Supporting Information

Perovskite $\text{La}_{0.75}\text{Sr}_{0.25}\text{Cr}_{0.5}\text{Mn}_{0.5}\text{O}_{3-\delta}$ Sensitized $\text{SnO}_2$ Fiber-in-Tube Scaffold: Highly Selective and Sensitive Formaldehyde Sensing

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11. Resistance variation graph of LSCM particles during 1-5 ppm of formaldehyde exposure.

Table 1. Resistance values of LSCM@SnO₂ FITs before and after injection of formaldehyde gas.
**Fig. S1.** SEM image of a) pristine SnO$_2$ NTs, b) 2.5 wt%-, and c) 30 wt% LSCM@SnO$_2$ FITs.
Fig. S2. SAED pattern of LSCM@SnO$_2$ FITs.
Fig. S3. XRD analysis data of LCO particles and LCO@SnO\textsubscript{2} FITs.
**Fig. S4.** SEM image of a) LCO particles, b) LSCM@SnO$_2$ NFs, c) as-spun LCO@PVP/Sn NFs and d) LCO@SnO$_2$ FITs.
Fig. S5. a) Formaldehyde sensing tests at 400 °C as a function of loading amount of LSCM particles and b) temperature-dependent sensing tests toward 5 ppm of formaldehyde.
Fig. S6. Resistance variation graphs and response times of LSCM@SnO$_2$ FITs towards a) 5 ppm, b) 4 ppm, c) 3 ppm, d) 2 ppm, and e) 1 ppm of formaldehyde gases.

The response time is defined as the time taken for the resistance to decrease by 90% of maximum resistance difference ($R_{\text{air}} - R_{\text{gas}}$) after injecting reducing gases. In case of 5 ppm formaldehyde exposure, $R_{\text{air}}$ and $R_{\text{gas}}$ are 253.03 kΩ and 9.10 kΩ, respectively. Therefore, 90% of $R_{\text{air}} - R_{\text{gas}}$ is 219.54 kΩ, and the response time is the time taken for the resistance to decrease 253.03 kΩ to 33.49 kΩ (253.03-219.54 kΩ). As indicated in Fig. S6a, the response time of LSCM@SnO$_2$ FITs is 12 s, in case of 5 ppm formaldehyde exposure. The same calculation method is applied to 4, 3, 2, and 1 ppm of formaldehyde exposure, and to the control samples (pristine SnO$_2$ NFs, SnO$_2$ NTs, LSCM@SnO$_2$ NFs, and LCO@SnO$_2$ FITs).
Fig. S7. a) Recovery times of SnO$_2$ NFs, SnO$_2$ NTs, LCO@SnO$_2$ NFs, LSCM@SnO$_2$ NFs, and LSCM@SnO$_2$ FITs in the concentration range of 1–5 ppm. b-f) Resistance variation of LSCM@SnO$_2$ FITs after injection of air and recovery times in the concentration of 1-5 ppm of formaldehyde.
Figure S8. UPS analysis of LSCM particles.
Figure S9. XPS spectra of (a) Mn 2p of pristine LSCM particles and (b) Sn 3d of LSCM@SnO$_2$ FITs after heating at 400 °C.
Figure S10. XPS spectra of O 1s of a) LCO and b) LSCM particles and c) spectra feature table of O 1s.
Figure S11. Resistance variation graph of LSCM particles toward 1-5 ppm of formaldehyde.
**Table S1.** Resistance values of LSCM@SnO$_2$ FITs before and after injection of formaldehyde gas.

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<th>Gas concentration (ppm)</th>
<th>$R_{air}$ (0 s)</th>
<th>$R_{gas}$ (4s)</th>
<th>8 s</th>
<th>12 s</th>
<th>16 s</th>
<th>20 s</th>
<th>24 s</th>
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