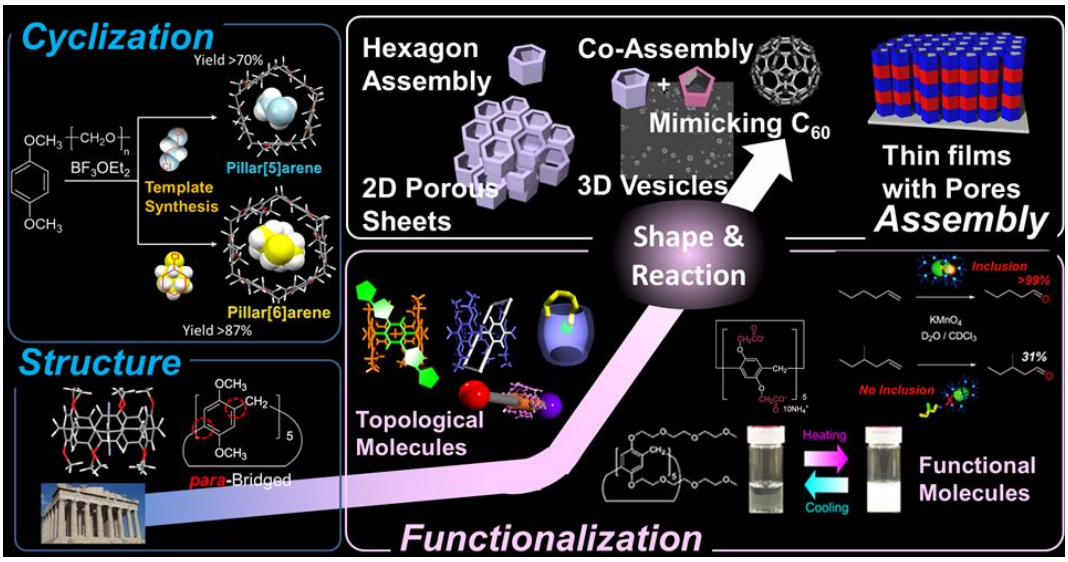
Pillar-Shaped Macrocyclic Compounds "Pillar[*n*]arenes": from Simple Molecular Receptors to Bulk Supramolecular Assemblies

Tomoki Ogoshi

Graduate School of Natural Science and Technology, Kanazawa University, Kakuma-machi, Kanazawa 920-1192, Japan

Macrocyclic compounds play a major role in supramolecular chemistry because of their beautiful shape, nano-scale size and molecular recognition ability. Numerous supramolecular architectures have been constructed and studied as new components of materials as well as entities related to biological structural formation and functions using various macrocyclic hosts.

In 2008, we reported a new class of macrocyclic hosts named "pillar[*n*]arenes".[1,2] Linear 1,2-dichloroethane and bulky chlorocyclohexane acted as template solvents for high-yield synthesis of pillar[5]- and pillar[6]arenes, respectively. They have unique symmetrical pillar structures due to their para-bridge linkage. We have synthesized various topological and functional molecules based on functionality of pillar[*n*]arenes, and constructed 2D sheets and 3D vesicles based on geometric assemblies of their pentagonal and hexagonal structures.[3]



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