Electronic Supplementary Information

Ultrafast resistive type γ-Fe_2O_3-rGO nanohybrids based humidity sensor – a respiratory monitoring tool

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This pdf contains:

Figure S1-S10

Table S1

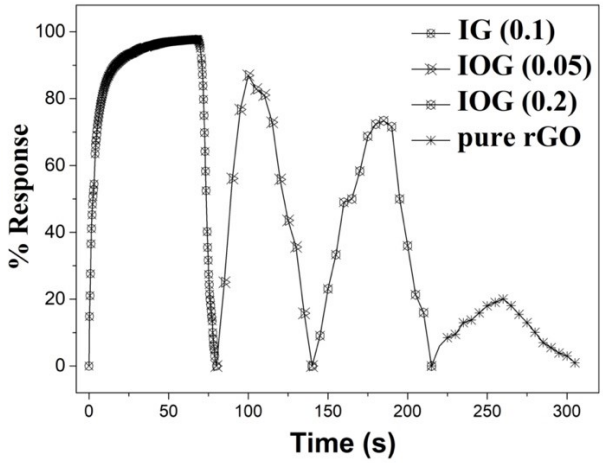

Fig. S1. The % response versus time plot against 5 to 95% RH for all fabricated sensors.

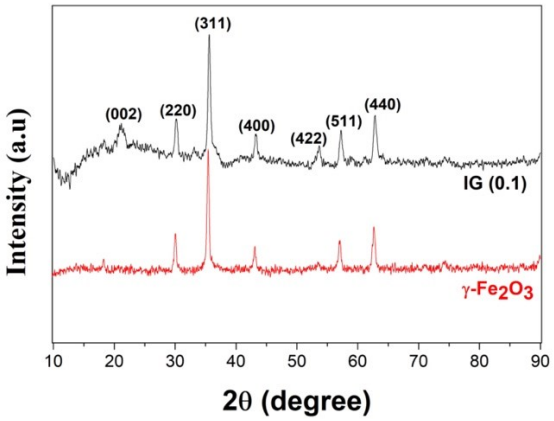

Fig. S2. XRD patterns of IG (0.1), and un-doped γ-Fe_2O_3.

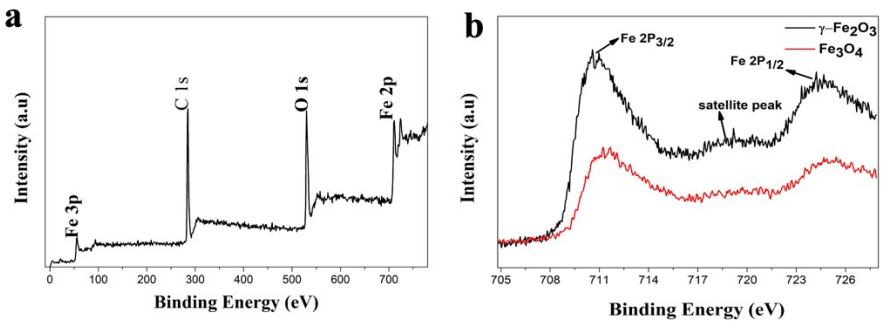

Fig. S3. (a) Wide scan XPS spectra of IG (0.1) nanohybrid sensor. (b) Comparison of Fe 2p peak in γ-Fe_2O_3 and Fe_3O_4.

Table S1. Fitting results of O 1s XPS spectra of un-doped γ-Fe_2O_3 and IG (0.1) nanohybrids.

Materials	Oxygen species	Binding energy (eV)	Relative percentage (%)
Bare γ-Fe_2O_3	O_L	529.69	55.59
	O_V (vacancy)	531.40	40.41
	O_C (chemisorbed)	533.59	3.99
IG (0.1)	O_L	529.66	30.241
	O_V (vacancy)	530.93	63.87
	O_C (chemisorbed)	533.11	5.99

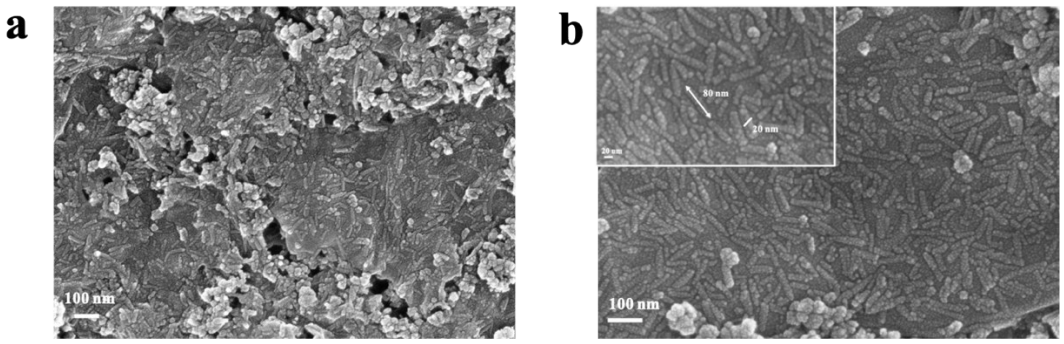

Fig. S4. (a-b) FESEM images of IG (0.1) nanohybrids.

