The roles of metal species supported on Fe_3O_4 aerogel for photoassisted 4-nitrophenol reduction and benzoic acid oxidation

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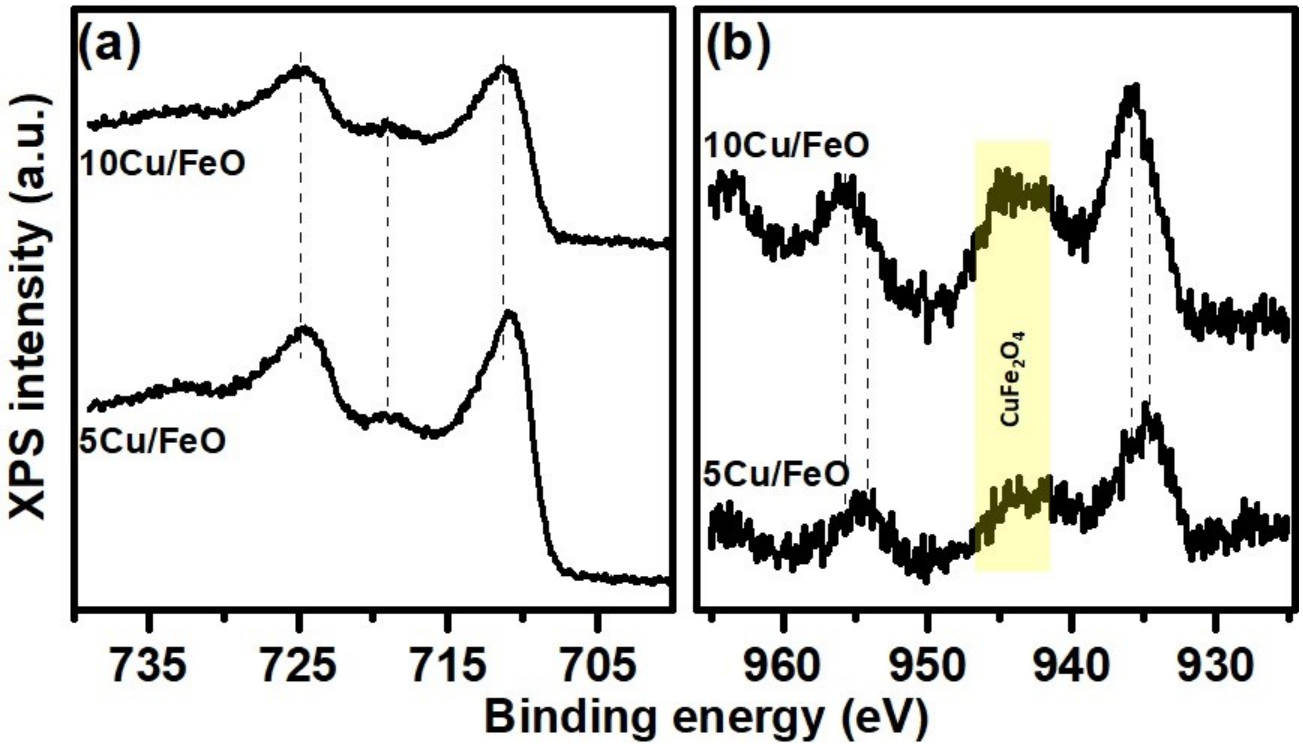

Figure S1 High-resolution (a) Fe *2p* and (b) Cu *2p* XPS profiles of 10Cu/FeO and 5Cu/FeO samples.

