DESCRIPTION

*Chemosphere* is an international journal designed for the publication of original communications and review articles. As a multidisciplinary journal, *Chemosphere* offers broad and impactful dissemination of investigations related to all aspects of environmental science and engineering.

*Chemosphere* will publish:

- Original communications (research papers) describing important new discoveries or further developments in important fields of investigation related to the environment and human health
- Reviews, mainly of new developing areas of environmental science
- Discussion papers
- Letters to the editor
- Short communications
- Special themed issues on relevant topics.

All papers should demonstrate a high level of novelty, originality and uniqueness. The following sections and subject fields are included:

**Environmental Chemistry (including Persistent Organic Pollutants and Dioxins)**

This section will publish manuscripts dealing with fundamental processes in the environment that are related to the behavior, fate and alteration of organic and inorganic contaminants of environmental concern. This sections focuses on the dynamics of contaminants in environmental compartments such as water, soil, sediment, organisms, dust and air their interactions with the biosphere. This section also includes all scientific aspects of persistent organic pollutants (POPs), including exposure studies in the environment and people, toxicology, epidemiologic investigations, risk assessment and processes that generate or attenuate these pollutants. Only studies that are of significance to an international audience, including case studies of particular global interest, or lend themselves to interpretation at the global level should be submitted. Papers on climate change are not considered.

Specific topics of interest include:
- Emerging contaminants, such as pharmaceuticals, pesticides, flame retardants, other industrial chemicals, POPs, endocrine disruptors, etc.
- Trace metals, organometals, metalloids and radionuclides
- Environmental fate studies including transport, biodegradation, bio-accumulation and/or deposition, atmospheric (photo)chemical processes, hydrolysis, adsorption/desorption
• Transformation and mineralisation of chemicals, e.g. by bio- and photo degradation, redox processes and hydrolysis
• Soil and water chemistry focused on interaction, degradation and speciation aspects of environmental contaminants
• Novel environmental analytical methods including case studies
• Development and application of environmental modelling and quantitative structure-activity relationships to study fate and environmental dynamics
• Monitoring studies presenting new strategies, report of novel contaminants, findings or interpretations of general interest for an international readership.
• Non-target and suspect screening (e.g. effect-directed analysis)
• Marine toxins

**Toxicology and Risk Assessment**

The section on Environmental Toxicology and Risk Assessment covers all aspects of toxicology, i.e., the science of adverse effects of chemicals and toxic substances on living organisms including humans, and the scientific assessment of the risk that such adverse effects may occur.

Specific topics of interest include:
• Adverse effects of chemicals in environmental, aquatic and terrestrial, organisms
• Epidemiological studies on effects of chemicals in humans
• Biochemical studies related to mechanisms of adverse effects
• Toxicokinetics and metabolic studies on chemicals related to adverse effects
• Development and validation of testing methods based on living organisms or biological materials
• Effects of nanoparticles, nanocomposites and microplastics in the environment
• Endocrine disruption
• High-throughput screening
• Mechanistic toxicology
• Fish toxicology
• DNA and protein adducts
• In vitro assays and omics techniques
• Phytotoxicity

**Treatment and Remediation**

This section focuses on technologies that manage and/or reduce environmental contaminants, including reuse and recycling processes. The technology must be beyond a basic laboratory study or have obvious implications for current or potential treatment or remediation technologies. As an example, manuscripts focusing on fundamental (bio)adsorption studies or metal extraction by plant species should be submitted to a more suitable journal. The results of studies of a routine nature should not be submitted for review. For example, for oxidation processes, the intermediates and/or the extent of mineralization of the targeted compound(s) and wastes must be quantified in addition to target compound attenuation.

Specific topics that are encouraged for publication include:
• Advanced water and wastewater treatment processes and sludge management
• Remediation (including phytoremediation) employing novel strategies, findings, or interpretations
• Hazardous waste industrial chemicals
• Hydraulic fracturing and produced water
• Electrochemical methods for water and solids treatment
• Nanotechnology
• Advanced oxidation processes
• Photolysis and photocatalysis
• Natural treatment systems (riverbank filtration, aquifer recharge and recovery)
• Characterization and fate of natural and effluent organic matter

**Not considered** are studies that focus on the synthesis of new materials to be used in waste water purification or remediation. Studies focusing on the removal of single contaminants are often less competitive for publication in Chemosphere.
AUDIENCE

Environmental scientists, chemical engineers, biologists, toxicologists.

