Electronic Supplementary Information

Transition Metal Ions–Assisted Synthesis of Monodisperse, Quasi-Spherical Gold Nanocrystals via Citrate Reduction

Peina Zhang,[a] *Chunxiao Xi,*[a] *Cong Feng,*[a] *Haibing Xia,*[a,*] *Dayang Wang*[b] *and Xutang Tao*[a]

[a]State Key Laboratory of Crystal Materials, Shandong University, Jinan, 250100, P. R China;

[b]Ian Wark Research Institute, University of South Australia, Adelaide, SA 5095, Australia

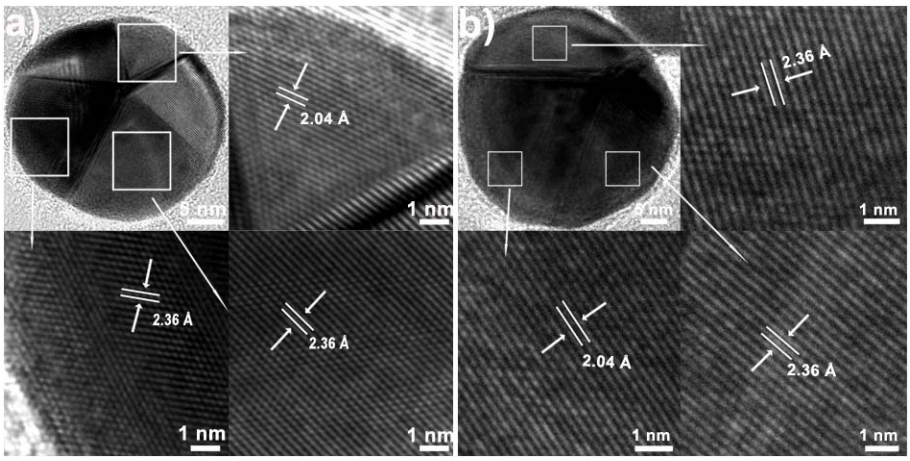

Fig. S1 HRTEM images (a and b) of Au NCs shown in Fig. 1e and Fig. 1f, respectively.

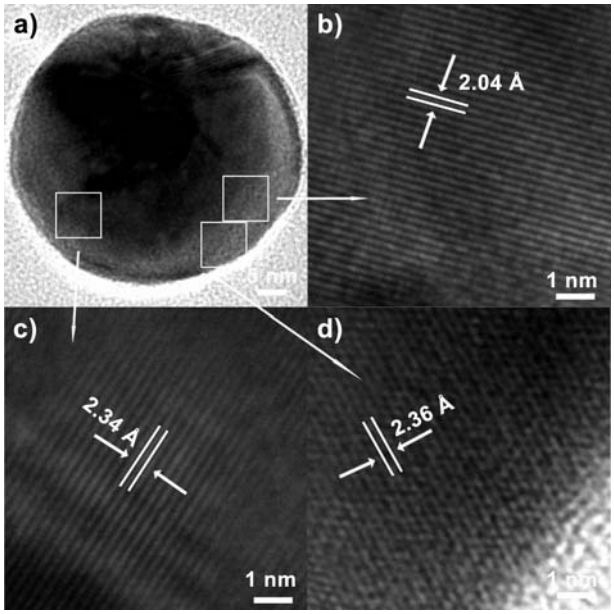

Fig. S2 HRTEM images of Au NCs shown in Fig. 4c.

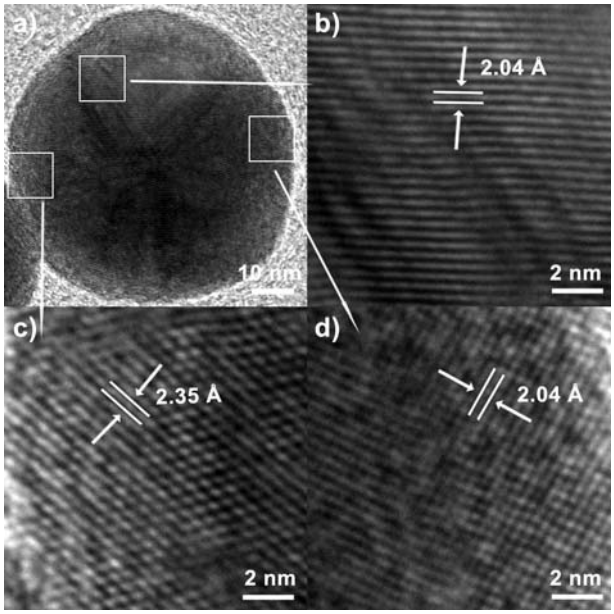

Fig. S3 HRTEM images of Au NCs shown in Fig. 5a.

