

## *Supporting Information for*

# **Face-Selective Crystal Growth of Hydrothermal Tungsten Oxide**

## **Nanowires for Sensing Volatile Molecules**

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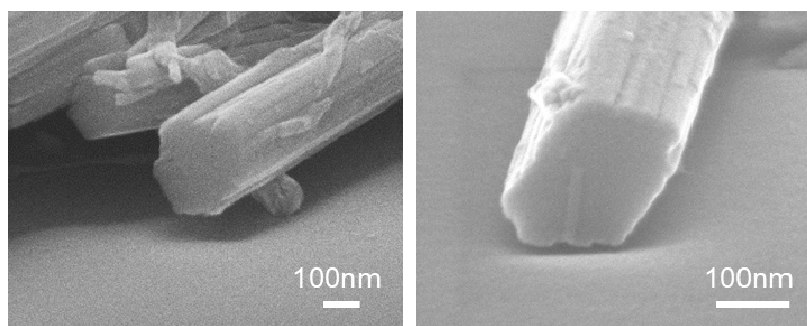
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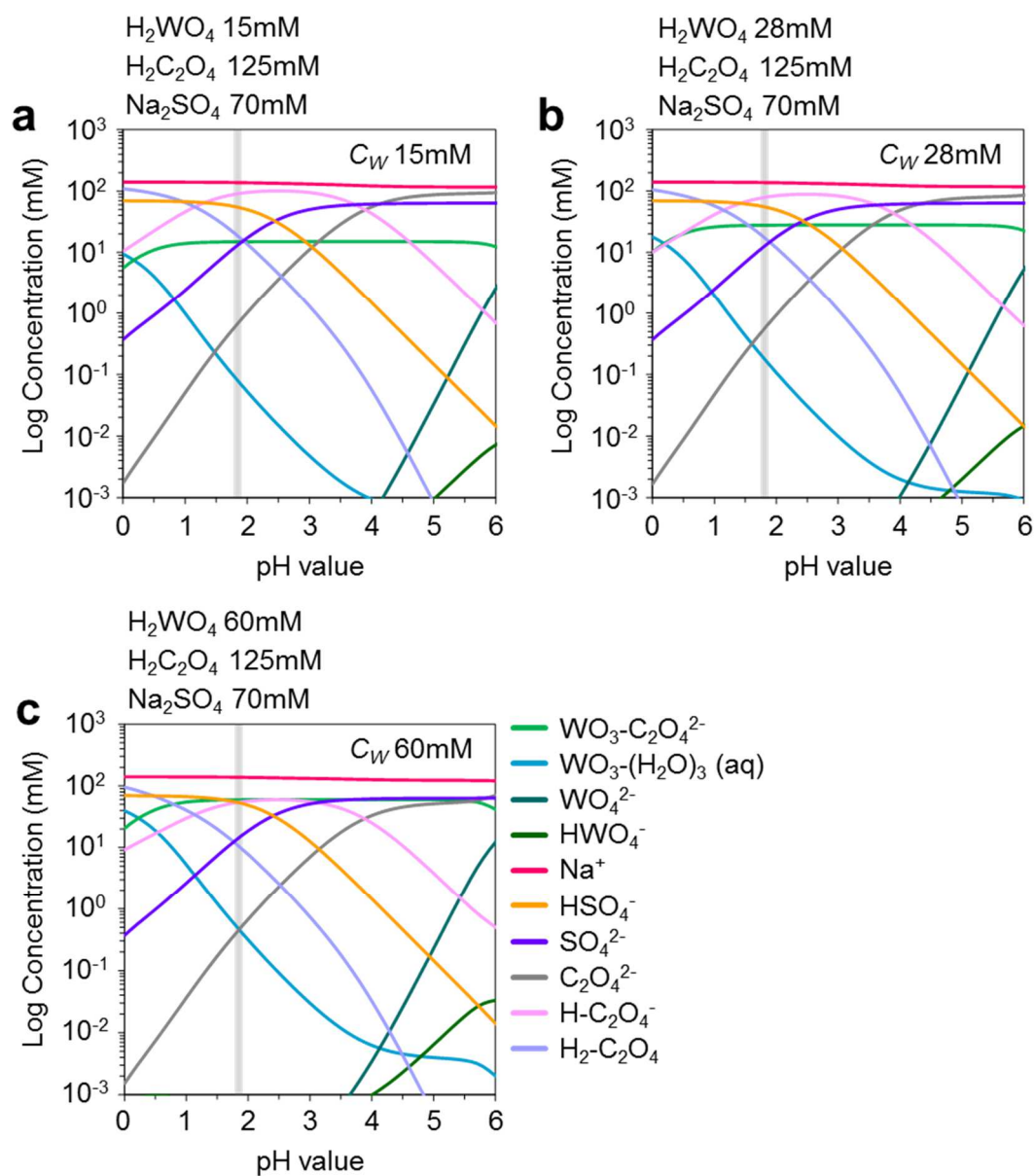
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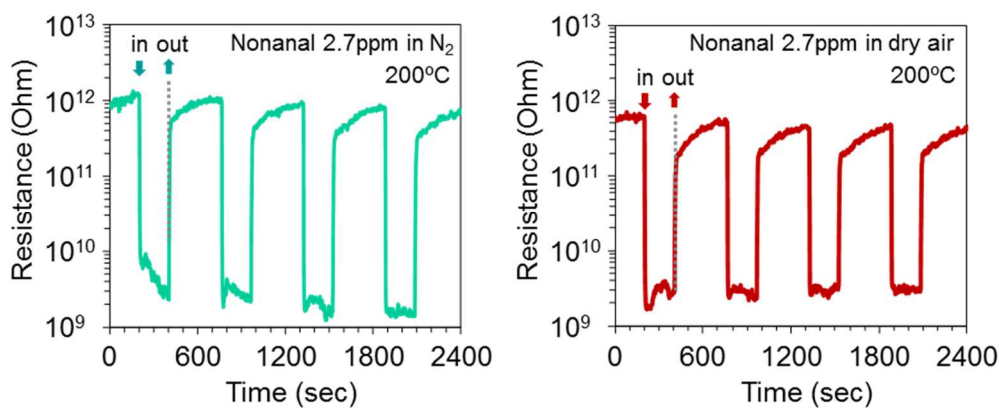
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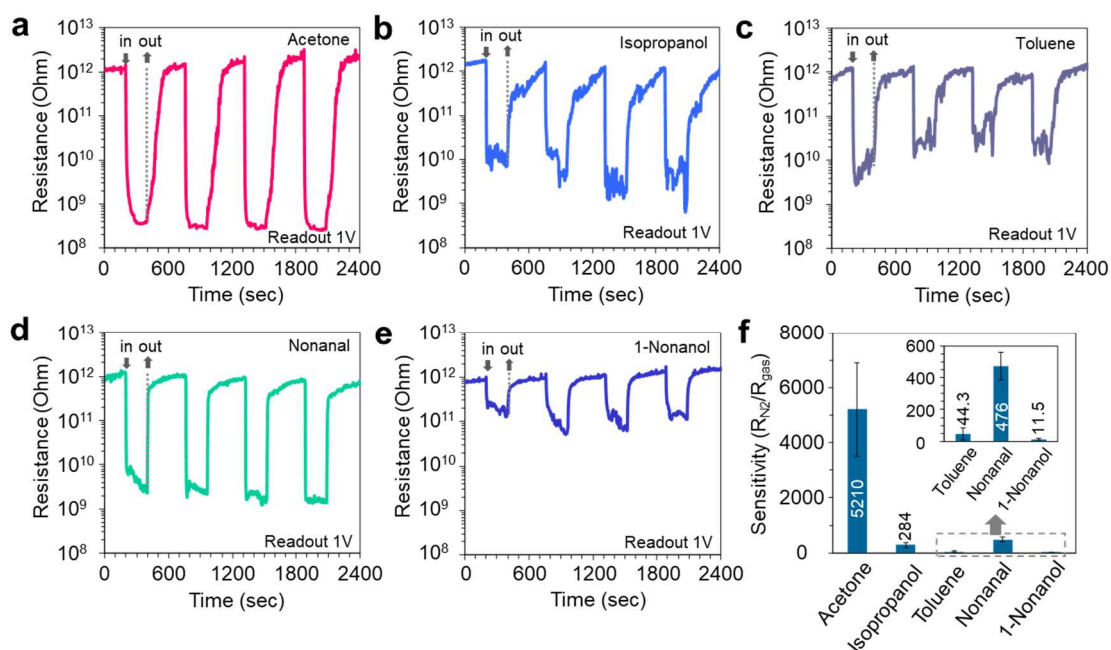
**Figure S1.** The SEM images at edge of  $\text{WO}_3$  nanowires grown with  $C_W$  92 mM.



