

Characteristics of Perovskite solar cell with Al₂O₃ electron transfer layer formed by thermal evaporator

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Al₂O₃ electron transfer layer coating methods are ALD, sol-gel, nano-particle, and so on. In this study, we confirmed the electrical characteristics of Perovskite solar cell with Al₂O₃ ETL formed by thermal evaporation. Structure of the device was FTO / Al₂O₃ / CH₃NH₃PbI₃ / spiro-OMeTAD / Ag. Al was deposited to 10, 20, 30nm on the FTO using a thermal evaporator and sintered in a furnace at 500 °C for 30 minutes to form an Al₂O₃ thin film. SEM images were taken to confirm the thickness change of the ETL. XPS measurement was performed to confirm the energy binding of Al₂O₃, and the binding energy between the peak of Al2p and the O1s was confirmed. Crystal structure of the Al₂O₃ ETL was hexagonal system, measured by XRD. Electrical characteristic was measured by solar simulator. Open circuit voltage were same all devices as 0.9V, the Perovskite solar cell which oxidized 10 nm Al device showed the highest photoelectric conversion efficiency.