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**ABSTRACTS**

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ABSTRACTS

**POSTER**

**PRESENTATIONS**

SYMPOSIUM A

## Microwave and conventional annealing of TiO<sub>2</sub> blocking layers for perovskite solar cells

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Perovskite solar cells (PSCs) are one of the most encouraging designs in third-generation thin-film photovoltaics. They offer several appropriate properties including high absorption, tunable bandgap, and long carrier diffusion length and can be fabricated easily and inexpensively by solution processing. Their power-conversion efficiencies (PCEs) have been increased in few years from 3.8% to 23.7%. The electron transport layer (ETL) plays an important role in transporting photogenerated electrons and blocking holes, suppressing recombination of holes and electrons to eliminate the electrical shunt and yield highly efficient PSCs.

Titanium oxide (TiO<sub>2</sub>) is widely considered a favorable material for the ETLs in PSCs. The surface morphology and properties of the TiO<sub>2</sub> blocking layer (BL) significantly influence the quality of the perovskite layer in terms of the crystal size, uniformity, and surface coverage, all of which affect the photovoltaic performance. A uniform, pinhole-free and with high electrical conductivity BL is required for an efficient PSC. Thus, morphology, thickness, crystallinity and electrical conductivity of TiO<sub>2</sub> BLs must be optimised to enhance the performances of PSCs.

Here we report different preparations of TiO<sub>2</sub> BLs coated onto fluorine-doped tin oxide (FTO) as the substrate. Each preparation was annealed at 500 °C in a conventional oven and annealed via microwave irradiation. Morphologic, structural, electrochemical and electric characterization were performed and results compared.

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