Supplementary Information

Highly sensitive hydrazine chemical sensor based on ZnO nanorods field-effect transistor

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1. ZnO NRs adhesion test

The established tight contact between the directly grown ZnO NRs and electrode were tested using adhesion-testing tape. From the FESEM image (Figure S2), the structural morphology of the as-grown ZnO NRs after testing with adhesion-testing tape was found to be similar without any changes. Thus, it confirms the stability of the vertically grown ZnO NRs, which also helps in fast electron transport due to large surface area.

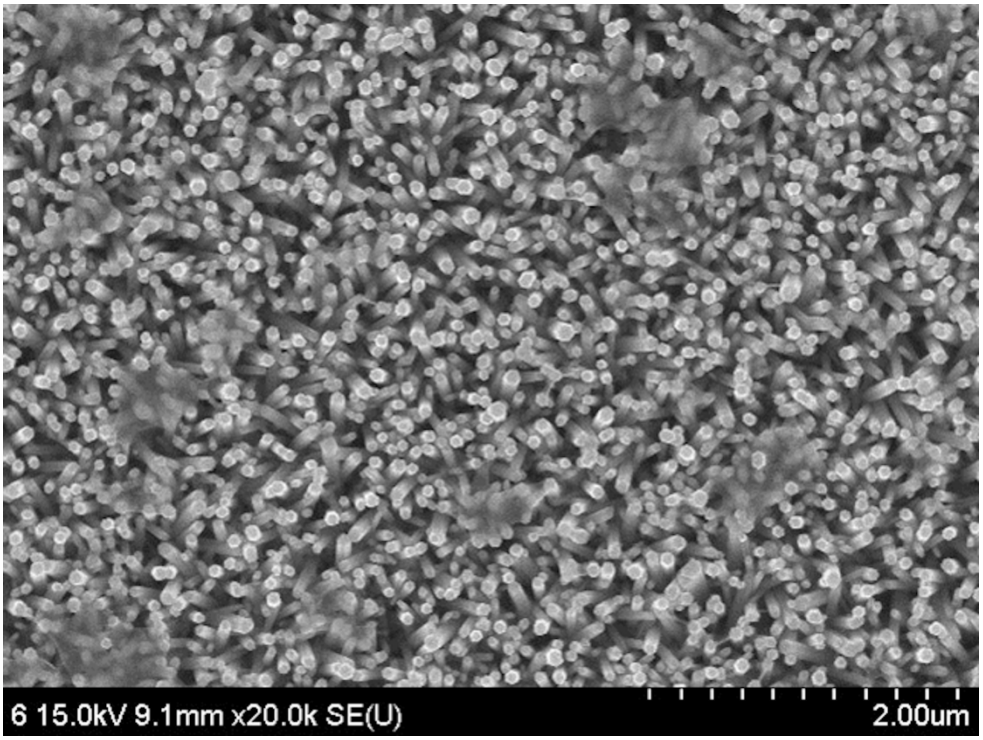

Fig. S1 FESEM image of ZnO NRs taken after adhesion tape test.

2. Transfer characteristic

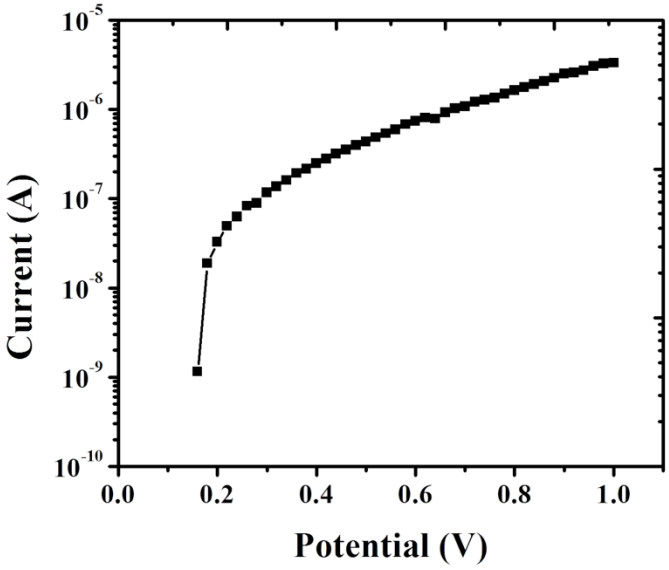

Fig. S2 Transfer characteristic curve of the FET based hydrazine sensor in the presence of 5 μM hydrazine in 0.01 M PBS at Vg =0.1. The calculated on/off ratio is ~10^4.

3. Table-S1: A response comparison of the ZnO NRs based FET with various ZnO nanostructure based amperometric hydrazine sensors.

Electrode materials	**Sensitivity ($\mu A/cm^2$ μM**	**Detection limit (µM)**	**Response time (s)**	**Linear range (µM)**	**Ref.**
ZnO nanonails	8.56	0.2	<5	0.1-1.2	2
ZnO nanorods	4.76	2.2	<10	0.2-2.0	3
ZnO nanorods	~0.044	~515.7	10	0.3-300	4
ZnO nanoparticles	97.133	0.14754	<5	0.1-10	5
ZnO nanoflower	0.2469	0.18	<3	0.6-250	6
Pristine ZnO nanorods arrays on alloy	4.48	0.2	<8	0.1-3.0	7
C@ZnO nanorod arrays on alloy	9.4	0.1	<4	0.1-3.8	7
Flower-like microstructure ZnO	0.095	2.1	<4	3.0-120	8
Hierarchical micro/ nanoarchitecture ZnO	0.51	0.25	<3	0.8-200	8
ZnO NRs based FET	59.175	~0.00386	~4	0.001-60	This work

4. Reference

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