Synthesis and characterization of new thiobenzamide-based Ru(II) complexes: potential anticancer agents

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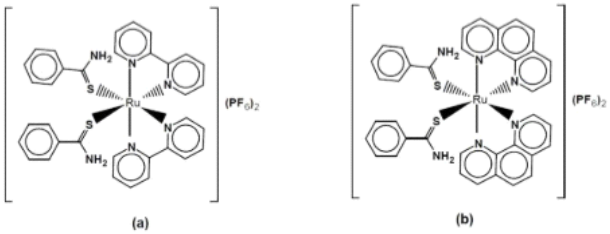
Cancer is a generic term used to refer to a broad group of diseases that can affect various areas of the human body, being an illness present and known to humanity for a long time. Currently, cancer is one of the most prevalent diseases worldwide, and its incidence could be reduced with programs promoting prevention and early detection. Furthermore, this disease is strongly associated with social and economic factors, predominantly affecting or having a greater impact on low-income countries where diagnoses are often delayed and affordable treatments are scarce. Due to its manifestation in different forms and organs, there is a need to obtain a variety of drugs. In this context, with the advancement of Chemistry, coordination compounds have emerged as a viable alternative to treat this illness. Ruthenium complexes have stood out for their low cytotoxicity compared to platinum-based chemotherapeutic complexes.[1] Ru(II) complexes are generally stabilized by ligands with strong π-acceptor character, such as phosphines, pyridines, and their derivatives.[2] This can influence the reactivity of other species coordinated to Ru(II). Moreover, ligands can be labile depending on their Lewis basicity and oxidation state variation (Ru(II)/Ru(III)), allowing controlled release, a feature widely explored in the development of ruthenium complexes as potential drugs. Therefore, the choice of ligands is crucial for the end activity of the complex. The literature reports cytotoxic activity of a complex based on thiobenzamide (TBz).[1] Complexes produced by our group containing the same ligand have also shown cytotoxic activity.* Based on this, *cis*-$[Ru(TBz)_2(L)_2](PF_6)_2$ complexes (Figure 1), where L = 2,2'-bipyridine (bpy) or o-phenanthroline (phen), were synthesized and characterized by voltammetry and spectroscopic techniques (IR, UV-vis, NMR ^1H and ^{13}C).

Figure 1- Structural formula of the complexes to be synthesized: (a) cis-$[Ru(TBz)_2(bpy)_2](PF_6)_2$ and (b) cis-$[Ru(TBz)_2(phen)_2](PF_6)_2$.



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