Supporting Information for

Airflow-Assisted Dielectrophoresis to Reduce the Resistance Mismatch in Carbon Nanotube-Based Temperature Sensors

Abdullah Abdulhameed, Izhal Abdul Halin, Mohd Nazim Mohtar, and Mohd Nizar Hamidon

Fig. S1. The steps that are used to fabricate the electrodes of the temperature sensors.

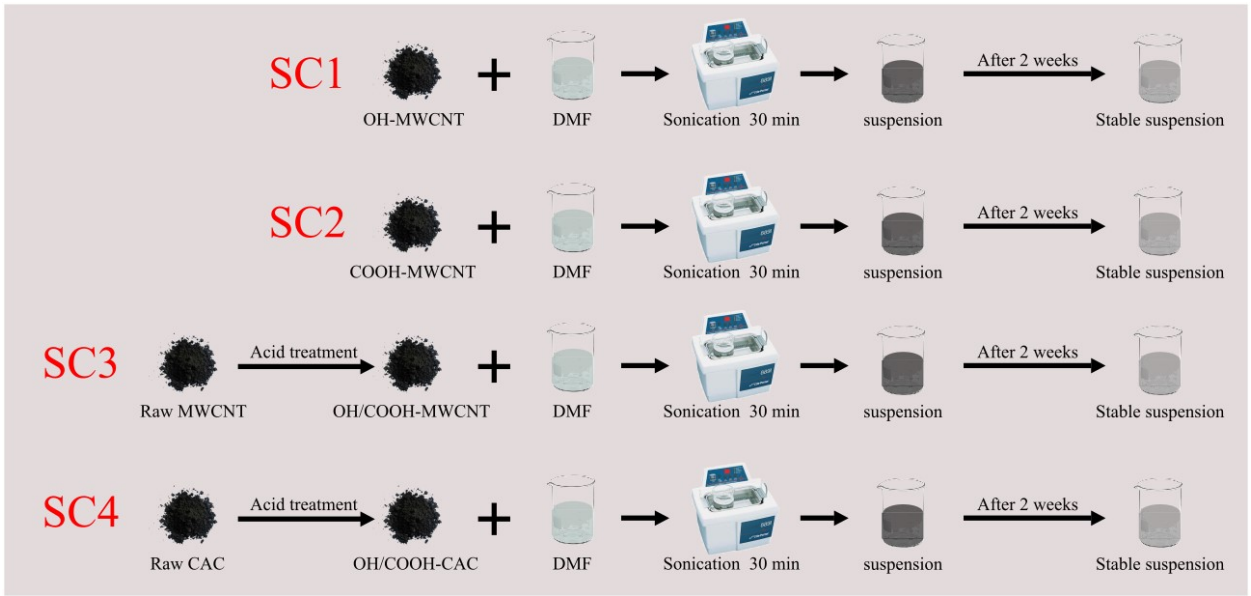

Fig. S2. Samples preparation procedures.

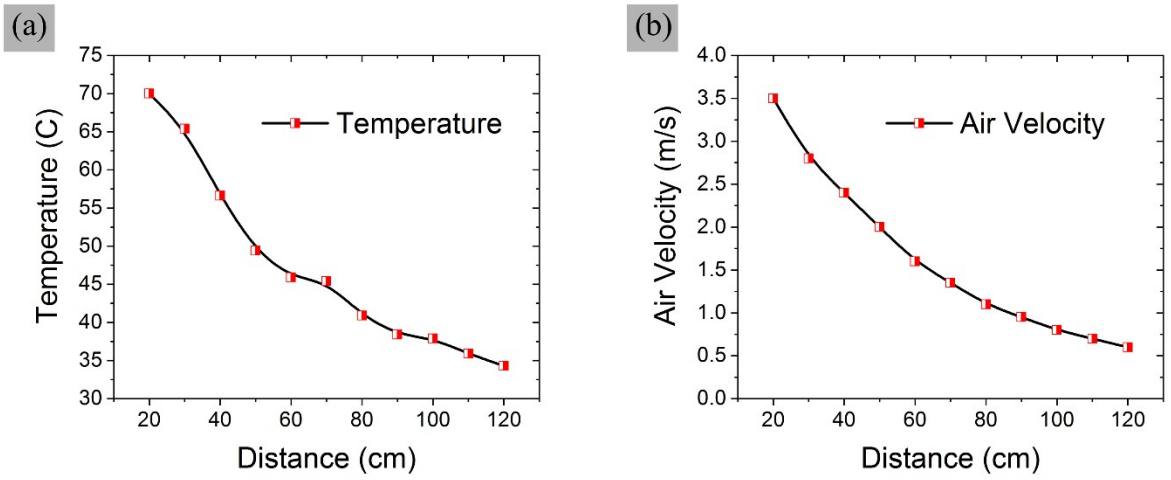

Fig. S3. The airflow temperature and velocity were controlled by placing the air gun at different distances from the sensor. The airflow velocity and temperature were measured using an anemometer. (a) Airflow temperature at different distances. (b) Airflow velocity at different distances.

