

Formulation of Catalysts - Mesoporous ZeolitesXiaolei Fan*School of Chemical Engineering and Analytical Sciences, The University of Manchester, UK*Contact Email: xiaolei.fan@manchester.ac.uk

Synthetic zeolites, such as FAU Y and MFI ZSM-5 zeolites, are industrially important solid acid catalysts, especially in petrochemical fluid catalytic cracking (FCC) for producing gasoline range organics and gaseous products such as propylene. Reactivity, selectivity and accessibility are important features of zeolites, being critical to determine the performance of industrial catalysts formulated with zeolites.

Specifically, zeolites with the intrinsic microporous crystalline framework (0.3-0.8 nm) impose the accessibility and transport issues in some of their applications involving bulky molecules, leading to the deactivation.

Accordingly, various strategies are being developed and explored to address the issues, such as the design and synthesis of nanozeolites and zeolite-type materials with intrinsic large pores, the templating method to prepare zeolites with secondary mesopores and the post-synthesis modification (such as dealumination and desilication) of zeolites to introduce the mesoporosity.

In this talk, the new post-synthesis modification strategies for formulating zeolites with mesoporous features, specifically the hierarchical mesoporous FAU Y and mesoporous low Si/Al ratio hollow ZSM-5 zeolites, will be presented. Additionally, their catalytic performance in model cracking reactions will also be discussed to demonstrate the effectiveness of these newly developed mesoporous zeolites.