The chemistry of palladium(II) and platinum(II) with dithio ligands such as xanthate, dithiocarbamate and dithiophosphates is well developed. However, the chemistry of these metals in +1 oxidation state with these ligands has not received much attention. Thus in order to obtain palladium(I) complexes, we explored the redox reaction involving palladium(0) and palladium(II) complexes. In all these reactions, however, only palladium(II) complexes were found. The crystal structure of the title compound, (Fig. 1) 1, has been determined and is presented. The title compound, [Pd{S2P(O)(OPr i)}(PPh3)2], prepared according to the literature method 1, was obtained as yellow crystals in 47% yield from acetone-hexane. The melting point of this crystal is 200˚C.

A view of the molecule together with atomic numbering scheme is shown in Fig. 2. The structure consists of discrete monomeric molecules with square planar con-
configuration around palladium, which is coordinated with two cis PPh$_3$ ligands and a symmetrically chelated (Pr iO)(O)PS$_2$ group. Although Pd-P bond distances are in the range reported in a number of Pd(II) phosphine complexes, one of the bonds Pd1-P3 is slightly longer (ca. 0.02 Å) than the other. This difference makes the two PPh$_3$ ligands different which is manifested in the $^{31}$P NMR spectra (two closely spaced $^{31}$P signals). Because of the four-membered chelate ring, the angle S$_1$–Pd$_1$–S$_2$ has been compressed to 83.26(9)° while the P$_2$–Pd$_1$–P$_3$ has opened to 98.61(8)°. The maximum 2$\theta$ for data collection is 45.0°. The data collection would not go beyond this limit, because the crystal quality was not good. All the H-atoms were fixed geometrically and refined using constraint with isotropic temperature factor with 0.12 Å$^2$ and 0.08 Å$^2$.

The authors (KP and THL) thank the National Science Council for support under grants NSC88-2811-M007-0004 and NSC88-2112-M007-013. One of the authors (SN) is grateful to DAE for the award of a Senior Research Fellowship to him. The authors thank Drs. J. P. Mittal and C. Gopinathan for their encouragement of this work.

References


(Received October 29, 1998)

(Accepted February 8, 1999)