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Renewable Chemicals from Furans

Technology No. 20160256

IP Status: Issued US Patent; **Application #:** 15/474,401

Simple Pathway to Bio-based Chemicals

A new reaction path has been discovered to make metastable lactone acid in high yield (94%) by simple mixing of a 1:1 blend of corn-based chemicals - itaconic anhydride and furfuryl alcohol – at room temperature. In addition, multiple reaction pathways have also been demonstrated for conversion of itaconic anhydride and furans into derivatives amenable to novel polymer or chemical compound synthesis. See Image Gallery for sample of possible synthesis pathways.

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Itaconic Acid and Furfuryl Alcohol

Novel chemical compounds can be synthesized from itaconic anhydride (dehydrated itaconic acid) and furfuryl alcohol or other furans. These compounds are potential monomers or reactants useful for making new renewable polymers or specialty chemicals such as surfactants or plasticizers.

BENEFITS AND FEATURES:

- Starting materials are commercially available.
- Production equipment is relatively simple and low cost. Reactions in the bulk have been demonstrated.
- Multiple compounds can be produced in high yield.

APPLICATIONS:

- Renewable polymers
- Renewable specialty chemicals

Phase of Development – Laboratory scale proof of concept. Chemicals compounds characterized.

Researchers

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Merck Professor, Chemistry Department, College of Pharmacy
External Link (www.pharmacy.umn.edu)

Publications

Diels–Alder Reactions of Furans with Itaconic Anhydride: Overcoming Unfavorable Thermodynamics
ACS Organic Letters, May 23, 2016, 18 (11), pp 2584–2587

Files and Attachments

Versatile Reaction Technology for Corn-based Renewable Chemicals - Itaconic Acid & Furans [PDF]