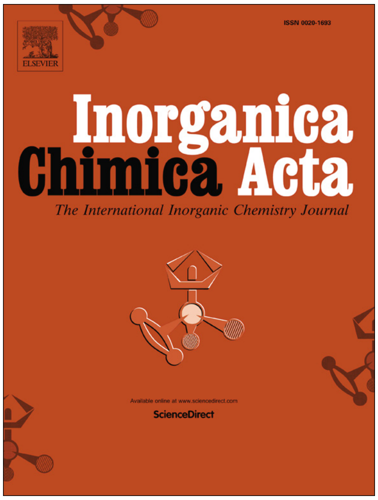

Research paper

The effect of substituents at C^2/N^1 atoms of salicyladehyde and 2-hydroxyacetophenone based thiosemicarbazones on the nature of nickel(II) complexes with 1,10-phenathroline and terpyridine as co-ligands

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The effect of substituents at C^2/N^1 atoms of salicyladehyde and 2-hydroxyacetophenone based thiosemicarbazones on the nature of nickel(II) complexes with 1,10-phenathroline and terpyridine as co-ligands

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ABSTRACT

Coordination chemistry of nickel(II) with salicyladehyde and 2-hydroxyacetophenone based thiosemicarbazones {(2-OH-5-X-C_6H_3)-$C^2(R^2)$=N^3-N^2H-C^1(=S)-N^1HR^3, LH_2} and 1,10-phenanthroline (phen) / terpyridine (terpy) as a co-ligand has been investigated by varying the substituents at C^2 (X = H, Me, MeO; R^2 = H, Me) and N^1 (R^3= H, Me, Et, Ph) atoms of thiosemicarbazones. Reactions of nickel(II) acetate with various thio-ligands, LH_2 {X = H, R^2 = H: L^1H_2 (R^3 = H), L^2H_2 (R^3 = Me), L^3H_2 (R^3 = Et), L^4H_2 (R^3 = Ph); X = Me, R^2 = H, L^5H_2 (R^3 = Me), L^6H_2 (R^3 = Et); X = H, R^2 = Me, L^7H_2 (R^3 = Me), L^8H_2 (R^3 = Et); X = MeO, R^2 = H, L^9H_2 (R^3 = Me)} have yielded dinuclear, [Ni_2L_2(phen)(D)] (D = H_2O, L^{2-} = L^1–L^4, **1–4**; MeOH, L^5, L^6, **5**, **6**) and tetranuclear [$Ni_4L_4(phen)_2$] (L^{2-} = L^7, **7**, L^8, **8**) complexes in the presence of phen as a co-ligand, while in the presence of terpy as a co-ligand, only mononuclear [NiL(terpy)] (L^{2-} = L^2, **9**; L^4, **10**; L^9, **11**) complexes were formed. All these complexes have been characterized with the help of analytical data, spectroscopic techniques (IR and UV-visible), magnetic moments and single crystal X–ray crystallography (**2**, **3**, **5**, **6**, **8–11**). Thio-ligands undergo deprotonation of –OH and –N^2H- groups during complexation and coordinate to the metal centers as dianions in these complexes. In dinuclear complexes **1-6**, one metal center is octahedral and second metal center is square planar (6, 4-coordination pair) and