

Supporting Information

**Highly stable CdTe quantum dots hosted in gypsum via a  
flocculation-precipitation method**

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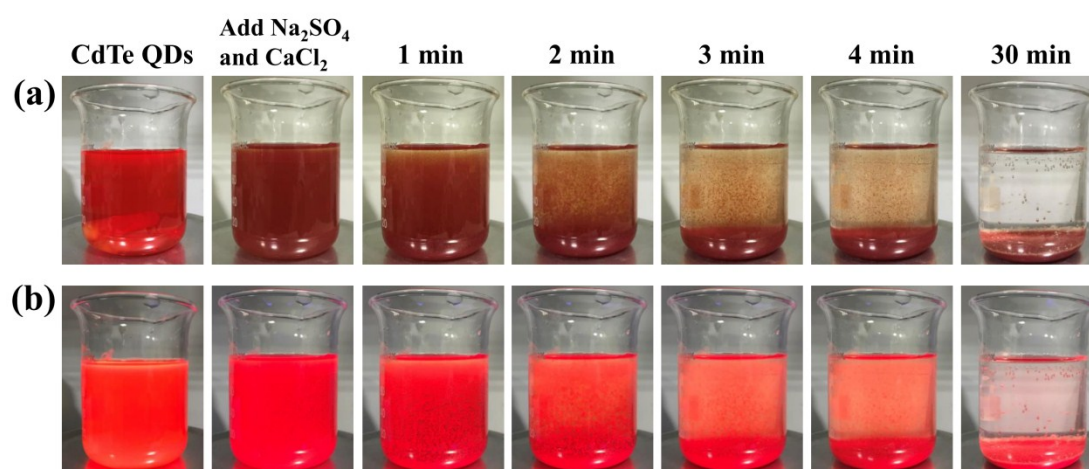
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**Table S1** Fluorescence characters of CdTe QDs with different sizes.

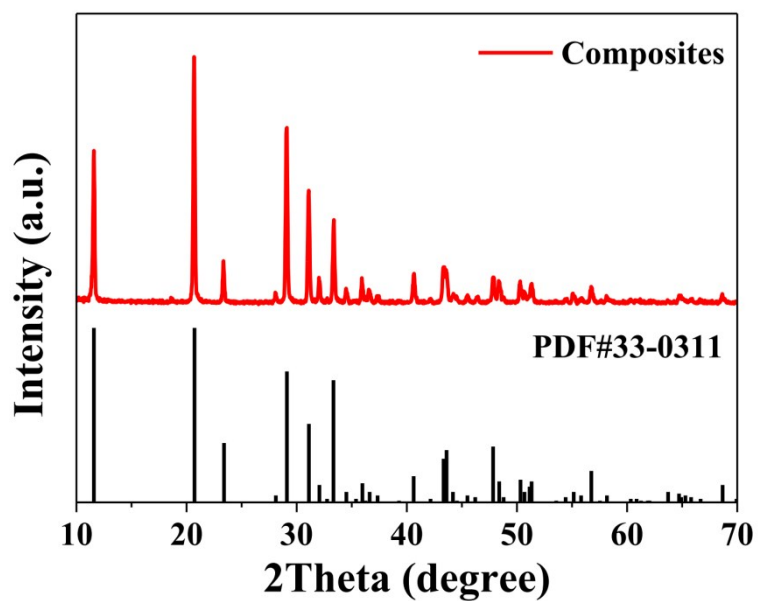
CdTe QDs	QDs size (nm)	Absorption peak (nm)	Emission peak (nm)	FWHM (nm)	PLQY (%)
1	2.5	506	552	56	19
2	2.8	518	569	64	21
3	3.0	532	584	67	24
4	3.3	561	621	70	28



