

Supporting information for

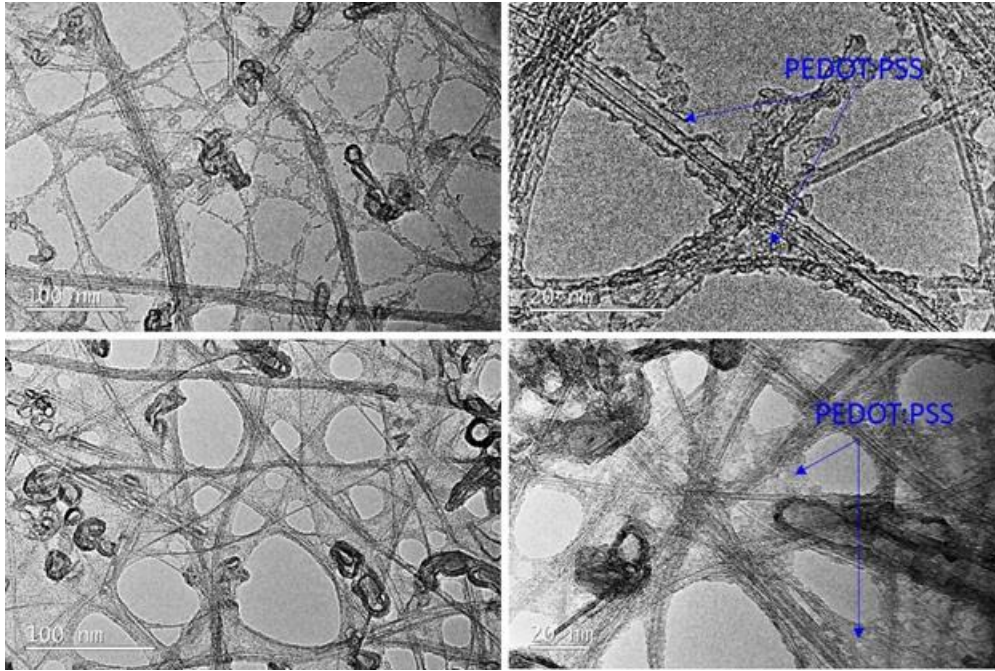
**Heating-Rate-Triggered Carbon-Nanotube-based 3-Dimensional Conducting Networks for a Highly Sensitive Noncontact Sensing Device**

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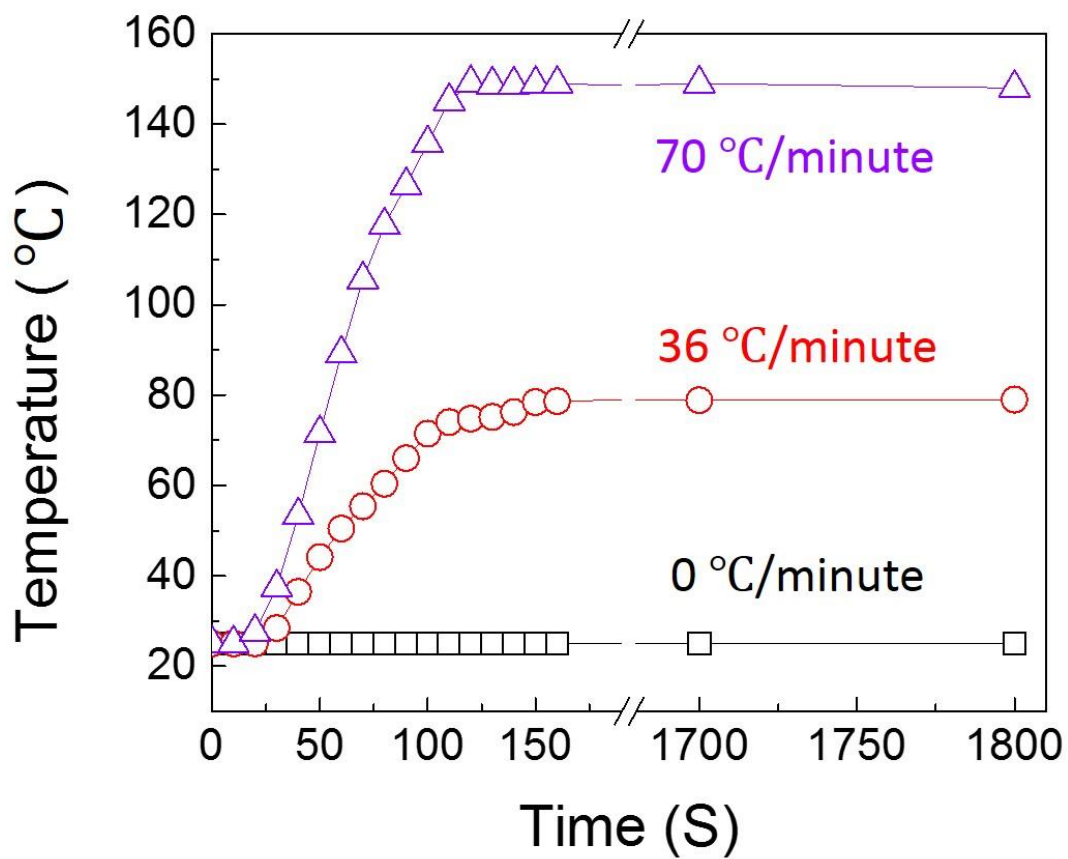
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**Figure S1.** TEM of SWCNT/PEDOT:PSS ink (diluted concentration) at different magnifications



