Electronic Supplementary Material (ESI) for RSC Advances.

Graphene and Graphene Oxide Double Decorated SnO_2 Nanofibers with Enhanced Humidity Sensing Performance

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Figure S1

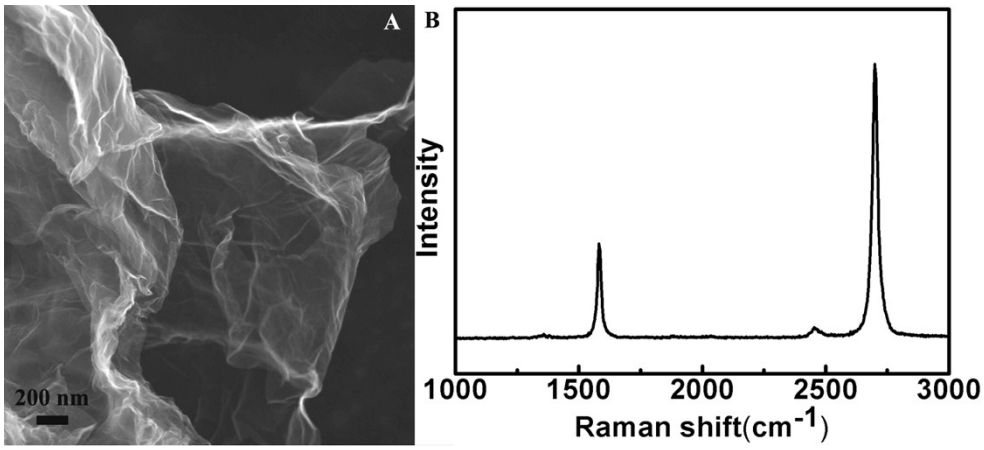

Figure S1 (A) SEM images of graphene. (B) Raman spectra of graphene.

Fig S2

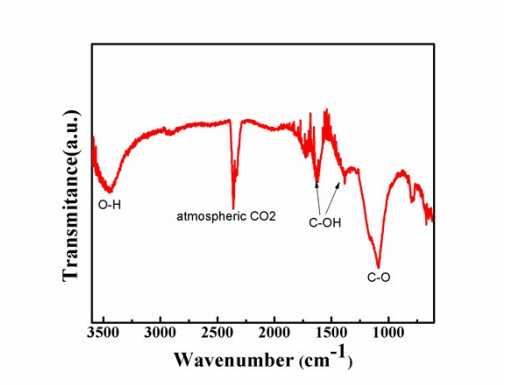

Figure S2 shows the typical FTIR spectrum of GO sheets. The spectrum presence of different type of oxygen functionalities in graphene oxide was confirmed at 3400 cm^{-1}

(O-H stretching vibrations), at 1720 and 1576 cm^{-1} (stretching vibrations from C–OH vibrations from COOH and H_2O), and at 1060 cm^{-1} (C-O stretching vibrations). The peaks at ~2336 cm^{-1} is due to atmospheric CO_2.

Fig S3

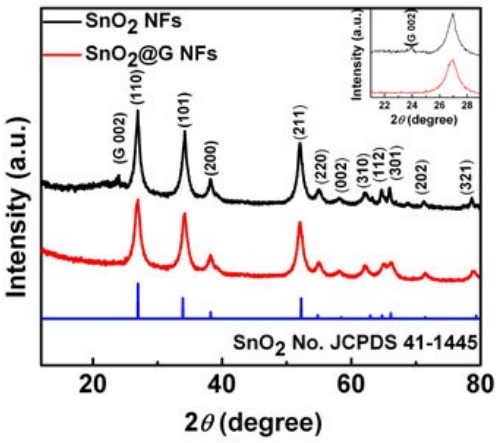

Figure S3 The XRD patterns of pure SnO_2 and SnO_2@G composites. For SnO_2 nanofibers, all the peaks can be readily indexed to the rutile phase SnO_2 (JCPDS No. 41-1445). Compared to pure SnO_2 nanofibers, in the XRD pattern of SnO_2@G nanofibers, the appearance of a broadened peak at 24° (inset) corresponding to the (002) of graphite indicates the existence of graphene.

Figure S4

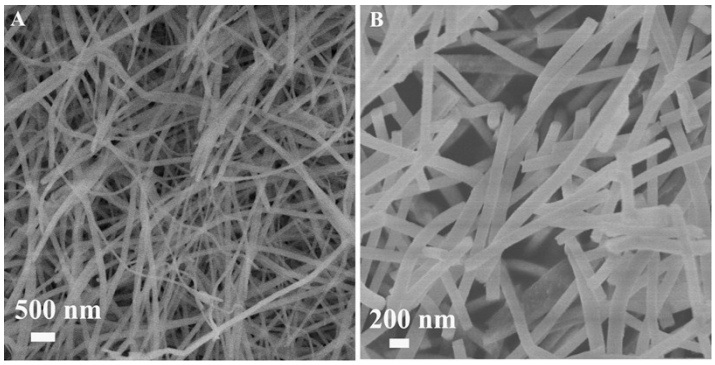

Figure S4 (A) SEM images of as-spun SnO_2@G nanofibers, and (B) SEM images of SnO_2@G nanofibers after annealing.

