catalysts

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Article

In-situ partial sulfidation for preparing Cu/Cu2-xS core/shell nanorods with enhanced photocatalytic degradation

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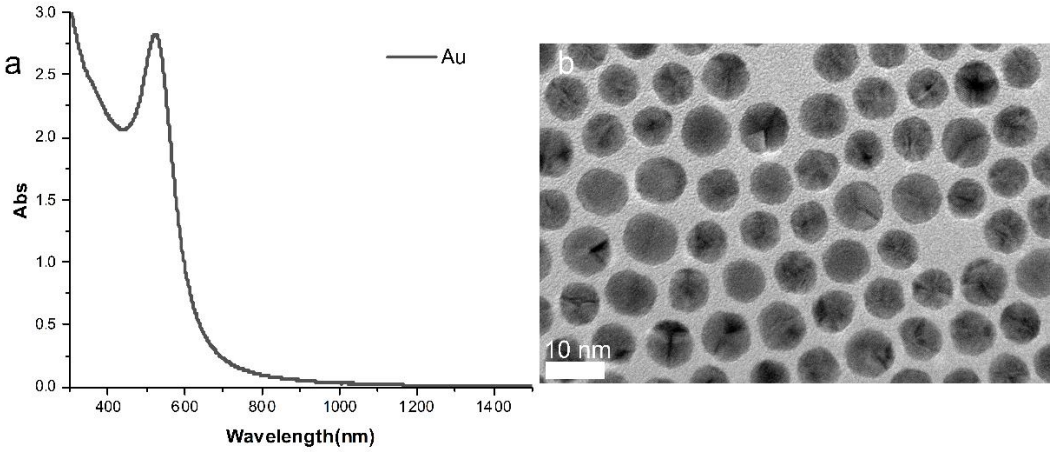

Figure S1. (a) Absorption spectrum and (b) TEM image of Au seeds.

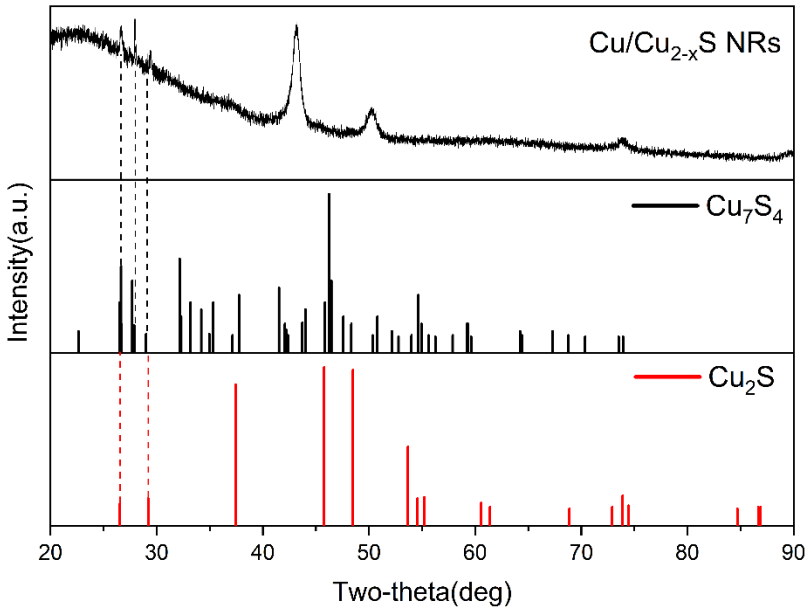

Figure S2. XRD patterns of Cu NRs after sulfidation. The bottom column diagram represents the standard diffraction pattern of Cu_7S_4 (#33-0489), and Cu_2S (#26-1116).

