Cu-MOFs/GO composite based electrochemical sensor in simultaneous measurement of xanthine, hypoxanthine and caffeine at trace level

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Supplementary Information

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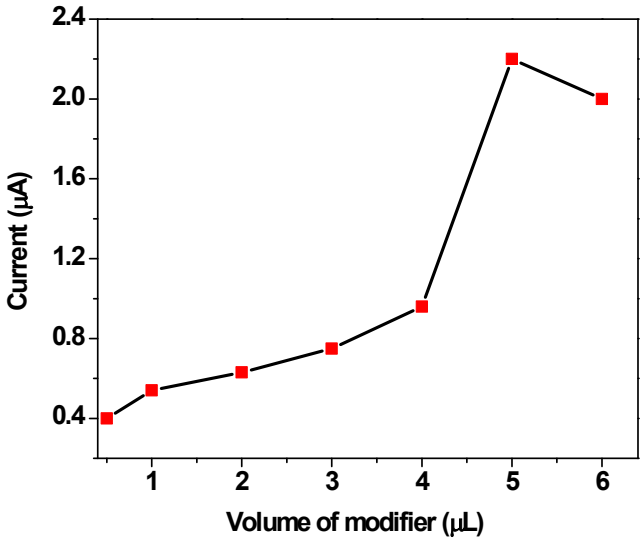
