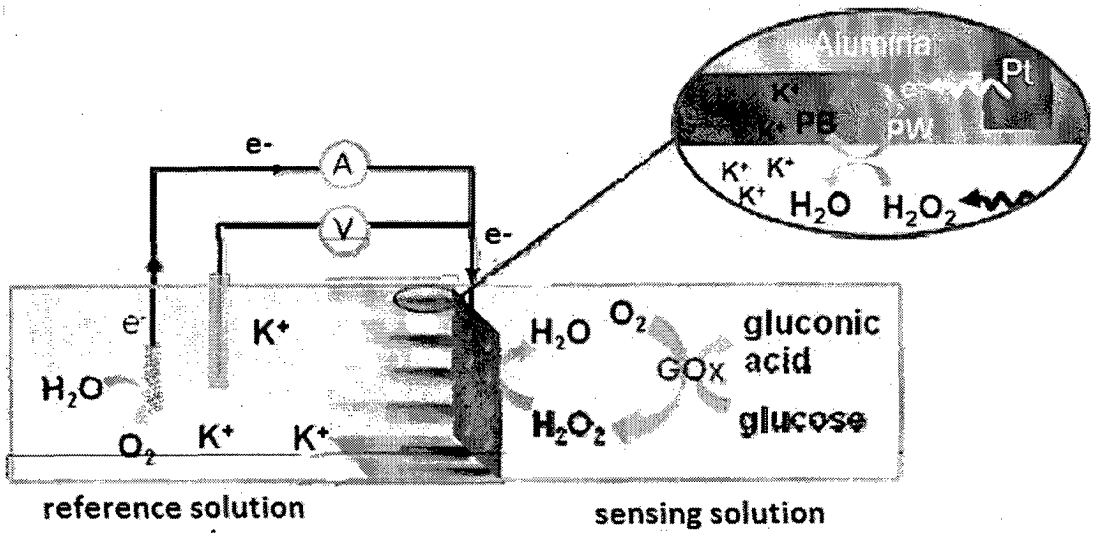

Alumina
Pt
K+
PB
PW
K+ K+
K+ H2O H2O2
e-
A
V
e-
e-
K+
H2O
O2
gluconic
acid
GOx
glucose
H2O2
H2O
O2
K+
K+
reference solution
sensing solution

FIG. 1(a)

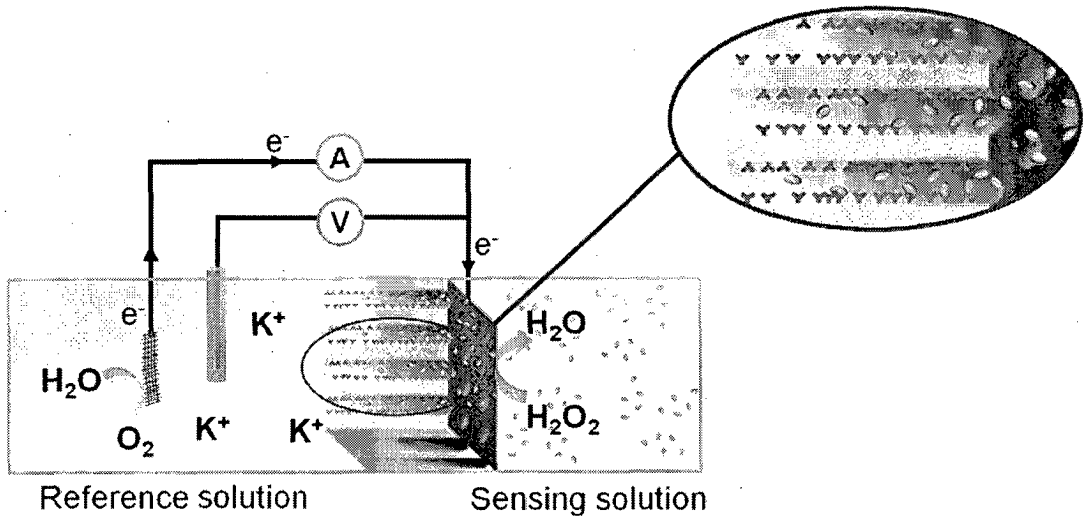

e-
A
V
e-
e-
K+
H2O
H2O
O2
K+
K+
H2O
H2O2
Reference solution
Sensing solution

FIG. 1(b)

