Supporting Information

Enhancing Optical and Thermal Stability of Blue-emitting Perovskite Nanocrystals through Surface Passivation with Sulfonate or Sulfonic Acid Ligands

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Table S1. Carrier lifetime parameters of TR-PL decay curves of the original and modified perovskite NCs.

perovskite NCs	A1 (%)	τ_1 (ns)	A2 (%)	τ_2 (ns)	A3 (%)	τ_3 (ns)	τ_{avg} (ns)
original	74.13	1.91	24.35	8.24	1.52	50.14	17
SBS-modified	82.51	2.38	16.2	14.19	1.29	106.99	32.6
SbSS-modified	78.27	1.87	20.1	11.18	1.63	74.42	23.9
SPTS-modified	80.87	2.63	17.28	16.72	1.85	118.83	43.6
DBSA-modified	79.5	1.72	19.08	10.09	1.42	67.17	7.1

*τ_1, τ_2 and τ_3 are the lifetimes of different recombination decays.

The average lifetime was calculated by *Eq* (S1):

$$\tau_{avg} = \frac{A_1\tau_1^2 + A_2\tau_2^2 + A_3\tau_3^2}{A_1\tau_1 + A_2\tau_2 + A_2\tau_3} \qquad Eq(\mathrm{S1})$$

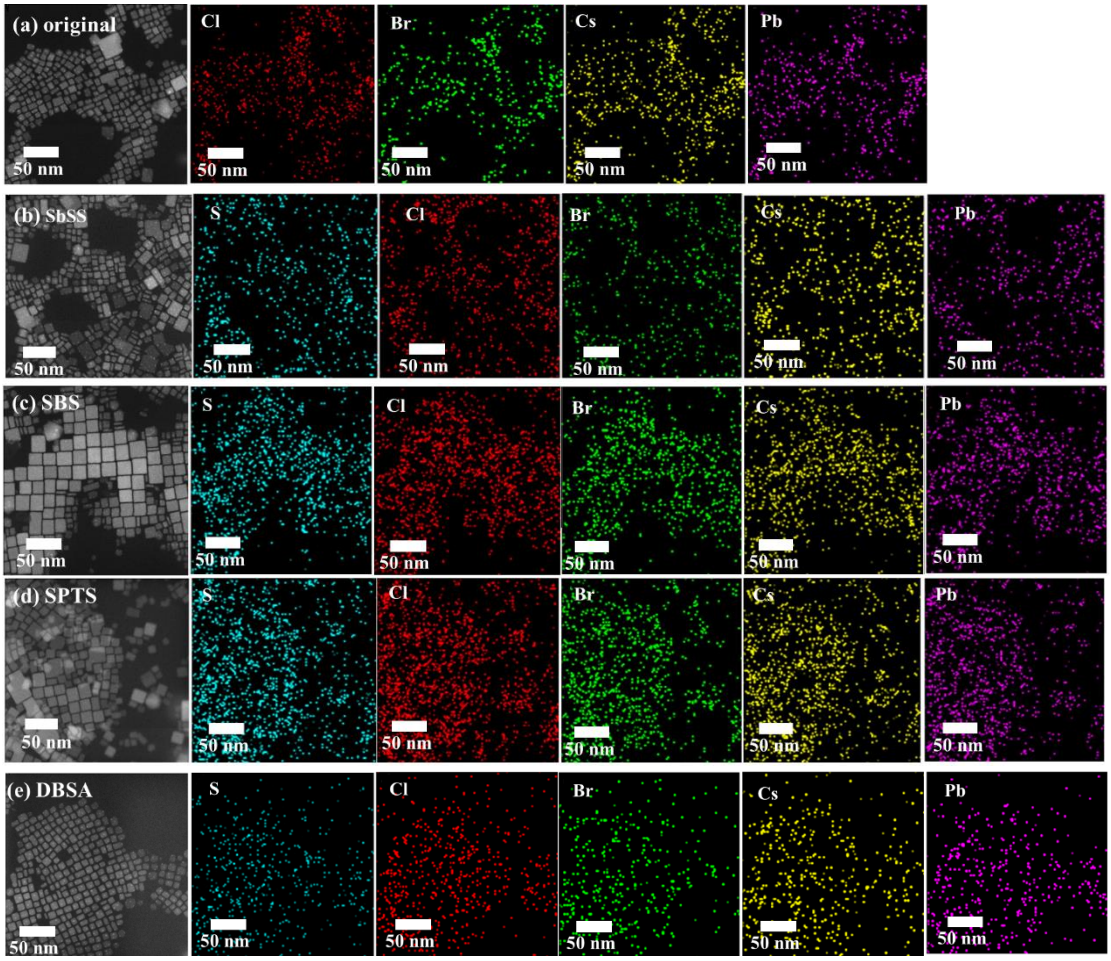

Figure S1. HAADF-STEM images and elemental mapping of S, Cl, Br, Cs, and Pb elements of the (a) original and (b) SbSS-, (c) SBS-, (d) SPTS-, (e) DBSA-modified perovskite NCs.