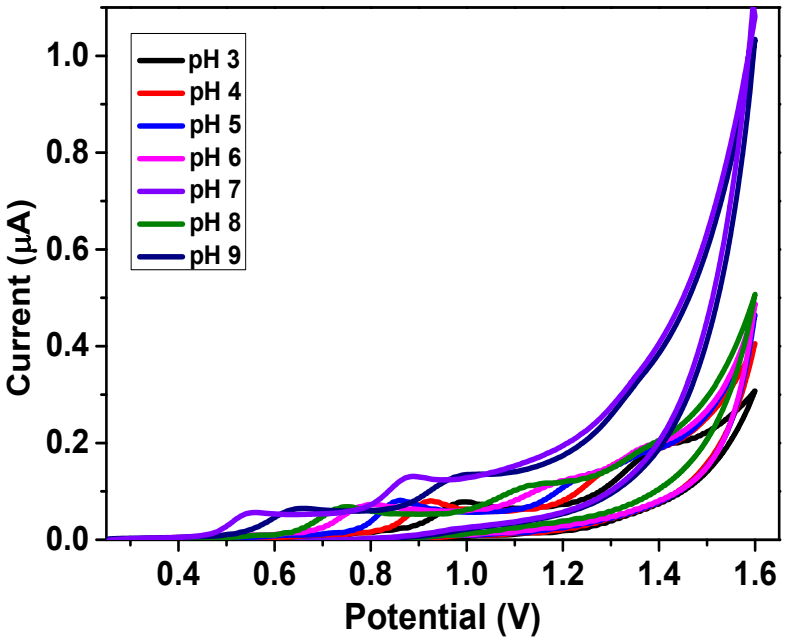
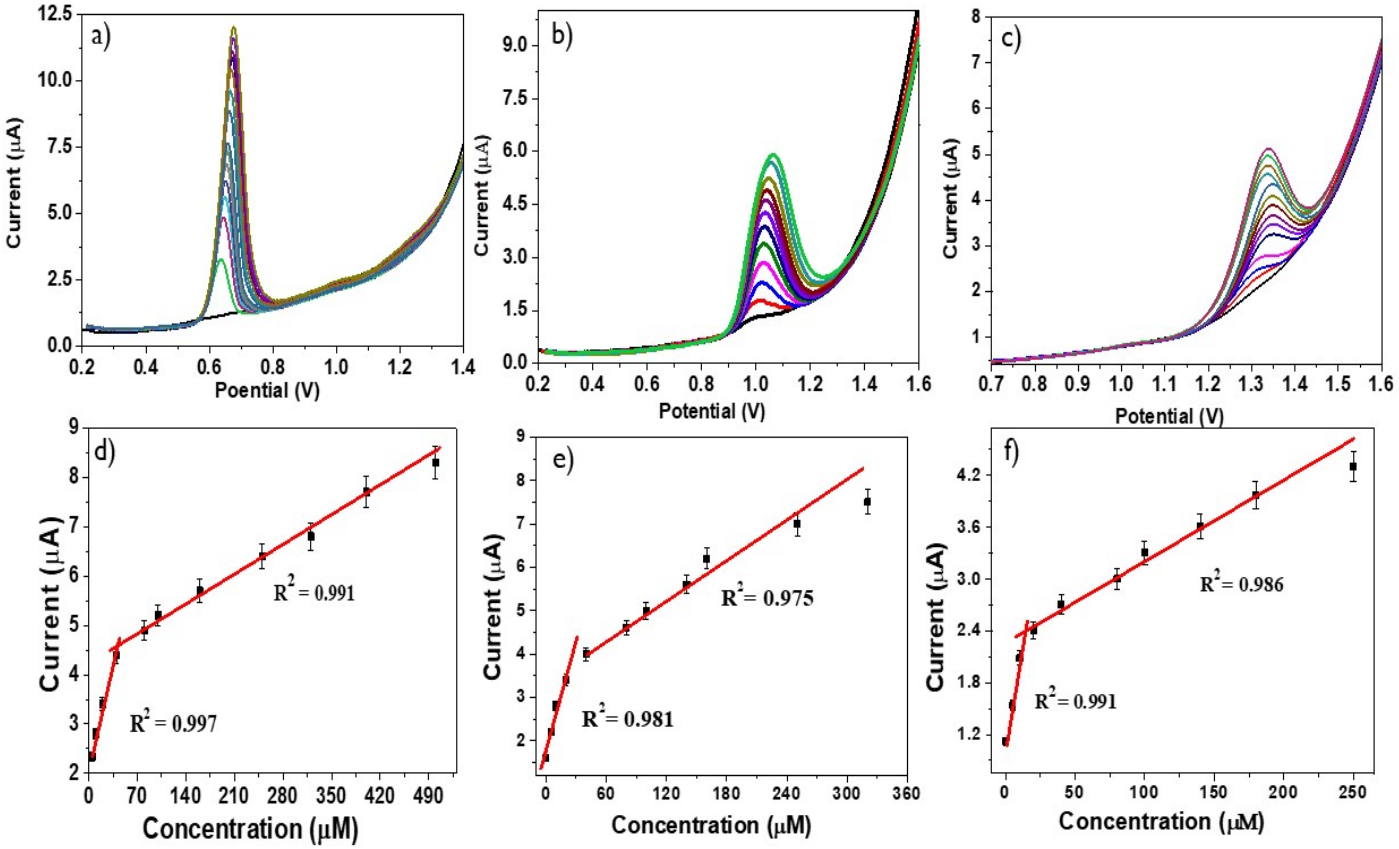
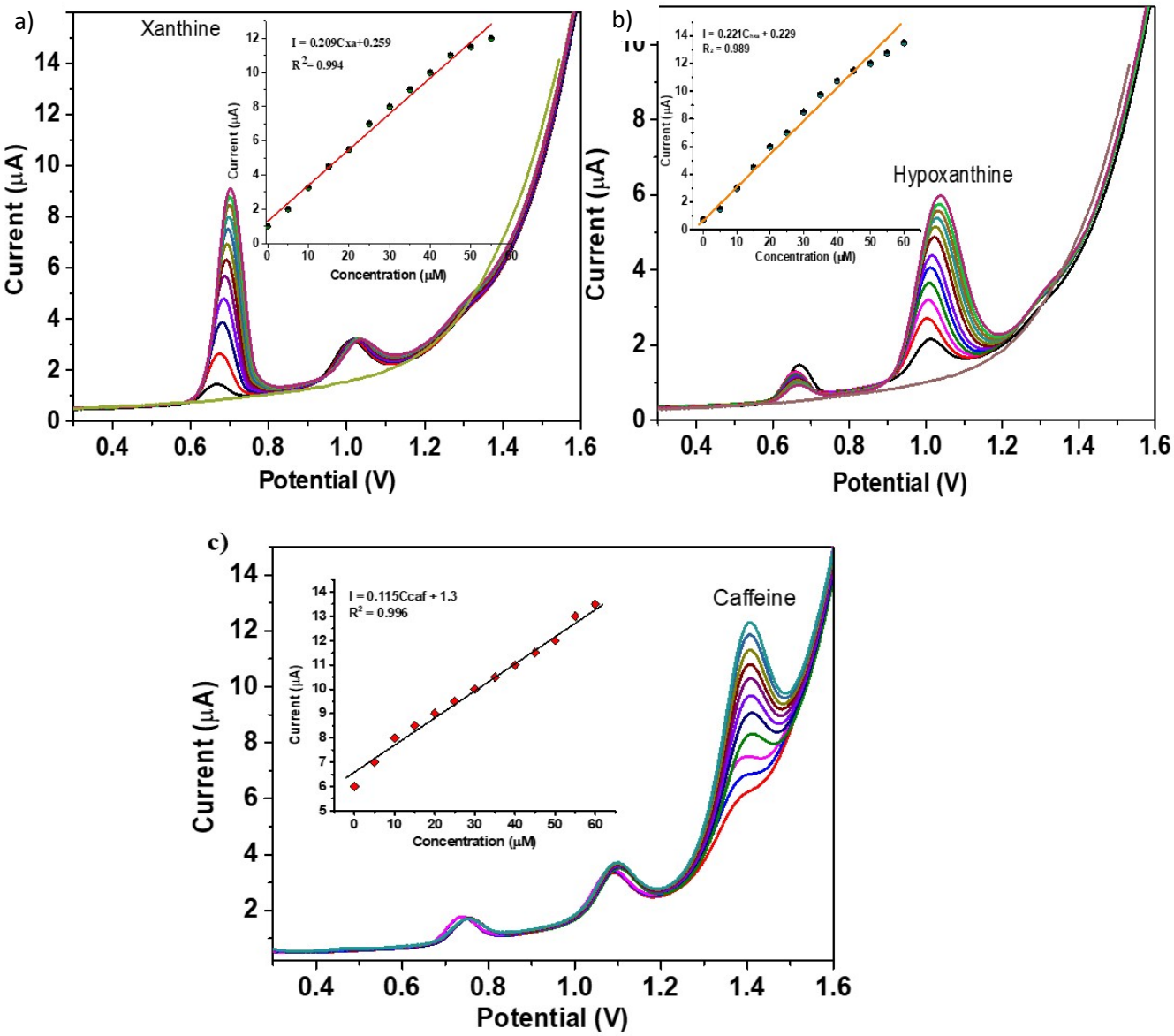
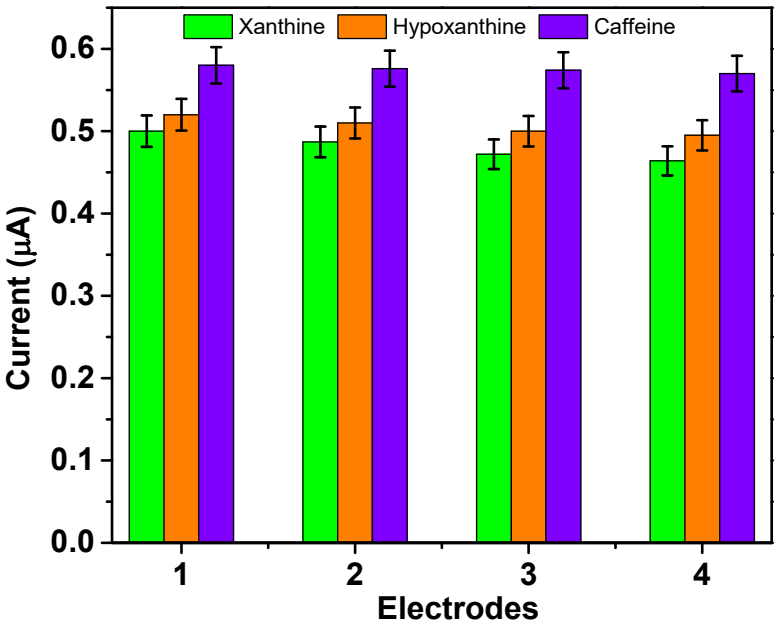

