



Hara Lab

Creation of Advanced Inorganic Catalyst Materials Construction of Environment-Friendly Chemical Processes Laboratory for Materials and Structures

<http://www.msl.titech.ac.jp/~hara/index-e.html>

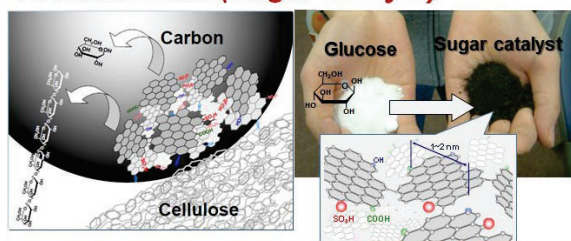
- Efficient Utilization of Biomass Resources
- Low-energy Ammonia Synthesis

Hara Lab is investigating catalysis and material science.

Our aims are creation of innovative catalyst materials to produce chemical resources and energy without environmental burden. Our ongoing projects are as follows.

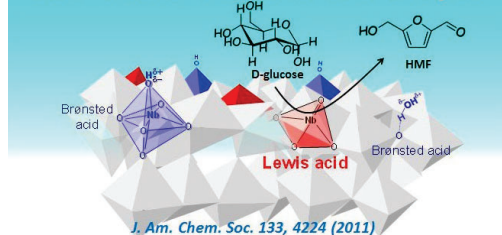
Utilization of Biomass Resources

"Protonic solid (Sugar catalyst)"

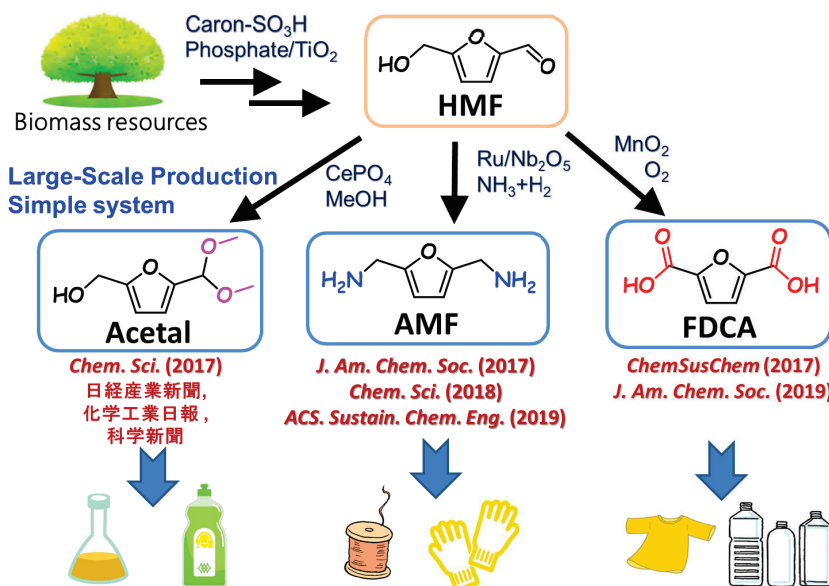


Nature 429, 519 (2004); *Nature* 438, 178 (2005); *J. Am. Chem. Soc.* 130, 12787 (2008)

"Water-Tolerant Lewis Acid Solid Catalysts"

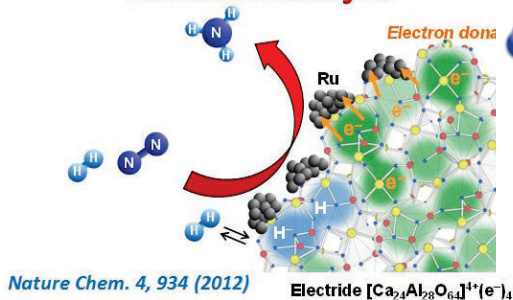


J. Am. Chem. Soc. 133, 4224 (2011)



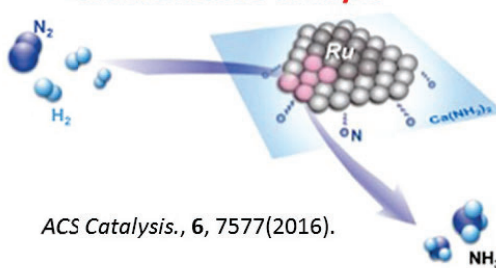
Low-energy Ammonia Synthesis

"Electride catalyst"



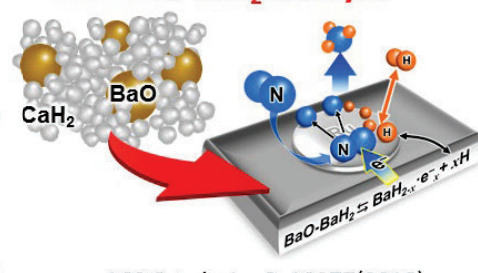
Nature Chem. 4, 934 (2012)

"Calcium amide catalyst"

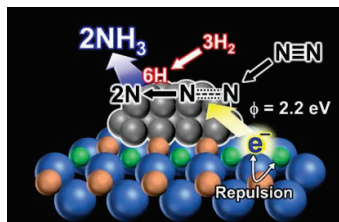
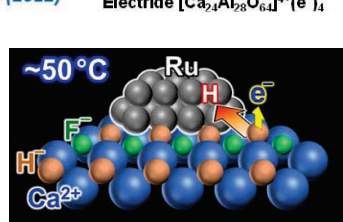


ACS Catalysis., 6, 7577(2016).

"BaO and CaH2 catalyst"



ACS Catalysis., 8, 10977(2018).



Nature Communications.
11, 2001 (2020).