



Phosphine Ligands Made Cheaper, Better

INVENTORS • Jennifer Schomaker, Robert Grigg, Ryan Van Hoveln

WARF: P130268US02

[View U.S. Patent No. 9,382,279 in PDF format.](#)

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing groundbreaking methods for preparing chiral phosphine ligands used in synthetic chemistry.

OVERVIEW

Enantiomers are pairs of compounds that have the same chemical formula but different spatial structures (like your left and right hand, they are non-superimposable mirror images of each other). This is important because the different structures can have distinct reaction properties. As a result, enantioselectivity, the ability to distinguish and control which enantiomer is being produced and used, is an important ligand production parameter.

Phosphine ligands are key components in many important enantioselective transformations, such as asymmetric Diels-Alder reactions and hydrogenations. Until now, synthesizing these ligands has been expensive and required multiple steps.

THE INVENTION

UW-Madison researchers have developed methods for synthesizing novel classes of chiral phosphine ligands via enantioselective copper-catalyzed halogenation. The process is rapid and flexible, and also can be used to streamline the preparation of known phosphines.

The researchers previously described their 'recycling' method for use with aromatic compounds. Now, they have rendered the process enantioselective using an asymmetric bidentate phosphine ligand to produce scaffolds with high enantiomeric purity.

In essence, the use of the phosphine ligand helps form a chiral center in a complex product that is otherwise costly or impossible to create.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



APPLICATIONS

- Preparing known and novel phosphine ligands
- Synthesizing intermediates for other useful compounds, like therapeutic agents

KEY BENEFITS

- Process is less expensive, easier and more resourceful.
- The new ligands show better reactivity and enantioselectivity.
- Facilitates cheaper/more effective catalysis
- May enable reactions that cannot be done with current ligands

ADDITIONAL INFORMATION

Related Technologies

[WARF reference number P110299US02 describes an easy method for synthesizing asymmetric, heteroatom-bearing stereotriads and tetrads.](#)

Publications

Grigg R.D., Van Hoveln R. and Schomaker J.M. 2012. Copper-Catalyzed Recycling of Halogen Activating Groups via 1,3-Halogen Migration. J. Am. Chem. Soc. 134, 16131-16134.

Tech Fields

Clean Technology - Energy & resource efficiencies

Research Tools - Synthesis & purification

Materials & Chemicals - Synthesis

Materials & Chemicals - Biochemicals

CONTACT INFORMATION

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