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Supplementary Information for:

The Effect of Ionic Composition on Acoustic Phonon Speeds in Hybrid Perovskites from Brillouin Spectroscopy and Density Functional Theory

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Figure S4: Photos showing typical size and shape of measured crystals.

Table ST1: Composition analysis of the mixed perovskite based on XRD data.

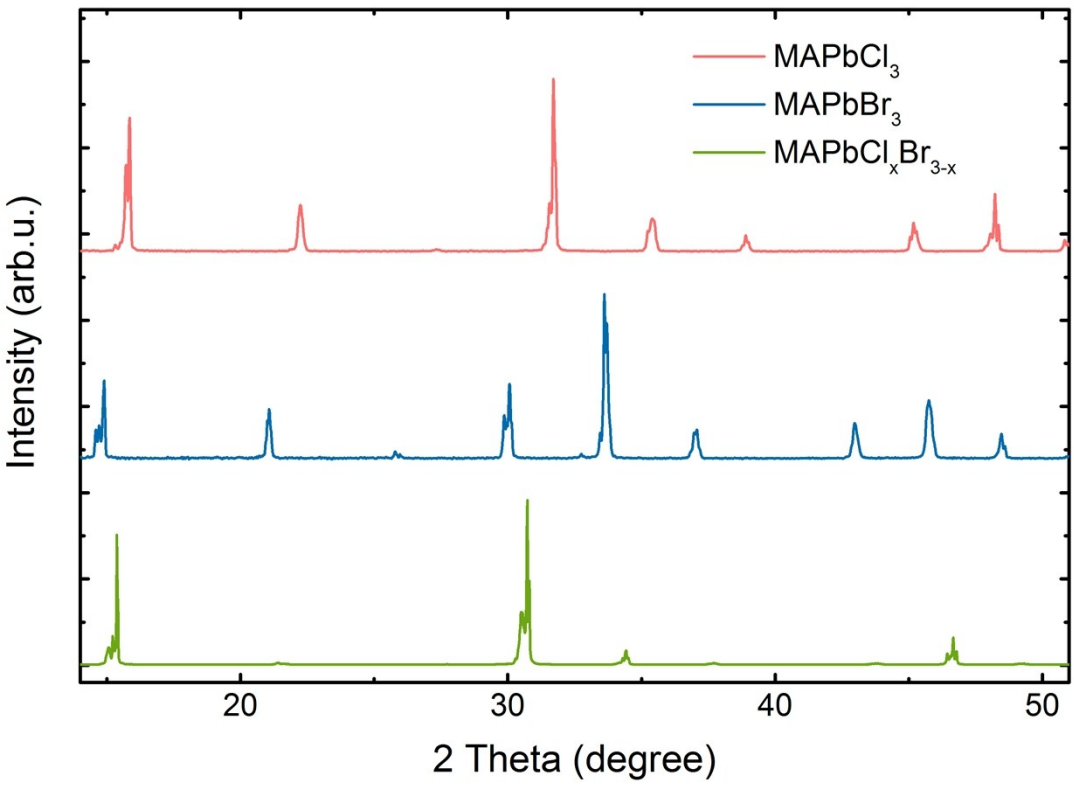

Figure S1. XRD data for MA-based perovskite crystals. The analysis of the peak positions is shown in the Tables ST1.

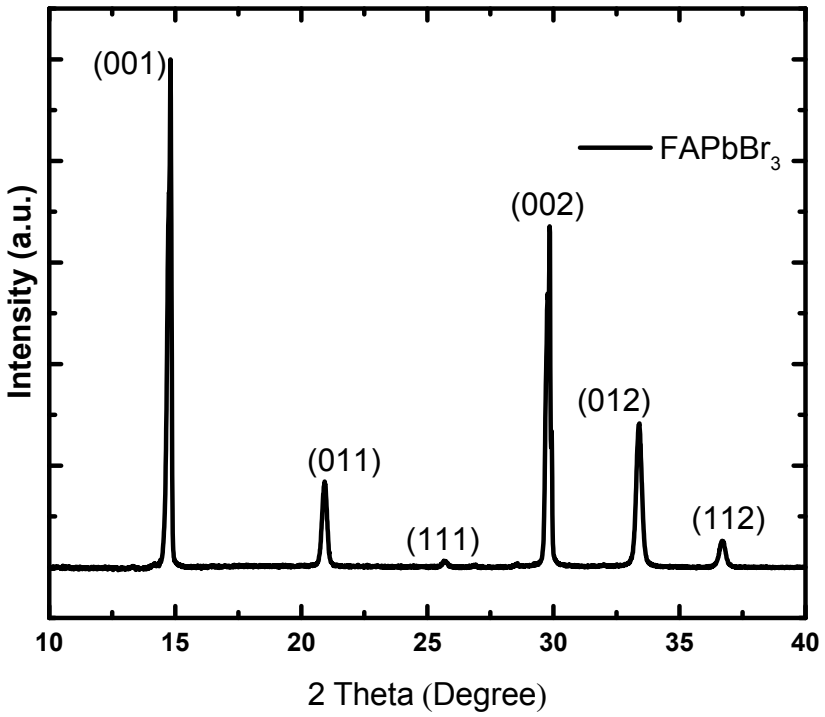

Figure S2: Powder XRD data for the $FAPbBr_3$ crystal.

