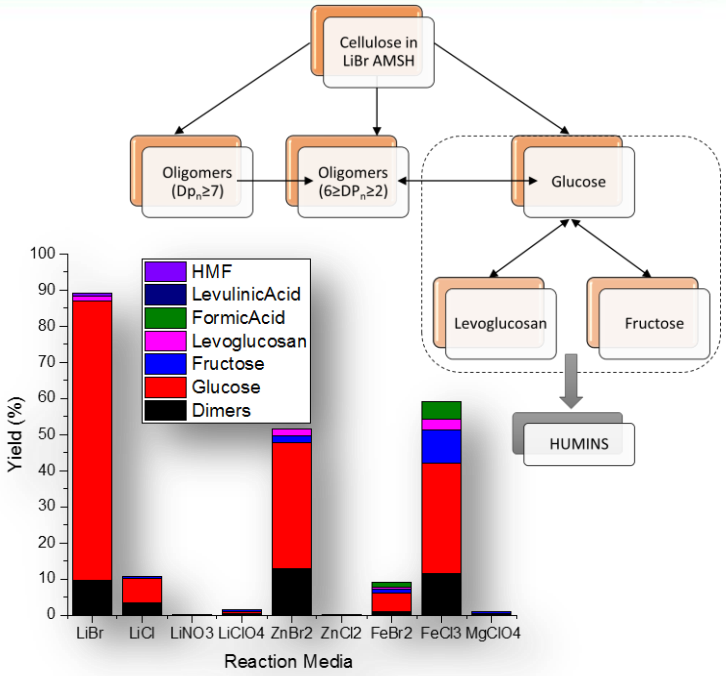
Cellulose Hydrolysis in Acidified Molten Salt Hydrate Media

Scientific Achievement

Kinetic experiments reveal almost complete cellulose hydrolysis with remarkable glucose yields (~82%) by using acidified LiBr molten salt hydrate (MSH) reaction media.

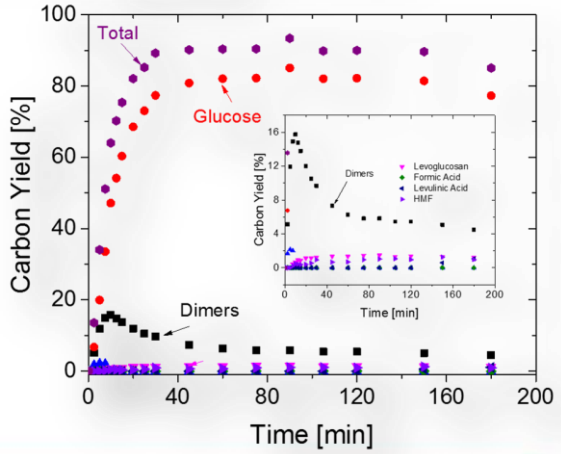
Significance and Impact

- **Hydrolysis of cellulose under mild conditions achieved.**
- **Our work is the first to demonstrate that hydrolysis is catalyzed by the synergistic effect of the LiBr MSH and Brønsted acid and not by LiBr.**
- **Metal salts could potentially serve as Lewis acids for "one-pot" downstream tandem reactions.**



Research Details

- Kinetic experiments indicate an equilibrium between glucose with its dimers and oligomers.
- Complete transformation of crystalline cellulose to an amorphous structure in molten salt hydrates.
- Vibrational spectroscopy reveals high flexibility of the glycosidic bonds and C_6H_2OH group in LiBr media.



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