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Nanoparticle Cluster Gas Sensor: Pt Activated SnO_2 Nanoparticle for NH_3 Detection with Ultrahigh Sensitivity

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Table S1. Structural data and refinement parameters for SnO_2 nanoparticle clusters calculated by Rietveld refinement of the experimental XRD powder pattern.

Space group	$P4_2/mnm$ (136)
Lattice parameters	
a (Å)	4.7334
b (Å)	4.7334
c (Å)	3.1600
Unit Cell Volume (Å^3)	70.800
Sn	
x	0
y	0
z	0
O	
x	0.2827
y	0.2827
z	0
Average crystallite size (nm)	3.0
Average maximum strain (10^{-3})	5.5365
R_{WP} (%)	14.7
R_P (%)	11.0

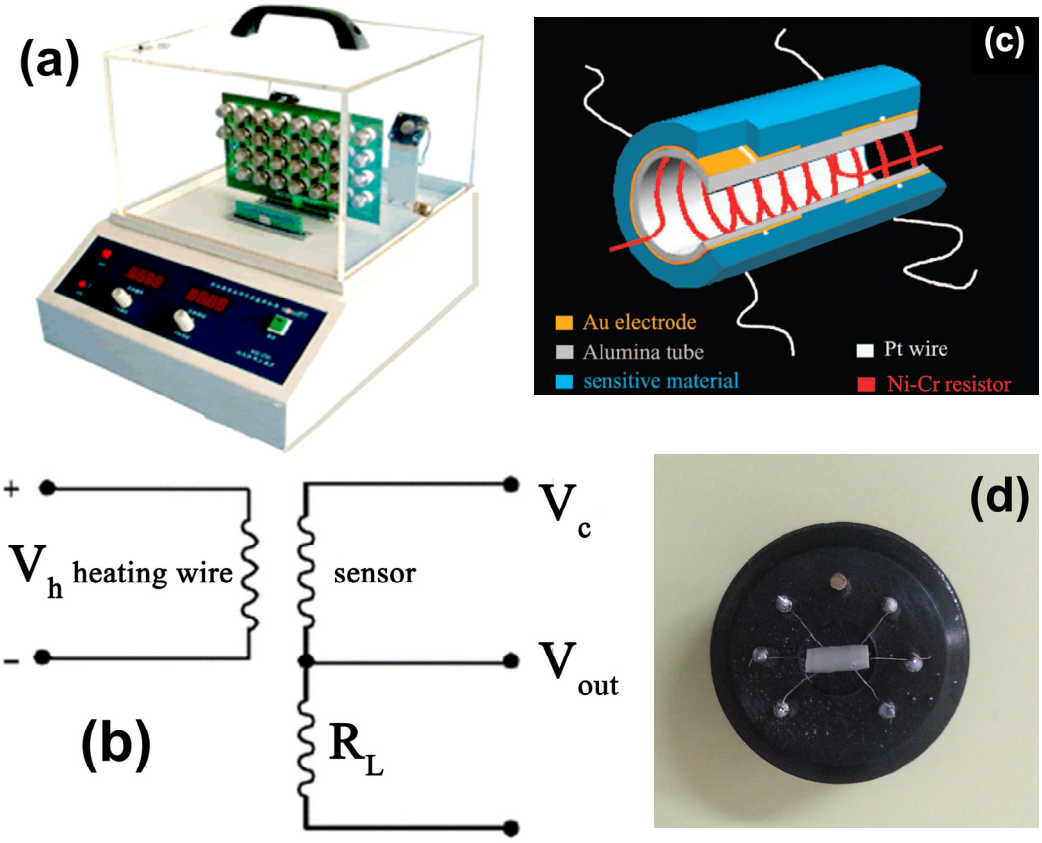

Fig. S1 (a) A photograph of the WS-30 A testing system, (b) the basic testing principle (where V_h is the heating voltage, R_L is a constant load resistance, V_{out} is the sensor export voltage, and V_c is the working voltage (5V).), (c) the schematic structure of the gas sensor, and (d) the picture of a completed gas sensor.

