

The Structural Chemistry of Gold(I) Quinoline-2-thiolate and Iodide Complexes of Polytertiary Phosphines

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Treatment of (chloro)gold(I) complexes of di- and tetra-tertiary phosphines with equivalent quantities of sodium quinoline-2-thiolate in methanol / dichloromethane affords the corresponding (phosphine)gold(I) quinoline-2-thiolates in high yields. The di- and tetranuclear complexes, respectively, of α,ω -bis(diphenylphosphino)-propane (**1**), -butane (**2**) and -pentane (**3**) and of tris(2-diphenylphosphino-ethyl)phosphine (**4**) have been obtained as crystalline solids, and the structures of **2** and **4** have been determined by single crystal X-ray diffraction studies. Unexpectedly, the molecules of **2** are loosely aggregated into strings via weak intermolecular gold-sulfur, not via Au...Au interactions. Compound **4** is a monomeric tetranuclear cluster in the solid state with two intramolecular gold-gold bonds. Bis(2-diphenylphosphino-ethyl)phenylphosphine (PPP) forms trinuclear complexes with gold(I) chloride, bromide and iodide (**5a - c**). The iodide complex features a chain structure through intermolecular Au...Au contacts between the two terminal P-Au-I units. The closest contacts between the chains are determined by Au...I and I...I interactions of the central P-Au-I unit.