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Stability of $CsPbI_3$ with Divalent Cations Incorporated via Mechanochemical Alloying

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Table S1 presents fitting parameters derived from X-ray Photoelectron Spectroscopy (XPS) analysis for three different perovskite compositions: $CsPb_{0.6}Sn_{0.4}I_3$, $CsPb_{0.9}Ni_{0.1}I_3$, and $CsPb_{0.8}Mn_{0.2}I_3$. The table breaks down parameters for each core-level spectrum analyzed, including doublet splitting, the ratio of peak intensities, Gaussian and Lorentzian contributions to the full width at half maximum (FWHM), the presence of a double Lorentzian shape, Doniach-Sunjic asymmetry parameters, and the curve type used for fitting, which is Voigt across all entries.

Table S1: XPS Fitting Parameters for Perovskite Compositions $CsPb_{0.6}Sn_{0.4}I_3$, $CsPb_{0.9}Ni_{0.1}I_3$, and $CsPb_{0.8}Mn_{0.2}I_3$.

Region	Doublet Splitting (eV)	Ratio	Gaussian FWHM	Lorentzian width	Double Lorentzian	DoniachS	Curve type
$CsPb_{0.6}Sn_{0.4}I_3$							
Cs 3d	13.946	0.674	1.956	0	1	0.1	Voigt
Pb 4f	4.894	0.757	1.060	0	1	0.1	Voigt
Sn 3d	8.508	0.681	1.917	0.345	1	0.1	Voigt
I 3d	11.491	0.662	0.928	0.660	1	0.1	Voigt
$CsPb_{0.9}Ni_{0.1}I_3$							
Cs 3d (BE:724.5 eV)	13.954	0.660	1.264	0	1	0.1	Voigt
Cs 3d (BE:726 eV)	13.931	0.660	2.394	0.08	1	0.1	Voigt
Pb 4f	4.887	0.750	0.989	0	1	0.1	Voigt
Ni 2p (BE: 855.14 eV)	17.273	0.512	3.250	0	9.93	0.1	Voigt
Ni 2p (BE: 858.80eV)	17.273	0.501	4.320	0	10	0.1	Voigt
I 3d (BE: 618.75 eV)	11.460	0.671	1.392	0	1	0.1	Voigt
I 3d (BE: 620 eV)	11.460	0.671	1.511	0	1	0.1	Voigt
$CsPb_{0.8}Mn_{0.2}I_3$							
Cs 3d (BE: 724.15 eV)	13.941	0.676	2.03	0	1	0.1	Voigt
Cs 3d (BE: 725.94 eV)	13.941	0.676	1.412	0	1	0.1	Voigt
Pb 4f	4.883	0.755	1.787	0	1	0.1	Voigt
Mn 2p (BE: 642.75 eV)	11.31	0.51	2.349	3.856	1	0.1	Voigt
I 3d (BE: 618.36 eV)	11.460	0.668	1.037	0	1	0.1	Voigt
I 3d (BE: 619.91 eV)	11.460	0.668	1.628	0	1	0.1	Voigt