Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

Multiphase separation of copper nanowires

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Experimental methods and instrumentation

All chemicals and solvents were purchased from Sigma-Aldrich (St. Louis, MO) and used as received. The scanning electron microscope (SEM) images were collected in a JEOL-JSM-7401F field emission SEM. The transmission electron microscope (TEM) images and diffraction pattern were taken by a FEI Titan 80-300 S TEM. The purified and non-purified CuNW samples were characterized by XRD with a Bruker AXS D8 Advance diffractometer. Diffraction patterns were recorded from 10 to 75° 2θ with a step size of 0.038° at 1.5 second per step. The thermal analysis (DSC/TGA) was performed on a NETZSCH STA 449 F3 Jupiter. The sample was heated up to 500 C in a silicon carbide furnace at a heating rate of 5K/min. The heating was conducted under Ar gas flow set at 100 mL/min. A sample weight of at least 10 mg was used. FT-IR studies were performed using an ALPHA FTIR Spectrometer (Bruker Inc).

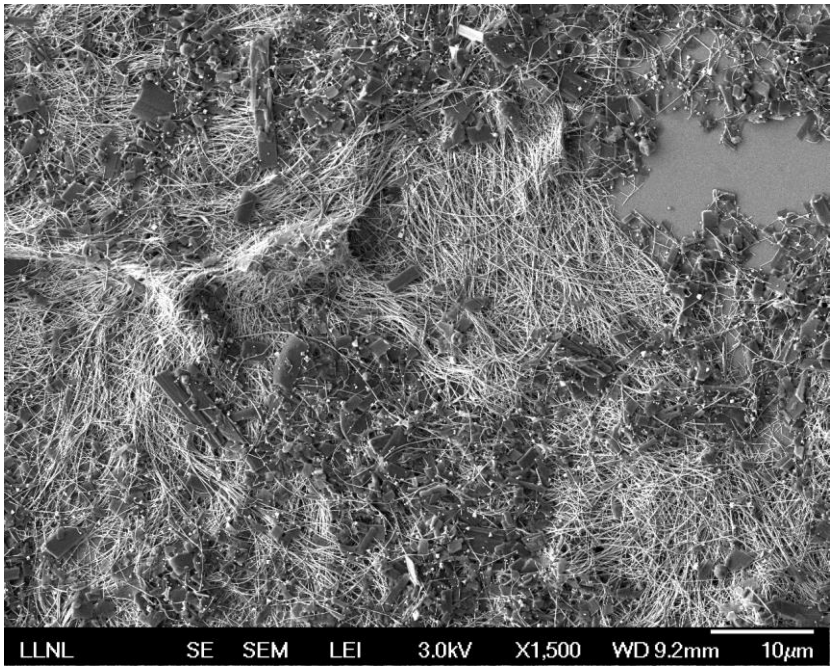

Figure S1. A representative SEM image of the products in the as-prepared original solution, without wash or purification.