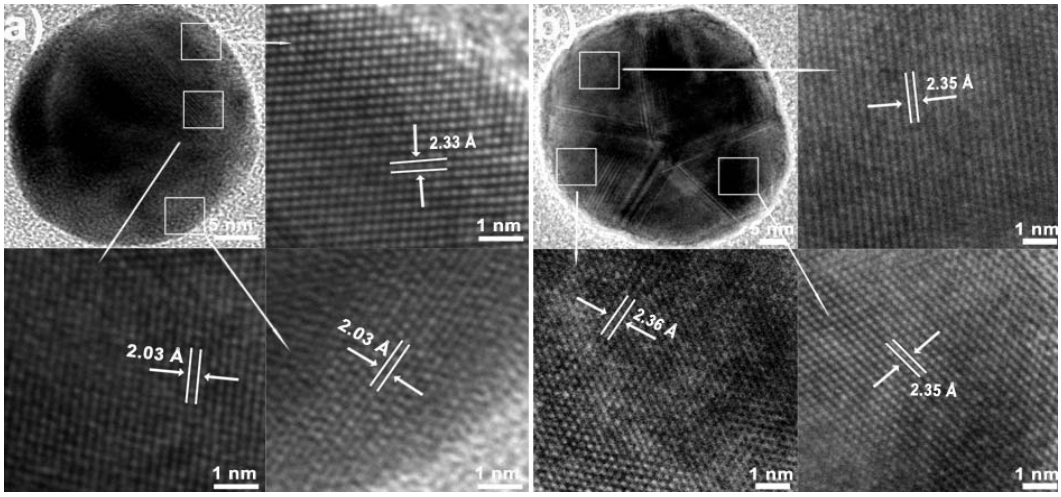

Fig. S4 HRTEM images (a and b) of Au NCs shown in Fig. 7a and Fig. 7b, respectively.

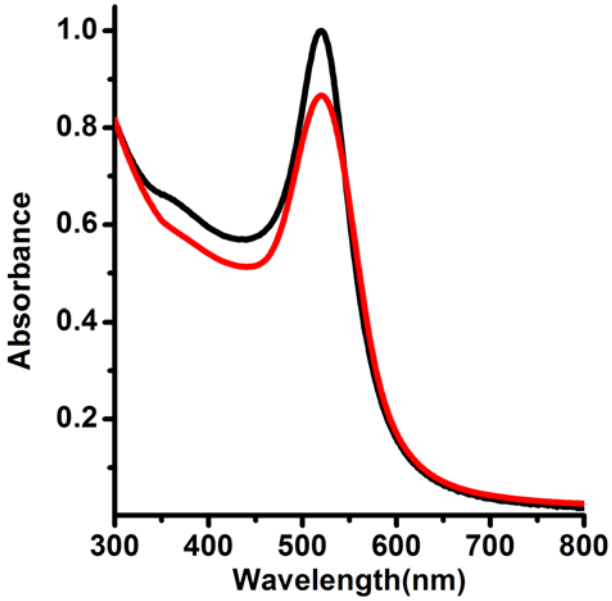

Fig. S5 UV-vis spectra of Au NCs obtained via Frens method (black curves) and the solution of as-prepared Au NCs after centrifugation treatment (red curves). The concentrations of $HAuCl_4$ and sodium citrate used are 0.01 wt % and 3×10^{-2} wt %, respectively.

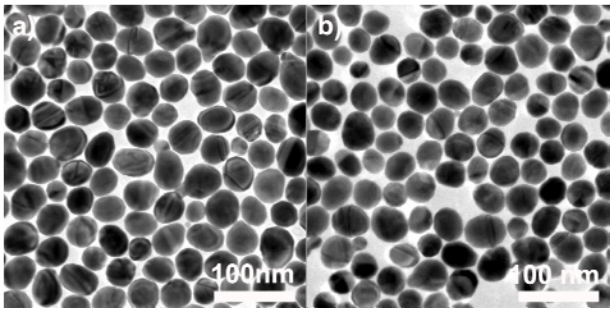

Fig. S6 TEM images of Au NCs obtained via Ag^{+}-assisted Frens method under different concentrations of silver ions: 6×10^{-4} wt% (a) and 1.0×10^{-3} wt% (b). The concentrations of $HAuCl_4$ and citrate used were 0.01 wt% and 6×10^{-3} wt%, respectively.

