

Electronic Supplementary Information

for

Perpendicularly oriented 2D perovskite thin films prepared using the bar-
coating method and DMSO additive

Misato Akiyoshi^a, Masahiro Yoshizawa-Fujita^a, Yuko Takeoka^{*a}, and Masahiro
Rikukawa^a

^a Faculty of Science and Engineering, Sophia University, 7-1 Kioi-cho, Chiyoda-ku,
Tokyo 102-8554, Japan

1. Materials

Hydroiodic acid (HI), *N,N*-dimethylformamide (DMF), and *N,N*-dimethylsulfoxide (DMSO) were purchased from the FUJIFILM Wako Pure Chemical, Ltd. *N*-cyclohexyl-2-pyrrolidone (CHP) was obtained from the Tokyo Chemical Industry Co., Ltd.

2. Characterization

X-ray diffraction (XRD) patterns were obtained with an X-ray diffractometer (SmartLab, Rigaku), in conjunction with a Ni-filtered copper $K\alpha$ target and operating at 45 kV and 200 mA. Scanning electron microscopy (SEM) images were obtained with an SU8000 instrument (HITACHI).

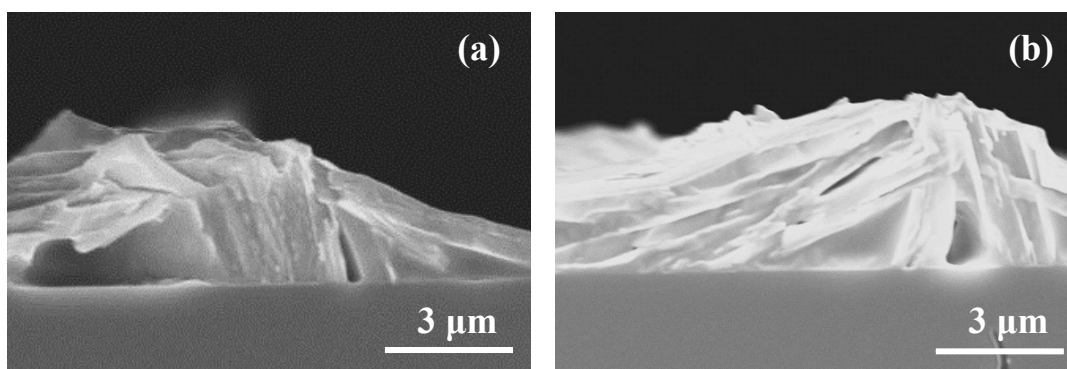


Figure S1. Cross-sectional SEM images of 7-AHA₂PbI₄ films fabricated by bar-coating method with CHP, (a) Pb:CHP = 1:0.6, (b) 1:1.

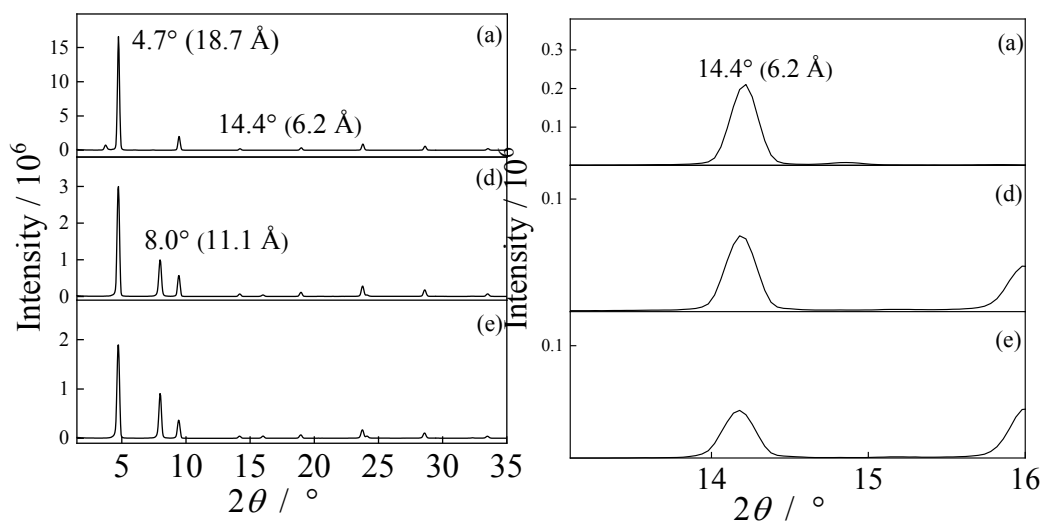


Figure S2. *Out-of-plane* XRD patterns of 7-AHA₂PbI₄ films fabricated by the bar-coating method with DMSO, (a) Pb:DMSO = 1:0, (d) 1:0.6, and (e) 1:1.

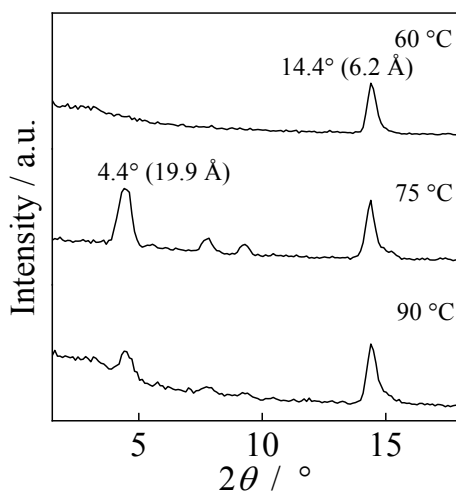


Figure S3. *In-plane* XRD patterns of 7-AHA₂PbI₄ films for different pre-annealing temperatures: 60 °C, 75 °C, and 90 °C.

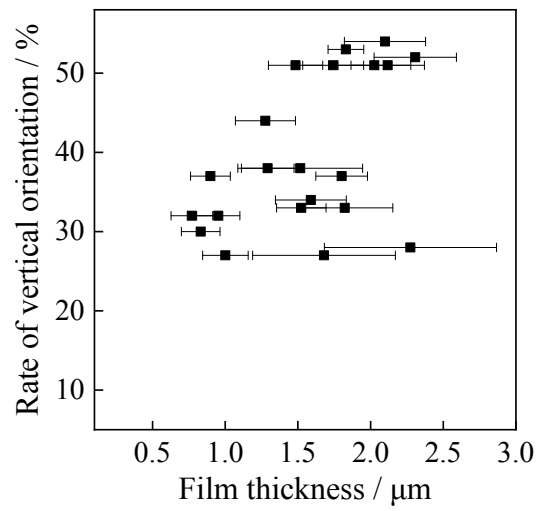


Figure S4. Correlation between film-thickness and the ratio of vertical orientation. (I_{hor} : Integrated intensity of horizontal orientation, I_{ver} : Integrated intensity of vertical orientation, W_{hor} : Integral width of horizontal orientation, W_{ver} : Integral width of vertical orientation)