Supporting Information

Robust, Conformal Cu_2O Coatings on Polypropylene Fabrics via Atmospheric-Pressure Spatial Atomic Layer Deposition

*Guvanch Gurbandurdyyev, Sarah Khalid, Samantha Lum, Fan Ye, Autumn Cheon, Kam Chiu Tam, Stephanie DeWitte-Orr, and Kevin P. Musselman**

*Corresponding author: kevin.musselman@uwaterloo.ca

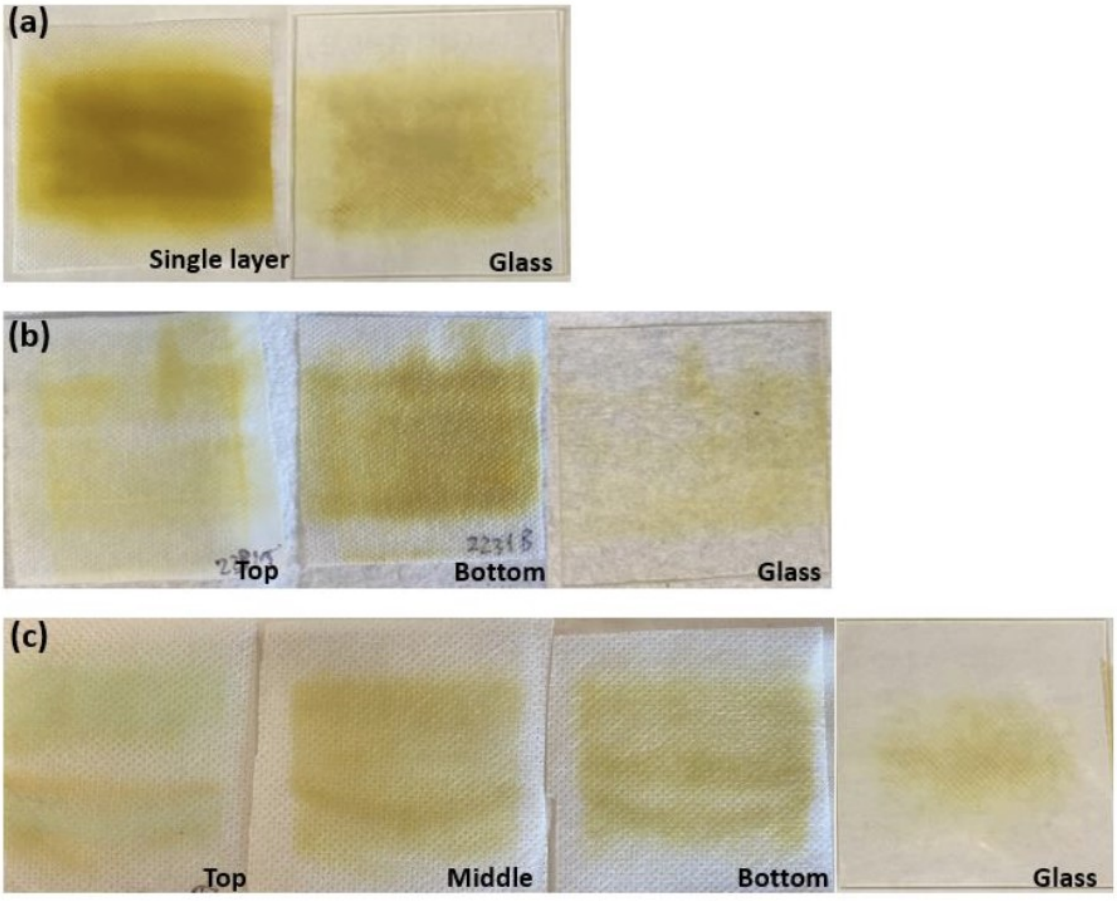

Figure S1. *Coating of (a) one layer, (b) two layers, and (c) three layers of PP fabric on glass (7 cm x 7cm) with Cu_2O.*

