

Synthesis and Crystal Structure of Gold(III) Compounds with Semicarbazone

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Several gold(I) and gold(III) compounds have been widely investigated because of their attractive properties for materials science and medicine.¹ Recently, anti-cancer properties and anti-HIV activities of various gold(I) and gold(III) compounds have been reviewed.^{1,2} Semicarbazones are very promising ligands for pharmacological application. The versatility of their coordination mode also boosts studies regarding their supramolecular arrangement aiming at a more rational design for new derivatives.³ Due to our interest in the synthesis of complexes with potential biological activities, we describe the synthesis and the crystal structure of new semicarbazone, di-2-pyridylketone-N⁴-phenyl-3-semicarbazone monochloride dihydrated (**1**) and two gold(III) derivatives with this ligand [HCl dpkpsz][AuBr₄] (**2**) and [HCl dpkpsz][AuCl₄] (**3**) have been determined by X-ray diffraction studies. The structural analysis shows the compounds (**1**) exists in ketene form, confirmed by the presence of hydrazinic hydrogen. In both compound the protonated nitrogen atom N-pyridil acts as proton donor to bond the chloride ion. The N-amine atom also made a hydrogen bond with the chloride ion to give a bifurcated arrangement. It can be seen that the compounds (**2**) and (**3**) rather than coordinating to the gold cation, the reaction formed a salt comprised of [AuX₄]⁻ and protonated (**1**) compound but it assists the stabilization of supramolecular networks by distinct hydrogen-bonding.

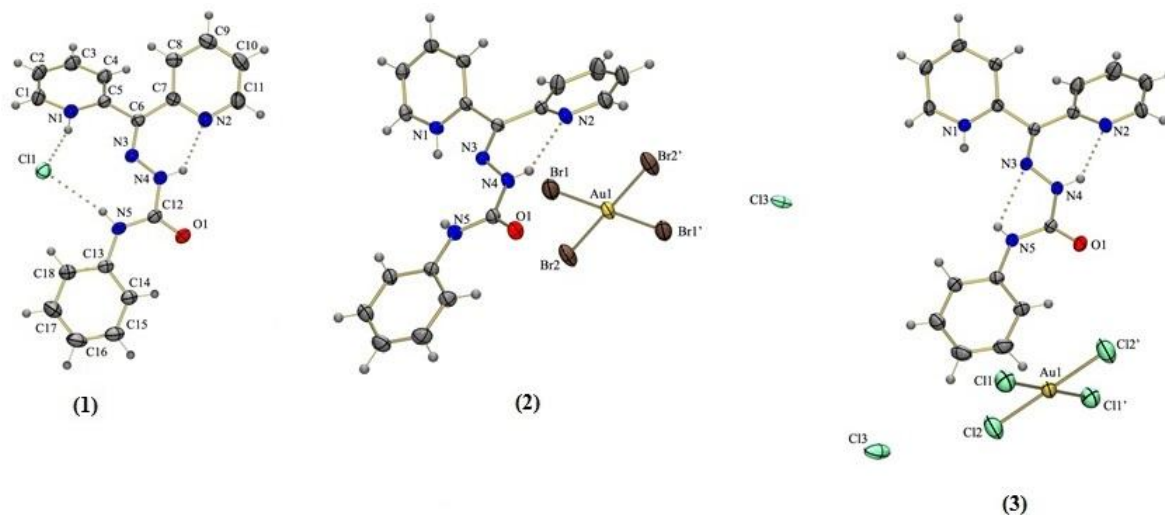


Figure 1. Graphical representation of the molecular structure of compounds (**1**), (**2**) and (**3**).

¹ Casas, J.S.; Tasende, M.S.G.; Sordo, J.; *Coord. Chem. Rev.* **2000**, 209, 197.

² Sriram, D.; Yogeewari, P.; Thirumurugan, R.; *Bioorg. Med. Chem. Lett.* **2004**, 14, 3923.

³ Bhaskar, R.; Salunkhe, N.; Yaul, A.; *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.* **2015**, 151, 621-627

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