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SUPPLEMENTARY MATERIAL

Linear dipole behavior of single quantum dots encased in metal oxide semiconductor nanoparticles films

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Aspect ratios of QDs and the calculation of the polarization degree

The typcial transmission electron microscope (TEM) image of single NIR emitting CdSeTe/ZnS_{3ML} core/multishell QDs is shown in Fig. 1(b) in the main text, which shows that the QDs deviate from a spherical shape. Histogram of aspect ratio of CdSeTe/ZnS_{3ML} core/multishell QDs is obtained from the TEM image, as shown in Fig. S1(a). The maximal aspect ratio is up to 2.2. By taking into account the aspect ratio, dielectric environment and material properties, we calculate the polarization degrees of QDs by the theory in Refs. [1,2]. The calculated polarization degree as a function of aspect ratio is shown in Fig. S1(b). The polarization degree is smaller than 0.15 for the aspect ratio of 2.2. Therefore, the ITO nanoparticles should be accountable for the average polarization degree of 0.45 observed in main text.

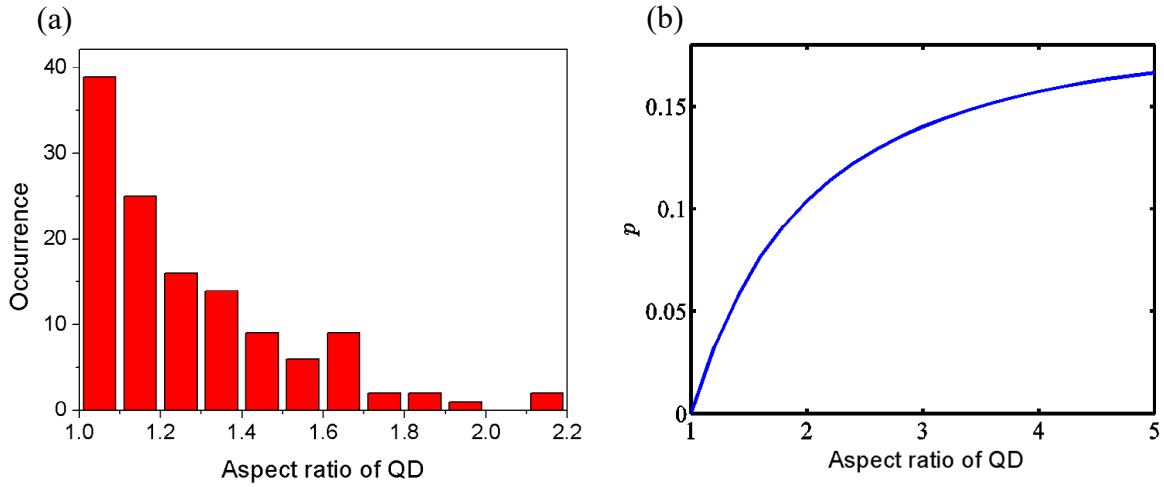

Fig. S1 (a) Histogram of aspect ratios of CdSeTe/ZnS_{3ML} core/multishell QDs obtained from the TEM image in Fig. 1(b). **(b)** The calculated polarization degree (p) as a function of aspect ratio for single QDs.

References

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