Electronic Supplementary Information for

Sea urchin-like Ag/α-Fe_2O_3 Nanocomposite Microspheres: Synthesis and Gas Sensing Application

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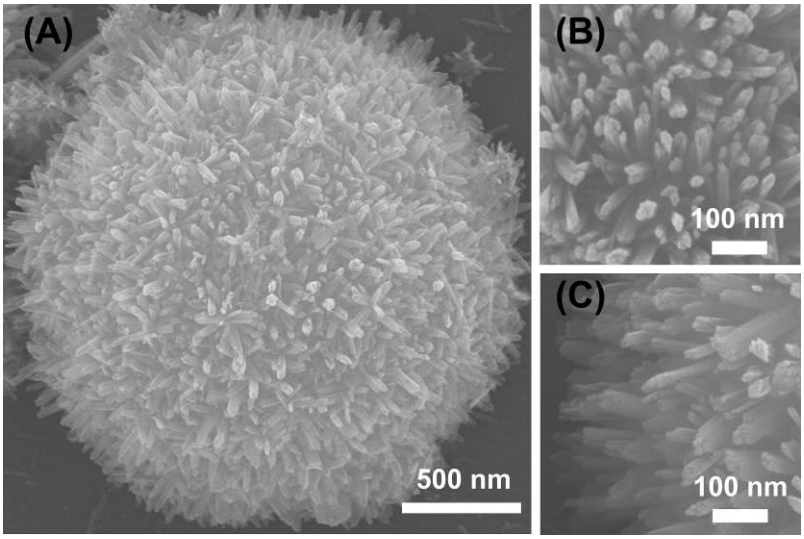

Fig. S1 SEM images of (A) a single α-FeOOH microsphere and (B), (C) magnified view of parts of the microsphere from the different visual direction.

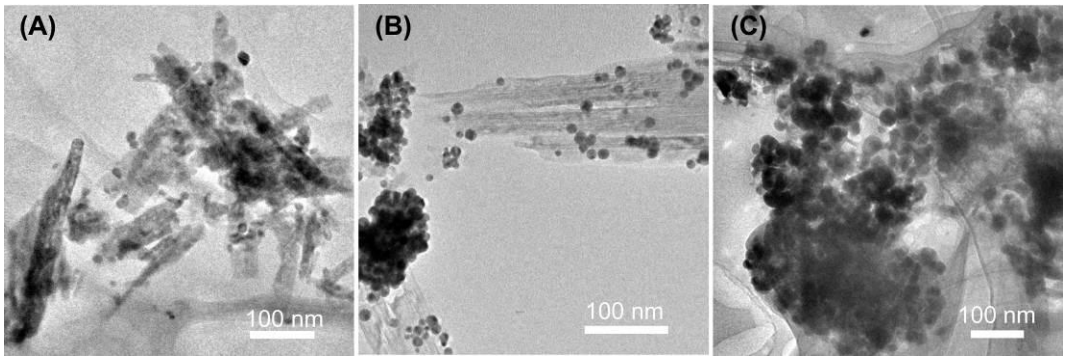

Fig. S2 TEM images of Ag-loaded α-Fe_2O_3 architectures, corresponding to the 5.0 wt% (A), 10.0 wt% (B), and 15.0 wt% (C) Ag/α-Fe_2O_3.

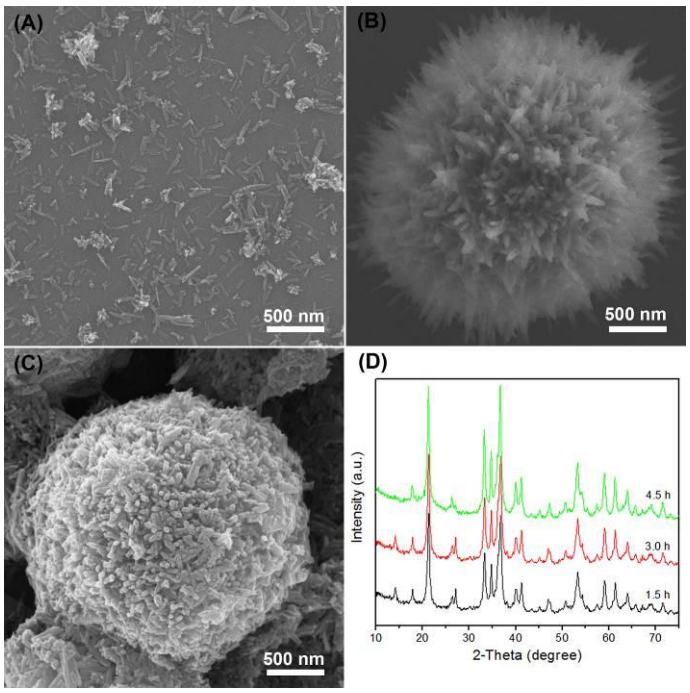

Fig. S3 Typical SEM images of the as-prepared samples at 120 ºC for different reaction times: (A) 1.5 h, (B) 3 h, (C) 4.5 h, and corresponding XRD patterns (D).

