Octahedral Molybdenum clusters containing hybrid materials: from their synthesis to their studies on the Caphter platform

Yann MOLARD,[1, 2] Grégory TAUPIER,[2] Maria AMELA-CORTES,[1] Soumaya KHLIFI,[1] Noée DUMAIT,[1] Serge PAOFAI,[1] Malo ROBIN,[1] Philipp EHNI,[3] Stephane CORDIER,[1] and Sabine LASCHAT[3]

[1] *Institut des sciences chimiques de Rennes, Université de Rennes, Rennes, France*
[2] *Caphter platform, UER ScanMAT, Rennes, France*
[3] *Department of organic chemistry, University of Stuttgart, Stuttgart, Germany*
Email: yann.molard@univ-rennes1.fr

Metal clusters are nanometric assemblies of metal atoms maintained by metal–metal bonds. Within this compound family, octahedral cluster compounds of general formula $A_nM_6X^i_8L^a_6$ (A=alkali cation; M: Mo, W, Re; X^i: halogen, chalcogen; L^a: anion) are obtained by solid-state chemistry routes and show a stable phosphorescence in the red-NIR with high quantum yield values. Here, we will show how, by taking advantage of $A_2M_6X^i_8L^a_6$ cluster specificities, we integrate them homogeneously in soft organic matrices like liquid crystal[1] or polymer[2]. The photophysical studies realized on the Caphter Platform (UER ScanMAT, Rennes), demonstrate that obtained hybrids combine the host matrix properties and the metal clusters red-NIR emission. They have potential in applications like oxygen sensors, theranostic, photocatalysis, optoelectronic, lighting or smart windows. Adding complementary emitters within such hybrids enhances their emission abilities and response toward external stimuli.[3]

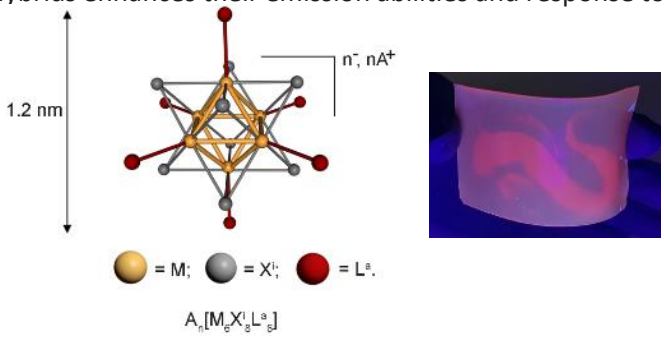

Figure 1. left: Schematic representation of a cluster compound; right: PMMA sheet doped with a cluster compound and a complementary luminophore under UV-A.

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