

Supporting Information for

Laser-Assisted Reduction of Highly Conductive Circuits based on Copper Nitrate for Flexible Printed Sensors

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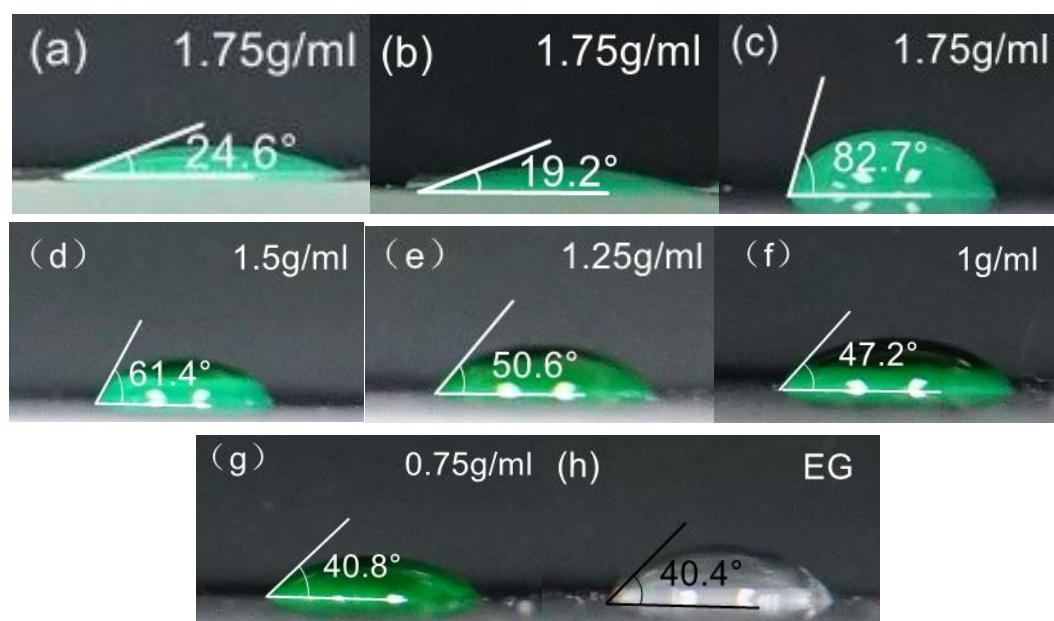


Figure S1 Contact angle of copper salt. The glass substrate **a** treated and **b** did not treated by oxygen plasma. **c-g** Contact angel of different concentration of copper salt on PET substrate. **h** Contact angle of EG on PET substrate

