

Novel Template Synthesis for Disilacycloalkanes Utilizing Reactivity of a Siloxane Bond

(Graduate School of Urban Environmental Science, Tokyo Metropolitan University)

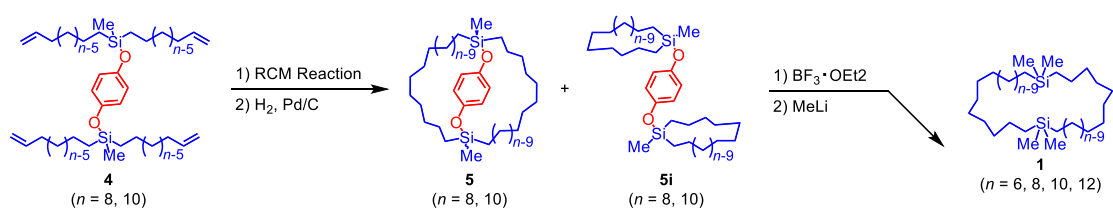
○Yuyang Tu, Yusuke Inagaki, Wataru Setaka

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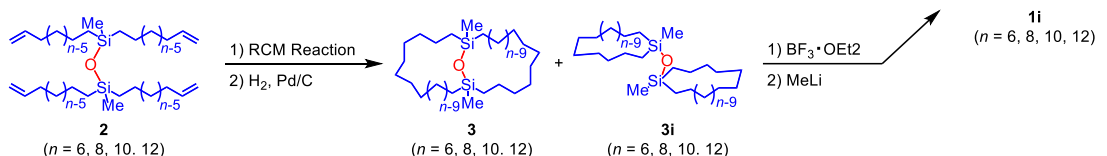
Macrocyclic compounds with flexible structures are generally much more difficult to synthesize than those with rigid structures. Previously, we reported the synthesis of two kinds of disilacycloalkanes **1**, starting from dihydroxybenzene templated compounds **4** with two different lengths of alkene chains **C8** and **C10** (Method A).¹⁾ Their structures in both solution and solid-state were also discussed. However, there were three issues that make low yields of the target compounds **1**.¹⁾ Intermediate compounds **5** and **5i** were easily decomposed because of the chemically liable Si-O bonds. Synthesis of a smaller size (**C6**) derivatives are difficult due to large size of the template. The selectivity of the ring-closing metathesis (RCM) reactions was particularly unsatisfactory making the yield of the disilacycloalkanes lower.

Herein, we developed a more efficient and selective method for the synthesis of disilacycloalkanes utilizing the reactivity of a siloxane bond (Method B). Particularly, this novel method showed high selectivity for desired cyclic compounds **3**. Also, siloxane-based compounds were extremely stable which make us successfully synthesize compound **1** with larger and smaller sizes (**C6** and **C12**). In this talk, the details of the synthesis and properties of the final compounds and intermediates will be discussed.

Method A (Previous Study¹⁾)



Method B (This Study)



1) Tu, Y.; Inagaki, Y.; Kwon, E.; Setaka, W. *Chem. Lett.* **2021**, 50 (7), 1397–1399.