Invitation to a John van Geuns Foundation lecture by

Prof. Michael Mastalerz

Organisch-Chemisches Institut, Ruprecht-Karls-Universität Heidelberg,
Heidelberg, Germany

Shape-Persistent Organic Cages and their Catenanes

Tuesday 17 June 2025, D1.116, 10:15 am



The synthesis of shape-persistent organic cages by reversible bond formations is meanwhile an established method to generate a plethora of different structures and geometries of functional molecular cages from rather simple building blocks in one step.[1] When structurally related but different building blocks are reacted, self-sorting processes can occur,[2,3] which is presented in the first part of the talk.

The formation of catenated cages will be discussed in the second part of the talk.[4,5,6] Here, by various substituents in combination with different solvents, catenation events can be controlled giving preferably monomeric, dimeric, or trimeric (catenated) cages.

Finally, a fundamental understanding of underlying weak interactions will pave the way to be able to achieve even larger catenated oligomeric structures.

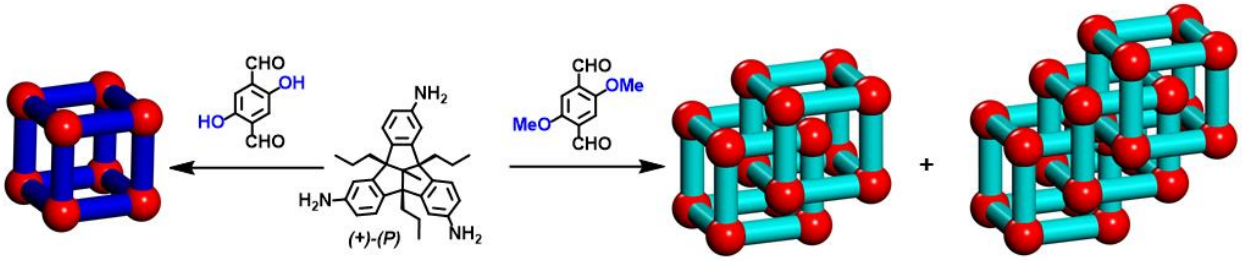


Figure 1. Substituent directed self-assembly to dimeric and trimeric catenanes.

References

[1] M. Mastalerz, *Acc. Chem. Res.* **2018**, *51*, 2411-2422.
[2] D. Beaudoin, F. Rominger, M. Mastalerz, *Angew. Chem. Int. Ed.* **2017**, *56*, 1244-1248.
[3] P. Wagner, F. Rominger, W.-S. Zhang, J. H. Gross, S. M. Elbert, R. R. Schröder, M. Mastalerz, *Angew. Chem. Int. Ed.* **2021**, *60*, 8896-8904.
[4] G. Zhang, O. Presly, F. White, I. M. Oppel, M. Mastalerz, *Angew. Chem. Int. Ed.* **2014**, *53*, 5126-5130.
[5] B. P. Benke, T. Kirschbaum, J. Graf, J. H. Gross, M. Mastalerz, *Nat. Chem.* **2023**, *15,* 413-423.
[6] P. Wagner, F. Rominger, J.H. Gross, M. Mastalerz, *Angew. Chem. Int. Ed.* **2023**, *62*, e20221725.