

Secondary Interactions in Gold(I) Complexes with Thione Ligands.

1. Three Ionic Chlorides

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Secondary interactions in the structures of [(etu)₂Au]⁺Cl[−]·H₂O (**1**), [(etu)₂Au]⁺Cl[−] (**2**) and [(Me-etu)₂Au]⁺Cl[−] (**3**) (etu = imidazolidine-2-thione) have been analysed. Within the cations, the torsion angle C-S⋯S-C is effectively the sole degree of freedom, and varies from almost eclipsed for **1** (−20°) *via* −79° for **2** to exactly 180° in **3**. Both **1** and **2** form ten-membered rings in which the water molecule or the chloride ion respectively act as hydrogen bond acceptor to two NH donors of the cation. Further classical hydrogen bonds lead to the formation of double layer structures. Compound **3**, in which the gold atom lies on an inversion centre and the chloride on a twofold axis, utilises its one N-H⋯Cl contact to form chains of hairpin bends, with Au⋯Cl contacts in the chain direction. Weak hydrogen bonds C-H⋯Cl and C-H⋯Au play at best a minor role in **1**, but are more pronounced in **2** and **3**.

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