

## Charge transport properties in perovskite thin films

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Organometal perovskite materials have been attracting much attention due to low-cost fabrication process and outstanding electron-optical properties. Using perovskite materials, researchers have demonstrated promising applications, such as photodetectors, phototransistors, and light-emitting diodes. The perovskite films, acting as the active layer of the devices, are very important for perovskite-related devices. Thus high-quality perovskite film is a prerequisite for high-performance perovskite devices. In our previous work, we demonstrated that the annealing condition and chemical compound can significantly affect the quality of perovskite films, and that the quality of the perovskite film can be largely improved by our fabrication method.<sup>[1,2]</sup>

In this work, we studied charge transport properties in perovskite thin films. As shown in Fig. 1(a) and Fig. 1(b), the crystal size in the perovskite film fabricated by our proposed method is about 20 times larger than that in the film fabricated by a widely used two-step method. The conductive atomic force microscopic (c-AFM) images shown in Fig. 1(c), and Fig. 1(d) were measured by placing a gold electrode at the right edge of the measured area, and applying voltage between the electrode and the AFM cantilever. It is demonstrated that charge transport in the two perovskite films is quite different. The details of this work will be presented at the conference.

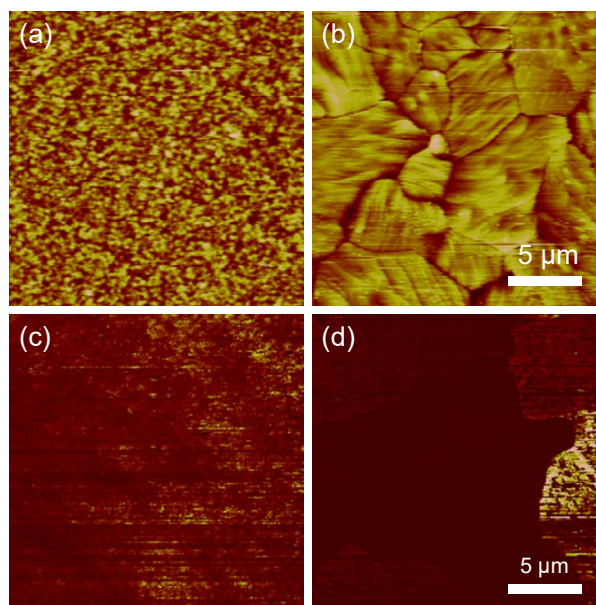


Fig. 1 AFM images of perovskite films fabricated by two-step method (a) and our method (b), and c-AFM images of the two films (c and d).

[1] T. Ma, *et al*, *J. Mater. Chem. A*, 2015, **3**, 14195-14201.

[2] T. Ma, *et al*, *JSAP Spring Meeting*, March, 2016, Tokyo Institute of Technology, 20a-W531-8.