DESCRIPTION

The aim of Advanced Powder Technology is to meet the demand for an international journal that integrates all aspects of science and technology research on powder and particulate materials. The journal fulfills this purpose by publishing original research papers, rapid communications, reviews, and translated articles by prominent researchers worldwide.

The editorial work of Advanced Powder Technology, which was founded as the International Journal of the Society of Powder Technology, Japan, is now shared by distinguished board members, who operate in a unique framework designed to respond to the increasing global demand for articles on not only powder and particles, but also on various materials produced from them.

Advanced Powder Technology covers various areas, but a discussion of powder and particles is required in articles. Topics include:
- Production of powder and particulate materials in gases and liquids (nanoparticles, fine ceramics, pharmaceuticals, novel functional materials, etc.)
- Aerosol and colloidal processing
- Powder and particle characterization
- Dynamics and phenomena
- Calculation and simulation (CFD, DEM, Monte Carlo method, population balance, etc.)
- Measurement and control of powder processes
- Particle modification
- Communion Powder handling and operations (storage, transport, granulation, separation, fluidization, etc.)

IMPACT FACTOR

2019: 4.217 © Clarivate Analytics Journal Citation Reports 2020

ABSTRACTING AND INDEXING

Science Citation Index Expanded
Current Contents
ScienceDirect
Scopus
Engineering Index
INSPEC
EDITORIAL BOARD

Editor-in-Chief
Masayoshi Fuji, Nagoya Institute of Technology, Nagoya, Japan

Executive Editors
Rajesh N. Davé, New Jersey Institute of Technology, Newark, New Jersey, United States of America
Stefan Heinrich, Hamburg University of Technology, Hamburg, Germany
Hee Dong Jang, Korea Institute of Geoscience and Mineral Resources, Daejeon, South Korea
Hsiu-Po Kuo, National Taiwan University, Taipei, Taiwan
Ryoichi Kurose, Kyoto University, Kyoto, Japan
Giridhar Madras, Indian Institute of Science, Bengaluru, India
Jun Oshtiani, Okayama University of Science, Okayama, Japan
Cordelia Selomulya, University of New South Wales, Sydney, New South Wales, Australia

Associate Executive Editors
Ecevit Bilgili, New Jersey Institute of Technology, Newark, United States of America
Jung Hyeun Kim, University of Seoul, Seoul, South Korea
Raymond Wai Man Lau, Nanyang Technological University, Singapore, Singapore