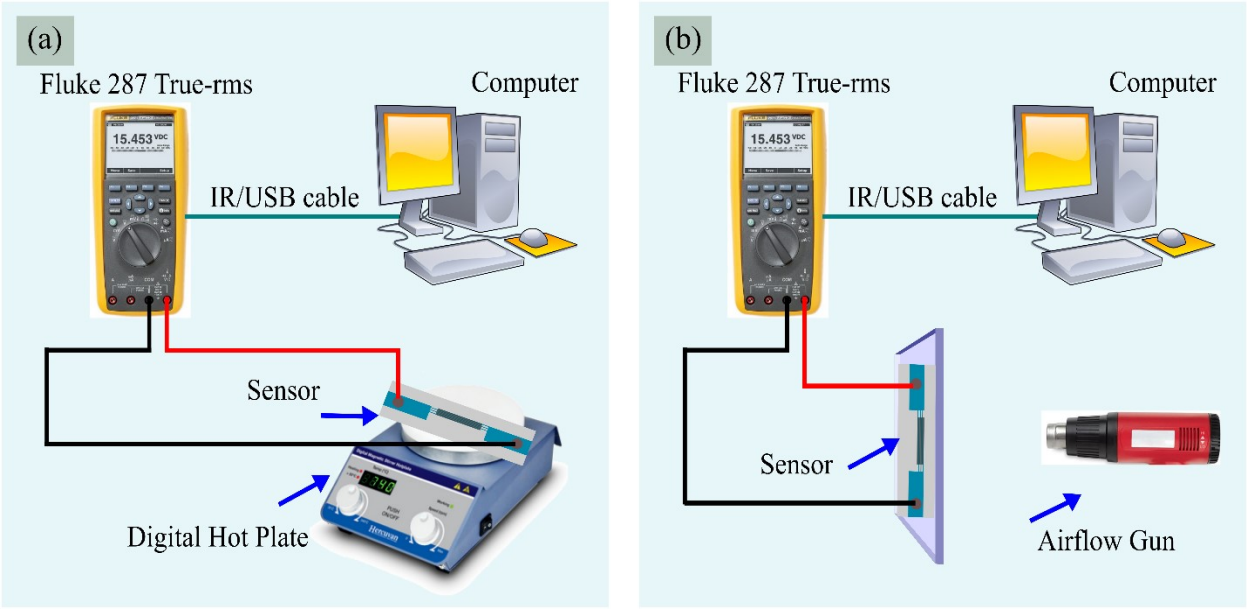

Fig. S4. Sensing setups to test the sensitivity of long MWCNT bridges toward temperature variation. (a) The sensor was placed on a digital hotplate. (b) The sensor was exposed to hot airflow.

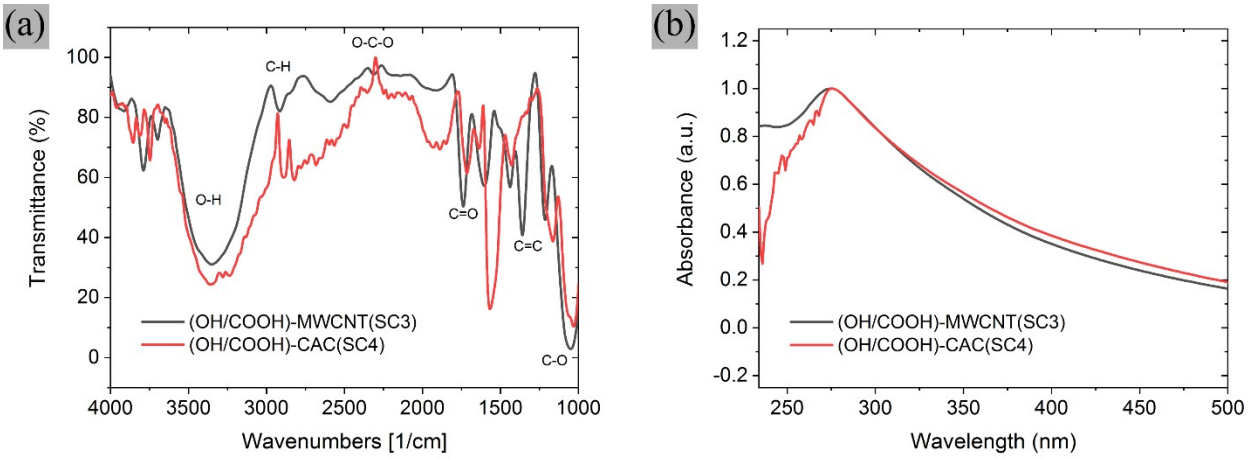

Fig. S5. Characterization results of samples SC3 and SC4. (a) FTIR. (b) UV-Vis. Further discussion can be found elsewhere [1,2].

