Secondary Interactions in Gold(I) Complexes with Thione Ligands, 3. Three Ionic Dimesylamides [1, 2]

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Three structures of the form bis(thione)gold(I) di(methanesulfonyl)amide [thione = imidazolidine-2-thione, **1**; 1-methyl-imidazolidine-2-thione, **2**; thiazolidine-2-thione, **3**] were determined; all crystallize with one formula unit in the asymmetric unit. Each N-H hydrogen bond donor forms one classical two-centre hydrogen bond with an anion acceptor. Compound **1** thereby forms a complex layer structure with a layer thickness of 10.17 Å; the packing may be analysed in terms of thinner subunit layers consisting of interlinked, hydrogen-bonded chains and rings. Compound **2** forms a chain structure consisting of a series of "hairpin bends", a common feature in the gold complexes of 1-alkyl-imidazolidine-2-thiones. Compound **3** forms a corrugated ribbon structure in which the central region consists of parallel S-Au-S axes linked by aurophilic interactions; the anions exercise a "clamping" function by forming hydrogen bonds at the periphery of the ribbons. Further short contacts can be classed as weak hydrogen bonds C-H···X, with X = N, O, S or Au.

Key words: Aurophilicity, Thiones, Dimesylamides, Gold, Hydrogen Bonds