

Last updated: December 29, 2023 [View the latest guidelines online](#)

## Scope of the Journal

The journal *Organic Process Research & Development* (OPR&D) serves as a communication tool between industrial chemists and chemists working in universities and research institutes. As such, it reports original work from the broad field of industrial process chemistry but also presents academic results that are relevant, or potentially relevant, to industrial applications. Process chemistry is the science that enables the safe, environmentally benign, and ultimately economical manufacturing of organic compounds that are required in larger amounts to help address the needs of society. Consequently, it encompasses every aspect of organic chemistry, including all aspects of catalysis, synthetic methodology development, and synthetic strategy exploration, but also includes aspects from analytical and solid-state chemistry and chemical engineering, such as workup tools or flow chemistry. The goal of development and optimization of chemical reactions and processes is their transfer to a larger scale; original work describing such studies and the actual implementation on scale is highly relevant to this journal. However, studies on new developments from either industry, research institutes, or academia that have not yet been demonstrated on scale, but where industrial utility can be expected and where the study has addressed important prerequisites for a scale-up, also serve the mission of OPR&D as a communication tool between the different contributors to the field.

OPR&D aims to cover research & development (R&D) from and for the fine organic chemicals and specialty chemicals industries, including pharmaceuticals, agrochemicals, electronic chemicals, flavors and fragrances, intermediates, food additives, and specialty polymers, with work from commodity chemicals, petrochemicals, and polymers being appropriate as well.

In summary, OPR&D serves the community interested in the practical application of organic chemistry, in both industry and academia, by publishing original scientific work, reviews on relevant topics, and opinion articles.

### **Correspondence to the Editor-in-Chief should be addressed to:**

Dr. Kai Rossen, Editor-in-Chief *Organic Process Research & Development*

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## Manuscript Types

Several types of manuscripts are admissible:

### **Editorials**

**Editorials** provide a discussion forum for topics of interest to the industrial readership.

### **Highlights**

Brief reviews of publications (“**Highlights**”) are an essential part of the mission of the journal. Given the industrial relevance, topics dealing with the legal environment of the industry, such as

regulatory requirements and environmental regulations, are especially suitable.

## Perspectives

**Perspectives** are personal reviews of a field or area, and they are focused rather than comprehensive. They should touch base with the current literature, including key contributors and references, but will primarily serve to inspire and help direct future research efforts. Authors interested in submitting a Perspective may contact the Editor prior to manuscript preparation and submission to seek conditional approval of the proposed topic.

## Reviews

The journal welcomes **Reviews** that cover a topic of general importance for the field of process research. **Reviews** may be limited to the work of the author, or they may be more comprehensive of the field or provide the scientific framework for developments in the industries covered by the journal.

## Articles

**Articles** describe original work that has not been previously published and that is not for consideration for publication elsewhere. Novelty of the submitted manuscript is an absolute requirement. Manuscript topics for which an industrial patent application has been published by the authors are an exception to this rule, as it is understood that relevant industrial research is usually patented. The Experimental Section of an Article, describing the work performed on a preparative scale, is a valuable asset of the journal. Requirements for the Experimental Section are described below.

## ACS Publishing Center

While this document will provide basic information on how to prepare and submit the manuscript as well as other critical information about publishing, we also encourage authors to visit the [ACS Publishing Center](#) for additional information on everything that is needed to prepare (and review) manuscripts for ACS journals and partner journals, such as

- [Mastering the Art of Scientific Publication](#), which shares editor tips about a variety of topics including making your paper scientifically effective, preparing excellent graphics, and writing cover letters.
- Resources on [how to prepare and submit a manuscript](#) to ACS Paragon Plus, ACS Publications' manuscript submission and peer review environment, including details on selecting the applicable [Journal Publishing Agreement](#).
- [Sharing your research](#) with the public through the ACS Publications open access program.
- [ACS Reviewer Lab](#), a free online course covering best practices for peer review and related ethical considerations.
- [ACS Author Lab](#), a free online course that empowers authors to prepare and submit strong manuscripts, avoiding errors that could lead to delays in the publication process.
- [ACS Inclusivity Style Guide](#), a guide that helps researchers communicate in ways that recognize and respect diversity in all its forms.

