Electronic Supplementary Information

Understanding the Roles of Metal Sources and Dodecanethiols in the Formation of Metal Sulfide Nanocrystals via a Two-Phase Approach

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Figure S1

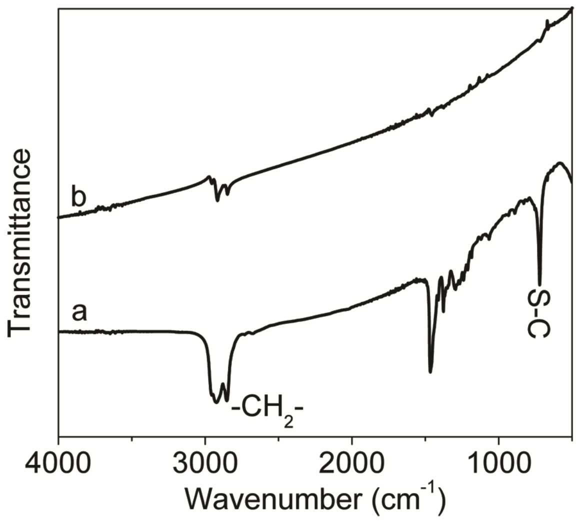

Fig. S1 FT-IR spectra of (a) the intermediate compound and (b) the corresponding final products synthesized using $Cu(NH_3)_4^{2+}$ as Cu sources in the presence of 5 mL of DDT.

Figure S2

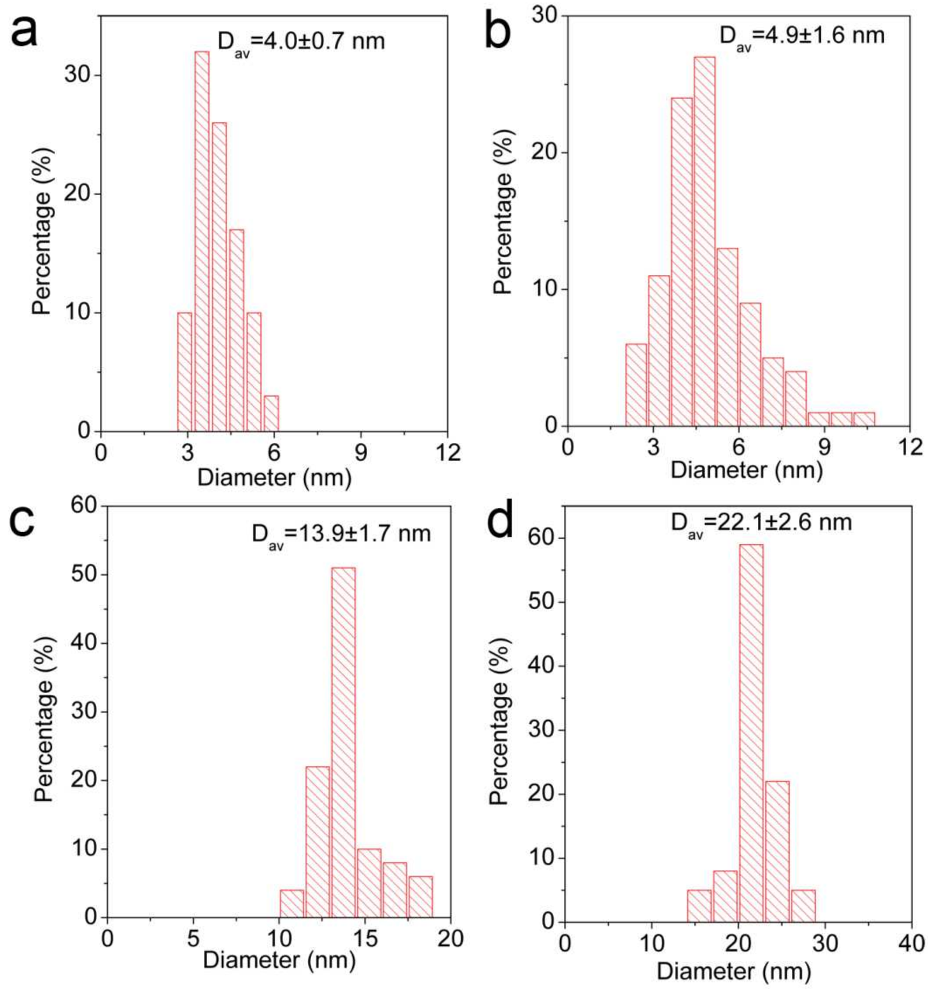

Fig. S2. The size distribution histograms of the as-obtained products synthesized using $Cu(NH_3)_4^{2+}$ as Cu sources in the presence of different volumes of DDT: (a) 1 mL; (b) 1.5 mL; (c) 2 mL; (d) 5 mL.

