**Rhodium(III) and cadmium(II) complexes based on polypyridyl ligand 2,3,5,6-tetrakis(2-pyridyl)pyrazine** **(tppz)**

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**Abstract**

 Tppz (2,3,5,6-tetrakis(2-pyridyl)pyrazine) complexes [Rh(tppz)(bpy)Cl][PF6]2.acetylacetone (bpy = 2,2'-bipyridine) and [{CdCl2}2(µ-tppz)].ethylene glycol have been synthesized and characterized by elemental analyses, IR, 1H NMR, cyclic voltammetry, photoluminescence and electronic spectral studies. Solid state structures of both complexes have been determined by single-crystal X-ray crystallography. The structural determination shows that the dinuclear Cd(II) complex, [{CdCl2}2(µ-tppz)], is 1D coordination polymer. ORTEP drawing of [Rh(tppz)(bpy)Cl][PF6]2.acetylacetone shows that the coordination geometry around the Rh(III) is a distorted octahedron. [{CdCl2}2(µ-tppz)] displays intraligand 1(π-π\*) fluorescence and can potentially serve as photoactive material. For mononuclear Rh(III) complex, only a two-electron reduction process occurs at the metal with an elimination of Cl- ligand. The emission of this complex is assigned as πd\* phosphorescence.

*Keywords:* X-ray crystallography; Phosphorescence; Fluorescence; Cadmium complex; Rhodium complex; Cyclic voltammetry