FIG. 1

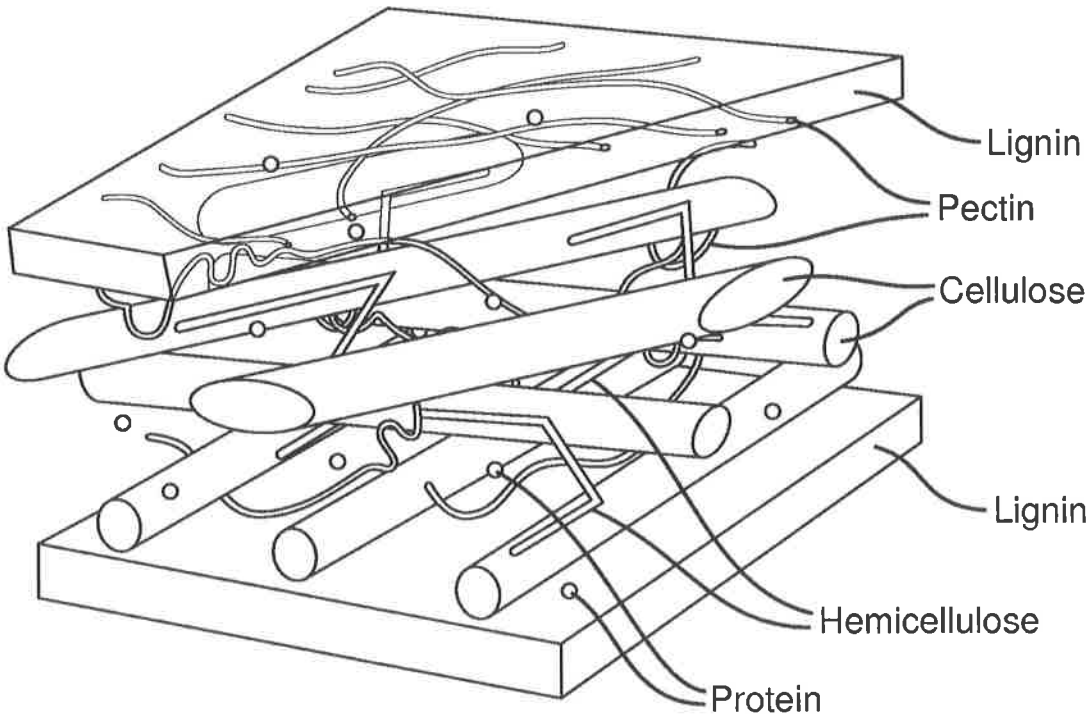


FIG. 2

