

## Electronic Supplementary Material

### **Nanosized iron telluride for simultaneous nanomolar voltammetric determination of dopamine, uric acid, guanine and adenine**

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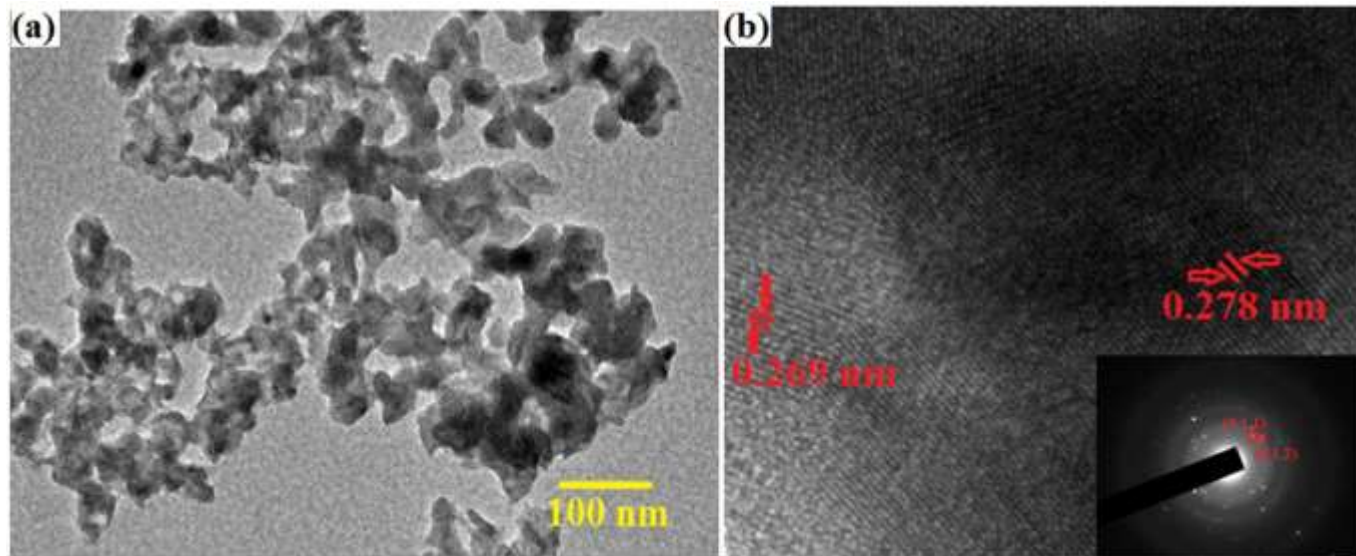
