Supporting Information

Triethyl-borate as Surfactants to Stabilize Semiconductor Nanoplatelets in Polar Solvents and to Tune Their Optical Properties

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Figure S1 | The FT-IR of 4.5 ML-TEB treated by OA or Olam back exchange in nonpolar solvent

Table S1 Element content of samples before and after TEB treatment (mmol)

|                  | Cd   | Se   | B    | Cd/Se |
|------------------|------|------|------|-------|
| CdSe-OOCR        | 0.097| 0.0746| 0    | 1.30  |
| CdSe-TEB         | 0.017| 0.015| 0.0165| 1.13  |
Figure S2| The TEM images of NPLs (a) 3.5 ML-OOCR, (B) 3.5 ML-TEB; (C) 5.5 ML-OOR, (D) 5.5 ML-TEB.

Figure S3| The UV-vis absorption of 4.5 ML-TEB treated by OA or Olam back exchange in nonpolar solvent

Table S2 Optical properties of NPLs capped with RCOO⁻ and TEB

|          | HH (nm) | LH (nm) | SO (nm) | Em (nm) | PLQY (%) | Stock shift (nm) | FWHM (nm) |
|----------|---------|---------|---------|---------|----------|-----------------|-----------|
| CdSe-OOCR| 510     | 479     | 425     | 511     | 17.64    | 1               | 10        |
| CdSe-TEB | 550     | 506     | 431     | 565     | 20.42    | 15              | 32        |
Figure S4 | XRD pattern fitting curve of 4.5 ML NPLs.

Figure S5 | XRD pattern fitting curve of 3.5 ML NPLs.

Figure S6 | XRD pattern fitting curve of 5.5 ML NPLs.
Figure S7 | XRD pattern and UV-vis absorption curve of NPLs (A) and (B) 3.5 ML, (C) and (D) 5.5 ML.

Table S3. The lattice parameter information of NPLs for (220) Å

| Sample     | \(d_{220}\), lateral | \(d_{220}\), thickness | \(a\)   | \(c\)   | \(a/c\) |
|------------|----------------------|------------------------|--------|--------|--------|
| 3.5 ML-OOR | 2.174                | 2.087                  | 6.149  | 5.903  | 1.042  |
| 3.5 ML-TEB | 2.109                | 2.209                  | 5.965  | 6.248  | 0.955  |
| 5.5 ML-OOR | 2.23                 | 2.15                   | 6.307  | 6.081  | 1.037  |
| 5.5 ML-TEB | 2.11                 | 2.19                   | 5.968  | 6.194  | 0.963  |

Figure S8 | Energy shift of band gap for 3.5 and 5.5 ML NPLs.

Energy shift calculation (Zhou et al., 2015; Diroll and Schaller, 2019):
\[ \Delta E = -\alpha \frac{c_x-c_{OA}}{c_{OA}} Y \]  

(1)

\( \alpha \): Band gap pressure coefficient 43.1 meV/Gpa.

**Y**: Young's modulus 48.9 GPa.

Diroll, B. T., and Schaller, R. D. (2019). Shape-Selective Optical Transformations of CdSe Nanoplatelets Driven by Halide Ion Ligand Exchange. *Chem. Mater.* 31, 3556–3563. doi:10.1021/acs.chemmater.9b01261.

Zhou, Y., Wang, F., and Buhro, W. E. (2015). Large Exciton Energy Shifts by Reversible Surface Exchange in 2D II-VI Nanocrystals. *J. Am. Chem. Soc.* 137, 15198–15208. doi:10.1021/jacs.5b09343.