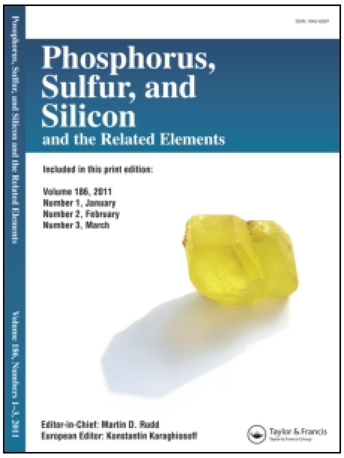

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Hypervalent Tellurium Compounds Containing Te-N Interactions. Mononuclear and Polynuclear Derivatives

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Various organotellurium derivatives containing the pendant arm $(2\text{-}Me_2NCH_2)C_6H_4$ group have been prepared and characterized. The structure of a hydrolysis by-product, $[(Ph_2TeCl)_2O]_2$, was also established.

Keywords: tellurium; hypervalent compounds; phosphorus ligands

INTRODUCTION

The chemistry of organotellurium compounds containing intramolecular N→Te interactions received considerably interest in recent years due to their enhanced thermal and hydrolytic stability[1,2]. In order to investigate the effect on the N→Te interaction of the ligand *trans* to nitrogen we decided to use dithio ligands. A few organotellurium compounds containing both *ortho*-tellurated benzylamino and dithiocarbamato ligands have been reported so far, *e.g.* $RTeS(S)CNR'_2$[3] and $RTe[S(S)CNEt_2]_3$[3,4], but no derivatives containing thiophosphorus ligands are described[5].

Here we report on the synthesis and characterization of various $[2\text{-}(Me_2NCH_2)C_6H_4]TeS(S)PR_2$ [R = Me, Et, Ph,) as well as the molecular structure of $[2\text{-}(Me_2NCH_2)C_6H_4Te]_2$, $[(Ph_2TeCl)_2O]_2$ and $[2\text{-}(Me_2NCH_2)C_6H_4]TeS(S)PPh_2$.

RESULTS AND DISCUSSION

The diorganoditelluride, $[2\text{-}(Me_2NCH_2)C_6H_4Te]_2$, was prepared according to a literature method[4] and its molecular structure was determined by X-ray diffractometry (Fig. 1). The crystal consists of monomeric dinuclear molecules which exhibit a T-shaped geometry around both tellurium atoms as result of the intramolecular N→Te [N···Te 2.84, 2.90 Å] interactions. The cordination geometry around the Te atoms can be described as *pseudo*-trigonal bipyramidal, with N and the second Te atoms in axial positions [N···Te-Te 166.2, 169.4°] and two lone pairs and the carbon atom in the equatorial plane.

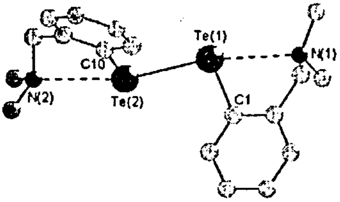

Fig. 1. View of the structure of $[2\text{-}(Me_2NCH_2)C_6H_4Te]_2$.

The reaction of Ph_2TeCl_2 and $[2\text{-}(Me_2NCH_2)C_6H_4]Li$ affords isolation of [2-(Me_2NCH_2)C_6H_4]$TePh_2Cl$. During evaporation of a $CDCl_3$/DMSO solution used for recording the NMR spectra, few crystals of a hydrolysis product, *i.e.* [(Ph_2TeCl)$_2$O.(CH_3)$_2$SO, were isolated. The crystal contains two similar independent molecules and the solvent molecules are disordered. The bridging nature of one of the Cl atoms from the monomeric unit [Cl(2)-Te(2) 2.815, Cl(2)-Te(1') 3.326 Å] results in a dimeric structure, [(Ph_2TeCl)$_2$O]$_2$ (Fig. 2), containing an eight-membered $Te_4O_2Cl_2$ inorganic ring. *Trans*-annular Te···Cl (3.59 Å) interactions are also present, leading to a condensed polycyclic system.

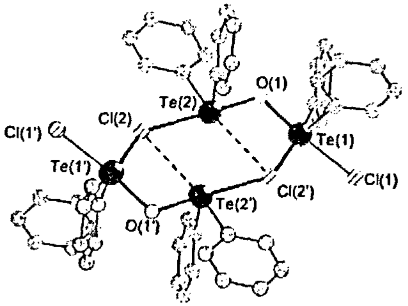

Fig. 2. View of the structure of [(Ph_2TeCl)$_2$O]$_2$.

The reaction between this diorganoditelluride and the corresponding disulfane, [$R_2P(S)S$]$_2$ (R = Me, Et, Ph) affords isolation of diorganodithiophosphinato derivatives:

$$[2\text{-}(Me_2NCH_2)C_6H_4Te]_2 + [R_2P(S)S]_2 \longrightarrow$$

$$\longrightarrow 2\,[2\text{-}(Me_2NCH_2)C_6H_4]TeS(S)PR_2$$

All compounds were characterized by multinuclear NMR spectroscopy (^1H, ^{13}C and ^{31}P) and the molecular structure of

$[2\text{-}(Me_2NCH_2)C_6H_4]TeS(S)PPh_2$ has been determined (Fig. 3). The compound is almost T-shaped as a result of the N→Te (2.439 Å) intramolecular interactions. The dithio ligand is monodentate [Te(1)-S(1) 2.5416 Å] and twisted to bring the non-bonded S(2) atom much closer to the tellurium atom [Te(1)⋯S(2) 3.878 Å].

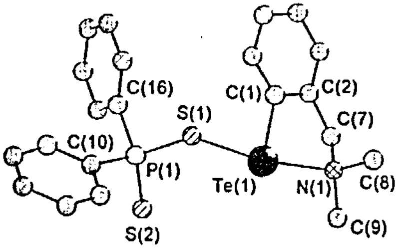

Fig. 3. View of the structure of $[2\text{-}(Me_2NCH_2)C_6H_4]TeS(S)PPh_2$.

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