Supporting information

Controllable synthesis of lanthanide Yb^{3+} and Er^{3+} co-doped AWO_4 (A = Ca, Sr, Ba) micro-structured materials: phase, morphology and up-conversion luminescence enhancement

Jingbin Huang,[a,b] Qingfeng Li,[a,c] Jia Wang,[a,c] Lin Jin,[a,c] Boshi Tian,[a,c] Chunyang Li,[a,c] Yurong Shi, [a,c] Zhenling Wang*[a,c] and Jianhua Hao*[d]

[a.] *Henan Key Laboratory of Rare Earth Functional Materials; The Key Laboratory of Rare Earth Functional Materials and Applications, Zhoukou Normal University, Zhoukou 466001, P. R. China*

[b.] *The College of Chemistry and Molecular Engineering, Zhengzhou University, Zhengzhou 450001, P. R. China*

[c.] *International Joint Research Laboratory for Biomedical Nanomaterials of Henan, Zhoukou 466001, P. R. China*

[d.] *Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong, P. R. China*

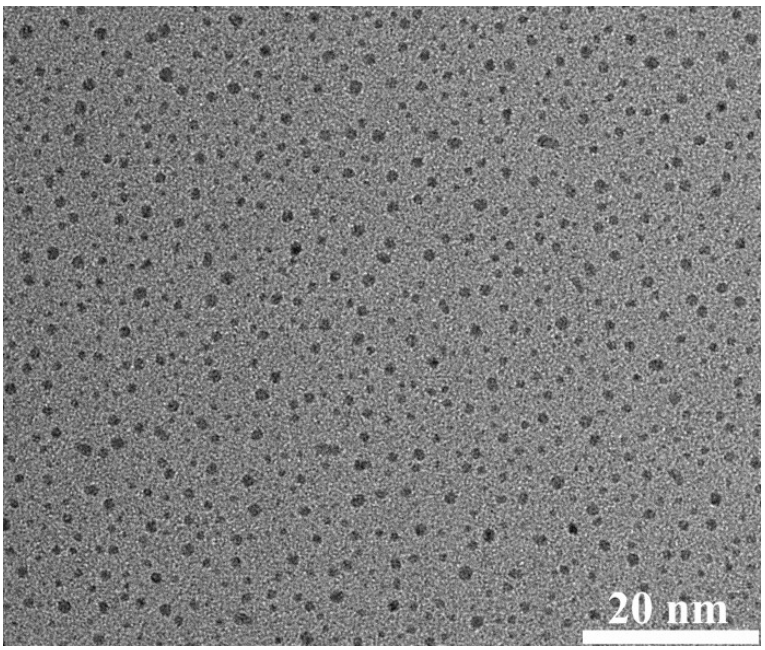

Fig. S1 TEM image of the as-prepared CDs aqueous solution.

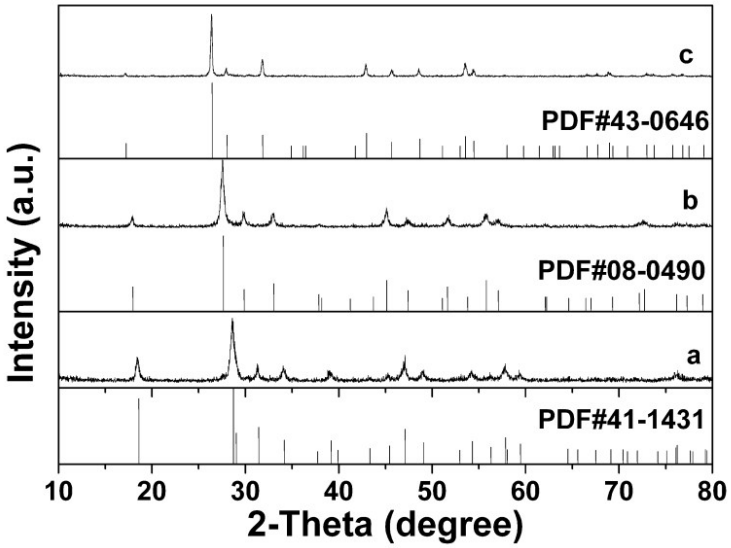

Fig. S2 XRD patterns of (a) CDs@$CaWO_4$: Yb^{3+}, Er^{3+}, (b) CDs@$SrWO_4$: Yb^{3+}, Er^{3+}, (c) CDs@$BaWO_4$: Yb^{3+}, Er^{3+}, and the corresponding standard data for bulk $CaWO_4$ (JCPDS No. 41-1431), $SrWO_4$ (JCPDS No. 08-0490) and $BaWO_4$ (JCPDS No. 43-0646) powders.

Fig. S3 The luminescence photograph of CDs solution under the excitation of 365 nm UV light.