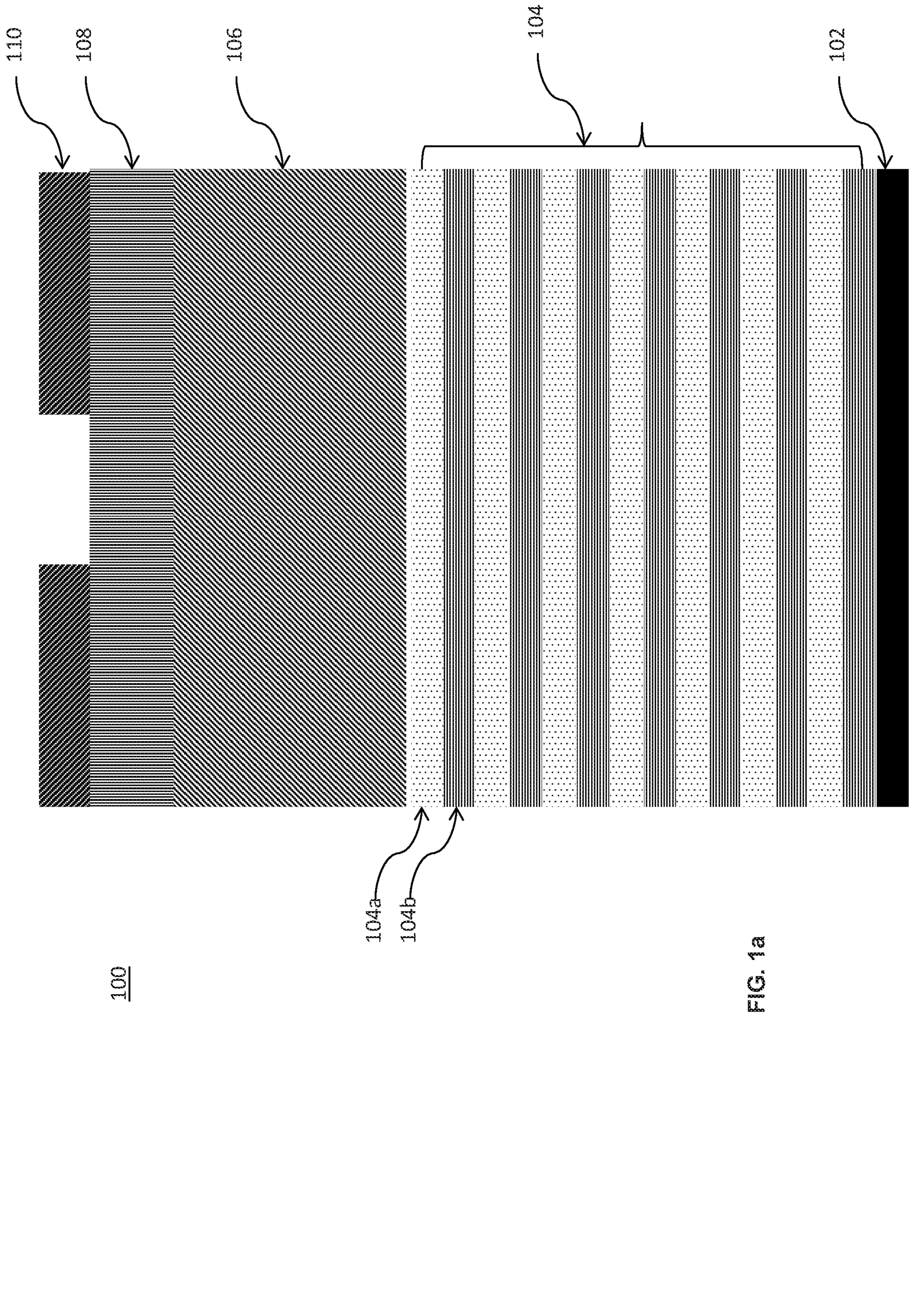

FIG. 1a

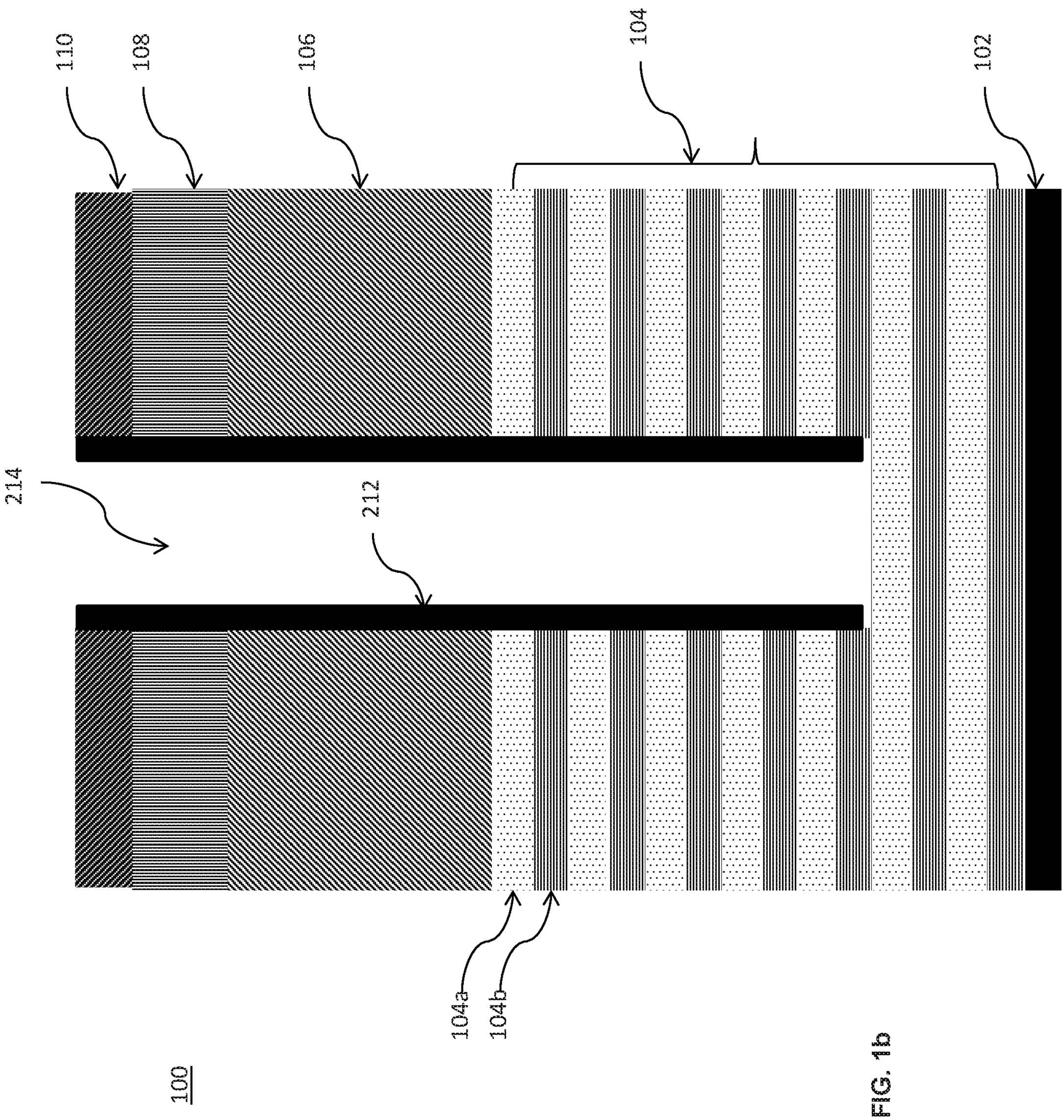

FIG. 1b

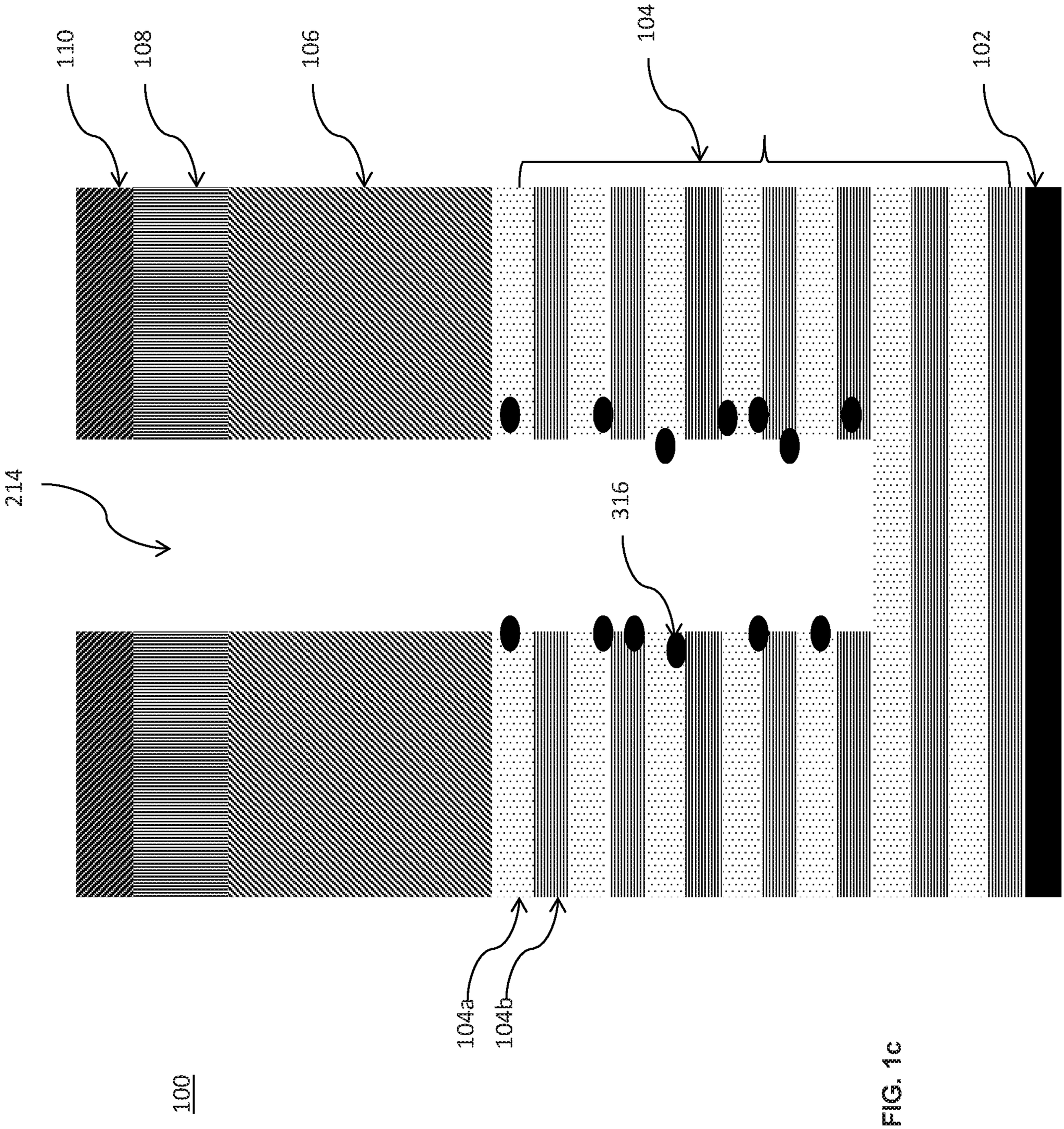

FIG. 1c

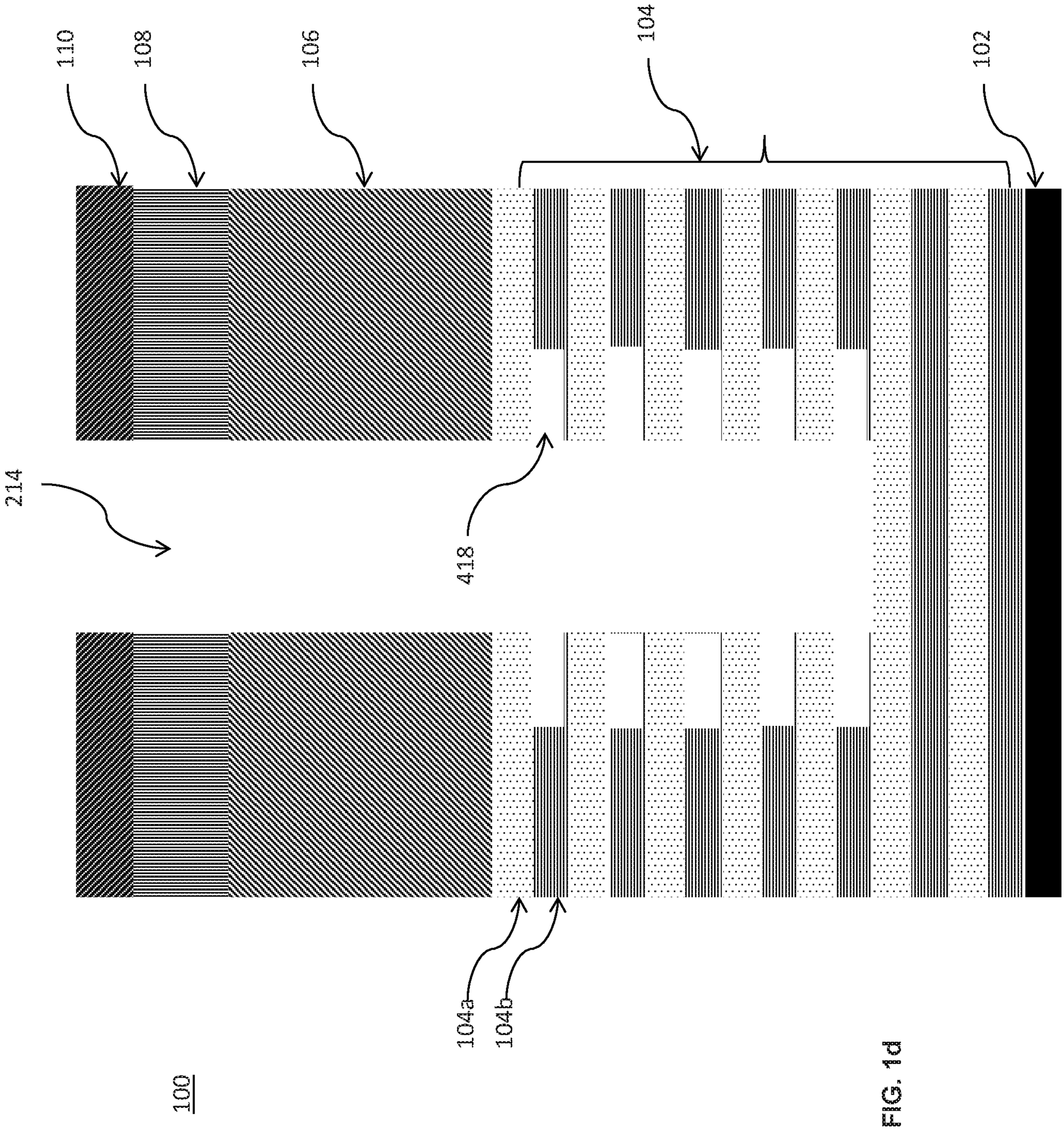

FIG. 1B

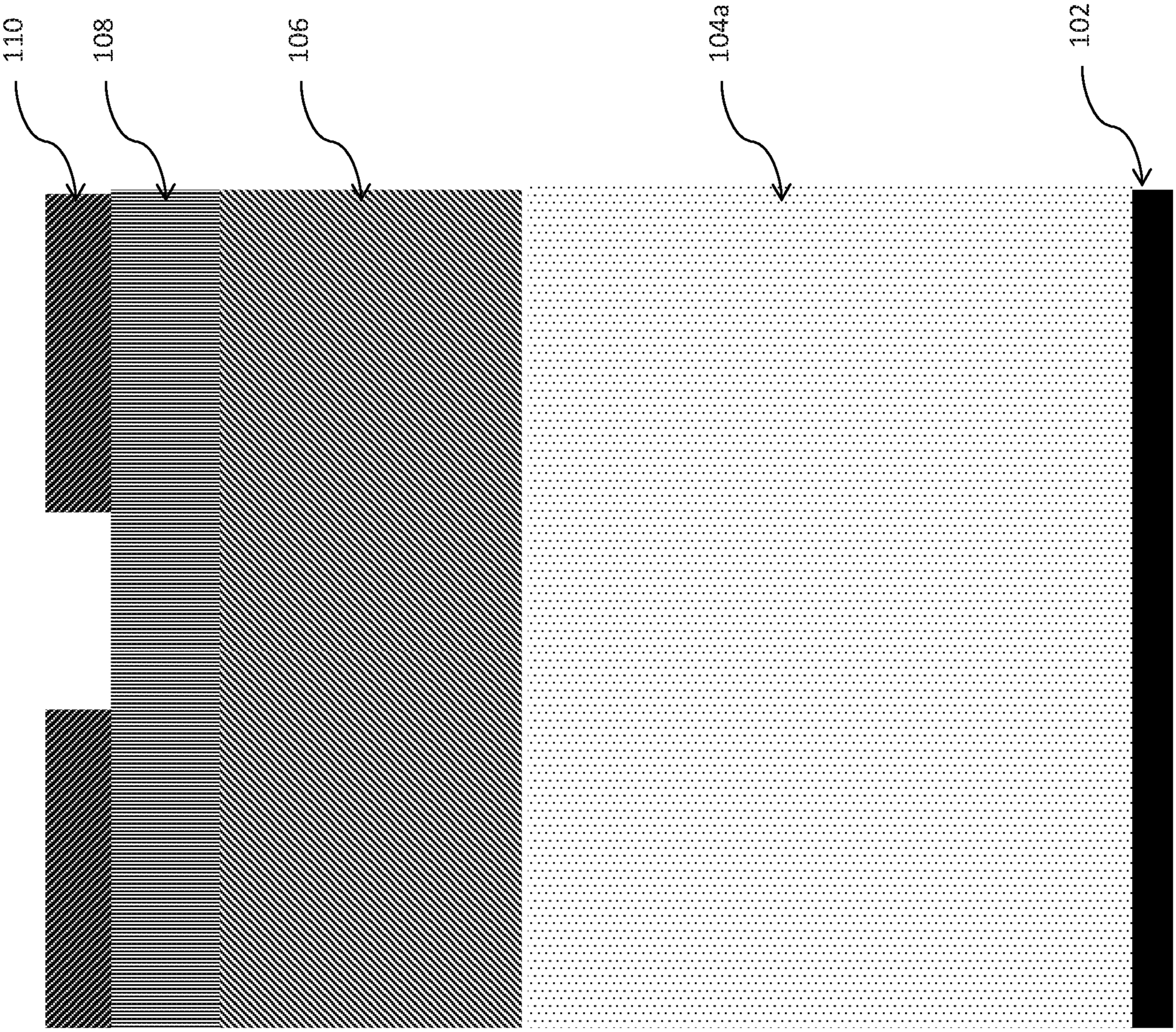

