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The effect of substituents at C²/N¹ atoms of salicylaldehyde and 2-hydroxyacetophenone based thiosemicarbazones on the nature of nickel(II) complexes with 1,10-phenanthroline and terpyridine as co-ligands

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ABSTRACT

Coordination chemistry of nickel(II) with salicylaldehyde and 2-hydroxyacetophenone based thiosemicarbazones {(2-OH-5-X-C₆H₃)-C²(R²)=N³-N²H-C¹(=S)-N¹HR³, LH₂} and 1,10-phenanthroline (phen) / terpyridine (terpy) as a co-ligand has been investigated by varying the substituents at C² (X = H, Me, MeO; R² = H, Me) and N¹ (R³ = H, Me, Et, Ph) atoms of thiosemicarbazones. Reactions of nickel(II) acetate with various thio-ligands, LH₂ {X = H, R² = H: L¹H₂ (R³ = H), L²H₂ (R³ = Me), L³H₂ (R³ = Et), L⁴H₂ (R³ = Ph); X = Me, R² = H, L⁵H₂ (R³ = Me), L⁶H₂ (R³ = Et); X = H, R² = Me, L⁷H₂ (R³ = Me), L⁸H₂ (R³ = Et); X = MeO, R² = H, L⁹H₂ (R³ = Me)} have yielded dinuclear, [Ni₂L₂(phen)(D)] (D = H₂O, L²⁻ = L¹-L⁴, **1-4**; MeOH, L⁵, L⁶, **5, 6**) and tetranuclear [Ni₄L₄(phen)₂] (L²⁻ = L⁷, **7**, L⁸, **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)] (L²⁻ = L², **9**; L⁴, **10**; L⁹, **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 -N²H- 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

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