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### SIMPLE METHOD FOR THE SYNTHESIS OF STANNOLE DIANION

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## SIMPLE METHOD FOR THE SYNTHESIS OF STANNOLE DIANION

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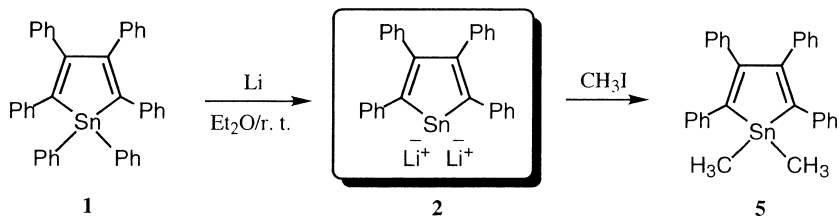
*Reduction of 1-*t*-butyl-1,2,3,4,5-pentaphenylstannole by lithium gave the stannole dianion. Reduction of the bi(1,1-stannole) having a *t*-butyl group on the tin by lithium also gave the stannole dianion, the formation of which was evidenced by spectral analysis and chemical trapping reaction.*

**Keywords:** 1-*t*-Butyl-1-phenylstannole; bi(1,1-stannole); reduction; stannole dianion

Recently, much attention has been focused on anions and dianions of siloles and gerroles, heavier congeners of cyclopentadienyl anion having aromaticity.<sup>1</sup> In contrast to the well-investigated dianions of siloles and gerroles, no report on dianions of stannole had been published before we succeeded in the first synthesis of a stannole dianion by the reduction of a newly synthesized bi(1,1-stannole) having a phenyl group on the tin.<sup>2</sup> Very recently, we have reported that the reduction of hexaphenylstannole **1** also gave the stannole dianion **2** together with phenyl lithium, as evidenced by <sup>1</sup>H, <sup>13</sup>C, and <sup>119</sup>Sn NMR analysis.<sup>3</sup> Reductive elimination of a phenyl group on the tin prompted us to investigate the reduction of other stannoles having an alkyl group on the tin. We report herein the synthesis of stannole dianion **2** from *t*-butyl-substituted stannoles, **3** and **4**.

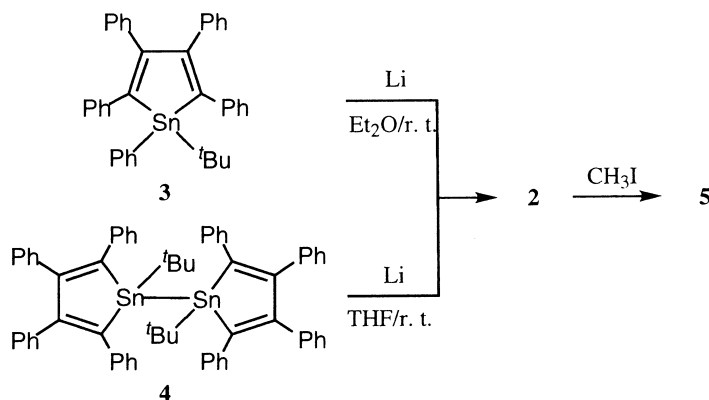
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## RESULTS AND DISCUSSION

Reaction of 1-*t*-butyl-1,2,3,4,5-phenylstannole (**3**) with lithium in ether gave a deep red solution, suggesting the formation of an anionic species. Treatment of the reaction mixture with methyl iodide gave the 1,1-dimethylstannole **5** in 67% yield. The formation of **5** was reasonably interpreted in term of the formation of stannole dianion **2**. Reductive elimination of a *t*-butyl group on the tin prompted us to investigate the reduction of bi(1,1-stannole) **4**.<sup>4</sup> Reaction of **4** with lithium in THF\* also gave a deep red solution. The  $^{13}\text{C}$  NMR spectrum of the reaction mixture showed the formation of stannole dianion **2**<sup>2</sup> as a main product. Treatment of the resulting solution with methyl iodide gave **5** in 21% yield.



In summary, reductive elimination of a *t*-butyl group of stannoles **3** and **4** gave the stannole dianion **2**.

\*Bi(1,1-stannole) **5** is sparingly soluble to ether.

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