FIG. 2

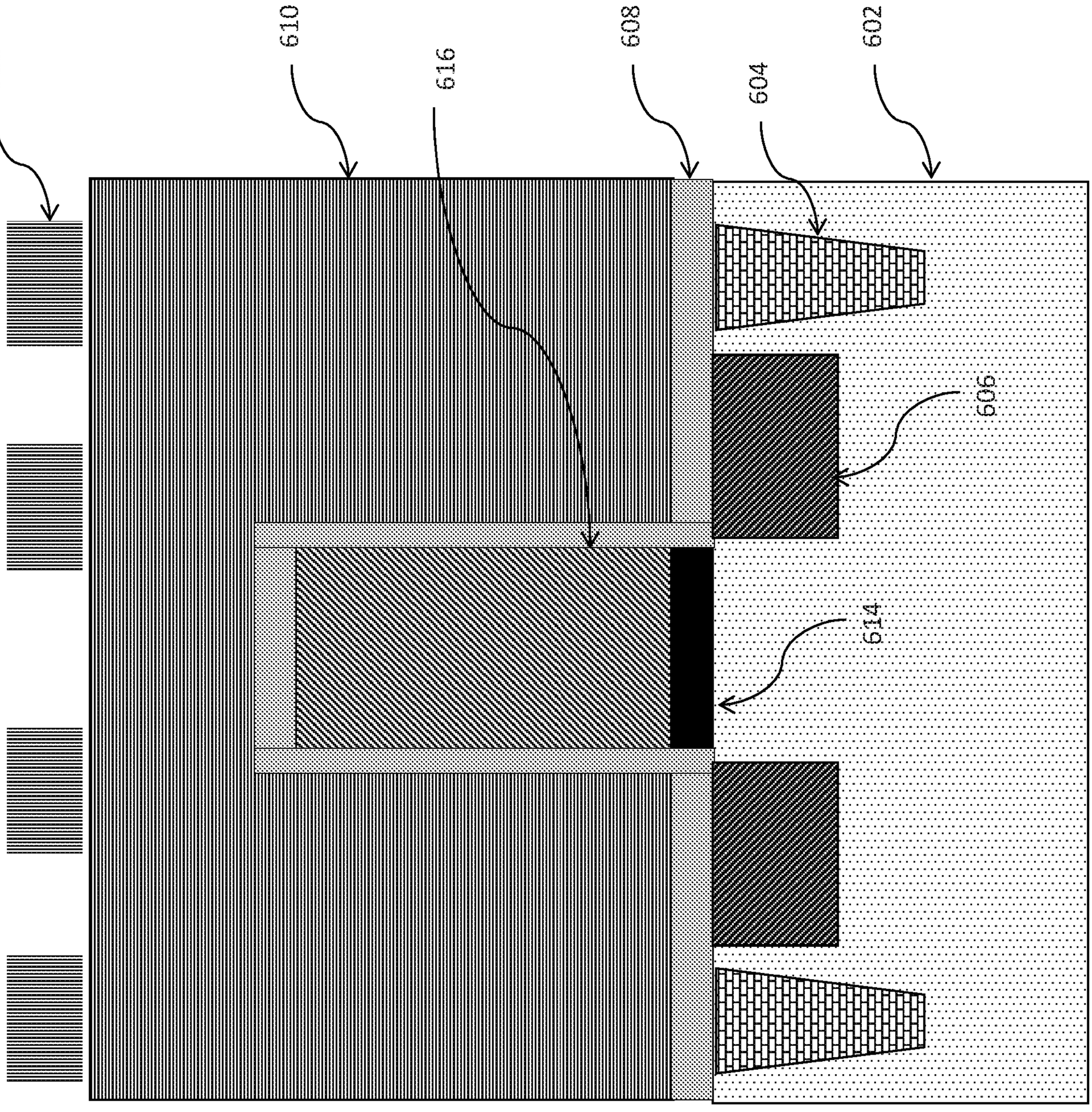

FIG 3a

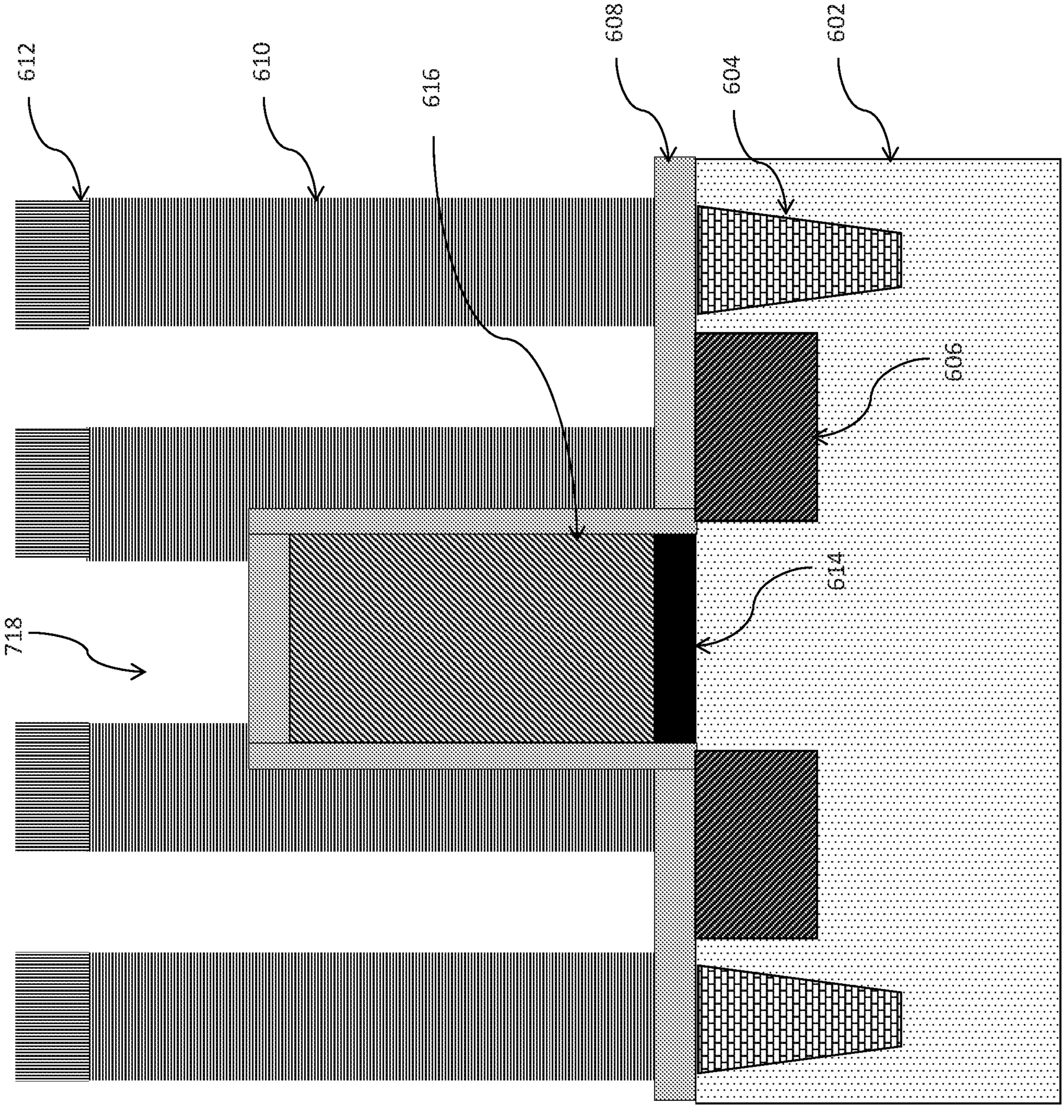

Fig 3b

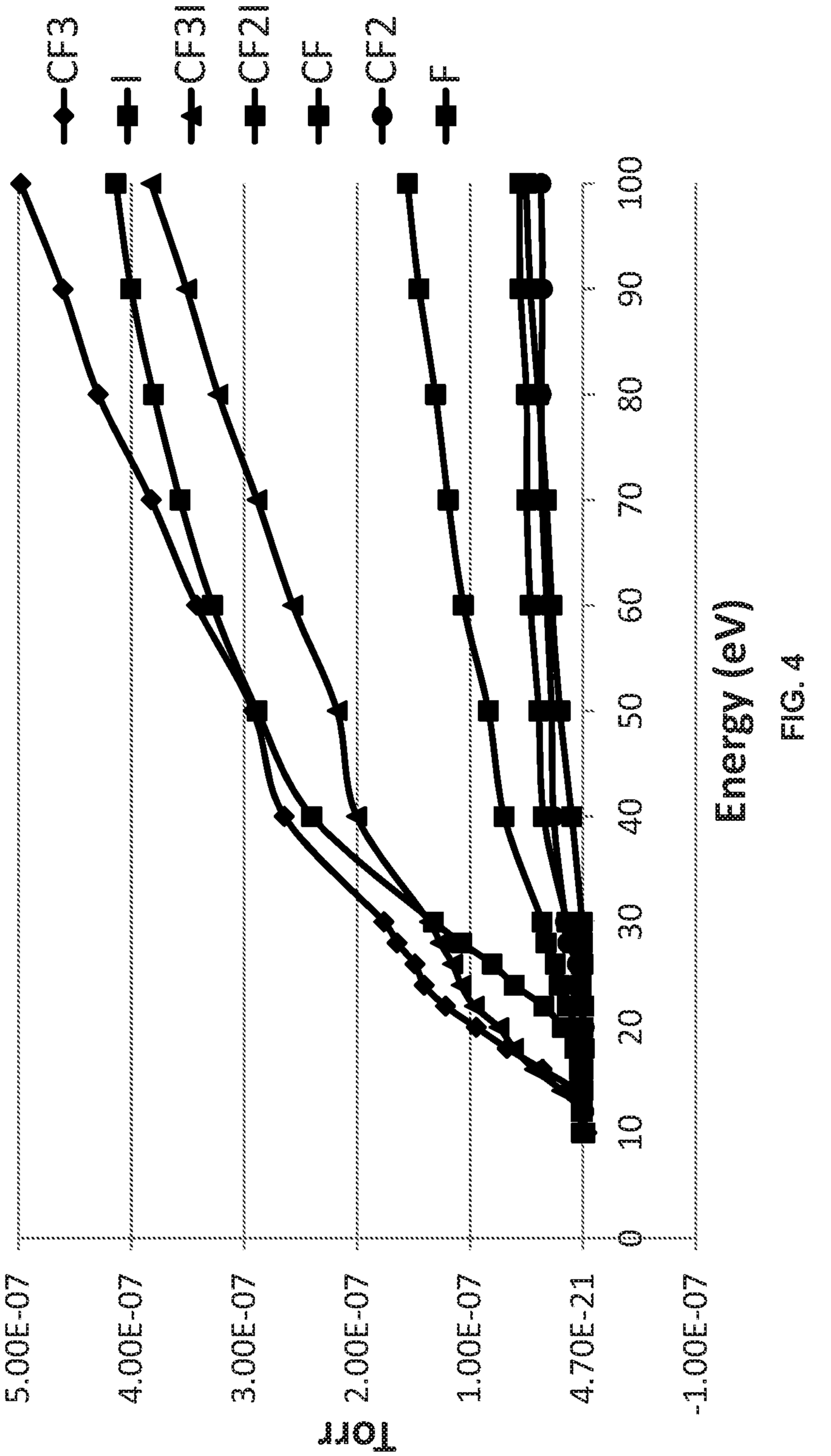
CE3
E
CE3I
CE2I
CE
CE2
Species concentration Vs Electron energy
Torr
5.00E-07
4.00E-07
3.00E-07
