

Electronic Supplementary Information:

Carrier concentration-dependent electron transfer in $\text{Cu}_2\text{O}/\text{ZnO}$ nanorod arrays and their photocatalytic performance

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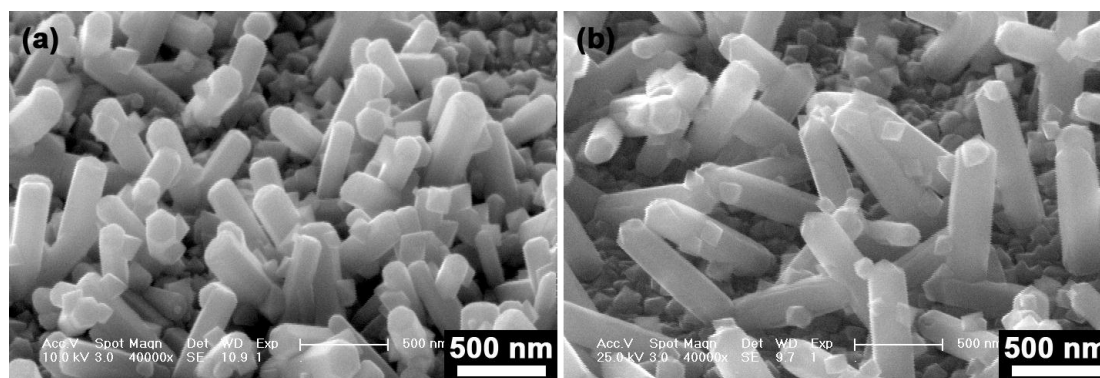


Fig. S1 SEM images of Cu_2O (pH 10.0)/ ZnO (a) and Cu_2O (pH 9.0)/ ZnO nanorod arrays (b).

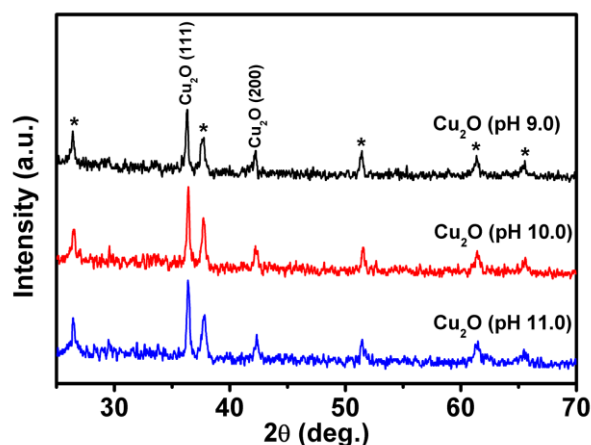


Fig. S2 The XRD patterns of Cu_2O films prepared at different pH values. The diffraction peaks of FTO substrate are marked with asterisks.

The XRD patterns of Cu_2O films prepared at different pH values were measured as shown in Fig. S2. All the diffraction peaks can be identified as the cubic phase Cu_2O (JCPDS 78-2076). No diffraction peaks of other crystalline phase could be found according to the XRD patterns, which means that the pH values do not affect the crystalline phase of Cu_2O in our experiment.

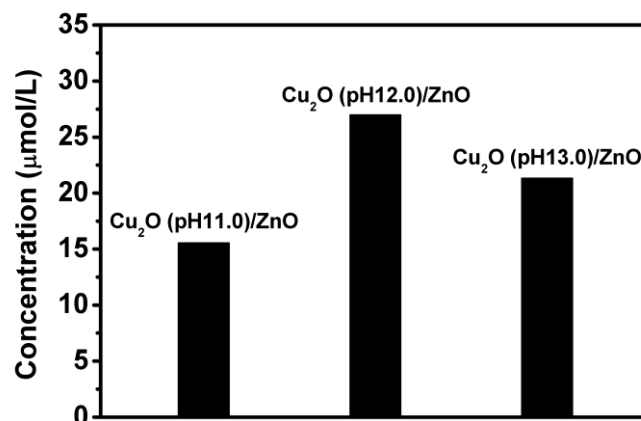


Fig. S3 The concentrations of MV²⁺ formation over different Cu₂O/ZnO nanorod arrays under visible light ($\lambda > 400$ nm) irradiation.

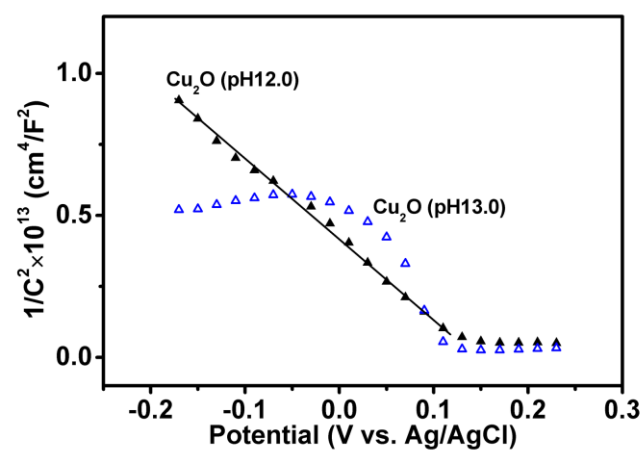


Fig. S4 Mott-Schottky plots of the Cu₂O prepared at different pH values in the dark.

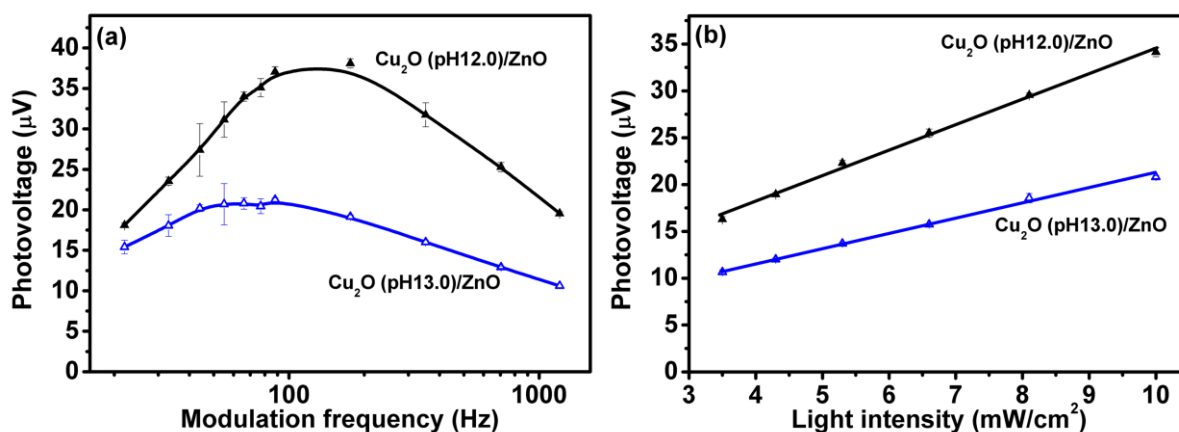


Fig. S5 (a) Modulation frequency dependent SPV of Cu₂O/ZnO nanorod arrays at 532 nm. The light intensity is 10 mW/cm². (b) Light intensity dependent SPV of Cu₂O/ZnO nanorod arrays at 532 nm. The modulation frequency is 77 Hz.