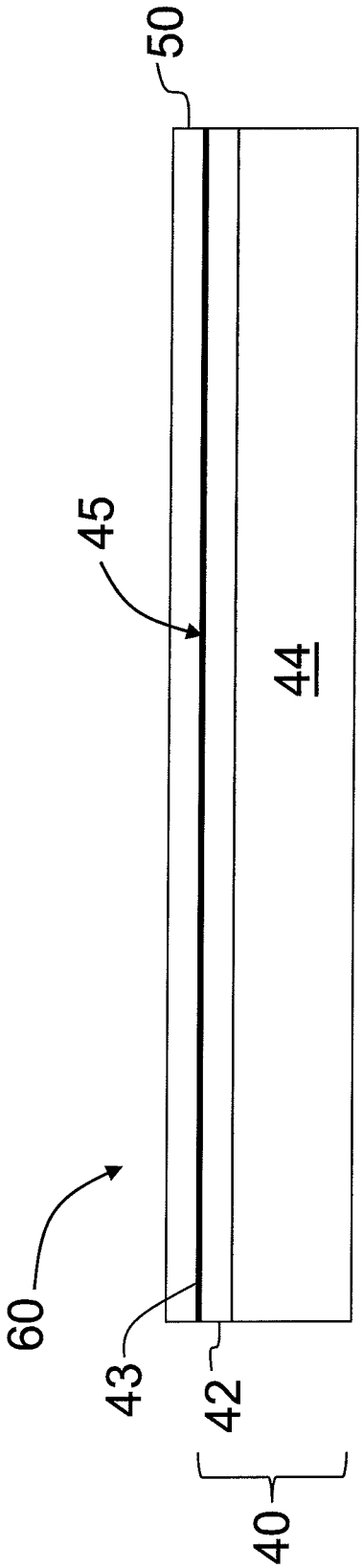


Fig. 1

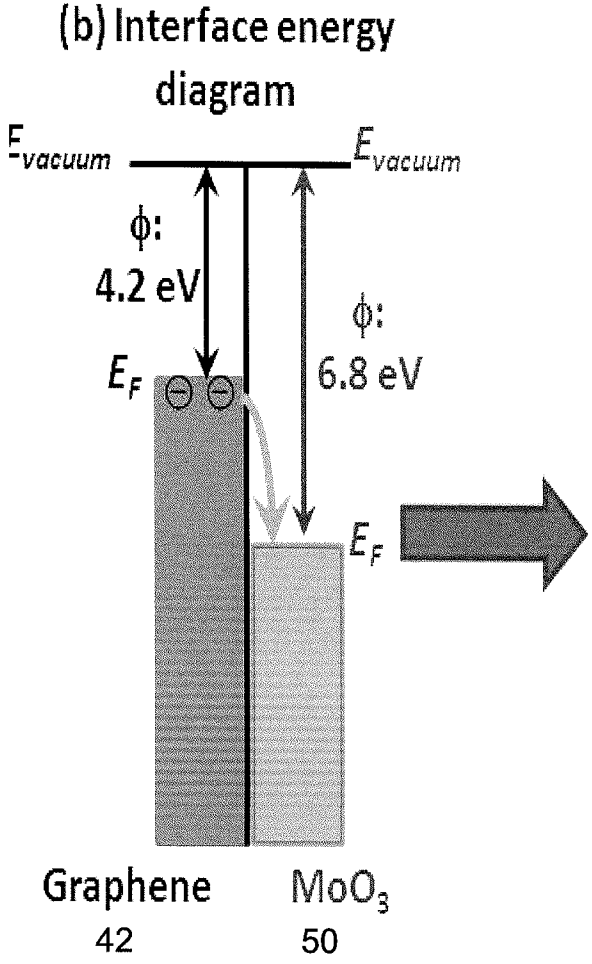

(b) Interface energy diagram
E_{vacuum}
E_{vacuum}
ϕ:
4.2 eV
ϕ:
6.8 eV
E_F
E_F
Graphene
42
MoO_3
50

Fig. 2

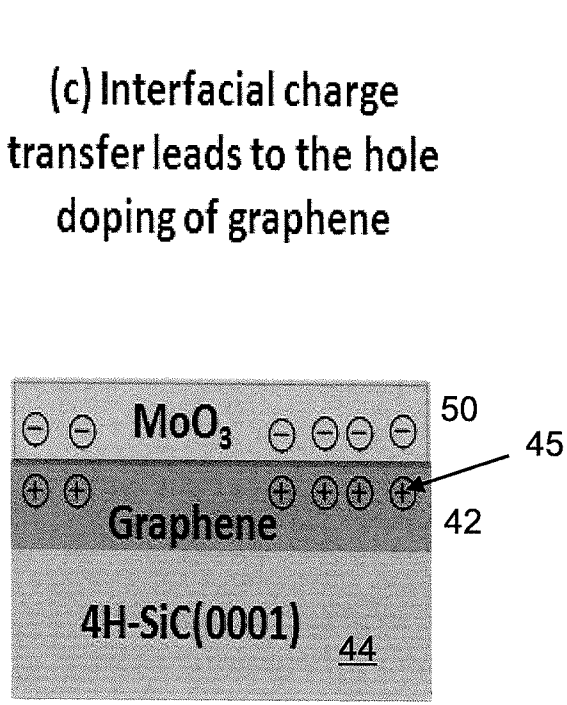

(c) Interfacial charge transfer leads to the hole doping of graphene
MoO_3
50
45
Graphene
42
4H-SiC(0001)
44

