

related problem, the field of Molecular Magnetism is currently shifting towards more complicated systems. One direction has been opened by the observation of slow relaxation of the magnetization in 1D systems (called Single Chain Magnets or SCMs). Synthetic efforts are devoted to the development of new systems SCMs that can help us understanding the physical background that lies beneath this phenomenon. In this contest several groups have development new tools allowing for the engineering of both magnetic and structural properties. Here we discuss some opportunities offered by the Metal Nitronilnitroxyde strategy. In particular the experimental and theoretical work developed on finite-size effects revealed itself a key point. We describe the rational strategy that allowed creating the first rare-earth based SCMs. We show that we can freely substitute the metallic centres without structural alterations, thus tuning of the magnetic properties. This affords a useful information on the key parameters that rule SCMs.

Keywords: molecular magnets, superparamagnets, synthesis of new materials

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Synthesis, crystal structure, and magnetic properties of trioxotriangulene stable neutral radical

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Synthesis and elucidations of molecular and electronic-spin structures of novel stable neutral radical derivatives are fundamentally important issues for the development of spin-mediated molecular functional materials. Oxophenalenoxyl derivatives are new persistent neutral radicals with two oxygen-atoms in the phenalenyl skeleton. Importantly, electronic-spin structures of these neutral radicals are intrinsically different in the topological symmetry from that of the phenalenyl. Furthermore, by controlling the redox process, these radicals show the reversible topological switching of the spin-delocalized nature. The electronic features enabled us to investigate the redox-based spin diversity and the molecular crystalline secondary battery. In this work, as the two-dimensional pi-extended derivative of 6-oxophenalenoxyls, we have synthesized and isolated trioxotriangulene neutral radical derivative having C₃-symmetric and 25pi-conjugated molecular/electronic structures. The electronic-spin structure and redox ability of this neutral radical have been revealed by X-ray crystal structure analysis (Figure), ESR and magnetic measurements, and DFT calculations.



Keywords: ESR, magnetic materials, radicals

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Hemidirected novel lead(II) azide complex of 2,6-diacetylpyridine dihydrazone

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The chelating behaviour of 2,6-diacetylpyridinedihydrazone (L) towards lead(II) with azide ion has been characterized by means of elemental analyses, FTIR and determined by single-crystal X-ray analysis. The title compound, Pb(C₉H₁₃N₁₁) (I), was crystallized in the monoclinic space group C2/c. Title complex exhibits the expected coordination sphere with five nitrogen atoms coordinated to the central lead(II) and shows distorted trigonal bipyramid coordination geometry. The coordination chemistry of title complex exhibits a gap around the lead(II) ion, occupied possibly by stereochemically active electron lone pair on lead(II) which results in a hemidirected lead complex. It has been obtained from the antimicrobial activities of the free ligand and its lead(II) complex that the antimicrobial activity of the complex is higher than the free ligand.

Keywords: biological activity, X-ray Diffraction, crystal structure

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Novel route to synthesis copper halide with Cu₂S₂ core and its crystal packing

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The novel route to synthesis of [Cu₂{·-S=C(NH)₂(CH₂)₂}₂{S=C(NH)₂(CH₂)₂}₂Br₂] or (I) was simply. Single crystal X-ray structure analysis and FT-IR spectra confirmed its components. The structure revealed a dimeric monobromide bis(ethylenethiourea)copper(I) complex with in the monoclinic space group C2/c. The final residual factor (R) is 0.0285. The Cu₂S₂ core of the dimer is lozenge with C-S distances of 2.375(1) and 2.408(1) Å, a Cu-S-Cu angle of 70.81(3)°. The crystal packing is stabilized by extensive N-H...Br interactions and weak N-H...S interactions.

Keywords: X-ray crystal structure, Cu₂S₂ lozenge core, crystal packing

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Crystal structures of two new tetranuclear copper complexes based on Schiff-base ligands

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Two new double azido-bridged tetranuclear copper complexes were synthesized, namely Bis{μ-[bisN,N'-(salicylidene)-1,3-propanediaminato-N,N'-diformamidocopper(II)]azido(μ-azido)copper(II)} (I) and Bis{μ-[bisN,N'-(salicylidene)-1,3-propanediaminato copper(II)]azido(μ-azido)copper(II)} dioxan (II), and their crystal structures were determined. In both compounds two doubly oxygen-bridged dinuclear Cu complexes are bridged in a head-to-head fashion via two azido groups. The terminal Cu ion in (I) and