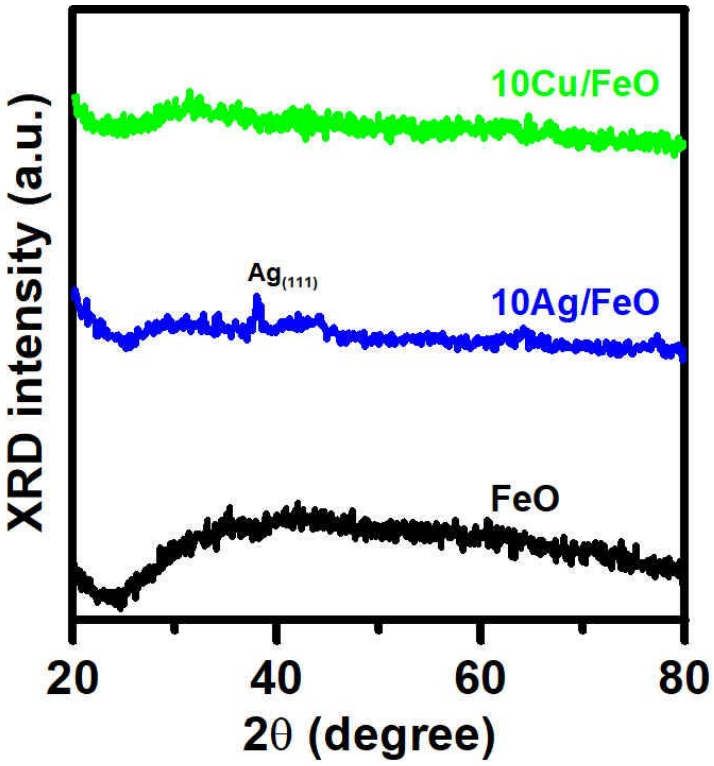

Figure S2 XRD patterns of FeO, 10Cu/FeO, and 10Ag/FeO samples.

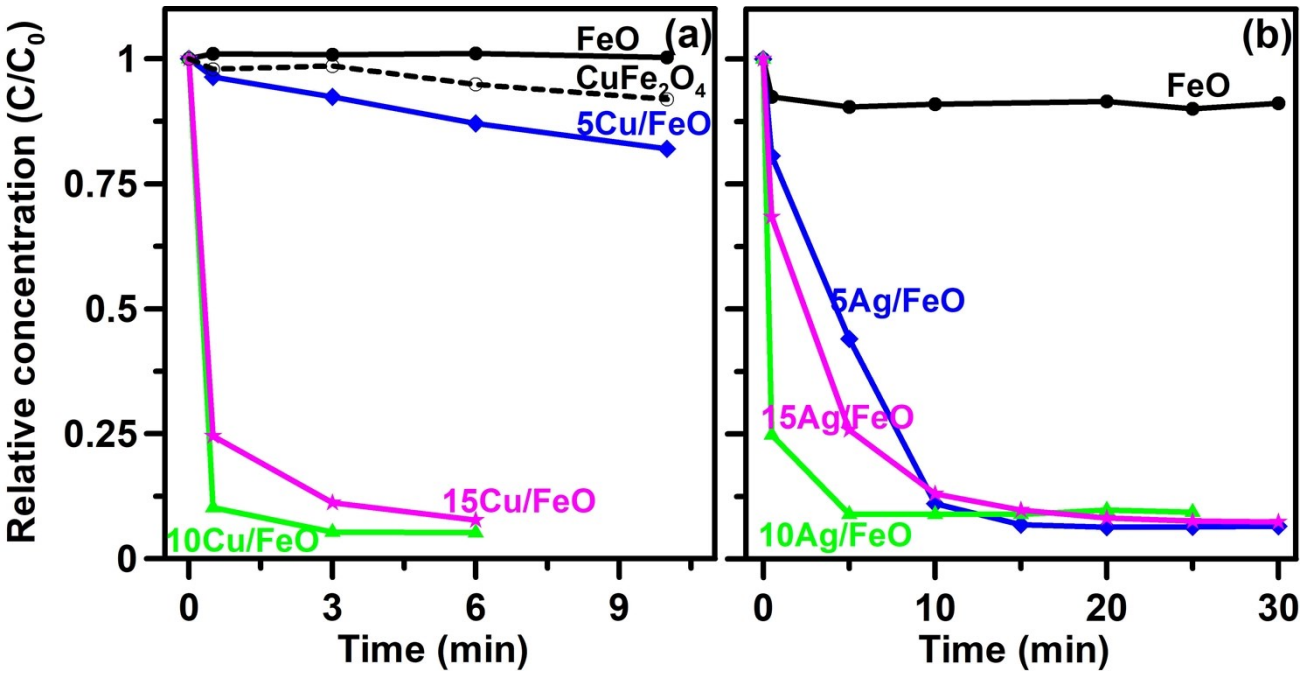

Figure S3 Photoassisted reduction of 4-NP (2×10^{-4} M, 50 mL) to 4-AP under simulated solar irradiation in the presence of $NaBH_4$ (0.1 M, 10 mL) as the reducing agent using (a) 0.001 g of FeO, 5Cu/FeO, 10Cu/FeO, 15Cu/FeO, and $CuFe_2O_4$, and (b) 0.02 g of FeO, 5Ag/FeO, 10Ag/FeO, and 15Ag/FeO samples.