Fig. 3

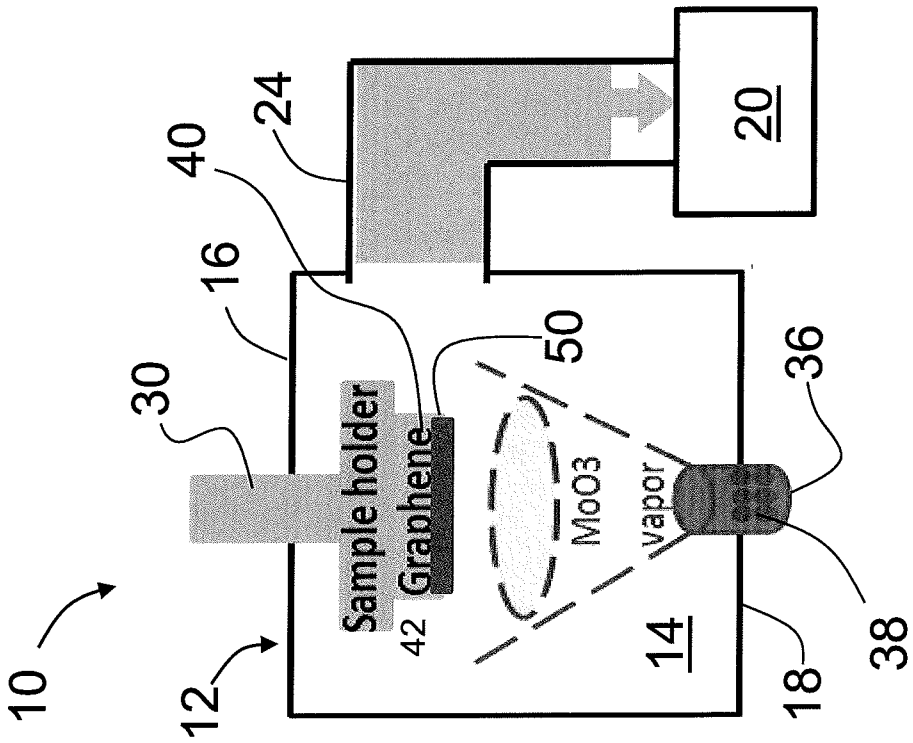

10
12
14
16
18
20
24
30
36
38
40
42
50
Sample holder
Graphene
MoO3
vapor

Fig. 4

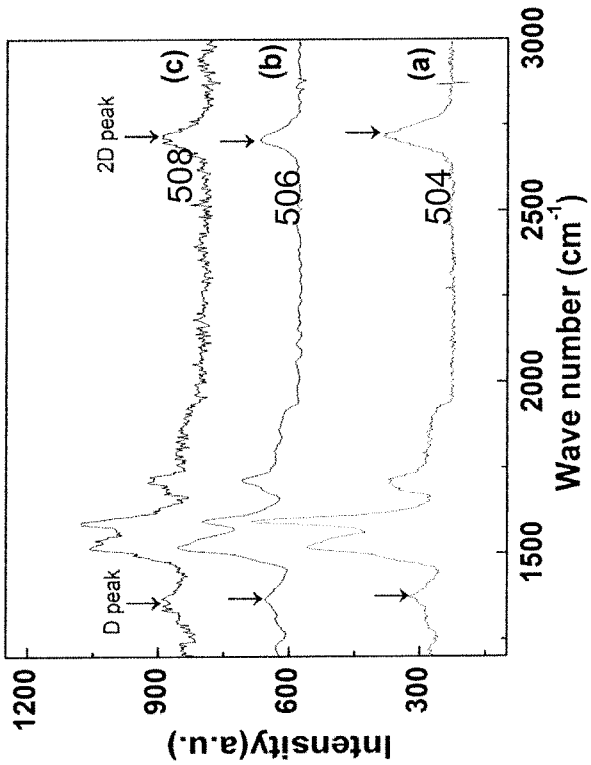

Intensity(a.u.)
1200
900
600
300
1500
2000
2500
3000
Wave number (cm-1)
D peak
2D peak
(c)
(b)
(a)
508
506
504

Fig. 5B

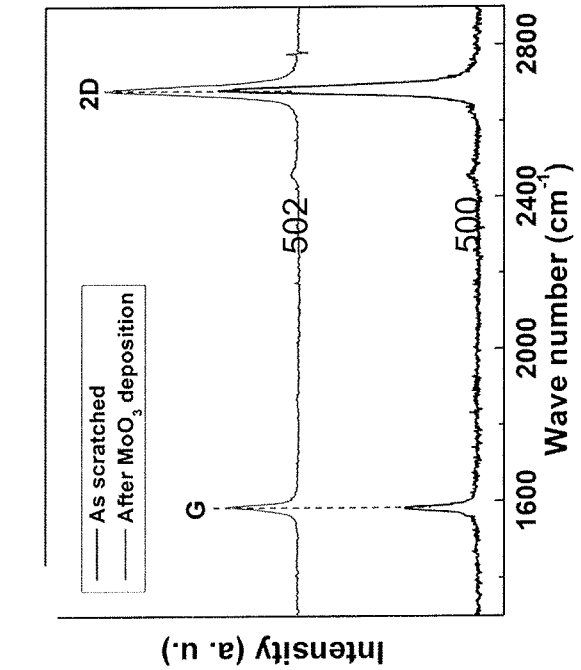

b
Intensity (a. u.)
As scratched
After MoO3 deposition
G
2D
502
500
1600
2000
2400
2800
Wave number (cm-1)