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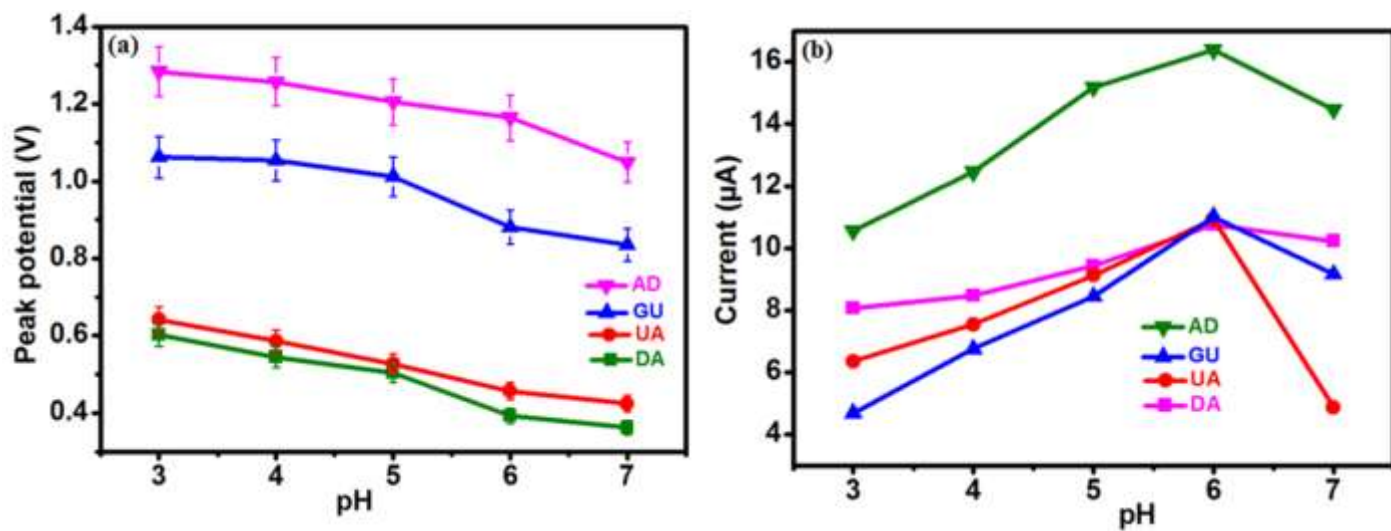
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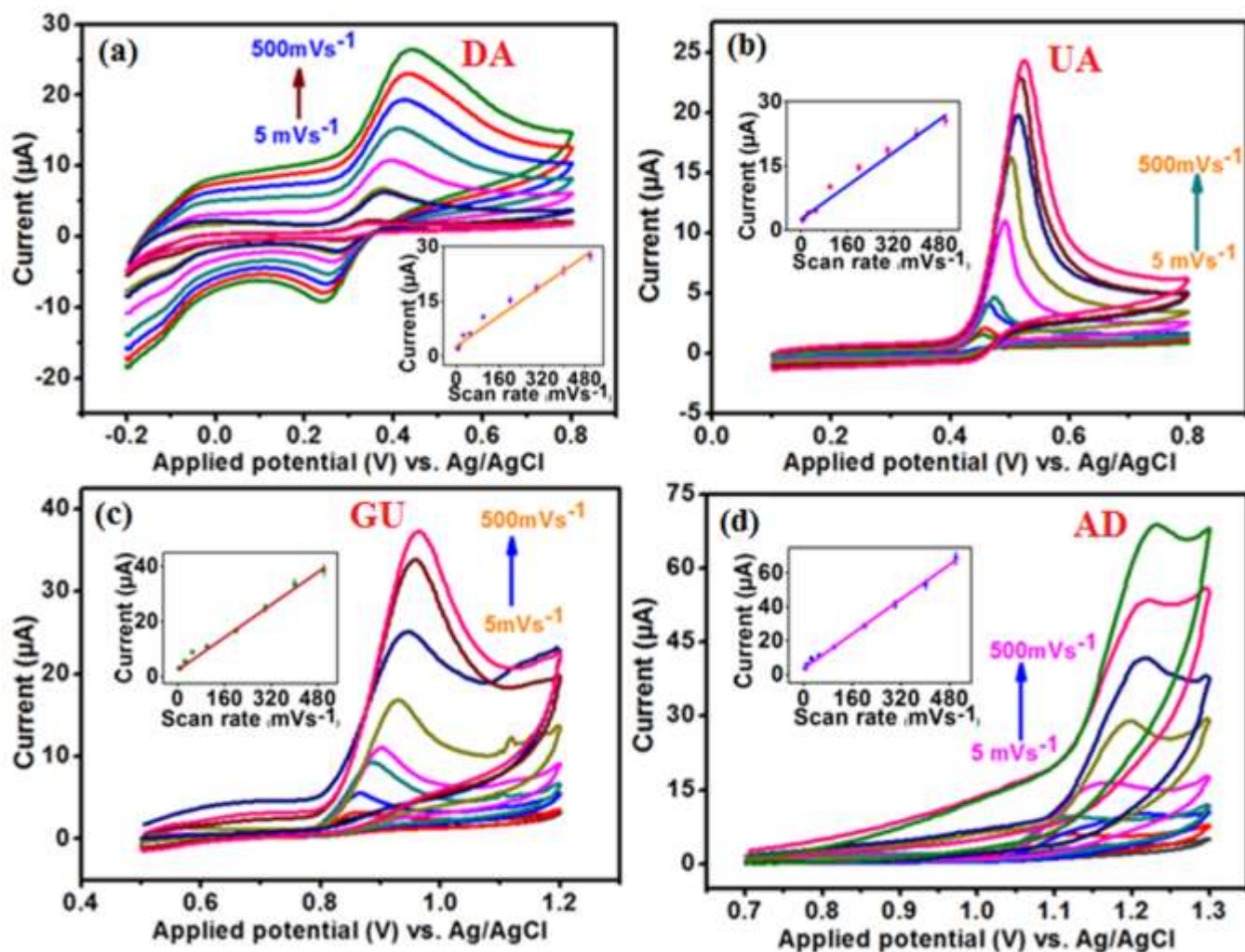
**Fig. S1** (a) TEM image of synthesized FeTe<sub>2</sub> nps (b) HRTEM image of FeTe<sub>2</sub> nanomaterial, inset shows SAED diffraction pattern

