Electronic Supplementary Material (ESI) for Nanoscale

Alumina Decorated TiO_2 Nanotubes with Ordered Mesoporous Walls as High Sensitivity of NO_x Gas Sensors at Room Temperature

Renjiang Lü[a,b], *Wei Zhou*[a], *Keying Shi*[a], *Ying Yang*[a,b], *Lei Wang*[a], *Kai Pan*[a], *Chungui Tian*[a], *Zhiyu Ren*[a], *Honggang Fu*[a]*

[a] Key Laboratory of Functional Inorganic Material Chemistry, Ministry of Education of the People's Republic of China, Heilongjiang University, Harbin 150080 P. R. China Tel.: +86 451 8660 4330, Fax: +86 451 8667 3647, E-mail: fuhg@vip.sina.com.

[b] College of Chemistry and Chemical Engineering, Qiqihar University, Qiqihar 161006, P. R. China

Supporting information

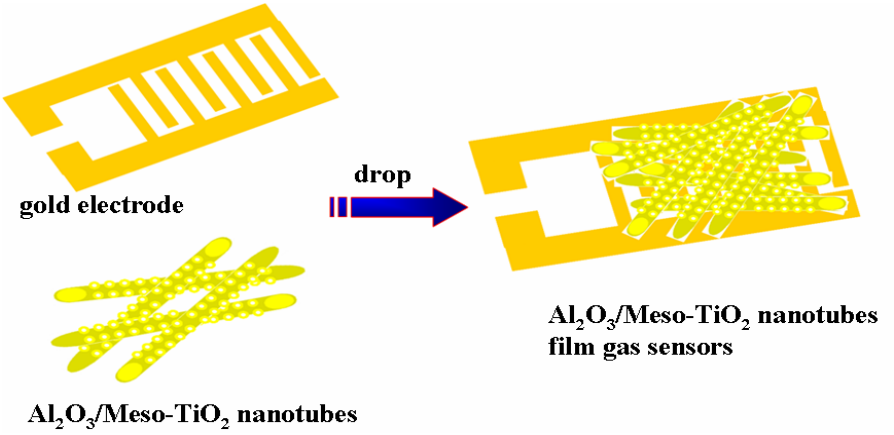

Fig. S1 Schematic illustration of fabrication for Al_2O_3/Meso-TiO_2 nanotubes film gas sensor.

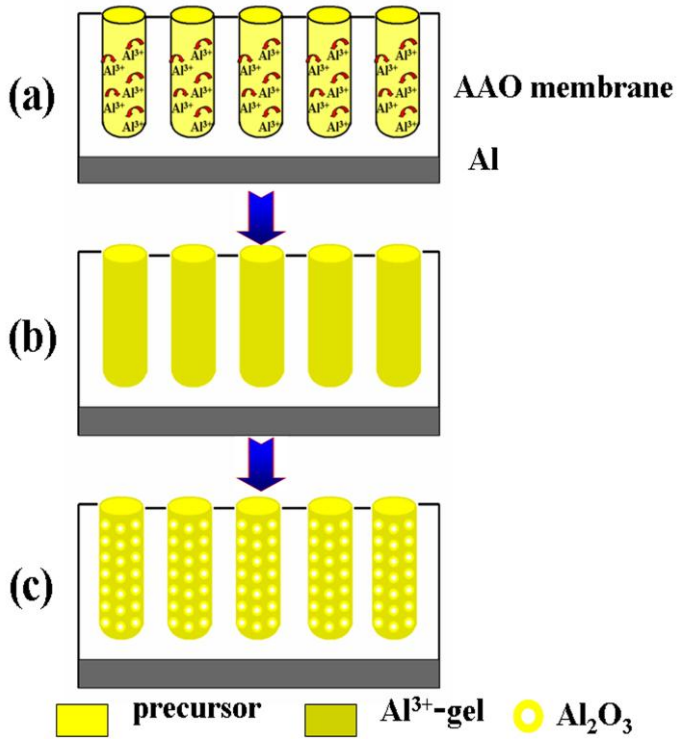

Fig. S2 Schematic illustration of the synthesis procedure for Al_2O_3/Meso-TiO_2 nanotubes.

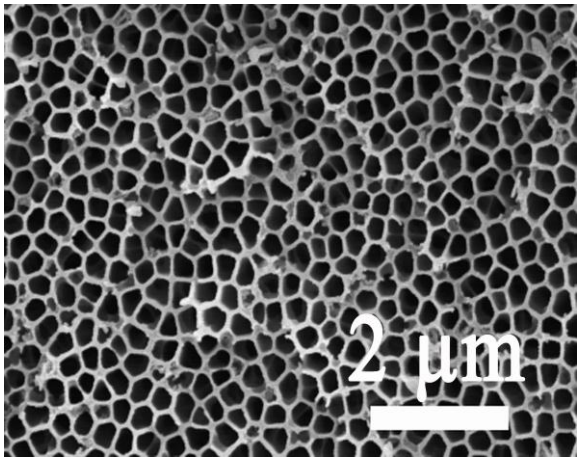

Fig. S3 SEM image of the prepared AAO membrane with ~200 nm pore diameters (top view).