Fig. 5A

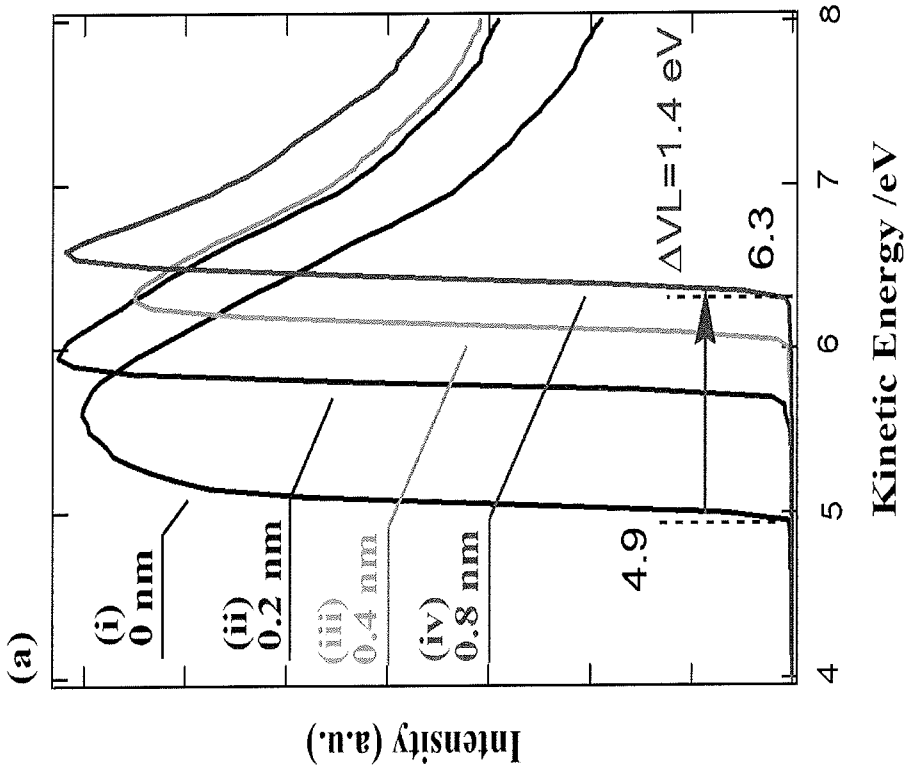

(a)
(i) 0 nm
(ii) 0.2 nm
(iii) 0.4 nm
(iv) 0.8 nm
4.9
6.3
ΔVL=1.4 eV
Intensity (a.u.)
Kinetic Energy /eV
4
5
6
7
8

Fig. 6

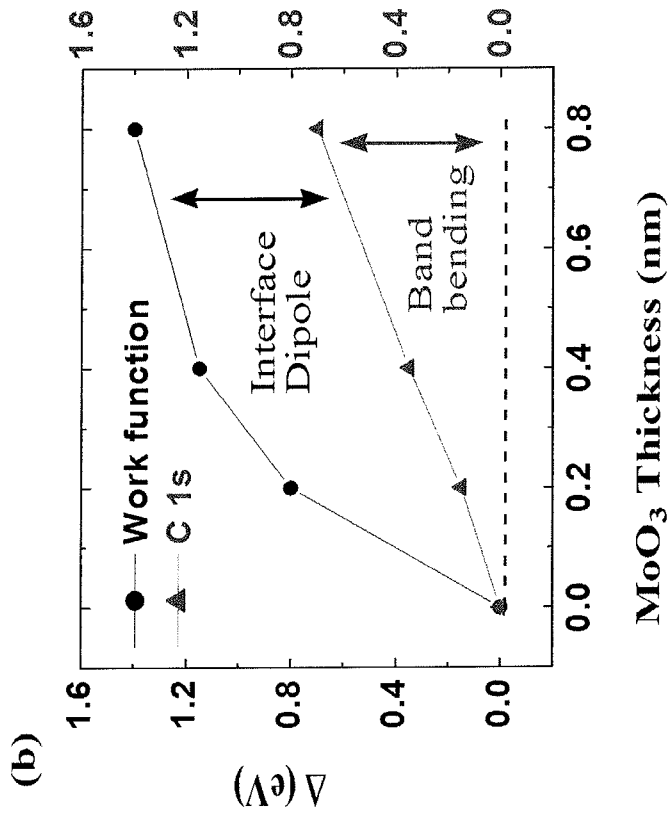
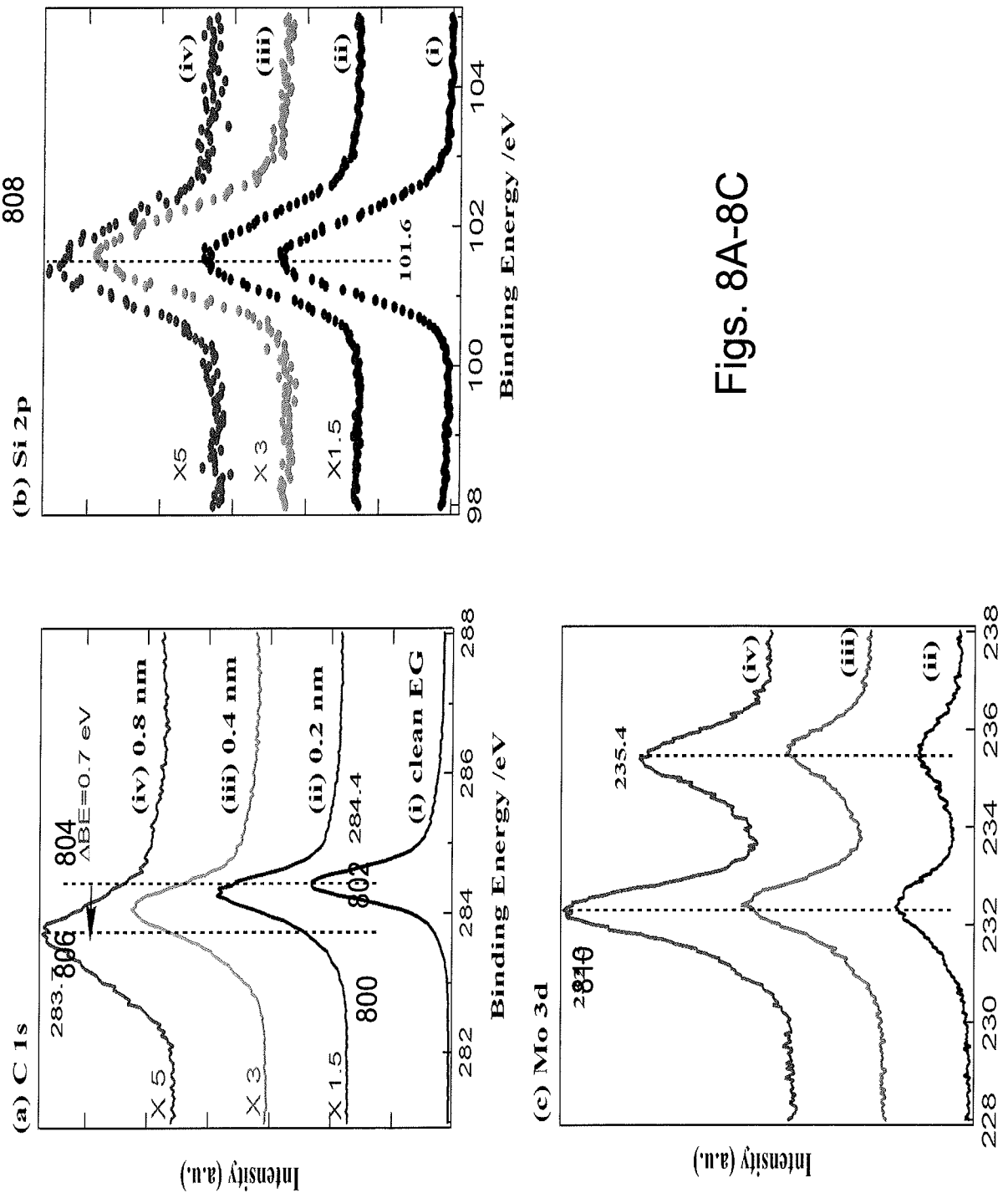

