FIG. 1A

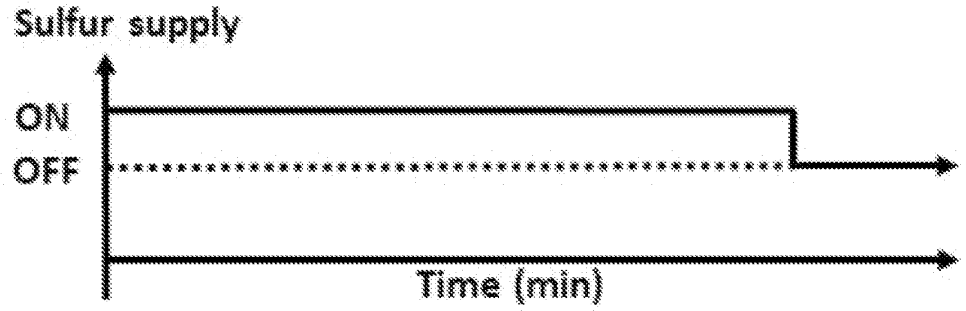

Sulfur supply
ON
OFF
Time (min)

FIG. 1B

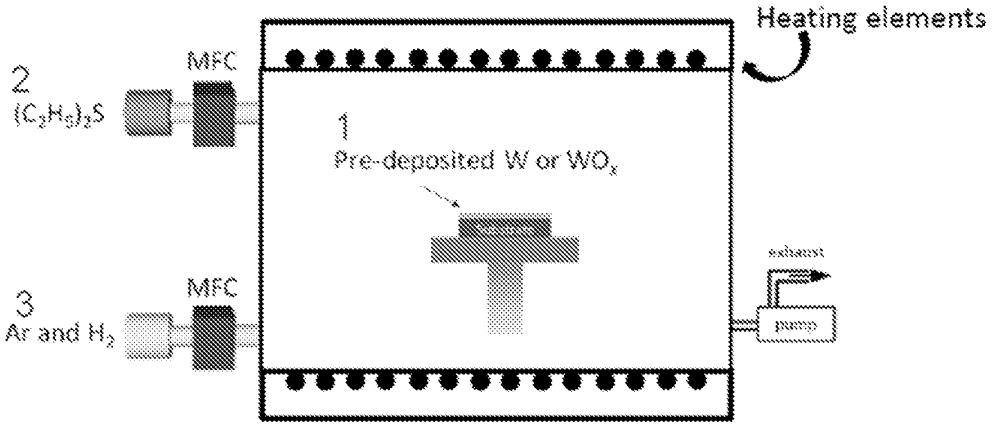

Heating elements
MFC
2
$(C_2H_5)_2S$
1
Pre-deposited W or WO_x
MFC
3
Ar and H_2
exhaust
pump

