

Facile synthesis of Cu(II) complexes of mono- and bicondensed N donor Schiff base 1*H*-pyrazolate ligands: crystal structures, spectroscopic and magnetic properties.

Autorzy

Sergey O. Malinkin
Yurii S. Moroz
Larysa V. Penkova
Volodymyr V. Bon
Elżbieta Gumienna-Kontecka
Vadim A. Pavlenko
Vasily I. Pekhnyo

Franc Meyer

Igor O. Fritsky

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Streszczenie

Two [2 × 2] grid-like complexes, [Cu₄(L¹)₄].2MeOH.2H₂O.dmf (**1**) and [Cu₄(L²)₄].2NaClO₄.2MeOH (**2**) based on new substituted pyrazole ligands 5-(1-((2-aminoethyl)imino)ethyl)-4-methyl-1*H*-pyrazole-3-carboxylic (H₂L¹) acid and 5-(1-((3-aminopropyl)imino)ethyl)-4-methyl-1*H*-pyrazole-3-carboxylic acid (H₂L²) have been synthesized and characterized spectroscopically and crystallographically. It was found that the ligand H₂L² condenses with 3-acetyl-4-methyl-pyrazole-5-carboxylic acid (H₂L) to produce a new dinuclear Cu(II) complex upon reaction with Cu(ClO₄)₂.6H₂O and CuAc₂.2H₂O. In the grid complexes the four Cu(II) atoms are in square-pyramidal environment formed by two pyrazole, imine and amine N atoms, and the carboxylate O atom and occupy the corners of a [2 × 2] grid with the Cu...Cu separations, varying from 3.998(1) to 4.2049(9) and 4.794(1) to 5.091(1) Å for the adjacent and diagonal atoms, respectively. In the dinuclear complex **3** the metal ions are found in square planar environment with their coordination planes lying roughly within the plane of the pyrazolate heterocycle. The separation between Cu(II) centers is 3.921(1) Å. Magnetic susceptibility measurements of **3** revealed the presence of strong antiferromagnetic interaction, with a *J* value of -207.5 cm⁻¹. This is larger than the *J* values found for the **1** and **2** grid complexes, which are -20.2 and -18.3 cm⁻¹, respectively.

Słowa kluczowe

Pyrazole ligands, Copper(II), Grid complexes, magnetic properties, Template reaction

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