

Bis(phosphane)copper(I) and silver(I) dithiocarbamates: crystallography and anti-microbial assay

ABSTRACT

The crystal and molecular structures of $(\text{Ph}_3\text{P})_2\text{M}[\text{S}_2\text{CN}(\text{Me})\text{CH}_2\text{CH}_2\text{OH}]$, $\text{M}=\text{Cu}$, isolated as a 1:1 dichloromethane solvate ($1 \cdot \text{CH}_2\text{Cl}_2$), and $\text{M}=\text{Ag}$ (**4**) show the central metal atom to be coordinated by a symmetrically ($1 \cdot \text{CH}_2\text{Cl}_2$) and asymmetrically chelating (**4**) dithiocarbamate ligand. The distorted tetrahedral geometries are completed by two PPh_3 ligands. The presence of hydroxyl— \cdots S(dithiocarbamate) hydrogen bonds leads to centrosymmetric dimeric aggregates in each crystal structure. In the molecular packing of $1 \cdot \text{CH}_2\text{Cl}_2$, channels comprising **1** are formed via aryl-C—H \cdots O interactions with the solvent molecules associated with the walls of the channels via methylene-C—H \cdots S, $\pi(\text{aryl})$ interactions. For **4**, the dimeric aggregates are connected via a network of aryl-C—H \cdots $\pi(\text{aryl})$ interactions. Preliminary screening for anti-microbial activity was conducted. The compounds were only potent against Gram-positive bacteria. Some further selectivity in activity was noted. Most notably, all compounds were active against methicillin resistant *Staphylococcus aureus*.

Keyword: Copper(I); Crystal structure analysis; Dithiocarbamate; Silver(I); X-ray diffraction