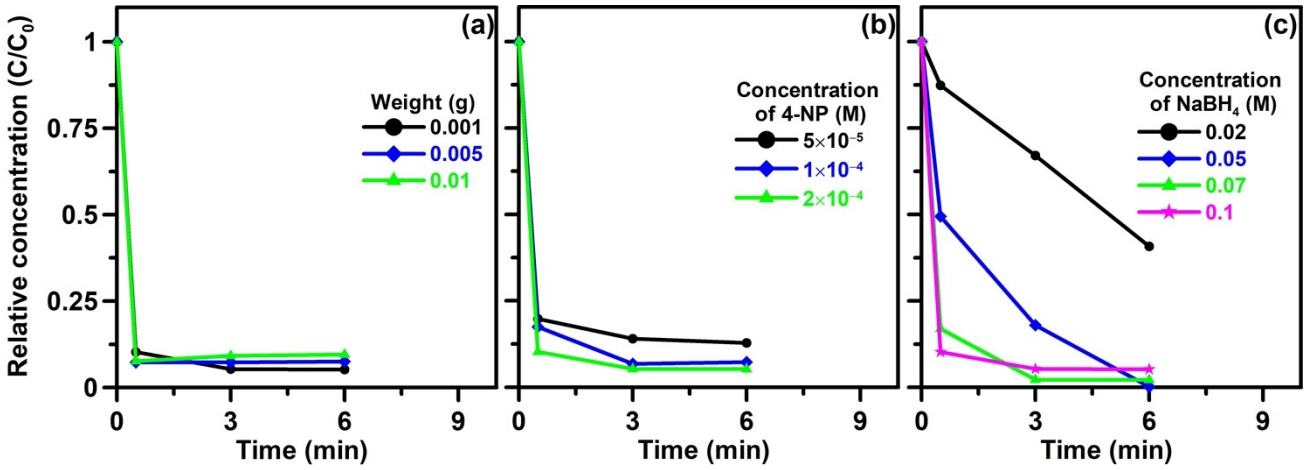

Figure S4 Photoassisted reduction of 4-NP to 4-AP under simulated solar irradiation using 10Cu/FeO under different experimental conditions: (a) reaction mixture contained 0.1 M of $NaBH_4$, 2×10^{-4} M of 4-NP, and different concentrations of 10Cu/FeO; (b) reaction mixture contained 0.1 M of $NaBH_4$, 0.001 g of 10Cu/FeO and different concentrations of 4-NP; (c) reaction mixture contained 2×10^{-4} M of 4-NP, 0.001 g of 10Cu/FeO and different concentrations of $NaBH_4$.

