Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information (ESI)

Size-Strain Distribution Analysis of SnO_2 Nanoparticles and its Multifunctional Applications of Fiber Optic Gas Sensor, Supercapacitor and Optical Limiter

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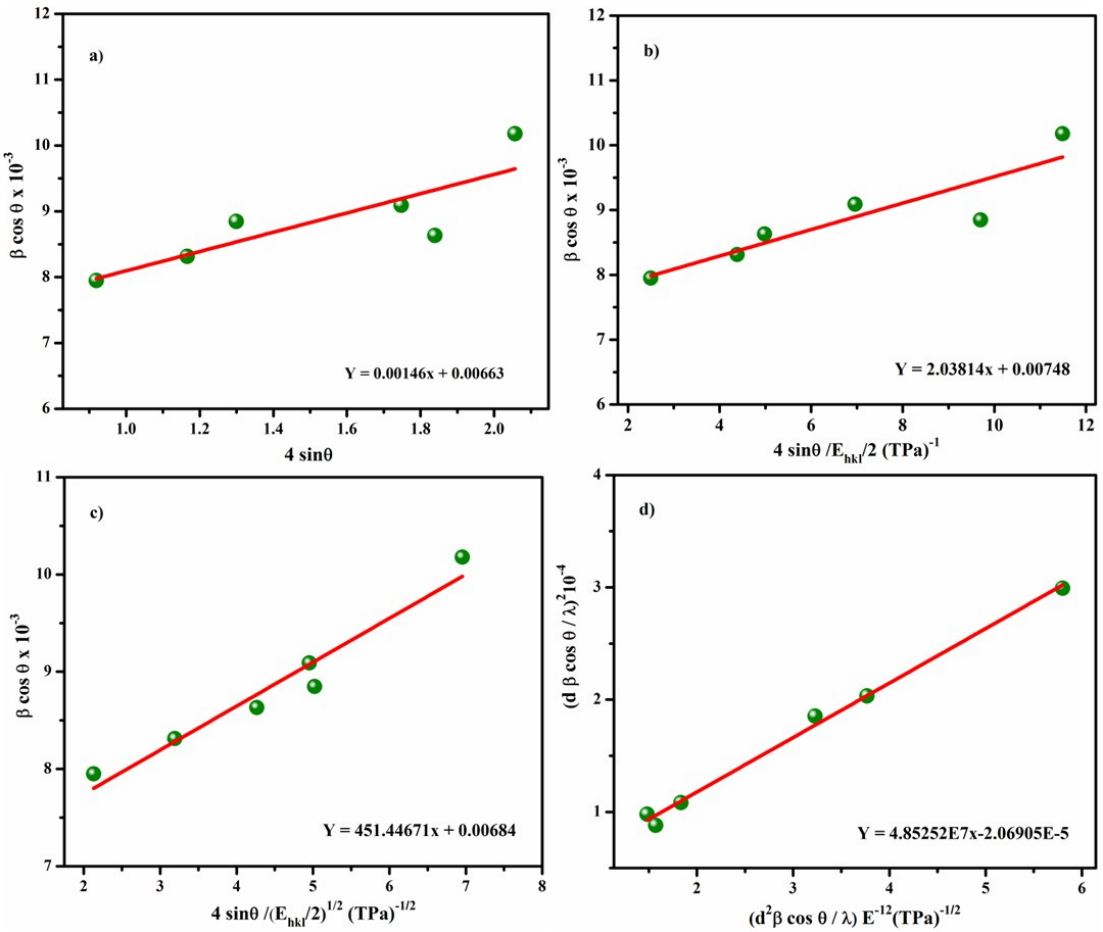

Fig. S1 (a) UDM, (b) USDM, (c) UDEDM and (d) SSP plot of SnO_2 NPs.

