

EES Catalysis

rsc.li/eescatalysis

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

eISSN 2753–801X CODEN ECEACE 1(3) 173–324 (2023)



Cover

See Ryu Abe *et al.*,
pp. 255–262.
Image reproduced
by permission of
Ryu Abe from
EES Catal.,
2023, 1, 255.

REVIEWS

179

Clarifying the local microenvironment of metal–organic frameworks and their derivatives for electrochemical CO₂ reduction: advances and perspectives

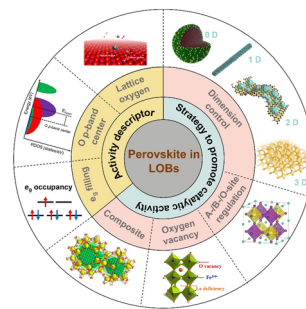
Muhammad Kashif Aslam, Kang Yang, Sheng Chen,*
Qiang Li* and Jingjing Duan*



230

Recent advances in perovskite oxide electrocatalysts for Li–O₂ batteries

Lulu Lyu, Seonyong Cho and Yong-Mook Kang*



Editorial Staff

Executive Editor

Emma Eley

Deputy Editor

Jon Ferrier

Editorial Production Manager

Sarah Whitbread

Assistant Editors

Jamie Purcell, Aphra Murray, Alexander John, Emily Ellison, Jack Pitchers

Editorial Assistant

Alex Holiday

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: EESCatalysisRSC@rsc.org

For pre-submission queries please contact

Emma Eley, Executive Editor.

E-mail: EESCatalysis-RSC@rsc.org

EES Catalysis (electronic: ISSN 2753-801X) is published 6 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

EES Catalysis is a Gold Open Access journal and all articles are free to read. Please email 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

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

For marketing opportunities relating to this journal, contact marketing@rsc.org

EES Catalysis

rsc.li/EESCatalysis

EES Catalysis publishes exceptional research on energy and environmental catalysis.

Editorial Board

Editor-in-Chief

Shizhang Qiao, The University of Adelaide, Australia

Associate Editors

Honggang Fu, Heilongjiang University, China
Susan Habas, National Renewable Energy Laboratory, USA
Zhichuan Xu, Nanyang Technological University, Singapore
Rebecca Melen, Cardiff University, UK

Advisory Board

Joel W. Ager III, Lawrence Berkeley National Laboratory, USA

Alexis Bell, University of California, Berkeley, USA

Annemie Bogaerts, University of Antwerp, Belgium

Charles T. Campbell, University of Washington, USA

Jingguang Chen, Columbia University, USA

Zhongwei Chen, University of Waterloo, Canada

Ib Chorkendorff, Technical University of Denmark, Denmark

Charles Dismukes, Rutgers University, USA

Shaojun Guo, Peking University, China

Qian He, National University of Singapore, Singapore

Ungyu Paik, Hanyang University, Korea

Menny Shalom, Ben-Gurion University of the Negev, Israel

Licheng Sun, KTH Royal Institute of Technology, Sweden

Zhiyong Tang, National Center for Nanoscience and Technology, China

David Tilley, University of Zurich, Switzerland

Ye Wang, Xiamen University, China

Information for Authors

Full details on how to submit material for publication in *EES Catalysis* 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/EESCatalysis

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

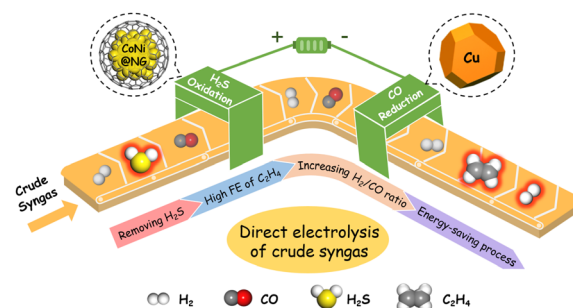


COMMUNICATION

250

Direct electrocatalytic conversion of crude syngas to ethylene *via* a multi-process coupled device

Mo Zhang, Ruixue Chen, Suheng Wang, Yunchuan Tu, Xiaoju Cui* and Dehui Deng*

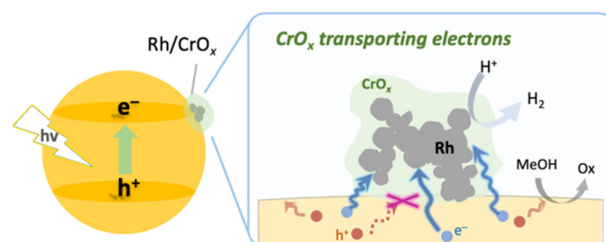


PAPERS

255

An unexplored role of the CrO_x shell in an elaborated Rh/CrO_x core-shell cocatalyst for photocatalytic water splitting: a selective electron transport pathway from semiconductors to core metals, boosting charge separation and H_2 evolution

