

Supplementary Materials: Improvement of Toluene-Sensing Performance of SnO₂ Nanofibers by Pt Functionalization

Jae-Hun Kim, Zain Ul Abideen, Yifang Zheng and Sang Sub Kim

Table S1. Various approaches for functionalization of tin oxide nanostructures and their responses.

SnO ₂ Morphology	Synthesis Method	Type of Gas	Temperature (°C)	Response	Reference
Cu-doped SnO ₂ spheres	Hydrothermal	H ₂ S (300 ppm)	300	40	[21]
Pt/SnO ₂ catalysts	Wet impregnation	CO	150	>50	[22]
Pd/SnO ₂ nanostructures	Microwave assisted hydrothermal	CO (200 ppm)	200	7	[23]
Pd-SnO ₂ nanowires	Sol-gel method	CO (2000 ppm)	275	7	[24]
CuO/SnO ₂ composite	Catalytic oxidation	C ₆ H ₆ (50 ppm)	280	6.3	[25]
V ₂ O ₅ /SnO ₂ composite	Non-aqueous synthesis	C ₆ H ₆ (50 ppm)	270	<5.5	[26]
TiO ₂ /SnO ₂ nanosheets	Hydrothermal process	(C ₂ H ₅) ₃ N (100 ppm)	260	52.3	[27]
Pt-SnO ₂ hierarchical nanocomposites	Dipping and precipitation method	C ₂ H ₅ OH (100 ppm)	100	11.2	[28]
Pt NPs-functionalized SnO ₂ nanofibers	Electrospinning and sputtering	C ₇ H ₈ (10 ppm)	300	11.9	Present work

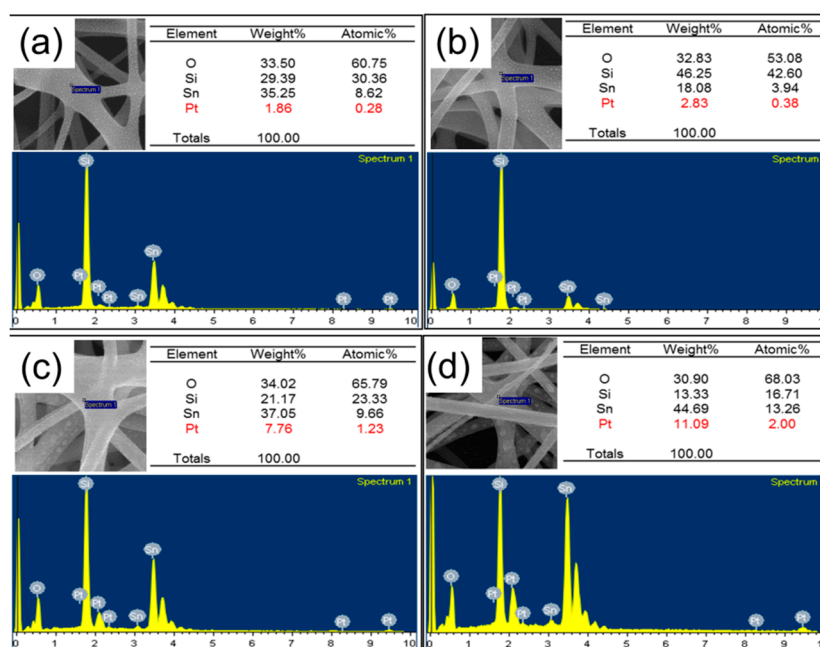


Figure S1. Cont.

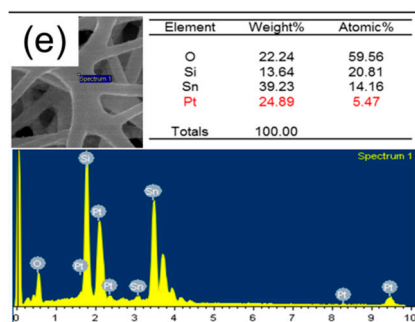


Figure S1. Elemental analysis by EDS of SnO₂ NFs functionalized with Pt NPs containing (a) 0.2 at.%; (b) 0.3 at.%; (c) 1.2 at.%; (d) 2.0 at.%; and (e) 5.4 at.% Pt.

0.2 at.% (a)			0.3 at.% (b)			1.2 at.% (c)		
Element	Weight%	Atomic%	Element	Weight%	Atomic%	Element	Weight%	Atomic%
O K	33.50 +/- 0.13	60.75	O K	32.83 +/- 0.13	53.08	O K	34.02 +/- 0.11	65.79
Si K	29.39 +/- 0.33	30.36	Si K	46.25 +/- 0.28	42.60	Si K	21.17 +/- 0.09	23.33
Sn L	35.25 +/- 0.32	8.62	Sn L	18.08 +/- 0.32	3.94	Sn L	37.05 +/- 0.26	9.66
Pt M	1.86 +/- 0.19	0.28	Pt M	2.83 +/- 0.20	0.38	Pt M	7.76 +/- 0.23	1.23
Totals	100.00		Totals	100.00		Totals	100.00	

2.0 at.% (d)			5.4 at.% (e)		
Element	Weight%	Atomic%	Element	Weight%	Atomic%
O K	30.90 +/- 0.13	68.03	O K	22.24 +/- 0.12	59.56
Si K	13.33 +/- 0.33	16.71	Si K	13.64 +/- 0.21	20.81
Sn L	44.69 +/- 0.37	13.26	Sn L	39.23 +/- 0.40	14.16
Pt M	11.09 +/- 0.30	2.00	Pt M	24.89 +/- 0.38	5.47
Totals	100.00		Totals	100.00	

$$at.\% = \left(\frac{wt.\%}{atomic\ weight} \right) \times 100$$

Figure S2. Elemental analysis including errors in quantitative calculation by EDS of SnO₂ NFs functionalized with Pt NPs containing (a) 0.2 at.%; (b) 0.3 at.%; (c) 1.2 at.%; (d) 2.0 at.%; and (e) 5.4 at.% Pt.