Ligand Properties of Tri(2-thienyl)- and Tri(2-furyl)phosphine and -arsine $(2\text{-}C_4H_3E)_3P/As$ (E = O, S) in Gold(I) Complexes

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Tri(2-thienyl)- and tri(2-furyl)phosphine and -arsine (L) have been introduced as ligands to gold(I) chloride and acetate (AuX). Structural studies have shown that in the 1:1 complexes of the type L-Au-X the gold atoms are bound exclusively to the phosphorus/arsenic centers without any intra- or intermolecular approach of the donor atoms of the three heterocycles towards the metal atoms. Intermolecular aurophilic bonding is found in the crystals of the [tri(thienyl)phosphine]gold acetate complex, but is absent in crystals of the chloride complexes. The phosphines L have been quaternized with methyl iodide and the resulting phosphonium salts [LMe]I structurally characterized to provide reference data as to the preferred configurational and conformational motifs. The mass spectra of the gold complexes indicate a high stability of the dinuclear cationic species $[(LAu)_2X]^+$ with X = Cl, OAc for all ligands L.

Key words: Gold Complexes, Heteroarylphosphines/arsines, Furylphosphines/arsines, Thienylphosphines/arsine, Phosphines, Arsines