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Key Roles of the N-Type Oxide Layer in Hybrid Perovskite Solar Cells

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Abstract : Wide bandgap n-type oxide layers (TiO2, SnO2, ZnO etc.) play key roles in perovskite solar cells. They act as electron transport layers, and they permit the charge separation. They are also the substrate for the preparation of perovskite in the direct architecture. Therefore, they have a strong influence on the perovskite loading, its crystallinity and they can induce a degradation phenomenon upon annealing. The interface between the oxide and the perovskite is important, and the quality of this heterointerface must be optimized to limit the recombination of charges phenomena and performance losses. One can also play on the oxide and use two oxide contact layers for improving the device stability and durability. These aspects will be developed and illustrated on the basis of recent results obtained at Chimie-ParisTech.

Keywords : oxide, hybrid perovskite, solar cells, impedance
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