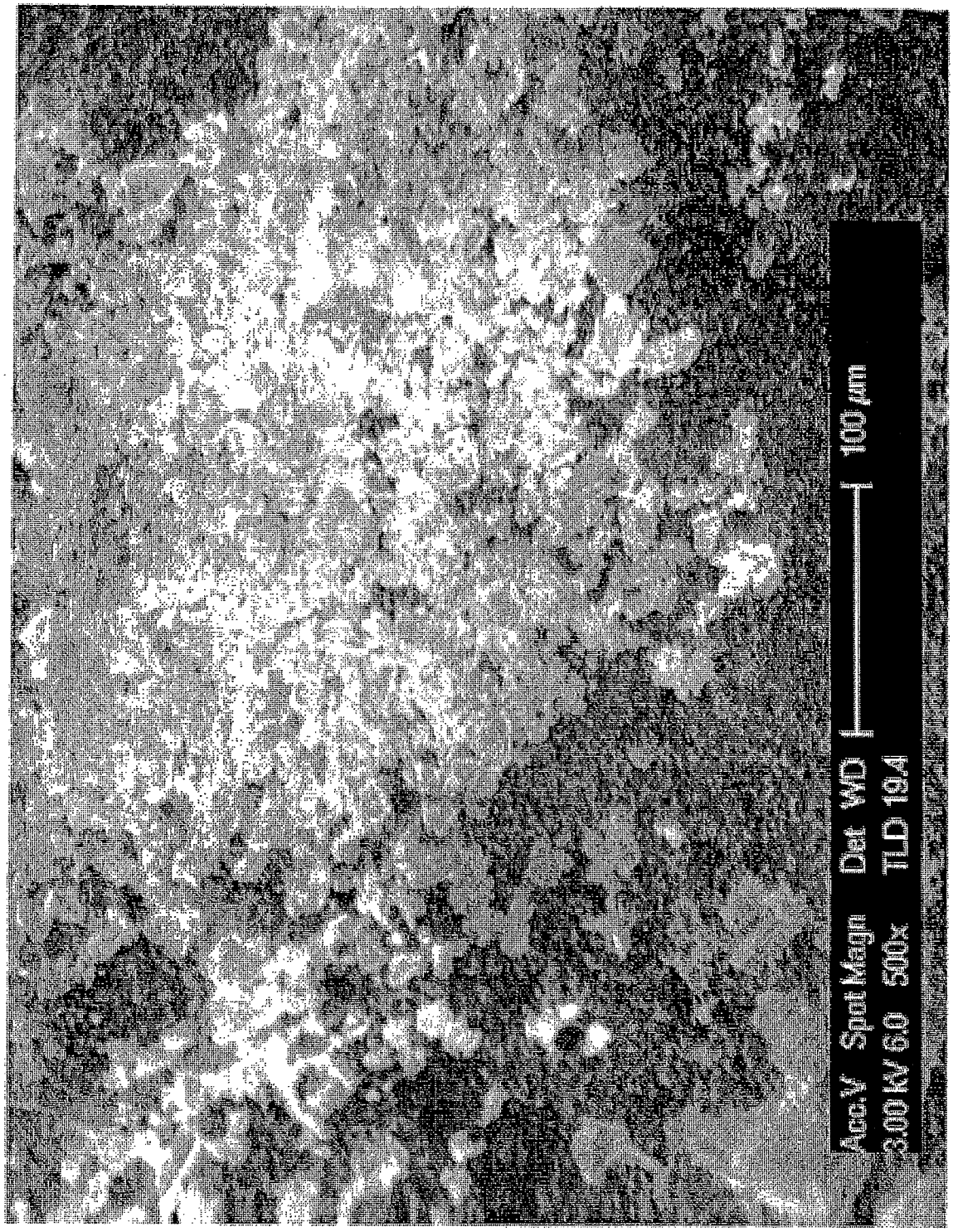
Appendix 1 – Image 7



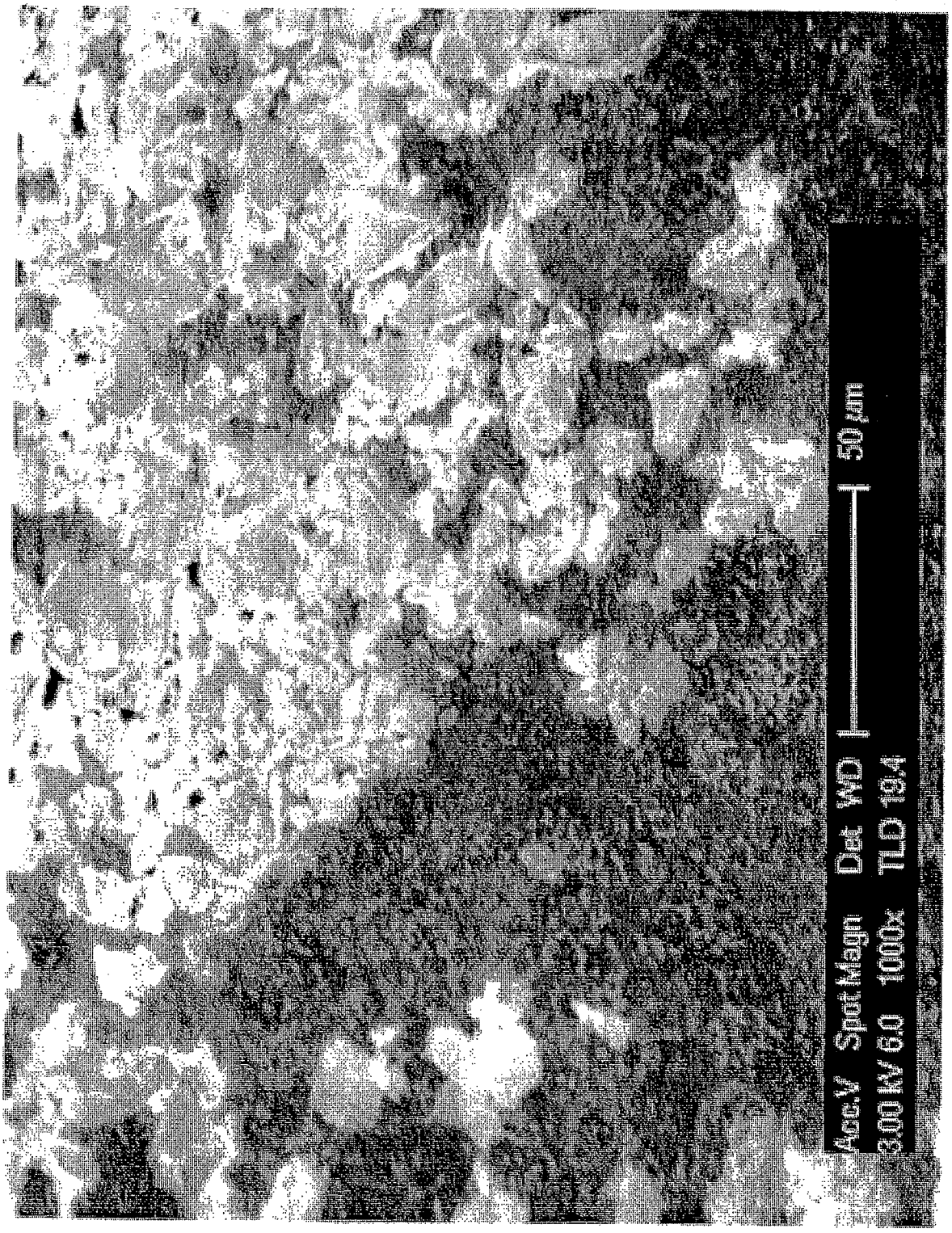
Appendix 1 – Image 8



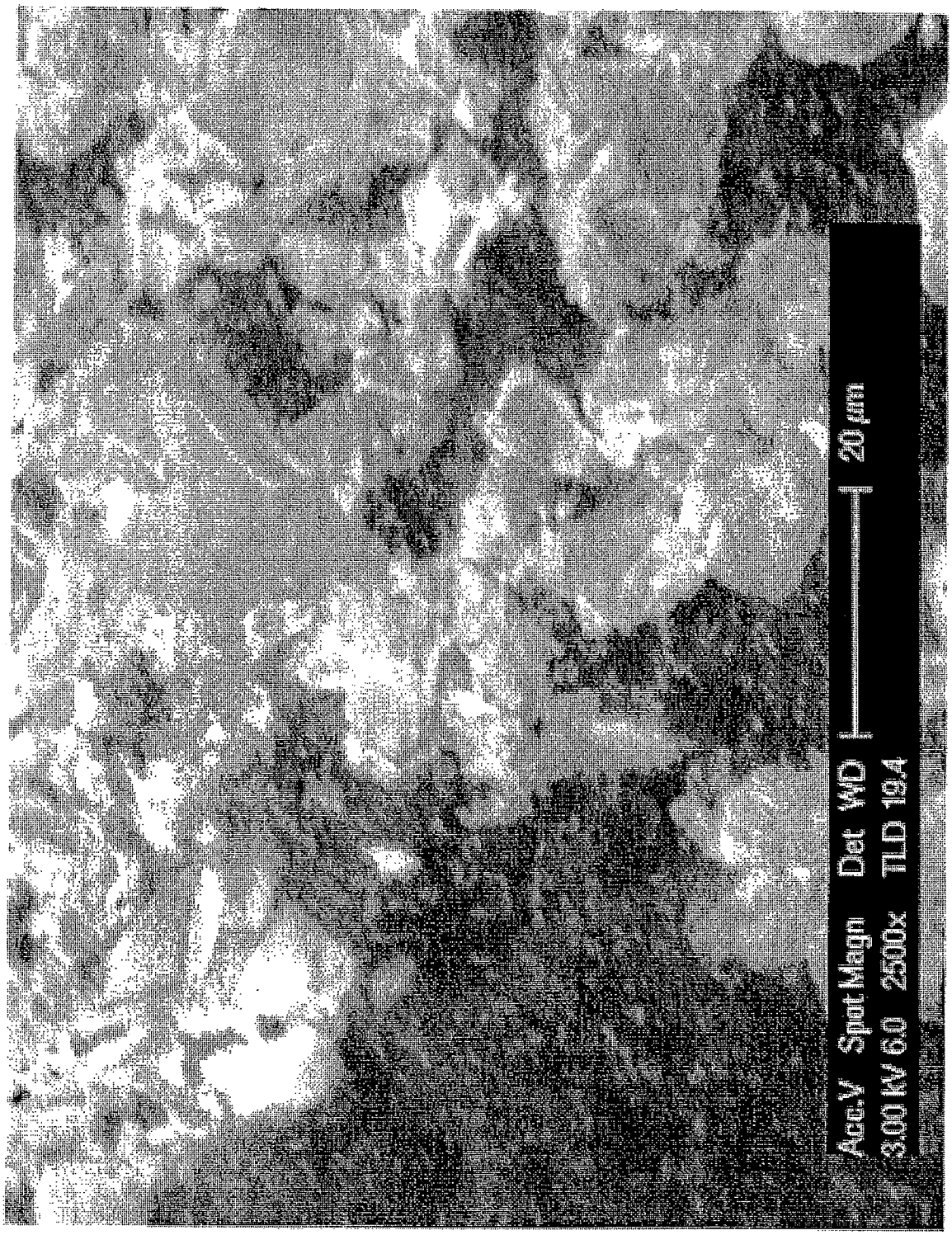
Appendix 1 – Image 9



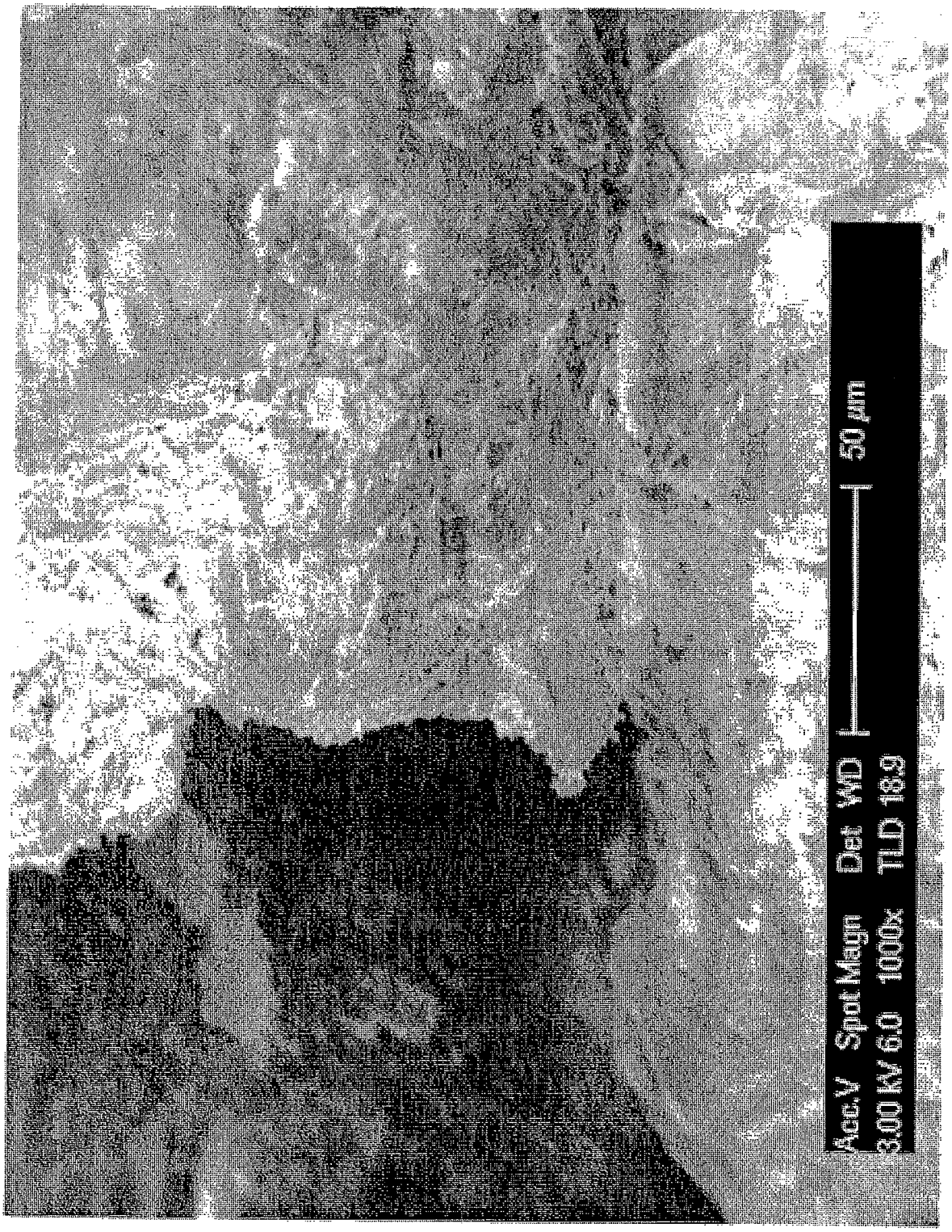
Appendix 1 – Image 10



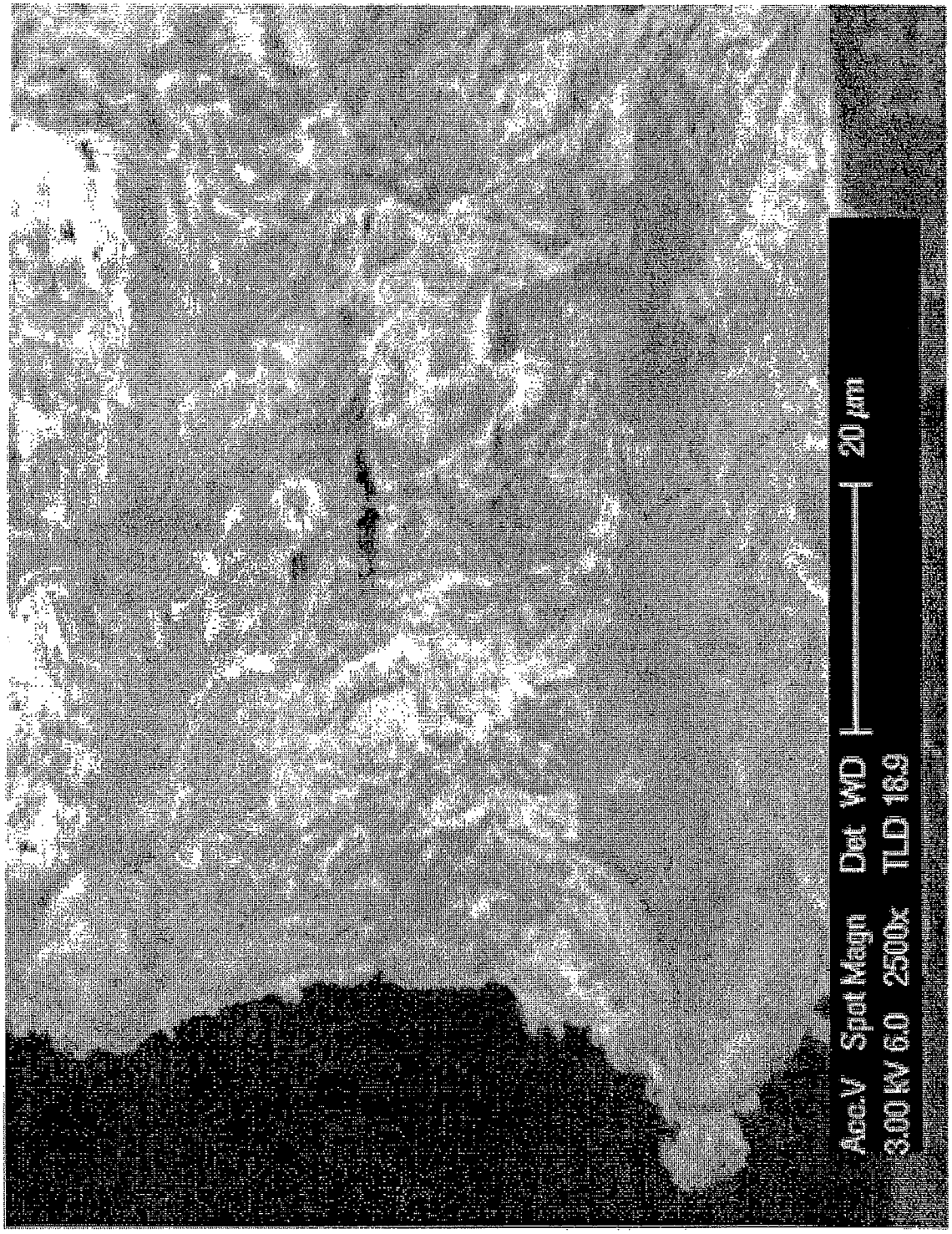
