Materials & Chemicals

Method for Renewably Sourced Diones as Fossil Chemical Alternative in Industry

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WARF: P110282US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method to fabricate commercially important 2,4-diones from another molecule, 4-hydroxy-6-substituted-2-pyrone (HMP), derived from biorenewable glucose.

Overview

Attention and investment increasingly look to renewable resources like sugars as foundations for the practical, chemical needs of industry. Diones are such compounds, vital to many processes including metal extraction, plating, dyeing and fuel additive production. Conventionally, a dione like acetylacetone is prepared in a 500 degrees Celsius, multistep process requiring reactants solely available from petroleum-based feedstock.

Clearly there exists great potential for an alternative, sustainable process that can yield these important compounds and ease industry's reliance on petroleum sources.

The Invention

UW–Madison researchers have developed a method for the conversion of 2,4-diones such as acetylacetone in high yield from renewable derivatives.

The process involves the acid catalysis or thermally induced ring opening of HMP derived from glucose. The molecule is reacted in a solvent selected from a group consisting of water, alcohols and tetrahydrofuran. In the absence of an acid, the reaction is conducted at mild temperature and pressure conditions to yield the corresponding dione.

Applications

- Metal extraction and plating
- Acetylacetonate intermediate
- Synthesis of heterocyclic compounds
- Fuel additive processes
- Resin modification

Key Benefits

- Sustainably sourced
- Non petro-reliant
- No high temperature isomerization

Stage of Development

The researchers have demonstrated the method and future work will focus on optimizing yield.

Additional Information

Related Technologies

- WARF reference number P110124US01 describes a cost-effective method for converting biomass into furan derivatives for fuel, commodity chemicals and other valuable products.

Tech Fields

- Materials & Chemicals : Biochemicals & biomaterials

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854