Electronic Supplementary Material (ESI) for RSC Advances.

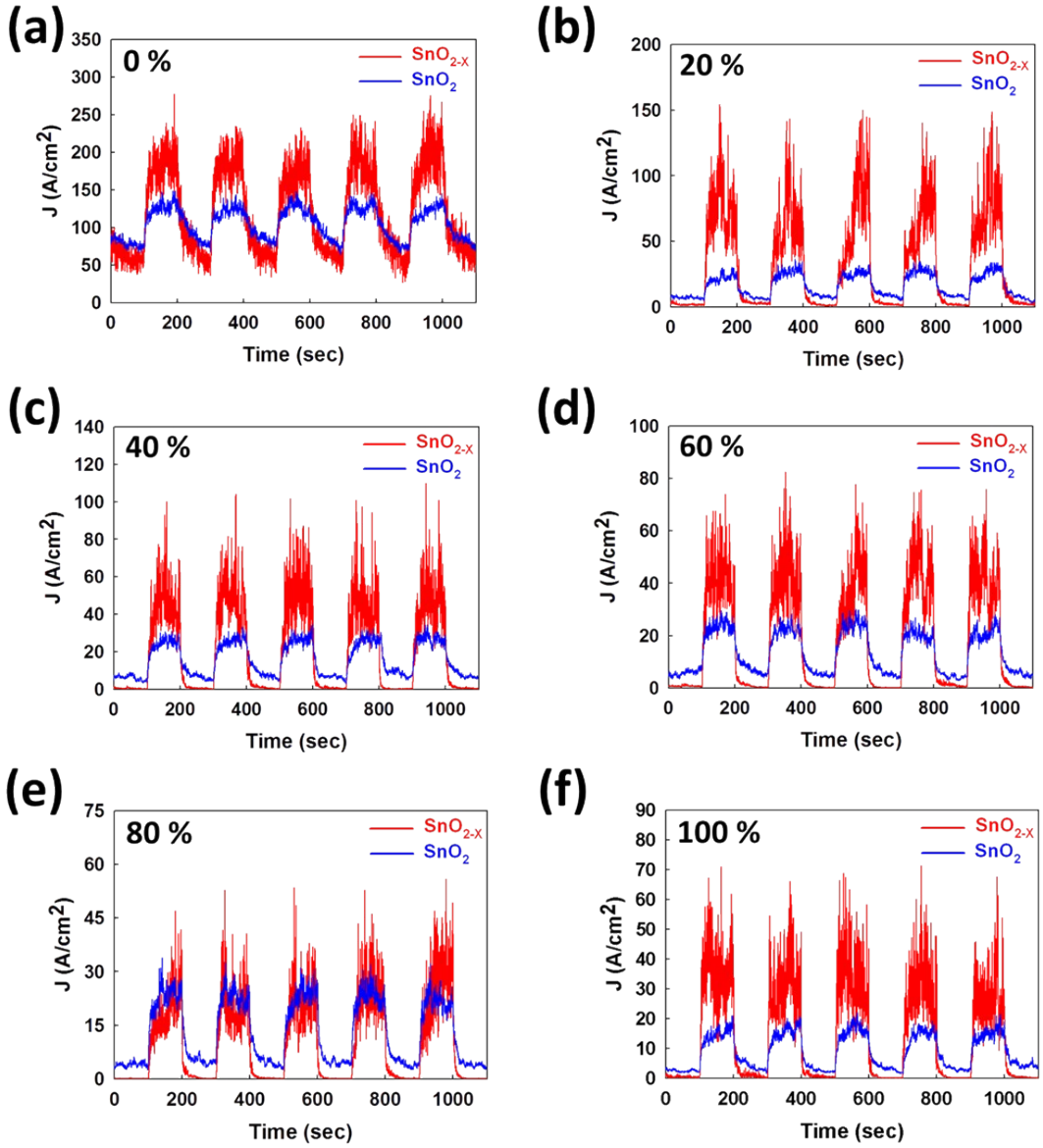

Figure S1. The UV (254nm) detection performance in different O_2 concentration environment from (a) 0% to (f) 100%.