## Manuscript Preparation

## Submit with Fast Format

All ACS journals and partner journals have simplified their formatting requirements in favor of a streamlined and standardized format for an initial manuscript submission. Read more about the requirements and the benefits these serves authors and reviewers [here](#).

Manuscripts submitted for initial consideration must adhere to these standards:

- Submissions must be complete with clearly identified standard sections used to report original research, free of annotations or highlights, and include all numbered and labeled components.
- Figures, charts, tables, schemes, and equations should be embedded in the text at the point of relevance. Separate graphics can be supplied later at revision, if necessary.
- When required by a journal's structure or length limitations, manuscript templates should be used.
- References can be provided in any style, but they must be complete, including titles. For information about the required components of different reference types, please refer to the [ACS Style Quick Guide](#).
- Supporting Information must be submitted as a separate file(s).

## Document Templates and Format

The templates facilitate the peer review process by allowing authors to place artwork and tables close to the point where they are discussed within the text. Learn more about document templates [here](#).

## Abbreviations

Authors are encouraged to make use of abbreviations and acronyms if it will result in a significant saving of space. If non-standard abbreviations or acronyms are employed, they must be defined the first time they are used. Beware of using multiple acronyms or trivial names for the same item, such as both ACN and MeCN for acetonitrile. Refer to the list of standard abbreviations and acronyms in [The ACS Style Guide](#).

## Nomenclature

Nomenclature should conform to American usage. Insofar as is practical, authors should use a systematic name, from either Chemical Abstracts or IUPAC, for each title compound in the Experimental Section. Unless the manuscript contains very few structures or the structures are very well known (e.g., benzene), it is generally good practice to identify all structures with a bold-faced Arabic numeral, unless the structure is not discussed in the text or listed in the Experimental Section. If a compound is given a number, it is expected that it also appears in a scheme or figure. It is also acceptable to use "semi-systematic names" for certain specialized classes of compounds, such as steroids, peptides, carbohydrates, and cyclophanes. In such a case, the name should conform to the generally accepted nomenclature conventions for the compound class. If the structures of the compounds in a manuscript are sufficiently complex that determination of their systematic names is impractical or the names are unduly long, compounds should be referred to in some unambiguous manner, such as "ketone **23**" or "amino acid **14a**". The latter usage is also particularly convenient in the narrative. Avoid the use of alternative nomenclature systems such as letters or non-Arabic numerals to identify compounds or unfamiliar acronyms to refer to intermediates or products. If the manuscript contains a large number of structures, be careful to avoid inadvertently assigning multiple numerals to the same structure or

multiple structures to the same numeral. Letter suffixes (e.g., **7a**, **7b**, **7c**) may be used to identify series of compounds that differ in only one moiety; however, avoid suffixes if clarity is compromised.

General information on the preparation of manuscripts may also be found in the [ACS Guide to Scholarly Communication](#).

## Acceptable Software, File Designations, and TeX/LaTeX

See the list of [Acceptable Software](#) and appropriate [File Designations](#) to be sure your file types are compatible with ACS Paragon Plus. Information for manuscripts generated from [TeX/LaTeX](#) is also available.

## Cover Letter

A cover letter must accompany every manuscript submission. During the submission process, you may type it or paste it into the submission system, or you may attach it as a file.

