Electronic Supporting Information

for

Reduced carbon dots employed for synthesizing metal

nanoclusters and nanoparticles

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Figures



Figure S1 Photographs of silica powder loaded without (I) or with CDs (II), r-CDs (III) under UV light.



Figure S2 Emission spectra of CDs (A) and r-CDs (C) by varying excitation wavelengths; upconversion photoluminescence spectra of CDs (B) and (D) by different excitation wavelengths as indicated.



Figure S3 X-ray photoelectron spectroscopy (XPS) spectra of the C 1s of the CDs (blank solid line)

and the r-CDs (red dashed line) on the glass substrate.



Figure S4 X-ray photoelectron spectroscopy (XPS) spectra of the S2p of the CDs (blank dashed

line) and the r-CDs (red solid line) on the glass substrate.



Figure S5 DLS data of CDs (A) and r-CDs (B).



Figure S6 FTIR of r-CDs-AuNCs.



Figure S7 MALDI-TOF mass spectra of r-CDs-AuNCs.



Figure S8 Emission spectra of r-CDs-AuNCs for various excitation wavelengths.



Figure S9 Fluorescence spectra of AuNCs by introducing different r-CDs.



Figure S10 (A) Fluorescence intensities of r-CDs-AuNCs along with varying concentrations of r-



CDs (0.5-10.0 g·L⁻¹) and HAuCl₄ (0.5-10.0 mM) (B).

Figure S11 Fluorescence spectra of r-CDs and r-CDs-AgNPs. Inset: photographs of r-CD and r-CDs-AgNPs under daylight (a) (b) and that under UV irradiation at 365 nm (c) (d).



Figure S12 UV-vis spectra of r-CDs-AgNPs by introducing different types of r-CDs.



Figure S13 (A) UV-vis spectra of r-CDs-AgNPs incubated with varied concentrations of r-CDs (0.1-1.5 g·L⁻¹). Insert: photographs of the corresponding r-CDs-AgNPs; UV-vis spectra of r-CDs-AgNPs originated from different concentrations of AgNO₃ (0.5-10.0 mM) (B), incubation temperature (C) and time (D).



Figure S14 UV-vis spectra of the r-CDs-AuNPs by adding different types of r-CDs.



Figure S15 (A) UV-vis spectra of r-CDs-AuNPs incubated with varied concentrations of r-CDs (0.1-2.0 g·L⁻¹). Insert: photographs of the corresponding r-CDs-AuNPs; UV-vis spectra of r-CDs-AuNPs originated from different concentrations of HAuCl₄ (0.2-4.0 mM) (B), incubation temperature (C) and time (D).

CDs sample	Zata potentials (mV)	QY (%)
CDs	-11.1	4.7
r-CDs	-20	31.4

 Table S1 Zata potentials and QY of CDs and r-CDs.