Fig S5

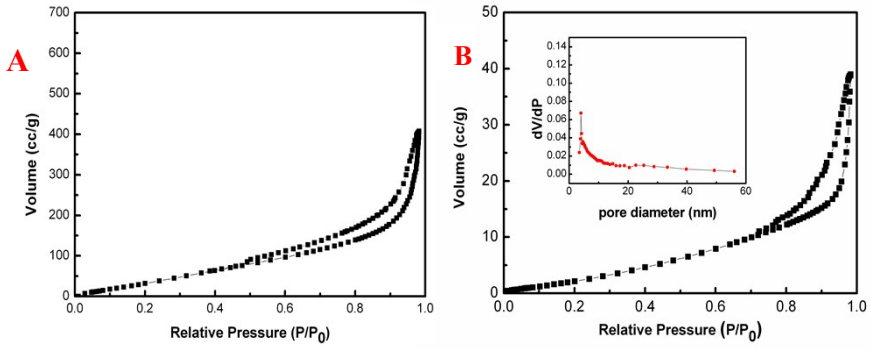

Figure S5 (A) Nitrogen adsorption/desorption isotherms of the SnO_2@G-GO nanocomposite. The specific surface area of the SnO_2@G-GO nanocomposite is 193.62 m^2 g^{-1}. (B) Nitrogen adsorption/desorption isotherms of the SnO_2@G nanofibers. The specific surface area of the SnO_2@G nanofibers is 29.34 m^2 g^{-1}. The pore diameter is about 3.8nm.

Fig S6

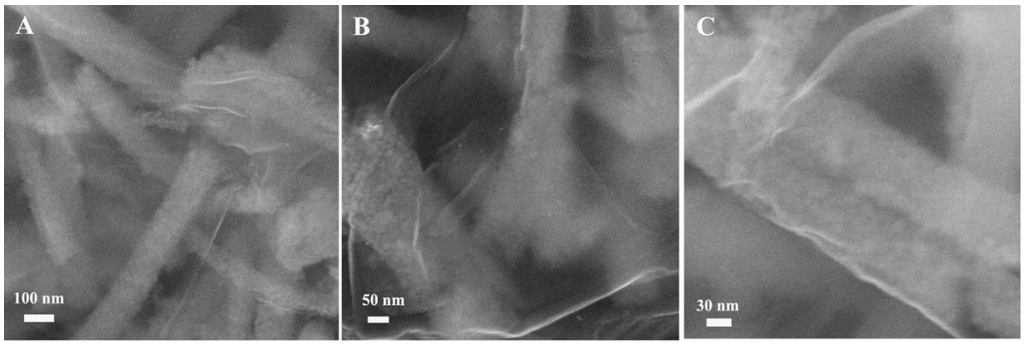

Figure S6 SEM images of SnO_2@G-GO. The SnO_2@G hybrid nanofibers were apparently wrapped by the well-stretched GO.

Figure S7

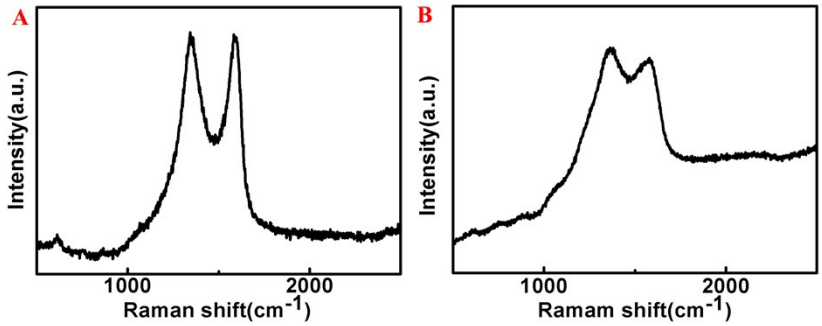

Figure S7 Raman spectra of (A) SnO_2@G nanofibers, and (B) SnO_2@G-GO nanocomposite.

Figure 8

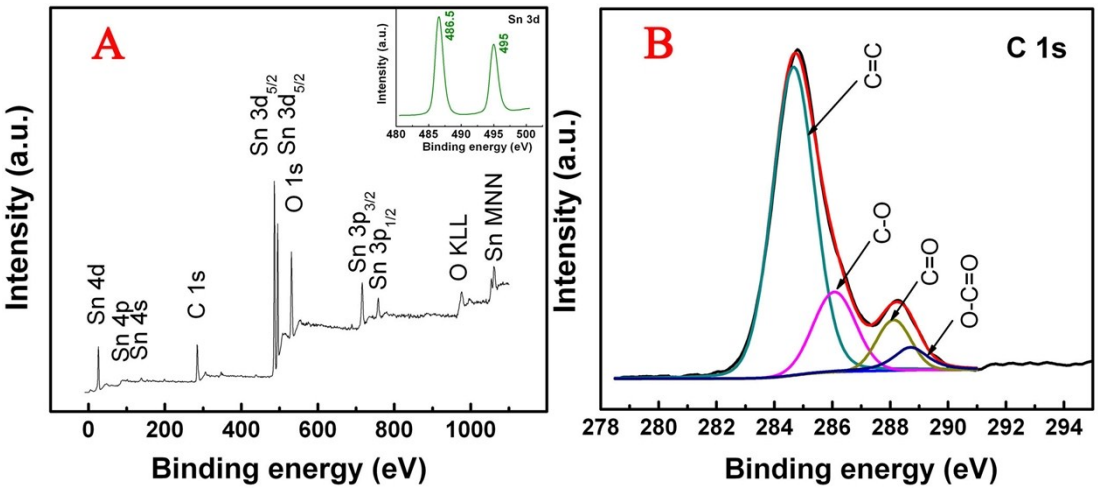

Figure S8 XPS spectra of the SnO_2@G-GO nanocomposites (A); insets: the Sn 3d doublet; (B) the C 1s XPS spectrum of the graphene and GO.