Appendix 1 – Image 11



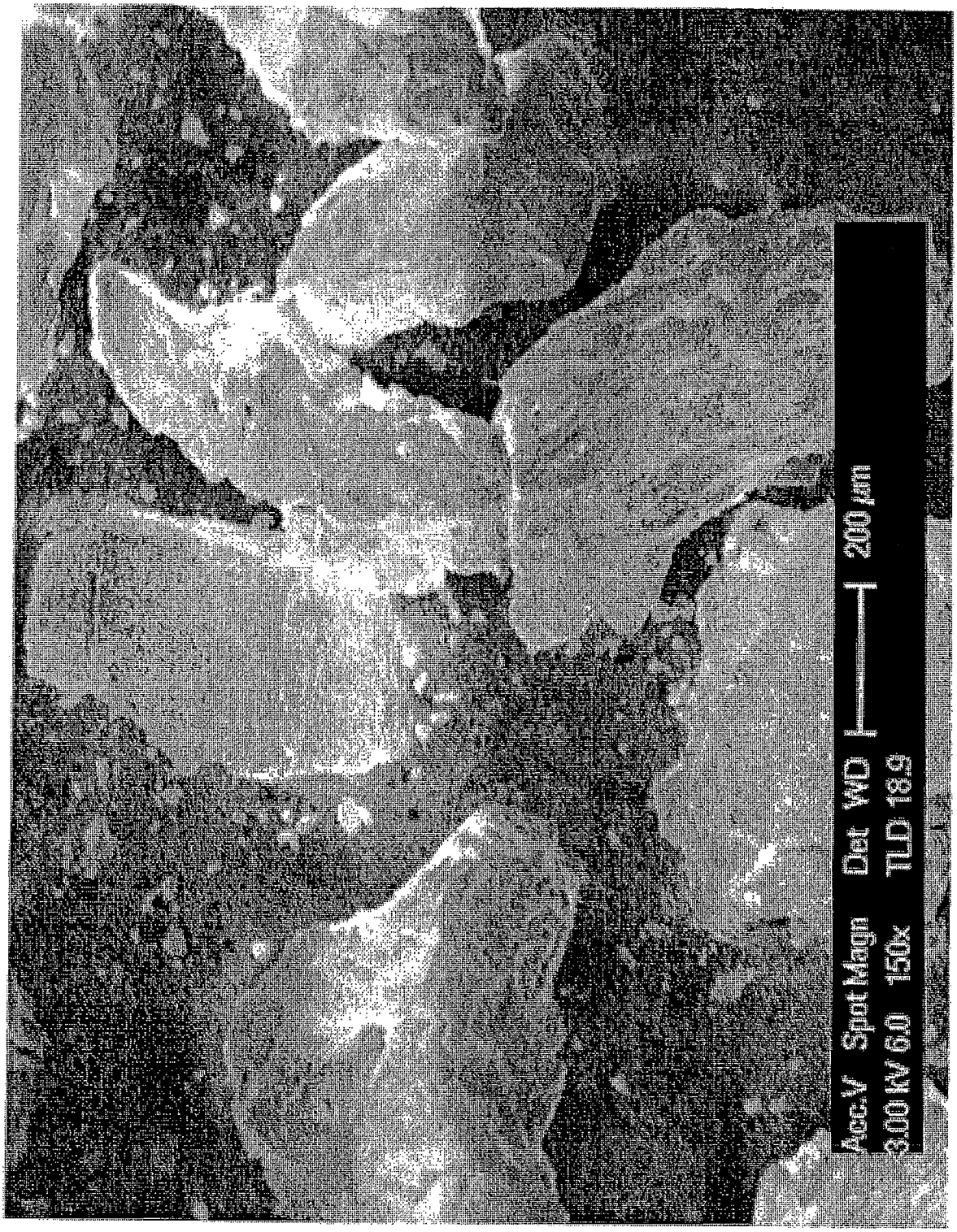
Appendix 1 – Image 12



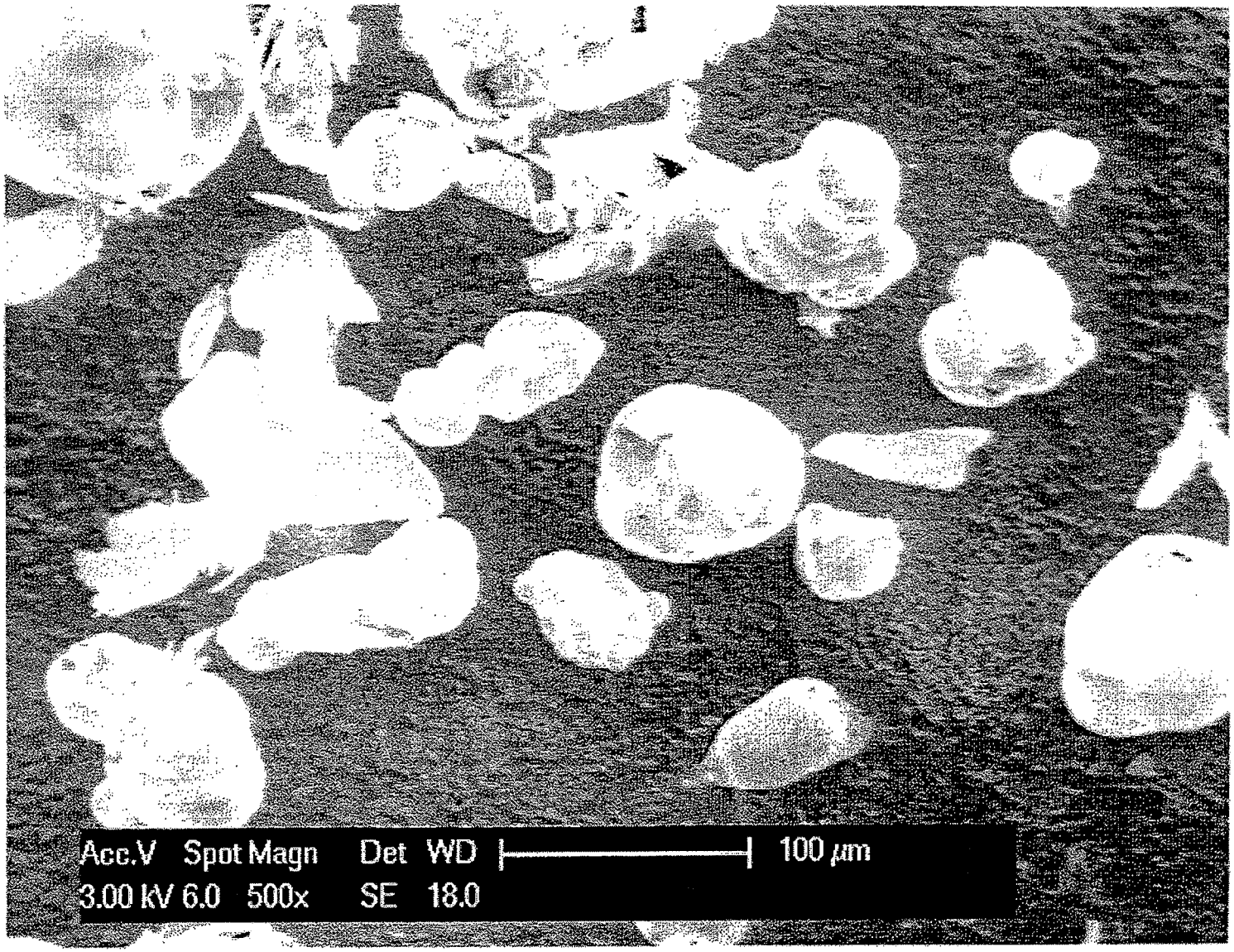
Appendix 2 – Image 1



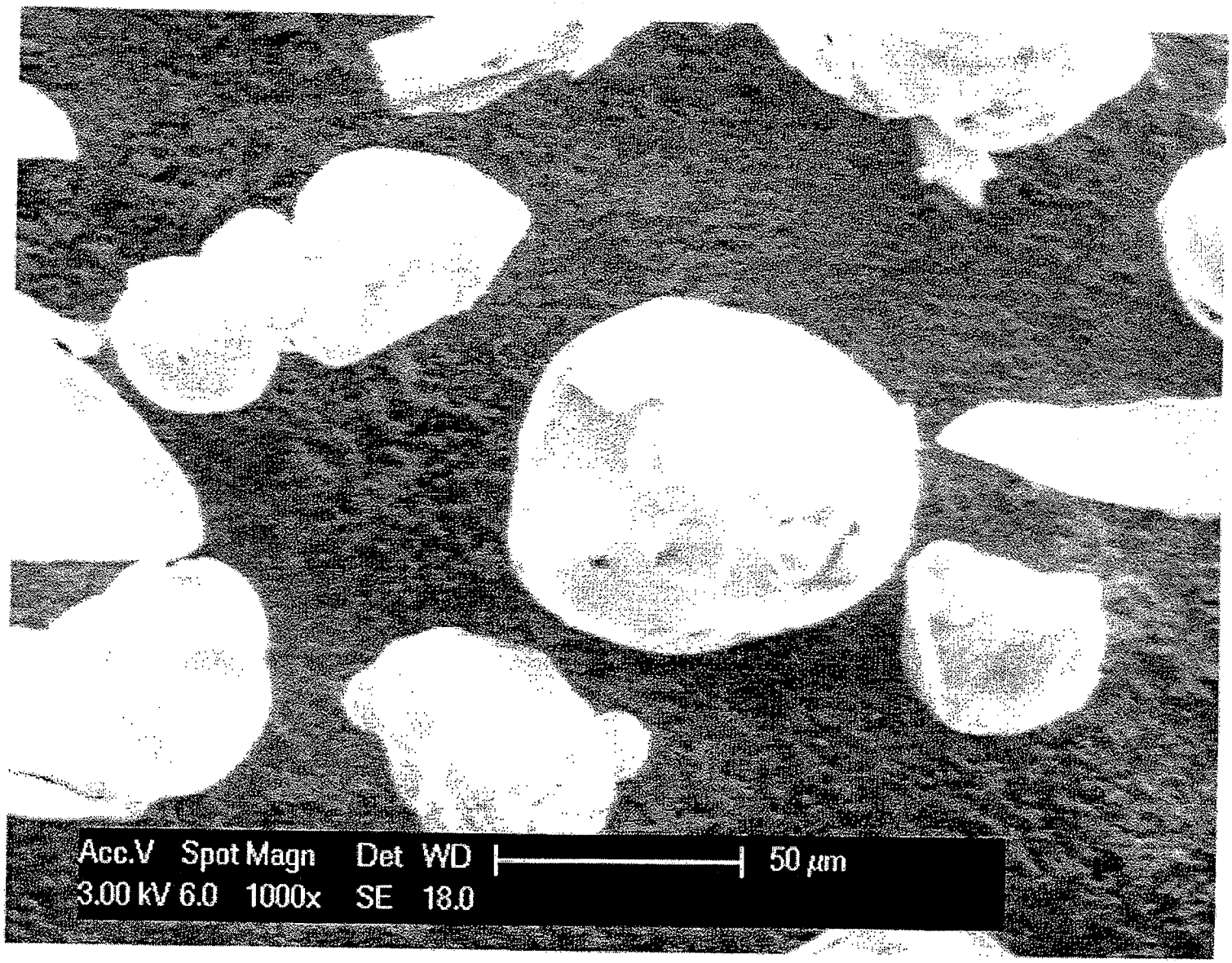
Appendix 2 – Image 2



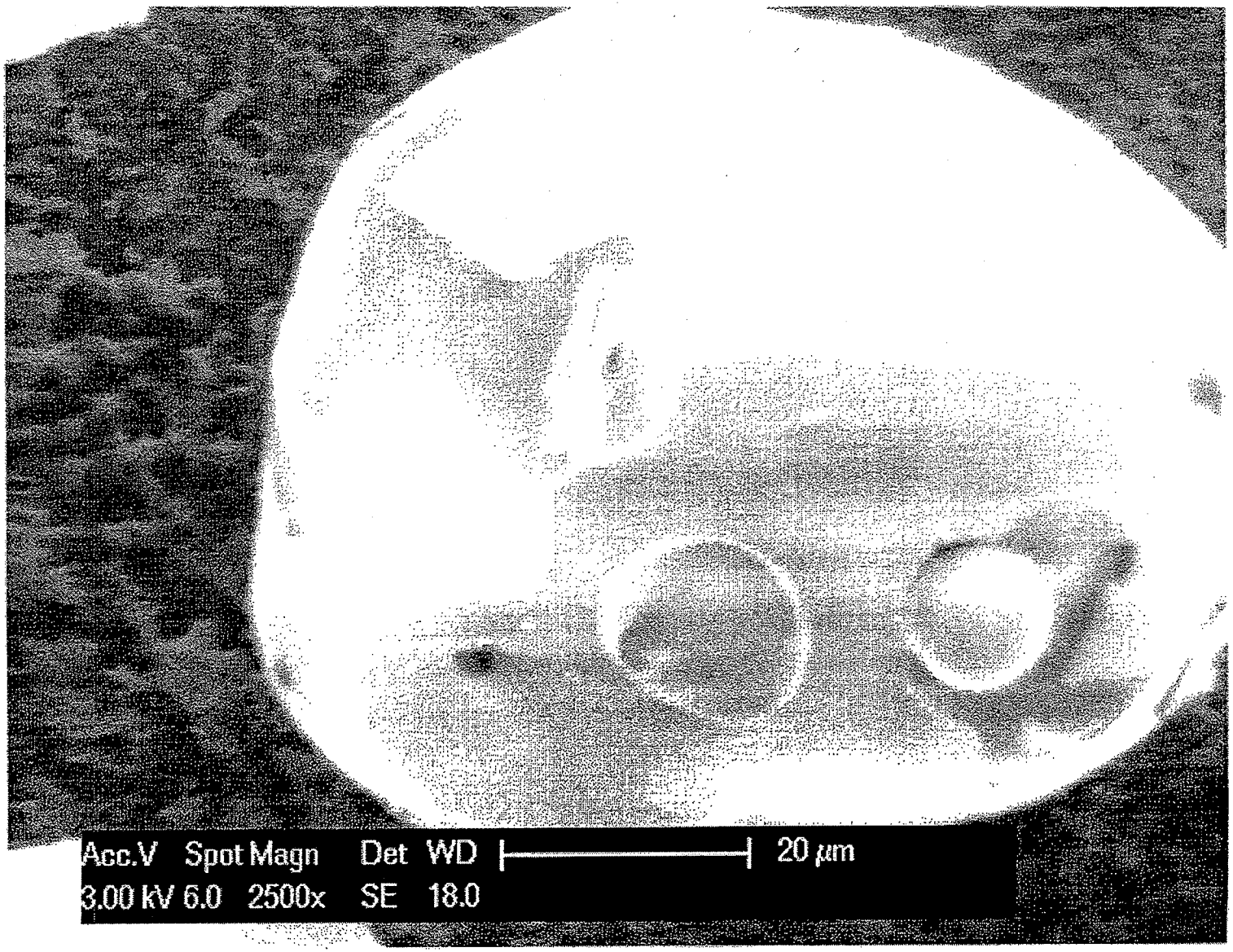