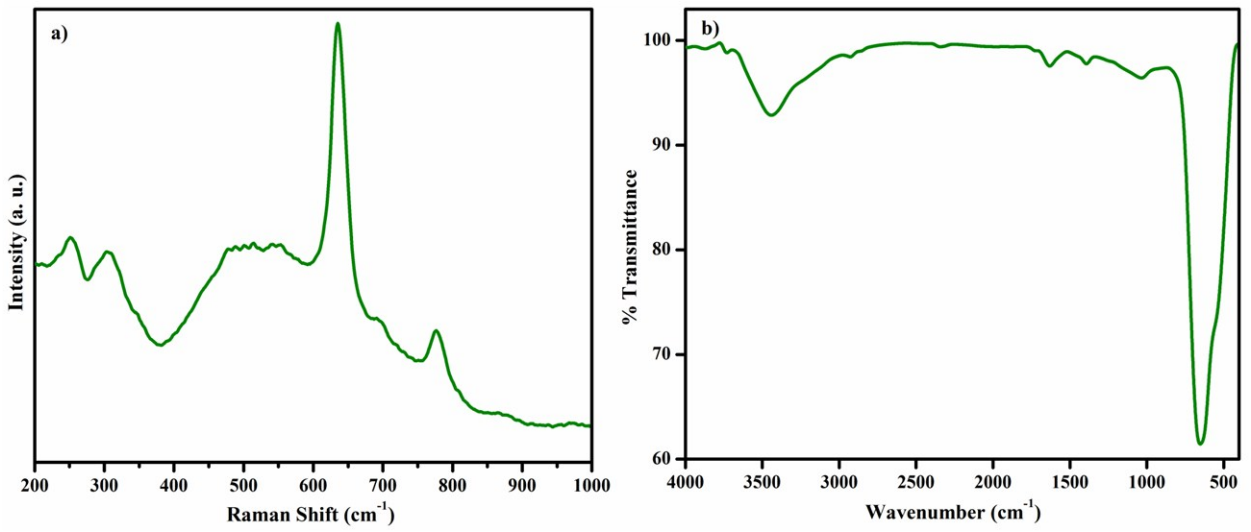

Fig. S2 (a) Micro-Raman and (b) FTIR spectrum of SnO_2 NPs

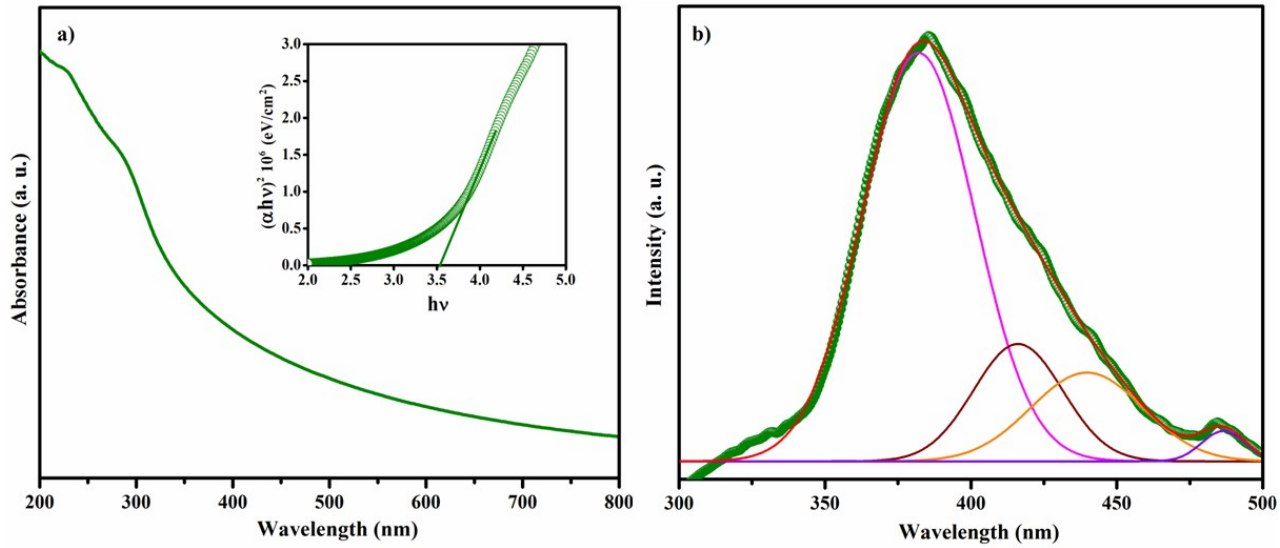

Fig. S3 (a) UV-Vis absorption (inset: Tauc plot) and (b) PL spectrum for SnO_2 NPs.

Table S1. Comparison of the fiber optic gas sensing performance of SnO_2 NPs with other nanomaterials towards ammonia at ambient temperature.

Materials	Morphology	Sensitivity (counts/100ppm)	Ref
SWCNT (Purity:94wt%, diameter:1.3 nm)	Nanotubes	11	40
Li: ZnO	Nanocrystalline	15	41
Ag	Nanowires	17	42
SnO_2	Nanoparticles	18	Present work

Table S2. Comparison of specific capacitance of SnO_2 NPs electrode with other metal oxide nanostructures.

Materials	Morphology	Electrolyte	Current density	Specific capacitance ($F.g^{-1}$)	Ref
CuO	Nanoporus	3M KOH	3.5 $mA.cm^{-2}$	431	45
NiO	Nanocluster	1M KOH	0.3 $A.g^{-1}$	449	46
CO_3O_4	Coralliod Nanostructure	3M KOH	0.5 $A.g^{-1}$	591	47
MnO_2	Nanorod	1M KOH	1 $A.g^{-1}$	821	48
SnO_2	Nanoparticles	2M KOH	2 $mA.cm^{-2}$	1686	Present work

Table S3. Comparison of the NLO parameters of SnO_2 NPs with other NLO nanomaterials.

Laser	Materials	Energy (μJ)	Intensity (I_0) (GW/m^2)	NLO Response	β x 10^{-11} m/W	Ref.
532 nm, 6.5 ns, 10 Hz	ZrS_3/RGO Composites	32	1430	RSA	62.7	55
532 nm, 5 ns, 0.1 Hz	(1-x) $BiFeO_3$-x $NaNbO_3$ Multiferroic Nanocomposites	40	-	TPA	10	56
532 nm, 5 ns, 0.2 Hz	CuO NPs	50	-	TPA	6.4	52
532 nm, 40 ns, 1 kHz	MAPbI3 Perovskite film	-	2.5	TPA	22200	57
532 nm, 5 ns, 1 Hz	$ErMn_{1-x}Cr_xO_3$ NPs	90	-	TPA	1.4	58
532 nm, 5 ns, 10 Hz	SnO_2 NPs	50	2.83	TPA	1.7	Present work
532 nm, 5 ns, 10 Hz	SnO_2 NPs	100	5.68	TPA	2.1	Present work