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Supplementary Information for:

Impact of the polar optical phonon and alloy scattering on the charge-carrier mobilities of $FA_{0.83}Cs_{0.17}Pb(I_{1-x}Br_x)_3$ hybrid perovskites

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Table S1 Calculated individual charge-carrier mobilities for the $FA_{0.83}Cs_{0.17}Pb(I_{1-x}Br_x)_3$ alloying system.

	$\mu_{LO,e}$	$\mu_{LO,h}$	$\sum \mu_{LO}$	$\mu_{AL,e}$	$\mu_{AL,h}$	$\sum \mu_{AL}$
	($cm^2V^{-1}s^{-1}$)	($cm^2V^{-1}s^{-1}$)	($cm^2V^{-1}s^{-1}$)	($cm^2V^{-1}s^{-1}$)	($cm^2V^{-1}s^{-1}$)	($cm^2V^{-1}s^{-1}$)
$FA_{0.83}Cs_{0.17}Pb(I_{0.83}Br_{0.17})_3$	19.7	13.3	33.0	143.4	85.7	229.1
$FA_{0.83}Cs_{0.17}Pb(I_{0.67}Br_{0.33})_3$	18.2	11.6	29.8	84.1	47.1	131.2
$FA_{0.83}Cs_{0.17}Pb(I_{0.5}Br_{0.5})_3$	13.3	7.9	21.2	51.2	26.8	78.0
$FA_{0.83}Cs_{0.17}Pb(I_{0.33}Br_{0.67})_3$	7.9	6.1	14.0	31.4	22.5	53.9
$FA_{0.83}Cs_{0.17}Pb(I_{0.17}Br_{0.83})_3$	7.9	6.1	14.0	50.0	35.8	85.8

Table S2 Calculated total charge-carrier mobilities for the $FA_{0.83}Cs_{0.17}Pb(I_{1-x}Br_x)_3$ alloying system.

	electron mobility ($cm^2V^{-1}s^{-1}$)	**hole mobility** ($cm^2V^{-1}s^{-1}$)	**total charge-carrier mobility** ($cm^2V^{-1}s^{-1}$)
	$\left(\mu_{LO,e}^{-1} + \mu_{AL,e}^{-1}\right)^{-1}$	$\left(\mu_{LO,h}^{-1} + \mu_{AL,h}^{-1}\right)^{-1}$	$\sum \mu$
$FA_{0.83}Cs_{0.17}Pb(I_{0.83}Br_{0.17})_3$	17.4	11.5	28.9
$FA_{0.83}Cs_{0.17}Pb(I_{0.67}Br_{0.33})_3$	15.0	9.3	24.3
$FA_{0.83}Cs_{0.17}Pb(I_{0.5}Br_{0.5})_3$	10.5	6.1	16.6
$FA_{0.83}Cs_{0.17}Pb(I_{0.33}Br_{0.67})_3$	6.3	4.7	11.0
$FA_{0.83}Cs_{0.17}Pb(I_{0.17}Br_{0.83})_3$	6.8	5.2	12.0

Table S3 Calculated polaron binding energies for electrons and holes ($E_{PB,e}$ and $E_{PB,h}$) in lead halide perovskites.

	α_e	α_h	E_{LO} (meV)	$E_{PB,e}$ (meV)	$E_{PB,h}$ (meV)
$FA_{0.83}Cs_{0.17}PbI_3$	2.25	2.50	15.0	8.0	10.0
$FAPbI_3$	2.57	2.85	11.5	8.0	10.0
$FAPbBr_3$	3.37	3.60	16.5	19.8	22.7
$FA_{0.83}Cs_{0.17}PbBr_3$	3.53	3.78	15.0	19.8	22.7
$FA_{0.83}Cs_{0.17}Pb(I_{0.83}Br_{0.17})_3$	2.42	2.68	13.0	8.0	10.0
$FA_{0.83}Cs_{0.17}Pb(I_{0.67}Br_{0.33})_3$	2.47	2.77	13.0	8.4	10.6
$FA_{0.83}Cs_{0.17}Pb(I_{0.5}Br_{0.5})_3$	2.68	3.05	13.0	10.0	12.8
$FA_{0.83}Cs_{0.17}Pb(I_{0.33}Br_{0.67})_3$	3.05	3.26	13.0	12.8	14.6
$FA_{0.83}Cs_{0.17}Pb(I_{0.17}Br_{0.83})_3$	3.05	3.26	13.0	12.8	14.6