

# Environmental Science: Atmospheres

rsc.li/esatmospheres

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 2634-3606 CODEN ESANC9 3(11) 1579–1686 (2023)



Cover

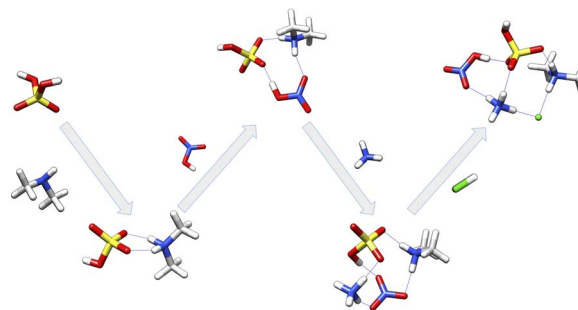
© Jose A. Bernat Bacete/Getty Images.

## PAPERS

1585

### The driving effects of common atmospheric molecules for formation of clusters: the case of sulfuric acid, nitric acid, hydrochloric acid, ammonia, and dimethylamine

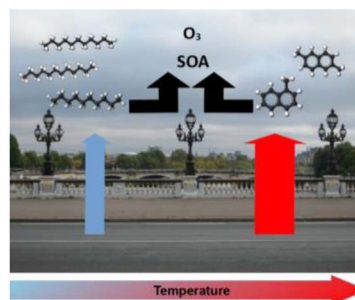
Olivia M. Longworth, Conor J. Bready, Macie S. Joines and George C. Shields\*



1601

### VOC emissions by fresh and old asphalt pavements at service temperatures: impacts on urban air quality

J. Lasne,\* A. Lostier, M. N. Romanias, S. Vassaux, D. Lesueur, V. Gaudion, M. Jamar, R. G. Derwent, S. Dusanter and T. Salameh\*



**Executive Editor**

Emma Eley

**Editorial Production Manager**

Sarah Whitbread

**Deputy Editor**

Jon Ferrier

**Assistant Editors**

Jamie Purcell, Alexander John, Emily Ellison, Jack Pitchers, Clare Fitzgerald

**Editorial Assistant**

Alex Holaday

**Publishing Assistant**

Lee Colwill

**Publisher**

Neil Hammond

For queries about submitted papers, please contact Sarah Whitbread, Editorial Production Manager in the first instance. E-mail: [esatmospheres@rsc.org](mailto:esatmospheres@rsc.org)

For pre-submission queries please contact Emma Eley, Managing Editor. Email: [esatmospheres-rsc@rsc.org](mailto:esatmospheres-rsc@rsc.org)

Environmental Science: Atmospheres (electronic: ISSN 2634-3606) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF. Environmental Science: Atmospheres is a Gold Open Access journal and all articles are free to read. Please email [orders@rsc.org](mailto:orders@rsc.org) to register your interest or contact Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK Tel +44 (0)1223 432398; E-mail: [orders@rsc.org](mailto:orders@rsc.org)

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

**Advertisement sales:**

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail [advertising@rsc.org](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

# Environmental Science: Atmospheres

Interdisciplinary open access journal advancing the understanding of atmospheric science and related challenges.

[rsc.li/esatmospheres](http://rsc.li/esatmospheres)

Led by Neil Donahue (Carnegie Mellon University), *Environmental Science: Atmospheres* is a gold open access journal committed to bringing the wider environmental science and climate change communities together in a fresh, open approach.

## Editorial Board

**Editor-in-Chief**

Neil Donahue, Carnegie Mellon University, USA

**Associate Editors**

Claudia Mohr, Paul Scherrer Institute, Switzerland  
Nonne Prisle, University of Oulu, Finland

Lin Wang, Fudan University, China  
Stephen Klippenstein, Argonne National Laboratory, USA  
Tzung-May Fu, Southern University of Science and Technology, China

**Members**

Joel Thornton, University of Washington, USA  
Dwayne Heard, University of Leeds, UK

## Advisory Board

Katye Altieri, University of Cape Town, South Africa  
Federico Bianchi, University of Helsinki, Finland  
Muhammad Bilal, University of Wisconsin—Madison, USA  
William Bloss, University of Birmingham, UK  
Ann Marie Carlton, University of California Irvine, USA  
Peter DeCarlo, Johns Hopkins University, USA  
Aijun Ding, Nanjing University, China  
Delphine Farmer, Colorado State University, USA  
Barbara Finlayson-Pitts, University of California, Irvine, USA  
Christian George, CNRS, University Claude

