Production of Methyl Isobutyl Ketone is Problematic

Methyl isobutyl ketone (MIBK) is an industrial solvent that is used in numerous applications, such as the manufacture of surface coatings, rubber chemicals, pharmaceuticals and adhesives. The current industrial production route for MIBK is problematic and costly, in that it involves a high pressure reaction, relies on petroleum as the feedstock, and operates at low yields of 10-30%.

Converts Glucose to Isovaleric Acid

To address the need for cost effective, bio-based routes to produce MIBK a two-step bio-based process has been developed that converts glucose into MIBK. The process utilizes a modified microbe that converts glucose into isovaleric acid and isocaproate. These intermediate chemicals can then be converted to MIBK, diisobutyl ketone or methyl isoamyl ketone.

Increases Specificity and Yield in Production of Methyl Isobutyl Ketone

This process has high specificity and yield, and offers a bio-based renewable production route that is cost competitive with the current petroleum based method. In addition, MIBK is currently too expensive to use as a fuel source due to the low efficiency of conversion from petroleum-derived feedstock (currently about 10-30%). With this technology, MIBK could become a potential fuel source.

FEATURES AND BENEFITS OF ISOVALERIC ACID FROM RENEWABLE FEEDSTOCKS:

Learn about more groundbreaking discoveries at [www.research.umn.edu/techcomm](http://www.research.umn.edu/techcomm)
The reaction involves a renewable sugar feedstock instead of a petroleum-derived feedstock.
Involves a catalyst that can be utilized under atmospheric pressure (cheaper than high pressure).
The catalysts have high specificity and yield (could improve economics of reaction).
Also improves conversion efficiency of methyl isobutyl ketone from 10-30% to >80% using a novel catalyst.

**Inventors**

Kechun Zhang, PhD
Assistant Professor, Department of Chemical Engineering and Material Sciences, College of Science and Engineering

**IP: UM Docket 20110196**

**For additional information, contact**

Larry Micek  
Technology Licensing Officer  
exprlic@umn.edu  
612-624-9568

Learn about more groundbreaking discoveries at [www.research.umn.edu/techcomm](http://www.research.umn.edu/techcomm)