Supporting Information

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

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Table S1 Fluorescence characters of CdTe QDs with different sizes.

<table>
<thead>
<tr>
<th>CdTe QDs</th>
<th>QDs size (nm)</th>
<th>Absorption peak (nm)</th>
<th>Emission peak (nm)</th>
<th>FWHM (nm)</th>
<th>PLQY (%)</th>
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<td>2.5</td>
<td>506</td>
<td>552</td>
<td>56</td>
<td>19</td>
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<tr>
<td>2</td>
<td>2.8</td>
<td>518</td>
<td>569</td>
<td>64</td>
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<tr>
<td>3</td>
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<td>67</td>
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<td>4</td>
<td>3.3</td>
<td>561</td>
<td>621</td>
<td>70</td>
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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.

<table>
<thead>
<tr>
<th>CdTe-gypsum</th>
<th>QDs size (nm)</th>
<th>Absorption peak (nm)</th>
<th>Emission peak (nm)</th>
<th>FWHM (nm)</th>
<th>PLQY (%)</th>
</tr>
</thead>
<tbody>
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</table>
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. (λ<sub>ex</sub> = 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$^{3+}$ phosphors excited with a blue InGaN chip.