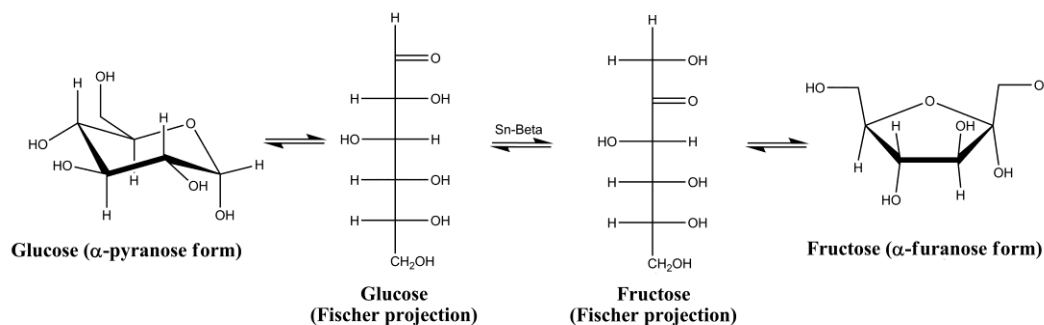




New Catalyst Converts Selectively Biomass-Derived Sugars to Chemicals

This research was conducted by the group of Mark Davis at the California Institute of Technology.

A novel catalyst was developed to efficiently convert biomass derived sugars. This development can have unprecedented impact on the production of renewable chemicals and fuels. Interest in carbohydrate chemistry has been revitalized by the recent push to produce chemicals from biomass. A reaction of particular importance and difficulty is the isomerization of glucose to fructose, an intermediate step in the production of biofuels. Engineers at Caltech have shown that the use of Sn-beta zeolites as catalysts for this reaction offers significant advantages over the traditional enzyme catalyst^[1]. This catalyst has been shown to be more stable than the enzyme catalysts, is unaffected by impurities that harm enzyme activity and is compatible with harsh environments, such as acidic solutions. By coupling a dehydration reaction to the isomerization in hydrochloric acid solution, for instance, glucose was converted directly to 5-hydroxymethyl-furfural (HMF) in high yields, proving Sn-beta as an attractive catalyst for a one-pot process.



RELEVANT PUBLICATION:

^[1] Moliner, M.; Roman-Leshkov, Y.; Davis, M.E., “**Tin-containing zeolites are highly active catalysts for the isomerization of glucose in water,**” *Proc. Natl. Acad. Sci.*, 107, 6164-6168 (2010). [DOI: 10.1073/pnas.1002358107]