

Supporting information

Copper nanocubes as low-cost enzyme mimics in a sarcosine-sensing reaction cascade

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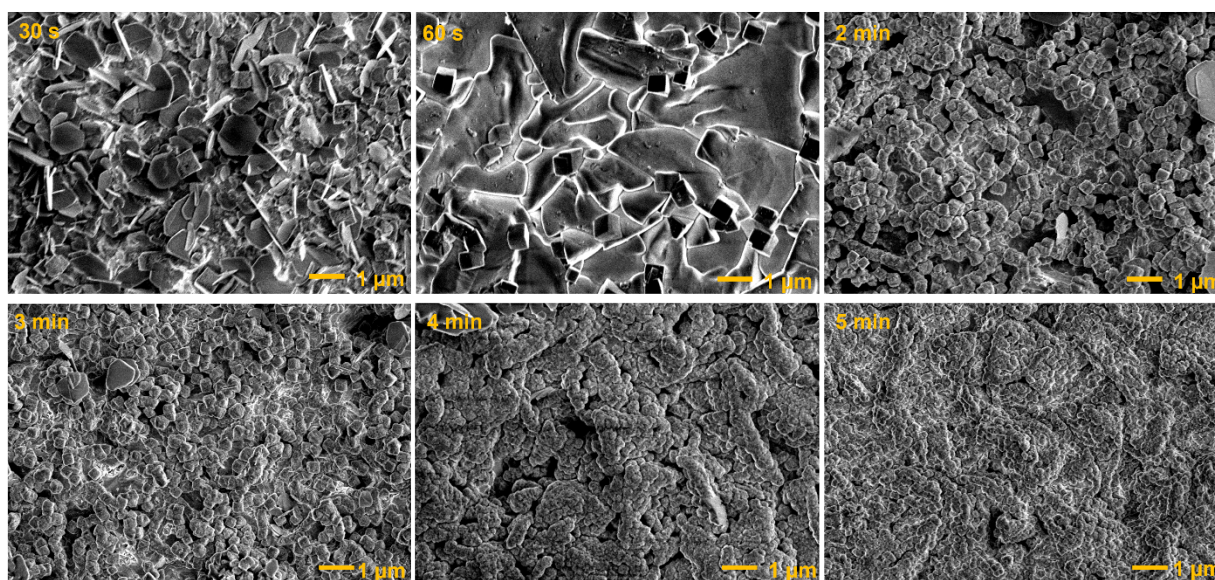


Figure S1: SEM images of etched Cu foil at different time intervals. All samples were etched at constant 8 volts and 4 amperes.

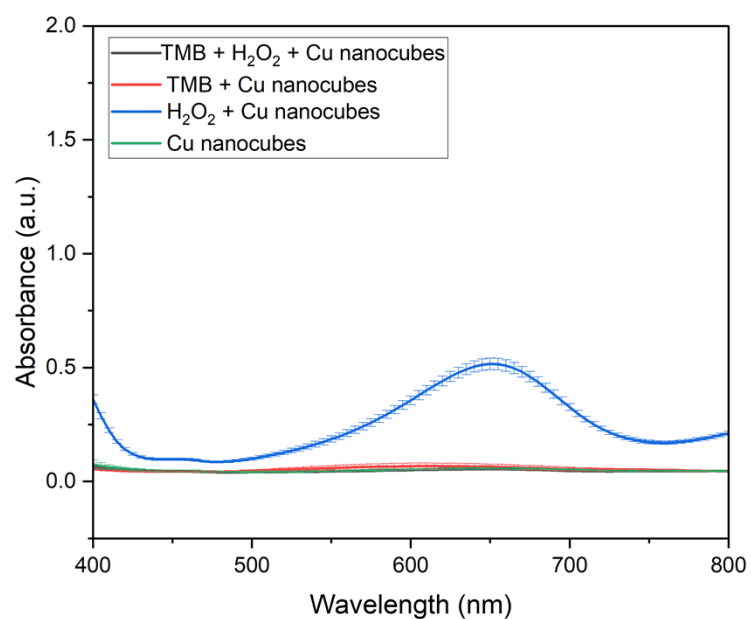


Figure S2: Comparison of absorbance spectra for an aqueous solution containing 1 mM TMB and 100 μ M H₂O₂ showing catalysis by Cu nanocubes (blue curve), alongside spectra for solutions containing Cu nanocubes with either 1 mM TMB (red curve) or 100 μ M H₂O₂ (black curve), and Cu nanocubes with PBS solution (green curve). Absorbance measurements were taken 30 minutes after immersion of Cu nanocubes in the solution. Error bars represent the standard deviation of three technical replicates.