## Manuscript Text Components

### Title and Abstract

The title, abstract, and keywords are essential to allow your work to be discovered and recognized. They need to be picked with great care with a focus on highlighting the most important scientific aspects of the work and avoiding terminology relevant only to your institution or a small group of specialists. A well-written title and abstract can attract the attention of potential readers and increase the likelihood that other researchers will cite the published paper. The title should be descriptive of the topic of the article and as short as possible, using easily searchable keywords and avoiding abbreviations and acronyms unless they are more commonly used than spelled out words. In addition, titles should avoid complex compound names as much as possible in the title by using generic names, and spell out elements rather than using symbols unless part of a compound name. For additional guidance, please view resources such as [ACS's guide for how to make your chemistry research paper discoverable](#) as well as [Chapter 2.3 of the ACS Guide to Scholarly Communication](#).

All manuscripts must be accompanied by an abstract, which should state concisely the purpose of the research, the principal results, and major conclusions. Reference to structural formulas or tables in the text, by number, may not be made in the abstract. Additionally, citations of reference by number may not be made in the abstract. If a reference must appear in the abstract, the citation information must appear, not a superscript pointing to the reference list.

Four to six keywords may be provided following the abstract.

### Main Text

The main text includes the Introduction, Experimental Section, Results, Discussion, and Conclusion (the Discussion and the Experimental Section are discussed in more detail below).

Given the scope of the journal, particular attention has to be given to the relevance of the described chemistry to be performed reliably on scale. In this context, attention to safety, including

choice of acceptable solvents, workup, and isolation procedures is critically important to give the reader the trust that the chemistry is reliable and likely to be scalable. The scientific rationale for the choice of the optimal reaction conditions must be explained.

## Experimental Section

*For this journal, vital experimental procedures must not be placed into Supporting Information but instead should be kept in the manuscript itself.*

The Experimental Section should be clearly distinguished from the rest of the text. Tabulation of experimental results is encouraged whenever it leads to a more effective presentation or economical use of space. Authors should use a general Experimental Section to identify sources of commercial and known compounds to provide comprehensive and traceable access to the key starting materials used in the experimental part. Key chromatographic method parameters need to be given. It should be clear whether the purity listed is determined by area % (whether absolute area % or relative area %) or weight %.

Clear, unambiguous expression in individual experimental descriptions is vital. Authors are encouraged to use the briefest style possible, describing the experiment with quantitative numbers. Any detailed descriptions of apparatus and routine procedures should be avoided unless precise adherence to a protocol is essential to the success of the experiment being described. The title of an experiment should give the full Chemical Abstracts or IUPAC name and structure number of the product prepared, when appropriate, but this compound should only be identified thereafter by structure number. Abbreviations or chemical formulas for simple chemicals are encouraged if consistent with nomenclature used in the Discussion, as well as the use of a structure number rather than a lengthy chemical name to identify a starting material. Standard abbreviations should be used throughout the Experimental Section, without periods.

It is critical that special attention be called to hazardous compounds and operations and that appropriate handling procedures and literature references to their properties and safe handling be offered. Please use warnings in **bold** font for significant hazards.

## Discussion

The Discussion section should be clearly distinguished from the rest of the text. Avoid the presentation of irrelevant data or lengthy discussion of unproductive pathways. All parts of the narrative should function to advance the central story. The presentation of experimental details in the text of the Discussion section should be kept to a minimum. Avoid the reiteration of information that is made obvious in a table or scheme.

It is important to define whether the purity stated is determined by HPLC area % (whether absolute area or relative area) or versus a known standard (weight %). If the purity technique stated throughout the manuscript is consistent with the first mention of a purity, it is not necessary to restate the basis thereafter (until the Experimental Section); it can be listed without further explanation until a different basis is used.

Supporting Information is a good compromise for the location of data and information that appears to be superfluous for the Discussion yet would still be useful to a reader desiring further information or to provide the experimental basis for observations or conclusions stated in the Discussion. Examples may include copies of spectra, safety related data, pictures or schemes of

experimental equipment that is not widely understood, details of design of experiments, or any other data-intensive document.

## Acknowledgments

The Acknowledgments should recognize technical assistance, advice from colleagues, gifts, etc. Permission should be sought from persons whose contributions to the work are acknowledged in the manuscript, but confirmation from the Editor is not needed.