FIG. 2

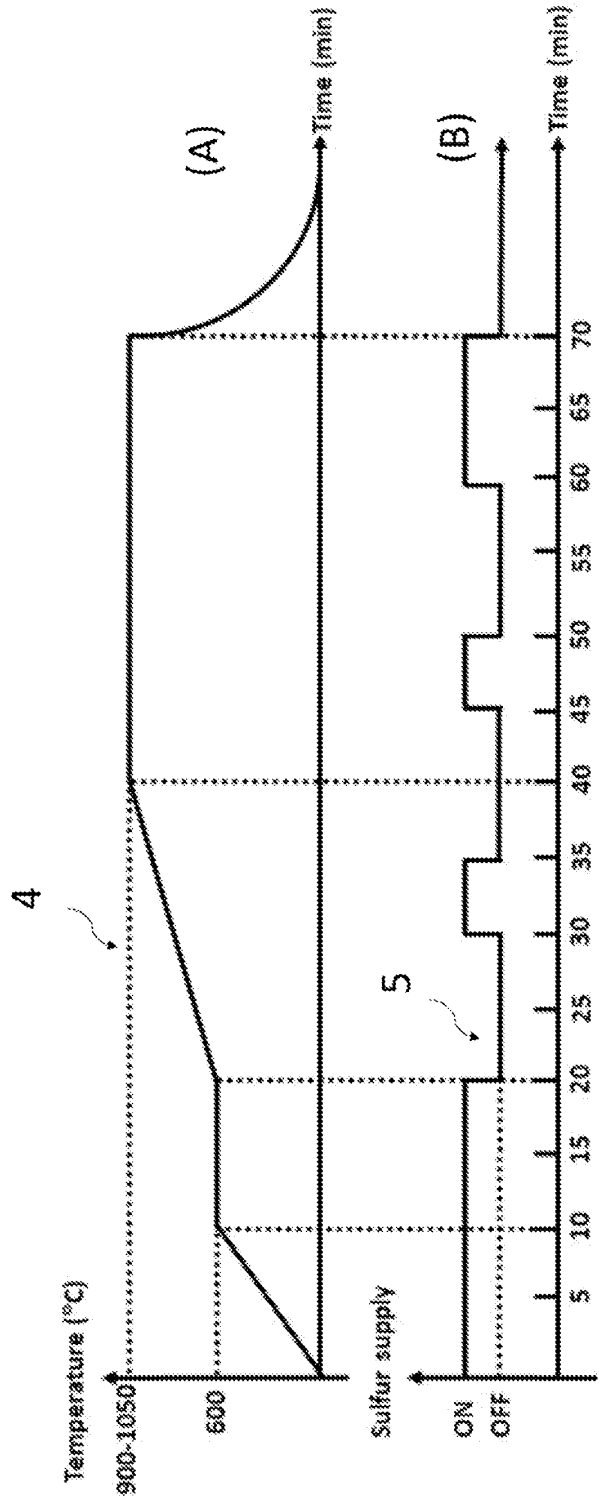
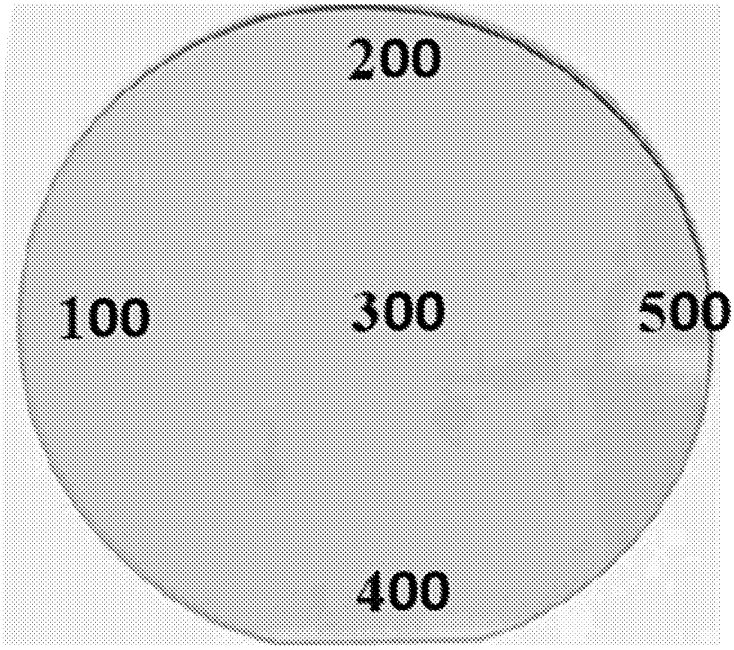

(A)
Time (min)
(B)
Time (min)
4
5
Temperature (°C)
900-1050
600
Sulfur supply
ON
OFF
5
10
15
20
25
30
35
40
45
50
55
60
65
70