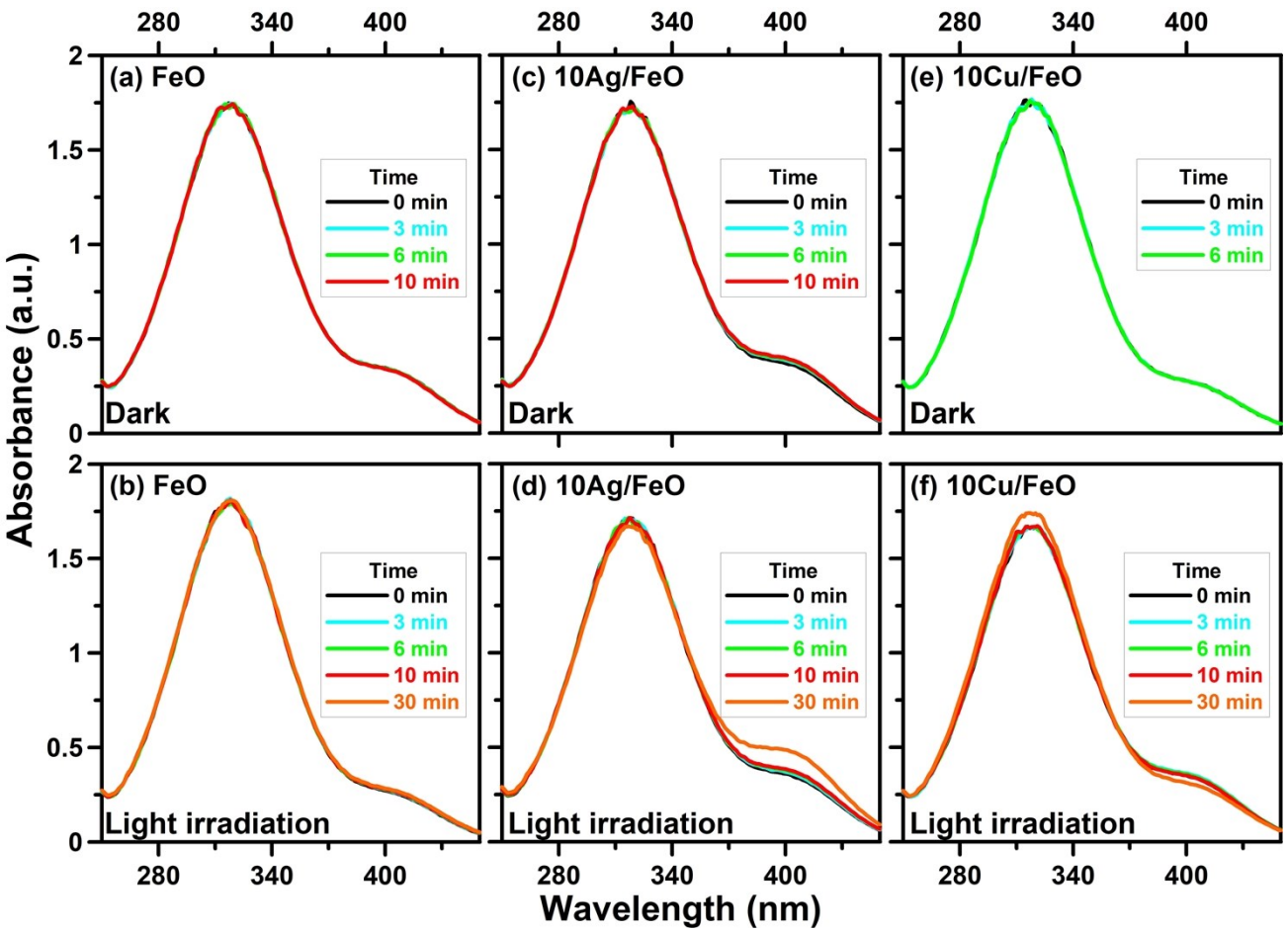

Figure S5 Photoassisted reduction of 4-NP to 4-AP conversion FeO, 10Ag/FeO, and 10Cu/FeO in the dark or under simulated solar irradiation in the absence of $NaBH_4$.

