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# Structure and magnetic behavior of unpredictable EE-azide bridged tetranuclear Mn(II) complex with ONO-donor hydrazone ligand and its transformation to dinuclear Mn(III) complex

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## Abstract

The reaction of  $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$  with sodium azide and ONO-donor hydrazone ligand, ( $\text{H}_2\text{L} = (E)\text{-}3\text{-hydroxy-}N'\text{-}((Z)\text{-}4\text{-hydroxy-}4\text{-phenylbut-3-en-2-ylidene})\text{-}2\text{-naphthohydrazide}$ ), in methanol gives rise to the formation of red crystals which are stable out of the solvent. The red crystals slowly transform to brown crystals in the methanolic solution. In the last case, the rate of the transformation from red to brown crystals mainly depends on the presence of molecular oxygen and reaction temperature. Both compounds are characterized by elemental analysis, spectroscopic methods and single crystal X-ray diffraction studies. The X-ray analysis indicates that the red crystals consist of a tetranuclear Mn(II) complex molecules,  $[\text{Mn}_4(\text{H}_{0.5}\text{L})_4(\mu_{1,3}\text{-N}_3)_2(\text{CH}_3\text{OH})_4]$  (**1**), while the brown crystals consist of dinuclear Mn(III),  $[\text{Mn}_2\text{L}_2(\mu_{1,1}\text{-OCH}_3)_{1.5}(\mu_{1,1}\text{-N}_3)_{0.5}]$  (**2**) molecules. In complex **1** molecules of  $\text{D}_2$  (222)

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