

SUSTAINABILITY NEWS

Chemistry Department | University of Michigan



TOP NEWS OF THE MONTH



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Get involved in some friendly competition between labs in the department. Your lab could have a chance at winning a sustainability challenge. Award includes Blank Slate Ice Cream!

**WIN BLANK
SLATE ICE
CREAM**

WHO ARE WE?

Graduate students, postdocs, and faculty in the department are piloting a Chemistry Sustainability Team, in collaboration with LSA's [Year of Sustainability](#) and the [Office of Campus Sustainability](#). There are multiple opportunities to get involved and to take part in professional development and certification through [Planet Blue](#) and [My Green Lab](#). Please contact chem.sus.info@umich.edu if you would like to get involved or have any questions.

THE FREEZER CHALLENGE



Participating labs have the chance of **winning** a Blank Slate Ice Cream Party. To get started, each lab will need to nominate one representative and fill out this [form](#). The whole process should take no more than 30 min and can be integrated into your group's regular cleanup! If you're interested, you can read more about this initiative here: [My Green Lab freezer challenge](#)

DID YOU KNOW?

Participants in the 2023 Freezer Challenge saved a combined **20.7 million kWh/year!**

20.7 million kWh
energy avoided is equivalent to:



37.5 million miles

driven by an average gasoline-powered vehicle



4663 metric tons of CO2 equiv.

Source: UESPA Greenhouse Gas Calculator; My Green Lab

CHEMISTRY TURNS OFF ICE MACHINES TO SAVE ENERGY

The Chemistry Sustainability Team partnered with LSA to monitor energy and usage in several of the department's 20 ice machines. Using this data, the Department has turned off 6 ice machines (3 on research floors and 3 in atrium teaching labs). The energy savings per year will be equivalent to saving >160 gallons of gasoline.

CHEMISTRY WINS \$25K GRANT FOR FINDENSERS!

Led by graduate student Dylan Vitt (Maldonado group), the Chemistry Sustainability Team has been **awarded \$25k** from the LSA Sustainability Innovations and Incentives Fund towards purchasing 121 Heidolph Radleys Findenser Super Air Condensers for research and teaching labs. These will replace single-pass water-cooled condensers to reduce water usage and increase safety across the Chemistry Department. This project is estimated to save between **1 and 4 million liters** of water per year! Stay tuned for the delivery in early June!

[RETURN TO ISSUE](#) | [< PREV](#) [ARTICLE](#) [NEXT >](#)

Gravimetric and Thermal-Imaging Characterization of Water-Free Reflux Condensers for Laboratory Applications

Kevin Lam, Brittany Armstrong, and Eric L. Margelefsky*

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HOW CAN YOU GET INVOLVED?

TURN OFF LAB AND OFFICE LIGHTS

An easy step to take individually is through turning off lab and hood lights whenever possible. Students are encouraged to promote best practices by posting stickers in and around labs.



GET RID OF YOUR SMALL TRASH BINS

A recent audit of waste from Chemistry revealed that ~10% of the waste was plastic liners from bins. One way to reduce this waste stream is to have fewer waste bins. You can bring your small waste bins to the loading dock (or Tracy's office) to donate it.

TRAINING AND CERTIFICATION

If you would like to get certified or become a lab ambassador, there are several ways to get involved. These look great on a CV or resume!

[Planet Blue Ambassador](#)

[OCS Sustainable Lab Certification](#)

[My Green Labs Ambassador Training](#)

STAY TUNED

Stay tuned for other initiatives, including “shut the sash”, waste reduction, composting, recycling & procurement.

ADDITIONAL NEWSLETTER SIGNUP!

Email sustainable-labs@umich.edu to sign up for sustainability-related ideas for research labs on campus.

