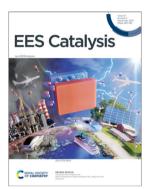
EES Catalysis

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.

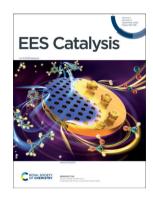
IN THIS ISSUE

eISSN 2753-801X CODEN ECEACE 1(5) 583-786 (2023)



Cover

See Sangaraju Shanmugam et al., pp. 645-664. Image reproduced by permission of Sangaraju Shanmugam from EES Catal., 2023, 1, 645.



Inside cover

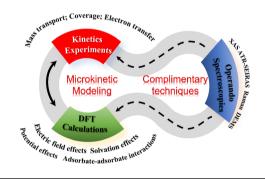
See Chenxi Zhang, Fei Wei et al., pp. 677-686. Image reproduced by permission of Chenxi Zhang and Fei Wei from EES Catal., 2023, 1, 677.

REVIEWS

590

Microkinetic studies for mechanism interpretation in electrocatalytic CO and CO2 reduction: current and perspective

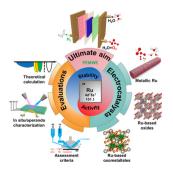
Xiaofei Lu, Keisuke Obata and Kazuhiro Takanabe*



619

Strategies for the design of ruthenium-based electrocatalysts toward acidic oxygen evolution reaction

Liqiang Hou, Xiumin Gu, Xuemei Cui, Jiachen Tang, Zijian Li, Xien Liu* and Jaephil Cho*



Editorial Staff

Executive Editor

Emma Eley

Deputy Editor

Ion Ferrier

Editorial Production Manager

Sarah Whitbread

Assistant Editors

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

Alex Holiday

Publishing Assistant

Cambridge, UK CB4 0WF.

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,

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/EESCatalvsis

EES Catalysis publishes exceptional research on energy and environmental catalysis.

Associate Editors

Editorial Board

Editor-in-Chief

Shizhang Qiao, The University of Adelaide.

Australia

Honggang Fu, Heilongjiang University, China Zhichuan Xu, Nanyang Technological Susan Habas, National Renewable Energy

Laboratory, USA Rebecca Melen, Cardiff University, UK University, Singapore

Advisory Board

Joel W. Ager III, Lawrence Berkeley National Laboratory, USA Jong-Beom Baek, Ulsan National Institute of

Science & Technology (UNIST), Korea Alexis Bell, University of California, Berkeley,

Annemie Bogaerts, University of Antwerp,

Charles T. Campbell, University of Washington, USA

Richard Catlow, University College London,

Jingguang Chen, Columbia University, USA

Zhongwei Chen, University of Waterloo,

Ib Chorkendorff, Technical University of Denmark, Denmark

Charles Dismukes, Rutgers University, USA Shaojun Guo, Peking University, China Qian He, National University of Singapore, Singapore

Douglas MacFarlane, Monash University, Australia

Kie Tae Nam, Seoul National University, Korea

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

Xin Wang, City University of Hong Kong, Hong Kong

Ye Wang, Xiamen University, China

Information for Authors

Full details on how to submit material for publication in EES Catalysis This journal is @ The Royal Society of Chemistry 2023. Apart from are given in the Instructions for Authors (available from http://www.rsc. fair dealing for the purposes of research or private study for nonorg/authors). Submissions should be made via the journal's homepage: commercial purposes, or criticism or review, as permitted under 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.

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

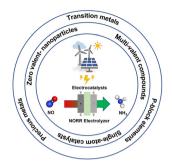


REVIEWS

645

Recent advances in electrocatalytic NO_x reduction into ammonia

Harish Reddy Inta, Dinesh Dhanabal, Sridhar Sethuram Markandaraj and Sangaraju Shanmugam*

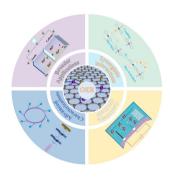


PERSPECTIVES

665

Advanced dual-atom catalysts for efficient oxygen evolution reaction

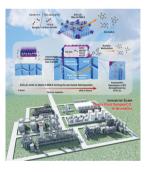
Xiaobo Zheng, Jiarui Yang and Dingsheng Wang*