Appendix 2 – Image 3



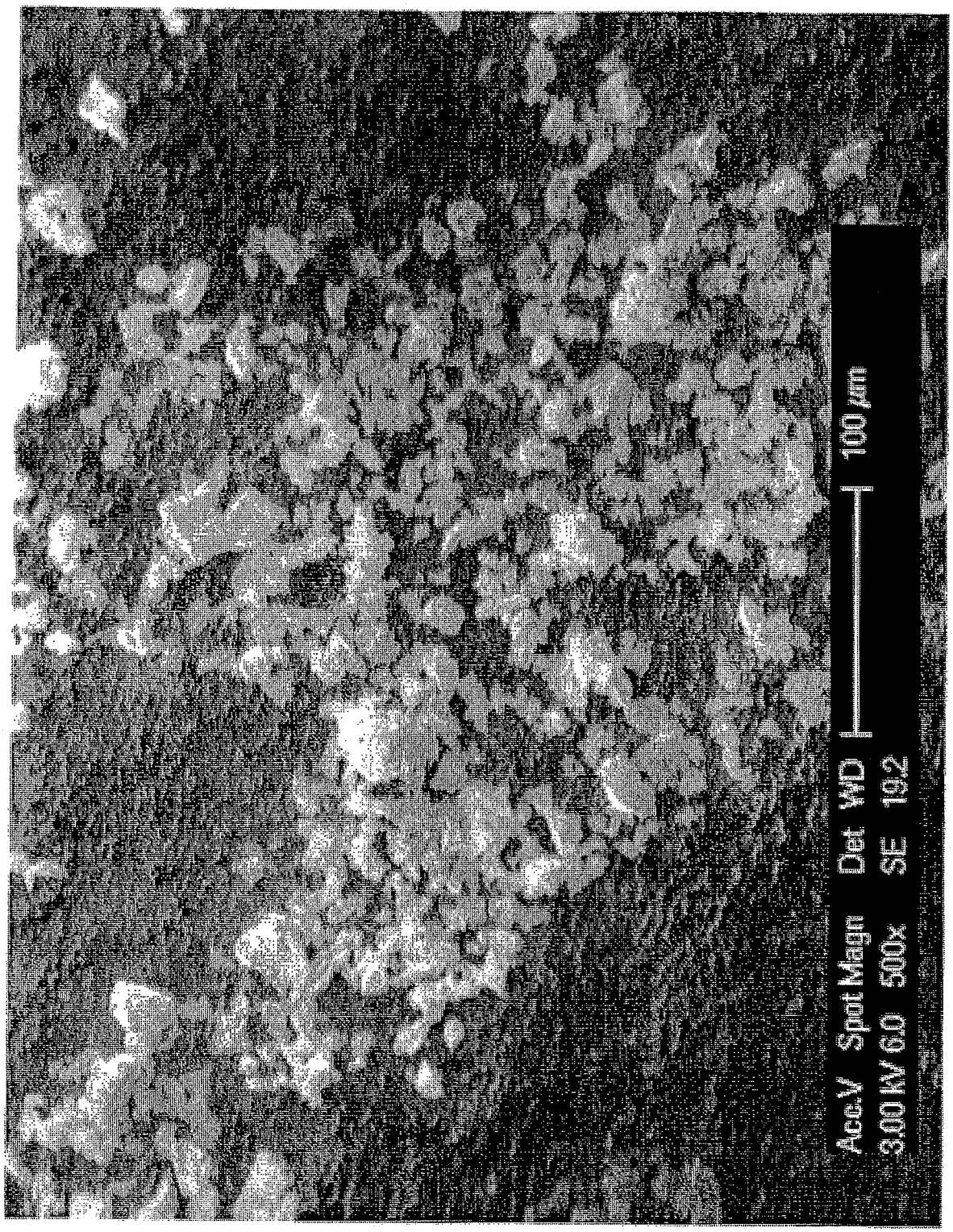
Appendix 2 – Image 4



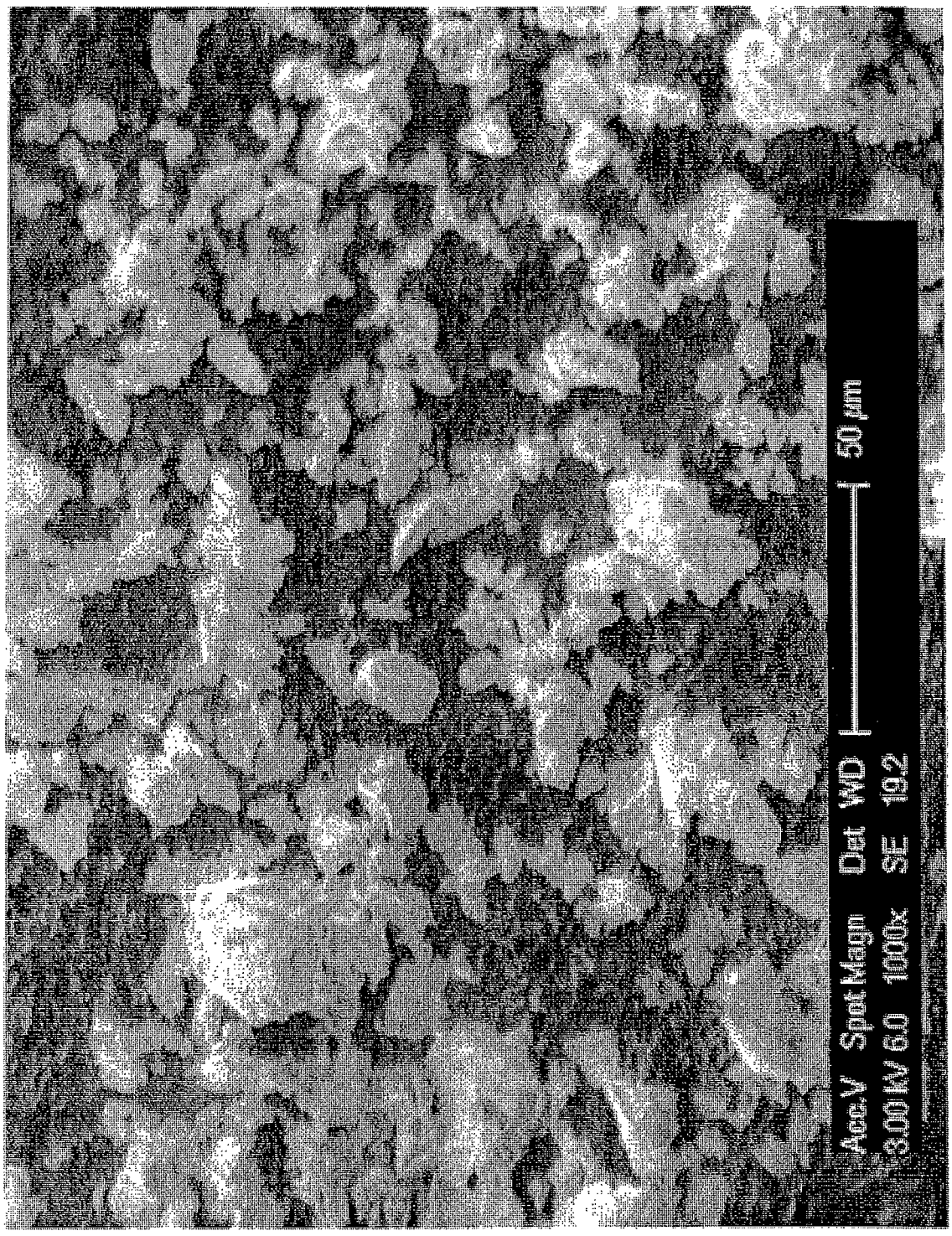
Appendix 2 – Image 5



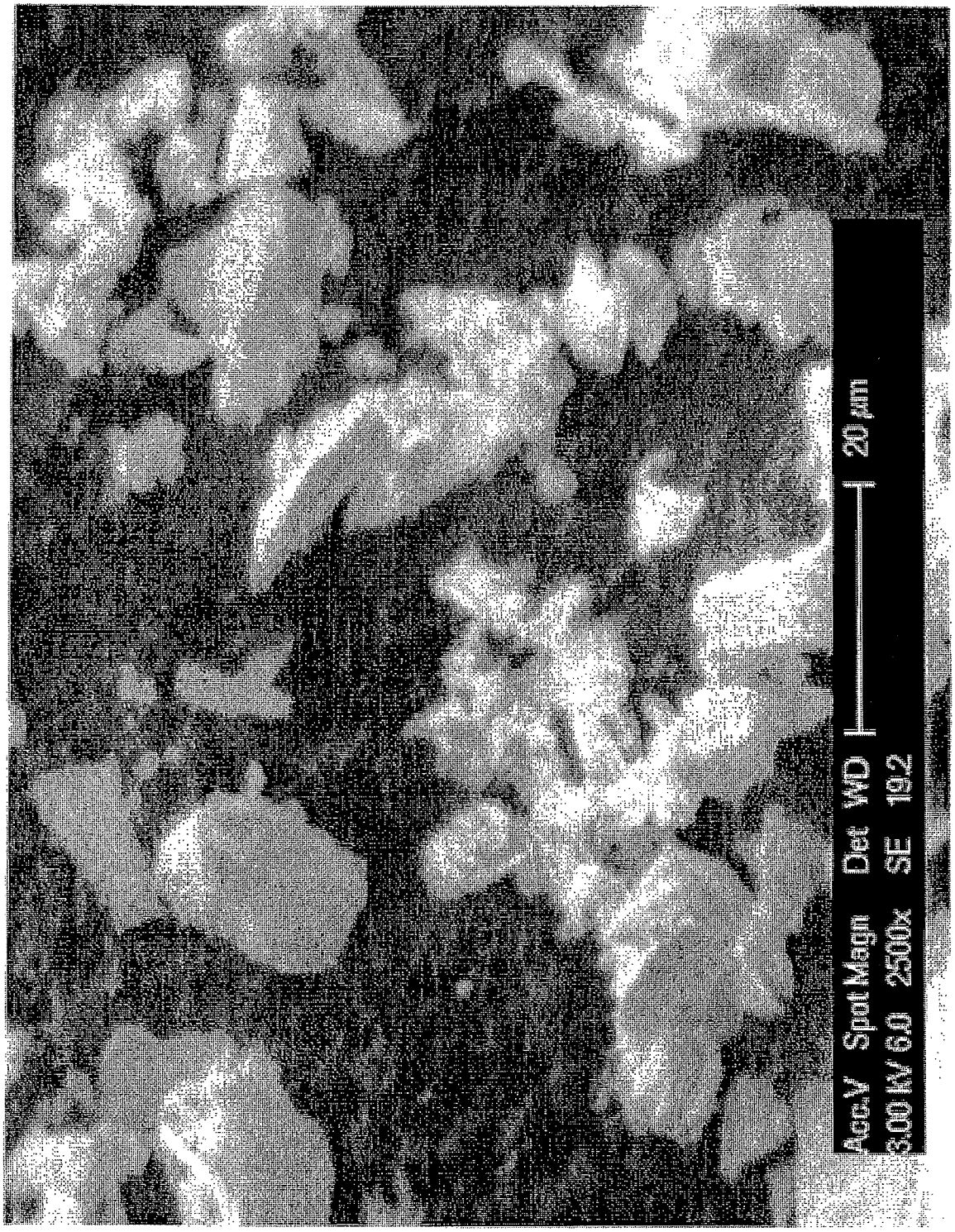
Appendix 2 – Image 6



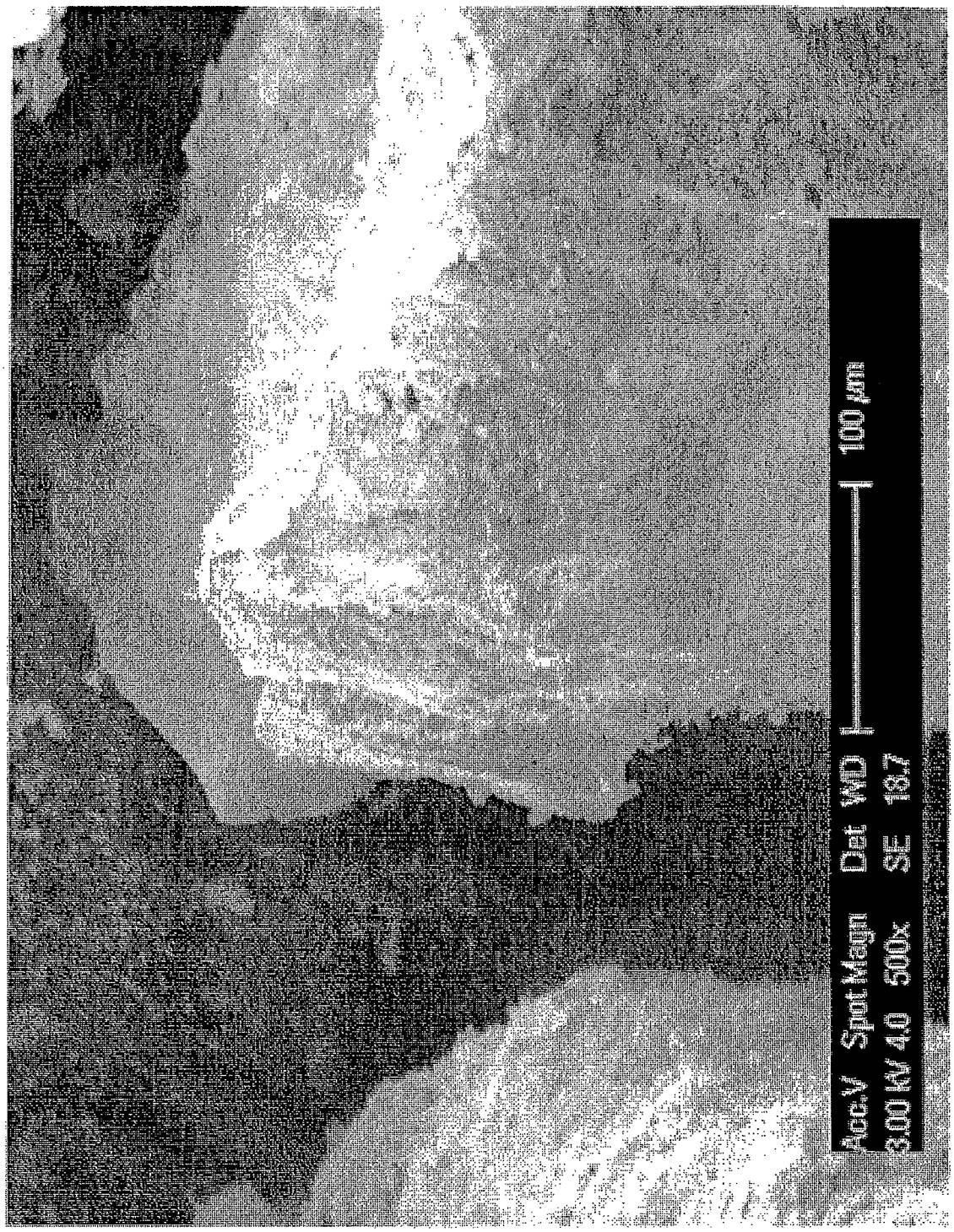
Appendix 2 – Image 7