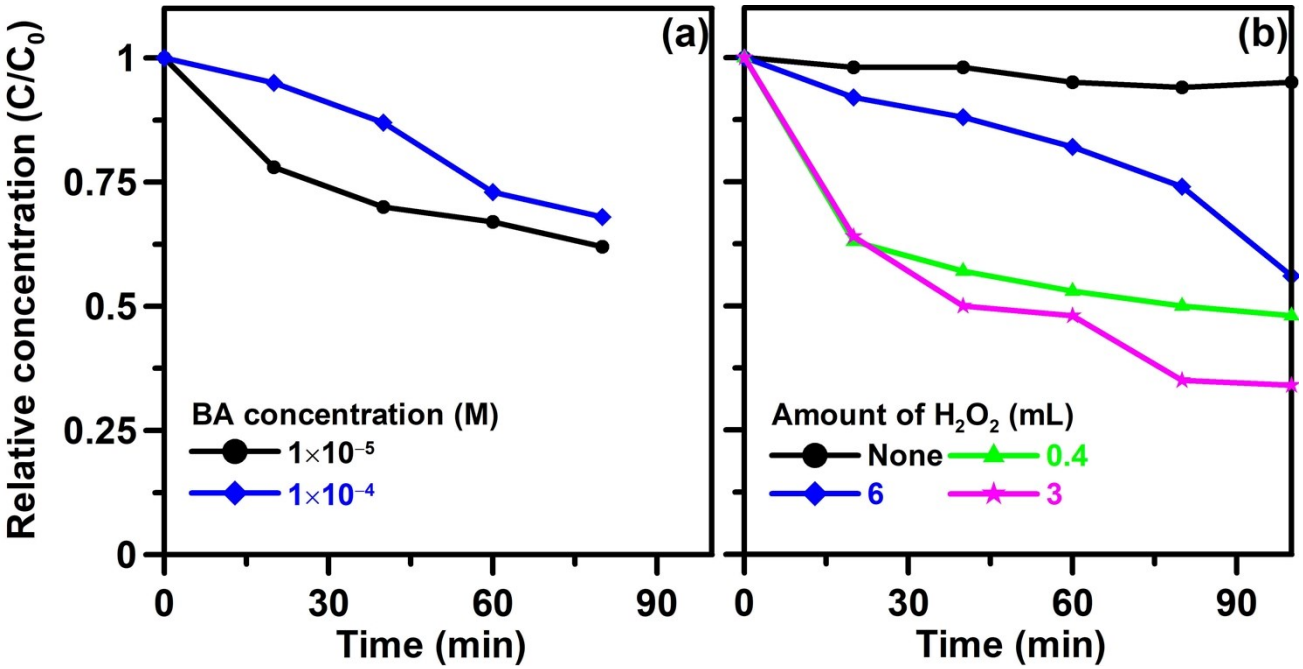

Figure S6 Photoassisted oxidation of BA over 10Ag/FeO under simulated solar light irradiation and different experimental conditions: (a) BA concentrations of 1×10^{-5} M, and 1×10^{-4} M (100 mL) and 1 mL of H_2O_2; (b) BA concentration of 1×10^{-5} M (100 mL) and different amounts of H_2O_2 (0, 0.4, 3, and 6 mL).

