†Electronic Supplementary Information(ESI)

Probing luminescent Fe-doped ZnO nanowires for high-performance oxygen gas sensing application†

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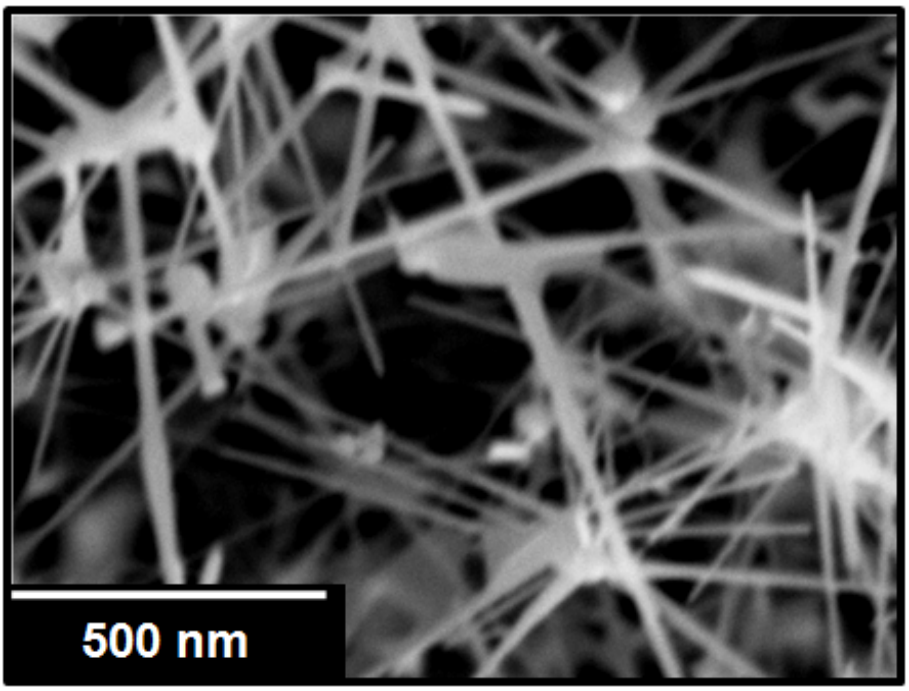

Fig. S1 The magnified view of the surface morphology of 9 wt % Fe-doped ZnO nanowires based film which is shown in Scheme 1c.