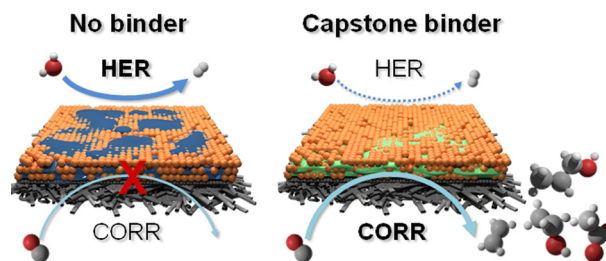
Tetsu Kotani, Kanta Ogawa, Hajime Suzuki, Kosaku Kato, Osamu Tomita, Akira Yamakata and Ryu Abe*



263

Local hydrophobicity allows high-performance electrochemical carbon monoxide reduction to C_{2+} products

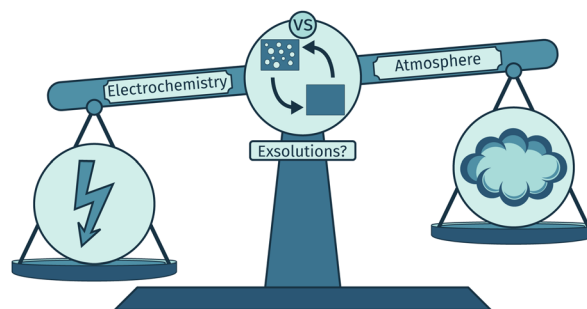
Attila Kormányos, Balázs Endrődi,* Zheng Zhang, Angelika Samu, László Mérai, Gergely F. Samu, László Janovák and Csaba Janáky*



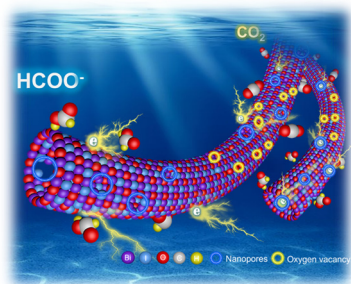
274

Exsolved catalyst particles as a plaything of atmosphere and electrochemistry

Harald Summerer,* Andreas Nenning, Christoph Rameshan and Alexander K. Opitz



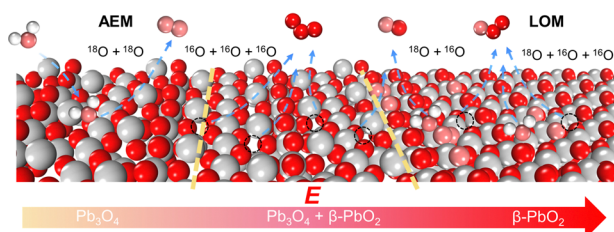
290



Unlocking nanotubular bismuth oxyiodide toward carbon-neutral electrosynthesis

Peng-Fei Sui, Min-Rui Gao, Meng-Nan Zhu, Chenyu Xu, Yi-Cheng Wang, Subiao Liu and Jing-Li Luo*

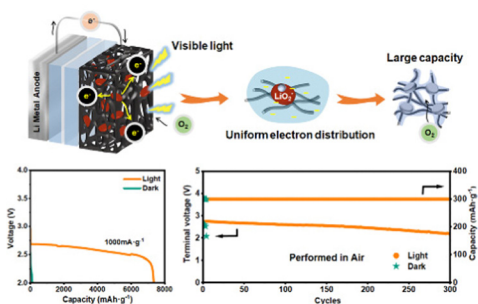
301



Phase shuttling-enhanced electrochemical ozone production

Jia Liu, Shibin Wang, Zhangnv Yang, Chencheng Dai, Ge Feng, Beibei Wu, Wenwen Li, Lu Shu, Kamal Elouarzaki, Xiao Hu, Xiaonian Li, Hui Wang, Zhen Wang,* Xing Zhong,* Zhichuan J. Xu* and Jianguo Wang*

312



Facet-engineered photoelectrochemical nanocatalysts toward fast kinetic lithium–air batteries

Yiqiao Wang, Siyuan Pan, Huan Li, Dewang Li, Yong Guo, Sijia Chi, Chuannan Geng, Shichao Wu* and Quan-Hong Yang*