FIG. 3A



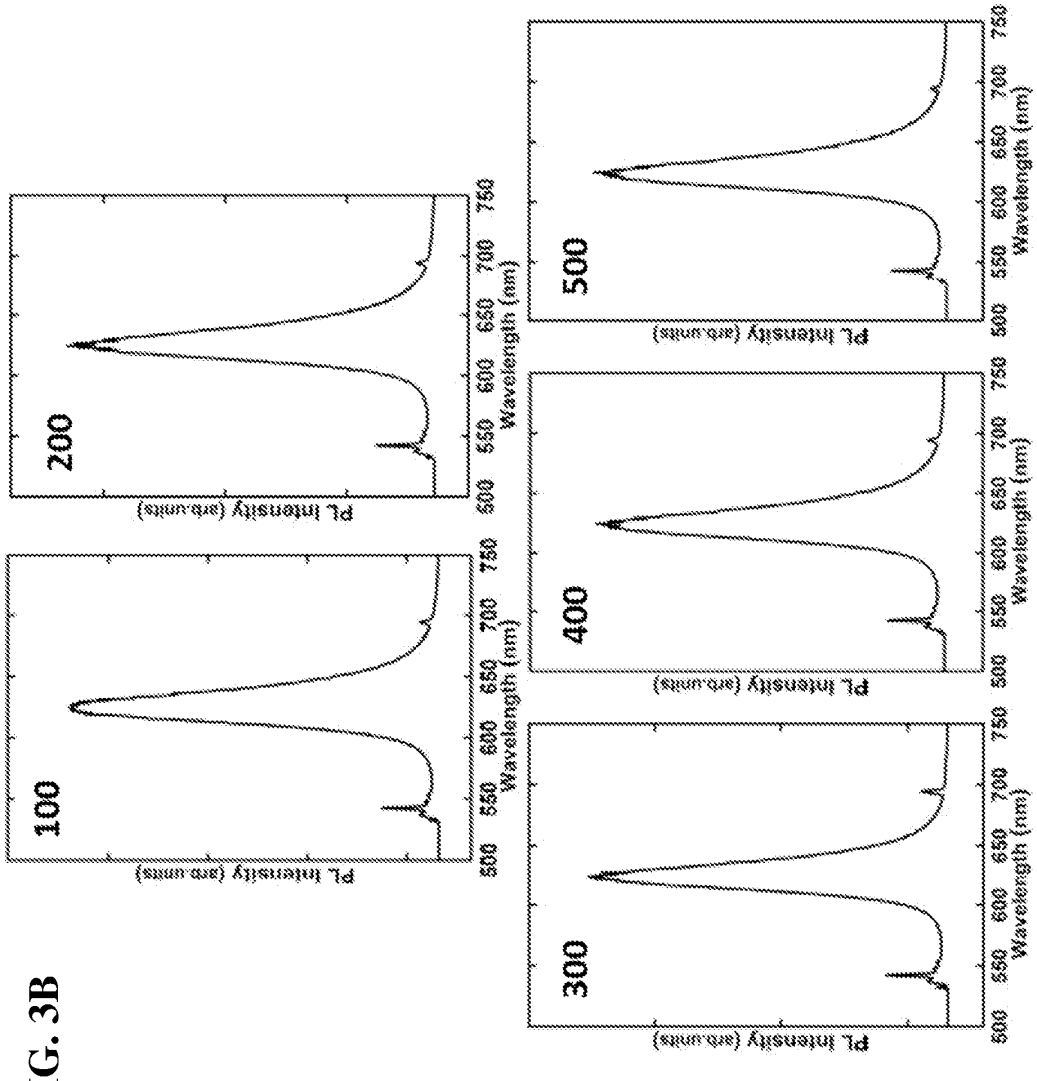

100
200
300
400
500
PL Intensity (arb.units)
Wavelength (nm)
500
550
600
650
700
750

