Supplementary Information

A Facile Green Antisolvent Approach to Cu^{2+}-doped ZnO Nanocrystals with Visible-Light-Responsive Photoactivities

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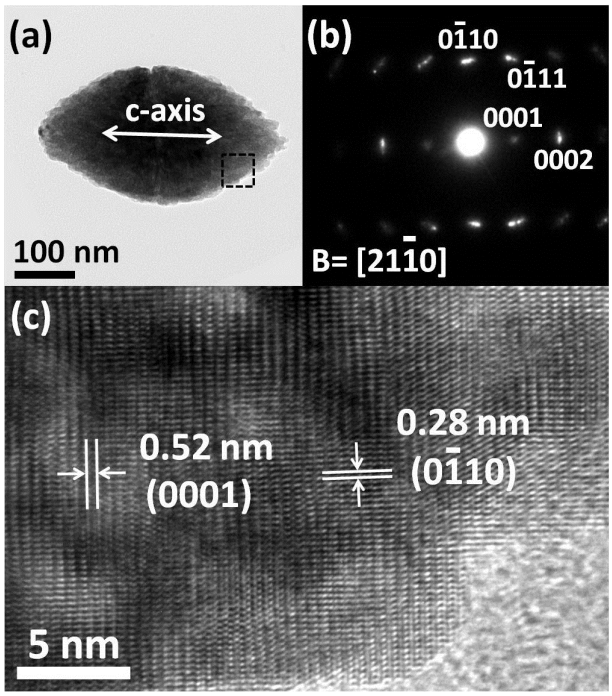

Fig. S1 (a) TEM image, (b) SAED pattern and (c) HRTEM image of pure ZnO nanocrystals obtained from antisolvent process.

