The Art of Control in Surface Molecular Assemblies

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Controllability of molecular assemblies at surfaces is a top priority in surface self-assembly.[1] A molecular assembly at surface is balanced by various weak interactions like van der Waals forces, hydrogen bonds, halogen bonds and coordination bonds, to name just a few. A slight change in the molecular structure or an input of small external energy would drastically break the balance and hence, change the assembling structures. To control the assembling structures, various approaches have developed.[2-7] Among all these approaches, a particular one is to tune the assembling structures at surface in a controlled manner by tweaking physical parameters like surface coverage and substrate temperature. This is sort of like using the same tiles and bricks to build different types of houses. In this presentation, we'll talk about several case studies showing how to stepwise control the inter-pore distance[8] and pore shape[9] of molecular porous networks, catalyzed assemblies[10] and a series of fractal assemblies by utilizing hydrogen/halogen bonds.

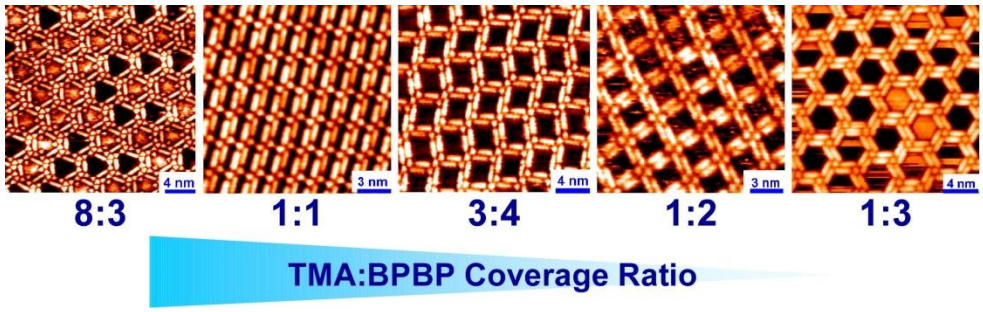

Figure 1. Controlling the pore shape of a binary molecular porous network.

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