**Figure S2.** The calculated data of pH dependent equilibrium concentrations of ionic species existing in the growth solutions for  $C_W$  15 mM, 28 mM and 60 mM, respectively. Temperature condition employed in this calculation is 99.99 °C.



**Figure S3.** Nonanal sensing response when using N<sub>2</sub> (left) and dry air (right) as carrier gases. The sensing measurements are performed at 200 °C with the readout voltage of 1 V. For this measurement, the WO<sub>3</sub> nanowire with 50 nm width was employed.



**Figure S4.** Sensing response of  $\text{WO}_3$  nanowire sensor to (a) acetone (1943 ppm), (b) isopropanol (348 ppm), (c) toluene (232 ppm), (d) nonanal (2.7 ppm) and (e) 1-nonanol (0.13 ppm). (f) Summary of sensitivity to various volatile molecules. Inset shows the magnified data for toluene, nonanal and 1-nonanol. The sensing measurements are performed at 200 °C with the readout voltage of 1 V under  $\text{N}_2$  flow in air. For this measurement, the  $\text{WO}_3$  nanowire with 50 nm width was employed.

**Table S1.** Summary of nonanal sensing performance in previous studies and this study.

Sensor type	Material	Sensitivity ( $R_{air}/R_{N_2}/R_{gas}$ )	Recovery time	Operation temperature	Ref
metal oxide semiconductor sensor	Pt, Pd, Au/SnO <sub>2</sub>	~5 (55 ppb)	102 s	250 °C	54
	Pt, Pd, Au/SnO <sub>2</sub> nanoparticles/nanosheet	~3 (55 ppb)	~300 s	300 °C	55
	SnO <sub>2</sub> nanosheet	1.38 (100 ppb)	-	250 °C	56
	nanotextile WO <sub>3</sub> nanowires	2.96 (2.7 ppm)	66 s	RT	31
	single WO <sub>3</sub> nanowire	3.80 (27 ppb)	252 s	200 °C	this study
QCM	molecularly imprinted TiO <sub>2</sub>	- (several ppm)	>1800s	RT	57
field effect transistor	DNA-decorated carbon nanotubes	- (limit: 0.1% of saturated vapor)	-	unknown	58
chemiresistive sensor	molecularly functionalized gold nanoparticles	- (limit: 190ppb)	-	RT	59
	polymer and carbon black	- (limit: 3.42ppm)	-	unknown	60
strain-induced chemiresistive sensor	molecularly functionalized gold nanoparticles	- (limit: 50ppb)	-	unknown	61