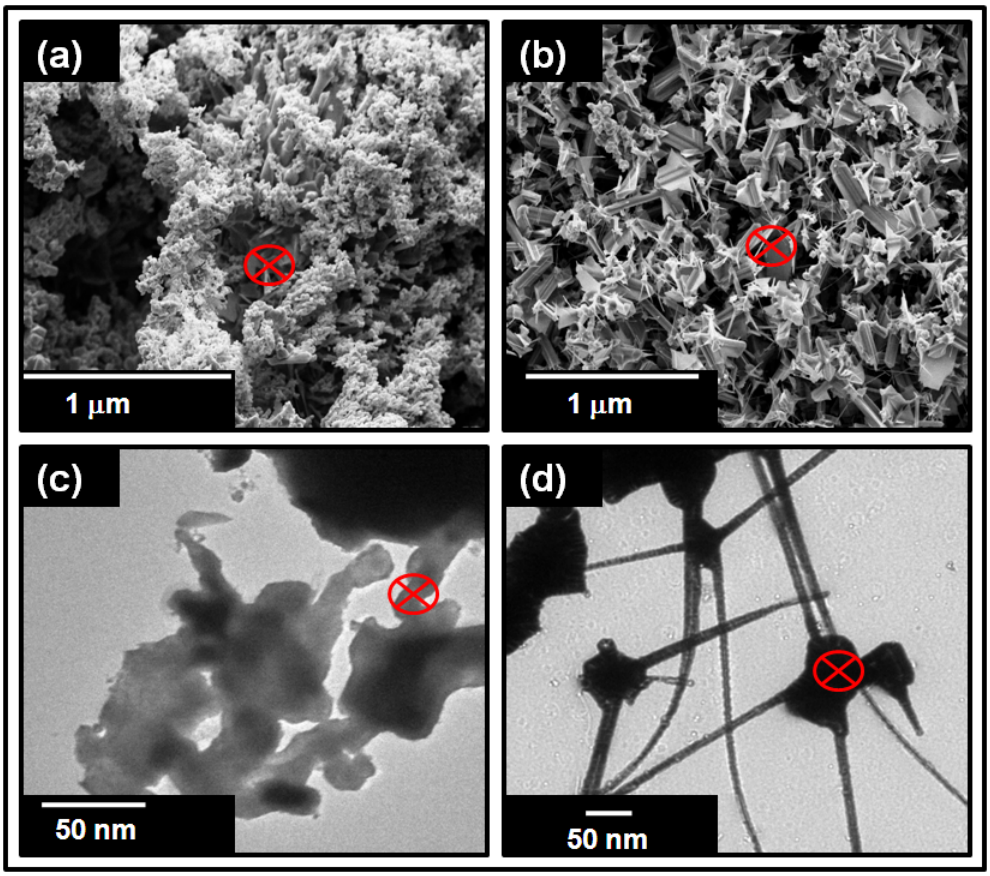

Fig. S2 (a &b) represent the SEM images of 1wt% and 10 wt% Fe-doped ZnO nanowires respectively. (c &d) represent the TEM images of 1wt% and 10 wt% Fe-doped ZnO nanowires respectively. It can be easily noticed from micrographs (a & c) that 1 wt% Fe-doped ZnO nanowires shows the under growth morphology of Fe-doped ZnO nanowires which is marked by red cross circle and (b & d) 10 wt% Fe-doped ZnO nanowires exhibits the cluster formation of unconsumed Fe during nanowire growth process.