IMPACT FACTOR

2017: 4.427 © Clarivate Analytics Journal Citation Reports 2018

ABSTRACTING AND INDEXING

MEDLINE®
Environmental Periodicals Bibliography
Analytical Abstracts
Aqualine Abstracts
BIOSIS
Elsevier BIOBASE
Cambridge Scientific Abstracts
Current Contents/Agriculture, Biology & Environmental Sciences
Chemical Abstracts
EMBASE
PASCAL/CNRS
Science Citation Index
SciSearch
Research Alert
Scopus

EDITORIAL BOARD

Co-Editors-in-Chief
Jacob de Boer, Dept. Environment and Health, Vrije Universiteit Amsterdam, De Boelelaan 1085, 1081 HV, Amsterdam, Netherlands
Non-dl-POPs, FRs, levels, trends, analytical methods, food chain accumulation, interlab studies, biomonitoring, fate, exposure, fish, shellfish toxins
Shane Snyder, University of Arizona, 1133 E. James E. Rogers Way, Harshbarger 108, Tucson, Arizona, AZ 85721-0011, USA
Drinking water, hydraulic fracturing, produced water, water treatment processes (particularly advanced oxidation), use of cellular bioassays for characterizing complex mixtures of contaminants

Special Issues Editor
Derek Muir, Aquatic Contaminants Research Division, Environment and Climate Change Canada, 867 Lakeshore Road, Burlington, L7S1A1, Ontario, Canada
Environmental chemistry; Biogeochemistry; Bioaccumulation; Persistent organic pollutants; Chemicals of emerging concern; Chemical inventories; Mercury; Polycyclic aromatic compounds; Arctic; Marine mammals; Fish

Associate Editors

Environmental Chemistry
Xinde Cao, Shanghai Jiao Tong University, Shanghai, China
Soil remediation, contaminant removal from water, flue gas, metal speciation, metals in soil, bioavailability and human health, arsenic, phosphate, development, application of solid waste-derived environmentally functional materials, biochar, recycling, groundwater
Jacob de Boer, Vrije Universiteit Amsterdam, Amsterdam, Netherlands
Non-dl-POPs, FRs, levels, trends, analytical methods, food chain accumulation, interlab studies, biomonitoring, fate, exposure, fish, shellfish toxins
Ralf Ebinghaus, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
PM2.5, air pollution, organic and inorganic contaminants, mercury, POPs, emerging contaminants, marine environment, polar environment, atmosphere
Petra Krystek, Vrije Universiteit Amsterdam, Amsterdam, Netherlands
trace elements, speciation, nanomaterials, environment, health, exposure, (hyphenated) analytical techniques, method development, validation

**Klaus Kümmener**, Leuphana Universität Lüneburg, Lüneburg, Germany
Sustainable Chemistry; Green Chemistry; Green and Sustainable Pharmacy; Resources; Benign by Design; Environmental Chemistry; Time and sustainability

**Martine Leermakers**, Vrije Universiteit Brussel (VUB), Bruxelles, Belgium
Trace metals, organometals, metalloids, radionuclides, analytical techniques, geochemical cycling, metals and human health, gel diffusion techniques, for in situ trace metal speciation DGT (diffusive gradients in thin films) and DET (diffusive equilibrium in thin films), mining

**Lena Ma**, University of Florida, Gainesville, Florida, USA
Biogeochemistry of trace metals in soils, wastes, and plants; Soil contamination and remediation; Phytoremediation; Chemical stabilization; Metal speciation; Metal bioavailability and bioaccessibility; Metal exposure and human health; Plant metal uptake and transport; Microbial transformation of metals; Metal availability and food safety

**Keith Maruya**, Southern California Coastal Water Research Project, Costa Mesa, California, USA
Sources, fate, effects of emerging contaminants, natural organohalogens, aquatic ecosystems, bioanalytical tools, passive samplers, POPs, HOCs, contaminated sediments, recycled water

**Derek Muir**, Environment and Climate Change Canada, Burlington, Ontario, Canada
Environmental chemistry; Biogeochemistry; Bioaccumulation; Persistent organic pollutants; Chemicals of emerging concern; Chemical inventories; Mercury; Polycyclic aromatic compounds; Arctic; Marine mammals; Fish

**Patryk Oleszczuk**, Maria Curie-Sklodowska University, Lublin, Poland
Biochar; organic contaminants; heavy metals; polycyclic aromatic hydrocarbons; nanoparticles; sewage sludge; ecotoxicology; remediation

