

## **Supporting Information**

# Sustaining Enhanced Electrical Conductivity in KAuBr<sub>4</sub>-Doped Carbon Nanotube Wires at High Current Densities

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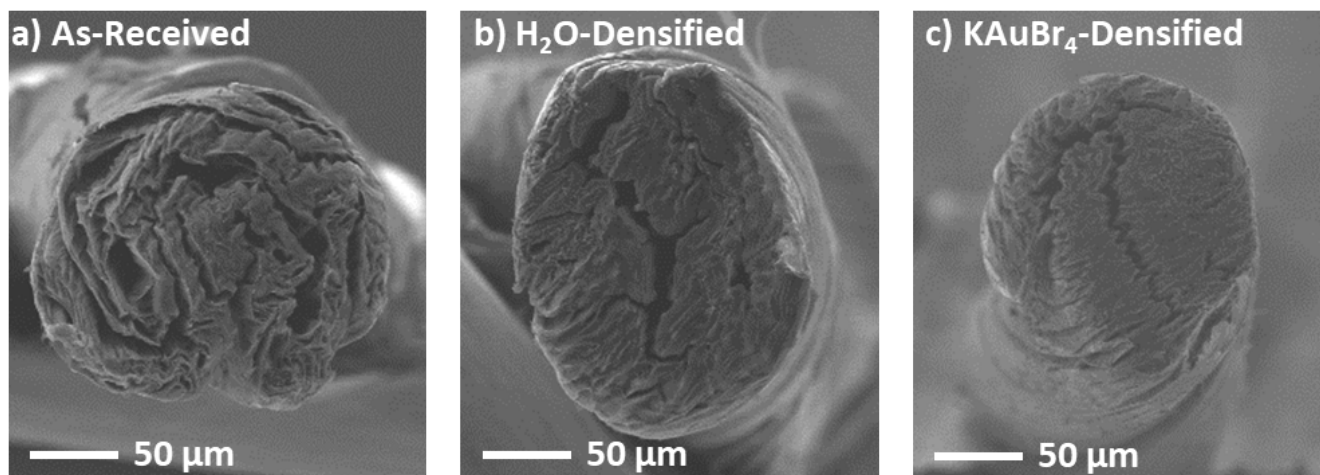


Figure S1: Cross-section SEMs of as-received,  $\text{H}_2\text{O}$ -densified, and  $\text{KAuBr}_4$ -densified CNT yarns.

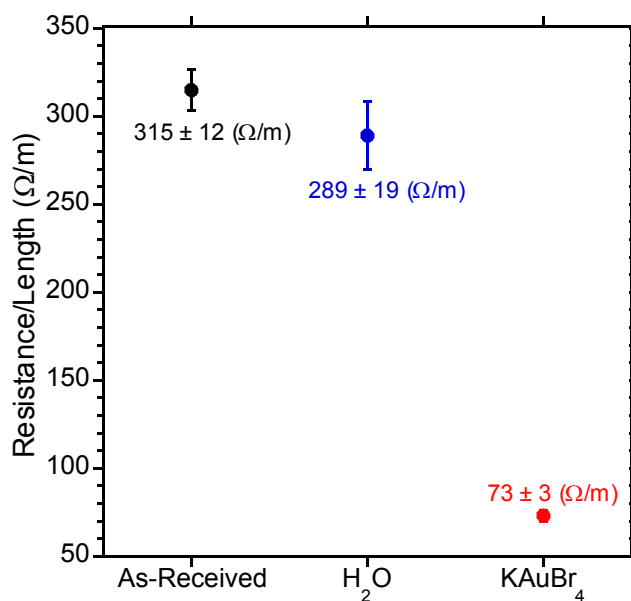


Figure S2: Resistance per length measurements taken at room temperature indicating the different charge transport properties of the CNT yarns, independent of changes in diameter.

