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Colorado State University

Highly Active and Lower Cost Nanoparticle Catalyst for Producing Biofuel and Feedstock Chemicals

HMF has been identified as an important chemical intermediate in a proposed biorefining pathway. Known to be derivable from biomass, HMF can be a feed-stock chemical for conversion into biofuels and other value-added chemicals. While HMF synthesis from cellulose has already been realized at laboratory scale, it has not reached levels that are commercially and economically viable.

Researchers in the Chemistry Department at Colorado State University are investigating several new means by which inedible sources of glucose and cellulose may be converted into the biofuel intermediate HMF, one of which consists of chromium nanoparticles. This chromium nanoparticle catalyst has been shown to possess greater catalytic activity than state-of-the-art catalyst $CrCl_2$. The increased catalytic activity results in lower catalyst loading requirements, reducing the overall cost of biomass-to-HMF conversion. The catalyst precursor is also more stable when exposed to air than $CrCl_2$. Most importantly, this catalyst is capable of converting inedible biomass sources into HMF, allowing edible sources to remain part of human food chains.

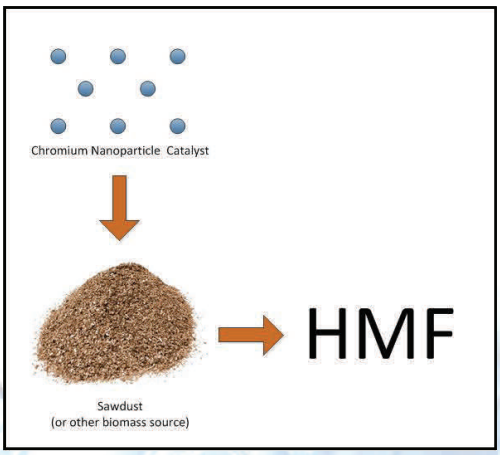
This technology will be of special interest to those looking to create biofuels from cellulosic sources. Any source of glucose or cellulose may be converted into HMF with this catalyst—crop residues such as straw and corn stover are just one potential source for this and related technologies.

Contact us for more information regarding this exciting new technology.

Patent Information
U. S. patent pending

Inventor Information
Eugene Y. Chen

Jianghua He



Features and Benefits

- Catalytic conversion of cellulosic or glucosic biomass sources into biofuel intermediate
- Greater air stability
- Higher catalytic activity than state-of-the-art
- Lower catalyst loading required
- Lower cost than state-of-the-art

Contact Information:
Jeremy Nelson
Phone: 970.491.7100
Email: jeremy.nelson@colostate.edu
www.csurf.org/tto