2.00E-07
1.00E-07
4.70E-21
-1.00E-07
0
10
20
30
40
50
60
70
80
90
100
Energy (eV)

FIG. 4

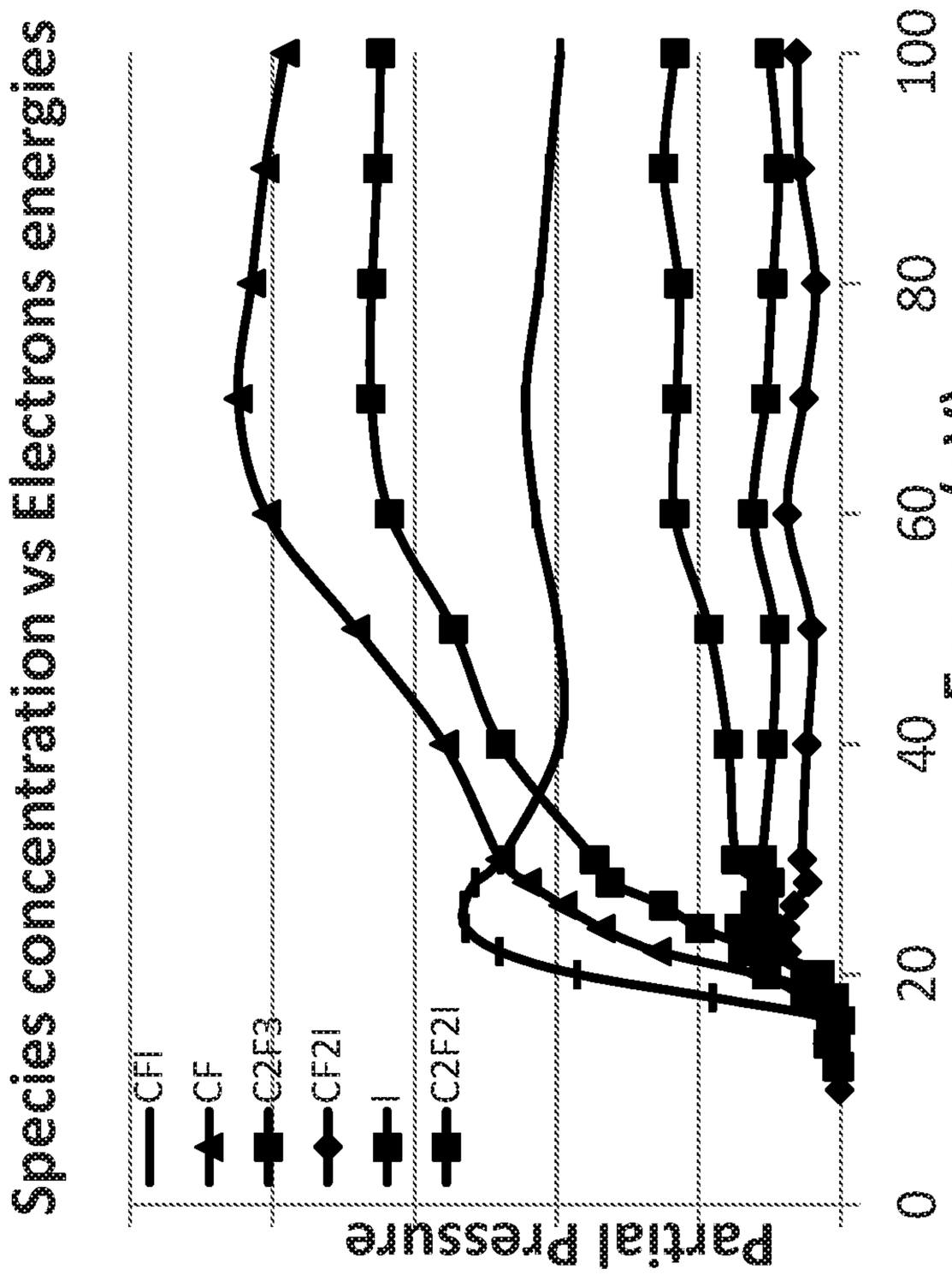
Species concentration vs Electrons energies
Partial Pressure
Energy (eV)
0
20
40
60
80
100
CFI
CF
C2F3
CF2I
I
C2F2I