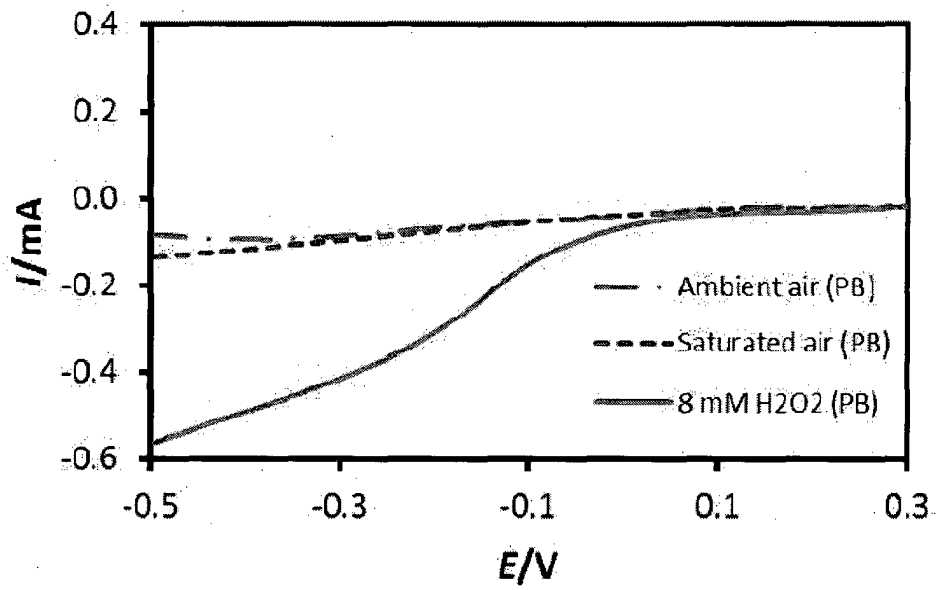

0.4
0.2
0.0
-0.2
-0.4
-0.6
I/mA
-0.5
-0.3
-0.1
0.1
0.3
E/V
Ambient air (PB)
Saturated air (PB)
8 mM H2O2 (PB)

FIG. 2(a)

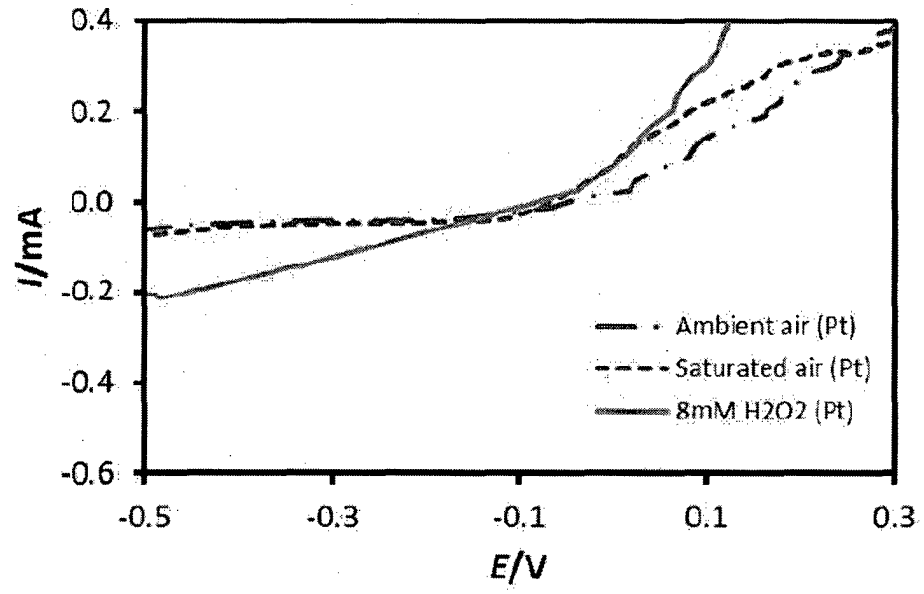

0.4
0.2
0.0
-0.2
-0.4
-0.6
I/mA
-0.5
-0.3
-0.1
0.1
0.3
E/V
Ambient air (Pt)
Saturated air (Pt)
8mM H2O2 (Pt)

FIG. 2(b)

