**Link:** <https://solar-power-tech.com/e-posters/psc_eposter_14/>

**Abstract**

Perovskite solar cells (PSC) have a photoelectric conversion efficiency of over 20% and it can be fabricated only printing and coating processes, so it is expected as next-generation solar cells. However, the back-contact electrode (*e.g.* Au, Ag) and hole transport materials (*e.g.* Spiro-OMeTAD) used for PSC are unstable against water and oxygen, and there is a problem with long-term stability. Therefore, we focused on fully printable carbon-based multi-porous-layered-electrode PSCs (MPLE-PSC)1-4 which have an electron transport layer (mesoporous TiO2), insulation layer (mesoporous ZrO2) and hole transport/back contact electrode layer (carbon-graphite) [1-4]. MPLE-PSC has long-term stability because the thick carbon layer (~15 μm) can be protected the light absorption layer from ambient water and oxygen.

In this work, we verified of accurate *I-V* measurement method for MPLE-PSCs. Two types of perovskite materials, (5-AVA)0.05(MA)0.95PbI3 and Cs0.1FA0.9PbI3, were dropped and permeated into the layered electrodes produced by screen printing, and crystallized by heating and drying to complete the PSC. When *I-V* measurements were performed on these PSCs at a scan rate of 1 to 6400 ms, the shape of the *I-V* curves changed. An accurate *I-V* curves were obtained with a fast scan rate for (5-AVA)0.05(MA)0.95PbI3 and a slow scan rate for Cs0.1FA0.9PbI3. This indicates that the accurate *I-V* data acquisition method differs depending on the perovskite material. It shows that different scan rates need to be set for (5-AVA)0.05(MA)0.95PbI3 and Cs0.1FA0.9PbI3 to get an accurate I-V curve. This is thought to be caused by the cations (MA, CsFA) of the perovskite crystals. In order to understand this phenomenon in detail, *I-V*, EIS, and MPPT measurements were performed. At the conference, we will discuss this research in detail.