



演題：**Hierarchical Zeolites in Catalysis**

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日時：2016年6月9日（木）13:00~14:30

場所：フロンティア応用科学研究棟・セミナー室 1

要旨： Zeolites are crystalline, porous silicates of great importance to catalysis, adsorption and separation. The appeal of zeolites is attributable to distinct pore dimensions, high surface areas, outstanding chemical and thermal stabilities, and the availability of more than 220 topologies that can be targeted by appropriate synthesis. With their (micro)pore size in the range of 0.3-2 nm, they can separate molecules on the basis of size exclusion. Owing to their acidic (Brønsted, Lewis type) properties, they are widely used for shape-selective catalysis. Applications of zeolites as catalysts in the chemical industry range from traditional cracking of oil feedstock to novel processes such as methanol conversion to bulk chemicals. Prospective applications include direct methane upgrading and sugar conversion.

In this lecture, I will discuss the main structural and chemical properties of zeolites focusing on applications of zeolites as catalysts. Several processes will be discussed. A major part of the lecture will be devoted to one of the great challenges in zeolite catalysis, namely the diffusional resistance to molecules that have to traverse zeolite crystals that are typically much larger than the pore dimensions. Strategies to overcome slow diffusion will be highlighted. Making a next step towards hierarchical/nanostructured zeolites requires understanding better how zeolites form, which remains a considerable challenge.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

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