**Figure S2.** Heating rate during the fabrication of SWCNT-PTCFs (S1).

### Pure PEDOT:PSS



### Different ratios of SWCNT/PEDOT:PSS



1:1

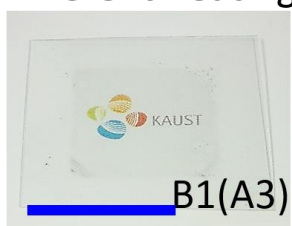


1:0.75

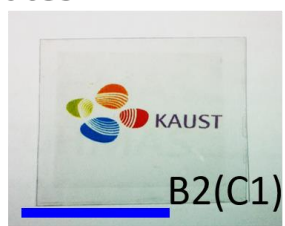


1:0.5

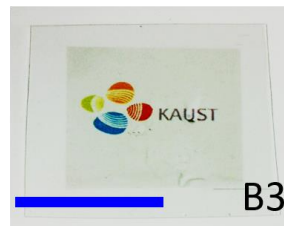
### Different heating rates



0 °C/minute



36 °C/minute

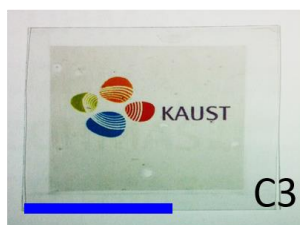


70 °C/minute

### Different ink concentrations



1 mg/ml

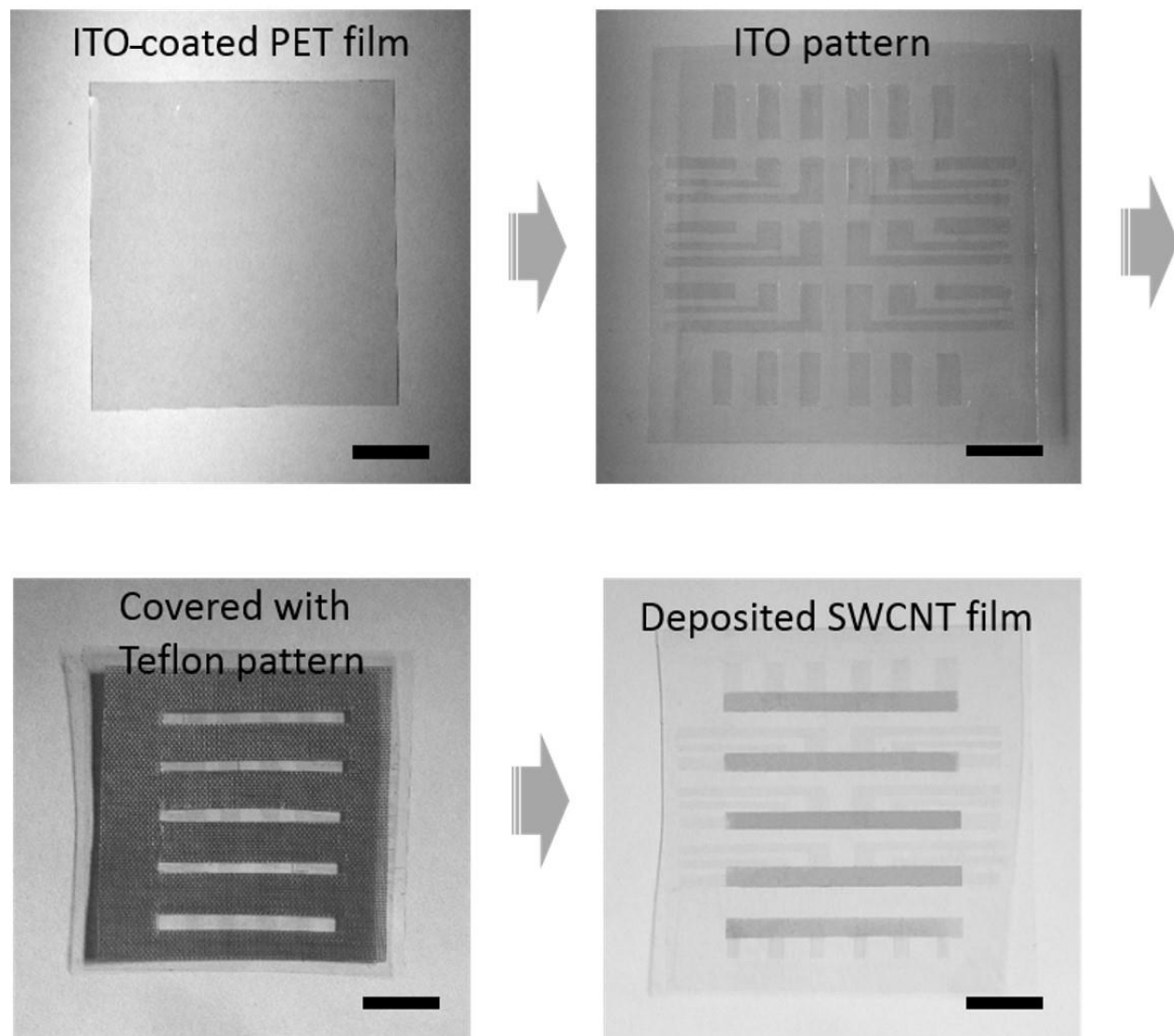


2 mg/ml

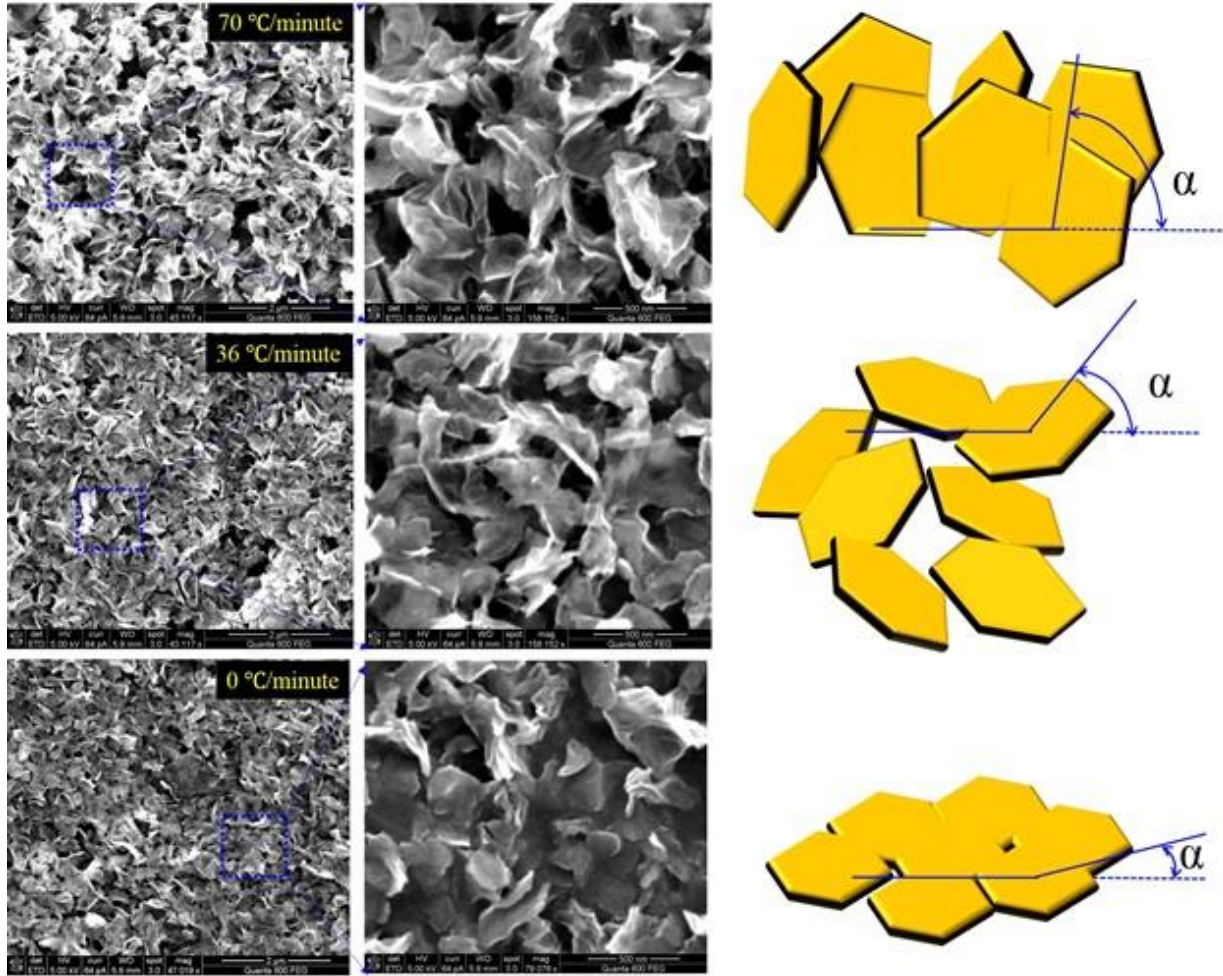


3 mg/ml