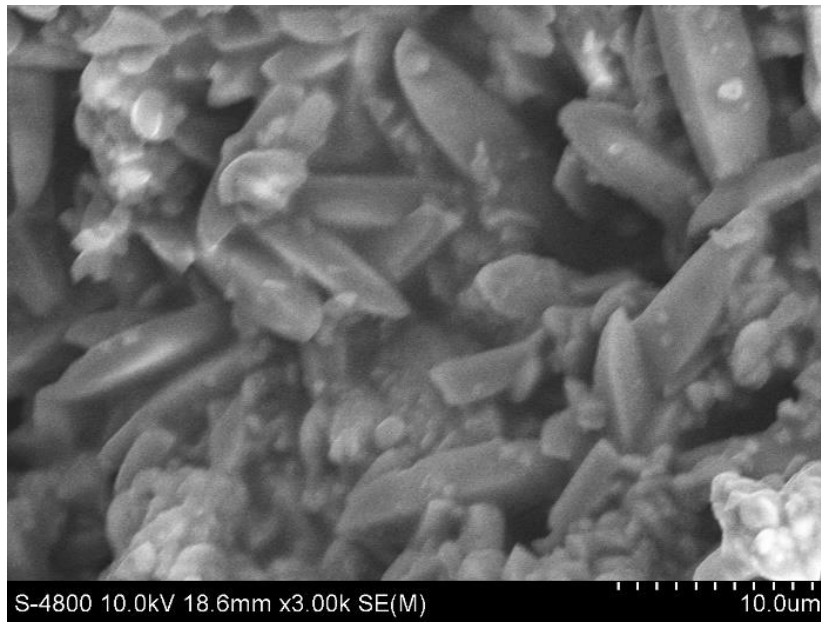


Figure S2 SEM image of copper salt

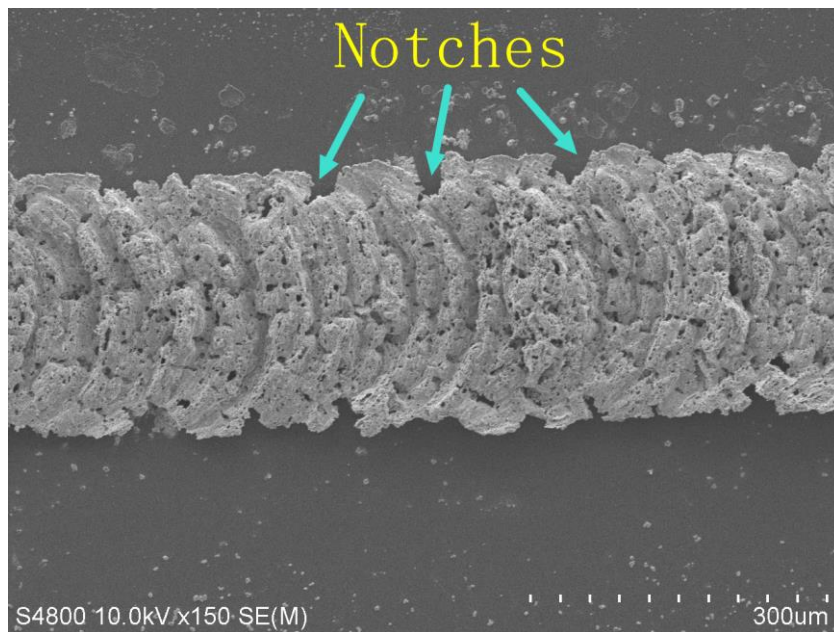


Figure S3 SEM images of copper line on glass reduced by laser at the power of 2 W

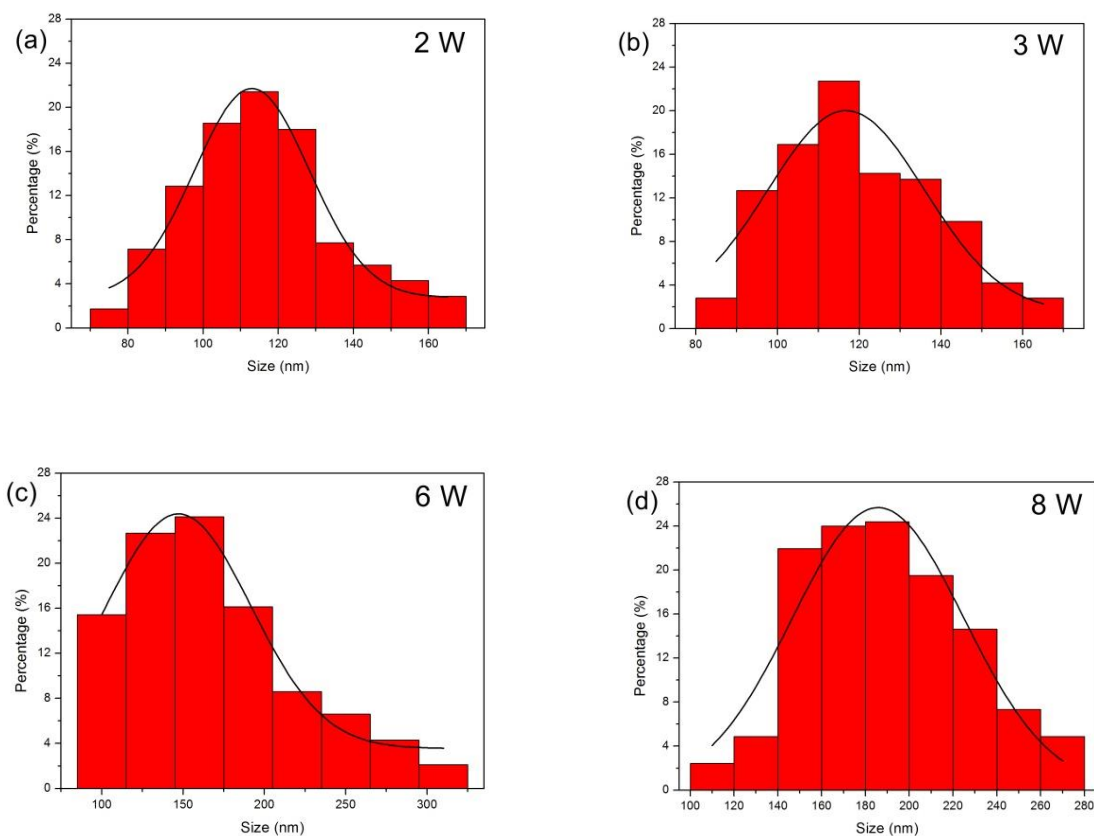


Figure S4 The size distribution of Cu nanoparticles reduced by laser at a power of **a** 2 W, **b** 3W, **c** 6W and **d** 8W

