A FACILE ONE-POT SYNTHESIS OF β – AND MESO- SUBSTITUTED EXPANDED PORPHYRINS

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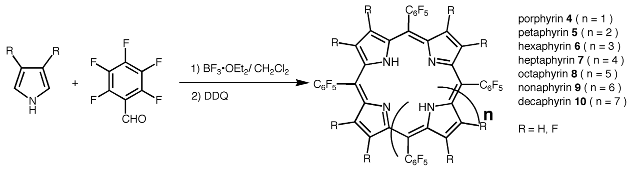
In recent years, increasing interest has been paid to porphyriniods due to the unique characters. Among them expnaded porphyrins are promising because of the optical, electrochemical, stereochemical, and coordination properties. Although several expanded porphyrins were reported, it still remains a challenge to synthesize and determine the structures. Recently we have discovered a facile acid catalyzed synthesis of a series of *meso*-aryl expanded porphyrins from pyrrole and penta-fluorobenzaldehyde[1, 2], and extended this synthesis. From the same reaction of 3,4-difluoropyrrole and penta-fluorobenzaldehyde, β – and *meso*- perfluorinated expanded porphyrins were obtained (Scheme) [3]. These variety of expanded porphyrins possess large cavities where multi metal ions or anions can be bound (Figure 1) and multiple oxidation states which are interconvertible each other by dehydrogenation and dihydrogenation processes where the spectral and structural changes take place (Figure 2). These molecules are also interesting in view of aromaticity.



Scheme

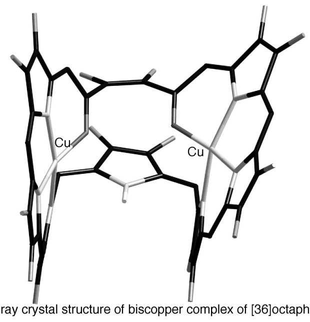


Figure 1. X-ray crystal structure of biscopper complex of [36]octaphyrin

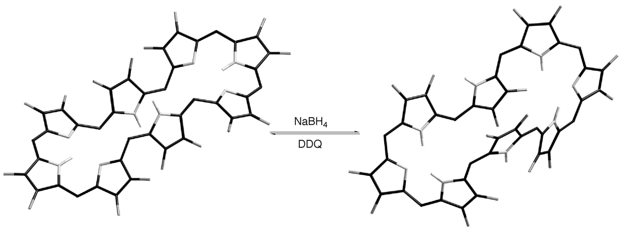


Figure 2. X-ray crystal structures of [36]octaphyrin (left) and [38]octaphyrin (right)

1. Shin, J-Y.; Furuta, H.; Yoza, K.; Igarashi, S.; Osuka, A. *J. Am. Chem. Soc.* **2001,** *123,* 7190.
2. Shin, J-Y.; Furuta, H.; Osuka, A. *Angew. Chem., Int. Ed.* **2001,** *40,* 619.
3. Shimizu, S.; Shin, J-Y.; Furuta, H.; Ismael, R.; Osuka, A. *Angew. Chem., Int. Ed.* in press.