

Selective Upgrade of Biomass Derivatives to Alkenes with Inexpensive Catalysts

Scientific Achievement

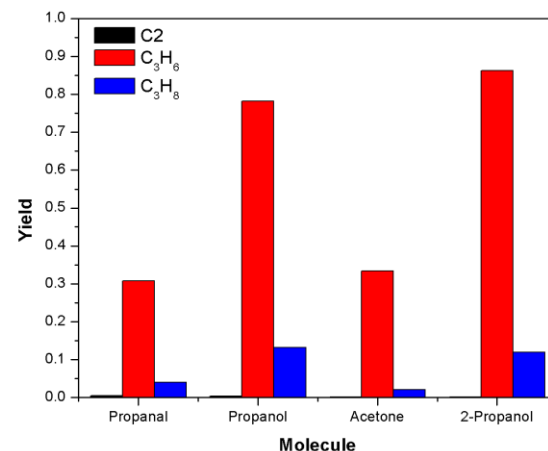
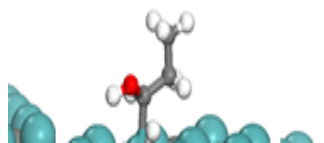
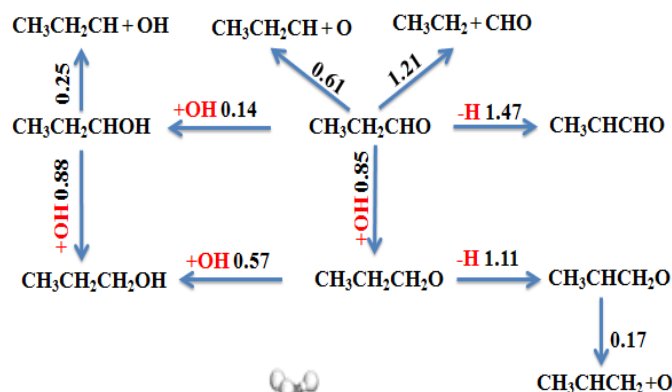
Mo_2C has been shown to be an active and very selective catalyst for conversion of oxygenates to alkenes via hydrodeoxygenation (HDO).

Significance and Impact

- Identification of inexpensive, highly selective catalysts for upgrade of biomass derivatives produced from sugars or pyrolysis bio-oil is essential for commercialization of renewable chemicals and fuels from lignocellulose.
- Unlike precious metal catalysts, the primary products using Mo_2C are high-value alkenes. Equally important, the overall consumption of H_2 is low.

Research Details

- Combination of DFT calculations, surface science experiments, and reactor evaluation identifies for the first time Mo_2C as an inexpensive, very selective, and stable HDO catalyst in upgrading oxygenated molecules to alkenes.



Ren, H.; Yu, W.; Saliccioli, M.; Chen, Y.; Huang, Y.; Xiong, K.; Vlachos, D. G.; Chen, J. G. *ChemSusChem*, 2013, 6, 798.

Work was performed by the groups of Jingguang Chen and Dion Vlachos at the University of Delaware