

Carbazolyl-substituted phosphoramides as ligands for Mn(II) luminescent complexes

M. Bortoluzzi,¹J. Castro,²V. Ferraro¹

¹Dipartimento di Scienze Molecolari e Nanosistemi, Università Ca' Foscari
Venezia, 30172, Mestre (VE), Italy

²Departamento de Química Inorgánica, Universidade de Vigo, Facultade de
Química, Edificio de Ciencias Experimentais, 36310, Vigo (Galicia), Spain
e-mail: markos@unive.it

Ligands containing the {O=P} donor moiety are of paramount importance in the sensitization of Mn(II) luminescence [1]. Besides mono- and polydentate phosphine oxides, ligands based on the phosphoramidate skeleton revealed to be suitable for the preparation of luminescent Mn(II) complexes [2,3], and it was observed an improvement of the luminescence on increasing the light-harvesting features of the substituents on the ligands.

A potential fragment able to efficiently absorb UV radiation is the carbazolyl moiety. The phosphoramidate *N,N,N',N'*-tetramethyl-*P*-carbazol-9-ylphosphonic diamide (L) was successfully coordinated to MnX₂ halides (X = Cl, Br, I), obtaining tetrahedral complexes having general formula [MnX₂L₂]. The structures were ascertained by means of single-crystal X-ray diffraction. The three complexes showed noticeable luminescence in the green region upon excitation with UV radiation, attributed to the Mn(II) ⁴T₁(⁴G) → ⁶A₁(⁶S) transition. The luminescence lifetimes are strongly dependent upon the choice of the coordinated halide.

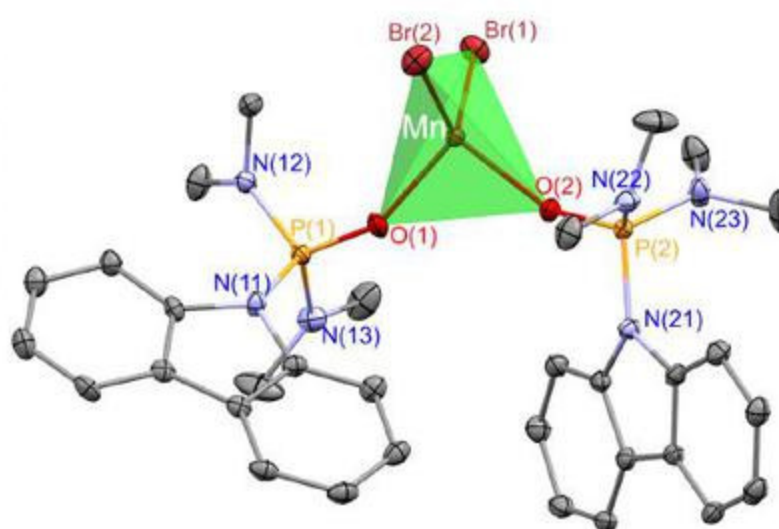


Figure 1 – X-ray structure of [MnBr₂L₂].

- 1.Y. Qin, P. She, X. Huang, W. Huang, Q. Zhao, *Coord. Chem. Rev.* **416** (2020) 213331.
- 2.M.Bortoluzzi, J. Castro, F. Enrichi, A. Vomiero, M. Busato, W. Huang, *Inorg. Chem. Commun.* **92** (2018) 145.
- 3.M.Bortoluzzi, J. Castro, A. Gobbo, V. Ferraro, L. Pietrobon, *Dalton. Trans.* **49** (2020) 7525.