



Metal(II) ion complexes with 5-(pyrazin-2-yl)-2,4-dihydro-3H-1,2,4-triazole-3-thione :
synthesis, structural characterization, acid-base, and complexing properties in solution.

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Streszczenie

The study reports the synthesis of complexes $\text{Co}(\text{HL})\text{Cl}_2$ (**1**), $\text{Ni}(\text{HL})\text{Cl}_2$ (**2**), $\text{Cu}(\text{HL})\text{Cl}_2$ (**3**), and $\text{Zn}(\text{HL})_3\text{Cl}_2$ (**4**) with the title ligand, 5-(pyrazin-2-yl)-1,2,4-triazole-5-thione (HL), and their characterization by elemental analyses, ESI-MS (m/z), FT-IR and UV/Vis spectroscopy, as well as EPR in the case of the Cu^{II} complex. The comparative analysis of IR spectra of the metal ion complexes with HL and HL alone indicated that the metal ions in **1**, **2**, and **3** are chelated by two nitrogen atoms, N(4) of pyrazine and N(5) of triazole in the thiol tautomeric form, whereas the Zn^{II} ion in **4** is coordinated by the non-protonated N(2) nitrogen atom of triazole in the thione form. pH potentiometry and UV/Vis spectroscopy were used to examine Co^{II} , Ni^{II} , and Zn^{II} complexes in 10/90 (v/v) DMSO/water solution, whereas the Cu^{II} complex was examined in 40/60 (v/v) DMSO/water solution. Monodeprotonation of the thione triazole in solution enables the formation of the $\text{L}:\text{M} = 1:1$ species with Co^{II} , Ni^{II} and Zn^{II} , the 2:1 species with Co^{II} and Zn^{II} , and the 3:1 species with Zn^{II} . A distorted tetrahedral arrangement of the Cu^{II} complex was suggested on the basis of EPR and Vis/NIR spectra.

Słowa kluczowe

s ligand, divalent metals, spectroscopic and equilibrium studies,
synthesis design

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