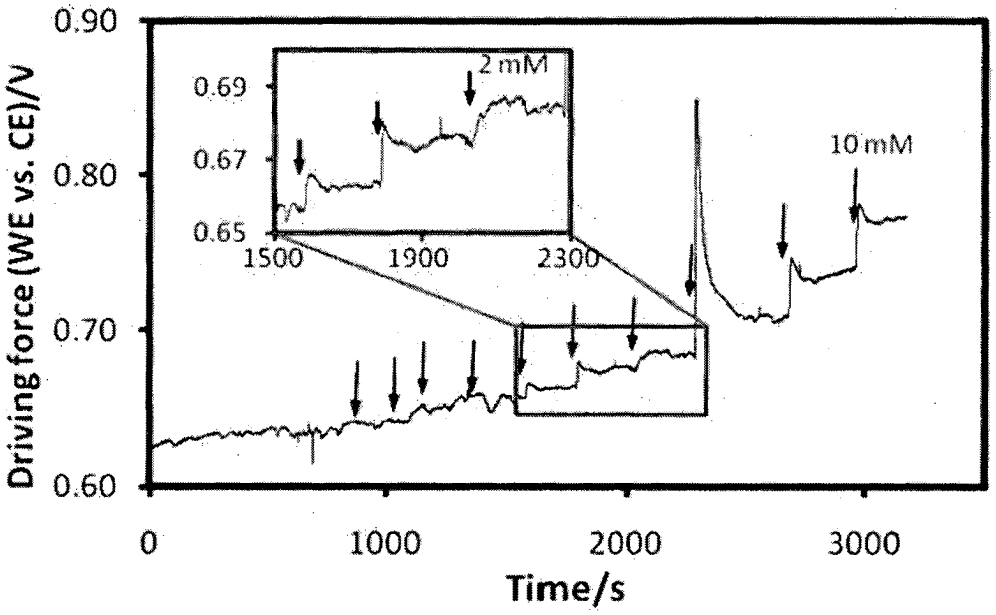

0.90
0.80
0.70
0.60
Driving force (WE vs. CE)/V
0
1000
2000
3000
Time/s
2 mM
10 mM
0.69
0.67
0.65
1500
1900
2300

FIG. 3(a)

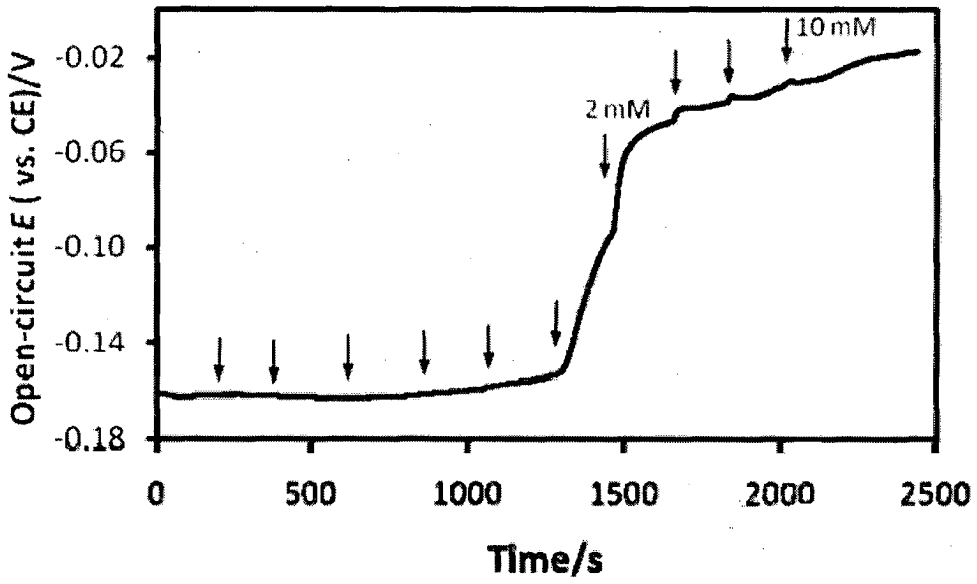

-0.02
-0.06
-0.10
-0.14
-0.18
Open-circuit E (vs. CE)/V
0
500
1000
1500
2000
2500
Time/s
2 mM
10 mM

FIG. 3(b)

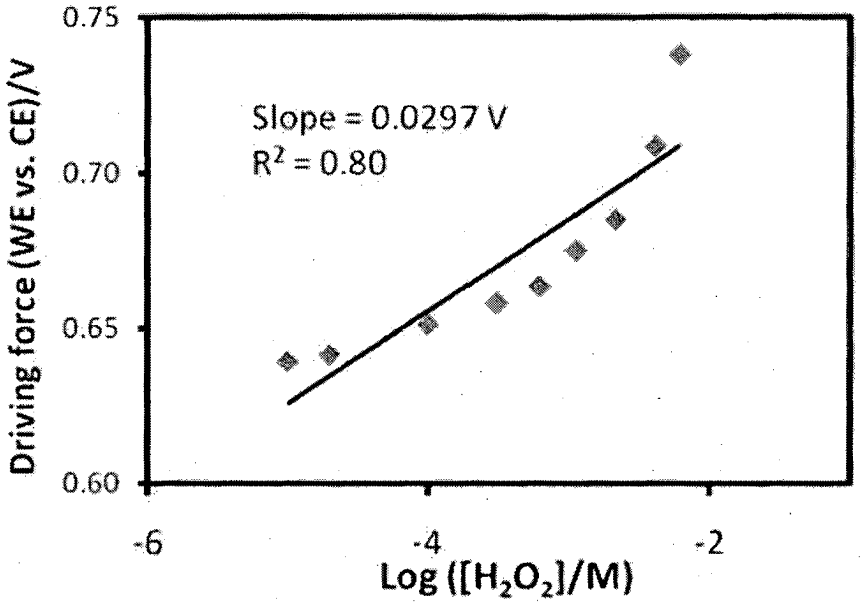

0.75
0.70
0.65
0.60
Driving force (WE vs. CE)/V
Slope = 0.0297 V
R² = 0.80
-6
-4
-2
Log ([H2O2]/M)

FIG. 3(c)