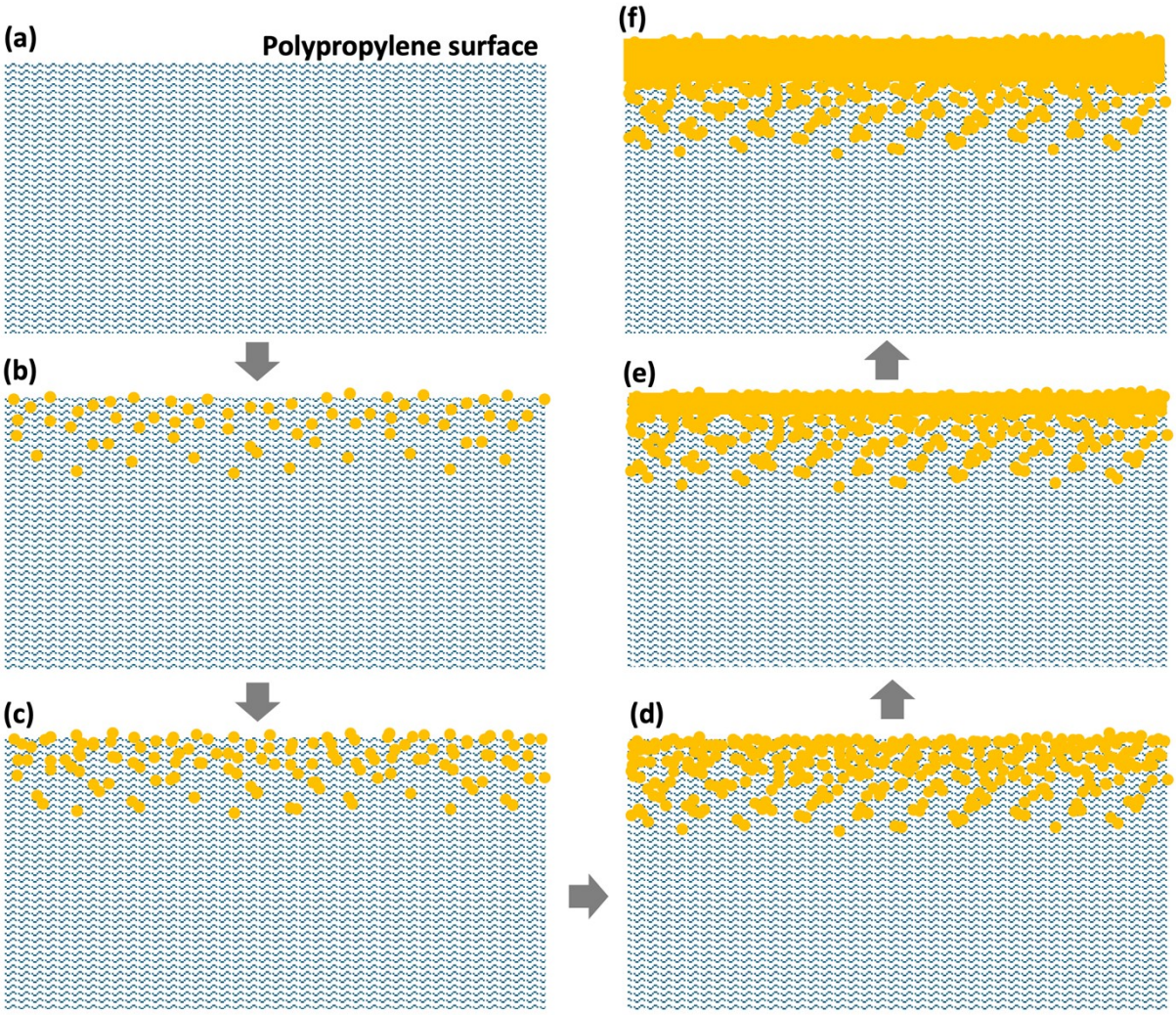

Figure S2. *Illustration of subsurface infiltration process. (a) Surface of polypropylene fiber. (b) The chemical precursors, Cupraselect and water, get trapped in the near-surface region, forming Cu_2O nucleation clusters. (c-d) The Cu_2O clusters coalesce into larger clusters that fill the space between the polymer chains. (e-f) Cluster coalescence results in the formation of a continuous Cu_2O film that grows on the polypropylene surface.*

