

Secondary structures formed by [6]cycloparaphenylene

Utah Mashiko^a, Sieun Choi^a, Yuki Nagai^a, Takanobu Minakawa^b, Shunji Kurosu^c
and Toru Maekawa^{a,b,c}

^a Graduate School of Interdisciplinary New Science, Toyo University

^b Department of Biomedical Engineering, Toyo University

^c Bio-Nano Electronics Research Centre, Toyo University

Cycloparaphenylene (CPP) is a cyclic molecule in which benzene rings are bonded at the para position (see Figure 1) [1]. CPP is categorised into [6]CPP, [10]CPP, [12]CPP and so on depending on the number of benzene rings. CPP also shows different reactivities depending on the number of benzene rings. In particular, the HOMO-LUMO bandgap becomes narrower as the number of benzene rings decreases, which contributes to the reactivity [2].

In this study, we synthesise secondary structures formed by [6]CPPs. 0.5 μmol of CPPs are dissolved in 1 ml of dichlorobenzene. The above solution was dropped onto an Si substrate at room temperature. The structures of the nano materials produced on the substrate are observed by scanning electron microscopy (SEM) ((SU8030, Hitachi).

We find that hexagonal sheets composed of [6]CPPs are formed along the circumference of the droplet of the solution on the substrate at room temperature, whereas no structures are formed over 50 °C.

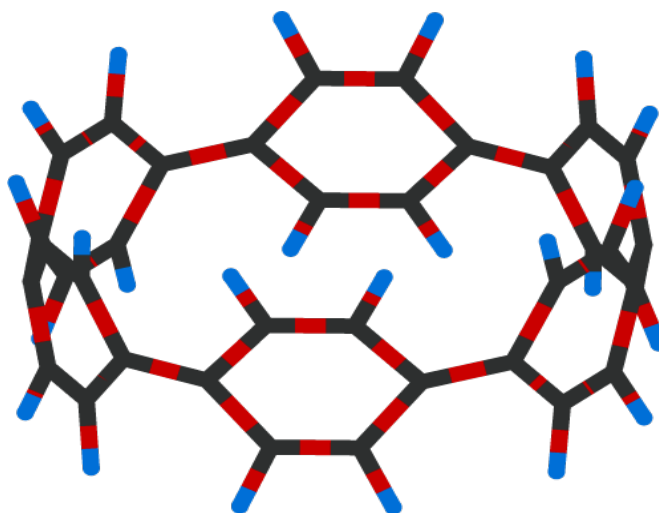


Figure 1. [6]cycloparaphenylene.

References:

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- [2] T. Fukushima, H. Sakamoto, K. Tanaka, Y. Hijikata, S. Irle and K. Itami, Polymorphism of [6]cycloparaphenylene for packing structure-dependent host-guest interaction, *Chem. Lett.* **46**, 855-857 (2017).