Electronic Supplementary Material (ESI) for RSC Advances.

Highly active and porous single-crystal In_2O_3 nanosheet for excellent-response NO_x gas sensor at room temperature

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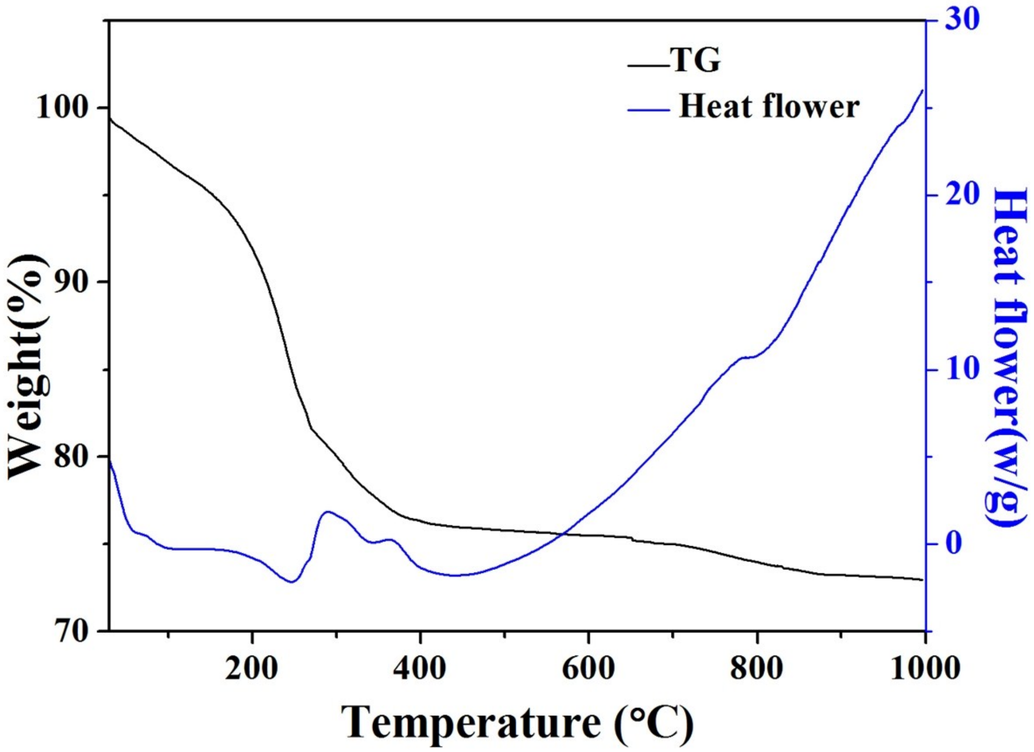

Figure S1. TG-DSC analyses of $In(OH)_3$ precursors

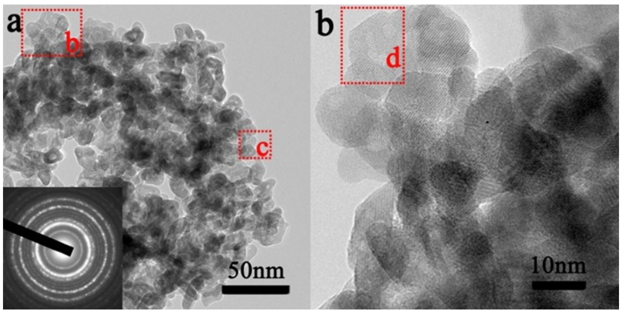

Figure S2. The TEM images of the synthesized In_2O_3 with 0.6 g $In(NO_3)_3$.

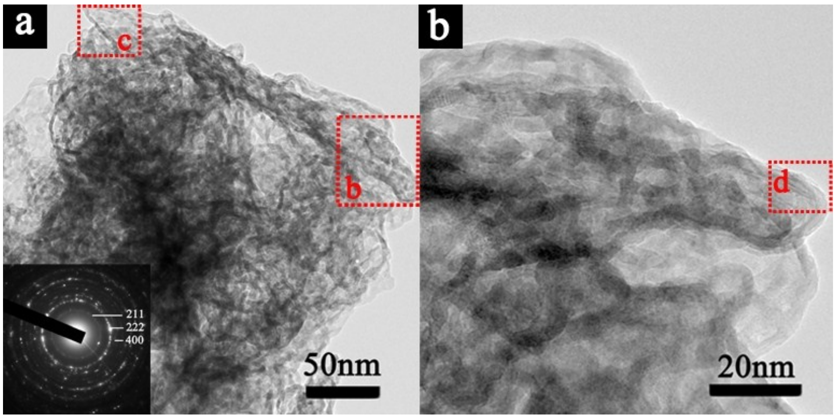

Figure S3. The TEM images of the synthesized In_2O_3 with 0.8 g $In(NO_3)_3$.

