

Collection of Czechoslovak Chemical Communications 2010 vol.75 N5, pages 507-515

Zn(II), Co(II) and Ni(II) complexes of a phosphorylthiourea derivative of 4-[(EtO)₂P(O)CH₂-C₆H₄-NHC(S)NHP(O) (OiPr)₂

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Abstract

The reaction of O,O'-diisopropyl phosphorisothoncyanatidate, (iPrO) ₂P(O)NCS, with diethyl(-aminobenzyl)phosphonate leads to the new N-phosphorylated thiourea derivative, 4-[(EtO)₂P(O)CH₂]-C₆H₄NHC(S)NHP(O)(OiPr)₂ (HL). The reaction of its potassium salt KL with Zn(II) or Co(II) in aqueous EtOH leads to the complexes of formulae M(L-O,S)₂ (ZnL₂, CoL₂). The metal cation in all complexes is coordinated by two deprotonated ligands through the sulfur atoms of the thiocarbonyl groups and the oxygen atoms of the phosphoryl groups. The reaction of KL with Ni(II) leads to the formation of two types of complexes: the blue Ni(L-N,S)₂ complex, where the ligand is coordinated through the nitrogen atom of the phosphorylamide group and the sulfur atom of the thiocarbonyl groups and light red Ni(L-O,S)₂ complex with the same coordination of L- anion as it was observed for ZnL₂ and CoL₂. According to UV/Vis spectral data, it was established that the metal cation of Ni(L-N,S)₂ is in a square-planar environment in CH₂Cl₂, whereas the Ni(L-O,S)₂ complex shows features of tetrahedral complexes. © 2010 Institute of Organic Chemistry and Biochemistry.

<http://dx.doi.org/10.1135/cccc2009074>

Keywords

Chelates, Cobalt complexes, Coordination chemistry, N,S-Ligands, N-Phosphorylthiourea, Nickel complexes, Phosphonates, Zinc complexes