

Effect of nanostructured ZnO electron transfer layer on Perovskite solar cell

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The electron transfer layer(ETL) of the Perovskite solar cell was coated as the nanostructure ZnO and characteristics were confirmed. The FTO substrate was immersed in a solution of zinc nitrate(aq) and hydrothermally synthesized at 180°C for 20 hours. The morphology, crystal structure, and chemical bonding of the nanostructure ZnO ETL were confirmed by SEM, XRD, and XPS, respectively. As a result of SEM, the ZnO ETL was formed in a rod shape. As a result of XRD, the crystal structure of the ZnO ETL was confirmed as wurtzite. As a result of XPS, ZnO ETL was coated as a metal oxide along the Zn2p peak. The structure of Perovskite solar cell is FTO / nano-structured ZnO ETL / Perovskite(CH₃NH₃PbI₃) / spiro-MeOTAD hole transfer layer / Ag electrode. The characteristic of the device was measured with a solar simulator, and photoelectric conversion efficiency of 6.8% was obtained.