## References

Avoid unnecessarily long reference lists by selecting citations judiciously and citing reviews when possible. Literature citations and explanatory notes must be numbered in one consecutive series by order of mention in the text. In literature references, journal abbreviations should be those used by Chemical Abstracts Service Source Index ([CASSI](#)).

List submitted articles as “in press” only if they have been formally accepted for publication. Otherwise, use “unpublished work” with the name of the place where the work was done and the date. Include name, affiliation, and date for “personal communications”. For work published online (ASAP, in press), the DOI should be furnished in addition to the author name(s), article title, journal name, and year.

Example of a journal reference:

- Kaiser, D.; Yang, J.; Wuitschik, G. Using Data Analysis To Evaluate and Compare Chemical Syntheses. *Org. Process Res. Dev.* **2018**, *22*, 1222–1235.

Example of an in press journal reference:

- Jiang, J.; Cui, F.; Shen, S.; Guo, X.; Ni, L.; Pan, Y. New Thermal Runaway Risk Assessment Methods for Two Step Synthesis Reactions. *Org. Process Res. Dev.* **2018**, DOI: 10.1021/acs.oprd.8b00266.

Example of a patent reference:

- Cristau, P.; Rahn, N.; Tsuchiya, T.; Wachendorff-Neumann, U.; Voerste, A.; Benting, J. Thiazolyl oxime ethers and hydrazones as crop protection agents. Patent WO2010066353A1, 2010.

Example of a reference to a book with no editors:

- Dicks, A. P.; Hent, A. Selected Qualitative Green Metrics. In *Green Chemistry Metrics: A Guide to Determining and Evaluating Process Greenness*; Springer International Publishing: Cham, Switzerland, 2015; pp 69–79.

Example of a reference to a book with editors:

- Chapsal, B. D.; Ojima, I. Catalytic Asymmetric Synthesis with Novel Monodentate Phosphorus Ligands. In *New Methodologies and Techniques for a Sustainable Organic Chemistry*; Mordini, A., Faigl, F., Eds.; Springer: Siena, Italy, 2005; pp 29–54.

## Supporting Information

This information is provided to the reviewers during the peer-review process (for Review Only) and is available to readers of the published work (for Publication). Supporting Information must be submitted at the same time as the manuscript. See the list of [Acceptable Software by File Designation](#) and confirm that your Supporting Information is [viewable](#).

If the manuscript is accompanied by any supporting information files for publication, these files will be made available free of charge to readers. A brief, nonsentence description of the actual contents of each file, including the file type extension, is required. This description should be labeled Supporting Information and should appear before the Acknowledgement and Reference sections. Examples of sufficient and insufficient descriptions are as follows:

Examples of sufficient descriptions: “Supporting Information:  $^1\text{H}$  NMR spectra for all compounds (PDF)” or “Additional experimental details, materials, and methods, including photographs of experimental setup (DOC)”.

Examples of insufficient descriptions: “Supporting Information: Figures S1-S3” or “Additional figures as mentioned in the text”.

When including supporting information for review only, include copies of references that are unpublished or in-press. These files are available only to editors and reviewers.

## Research Data Policy

All ACS journals strongly encourage authors to make the research data underlying their articles publicly available at the time of publication.

*Research data* is defined as materials and information used in the experiments that enable the validation of the conclusions drawn in the article, including primary data produced by the authors for the study being reported, secondary data reused or analyzed by the authors for the study, and any other materials necessary to reproduce or replicate the results.

The [ACS Research Data Policy](#) provides additional information on Data Availability Statements, Data Citation, and Data Repositories.

## Data Requirements

### Compound Characterization

For all known compounds, the source of the material or references to the utilized literature preparation method and published characterization data must be provided unless the material is a commodity available from common chemical vendors. Spectral data should be presented only if they augment or update the previously published data. Typically,  $^{13}\text{C}$ -NMR and  $^1\text{H}$ -NMR data should be included. Refer to the [NMR Guidelines for ACS Journals](#) for information on including NMR spectra and/or data in an article.

