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Electronic Supplementary Information (ESI) for

Cubic mesoporous Pd-WO_3 loaded graphitic carbon nitride (g-CN) nanohybrids: highly sensitive and temperature dependent VOCs sensors

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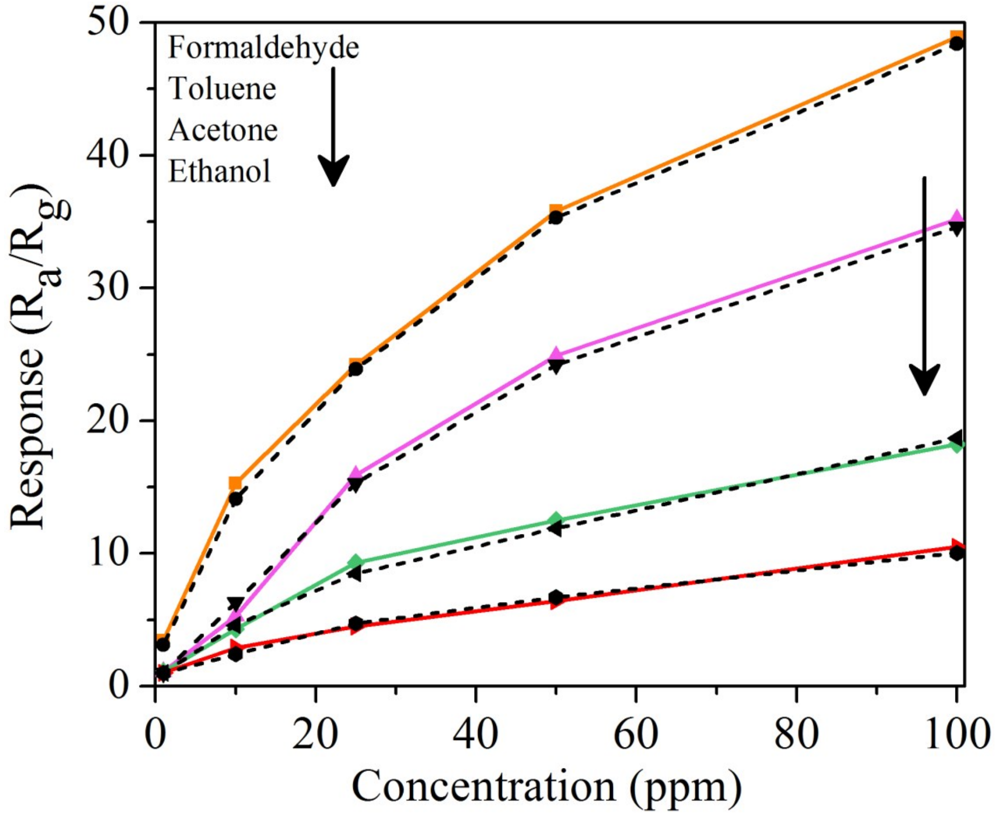

Figure S1: Comparison of sensing performance of Pd-WO_3/g-CN for test VOCs measured using Ag-Pd IDE (—) and ceramic substrate (- - -) measured at 120 ºC.

Table ST1: Formaldehyde concentration measurement inside the gas chamber using Drager's tube

Injected concentration of formaldehyde (ppm)	**Formaldehyde detected inside the chamber using Drager's tube (ppm)**	
	Day 0	**Day 5**
5	5 ± 0.35	5 ± 0.36
10	10 ± 0.18	10 ± 0.3
25	25 ± 0.3	25 ± 0.24

Table ST2: A comparison of formaldehyde sensing performance of previously published works.

