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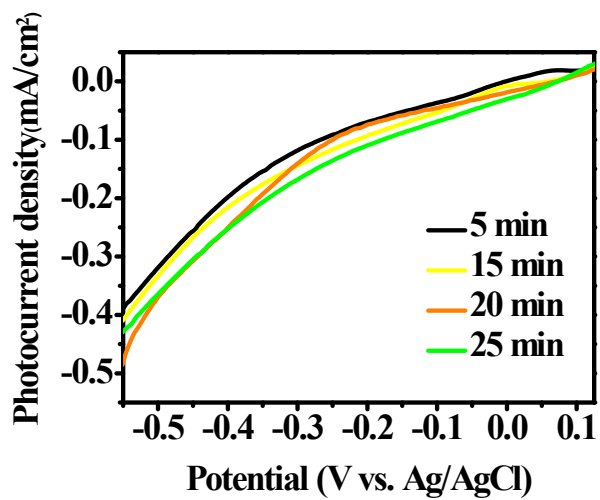


Fig. S1 Photocurrent density-voltage curves of bare CuO with different electrodeposition time

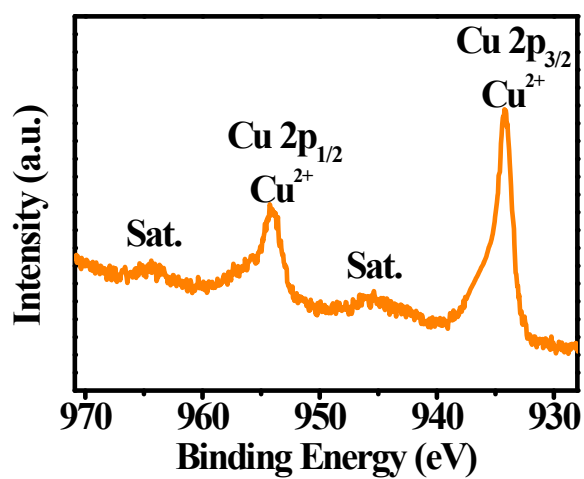


Fig. S2 XPS spectra of Cu 2p before photocorrosion stability test

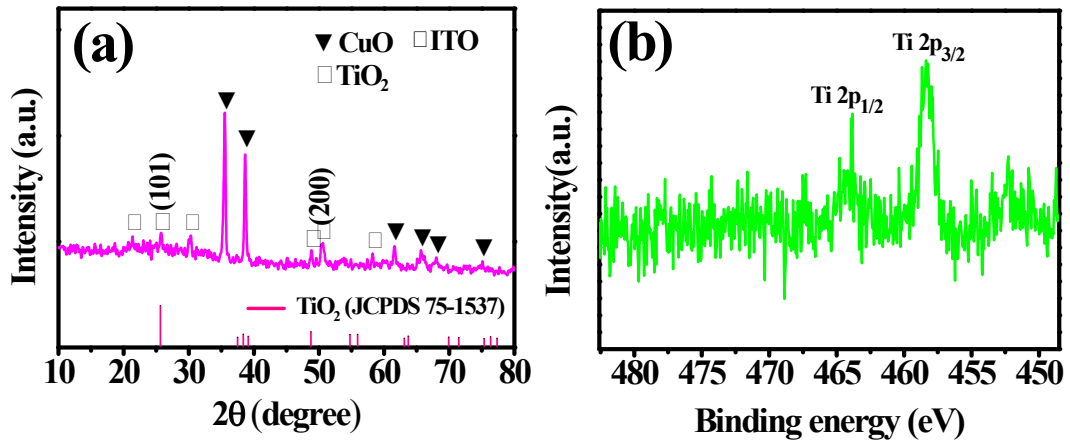


Fig. S3 XRD pattern (a) XPS spectra of Ti 2p (b) of CuO/TiO₂

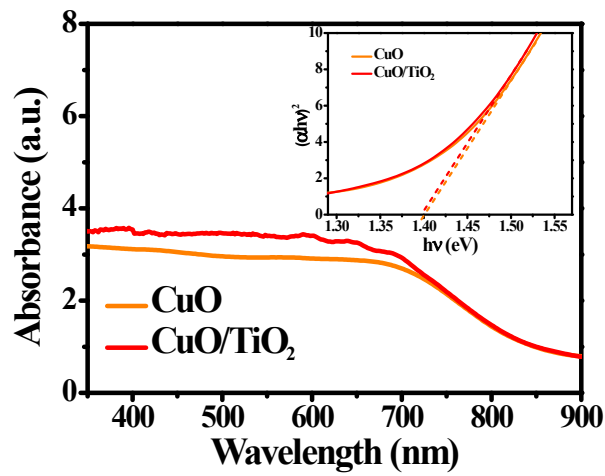