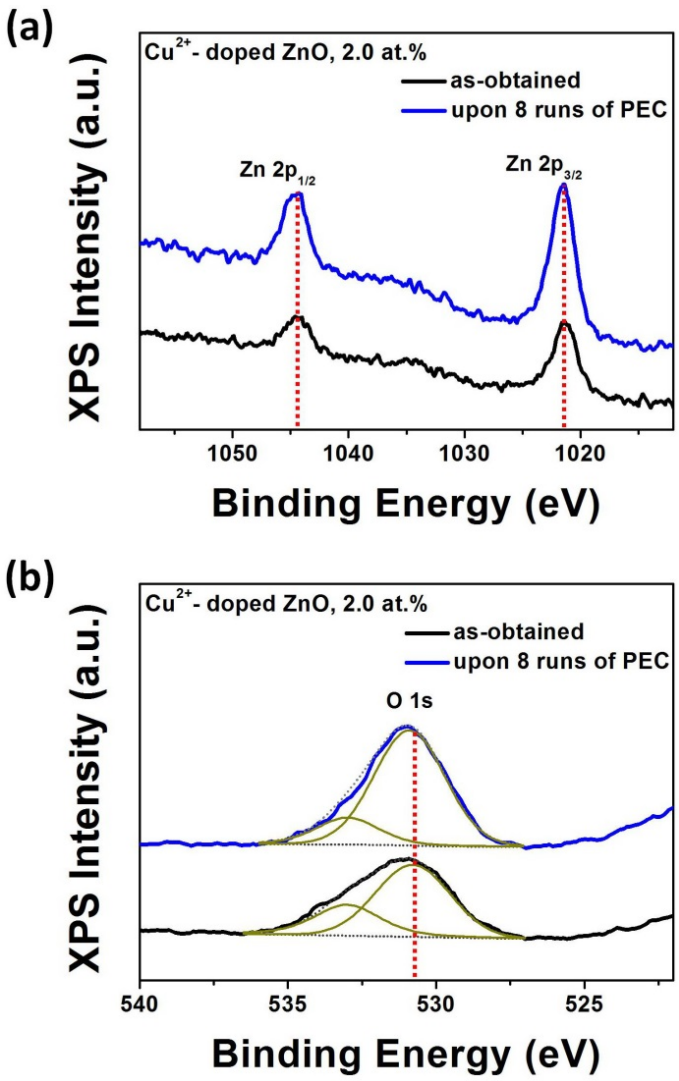

Fig. S2 XPS spectra of Cu^{2+}-doped ZnO nanocrystals before and after 8 runs of photoelectrochemical measurement. The Zn 2p signals were consistent with the presence of ZnO with the binding energy of 1022 and 1045 eV for Zn $2p_{1/2}$ and Zn $2p_{3/2}$, respectively. The deconvolution of O 1s produced two peaks which were assigned to the O-H species (533 eV) and Zn-O bonding (531 eV).[1] No appreciable change in the binding energy of Zn 2p and O 1s was observed upon 8 runs of measurement. Each run contained an *I-t* scan for an on/off cycle of light illumination (200 sec).

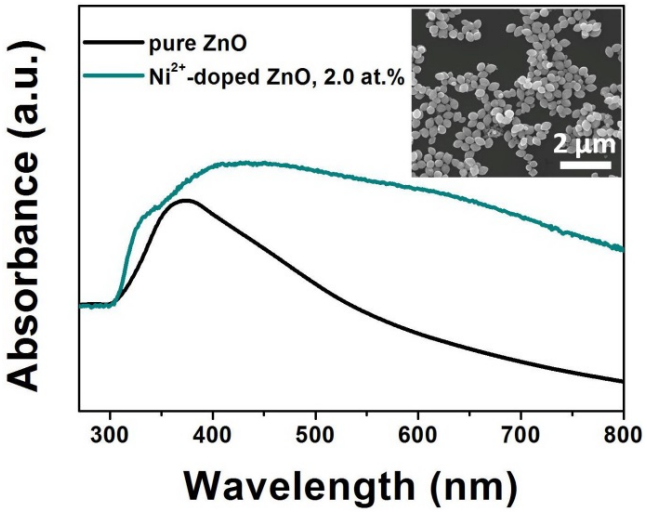

Fig. S3 UV-visible absorption spectra of the pure ZnO and Ni^{2+}-doped ZnO nanocrystals. The inset shows an SEM image of Ni^{2+}-doped ZnO.

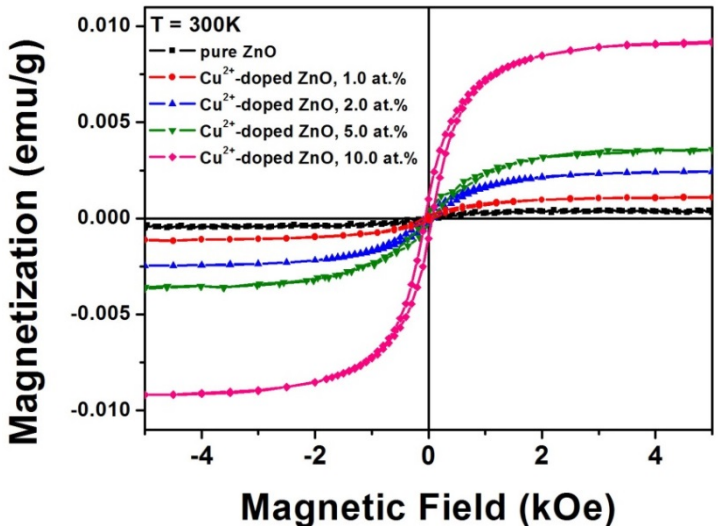

Fig. S4 Magnetic hysteresis curves of the pure ZnO and Cu^{2+}-doped ZnO nanocrystals with different Cu^{2+} concentrations measured at 300K. Well-defined hysteresis loops were observed in the Cu^{2+}-doped ZnO, indicative of the phenomenon of the room temperature ferromagnetism. Due to promoted coupling of Cu^{2+} with the host lattice,[2] saturation magnetization is enhanced with increasing Cu^{2+} concentrations.

References

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[2] (a) J. M. D. Coey, M. Venkatesan and C. B. Fitzgerald, *Nat. Mater.* 2005, **4**, 173. (b) D. Y. Inamdar, A. K. Pathak, I. Dubenko and N. Ali, S. Mahamuni, *J. Phys. Chem. C* 2011, **115**, 23671.