

Gold(I) complexes with selenones and triphenylphosphine as ligands

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Abstract

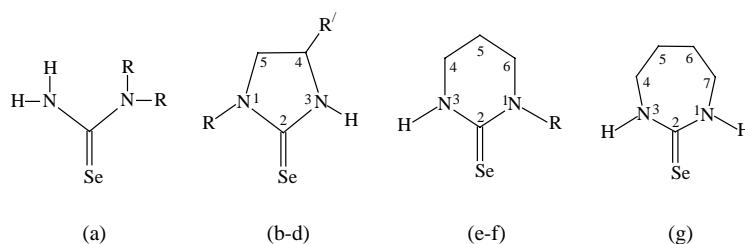
A number of mixed ligand complexes of gold(I) with various selenones and Ph_3P , $[\text{Ph}_3\text{PAuSe}=\text{C}<]\text{Cl}$ have been prepared and characterized by elemental analyses, i.r. and n.m.r. methods. A decrease in the i.r. frequency of the $\text{C}=\text{Se}$ mode of selenones upon complexation is indicative of gold(I) binding *via* a selenone group. An upfield shift in the ^{13}C -n.m.r. for the $\text{C}=\text{Se}$ resonance of selenones and downfield shifts in ^{31}P -n.m.r. for the Ph_3P moiety are consistent with the selenium coordination to gold(I). Available data in the literature suggest that $\text{P}-\text{Au}-\text{Se}$ type complexes are usually linear.

Introduction

Gold(I) complexes are of considerable importance in the treatment of rheumatoid arthritis [1, 2]. A number of Ph_3P gold(I) complexes have also been reported to possess anticancer activity [3, 4].

We have been investigating the coordination chemistry of $>\text{C}=\text{S}$ and $>\text{C}=\text{Se}$ ligands with d^{10} metal ions in an attempt to examine their mode of binding and to study their physical properties [5–8]. Recently, we reported the

synthesis and characterization of several $[\text{R}_3\text{PAuTu}]\text{Cl}$ [9] and $[\text{R}_3\text{PAuSeu}]\text{Cl}$ complexes [10, 11] (Tu, thiourea; Seu, selenourea). As an extension of our interest in the structural chemistry of metal–selenium interactions, we report here the synthesis and characterization of a series of mixed ligand gold(I) complexes incorporating Ph_3P and one of the selenones as ligands. Some of these complexes might have some potential biological applications. The structures of the selenones used in this study and their resonance assignments are described in Scheme 1.



- (a) $\text{R} = \text{Me}$; *N,N*-dimethylselenourea (DmSeu)
(b) $\text{R} = \text{R}' = \text{H}$; Imidazolidine-2-selenone (ImSe)
(c) $\text{R} = \text{Me}$, $\text{R}' = \text{H}$; *N*-methylimidazolidine-2-selenone (MeImSe)
(d) $\text{R} = \text{H}$, $\text{R}' = i\text{-Pr}$; *N*-(*i*-propyl)imidazolidine-2-selenone (*i*-PrImSe)
(e) $\text{R} = \text{H}$; 1,3-Diazinane-2-selenone (DiazSe)
(f) $\text{R} = \text{Me}$; *N*-methyl-1,3-Diazinane-2-selenone (DiazSe)
(g) 1,3-Diazipine-2-selenone (DiapSe)

Scheme 1

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