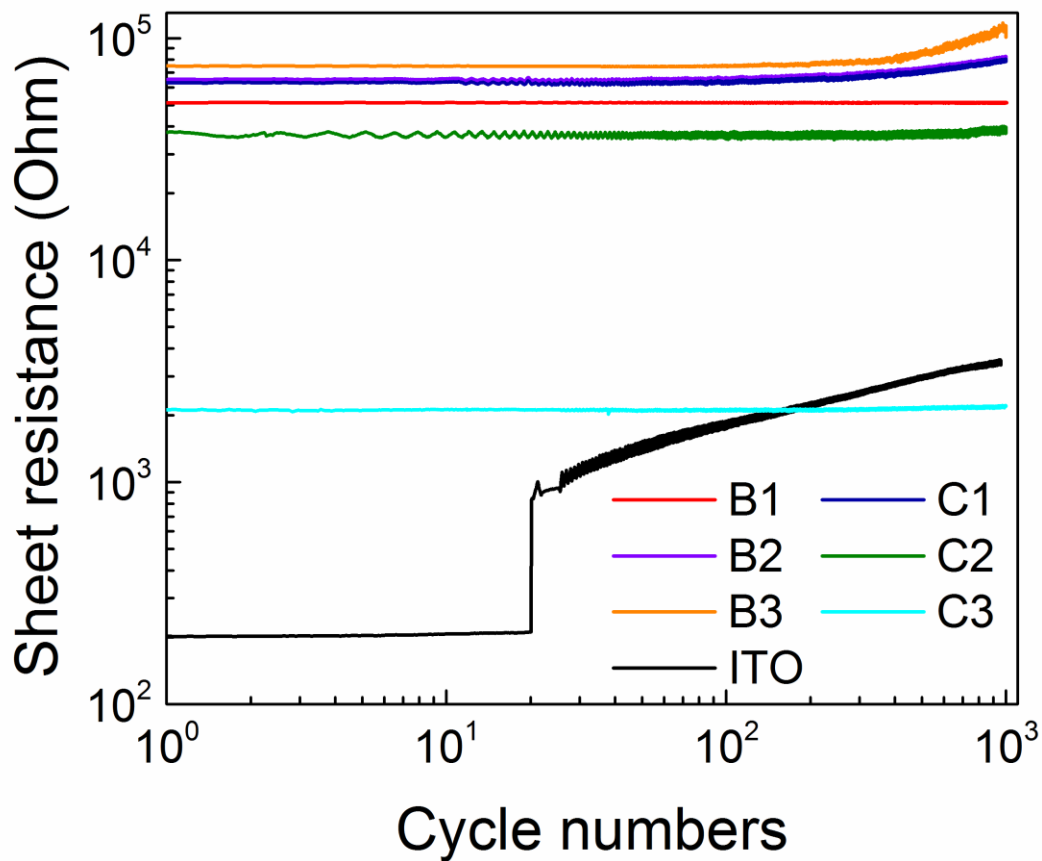
**Figure S3.** Typical SWCNT-TCFs under different fabrication conditions. The default ratio of SWCNT vs. PEDOT:PSS, SWCNT concentration, and heating rate is 1:0.5, 1 mg/ml, and 36 °C/minute, respectively. All scale bars are 1 cm.



**Figure S4.** A typical fabrication process of the fully transparent, flexible, noncontact sensor panel with  $5 \times 5$  sensing pixels. All scale bars are 1 cm.



**Figure S5.** SEM images of graphene-PTCFs at different magnifications fabricated at different heating rates. Graphene concentration is 0.1 mg/ml, and the ratio of graphene to PEDOT:PSS is 1:0.5. (S2)



**Figure S6.** Properties of the mechanical resistance response of SWCNT-PTCFs (long cyclic tests under a dynamic force of 0.1 N with a preload of 0.1 N).

## REFERENCES

S1. J. Han, B. Kim, J. Li, M. Meyyappan. Carbon Nanotube Based Humidity Sensor on Cellulose Paper. *J. Phys. Chem. C* 2012, 116, 22094–22097

S2. A. Zahab, L. Spina, P. Poncharal, C. Marliere, Water–vapor effect on the electrical conductivity of a single-walled carbon nanotube mat, *Phys. Rev. B* 2000, 62, 10000–10003