Electronic Supplementary Information

Synthesis of magnetic core-shell carbon dots@MFe_2O_4 (M = Mn, Zn and Cu) hybrid materials and their catalytic properties

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[Jan 29, 2016]

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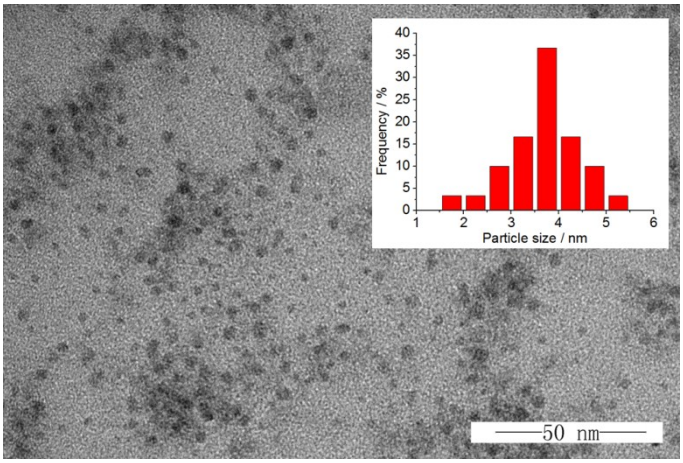

Figure S1. TEM image of as-prepared C-dots. (Inset: Size distribution histogram obtained from TEM measurements.)

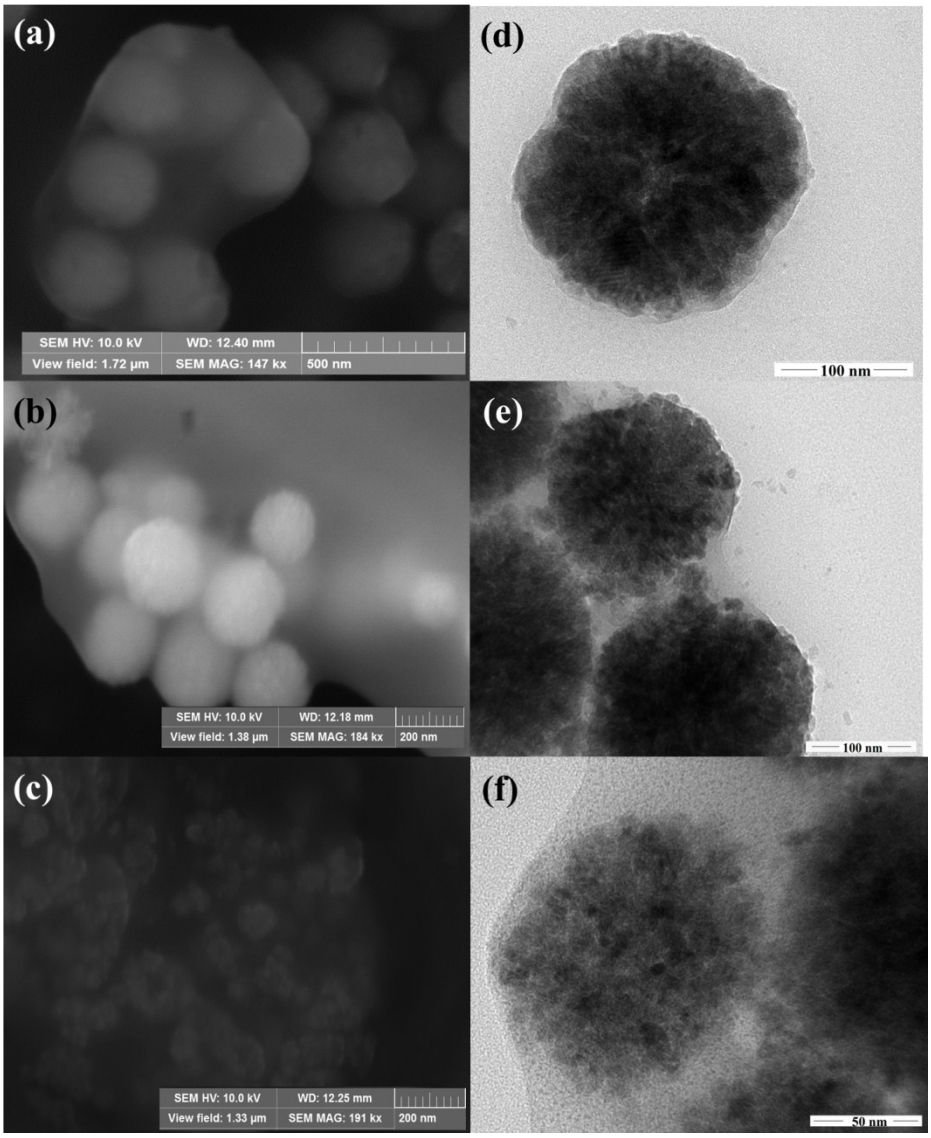

Figure S2. Magnified FLSEM and TEM images of (a, d) C-dots@$MnFe_2O_4$, (b, e) C-dots@$ZnFe_2O_4$ and (c, f) C-dots@$CuFe_2O_4$.