FIG. 5

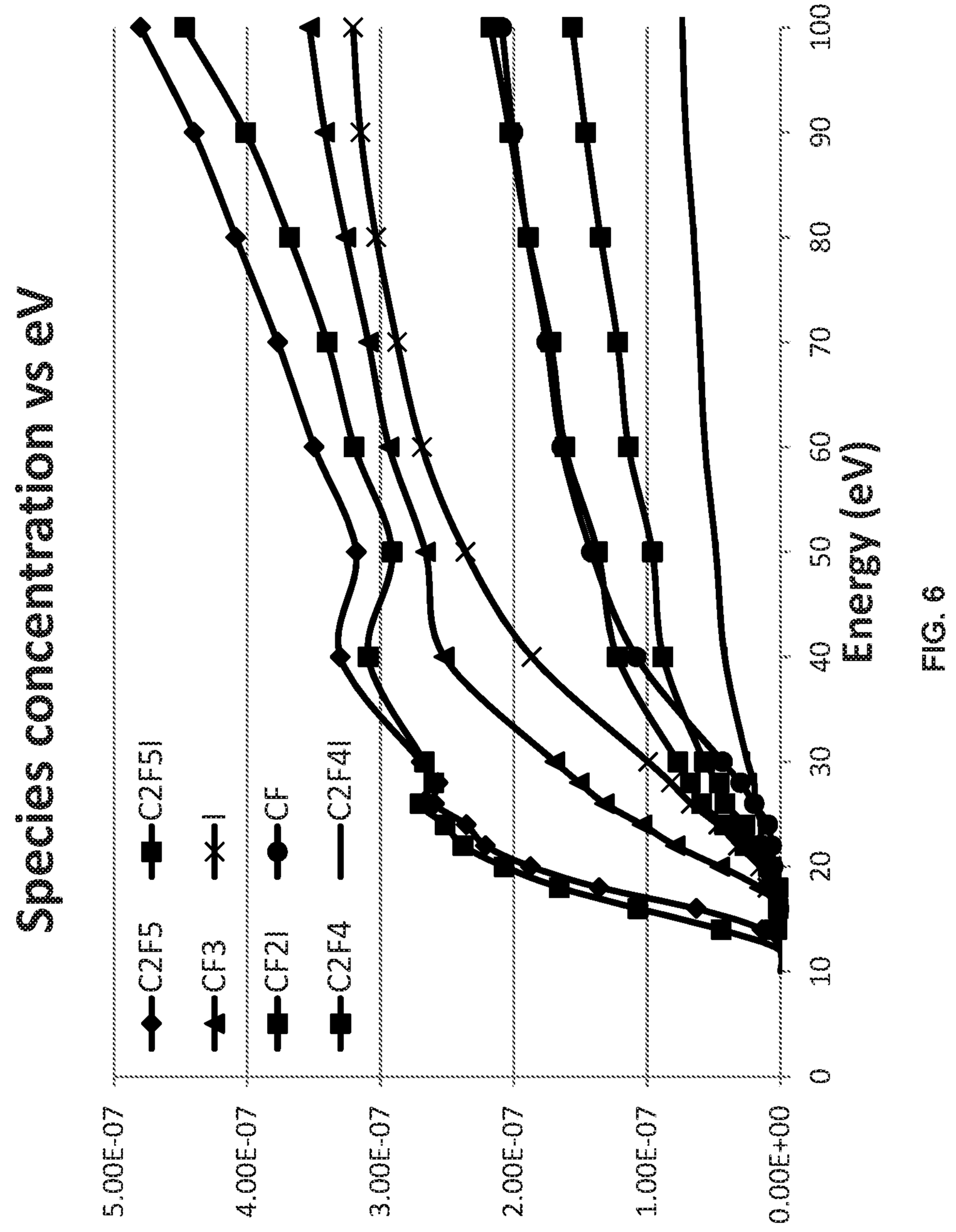
Species concentration vs eV
C2F5
C2F5I
CF3
I
CF2I
CF
C2F4
C2F4I
0.00E+00
1.00E-07
2.00E-07
3.00E-07
4.00E-07
5.00E-07
0
10
20
30
40
50
60
70
80
90
100
Energy (eV)
TORR
0.5
1
2
3
4
5

FIG. 6

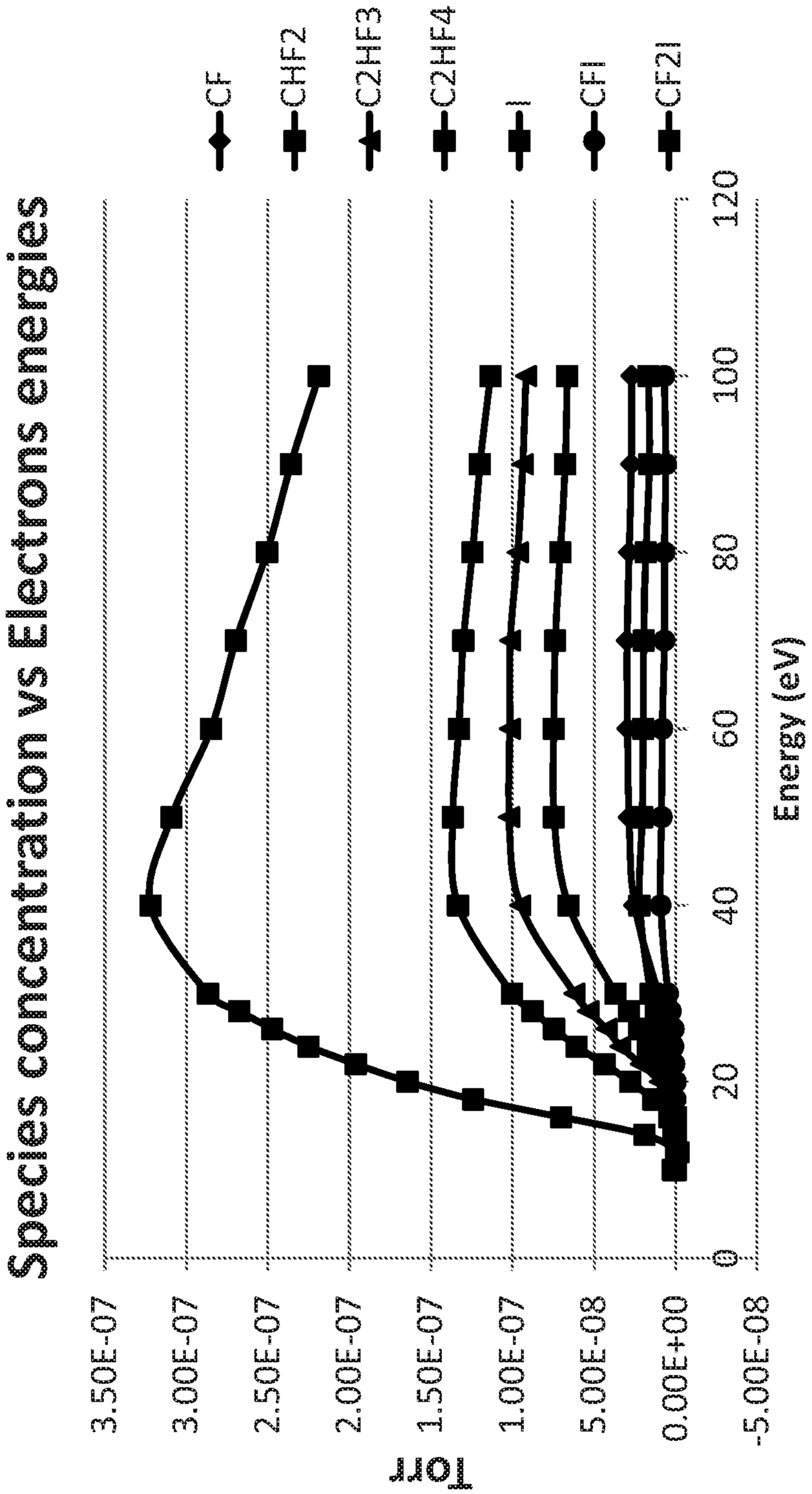
Species concentration vs Electrons energies
Energy (eV)
0
20
40
60
80
100
120
Torr
3.50E-07
3.00E-07
2.50E-07
2.00E-07
1.50E-07
1.00E-07
5.00E-08
0.00E+00
-5.00E-08
CF
CHF2
C2HF3
C2HF4
CFI
CF2I

FIG. 7

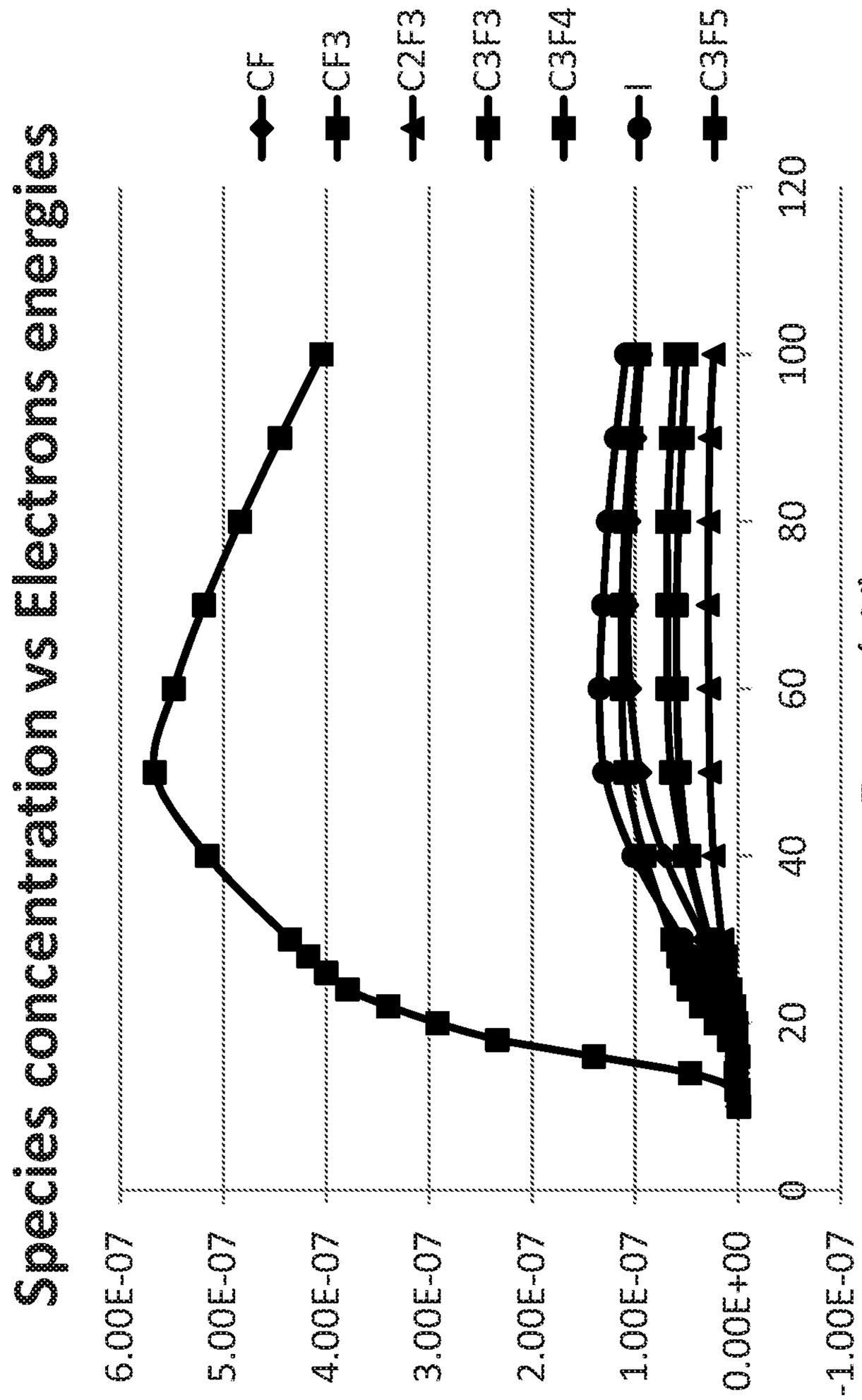
Species concentration vs Electrons energies
CF
CF3
C2F
C3F
C3F
I
C3F
Energy (eV)
0
20
40
60
80
100
120
Torr
6
5
4
3
2
1
0
-1

