



Fabrication and Optoelectronic Properties of 2D and quasi-2D Perovskite Flakes



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Introduction and Motivations

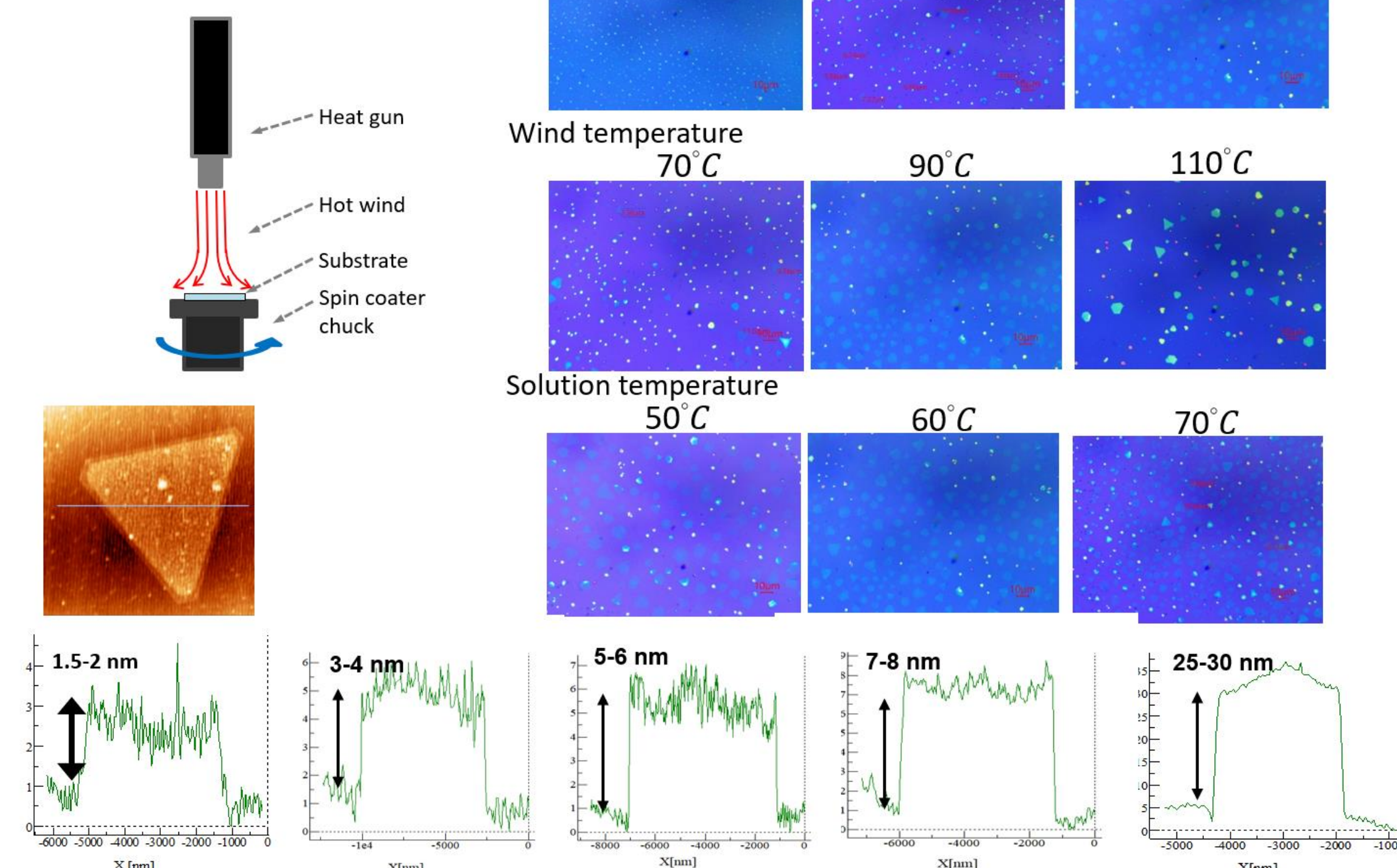
The facile method of material preparation makes it possible for most researchers to obtain materials for their research, which helps to stimulate extensive research on a topic. If the material preparation procedures are too complicated or expensive equipment must be used, the barriers to entry for researchers will be too high. The preparation of atomically thick perovskites is an important core cornerstone of this project. This year's work has confirmed that we can fabricate perovskite flakes on substrates. The material structure and optoelectronic properties of perovskite flakes were also investigated. Chiral perovskites and their chiroptical properties were also investigated.