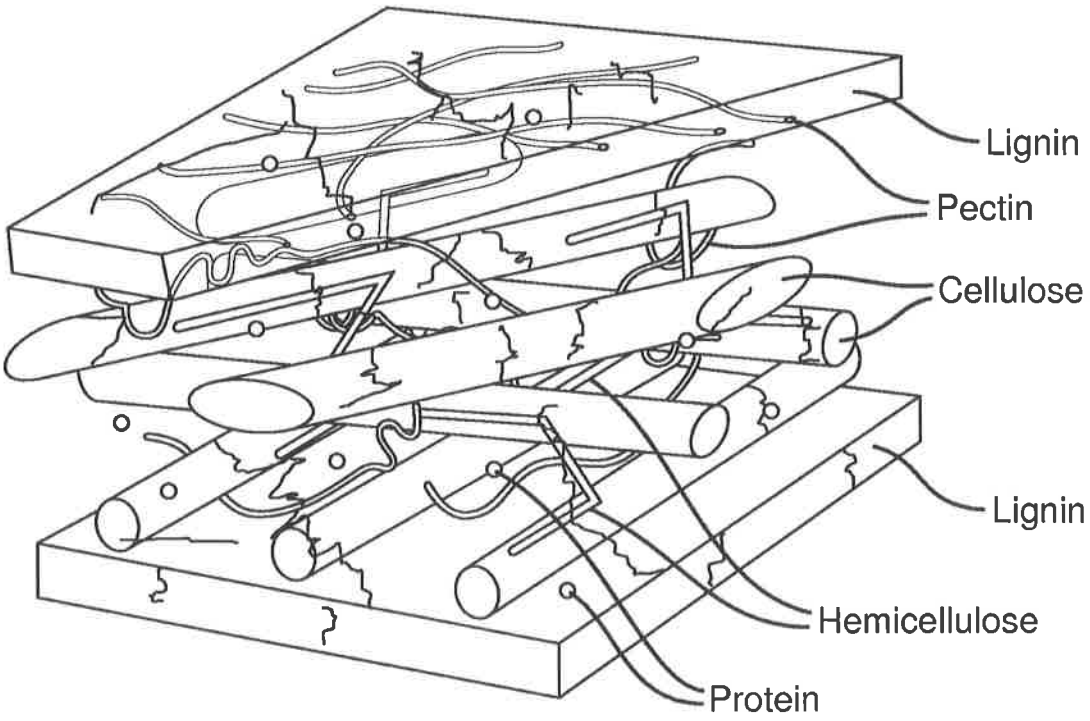
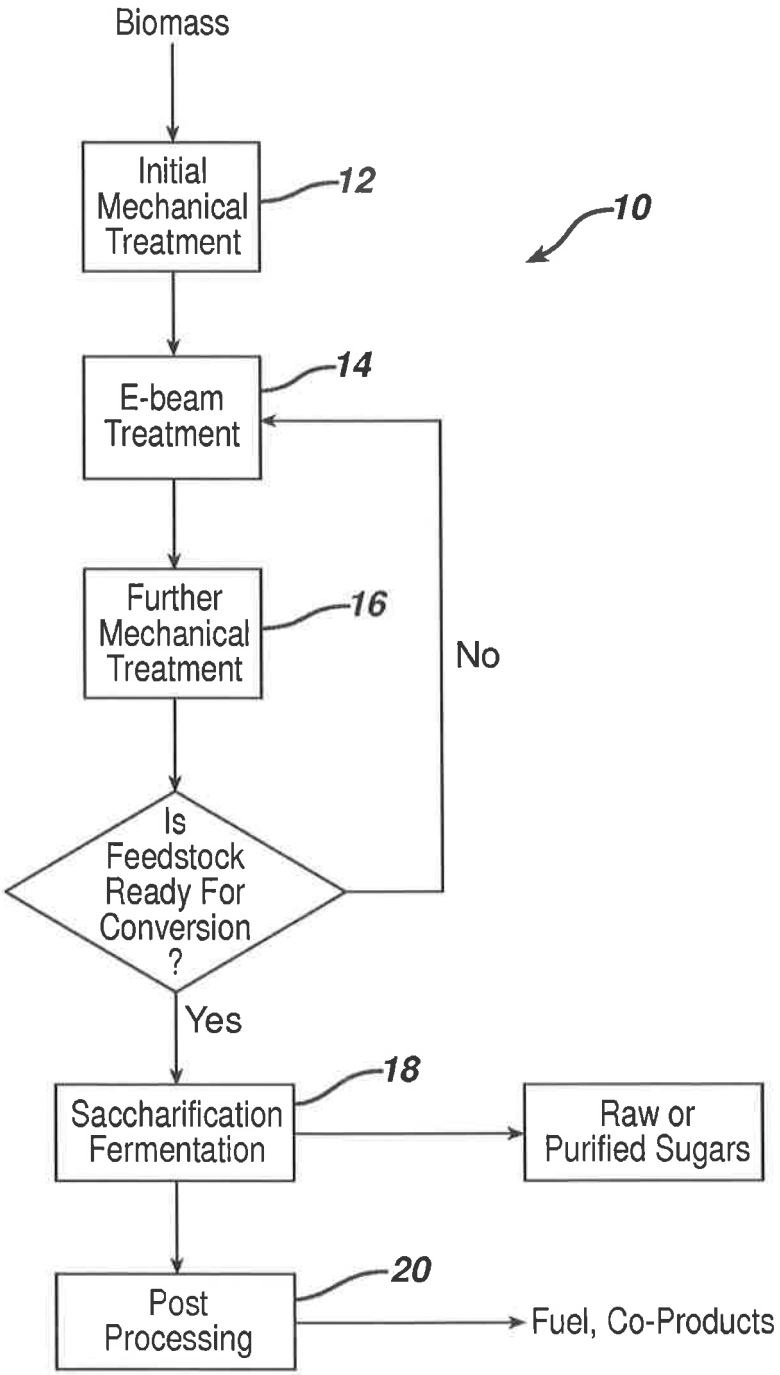


