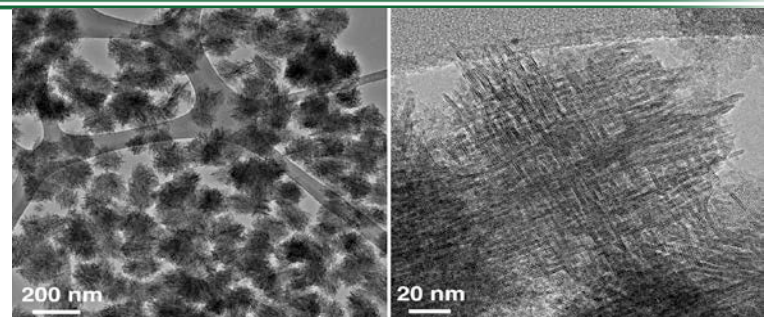


Self-Pillared, Single-Unit-Cell Sn-MFI Zeolite Nanosheets and their Use for Glucose and Lactose Isomerization

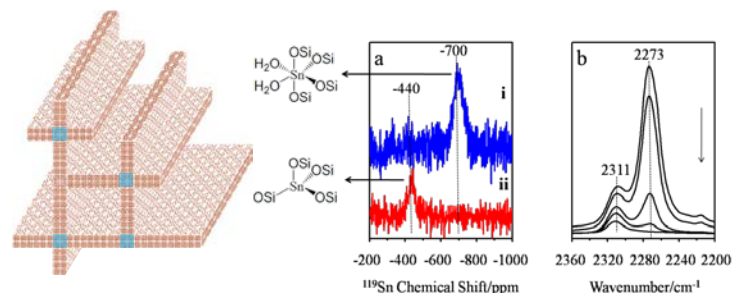
Scientific Achievement

- A hierarchical zeolite catalyst, containing micro and mesopores and Lewis acid catalytic sites, was synthesized by single-step hydrothermal crystallization.
- High yields for sugar isomerization and p-xylene production from dimethyl furan were demonstrated.



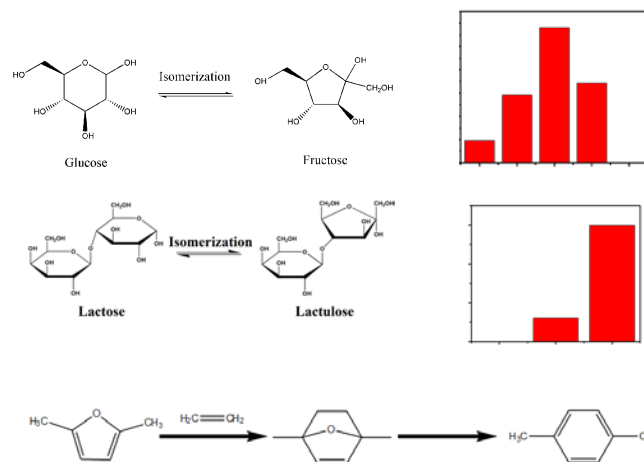
Significance and Impact

- The hierarchical zeolite catalyst contains Sn exclusively located at the framework (substituting framework Si); the desirable arrangement for selective Lewis acid catalysis.
- The zeolite domains are single-unit-cell (2nm) thick and they are surrounded by a network of 2-8nm mesopores, combining the catalytic activity of zeolites with accessibility of mesoporous materials.



Research Details

Absence of extra-framework Sn confirmed by electron microscopy, *nuclear magnetic resonance* and *infrared spectroscopy* - a collaborative effort between UMN and *Caltech* groups. Catalyst also recently tested for p-xylene production by UMass group



Ren *et al.* " *Angewandte Chemie International Edition*, 54(37), 10848- 10851, (2015)



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Work was performed at the University of Minnesota by the group of Michael Tsapatsis in collaboration with the Davis group (Caltech) and recently with the Fan group (UMass)

