Novel Luminescent Isostructural Zn-MOFs: Spectral and Photodynamical Behavior

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Metal-Organic Frameworks (MOFs) are crystalline materials self-assembled from metal ions or clusters with organic ligands (linkers) to form a highly cross-linked structure with chemically adjustable porosities and high surface area. Over the last decade, a special subclass of MOFs, termed luminescent MOFs (LMOFs), which are materials with the ability of emit light, have attracted great attention due to their potential applicability in modern key technologies such as sensors, LEDs, biological markers, etc.[1-3] The performance of LMOFs in those fields is directly related to their photophysical properties, and therefore, an appropriate characterization of their optical and time-resolved emission behaviors is elemental to design tunable and more efficient materials.

Here, we present the UV-vis steady-state and photodynamics properties of two novel isostructural Zn-based MOFs **(Figure 1a)**. Both MOFs are fabricated using the same building blocks, but different organic linkers (naphthalene and pyrene derivates). The UV-Vis steady-state absorption and emission properties of these MOFs been explored in suspension and solid-state, and compared to the pristine organic linkers. The emission of the Zn-naphthalene MOF (Zn-OMeNDC) is blue in color **(Figure 1b)** while the emission of the Zn-pyrene MOF is green **(Figure 1c)**. The photodynamics of both materials have been also investigated by using a time-correlated single photon counting instrument. These LMOFs present an intricate and rich photodynamics, showing a multiexponential behaviour, which reflects the high heterogeneity of both materials. These preliminary results are a strong base to unravel the photonic behaviour of these MOFs, which will be essential to further explore their possible applicability as sensors or as the electroluminescent layer of LED devices.

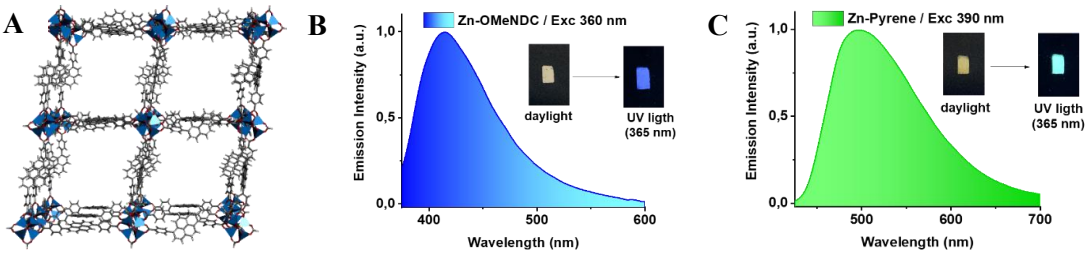

Figure 1. A) *Representation of the 3D structure of Zn-pyrene MOF. Emission spectra of* ***B)*** *Zn-OMeNDC and* ***C)*** *Zn-pyrene MOFs. The photos are the Zn-MOF powders under daylight and UV (365 nm) irradiation.*

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References

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