FIG. 3


Biomass
Initial Mechanical Treatment
12
10
E-beam Treatment
14
Further Mechanical Treatment
16
No
Is Feedstock Ready For Conversion ?
Yes
Saccharification Fermentation
18
Raw or Purified Sugars
Post Processing
20
Fuel, Co-Products

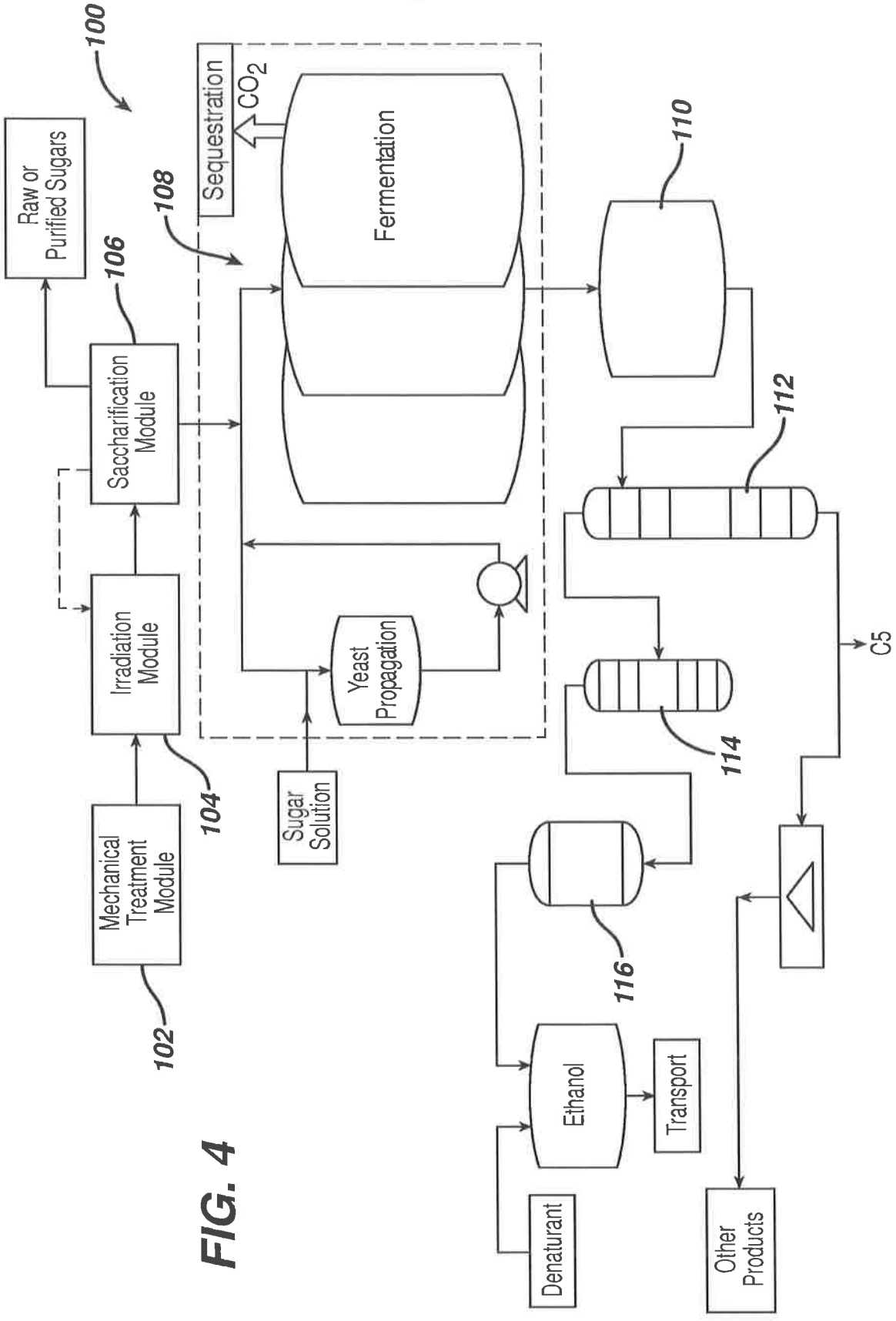

100
Raw or Purified Sugars
106
Saccharification Module
108
Sequestration
CO_2
Fermentation
110
112
Irradiation Module
Yeast Propagation
C5
Mechanical Treatment Module
104
Sugar Solution
114
116
Ethanol
Transport
Denaturant
Other Products
102

