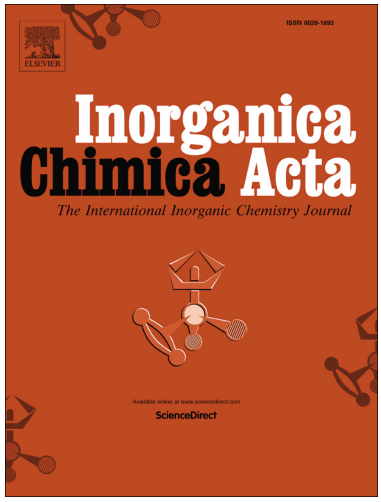

Research paper

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A series bi-spin transition metal(II) complexes based on triazole nitronyl nitroxide radical

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Abstract: Four new transition complexes were obtained by using triazole nitronyl nitroxide radical as ligand. The complexes with formula [Mn(4-Me-3-Nit-trz)(hfac)$_2$] (**1**) and [M(4-Me-3-Nit-trz)(hfac)$_2$]$_2$ [M = Co(II) **2,** Ni(II) **3**, Cu(II) **4**; 4-Me-3-Nit-trz = 2-[3-(4-methyl-l,2,4-triazolyl)]-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide; hfac = hexafluoroacetylacetone] are characterized structurally and magnetically. The metal ions in the four complexes are all in six-coordinated environment with four oxygen atoms from two hfac$^-$ ligands, and one radical oxygen atom and one triazole nitrogen atom from a two teeth 4-Me-3-Nit-trz ligand. The magnetic behaviors for **1**-**3** indicate that the metal ions and the direct coordinated radicals are antiferromagnetically coupled ($J_{Mn\text{-}rad}$ = -49.61 cm^{-1}, for **1**; $J_{Co\text{-}rad}$ = -22.36 cm cm^{-1}, for **2**; $J_{Ni\text{-}rad}$ = -115.39 cm^{-1}, for **3**), whereas a ferromagnetic coupling between the Cu(II) ion and the nitroxide group ($J_{Cu\text{-}rad}$ = 3.45 cm^{-1}) is observed in **4**.

Keywords: radicals, nitronyl nitroxide, triazole, mononuclear, magnetic properties

1. Introduction

Nitronyl nitroxide radicals which can not only act as spin carriers but also as bridging ligands attract much attention since the discovery of the first single chain magnets (SCMs) by D. Gatteschi's group [1]. Recently, the chemistry and magnetic

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