New polymeric thiocyanatoiron(II) complex with*N*,*N*′-diethylnicotinamide - synthesis, structure, magnetic and spectral properties.

Autorzy

Iveta Ondrejkovičová

S. Galková

Jerzy Mroziński

Julia Kłak

Tadeusz Lis

Zofia Olejnik

Rok wydania

2008

Czasopismo

Inorganica Chimica Acta

Numer woluminu

361

Strony

2483-2490

DOI

10.1016/j.ica.2008.01.009

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The iron(II) compound of formula $[Fe(NCS)_2(dena)_2]_n$ (dena = *N*,*N*′-diethylnicotinamide) has been prepared by the reaction between iron(III) thiocyanate and dena in ethanol solution. The complex was characterized by elemental analysis, spectral and magnetic measurements. Single-crystal X-ray diffraction methods show that the complex, crystallizing in the triclinic space group, undergoes a phase transition between 220 K and 230 K, connected with the doubling of cell volume. Crystal structures at 230 K (**1a**; HT phase) and 150 K (**1b**; LT phase) are described and a transition mechanism is discussed. In both phases the compound has an extended chain structure, in which the neutral molecule of *N*,*N*′-diethylnicotinamide acts as a bridging ligand binding through pyridine N atom to one centre and through amide O atom to the neighbouring Fe centre. The Fe^{2+} ion has a slightly distorted *trans*-octahedral environment with FeO_2N_4 chromophore, and all Fe–O and Fe–N bonds in the typical for high-spin iron(II) compounds range. Variable-temperature magnetic susceptibility data in the temperature range 1.8–300 K show that iron(II) is high-spin $S = 2(^5T_{2g})$ and as a result effects due to zero-field splitting are anticipated at low temperatures. The IR spectrum suggested the coordination of *N*,*N*′-diethylnicotinamide to the central atom of iron(II) as a bridging ligand and NCS group as a monodentate ligand.

Adres publiczny

https://doi.org/10.1016/j.ica.2008.01.009

Strona internetowa wydawcy

http://www.elsevier.com