**Myrto Petreas**, California Environmental Protection Agency, Berkeley, California, USA
Levels, trends, dl-POPs, BFRs, analytical methods, bioaccumulation, biomonitoring, exposure assessment, emission, production, generation

**Andreas Sjödin**, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, USA
Human health; Analytical methods; Di- and non-dl-POPs

**Toxicology and Risk Assessment**

**Tamara Galloway**, University of Exeter, Exeter, England, UK
Nanopolymers and nanocomposites, microplastics as marine pollutants, ecotoxicology, adaptation, oil fracking and drilling, human biomonitoring

**Andreas Gies**, German Environment Agency, Berlin, Germany
Bioassays, human biomonitoring, ecotoxicology, epidemiology, indoor air, oil fracking and drilling

**Jian-Ying Hu**, Peking University, Beijing, China

**James Lazorchak**, National Exposure Research Laboratory, Cincinnati, Ohio, USA
Effect of EDCs on fish populations; Estrogenicity of WWTP discharge; G expression; Toxicity effects on a population; Invasive toxic algae; DNA and protein adducts; Impact of coal; Mineral, gas and oil extraction; Pharmaceuticals; Water quality criteria

**Willie Peijnenburg**, Universiteit Leiden, Leiden, Netherlands
Risk assessment; Ecological risk assessment; Environmental fate and effect assessment; Nanoparticles; Bioavailability; Metals; Organics; Quantitative structure-activity relationships (QSARs); Transformation of chemical substances; Biodegradation; Abiotic transformations

**David Volz**, University of California, Riverside, Riverside, California, USA
Fish toxicology; hepatotoxicity; cardiovascular toxicity; neurotoxicity; early life-stage toxicity; pesticides; high-volume chemicals; flame retardants; chemicals policy and regulation; human and ecological risk assessment; high-throughput screening; mechanistic toxicology;

**Treatment and Remediation**

**Enric Brillas**, Universitat de Barcelona, Barcelona, Spain
Non-dl-POPs, FRs, levels, trends, analytical methods, food chain accumulation, interlab studies, biomonitoring, fate, exposure, fish, shellfish toxins

**Teresa J. Cutright**, University of Akron, Akron, Ohio, USA
Bioremediation, phytoremediation, environmental engineering

**Jun Huang**, Tsinghua University, Beijing, China
DAOP (advanced oxidation process), photolysis/photocatalysis, mechanochemical destruction (MCD), alternative to POPs, PPCPs removal

**Hyunook Kim**, University of Seoul, Seoul, The Republic of Korea
Biological removal of organic compounds, nutrient removal, analysis and degradation of trace organics, odorants from water/wastewater

**Yongmei Li**, Tongji University, Shanghai, China

Removal and recovery of nutrients from wastewater; Fate and attenuation of emerging organic contaminants (e.g. NDMA, EDCs, PPCPs, etc.); Carbon source management; Modelling of wastewater treatment plant; Biological treatment; Advanced oxidation process

**Tsair-Fuh Lin**, National Cheng Kung University, Tainan, Taiwan

Identification, treatment, and process modeling relevant to cyanobacteria, taste and odor compounds and cyanotoxins present in reservoirs and water treatment plants; monitoring and treatment of arsenic and chlorinated hydrocarbons in ground water

**Yu Liu**, Nanyang Technological University, Singapore, Singapore

Anaerobic degradation, nutrient recovery

**William Mitch**, Stanford University, Stanford, California, USA

Environmental organic chemistry, disinfection byproduct formation mechanisms, nitrosamines, other research interests include the formation of nitrosamines formed by the reaction of NOx with amines used to capture CO2 from power plants, the effect of halides on the natural (i.e., sunlight) or engineered (i.e., advanced oxidation) photodegradation of contaminants, and the reductive transformation of contaminants sorbed to black carbons.