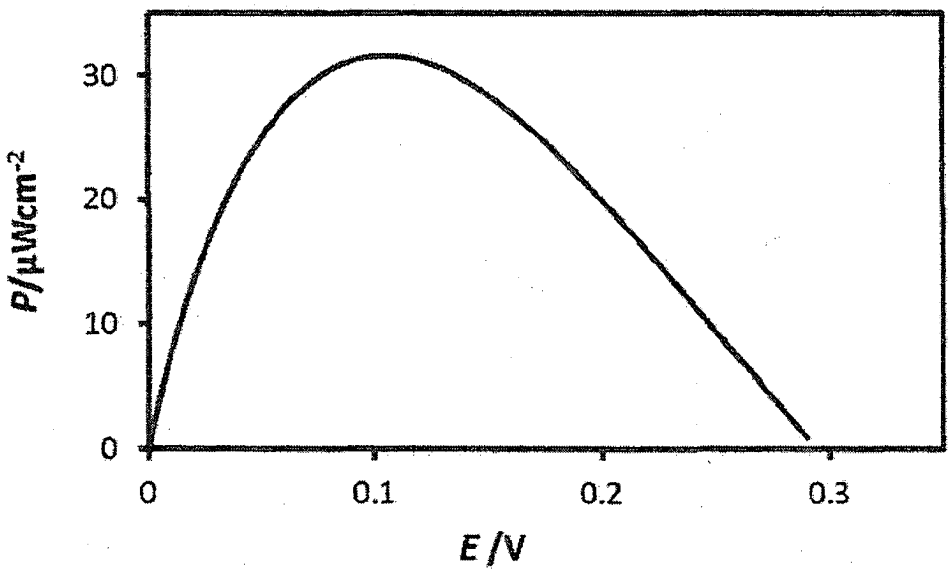

30
20
10
0
P/μWcm-2
0
0.1
0.2
0.3
E /V

FIG. 4

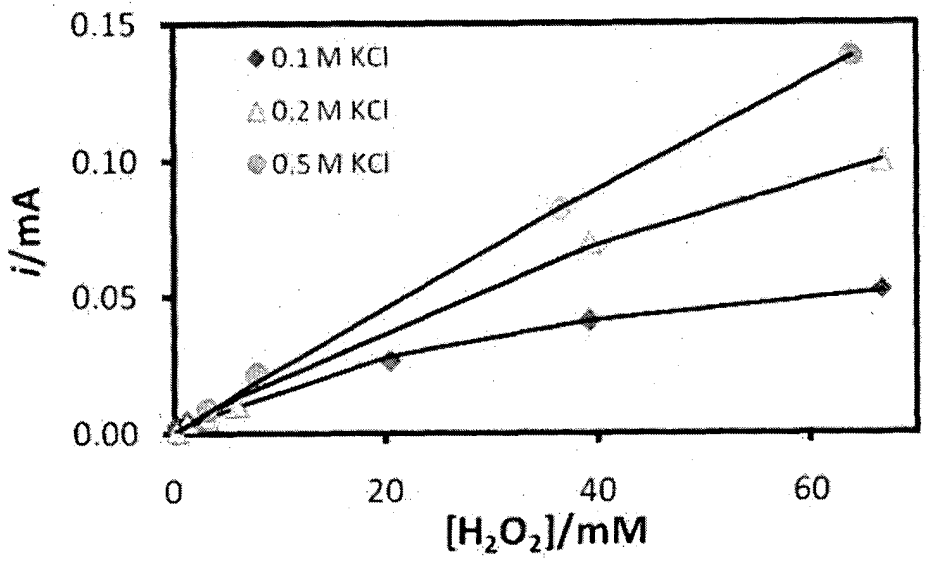

0.15
0.10
0.05
0.00
i/mA
0.1 M KCl
0.2 M KCl
0.5 M KCl
0
20
40
60
[H2O2]/mM

FIG. 5(a)

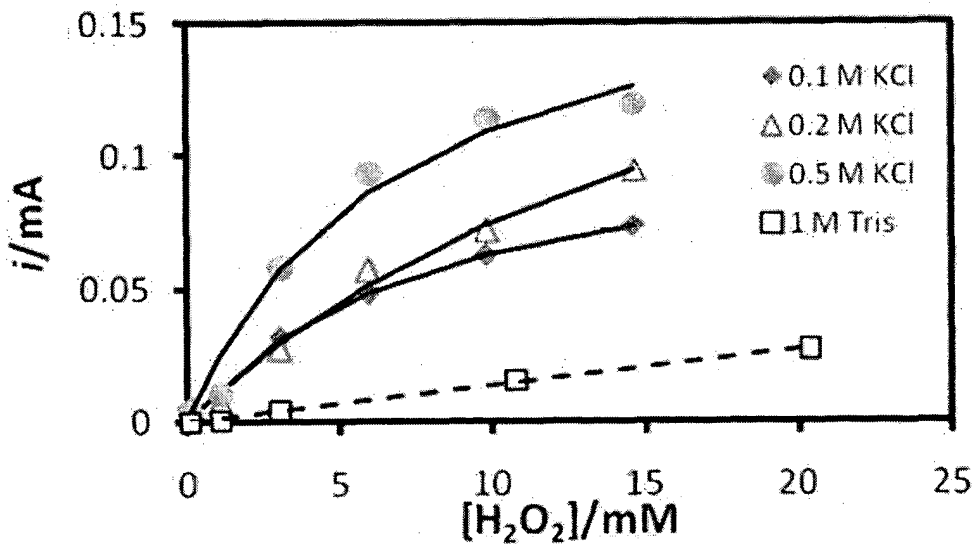

0.15
0.1
0.05
0
i/mA
0.1 M KCl
0.2 M KCl
0.5 M KCl
1 M Tris
0
5
10
15
20
25
[H2O2]/mM