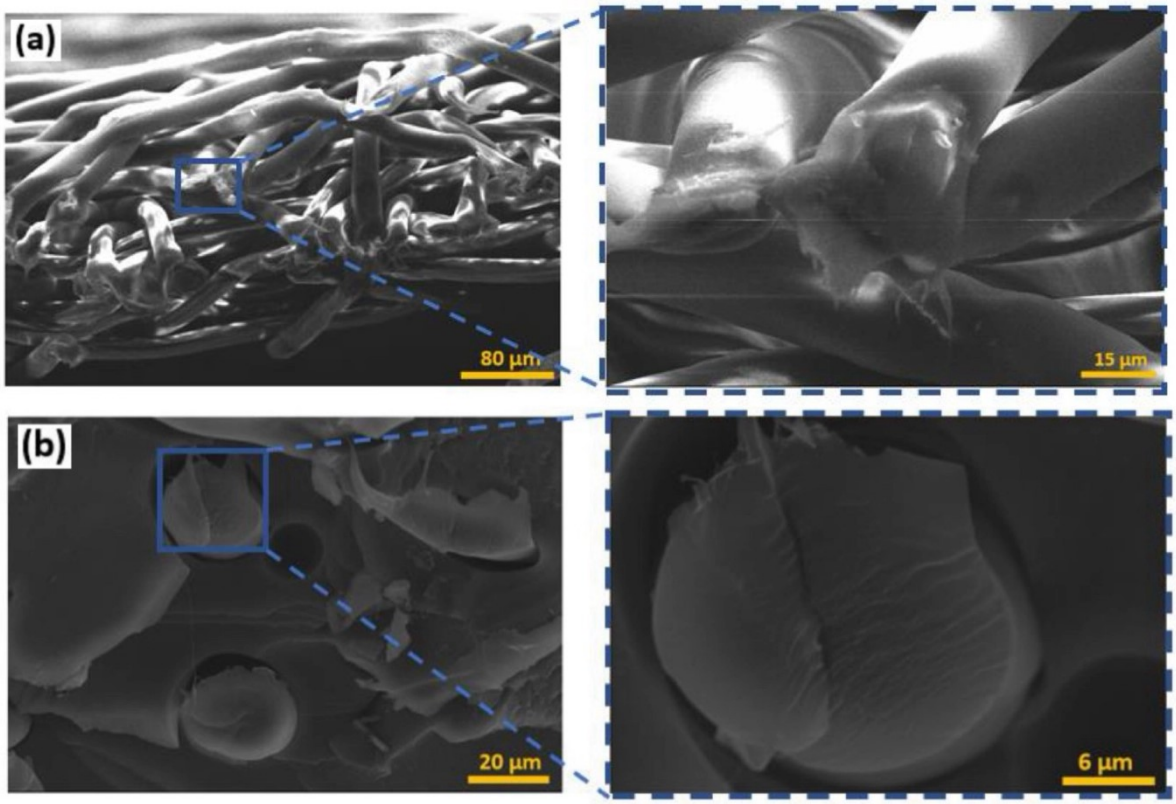

Figure S3. *Cross-section SEM image of Cu_2O-coated PP fabric (600 AP-SALD oscillations) (a) after immersed in liquid nitrogen, and (b) after encapsulated with epoxy.*

