Minicolloque n° MMPS28 **X Oral** **☐ Poster**

Discovery of Low-Dimensional Hybrid Lead Halides with Intense White-Light Emission

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Owing to quantum confinement, low-dimensional hybrid metal halide materials have recently shown a great potential for applications in optoelectronics. Such materials can exhibit broad- or narrow-band light emission and relatively high photoluminescence quantum yields (PLQY). However, the search for efficient phosphors with a specific set of characteristics remains difficult because the family of hybrid metal halides consists in an extremely large chemical system (i.e., different halides, metals, and organic molecules), and optical properties are not predictable prior to synthesis and characterization.

In this context, we carried out syntheses and characterizations in a high-throughput manner to discover hybrid metal halides with intense white-light emission for applications in solid-state lighting [1]. Large amounts of materials were synthesized and preliminary screening of PL properties enabled for the fast identification of compounds with intense photoemissions. A couple of hybrid metal halides with record PLQYs and high color rendering were characterized in depth (XRD, solid-state NMR, steady-state and time-resolved photoluminescence, ...) to reveal some structural characteristics favoring the broad-band emissions [2-4]. Machine learning approaches were also used to further optimize the performance of the white phosphors for solid-state lighting applications (Figure 1) [5].

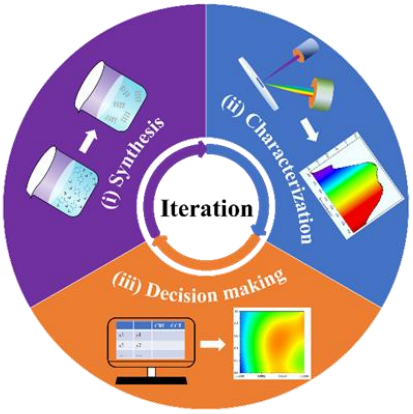

Figure 1 – Discovery of new hybrid metal halides with the decision making process performed by machine learning tools.

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