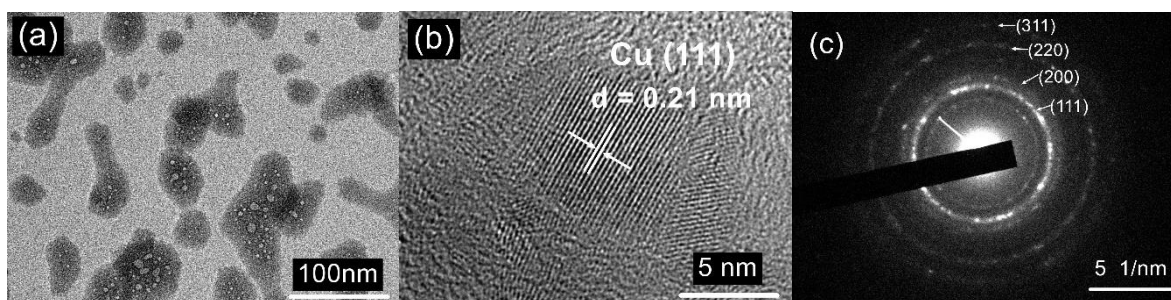


Figure S5 **a** TEM image of the laser reduced copper nanoparticles. **b** HRTEM image of the {111} copper nanoparticle. **c** SAED pattern of the laser reduced copper nanoparticle

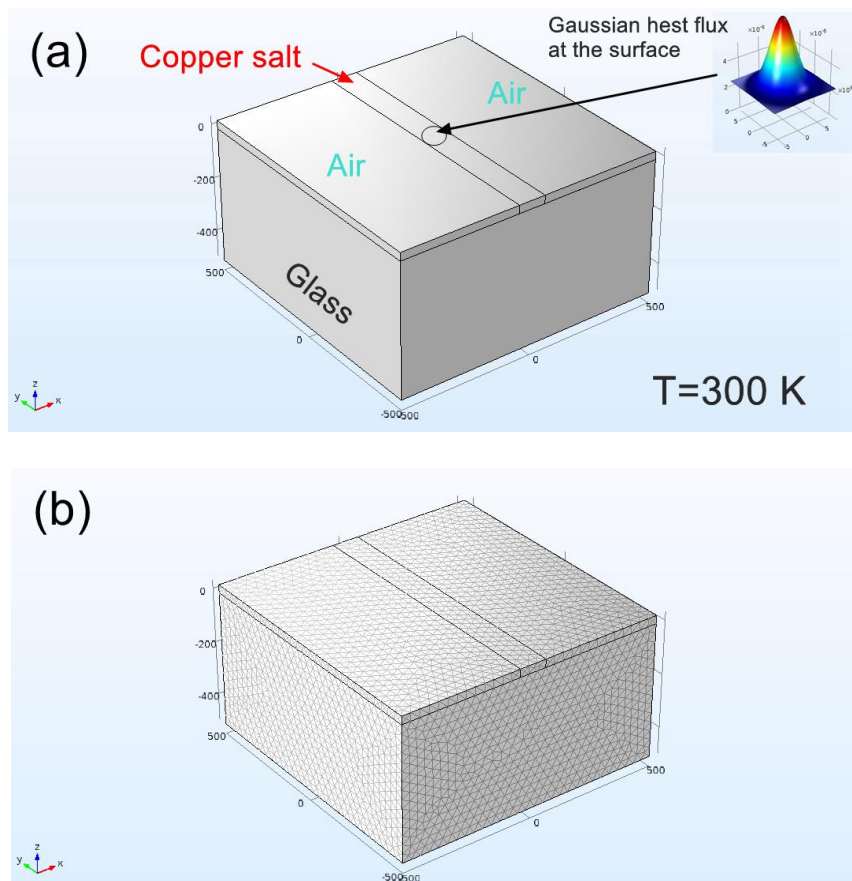


Figure S6 Details on the simulation. **a** Basic simulation parameters. Conjugate heat transfer module with isothermal surroundings ($T_0 = 300\text{ K}$) has been used in every simulation, while the heat source has been fixed as a Gaussian heat source with diameter = $150\text{ }\mu\text{m}$. **b** Mesh distribution and size of the module

