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Zinc(II), cooper(II) and nickel(II) dithiocarbazate complexes: structural and photophysical properties

Marcela C. Felix[1], Stephanny V. Delgado[1], Bernardo A. Iglesias[2], Victor M. Deflon[1]

[1]Instituto de Química de São Carlos, Universidade de São Paulo, São Carlos, Brasil
[2]Departamento de Química, Universidade Federal de Santa Maria, Santa Maria, Brasil
E-mail:marcela.felix@usp.br

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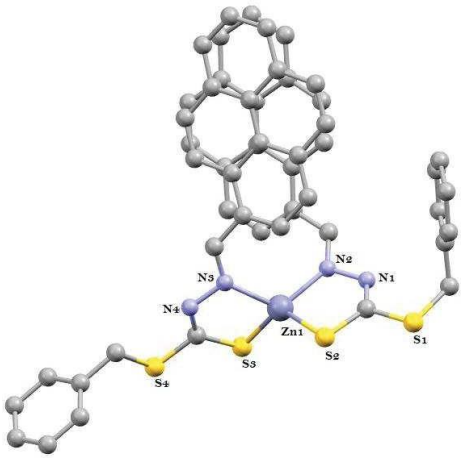
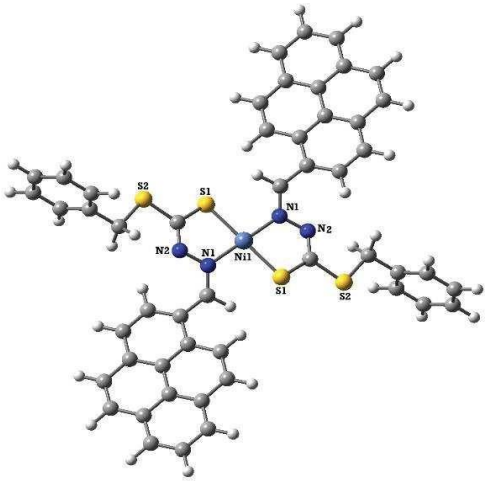
Thiosemicarbazones and dithiocarbazates possess similar structures and can act as ligands, stabilizing transition metal complexes. In previous investigations, palladium and platinum complexes containing a pyrene-derived thiosemicarbazone ligand were presented[1,2]. Here, new zinc(II), copper(II) and nickel(II) complexes were obtained with a new bidentate dithiocarbazate ligand containing a pyrene fluorophore group, named benzyl-(E)-2-(pyren-1-ylmethylene)hydrazine-1-carbodithioate (H-PrDTC). The ligand and the complexes $[Zn(PrDTC)_2]$ (**1**), $[Cu(PrDTC)_2]$ (**2**) and $[Ni(PrDTC)_2]$ (**3**) were prepared in good yields (around 70%) and were characterized by FT-IR, UV-Vis, and NMR (^1H and ^{13}C, for **1** and **3**) or EPR (for **2**) spectroscopies, elemental analysis, and single crystal X-ray diffraction (for **1** and **3**). The X-ray diffraction analyses show that complex **1** presents a distorted tetrahedral coordination geometry while complex **3** has a square-planar structure, as depicted below, left and right, respectively. The study of the photophysical properties of the compounds showed that all present steady-state fluorescence emission in the blue region, originating from the ligand due to the presence of the pyrene chromophore group in their structure.





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References

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[2] OLIVEIRA, C. G. *et. al*. Palladium(II) complexes with thiosemicarbazones derived from pyrene as topoisomerase IB inhibitors. **Dalton Transactions**, v. 48, n. 44, p. 16509-16517, 2019.