

Challenges in Zeolite Synthesis, Adsorption and Catalysis

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要旨

Zeolites are the most important inorganic materials applied in chemical industry mainly as adsorbents and catalysts. Their superior features stem from the presence of micropores having shape-selective properties for reactants, products and transition states and from the possibility to tailor the chemical composition of zeolites inducing various functionalities as catalytically active sites.

This lecture will focus on three important aspects of present zeolite research:

- 1) challenges in synthesis of zeolites are discussed with a particular attention focused on extra-large pore zeolites and novel 3D 10-ring channel systems, chirality of zeolites will be mentioned as well,
- 2) adsorption properties of zeolites with an example of determination of adsorption enthalpies of CO₂ on ferrierite with different alkali metal cations. This part provides a comparison of experimental and quantum chemical data.
- 3) role of test reactions for understanding the channel architecture of zeolites. Examples of toluene disproportionation and alkylation reactions will be highlighted in relation to the structures of 10-ring zeolites and their acidity. A particular attention will be paid to the presence of cages in zeolite structures.

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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