Table S1: Comparison of CV experimental results obtained from bare GP and FeTe<sub>2</sub>/GP electrodes

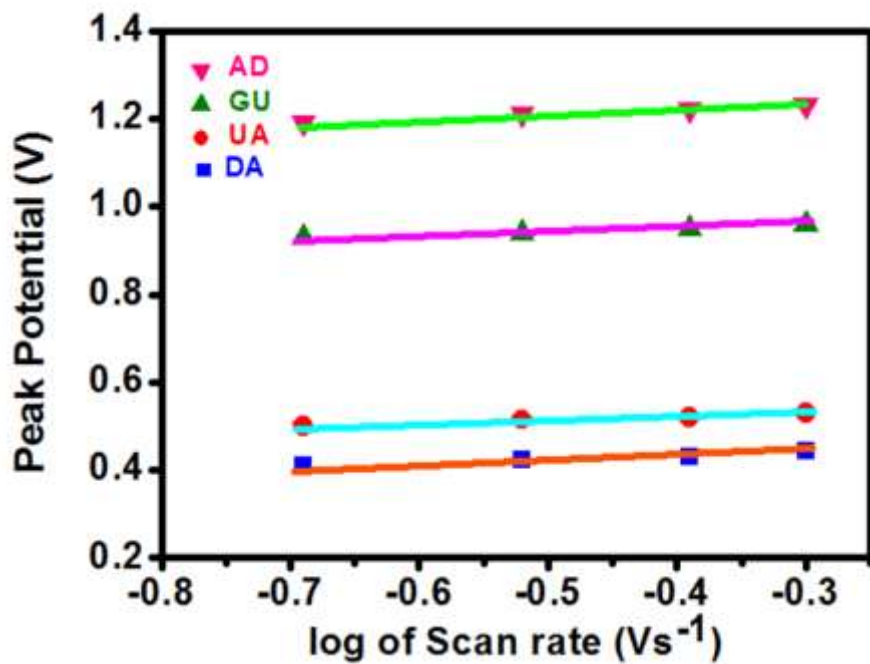
Electrodes	Concentration (μM)				Oxidation peak potential (mV)				Reduction peak potential (mV)				Oxidation peak current (μA)			
	DA	UA	GU	AD	DA	UA	GU	AD	DA	UA	GU	AD	DA	UA	GU	AD
FeTe <sub>2</sub> /GP	100	0	0	0	393	-	-	-	266	-	-	-	10.75	-	-	-
Bare GP	100	0	0	0	407	-	-	-	241	-	-	-	3.08	-	-	-
FeTe <sub>2</sub> /GP	0	100	0	0	-	457	-	-	-	-	-	-	-	10.93	-	-
Bare GP	0	100	0	0	-	478	-	-	-	-	-	-	-	5.57	-	-
FeTe <sub>2</sub> /GP	0	0	100	0	-	-	881	-	-	-	-	-	-	-	11.01	-
Bare GP	0	0	100	0	-	-	890	-	-	-	-	-	-	-	8.05	-
FeTe <sub>2</sub> /GP	0	0	0	100	-	-	-	1164	-	-	-	-	-	-	-	16.38
Bare GP	0	0	0	100	-	-	-	1184	-	-	-	-	-	-	-	10.41
FeTe <sub>2</sub> /GP	50	100	50	120	370	516	901	1254	255	-	-	-	8.84	11.2	9.52	21.44
Bare GP	50	100	50	120	-	-	954	1281	-	-	-	-	-	-	5.81	12.21