For all new compounds that appear as title compounds in the Experimental Section, adequate evidence to establish both the identity and degree of purity must be provided. Such evidence may be best presented as a combination of data/explanation located between the Discussion and Experimental Section. For instance, the Discussion may include information that a novel compound's identification arose from well-understood chemistry from a known compound or via a single-crystal X-ray structure determination, and the Experimental Section may include the

spectral data that establish the identity and evidence of purity such as a narrow melting range, high HPLC or GC purity, etc. Alternatively, these data can be published in the Supporting Information. In general, only enough data should be presented in the actual Experimental Section to allow another worker to identify the same compound by comparison.

Full lists of infrared absorptions and mass spectral fragmentations should not be presented in the main text. List only those infrared absorptions that are diagnostic for important functional groups and only those mass spectral fragments that are diagnostic for a particular skeleton. Authors may supply high-resolution mass spectrometry (HRMS) data as an additional criterion of compound identity. Additional spectral and characterization data may be presented as Supporting Information.

Evidence of optical purity should be derived from HPLC, GC, or other appropriate analytical data and not simply optical rotation data. Optical rotation, if reported, should be in the form  $[\alpha]^{temp} = (\pm)\text{value} (c \times, \text{solv})$ , where  $\lambda$  is the wavelength of light used for the determination (often the sodium D line), temp is the temperature at which the determination was made,  $c$  is the concentration in g/100 mL, and solv is the solvent used for the measurement. Note that  $[\alpha]$  is expressed without units; the actual units, deg mL/(g dm), are implied.

Evidence of the degree of purity of each compound should be presented. Ideally this evidence will include elemental analysis, but other methods (e.g., spectroscopic, chromatographic) may be used as appropriate, provided that the results are justified by the data. Analytical methods should be given in sufficient detail to allow reproduction. Information such as detailed NMR, 2D analysis, or MS data can be included in Supporting Information. Many processes do not require a high level of purification of an intermediate prior to transformation to the subsequent intermediate. The Experimental Section should indicate the actual purity range achieved.

## Spectra

Reproductions of spectra, or the relevant segments thereof, will be published only if concise numerical summaries are inadequate for the purposes of the article. Articles dealing primarily with interpretation of spectra and those in which band shape or fine structure needs to be illustrated might qualify for this exception. When presentation of spectra is deemed essential, only the pertinent sections (prepared as described for "Figures") should be presented. If an author wishes to publish reproductions of spectra as adjuncts to the characterization of compounds, these can be included as Supporting Information.

## Language and Editing Services

A well-written paper helps share your results most clearly. ACS Publications' [English Editing Service](#) is designed to help scientists communicate their research effectively. Our subject-matter expert editors will edit your manuscript for grammar, spelling, and other language errors so your ideas are presented at their best.

## Preparing Graphics

The quality of illustrations in ACS journals and partner journals depends on the quality of the original files provided by the authors. Figures are not modified or enhanced by journal production staff. All graphics must be prepared and submitted in digital format.



Graphics should be inserted into the main body whenever possible. Please see Appendix 2 for additional information.

Any graphic (figure chart, scheme, or equation) that has appeared in an earlier publication should include a [credit line](#) citing the original source. Authors are responsible for [obtaining written permission](#) to re-use this material.

## Figure and Illustration Services

The impact of your research is not limited to what you can express with words. Tables and figures such as graphs, photographs, illustrations, diagrams, and other visuals can play a significant role in effectively communicating your findings. Our [Artwork Editing](#) and [Graphical Abstract](#) services generate publication-ready figures and Table of Contents (TOC) graphics that conform to your chosen journal's specifications. For figures, this includes changes to file type, resolution, color space, font, scale, line weights, and layout (to improve readability and professional appearance). For TOC graphics, our illustrators can work with a rough sketch or concept or help extract the key findings of your manuscript directly for use as a visual summary of your paper.