**Adalberto Noyola**, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico

Biological wastewater treatment, anaerobic process for wastewater and sludge treatment, biological nitrogen removal, biofiltration of odorous gases, control of GHG emissions from wastewater treatment facilities

**Shane Snyder**, University of Arizona, Tucson, Arizona, USA

Drinking water, hydraulic fracturing, produced water, water treatment processes (particularly advanced oxidation), use of cellular bioassays for characterizing complex mixtures of contaminants

**Yeomin Yoon**, University of South Carolina, Columbia, South Carolina, USA

Water treatment; Membrane filtration; Adsorption; Sonodegradation; Oxidation; Micropolllutants; Nanotechnology

**Chang-Ping Yu**, National Taiwan University, Taipei, Taiwan

Environmental biotechnology, environmental microbiology, biodegradation, microbial electrochemical technology, biological wastewater treatment, bioremediation

**Xiangru Zhang**, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Water treatment, drinking water, emerging compounds, disinfection byproducts

**Editorial Board**

**Mari Asami**, National Institute of Public Health, Saitama, Japan

Water quality

**Georg Becher**, University of Oslo, Oslo, Norway

Assessment of Human Exposure to Organic Pollutants and Toxicants

**Henk Bouwman**, North-West University, Potchefstroom, South Africa

Dioxins, DDT, POPs

**Bella Chu**, Texas A&M University, College Station, Texas, USA

Biodegradation, Bioremediation, Endocrine-disrupting compounds, Emerging contaminants, Bioenergy and value-added products.

**Simonetta Corsolini**, Università degli Studi di Siena, Siena, Italy

Legacy and emergent POPs, environmental monitoring, bioaccumulation, distribution in abiotic and biotic compartments, POPs in polar ecosystem, POPs in tropical ecosystem, toxicity risk assessment, gas chromatography, ecology, penguins and seabirds, marine trophic webs, turtles, sharks, Ecotoxicology

**Shiming Ding**, Chinese Academy of Sciences (CAS), Nanjing, China

Bioavailability; Freshwater; Passive sampling; Metal; Nutrient; Water quality; Remediation; Geoengineering; Sediment; Soil

**Shinya Echigo**, Kyoto University, Kyoto, Japan

Disinfection by-products, fate of micropolllutants in the aquatic environment and water treatment processes, ozonation, advanced oxidation

**Mingliang Fang**, Nanyang Technological University, Singapore, Singapore

Metabolomics; Risk Assessment; Environmental Analytical Chemistry; Gut microbiome; Biomarkers; Exposome; Mixture Effect; Non-targeted identification

**Loretta Fernandez**, Northeastern University (NU), Boston, Massachusetts, USA

Environmental organic chemistry, contaminated sediment, fate and transport modeling, persistent organic pollutants, passive sampling

**Heidelore Fiedler**, Örebro University, Örebro, Sweden
Persistent Organic Pollutants and Dioxins

**Yanzheng Gao**, Nanjing Agricultural University, Nanjing, China
Organic contaminant; Soil-plant system; Soil contamination and remediation; Rhizosphere; Root exudates; Soil environmental chemistry; Bioremediation; Plant contamination

**Sergio Garcia-Segura**, Arizona State University, Tempe, Arizona, USA
Water treatment; Persistent organic pollutants; Electrochemically driven processes; Electrochemical Advanced Oxidation Processes; Electrochemical oxidation Electro-Fenton; Photoelectrocatalysis; Electrochemical management of nitrogen cycle; Photocatalysis; Nanotechnology

**Tom Harner**, Environment Canada, Toronto, Ontario, Canada
Persistent Organic Pollutants and their environmental fate, transport and passive sampling methods

**Rachel Ann Hauser-Davis**, Oswaldo Cruz Foundation (FIOCRUZ), Rio de Janeiro, Brazil
ecotoxicology, bioassays, proteomics, metallomics, metal contamination, biomarkers, metallothionein, oxidative stress, analytical techniques, POPs, enzymes, PAH, biomonitoring, bioaccumulation, HPLC-ICP-MS, ICP-MS, protein and DNA electrophoresis, fish, mussels, marine mammals, in vitro assays

**Ron Hoogenboom**, Wageningen Universiteit, Wageningen, Netherlands
dioxins, PCBs, transfer, bioassay, PFASs, analysis, risk assessment, exposure assessment

**Gwenaël Imfeld**, Université de Strasbourg, Strasbourg Cedex, France
wetland biogeochemistry; microbial ecology; pollutant transfer; biodegradation; pesticides

**Roland Kallenborn**, Norges miljø- og biovitenskapelige universitet (NMBU), Aas, Norway
Arctic, emerging contaminants

**Nynke Kramer**, Universiteit Utrecht, Utrecht, Netherlands
3R; In vitro toxicology; Distribution kinetics; Toxicokinetics; PBPK; Protein binding; QIVIVE; Chemical safety assessment; Toxicological risk assessment; Environmental chemistry

