Synthesis of Butterfly Cages

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Silsesquioxanes, siloxane compounds shown in the general formula $(RSiO_{1.5})_n$, are now recognized as an important building block for well-defined materials. There are various structures like cage, ladder, partial cage, or random. Among them, cage silsesquioxanes have been most intensively studied and applied to materials. In 2016, our group reported the facile synthesis and structure of Janus Cube silsesquioxane.[1] As ongoing research on cage silsesquioxanes with new structures, we are currently focusing on the silsesquioxanes with larger cages.

In this contribution, we will present our latest results on our novel cage systems based on double-decker silsesquioxanes.[2] As shown in Figure 1, these compounds contain silsesquioxane core (body) with flexible siloxane rings (wings). With these unique structures, butterfly cages are expected to show functions like host molecules, materials with new properties, and new building blocks. Synthesis, structure elucidation, and thermal properties will be discussed in detail.

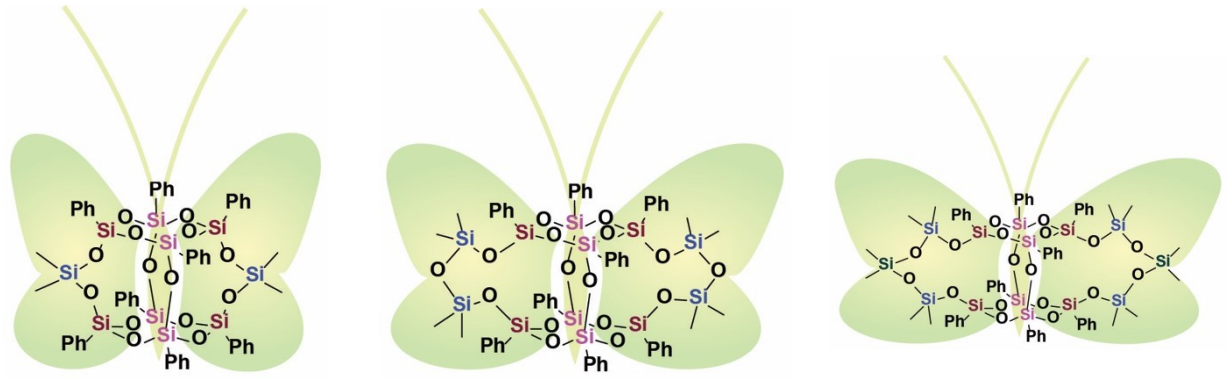

Figure 1. Structures of Butterfly Cages.

[1] N. Oguri, Y. Egawa, N. Takeda, and M. Unno, *Angew. Chem. Int. Ed.* **2016**, *55*, 9336-9339.
[2] Details of this study will be presented in Poster Session in this symposium by Rungthip Kunthom, Gunma University.