

## New dimeric copper(II) complex $[\text{Cu}(\text{5-MeOsal})_2(\mu\text{-nia})(\text{H}_2\text{O})]_2$ with magnetic exchange interactions through H-bonds.

### Autorzy

Dušan Valigura

Jan Moncol

Maria Korabik

Z. Půčeková

Tadeusz Lis

Jerzy Mroziński

Milan Melnik

### Rok wydania

2006

### Czasopismo

European Journal of  
Inorganic Chemistry

### Strony

3813-3817

### DOI

10.1002/ejic.200600477

### Kolekcja

Naukowa

### Język

Angielski

### Typ publikacji

Artykuł

### Streszczenie

The synthesis and characterization (elemental analysis, IR, electronic and EPR spectra as well as magnetization measurements over the temperature range 1.8 K–300 K) of solid complex  $[\text{Cu}(\text{5-MeOsal})_2(\mu\text{-nia})(\text{H}_2\text{O})]_2$  (**1**; 5-MeOsal = 5-methoxysalicylate, nia = nicotinamide) is reported together with the crystal structure. In blue–green complex **1**, two  $\text{Cu}(\text{5-MeOsal})_2(\text{H}_2\text{O})$  units are held together by a pair of bidentate nonchelating nicotinamide ligands, which form a  $(\text{CuNC}_3\text{O})_2$  ring. Each Cu atom adopts a distorted square-pyramidal geometry. The oxygen atoms from two unidentate 5-MeOsal anions occupy the *trans* position, a water molecule and the pyridine N atom of nicotinamide build the basal plane and a carboxamide O atom occupies the apical position. The separation between two Cu atoms within the centrosymmetric dimer is 6.940(2) Å. The dimeric units are self-assembled across a centre of symmetry by the formation of two pairs of strong hydrogen bonds, which create a one-dimensional polymeric structure with the interdimer  $\text{Cu}\cdots\text{Cu}$  separation 4.901(2) Å. It is believed that these hydrogen bonds between the copper(II) atoms are responsible for the unique magnetic properties of compound **1**. The magnetic susceptibility of complex **1** exhibits a maximum at 6 K. A satisfactory explanation was found with the Bleaney–Bowers equation for Cu–Cu interaction through carboxylato groups and H-bond bridges ( $2J = -6.83 \text{ cm}^{-1}$ ). An additional molecular field correction that was used to characterize the interaction across the nia bridges is assumed to be extremely weak ( $zJ' = -0.28 \text{ cm}^{-1}$ ).

### Adres publiczny

<https://doi.org/10.1002/ejic.200600477>

Plik został wygenerowany dnia 2026-07-02 01:09:36

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/np95bRr>.