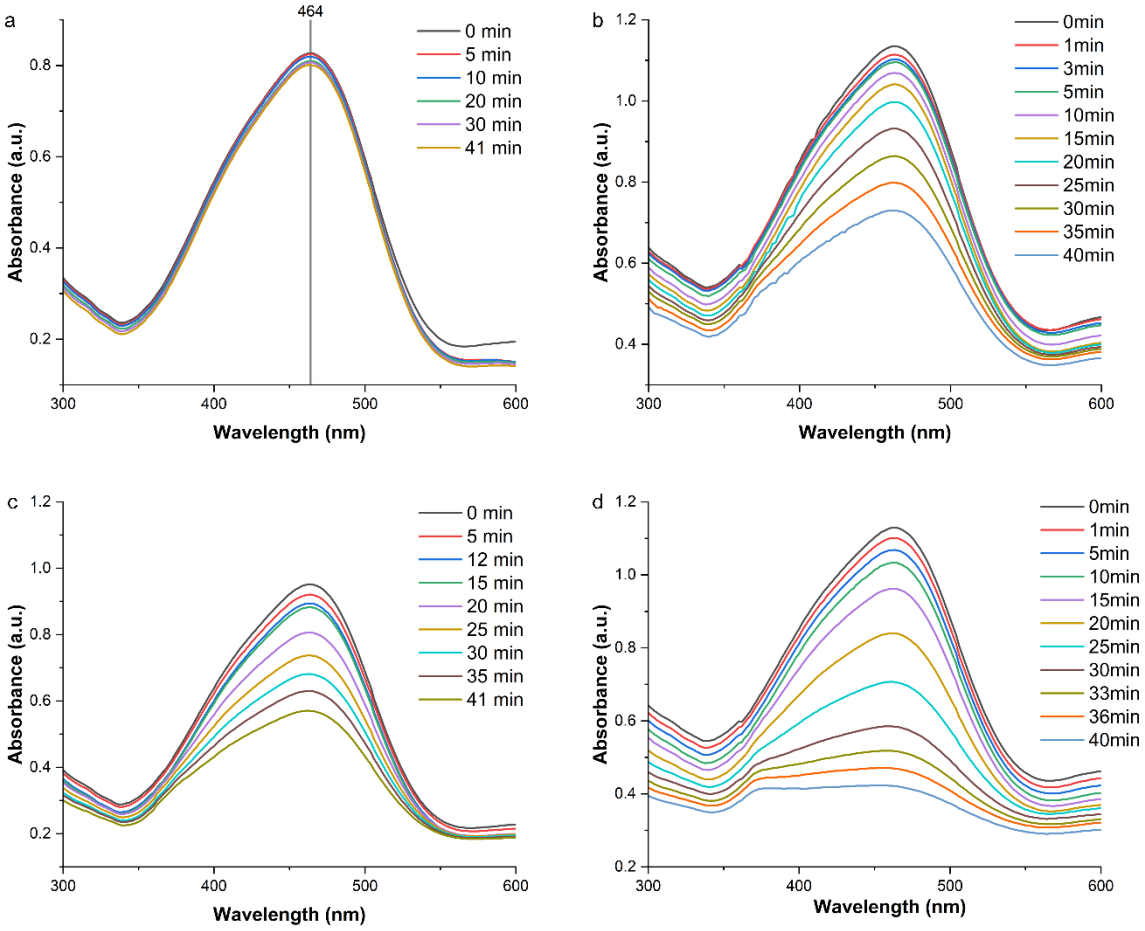

Figure S3. Absorption spectra of photocatalytic MO degradation by (a) Cu NRs under natural light, (b) Cu/$Cu_{2-x}S$ NRs under dark condition, (c) Cu/$Cu_{2-x}S$ NRs under natural light, and (d) Cu/$Cu_{2-x}S$ NRs under xenon lamp irradiation.