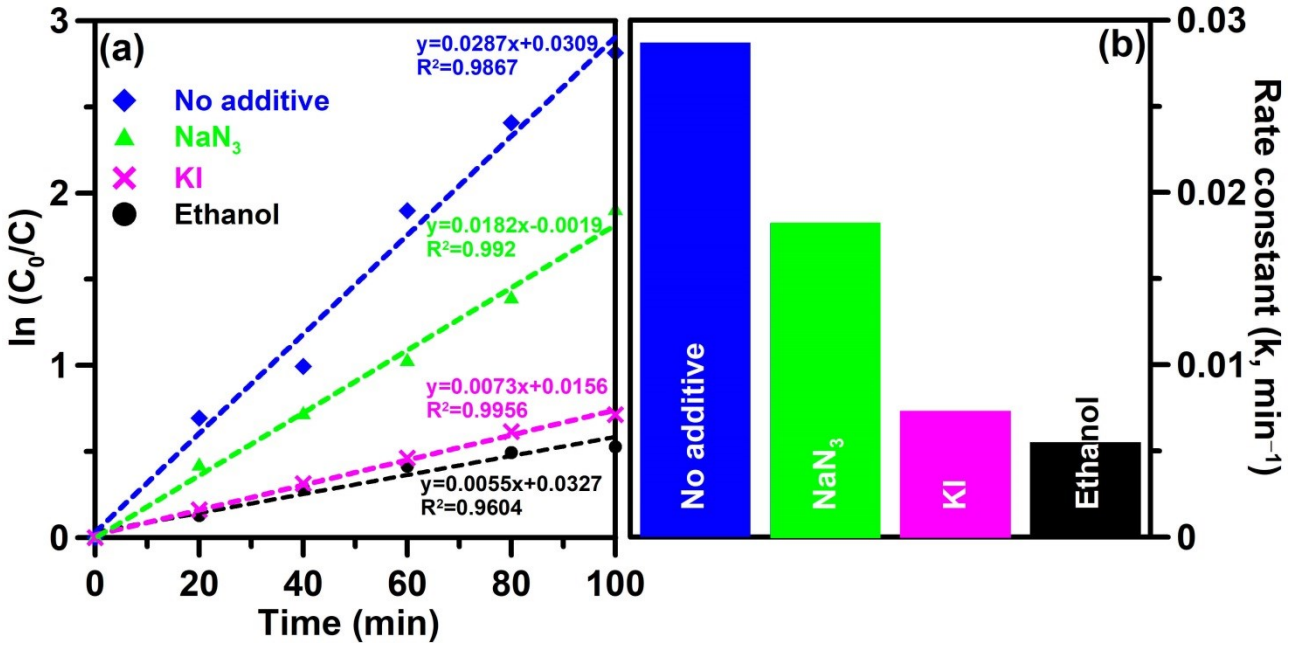

Figure S7 (a) Pseudo-first-order reaction kinetic plots of photoassisted oxidation of BA (1×10^{-5} M, 100 mL) using 0.03 g of 10Ag/FeO and H_2O_2 (3 mL) and NaN_3 (0.015 g), KI (0.04 g), or ethanol (10 mL) as scavengers. (b) Rate constants obtained from the pseudo-first-order reaction kinetic plot in (a).