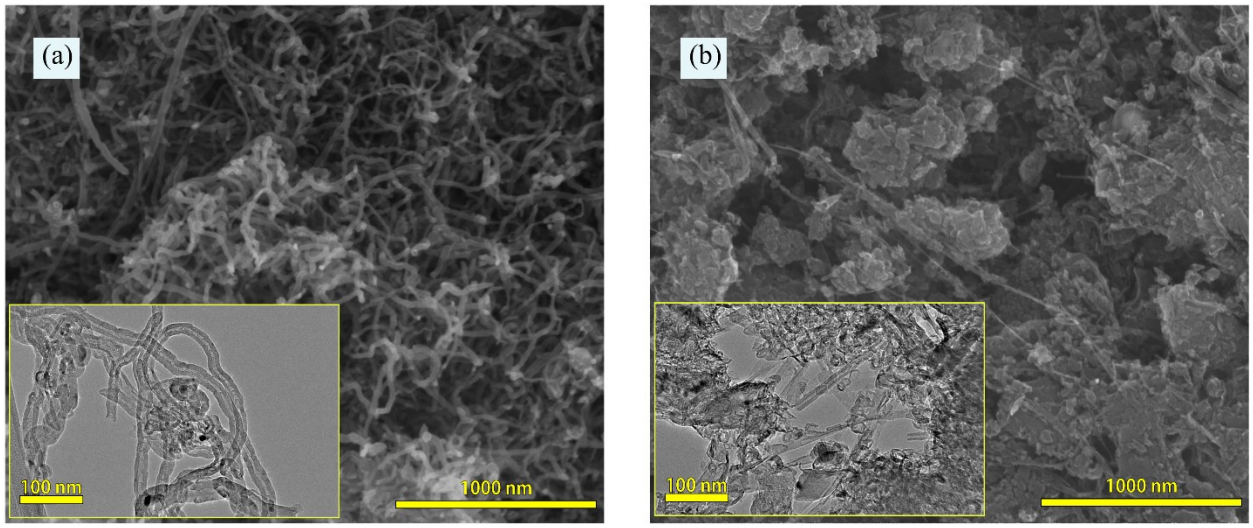

Fig. S6. FESEM and HRTEM imaging. (a) SC3. (b) SC4. Further discussion can be found elsewhere [1,2].

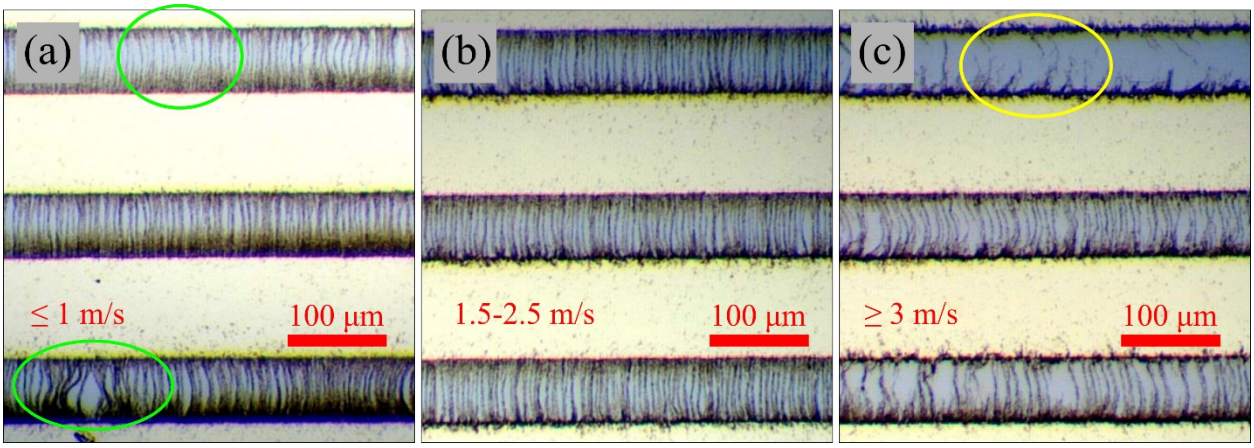

Fig. S7. Aligned MWCNT bridges across a gap width of 75 µm at different airflow velocities. (a) The airflow has no effects at velocities less than 1 m/s. The green circles indicate deformed bridges and uneven density in each gap. (b) The best alignment results were obtained at velocities between 1.5 m/s and 2.5 m/s. (c) At velocities higher than 3 m/s, many bridges are broken (yellow circle). Optical microscope: Moticam, BA310E