(b)
Δ (eV)
Work function
C 1s
Interface Dipole
Band bending
MoO3 Thickness (nm)
0.0
0.2
0.4
0.6
0.8
1.6
1.2
0.8
0.4
0.0

Fig. 7


(a) C 1s
283.8
806
804
ΔBE=0.7 eV
(iv) 0.8 nm
(iii) 0.4 nm
(ii) 0.2 nm
(i) clean EG
284.4
802
800
X 5
X 3
X 1.5
282
284
286
288
Binding Energy /eV
Intensity (a.u.)
(b) Si 2p
808
X5
X 3
X1.5
101.6
(iv)
(iii)
(ii)
(i)
98
100
102
104
Binding Energy /eV
(c) Mo 3d
235.4
(iv)
(iii)
(ii)
228
230
232
234
236
238
Binding Energy /eV
Intensity (a.u.)

Figs. 8A-8C

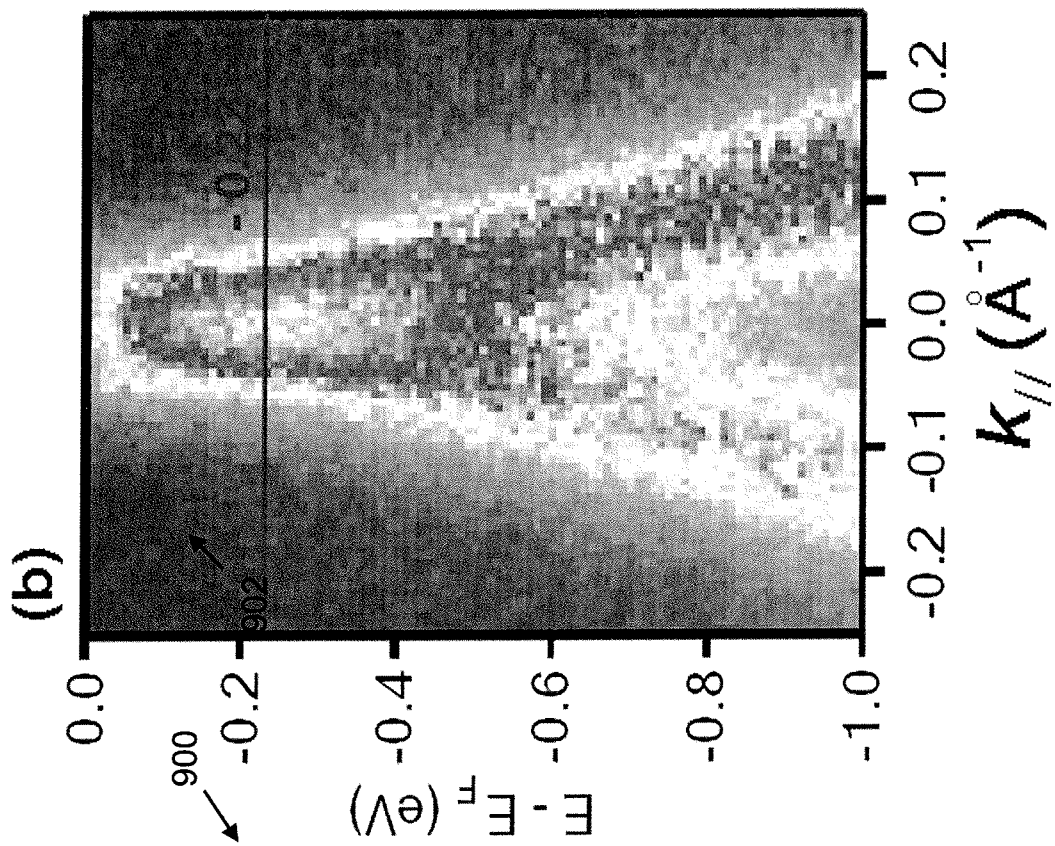

(b)
900
902
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
E - E_F (eV)
-0.2
-0.1
0.0
0.1
0.2
k// (Å-1)