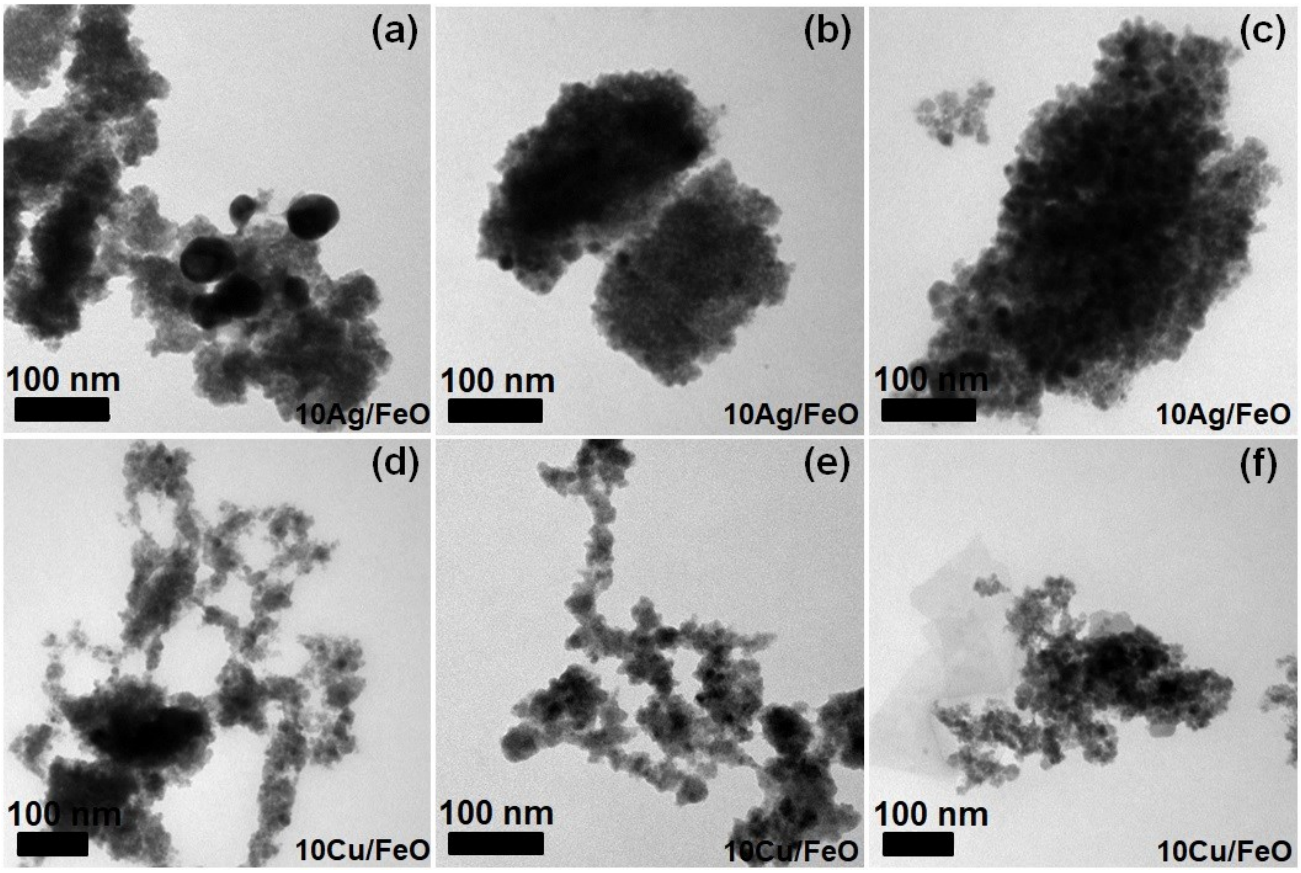

Figure S8 TEM images of (a)–(c) 10Ag/FeO and (d)–(f) 10Cu/FeO. (a) and (d) before the reaction, (b) and (e) after the oxidation of BA, and (c) and (f) after the reduction of 4-NP.

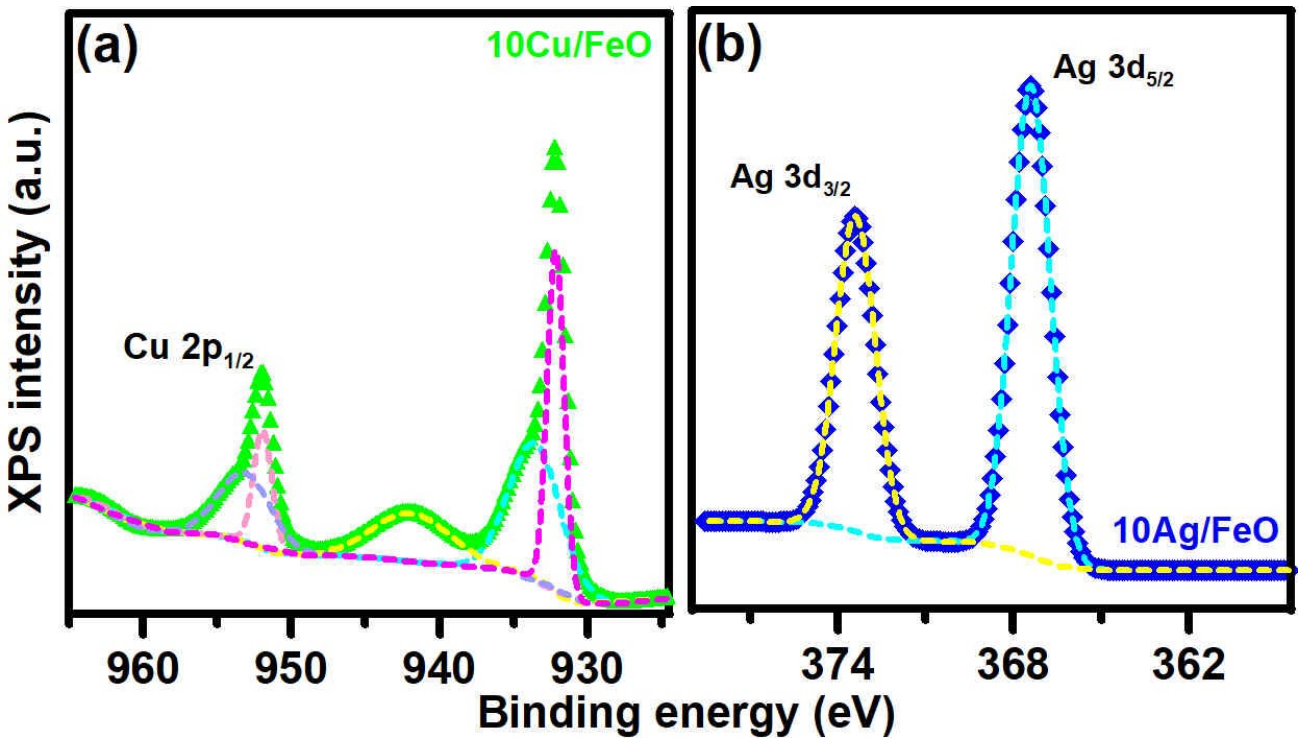

Figure S9 High-resolution (a) Cu *2p* and (b) Ag *3d* XPS profiles of 10Cu/FeO and 10Ag/FeO samples after the photoassisted reaction.