## Preparing for Submission

Manuscripts, graphics, supporting information, and required forms, as well as manuscript revisions, must all be submitted in digital format through [ACS Paragon Plus](#), which requires an ACS ID to log in. Registering for an ACS ID is fast, free, and does not require an ACS membership. Please refer to Appendix 1 for additional information on preparing your submission

## Prior Publication Policy

*OPR&D* considers for publication only original work that has not been previously published and is not under consideration for publication elsewhere. Duplication of already published data will eliminate the article from consideration. Publication of an extended abstract does not preclude consideration for publication. It is the responsibility of authors to notify the journal of any abstracts that have been published. Description of work in the form of a patent or a patent application does not preclude publication in *OPR&D*.

*OPR&D* authors are allowed to deposit an initial draft of their manuscript with a preprint service such as [ChemRxiv](#), [bioRxiv](#), [arXiv](#), or the applicable repository for their discipline prior to submission. Please note any use of a preprint server in the cover letter, include a link to the preprint, and, as appropriate, state how the manuscript has been adjusted/updated between deposition and submission. All other prior/redundant publication is forbidden. Upon publication in *OPR&D*, authors are advised to add a link from the preprint to the published article via the Digital Object Identifier (DOI). Some preprint servers, including ChemRxiv and bioRxiv, add this link for authors automatically after publication. For further details, contact the Editorial Office.

The ACS Publications policy on theses and dissertations can be found [here](#).

## Editorial Policies

## Review Process

Once submitted, the manuscript is checked for suitability for the journal (content, manner of presentation, linguistic quality) by the Editor. If the manuscript deemed acceptable, several reviewers are chosen by the Editor to comment on the scientific content of the submitted manuscript. In line with the rules of the ACS, the reviewers are anonymous and are known to the Editor and the Journal staff only. While the ultimate decision for a manuscript is solely at the discretion of the Editor, the input from well-thought-through reviews is a very strong determinant in the decision process.

## Providing Potential Reviewer Names

Authors are required to submit the names, e-mail contacts, and affiliations of four scientists who would be suitable to review the contents of the submitted manuscript and are asked to exercise good judgment in making their suggestions. Authors are encouraged to avoid suggesting reviewers from the authors' institutions. Do not suggest reviewers who may have a [real or perceived conflict of interest](#). Whenever possible, suggest academic email addresses rather than personal email addresses.

## Manuscript Transfer

If your submission is declined for publication by this journal, the editors might deem your work to be better suited for another ACS Publications journal or partner journal and suggest that the authors consider transferring the submission. [Manuscript Transfer](#) simplifies and shortens the process of submitting to another ACS journal or partner journal, as all the coauthors, suggested reviewers, manuscript files, and responses to submission questions are copied by ACS Paragon Plus to the new draft submission. Authors are free to accept or decline the transfer offer.

Note that each journal is editorially independent. Transferring a manuscript is not a guarantee that the manuscript will be accepted, as the final publication decision will belong to the editor of the next journal.

# PRODUCTION AND PUBLICATION

## Proofs via ACS Direct Correct

Correction of the galley proofs is the responsibility of the Corresponding Author. The Corresponding Author of an accepted manuscript will receive e-mail notification and complete instructions when page proofs are available for review via [ACS Direct Correct](#). Extensive or important changes on page proofs, including changes to the title or list of authors, are subject to review by the editor.

It is the responsibility of the Corresponding Author to ensure that all authors listed on the manuscript agree with the changes made on the proofs. Galley proofs should be returned within 48 hours in order to ensure timely publication of the manuscript.

## Publication Date and Patent Dates

Accepted manuscripts will be published on the ACS Publications Web site as soon as page proofs are corrected and all author concerns are resolved. The first date on which the document is published on the Web is considered the publication date.

Publication of manuscripts on the Web may occur weeks in advance of the cover date of the issue of publication. Authors should take this into account when planning their patent and intellectual property activities related to a document and should ensure that all patent information is available at the time of first publication, whether ASAP or issue publication.

