Supplementary Material (ESI) for Chemical Communications

Electronic Supplementary Information (ESI)

Morphology Effect on Antibacterial Activity of Cuprous Oxide

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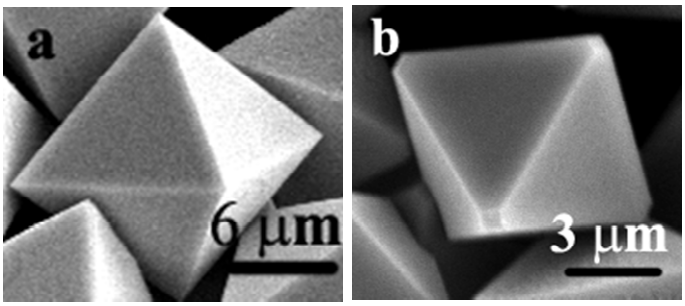
SI1. Experimental

In a typical procedure, the starting solution was prepared by mixing 0.05 g of glycine and 0.08 g of copper acetate in the mixed solvent of 10 mL of H_2O and 5 mL of C_2H_5OH, and the resulting solution was transferred into 50 mL stainless-steel autoclaves lined with poly(tetrafluoroethylene). The autoclave was sealed and maintained at 140 °C for 24 h and then cooled to room temperature. The products obtained at the bottom of the autoclave were collected, washed three times with deionized water, and dried in air.

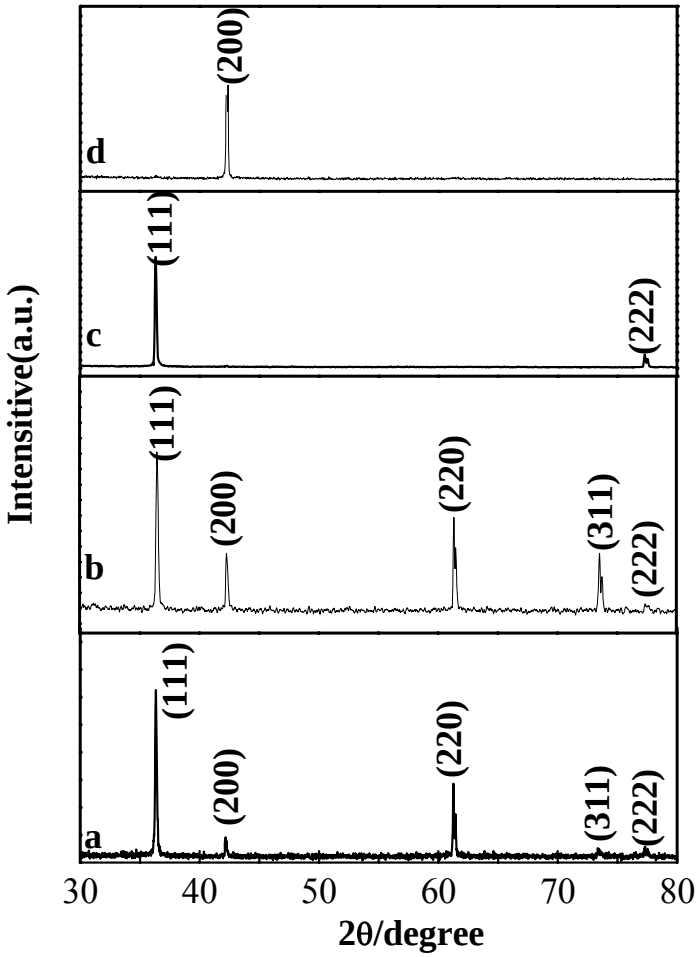
Characterizations: Scanning electron microscopy (SEM) characterization was performed on Hitachi S-4800 at 10 kV. Powder X-ray diffraction (XRD) patterns were collected using a SHIMADZU, XRD-6000 with Cu Kα radiation) (λ = 1.5418 Å).

The antibacterial activity of the synthesized crystals was tested against B. subtilis, S. aureus, S. faecalis, P. aeruginosa, and E. cloacae by determining the MICs (minimum inhibitory concentrations, μg/mL) through a colorimetric method using the dye MTT (3-(4,5)-dimethylthiahiazo (-z-y1)-3,5-di- phenytetrazoliumromide). A stock solution of the Cu_2O crystals (50 μg / ml) was prepared in dimethyl sulfoxide (DMSO) and graded quantities of the test crystals were incorporated in specified quantity of sterilized liquid medium. Then the solutions were poured into microtitration plates and suspension of the microorganism with concentration of approximately 10^5 cfu / mL was added. After incubation at 37 □ for 24 h, 50μL of PBS (Phosphate Buffered Saline 0.01 mol / L, pH 7.4: $Na_2HPO_4 \cdot 12H_2O$ 2.9 g, KH_2PO_4 0.2 g, NaCl 8.0 g, KCl 0.2 g, distilled water 1000 mL) containing 2 mg / mL of MTT was added to each well. Incubation was continued at room temperature for 4 - 5 h, followed by the addition of 100 μL of isopropanol containing 5% 1 mol/L HCl to extract the dye. At last, the optical density (OD) was measured with a microplate reader at 570 nm to determine the MICs.

SI2：SEM images of a single perfect octahedral Cu_2O crystal and a single corner-truncated octahedral Cu_2O crystal, from which it can be clearly seen that the perfect octahedral crystal has point angles as shown in Figure SI2a while the corners of the octahedral crystal in Figure SI2b are truncated.



SI3, XRD Patterns:



XRD patterns of the octahedral and cubic Cu_2O crystals: a) powder XRD pattern of the octahedral Cu_2O crystals; b) powder XRD pattern of the cubic Cu_2O crystals; c) XRD pattern of a single octahedral Cu_2O crystal; d) XRD pattern of a single cubic Cu_2O crystal.