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The coordination compounds of copper(I) with heterocyclic thione donors as ligands have been of considerable interest because of their stereochemistry. Many Cu complexes coordinated by sulfur atom donors have been synthesized and characterized by X-ray analysis [1]. Also it has been found that the II group metals form a wide range of tertiary phosphine (R_3P) complexes of the general stoichiometry LnMX (L = R_3P, n = 1–4) [2,3]. The value of n and the net electronic charge on the complex are somewhat dependent upon the coordinating ability of X. Also, the transition metals dithiolates containing MS_4 chromophores show interesting variations in their reactions with Lewis bases [4]. In this paper, we report the crystal structure of the title compound. Its structure contains two copper(I) bispropyldithiocarbamatobis(triphenylphosphine) dichloromethane solvate molecule, $Cu[(n\text{-}Pr)_2dtc(PPh_3)_2]\ CH_2Cl_2$. The Cu(I) ion is four-coordinated, forming a distorted tetrahedron. Fig. 1 shows the title compound with atom labeling. Selected bond distances and angles are listed in Table 1. Crystallographic data of the title compound have been deposited at the Cambridge Crystallographic Data Centre as deposition No. CCDC 149634.

The dithiocarbamate functions as a bidentate ligand coordinating through the S atom with the Cu–S distance of 2.4036(16) and 2.463(15) Å. The other positions of the tetrahedron are occupied by two triphenylphosphine ligands. The Cu–P distances [2.2516(15), 2.2763(15) Å] are comparable to those found in $(PPh_3)_2Cu(C_2H_4N_2S_2)Br$ [8] and $[Cu(HOPhCHNNHCSNH_2)(PPh_3)_2X]$ (X = I, Br) [9]. The P–Cu–P angles [124.09(5)] are in good agreement with values reported for other bis(triphenylphosphine)copper(I) compounds such as $[Cu(Py_2SH)(PPh_3)_2Br]$ [10] (125.0(2)), $[Cu(PPh_3)_2(C_2H_4N_2S_2)Br]$ [8] (123.8(2)). The four-membered CuS_2C structural unit is nearly planar. Cu lie 0.042 out of CuS_2 plane. The bite angle between the chelate ring and the plane of open C(37), N, S_2 group is 10.01 . The bond length of Cu–S(1) [2.4063(16) Å] is little longer than that of Cu–S(2) [2.4036(15) Å] because of the

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bond length of S(2)–C(37) [1.718(5) Å] being little longer than that of S(1)–C(37) [1.712(5) Å]. The C–S bond lengths are shorter than the single bond length of 1.81 Å. They are closer to the C=S distance of 1.69 Å, indicating partial double bond character. The N–C(37) bond length of 1.323(6) Å is normal, suggesting the double bond character. The bond parameters of the dithiocarbamate groups are normal. The P–C bond distances are also normal, with an average value of 1.832 Å. The C–P–C angles deviate appreciably from the ideal tetrahedral angle of 102.7 Å. The C(l) atoms of dichloromethane solvate molecule are disordered.

Table 1. Selected bond lengths (Å) and angles (°).

Cu1 P2	2.2516(15)	Cu1 P1	2.2763(15)
Cu1 S2	2.4036(16)	Cu1 S1	2.4063(15)
P1 C1	1.817(4)	P1 C7	1.831(4)
P1 C18	1.844(5)	P2 C31	1.822(5)
P2 C25	1.831(5)	P2 C19	1.838(5)
S1 C37	1.718(5)	S2 C37	1.712(5)
C1 C6	1.372(6)	C14 C2	1.414(6)
P2–Cu1–P1	124.09(5)	P2 –Cu1–S1	119.67(6)
P1 –Cu1 –S1	106.03(5)	P2 –Cu1 –S2	101.73(6)
P1 –Cu1 –S2	111.11(6)	S1 –Cu1 –S2	74.56(6)
C1– P1 –C7	102.04(18)	C1 –P1 –C18	102.50(19)

Symmetry transformations used to generate equivalent atoms: #1: –x, –y, –z.

To a heated aqueous solution of Na(Pr$_2$dtc) [2.00 g, 0.01 mol] was added an EtOH solution of copper(II) perchlorate [CuClO$_4$ 6H$_2$O, 2.00 g, 0.054 mol] with stirring. The brown precipate was deposited. Upon collection by filtration, the deposit was

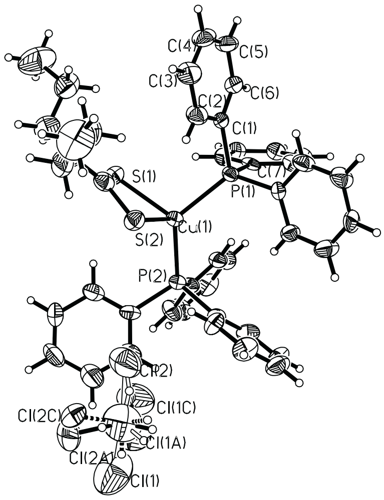

Figure 1. The structure of title compound showing 30% probability displacement ellipsoids and the atom-numbering scheme.

washed with water, dried overnight in air. Above brown solid was dissolved in EtOH, triphenylphosphine was added at 80–90 C with stirring, refluxing 4–5 hours, and cooling. The colorless solution obtained was filtered and left for evaporation. After one day, the colourless solid separated out and was recrystallized from EtOH. Single crystals suitable for X-ray analysis were obtained by a slow evaporation at room temperature from a EtOH/CH_2Cl_2 solvent.

Crystal data: $[(n\text{-}Pr)_2dtc(PPh_3)_2]Cu\ CH_2Cl_2$; Mr = 847.32; Triclinic; P-1; a = 12.582(3) Å; b = 13.203(3) Å; c = 15.114(3) Å; β = 90.01(3) ; Z = 2; V = 2204.4(8) $Å^3$ D_x = 1.277 mg/m^3; Mo K_α radiation; = 0.71073 Å; = 1.76–24.99 ; = 0.813/mm; 0.30 0.26 0.20 mm^3; T = 293 K; Prism; Brown.

Data collection: Four-circle CAD-4 diffractometer; /2 scans; Absorption correction; Empirical; 7680 Reflections collected; 4000 Independent reflections with I > 2 (I); R_{int} = 0.0717; h = 0 14 k = –15 13 l = –17 17; GOF = 1.033, 507 parameter; $(\Delta/\ )_{max}$ = 0.862; $\Delta\ _{max}$ = –0.740 e/$Å^3$; Extinction correction: none.

Empirical absorption corrections were carried out by *SADABS* [5] program. The structure of the title compound was solved by direct methods and refined by least squares on F^2_{obs} by using the *SHELXTL* [6] software package. All non H atoms were anisotropically refined. The hydrogen atoms were located by difference synthesis and refined isotropically. The final conventional R(F) = 0.0717 and wR(F^2) = 0.1886 for $I > 2\ (I)$ with weighting scheme, $w = 1/[\ ^2(F^2) + (0.0900P)^2 + 0.000P]$, where P = $(F^2 + 2Fc^2)/3$. The molecular graphics were plotted using *SHELXTL* [6]. Atomic scattering factors and anomalous dispersion corrections were taken from the International Tables for X-ray Crystallography [7].

Acknowledgments

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