### **Accepted Manuscript**

### Research paper

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

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PII: S0020-1693(17)31379-8

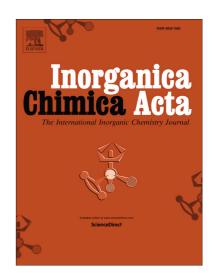
DOI: https://doi.org/10.1016/j.ica.2018.06.024

Reference: ICA 18316

To appear in: Inorganica Chimica Acta

Received Date: 2 September 2017

Revised Date: 7 June 2018 Accepted Date: 13 June 2018



Please cite this article as: P. Kumari, T.S. Lobana, R.J. Butcher, A. Castineiras, M. Zeller, The effect of substituents at C<sup>2</sup>/N<sup>1</sup> atoms of salicyladehyde and 2-hydroxyacetophenone based thiosemicarbazones on the nature of nickel(II) complexes with 1,10-phenathroline and terpyridine as co-ligands, *Inorganica Chimica Acta* (2018), doi: https://doi.org/10.1016/j.ica.2018.06.024

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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 thioligands, LH<sub>2</sub> { $X = H, R^2 = H$ :  $L^1H_2(R^3 = H), L^2H_2(R^3 = Me), L^3H_2(R^3 = Et), L^4H_2(R^3 = H)$ Ph); X = Me,  $R^2 = H$ ,  $L^5H_2$  ( $R^3 = Me$ ),  $L^6H_2$  ( $R^3 = Et$ ); X = H,  $R^2 = Me$ ,  $L^7H_2$  ( $R^3 = R^3 = R^3$ 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<sub>2</sub>O, L<sup>2-</sup> = L<sup>1</sup>-L<sup>4</sup>, 1-4; MeOH, L<sup>5</sup>, L<sup>6</sup>, 5, 6) and tetranuclear  $[Ni_4L_4(phen)_2]$  (L<sup>2-</sup> = L<sup>7</sup>, 7, L<sup>8</sup>, 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<sup>4</sup>, 10; L<sup>9</sup>, 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<sup>2</sup>H- 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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