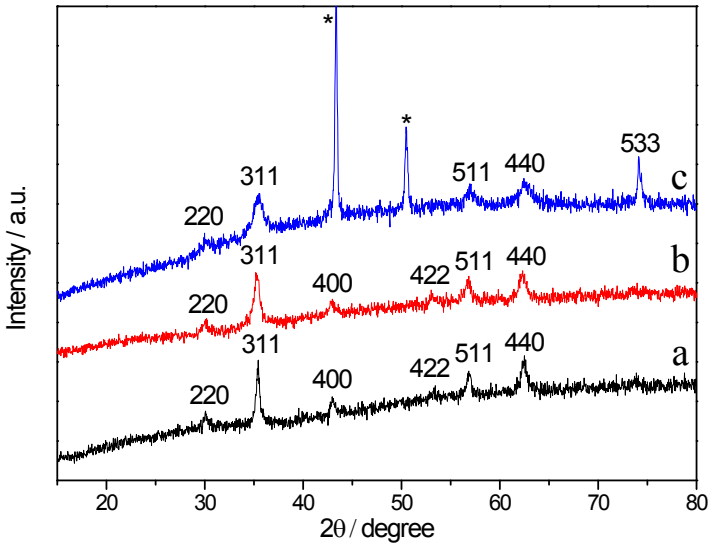

Figure S3. XRD patterns of (a) $MnFe_2O_4$ MNPs, (b) $ZnFe_2O_4$ MNPs and (c) $CuFe_2O_4$ MNPs.

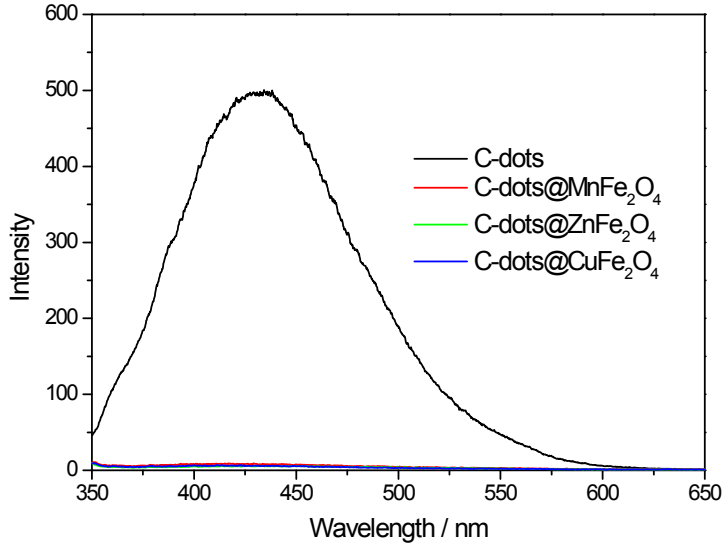

Figure S4. PL spectra of the C-dots and C-dots@MFe_2O_4 (M= Mn, Zn and Cu) hybrid materials.

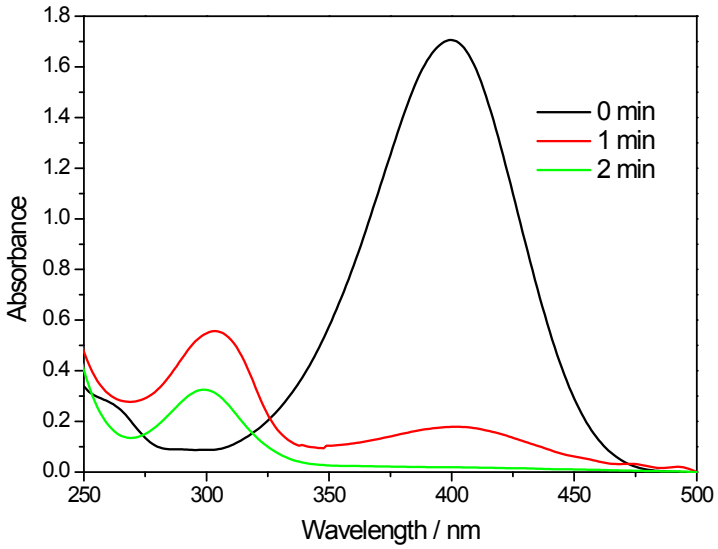

Figure S5. Time-dependent UV-Vis absorption spectra for the reduction of p-NP by $NaBH_4$ in the presence of $CuCl_2$.