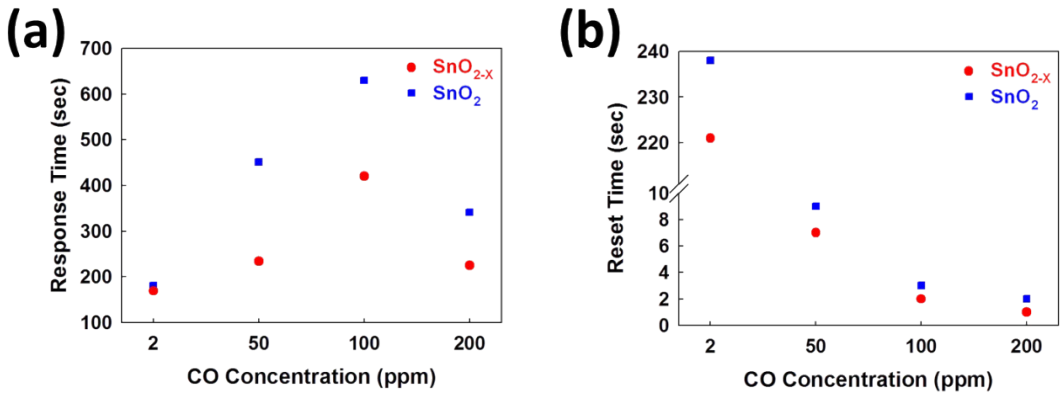

Figure S2. The trend of response (a) and reset time (b) in different CO concentration environment.

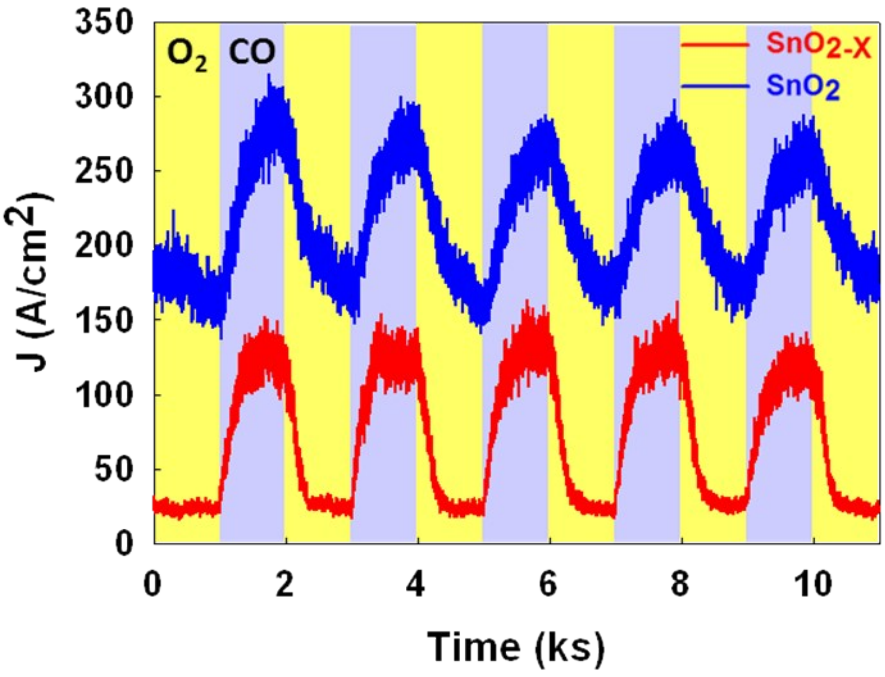

Figure S3. The repetition of both devices can be seen for 2 ppm CO detection.

