

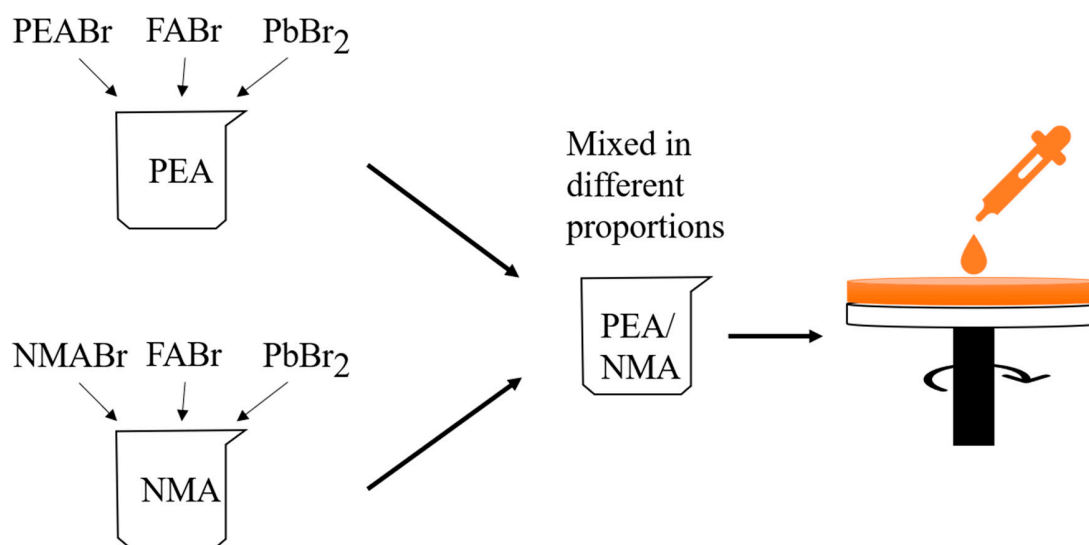
# Supplementary Materials: Photoluminescence Modulation of Ruddlesden -Popper Perovskite via Phase Distribution Regulation

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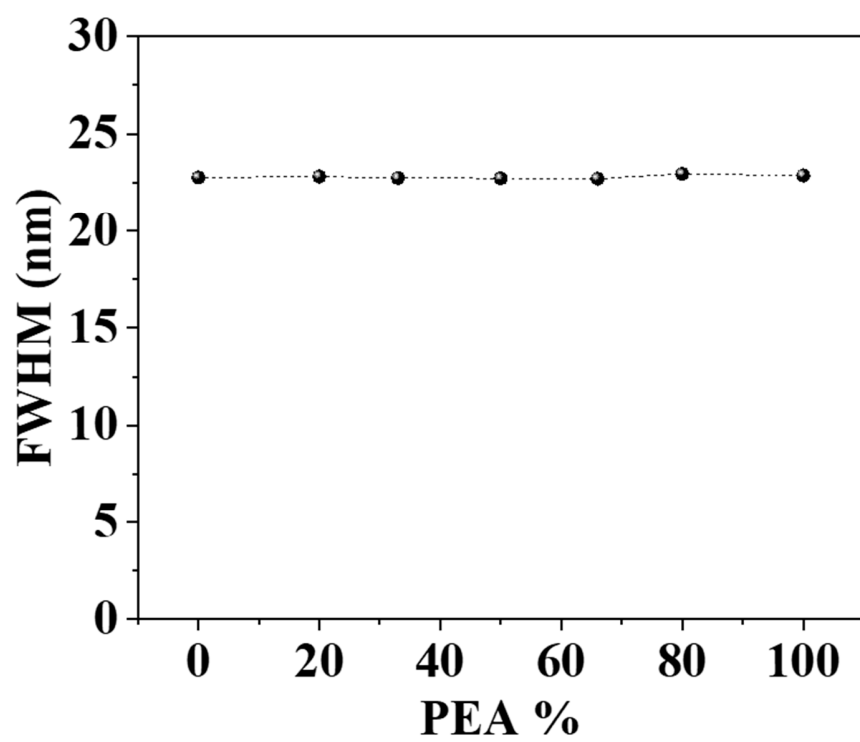
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**Figure S1.** Schematic diagram of preparation process of PEA and NMA mixed perovskite film



