Inorganic all-solid solar cells based on octahedral molybdenum clusters

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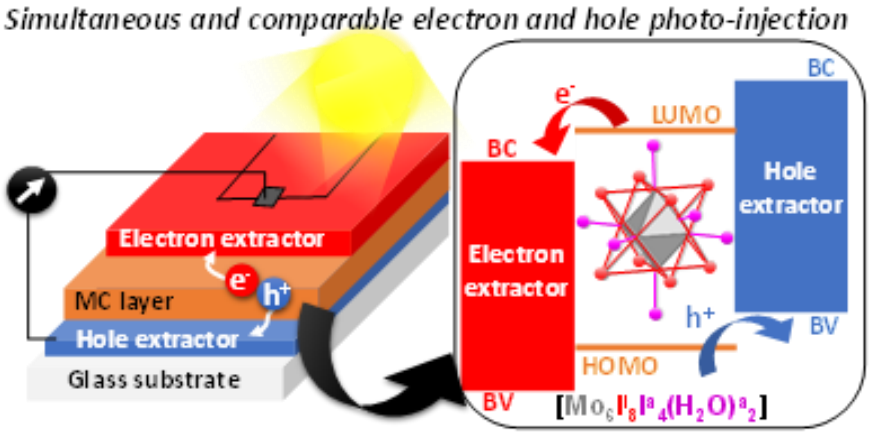
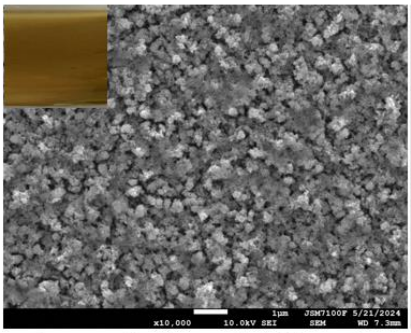


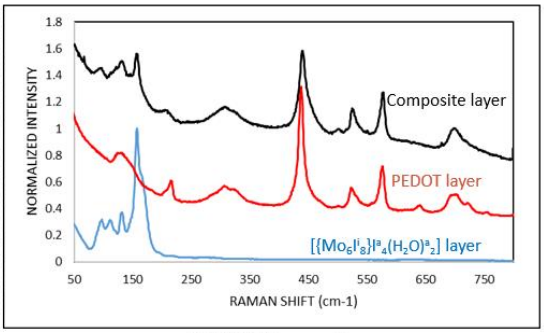
Transition metal cluster-based halides are nano-objects that exhibit fascinating optical and electronic properties such as molecule-like energy gaps, strong absorption in the visible or deep red luminescence that make them promising light-harvester for solar energy conversion.[1,2]

The integration of the molybdenum cluster iodides based on the $\{Mo_6I_8\}^{4+}$ cluster cores as light-harvester in photoelectrochemical solar cells and more recently in all solid solar cells demonstrated unambiguously the ambipolar character of such cluster-based layers. These ambipolar properties appear promising for solar energy conversion applications because of the charge transfer is not limited by a charge carrier type.

The challenge is now to design optimized solar cells by improving the charge transport and extraction. One strategy consists in the integration of the molecular inorganic clusters in a conductive polymeric matrix in order to improve the charge transfer and collection. My first year of thesis work led to produce the first polymer/cluster composite-based photoelectrodes. **During this talk, I will present the design and the characterization of these composite-based photoelectrodes.**



Composite layer SEM imaging



RAMAN spectra

References

[1] A. Renaud *et al.*, *ACS Appl. Mater. Interfaces* **2022**, 14, 1347-1354.
[2] A. Renaud *et al.*, *Electrochimica Acta* **2019**, 317, 737-745