Electronic supplementary information

Hydrazinium-loaded perovskite solar cells with the enhanced performance and stability

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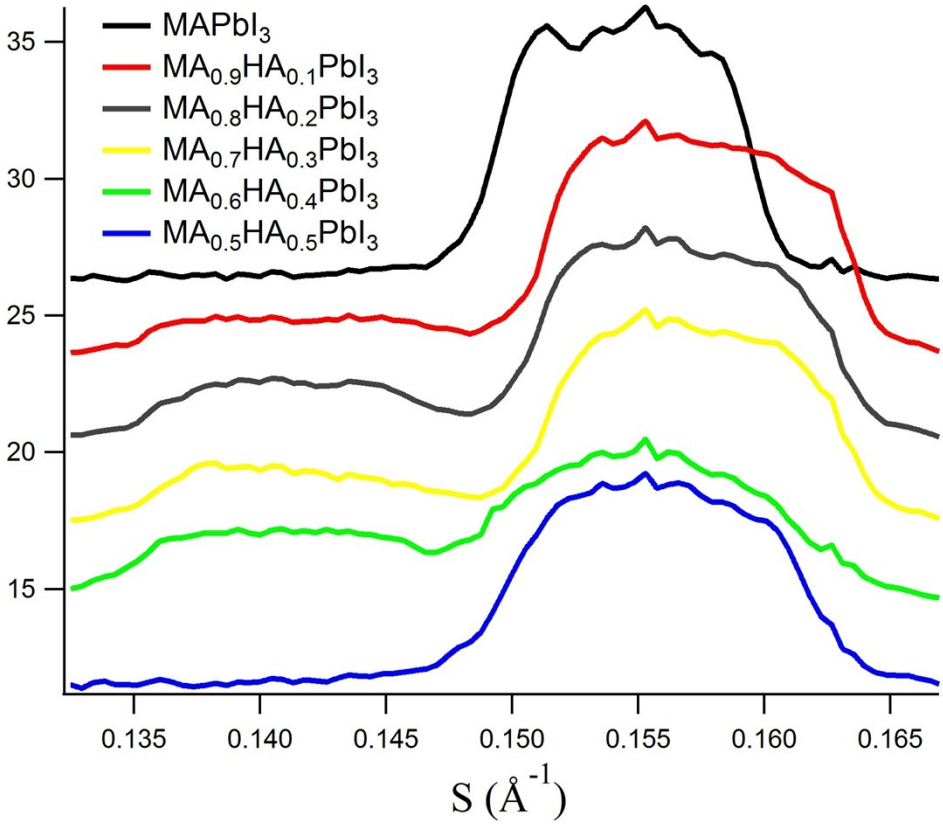

Fig. S1. Evolution of (110) peak of tetragonal phase of $MAPbI_3$ with increase of HA content.

