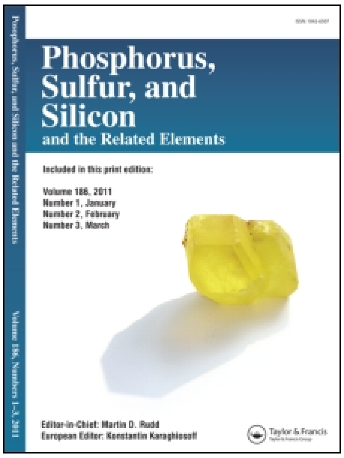

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SYNTHESIS AND REACTIONS OF THE FIRST STABLE PHOSPHABISMUTHENE, A NOVEL COMPOUND WITH PHOSPHORUS-BISMUTH DOUBLE BOND

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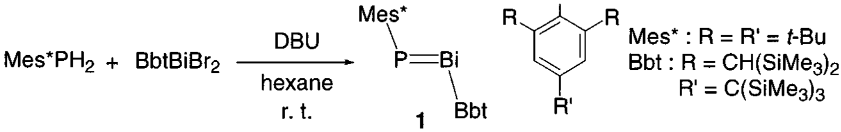
The syntheses, structures, and reactivities of multiple bonds between heavier main group elements have attracted wide interest as one of the active areas of chemical research. Very recently, we have succeeded in the synthesis of the first stable stibabismuthene (BbtSb=BiBbt)[1] by taking advantage of efficient steric protection groups, 2,6-bis-[bis(trimethylsilyl)methyl]-4-[tris(trimethylsilyl)methyl]phenyl (Bbt). However, there is no example of a heteronuclear doubly bonded system between phosphorus and bismuth. This article presents the synthesis of the first stable phosphabismuthene **1**.



SCHEME 1

Condensation reaction of $BbtBiBr_2$ with Mes^*PH_2 in the presence of 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU) as a base afforded phosphabismuthene **1** in 91% yield (estimated by ^1H NMR). Compound **1** is not only a new example of a novel class of heteronuclear doubly bonded systems between group 15 elements, but also the first example of a stable species with a double bond between the third and sixth row main group elements. The ^{31}P NMR (C_6D_6, 120 MHz) spectrum of **1** showed a signal characteristic of a low-coordinated phosphorous atom at very

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Address correspondence to Norihiro Tokitoh, Institute of Chemical Research, Kyoto University, Gokasho, Uji, Kyoto, 611-0011, Japan. E-mail: tokitoh@boc.kuicr.kyoto-u.ac.jp low field (612 ppm). The result of the X-ray crystallographic analysis of a green crystal of **1**·0.5(hexane) revealed the noteworthy P—Bi bond length of 2.4541(6) Å, which is just in the middle between P=P and Bi=Bi double-bond lengths. Thus, these results suggested that **1** features a double bond between P and Bi atoms in the solid state and even in solution.

REFERENCE

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