

Monomolybdenum and Dicopper Complexes Supported by Bis(diphenylphosphinomethyl)phthalazine-1,4-diamine Ligand

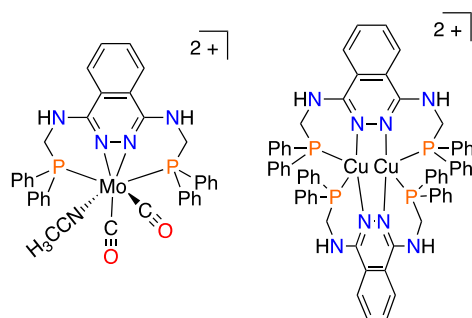
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Abstract

Metal-ligand and metal-metal cooperation are powerful tools to manipulate multi-electron and multi-proton processes; however, ligand designs rarely combine these two features into a single scaffold. In the past two years, our group have focused on designing ligand platforms which can integrate the metal-metal and metal-ligand cooperation. In this presentation, our recent progress on bis(diphenylphosphinomethyl)phthalazine-1,4-diamine ligand and corresponding monomolybdenum(II) and dicopper(I) complexes will be introduced (Figure 1).

The molybdenum(II) complex was prepared from a dimeric molybdenum(0) complex via oxidation reaction. The molybdenum(II) complex shows potential on water activation by stepwise ligand-based deprotonation and oxidation reactions. The dicopper(I) complex was isolated as a dimeric complex including two ligands and two Cu(I) centers. The structure of dicopper(I) complex was confirmed by X-Ray Crystallography. The dicopper(I) complex shows near-unity, tunable and long live-time photoluminescence. Unlike most of the copper(I) based photoluminescence materials, the dicopper(I) complex shows high thermal and air stability. In addition to the photoluminescence, the application on electrochemical CO₂ reduction of the dicopper(I) complex was tested.



Keywords – Metal-Ligand Cooperation, Metal-Metal Cooperation, Photoluminescence, Water Activation