Fig. 1

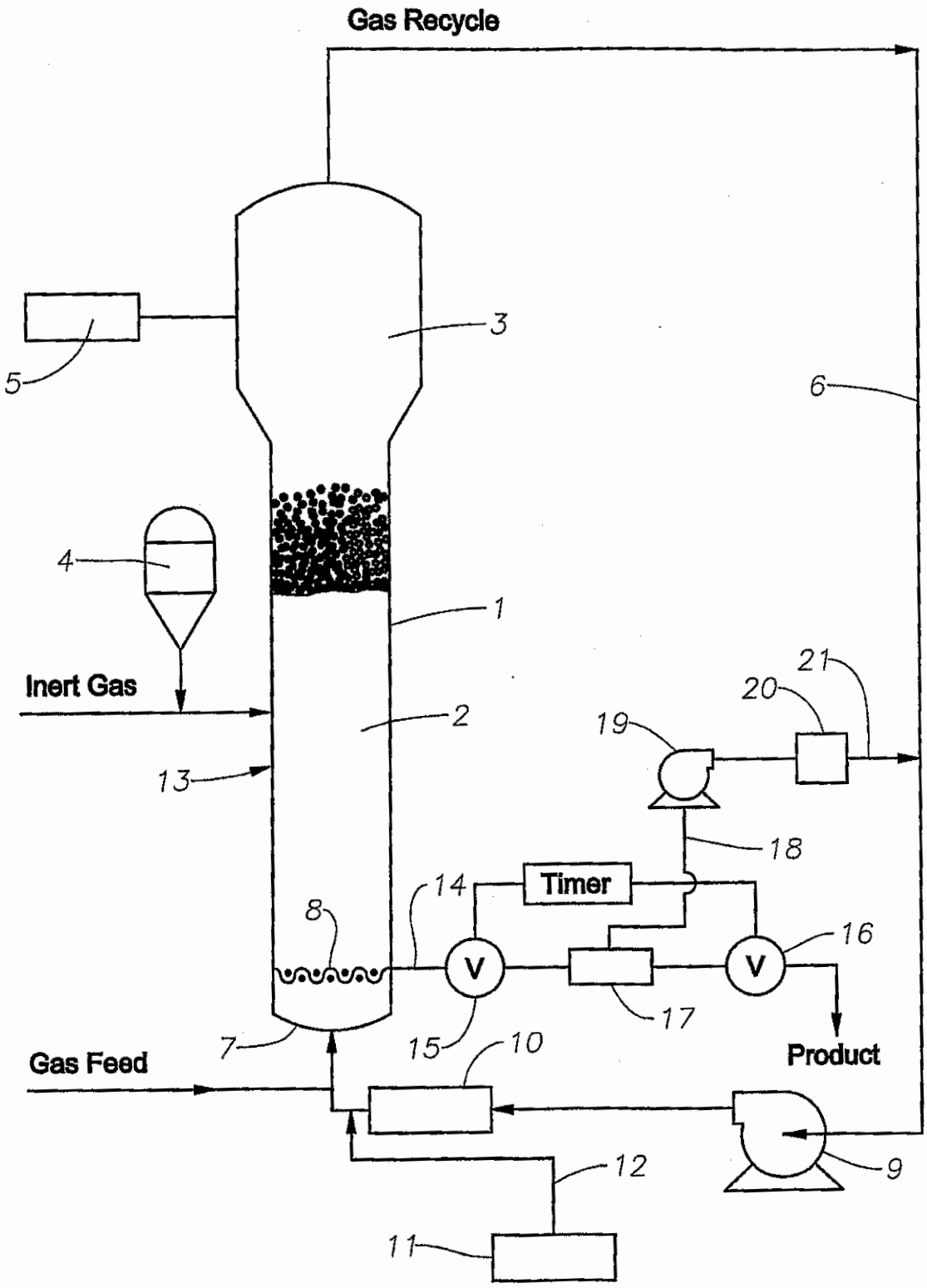

Gas Recycle
3
5
6
4
1
Inert Gas
2
21
20
19
13
18
Timer
14
8
16
V
V
17
7
15
10
Gas Feed
Product
12
9
11

