A NEW APPROACH IN OBTAINING LUMINESCENT ORDERED HYBRID SYSTEMS USING METALLOMESOGENS AND CARBON-BASED MATERIALS

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Abstract
Nowadays, the interest into luminescent hybrid liquid crystalline systems has increased significantly due to their unique properties as electro-optic active materials arising from the combination of the molecular and supramolecular order of liquid crystals (LC) with the emissive properties of carbon-based materials (CDs). Currently, this research area is limited to organic liquid crystals, although the use of liquid crystalline coordination complexes (metallomesogens) would bring additional properties induced by the presence of the metal ion (redox, magnetic, etc.), increasing their applicability. In this respect, our group recently reported the first hybrid materials containing metallomesogens and carbon-based nanomaterials designed for non-enzymatic electrochemical detection of various analytes [1-3].
Herein, two new series of hybrid materials based on room-temperature luminescent/non-luminescent metallomesogens (Zn_MM and Cu_MM, respectively) and optical-active polymeric carbon dots are described. The hybrid systems are obtained by ultrasonically mixing of the counterparts in different weight ratios and studied for their mesomorphic properties by polarized optical microscopy (POM) and differential scanning calorimetry (DSC). The luminescent properties of the final hybrid materials were investigated both in pristine and ordered state by polarized optical microscopy with epifluorescence (POM-EPIFL) (Figure 1) and fluorimetry.

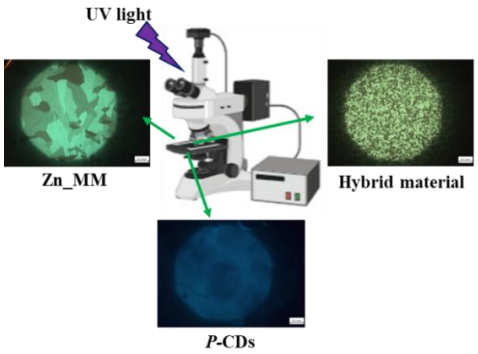

Figure 1. Schematic representation of luminescent hybrid LC system and their precursors

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