Figure S3

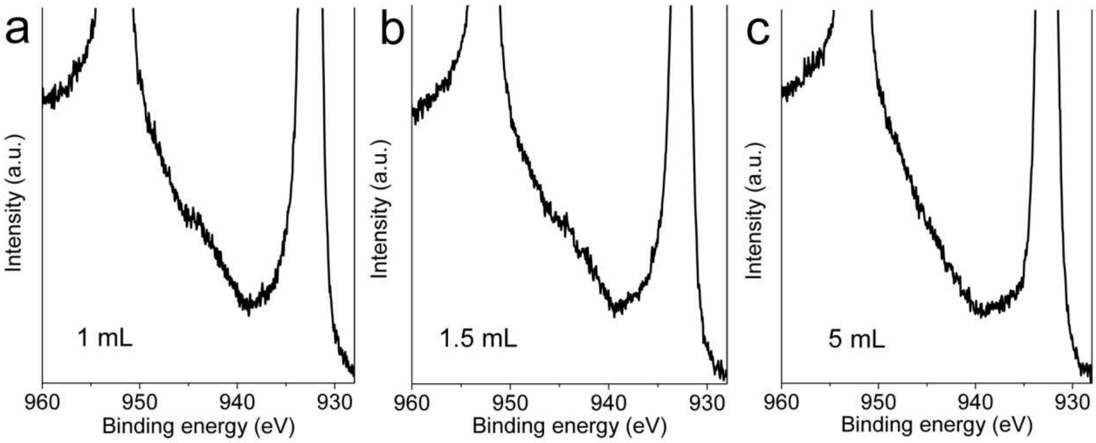

Fig. S3. The magnified Cu 2p spectra of the products synthesized in the presence of different volume of DDT: (a) 1 mL; (b) 1.5 mL and (c) 5 mL.

Figure S4

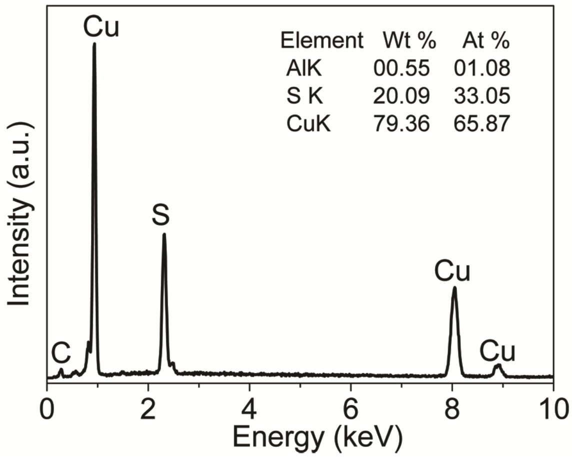

Fig. S4. EDS spectrum of the products synthesized in the presence of 5 mL of DDT.