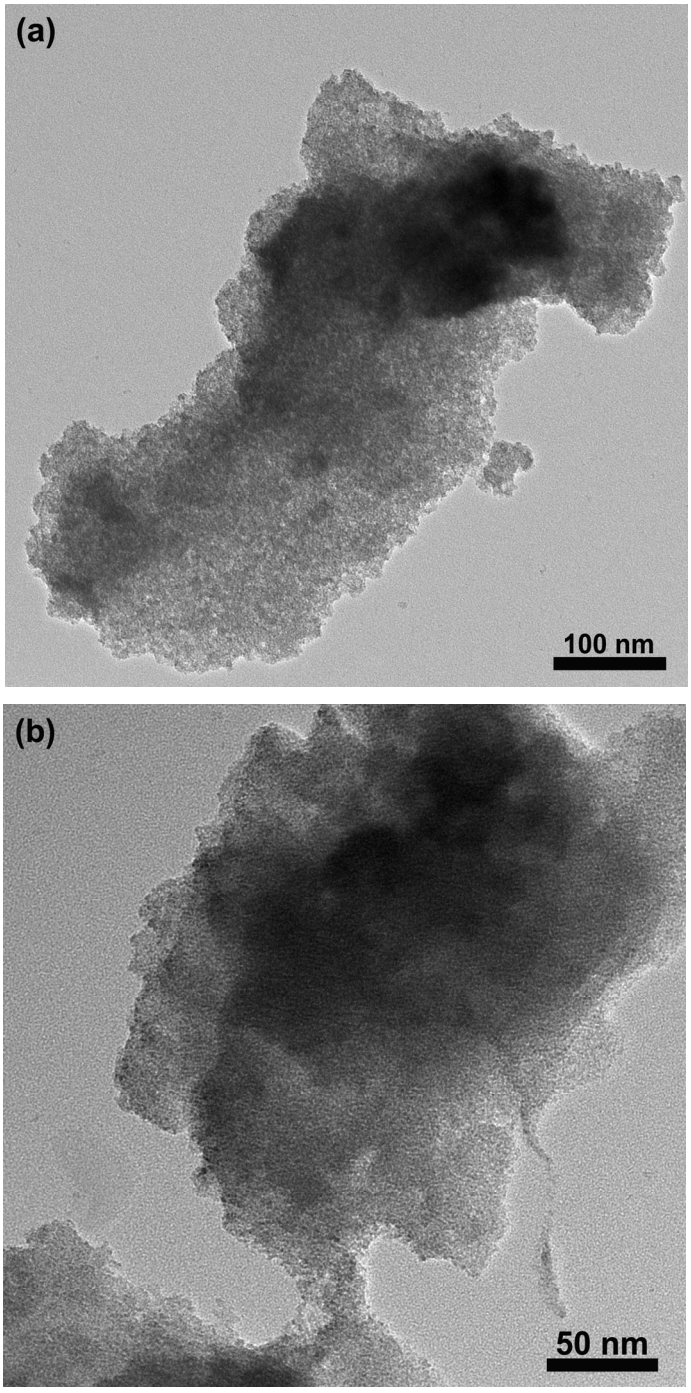

Fig. S2 TEM image of unbroken (a) Pt activated and (b) pure SnO_2 nanoparticle clusters.

