

# Photochemistry and Photophysics of Carbometalated Pt(II) Polyimine Complexes.

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Platinum is a third row transition metal that can be readily oxidized to Pt(II). The dicationic  $d^8$  configuration of Pt(II) almost always forms compounds with square planar geometry. A prototypical example is  $\text{Pt}(\text{trpy})\text{Cl}^+$  where trpy is 2,2':6',2''-terpyridine, which was shown to be non-luminescent in fluid solution. However, by modifying the tridentate trpy or the co-ligand it is possible to see emission in room temperature solution. Trpy analogues including the fused ring phenanthroline moiety have been found to exhibit enhanced excited state lifetimes. Carbometalation to the platinum center allows for lower energy emission by better stabilizing the formally "Pt(III)" in the excited with the anionic carbon ligand.

Tuning of the excited state can also be achieved by the addition of an electron donating dimethyl amino group on the ligand and therefore altering the orbital parentage of the excited state of the complex allowing for lower energy emission to be seen in fluid solution at room temperature. I present 3 novel complexes with such properties.

$\text{Pt}(\text{dma})\text{Cl}$  where dma denotes *N,N*-dimethyl-4-(1,10-phenanthroline-2-yl) aniline,  $\text{Pt}(\text{bdma})\text{Cl}$  where bdma denotes *N,N*-dimethyl-4-(4,7-diphenyl-1,10-phenanthroline-2-yl) aniline, and  $\text{Pt}(\text{zdma})\text{Cl}$  where zdma denotes *N,N*-dimethyl-4-(dipyrido[3,2-*a*:2',3'-*c*]phenazine-6-yl) aniline. All of these complexes show interesting photochemical properties with promising photophysical characteristics.