FIG. 3B

FIG. 4

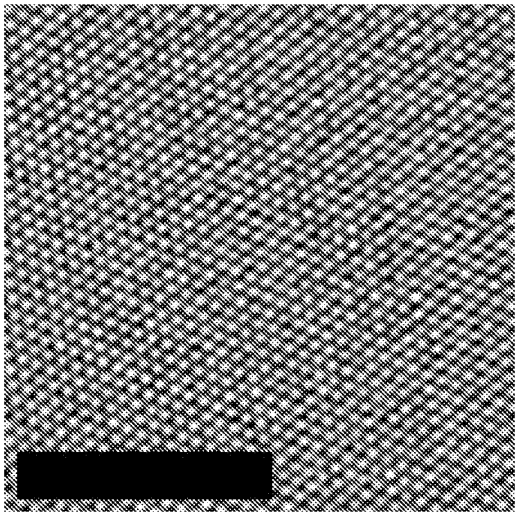


FIG. 5A

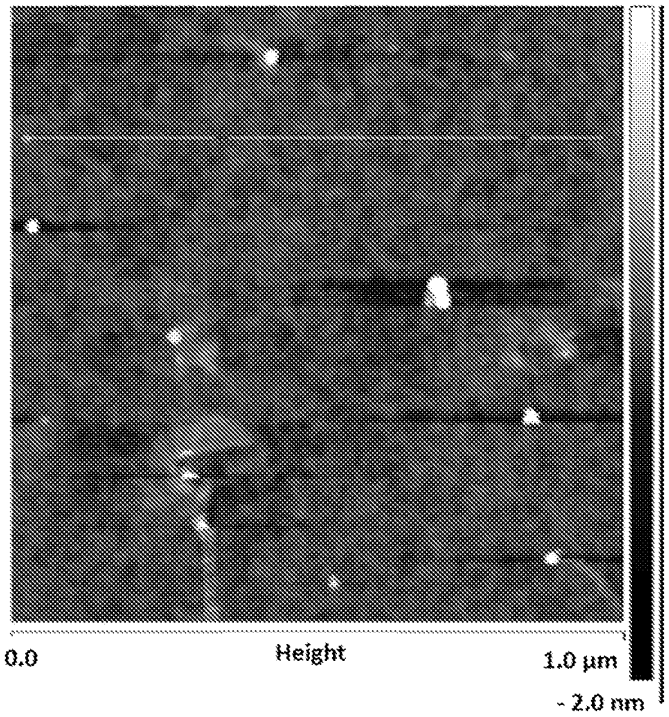


FIG. 5B

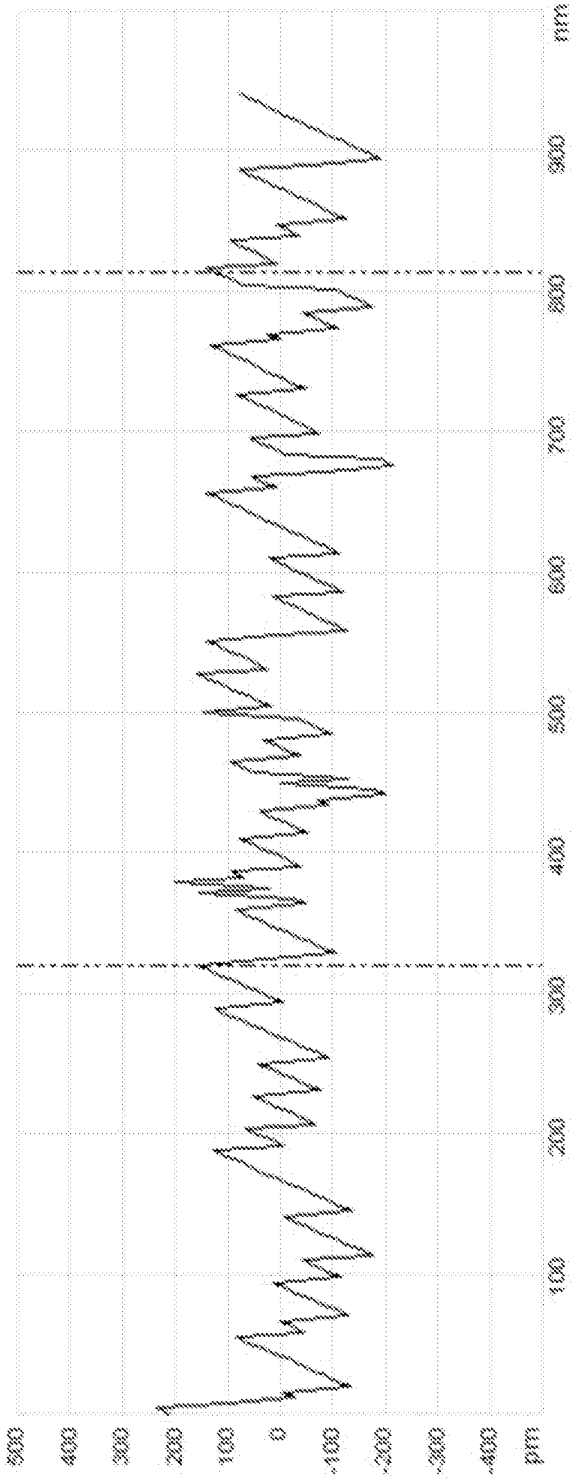

500
400
300
200
100
0
-100
-200
-300
-400
pm
100
200
300
400
500
600
700
800
900
nm