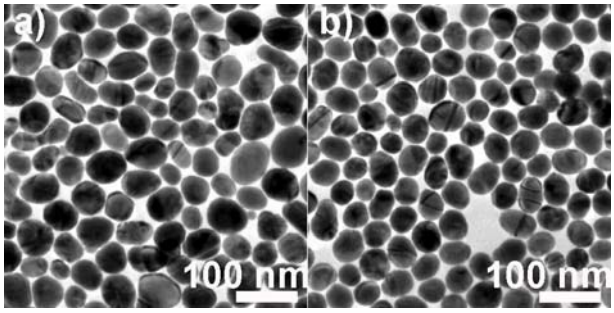

Fig. S7 TEM images of Au NCs obtained via Ag^{+}-assisted Frens method under different $AgNO_3$ concentrations: 5×10^{-4} wt% (a) and 6×10^{-4} wt% (b). The concentrations of $HAuCl_4$ and citrate used were 0.01 wt% and 4.2×10^{-3} wt%, respectively.

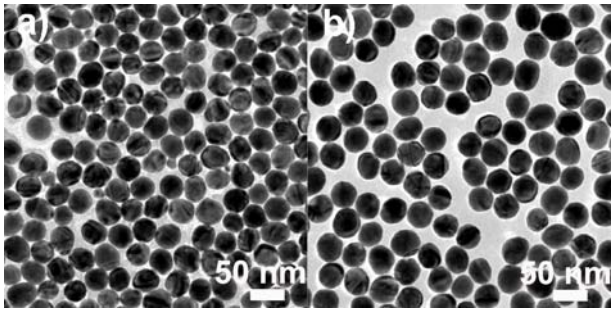

Fig. S8 TEM images of the corresponding Au NCs obtained via Ag^{+}/Fe^{2+}-assisted Frens method under different $FeCl_2$ concentrations: 1.0×10^{-5} wt % (a) and 2×10^{-5} wt % (b). The concentrations of $HAuCl_4$, $AgNO_3$ and citrate used were always 0.01 wt %, 8.5×10^{-4} wt %, and 6×10^{-3} wt %, respectively.

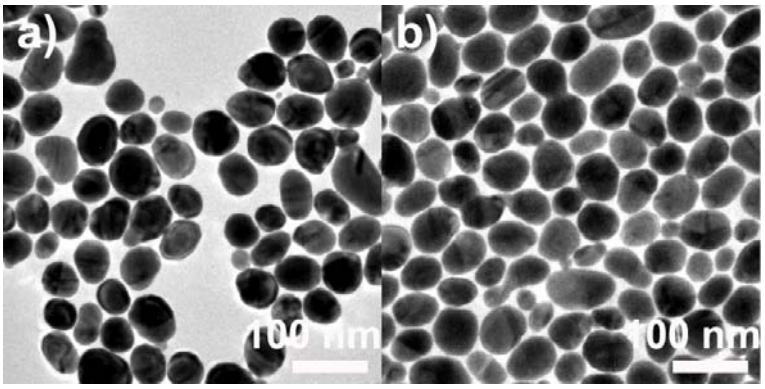

Fig. S9 TEM images of Au NCs obtained via Ag^{+}/Fe^{2+}-assisted Frens method under different $FeCl_2$ concentrations: 4×10^{-6} wt % (a) and 6×10^{-6} wt % (b). The concentrations of $HAuCl_4$, citrate and $AgNO_3$ used were 0.01 wt%, 4.2×10^{-3} wt % and 5.5×10^{-4} wt %, respectively.

Table S1 Summary of the redox potential values of half-reaction of Au^{3+}/Au^{0}, Fe^{3+}/Fe^{2+}, and Cu^{2+}/Cu^{+}.

Half-reaction	Potential values (V)
$Au^{3+} + 3e \leftrightarrow Au^{0}$	1.498
$Fe^{3+} + e \leftrightarrow Fe^{2+}$	0.771
$Cu^{2+} + e \leftrightarrow Cu^{+}$	0.153