Catalytic Upgrade of Intermediate Furanic Platforms

Scientific Achievement

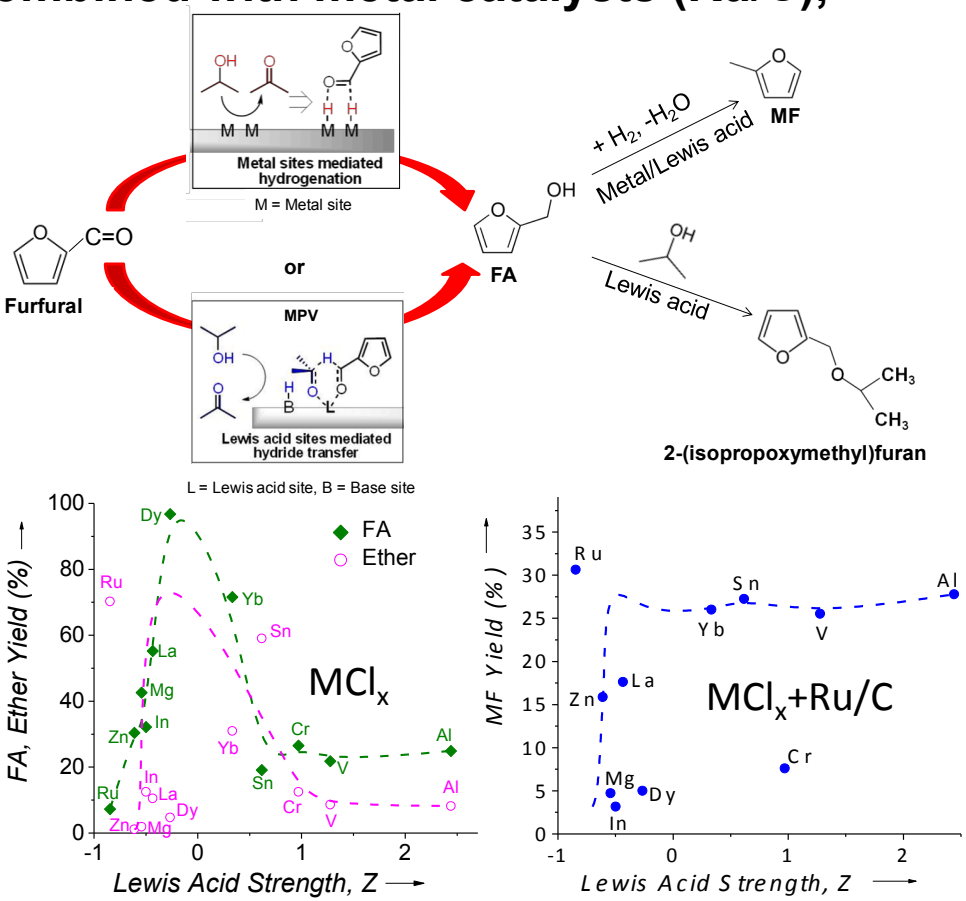
Demonstrated that metal salts behave as homogeneous Lewis acid catalysts in alcohol donors and convert furans to alcohols via hydrogenation through the MPV mechanism and then to ethers. Combined with metal catalysts (Ru/C), synergetic hydrogenolysis occurs.

Significance and Impact

- **Upgrade of furfural and HMF to alkylated furanics, alcohols, and ethers leads to drop-in fuels with high octane/cetane number and to monomers for polymers using alcohol donors without external H_2.**

Research Details

- Metal chlorides can be effective and selective catalysts for hydrogenation and etherification.
- Metal chlorides combined with Ru/C exhibit synergy and good yields to methyl furan.
- This work confirms that Lewis acid/metal catalysis is a general strategy for biomass upgrade.



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Work was performed at the University of Delaware by the group of Vlachos