Fig. 2

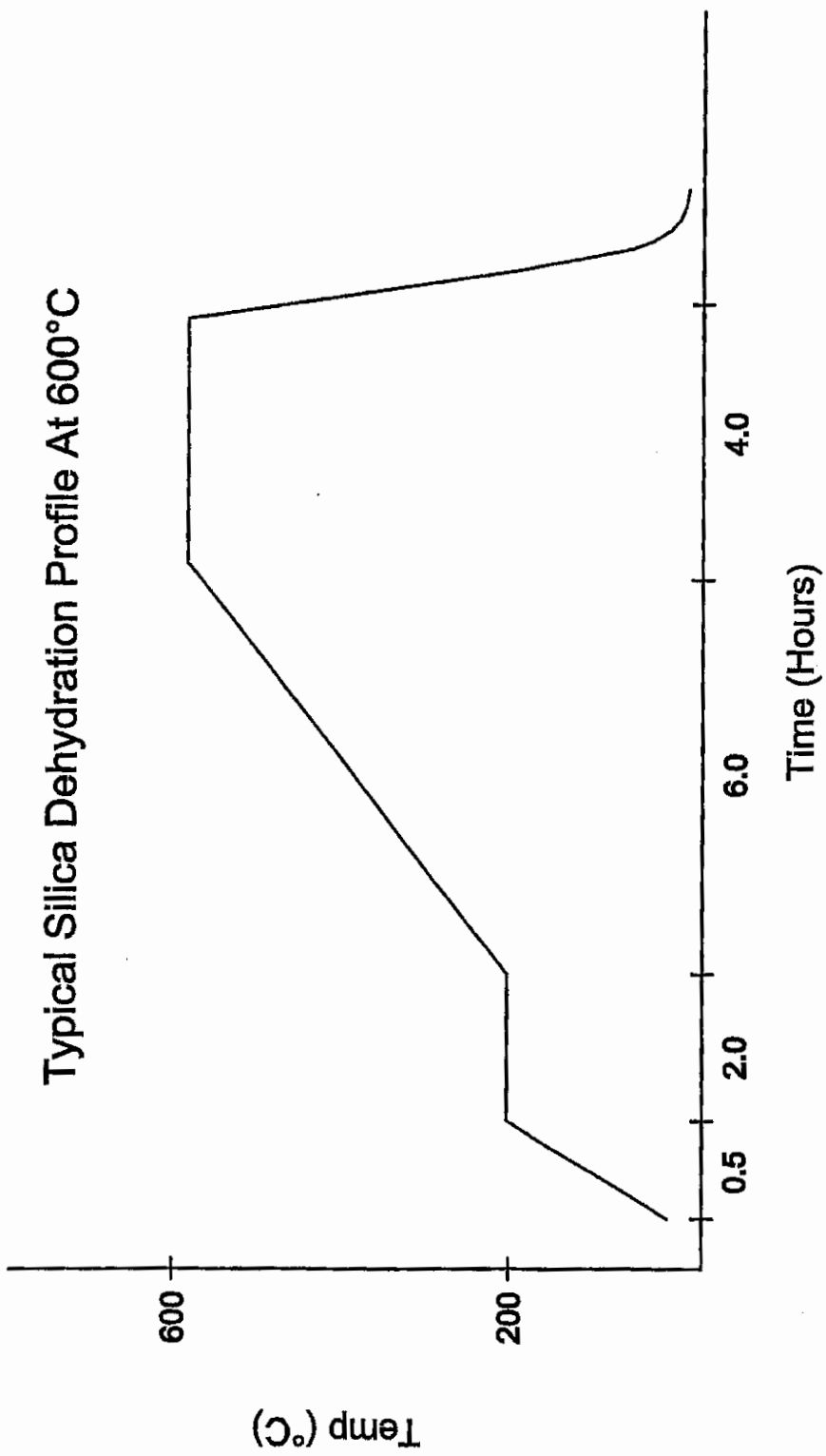

Typical Silica Dehydration Profile At 600°C
Temp (°C)
600
200
0.5
2.0
6.0
4.0
Time (Hours)

Fig. 3
MALVERN Particle Size Distribution of Davison 955, Davison 955 Screened (325 Mesh Fraction) and Ineos ES757 Silicas