Fig. 9B

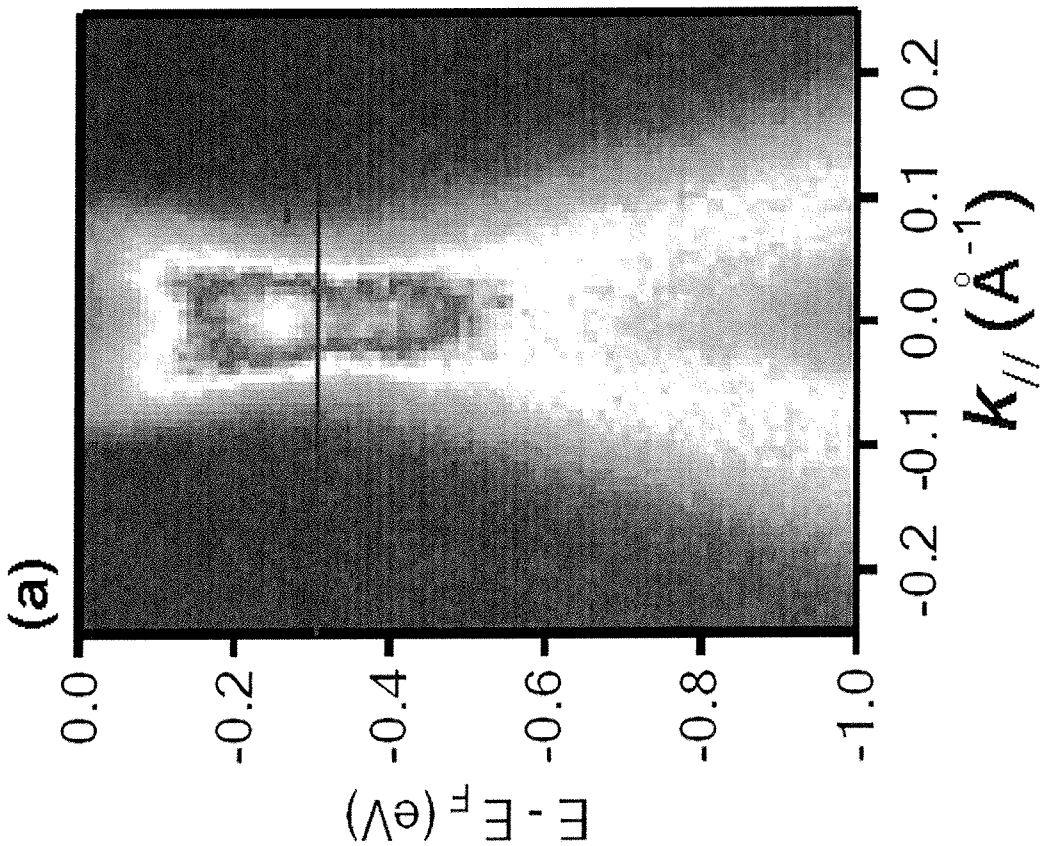

(a)
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
E - E_F (eV)
-0.2
-0.1
0.0
0.1
0.2
k// (Å-1)

Fig. 9A

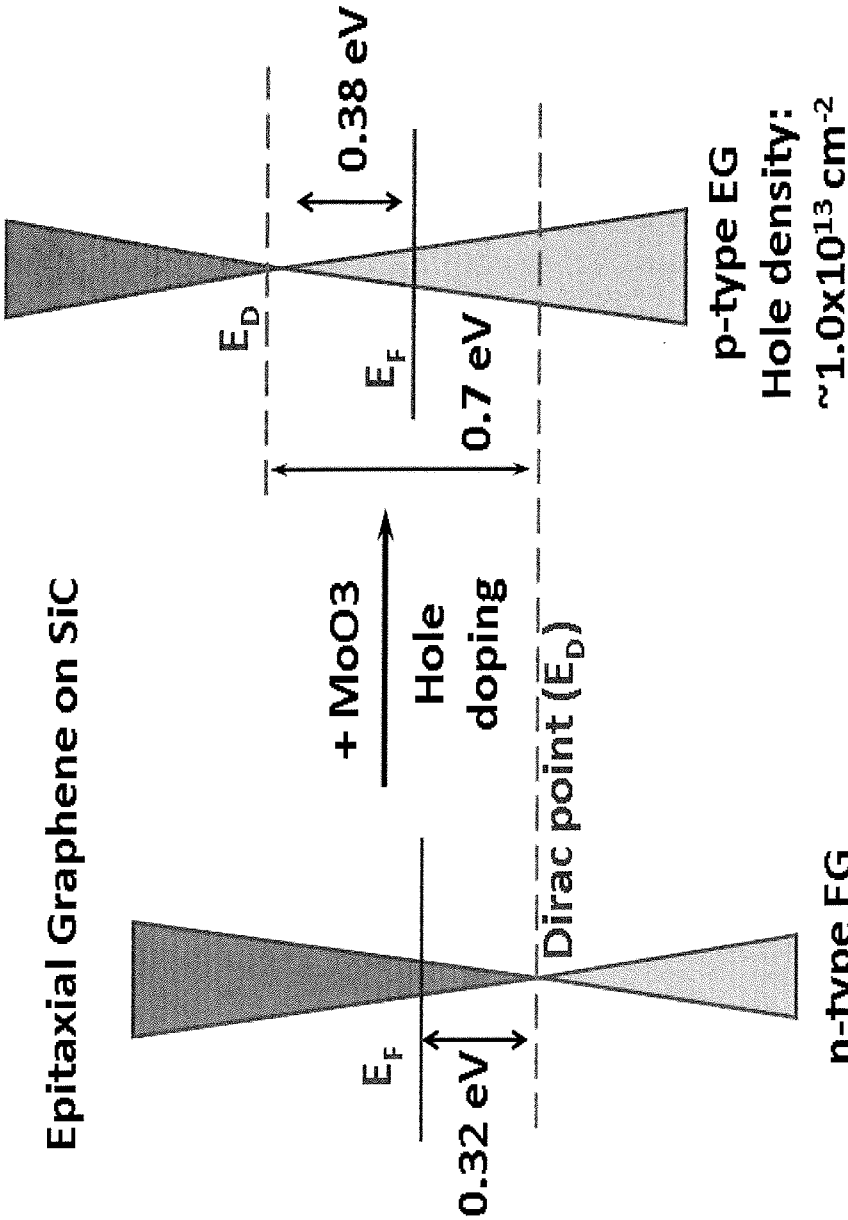

Epitaxial Graphene on SiC
+ MoO3
Hole doping
Dirac point (E_D)
E_F
0.32 eV
n-type EG
Electron density:
0.7~x10^{13} cm^{-2}
E_D
E_F
0.38 eV
0.7 eV
p-type EG
Hole density:
~1.0x10^{13} cm^{-2}

