Abstract of the thesis

Structural and magnetic studies of pseudohalide bridged di and polynuclear Ni(II) complexes with N, O donor Schiff base ligand

Magnets are a multi-billion dollar annual industry with a host of uses such as in switches, computer hard drives, credit/debit/ATM cards, televisions, audio devices, and highly specialized instruments such as medical MRI equipment, among many others. As the modern era continues the push towards greater miniaturization, smaller devices, and more digital information storage in a computer hard drive or iPod memory, the necessity of smaller and smaller magnets increases.

Studies of the magnetic interactions involving paramagnetic metal centers have become an intense research area in recent years because some of these can function as single molecule magnets (SMMs), which show magnetic hysteresis arising from slow magnetization reversal due to a high energy barrier and thus behave as magnets below a certain blocking temperature (T_B). Such tiny magnets have attracted particular interest in chemistry, physics, and materials sciences because they show novel phenomena at the classical/quantum interface, and because they are considered as promising nanoscale objects for, inter alia, future high-density memory storage devices, spintronics, and quantum computing technologies. In order to have such aforesaid practical applications, SMMs with higher blocking temperatures and slower relaxation rates are desirable. Therefore, search for the better SMMs derived from the transition metal ions has been continuing interest by the judicious choice of donor sites of organic ligands.

Hence, in the urge of the development of this field, our expertise encourages us to pursue in this field in order to design and synthesis of several dinuclear and polynuclear Ni(II) metal

clusters with varieties of organic ligands, which showed some interesting magnetic behavior. Furthermore, the magneto-structural correlations have been established from the experimental facts.

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