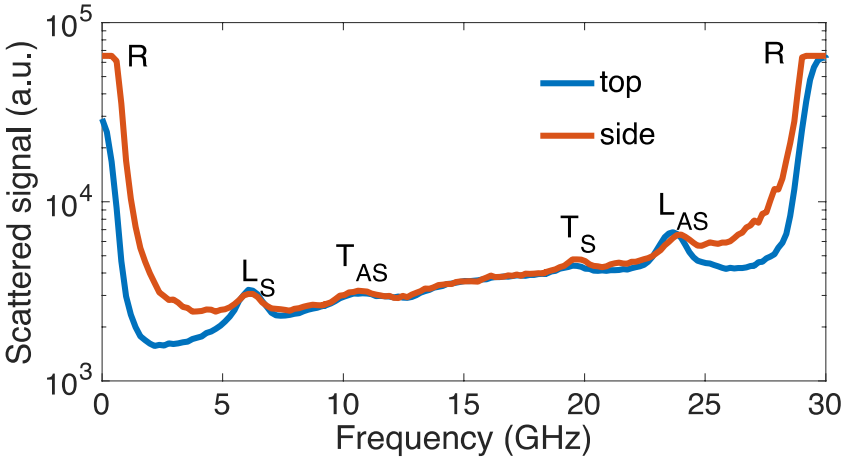

Figure S3. Brillouin spectroscopy data measured from the top and for a 90°-rotated (side) $MAPbCl_3$ crystal. The difference between the Brillouin shift for each type of the acoustic mode is within ~100-200 MHz.

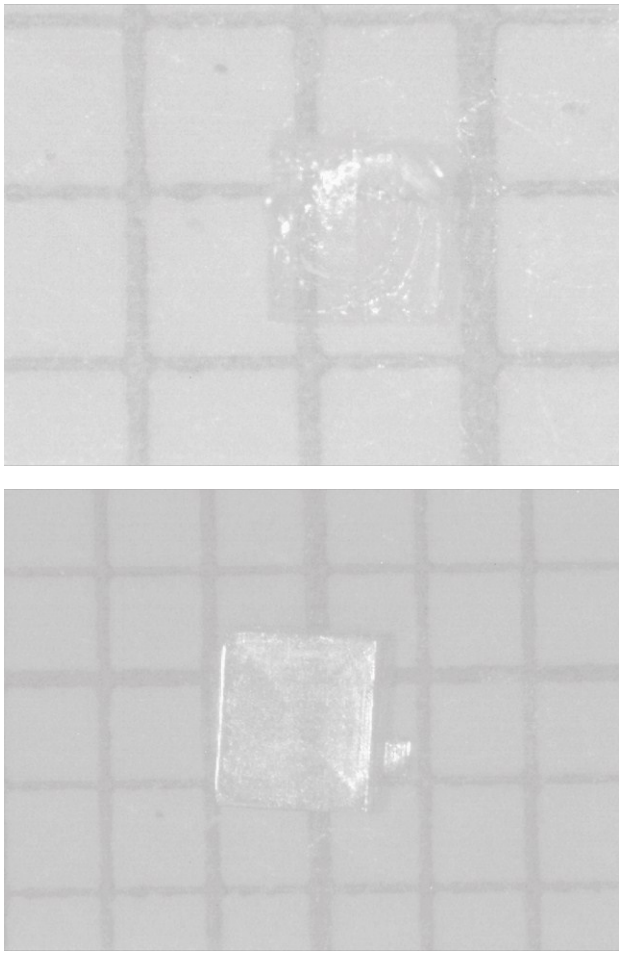

Figure S4. Photographs showing typical size and shape of measured crystals: $MAPbCl_3$ (top) and $MAPbBr_{1.25}Cl_{1.75}$ (bottom).

Table ST1: The positions of the peaks, as determined from the XRD data presented in Figure S1, for the MA-based perovskite crystals. The third line presents the prediction of peak positions for a 60%Cl-40%Br halide mixture. The prediction is in reasonable agreement with the measured values for the mixed perovskites.

	2 theta (100)	2 theta (200)	theta (100)	theta (200)	d (100)	d (200)
Cl crystal	15.84	31.71	7.92	15.86	5.59	2.82
mixed Cl-Br crystal	15.37	30.73	7.69	15.36	5.76	2.91
prediction 60%Cl-40%Br	15.46	31.05	7.73	15.52	5.73	2.88
Br crystal	14.90	30.05	7.45	15.02	5.94	2.97