

New dinuclear molecular-based magnets precursors containing partially deprotonated oxamato and Metal ions (Ni^{2+} , Co^{2+} , Fe^{2+} and Mn^{2+})

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The possibility to combining technological properties with magnetism in versatile systems is the great advantage of molecular-based magnets. Building block self-assembling via supramolecular chemistry have been widely used for researchers to obtain structures of different topologies for application in several areas. Inserted in this methodology, complexes containing oxamate are very versatile precursors since oxamate-based ligands can present different coordination modes.^{1,2} The objective of this work was to prepare novel series of compounds containing partially deprotonate oxamate that can be used as precursor of molecular magnets.

The series of compounds were obtained by slow diffusion of solutions of $\text{K}_2\text{H}_2\text{mpba}$ ($\text{mpba} = N,N'$ -1,3-phenilenobis(oxamate)) and corresponding metallic salt mixed with PPh_4Cl . After three weeks, X-ray quality crystals were collected from the tubes with Fe^{2+} , Co^{2+} , Mn^{2+} , and Ni^{2+} using dmsu/water mixture as solvent. Similar products were obtained changing the mixture solvent for ethanol/water. The infrared spectroscopy (KBr) for the product with cobalt(II) showed the following bands: ν/cm^{-1} 3258 (N-H); 3092 (C-H aromatic); 1672 (C=O mpba free); 1634 (C=O mpba coordinated); 1600, 1550, 1545, 1458 (aromatic ring); 1368 (C-N); 1028 (S-O). The crystallographic parameter determination (X-ray diffraction) of the crystals shows anionic units of $[\text{M}_2(\text{H}_2\text{mpba})_3]^{2-}$ in which two metallic centers are connected by three metacyclophane bridges. There is one crystallization molecule of dmsu and two crystallization water forming hydrogen bonds with amine groups. In addition, there is two PPh_4^+ units acting as counter ion. These compounds crystallizes in monoclinic system. The magnetic study are in progress but it is expected a ferromagnetic coupling between metal centers according to the literature. These complexes can be used as precursors for heterometallic systems with different topologies.

¹Simoes, T.R. G.; Pim, W. D., Stumpf, H.O., *CrystEngComm* **2013**, 15, 10165.

² Pardo, E., Julve, M., *Dalton Trans.*, **2008**, 2780–2805