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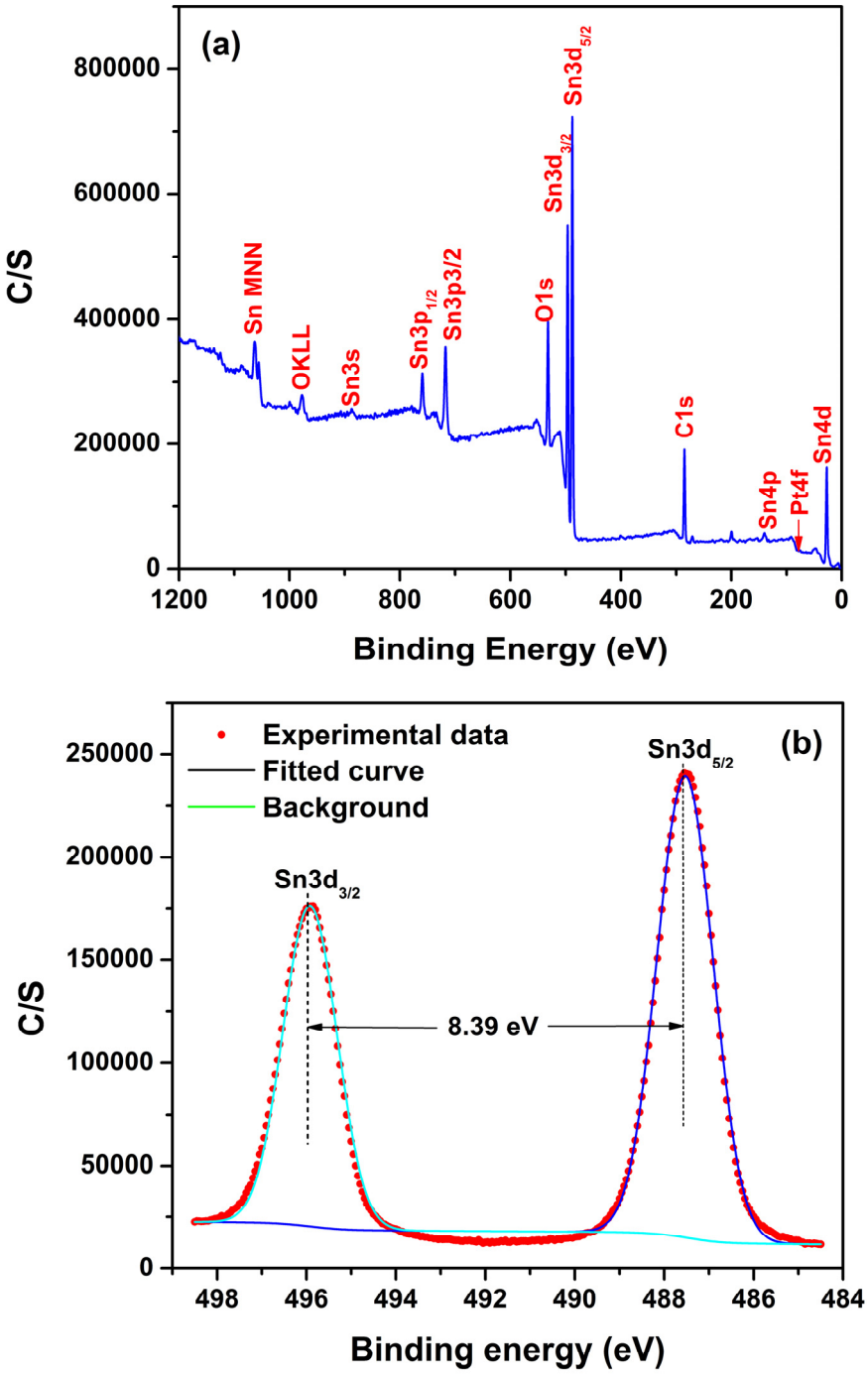

Fig. S3 (a) XPS survey and (b) high-resolution spectra of Sn3d for Pt activated SnO_2 nanoparticle clusters.