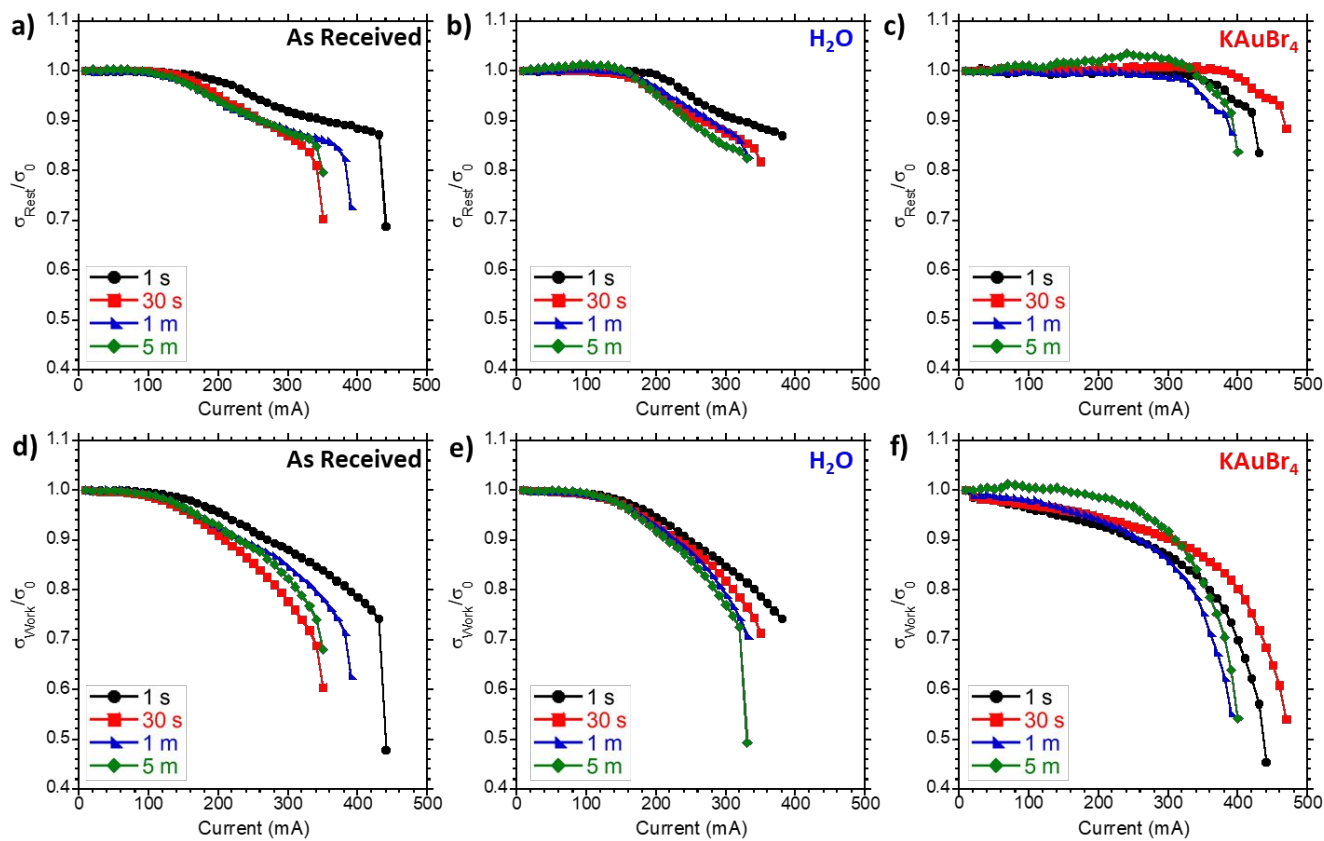


Figure S3: Relative change in resting and working conductivities for as-received, H<sub>2</sub>O-densified, and KAuBr<sub>4</sub>-densified CNT yarns with varying current “on” step times.