Current (μA)
Volume of modifier (μL)
2.4
2.0
1.6
1.2
0.8
0.4
1
2
3
4
5
6


pH 3
pH 4
pH 5
pH 6
pH 7
pH 8
pH 9
Current (μA)
Potential (V)
1.0
0.8
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
1.2
1.4
1.6


a)
Current (μA)
Poential (V)
b)
Current (μA)
Potential (V)
c)
Current (μA)
Potential (V)
d)
Current (μA)
R2 = 0.991
R2 = 0.997
Concentration (μM)
e)
Current (μA)
R2= 0.975
R2= 0.981
Concentration (μM)
f)
Current (μA)
R2= 0.986
R2= 0.991
Concentration (μM)


a)
Xanthine
I = 0.209Cxa+0.259
R2= 0.994
Current (μA)
Concentration (μM)
Current (μA)
Potential (V)
b)
I = 0.221Cxan + 0.229
R2 = 0.989
Hypoxanthine
Current (μA)
Concentration (μM)
Current (μA)
Potential (V)
c)
I = 0.115Ccaf + 1.3
R2 = 0.996
Caffeine
Current (μA)
Concentration (μM)
Current (μA)
Potential (V)



List of Tables

Molecule	Concentration ratio (Xa:interferant)	Signal change(± %)	Concentration ratio (Hxa:interferant)	Signal change(± %)	Concentration ratio (Caf:interferant)	Signal change(± %)
Folic acid	1:4	1.5	1:4	1.3	1:4	0
Glucose	1:4	0.8	1:4	0.6	1:4	0.6
Lactic acid	1:2	0.6	1:2	0.8	1:2	0.2
Dopamine	1:1	2.3	1:1	2.2	1:1	0.9
Ascorbic acid	1:1	2	1:1	1.6	1:1	0.8
Uric acid	1:1	2.5	1:1	2.6	1:1	1.1
Sucrose	1:2	0.5	1:2	0	1:2	0

Sample matrices	Originally present (µM)			Spiked(µM)			Total (µM)			Recovery (%)		
	Xa	**Hxa**	**Caf**	**Xa**	**Hxa**	**Caf**	**Xa**	**Hxa**	**Caf**	**Xa**	**Hxa**	**Caf**
Fish serum	0.4	0.75	ND	5	5	-	5.44	5.71	-	100.8	99.37	-
Chicken serum	ND	ND	ND	5	10	-	4.94	9.98	-	98.8	99.8	-
Coffee powder*	ND	ND	1.3	-	-	5	-	-	6.46	-	-	101.2
Tea powder*	ND	ND	0.4	-	-	5	-	-	4.99	-	-	99.2
Blood serum	1.2	1.9	0.8	2	2	2	3.09	3.6	2.82	99.5	98	102.5

Modifier substrates	Method	Linearity (µM)	LOD (µM)	Sample matrices	Ref.
Brushite nanoparticles	DPV	Xa: 0.75-220 Hxa:0.75-220 Caf: 0.75-220	Xa : 1.0 HXa : 0.076 Caf : 1.26	Human urine, coffee powder	47
Nb(BTC)MOF@CNF/ GCE	DPV	Xa: 5-2000 Hxa :5-2000	Xa : 0.076 HXa : 0.068	Human blood, slotted fish	48
Co-TMA MOF/CNFs	Amperometry	Xa: 25-700	Xa: 0.096	Blood serum and urine	49
$CuMOFP_2W18$/XC-72R	DPV	Xa: 0.5-240	Xa: 0.26	Blood serum	50
Cu-MOF@f-MWCNTs/SPE	DPV	Caf: 0.01-1500	Caf : 7.9	Coffee, beverages	51
CNFs/GCE	SWV	Caf : 25-450	Caf : 17.4	Food, beverages	52
Cu-MOFs/GO/GCE	**SWV**	**Xa: 1-400 Hxa: 1-400 Caf: 1-400**	**Xa:0.045 Hxa:0.052 Caf:0.02**	**Fish, chicken, blood serum, coffee & Tea powders**	**This work**