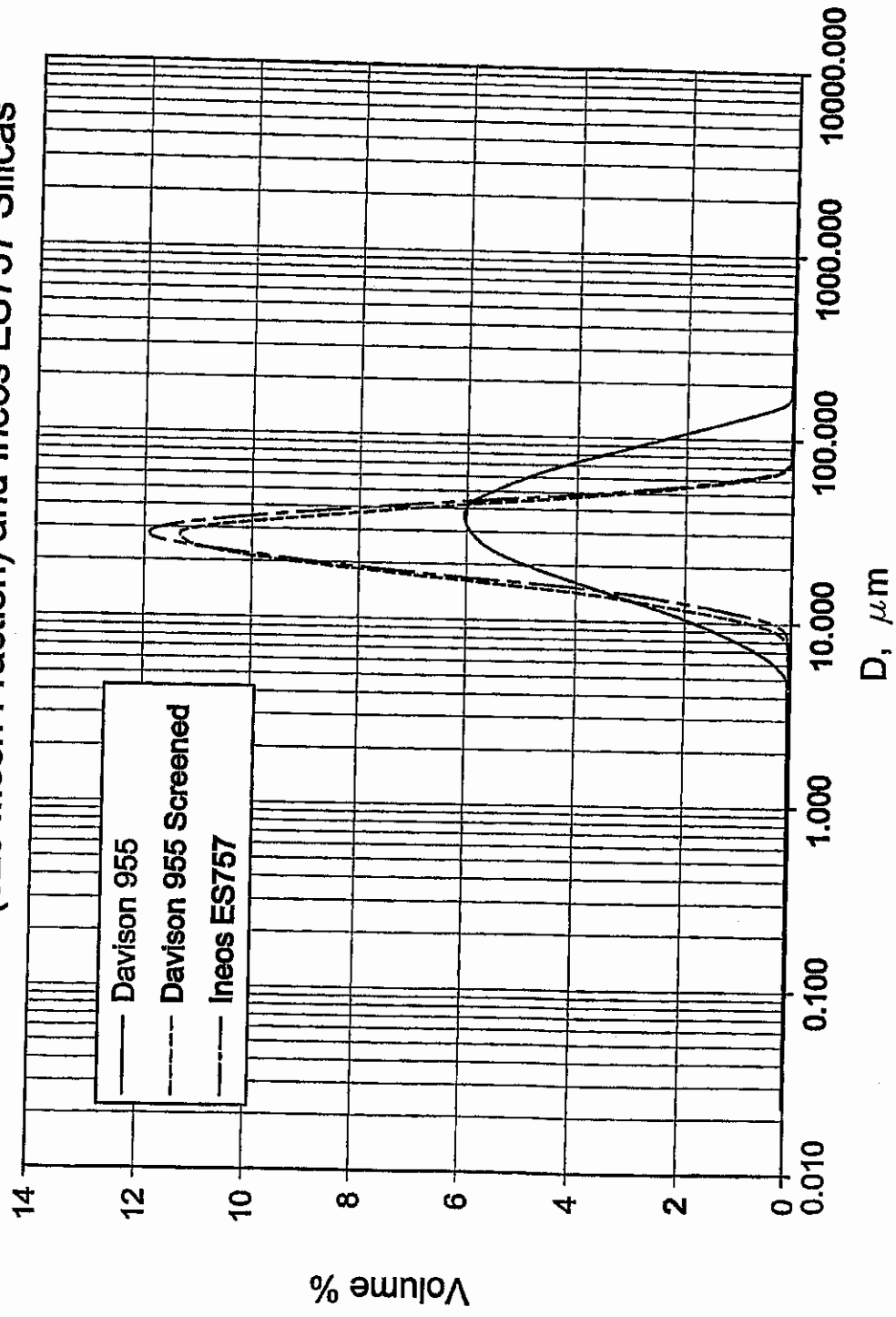


Fig. 4

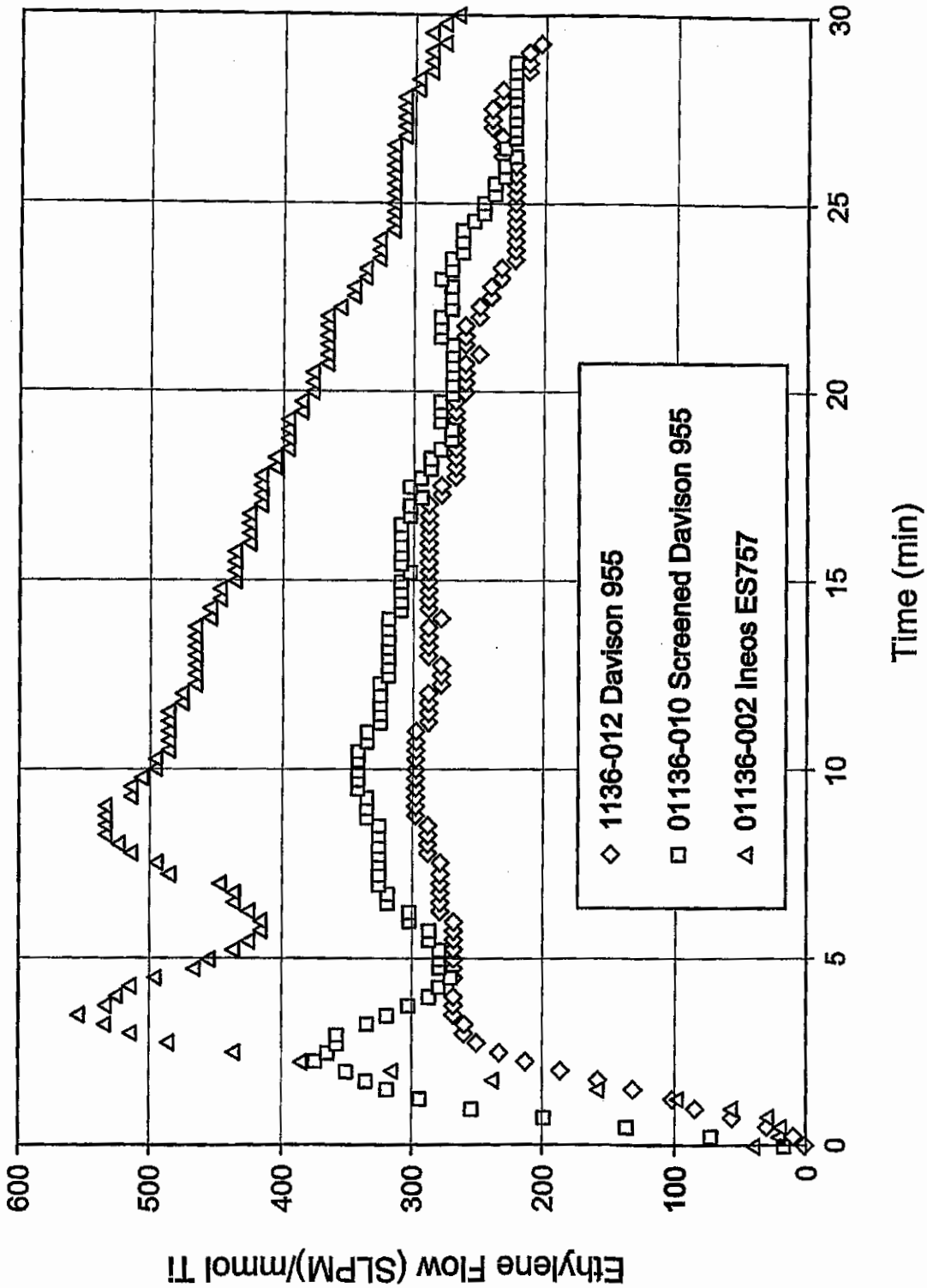

Ethylene Flow (SLPM)/mmol Ti
600
500
400
300
200
100
0
0
5
10
15
20
25
30
Time (min)
1136-012 Davison 955
01136-010 Screened Davison 955
01136-002 Ineos ES757