FIG. 4

FIG. 5

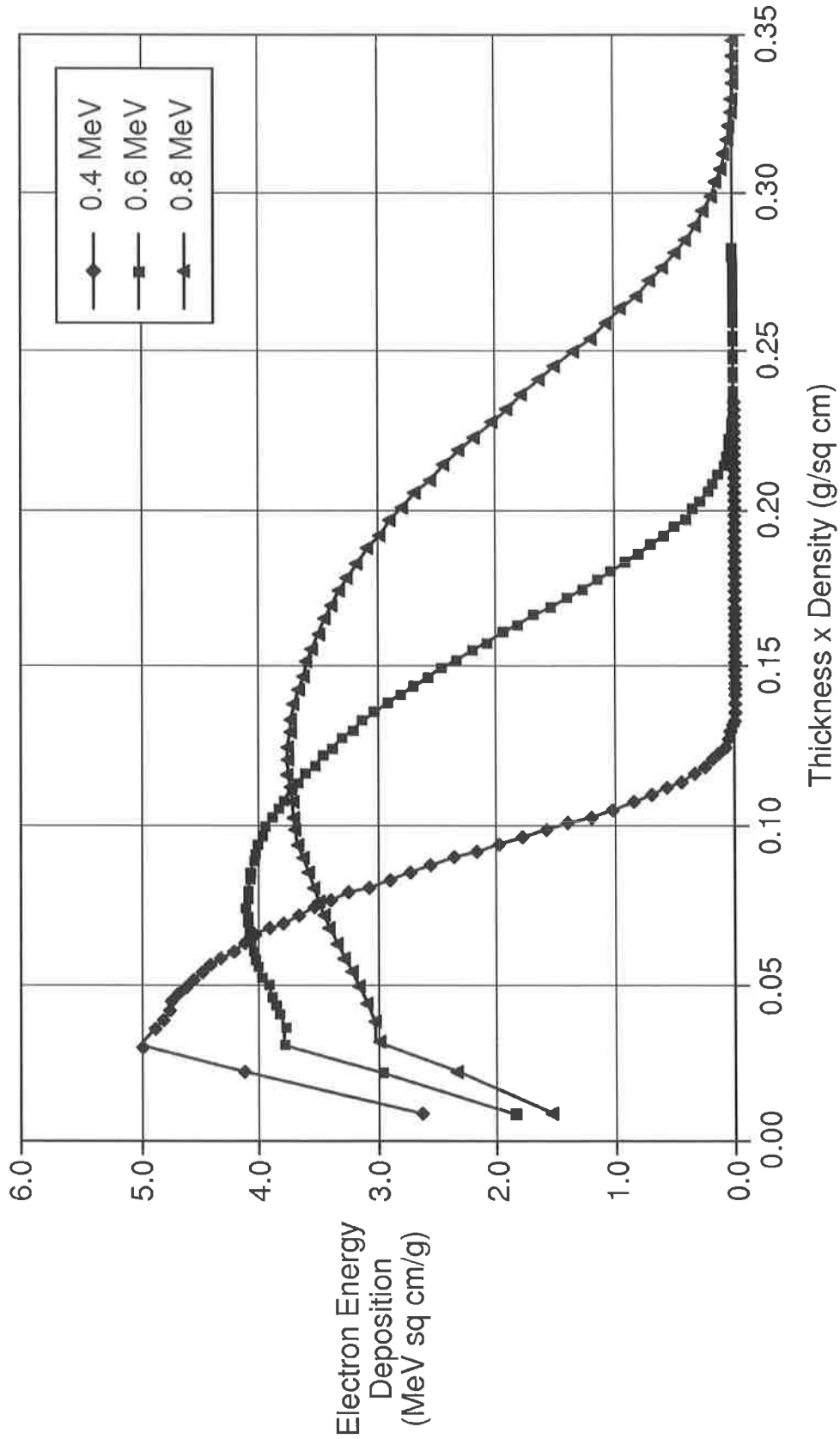

0.4 MeV
0.6 MeV
0.8 MeV
Electron Energy Deposition (MeV sq cm/g)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Thickness x Density (g/sq cm)