Fig. 10

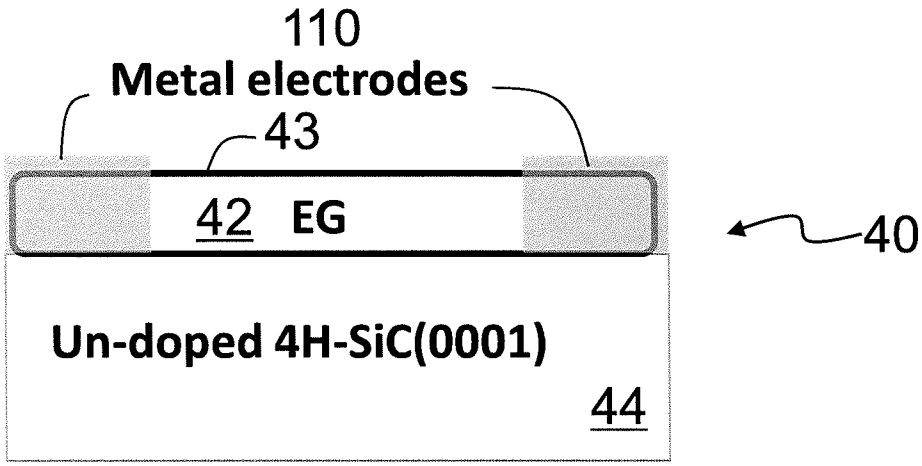


Fig. 11A

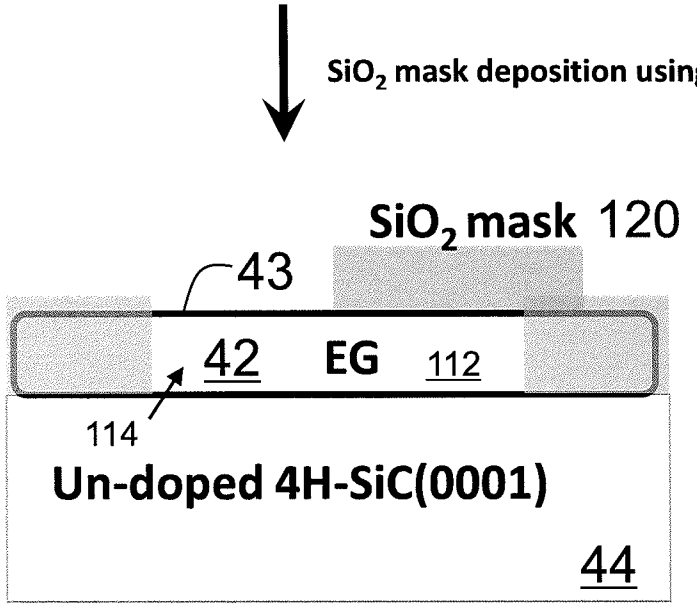


Fig. 11B

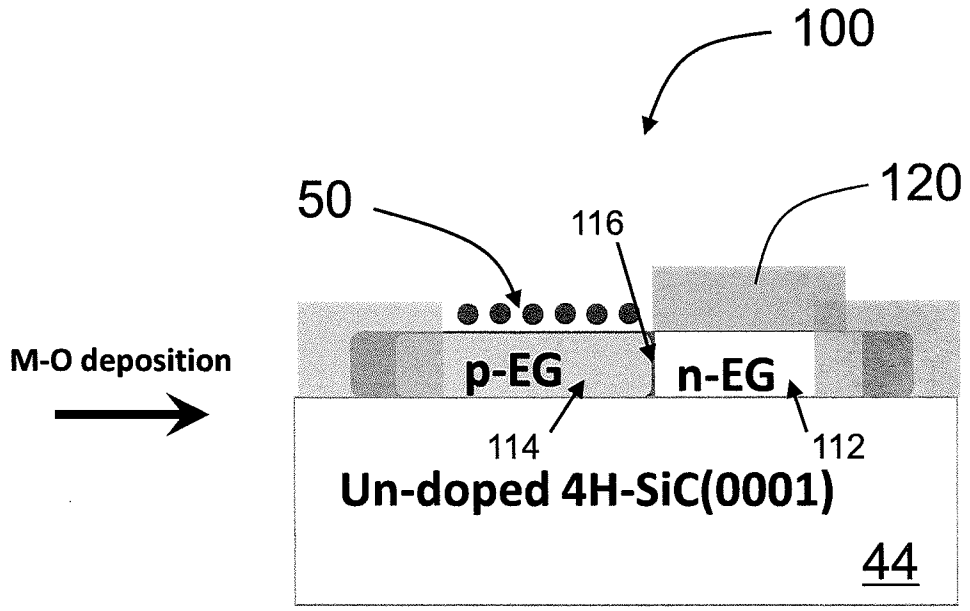


Fig. 11C

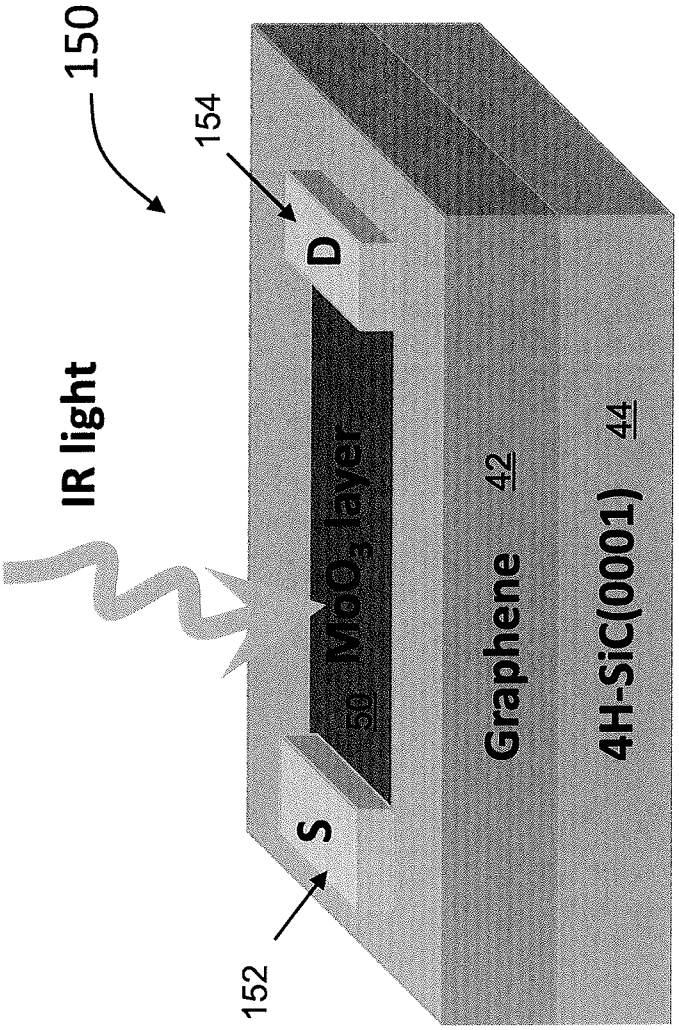
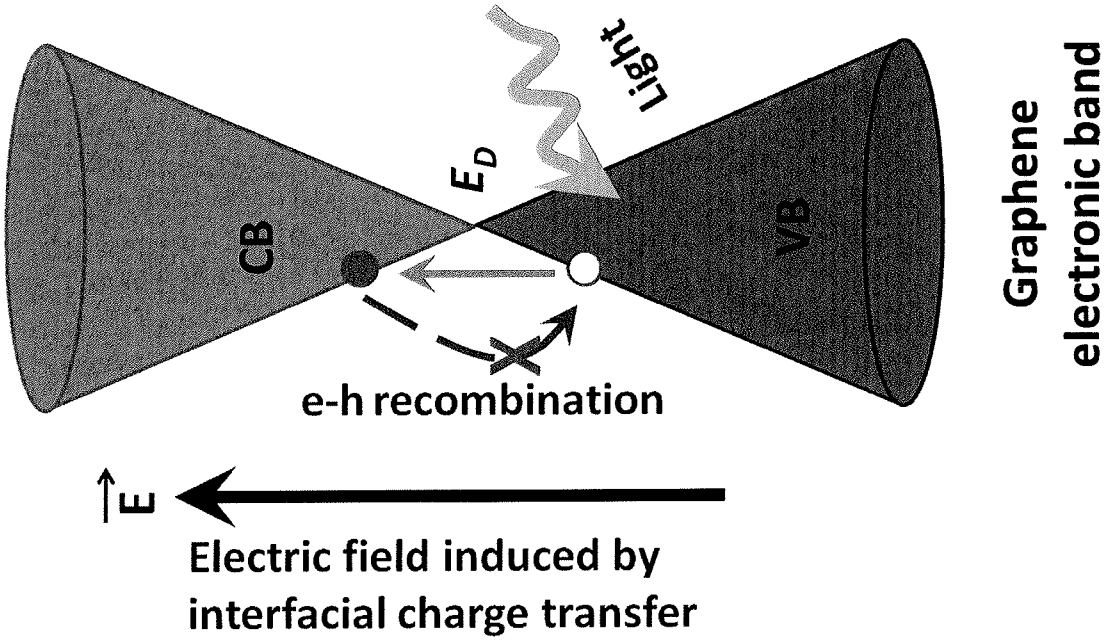

