

Effect of N-donor ancillary ligands on structural and magnetic properties of oxalate copper(II) complexes.

Autorzy

Anna Świtlicka-Olszewska

Barbara Machura

Jerzy Mroziński

Bożena Kalińska

Rafał Kruszyński

Mateusz Penkala

Rok wydania

2014

Czasopismo

New Journal of Chemistry

Numer woluminu

38

Strony

1611-1626

DOI

10.1039/c3nj01541f

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Through varying the auxiliary N-donor ligands under similar synthetic conditions nine new compounds: $[\text{Cu}(\text{C}_2\text{O}_4)(\text{pz})]_n$ (**1**), $[\text{Cu}(\text{C}_2\text{O}_4)(\text{apz})_2]_n \cdot (3\text{H}_2\text{O})_n$ (**2**), $[\text{Cu}_2(\mu\text{-C}_2\text{O}_4)_2(\text{H}_2\text{O})_2(\text{ampz})_4]$ (**3**), $[\text{Cu}(\text{C}_2\text{O}_4)(\text{mpz})_2]_n$ (**4**), $[\text{Cu}(\text{C}_2\text{O}_4)(\text{aind})_2]_n$ (**5**), $[\text{Cu}_2(\text{C}_2\text{O}_4)_2(\text{bpzm})_2]_n \cdot (3.5\text{H}_2\text{O})_n$ (**6**), $[\text{Cu}(\text{C}_2\text{O}_4)(\text{ampy})(\text{H}_2\text{O})]_n$ (**7**) $\{[\text{Cu}_2(\mu\text{-C}_2\text{O}_4)(\text{aepy})_2][\text{Cu}(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2]_n \cdot (2\text{H}_2\text{O})_n$ (**8**) and $[\text{Cu}_4(\mu\text{-C}_2\text{O}_4)_3(\text{aepy})_4(\text{H}_2\text{O})_2]\text{Cl}_2$ (**9**) (pz = pyrazole, apz = 3(5)-aminopyrazole, mpz = 3(5)-methylpyrazole, ampz = 3(5)-amino-5(3)-methylpyrazole, aind = 7-azaindole, bpzm = bis(pyrazol-1-yl)methane, ampy = 2-aminomethylpyridine and aepy = 2-(2-pyridyl)ethylamine) have been synthesized and characterised structurally (by single crystal X-ray analysis) and spectroscopically. On the basis of structural data, the influence of neutral N-donor ligands on the control of the final complex structures and the role of weak intermolecular interactions in the creation of molecular architectures have been discussed in detail. The two independent oxalate anions in **1**, adopting μ_3 -oxalato- $1\text{K}^2\text{O}^1, \text{O}^2:2\text{KO}^1:3\text{KO}^{2a}$ and a relatively rare μ_4 -oxalato- $1\text{K}^2\text{O}^1, \text{O}^2:2\text{KO}^1:3\text{KO}^{1a}, \text{O}^{2a}:4\text{KO}^{2a}$ coordination mode, connect the Cu centers into a two-dimensional net extending along the crystallographic plane (100). Simultaneous existence of both amino and methyl groups in the ampz ligand results in the formation of a 0D dimeric structure of **3**. Compounds **2** and **4–8** display one-dimensional coordination structures, and the most significant differences between these structures concern the geometry around the copper(II) center and the coordination mode of the oxalate bridge. The structures of **2–9** are stabilized by the extensive hydrogen-bonding interactions that give rise to the supramolecular architectures. Additionally, the magnetic properties of the complexes **1–9** have been investigated and discussed in the context of their structures.

Adres publiczny

<http://dx.doi.org/10.1039/c3nj01541f>

Strona internetowa wydawcy

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

Plik został wygenerowany dnia 2026-07-02 23:37:43

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