Supporting Information

Ligands removal and photo-activation of CsPbBr$_3$ quantum dots for enhanced optoelectronic devices.

Eric Moyen, Anil Kanwat, Sinyoung Cho, Haeyeon Jun, Roy Aad and Jin Jang$^*$

**Fig. S1.** Conventional (a) and modified (b) room temperature ligand assisted re-precipitation (LARP) technique for the fabrication of CsPbBr$_3$ quantum dots.

**Fig. S2.** The PL intensity of CsPbBr$_3$ thin films rapidly decreases after spin-coating due to solvent evaporation and ligands reorganization, and stabilizes after 30 min.
Fig. S3. Absorption spectra for the as dried CsPbBr3 QDs thin films (blue), after annealing for 20 min at 120°C w/o exposure to UV (red and green resp.)

Fig. S4. FWHM of the PL peaks of CsPbBr3 QDs as a function of the (a) annealing time at 120°C for various UV exposure times, (b) UV exposure times for various annealing times at 120°C.

Fig. S5. (a) time evolution of the PL emission wavelength of CsPbBr3 QDs upon annealing at 120°C in air and exposure to UV/O₃. (b) PL spectra of CsPbBr3 QDs after various exposure times to UV/O₃.
Fig. S6. FT-IR spectra of the as-dried CsPbBr$_3$ QDs thin films (blue), after exposure to UV for 20/60 min (short/long dashed blue), after annealing at 120°C for 20/60 min (plain/dashed red), and exposure to UV for 20 min (plain/dashed green).

Fig. S7. Details of the CsPbBr$_3$ QDs (202) XRD peak measured at room temperature and after annealing for 20 min at 200°C in air. Both peak perfectly superimpose, there is no peak broadening upon annealing which indicates no size widening of the QDs.
Fig. S8. PL emission spectra of CsPbBr$_3$ QDs thin films (a) after annealing for 20 min at 120°C and exposure to UV for 20 min (green). The intensity decreases of 10% after two days in air (blue) and recovers after 5 min exposure to UV (dashed red). (b) PL spectra of as-prepared and 6 months old CsPbBr$_3$ QDs thin films.

Fig. S9. Relative content of carbon, oxygen and nitrogen versus (a) Pb, (b) Br extracted from XPS data.

Fig. S10. Time-resolved photoluminescence (TRPL) measured on as dried CsPbBr$_3$ QDs thin films (blue), after annealing for 20 min at 120°C w/o exposure to UV (red and green resp.)
**Fig. S11.** Electroluminescence spectra in QLEDs with an emitting CsPbBr$_3$ QDs layer at room temperature (blue), annealed at 120°C for 10 min (red), additionally exposed to UV for 10 min (green).