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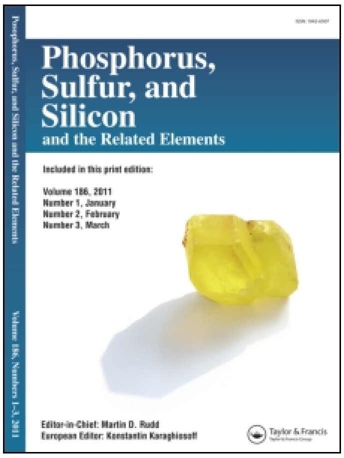

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Barbara Gehrhus; Michael F. Lappert

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NOVEL RING SYSTEMS BY REACTION OF A STABLE BIS(AMINO)SILYLENE WITH MULTIPLY BONDED COMPOUNDS

BARBARA GEHRHUS AND MICHAEL F. LAPPERT
The Chemistry Laboratory, University of Sussex,
Brighton UK, BN1 9QJ

Oxidative addition reactions of the stable bis(amino)silylene **1** with ketones, imines, nitriles, azides and aza- or oxadienes which have led to three-, four- or five-membered ring systems are described and discussed.

Keywords: Silylene, Oxidative addition reactions, Cycloadditions

INTRODUCTION

One of the most common reactions which transient silylenes undergo are oxidative additions with multiply bonded compounds, whereby a [1+2]-cycloaddition is believed to be the first step. The so formed three-membered ring compound is in the majority of cases not stable and reacts further, *e.g.*, to dimerise,[1] although stable silaoxiranes and silacyclopropenes have been described.[2]

We previously reported the synthesis and characterisation of a bis(amino)silylene $\overline{\text{Si}[\{\text{N}}(\text{CH}_2\text{Bu}^t)\}_2\text{C}_6\text{H}_4\text{-1,2}]$ **1**, which is thermally stable but highly reactive; **1** gave the tetravalent silicon compounds [1(X)Y] (X = Me or EtO and Y = I or H) or the cyclodisilachalcogenides $\overline{1\text{E}1\text{E}}$ (E = S, Se or Te).[3]

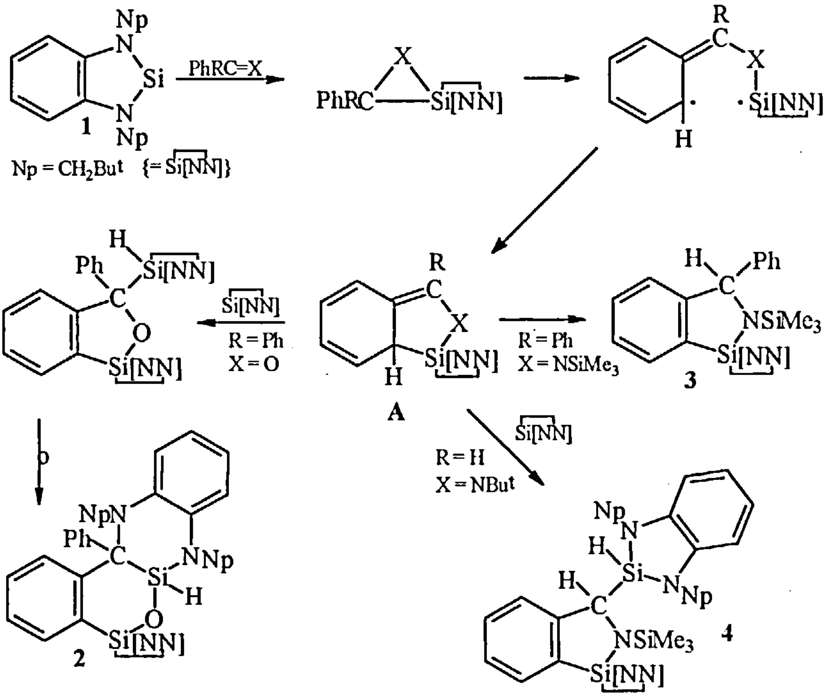
RESULTS AND DISCUSSION

The reaction of **1** with ketones, nitriles or acetylenes led to four-membered ring systems; disilaoxetanes for RR'C=O (R = R' = Ph; or R = Me, R' = Bu^t), a disilaazetine for Bu^tCN, or a disilabutene for PhCCSiMe_3. With adamantyl azide, depending on the mode of addition of the reactants, either a silaaziridine or a cyclosilatetrazole was obtained.[4]

Treatment of **1** with Ph_2CO in benzene at 60°C led to the isolation of the tetracyclic compound **2**. The suggested mechanism (by analogy, *cf.* ref. 5) is illustrated in Scheme 1.[6] Thus, we propose that a 1,5-diradical is formed which recombines to give the intermediate **A**, followed by first a formal insertion of **1** into a C-H bond and then a rearrangement to yield **2**.

Reaction of **1** with imines did not give four-membered ring products. Instead we obtained compound **3** by reaction with

$Ph_2C=N(SiMe)_3$, or **4** with PhCH=NBu^t;[4] a similar mechanism is believed to be operative as that for the formation of compound **2**.



Scheme 1

Reaction of **1** with 1-aza- or 1-oxa- and 1,4-diaza- or 1,4-dioxadienes showed similar results compared to transient silylenes[7] and yielded the corresponding 1-aza-, 1-oxa-, 1,4-diaza- or 1,4-dioxasilacyclopentenes.

Acknowledgements

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