677

A perspective of CO_x conversion to aromatics

Guo Tian, Xiaoyu Liang, Hao Xiong, Chenxi Zhang* and Fei Wei*



MINIREVIEW

687

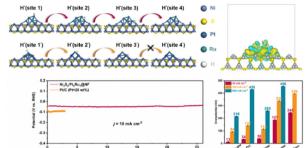
A review of II-VI semiconductor nanoclusters for photocatalytic CO₂ conversion: synthesis, characterization, and mechanisms

Kai Li, Junjun Ge, Enhao Li, Zhe Li, Hua Wang, Yuanyuan Wang,* Yang Zhou* and Jun-Jie Zhu*



PAPERS

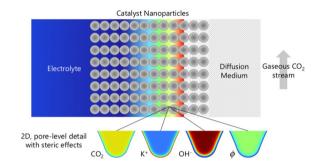
695



Hydrogen spillover in Pt₅Ru₁ nanoalloy decorated Ni₃S₂ enabling pH-universal electrocatalytic hydrogen evolution

Zuxi Yu, Xianhong Rui and Yan Yu*

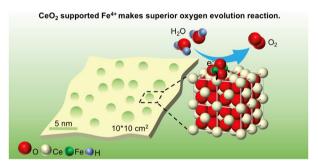
704



Pathways to enhance electrochemical CO₂ reduction identified through direct pore-level modeling

Evan F. Johnson, Etienne Boutin, Shuo Liu and Sophia Haussener*

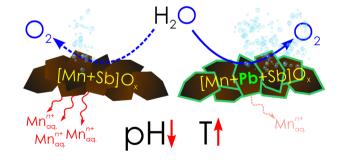
720



CeO₂ supported high-valence Fe oxide for highly active and stable water oxidation

Hongzhi Liu, Jun Yu,* Jinghuang Lin, Bin Feng, Mingzi Sun, Chen Qiu, Kun Qian, Zhichun Si, Bolong Huang,* Jean-Jacques Delaunay, Yuichi Ikuhara and Shihe Yang*

730



High performance acidic water electrooxidation catalysed by manganese-antimony oxides promoted by secondary metals

Sibimol Luke, Manjunath Chatti, Darcy Simondson, Khang N. Dinh, Brittany V. Kerr, Tam D. Nguyen, Gamze Yilmaz, Bernt Johannessen, Douglas R. MacFarlane, Aswani Yella,* Rosalie K. Hocking* and Alexandr N. Simonov*

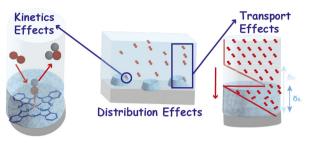
PAPERS

742

Deconvoluting kinetics and transport effects of ionic liquid layers on FeN₄-based oxygen reduction catalysts

Silvia Favero, Ifan E. L. Stephens* and Maria-Magdalena Titirici*

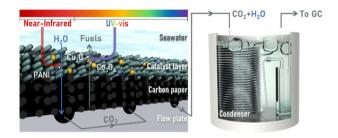
Ionic Liquid Layers for Oxygen Reduction



755

Full-spectrum utilization of solar energy for simultaneous CO2 reduction and seawater desalination

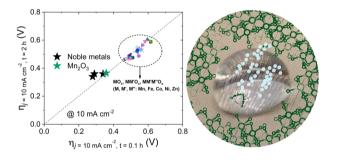
Yuting Yin, Wenhao Jing, Haoran Qiu, Feng Wang, Ya Liu* and Liejin Guo*



765

A survey of Earth-abundant metal oxides as oxygen evolution electrocatalysts in acidic media (pH < 1)

Jiahao Yu, Stefano Giancola, Bahareh Khezri, David Nieto-Castro, Jesús Redondo, Frederik Schiller, Sara Barja, Maria Chiara Spadaro, Jordi Arbiol, Felipe A. Garcés-Pineda* and José Ramón Galán-Mascarós*



774

Identification of non-metal single atomic phosphorus active sites for the CO₂ reduction reaction

Hong Bin Yang, Cong-Qiao Xu, Sambath Baskaran, Ying-Rui Lu, Chengding Gu, Wei Liu, Jie Ding, Jincheng Zhang, Qilun Wang, Wei Chen, Jun Li,* Yanqiang Huang, Tao Zhang and Bin Liu*

