

Supplementary Information

Room-temperature Random Lasing of Metal-halide Perovskites via Morphology-controlled Synthesis

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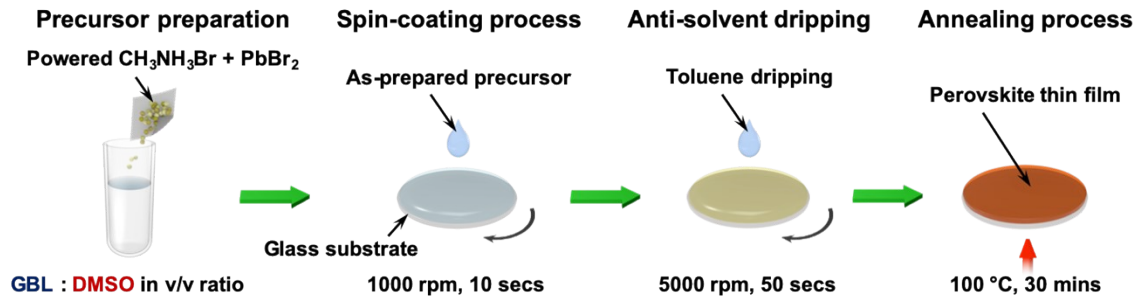


Fig. S1. Schematic diagram of fabrication. The MAPbBr_3 perovskite thin films are prepared *via* the method of solvent engineering along with an anti-solvent dripping technique.

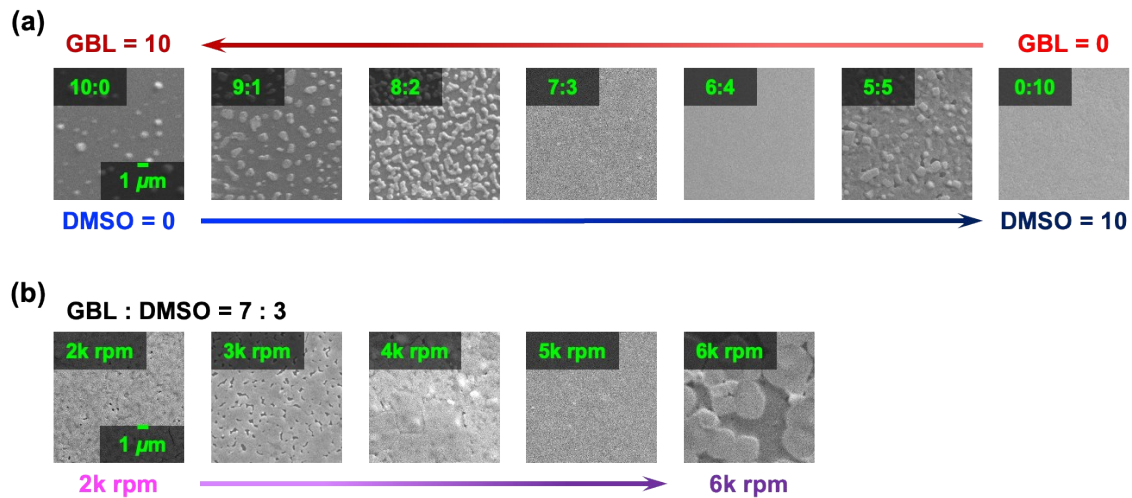


Fig. S2. Top-view SEM images with different processing parameters. (a) Synthesized MAPbBr_3 thin films with different solvent mixtures. (b) Synthesized MAPbBr_3 thin films at the volume ratio of 7:3 with different revolutions per minute (rpm).

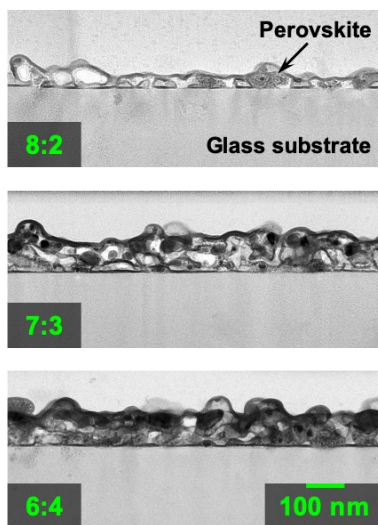


Fig. S3. Cross-section TEM images with different solvent mixtures.

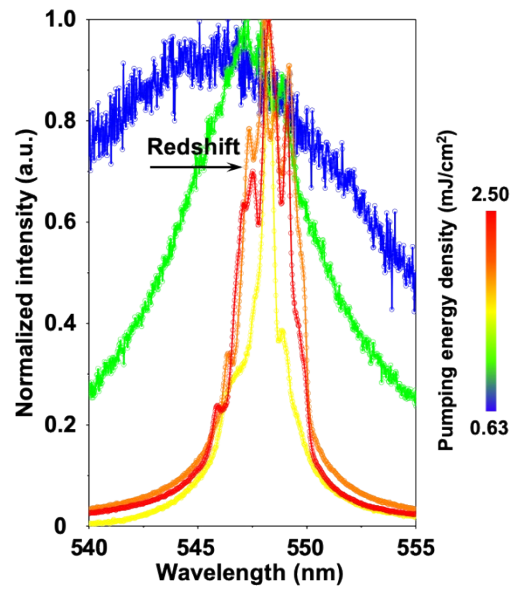


Fig. S4. Normalized red-shift emission spectrum of lasing mode under different pumping energy density.

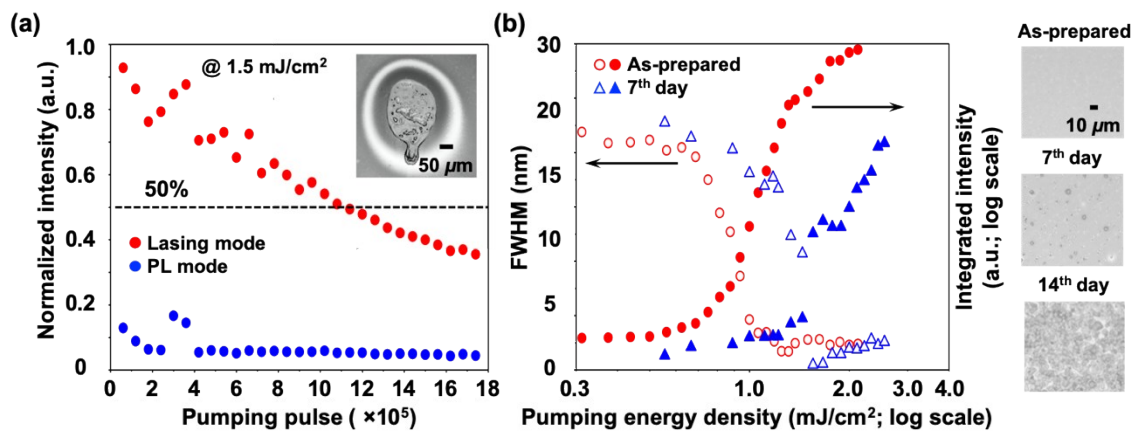


Fig. S5. Reliability and lifetime test of synthesized MAPbBr₃ thin films. (a) Lasing reliability test under a series of pulsed pumping. Inset: Thermal damage on the film surface caused by the optical pumping fluence. (b) Lifetime test in ambient conditions without any sealing package. Inset: OM images of synthesized MAPbBr₃ perovskite bare films in ambient conditions without any sealing package.