**Pim Leonards**, IVM/VU, Amsterdam, Netherlands
metabolomics, analytical chemistry, flame retardants, dust

**Domen Lestan**, University of Ljubljana, Ljubljana, Slovenia
Soil washing, phytoextraction, immobilisation of toxic elements, metals in soil, metals bioavailability and bioaccessibility, soil functioning, soil ecosystem services

**Xingfang Li**, University of Alberta, Edmonton, Alberta, Canada
Keywords: HPLC-MS, water disinfection byproducts, toxicology

**Heng Liang**, Harbin Institute of Technology, Harbin, China
Membrane Technology

**Grzegorz Lisak**, Nanyang Technological University, Singapore, Singapore
Waste to energy; Waste to materials; Circular economy; Waste management; Soil remediation; Municipal solid wastes; Gasification; Pyrolysis; Application of waste derived materials; Waste upcycling and recycling

**Jian Lu**, Chinese Academy of Sciences (CAS), Yantai, China
Emerging contaminants; Endocrine -disrupting chemicals; Antibiotics and heavy metals; Antibiotic resistance genes; Microplastics; Biodegradation; Persistent organic pollutants; Fate and transport; Coastal and marine pollution; Aquaculture and pollution

**Jean McLain**, University of Arizona, Tucson, Arizona, USA
Antibiotic resistance; Water quality; Indicator bacteria; Contaminant source tracking; Recycled wastewater

**Xiang-Zhou Meng**, Tongji University, Shanghai, China
persistent organic pollutants; wastewater; sewage sludge; soil; occurrence; fate; risk assessment

**Hyo-Bang Moon**, Hanyang University, Ansan, The Republic of Korea
Persistent organic pollutant (POPs), Emerging contaminants, Environmental fate, Human exposure

**Jochen Müller**, University of Queensland, Brisbane, Queensland, Australia
Emerging contaminants, dioxins

**Guillermo Quijano**, Universidad Nacional Autónoma de México (UNAM), Querétaro, Mexico
Biological treatment of gas pollutants; Biogas desulfurization; Biogas upgrading; greenhouse gases; Odors; Renewable energy from residues; Volatile organic compounds

**Gerhard Rimkus**, Intertek Food Services, Hamburg, Germany
sustainable technology
Synthetic fragrances and personal care products in the environment; Bioaccumulation and metabolism in biota like fish, seals, birds etc.; Bioaccumulation in human tissue/breast milk; Analysis of contaminants in biota and food samples; Residues and contaminants in food, EU food legislation

**Paolo Roccaro**, Università degli Studi di Catania, Catania, Italy
environmental engineering; water treatment and reuse; emerging contaminants; disinfection by-products.

**Virender K Sharma**, Texas A&M University, College Station, Texas, USA

**Reyes Sierra-Alvarez**, University of Arizona, Tucson, Arizona, USA
Biodegradation, biological treatment, bioremediation, microbial toxicity; engineered nanomaterials; nanotoxicity; metal-microbe interactions; wastewater treatment; metal bioremoval

**Werner Tirler**, Eco Research, Bolzano, Italy
air pollution, dioxins

**Daniel Tsang**, The Hong Kong Polytechnic University, Hong Kong, China
Green chemistry/engineering; Soil/sediment remediation; Engineered biochar; Waste valorization; Resource recovery; Wastewater/stormwater treatment; Catalytic conversion/degradation; Pollutant transport; Environmental pollution | Sustainable urban development, urban wastes, contaminated land and water, waste management (food, wood, plastic agro, sludge), green remediation, wastewater treatment.

**Stefan van Leeuwen**, Wageningen Universiteit, Wageningen, Netherlands
PFASs; BFRs; dioxins/PCBs; Fish; Exposure assessment; Human biomonitoring; Analytical techniques; Interlaboratory studies; Effect-directed analysis; Food safety

**Katrin Vorkamp**, National Environmental Research Institute, Roskilde, Denmark
Fate of organic pollutants in the environment; Persistent organic pollutants in the Arctic; New contaminants (e.g. brominated flame retardants); Analytical methods in complex matrices

**Qilin Wang**, University of Technology Sydney, Sydney, New South Wales, Australia
Biological wastewater treatment; Anaerobic digestion; Sludge treatment; Nutrient removal; Process modelling of biological wastewater treatment; Greenhouse gas production; Algae; Biochar; Bioenergy and value-added products; Aerobic digestion