FIG. 8

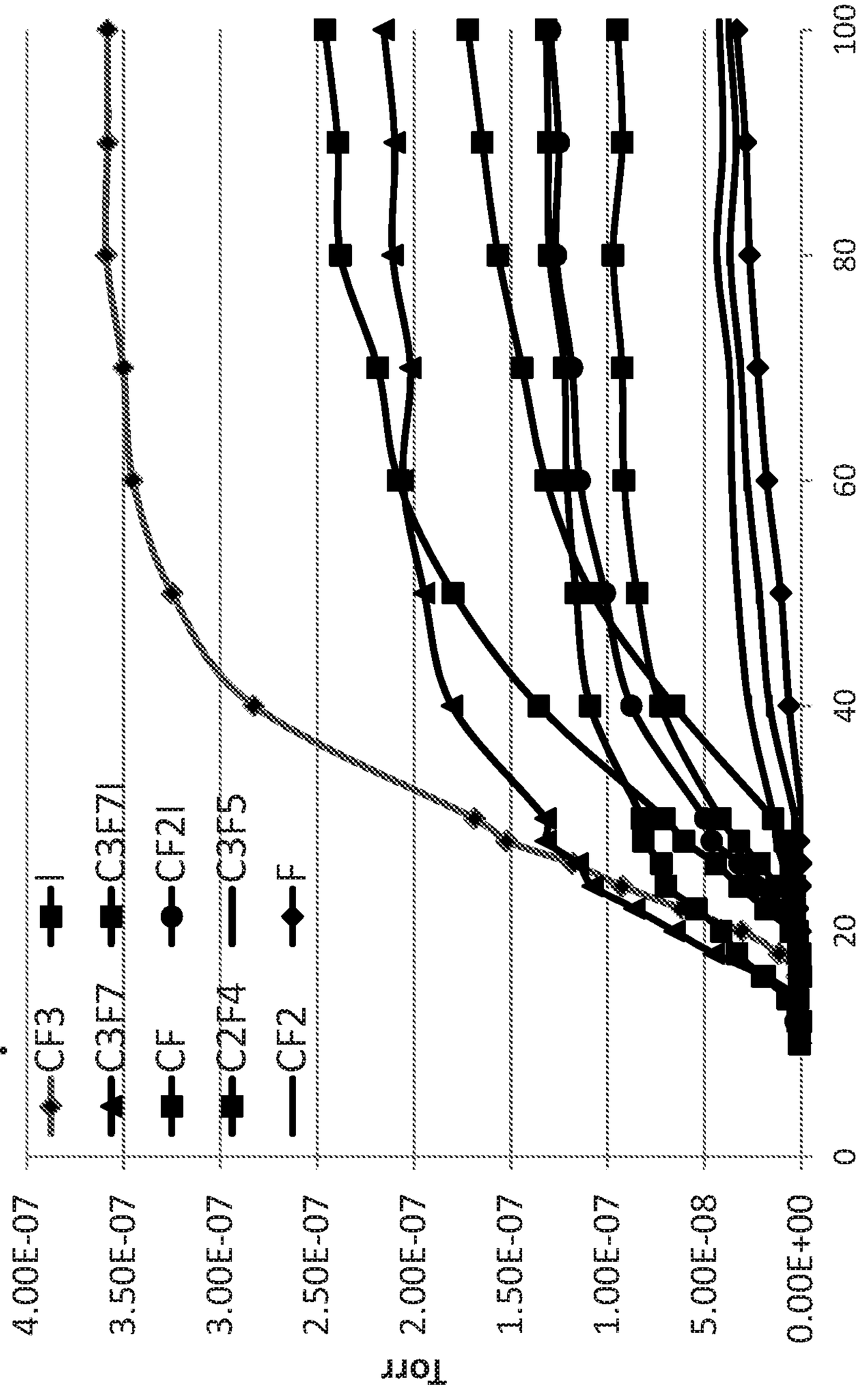
Species concentration vs eV
CF3
I
C3F7
C3F7I
CF
CF2I
C2F4
C3F5
CF2
F
4.00E-07
3.50E-07
3.00E-07
2.50E-07
2.00E-07
1.50E-07
1.00E-07
5.00E-08
0.00E+00
Torr
0
20
40
60
80
100
Energy (eV)

FIG. 9

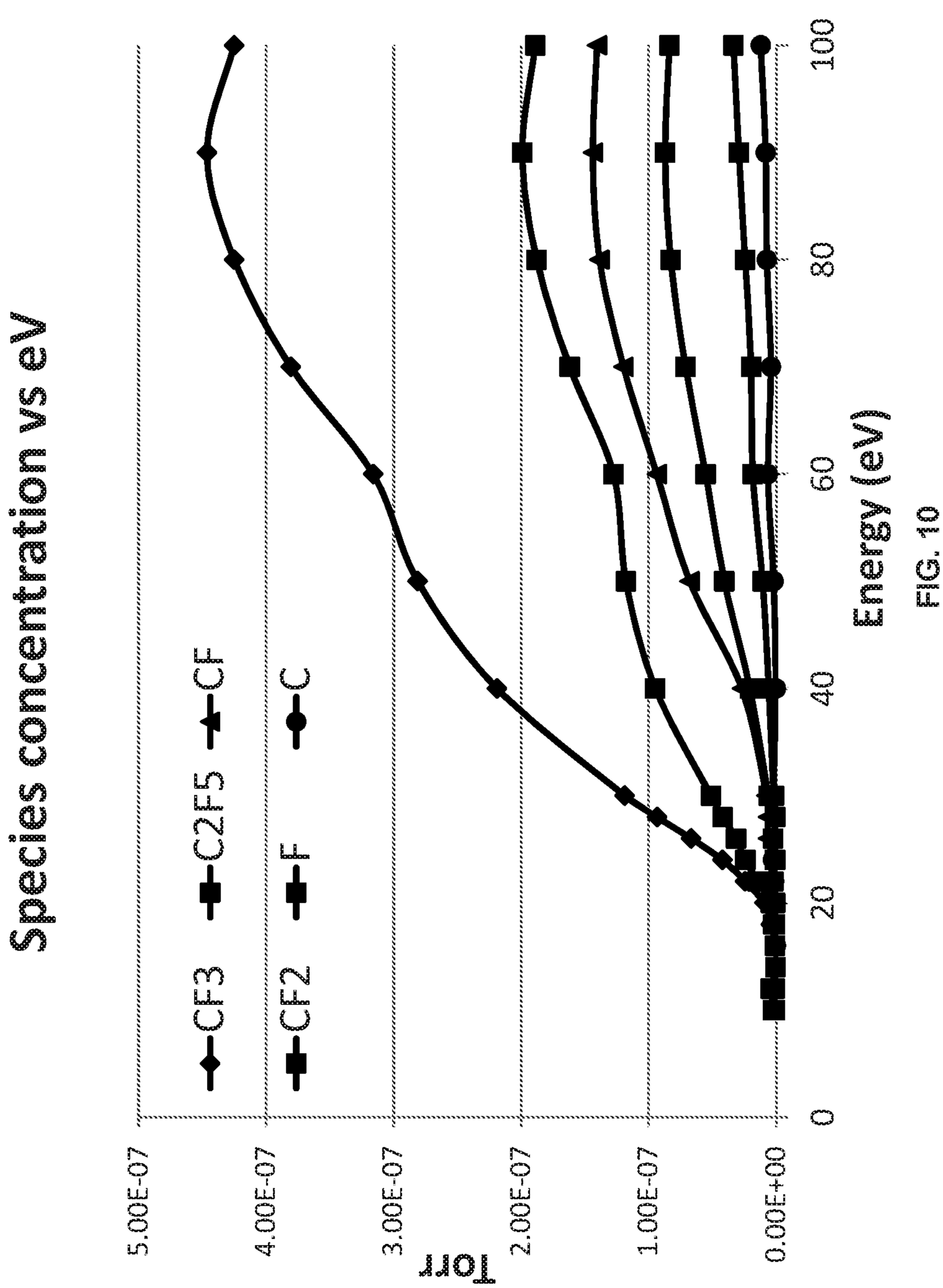
Species concentration vs eV
CF3
C2F5
CF
CF2
F
C
5.00E-07
4.00E-07
3.00E-07
2.00E-07
1.00E-07
0.00E+00
mol
0
20
40
60
80
100
Energy (eV)