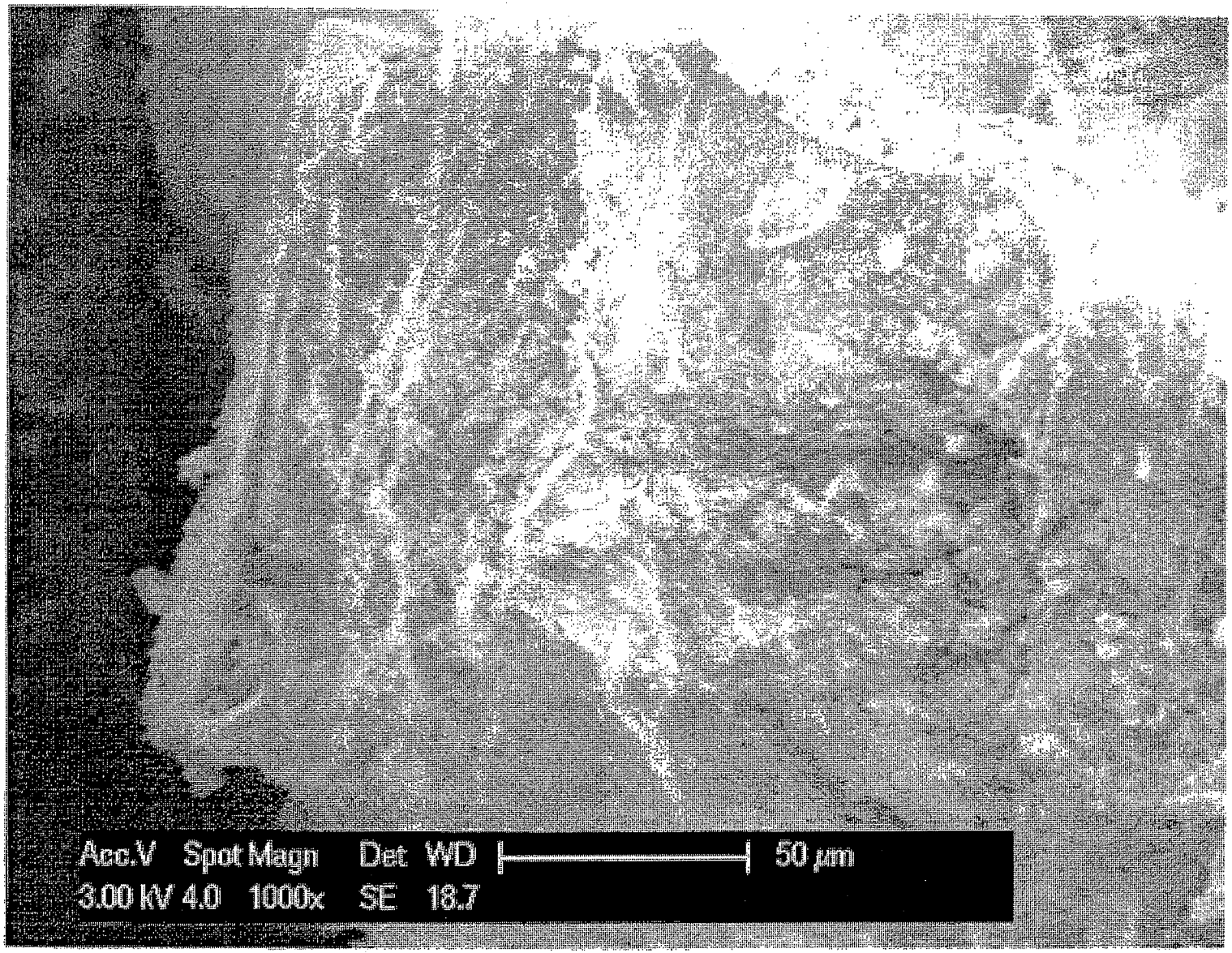
Appendix 2 – Image 8



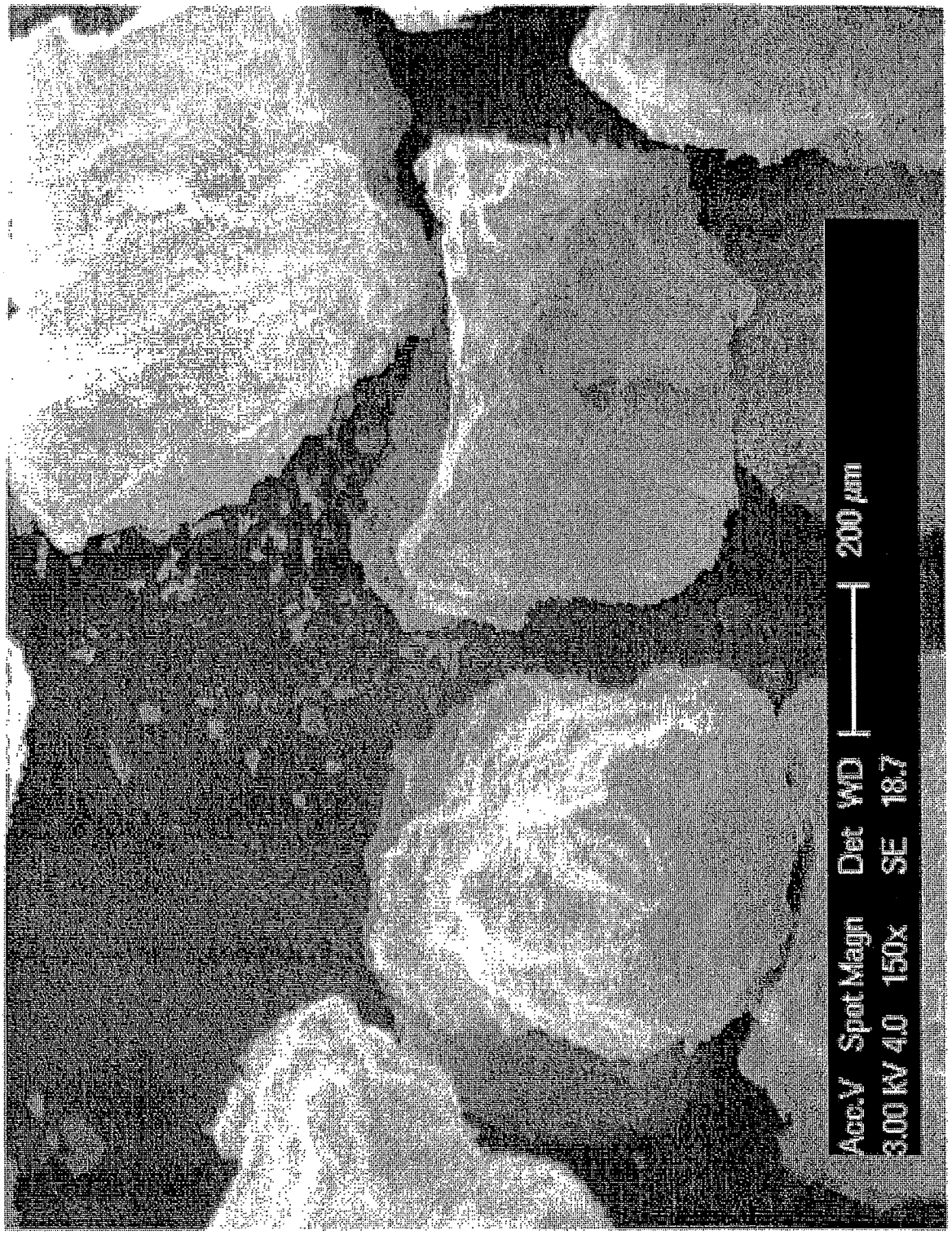
Appendix 2 – Image 9



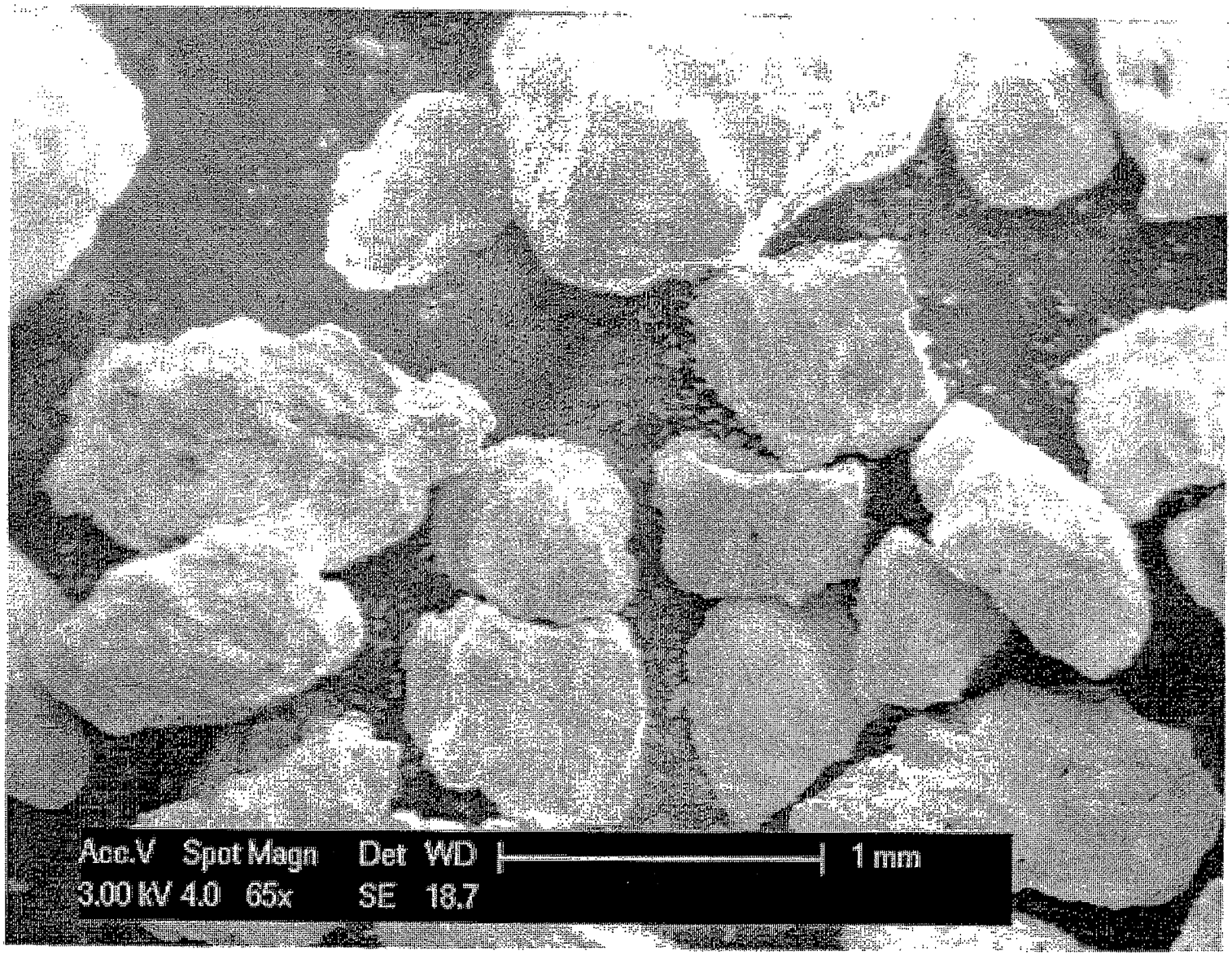
Appendix 2 – Image 10



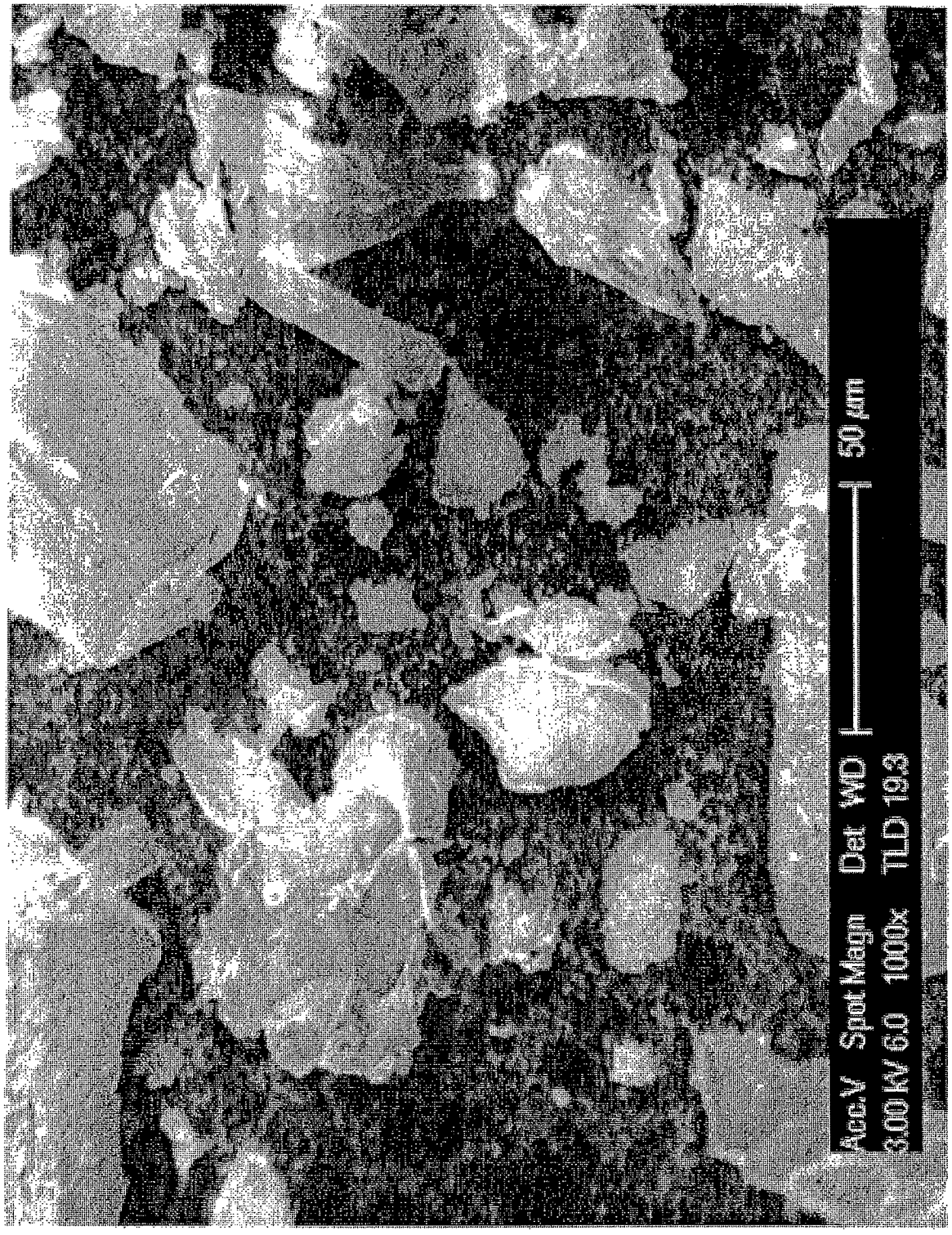
Appendix 2 – Image 11



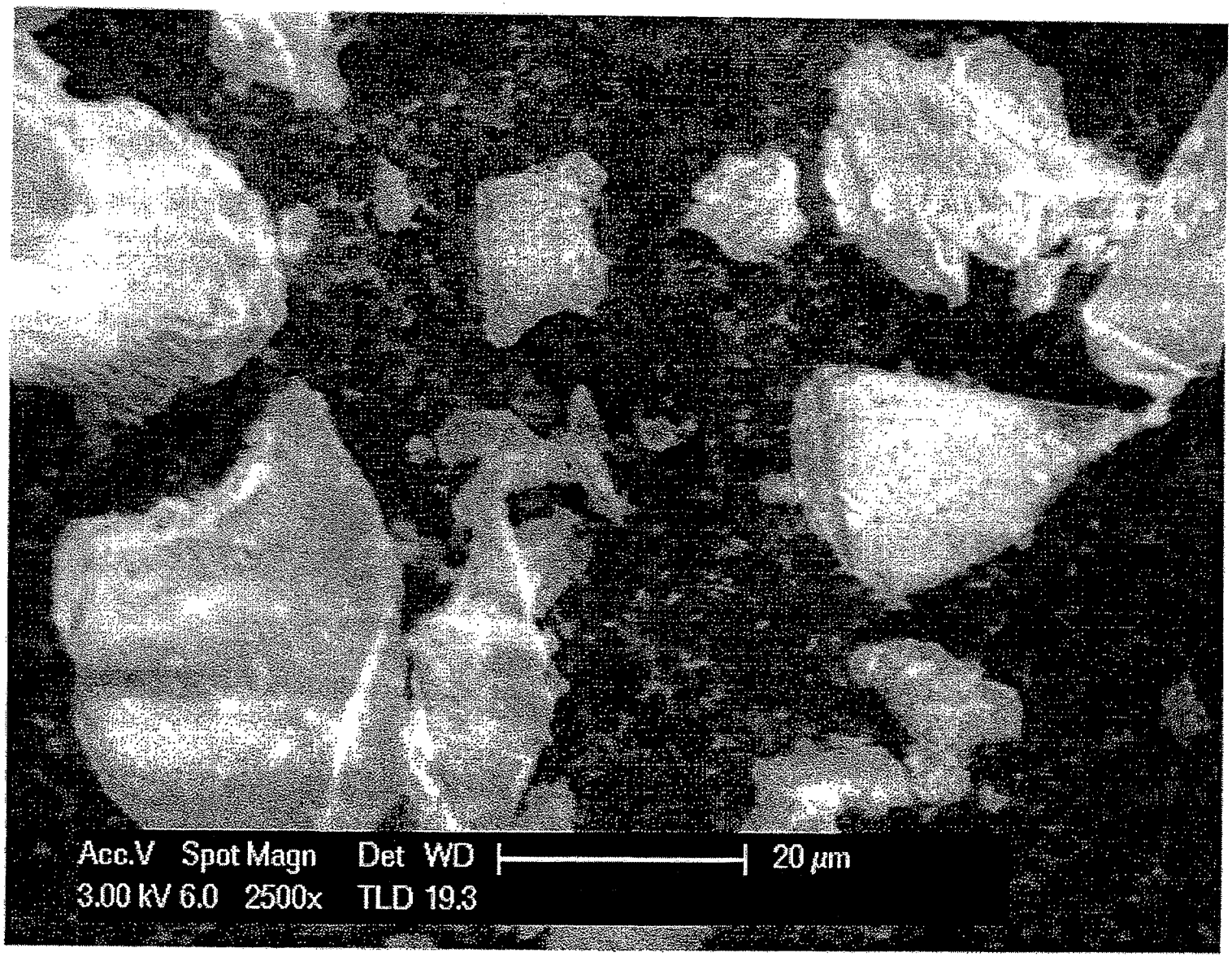