Bernard Lyon 1, France  
Marianne Glasius, Aarhus University, Denmark  
Mattias Hallquist, University of Gothenburg, Sweden  
Thomas Hanisco, NASA Goddard Space Flight Center, USA  
Lucy Hutyra, Boston University, USA  
Maria Kanakidou, University of Crete, Greece  
Prashant Kumar, University of Surrey, UK  
Tuhin Kumar Mandal, National Physical Laboratory, India  
Randall Martin, Washington University in St Louis, USA  
Ottmar Möhler, Karlsruhe Institute of Technology, Germany  
Yujing Mu, Research Center for Eco-Environmental Sciences, Chinese Academy

of Sciences, China  
Patricia K. Quinn, National Oceanic and Atmospheric Administration, Pacific Marine Environment Laboratory, USA  
Andrew Rickard, University of York, UK  
Ilona Riipinen, Stockholm University, Sweden  
Alfonso Saiz-Lopez, CSIC, Spain  
Sachchida Nand Tripathi, Indian Institute of Technology, Kanpur, India  
Ying I. Tsai, Chia Nan University of Pharmacy and Science, Taiwan  
Marina Vance, University of Colorado Boulder, USA  
Bingbing Wang, Xiamen University, China  
Shuxiao Wang, Tsinghua University, China

## Information for Authors

Full details on how to submit material for publication in Environmental Science: Atmospheres are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: [rsc.li/esatmospheres](http://rsc.li/esatmospheres)

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

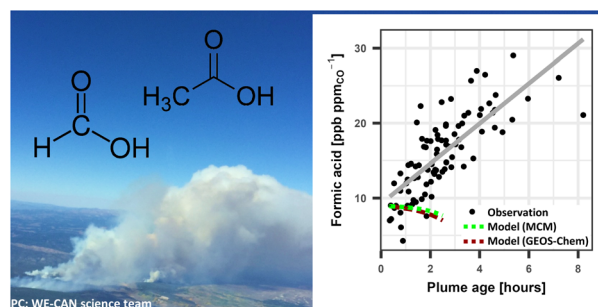


## PAPERS

1620

### Assessing formic and acetic acid emissions and chemistry in western U.S. wildfire smoke: implications for atmospheric modeling

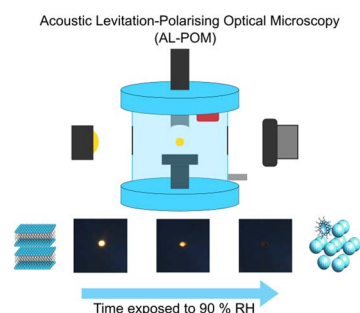
Wade Permar,<sup>\*</sup> Catherine Wielgasz, Lixu Jin, Xin Chen, Matthew M. Coggon, Lauren A. Garofalo, Georgios I. Gkatzelis, Damien Ketcherside, Dylan B. Millet, Brett B. Palm, Qiaoyun Peng, Michael A. Robinson, Joel A. Thornton, Patrick Veres, Carsten Warneke, Robert J. Yokelson, Emily V. Fischer and Lu Hu



1642

### Acoustic levitation with polarising optical microscopy (AL-POM): water uptake in a nanostructured atmospheric aerosol proxy

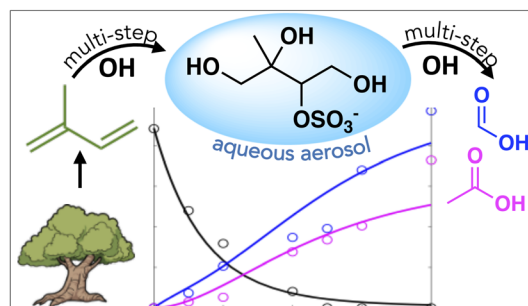
Adam Milsom, Adam M. Squires, Christopher Brasnett, William N. Sharratt, Annala M. Seddon and Christian Pfrang<sup>\*</sup>



1651

### Emerging investigator series: aqueous oxidation of isoprene-derived organic aerosol species as a source of atmospheric formic and acetic acids

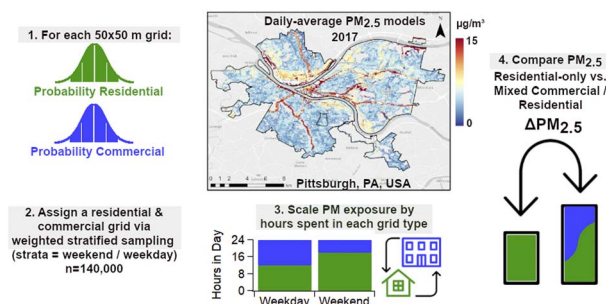
Kelvin H. Bates, Daniel J. Jacob, James D. Cope, Xin Chen, Dylan B. Millet and Tran B. Nguyen<sup>\*</sup>

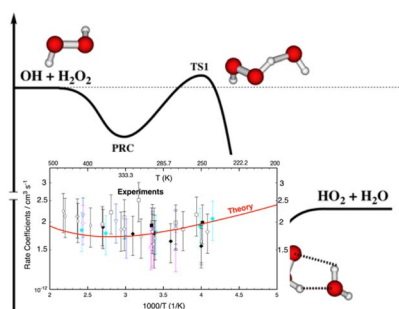


1665

### Using spatiotemporal prediction models to quantify PM<sub>2.5</sub> exposure due to daily movement

Sakshi Jain, Albert A. Presto and Naomi Zimmerman<sup>\*</sup>





# *Ab initio* rate coefficients for the reaction of OH and H<sub>2</sub>O<sub>2</sub> under upper troposphere and lower stratosphere conditions

Thanh Lam Nguyen<sup>\*</sup> and John F. Stanton<sup>\*</sup>