FIG. 5(b)

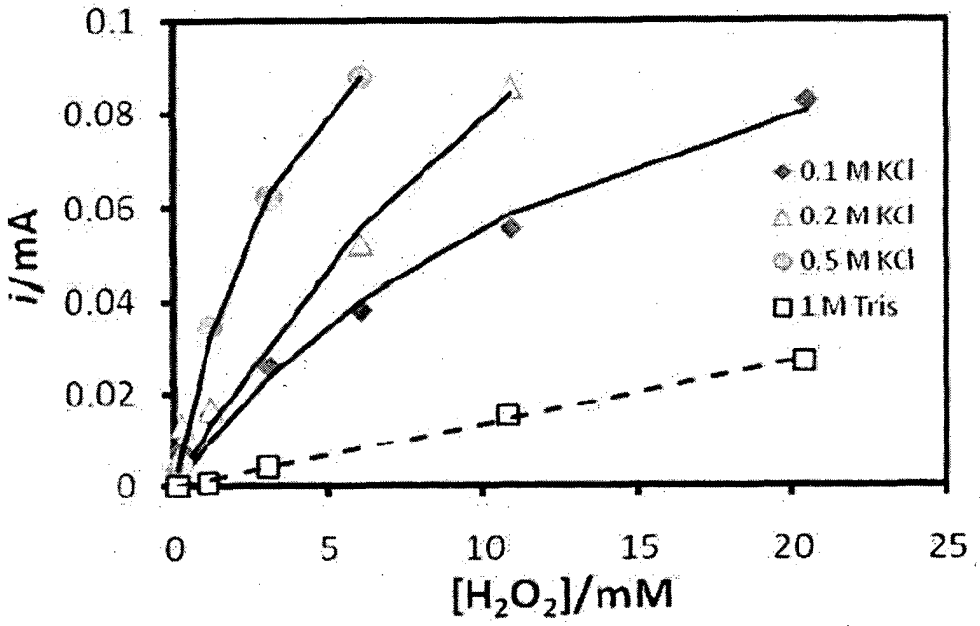

0.1
0.08
0.06
0.04
0.02
0
i/mA
0
5
10
15
20
25
[H2O2]/mM
0.1 M KCl
0.2 M KCl
0.5 M KCl
1 M Tris

FIG. 5(c)

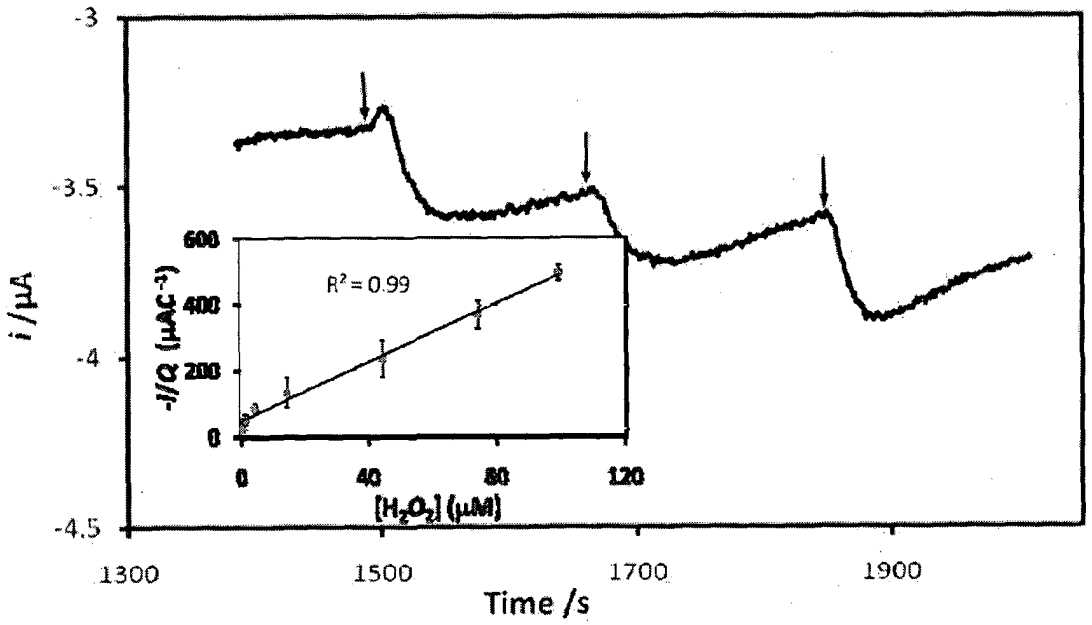

-3
-3.5
-4
-4.5
i /μA
1300
1500
1700
1900
Time /s
R² = 0.99
-I/Q (μAC⁻¹)
600
400
200
0
0
40
80
120
[H2O2] (μM)