Appendix 2 – Image 12



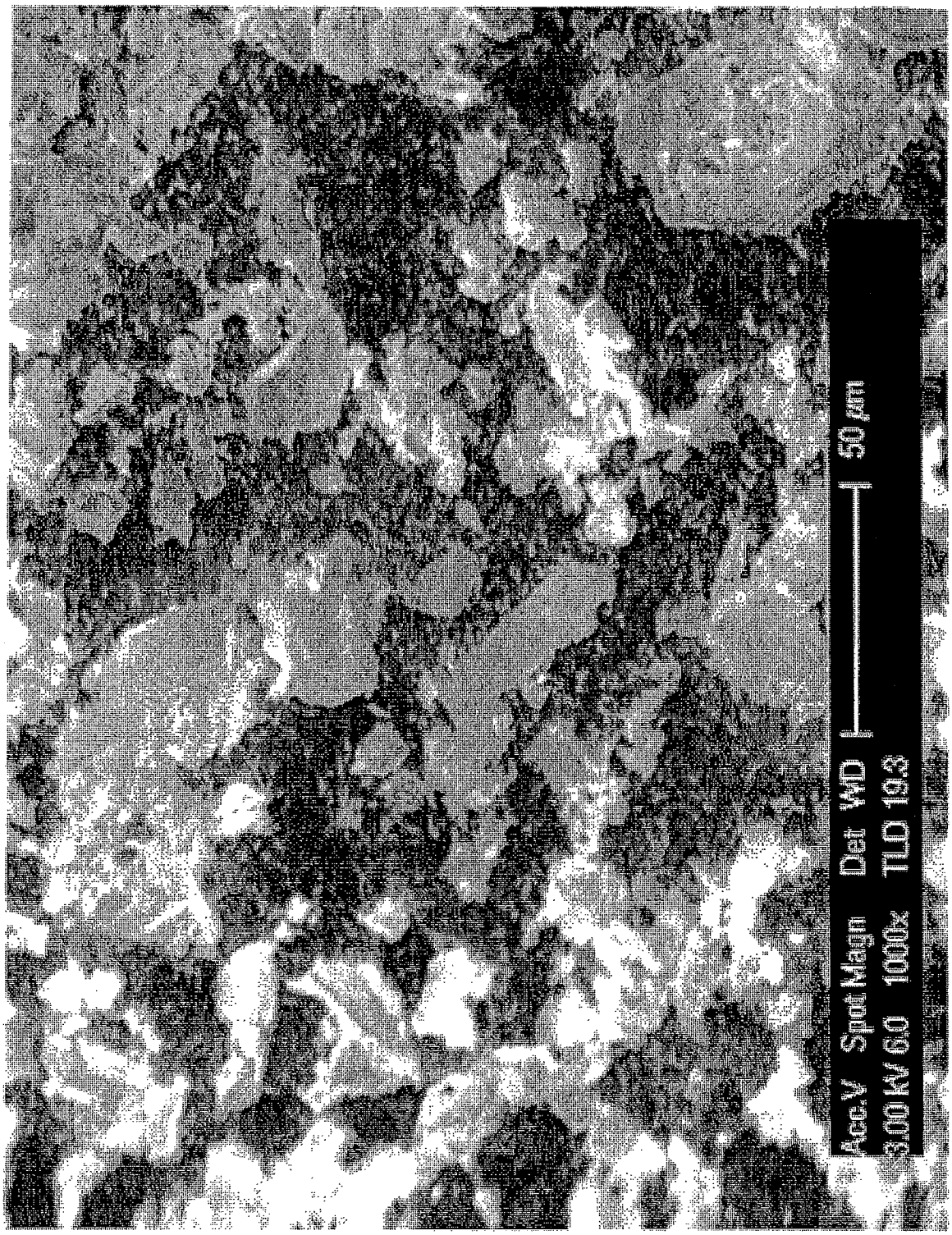
Appendix 2 – Image 13



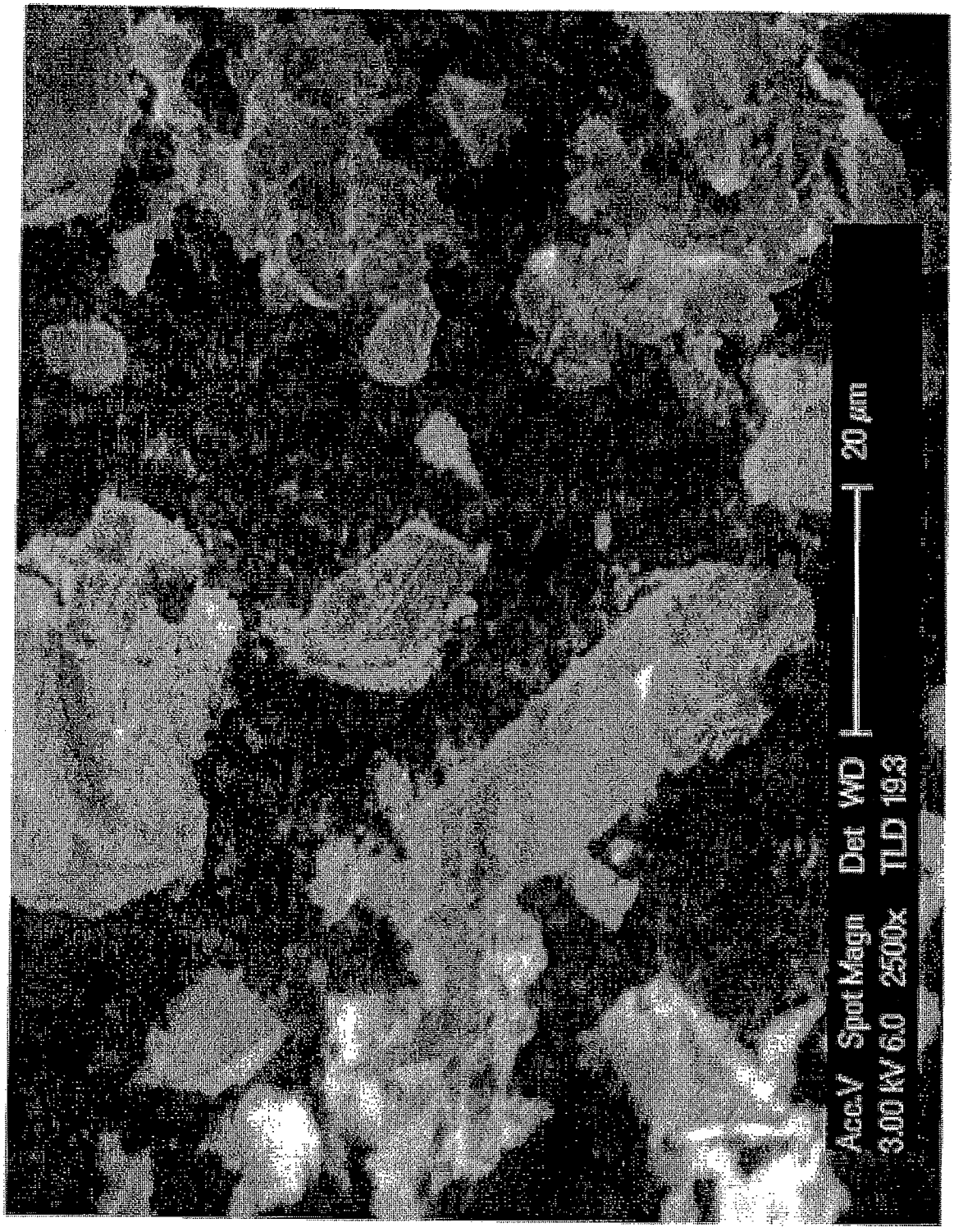
Appendix 2 – Image 14



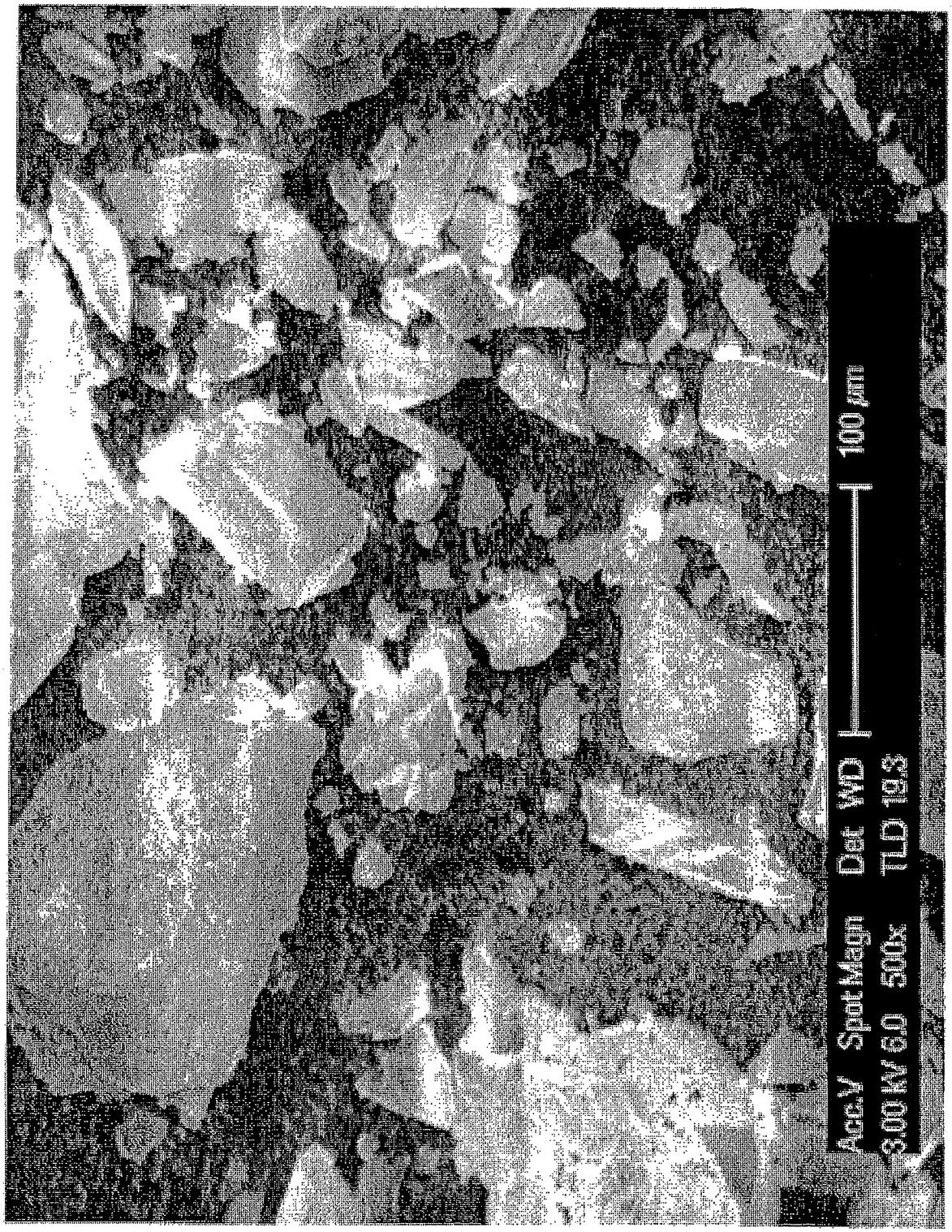
Appendix 2 – Image 15



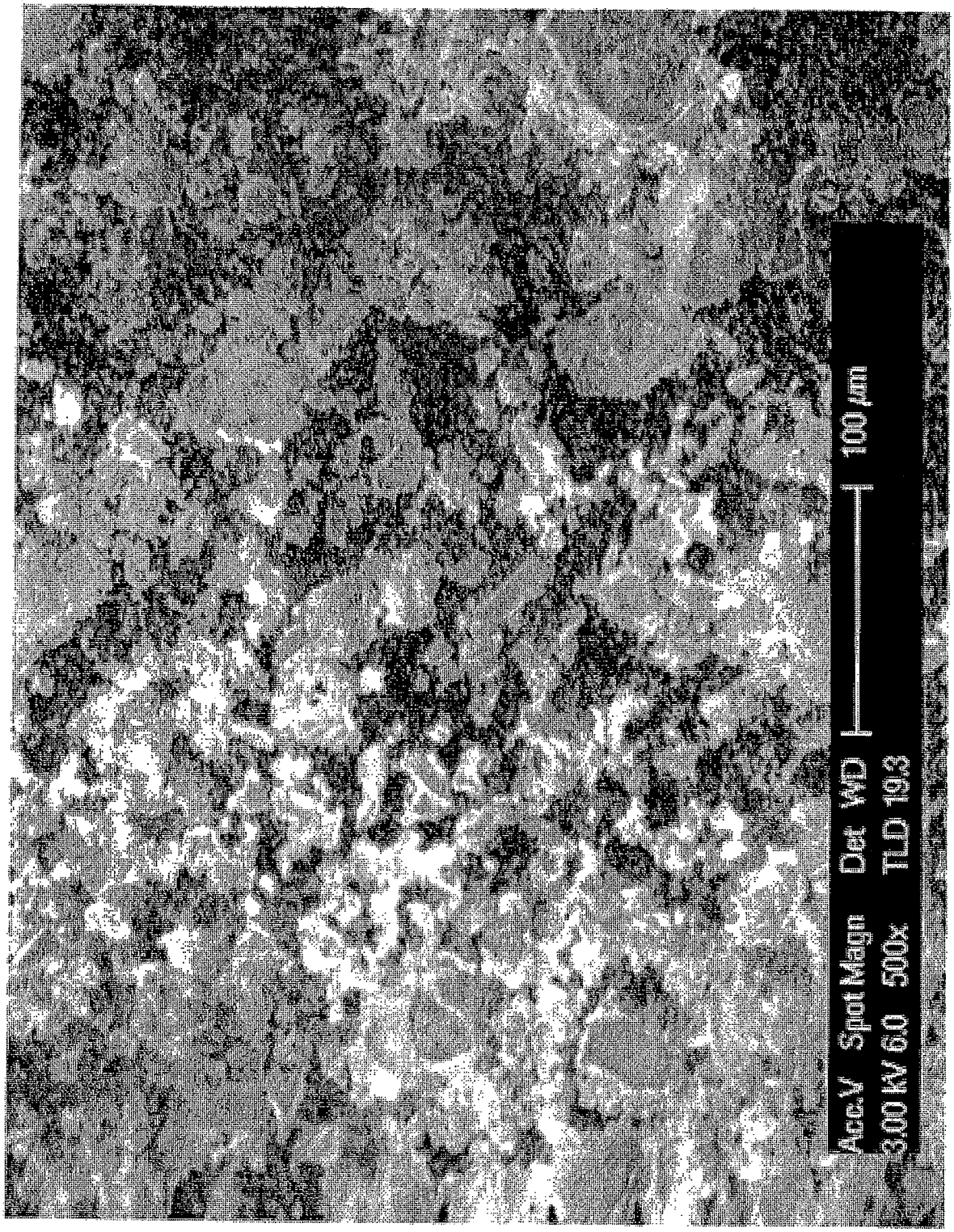
