

Magnetic properties of $\text{Mn}(\text{en})_2\text{Ni}(\text{CN})_4$ - three dimensional $S = 5/2$ Heisenberg antiferromagnet

M. Kajňaková^a, M. Orendáč^a, A. Orendáčová^a, J. Černák^b, A. Feher^a

^aCentre of Low Temperature Physics of the Faculty of Science UPJŠ & Institute of Experimental Physics SAS, Park Angelinum 9, SK - 04154 Košice, Slovakia

^bInstitute of Chemistry, FS UPJŠ, Moyzesova 11, SK - 04001 Košice, Slovakia

The experimental study of magnetic and thermodynamic properties and crystal structure of $\text{Mn}(\text{en})_2\text{Ni}(\text{CN})_4$, (en =ethylenediamine= $\text{C}_2\text{H}_8\text{N}_2$), is reported. Crystal structure suggests that $\text{Mn}(\text{en})_2\text{Ni}(\text{CN})_4$ represents three-dimensional Heisenberg antiferromagnet with $S = 5/2$. The comparison of the magnetic field dependence of magnetization with the theoretical prediction for ideal paramagnet represented by Brillouin function confirms the presence of antiferromagnetic correlations between the paramagnetic Mn(II) ions. The analysis of the temperature dependence of magnetic susceptibility using the Curie-Weiss yields $\theta = -3.85$ K. The temperature dependence of specific heat is performed from 100 mK to 1.8 K and the λ -like anomaly, indicating the phase transition to the ordered state is observed at $T_C = 0.46$ K. The fact that about 27% of total magnetic entropy $R \cdot \ln(2S + 1)$ for $S = 5/2$ is removed above the λ -anomaly supports the conjecture about three-dimensional character of the magnetic correlations in the studied system.

← 13.4 cm →

Subject category :

3. Transition Metals, Alloys and Compounds

Presentation mode :

poster

Corresponding author :

M. Kajňaková

Address for correspondence :

Dr. Marcela Kajňaková
P. J. Šafárik University, Faculty of Science
Park Angelinum 9
SK - 04154 Košice, SLOVAKIA

Email address :

mkajnak@upjs.sk

9.7 cm