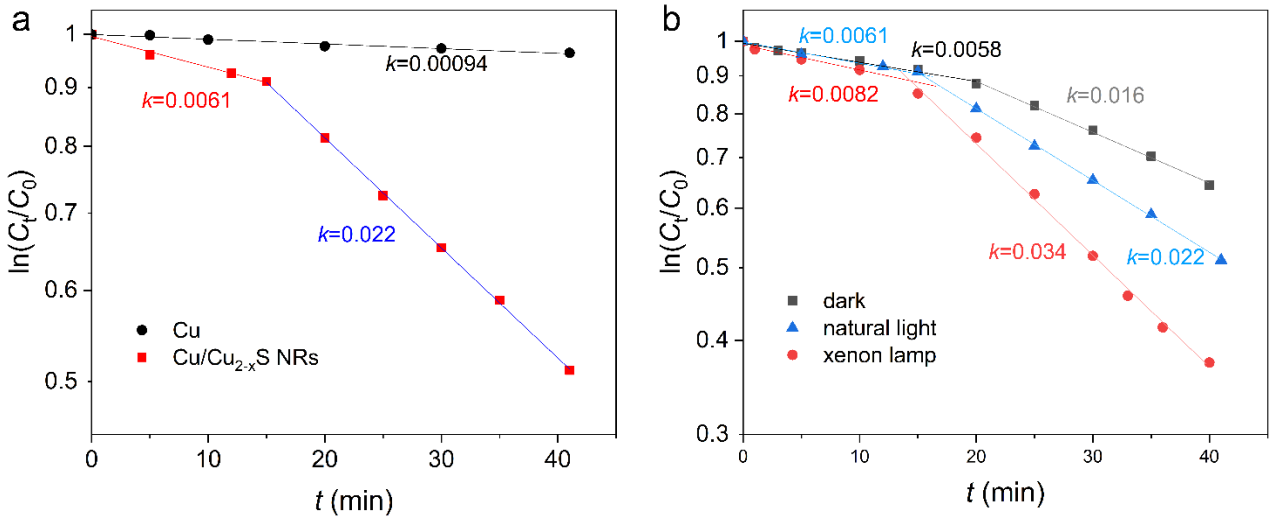

Figure S4. (a) Plot of ln(C_t/C_0) *vs*. time for both Cu and Cu/$Cu_{2-x}S$ NRs. (b) Plot of ln(C_t/C_0) *vs*. time for Cu/$Cu_{2-x}S$ NRs under the conditions of dark, natural light, and xenon lamp.

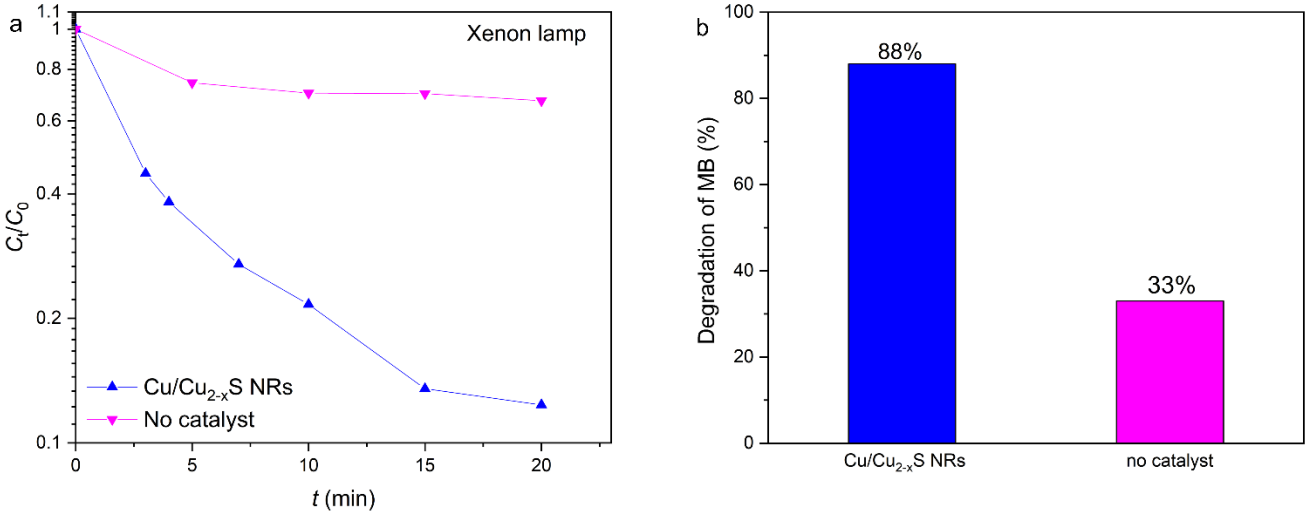

Figure S5. (a) Degradation curves and (b) degradation rate at 20 min for MB degradation by Cu/Cu$_{2-x}$S NRs under xenon lamp irradiation. The reference sample with no catalyst is also presented. (b) Degradation rate at 20 min for MB degradation with and without Cu/Cu$_{2-x}$S NRs. In this case of MB degradation, the photolysis of MB molecules under xenon lamp irradiation is observed.