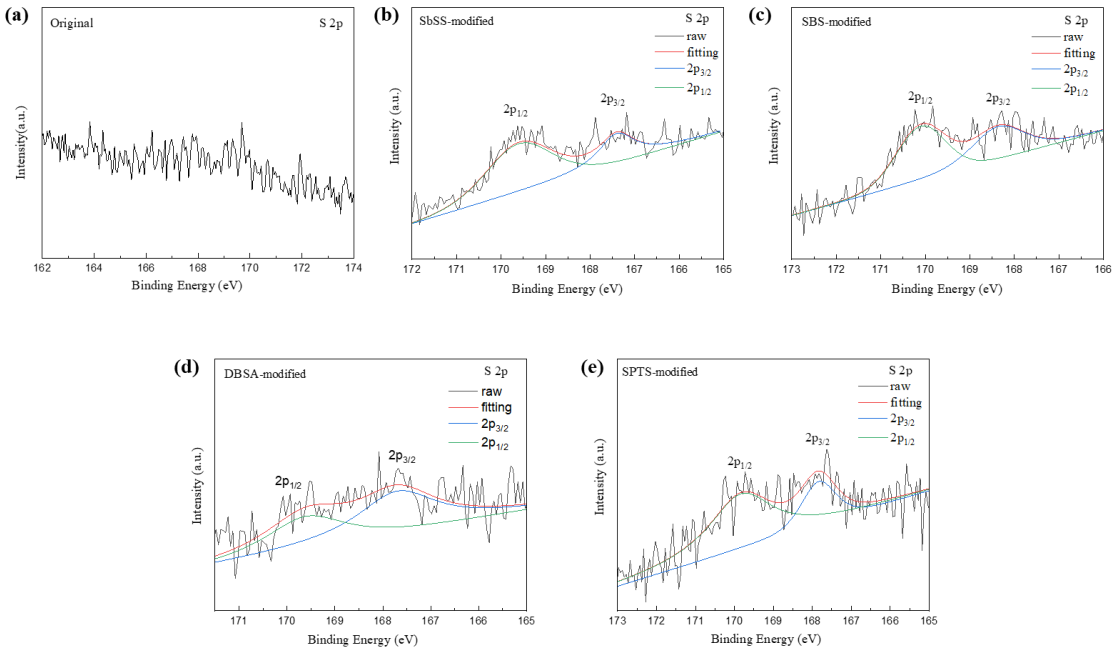

Figure S2. S 2p core-level XPS spectra of the (a) original and (b) SbSS-, (c) SBS-, (d) SPTS-, (e) DBSA-modified perovskite NCs.

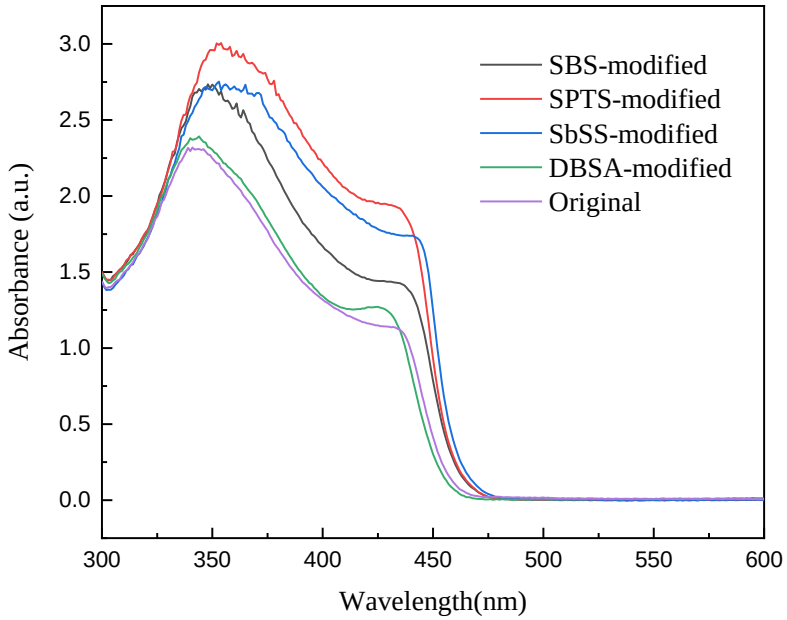

Figure S3. UV-vis absorption spectra of the original and sulfonate (or sulfonic acid) ligand-modified perovskite NCs.