**Jana Weiss**, Uppsala Universitet, Uppsala, Sweden
analytical chemistry, human exposure, non-target screening, effect-directed analysis

**Lingtian Xie**, South China Normal University, Guangzhou, China
Aquatic toxicology; Endocrine disrupting chemicals; Effects of PPCPs in aquatic organisms; Metal biodynamic modeling; Metal toxicity; Dietary exposure; Trophic transfer; Evolution of resistance; Antibiotic resistance; Biomarkers

**Yu (Frank) Yang**, University of Nevada at Reno, Reno, Nevada, USA
the biogeochemical cycles of carbon/nitrogen, the reductive degradation of emergent organohalide, fate and transport of engineering nano-materials in agricultural ecosystem and recover of energy/ nutrient from wastewater.

**Zeyu Yang**, Environment Canada, Ottawa, Canada
Organic contaminants; Oil fingerprinting; Fate and behavior of oil and organic contaminants; Analytical method development; Bioavailability assessment of organic contaminants; Passive sampling technologies; Polycyclic aromatic hydrocarbons; Petroleum biomarkers; Naphthenic acids Chromatography

**Minghui Zheng**, Chinese Academy of Sciences (CAS), Beijing, China
Persistent Organic Pollutants, Dioxins, Incineration, POPs Emission, POPs Monitoring

**Bingsheng Zhou**, Chinese Academy of Sciences (CAS), Wuhan, China
Fish; In vitro toxicology; Developmental and reproductive toxicology; Neurotoxicology; Oxidative stress; Molecular response and adverse outcome; Endocrine disruptors; Emerging pollutants; Nanoparticles and toxicity
GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.
To find out more, please visit the Preparation section below.

INTRODUCTION
Submission of Papers
All manuscripts should be submitted electronically through Elsevier Editorial System (EES) which can be accessed at http://ees.elsevier.com/chem.

During submission papers should be marked for the attention of a subject Editor or the relevant section, if possible. Failure to provide this information will significantly delay processing of the manuscript.

Types of article
Chemosphere accepts Research Papers, Review Papers, Short Communications, Letters to the Editor, Replies and Discussion Papers. Please note that papers with a routine nature and lacking originality, novelty and uniqueness will not be accepted for publication.

A Short Communication should be of significant scientific merit (a novel finding that warrants immediate publication).

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
LINE and PAGE NUMBERING (NEW AND REVISED SUBMISSIONS):
Please ensure the text of your paper is double-spaced and has consecutive(continuous) LINE numbering. Please also ensure to add PAGE numbers to the source file- this is an essential peer review requirement.

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 pages on Ethics in publishing and Ethical guidelines for journal publication.

Declaration of 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 competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

Submission declaration
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.

Submission declaration
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 or as an electronic preprint, see https://www.elsevier.com/sharingpolicy), 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 including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder. The authors are asked to state this explicitly in their accompanying letter.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

Author contributions
For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example

Changes to authorship
This policy concerns the addition, deletion, or rearrangement of author names in the authorship of accepted manuscripts.
Before the accepted manuscript is published in an online issue: Requests to add or remove an author, or to rearrange the author names, must be sent by the corresponding author of the accepted manuscript to the Journal Manager and must include: (a) the reason the name should be added
or removed, or the author names rearranged and (b) written confirmation (e-mail, fax, 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. Requests that are not sent by the corresponding author will be forwarded by the Journal Manager to the corresponding author, who must follow the procedure as described above. Note that: (1) Journal Managers will inform the Journal Editors of any such requests and (2) publication of the accepted manuscript in an online issue is suspended until authorship has been agreed. After the accepted manuscript is published in an online issue requests to add, delete, or rearrange author names in an article published in an online issue will not be accepted anymore.

**Dual first authorship**
If requested, we can provide dual-first authorship if two authors have contributed equally to a paper. In that case a footnote will be added to the author names and an explanation will be given.

**Article transfer service**
This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. More information.

**Copyright**
This journal offers authors a choice in publishing their research: Open Access and Subscription.

**For Subscription articles:**

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (for more information on this and copyright, see https://www.elsevier.com/copyright). 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 (please consult https://www.elsevier.com/permissions). 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: please consult https://www.elsevier.com/permissions.

