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Complexation of Ni(II) with benzoic, p-methoxybenzoic, and isonicotinic acids hydrazides in aqueous acetonitrile

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Abstract

Solvation and complexation of Ni(II) with benzole (L1), p-methoxybenzoic (L3), and isonicotinic (L) acids hydrazides in water and aqueous acetonitrile were studied. The coordination of acetonitrile with Ni(II) was qualitatively estimated, and the formation constant were determined for the complexes Ni(L1)2+, Ni(L1)2+ 2, Ni(L3)2+, Ni(L3)2+ 2, Ni(HL)3+, NiL2+, NiL(HL)3+, and NiL2+ 2. The effects of dilution, ligand basicity, and ligand solvation on the stability of Ni(II) compounds with hydrazides of benzole acid and its derivatives were demonstrated. The stability of the Ni(II) complexes with isonicotinic acid hydrazide is governed by dehydration of the metal ion, decrease in the donor power of the coordinating hydrazide fragment on protonation of the pyridine substituent L, formation of the intracomplex hydrogen bond between the protonated and deprotonated pyridine nitrogen atoms in NiL(HL)3+, and stacking interaction between the heterocycles in NiL2+ 2.

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