

The fluoretic difference in homoleptic mono-nuclear and di-nuclear indium species

Orbett Alexander¹, Alice Brink¹, Robbin Kroon², Mart-Mari Duvenhage², Hendrik Swart², Hendrik Visser¹

¹Chemistry Department, University Of The Free State, Bloemfontein, South Africa, ²Physics Department, University of the Free State, Bloemfontein, South Africa
E-mail: alexanderorbett@gmail.com

Quinolinol derivatives have been since envisaged as promising fluorophores based on their peculiarities since the birth of Alq₃ entities as the prototype complex which was discovered by Tang and Van Slyke back in 1987.[1] As a result, that has prompted growth along the science of these M(Ox)₃ entities with other triels down the boron group such as gallium (Ga) and indium (In) as potential electroluminescence layer in the edifice of OLED's devices.

There have been structural discrepancies for over two decades posed by the perturbed geometrical conformation of these complexes resorting to isomerism (meridional vs. facial) which potentially significantly impacts on the luminescence properties thereof. It was mainly the aforementioned effect that shaded the trials of varying many substitutions (EDG and EWG's) on the backbone (to increase the efficiency of this complexes) and potentially set astray the postulated light outcome (unpredictable wavelength shifts).[2] What has been very true and crucial is the ability of this quinolinol framework to give light and form very rigid inorganic complexes with various metal centers and that is directly related to their chelato-aromatic properties, stability and tuneable luminescence properties.

The fact that the emissive transitions are ligand based automates an ideology of an increased number of quinolinol ligands around a metal center would give more light. That transpires via a metal coordination to the phenoxide oxygen of the ligand which triggers the lowest excited state to become an emissive ligand-centered n-n* transition.[3] with the obvious valence shortcoming of the trivalent icosagens, an opportunity presented itself in peeking at the di-nuclear complexes. Herein we have the opportunity to present a direct comparison between an Indium quinolinol monomer and di-nuclear species unequivocally.

1. Tang, C.W. et al. (1987). Appl. Phys., 51, 913-914.
2. Alexander, O.T. et al. (2017). Journ. Coord. Chem. 70 (8), 1316-1326.
3. Trogler, W.C. et al. (2013). Inorg. Chem., 52 (20), 12033-12045.

Keywords: [Indium](#), [Fluorescence](#), [Quinolinol](#)