Electronic Supplementary Information for:

Bulk Crystal Growth of Hydrid Perovskite Material $CH_3NH_3PbI_3$

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Fig. S1 The photograph of white MAI.

Fig. S2 The photograph of white with yellow MAI.

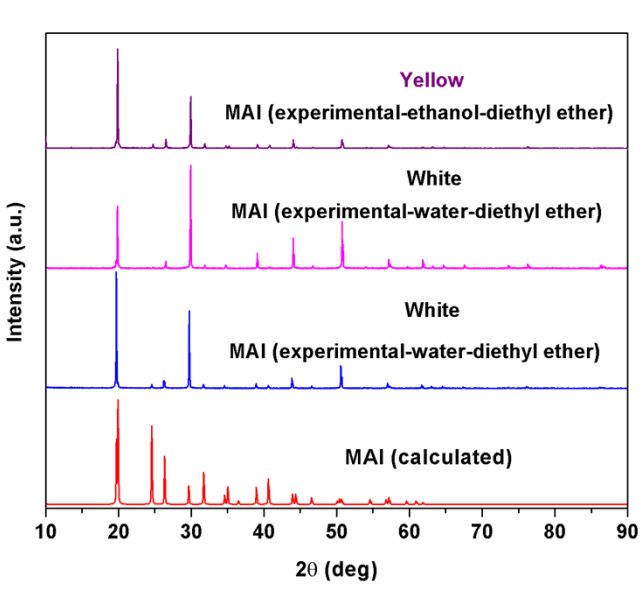

Fig. S3 Calculated and experimental powder X-ray diffraction patterns for MAI.

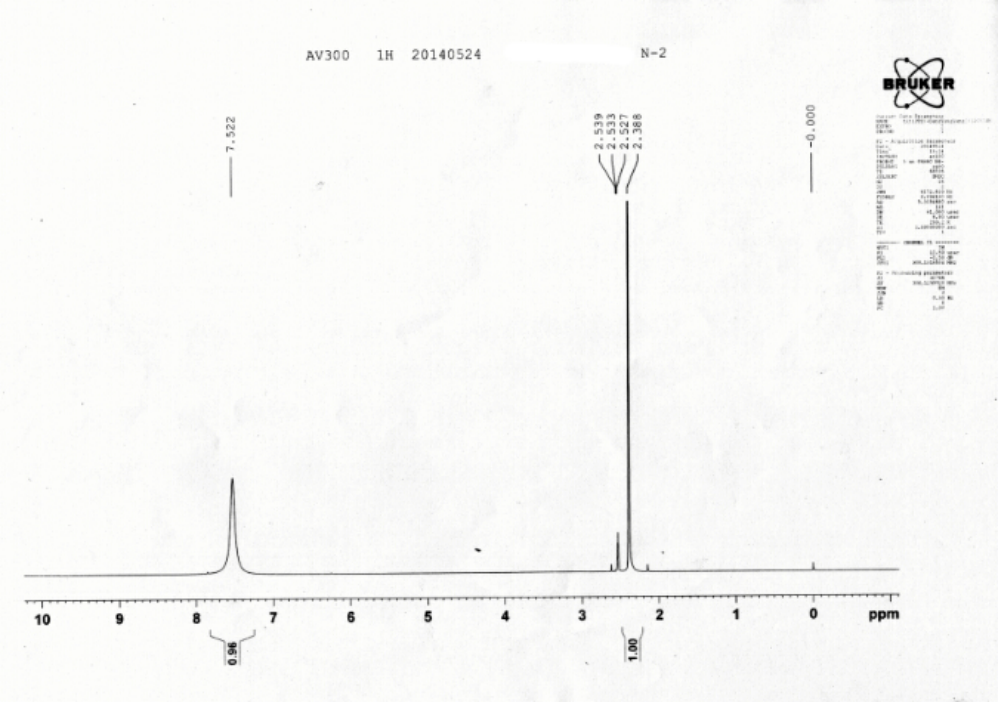

Fig. S4 ^{1}H-NMR spectrum of MAI.

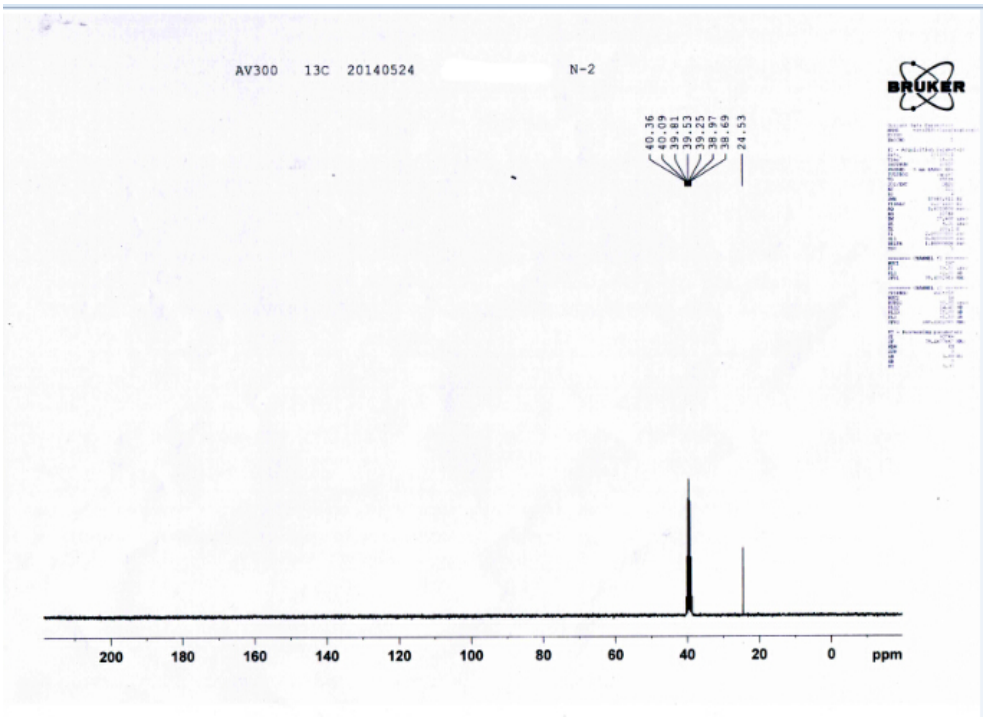

Fig. S5 ^{13}C-NMR spectrum of MAI.