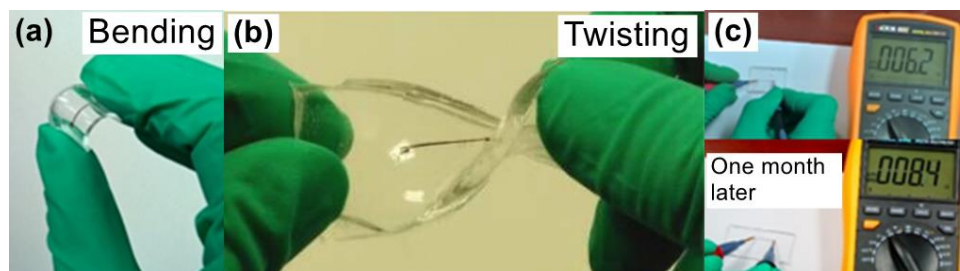


Figure S7 Bending **a** and twisting **b** of a Cu wire sensor. **c** Resistances of the copper electrode measured by a multimeter

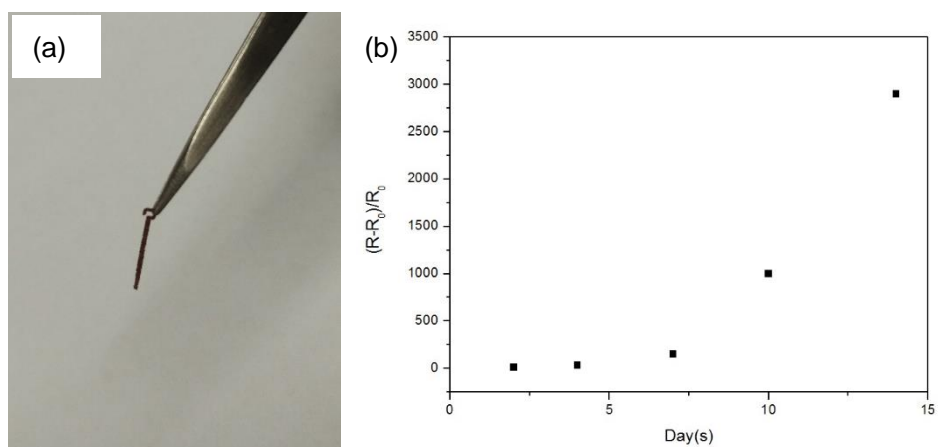


Figure S8 **a** Reduced copper circuits was picked up by tweezers. **b** The resistivity of bare copper lines changing in the air without any protection

