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IMPEDANCE SPECTROSCOPY ANALYSIS OF THIRD GENERATION SOLAR CELLS

In this lesson, I will present the foundations and applications of impedance spectroscopy, in particular in the context of the analysis of emerging photovoltaic devices, such as dye sensitized solar cells and perovskite solar cells. For instance, metal halide perovskites are mixed electronic-ionic semiconductors with an extraordinary rich optoelectronic behavior and the capability to function very efficiently as active layers in solar cells, with a record efficiency surpassing 24% nowadays.

In the lesson I will explain experimental protocols and basic modeling to provide a consistent interpretation of the signals observed in the impedance spectrum. Based on that, I will present procedures to extract relevant information from the spectra, such as charge collection efficiencies, ideality factors and recombination mechanisms, ionic diffusion coefficient and ion vacancy concentrations.

Keywords: Abstract; language; scientific articles; congresses.