

This article was downloaded by:

On: 29 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

Synthesis of Small-Ring Sulfur Compounds Containing Germanium and Tin

Renji Okazaki^a; Yasusuke Matsushashi^a; Tsuyoshi Matsumoto^a; Masaichi Saito^a; Kyoko Manmaru^a; Norihiro Tokitoh^a

^a Department of Chemistry, Faculty of Science, The University of Tokyo, Tokyo, Japan

To cite this Article Okazaki, Renji , Matsushashi, Yasusuke , Matsumoto, Tsuyoshi , Saito, Masaichi , Manmaru, Kyoko and Tokitoh, Norihiro(1993) 'Synthesis of Small-Ring Sulfur Compounds Containing Germanium and Tin', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 74: 1, 397 – 398

To link to this Article: DOI: 10.1080/10426509308038133

URL: <http://dx.doi.org/10.1080/10426509308038133>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

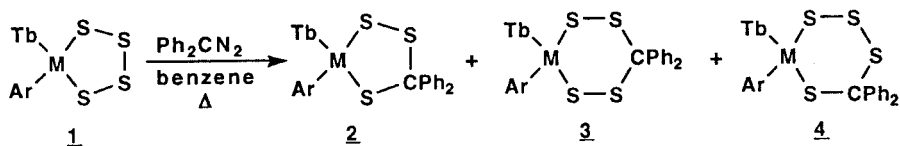
SYNTHESIS OF SMALL-RING SULFUR COMPOUNDS CONTAINING GERMANIUM AND TIN

RENJI OKAZAKI, YASUSUKE MATSUHASHI, TSUYOSHI MATSUMOTO, MASAICHI SAITO, KYOKO MANMARU, AND NORIHIRO TOKITOH

Department of Chemistry, Faculty of Science, The University of Tokyo, Hongo, Tokyo 113, Japan

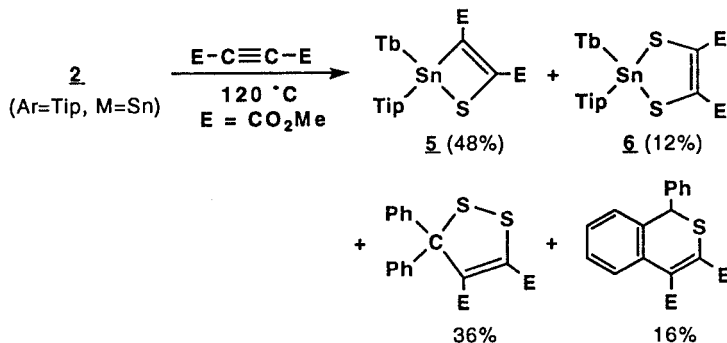
Abstract Synthesis of some novel types of four-membered organosulfur compounds containing germanium and tin by [2+2]cycloaddition of germanethione ($R_1R_2Ge=S$) and stannanethione ($R_1R_2Sn=S$) intermediates is reported.

1,2,4,3-Trithiametallolanes (**2**) were synthesized by the reaction of 1,2,3,4,5-tetrachalcogenametallolanes (**1**)¹ with diphenyldiazomethane followed by dechalcogenation with a trivalent phosphorus reagent. **3** and **4** were reacted with $P(NMe_2)_3$ to give **2**.



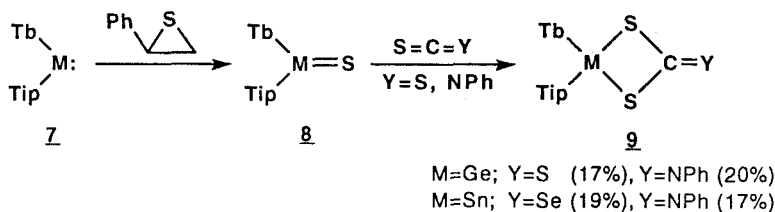
M = Ge, Sn

Ar = mesityl(Mes), 2,4,6-triisopropylphenyl(Tip)

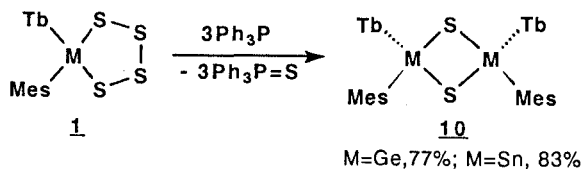


2 (Ar=Tip, M=Sn) reacted with dimethylacetylene dicarboxylate (DMAD) upon heating to give a new type of sulfur heterocycles **5** and **6** containing tin, suggesting the intermediacy of Tb(Tip)Sn=S and Tb(Tip)SnS₂. **2** (M=Ge) underwent a similar reaction with DMAD.

Reaction of germylene (**7**, M=Ge) or stannylene (**7**, M=Sn), generated *in situ* in solution, with styrene episulfide followed by addition of thiocumulenes (S=C=Y; Y=S, NPh) afforded novel heterocycles **9** via [2+2]cycloaddition of **6** with the thiocumulenes.



Dechalcogenation of **1** (Ar=Mes) with triphenylphosphine (3 eq.) gave *cis*-**10** stereospecifically.



Some structures of newly obtained **5**, **9**, and **10** were determined by X-ray crystallography.

Some four-membered selenium compounds of similar structures were also synthesized.

REFERENCES

1. N. Tokitoh, H. Suzuki, T. Matsumoto, Y. Matsuhashi, R. Okazaki, and M. Goto, *J. Am. Chem. Soc.*, **113**, 7047 (1991).