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### Coordination of Trimethylphosphine with Pentaphenyltelluronium Salts

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## COORDINATION OF TRIMETHYLPHOSPHINE WITH PENTAPHENYLTELLURONIUM SALTS

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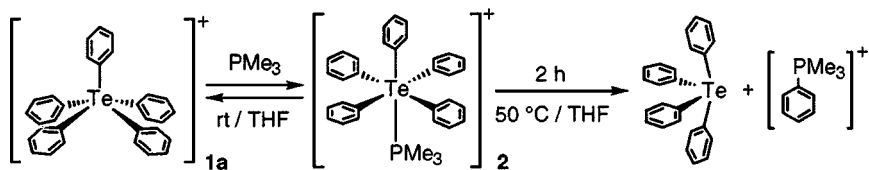
Recently we reported synthesis of the first hypervalent tellurium cation,  $\text{Ph}_5\text{Te}^+(\text{C}_6\text{F}_5)_4\text{B}^-$  **1a**.<sup>1</sup> Pentaphenyltelluronium in **1a** is free from interaction with its counteranion and has square pyramidal structure which is rare in pentasubstituted main group element compounds. In the case of telluronium having large counteranion,  $\text{Ph}_5\text{Te}^+[\text{3,5}-(\text{CF}_3)_2\text{C}_6\text{H}_3]_4\text{B}^-$ , **1b**, tellurium center is weakly coordinated by nitrogen atom of  $\text{CH}_3\text{CN}$  derived from recrystallization solvent in the solid state.<sup>2</sup> Here we report the coordination reaction between the telluronium and  $\text{PMe}_3$ .

The reaction of **1a** and an equimolar amount of  $\text{PMe}_3$  was carried out in THF solution in a sealed tube. At  $-90^\circ\text{C}$ , the  $^{125}\text{Te}$  NMR resonance of the mixture was observed as sharp signals along with large  $^{31}\text{P}$ - $^{125}\text{Te}$  coupling constant ( $J = 787$  Hz) which was shifted to higher field ( $\delta$  573) relative to the free state ( $\delta$  659). The same large coupling constant and lower field shift was also observed in the  $^{31}\text{P}$  NMR ( $\delta$   $-31.8$ ).

These observations indicated that the coordinated compound **2** was formed and the tellurium-phosphorus bond in this complex possessed a covalent bond character at a low temperature in solution. Since broad signals were observed in both NMR at room temperature, tellurium-phosphine complex may exist in the dissociation equilibrium between **1a** and **2**.

Although the isolated telluronium is thermally very stable, the phosphorus complex **2** gradually underwent decomposition in THF solution via ligand coupling reaction. This reaction proceeded at  $50^\circ\text{C}$  and was completed after 2 h leading to the quantitative formation of the phosphonium salt,  $\text{PhMe}_3\text{P}^+(\text{C}_6\text{F}_5)_4\text{B}^-$ , along with tetraphenyltellurium and its decomposition product.

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## SCHEME 1

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