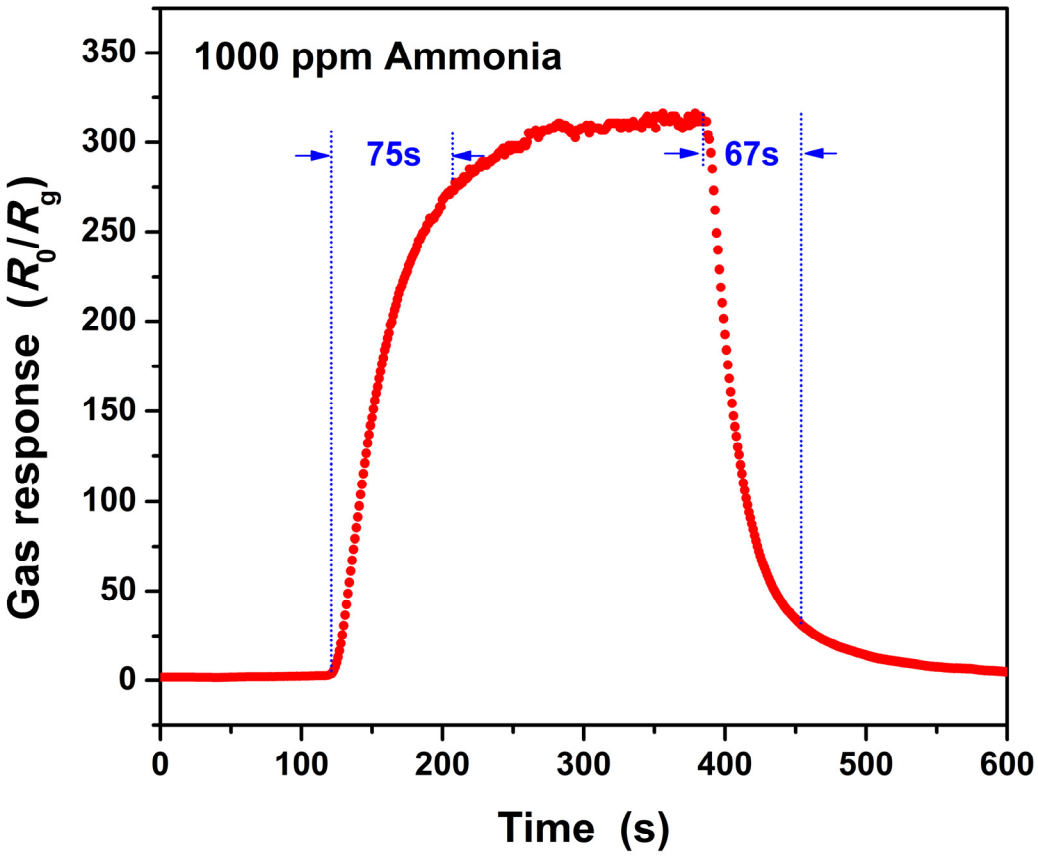

Fig. S4 Magnified dynamic response-recovery curve of as-fabricated sensor based on Pt activated SnO_2 nanoparticle clusters toward 1000 ppm ammonia at 115 °C

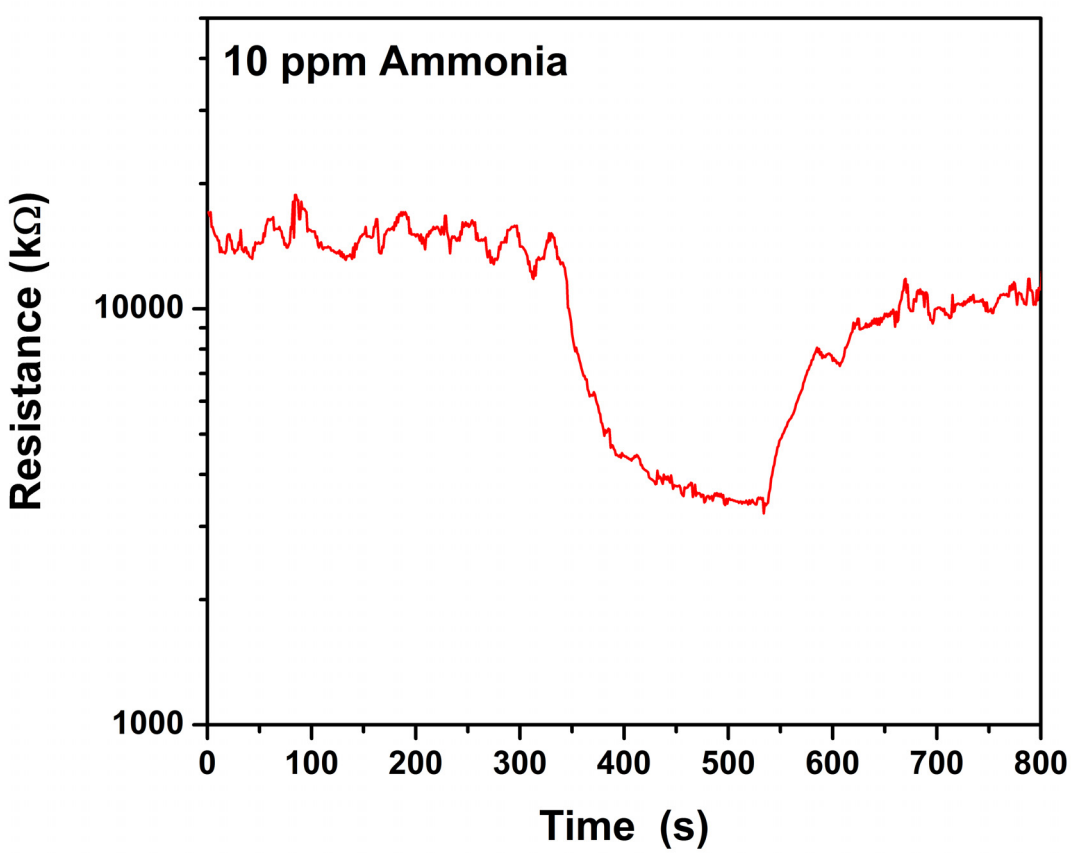

Fig. S5 Dynamic response-recovery curve of as-fabricated sensor based on Pt activated SnO_2 nanoparticle clusters toward 10 ppm ammonia at 115 °C

