# 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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Streszczenie

The reaction of manganese(II) chloride tetrahydrate with sodium azide and ONO-donor hydrazone ligand, ($H_2L$=(*E*)-3-hydroxy-*N*′-((*Z*)-4-hydroxy-4-phenylbut-3-en-2-ylidene)-2-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, $[Mn_4(H_{0.5}L)_4(\mu_{1,3}\text{-}N_3)_2(CH_3OH)_4]$ (**1**), while the brown crystals consist of dinucelar Mn(III), $[Mn_2L_2(\mu_{1,1}\text{-}OCH_3)_{1.5}(\mu_{1,1}\text{-}N_3)_{0.5}]$ (**2**) molecules. In complex **1** with molecules of $D_2$ (222) point symmetry, four Mn(II) ions are connected together by four ONO-donor hydrazone ligands and two end-to-end (EE) bridging azide anions. In complex **2** two Mn(III) ions are connected together by azide or methoxy bridging groups. Magnetic susceptibility measurements on complex **1** reveal the occurrence of antiferromagnetic couplings through azide ligands and enolate oxygen atom of the ligand in which the magnetic coupling constants have been determined.

Słowa kluczowe

manganese complexes, hydrazone, magnetic behavior, hydrogen bonding, spectroscopic studies