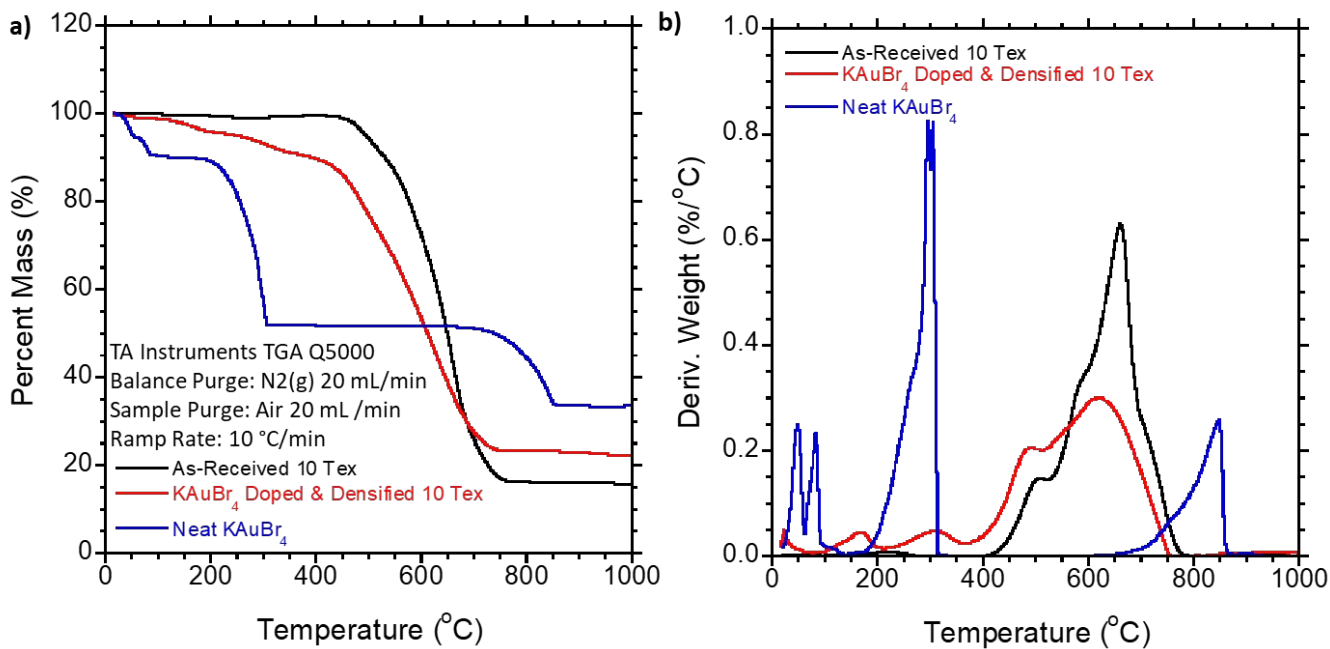


Figure S4: Thermogravimetric analysis of as-received and KAuBr<sub>4</sub>-densified CNT yarns compared to neat KAuBr<sub>4</sub> solids.

