Project 3.12 Development of strategies for improving stability of perovskite solar cells

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Background:

The lead halide perovskites have attracted increasing attention and exhibit unique physicochemical properties such as low band gaps, high extinction coefficients and high carrier mobilities. The method of formation perovskite thin films plays a key role in their chemical and physical properties, i.e. crystallinity, phase purity, morphology, grain size dispersion. Despite the success in boosting the efficiency of perovskite solar cells, the devices are still facing several critical challenges that hinder their commercialization e.g. low stability of perovskites under high relative humidity. In this context, developing methods to produce new perovskite systems with desirable chemical and physical properties for applications in photovoltaic market continues to be a still challenging task.

Aim:

The overall goal of this project is to develop advantageous methods for the preparation of new lead halide perovskite compositions showing high stability in high humidity conditions for application in photovoltaic. The relationship between optoelectronic properties of the newly developed perovskite compositions and modification of ETL with the device performance will be systematically investigated, which would shed light on the further exploration of new materials for photovoltaics.

Requirements:

- a university degree in chemistry or materials science,
- experience in laboratory work in the field of inorganic and coordination chemistry,
- knowledge in spectroscopic methods,
- independence to design and execute experiments/characterizations, and analytical mindset for interpreting measured data.