FIG. 5C

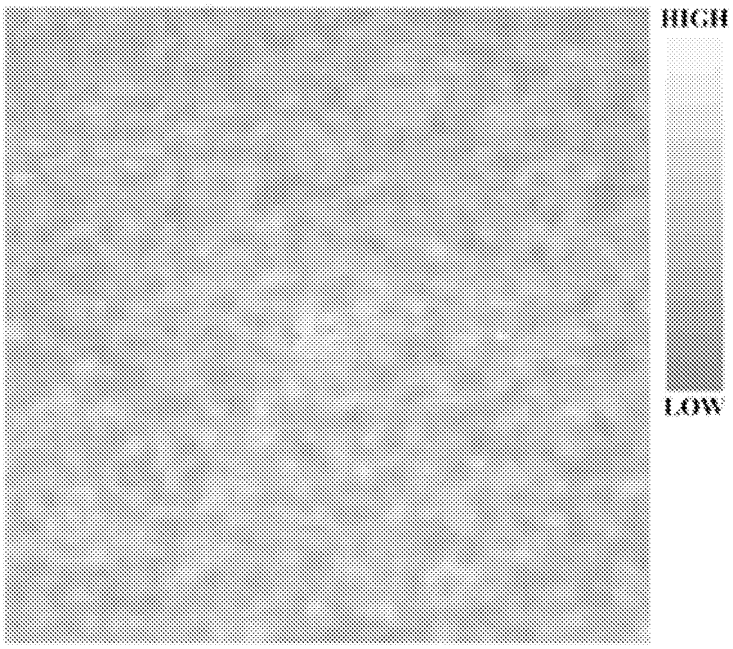

HIGH
LOW

FIG. 5D

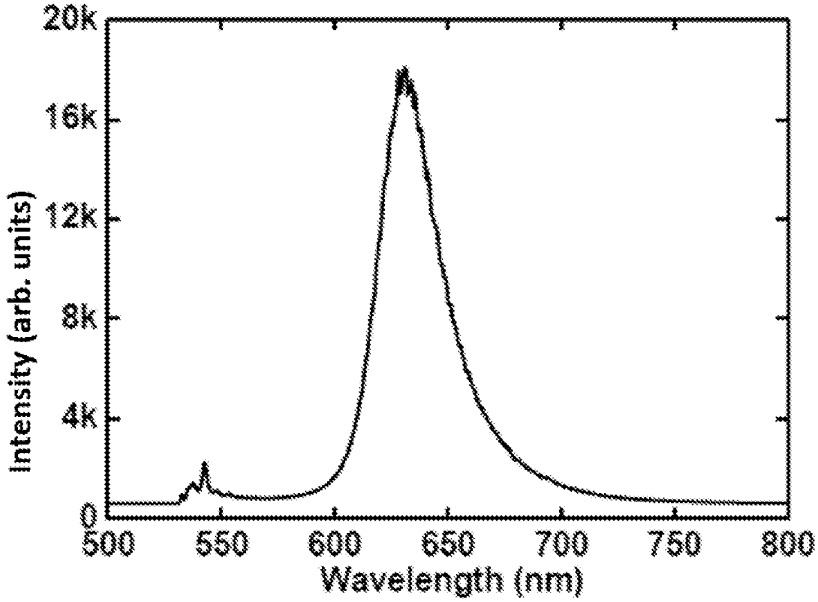

20k
16k
12k
8k
4k
0
Intensity (arb. units)
500
550
600
650
700
750
800
Wavelength (nm)

