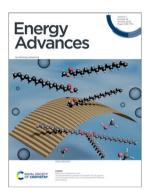
# **Energy Advances**

# rsc.li/energy-advances

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.

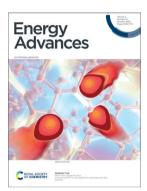
## IN THIS ISSUE

ISSN 2753-1457 CODEN EANDBJ 2(10) 1533-1772 (2023)



#### Cover

See Katherine Huddersman et al., pp. 1604-1625. Image reproduced by permission of Katherine Huddersman from Energy Adv., 2023, **2**, 1604.



#### Inside cover

See Milton Chai, Jingwei Hou et al., pp. 1591-1603. Image reproduced by permission of Jingwei Hou from Energy Adv., 2023, **2**, 1591.

#### **REVIEWS**

1541

# Photothermal catalytic C1 conversion on supported catalysts

Hui Liu, Liangliang Han, Xiaoguang Duan, Hongqi Sun, Shaobin Wang and Jingiang Zhang\*



#### 1565

# High-entropy materials for electrochemical energy storage devices

Jie Qu, Mark A. Buckingham and David J. Lewis\*



**Executive Editor** 

**Editorial Production Manager** Sarah Whitbread

**Deputy Editor** 

Jon Ferrier

Editorial Assistant

Alex Holiday

**Publishing Assistant** 

Lee Colwill

Assistant Editors

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

For queries about submitted papers, please contact Sarah Whitbread, Editorial Production Manager in the first instance. E-mail: energyadvances@rsc.org For pre-submission queries please contact Emma Eley, Executive Editor. Email: energyadvances-rsc@rsc.org

Energy Advances (electronic: ISSN 2753-1457) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

Energy Advances 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

# **Energy Advances**

## rsc.li/energy-advances

Energy Advances is a multidisciplinary journal that publishes research across a broad scope of topics, and welcomes work that contributes to developments throughout energy science and related fields. We offer an inclusive home to advances across the spectrum of energy science - from central concepts to exciting research at the nexus of subdisciplines.

#### **Editorial Board**

Editor-in-Chief

Volker Presser, Leibniz Institute for New Materials, Germany

Associate Editors

B. Layla Mehdi, University of Liverpool, UK

Michael Naguib, Tulane University, USA Guang Feng, Huazhong University of Science Kong Polytechnic University, Hong Kong, and Technology (HUST), China Matthew Suss, Form Energy, USA You Han, Tianjin University, China

Wai-Yeung (Raymond) Wong, The Hong

## **Advisory Board**

Nirmala Grace Andrews, Vellore Institute of Technology, India Sarbajit Banerjee, Texas A&M University, USA

Sudip Chakraborty, Harish-Chandra Research Institute (HRI) Allahabad, India Graeme Cooke, University of Glasgow, UK Benjamin Dietzek, Friedrich Schiller University Jena, Germany Liming Ding, National Center for

Nanoscience and Technology, China Baizeng Fang, The University of British Columbia, Canada John Gordon, Brookhaven National

Laboratory, USA Anita Ho-Ballie, University of Sydney, Australia

Shaojun Guo, Peking University, China Kui Jiao, Tianjin University, China Dattaray Late, CSIR-National Chemical Laboratory, India

Yan Lu, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany Heather MacLean, University of Toronto, Canada

Hoi Ri Moon, Ulsan National Institute of Science and Technology, Korea Thuc-Quyen Nguyen, University of California Santa Barbara, USA

Petr Nikrityuk, University of Alberta, Canada Kenneth Ozoemena, University of the Witwatersrand, South Africa Kristin Persson, University of California,

USA, and Lawrence Berkeley National Laboratory, USA

Jenny Pringle, Deakin University, Australia Jürgen Steimle, Universität des Saarlandes,

Valeska Ting, University of Bristol, UK Shenghao Wang, Shanghai University, China Ajayan Vinu, The University of Newcastle, Australia

Naoaki Yabuuchi, Yokohama National University, Japan

Aldo José Gorgatti Zarbin, Universidade Federal do Paraná (UFPR), Brazil Qiang Zhang, Tsinghua University, China Hongcai Zhou, Texas A&M University, USA

## Information for Authors

Full details on how to submit material for publication in Energy Advances 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/energy-advances

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

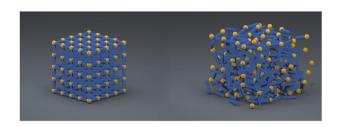


## **PERSPECTIVE**

#### 1591

# Amorphous MOFs for next generation supercapacitors and batteries

Wupeng Wang, Milton Chai,\* Rijia Lin, Fangfang Yuan, Lianzhou Wang, Vicki Chen and Jingwei Hou\*

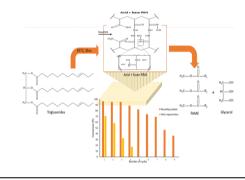


## **PAPERS**

#### 1604

Transesterification reaction of tristearin (TS) & glycerol mono stearate (GMS) over surface basified PAN fibrous solid catalyst

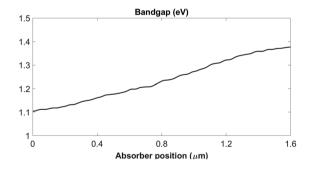
Rawaz A. Ahmed, Sanaa Rashid, Ketan Ruparelia and Katherine Huddersman\*



## 1626

# A study of bandgap-graded CZTGSe kesterite thin films for solar cell applications

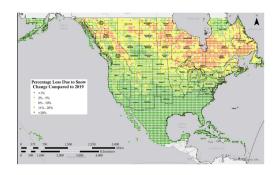
Romain Scaffidi,\* Guy Brammertz, Yibing Wang, Arman Uz Zaman, Keerthi Sasikumar, Jessica de Wild, Denis Flandre and Bart Vermang