MAPbBr₃ Flakes Preparation

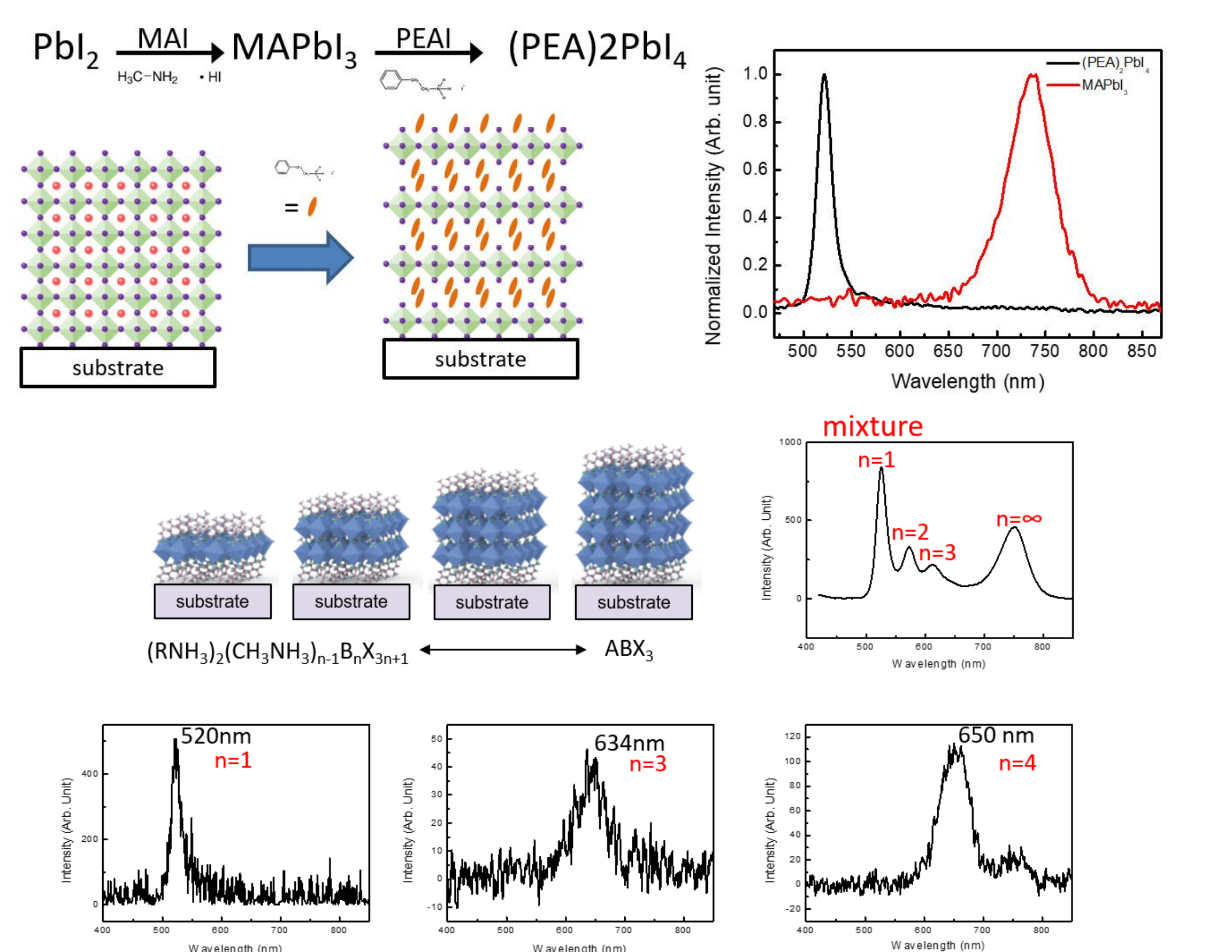
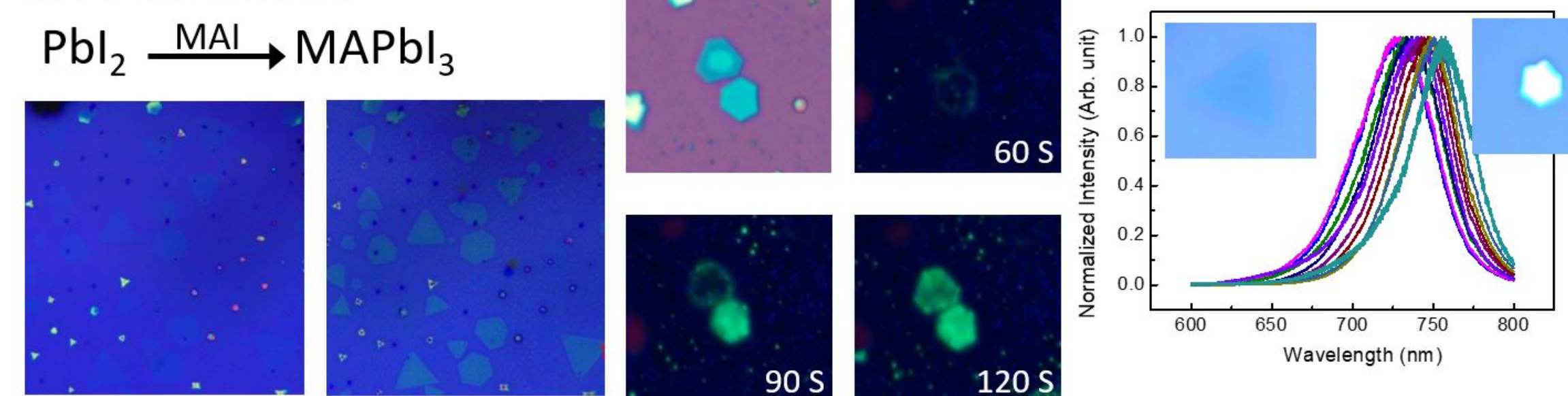
Uniform PbI₂ flakes can be obtained by adjusting the PbI₂ concentration, heat gun temperature and solution temperature. By changing the process parameters, PbI₂ flakes with different thicknesses and areas can be obtained. At present, the thinnest PbI₂ can obtain a thickness between 1.5 and 2 nm. After a short period of immersion in CH₃NH₃I or CH₃NH₃Br solution, or by using CVD, CH₃NH₃PbI₃ or CH₃NH₃PbBr₃ perovskite flakes can be obtained within two minutes. Similarly, using the PEA for treatment, CH₃NH₃PbI₃ could be converted into (PEA)₂PbI₄. A uniform *n* value can be obtained by controlling the ratio between the various solvents used.