150
154
IR light
D
MoO_3 layer
50
Graphene
42
4H-SiC(0001)
44
S
152

Fig. 12A



Graphene
electronic band

Fig. 12C

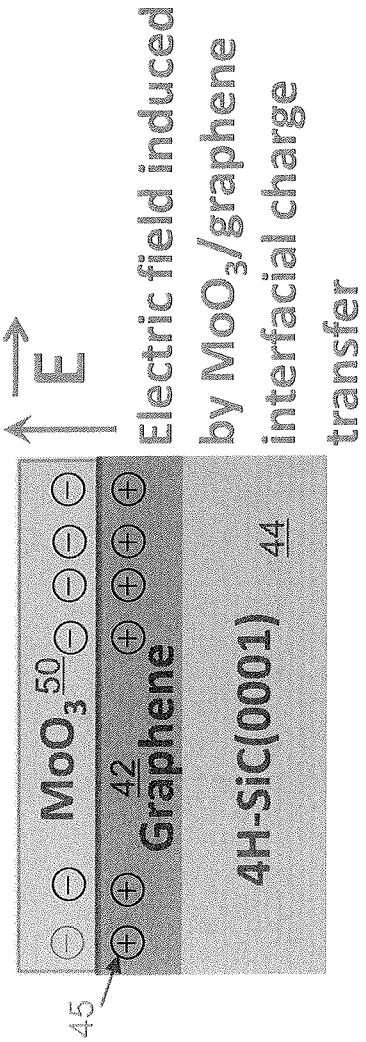


Fig. 12B

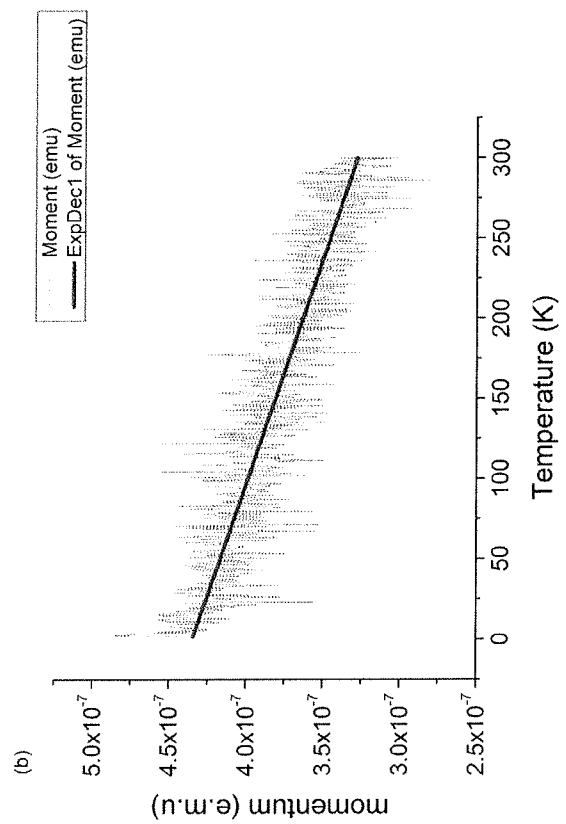


Fig. 13B

