Fast and Efficient Catalytic Metathesis of Secondary Amides for the Synthesis of Novel Molecules

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method and reagents for the equilibrium-controlled catalytic metathesis of secondary amides.

OVERVIEW

Dynamic covalent chemistry (DCC) offers a powerful approach for the controlled synthesis of organic molecules with interesting structures and/or properties. It describes reactions that involve the exchange of functional groups, such as esters, thioesters, imines or disulfides, among reactants.

Extending this approach to molecules that contain carboxamide groups would be useful, but carboxamide groups are not very reactive. Identifying catalysts that induce amide metathesis, a chemical reaction that involves the exchange of amide groups between reactants, has been challenging.

The inventors previously developed methods of catalytic transamidation and amide metathesis under moderate conditions (see WARF reference number P03068US). Those methods involved a metal-catalyzed reaction that could be carried out at lower temperatures than previous methods.

THE INVENTION

UW-Madison researchers now have developed a different approach that allows catalytic transamidation and amide metathesis reactions to occur efficiently, quickly and at low temperatures. This approach uses imides to initiate the reactions.

Specifically, this method involves reacting two or more distinct secondary amides in an aprotic solvent in the presence of a Bronsted base and an imide initiator. During the reaction, an acyl group exchange occurs between the secondary amides.
APPLICATIONS

- Polymer manufacturing
- Peptide synthesis for drug development

KEY BENEFITS

- Provides a powerful approach for the thermodynamically-controlled synthesis of industrially useful molecules
- Enables improved control of reaction rates
- Reaction is fast and efficient and takes place at low temperatures.
- Resulting molecules may have novel biological activity and therapeutic applications.
- Provides a novel strategy for implementing amide-based DCC

ADDITIONAL INFORMATION

Related Technologies
See WARF reference number P03068US for novel methods of catalytic transamidation and amide metathesis under moderate conditions.

Tech Fields
Materials & Chemicals - Synthesis

CONTACT INFORMATION

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or (608) 265-9861.