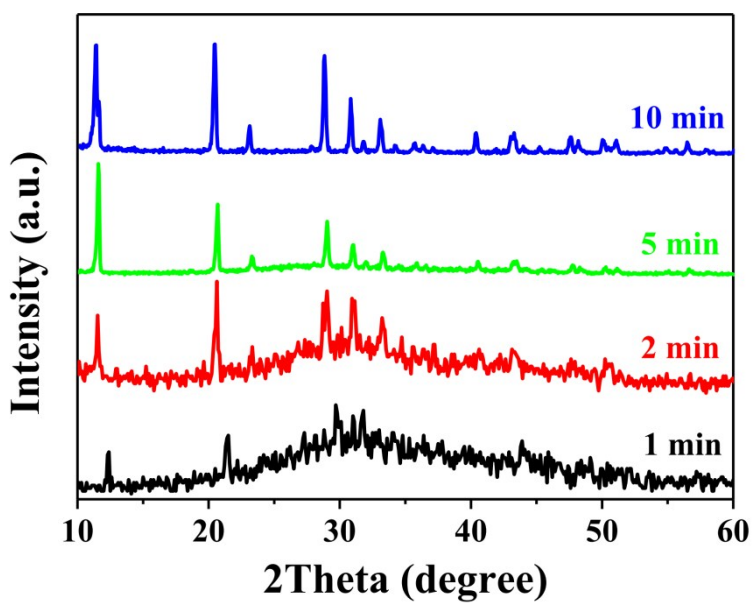
**Fig. S1** True color image of the incorporation and flocculation process of CdTe-gypsum nanocomposites (a) under daylight and (b) under 365 nm UV lamp.

**Table S2** Fluorescence characters of CdTe-gypsum nanocomposites with different QDs sizes.

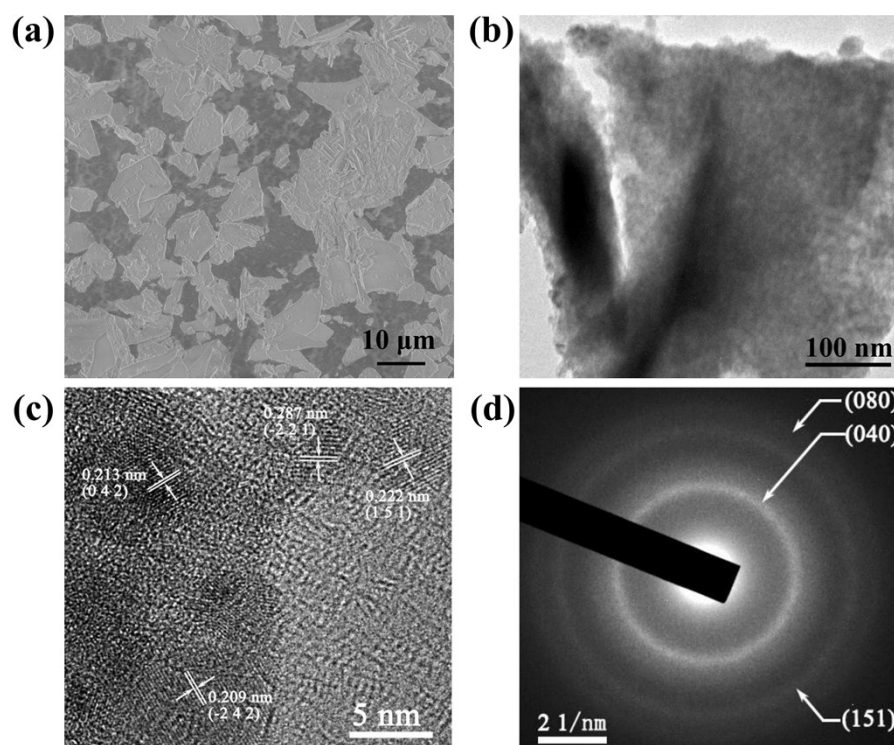
CdTe-gypsum	QDs size (nm)	Absorption peak (nm)	Emission peak (nm)	FWHM (nm)	PLQY (%)
1	2.5	507	561	51	15
2	2.8	518	586	53	18
3	3.0	538	610	63	22
4	3.3	567	630	72	27



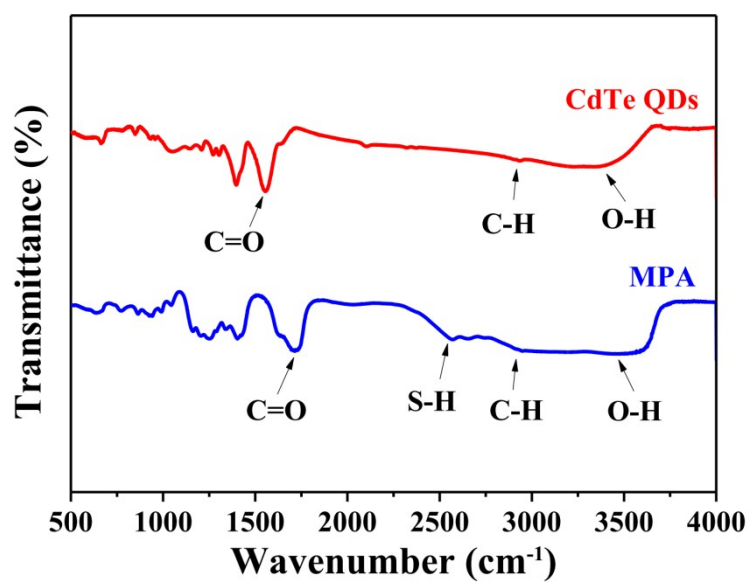
**Fig. S2** XRD pattern of CdTe-gypsum nanocomposites (red curve). As comparison, the standard XRD pattern of gypsum is also provided.