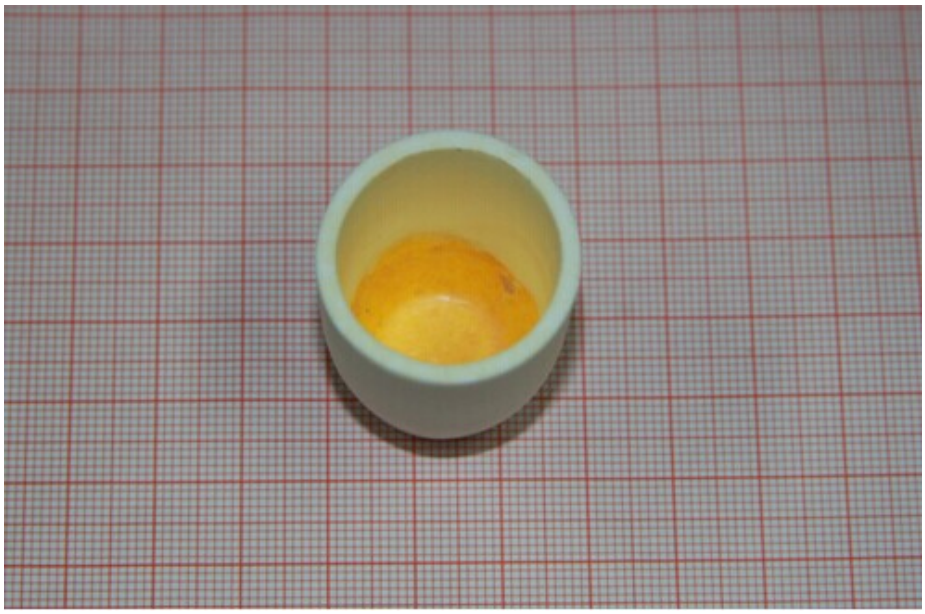

Fig.S6 The photograph of residue PbI_2.

Table S1 Selected bond length(Å) and bond angles(deg) for β-$MAPbI_3$[1]

Pb-I(1)	3.125(8)
Pb-I(2)#1	3.1613(8)
Pb-I(2)#2	3.1613(8)
Pb-I(2)#3	3.1613(8)
Pb-I(2)#4	3.1613(8)
Pb-I(1)#5	3.196(8)
I(1)-Pb#6	3.196(8)
I(2)-Pb#7	3.1613(8)
I(2)-Pb#8	3.1613(8)
C-N	1.39(2)
I(1)-Pb-I(2)#1	88.94(13)
I(1)-Pb-I(2)#2	88.94(13)
I(2)#1-Pb-I(2)#2	177.9(3)
I(1)-Pb-I(2)#3	88.94(13)
I(2)#1-Pb-I(2)#3	89.980(5)
I(1)-Pb-I(2)#4	88.94(13)
I(2)#1-Pb-I(2)#4	89.980(5)
I(2)#3-Pb-I(2)#4	177.9(3)
I(1)-Pb-I(1)#5	180.0
I(2)#4-Pb-I(1)#5	91.06(13)

Pb-I(1)-Pb#6	180.0
Pb#7-I(2)-Pb#8	163.55(6)

Symmetry transformations used to generate equivalent atoms:

#1 -y+1,x,z #2 y-1,-x,z #3 x,y-1,z

#4 -x,-y+1,z #5 x,-y,z-1/2 #6 x,-y,z+1/2

#7 x+1/2,-y+1/2,z+0 #8 x,y+1,z

Table S2 Atomic coordinates and equivalent isotropic displacement parameters for $MAPbI_3$

Atom	x	y	z	U(eq)(Å^2)
Pb(01)	0	0	0.1274	0.033(1)
I(002)	0	0	-0.1226(8)	0.122(2)
I(003)	0.2769(4)	0.2231(4)	0.1311(8)	0.104(2)
N(1)	0.4480(4)	0.9480(4)	0.8480(30)	0.063(15)
C(1)	0.4480(4)	0.9480(4)	0.8480(30)	0.063(15)

[a]Ueq is defined as one third of the trace of the orthogonalized Uij tensor.

Table S3. Anisotropic displacement parameters for $MAPbI_3$

Atom	U11	U22	U33	U23	U13	U12
Pb(01)	0.032(1)	0.032(1)	0.035(10	0	0	0
I(002)	0.156(3)	0.156(3)	0.025(2)	0	0	0
I(003)	0.081(2)	0.081(2)	0.150(4)	0.055(3)	-0.055(3)	-0.053(2)
N(1)	0.070(2)	0.070(2)	0.05(2)	0.016(15)	0.016(15)	0.050(2)
C(1)	0.070(2)	0.070(2)	0.05(2)	0.016(15)	0.016(15)	0.050(2)

The anisotropic displacement factor exponent takes the form:

-2 pi^2 [h^2 a*^2 U11 + ... + 2 h k a* b* U12]

Reference

1. C. C. Stoumpos, C. D. Malliakas, and M. G. Kanatzidis, *Inorg. Chem.*, 2013, **52**, 9019.