Figure S5

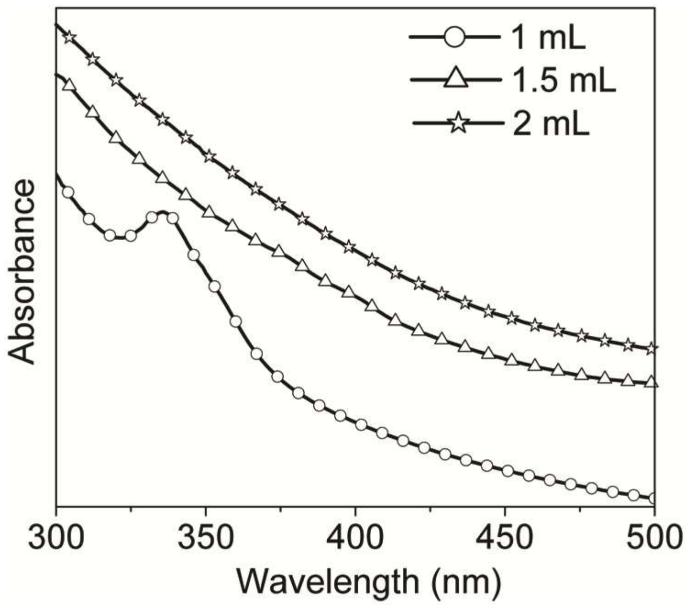

Fig. S5. The UV-Vis absorption spectra of the products synthesized in the presence of different volume of DDT: (a) 1 mL; (b) 1.5 mL and (c) 2 mL.

Figure S6

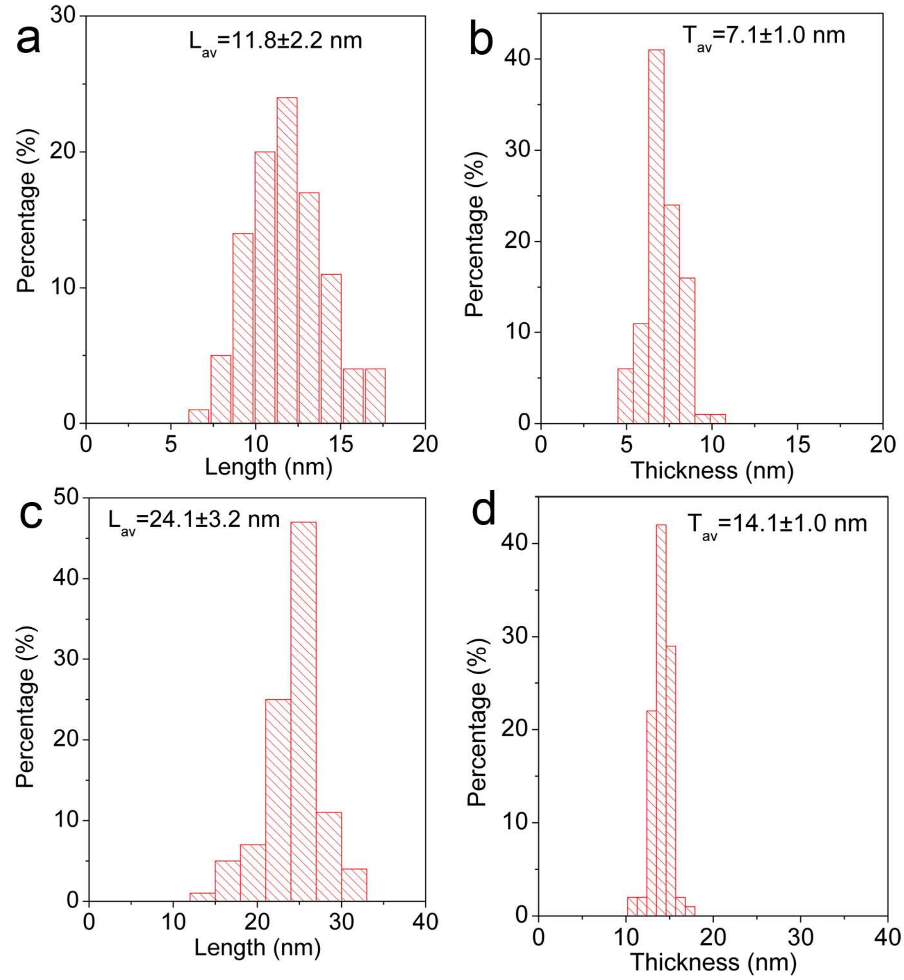

Fig. S6 The size distribution histograms of the as-obtained products synthesized using $Cu(NO_3)_2$ as Cu sources in the presence of different volumes of DDT: (a, b) 0.5 mL and (c, d) 1.5 mL; Left panel: length, right panel: thickness.