Appendix 2 – Image 16



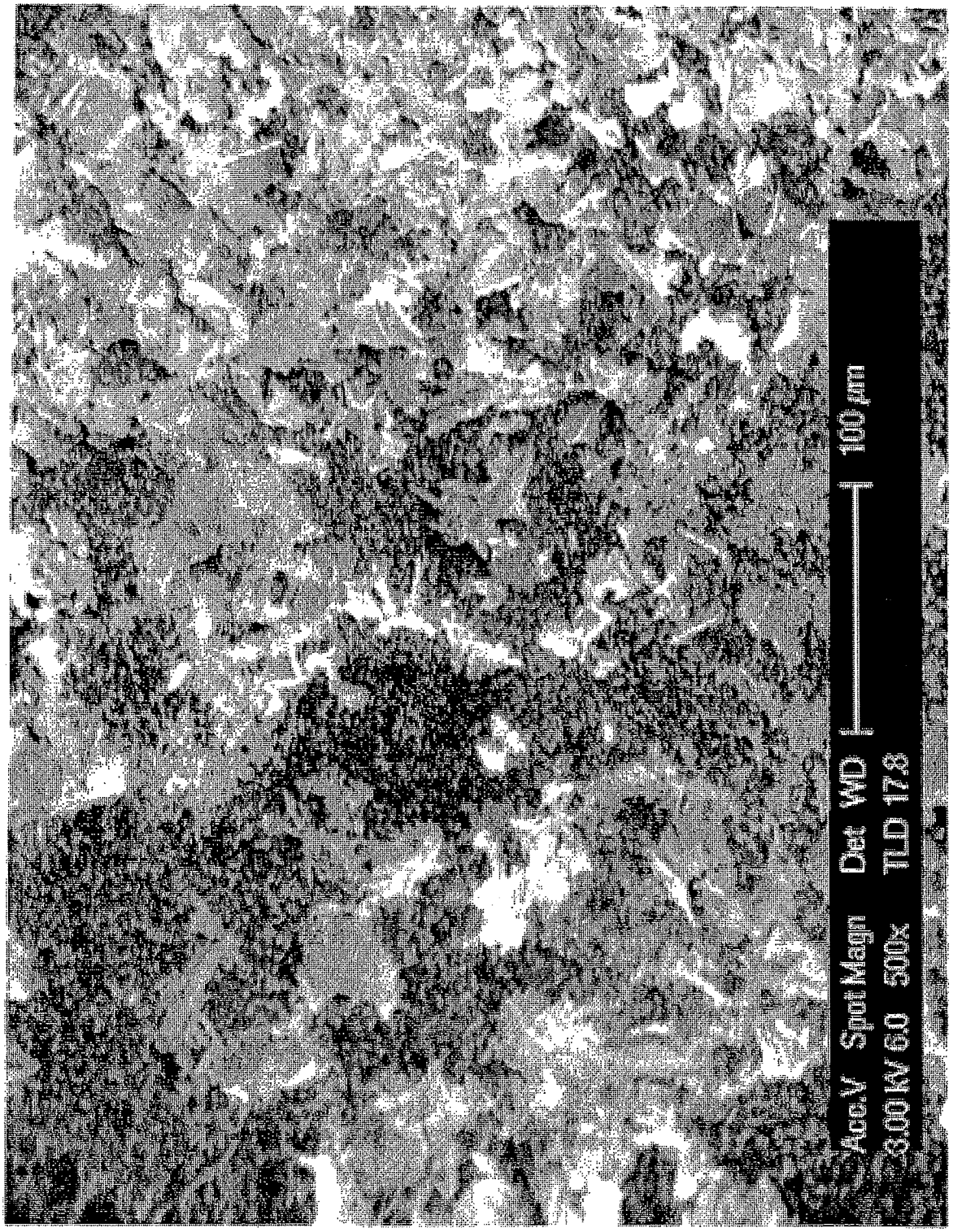
Appendix 2 – Image 17



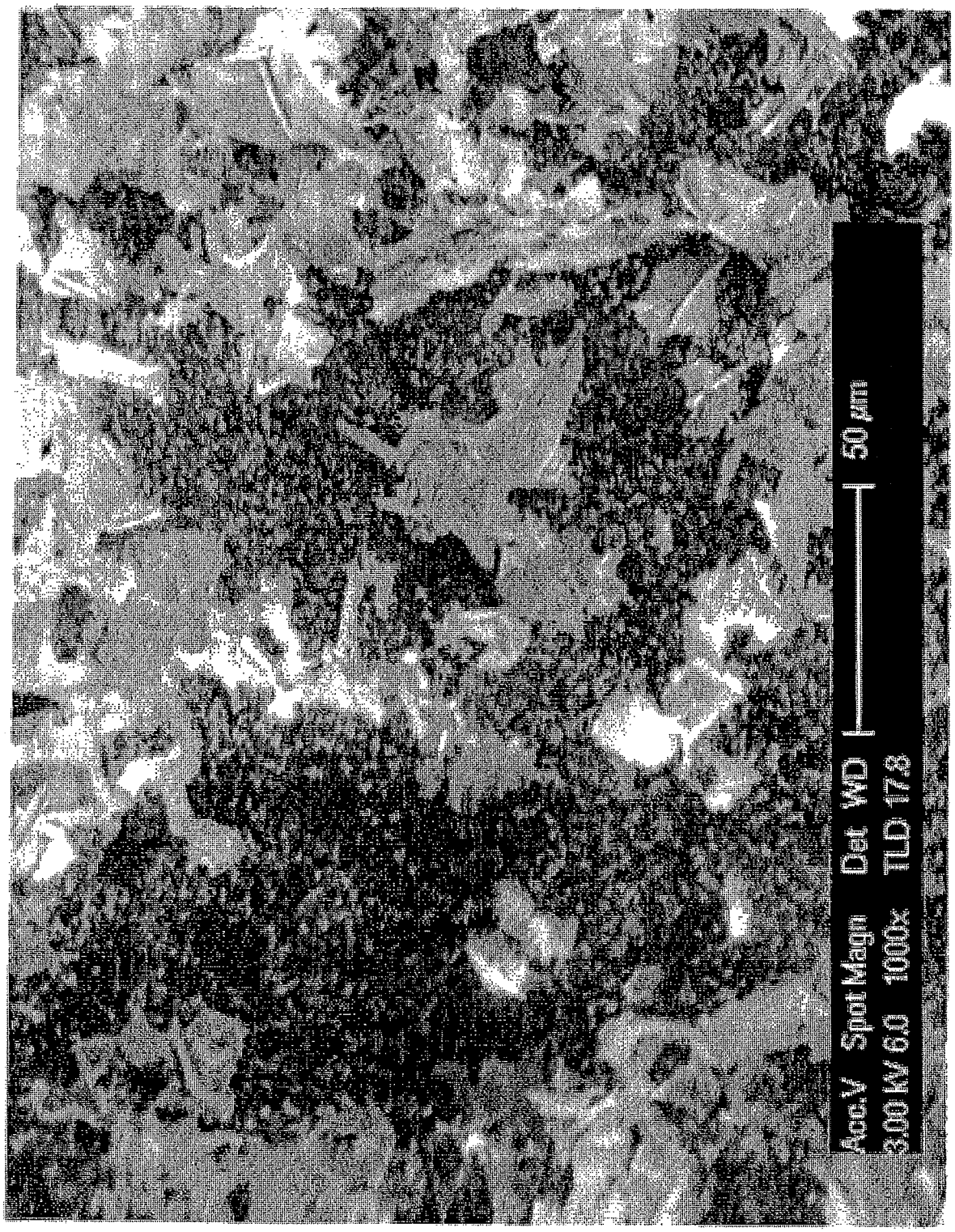
Appendix 3– Image 1



Appendix 3– Image 2



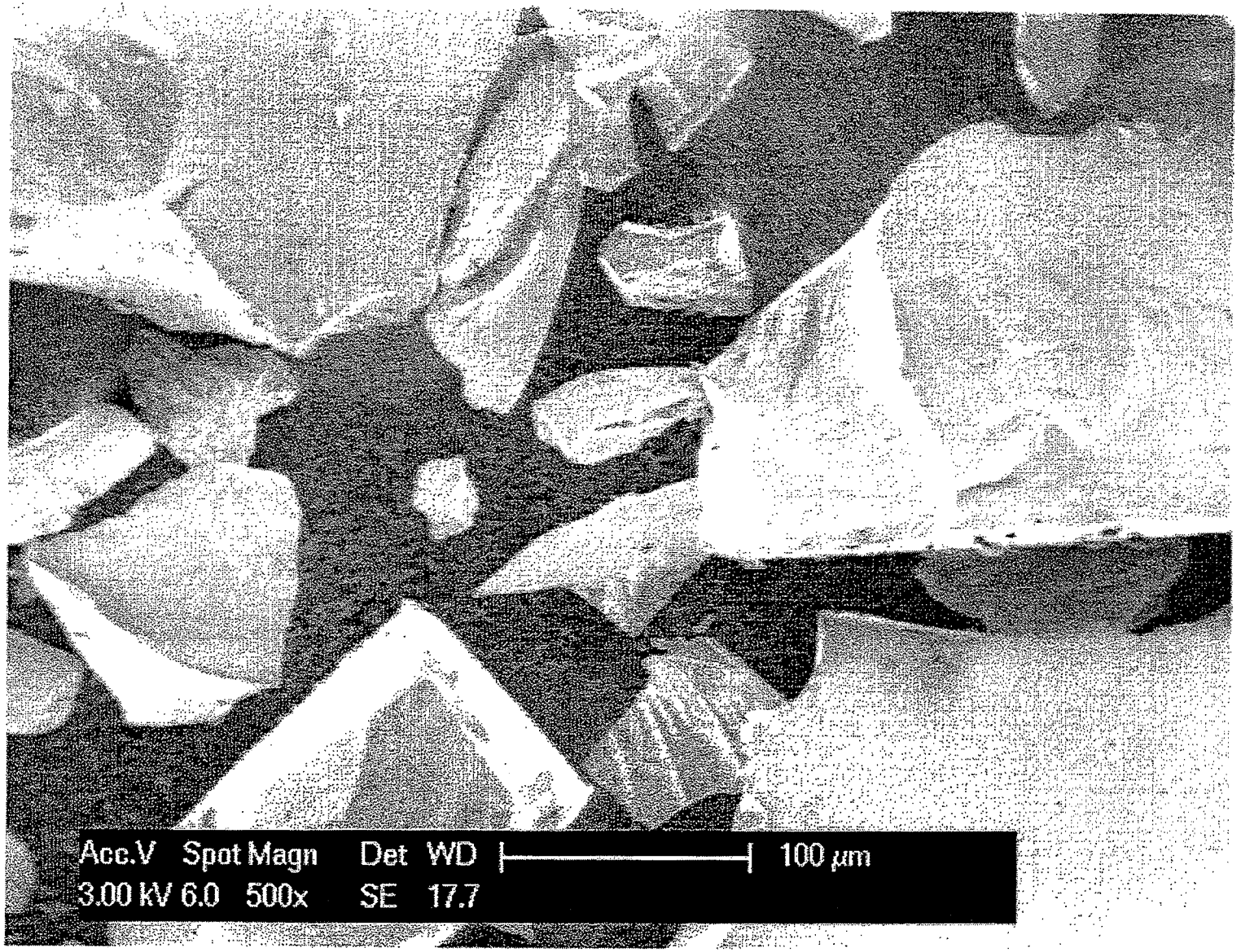
Appendix 3 – Image 3



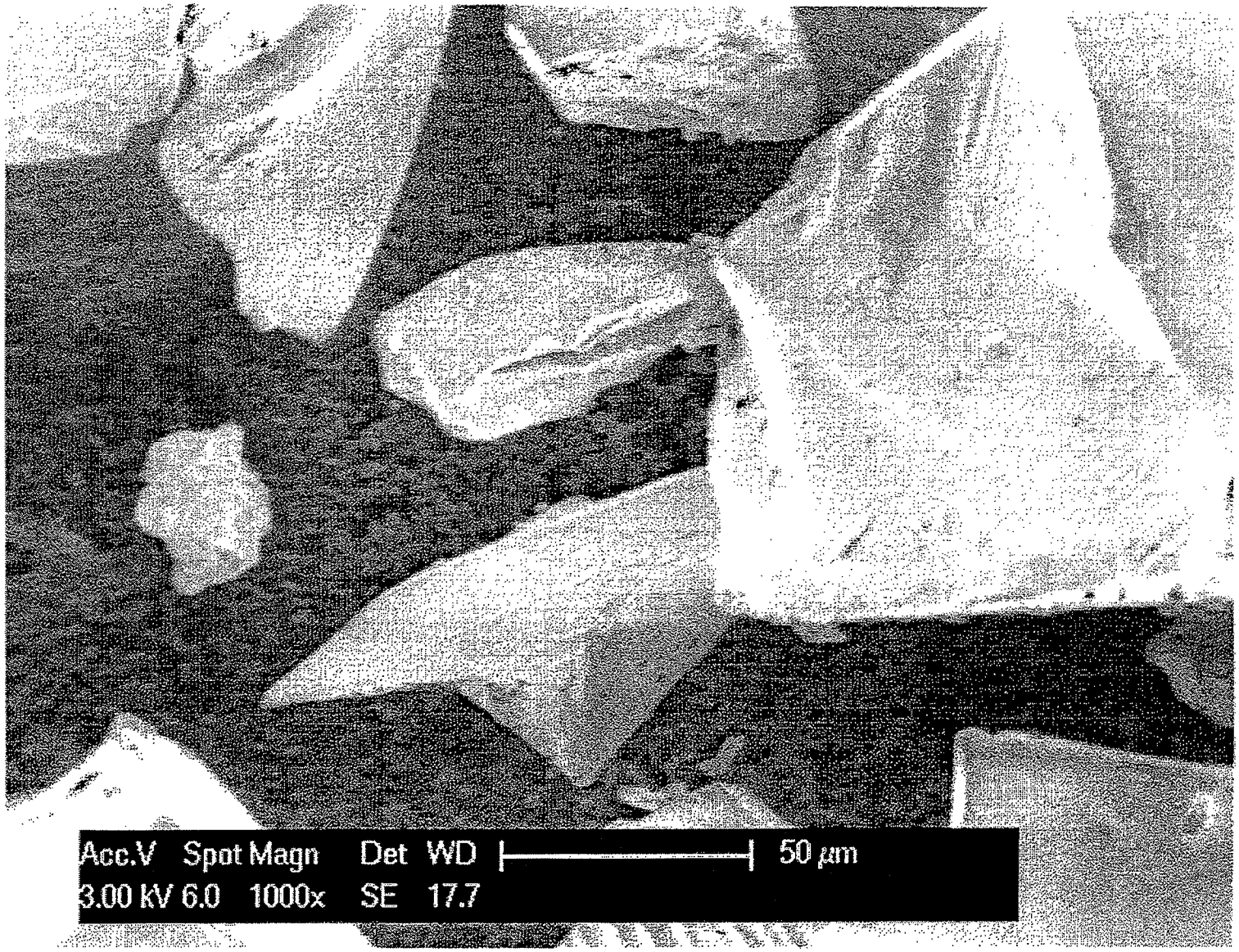
