VACUUM

AUTHOR INFORMATION PACK

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DESCRIPTION

Vacuum is an international rapid publications journal with a focus on short communication. All papers are peer-reviewed, with the review process for short communication geared towards very fast turnaround times. The journal also published full research papers, thematic issues and selected papers from leading conferences.

A report in Vacuum should represent a major advance in an area that involves a controlled environment at pressures of one atmosphere or below.

The scope of the journal includes:
1. Vacuum; original developments in vacuum pumping and instrumentation, vacuum measurement, vacuum gas dynamics, gas-surface interactions, surface treatment for UHV applications and low outgassing, vacuum melting, sintering, and vacuum metrology. Technology and solutions for large-scale facilities (e.g., particle accelerators and fusion devices). New instrumentation ( e.g., detectors and electron microscopes).
2. Plasma science; advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.
3. Surface science; surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.

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AUDIENCE

Surface Scientists, Materials Scientists.

IMPACT FACTOR

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Research Alert
Cambridge Scientific Abstracts
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To find out more, please visit the Preparation section below.

INTRODUCTION

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2. Plasma science; advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.

3. Surface science; surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.


Types of Paper
Vacuum will consider three types of peer-reviewed manuscripts:

1. Short Communications: should have the format of a letter (main text without headings) and are intended as brief reports of significant, original and timely research results, which require rapid publication. The submitted manuscripts should be kept concise and short; the number of figures and tables should also be kept to a minimum. See below for details. In considering a manuscript for publication, particular attention will be given to the originality of the research and the desirability of speedy publication and the clarity of the presentation. The editors will aim for a rapid review process and only manuscripts that need no changes or only minor revisions will be accepted.

2. Full Research Papers: should be full reports including in-depth analysis and extensive discussion. The described research should be complete and thorough, and there are no limitations to text length or number of figures/tables, as long as they add to the understanding of the described research. Criteria for publication are completeness, novelty, and clarity. Manuscripts may be accepted after major revisions. The editors will aim to apply a thorough review process.

3. Besides these two types of manuscripts, Vacuum will publish reviews, thematic issues and a selection of conference papers. These contributions must have the Full Research Paper structure. Such contributions must be prepared in consultation with the special issues editor and can only be submitted after invitation by the guest editor for that issue.

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Additional information

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Subdivision Main Text:
This journal accepts two different types of unsolicited manuscripts with different subdivision of text: Short Communications (Letters) and Full Research Papers.
1. Short Communications
Short Communications should be kept concise and short, the number of figures and tables should also be kept to a minimum. The main text of the manuscripts should not exceed 2,500 words, and the number of combined tables/images/figures should not exceed 5. Abstract should contain less than 150 words. The main text should not contain any headings. The main text should end with a concluding statement and optional acknowledgement.
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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Results
Results should be clear and concise.

Discussion
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Conclusions
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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].

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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).

Units to be used in 'Vacuum'
Pressure: Authors are asked to use bar (bar), millibar (mbar) or the pascal (Pa).
The SI unit of pressure is the pascal (Pa), the special name for the newton per square metre (N m⁻²). The standard atmosphere (atm) is defined in ISO 31/111-1978 (E) as exactly 101.325 kPa. The standard atmosphere should only be used to define a reference environment and not as a pressure unit. The 'bar' has become widely used as a unit of pressure in vacuum measurement.

1 bar = 10⁶ Pa exactly
1 millibar (mbar) = 100 Pa exactly.

Other units of pressure are sometimes to be found in published literature but their use is deprecated in ISO 31/111-1978(E) and in some countries their use is unlawful for certain purposes. A table of conversion factors for such units is given below to allow authors to change their units to pascals or millibars.
The pascal can be combined with other SI units to give the units for other quantities commonly measured in vacuum science and technology. Some examples of these quantities are given below.
**Pump speed**: Authors are asked to use cubic metre per second \((m^3 \, s^{-1})\), cubic metre per hour \((m^3 \, h^{-1})\), or, litre per second \((l \, s^{-1})\). The SI unit for volumetric rate of flow such as is used when expressing the speed of a vacuum pump is cubic metre per second \((m^3 \, s^{-1})\). The speed of most mechanical pumps is expressed in terms of cubic metre per hour \((m^3 \, h^{-1})\).

\[1 \, m^3 \, h^{-1} = 1/3600 \, m^3 \, s^{-1} \times 0.000278 \, m^3 \, s^{-1}\].

The speed of most high vacuum pumps such as diffusion and turbomolecular pumps is expressed in terms of liter per second \((l \, s^{-1})\).

\[1 \, l \, s^{-1} = 10^{-3} \, m^3 \, s^{-1}\].

**Leak rate**: Authors are asked to use pascal metre cube per second \((Pa \, m^3 \, s^{-1})\) or millibar litre per second \((mbar \, l \, s^{-1})\). The SI unit for leak rate is pascal metre cube per second \((Pa \, m^3 \, s^{-1})\). Other commonly used units of leak rate with their conversion to the SI unit are given in the table.

**Outgassing rate**: Authors are asked to use pascal metre cube per second per square metre \((Pa \, m^3 \, s^{-1} \, m^{-2})\) or millibar litre per second per square centimetre \((mbar \, l \, s^{-1} \, cm^{-2})\). The SI unit for outgassing rate from surfaces is pascal metre cube per second per square metre \((Pa \, m^3 \, s^{-1} \, m^{-2})\). Other commonly used units of outgassing rate with their conversion to the SI unit are given in the table.

1 (1) Quantity measured in (2) Multiply by (3) Resulting number in (4) Multiply column (3) by (5) Resulting number

<table>
<thead>
<tr>
<th>Unit</th>
<th>Conversion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>torr</td>
<td>133.322 Pa</td>
</tr>
<tr>
<td>mbar</td>
<td>10 mbar</td>
</tr>
<tr>
<td>mm Hg</td>
<td>133.322 Pa</td>
</tr>
<tr>
<td>mbar micron</td>
<td>0.133322 Pa</td>
</tr>
<tr>
<td>Pa</td>
<td>0.133322 m^3 s^{-1} 10 mbar l s^{-1} 0.001 m^3 s^{-1}</td>
</tr>
<tr>
<td>technical atmospheres (kgf cm^{-2})</td>
<td>98.0665 kPa</td>
</tr>
<tr>
<td>10 mbar m^{-3} h^{-1}</td>
<td>0.000278 m^3 s^{-1}</td>
</tr>
<tr>
<td>10 mbar l s^{-1}</td>
<td>0.001 m^3 s^{-1}</td>
</tr>
<tr>
<td>standard atmosphere ((cm^3 s^{-1}))</td>
<td>0.101325 Pa</td>
</tr>
<tr>
<td>10 mbar l s^{-1}</td>
<td>0.001 m^3 s^{-1}</td>
</tr>
<tr>
<td>torr</td>
<td>1333.22 Pa m^{-3} s^{-1}</td>
</tr>
<tr>
<td>cm^{-2}</td>
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</tr>
<tr>
<td>0.001 mbar l s^{-1} cm^{-2}</td>
<td></td>
</tr>
</tbody>
</table>

**Table of conversion factors**

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Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors 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.

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*Electronic artwork*

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- 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.**

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