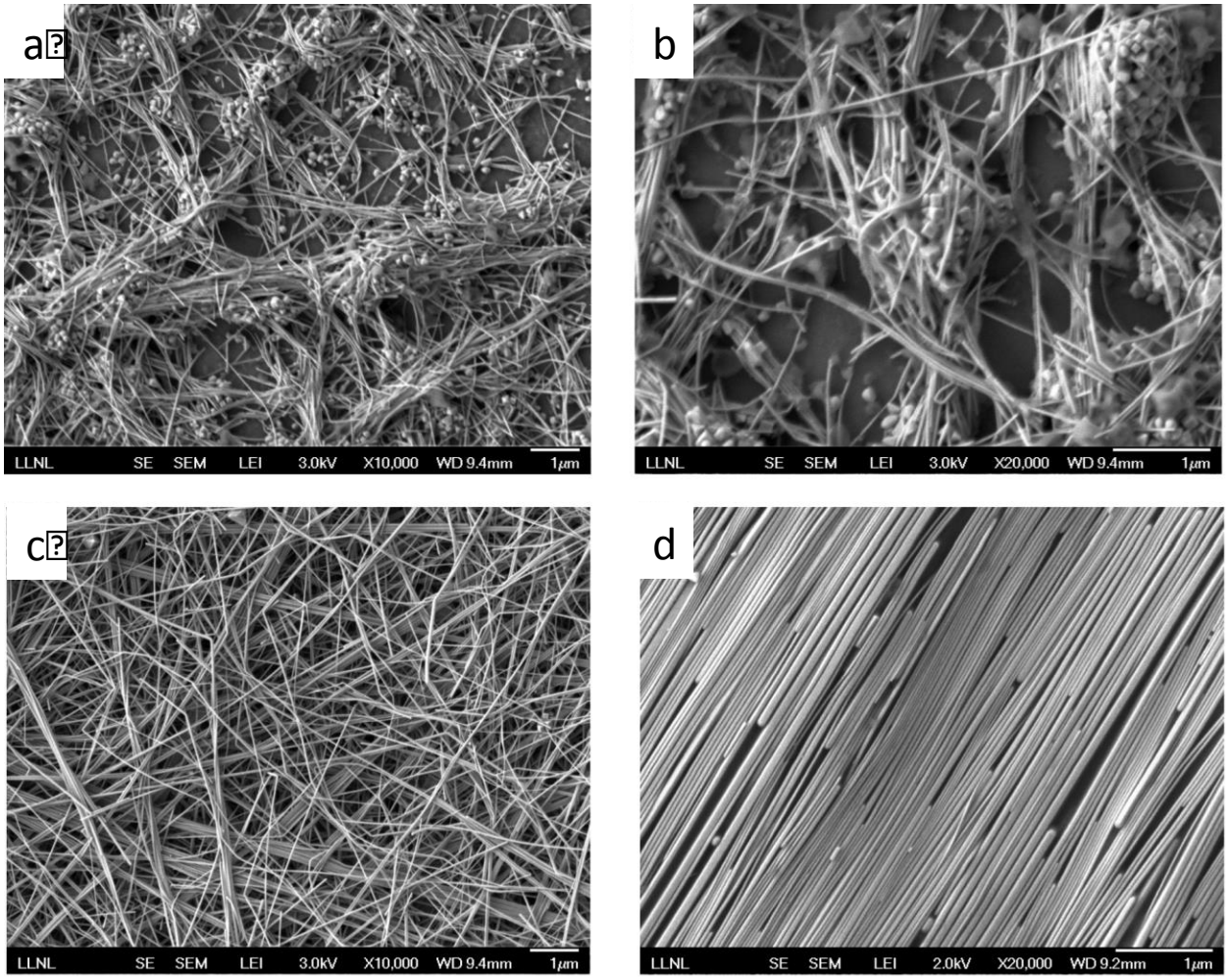

Figure S2. High-resolution SEM images of (a, b) non-purified nanowires and (c, d) purified nanowires using the chloroform/water bi-phase system.