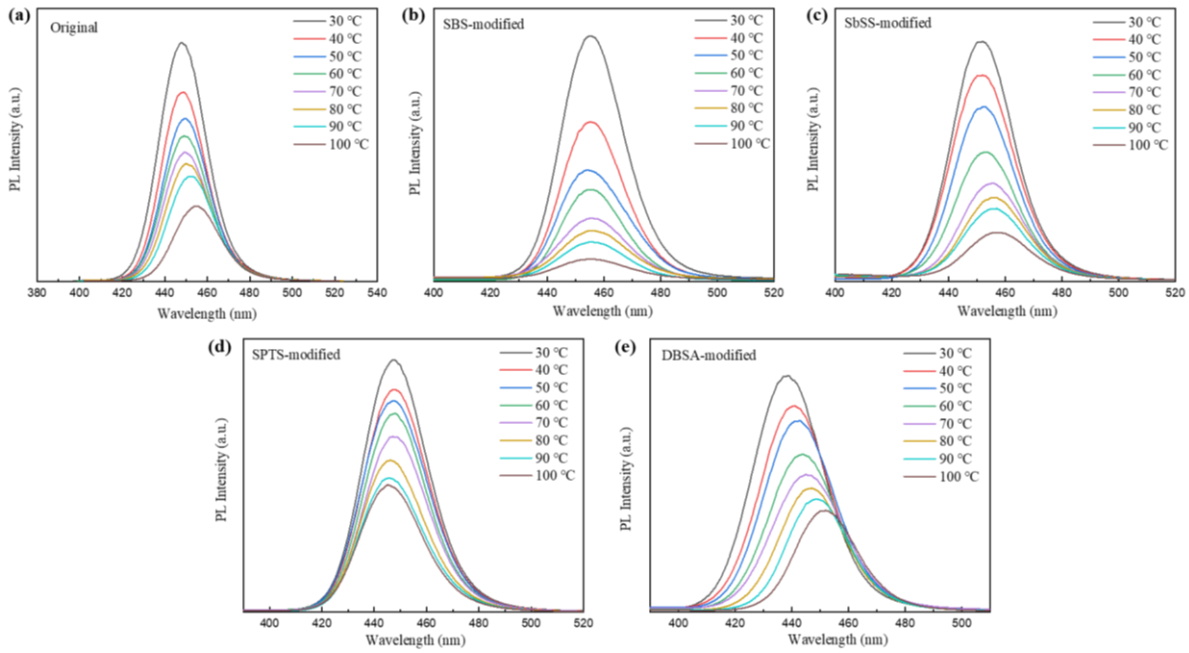

Figure S4. PL spectra of the (a) original and (b) SBS-, (c) SbSS-, (d) SPTS-, (e) DBSA-modified perovskite NCs at different heating temperatures.

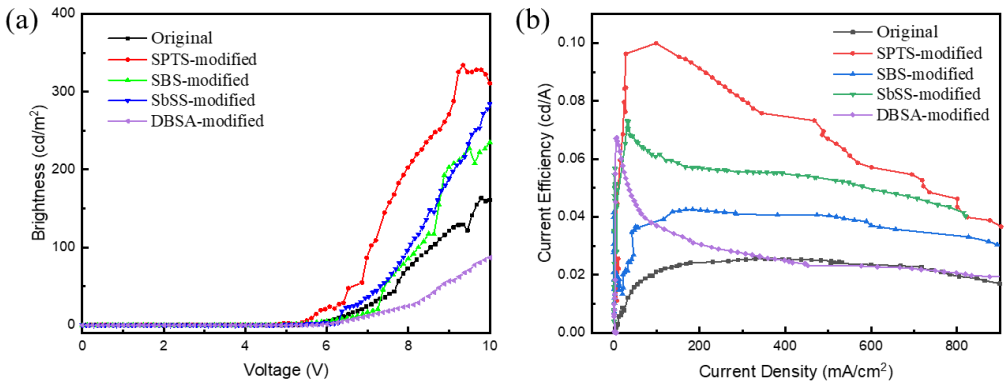

Figure S5. (a) Brightness–voltage and (b) current efficiency–current density characteristics of PeLEDs.