**For Open Access articles:**

Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (for more information see https://www.elsevier.com/OAauthoragreement). Permitted reuse of open access articles is determined by the author's choice of user license (see https://www.elsevier.com/about/policies/open-access-licenses).

**Retained author rights**

As an author you (or your employer or institution) retain certain rights. For more information on author rights for: Subscription articles please see https://www.elsevier.com/journal-authors/author-rights-and-responsibilities. Open access articles please see https://www.elsevier.com/OAauthoragreement.

**Elsevier supports responsible sharing**

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

**Funding Source Disclosure**

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.
Funding body agreements and policies
Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of existing agreements are available online.

Open access
This journal offers authors a choice in publishing their research:

Subscription
- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.
- The Author is entitled to post the accepted manuscript in their institution's repository and make this public after an embargo period (known as green Open Access). The published journal article cannot be shared publicly, for example on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications. The embargo period for this journal can be found below.

Gold open access
- Articles are freely available to both subscribers and the wider public with permitted reuse.
- A gold open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For gold open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

Creative Commons Attribution (CC BY)
Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)
For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The gold open access publication fee for this journal is USD 3400, excluding taxes. Learn more about Elsevier's pricing policy: https://www.elsevier.com/openaccesspricing.

Green open access
Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 24 months.

Elsevier Researcher Academy
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.
Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). In case of doubt, let your manuscript check by a native English or American colleague, or a professional service. Regularly, manuscripts are rejected before review because of poor language. 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 WebShop (http://webshop.elsevier.com/languageediting/) or visit our customer support site (https://service.elsevier.com) for more information.

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.

LINE and PAGE NUMBERING (NEW AND REVISED SUBMISSIONS)
Please ensure the text of your paper is double-spaced and has consecutive (continuous) LINE numbering. Please also ensure to add PAGE numbers to the source file- this is an essential peer review requirement.

Referees
With the submitted manuscript authors are requested to provide full contact details of six potential reviewers including email addresses. The suggested reviewers should not be from the same institution as the author, Chemosphere Editors or Editorial Board members. Not more than one should come from the same country as the author. It should also be avoided to suggest referees that are living in a different country but have the same nationality as the author.

PREPARATION
NEW 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 your files to a single PDF file, which is used in the peer-review process.

As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately. If you use the Your Paper Your Way service, please make sure that you also provide your highlights and the six suggested referees in this document.

References
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

Formatting requirements
There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.
Figures and tables embedded in text
Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

Peer review
This journal operates a single blind 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. More information on types of peer review.

REVISED SUBMISSIONS
Use of word processing software
Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier: https://www.elsevier.com/guidepublication). 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. For revised submissions: always include one copy of the new text with changes clearly indicated (in red or bold or track change) and one version with all changes accepted, and a letter with your response to the comments of the reviewers.

Article structure
Please see our Important instructions for Authors submitting to The Science of Environmental Toxicology Section

Subdivision - numbered sections
Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

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.

• **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. 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 phone 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.

• **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.

**Highlights**

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and 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). You can view example Highlights on our information site.

**Abstract**

A concise and factual abstract is required. 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 (and then later again when used in the text, see Abbreviations).

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. 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 and in accordance with all technical requirements.

**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using American 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.).
Nomenclature and units
Follow internationally accepted rules and conventions: use the international system of units (SI). If other quantities are mentioned, give their equivalent in SI. You are urged to consult IUPAC: Nomenclature of Organic Chemistry: http://www.iupac.org/ for further information.

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 wordprocessors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Table footnotes
Indicate each footnote in a table with a superscript lowercase letter.

Artwork
Electronic artwork
General points
- Make sure you use uniform lettering and sizing of your original artwork.
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.
- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
- Please note that individual figure files larger than 10 MB must be provided in separate source files. 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
Regardless of the application used, 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 the font or save the text as 'graphics'.
TIFF (or JPEG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.
TIFF (or JPEG): Bitmapped line drawings: use a minimum of 1000 dpi.
TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- 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. For further information on the preparation of electronic artwork, please see https://www.elsevier.com/artworkinstructions.

Please note: Because of technical complications which can arise by converting color figures to 'gray scale' (for the printed version should you not opt for color in print) please submit in addition usable black and white versions of all the color illustrations.
Figure captions
Ensure that each illustration has a caption. 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.

Tables
Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

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.

Reference links
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.