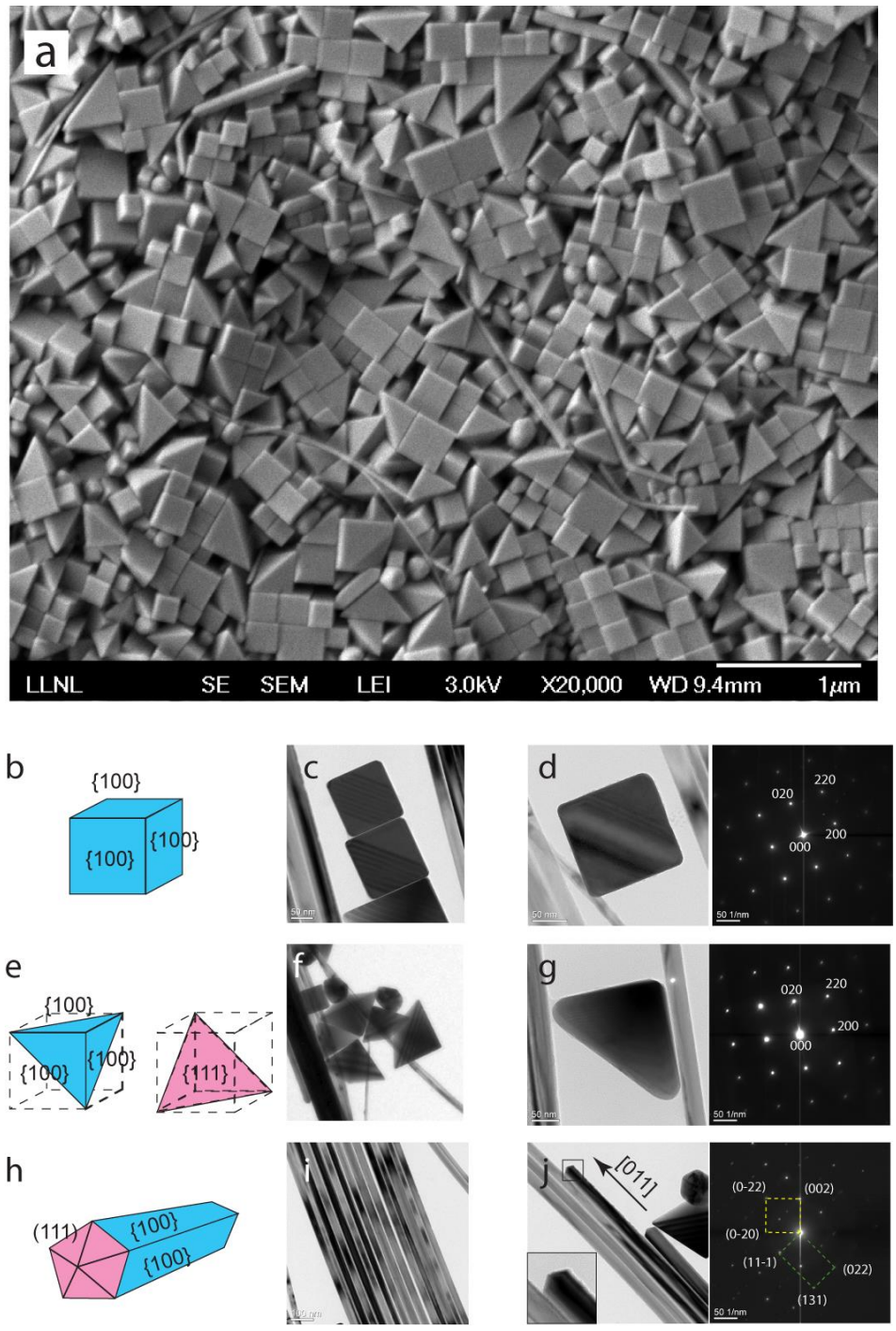

Figure S3. (a) A high-resolution SEM image of Cu nanocrystals in the water phase after purification. Main shapes consisted of cubes and trigonal pyramids. Schematic representations and TEM images and corresponding electron diffraction patterns taken from the dominant morphologies in the as-prepared copper nanomaterials, (b-d) nanocubes, (e-g) trigonal pyramid, and (h-j) nanowires.

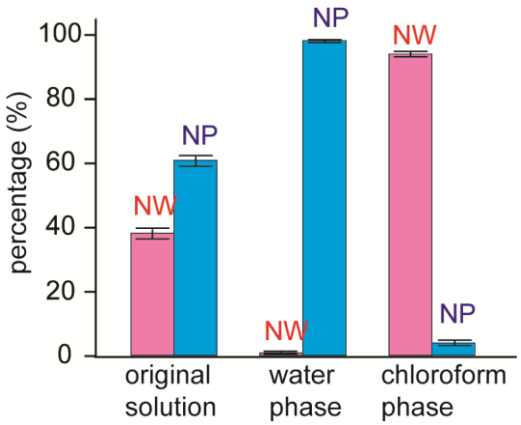

Figure S4. Histogram of NWs versus NPs in the as-synthesized original solution, and water phase and chloroform phase after multiphase separation. The values presented here are results of SEM image analysis, manually counting NWs and NPs.

Video S5: The dynamic interface of water (left) and toluene (right). Nanowires were first enriched at the interface and then crossed the interface spontaneously towards toluene side (see attached video).

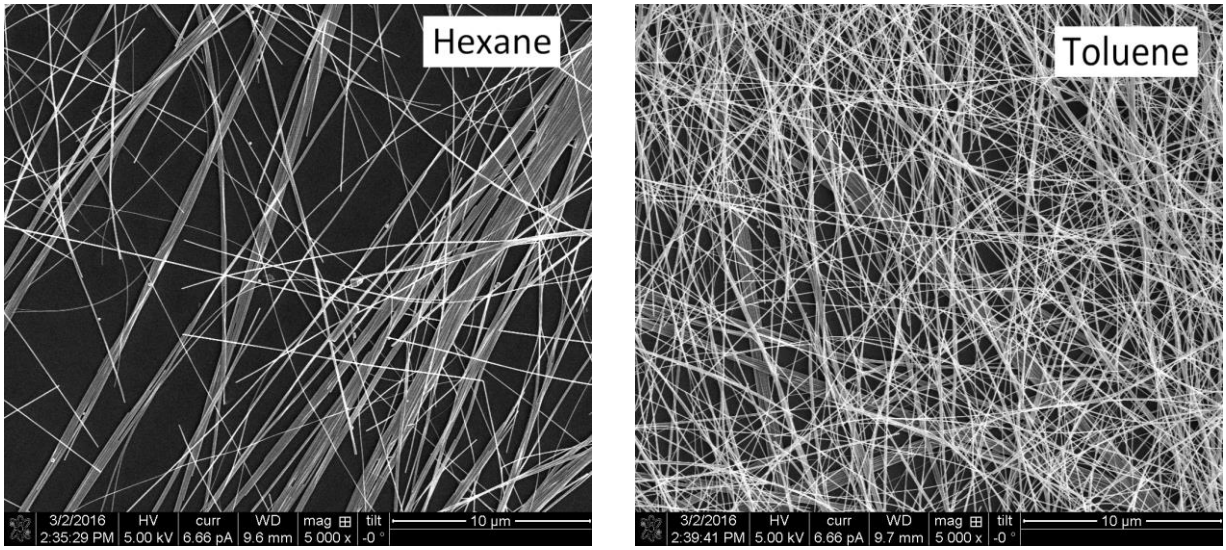

Figure S6. SEM images comparing purified nanowire samples using hexane/water system (left), or toluene/water system (right).