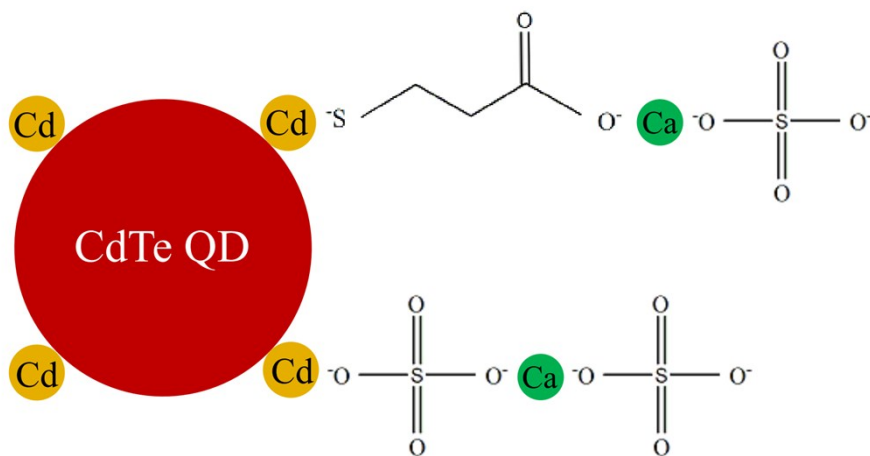
**Fig. S3** XRD pattern of the in-situ crystallization process of CdTe-gypsum nanocomposites.



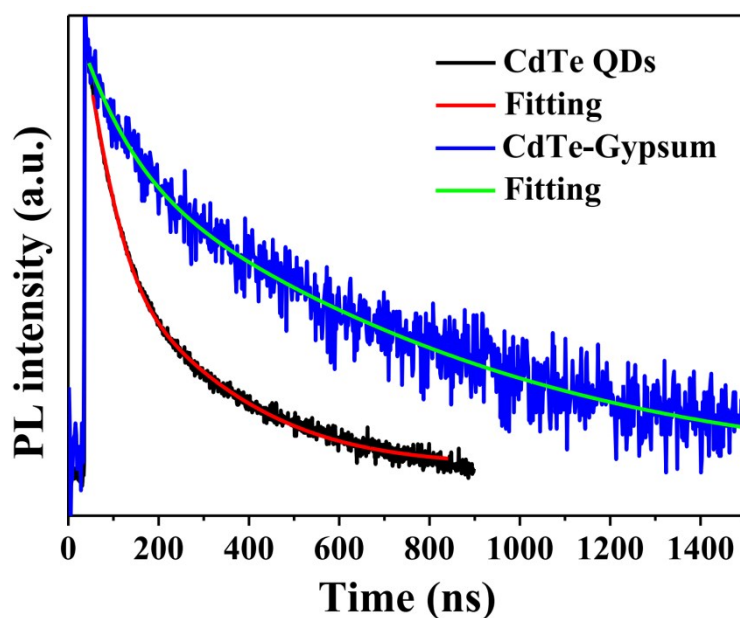
**Fig. S4** (a) SEM, (b) TEM, (c) HRTEM and (d) selected area electron diffraction (SEAD) image of CdTe-gypsum nanocomposites.



