

Abstract of Presentation

Presentation Title:

Nano-Structured Complex Metal Oxide Catalysts

Abstract :

Solid-state materials with nano-scale structures are expected to be potential catalysts for various chemical reactions because the materials would have attractive catalytic properties and functions due to their unique reaction field and space around catalytic active sites. In addition, three-dimensional organization or structuring of catalytic components in an ordered manner is highly important for solid-state catalysts, particularly for a multi-functional one in which multi-steps catalytic reactions can take more easily and effectively. However, it is generally very difficult to rationally prepare materials with desired arrangements or frameworks of necessary catalytic components as far as using conventional preparation methods and techniques. Therefore, development of nano-scale materials structuring has been highly demanded. It appears that method using inorganic soft syntheses like sol-gel method, hydrothermal method, solvothermal method, organic template method, and so on, thought to be significantly important but still need more technical improvement.

In the presentation the following four types nano-structuring methods for complex metal oxide catalysts; (a) unit synthesis method for preparing crystalline materials with high dimensional crystal structures, (b) organic sphere template method for three-dimensionally ordered macroporous materials preparation, (c) carbon nano-fiber template method for nano-tube shaped materials, and (d) preparation of immobilized nano-fibrous complex metal oxides on ceramic fibers will be focused.