Editorial Board
Mohammad Azad, North Carolina Agricultural and Technical State University, United States of America
Takeyuki Ban, Gifu University, Japan
Andrzej Calka, University of Wollongong, Australia
Hankwon Chang, Korea Institute of Geoscience and Mineral Resources, South Korea
Bodhisattwa Chaudhuri, University of Connecticut, United States of America
Jia Wei Chew, Nanyang Technological University, Singapore
Hee Chan Cho, Seoul National University, South Korea
Clive E Davies, Massey University - Auckland Campus, New Zealand
Geoffrey Michael Evans, The University of Newcastle School of Engineering, Australia
George Franks, The University of Melbourne Department of Chemical Engineering, Australia
Kunihiro Fukui, Hiroshima University, Japan
Pablo García-Triñanes, University of Greenwich Faculty of Engineering and Science, United Kingdom
Benjamin B. Glasser, Rutgers, The State University of New Jersey, Newark, United States of America
Yongsheng Han, Chinese Academy of Sciences, China
Dalton Harvie, The University of Melbourne, Australia
Kimberly Hayden Henthorn, Rose Hulman Institute of Technology, United States of America
Yuji Hotta, National Institute of Advanced Industrial Science and Technology Chubu Center, Japan
Shu-San Hsiau, National Central University, Taiwan
An-Ni Huang, Chang Gung University, Taiwan
Motonyuki Iijima, Yokohama National University, Japan
Kenji Iimura, Hyogo University, Japan
Miki Inada, National University Corporation Kyushu University, Japan
Naoyuki Ishida, Okayama University, Japan
Tomohiro Iwasaki, Osaka Prefecture University, Japan
Kazunori Kadota, Osaka Medical and Pharmaceutical University, Japan
Yong Kang, Chungnam National University, South Korea
Junya Kano, Tohoku University, Japan
Tae-Oh Kim, Kumoh National Institute of Technology, South Korea
Mitsumasa Kimata, Yamagata University, Japan
Takahiro Kozawa, Osaka University, Japan
Praveen Kumar, Indian Institute of Science, India
Arno Kwade, Braunschweig University of Technology, Germany
Donggeun Lee, Pusan National University, South Korea
Fanxing Li, University of North Carolina System, United States of America
Xinhua Liang, Missouri University of Science and Technology, United States of America
Eldin Wee Chuan Lim, National University of Singapore, Singapore
Shih-Yuan Lu, National Tsing Hua University, Taiwan
Kun Luo, Zhejiang University, China
Lutz Mädler, University of Bremen, Germany
Takuro Matsunaga, Toyota Central Research and Development Labs Inc, Japan
Amitava Mukherjee, VIT University Centre for NanoBiotechnology, India
Hideya Nakamura, Osaka Prefecture University, Japan
Keitaroh Nakamura, Nisshin Seifun Group Inc, Japan
Bernardshaw Neppolian, SRM Institute of Science and Technology, India
Toshiyuki Nomura, Osaka Prefecture University, Japan
Takashi Ogi, Hiroshima University, Japan
Tomoya Ohno, Kitami Institute of Technology, Japan
Urs Alexander Peuker, Institut fur MVT/AT, Germany
Yansong Shen, University of New South Wales School of Chemical Engineering, Australia
Svetlana Stevanovic, Deakin University, Australia
Kohei Tahara, Gifu Pharmaceutical University, Japan
Chika Takai-Yamashita, Gifu University, Japan
Hidekazu Tanaka, Shimane University, Japan
Kenji Tanno, Central Research Institute of Electric Power Industry, Japan
Chiharu Tokoro, Waseda University, Japan
Do-Hao Tsai, National Tsing Hua University, Taiwan
Ravikrishnan Vinu, Indian Institute of Technology Madras, India
Hiroyuki Watanabe, National University Corporation Kyushu University, Japan
Satoshi Watanabe, Kyoto University, Japan
Craig Wheeler, The University of Newcastle, Australia
Yangchuan Xing, University of Missouri, United States of America
Tetsuya Yamamoto, Nagoya University, Japan
Jun Yao, Xiamen University, China
Xiaolong Yin, Colorado School of Mines, United States of America
Alex Chi-Kin Yip, University of Canterbury, New Zealand
Seung-Joon Yoo, Seonam University, South Korea
Mikio Yoshida, Doshisha University, Japan

Advisory Board
Keith Carpenter, Singapore, Singapore
Reg Davies, Wilmington, Delaware, United States of America
Liang-Shih Fan, Columbus, Ohio, United States of America
Mojtaba Ghadiri, Leeds, United Kingdom
Leon Gradoń, Warszawa, Poland
Hidehiro Kamiya, Tokyo, Japan
Chikao Kanaoka, Kanazawa, Japan
Yoshiaki Kawashima, Aichi, Japan
Devang V. Khakhar, Mumbai, India
Duu-Jong Lee, Taipei, Taiwan
Hans Leuenberger, Basel, Switzerland
Jinghai Li, Beijing, PRC, China
Hisao Makino, CRIEPI, Japan
Hiroaki Masuda, Kyoto, Japan
Moudgil, Gainesville, Florida, United States of America
Kikuo Okuyama, Hiroshima, Japan
Park, Seoul, South Korea
Wolfgang Peukert, Erlanger-Nuremberg, Germany
Robert Pfeffer, New Jersey, United States of America
Sotiris S.E. Pratsinis, Zurich, Switzerland
Martin Rhodes, Clayton, Victoria, Australia
Peter Scales, Melbourne, Victoria, Australia
Andreas Schmidt-Ott, Delft, The Netherlands
Mamoru Senna, Yokohama, Japan
Hisao Suzuki, Shizuoka, Japan
Wiwutt Thantpanichakoon, Bangkok, Thailand
Chi-Hwa Wang, Singapore, Singapore
Richard A. R.A. Williams, Birmingham, United Kingdom
Hideo Yamamoto, Tokyo, Japan
Shinichi Yuu, Kitakyushu, Japan

Founding Editor
Keizo Morikawa, Japan

Honorary Editors-in-Chief
Gotoh, Toyohashi, Japan
Ko Higashitani, Kyoto, Japan
Shuji Matusaka, Kyoto, Japan
Yasushige Mori, Kyotanabe, Japan

Editorial Office
GUIDE FOR AUTHORS

Introduction
It is now possible to submit your paper online and benefit from the considerably shorter time required to reach an editorial decision about publication. For all further information, please go to the journal’s homepage on https://www.elsevier.com/locate/apt.

