Magnetic studies and Hirshfeld surface analysis of acetato bridged 2D Mn(II) coordination polymer with 4-aminobenzohydrazide ligand

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Streszczenie

A new acetato bridged 2D coordination polymer with general formula of $[Mn(\mu\text{-}4\text{-ambh})(\mu\text{-}OAc)(OAc)]_n$ (**1**) was prepared by the reaction of $Mn(OAc)_2{\cdot}4H_2O$ with 4-aminobenzohydrazide (4-ambh) in equimolar ratio. The reaction was done in methanol under reflux condition and the single crystals of **1** were obtained by evaporation of the solvent. The structure of this compound was determined by X-ray analysis, and its spectroscopic properties and thermal stability were also studied. These studies indicated that in this compound, the manganese ions are connected by a mixture of acetate and 4-ambh bridges to form a 2D polymeric network at the *bc* crystallographic plane. The intermolecular and intramolecular interactions were investigated by Hirshfeld surface analysis. Magnetic studies revealed a dominant antiferromagnetic intermetallic coupling of $J = -0.78$ cm^{-1} magnitude. Magnetization measurements suggest a diamagnetic ground state and a small gap of 1.59 cm^{-1} with the first excited state; while the axial zero-field splitting parameter, D, was calculated at -0.21 cm^{-1}.

Słowa kluczowe

2D coordination polymer, Magnetic studies, Crystal structure, 4-aminobenzohydrazide, Hirshfeld surface analysis

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