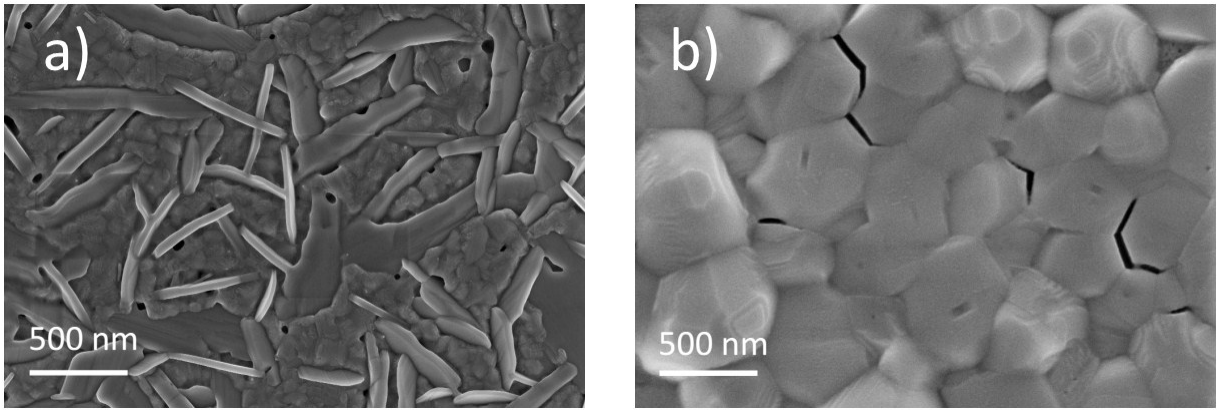

Fig. S2. SEM images of $MA_{0.3}HA_{0.7}PbI_3$ and $HAPbI_3$ films.

Table S1. Photovoltaic characteristics of the best devices based on $MA_{1-x}HA_xPbI_3$.

HA concentration	V_{oc}, mV	J_{sc}, mA/cm^2	FF, %	η, %
0	941	14.1	76	10.1
0.05	920	15.4	73	10.3
0.1	**927**	**16.9**	**74**	**11.6**
0.2	899	15.6	71	10.0
0.3	804	12.6	71	7.2
0.4	829	9.5	70	5.5
0.5	871	4.3	51	1.9
0.6	896	0.9	56	0.5
0.8	385	0.1	29	0.008
1	101	0.08	26	0.002