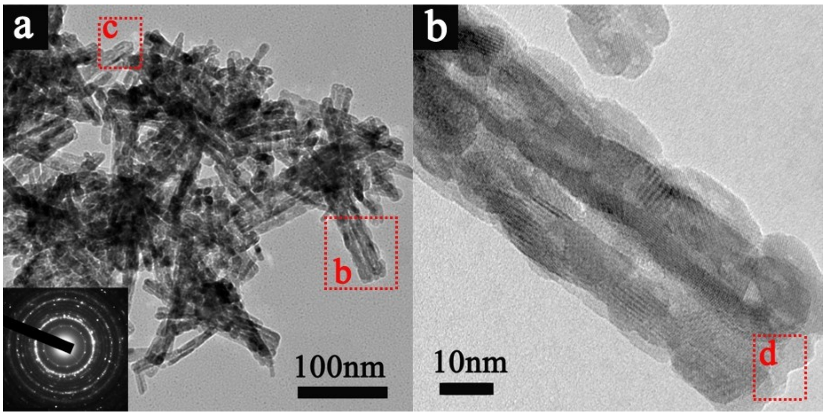

Figure S4. The TEM images of the synthesized In_2O_3 with 1.2 g $In(NO_3)_3$.

Table S1 The results of the surface area, pore volume and pore size.

Sample	S_{BET} (m^2 g^{-1})	pore volume (cm^3 g^{-1})	pore size (nm)
In_2O_3-0.6	50.99	0.53	34.73
In_2O_3-0.7	52.89	0.47	36.10
In_2O_3-0.8	65.70	0.27	18.07
In_2O_3-0.9	44.85	0.28	25.51
In_2O_3-1.0	41.09	0.29	28.89
In_2O_3-1.2	36.33	0.16	21.21

Table S2 The gas response of synthesized In_2O_3 with different $In(NO_3)_3$ addition for 97.0 ppm~0.485 ppm NO_x at room temperature.

Sample	Response $(R_N-R_0)/R_0$						
	97.0 ppm	48.5 ppm	29.1 ppm	9.70 ppm	4.85 ppm	0.97 ppm	0.485 ppm
In_2O_3-0.7	14.45	13.10	9.15	11.49	4.21	2.52	2.46
In_2O_3-0.8	20.37	13.48	8.42	3.5	2.24	0.77	--
In_2O_3-0.9	89.48	80.26	75.12	45.49	22.72	11.98	4.77
In_2O_3-1.0	14.88	13.59	11.62	12.17	8.86	7.95	1.67
In_2O_3-1.2	17.00	9.99	7.36	5.39	5.06	2.15	1.73

Table S3 The response time of synthesized In_2O_3 with different $In(NO_3)_3$ addition for 97.0 ppm~0.485 ppm NO_x at room temperature.

Sample	Response time (s)						
	97.0 ppm	48.5 ppm	29.1 ppm	9.70 ppm	4.85 ppm	0.97 ppm	0.485 ppm
In_2O_3-0.7	27	74	182	292	27	182	230
In_2O_3-0.8	20.6	20.6	16.6	20.0	27.3	27.3	--
In_2O_3-0.9	16.6	24.0	27.3	36.0	38.6	39.3	59.3
In_2O_3-1.0	11.33	74.0	79.3	72.6	133	136	400
In_2O_3-1.2	17.3	422.0	470.0	492.6	320.0	130.0	203.3

Table S4 The gas sensing performance of In_2O_3 sensors to NO_x gas.

	Material	Operating temperature	NO_x Concentration (ppm)	Response	Lowest detectable limit (ppm)
Our work	ps-In_2O_3 NS	Room temperature	0.485	4.77[a]	0.485
[S1]	Zn-doped In_2O_3	300 °C	5	2.74[b]	5
[S2]	Pd-loaded In_2O_3	110 °C	5	9[b]	5
[S3]	Porous In_2O_3	250 °C	50	164[b]	1
[S4]	In_2O_3	150 °C	100	33.45[b]	5
[S5]	In_2O_3-rGO	Room temperature	30	8.25[b]	----

[a]Response = $(R_g-R_a)/R_a$; [b]Response= R_g/R_a, where R_g and R_a are the resistance values of the sensor measured in the target gas and air, respectively.

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