GREEN CHEMISTRY LITERATURE

ORGANIC PROCESS RESEARCH & DEVELOPMENT
OPR&D

pubs.acs.org/OPRD

Green Chemistry Highlights

Green Chemistry Articles of Interest to the Pharmaceutical Industry

Check This Out: Process Res. Dev. 2023, 27, 563-570

Read Online

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Metrics & More

Article Recommendations

CONTENTS

1. Introduction	563
2. Alcohol Activation for Nucleophilic Displacement	563
3. Amide Formation	564
4. Asymmetric Hydrogenation	564
5. Base-Metal Catalysis	565
6. Biocatalysis	566
7. Fluorination	566
8. Heterogeneous Catalysis	567
9. Medium-Sized Molecules	567
10. Oxidation	568
11. Solvents	569
12. Wings Chemistry	569
13. General Green Chemistry	569
Author Information	570
Author Contributions	570

1. INTRODUCTION

The American Chemical Society (ACS) Green Chemistry Institute (GCI) Pharmaceutical Roundtable (PR) was developed in 2005 to encourage the integration of green chemistry and green engineering into the pharmaceutical industry. The ACS GCI is a not-for-profit organization whose mission is to catalyze and enable the implementation of green and sustainable chemistry throughout the global chemistry enterprise. The ACS GCI PR is composed of pharmaceutical and biotechnology companies, including contract research/manufacturing organizations, generic pharmaceuticals, and related companies. For details of the current membership, see [acs.org/pr](https://www.acs.org/pr).

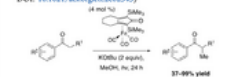
One of the strategic priorities of the Roundtable is to inform and influence the research agenda. Two of the first steps to achieve this objective were to publish a paper outlining key green chemistry research areas from a pharmaceutical perspective (*Green Chem.* 2007, 9, 411–420) and to establish annual ACS GCI PR research grants. The reaction classes highlighted herein are based on those in the Green Chemistry paper, though new sections have been added based on a follow-up article (*Green Chem.* 2018, 20, 5082–5103). This article covers material published or which became available for publication between April 2022 and September 2022 (inclusive).

These articles of interest represent the opinions of the authors and do not necessarily represent the views of member companies. Some articles are included because, while not currently being regarded as green, the chemistry has the

potential to become so if developed further. The inclusion of an article in this document does not give any indication of safety or operability. Anyone wishing to use any reaction or reagent must consult and follow their internal chemical safety and hazard procedures.

2. ALCOHOL ACTIVATION FOR NUCLEOPHILIC DISPLACEMENT

The application of methanol as a sustainable and cost-effective methylating reagent has gained increased attention in recent years. However, the activation of methanol for use in hydrogen autotransfer processes frequently requires high temperature or expensive precious metal catalysts. A report from the Sundaravalli group discusses a visible-light-mediated protocol for the *o*-methylation of lactones using the Koser catalyst in methanol. This approach avoids the need for high temperature or costly phosphine ligands. The transformation is amenable to a range of aryl alkyl lactones containing a range of halogens and other substituents on the aryl group, and the *o*-methylated products are delivered in good to excellent yields. (Org. Lett., DOI: 10.1021/acs.orglett.2c02545)



The amination of allylic alcohols is often required due to the prevalence of allyl amines in bioactive molecules. A recent report from the groups of Liu and Liu demonstrates a transition-metal-free strategy for allylic amination. The method was successfully applied toward primary allyl alcohols—a current limitation with existing transition-metal-free approaches. The reaction utilizes catalytic quantities of Mg(OAc)₂—formed in situ from Mg(OAc)₂ and NaOAc—and generates water as the sole byproduct. This catalytic system provides suitable Lewis acidity to activate the alcohol substrate. A broad range of allylic and benzylic alcohols can

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ACS Publications

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563

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If you are an organic chemist and unfamiliar with Green Chemistry principles, a great place to start is this article published in OPRD last year. While we may be more familiar with traditional methodology reactions, this work focuses on how optimization may look through a sustainability lens. Several different strategies are introduced in reactions, included, but not limited to, lowering reaction temperature, base-metal catalysis, and biocatalysis.

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