FIG. 10

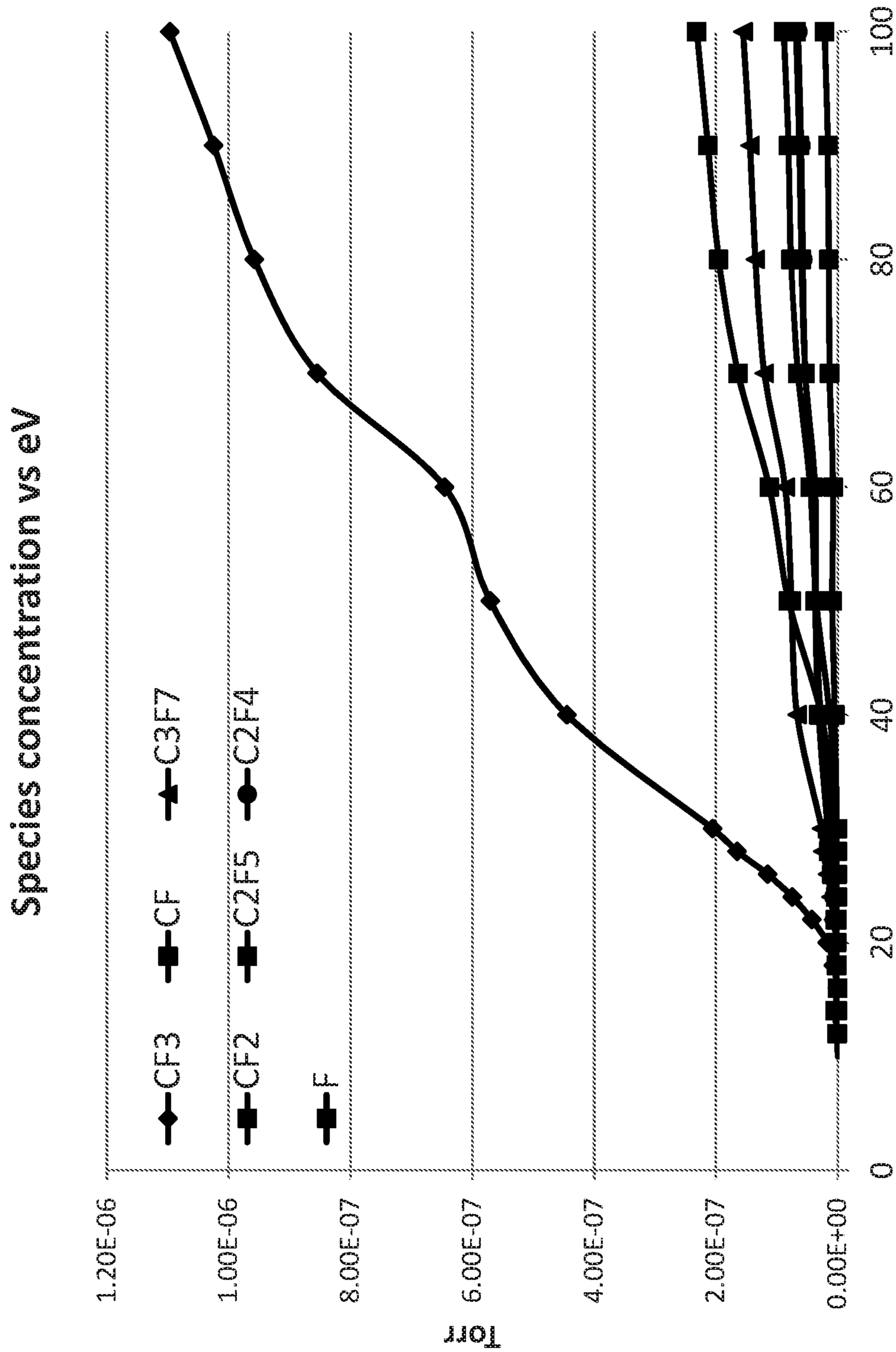
Species concentration vs eV
CF3
CF2
F
CF
C2F5
C3F7
C2F4
Torr
1.20E-06
1.00E-06
8.00E-07
6.00E-07
4.00E-07
2.00E-07
0.00E+00
0
20
40
60
80
100
Energy (eV)

FIG. 11

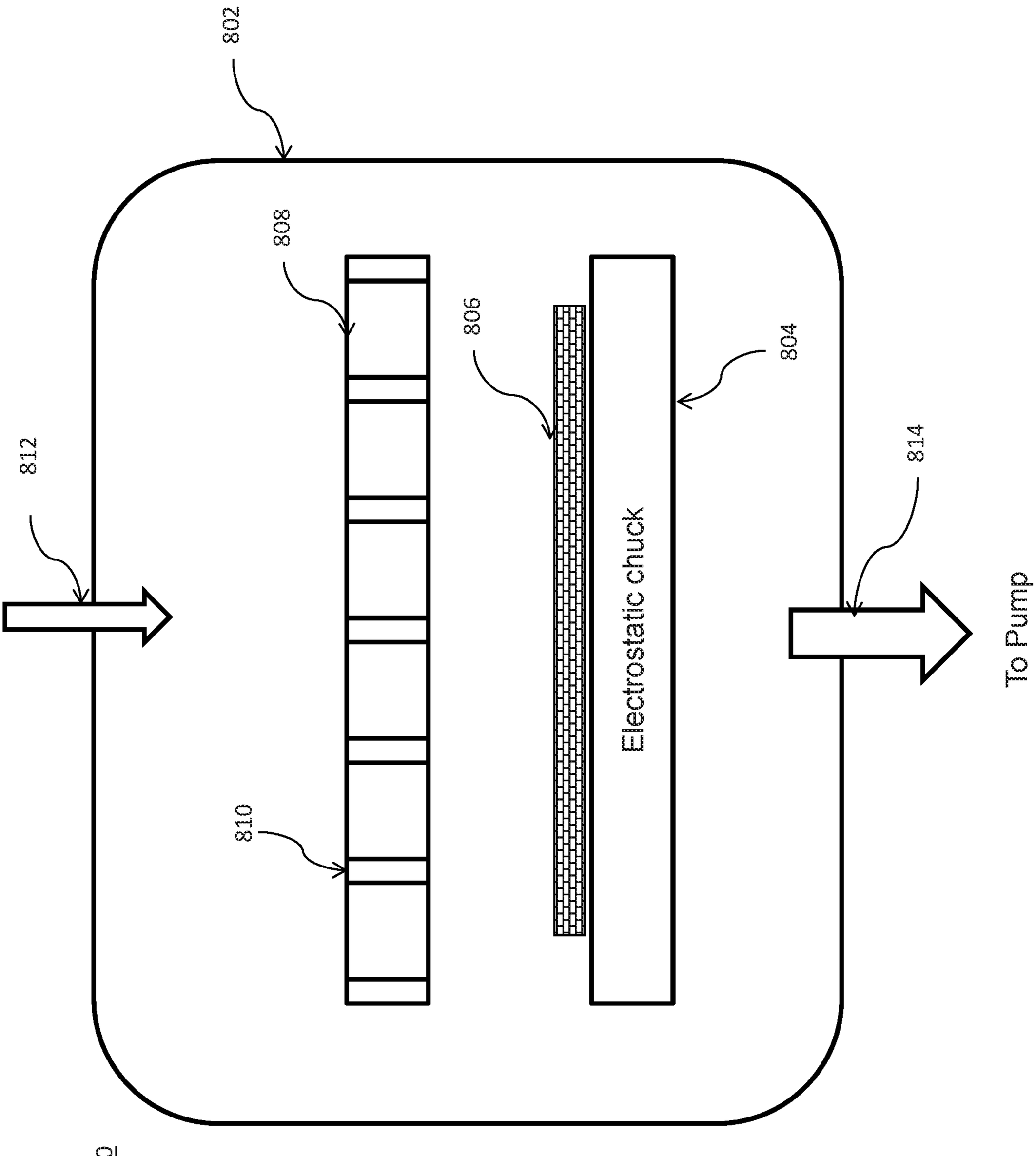

FIG. 12

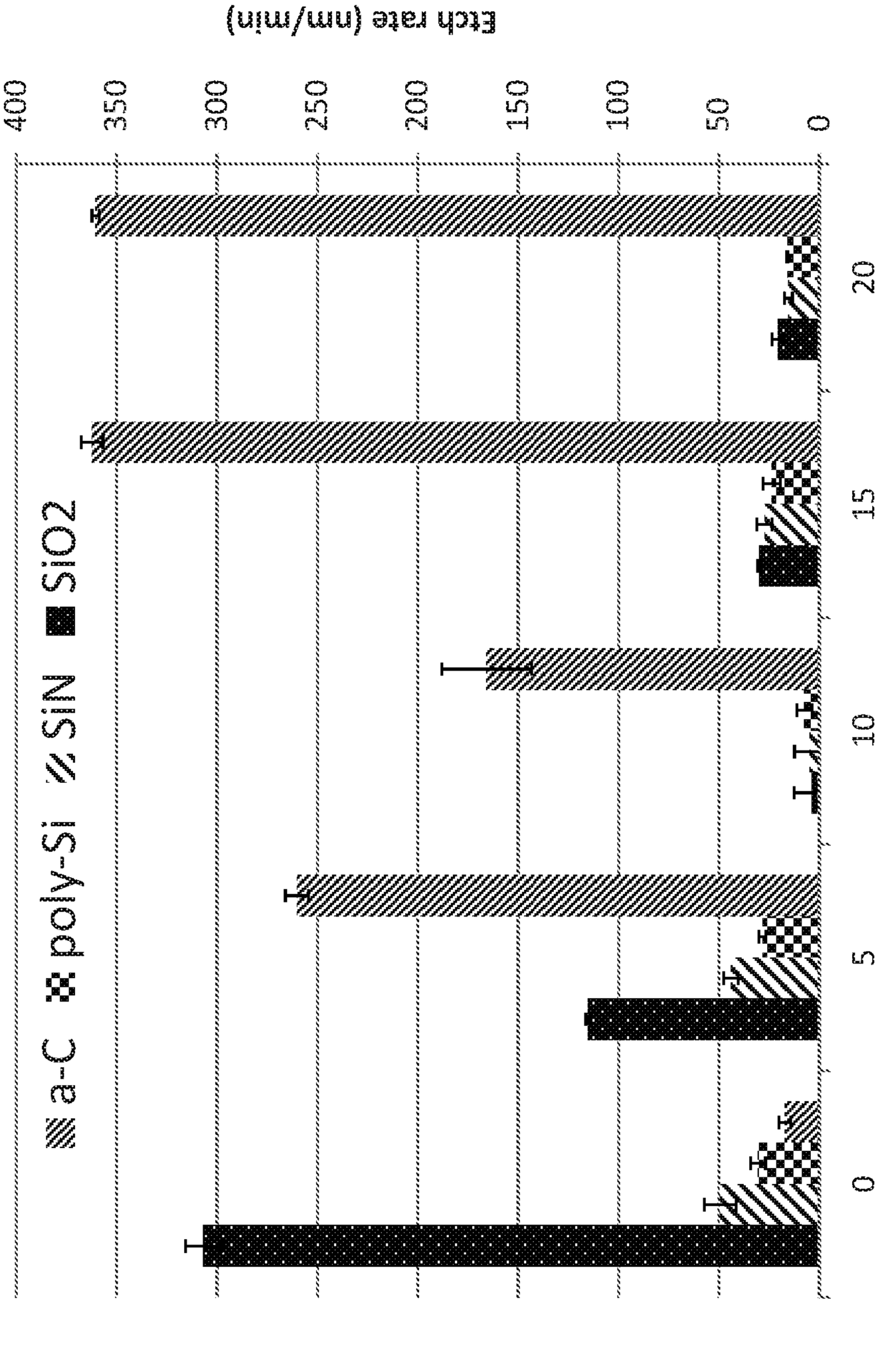
CF_3I at various O_2 flow
a-C
poly-Si
SiN
SiO2
Etch rate (nm/min)
400
350
300
250
200
150
100
50
0
0
5
10
15
20
O_2 flow [sccm]