S. No.	Material	Morphology/Synthesis route	Concentration (ppm)	Operating temperature (°C)	Response	Response/ Recovery time (s/s)	Ref
1	SnO_2	Nanosheets/hydrothermal	100	240	7	1/6	1
2	SnO_2/Zn_2SnO_4	Nanorods/ hydrothermal	1000	162	83.8	35/78	2
3	SnO_2/graphene	Mesoporous/solvothermal	100	120	45#	1/85 (1 ppm)	3
4	NiO/Sn	3-D ordered mesoporous/ colloidal crystal template	100	225	145	30/160	4
5	NiO	Flower/solvothermal	100	200	3.5	30/56	5
6	Ag/Al-ZnO	Macro-mesoporous/one step solution combustion method	100	240	87.6	47/5	6
7	Au-ZnO	Single crystalline nanoplates/ hydrothermal + photodeposition	50	360	23#	N.D.	7
8	$Ag/LaFeO_3$	Cage like/ hydrothermal + chemical synthesis	1	70	23	20/30	8
9	Sr/In_2O_3	Hollow submicrospheres/ solvothermal	100	200	9.4	43#/12#	9
10	Zn/SnO_2	Microspheres/solvothermal	100	160	15.2	2/2	10
11	Ag/Co_3O_4	Microspheres/hydrothermal	20	90	17.25	N.D.	11
12	SnO_2/In_2O_3	Nanotubes/electrospinning	50	300	118	60/97	12
13	$Ag/LaFeO_3$	Nanocomposite/molecular imprinting technique	2	125	25#	90/80	13
14	$CuO-TiO_2$	Nanofiber/electrospinning + hydrothermal	10	200	5#	1.4/24.8	14
15	$Au@In_2O_3$	Core shell/ hydrothermal + aging	100	200	17	7/135	15
16	NiO	Ordered mesoporous/ hydrothermal + nanocasting	100	300	10#	119/39 (390 ppm)	16
17	**$Pd-WO_3$/g-CN**	**Ordered mesoporous/ hydrothermal + nanocasting**	**25**	**120**	**24.2**	**6.8/4.5**	**This work**

Estimated

Table ST3: A comparison of toluene sensing performance of previously published works

S. No	Material	Morphology/Synthesis route	Concentration (ppm)	Operating temperature (°C)	Response	Response/ Recovery time (s/s)	Ref
1	SnO_2	Yolk shell cuboctahedra/ Chemical Synthesis	20	250	28.6	1.8/4.1	17
2	Au/WO_3	Nanosheets/hydrothermal	100	300	50	2/9	18
3	NiO/SnO_2	Nanofibers/ Electrospinning	50	330	11	11.2/4	19
4	SnO_2/Fe_2O_3	Nanotubes/Chemical synthesis	50 1	260	25.3 (50 ppm) 3.9 (1 ppm)	-- 5/11	20
5	ZnO	Flower like/Hydrothermal	100	350	42.6	53/151	21
6	Au/ZnO	Nanowires/Chemical synthesis	50	340	7.5*	45/39	22
7	rGO/Co_3O_4	Nanosheets/Hydrothermal	5	110	11.3	>150/>180*	23
8	rGO/polyethylene oxide	Thin film/Chemical synthesis	80	Room temperature	0.03#	127/143	24
9	Co_3O_4	Nanosheets/Chemical synthesis	100	150	6.08	150/200*	25
10	α-Fe_2O_3/SnO_2	Heterostructure/Ultrasonic spray pyrolysis	100	90	49.7#	25/20*	26
11	SnO_2	Nanofibers/Electrospinning	100	350	6	1/5	27
12	α-Fe_2O_3/SnO_2	Core-shell nanotubes/ Hydrothermal	100	300	4.2	--	28
13	**Pd-WO_3/g-CN**	**Ordered mesoporous/ hydrothermal + nanocasting**	**25**	**120**	**21.7**	**7.2/4.9**	**This work**

* Estimated value

Response = $(R_g-R_a)/R_a$

Table ST4: A comparison of acetone sensing performance of previously published works

S. No	Material	Morphology/Synthesis route	Concentration (ppm)	Operating temperature (°C)	Response	Response/ Recovery time (s/s)	Ref
1	La/SnO_2	Layered nanoarray/ hydrothermal	200	300	70	48/56	29
2	SnO_2	Hollow microspheres / hydrothermal	50	200	15	5/7	30
3	Pt/WO_3	Hemitubes / Sputter deposition	2	300	4.11	--	31
4	Y-SnO_2	Nanobelt/ Thermal evaporation	100	210	11.4	9-25/10-30	32
5	SnO_2	Hollow nanobelt/ Single capillary electrospinning	100	260	52.7	46/10 (10 ppm)	33
6	Au/WO_3	Nanorods/ Thermal evaporation	200	300	132	98/91	34
7	Ce-SnO_2	Hollow spheres/ Chemical synthesis	100	250	11.9	18/7	35
8	WO_3	Nanotubes/ Electrospinning	40	250	19.7	5/22	36
9	Eu-SnO_2	Nanofibers/ Electrospinning	100	280	32.2	4/3	37
10	Au/SnO_2	Hollow microspheres/ Hydrothermal	5	220	3.1	0.9/21	38
11	α-Fe_2O_3/ SnO_2	Nanofibers/ Electrospinning	100	275	5..3	1.5/2.5	39
12	Au@TiO_2-SnO_2	Flower-like/ Hydrothermal	100	220	43	6.5/8	40
13	**Pd-WO_3/g-CN**	**Ordered mesoporous/ hydrothermal + nanocasting**	**25**	**120**	**21.3**	**8.1/7.1**	**This work**

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