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EFECT OF THE COUNTERANION IN THE PHOTOPHYSICAL PROPERTIES OF ANIONIC CYANO CYCLOMETALATED PLATINUM(II) COMPLEXES

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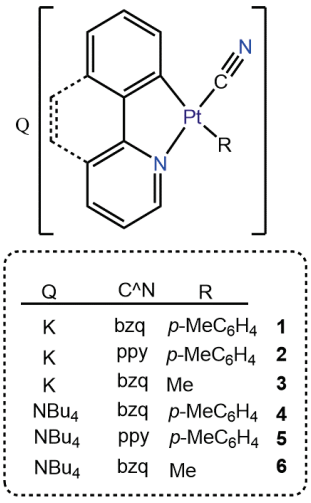
Cyclometalated Pt (II) complexes have attracted much attention due to their optical properties and diverse applications in many fields such as organic light-emitting diodes (OLEDs), dye-sensitized solar cells (DSSC), hydrogen production, chemical sensing and bioimaging. The coordination of ancillary ligands with strong ligand field in cycloplatinated complexes raise the energy of d-d excited states (MC) and suppress fast nonradiative decay, increasing the efficiency of the emission.[1,2] In addition, the utilization of different counterions in anionic Pt (II) complexes allows controlling of solubility and tuning the luminescence properties. Generally, bulky tetrabutylammonium cations surrounding anionic square-planar complexes provided distinct structures without Pt···Pt, π-π interactions leading to monomer emission whereas related anionic Pt(II) complexes stabilized with alkali metals cations, such as potassium and sodium cations favors the formation of low lying excited states driven by M···M interactions .[2,3]

Here, we describe the synthesis and characterization of new anionic cycloplatinated(II) complexes $[(C^N)Pt(CN)(R)]^-$ [C^N = benzo[h]quinolate (bzq), phenylpyridinate (ppy)] with two different kinds of counterions, namely, tetrabutylammonium and potassium, prepared from precursors $[(C^N)Pt(SMe_2)(R)]$ (R= Me, *p*-MeC_6H_4,). A comparative study of their photophysical properties in different media (solid state, solution, PS film for emission) was carried out. In addition, density functional theory (DFT) and Time Dependent DFT (TD-DFT) calculations have been applied for supporting of absorption and emission spectra of these complexes.



Q	C^N	R	
K	bzq	*p*-MeC_6H_4	**1**
K	ppy	*p*-MeC_6H_4	**2**
K	bzq	Me	**3**
NBu_4	bzq	*p*-MeC_6H_4	**4**
NBu_4	ppy	*p*-MeC_6H_4	**5**
NBu_4	bzq	Me	**6**

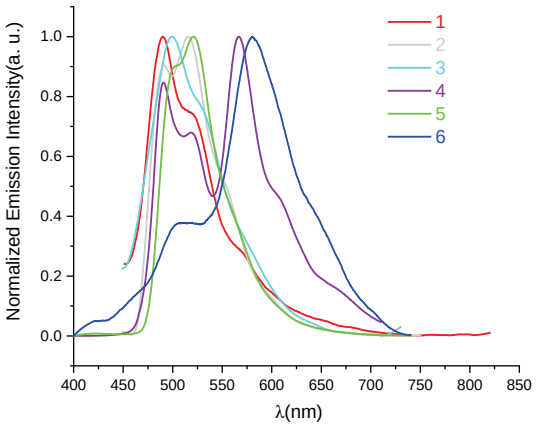


Figure 1. Emission Spectra of complexes in polystyrene films (1% *wt* **1-3**; 10% *wt* **4-6**) at 298 K.

References

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