FIG. 13

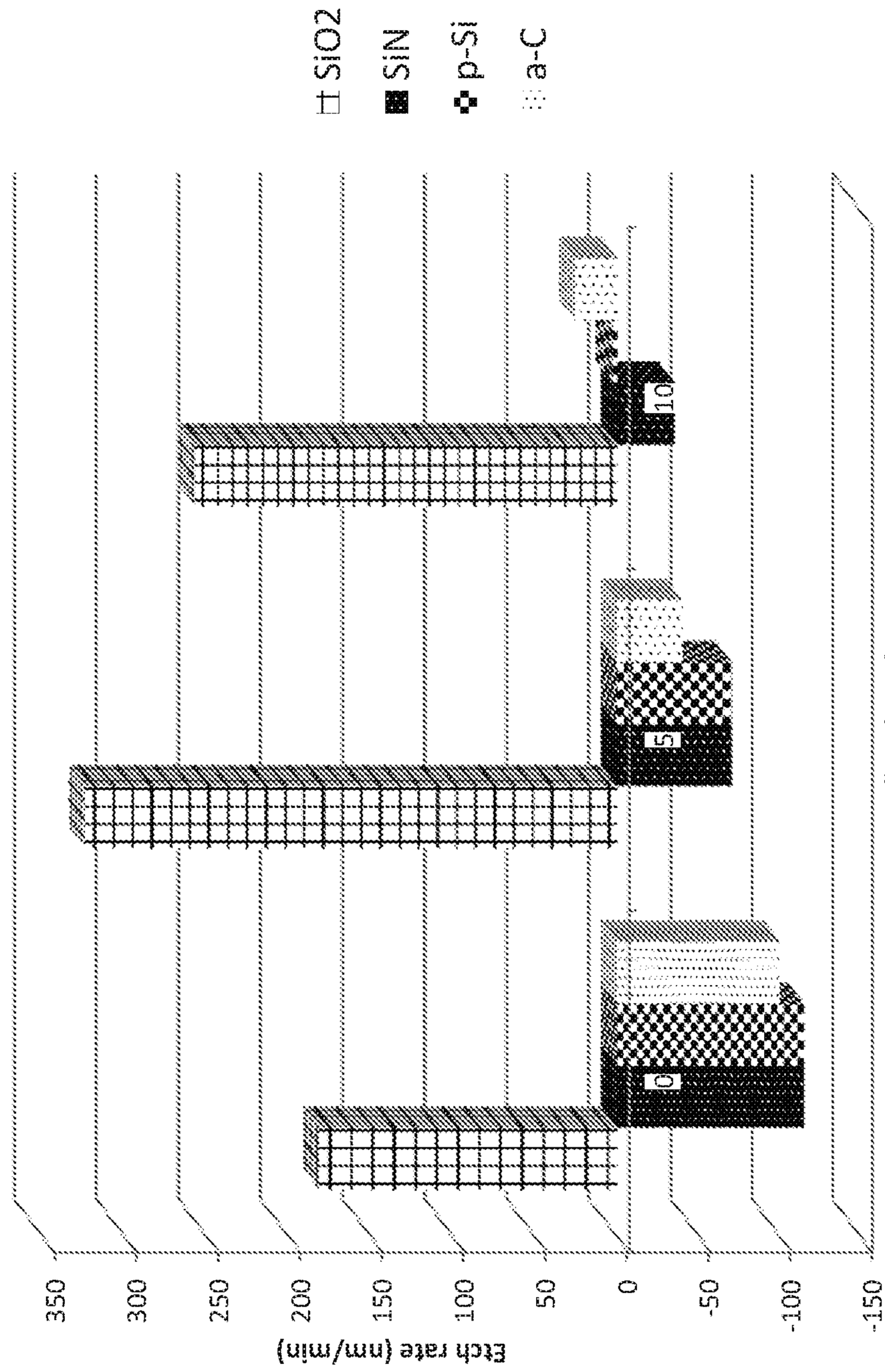
SiO2
SiN
Si
Ge
10
5
0
O2 flow (sccm)
Etch rate (nm/min)
350
300
250
200
150
100
50
0
-50
-100
-150

FIG. 14

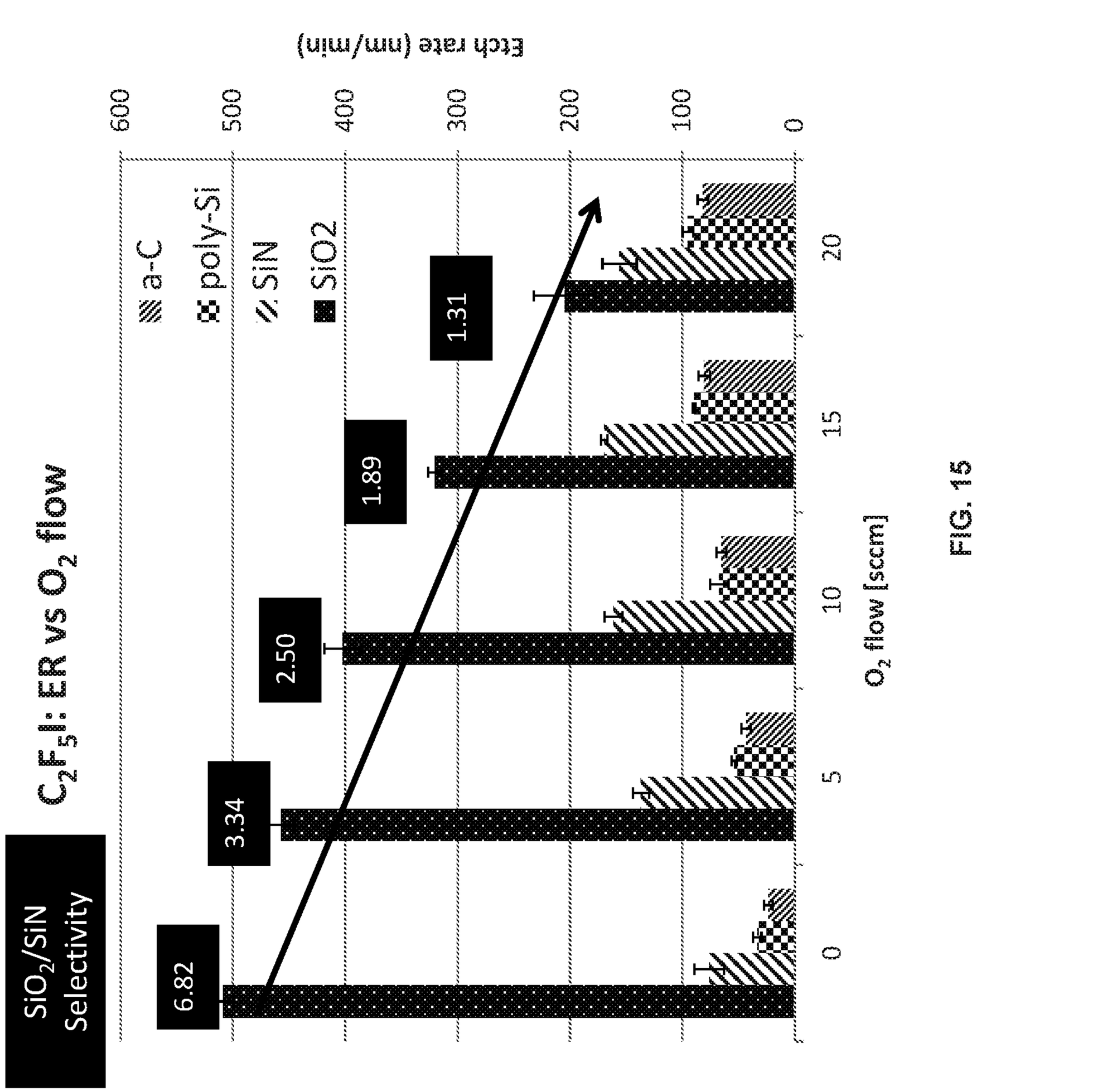
C_2F_5I: ER vs O_2 flow
SiO_2/SiN Selectivity
6.82
3.34
2.50
1.89
1.31
a-C
poly-Si
SiN
SiO2
Etch rate (nm/min)
600
500
400
300
200
100
0
0
5
10
15
20
O_2 flow [sccm]

FIG. 15

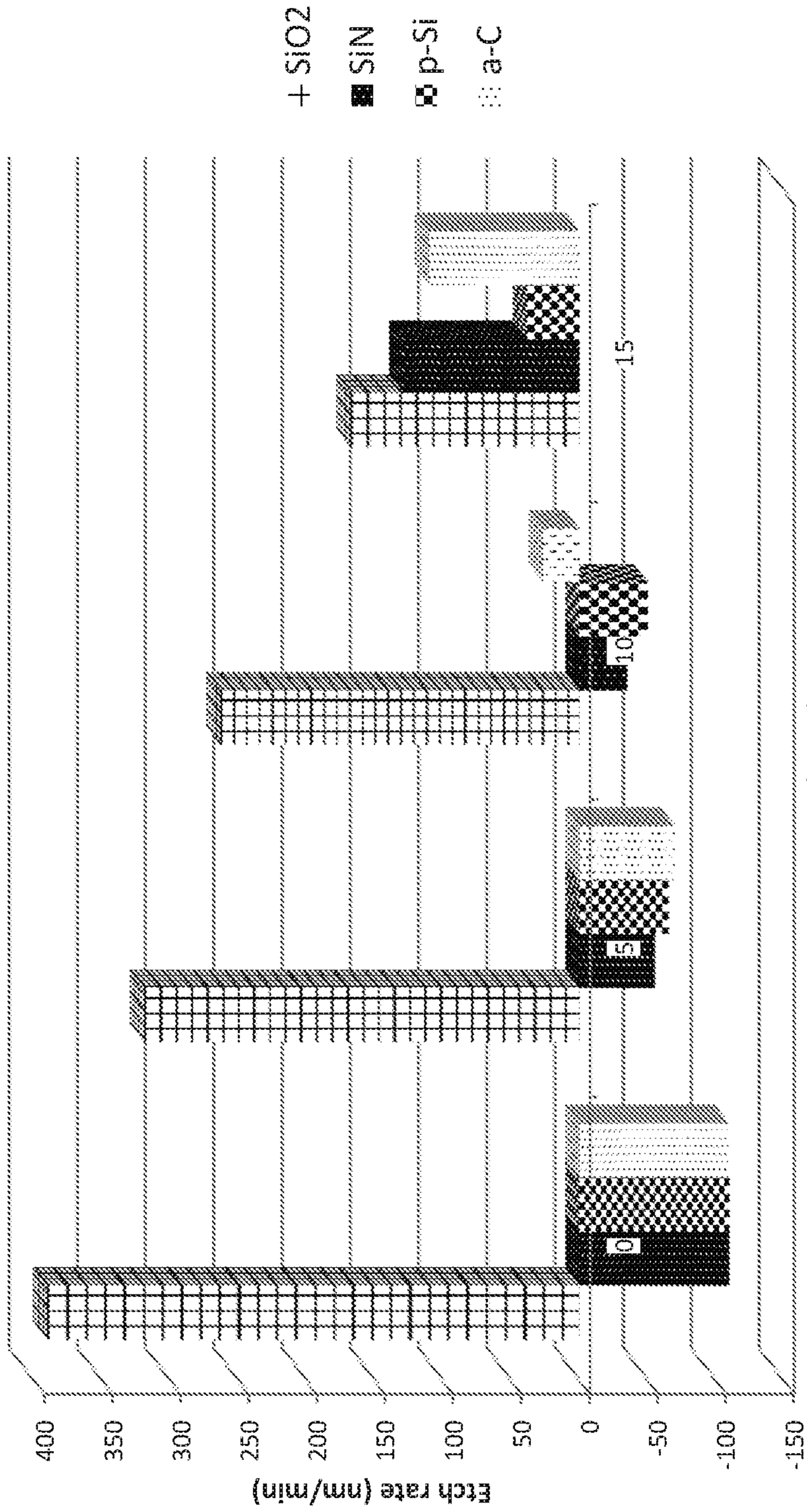
+ SiO2
SiN
p-Si
a-C
15
10
5
0
O2 flow (sccm)
Etch rate (nm/min)
400
350
300
250
200
150
100
50
0
-50
-100
-150

