**Mononuclear nickel(II) complexes coordinated by polypyridyl ligands**

**Ghobad Mansouri**

**Abstract**

Three mononuclear polypyridyl complexes of Ni(II), [Ni(Ph2phen)3](PF6)2·CH3CN (**1**), [Ni(dpa)2(phen)](PF6)2 (**2**) and [Ni(bpy)3](PF6)2 (**3**), where Ph2phen is 4,7-diphenyl-1,10-phenanthroline, dpa is 2,2*′*-dipyridylamine, bpy is 2,2*′*-dipyridine, and phen is 1,10-phenanthroline, were prepared and their solid state structures determined by single-crystal X-ray crystallography. The structural determination shows that the coordination geometry around the Ni(II) center is a distorted octahedron in each complex. The investigation of synthesis procedure and crystallographic data of complex **3** indicates the spontaneous resolution of supramolecular chirality. A careful inspection of the packing pattern in the lattice of each complex reveals that non-covalent interactions of two different types, *viz.* C−H···F and C−H···*π* interactions, are active in the lattice. The packing structures of **1**-**3** alsoshow that the rings of the polypyridyl ligands, Ph2phen, dpa, bpy, and phen, are not located face-to-face and can not interact through *π*-*π* interactions. Cyclic voltammetry data of **1** and **3** show that the Ni(III/II) reduction couple is quasi-reversible and this reduction becomes progressively more difficult on passing from bpy to Ph2phen, while complex **2** shows an irreversible behavior with the peak-to-peak separation of about 500 mV. Magnetic susceptibility data derived from paramagnetic NMR revealed effective magnetic moments of 3.12 BM for **1**, 3.27 BM for **2**, and 3.14 for **3** at room temperature.

*Keywords:* Polymorphism; Nickel(II) complex; Polypyridyl ligands; supramolecular chirality; Magnetic moment; Supramer