Figure S7

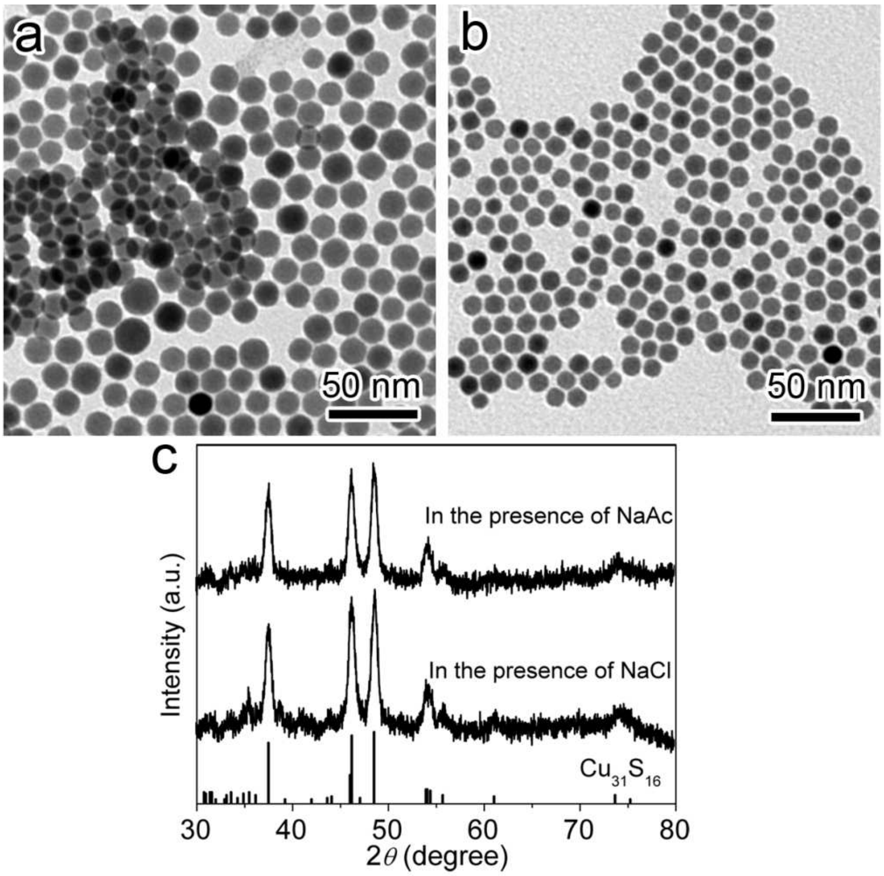

Fig. S7 TEM images of the products synthesized by using $Cu(NH_3)_4^{2+}$ as Cu sources in the presence of 2 mL of DDT and other added anions (a) Cl^-; (b) Ac^-; (c) the corresponding XRD patterns together with the standard diffraction lines of $Cu_{31}S_{16}$ (JCPDS No. 23-0959).