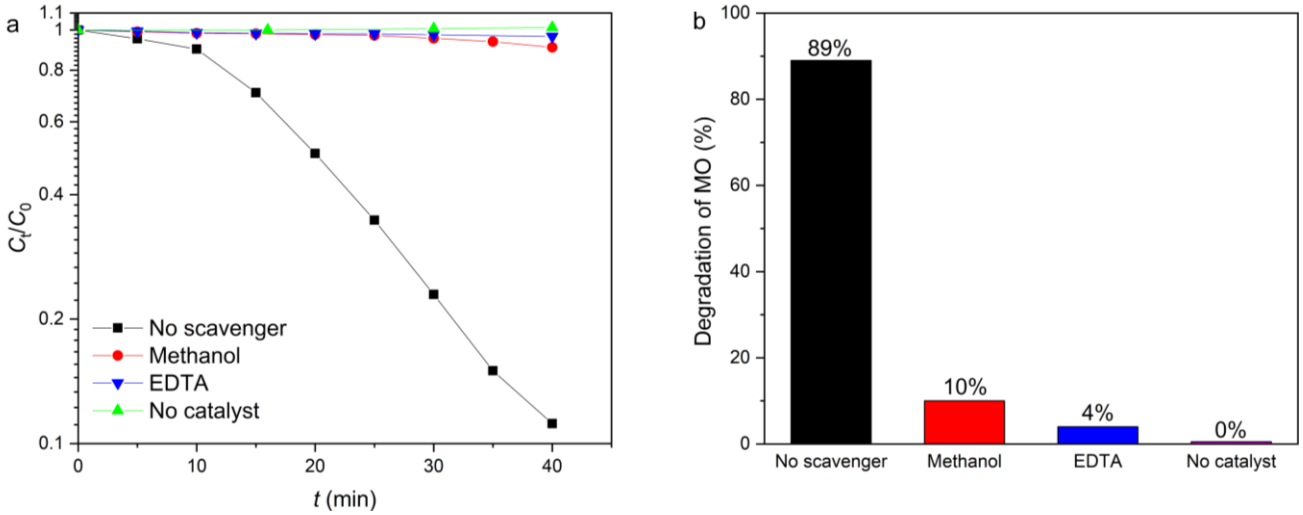

Figure S6. (a) Degradation curves and (b) degradation rate at 40 min for MO degradation by Cu/Cu$_{2-x}$S NRs under xenon lamp irradiation. The radical scavengers of methanol and EDTA are added for examining the role of ·OH and h$^+$. The reference sample with no catalyst is also presented. The photolysis of MO molecules under xenon lamp irradiation is not observed.