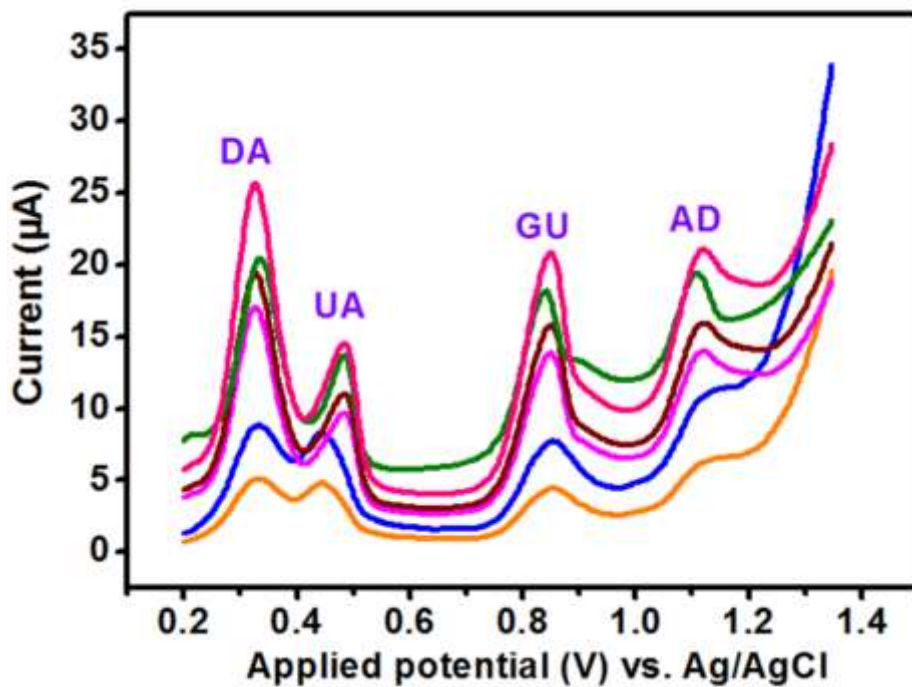
**Fig. S2** Variation of (a) pH vs peak potential and (b) pH vs current plot in 0.1 mM DA, 0.1 mM UA, 0.1 mM GU, 0.1 mM AD at FeTe<sub>2</sub>/GP electrode respectively.



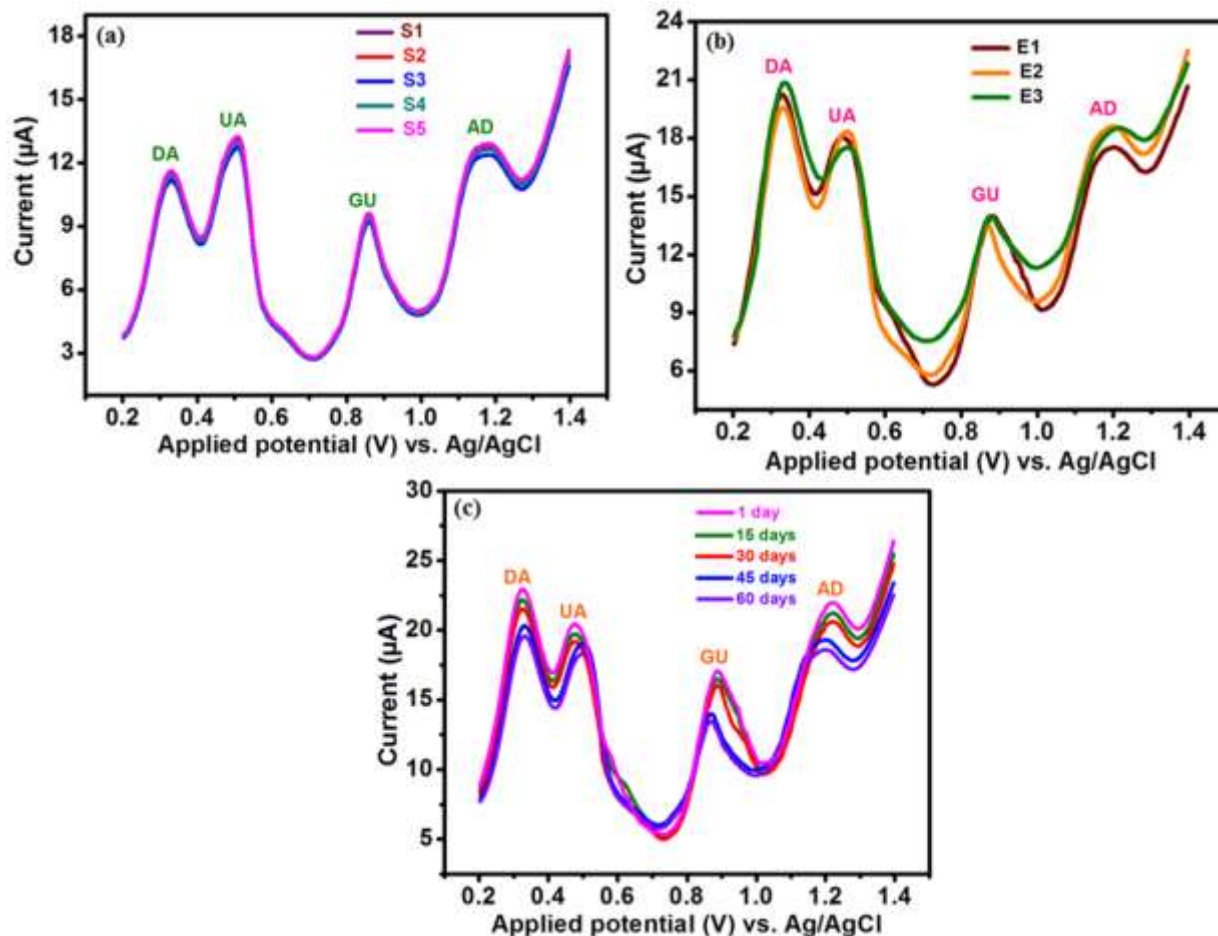
**Fig. S3** CV plots of scan rate variation ranging from 5 mVs<sup>-1</sup> to 500 mVs<sup>-1</sup> at FeTe<sub>2</sub>/GP electrode in presence of (a) 0.1 mM DA; inset shows corresponding oxidation peak current vs scan rate, (b) 0.1 mM UA; inset shows corresponding anodic peak current vs scan rate, (c) 0.1 mM GU; inset depicts oxidation peak current vs scan rate and (d) 0.1 mM AD; inset indicates corresponding oxidation peak current vs scan rate plot.