Appendix 3 – Image 4



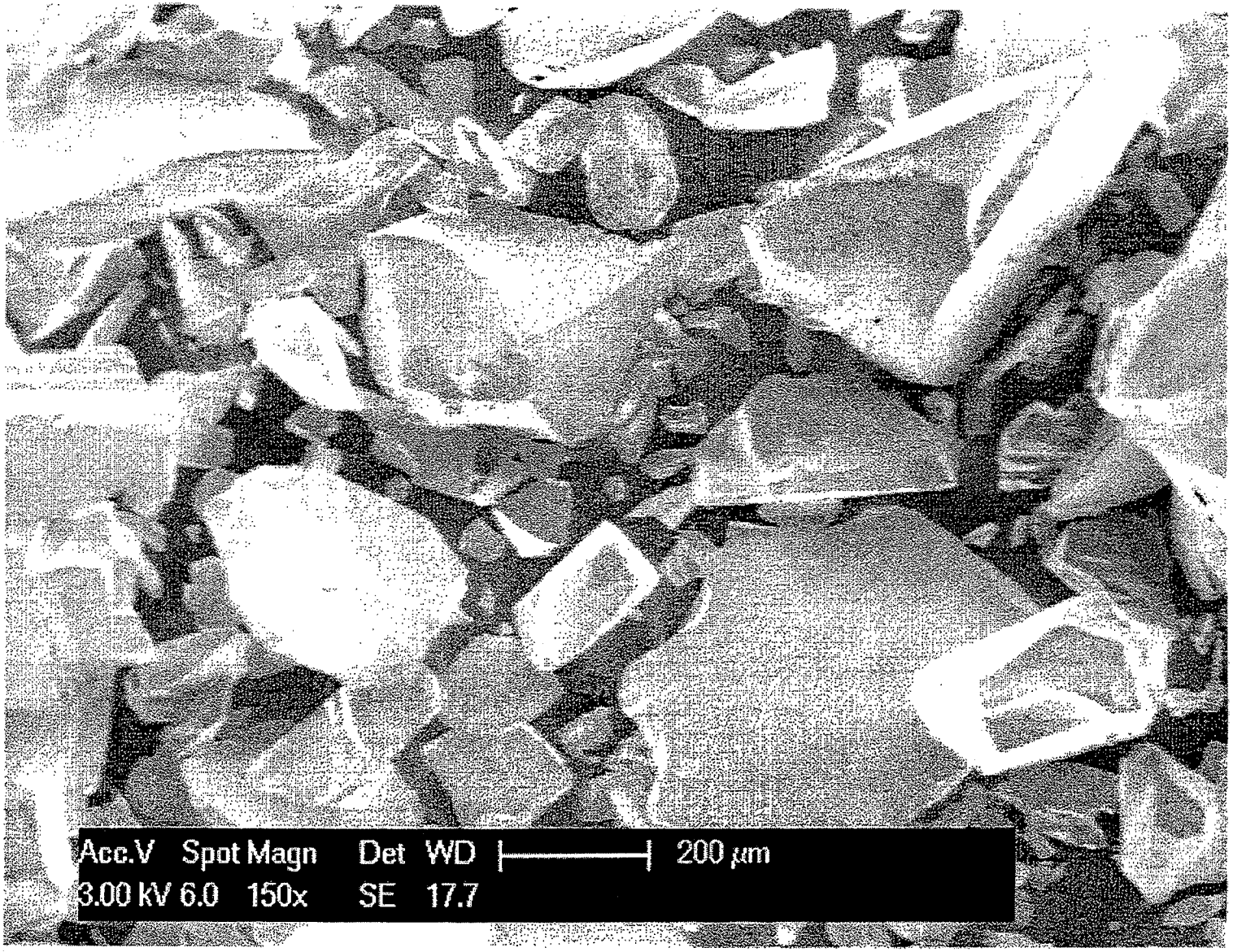
Appendix 3 – Image 5



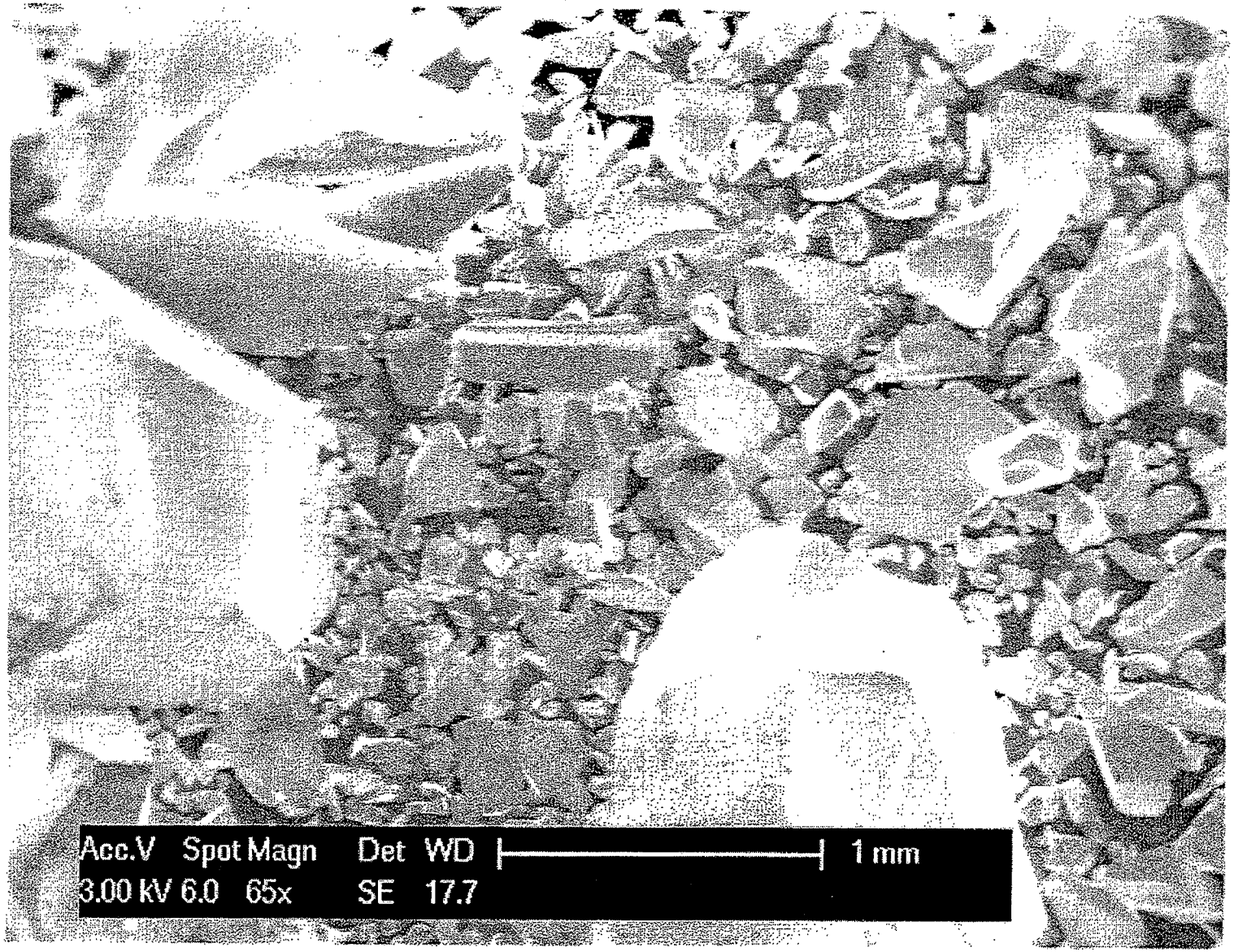
Appendix 3 – Image 6



Appendix 3 – Image 7



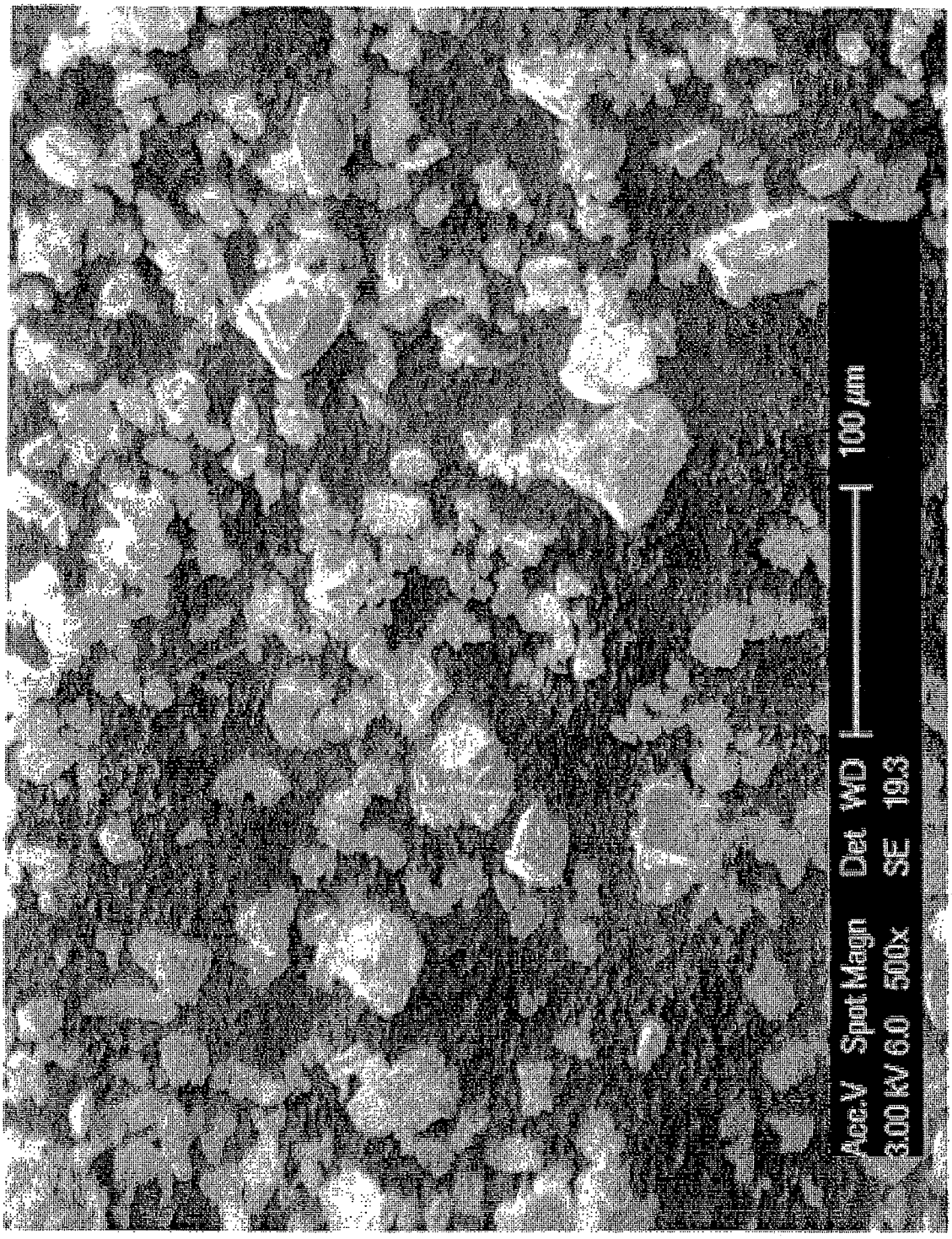
Appendix 3 – Image 8



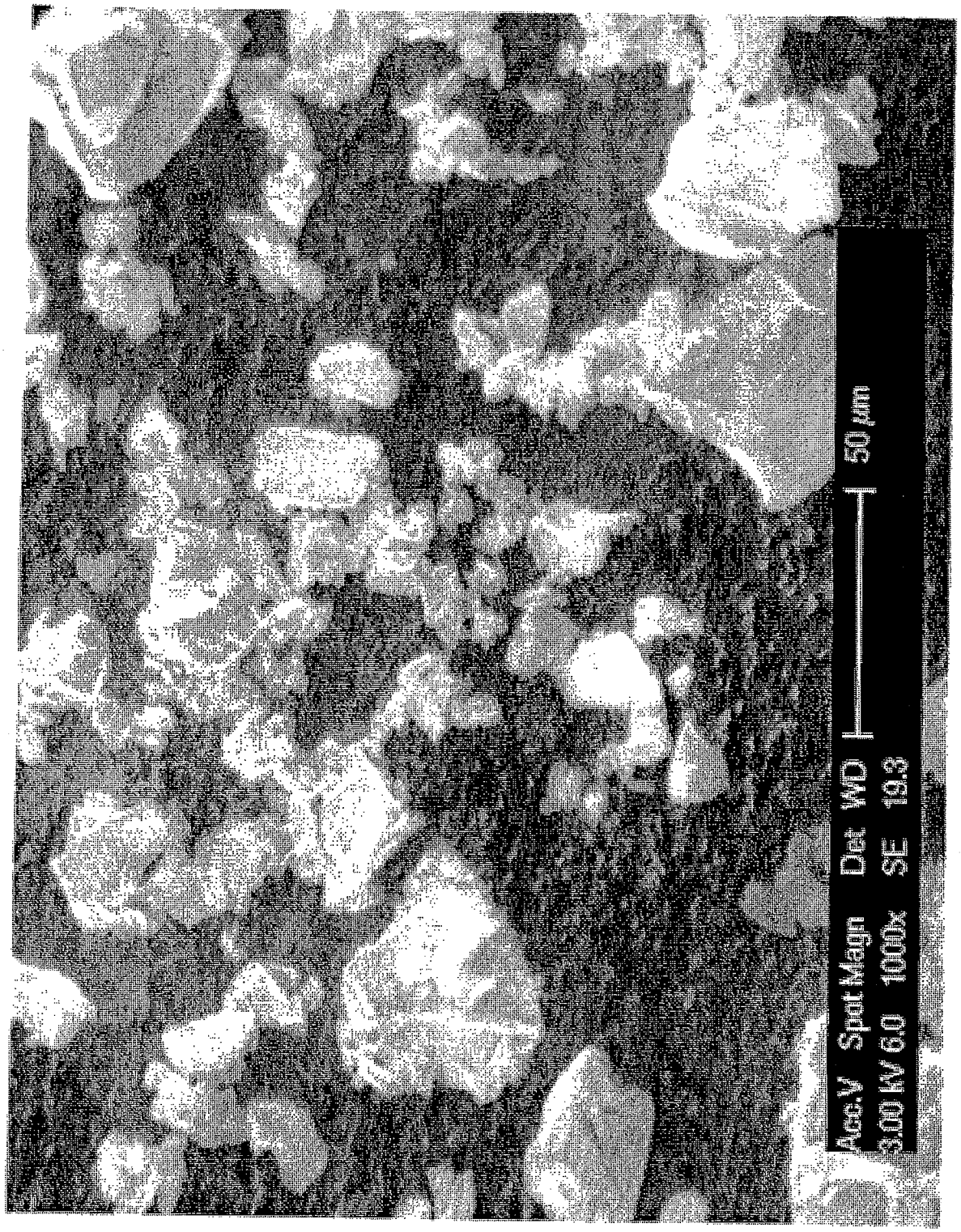