## 1634

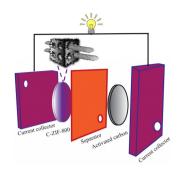
# The impact of snow losses on solar photovoltaic systems in North America in the future

Ryan A. Williams, Daniel J. Lizzadro-McPherson and Joshua M. Pearce\*



## **PAPERS**

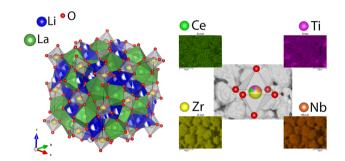
#### 1650



# High-performance asymmetric supercapacitor device with nickel-cobalt bimetallic sites encapsulated in multilayered nanotubes

Rahul Patil, Lingaraj Pradhan, Babasaheb M. Matsagar, Omnarayan Agrawal, Kevin C.-W. Wu, Bikash Kumar Jena\* and Saikat Dutta\*

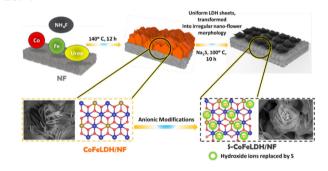
# 1660



# Rapid sintering of $Li_{6.5}La_3Zr_1Nb_{0.5}Ce_{0.25}Ti_{0.25}O_{12}$ for high density lithium garnet electrolytes with current induced in situ interfacial resistance reduction

M. P. Stockham, \* B. Dong, M. S. James, P. Zhu, E. Kendrick and P. R. Slater\*

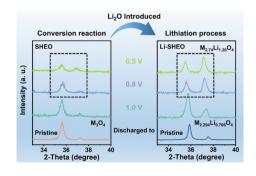
## 1674



## A 3D-hierarchical flower like architecture of anion induced layered double hydroxides for competing anodic reactions

Krishankant, Aashi, Baljeet Kaur, Jatin Sharma, Chandan Bera and Vivek Bagchi\*

#### 1685



# Understanding the lithiation mechanism of Li<sub>2</sub>O-doped spinel high-entropy oxides as anode materials for Li-ion batteries

Guozhe Ma, Yu Zheng, Fanbo Meng and Renzong Hu\*

## **PAPERS**

#### 1693

Design and development of a low-cost imidazolebased hole transporting material for perovskite solar cells

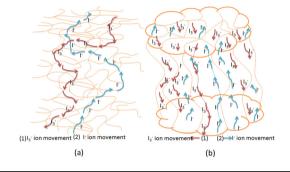
Fatemeh Sadeghi, Babak Pashaei, Babak Nemati Bideh, Negin Sabahi, Hashem Shahroosvand\* and Mohammad Khaja Nazeeruddin\*



## 1702

A novel poly(acrylonitrile)/poly(ethylene glycol)based polymer gel electrolyte for high efficiency dye sensitized solar cells

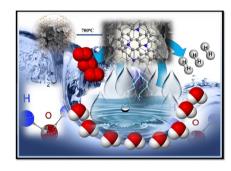
Madhu Mohan Varishetty,\* Murakami Kenji, Nazia Tarannum, Srinivasa Rao Damaraju and Madhavi Jonnalagadda



## 1713

Generation of covalent organic framework-derived porous N-doped carbon nanosheets for highly efficient electrocatalytic hydrogen evolution

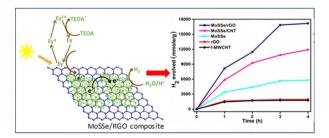
Sayan Halder, Anup Kumar Pradhan, Soumen Khan and Chanchal Chakraborty\*



# 1724

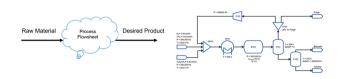
Molybdenum sulfo-selenide nanocomposites with carbon nanotubes and reduced graphene oxide for photocatalytic hydrogen evolution reaction

Namsheer K, K. Pramoda,\* Kothanahally S. Sharath Kumar, Sithara Radhakrishnan and Chandra Sekhar Rout\*



## **PAPERS**

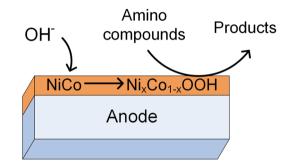
#### 1735



A coupled reinforcement learning and IDAES process modeling framework for automated conceptual design of energy and chemical systems

Dewei Wang,\* Jie Bao,\* Miguel A. Zamarripa-Perez, Brandon Paul, Yunxiang Chen, Peiyuan Gao, Tong Ma, Alexander A. Noring, Arun K. S. Iyengar, Daniel T. Schwartz, Erica E. Eggleton, Qizhi He, Andrew Liu, Olga A. Marina, Brian Koeppel and Zhijie Xu

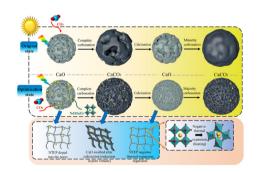
#### 1752



# Electrocatalytic behavior of amino compound oxidation on NiCo catalyst and energy conversion

Wei Xu,\* Zhaozhao Yan, Chunhong Liu, Xu Yang, Hua Yu, Hongchao Chang, Jiarong Zang, Guangyao Xu, Linmin Du and Binbin Yu\*

#### 1761



Long-stable solar energy capture and storage via negative thermal expansion regulated calcium-based particles

Jingrui Liu, Yimin Xuan,\* Liang Teng, Chen Sun, Qibin Zhu and Xianglei Liu

## CORRECTION

## 1770

Correction: Understanding the lithiation mechanism of Li<sub>2</sub>O-doped spinel high-entropy oxides as anode materials for Li-ion batteries

Guozheng Ma, Yu Zheng, Fanbo Meng and Renzong Hu\*