**Fig. S4** peak potential vs. logarithm of scan rate variation plot in 0.1 mM DA, 0.1 mM UA, 0.1 mM GU and 0.1 mM AD at FeTe<sub>2</sub>/GP electrode



**Fig. S5** DPVs of different concentrations of DA, UA, GU and AD in 0.1 M PBS (pH=6) at FeTe<sub>2</sub>/GP electrode.

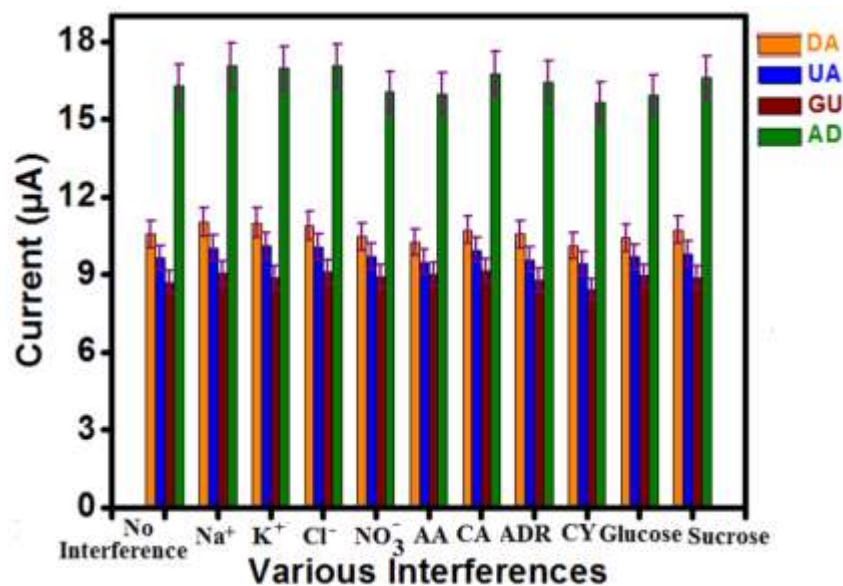


**Fig.S6** (a) Five successive DPV measurements of DA, UA, GU and AD at FeTe<sub>2</sub>/GP in the ternary mixture of 0.03 mM DA + 0.04 mM UA + 0.04 mM GU + 0.02 mM AD; (b) DPVs of mixture of 0.12 mM DA + 0.1 mM UA + 0.1 mM GU + 0.06 mM AD at prepared three different FeTe<sub>2</sub>/GP electrodes under same condition and (c) DPV plots of mixture of 0.12 mM DA + 0.15 mM UA + 0.14 mM GU + 0.08 mM AD at different time intervals.