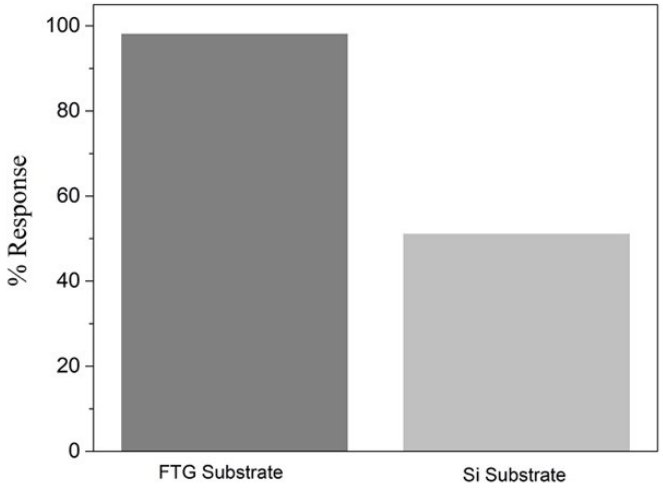

Fig. S5. Comparison of %response in case of FTG and silicon (Si) substrate.

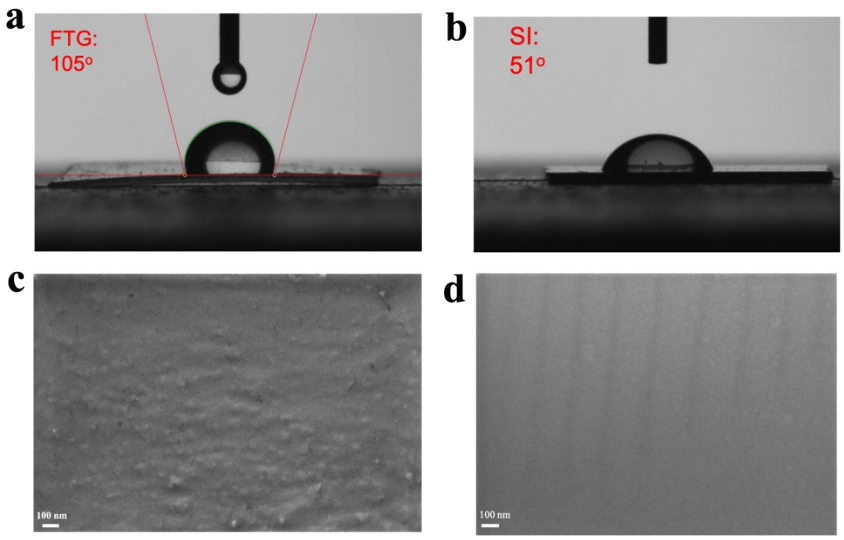

Fig. S6. (a, b) Photograph showing that the measured contact angle of a water droplet on the FTG and SI substrate is 105° and 51°. (c, d) FE-SEM image of FTG and SI substrate.

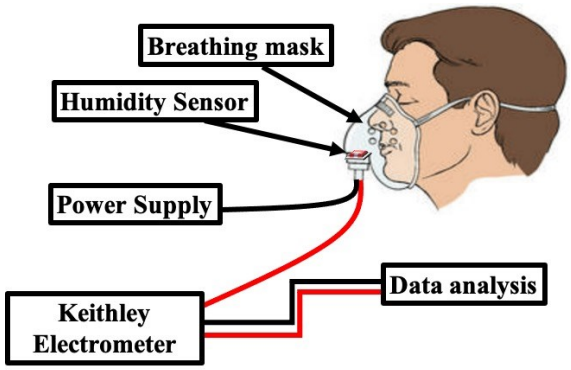

Fig. S7. Set up for mastering different respiration rates and other activities.

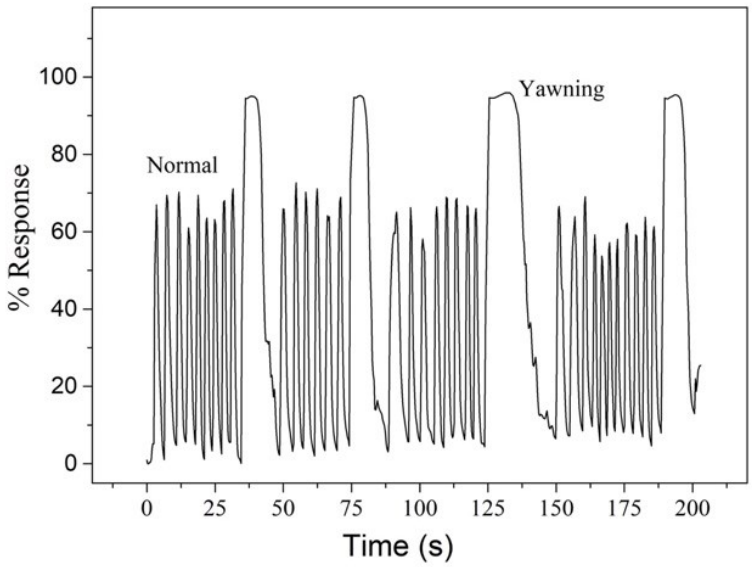

Fig. S8. The normal breathing response and yawning response.