Categories of submission

• **Original research paper**
  Research papers deal with original and ingenious ideas, as well as academically valuable findings and conclusions.

• **Rapid communication**
  Rapid communications deal with any topics which are necessary to be promptly and preferentially published, therefore the authors must submit the statement briefly described why the topics should be published as soon as possible for readers.

• **Letter to editor**
  Letter to editor is an additional and supplemental comment to/against an article published in the journal.

• **Review article**
  Review articles are what describe the latest developments and trends in a specific field related with particle technology, and are committed and invited by the editorial board.

• **Translated paper**
  Research papers translated in English, at the request of the editorial board, from among the articles published in Journal of the Society of Powder Technology, Japan, for the reason that the editorial board committed they are worth and need to be introduced worldwide.

Page charge
There are no page charges.

Contact details for submission
Any questions regarding submission should be directed to the editorial office:

The Society of Powder Technology, Japan
No.5 Kyoto Bldg.,181 Kitamachi, Karasuma-dori, Rokujo-agaru, Shimogyo-ku, Kyoto 600-8176 Japan
Tel: +81-(0)75-351-2318, Fax: +81-(0)75-352-8530, E-mail: apt@sptj.jp

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
**Manuscript:**
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print

**Graphical Abstracts / Highlights files** (where applicable)
**Supplemental files** (where applicable)

Further considerations
• Manuscript has been 'spell checked' and 'grammar checked'
• All references mentioned in the Reference List are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Internet)
• A competing interests statement is provided, even if the authors have no competing interests to declare
• Journal policies detailed in this guide have been reviewed
• Referee suggestions and contact details provided, based on journal requirements

For further information, visit our Support Center.

BEFORE YOU BEGIN

Ethics in publishing
Please see our information on Ethics in publishing.

Declaration of competing interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors should complete the declaration of competing interest statement using this template and upload to the submission system at the Attach/Upload Files step. Note: Please do not convert the .docx template to another file type. Author signatures are not required. If there are no interests to declare, please choose the first option in the template. More information.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Changes to authorship
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.
Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.
Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

Author rights
As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Open access
Please visit our Open Access page for more information.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's Author Services.

Submission
Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts source files to a single PDF file of the article, which is used in the peer-review process. Please note that even though manuscript source files are converted to PDF files at submission for the review process, these source files are needed for further processing after acceptance. All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail removing the need for a paper trail. The authors should select 2 or more classifications shown in the submission process through Editorial Manager.

Upon submission, please identify which member of the editorial board you would like to review your manuscript. Without such a request, the editorial office will assign your paper to the appropriate editorial board member.

Referees
Please submit the names and institutional e-mail addresses of several potential referees. For more details, visit our Support site. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

PREPARATION

Peer review
This journal operates a single anonymized review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor’s decision is final. Editors are not involved in decisions about papers which they have written themselves or have been written by family members or colleagues or which relate to products or services in which the editor has an
interest. Any such submission is subject to all of the journal's usual procedures, with peer review handled independently of the relevant editor and their research groups. More information on types of peer review.

**Use of word processing software**

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

**LaTeX**

You are recommended to use the Elsevier article class elsarticle.cls to prepare your manuscript and BibTeX to generate your bibliography.

Our LaTeX site has detailed submission instructions, templates and other information.

**Article Structure**

Headings and subheadings for different sections of the paper (e.g. Introduction, Methods, Results, Discussion, and Conclusion) should be clearly indicated. Units of measurement, abbreviations and symbols should follow the International System of Units (SI). Equations and formulae should be typewritten. Equations should be numbered consecutively with Arabic numerals in parentheses on the right-hand side of the page. Authors are requested to use double line spacing of the text and to be numbered beginning with the title page.

**Introduction**

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

**Material and methods**

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

**Theory/calculation**

A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

**Results**

Results should be clear and concise.

**Discussion**

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

**Conclusions**

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

**Appendices**

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.
Essential title page information

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. Authors are not permitted to submit two or more consecutive papers with any sub-title. Each paper is to be treated as an individual paper; authors should not use "Part I," "Part II," or other similar phrases in the title.

