

**Supporting information for J. Phys. Chem. C**

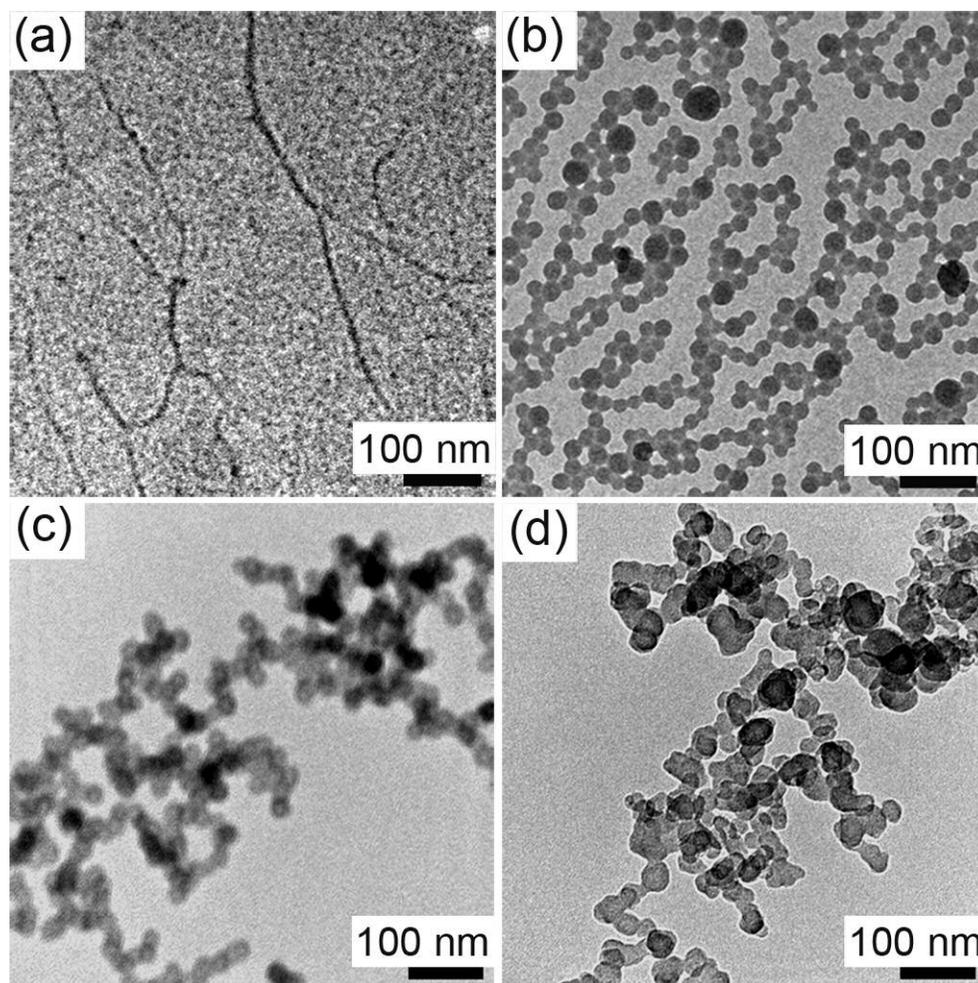
# Luminescent Cadmium Sulfide Nanochains Templated on Unfixed Deoxyribonucleic Acid and Their Fractal Alignment by Droplet Dewetting

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## Influence of Molar Ratio of DNA to $\text{Cd}^{2+}$ on Morphology of CdS NCs

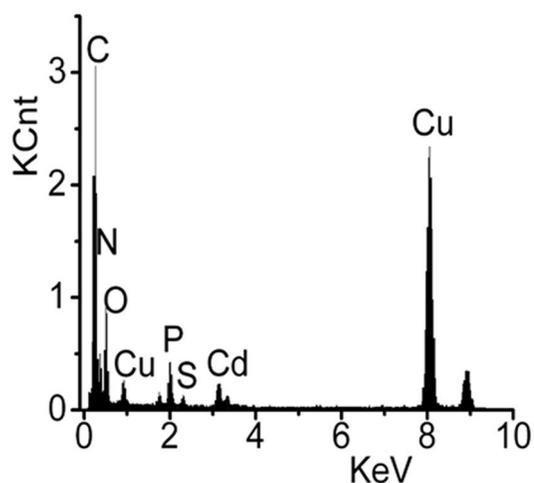
To optimize the molar ratio of DNA to  $\text{Cd}^{2+}$ , different volumes of 2.0 mM cadmium chloride solution were used to synthesize a series of CdS NCs. The morphology and size of the as-synthesized CdS NCs were characterized by TEM (Figure S1). Obviously the CdS NCs prepared at the molar ratio of 1:1 showed the best morphology of linear CdS NCs, at which the optimal volume of 2.0 mM cadmium chloride solution was 4.6 mL when 9.2  $\mu\text{mol}$  DNA (per nucleotide phosphate) was used for preparation of the CdS NCs.



