ACS Publications
Most Trusted. Most Cited. Most Read.

RETURN TO ISSUE

< PREV **PERSPECTIVE** NEXT >

Get e-Alerts

Hetero-ene Metathesis

J. Drake Johnson and Aleksandr V. Zhukhovitskiy*

Cite this: *ACS Catal.* 2024, 14, 1, 21–33
Publication Date: December 8, 2023
https://doi.org/10.1021/acscatal.3c04135

Article Views	Altmetric	Citations
2025	5	-

LEARN ABOUT THESE METRICS

Share Add to Export

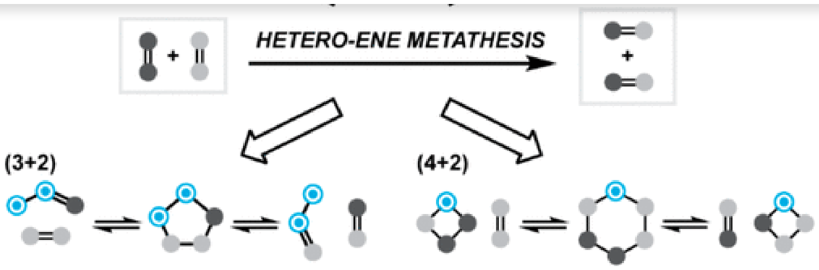
RIS

Access Through Your Institution

Other access options

SUBJECTS: Catalysts, Cyclization, Hydrocarbons, Metathesis, Olefin metathesis

Abstract



Metathesis of double bonds has enabled innovation in a broad range of fields: from materials science to medicine. However, this chemistry has largely focused on alkenes rather than hetero-enes, or heteroatom-containing double bonds. Yet, the ability to do hetero-ene metathesis could grant access to valuable heteroatom-rich molecules. Catalysis of double bond metathesis has classically, though not exclusively, relied on the [2+2] cycloaddition/elimination mechanism, which in the case of olefins involves transition metal alkylidenes. However, this mechanism may not be ideal for some hetero-enes, nor is it uniquely suited for the purposes of metathesis: other mechanisms are feasible and, in some cases, precedented. In this Perspective, we present a general framework for mechanistic design that would apply to hetero-ene metathesis, with examples of reported transformations that justify this classification. Advantages, challenges, and opportunities within each class of mechanisms are also outlined. We hope that this Perspective will catalyze further research in this burgeoning field.

KEYWORDS: metathesis, hetero-ene, mechanism, cycloaddition, cycloelimination, insertion, elimination, pseudosymmetry

Read this Article

To access this article, please review the available access options below.

ACS Publications
Most Trusted. Most Cited. Most Read.

Purchase Access

Restore my guest access

Recommended

Access through Your Institution

You may have access to this article through your institution.

Access Through Your Institution

Log in to Access

You may have access to this article with your ACS ID if you have previously purchased it or have ACS member benefits. Log in below.

Cited By

This article has not yet been cited by other publications.

Download PDF

1155 Sixteenth Street N.W.
Washington, DC 20036

About

About ACS Publications
ACS & Open Access
ACS Membership
ACS Publications Blog

Resources and Information

Journals A-Z
Books and Reference
Advertising Media Kit

Support & Contact

Help
Live Chat
FAQ