MAPbI₃ Flakes

PbI₂ Flake Formation

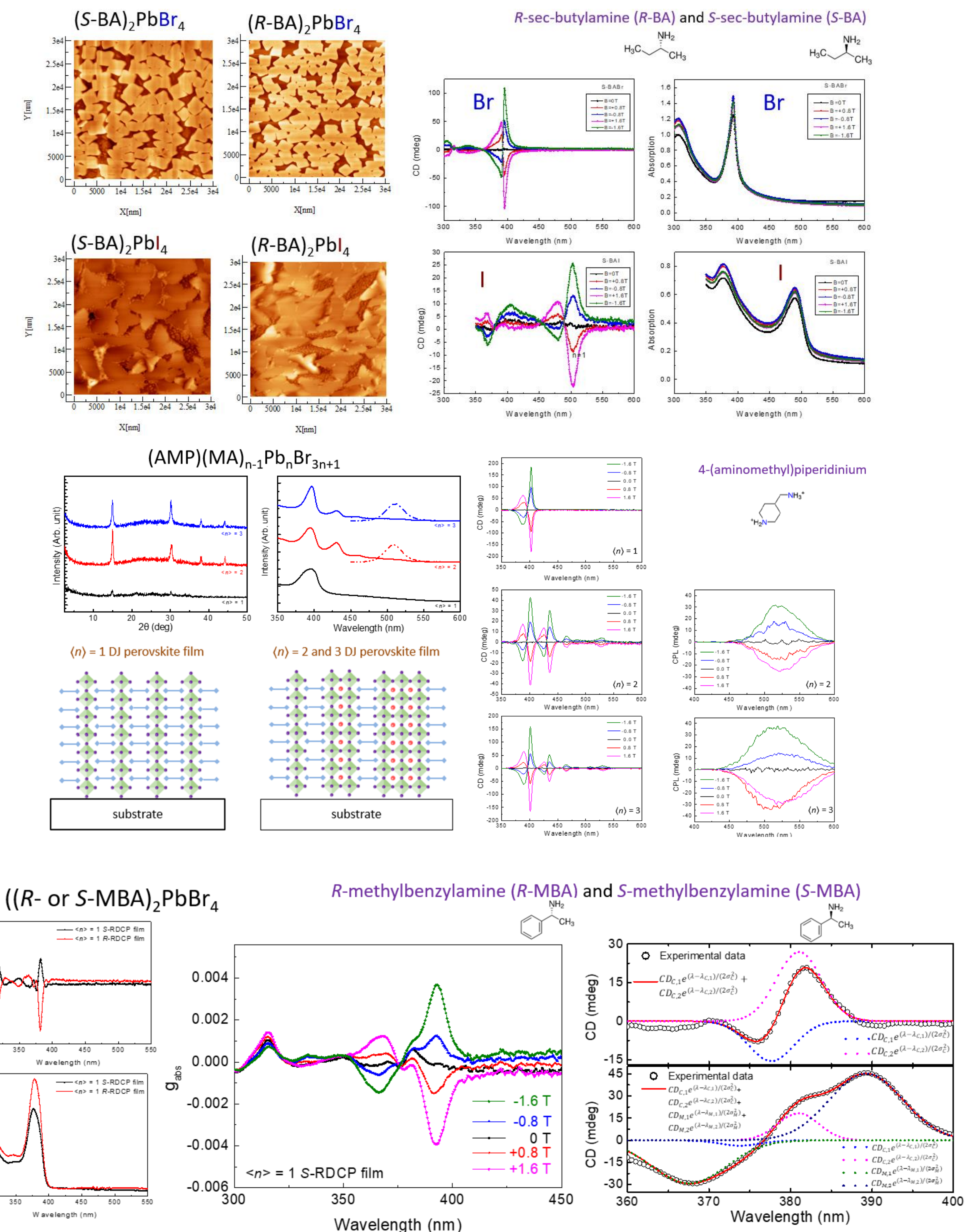


Transformation



Chiral Perovskites

Chiral perovskite flakes can also be prepared in the same way.



Lead-Free Perovskites

Lead-free perovskite flakes can also be prepared in the same way.

