

MS35-P03 | LUMINESCENT [Os(Cl)(CO)(P^P)(Pbi)] COMPLEXES

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A series of [Os(Cl)(CO)(P^P)(pbi)] complexes have been synthesized and characterized using FT-IR, ^1H NMR, and ^{31}P NMR spectroscopy. Their molecular structures have been confirmed by means of X-ray diffraction studies. For each of the studied bidentate phosphines (P^P = *cis*-1,2-bis(diphenylphosphino)ethane – dppv, 1,2-bis(diphenylphosphino)ethane – dppe, 1,2-bis(diphenylphosphino)benzene – dppb) the applied synthesis procedure has afforded in preparation of two isomers with pseudo-octahedral coordination of the osmium(II) ion. Each of *cis*-[Os(Cl)(CO)(P^P)(pbi)] show intense green emissions attributable to the excited triplet state of pbi ligand, whereas yellow emissions from the excited *trans*-[Os(Cl)(CO)(P^P)(pbi)] exhibit slight metal-to-ligand charge transfer character (from Os(Cl)(CO)(P^P) fragment to pbi ligand). The investigated complexes are generally well emissive with emission quantum yields up to 0.45 and emission lifetimes in the range of 10-100 ns. Only the yellow emissive *trans*-[Os(Cl)(CO)(dppv)(pbi)] exhibits remarkably different photophysical behaviour despite that all three *trans*-[Os(Cl)(CO)(P^P)(pbi)] isomers emit in the same spectral region. In the view of DFT/TD-DFT results this has been explained by the presence of an additional excited dark state possessing distinct charge transfer character (from Os(Cl)(CO)(pbi) fragment to dppv ligand).

In this paper the crystal structures of the [Os(Cl)(CO)(P^P)(pbi)] complexes are presented.