Fig. 5

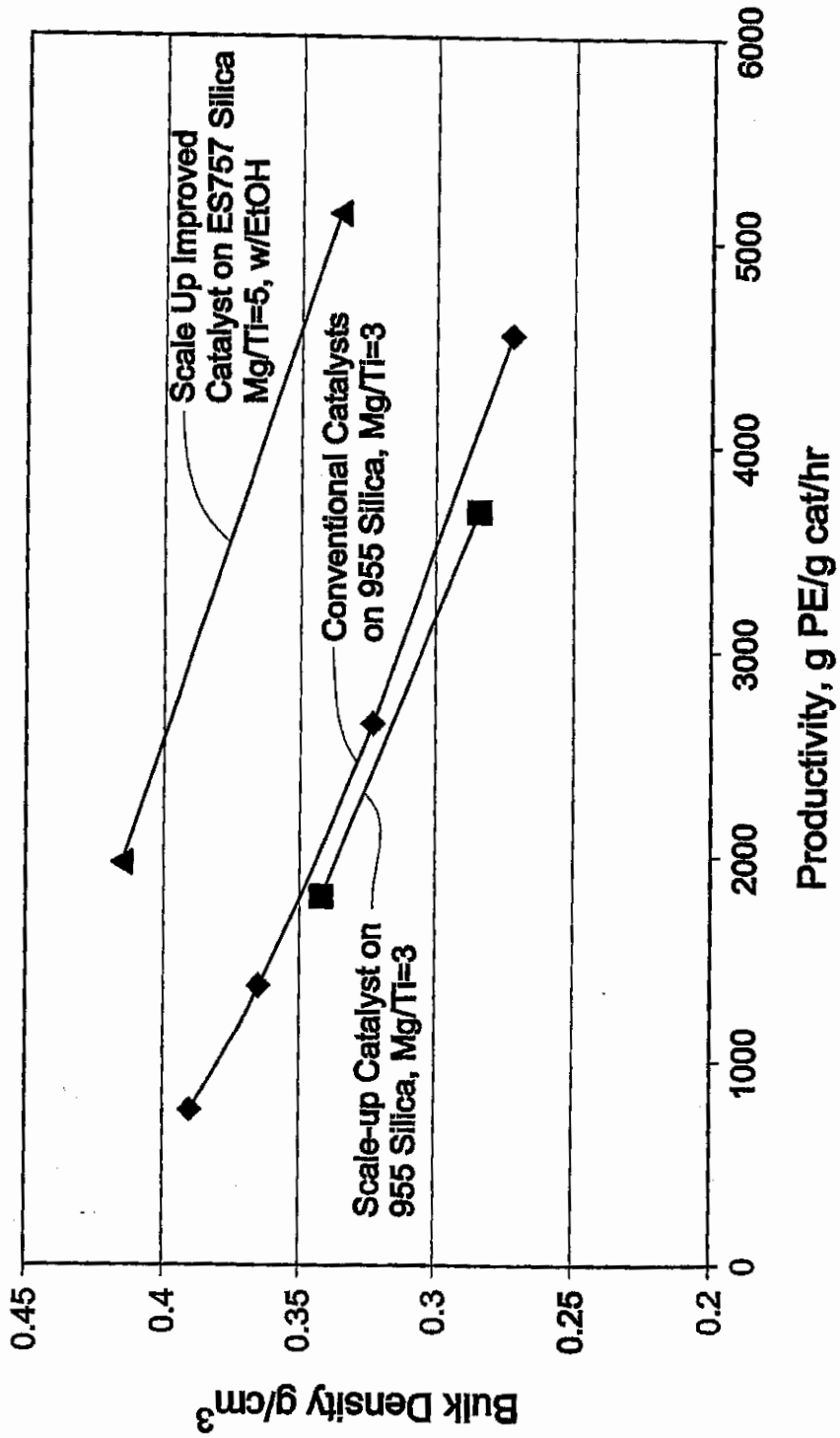
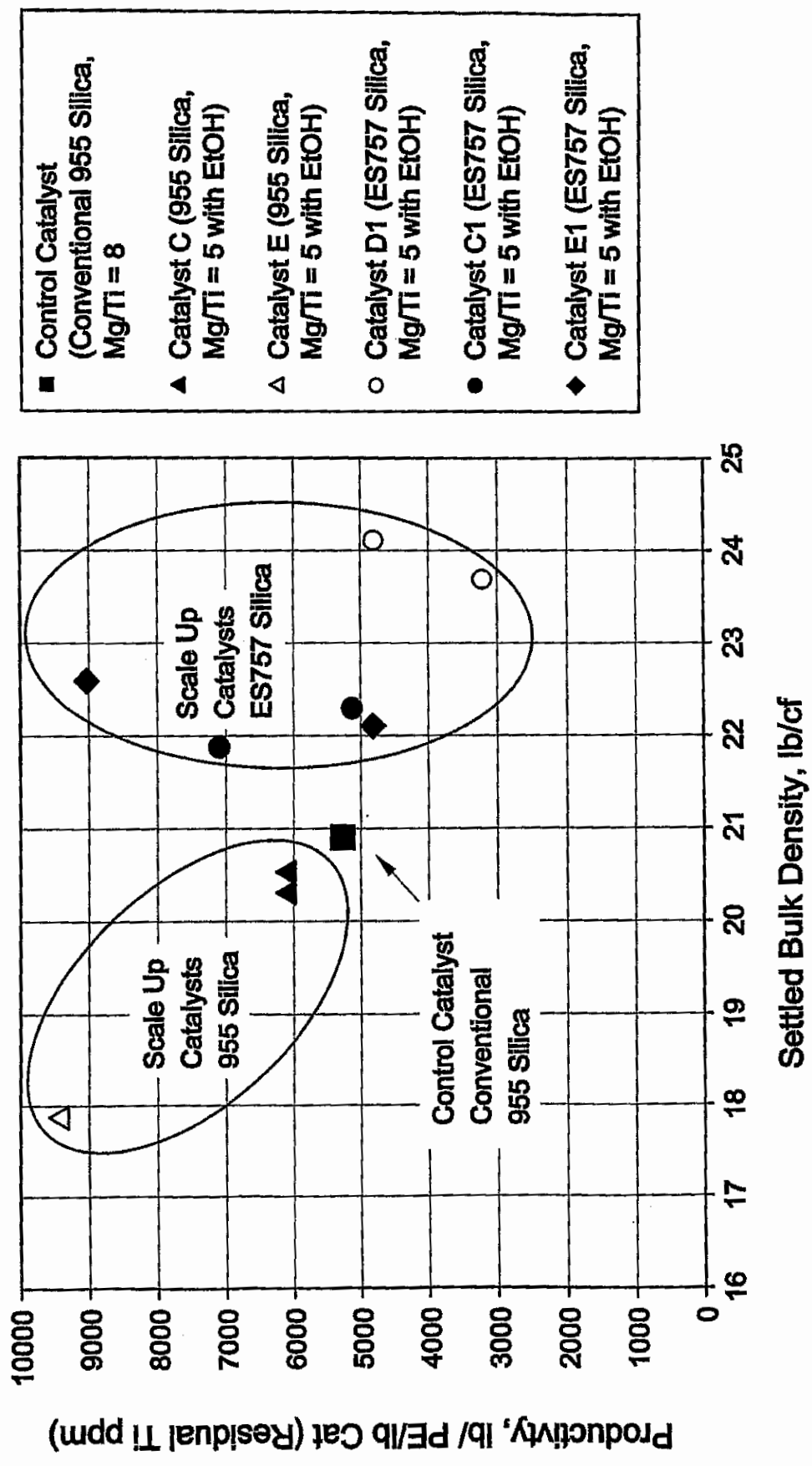

