STABILITY OF GOLD(III) COMPLEXES WITH VARIOUS N,O-DONOR LIGANDS INCLUDING HYDRAZONES, MACROCYCLES AND BIOMOLECULES

Gamov G.A., Yarullin D.N., Logacheva O.I., Zavalishin M.N.
Ivanovo State University of Chemistry and Technology
153000, Ivanovo, Sheremetevskii pr., 7

Among metals suitable for medicinal use and likely to enter the organism, gold attracts significant interest. This is due to the many promising antitumor agents synthesized from gold(III) complexes, which are isostructural and isoelectronic to the established anticancer drug cisplatin. The antibacterial potential of gold(III)-based organometallic compounds is also under active investigation (see, e.g., paper [1]), and gold coatings are already utilized in surgical instruments. It is important to note, however, that gold(III) complexes typically function as prodrugs rather than active pharmaceutical agents; they require prior activation to exert a biological effect [2]. This activation may involve ligand substitution in the gold coordination sphere (e.g., *via* hydrolysis) or redox processes (oxidation/reduction).

As we demonstrated [3], the dissociation of a metal complex in the presence of a protein can lead to the formation of a metal-protein associate. Therefore, to completely describe behavior of gold(III) complexes in biological fluid, equilibria involving metal ions (or their simple complexes, such as tetrachloroaurate(III), since Au^{3+} itself cannot persist in aqueous solution) with biologically active ligands, proteins and DNA must be taken into account.

In this report, we are going to provide the values for stability constants of gold(III) complexes determined by us for such classes of N,O-donor ligands as pyridoxal or pyridoxal 5'-phosphate-derived hydrazones [4], 18-crown-6 ester and its aza-substituted derivatives, blood serum proteins including albumins [5] and γ-globulins [6], and DNA [7]. The information about the structure of the complexes formed derived from multispectroscopic approach as well as quantum chemical calculations is also to be discussed.

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