In-situ growth of SnO$_2$ nanosheets on the substrate via hydrothermal synthesis assisted by electrospinning and gas sensing properties of the SnO$_2$/polyaniline nanocomposites

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Fig. S1 SEM images of nanofibers obtained with different electrospinning parameters before/after hydrothermal treatment. (a) solvent: DMF, after hydrothermal treatment; (b) solvent: ethanol, after hydrothermal treatment; (c-d) collection distance: 10 cm, (c) before and (d) after hydrothermal treatment; (e-f) collection distance: 20 cm, (e) before and (f) after hydrothermal treatment; (g-h) flow rate: 0.1 mL/h, (g) before and (h) after hydrothermal treatment; (i-j) flow rate: 0.5 mL/h, (i) before and (j) after hydrothermal treatment.
Fig. S2 EDAX pattern of as-prepared SnO$_2$ nanosheets.

Fig. S3 I-V curves of the (A) SnO$_2$@PANI-1 and (B) SnO$_2$@PANI-2 in (a) air; (b) NH$_3$ of 1 ppm and (c) 5 ppm.
Fig. S4 SEM image of the film prepared by dip-coating of the electrospinning solution after the hydrothermal treatment at 135°C for 8 h.

Fig. S5 SEM images of SnO$_2$ nanosheets fabricated via the hydrothermal treatment of the electrospun nanofibers at 135°C for different times: (a-b) 2 h; (c-d) 4 h; (e-f) 6 h; (g-h) 8 h; (i-g) 12 h; (k-l) 24 h.
Fig. S6 SEM image of the PVB nanofibers after the hydrothermal treatment at 135°C for 8 h.

Fig. S7 SEM images of the SnO$_2$ nanosheets fabricated at different hydrothermal temperatures: (a) 120°C; (b) 150°C; (c) 180°C.
Fig. S8 SEM images of the electrospun nanofibers with different additive: (a) D-glucose; (b) H\textsubscript{2}O\textsubscript{2} and NaOH; (c-d) Na\textsubscript{3}C\textsubscript{6}H\textsubscript{5}O\textsubscript{7} after the hydrothermal treatment at (a-c) 135°C for 8 h and (d) 180°C for 12 h.
Fig. S9 Calibration curves of the PANI based sensors.

Fig. S10 Effect of humidity on the dynamic responses of SnO$_2$@PANI-2 towards 5 ppm of NH$_3$. 