Figure S8

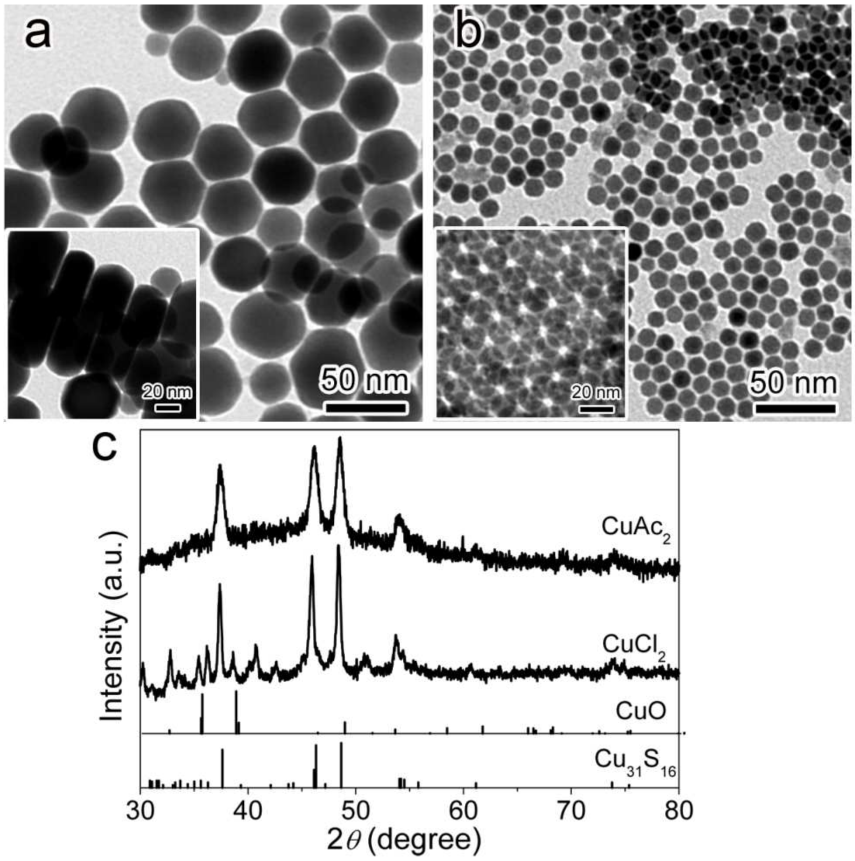

Fig. S8 TEM images of the products synthesized by using (a) $CuCl_2$ and (b) $CuAc_2$ as Cu sources in the presence of 2 mL of DDT, and (c) the corresponding XRD patterns together with the standard diffraction lines of $Cu_{31}S_{16}$ (JCPDS No. 23-0959) and CuO (JCPDS No. 89-5895)

Figure S9

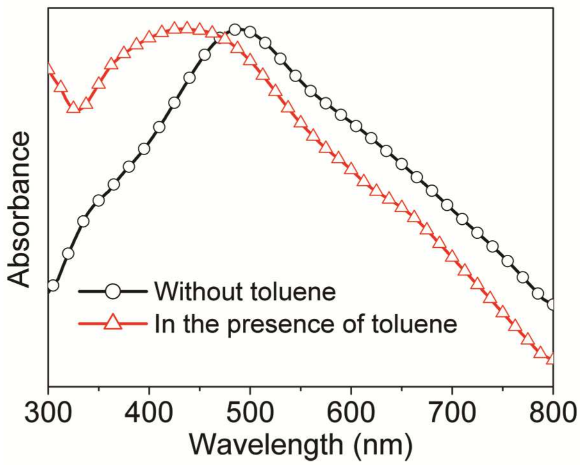

Fig. S9 Absorption spectra of the products synthesized by reaction of 1 mmol of $AgNO_3$ and 2 mL of DDT with and without toluene.

Figure S10

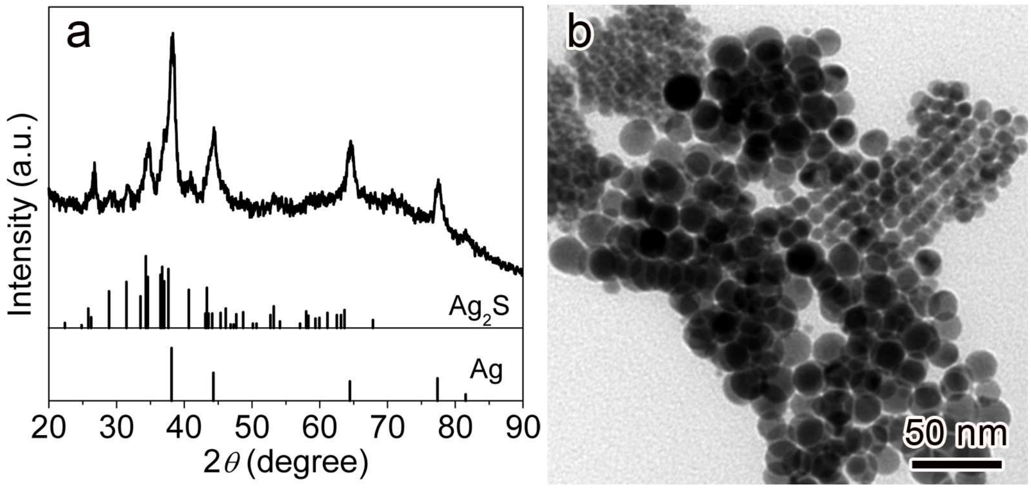

Fig. S10 (a) XRD patterns of the sample synthesized by using $Ag(NH_3)^+$ as Ag sources and 2 mL of DDT, and the bottom lines represent the standard diffraction peaks of monoclinic Ag_2S (JCPDS No. 14-0072) and metallic Ag (JCPDS No.04-0783); (b)the corresponding TEM image, indicating that the products are composed of Ag nanocrystals (large-sized particles) and Ag_2S nanocrystals (small-sized particles).