All articles published ahead of print receive a unique Digital Object Identifier (DOI) number, which is used to cite the manuscript before and after the paper appears in an issue. Additionally, any supplemental information submitted along with the manuscript will automatically be assigned a DOI and hosted on Figshare to promote open data discoverability and use of your research outputs.

## **ASAP Publication**

Manuscripts will be published on the “ASAP Articles” page on the web as soon as page proofs are corrected and all author concerns are resolved. ASAP publication usually occurs within a few working days of receipt of page proof corrections, which can be several weeks in advance of the cover date of the issue.

## **Post-Publication Policies**

The American Chemical Society follows guidance from the [Committee on Publication Ethics](#) (COPE) when considering any ethical concerns regarding a published article, Retractions, and Expressions of Concern.

## **Additions and Corrections**

Additions and Corrections may be requested by the author(s) or initiated by the Editor to address important issues or correct errors and omissions of consequence that arise after publication of an article. All Additions and Corrections are subject to approval by the Editor, and should bring new and directly relevant information and corrections that fix scientific facts. Minor corrections and additions will not be published. Readers who detect errors of consequence in the work of others should contact the corresponding author of that work.

Additions and Corrections must be submitted as new manuscripts via ACS Paragon Plus by the Corresponding Author for publication in the “Addition/Correction” section of the Journal. The corresponding author should obtain approval from all coauthors prior to submitting or provide evidence that such approval has been solicited. The manuscript should include the original article title and author list, citation including DOI, and details of the correction.

## **Retractions**

Articles may be retracted for scientific or ethical reasons and may be requested by the article author(s) or by the journal Editor(s), but are ultimately published at the discretion of the Editor. Articles that contain seriously flawed or erroneous data such that their findings and conclusions cannot be relied upon may be retracted in order to correct the scientific record. When an article is retracted, a notice of Retraction will be published containing information about the reason for the Retraction. The originally published article will remain online except in extraordinary circumstances (e.g. where deemed legally necessary, or if the availability of the published content poses public health risks).

## Expressions of Concern

Expressions of Concern may be issued at the discretion of the Editor if:

- there is inconclusive evidence of research or publication misconduct by the authors;
- there is evidence that the findings are unreliable but the authors' institution will not investigate the case;
- an investigation into alleged misconduct related to the publication either has not been, or would not be, fair and impartial or conclusive;
- an investigation is underway but a judgment will not be available for a considerable time.

Upon completion of any related investigation, and when a final determination is made about the outcome of the article, the Expression of Concern may be replaced with a Retraction notice or Correction.

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## Appendix 1: PREPARING FOR SUBMISSION

We've developed ACS' publishing and editorial policies in consultation with the research communities that we serve, including authors and librarians. Browse our policies below to learn more.

## Ethical Guidelines

ACS editors have provided [Ethical Guidelines](#) for persons engaged in the publication of chemical research—specifically, for editors, authors, and reviewers. Each journal also has a specific [policy on prior publication](#).

## OFAC Compliance

As a U.S.-based non-profit organization, the American Chemical Society (ACS) is required to comply with U.S. sanctions laws and regulations administered by the [U.S. Treasury Department's Office of Foreign Assets Control](#) (OFAC). While these laws and regulations permit U.S.-based publishers like ACS to engage in publishing-related activities with authors located in sanctioned regions in many cases, ACS may be prohibited under U.S. law from engaging in publishing-related activities in some cases, including, but not limited to, instances where an author or the institution with which an author is affiliated is located in a particular sanctioned region or has been designated by OFAC as a [Specially Designated National](#) (SDN) pursuant to certain U.S. sanctions programs. ACS reserves the right to refrain from engaging in any publishing-related activities that ACS determines in its sole discretion may be in violation of U.S. law.