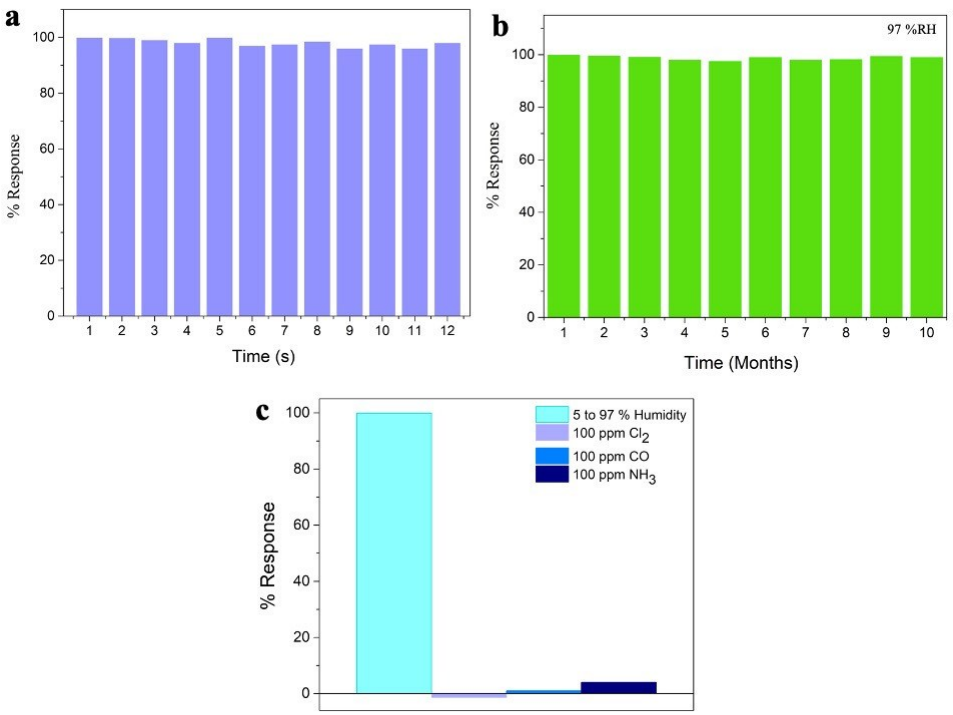

Fig. S9. (a, b) The plot of repeatability and stability data. (c) Selectivity of hybrid sensor.

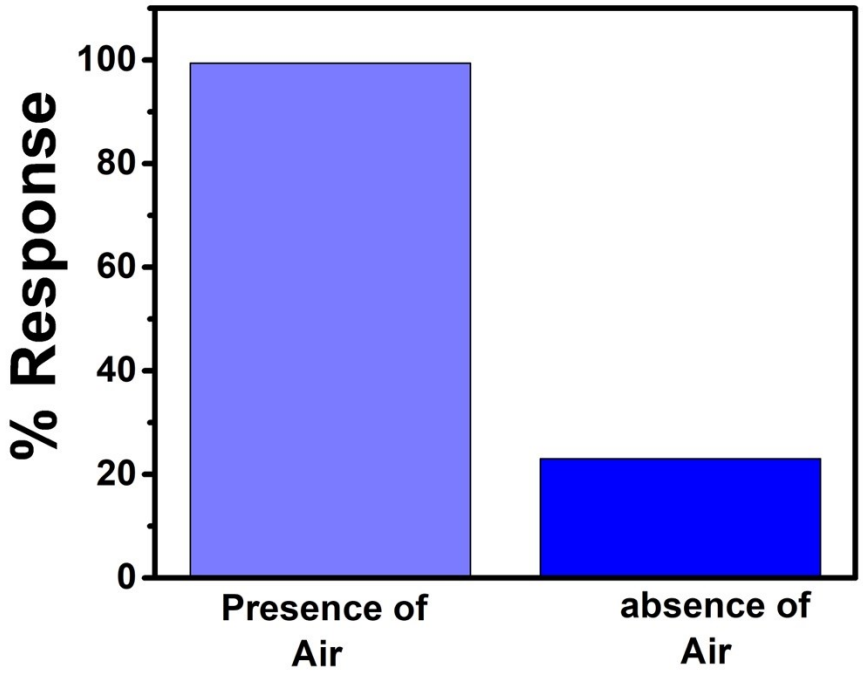

Fig. S10. Comparison of % response in case of without N_2 environment and with N_2 environment.