

Crystal structure and magnetic properties of a new chiral manganese(II) three-dimensional framework: Na₃[Mn₃(HCOO)₉]

Paredes-García, Verónica

Vega, Andrés

Novak, Miguel A.

Vaz, Maria G.F.

Souza, Denise A.

Venegas-Yazigi, Diego

Spodine, Evgenia

A structural and magnetic characterization of a trinuclear chiral Mn(II) formate three-dimensional framework exhibiting a triangular arrangement is presented. Compound Na₃[Mn₃(HCOO)₉] was obtained by solvothermal synthesis and crystallizes in the chiral cubic space group P213 and is well described by a χ conformation. The structure displays triangular Mn₃ building blocks, in which the metal centers are bonded by formate ligands in a syn-anti mode (Mn-Mn 5.697(1) Å). The coordination sphere of manganese(II) is completed by six oxygen atoms from six formate ligands, resulting in an octahedral geometry. Magnetic susceptibility measurements showed antiferromagnetic interactions at high temperature and a strongly field dependent magnetic behavior below 40 K. At fields higher than 1.0 kOe only the antiferromagnetic interactions can be observed. At applied fields lower than 1.0 kOe magnetic susceptibility becomes irreversible with maxima observed at 22 and 34 K. These maxima suggest a weak f