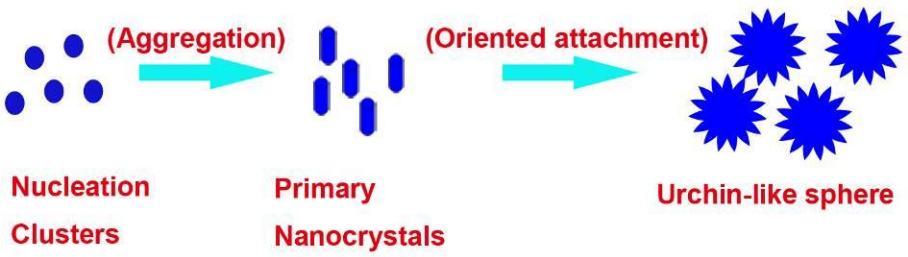

Fig. S4 Schematic illustration for the formation process of the sea urchin-like α-FeOOH microspheres.

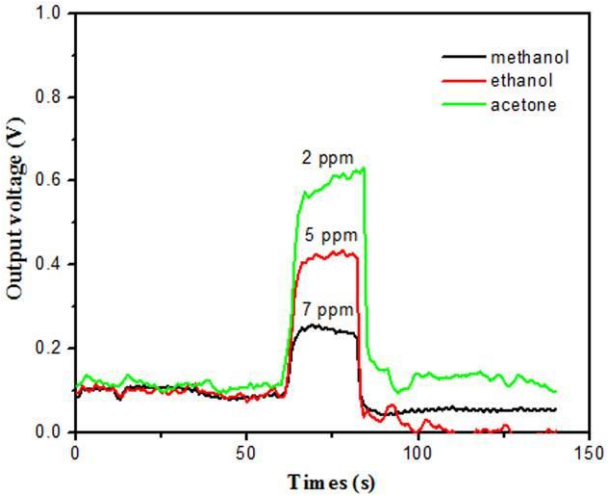

Fig. S5 Typical response curve and variations of the sensitivity of 3D sea urchin-like 4.0 wt% Ag/α-Fe_2O_3 sensors exposed to methanol, ethanol, and acetone.

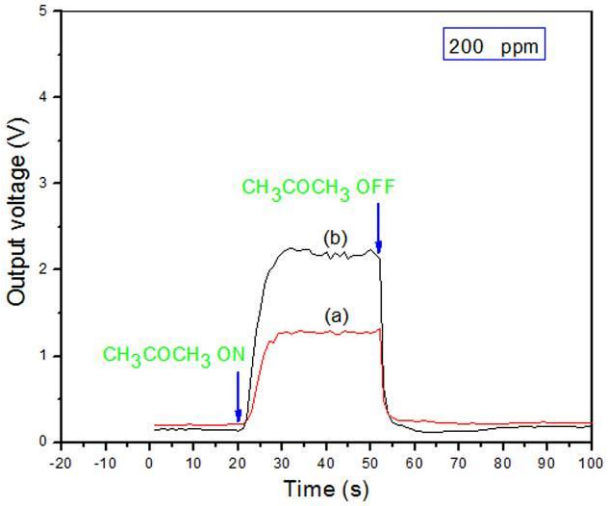

Fig. S6 Typical response curve and variations of the sensitivity of nanocubes (a) and 3D sea urchin-like α-Fe_2O_3 (b) sensors exposed to acetone at concentration of 200 ppm measured at 350 ºC.

Table S1. Brunauer–Emmett–Teller surface area and pore size distribution of Ag/Fe_2O_3 samples.

Ag/Fe_2O_3 (wt%)	0	0.5	1.0	2.0	4.0	5.0	10.0	15.0
Specific surface area (m^2/g)	37.6	44.7	55.1	62.3	70.5	50.8	29.9	25.9
Pore size (nm)	5.51	5.47	5.49	5.50	5.52	5.56	5.53	5.54

Table S2. Elemental analysis of Ag/Fe_2O_3 samples.

Ag/Fe_2O_3 loaded with different Ag contents (wt%)	Ultimate analysis (wt%)		
	C	H	S
pure	0.008	0.283	1.325
0.5	0.018	0.230	1.636
1.0	0.003	0.207	1.636
2.0	0.016	0.198	1.789
4.0	0.002	0.134	1.982
5.0	0.004	0.151	1.891
10.0	0.008	0.205	1.783
15.0	0.002	0.179	1.672