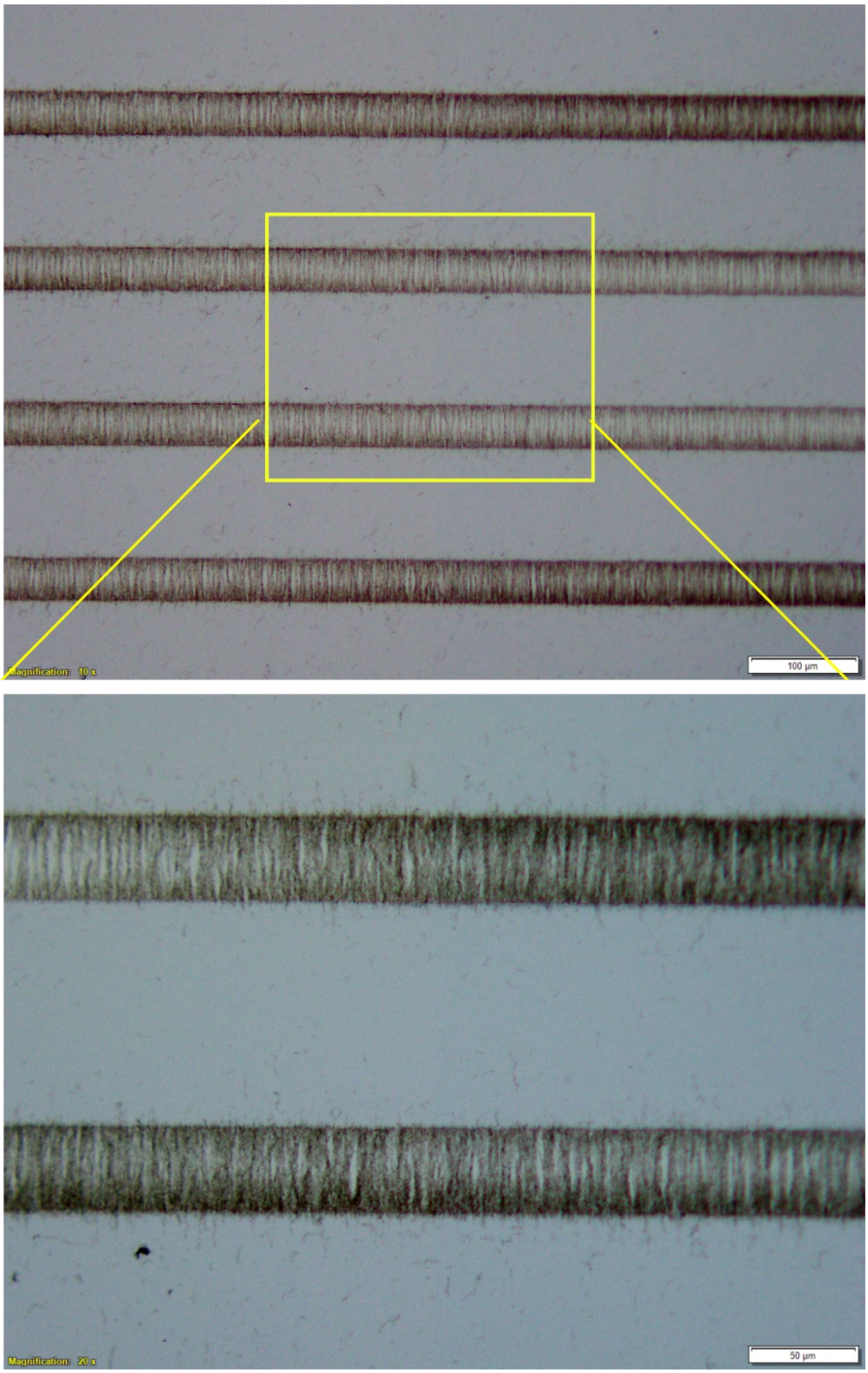

Fig. S8. Temperature sensor with aligned MWCNT bridges across a gap width of 50 µm. (sample: SC3, deposition time: 10 min, concentration: 0.002 wt.% Optical microscope: Olympus, BX51).