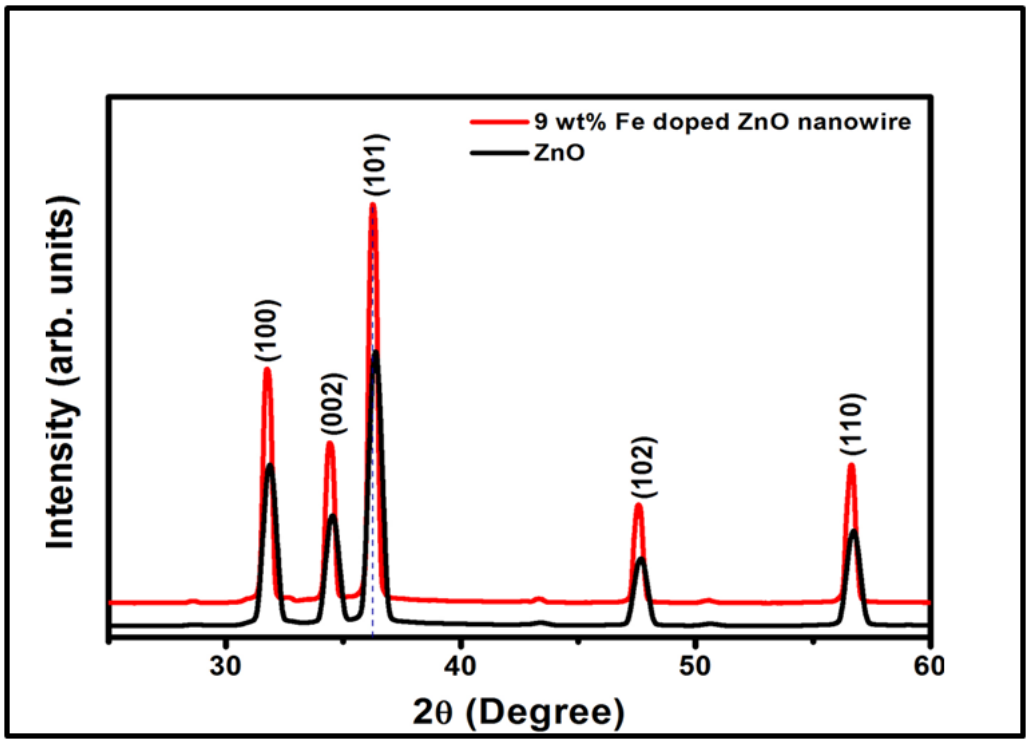

Fig. S3 XRD patterns of undoped and 9 wt% Fe-doped ZnO nanowires.

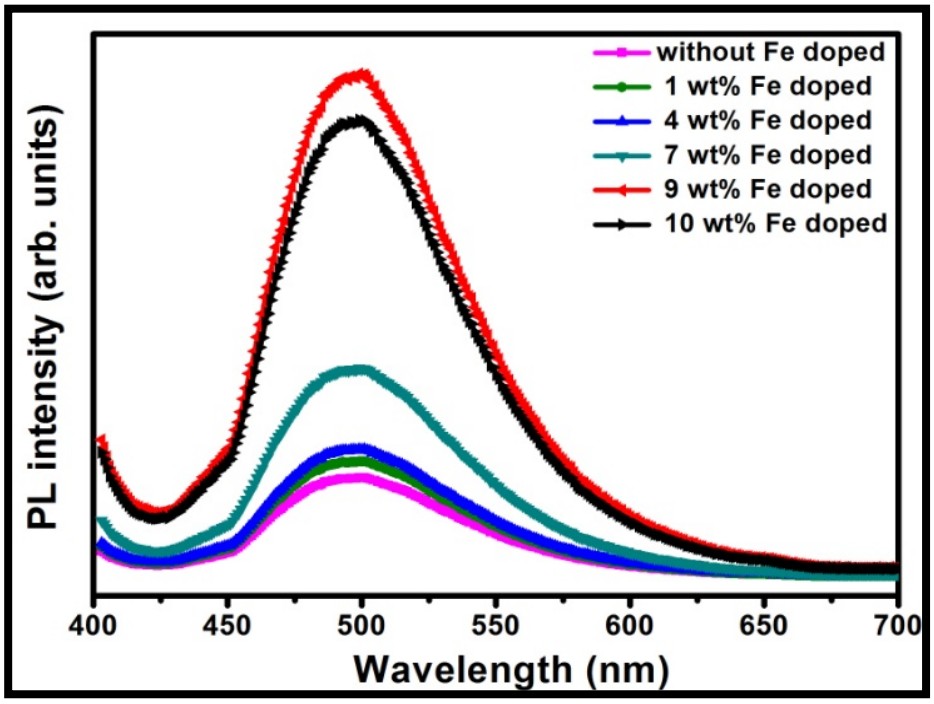

Fig. S4 PL spectra of different concentration (0, 1, 4, 7, 9 and 10 wt%) of Fe doped ZnO nanowires.

