



O-10

Constructing magnetic coordination polymers by employing short range bridging ligands in the presence of O, N donor co-ligands and some transition metals under mild and sonochemical conditions

Azam Hassanpoor, Masoud Mirzaei*, Hossein Eshtiagh-Hosseini
Department of Chemistry, Ferdowsi University of Mashhad, 917751436 Mashhad, Iran.
(E-mail: mirzaeesh@um.ac.ir)

ABSTRACT

Magnetic chain compounds have attracted continuous interest because they provide genuine opportunities to explore the fundamental aspects of magnetic interactions and magneto-structural correlations in molecular systems. The rational design for building such chain compounds require the consideration of two basic aspects: spin carriers and bridges. The magnetic anisotropy of the spin carriers is the key factor that affects on the magnetic behavior of such 1D systems. For this purpose it is focused on the magnetic 3d transition metal ions such as Mn, Fe, Co, Ni and Cu. These ions, including the isotropic spins (Mn^{2+} and Cu^{2+}), the highly anisotropic one (Mn^{3+}), and one with large residual orbital contribution (Co^{2+}), provide good opportunities for the magnetic investigation. For the bridges, short range ligands such as hydroxyl, cyano, azido, oxalato/oxamate, and carboxylate, have most commonly been employed, because they can efficiently transmit magnetic coupling. The combination of ancillary multidentate ligands with metal-short range ligand systems has provided a wealth of magnetic chain compounds. Furthermore, nano-sized particles of coordination polymers are fascinating to explore, since they often exhibit new interesting sized-dependent physical and chemical properties such as magnetism, luminescence and thermal stability that can not be observed in their bulk analogous. Here, we will mainly concentrate on the magnetic systems containing bridged short range ligands, to demonstrate the design strategy, the various complexes and their rich magnetic properties. The characteristics of the short range bridges in coordination behavior, magnetic transmitting, the role of the co-ligands and template will be briefly discussed.

Keywords: Magnetic coordination polymer, Short range bridging ligands, sonochemistry.

REFERENCES

- [1] a) Kahn, O., *Molecular Magnetism*, Wiley-VCH, Weinheim, **1993**; b) Miller, J.S., *Drillon, Magnetism: Molecules to Materials I*, Wiley-VCH, Weinheim, **2001**.
- [2] a) Sun, H-L., Wang, Zh-M., and Gao, S., *Chem. Eur. J.*, **15**, 1757-1764, **2009**; b) Mirzaei, M., Eshtiagh-Hosseini, H., Hassanpoor, A., Szymańska-Buzar, T., Mague, J.T., Korabik, M., and Kochel, A., *Inorg. Chim. Acta*, **391**, 232-238, **2012**.
- [3] Wang, X-Y., Wang, Zh-M., and Gao, S., *Chem. Commun*, 281-294, **2008**