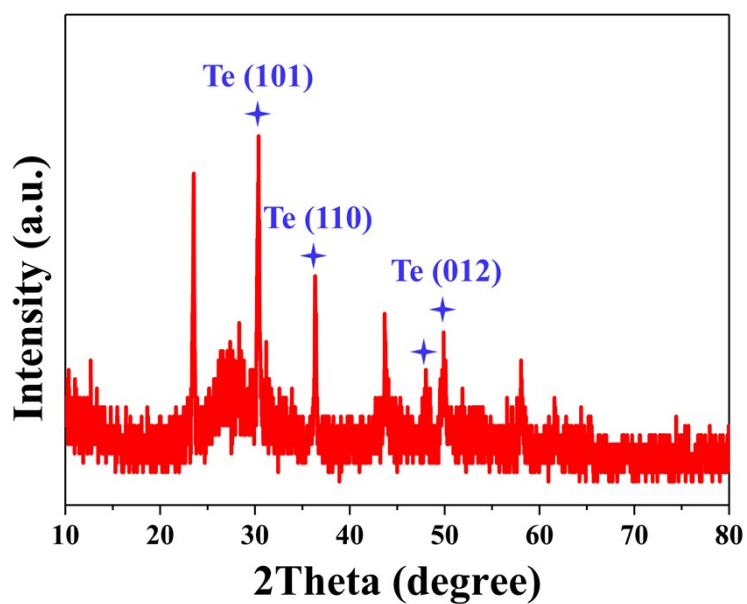
**Fig. S5** FTIR spectra of MPA (blue curve) and CdTe QDs powders (red curve).



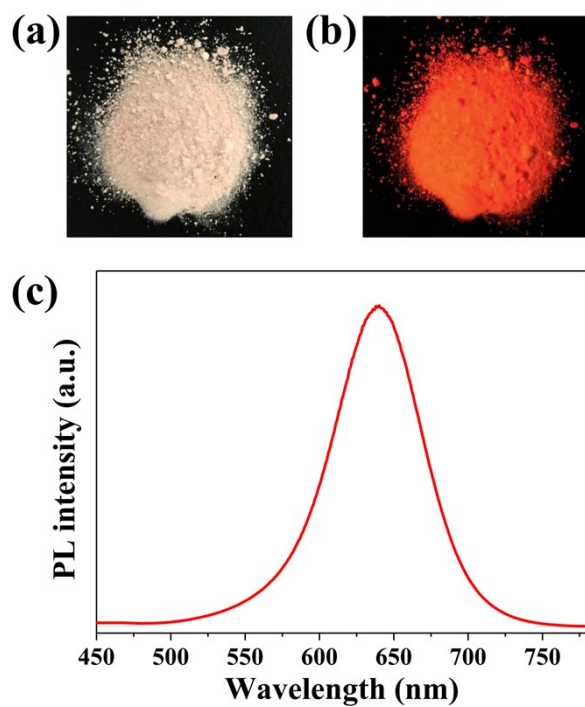
**Fig. S6** Schematic of MPA capped CdTe QD hosted in gypsum.



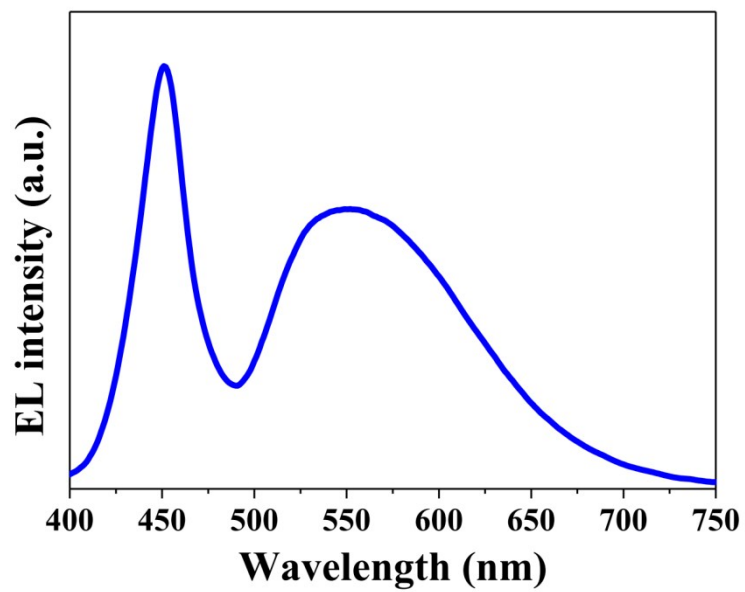
**Fig. S7** Time-resolved PL decay lifetime of CdTe QDs (black curve) and the corresponding CdTe-gypsum nanocomposites (blue curve) as well as their fitting curves. ( $\lambda_{ex} = 370$  nm).



**Fig. S8** XRD pattern of CdTe QDs after UV irradiation for two days. The blue marks show the existence of Te.



**Fig. S9** Digital image of CdTe-gypsum nanocomposites after being stored over 4 years in ambient condition (a) under daylight and (b) 365 nm UV light. (c) PL spectrum of CdTe-gypsum nanocomposites after being stored over 4 years.



**Fig. S10** EL spectrum of the WLED crafted by using YAG: Ce<sup>3+</sup> phosphors excited with a blue InGaN chip