Fig. S4 UV-Vis absorbance spectra of CuO and CuO/TiO₂

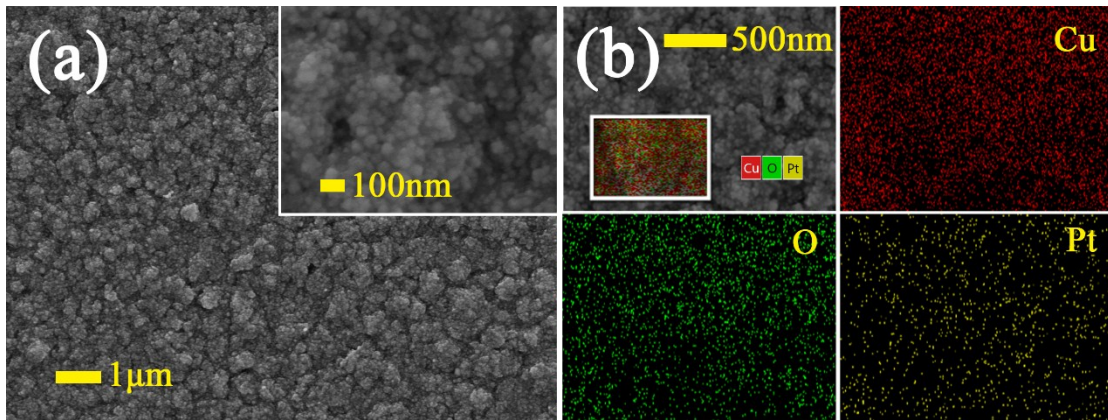


Fig. S5 Top-view SEM image of CuO/Pt (a) and corresponding elemental mapping images of Cu, O and Pt of CuO/Pt (b)

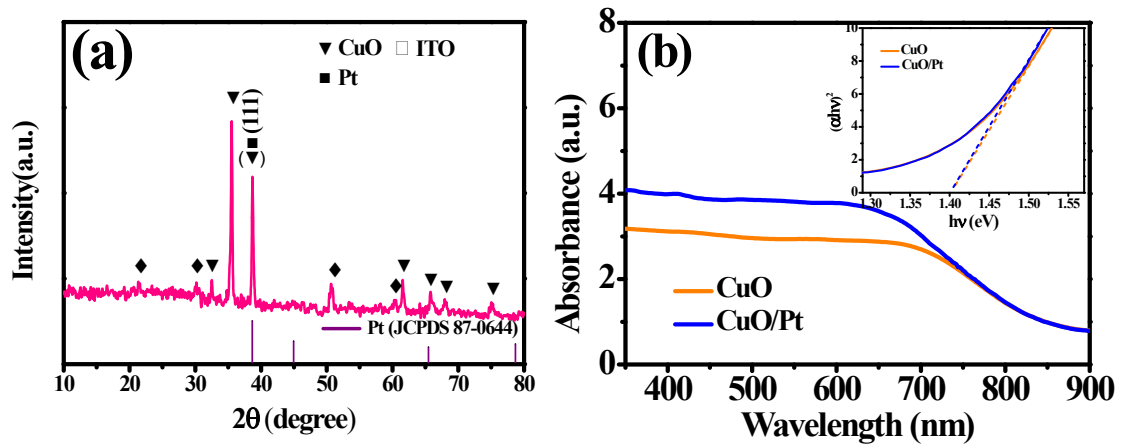


Fig. S6 XRD pattern of CuO/Pt (a) UV-Vis absorbance spectra of CuO and CuO/Pt (b)

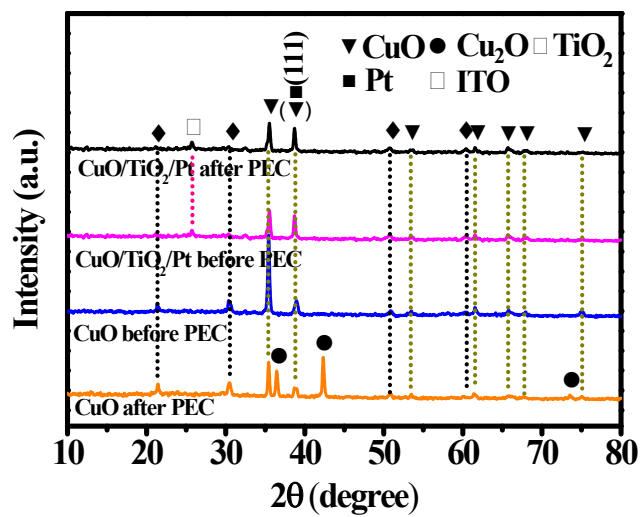


Fig. S7 XRD pattern of CuO as well as CuO/TiO₂/Pt photocathode before and after stability test