A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

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
This journal has standard templates available in key reference management packages EndNote (http://www.endnote.com/support/enstyles.asp) and Reference Manager (http://refman.com/support/rmstyles.asp). Using plug-ins to wordprocessing packages, authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style which is described below.

Reference formatting
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

Reference style
Text: All citations in the text should refer to:
1. **Single author:** the author's name (without initials, unless there is ambiguity) and the year of publication;
2. **Two authors:** both authors' names and the year of publication;
3. **Three or more authors:** first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999). Kramer et al. (2010) have recently shown ....'

**List:** References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

**Examples:**
- Reference to a journal publication:
- Reference to a book:
- Reference to a chapter in an edited book:

**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 data**
Elsevier accepts electronic supplementary material to support and enhance your scientific research. Supplementary files offer the author additional possibilities to publish supporting applications, high resolution images, background datasets, sound clips and more. Supplementary files supplied will be published online alongside the electronic version of your article in Elsevier Web products, including ScienceDirect: [http://www.sciencedirect.com](http://www.sciencedirect.com). In order to ensure that your submitted material is directly usable, please provide the data in one of our recommended file formats. Authors should submit the material in electronic format together with the article and supply a concise and descriptive caption for each file. For more detailed instructions please visit our artwork instruction pages at [https://www.elsevier.com/artworkinstructions](https://www.elsevier.com/artworkinstructions).

**Data at PANGAEA**
Electronic archiving of supplementary data enables readers to replicate, verify and build upon the conclusions published in your paper. We recommend that data should be deposited in the data library PANGAEA ([http://www.pangaea.de](http://www.pangaea.de)). Data are quality controlled and archived by an editor in standard
machine-readable formats and are available via Open Access. After processing, the author receives
an identifier (DOI) linking to the supplements for checking. As your data sets will be citable you
might want to refer to them in your article. In any case, data supplements and the article will be
automatically linked as in the following example: https://doi.org/10.1016/0016-7037(95)00105-9.
Please use PANGAEA's web interface to submit your data (http://www.pangaea.de/submit/).

**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
one or multiple data articles, a new kind of article that houses and describes your data. Data articles
ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly
available to all upon publication. You are encouraged to submit your 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 and published in the open access data journal, Data in Brief. Please note an open
access fee of 500 USD 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.

**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.

**Submission checklist**
The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

**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, and contain:
• Keywords
• All figure captions
• All tables (including title, description, footnotes)
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 Web)
• Color figures are clearly marked as being intended for color reproduction on the Web (free of charge) and in print, or to be reproduced in color on the Web (free of charge) and in black-and-white in print
• If only color on the Web is required, black-and-white versions of the figures are also supplied for printing purposes.
For any further information please visit our customer support site at https://service.elsevier.com.

**Additional information**

Paper Length: The Editors generally encourage brevity for all Research Papers.

Short Communications must not exceed 2,000 words and will be given priority for rapid publication.

Research papers should preferably not exceed 6,500 words (excluding refs.). The abstract could range upto 250 words. Review papers should preferably be 10,000 words or less (excluding refs.). Each figure or table should be considered equal to 300 words. The number of figures and/or tables should not exceed a total amount of seven. Every page of the manuscript, including the title page, references, tables, etc. should be numbered. However, in the text no reference should be made to page numbers; if necessary, one may refer to sections. In case you have serious reasons for submitting a paper that is longer that the aforementioned word limits, make sure you include convincing arguments in your cover letter. Please avoid lengthy submissions if possible.

**AFTER ACCEPTANCE**

**Online proof correction**
 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 upload all of your corrections within 48 hours. 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. Note that Elsevier may proceed with the publication of your article if no response is received.

**Offprints**
The corresponding author will, at no cost, receive 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 Webshop. 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**
For inquiries relating to the submission of articles (including electronic submission) please visit this journal's homepage.

**Revision submissions:**
If you have any specific questions related due date extensions for revision, please contact the Journal Manager, Pallavi Das at chem-eo@elsevier.com.
For detailed instructions on the preparation of electronic artwork, please visit https://www.elsevier.com/artworkinstructions. Contact details for questions arising after acceptance of an article, especially those relating to proofs, will be provided by the publisher. You can track accepted articles at https://www.elsevier.com/trackarticle. You can also check our Author FAQs at https://www.elsevier.com/authorFAQ and/or contact Customer Support via https://service.elsevier.com.

© Copyright 2016 Elsevier | https://www.elsevier.com

© Copyright 2018 Elsevier | https://www.elsevier.com