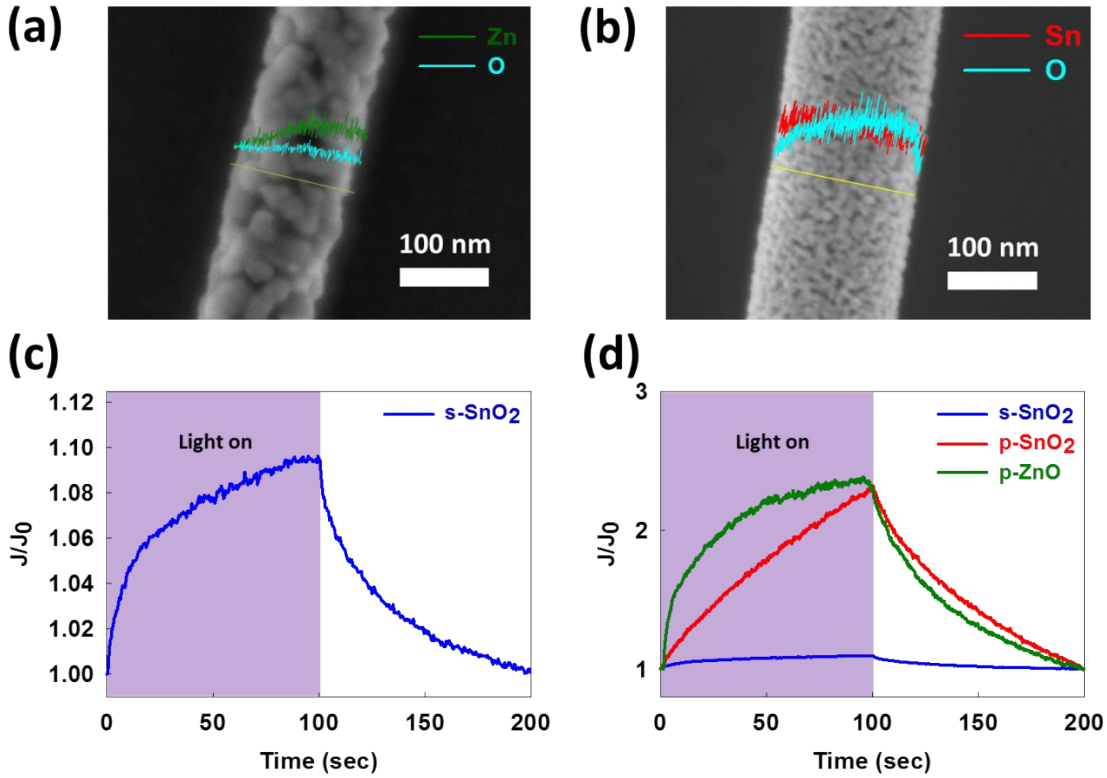

Figure S4. (a) and (b) show the SEM analyses of the p-ZnO and p-SnO_2 NWs. (c) Show the UV light sensing for single crystal SnO_2. (d) Show the comparison with the UV light sensing of single crystal SnO_2, polycrystalline SnO_2, and polycrystalline ZnO. The sensitivity can be improved by increasing the number of defects. The sensitivities of s-SnO_2, p-SnO_2.and p-ZnO devices are 9.4 %, 132.3 % and 130.7 %, respectively.

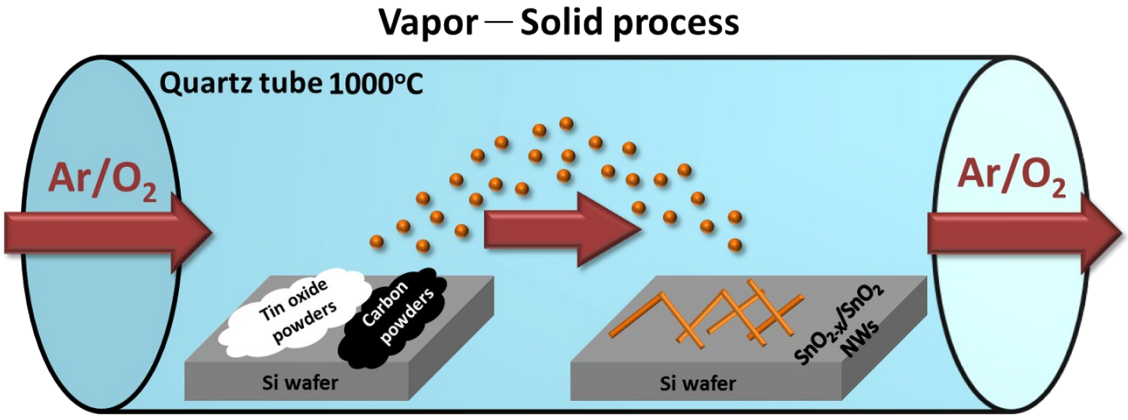

Figure S5. The sketch of the fabrication process can be seen.

Table S1. The UV detection comparison with reported works is shown.

Sample	Sensitivity	Reference
SnO_{2-X} nanowire	249.64 %	This work
SnO_2 nanowire	142.84 %	This work
SnO_2 nanowire	130 %	46
ZnO nanowire films	900 %	45

Table S2. The CO detection comparison with reported works is shown.

Sample	CO (ppm)	Response (R_a/R_g)	Temperature (^oC)	Reference
SnO_{2-X} nanowire	2	5.9 ± 0.43	200	This work
SnO_2 nanowire	2	0.75 ± 0.07	200	This work
SnO_2 nanowire	5	≈ 1.05	295	25
SnO_2 particle	20	≈ 2.2	250	19
SnO_2 nanosheets	10	≈ 1.90	400	44
ZnO nanowire with Au	50	≈ 1.85	350	52
Anatase TiO_2 powders	200	≈ 1.6	600	43