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Molecular Aggregates - Functional Mesoporous Materials Assembled by Single Micelles

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Functional mesoporous materials are a class of porous solids with a pore size of 2-50 nm. They not only possess unique properties such as a high specific surface area, large pore size and uniform and controllable pore volume, but also have excellent optical, electrical and magnetic properties of inorganic functional nanoparticles. In this lecture, we mainly demonstrate the recent progress in the orientation assembly controllable synthesis of multilevel structural functional mesoporous materials through interface molecular aggregation control. Based on the idea of interface assembly regulation, we have developed a series of new methods for the synthesis of multilevel structural functional mesoporous materials such as single micelles. Here we mainly introduce a method for super-assembly using single micelles as a structural unit. Using this approach, we can controllably prepare a series of novel multilevel structural functional mesoporous materials, which not only have unique and uniform morphology, but also have controllable mesoscopic pore structure, high specific surface area, large pore volume and open pore. At the same time, we will also introduce the recent applications of functional mesoporous materials in catalysts, electrode materials, thermal insulation materials, dielectric materials and other fields.

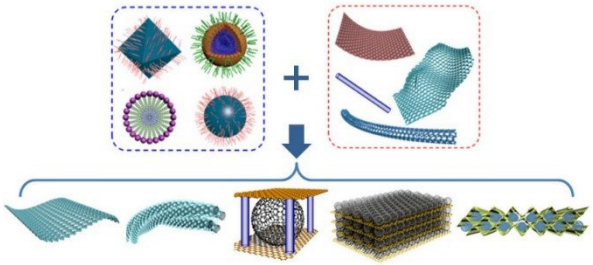

Figure 1. Modular super-assembly of hierarchical superstructures from monomicelle building blocks.

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