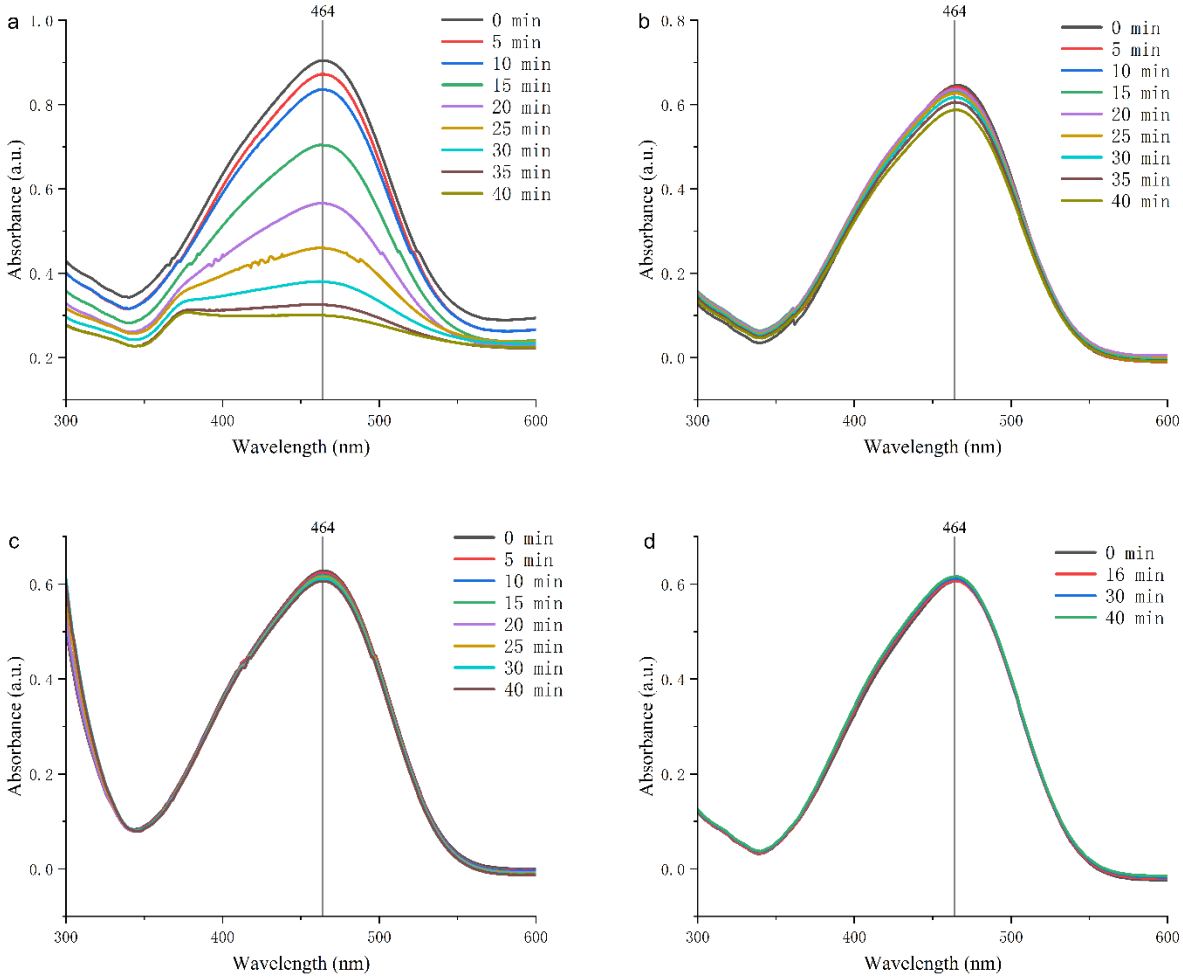

Figure S7. Absorption spectra of photocatalytic MO degradation by Cu/$Cu_{2-x}S$ NRs under xenon lamp irradiation: (a) without scavenger, (b) with methanol, (c) with EDTA, and (d) without catalyst of Cu/$Cu_{2-x}S$ NRs.

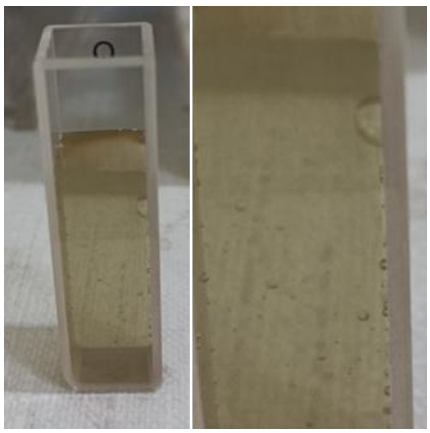

Figure S8. Photograph of MO degradation of by Cu/$Cu_{2-x}S$ NRs under natural light for 40 min. The generated bubbles due to MO degradation are clearly observed.