東京大学グローバルCOEプログラム　機械システム・イノベーション国際拠点

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Hydrothermal Synthesis of Zeolites with Three-Dimensionally Ordered Mesoporous-Imprinted Structure

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会場：東京大学工学部5号館5F　第3輪講室

要旨

Due to their ordered micropore structures and acid strength, zeolites are extensively used as heterogeneous acid catalysts in oil refinery and petrochemical processes. However, their micropore structures and high intrinsic activities frequently make these materials subject to diffusion limitations that restrict reactant accessibility to the active sites on the interior surfaces of zeolites and inhibit the full utilization of zeolite catalysts. Nanofabrication of hierarchical zeolite catalysts with mesoporosity is a proven strategy for integrating shape selectivity provided by the intrinsic micropore structures and efficient mass transport facilitated by the mesopore structures.

In this talk, I will demonstrate how a wide range of zeolite morphologies can be realized through the confined growth of zeolites within 3-dimensionally ordered mesoporous (3DOm) carbon. A wide range of zeolites with ordered mesoporosity have been synthesized within the 3DOm carbon template by steam assisted crystallization method or conventional hydrothermal treatment. The approach exhibits versatile abilities for controlling the mesoporosity of hierarchical zeolites from 5 nm to 15 nm. The mass transport in the hierarchical zeolites has been significantly improved, which can mostly be attributed to the shortened diffusion path length in the micropores. The catalytic performance of the hierarchical zeolite catalysts for the reactions of bulky chemicals and biomass conversion will be discussed in this talk too.

主催：東京大学グローバルCOEプログラム「機械システム・イノベーション国際拠点」
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