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Synthesis, crystal structure and magnetic properties of a pentanuclear Mn(III) cluster with 1,2,4-triazole based Schiff base ligand.

Autorzy

Rahman Bikas

Parinaz Mirzakhani

Nader Noshiranzadeh

Joaquin Sanchiz

Marta S. Krawczyk

Dimitris A. Kalofolias

Tadeusz Lis

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Streszczenie

The reaction of equimolar amounts of 2-hydroxy-5-iodobenzaldehyde and 5-(methylthio)-1*H*-1,2,4-triazol-3-amine in methanol yielded a new 1,2,4-triazole based Schiff base ligand, H_2L, which was characterised by spectroscopic methods. The combination of this Schiff base ligand with $Mn(OAc)_2{\cdot}4H_2O$ and KSCN in methanol yielded dark brown crystals of $[KMn_5(L)_4(O)_2(OAc)_4(CH_3OH)_2(H_2O)]{\cdot}5.25(CH_3OH){\cdot}2.33(H_2O)$ (1), which were characterised by elemental analysis, spectroscopic methods and single-crystal X-ray diffraction. The compound contains Mn(III) pentanuclear clusters in which two oxido, four acetate and four dinegative Schiff base ligands link the Mn(III) ions. The structure of the cluster consists of two perpendicular Mn_3O units and one Mn(III) ion acting as a bridge between them. The study of the magnetic properties revealed the occurrence of antiferromagnetic intramolecular interactions among the Mn(III) atoms. Since this type of compounds are candidates to exhibit SMM-behavior, the presence of SMM behavior is also investigated.

Słowa kluczowe

Crystal structure, Magnetic studies, Pentanuclear Mn(III) complex, 1,2,4-triazole ligands, Spectroscopic studies

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