- **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author’s name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author. Our editorial policy requires that the corresponding author use the e-mail address they were given by their professional affiliation (university/institution/company). If the corresponding author has any difficulty using their professionally affiliated e-mail address, he/she may use any free e-mail address by portal sites, such as yahoo.com, gmail.com and others, only as a tentative measure for contact between the editorial office, publisher and the corresponding author. However, please be advised that manuscripts without a professionally affiliated e-mail address may be returned before proceeding with the review. We are unable to formally publish any manuscripts without the corresponding author's affiliation's e-mail address in our journal, even though they are accepted.

- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

- **Suggestive reviewers.** Our editorial policy also requires the authors to provide the information of three or more Suggestive Reviewers, whose e-mail address are given by their professional affiliation (university/institution/company). If the authors offer their information with any free e-mail address by portal sites, such as yahoo.com, gmail.com and others, we do not receive any such submissions.

**Highlights**

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

**Abstract**

A concise and factual abstract of no more than 200 words is required and should follow the title page on a separate sheet. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

**Graphical abstract**

A graphical abstract is mandatory for this journal. It should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership online. Authors must provide images that clearly represent the work described in the article. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site. Authors can make use of Elsevier's Illustration Services to ensure the best presentation of their images also in accordance with all technical requirements.

**Keywords**
Immediately after the abstract, provide a maximum of 5 keywords, using British spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Formatting of funding sources**
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Math formulae**
Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

**Footnotes**
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

**Artwork**

**Electronic artwork**

**General points**
- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
- Ensure that color images are accessible to all, including those with impaired color vision.

A detailed [guide on electronic artwork](#) is available.

**You are urged to visit this site; some excerpts from the detailed information are given here. Formats**

AUTHOR INFORMATION PACK 17 Jun 2021 www.elsevier.com/locate/apt 9
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.
TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article. Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure Captions
Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

In the captions, please number each item consecutively in accordance with the appearance in the text.

Tables
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References
Citation in text
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

In the text, please indicate references by number(s) in square brackets in line with the text, and also please number the references (numbers in square brackets) in the list in the order in which they appear in the text.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
http://open.mendeley.com/use-citation-style/advanced-powder-technology
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Sample list of references

Journal Publication:

Book:

Edited Book:

Book Section:

Proceedings:

Patent:

Web Reference:

Data Citation:

**Journal abbreviations source**
Journal names should be abbreviated according to the List of Title Word Abbreviations.

**Video**
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

**Data visualization**
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

**Supplementary material**
Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

**Research data**
This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

**Data linking**
If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.
In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

Mendeley Data
This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

Data in Brief
You have the option of converting any or all parts of your supplementary or additional raw data into a data article published in Data in Brief. A data article is a new kind of article that ensures that your data are actively reviewed, curated, formatted, indexed, given a DOI and made publicly available to all upon publication (watch this video describing the benefits of publishing your data in Data in Brief). You are encouraged to submit your data article for Data in Brief as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to Data in Brief where it will be editorially reviewed, published open access and linked to your research article on ScienceDirect. Please note an open access fee is payable for publication in Data in Brief. Full details can be found on the Data in Brief website. Please use this template to write your Data in Brief data article.

MethodsX
You have the option of converting relevant protocols and methods into one or multiple MethodsX articles, a new kind of article that describes the details of customized research methods. Many researchers spend a significant amount of time on developing methods to fit their specific needs or setting, but often without getting credit for this part of their work. MethodsX, an open access journal, now publishes this information in order to make it searchable, peer reviewed, citable and reproducible. Authors are encouraged to submit their MethodsX article as an additional item directly alongside the revised version of their manuscript. If your research article is accepted, your methods article will automatically be transferred over to MethodsX where it will be editorially reviewed. Please note an open access fee is payable for publication in MethodsX. Full details can be found on the MethodsX website. Please use this template to prepare your MethodsX article.

Data statement
To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

AFTER ACCEPTANCE

Online proof correction
To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.
**Offprints**
The corresponding author will, at no cost, receive 25 free paper offprints, or alternatively a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's Author Services. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

**AUTHOR INQUIRIES**
Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch. You can also check the status of your submitted article or find out when your accepted article will be published.