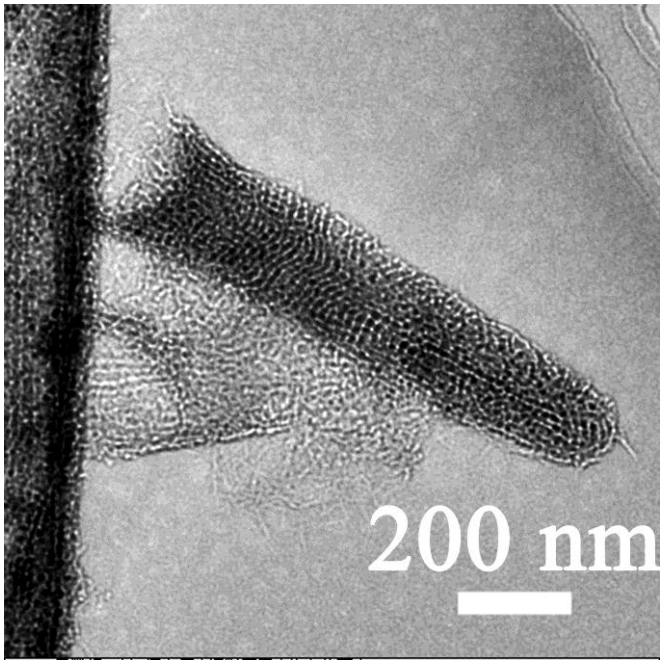

Fig.S4 TEM image of Al_2O_3/Meso-TiO_2 nanotubes sample after removing the AAO template.

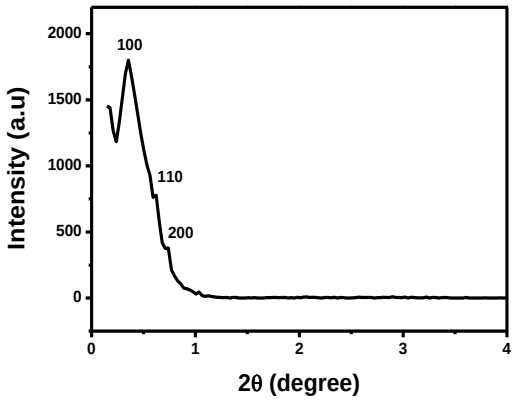

Fig. S5 The small-angle XRD patterns of the Al_2O_3/Meso-TiO_2 nanotubes samples.

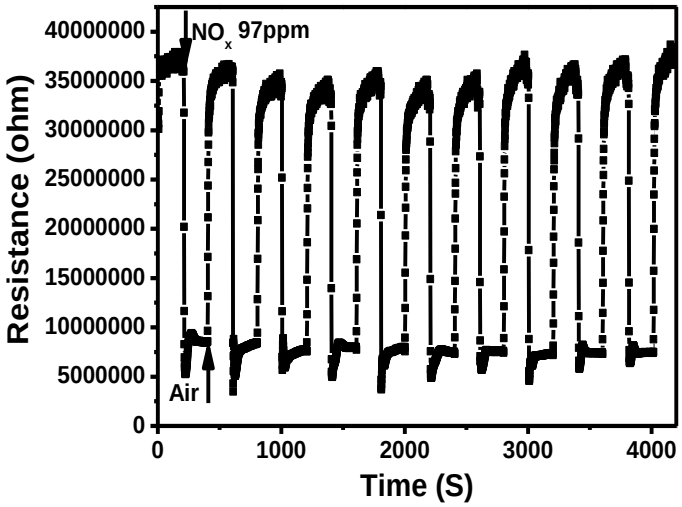

Fig. S6 Response-recovery curves of fabricated Al_2O_3/Meso-TiO_2 nanotubes film gas sensor to NO_x gas at 97 ppm (10 cycles) in air at room temperature.

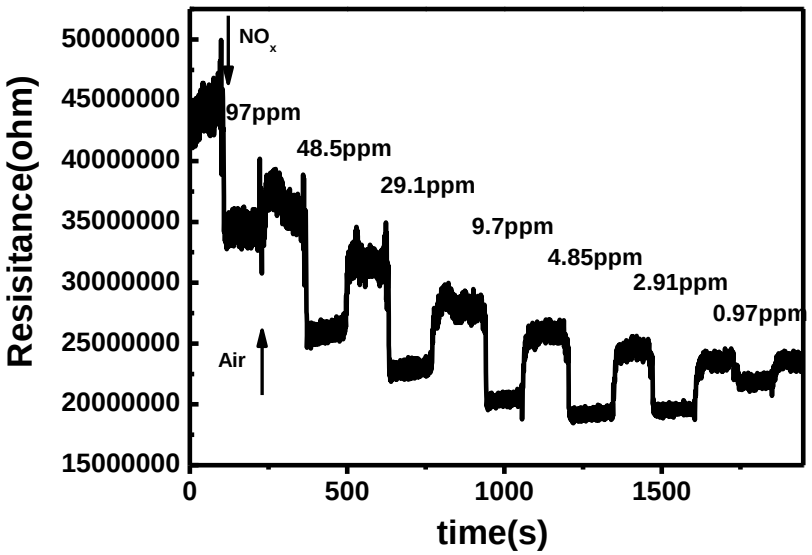

Fig. S7 Rresponse-recovery curves curves of Meso-TiO_2 nanotubes film gas sensor to various concentrations (0.97-97 ppm) NO_x gas at room temperature.

Table S1 Sensitivity, response time and recovery time of fabricated Al_2O_3/Meso-TiO_2 nanotubes film gas sensor to various concentrations (0.97-97 ppm) NO_x gas at room temperature.

NO_x Volume Concentration (ppm)	97	48.5	29.1	9.7	4.85	2.91	0.97
Sensitivity (%)	88.04	79.77	72.10	59.76	57.04	32.42	22.25
Response time (s)	8.0	7.3	7.3	7.3	8.6	14.0	16.0
Recovery time (s)	8.6	6.6	6.0	5.3	8.3	8.3	8.4