Table S2: Influence of various foreign substances towards the peak current of DA, UA, GU and AD

Various interferences	Peak current ( $\mu\text{A}$ )				Relative signal change (%)			
	DA	UA	GU	AD	DA	UA	GU	AD
No interferences	10.57	9.65	8.7	16.3	-	-	-	-
Na <sup>+</sup>	11.03	10.03	9.05	17.08	4.35	3.93	4.02	4.78
K <sup>+</sup>	11.01	10.11	8.87	16.96	4.35	4.66	1.95	4.04
Cl <sup>-</sup>	10.88	10.08	9.09	17.06	2.93	4.76	4.48	4.66
NO <sub>3</sub> <sup>-</sup>	10.47	9.7	8.92	16.05	-0.94	0.52	2.53	-1.53
Ascorbic acid (AA)	10.25	9.48	9.02	16	-3.02	-1.76	3.67	1.84
Citric acid (CA)	10.72	9.95	9.17	16.78	1.42	3.1	4.71	2.94
Adrenaline (ADR)	10.55	9.57	8.79	16.45	-0.19	-0.83	-1.03	0.92
Cysteine (CY)	10.13	9.42	8.43	15.67	-4.16	-2.38	-3.1	-3.86
Glucose	10.42	9.69	8.95	15.93	-1.42	0.41	2.87	-2.26
Sucrose	10.73	9.81	8.9	16.61	1.51	1.55	2.29	1.9



**Fig. S7** Influence of some interfering agents (metals and bio-molecules) to the voltammetric peak current responses of 0.02 mM DA, 0.01 mM UA, 0.02 mM GU and 0.06 mM AD molecules in PBS (pH 6) at FeTe<sub>2</sub>/GP electrode.

Table S3: Real sample analysis using FeTe<sub>2</sub>/GP electrode

Sample	Original (μM)	Spiking (μM)	Found (μM)	Reference Method	<sup>a</sup> Recovery± <sup>b</sup> SD (n=3)	% <sup>c</sup> RSD	<sup>1</sup> t <sub>exp</sub>	<sup>2</sup> t <sub>std</sub>	<sup>3</sup> F <sub>exp</sub>	<sup>4</sup> F <sub>std</sub>
<b><u>Human Urine Sample</u></b>										
DA	00	10	9.96	10.12	99.6± 0.94	0.95	1.19	4.303	15.99	19
UA	15	5	20.01	19.86	100.2 ± 0.86	0.86	2.71	4.303	1.47	19
GU	00	10	10.27	9.75	102.7 ± 2.45	2.39	1.12	4.303	2.39	19
AD	00	10	10.14	10.42	101.4 ± 1.90	1.88	3.43	4.303	0.30	19
<b><u>Human Plasma Sample</u></b>										
DA	00	10	10.43	10.38	104.3 ± 1.67	1.61	2.53	4.303	2.59	19
UA	10	10	20.07	20.24	100.7 ± 1.55	1.54	1.72	4.303	1.58	19
GU	00	10	10.26	10.15	102.6 ± 1.77	1.74	2.19	4.303	1.05	19
AD	00	10	10.28	10.36	102.8 ± 1.22	1.19	1.42	4.303	0.43	19
<b><u>Dopamine hydrochloride injection</u></b>										
DA	20	20	39.46	40.14	97.3 ± 1.21	1.24	1.31	4.303	6.53	19

$${}^a\text{Recovery} = \frac{\text{Found}(\mu\text{M}) - \text{Diluted biological fluids/pharmaceutical sample}(\mu\text{M})}{\text{Spiking}(\mu\text{M})} \times 100\%; \text{ } {}^b\text{Standard}$$

deviation; <sup>c</sup>Relative standard deviation

<sup>1</sup>t<sub>exp</sub> is calculated t value; <sup>2</sup>t<sub>std</sub> is obtained from table of Student's t-test, <sup>3</sup>F<sub>exp</sub> is calculated F value; <sup>4</sup>F<sub>std</sub> is obtained from the table of F test.



Table S4: Analysis of synthetic sample at FeTe<sub>2</sub>/GP electrode surface

Samples	Determined (μM)	Spiked (μM)	Found (μM)	Recovery (%)	RSD (%)
<b>DA</b>	30.22	10	40.14	99.2	1.6
		15	44.97	98.33	1.4
		20	50.24	100.1	1.1
		30	59.82	98.66	1.5
<b>UA</b>	20.38	10	30.62	102.4	1.2
		20	40.45	100.4	1.5
		30	51.22	102.8	2.2
		40	60.87	101.2	2.1
<b>GU</b>	20.46	10	30.22	97.6	1.5
		20	40.65	100.9	1.1
		30	51.25	102.6	2.4
		40	61.18	101.8	1.8
<b>AD</b>	30.58	10	40.84	102.6	1.7
		15	46.02	102.9	2.8
		20	50.19	98.05	1.4
		30	61.11	101.7	1.2