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Complexes of [(iPrO)₂P(O)NHC(S)NHCH₂]₂CH₂ with Co(II), Ni(II), Zn(II), and Pd(II): Reaction of [(iPrO)₂P(O)NHC(S)NHCH₂]₂ with KOH leading to the imidazolidine-2-imine derivative

Babashkina M., Safin D.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Reaction of O,O'-diisopropylphosphoric acid isothiocyanate (iPrO)₂P(O)NCS with NH₂(CH₂)_nNH₂ (n = 3, 2) leads to the N-phosphorylated bis-thioureas [(iPrO)₂P(O)NHC(S)NH]₂Z (Z = -(CH₂)₃, H₂LI; -(CH₂)₂, H₂LII). Reaction of the potassium salt of H₂LI with Co(II) and Zn(II) in aqueous EtOH leads to complexes of formula M₂(L-O,S)₂. The metal cation in both complexes is coordinated by two deprotonated ligands through the sulfur atoms of the thiocarbonyl groups and the oxygen atoms of the phosphoryl groups. Reaction of K₂LI with Ni(II) and Pd(II) in the same conditions leads to M₂(L-N,S)₂ complexes. In both compounds, the metal center is found in a square-planar N₂S₂ environment formed by the C=S sulfur atoms and the P-N nitrogen atoms of two deprotonated ligands LI. Reaction of H₂LII with KOH leads to a product of heterocyclization, in which one of the thiourea fragments is retained. Compounds obtained were investigated by IR, UV-Vis, ¹H and ³¹P NMR spectroscopy, and microanalysis. Copyright © Taylor & Francis Group, LLC.

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Keywords

Chelate, cobalt, complex, heterocycles, nickel, palladium, phosphorylthiourea, zinc