IBS Center for Multidimensional Carbon Materials

Special Guest Speaker

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Interfacial Assembly and Engineering of Ordered Functional Mesoporous Materials for Applications

11:00 THUR
APRIL 20

Bldg. 101
Seminar room on the 1st floor

With recent progresses made in modern nanoscience and nanotechnology, ordered mesoporous materials have been one of the hottest research topics in scientific community spanned chemistry, materials science, physics and biology. The construction of mesoporous materials is mainly concerned with building monodispersed mesosized (2-50 nm) pore voids and arranging them in a long-range ordered array. Generally, two kinds of templates are used to produce the mesopores: supramolecular aggregates such as surfactant micelle arrays, and rigid preformed solids such as ordered mesoporous silica, carbon, and colloidal crystals. Noticeably, besides the templates, the interface also plays a central role in the synthetic process, because it provides a rich and crucial space for the assembly and construction of mesostructures. Generally, two kinds of interfaces involve in the synthetic system. The first one is at between surfactant templates and guest species, which has been extensively investigated. Another important interface is the two-phase (solid, liquid and gas) one, including liquid-solid, gas-liquid, liquid-liquid, gas-solid, and solid-solid interface, which has been well developed for the synthesis of ordered mesoporous materials. Compared with the one phase synthesis referring to homogeneous nucleation and growth, the introduction of a two-phase interface in the system can change the growth behaviors of mesoporous materials and lead to the formation of molding or multifunctional mesoporous materials. For example, mesoporous thin films or membranes have been widely fabricated on a substrate *via* an evaporation-induced self-assembly (EISA) method. Multifunctional core-shell structured mesoporous materials can be obtained by rationally depositing mesoporous shells on well-designed cores at the interface. Recently we have developed a novel facile approach i.e. a solvent evaporation-induced aggregating assembly (EIAA) to synthesize large pore mesoporous silica materials. In addition, the well-known hard-templating method for mesoporous materials is also a typical interface reaction.

References

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You are cordially invited to attend!