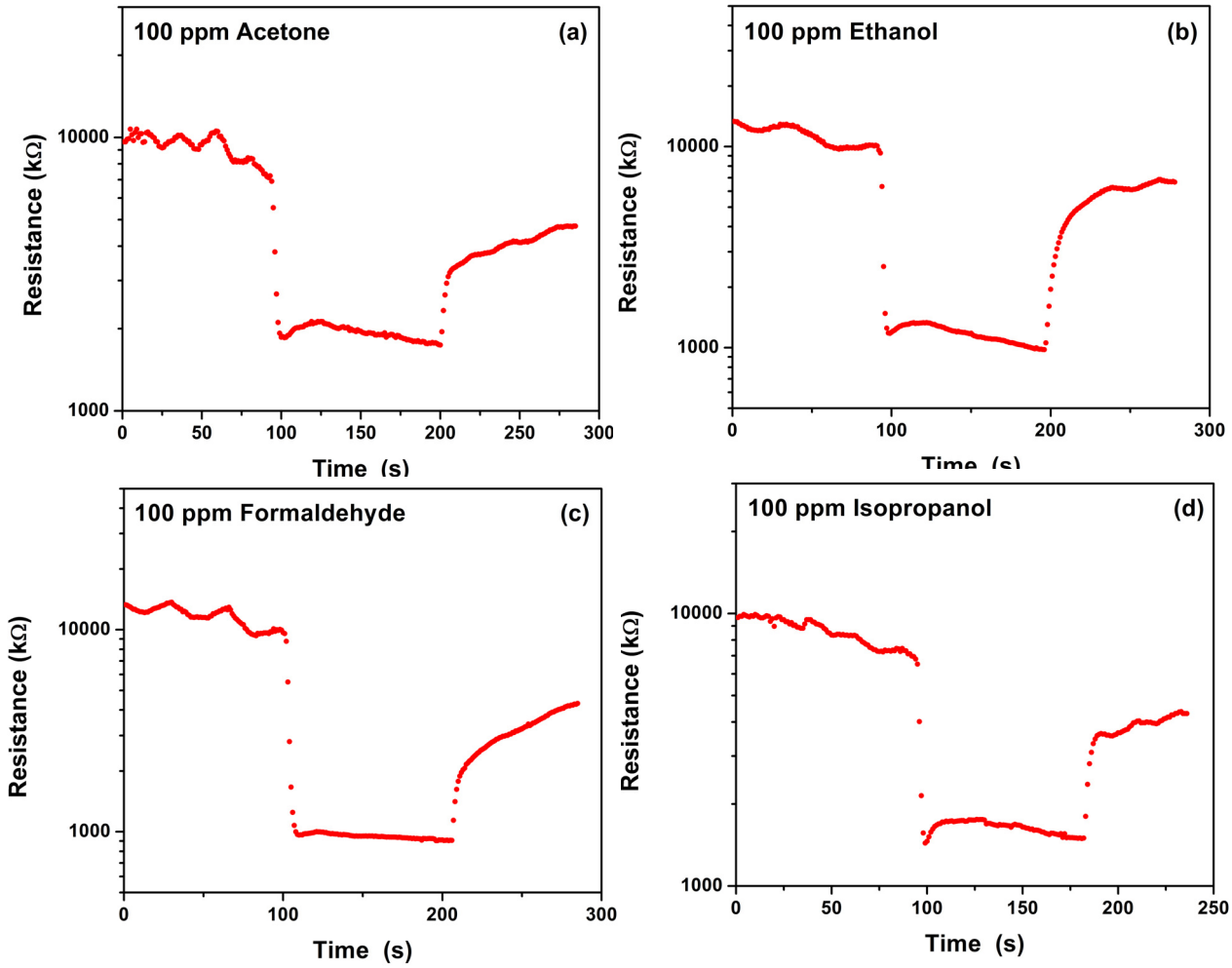

Fig. S6 Dynamic response-recovery curves of as-fabricated sensor based on Pt-SnO_2 nanoparticles toward 100 ppm (a) acetone, (b) ethanol, (c) formaldehyde and (d) isopropanol at 115 °C**.**