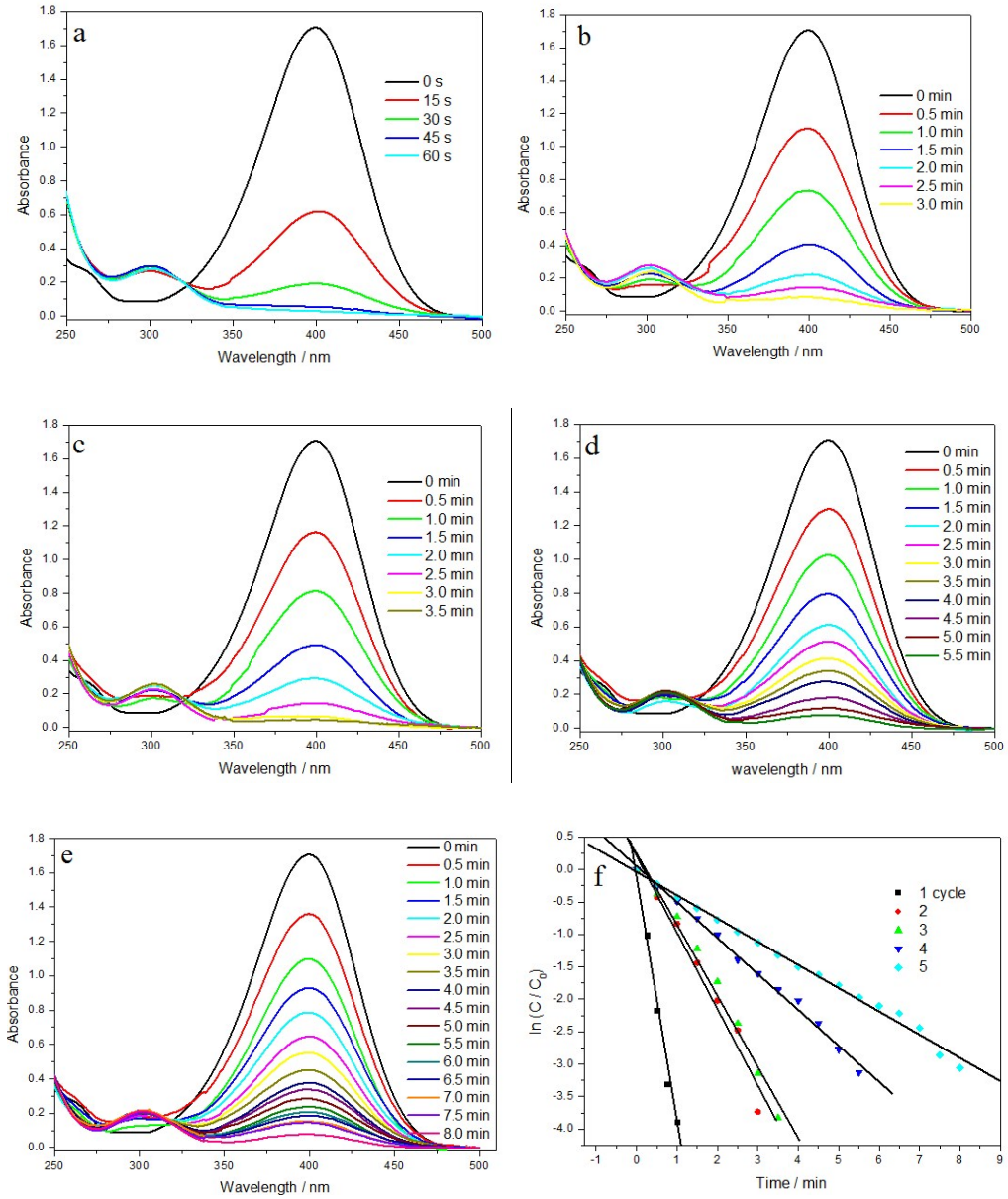

Figure S6. Time-dependent UV-visible absorption spectra for (a) 1st, (b) 2nd, (c) 3rd, (d) 4th and (e) 5th cycles of the catalytic reduction of p-NP with the C-dots@$CuFe_2O_4$ catalyst. (f) Plots of ln(C/C_0) versus reaction time for five successive cycle reactions with the C-dots@$CuFe_2O_4$ catalyst.

Table S1. Elemental and ICP analyses for the C-dots@MFe_2O_4 (M = Mn, Zn and Cu) hybrid materials.

Sample	element (wt %)
C-dots@$MnFe_2O_4$	C, 19.08; H, 1.92; Mn, 14.78; Fe, 41.95
C-dots@$ZnFe_2O_4$	C, 21.44; H, 2.37; Zn, 15.76; Fe, 39.59
C-dots@$CuFe_2O_4$	C, 20.88; H, 2.16; Cu, 22.41; Fe, 34.27

Table S2. The proportion of different carbon in the total carbon at the surface of the C-dots@MFe_2O_4 (M = Mn, Zn and Cu) calculated from XPS.

Sample	C-C	C-OH	C=O	O=C-OH
C-dots@$MnFe_2O_4$	65.68%	20.02%	7.92%	6.39%
C-dots@$ZnFe_2O_4$	67.16%	19.94%	6.82%	6.08%
C-dots@$CuFe_2O_4$	63.00%	22.15%	8.53%	6.32%

Table S3. Substituent and reducing agent effects on the catalytic reduction of nitrophenols with C-dots@$CuFe_2O_4$.

Reducing agent	Sample	Reaction time / min	Conversion / %	k_{app} / (min^{-1})
$NaBH_4$	o-NP	1	97.2	3.75
	m-NP	0.75	98.0	5.30
	p-NP	1	98.0	4.03
AB	o-NP	12	5.1	0.0033
	m-NP	14	23.2	0.0171
	p-NP	14	18.4	0.0136