Fabrication of perovskite solar cell

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Organometallic perovskite solar cells have shown great promising for next-generation thin-film solar cells [1,2,3,4]. Solar cell devices made of organometallic halide perovskite material have reached an efficiency of more than 21% [5]. Perovskite materials are the most appropriate for energy harvesting technology; we are using perovskite materials as the heart of solar cells because perovskite material has good photovoltaic properties. The absorption of light and diffusion length is also a major factor to select material for energy harvesting. The direct bandgap of the perovskite CH3NH3PbI3 material is 1.55 eV which is good for the power conversion efficiency of the solar cells.

The major problem to make the perovskite solar cell as commercially is their stability [16,17,18,19,20,21,22]. Perovskite material degrades due to humidity, temperature, UV light, and oxygen. To analyze the effect of humidity on the perovskite solar cell we have to minimize the other degradation factor (O2, temperature, light) as well as we need to keep the solar cell at a particular humidity to analyze its degradation with time. Controlling the humidity in an open environment is very difficult, so we made a chamber to control each factor precisely. Humidity is an important factor in the degradation so we first start analyzing the degradation of perovskite solar cells under different humidity conditions. In the chamber, we can control humidity precisely.

In this paper, I am going to analyzing how the perovskite solar cell parameters open-circuit voltage, photocurrent, and capacitance are going to change in different humidity conditions and how perovskite solar cell parameters change with degradation in high humidity condition.

For the perovskite deposition, TiO2 films were transformed into the glove box. The perovskite layer was deposited [6].