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Supporting Information

Viscoelastic Wormlike Micelles Formed by Ionic Liquid-Type Surfactant [C_{16}imC_8]Br Towards Template-Assisted Synthesis of CdS Quantum Dots

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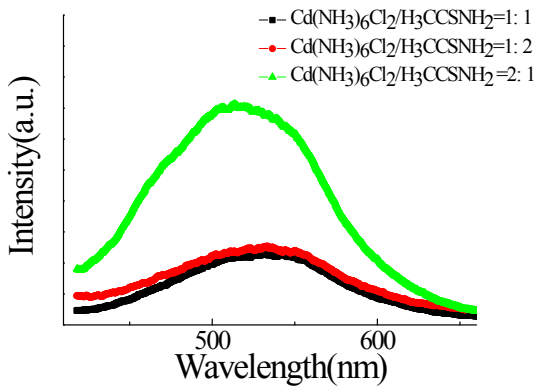

Fig. S1 Photoluminescence spectra of CdS QDs solution fabricated at different molar ration of $Cd(NH_3)_6Cl_2/H_3CCSNH_2$ in 3.00 wt.% $[C_{16}imC_8]Br/H_2O$ solution.

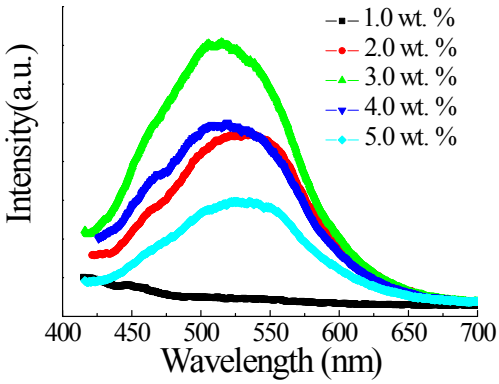

Fig. S2 Photoluminescence spectra of CdS QDs synthesized in different concentration $[C_{16}imC_8]Br/H_2O$ solution. Synthesis conditions: $[Cd(NH_3)_6]Cl_2]$ = 1 mM, $[H_3CCSNH_2]$ = 0.5 mM.

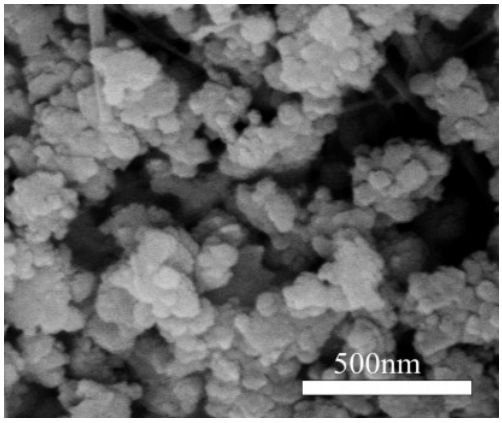

Fig. S3 Typical SEM image of CdS particles synthesized in water without $[C_{16}imC_8]Br$.

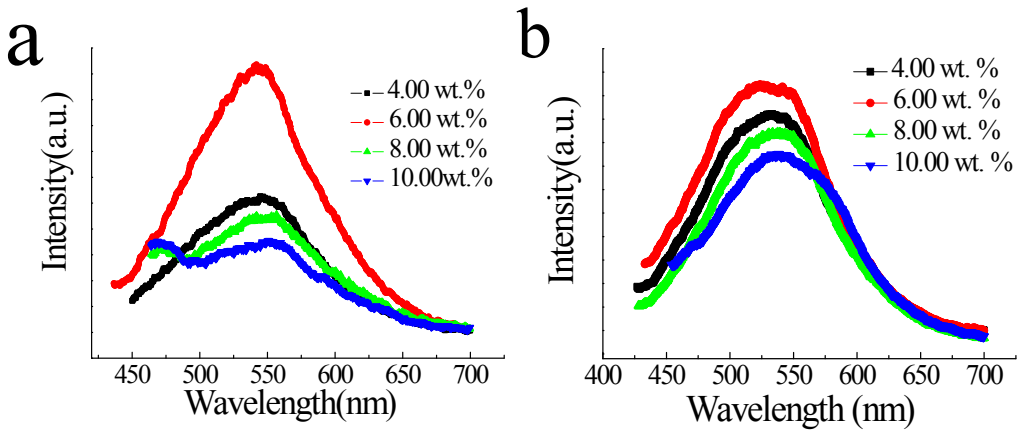

Fig. S4 Photoluminescence spectra of CdS QDs synthesized in (a) $[C_{16}imC_4]Br/H_2O$ and (b) $[C_{16}imC_6]Br/H_2O$ solutions. Other synthetic conditions: $[Cd(NH_3)_6]Cl_2]$ = 1 mM, $[H_3CCSNH_2]$ = 0.5 mM.

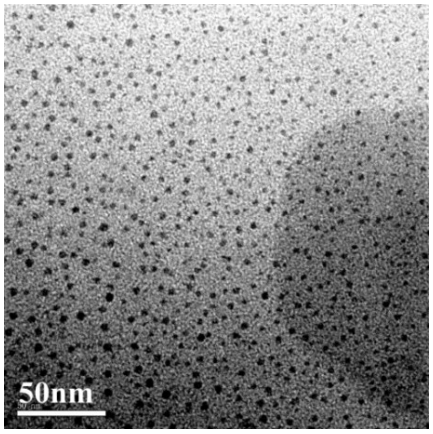

Fig. S5 TEM image of Ag nanoparticles synthesized in 3.00 wt.% $[C_{16}imC_8]Br/H_2O$ wormlike micelles by injection of 2 mM $Ag(NH_3)_2NO_3$.

Quantum yield of CdS QDs can be calculated by:

$$Y_{\mathrm{U}} = Y_{\mathrm{S}} \times \frac{F_U}{F_S} \times \frac{A_S}{A_U} \times \frac{I_U^2}{I_S^2} \tag{S-1}$$

Where Y_{U}, F_{U}, I_{U} and A_{U} are the quantum yield, fluorescence integral area, refractive index and the absorbance value at excited wave of CdS QDs, respectively; Y_{S}, F_{S}, I_{S}, and A_{S} are the quantum yield, fluorescence integral area, refractive index and the absorbance value at excited wave of rhodamine 6G, respectively.

Tab. S1 Quantum yield of rhodamine 6G and CdS QDs.

Substance	**Excited wavelength**	**Absorbance value**	**Fluorescence integral area**	**Refractive index**	**Quantum yield**
rhodamine6G	405	0.033	96318	1.36	95%
CdS (25°C)	405	0.047	30930	1.333	20.54%
CdS (30°C)	405	0.064	37637	1.333	18.32%
CdS (40°C)	405	0.048	27165	1.333	17.49%
CdS (50°C)	405	0.051	13265	1.333	8.08%