FIG. 6(a)

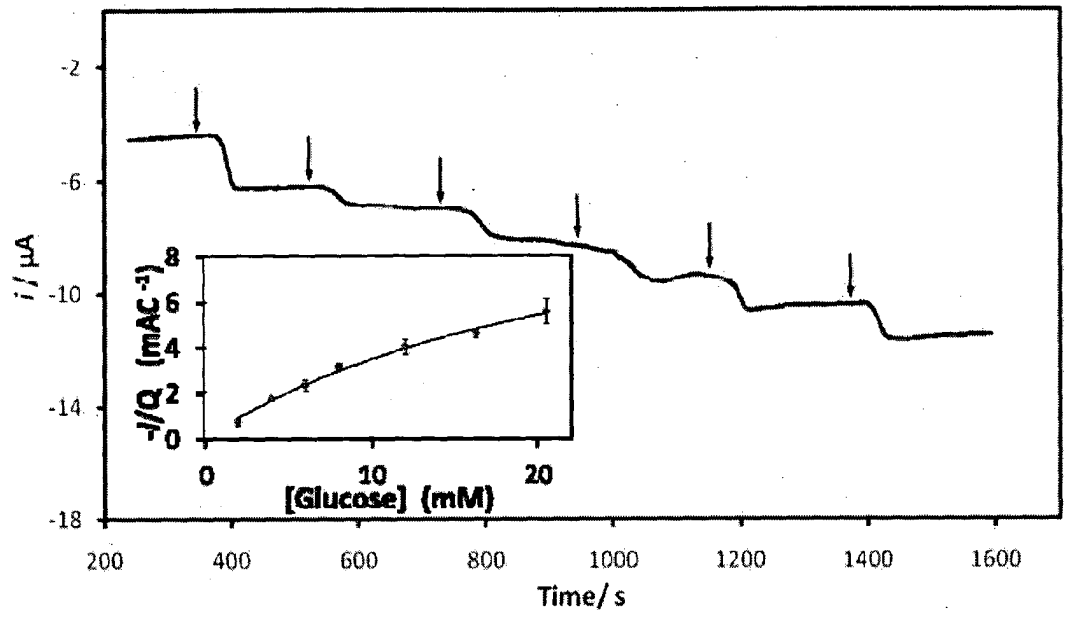

i / µA
-2
-6
-10
-14
-18
200
400
600
800
1000
1200
1400
1600
Time/ s
-I/Q (mAC-1)
0
2
4
6
8
0
10
20
[Glucose] (mM)

FIG. 6(b)

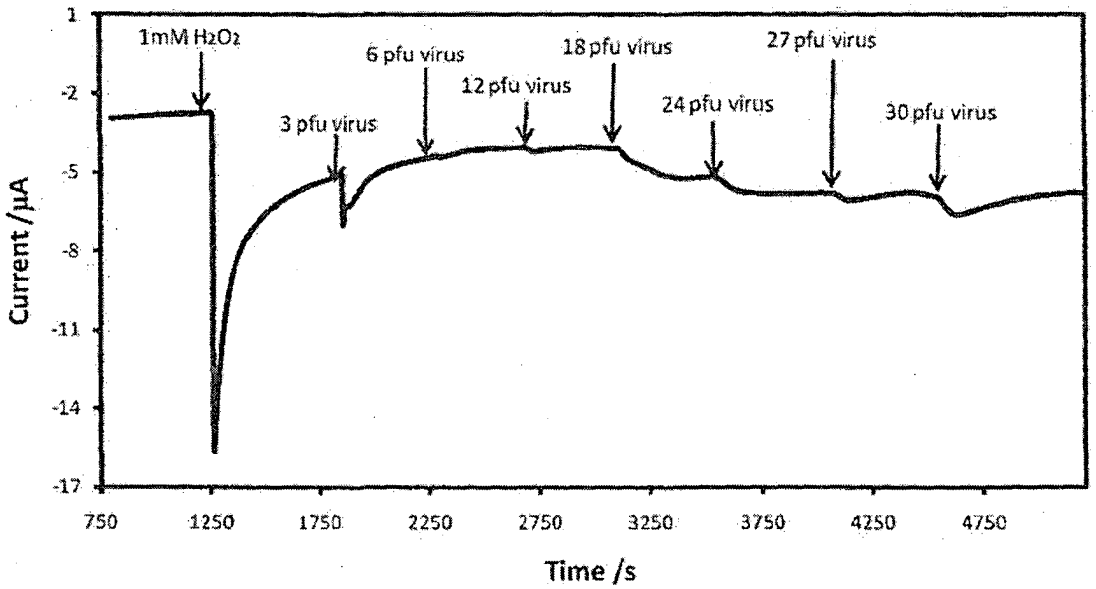

Current /µA
1
-2
-5
-8
-11
-14
-17
750
1250
1750
2250
2750
3250
3750
4250
4750
Time /s
1mM H2O2
3 pfu virus
6 pfu virus
12 pfu virus
18 pfu virus
24 pfu virus
27 pfu virus
30 pfu virus

