Electronic Supporting Information for

SnO_2@Co_3O_4 p-n heterostructures fabricated by electrospun and mechanism analysis enhanced acetone sensing

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Table S1 Absolute electronegativity (X), estimated band gap (E_g), energy levels of calculated conduction band edge (CB), and valence band edge (VB) for Fe_2O_3 and WO_3

	X	E_g (eV)	CB (eV)	VB (eV)
Co_3O_4	5.93	2.94	-0.04	2.90
SnO_2	6.25	3.50	0	3.50

The band gap energy of Co_3O_4 was calculated by its UV-Vis absorption spectra (shown in Figure S1)

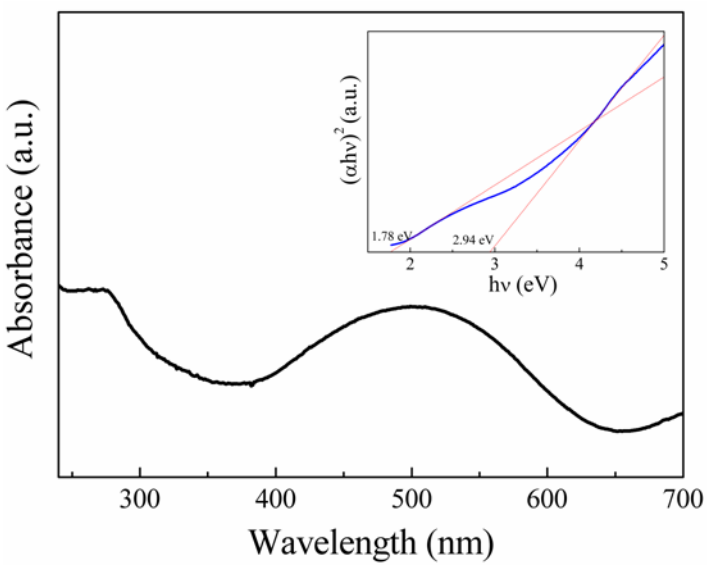

Figure S1. UV-Vis absorption spectra of Co_3O_4 (inset: the $(\alpha h\nu)^2$-$h\nu$ curves).

The UV-vis spectra of Co_3O_4 is shown in Figure S1. The band gap (E_g) engineering of Co_3O_4 can be calculated by the following Equation:

$(\alpha h\nu)^2 = A(h\nu - Eg)$

Where α is the optical density, hν is the photon energy and A is a constant relative to the material. Therefore, the band gaps of Co_3O_4 estimated from the extrapolated intercept with the α = 0 shown in Figure S1 inset are 1.78 eV and 2.94 eV. The first band can be assigned to the $O^{2-} \rightarrow Co^{3+}$ charge transfer (the Co^{3+} located below the conduction band), while the second one is ascribed to the $O^{2-} \rightarrow Co^{2+}$ charge transfer process.

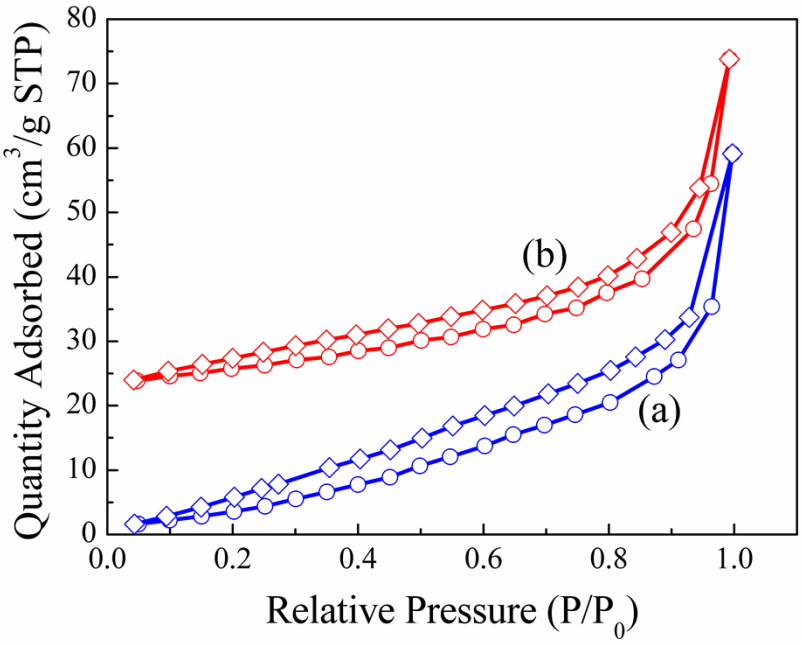

Figure S2. Nitrogen adsorption–desorption isotherms of (a) Co_3O_4 (b) SnO_2@Co_3O_4 samples.

As shown in Figure S2, the N_2 adsorption-desorption analysis of Co_3O_4 and SnO_2@Co_3O_4 samples were carried out to estimate their surface areas, which is an important parameters related to gas sensing properties, and they show similar N_2 adsorption-desorption isotherms. According to Brunauer-Deming-Deming-Teller (BDDT) classification, it is seen that the isotherms belong to Type IV with an H3 hysteresis loop, which are typical for mesoporous materials.