FIG. 6A

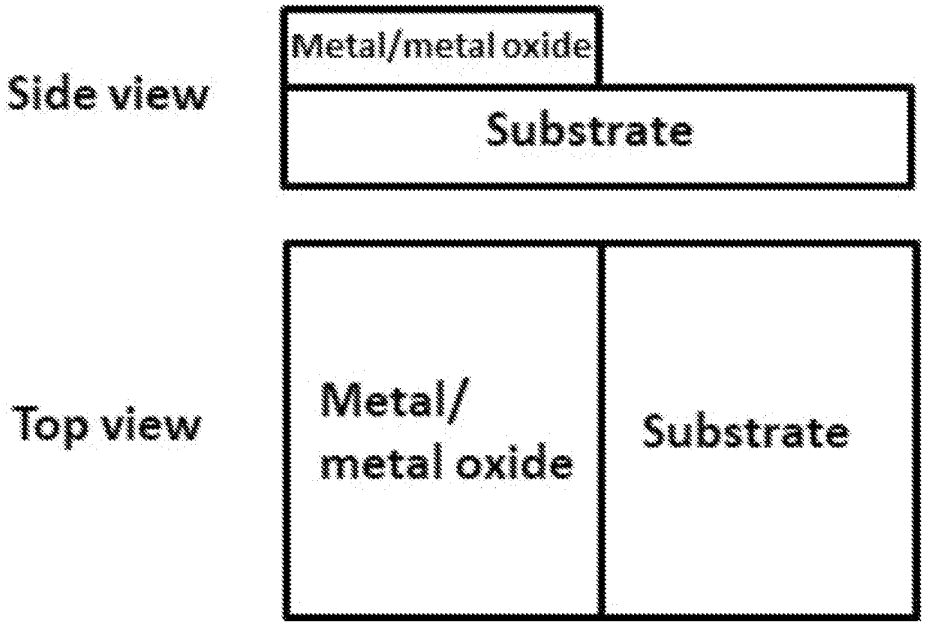

Side view
Metal/metal oxide
Substrate
Top view
Metal/
metal oxide
Substrate

FIG. 6B

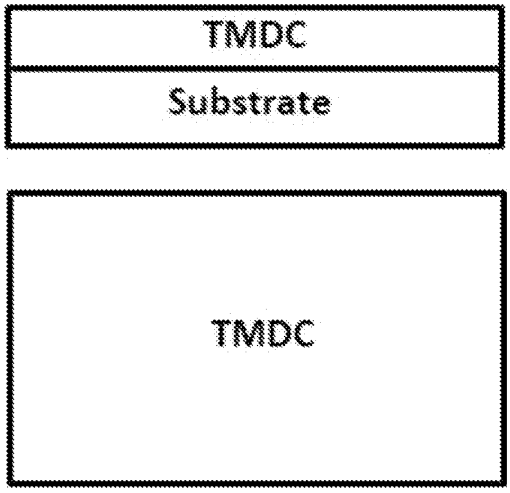

TMDC
Substrate
TMDC

FIG. 7A

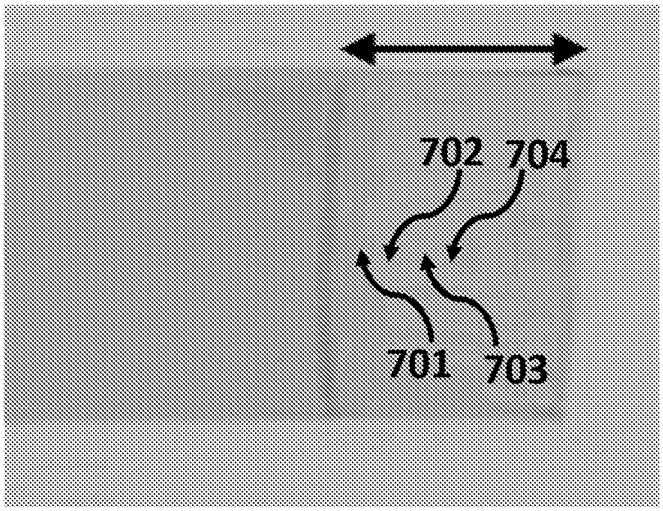
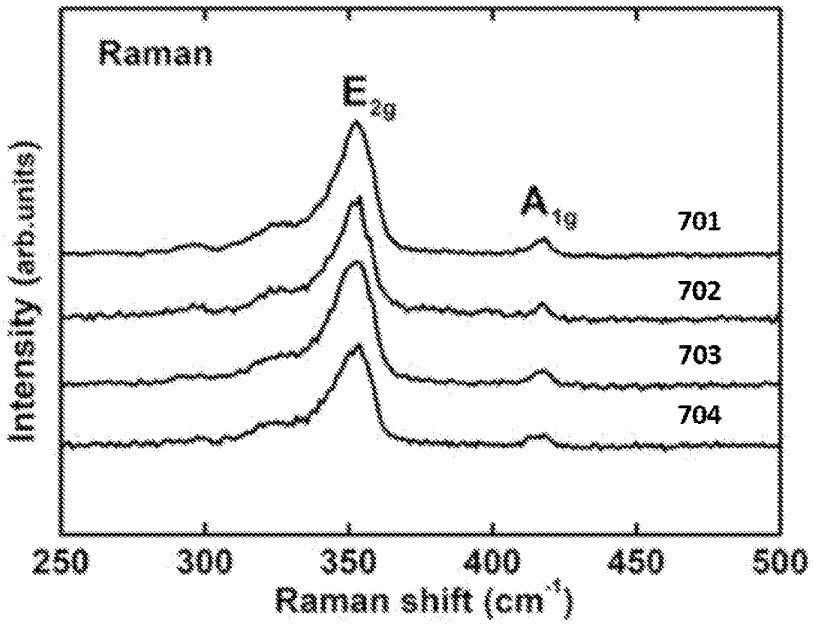

702
704
701
703

FIG. 7B


Raman
E_{2g}
A_{1g}
701
702
703
704
Intensity (arb.units)
250
300
350
400
450
500
Raman shift (cm^{-1})