

Copper(II) complexes of 3- and 4-picolinehydroxamic acids: from mononuclear compounds to 1D- and 2D-coordination polymers.

Autorzy

Irina A. Golenya

Elżbieta Gumienna-Kontecka

Matti Haukka

Oleksandr M. Korsun

Oleg N. Kalugin

Igor O. Fritsky

Rok wydania

2014

Czasopismo

CrystEngComm

Numer woluminu

16

Strony

1904-1918

DOI

10.1039/C3CE42343C

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

A series of copper(II) complexes with 3- and 4-picolinehydroxamic acids has been synthesized and characterized by a variety of spectroscopic methods, X-ray structure analysis and magnetic susceptibility measurements. The ligands show the tendency to form 1D- and 2D-polymeric structures with copper(II) ions due to the chelating-and-bridging binding mode involving the (O,O')-hydroxamate chelate formation combined with N-coordination of the pyridine moiety. In some cases the (O, μ_2 -O') chelating-and-bridging modes are realized, in which either amide or hydroxamic oxygen atoms play a μ_2 -bridging role. Molecular and crystal structures of two discrete complexes: mononuclear [Cu(**3-HPicHA**)₂(ClO₄)₂] (**1**) and binuclear [{Cu(**4-HPicHA**)(**bpy**)(ClO₄)₂}]₂(ClO₄)₂ (**4a**), and five coordination polymers *catena*-[Cu(**3-PicHA**)(**phen**)]_n(ClO₄)_n (**7**), *catena*-[Cu(**4-PicHA**)(**bpy**)]_n(OH)_n·3.25nH₂O (**8**), *catena*-[Cu(**4-PicHA**)(DMSO)₂]_{2n}(ClO₄)_{2n} (**9**), [Cu(**3-PicHA**)(DMSO)(ClO₄)]_{nm}·nmDMSO (**10**), and [{Cu(**4-PicHA**)(**phen**)₂]_n(ClO₄)_{2n} (**11**) were determined by single crystal X-ray analysis. In structures **1** and **4a** the hydroxamate ligands exist in a zwitterionic form with the O-deprotonated hydroxamate groups and protonated pyridine rings. The following types of coordination polymers have been structurally characterized: (i) single-stranded zigzag-shaped 1D polymers (**7** and **8**); (ii) double-stranded 1D polymer comprising binuclear subunits formed on account of μ_2 (O)-carbonyl oxygen bridging coordination to the axial position of the copper(II) ion (**9**); (iii) 2D netted coordination polymers of two different types comprising μ_2 (O)-bridged binuclear subunits (**10** and **11**). Magnetic susceptibility measurements (2–300 K) of powdered samples revealed the presence of moderate antiferromagnetic interaction in the binuclear complex **4a** ($2J = -7.164(6) \text{ cm}^{-1}$), while the coordination polymers exhibit weak antiferromagnetic interaction with a cryomagnetic behaviour obeying the Curie–Weiss law.

Adres publiczny

<http://dx.doi.org/10.1039/C3CE42343C>

Strona internetowa wydawcy

<https://www.rsc.org/>

Plik został wygenerowany dnia 2026-05-11 04:10:35

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/-2IYEZQ>.