## Safety Considerations

Authors must emphasize any unexpected, new, and/or significant hazards or risks associated with the reported work. This information should be in the Experimental Section of a full article and included in the main text of a letter. Statement examples can be found in the [Safety Statement Style Sheet](#) and additional information on communicating safety information from the *ACS Guide to Scholarly Communication* [is freely available here](#).

## Conflict of Interest Disclosure

A statement describing any financial conflicts of interest or lack thereof is published in each ACS journal and partner journal article.

During the submission process, the Corresponding Author must provide a statement on behalf of all authors of the manuscript, describing all potential sources of bias, including affiliations, funding sources, and financial or management relationships, that may constitute conflicts of interest. If the manuscript is accepted, the statement will be published in the final article.

If the manuscript is accepted and no conflict of interest has been declared, the following statement will be published in the final article: “The authors declare no competing financial interest.”

## Plagiarism

In publishing only original research, ACS is committed to deterring plagiarism, including self-plagiarism. ACS Publications uses CrossCheck's iThenticate software to screen submitted manuscripts for similarity to published material. Note that your manuscript may be screened during the submission process.

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[of Chemical Research](#). See also the [press release](#) regarding ACS' participation in the CrossCheck initiative.

## Authorship, Author List, and Coauthor Notification

Authors are required to obtain the consent of all their coauthors prior to submitting a manuscript. The submitting author accepts the responsibility of notifying all coauthors that the manuscript is being submitted.

During manuscript submission, the submitting author must provide contact information (full name, email address, institutional affiliation, and mailing address) for all of the coauthors. Because all of the author names are automatically imported into the electronic [Journal Publishing Agreement](#), the names must be entered into ACS Paragon Plus. (Note that coauthors are not required to register in ACS Paragon Plus.) Author affiliation should reflect where the work was completed, even if the author has since left that institution. Authors may include a note with a current address if their institution has changed since the work was completed.

To expedite the processing of your manuscript, please format your author and affiliation information according the guidelines in this link:

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## Appendix 2: Preparing Graphics

### Resolution

Digital graphics pasted into manuscripts should have the following minimum resolutions:

- Black and white line art, 1200 dpi
- Grayscale art, 600 dpi
- Color art, 300 dpi

### Size

Graphics must fit a one- or two-column format. Single-column graphics can be sized up to 240 points wide (3.33 in.) and double-column graphics must be sized between 300 and 504 points (4.167 in. and 7 in.). The maximum depth for all graphics is 660 points (9.167 in.) including the caption (allow 12 pts. For each line of caption text). Lettering should be no smaller than 4.5 points in the final published format. The text should be legible when the graphic is viewed full-size. Helvetica or Arial fonts work well for lettering. Lines should be no thinner than 0.5 point.

### Color

Color may be used to enhance the clarity of complex structures, figures, spectra, and schemes, etc., and color reproduction of graphics is provided at no additional cost to the author. Graphics intended to appear in black and white or grayscale should not be submitted in color.

### Type of Graphics

#### Table of Contents (TOC)/Abstract Graphic

Consult the Guidelines for [Table of Contents/Abstract Graphics](#) for specifications.

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## Figures

A caption giving the figure number and a brief description must be included below each figure. The caption should be understandable without reference to the text. It is preferable to place any key to symbols used in the artwork itself, not in the caption. Ensure that any symbols and abbreviations used in the text agree with those in the artwork.

## Charts

Charts (groups of structures that do not show reactions) may have a brief caption describing their contents.

## Tables

Each table must have a brief (one phrase or sentence) title that describes the contents. The title should be understandable without reference to the text. Details should be put in footnotes, not in the title. Tables should be used when the data cannot be presented clearly in the narrative, when many numbers must be presented, or when more meaningful inter-relationships can be conveyed by the tabular format. Tables should supplement, not duplicate, information presented in the text and figures. Tables should be simple and concise.

## Schemes

Each scheme (sequences of reactions) may have a brief caption describing its contents.

## Chemical Structures

Chemical structures should be produced with the use of a drawing program such as ChemDraw.

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