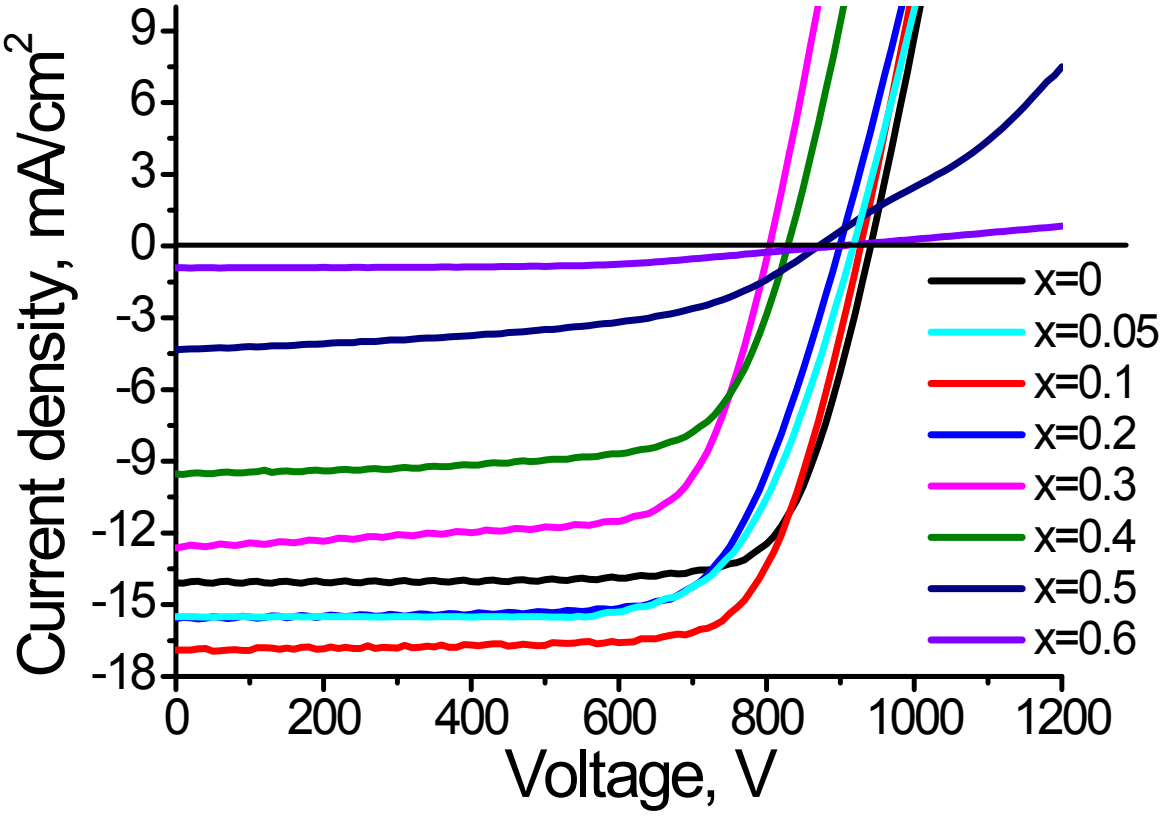

Fig. S3. *J-V* curves of the solar cells based on $MA_{1-x}HA_xPbI_3$ measured in the forward direction with the voltage sweeping rate of 100 mV/s.

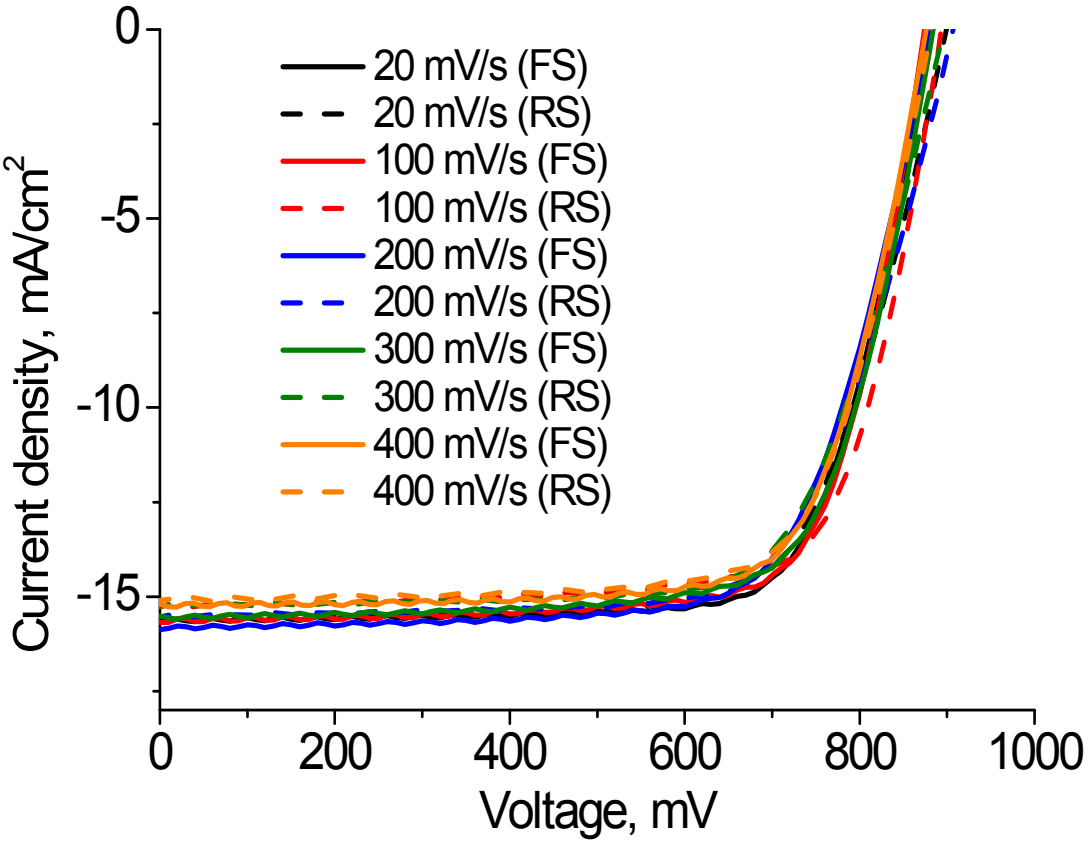

Fig. S4. *J-V* curves of the device based on the $MA_{0.9}HA_{0.1}PbI_3$ perovskite measured at different scan rates with the forward (FS) and reverse (RS) voltage sweep directions.