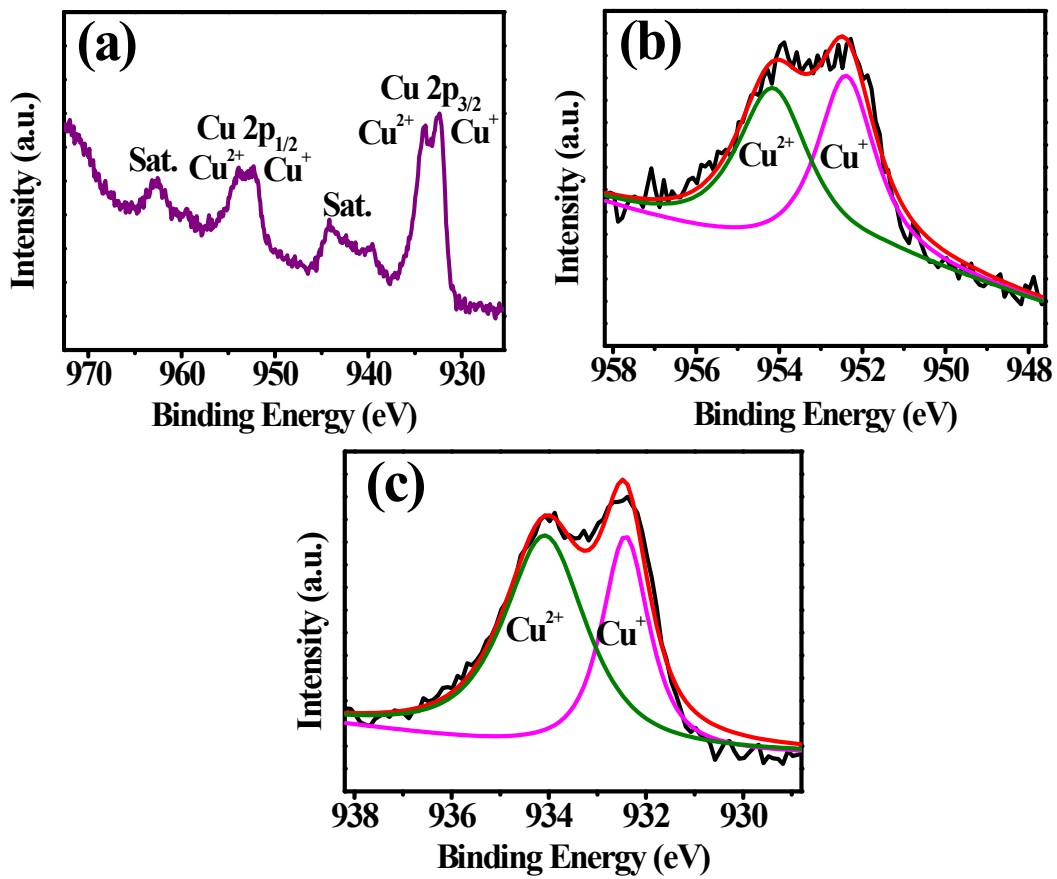


Fig. S8 XPS spectra of (a) Cu 2p; XPS deconvoluted spectrum of (b) Cu 2p_{1/2}, (c) Cu 2p_{3/2} after photocorrosion stability test

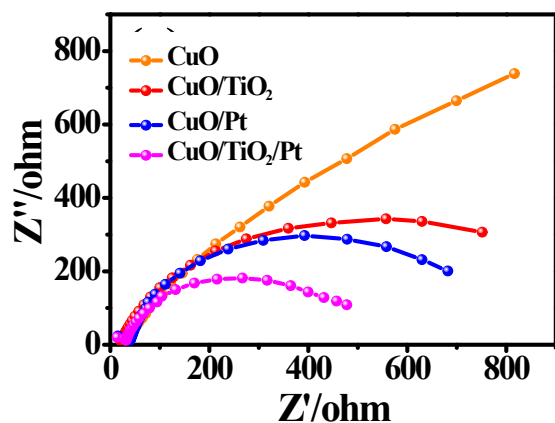


Fig. S9 Nyquist plots measured at -0.55 V vs. Ag/AgCl of CuO, CuO/TiO₂, CuO/Pt and CuO/TiO₂/Pt composite photocathodes

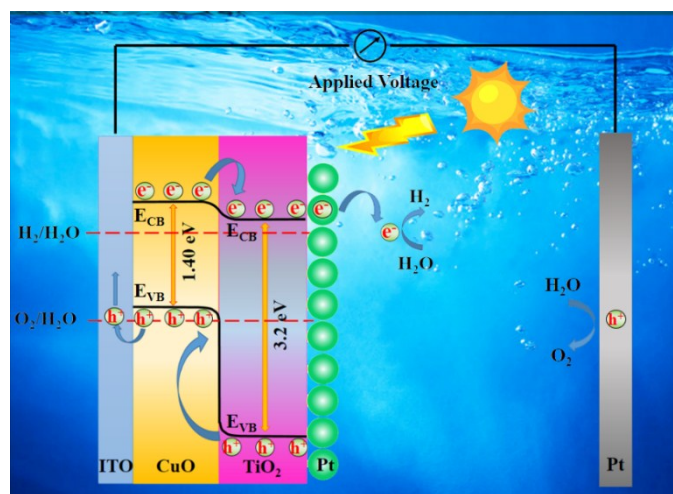


Fig. S10 Schematic illustration of charge separation and transfer of the CuO/TiO₂/Pt composite photocathode in the process of PEC water splitting