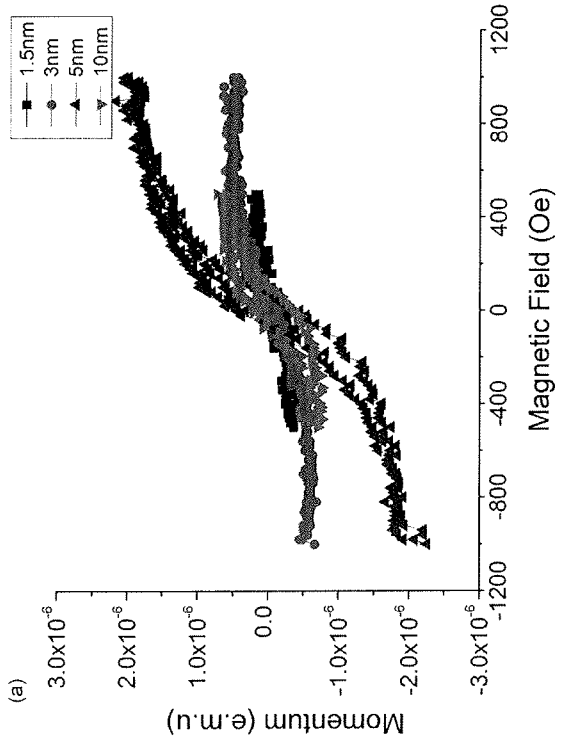


Fig. 13A

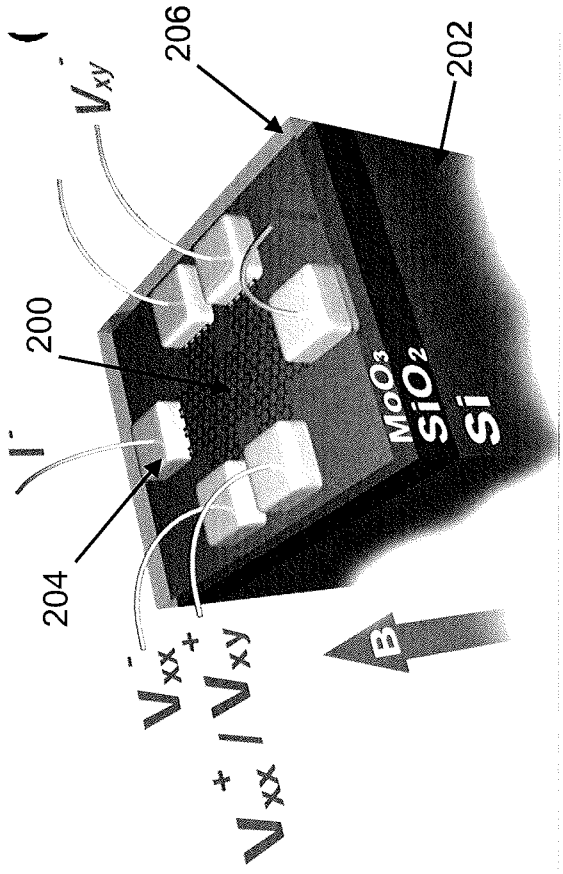


Fig. 14

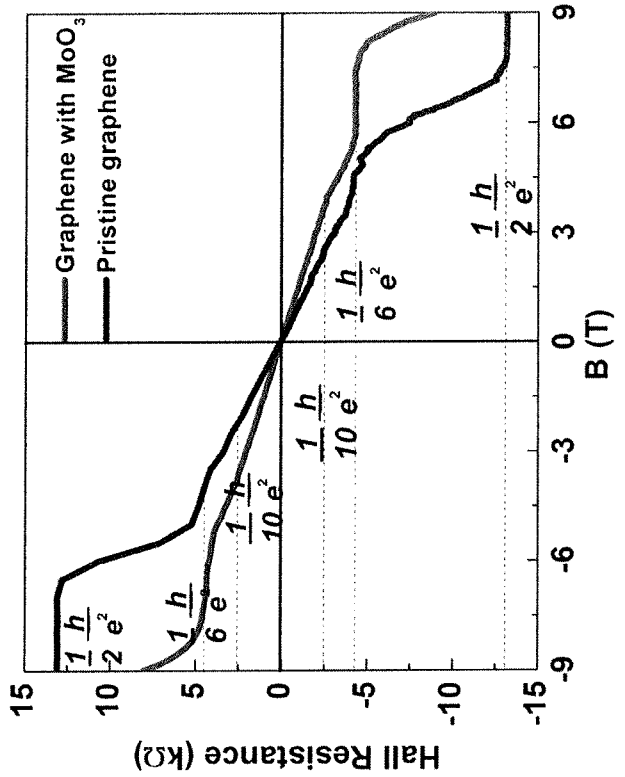


Fig. 15B

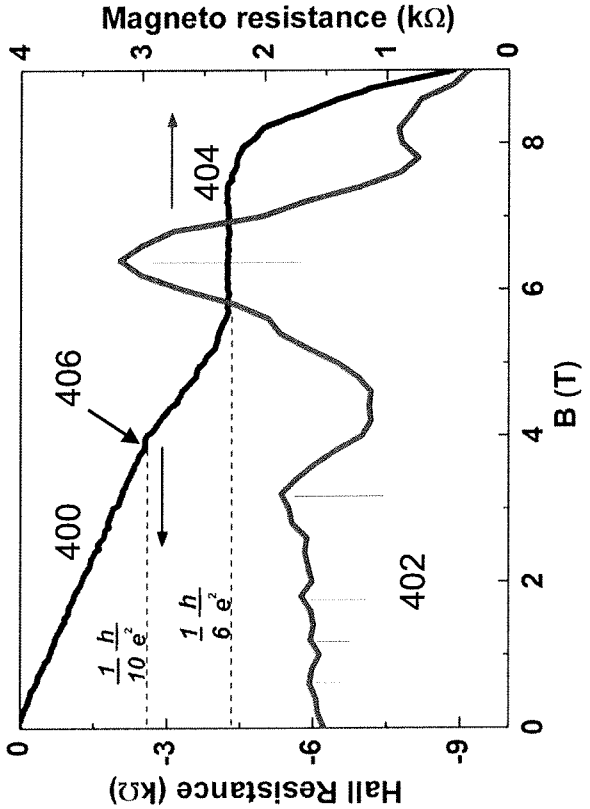


Fig. 15A

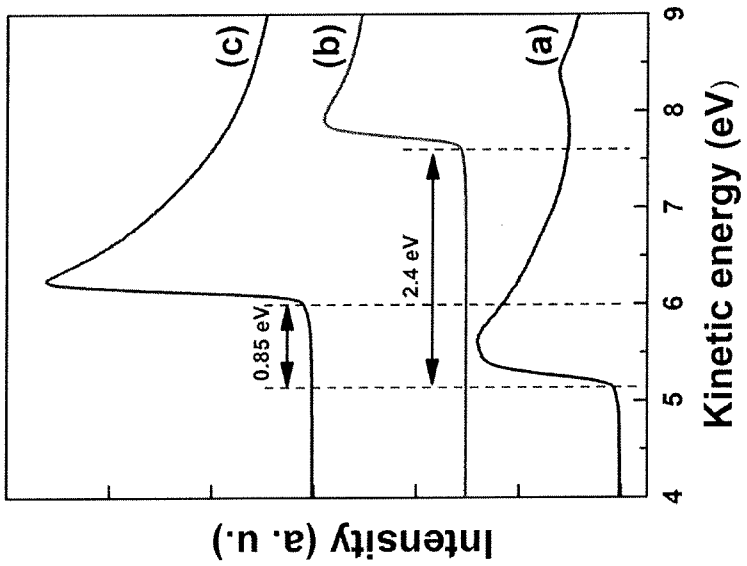


Fig. 16