FIG. 16

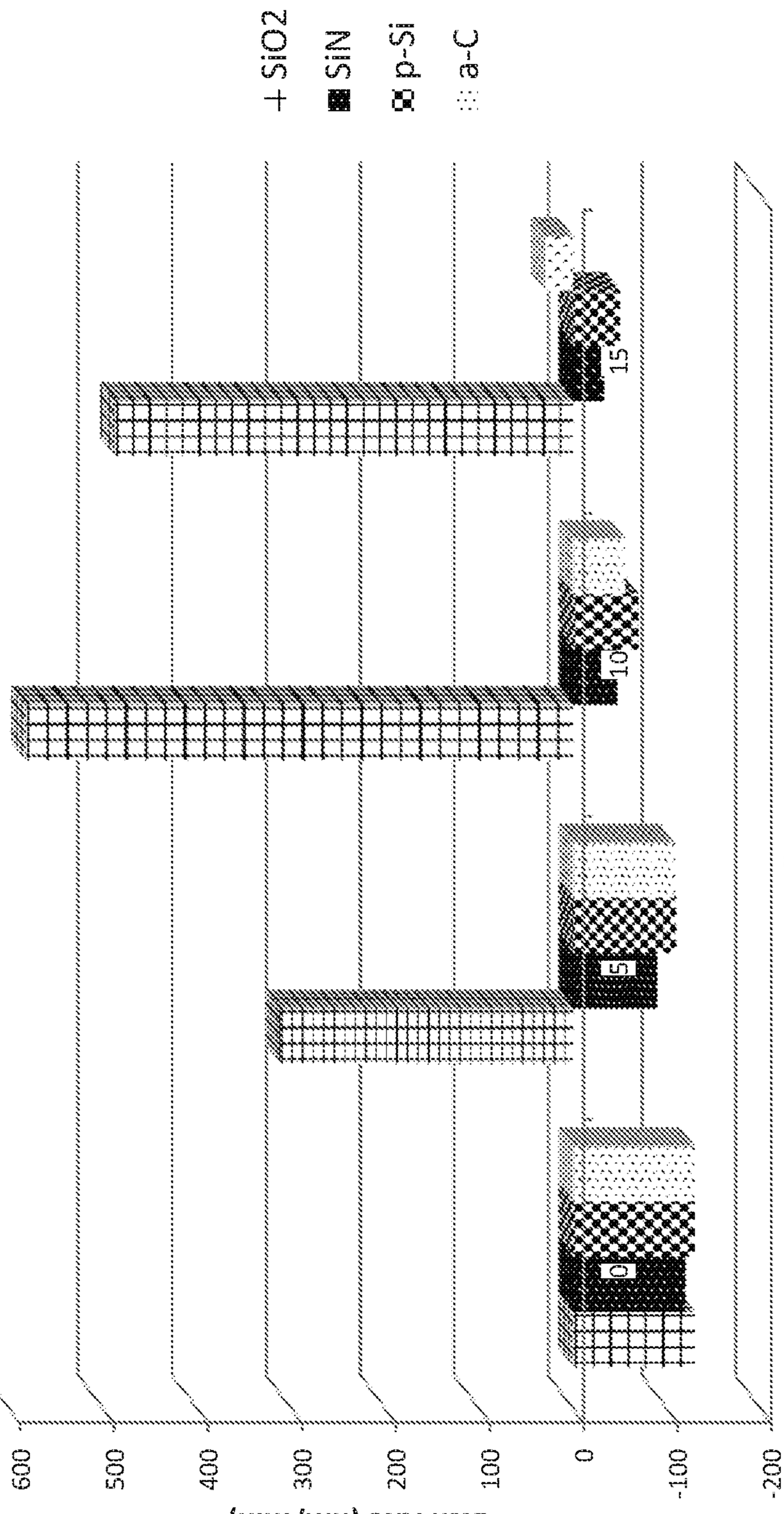
+ SiO2
SiN
p-Si
a-C
15
10
5
0
O2 flow (sccm)
Etch rate (nm/min)
600
500
400
300
200
100
0
-100
-200

FIG. 17

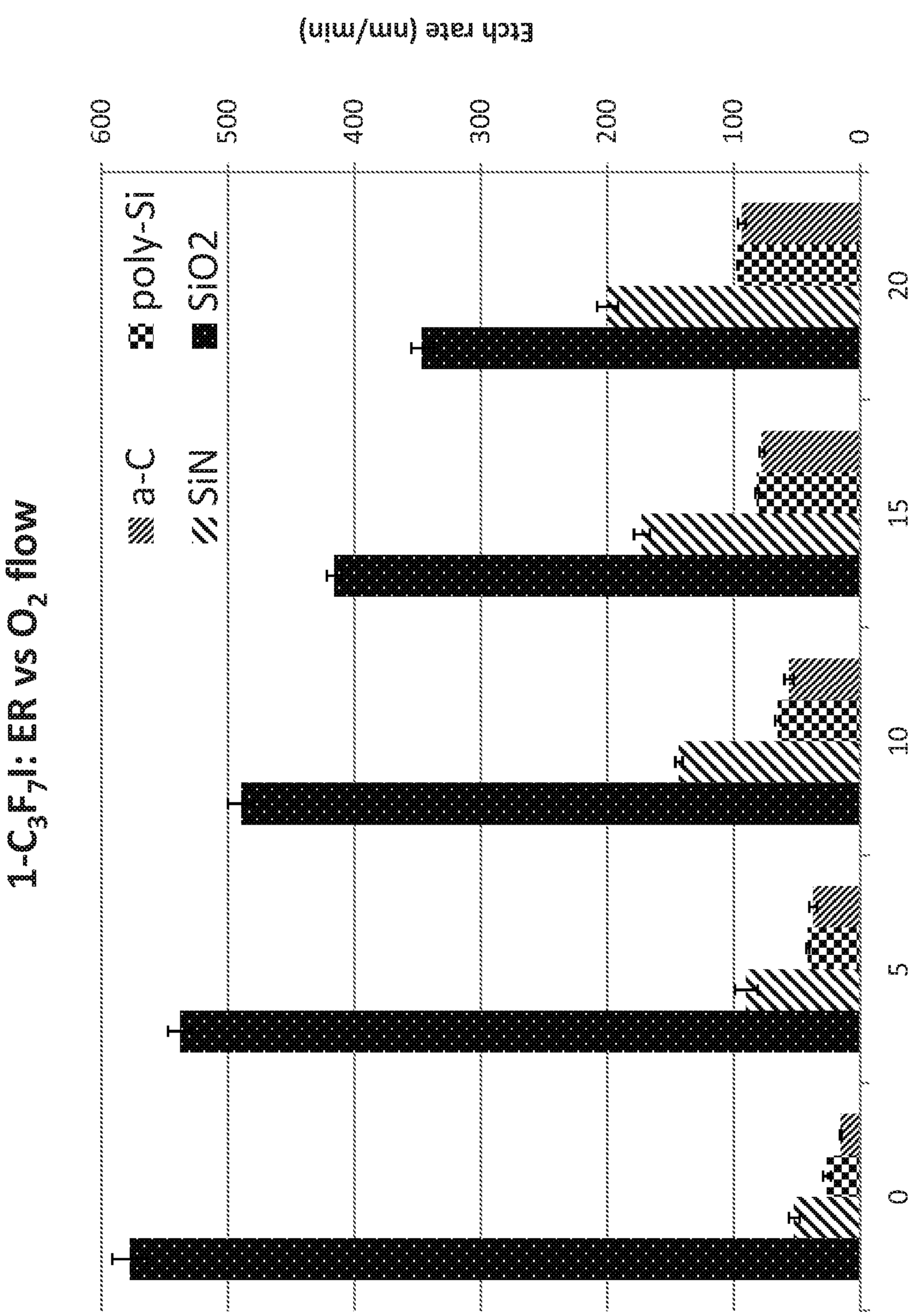
1-C3F7I: ER vs O2 flow
Etch rate (nm/min)
600
500
400
300
200
100
0
a-C
poly-Si
SiN
SiO2
0
5
10
15
20
O2 flow [sccm]

FIG. 18

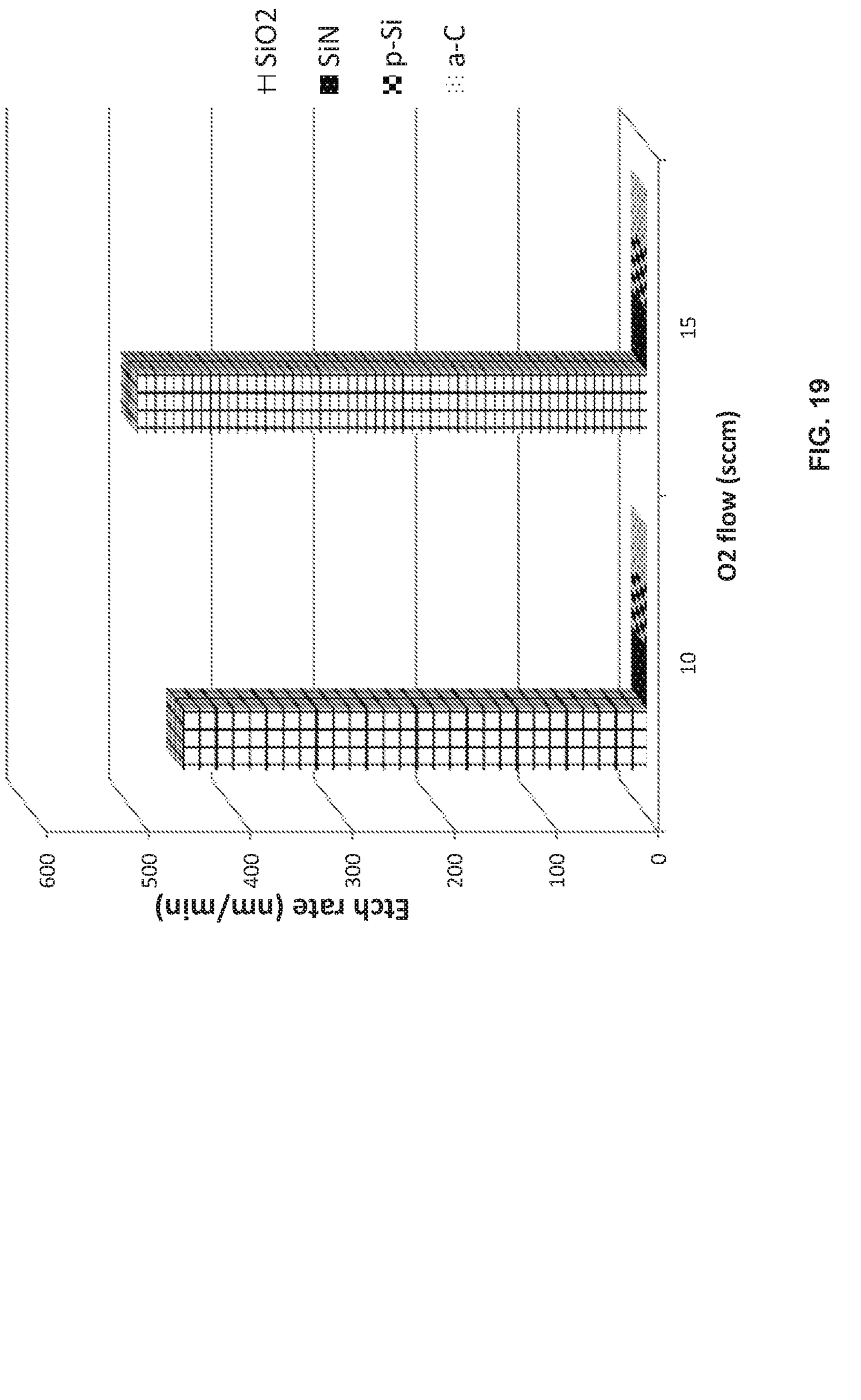
SiO2
SiN
p-Si
a-C
etch rate (nm/min)
600
500
400
300
200
100
0
O2 flow (sccm)
10
15

FIG. 19