FIG. 7

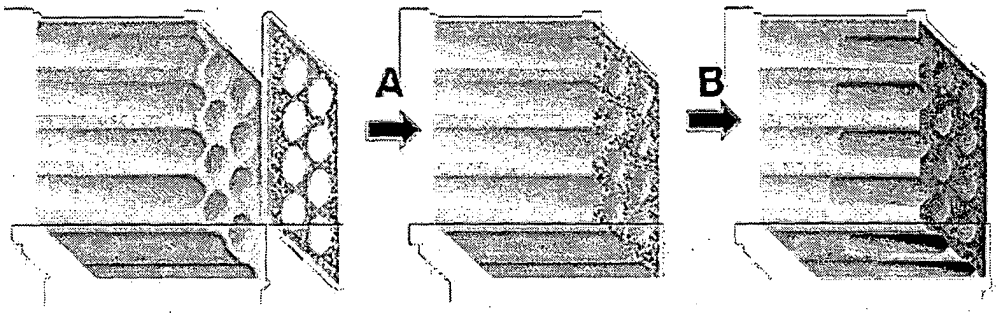

A
B

FIG. 8

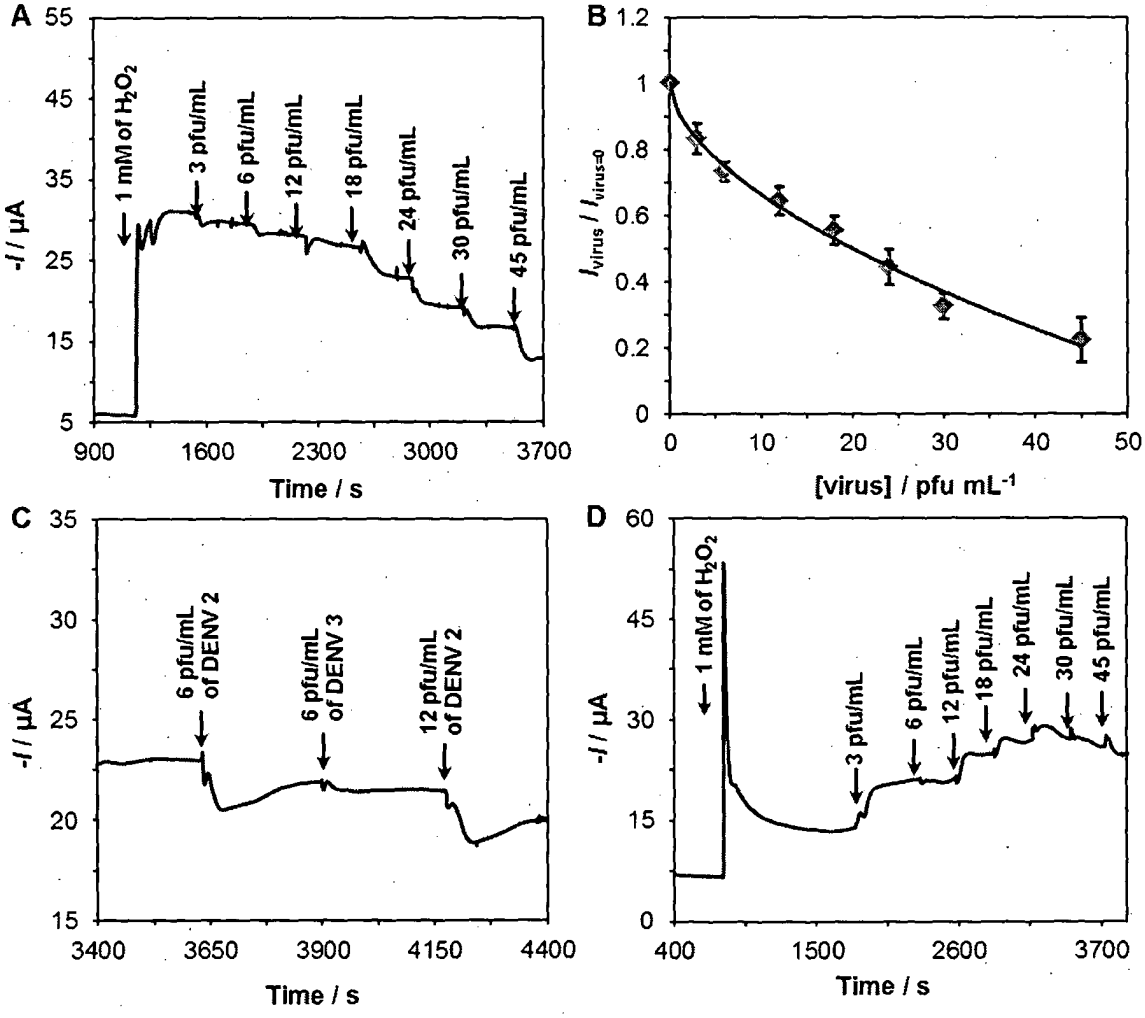

A
-I / µA
Time / s
1 mM of H2O2
3 pfu/mL
6 pfu/mL
12 pfu/mL
18 pfu/mL
24 pfu/mL
30 pfu/mL
45 pfu/mL
B
I virus / I virus=0
[virus] / pfu mL-1
C
6 pfu/mL of DENV 2
6 pfu/mL of DENV 3
12 pfu/mL of DENV 2
D

FIG. 9