FIG. 5A

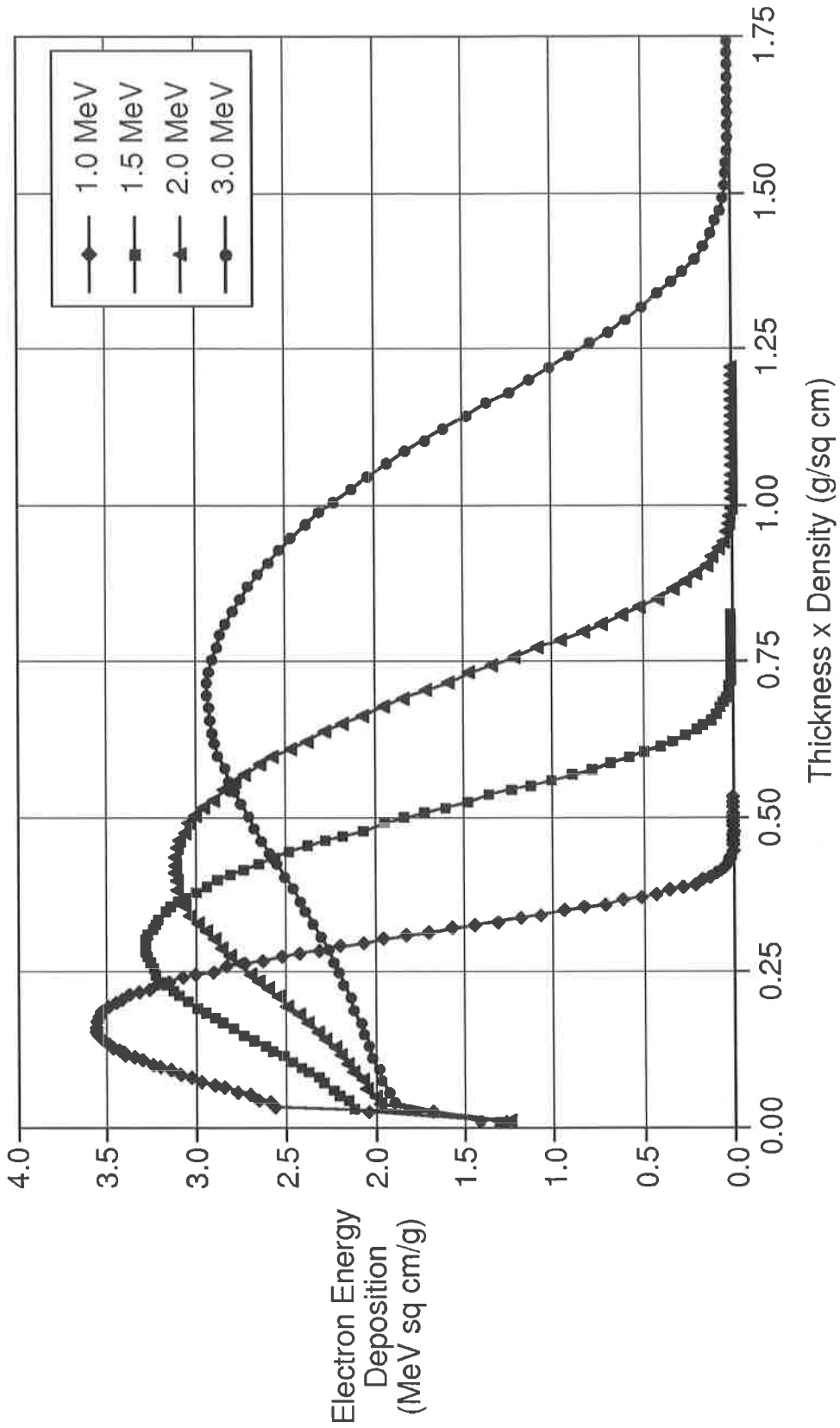
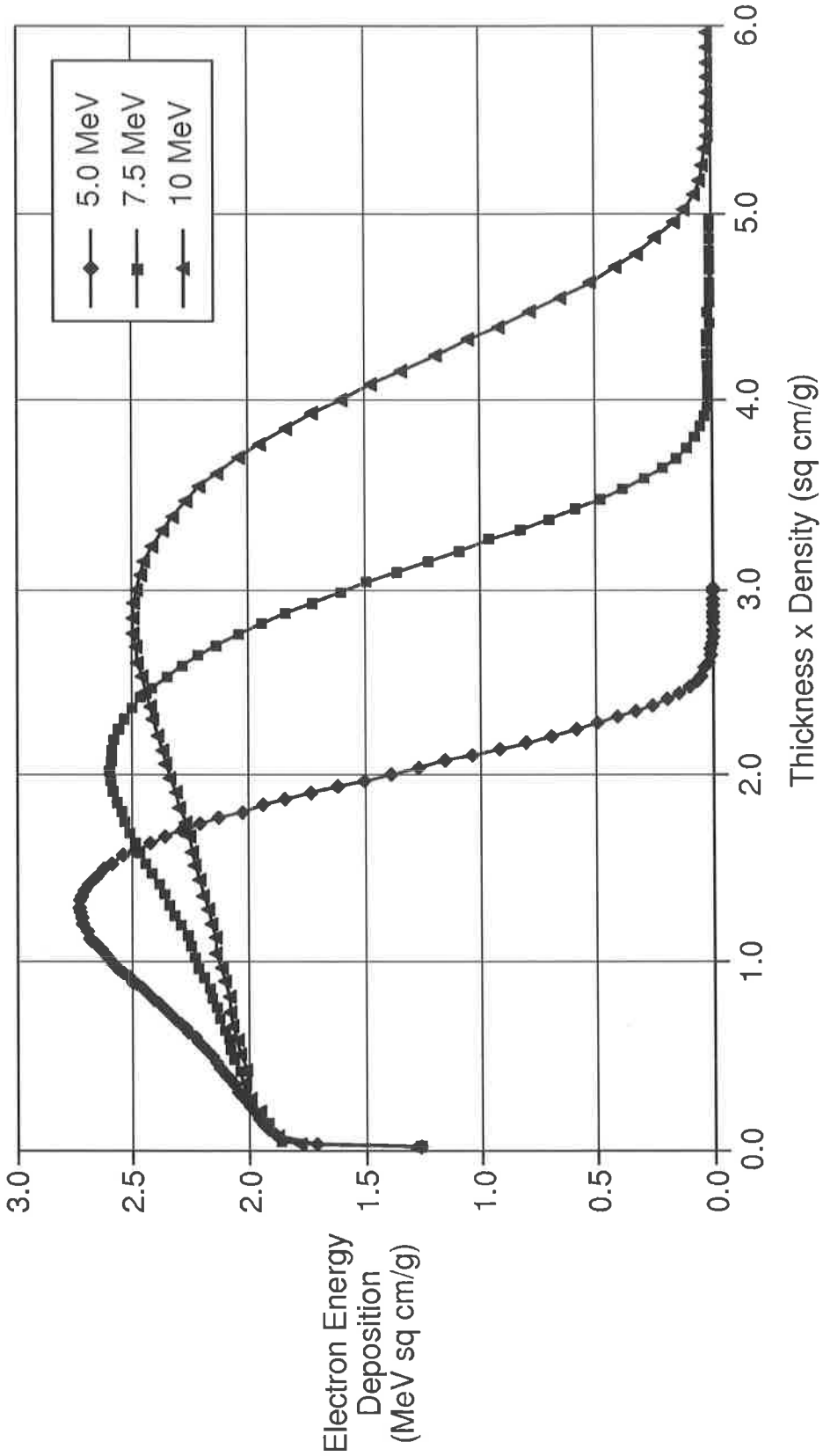

1.0 MeV
1.5 MeV
2.0 MeV
3.0 MeV
Electron Energy Deposition (MeV sq cm/g)
Thickness x Density (g/sq cm)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75

FIG. 5B


5.0 MeV
7.5 MeV
10 MeV
Electron Energy Deposition (MeV sq cm/g)
Thickness x Density (sq cm/g)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0