

# DIPLATINUM(II) CYANIDE-BRIDGED COMPLEXES: PROPERTIES TUNING BY LIGAND AND SOLVENT EFFECT

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Organoplatinum(II) complexes represent an outstanding class of chromophores among metal-based emitters. The planar structure of platinum(II) moieties together with orbital configuration of Pt(II) ions paves the way for non-covalent metallophilic and interplanar interactions, which results in specific optical behavior of the compounds. These interactions may be affected by the ligand structure as well as by external stimuli such as temperature, concentration, or mechanical forces. The area of mononuclear platinum(II) compounds has been intensively studied, whereas the scope of bi- and multimetallic systems based on platinum(II) scaffold is scarce. In this work, we present a series of bimetallic platinum(II) complexes bridged by ambidentate CN<sup>-</sup> ligand.

The study reveals tangible influence of cyclometallating fragment on aggregation ability of the objects given, which is observed both in solid state and solution. The presence of short Pt...Pt and  $\pi$ - $\pi$  intermolecular contacts in crystal were established by XRD analysis. These compounds are highly phosphorescent under ambient conditions reaching quantum yield of 0.73 in solution (**3**) and 0.62 in the solid state (**3**). In the absence of steric hindrance, cations **1** and **2** reveal pronounced tendency for aggregation in solution, which depends not only on the concentration and temperature, but also solvent polarity. The increase of the latter (CH<sub>2</sub>Cl<sub>2</sub> < acetone < MeCN < MeOH) causes bathochromic shift of the emission from green to NIR region assigned to the transition from the monomer to the trimer or a larger form. The formation of supramolecular structures was evaluated for **1** by diffusion NMR spectroscopy, which indicated that the assembly of tetrameric species [ $\{Pt(phbpy)\}_2(CN)\}_4^{4+}$  can be reached in acetone. Complexes **3** and **4** reveal no aggregation tendency due to the bulky structure of metalated ligands. However, complex **3** is found to show mechanochromism with reversible phase transition.

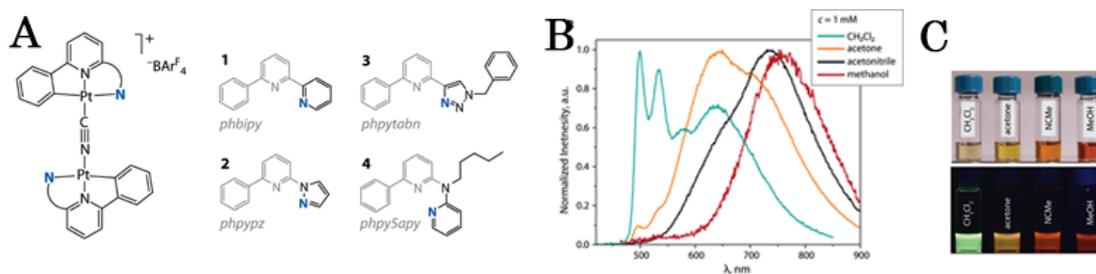


Fig. 1. a) Schematic representation of studied Pt(II) complexes; b). Emission spectra of **2** in DCM, acetone, acetonitrile and methanol; c) solution of **2** under ambient light (top) and UV (bottom)