Cu(II), Ni(II) and Zn(II) mononuclear building blocks based on new polynucleating azomethine ligand : synthesis and characterization.

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Streszczenie

Five new mononuclear complexes formed by the polynucleating ligand 2-[1-(3,5-dimethyl)pyrazolyl]-2-hydroxyimino-N′-[1-(2-pyridyl)ethylidene]acetohydrazide (H**L**): [Ni(**L**)(H**L**)]ClO_4·2CH_3OH (**1**), [Ni(**L**)$_2$]·CH_3OH (**2**), [Zn(**L**)(H**L**)]ClO_4·2CH_3OH (**3**), [Zn(**L**)$_2$]·CH_3OH (**4**) and [Cu(**L**)$_2$]·CH_3OH (**5**) were synthesized and characterized by elemental analysis, mass-spectrometry, IR-spectroscopy and X-ray analysis. The complexes reveal distorted octahedral N_4O_2 coordination arrangement formed by both protonated and deprotonated (**1**, **3**) or two deprotonated ligand molecules (**2**, **4**, **5**). The presence of non-coordinated oxime and pyrazole groups resulted in the formation of extensive systems of hydrogen bonds in the crystal packing of **1**–**5**. Potentiometric titrations, ESI-MS and spectrophotometric studies of complex formation in MeOH/H_2O solutions indicated the presence of mono- and polynuclear complexes with Cu(II), Ni(II) and Zn(II) ions. The solution studies carried out for an excess of Cu(II) over H**L** ligand (2:1 and 3:2 M ratio) indicated also the formation of polynuclear $Cu_3L_2H_x$ species, with an involvement of additional nitrogen donors in copper coordination. In binuclear complex [Cu_2(L)$_2$(DMF)$_2$](ClO_4)$_2$·DMF(**6**) obtained in solid state, the Cu(II) coordination, analogous to the one in **1**–**5**, was supported by pyrazole N atom.

Słowa kluczowe

coordination compounds, Cu(II), Ni(II), Zn(II) complexes, Schiff base ligands, Solution studies, Solid state data

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