Luminescent Silver(I) and Copper(I) Systems Containing Pyridyl Phosphine Bridges

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Dedicated to Professor Hubert Schmidbaur on the occasion of his 75th birthday

Luminescent silver(I) and copper(I) complexes containing pyridylphosphine ligands have been synthesized and structurally characterized by single crystal X-ray diffraction methods. The reaction of Ag(OTf) (OTf = trifluoromethanesulfonate) with 2-pyridyldiphenylphosphine in different molar ratios gives the species $[Ag_2(OTf)_2(\mu\text{-}PPh_2py)_2]$ (**1**), $[Ag(PPh_2py)_2]OTf$ (**2**), $[Ag(PPh_2py)_3]OTf$ (**3**), and $[Ag_2(PPh_2py)_3](OTf)_2$ (**4**) with several modes of coordination of the pyridylphosphine. The oxidation of the phosphine in compound **4** gave $[Ag_2(OTf)(\mu\text{-}PPh_2py)_2(OPPh_2py)]OTf$ (**5**) which has been structurally characterized. It shows two bridging phosphine ligands and one chelating $OPPh_2py$ ligand. The reactions of the silver salt with bis(2-pyridyl)phenylphosphine in different molar ratios affords the complex $[Ag_2(OTf)_2(\mu\text{-}PPhpy_2)_2]$ (**6**), while the corresponding reactions with $[Cu(NCMe)_4]PF_6$ lead to two different compounds, namely $[Cu_2(NCMe)_2(\mu\text{-}PPhpy_2)_2](PF_6)_2$ (**7**) and $[Cu_2(PPhpy_2)_2(\mu\text{-}PPhpy_2)_2](PF_6)_2$ (**8**). All complexes exhibit luminescence in the solid state at room temperature and at 77 K.

Key words: Silver, Copper, Pyridylphosphines, Luminescence, Metallophilic Interactions