Coordination properties of 1-allyl-2-methylimidazole relative to some metal ions in the solid state and aqueous solution.

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Streszczenie

Cobalt(II) and copper(II) complexes with 1-allyl-2-methylimidazole (L), of general formula $[ML_2(NO_3)_2]$, have been prepared in the solid state. The compounds were characterised by structural, spectroscopic and magnetic measurements. The metal ions in both six coordinate complexes are surrounded by two nitrogen atoms of the imidazole rings and four oxygen atoms of the chelating nitrato group (the CoN_2O_4 and CuN_2O_4 chromophores). The structure of both chromophores is described by a very distorted tetragonal bipyramid. The formation of successive complexes of the azole with Co^{2+}, Ni^{2+}, Cu^{2+}, Zn^{2+} and Cd^{2+} in aqueous solution was followed potentiometrically. An irregularity in the K_n constants of successive Co^{2+} and Zn^{2+} complexes suggests a change in the coordination sphere of the central ions from octahedral to tetrahedral. With the Co^{2+}–1-allyl-2-methylimidazole system, the change has been proven by inspection of the visible absorption spectra. Cobalt(II) and copper(II) complexes with 1-allyl-2-methylimidazole (L), of general formula $[ML_2(NO_3)_2]$, have been prepared and characterised by structural, spectroscopic and magnetic measurements. The structure of both chromophores (CoN_2O_4 and CuN_2O_4) is described by a very distorted tetragonal bipyramid. The formation of successive complexes of the azole with Co(II), Ni(II), Cu(II), Zn(II) and Cd(II) in aqueous solution was followed potentiometrically. An irregularity in the K_n constants of successive Co(II) and Zn(II) complexes suggests a change in the coordination sphere of the central ions from octahedral to tetrahedral. With the Co(II)–1-allyl-2-methylimidazole system, the change has been proven by inspection of the visible absorption spectra. In the case of the other studied metal ion, the complexation proceeded according to Bjerrum's model with retention of the six coordinate geometry of the central ion.

Słowa kluczowe

Imidazole derivatives, Transition metal complexes, Crystal structures, Spectra, Stability constant

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