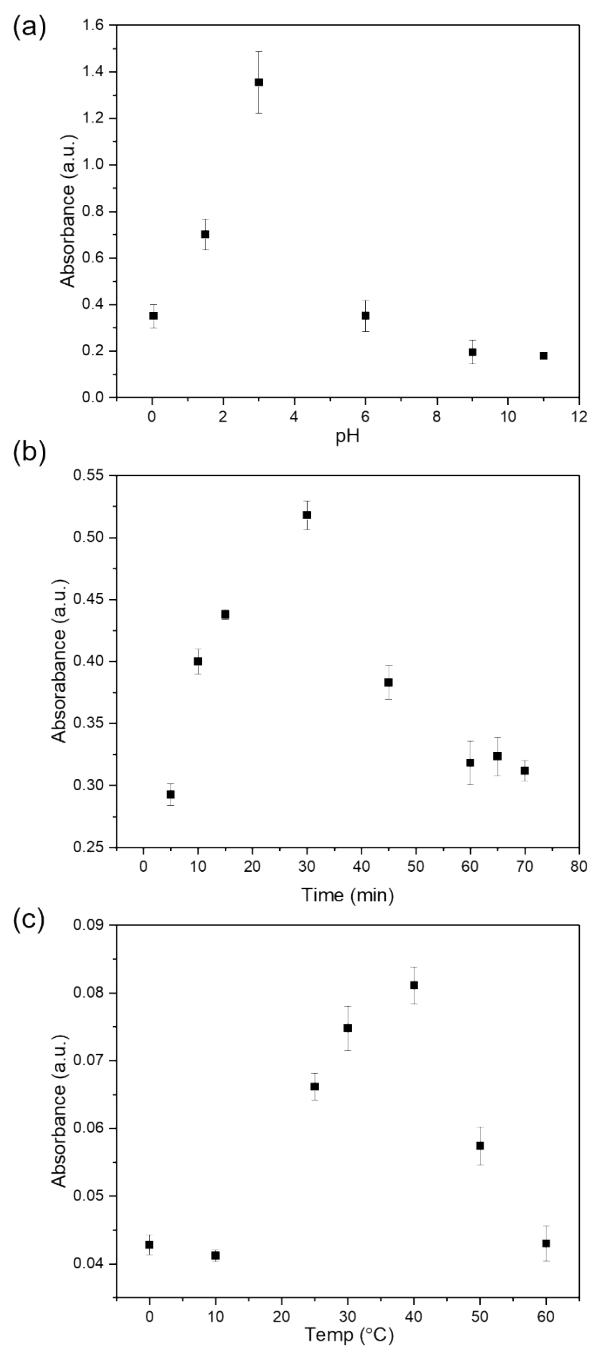


Figure S3: Representative UV-Vis absorbance measurements at 652 nm for optimization of TMB oxidation by Cu nanocubes. (a) Reaction pH was varied at fixed 1mM TMB and 60 μ M H_2O_2 concentrations to characterize the pH dependence. (b) Reaction time was varied at fixed 1mM TMB and 60 μ M H_2O_2 concentrations to characterize reaction time dependence. (c) Temperature was varied at fixed 1mM TMB and 2 μ M H_2O_2 concentrations. Absorbance was recorded after 30 minutes at room temperature. Error bars represent standard deviations of technical triplicate reactions.

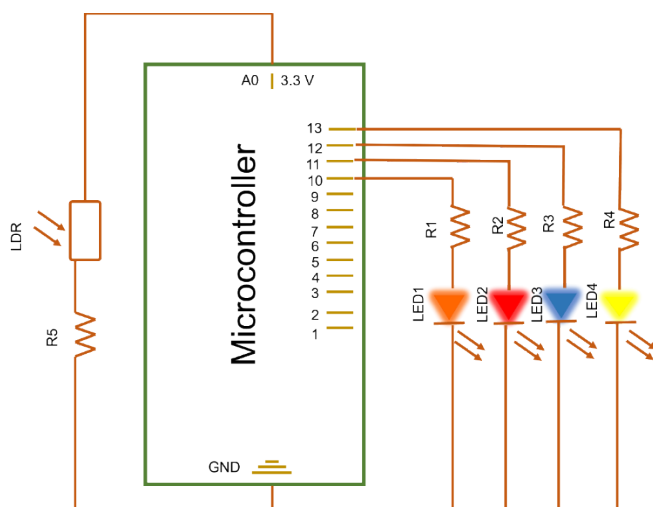


Figure S4: Proof of principle prototype device for visual readout. A schematic circuit diagram for our prototype microcontroller system integrating a light-dependent resistor (LDR), light-emitting diodes (LEDs), and five 10k-ohm resistors.