**Figure S1.** TEM images of CdS NCs at 2:1 (a), 1:1 (b), 1:1.3 (c), and 1:2 (d) molar ratios of DNA to  $\text{Cd}^{2+}$ .

## Energy-dispersive X-ray Spectrum of CdS NCs

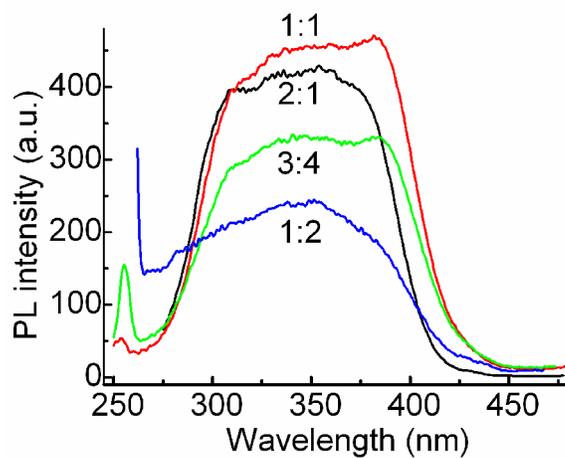
The composition of CdS NCs prepared at 1:1 molar ratio of DNA to Cd<sup>2+</sup> were validated by energy dispersive X-ray spectrum (EDS) and shown in Figure S2. Besides the Cu element from copper grid, the peaks for N, O, P, S and Cd elements could be detected. The appearance of P element should be attributed to DNA, while N element should be attributed to DNA and AET.



**Figure S2.** Energy-dispersive X-ray spectrum of CdS NCs in domain of TEM image obtained at the optimal molar ratio of DNA to Cd<sup>2+</sup>.

## Influence of Molar Ratio of DNA to Cd<sup>2+</sup> on PL Excitation Spectra of CdS NCs

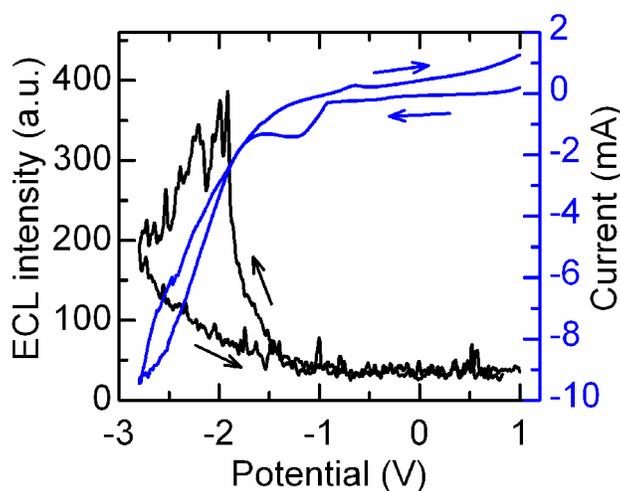
The PL excitation curves of CdS NCs revealed broad bands ranging from 310 to 370 nm (Figure S3).



**Figure S3.** PL excitation of CdS NCs at different molar ratios of DNA to Cd<sup>2+</sup>.

## Cyclic Scan ECL Curve of CdS NCs in Aqueous Solution

In aqueous medium a couple of oxidation and reduction peaks appeared at -0.66 and -1.20 V, respectively (Figure S4). The anodic peak at -0.66 V for hole injection was related to CdS/S<sup>0</sup> couple, which was also observed for thioglycerol-capped CdS nanocrystals.<sup>S1</sup> The cathodic peak for onset of electron injection at -1.20 V was comparable to the CdS/Cd<sup>0</sup> couple.<sup>S2</sup> Upon the cathodic scan the reduction current further increased, correspondingly, the ECL intensity increased.



**Figure S4.** Cyclic scan ECL curves of CdS NCs modified electrode at 400 mV s<sup>-1</sup> in 0.1 M pH 7.4 phosphate buffer saline containing 0.1 M KNO<sub>3</sub>.

## References

(S1) Haram, K.; Quinn, B. M.; Bard, A. J. *J. Am. Chem. Soc.* **2001**, *123*, 8860.

(S2) Cao, X. Z.; Zhang, W. H. *Inorganic Chemistry* (2nd Edition), High Education Publishing Company, Beijing, 1983, pp. 625.