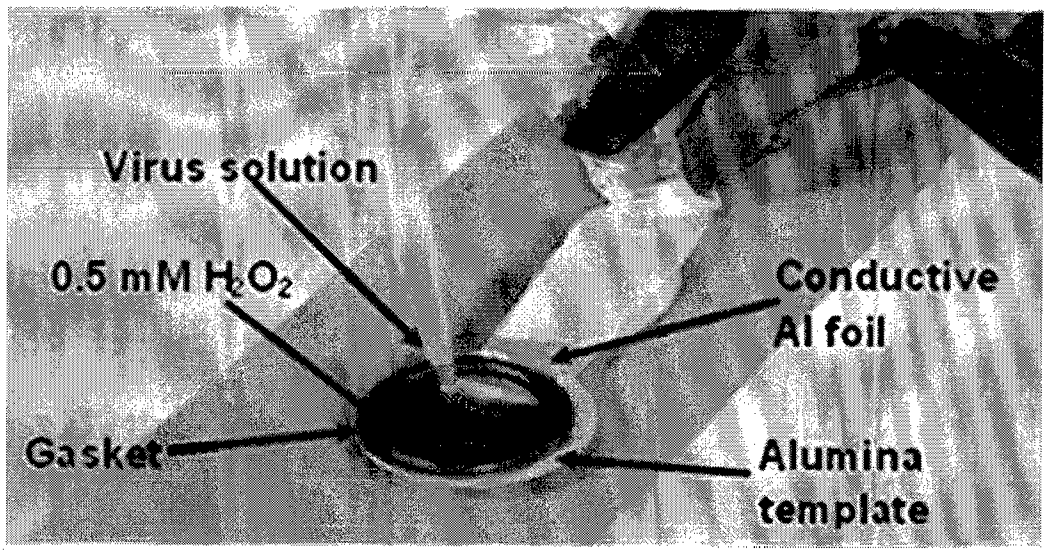

Virus solution
0.5 mM H_2O_2
Conductive Al foil
Gasket
Alumina template

FIG. 10

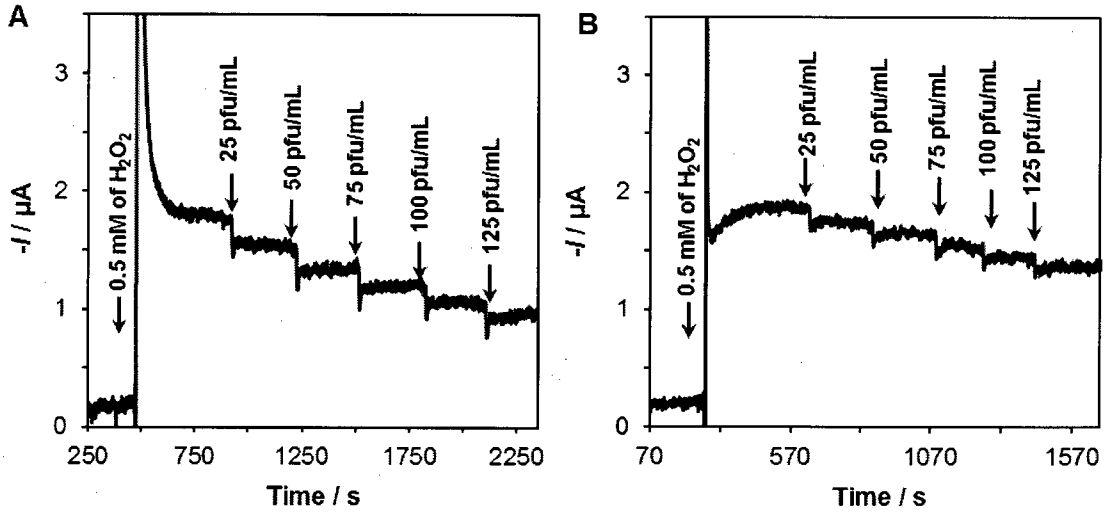

A
B
-I / µA
0.5 mM of H_2O_2
25 pfu/mL
50 pfu/mL
75 pfu/mL
100 pfu/mL
125 pfu/mL
Time / s
250
750
1250
1750
2250
70
570
1070
1570
0
1
2
3

FIG. 11