**Synthesis, Crystal Structure, Electrochemical and Fluorescence Studies of a Novel Zn(II)-Fluorophore, 1,10-phenanthroline-5,6-dione (Phen-dione)**

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**Abstract**

The first crystal structure of tris(1,10-phenanthroline-5,6-dione)zinc(II) hexafluorophosphate, [Zn(phen-dione)3](PF6)2, is reported. This complex is has been characterized by elemental analysis, IR, 1H-NMR, electronic absorption spectroscopy, cyclic voltammetry, and X-ray crystallography. Yellow crystals of [Zn(phen-dione)3](PF6)2 were grown by ether diffusion into an acetonitrile solution of the complex. This complex has a monoclinic crystal system (*Z*=2) and space group of *P21* with  *a* = 12.0299(15) *Å, b =* 14.5306(19) *Å, c =* 13.1879(17) *Å,* β = 94.058(2)°, and *V* = 2299.5(5) Å3. The structure was refined by using 10048 independent reflections, with I>2*σ*(I) to an *R* factor of 0.0490. ORTEP drawing of the complex shows that the coordination geometry around the Zn(II) is a distorted octahedron. The complex shows one intense fluorescence band at visible region (690 nm) in CH3CN when the excitation wavelength is 310 nm at 25.0 ±0.1oC.

*Keywords:* Zn(II) complex; 1,10-Phenanthroline-5,6-dione; Zn(II)-Fluorophore; Phen-semiquinonate; Fluorescence.