A generic *in-situ* seed-mediated size-control method in the case of cuprous oxide nanocubes and their antibacterial activities

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Characterization methods

X-ray diffraction (XRD) was performed on a D/M III X-ray diffractometer with Cu Kα radiation. Scanning electron microscopy (SEM) was performed on an FEI nova 400 filed emission scanning electron microscope. Transmission electron microscopy (TEM) and high resolution transmission electron microscopy (HRTEM) characterizations were carried out with a JEOL field emission transmission electron microscope operating at 200 kV. UV-vis absorption spectra were recorded by a Hitachi U-3310 UV-vis spectrophotometer.

Antibacterial activity measurement

The antibacterial activity experiments were conducted as follows: 120 μl of Cu_2O nanocubes solutions redispersed in water with five concentrations (800 μg/ml, 400 μg/ml, 200 μg/ml, 100 μg/ml and 50 μg/ml), 100μl liquid medium mainly composed of beef extract, peptone and water, and 20 μl solution of bacteria strain of *S. aureus* or *E. coli* for inoculating from Laboratory of Microorganism, Southwest University activated at 37 ℃ for 8 hours were successively added into wells of a 96-well plate. The blank controls were prepared by adding only 120 μl Cu_2O nanocubes solution and 100 μl liquid medium into wells. The negative controls were prepared by adding only 220 μl liquid medium and 20 μl bacterial solution into wells. After incubation the culturing medium at 37 ℃ for 24 hours, the optical density (OD) of each well was

measured by a microplate reader. Then the antibacterial activity of Cu_2O nanocubes was evaluated by the equation: Antibacterial activity= $(OD_{ex}-OD_{bc})/OD_{nc}*100\%$, where OD_{ex}, OD_{bc} and OD_{nc} refer to the optical density of experimental groups, blank control groups and negative control groups, respectively.

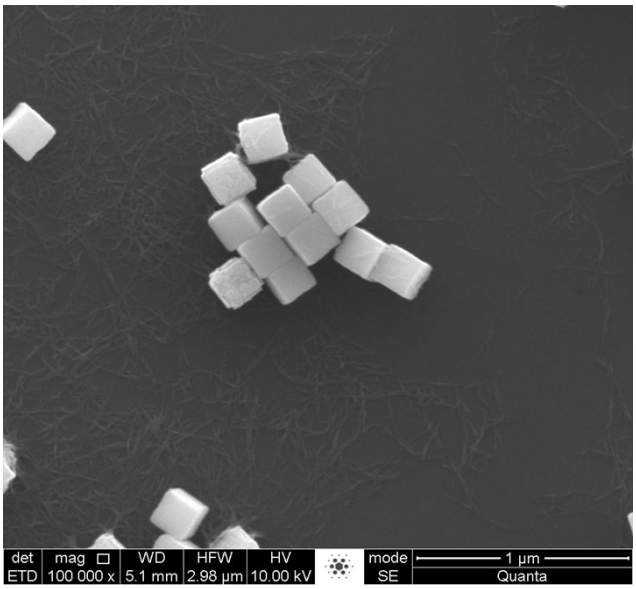

Figure S1. Sample prepared according to S1 but without D-glucose. Tiny fibers are clearly seen, which are ascribed to $Cu(OH)_2$ precipitates.

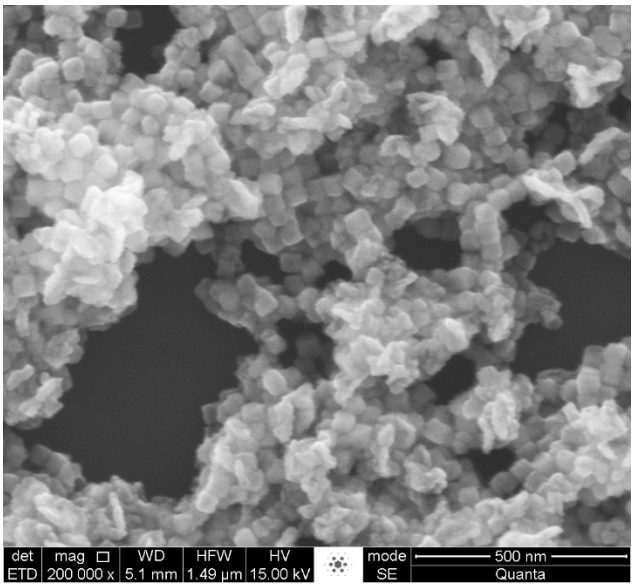

Figure S2. Sample prepared according to S1 but with increased nucleation duration (1 minute). The Cu_2O nanoparticles are agglomerated and their cubic morphology is less developed.