**Figure S2.** Full width at half maximum of PL as a function of PEA concentration.

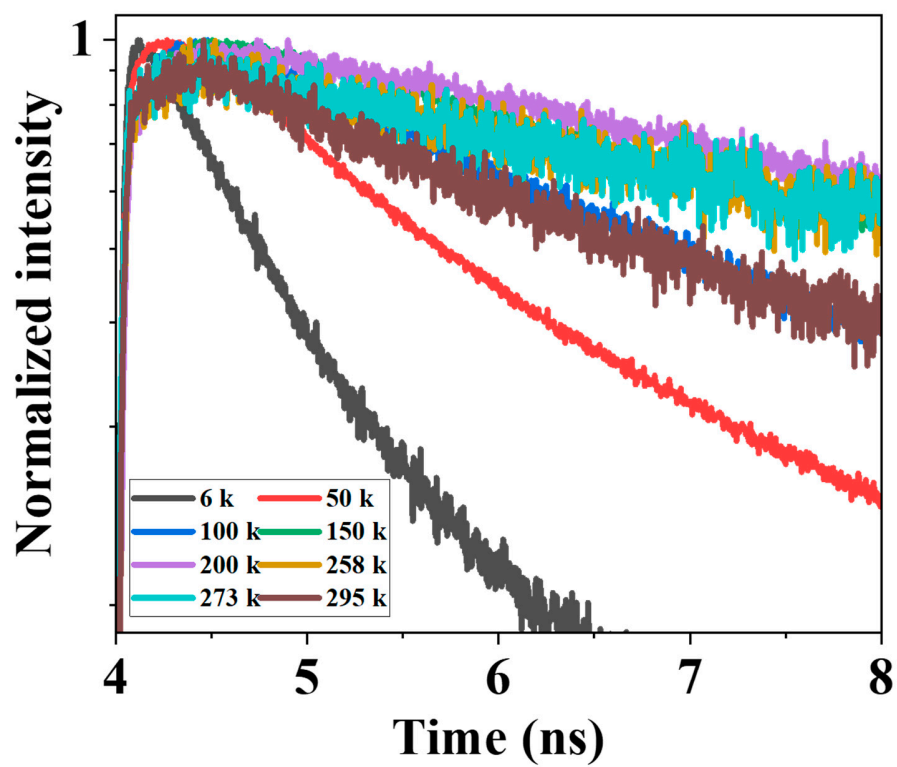
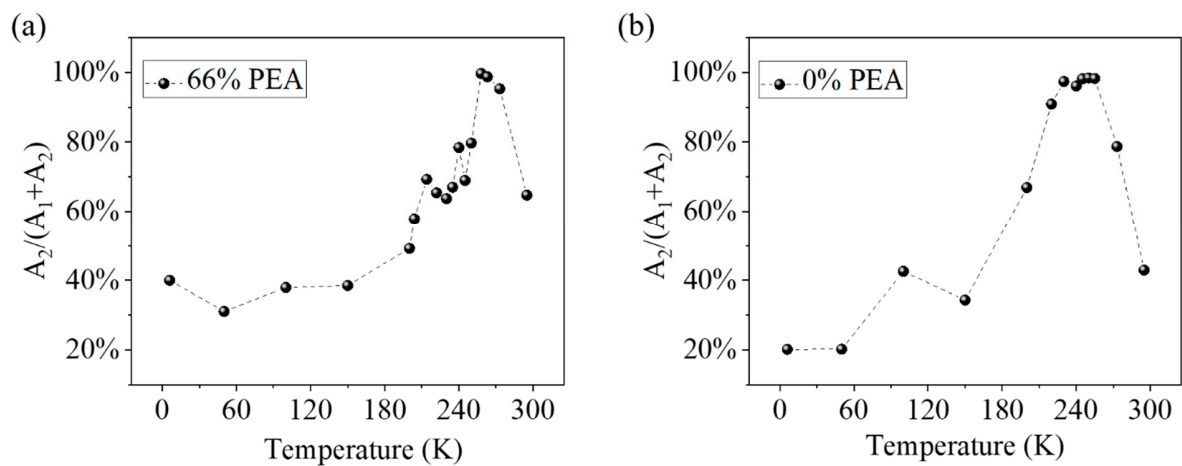
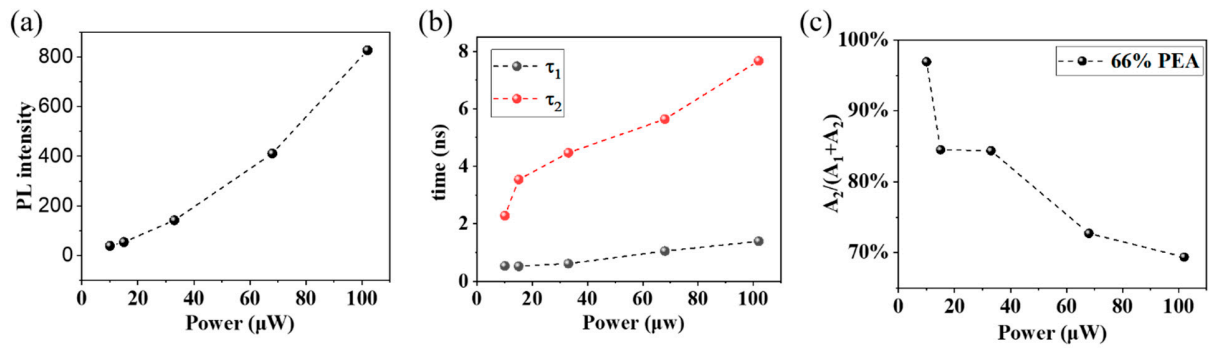


Figure S3. TRPL spectra of 0 % PEA sample with different temperature.



**Figure S4.** The weights of  $\tau_2$  as a function of temperature by fitting the data of 66 % PEA RPP in Figure 3c (a) and 0 % PEA RPP in Figure S1 (b).



**Figure S5.** Power-dependence TRPL of 66% PEA RPP at ~250 K. (a) The PL intensity with various power; (b) The fitting results of  $\tau_1$  and  $\tau_2$  with various power. (c) The weight of  $\tau_2$  with various power.