Productivity vs. Bulk Density
Scale Up Improved Catalyst on ES757 Silica Mg/Ti=5, w/EtOH
Conventional Catalysts on 955 Silica, Mg/Ti=3
Scale-up Catalyst on 955 Silica, Mg/Ti=3
Bulk Density g/cm3
0.45
0.4
0.35
0.3
0.25
0.2
Productivity, g PE/g cat/hr
0
1000
2000
3000
4000
5000
6000

Fig. 6


Scale Up Catalyst Productivity vs.
Polymer Settled Bulk Density
Productivity, lb/ PE/lb Cat (Residual Ti ppm)
Settled Bulk Density, lb/cf
Scale Up Catalysts 955 Silica
Scale Up Catalysts ES757 Silica
Control Catalyst Conventional 955 Silica
Control Catalyst (Conventional 955 Silica, Mg/Ti = 8
Catalyst C (955 Silica, Mg/Ti = 5 with EtOH)
Catalyst E (955 Silica, Mg/Ti = 5 with EtOH)
Catalyst D1 (ES757 Silica, Mg/Ti = 5 with EtOH)
Catalyst C1 (ES757 Silica, Mg/Ti = 5 with EtOH)
Catalyst E1 (ES757 Silica, Mg/Ti = 5 with EtOH)