Supplementary Information

Surface Passivation of Mixed-Halide Perovskite CsPb(Br$_x$I$_{1-x}$)$_3$

Nanocrystals by Selective Etching for Improved Stability

Qiang Jing,$^{1a}$ Mian Zhang,$^{1a}$ Xiang Huang,$^b$ Xiaoming Ren,$^b$ Peng Wang*$^a$ and Zhenda Lu*$^a$

$^a$ National Laboratory of Solid State Microstructures, College of Engineering and Applied Sciences and Collaborative Innovation Center of Advanced Microstructures, Nanjing University, Nanjing 210093, China.

$^b$ State Key Laboratory of Materials-Oriented Chemical Engineering and College of Science, Nanjing University of Technology, Nanjing, 210009, China.

$^{‡}$ Q. Jing and M. Zhang contributed equally to this work.

*e-mail: wangpeng@nju.edu.cn and luzhenda@nju.edu.cn
Fig. S1. XRD patterns of CsPbBr$_3$ (a) and CsPbI$_3$ (b) NCs after washing with ethanol and acetone.
Fig. S2. (a) Photograph of colloidal solutions of different perovskite CsPb(Br\textsubscript{x}I\textsubscript{1-x})\textsubscript{3} NCs under normal and UV light ($\lambda = 365$ nm). (b,c) Normalized PL spectra of nanoparticles CsPb(Br\textsubscript{x}I\textsubscript{1-x})\textsubscript{3} after washing with ethanol and acetone. (d) Corresponding PL peak position vs stoichiometric ratio of halide ions, extracted from Figure S1b and S1c.

Fig. S3. Normalized PL spectra of mix-halide pervoskite CsPb(Br\textsubscript{x}I\textsubscript{1-x})\textsubscript{3} NCs after washed with different antislovents.
**Fig. S4.** High-resolution XPS spectra corresponding to Pb 4f, Br 3d, I 3d, Cs 4d and Cs 3d in CsPb(Br$_x$I$_{1-x}$)$_3$ (x = 0.2) nanoparticles after washing with ethanol and acetone.

**Fig. S5.** Absolute quantum yield (QY) of mixed-halide CsPb(Br$_x$I$_{1-x}$)$_3$ nanocrystals with different x values.