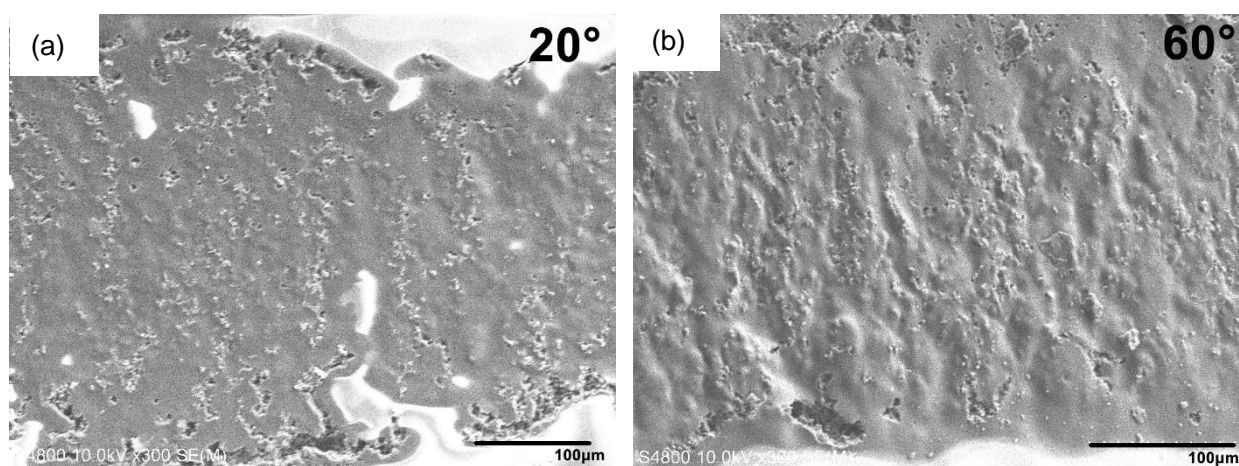


Figure S9 SEM images of copper circuits at a bending angle of **a** 20° and **b** 60°

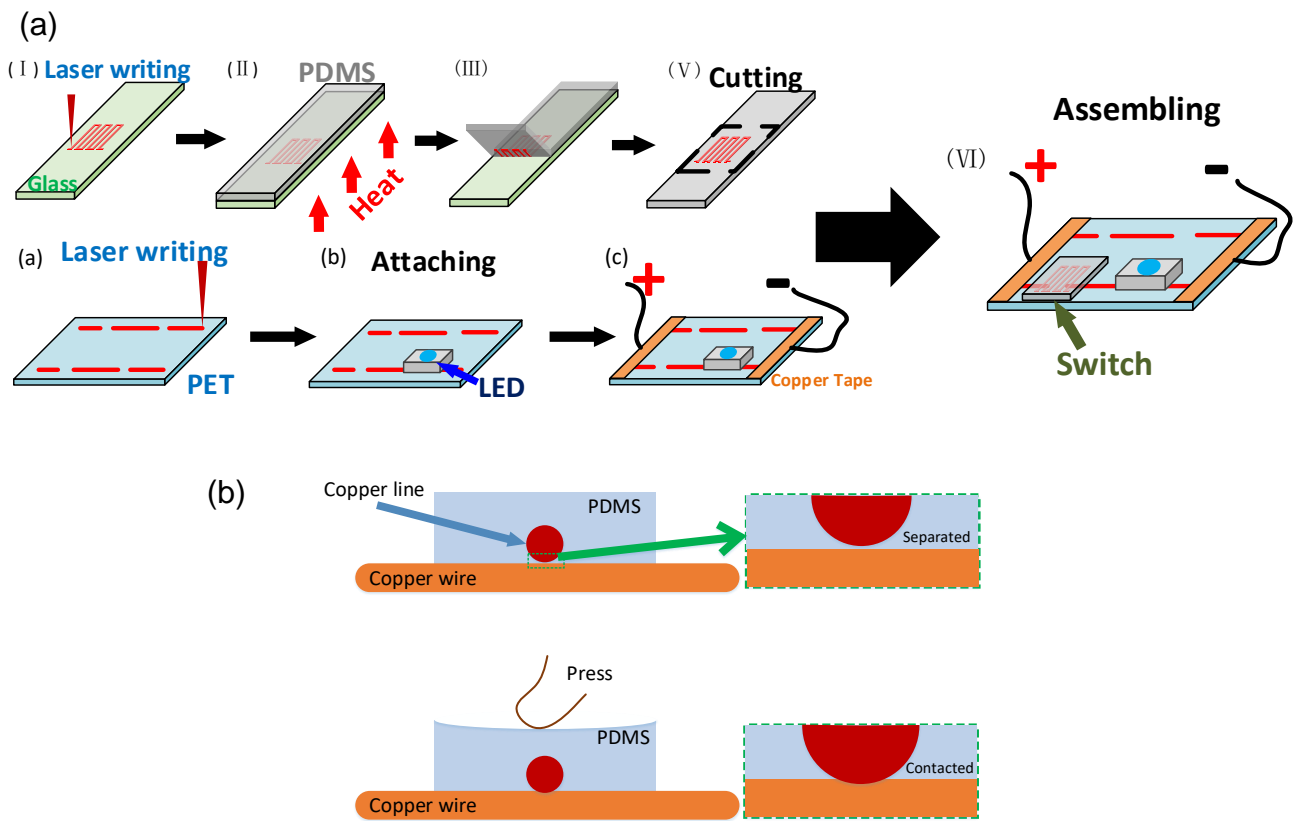


Figure S10 a The fabrication process about flexible device. **b** The operating principle of LED switch based on PDMS and copper electrodes