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

ABSTRACT

The crystal and molecular structures of (Ph3P)2M[S2CN(Me)CH2CH2OH], M=Cu, isolated as a 1:1 dichloromethane solvate (1·CH2Cl2), and M=Ag (4) show the central metal atom to be coordinated by a symmetrically (1·CH2Cl2) and asymmetrically chelating (4) dithiocarbamate ligand. The distorted tetrahedral geometries are completed by two PPh3 ligands. The presence of hydroxyl—···S(dithiocarbamate) hydrogen bonds leads to centrosymmetric dimeric aggregates in each crystal structure. In the molecular packing of 1·CH2Cl2, channels comprising 1 are formed via aryl-C–H···O interactions with the solvent molecules associated with the walls of the channels via methylene-C–H···S, π(aryl) interactions. For 4, the dimeric aggregates are connected via a network of aryl-C–H···π(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