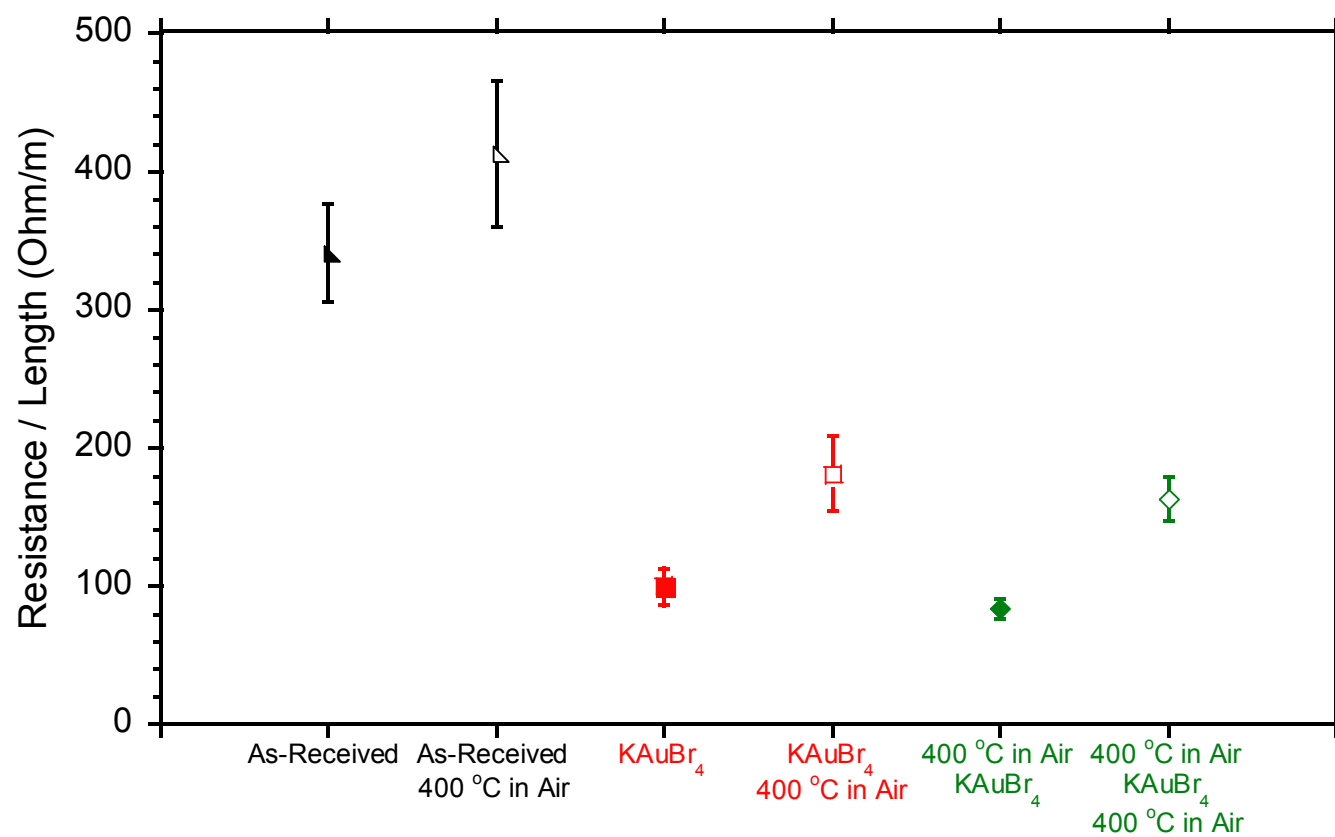


Figure S5: Resistance per length of CNT yarn samples for thermal stability study taken at room temperature.

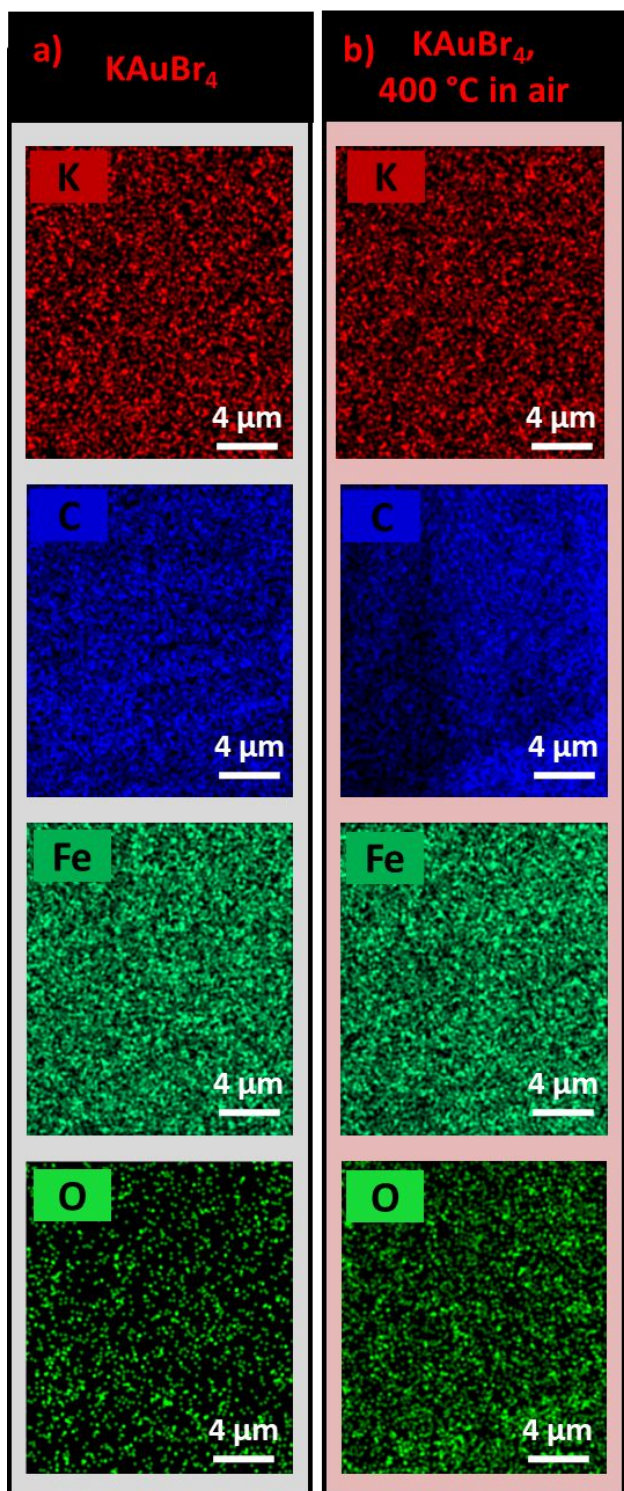


Figure S6: Elemental spatial analysis from EDX spectroscopy of potassium, carbon, iron, and oxygen for KAuBr<sub>4</sub>-doped CNT samples a) before (KAuBr<sub>4</sub> - ■) and b) after thermal oxidation to 400 °C (KAuBr<sub>4</sub>, - 400 °C in air - □).