Supplementary Information

Inorganic A-site cations improve the performance of band-edge carriers in lead halide perovskites

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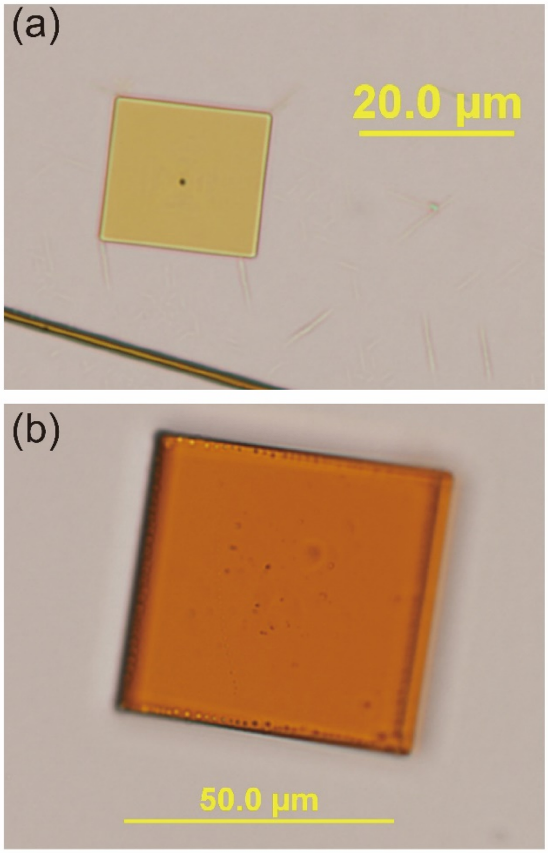

Fig. S1 Optical images of (a) $CsPbBr_3$ and (b) $MAPbBr_3$ microplates.

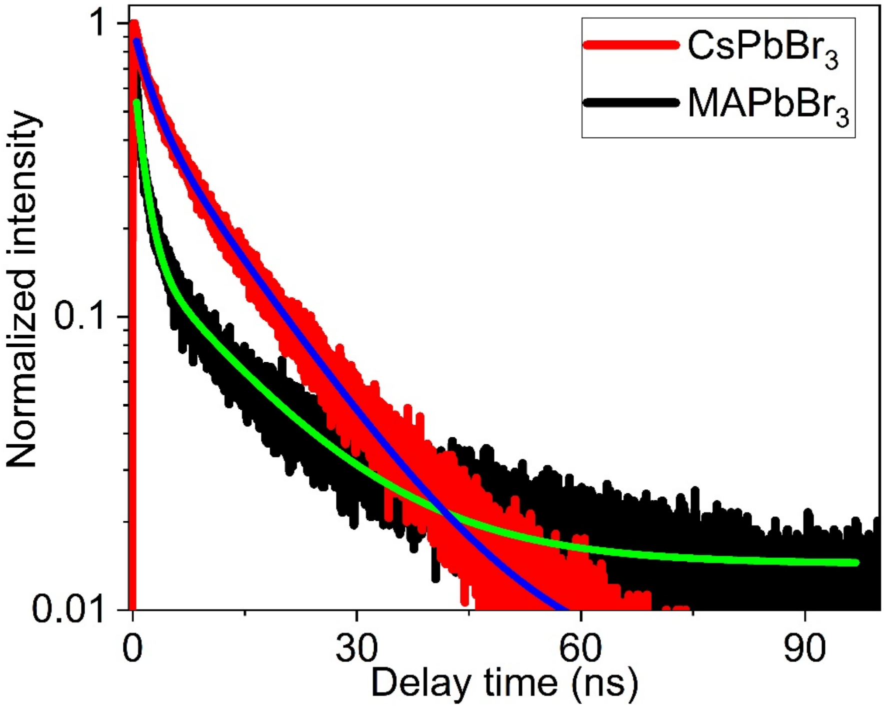

Fig. S2 The blue and green lines are the fitting data of TRPL dynamics of $CsPbBr_3$ and $MAPbBr_3$ respectively. Both of them are fitted by a bi-exponential decay function:

$$I(x) = y0 + A_1\exp(-x/t1) + A_2\exp(-x/t2).$$

The fitting parameters are presented in the following table:

	$t1$ (ns)	$t2$ (ns)
$MAPbBr_3$	1.34 ± 0.007	13.71 ± 0.078
$CsPbBr_3$	2.40 ± 0.022	11.95 ± 0.047

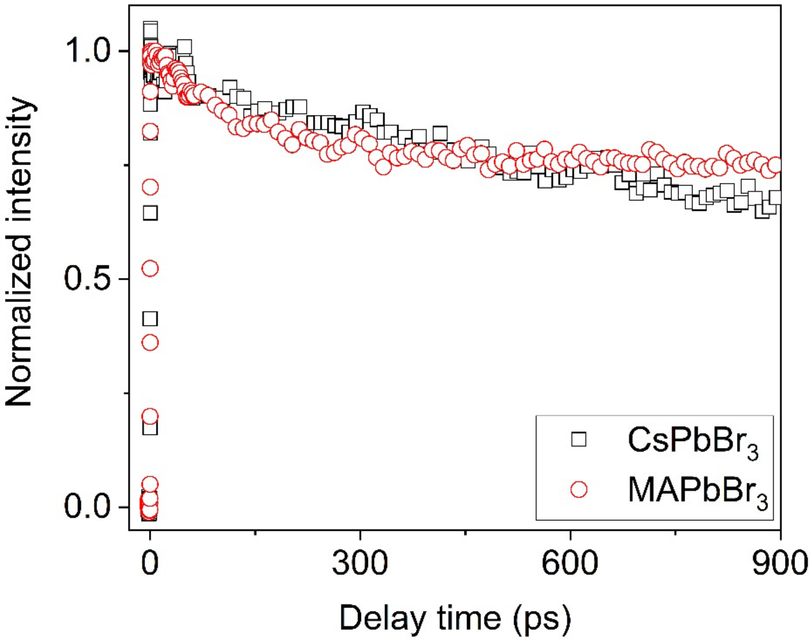

Fig. S3 The dynamics of the GSB peak from TA spectra. The dynamics of MAPbBr$_3$ and CsPbBr$_3$ show similar kinetics.

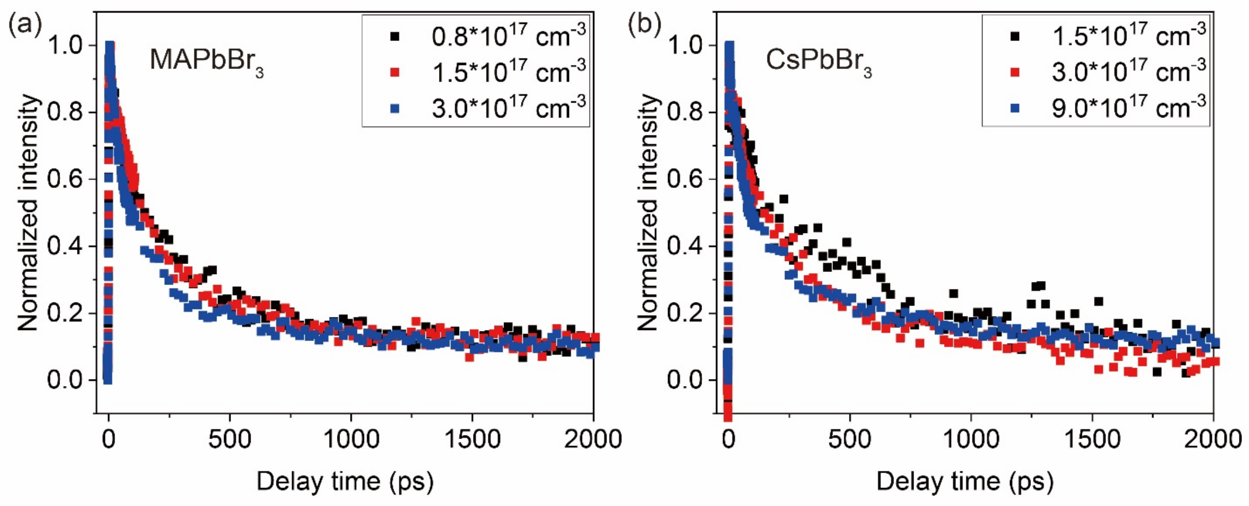

Fig. S4 The normalized TAM dynamics of (a) $MAPbBr_3$ and (b) $CsPbBr_3$ at various pump fluences. Similar kinetics suggest that annihilation effects are negligible here.