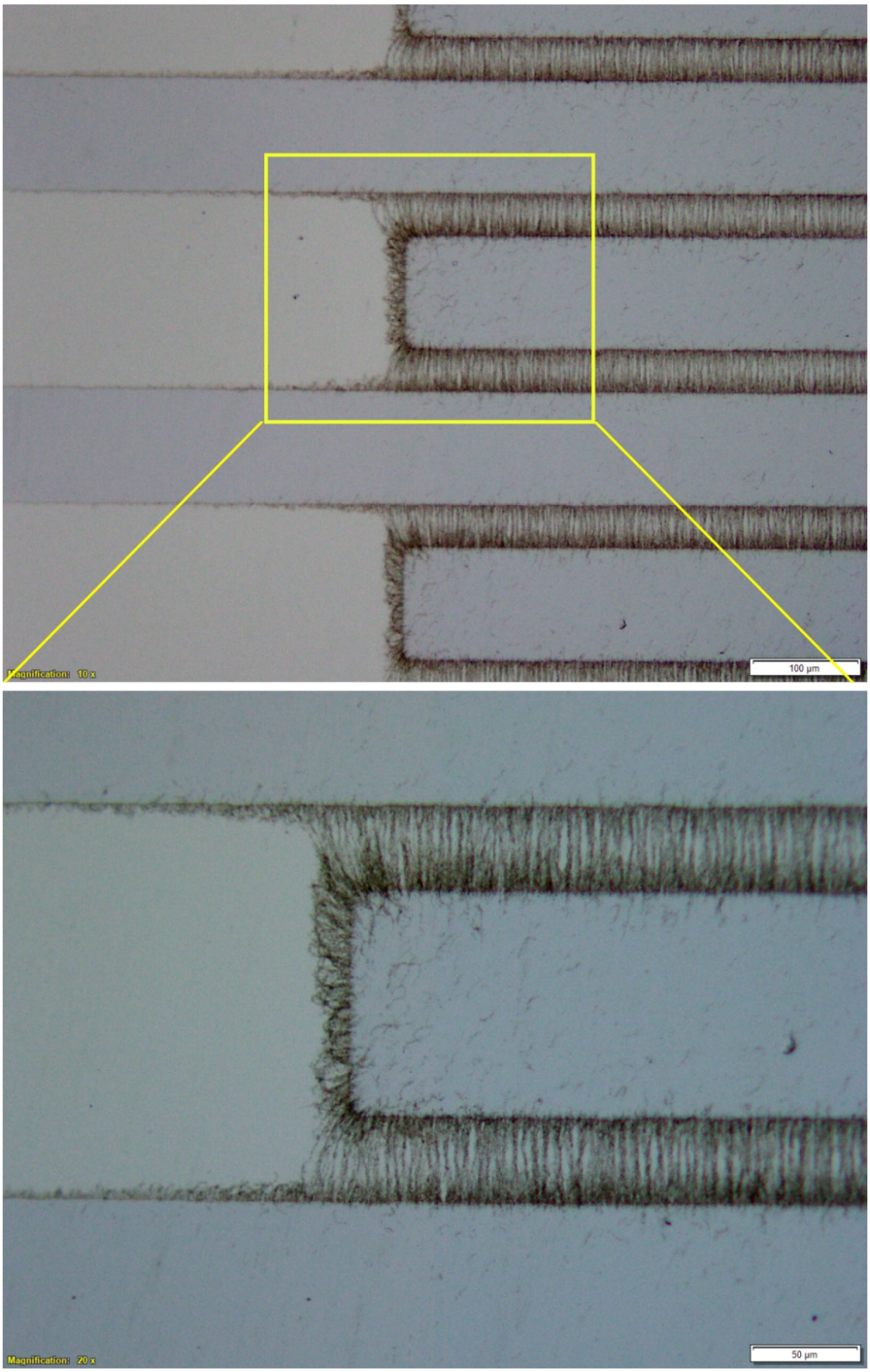

Fig. S9. Temperature sensor with aligned MWCNT bridges across a gap width of 50 µm. (sample: SC3, deposition time: 10 min, concentration: 0.002 wt.% Optical microscope: Olympus, BX51).

References

1 A. Abdulhameed, M. N. Mohtar, M. N. Hamidon and I. A. Halin, *Fullerenes Nanotube. Carbon Nanostructures*, 2021, **29**, 832–839.

2 A. Abdulhameed, M. Nazim Mohtar, M. N. Hamidon, I. Mansor and I. A. Halin, *Mater. Res. Express*, 2021, **8**, 55603.