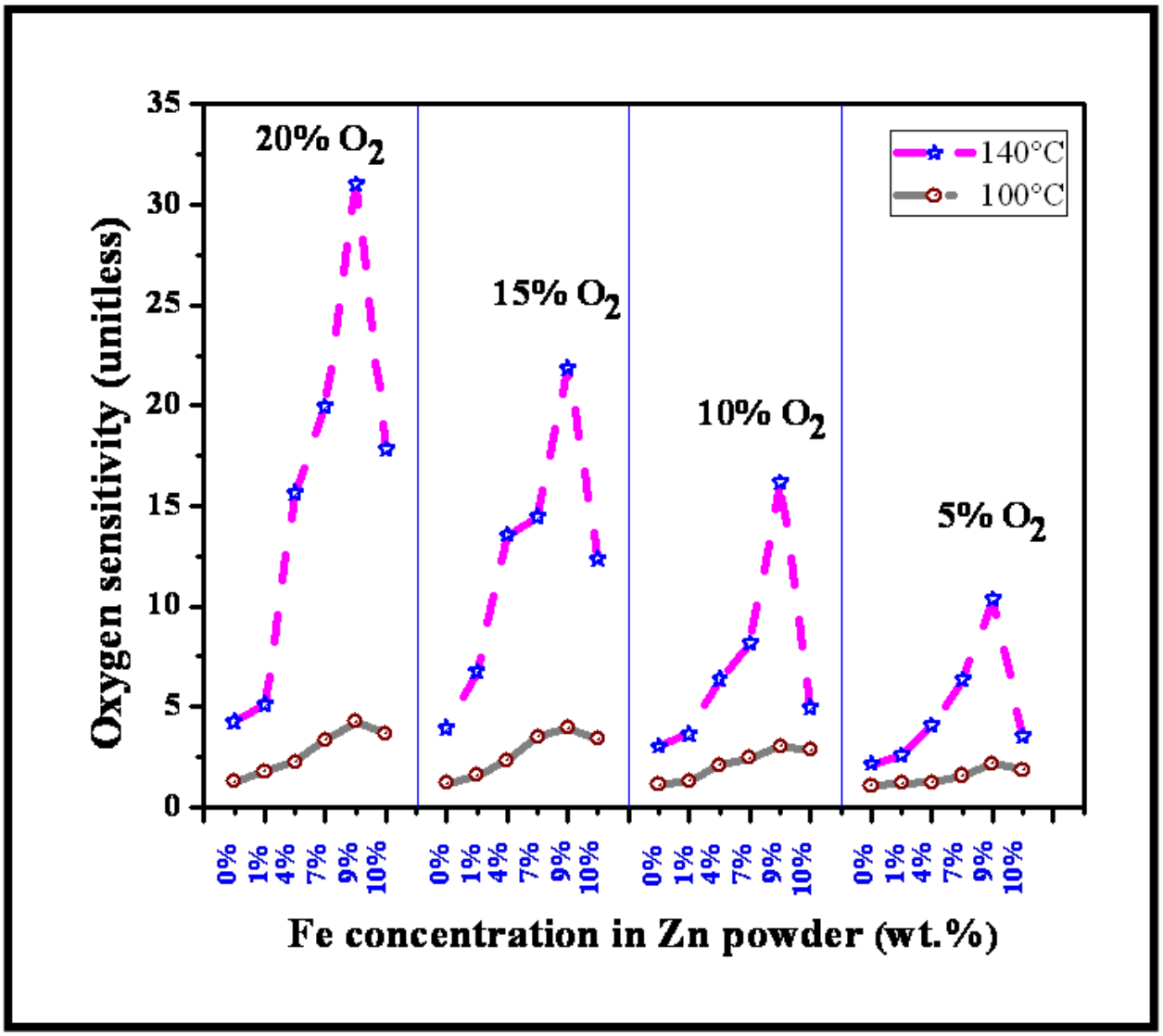

Fig. S5 Oxygen sensing performance of different concentration (0, 1, 4, 7, 9 and 10 wt%) of Fe-doped ZnO nanowire under different ambient condition of oxygen concentration.

Table TS1 Summary of gas sensing perfomance of undoped and 9 wt% Fe-doped ZnO nanowires.

ZnO-Nanowire	Operating Temperature (100°C)	Operating Temperature (140°C)
Sensitivity (Unitless)	1.26	4.27
Response Time (Sec)	81	12
Recovery Time (Sec)	74	19
Fe-doped ZnO-Nanowire	**Operating Temperature (100°C)**	**Operating Temperature (140°C)**
Sensitivity (Unitless)	23	31
Response Time (Sec)	38	11
Recovery Time (Sec)	46	11