Appendix 3 – Image 9



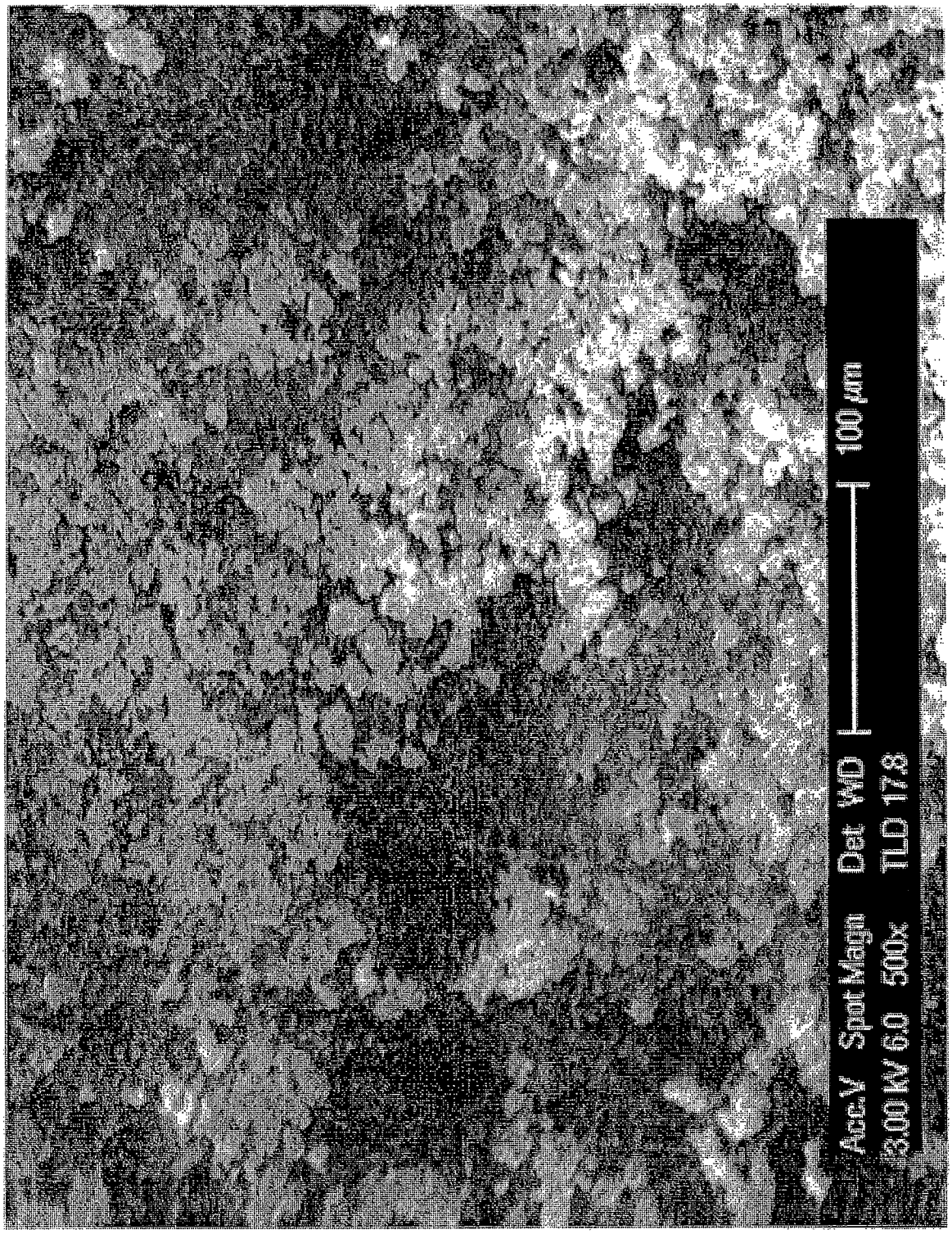
Appendix 3 – Image 10



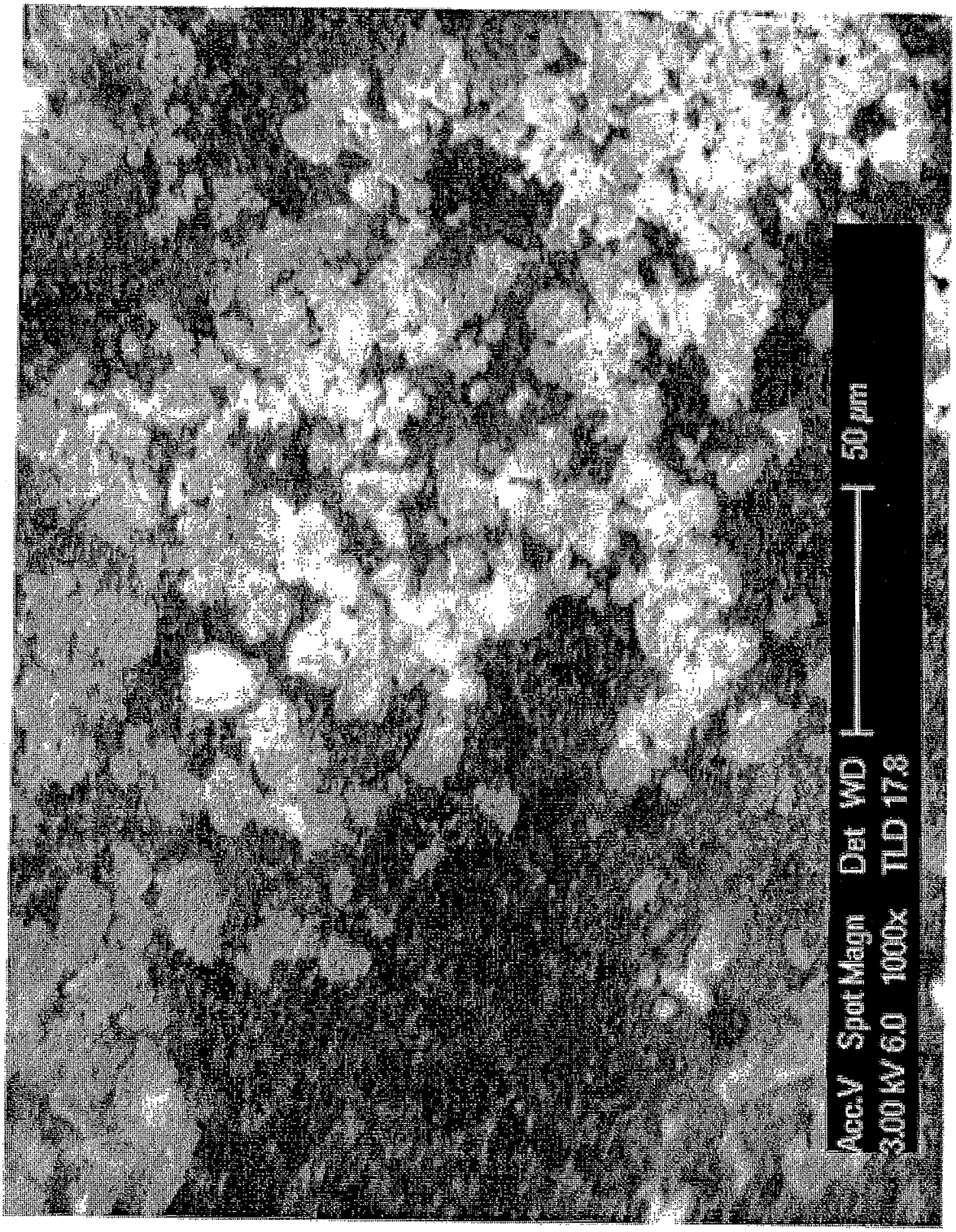
Appendix 3 – Image 11



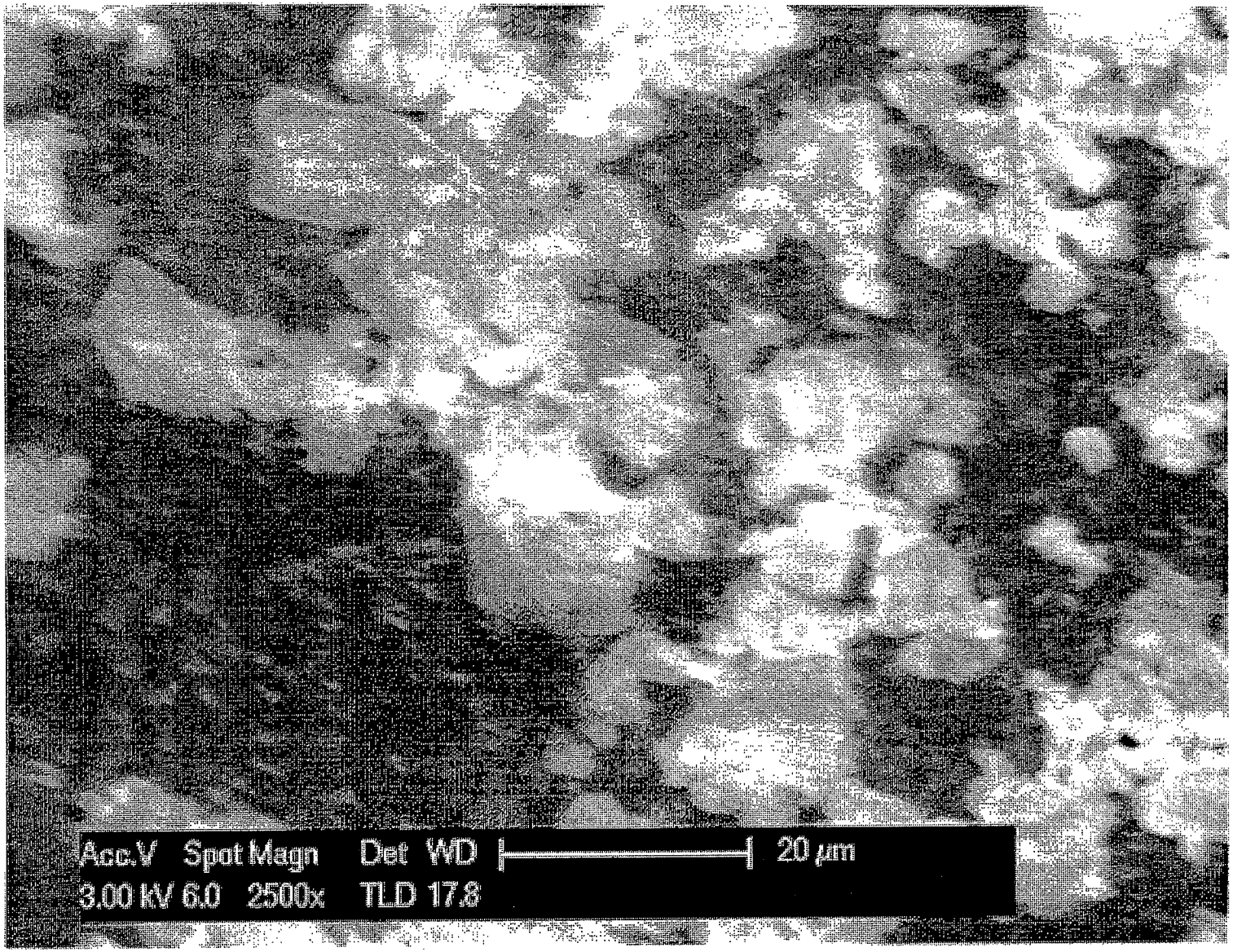
Appendix 3 – Image 12



Appendix 3 – Image 13



Appendix 3 – Image 14



Appendix 3 – Image 15