Supporting Information

Facile synthesis of 3D porous nitrogen-doped graphene as an efficient electrocatalyst for adenine sensing

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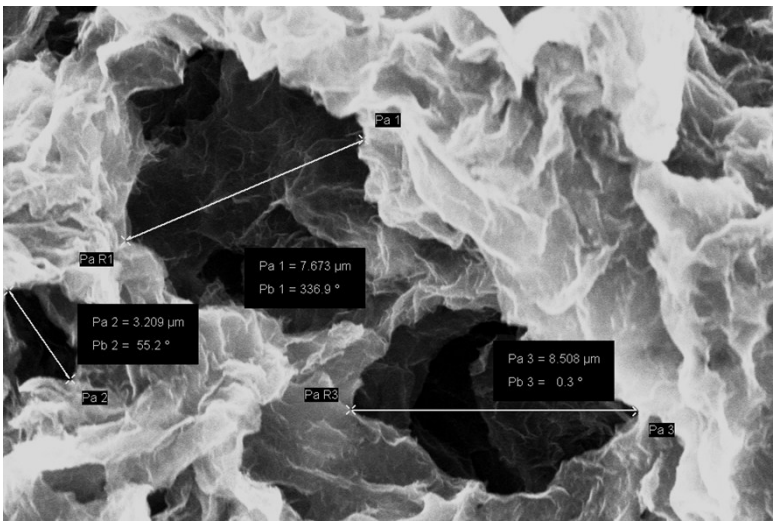

Fig. S1 The pore sizes of 3D porous nitrogen-doped graphene

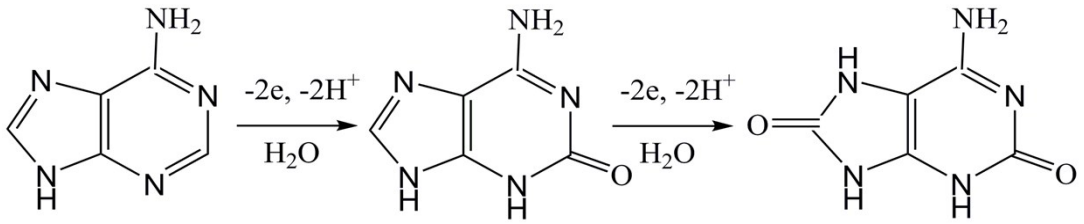

Fig. S2 The possible mechanism for adenine oxidation at the 3D-N-GN/GCE

Table S1 The six determination results for 1.0 μM adenine using the same 3D-N-GN/GCE.

Determination number	Oxidation peak current (μA)	RSD (%)
1	7.139	–
2	7.105	–
3	6.989	–
4	6.906	–
5	6.802	–
6	6.781	–
		2.17

Table S2 The determination results for 1.0 μM adenine using the six sensors fabricated under the same conditions.

Electrode number	Oxidation peak current (μA)	RSD (%)
1	7.259	–
2	7.338	–
3	7.192	–
4	6.801	–
5	6.706	–
6	6.652	–
		4.36

Table S3 The determination results for 1.0 μM adenine using the same sensor with the storage of one month.

Determination time	Day 1	Day 6	Day 12	Day 18	Day 24	Day 30
Oxidation peak current (μA)	6.694	6.612	6.520	6.275	5.967	5.824
Present value/original value (%)	–	98.7	97.4	93.7	89.1	87.0

Table S4 Influence of some possible interfering substances on the determination of 1.0 μM adenine (n = 3).

Interfering substances	Concentration (μM)	Oxidation potential [a] (V)	Relative error (%)
Glucose	500	–[b]	2.14
Sucrose	500	–	1.75
Arginine	500	–	1.63
Alanine	500	–	–1.81
Threonine	500	–	1.56
Serine	500	–	–0.96
Valine	500	–	1.12
Cysteine	500	0.325	–2.37

Tyrosine	50	0.695	3.65
Tryptophan	50	0.796	4.23
Ascorbic acid	50	0.119	3.78
uric acid	50	0.492	–2.55
Dopamine	50	0.289	7.89
Guanine	50	0.825	3.25
Thymine	50	1.223	4.56
Cytosine	50	1.306	3.68

[a] Oxidation potentials of interfering substances obtained at 3D-N-GN/GCE.

[b] No signal or weak signal observed.

Table S5 The applications of 3D-N-GN/GCE for the determination of adenine in biological fluids.

Sample	Spiked (μM)	Found [a] (μM)	Recovery (%)	RSD [b] (%)
Rabbit serum	0.20	0.19	95.0	3.9
	0.50	0.52	104.0	4.2
	0.80	0.83	103.8	3.2
human urine	0.20	0.21	105.0	2.7
	0.50	0.47	94.0	3.3
	0.80	0.78	97.5	2.5

[a] Average of five determinations; [b] RSD: relative standard deviation.