Supporting Information

Nanocube In$_2$O$_3$@RGO heterostructure based gas sensor for acetone and formaldehyde detection

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Fig. S1: XRD spectra of the as synthesized In$_2$O$_3$ nanocubes (a) and RGO (b).
Fig. S2: XPS survey spectra of In$_2$O$_3$ nanocube (a), deconvoluted spectrum of In 3d peaks (b) and RGO C 1s peak (c).
Fig. S3: Raman spectrum of the In$_2$O$_3$ nanocube (a) and RGO (b).
Fig. S4: The TEM, HR-TEM images and SAED pattern of the as synthesized (a) \( \text{In}_2\text{O}_3 \) nanocube and (b) RGO.
(a)
Fig. S5: FE-SEM images and corresponding elemental mapping of the as synthesized nanocube In$_2$O$_3$@RGO heterostructure (a), In$_2$O$_3$ nanocube (b) and RGO (c).
Fig. S6: Acetone (a) and formaldehyde (b) gas sensing characteristics of the In$_2$O$_3$ nanocube sensor as a function of operating temperature for various concentrations.

Fig. S7: Acetone (a) and formaldehyde (b) gas sensing characteristics of the RGO sensor as a function of operating temperature for various concentrations.
Fig. S8: Acetone (a) and formaldehyde (b) transient response characteristics of the nanocube \( \text{In}_2\text{O}_3@\text{RGO} \) heterostructure sensor at different operating temperatures for 25 ppm concentration.