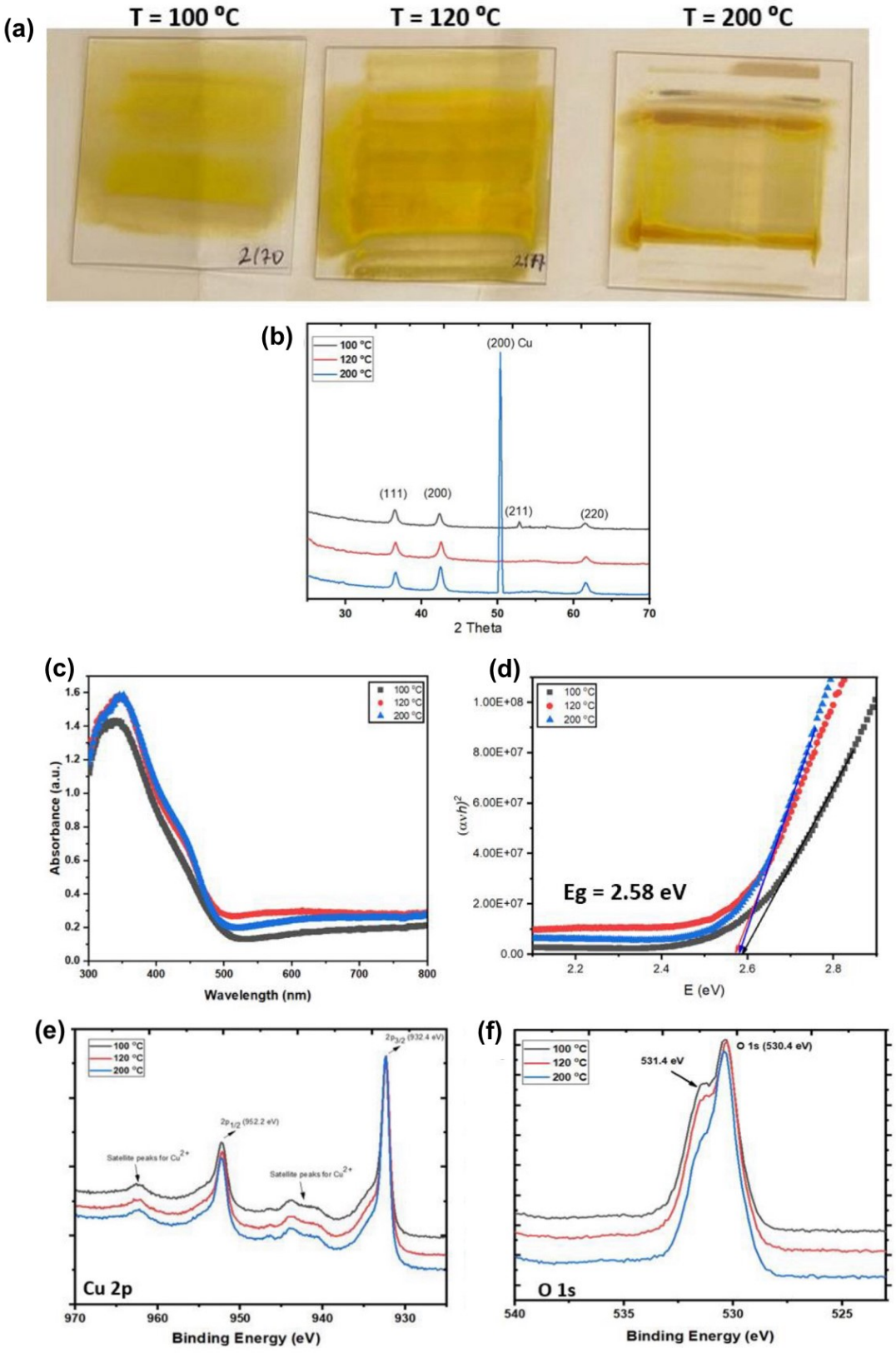

Figure S4. *(a) The Cu_2O thin-film coatings deposited at 100 °C, 120 °C, and 200 °C, (b) their XRD patterns, (c) UV-Vis absorbance spectra, and (d) corresponding Tauc plots with calculated optical band gap energy value (E_g). XPS measurement of Cu_2O samples showing (e) Cu 2p and (f) O 1s spectra.*