

# Journal of Materials Chemistry A

Materials for energy and sustainability

[rsc.li/materials-a](https://rsc.li/materials-a)

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.

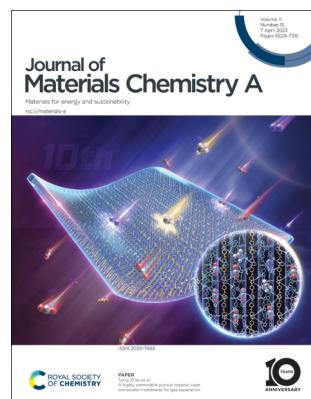
## IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 11(13) 6629–7316 (2023)



### Cover

See Ruitao Zhou and Kwok Ho Lam, pp. 6820–6830.  
Image reproduced by permission of Ruitao Zhou from *J. Mater. Chem. A*, 2023, 11, 6820.



### Inside cover

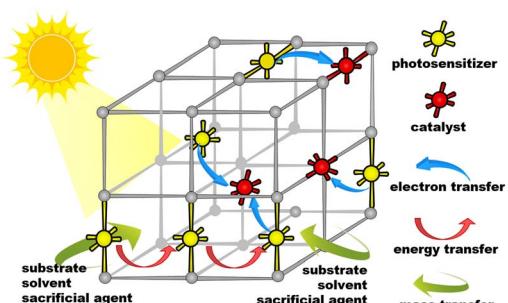
See Song Zhao et al., pp. 6831–6841. Image reproduced by permission of Song Zhao from *J. Mater. Chem. A*, 2023, 11, 6831.

## REVIEWS

6646

### Impacts of host–guest assembly on the photophysical and photocatalytic properties of heterogenized molecular photosensitizer and catalysts

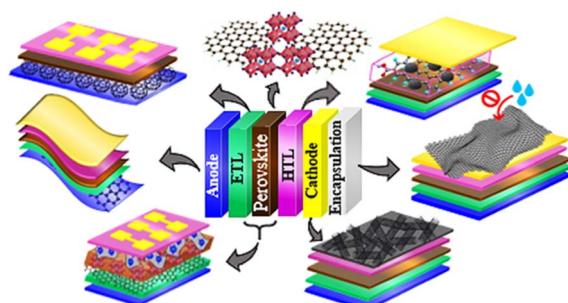
Jianying Shi,\* Zhifang Su, Xuan Li, Jianxin Feng and Chengzheng Men



6659

### Recent progress on the use of graphene-based nanomaterials in perovskite solar cells

Zohreh Niazi, Anders Hagfeldt and Elaheh K. Goharshadi\*



**Editorial Staff****Executive Editor**

Michaela Muehlberg

**Deputy Editor**

Geraldine Hay

**Editorial Production Manager**

Jonathon Watson

**Senior Publishing Editor**

Isobel Tibbets

**Development Editor**

Rose Wedgbury

**Publishing Editors**

Blake Baker, Matthew Blow, Chris Dias, Hemna Fathima, Juan Gonzalez, Ellie Griffiths, Rob Hindle, Sam Howell, Ash Hyde, Francesca Jacklin, Evie Karkerka, Shruti Karnik, Sophie Koh, Tamara Kosikova, Brian Li, Sam Mansell, Carole Martin, Kirsty McRoberts, Yasmine Mehanna, Tiffany Rogers, Cat Schofield, Charu Storr-Vijay, Manman Wang, Ella White, Tom Williams

**Editorial Assistant**

Daniel Smith

**Publishing Assistant**

Julie-Ann Roszkowski

**Publisher**

Sam Keltie

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

For pre-submission queries please contact  
Michaela Muehlberg, Executive Editor.  
E-mail: [materialsA-rsc@rsc.org](mailto:materialsA-rsc@rsc.org)

Journal of Materials Chemistry A (electronic: ISSN 2050-7496) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the 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)

2023 Annual (electronic) subscription price: £1968, \$4085. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at [www.rsc.org/ip](http://www.rsc.org/ip)

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

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)

# Journal of Materials Chemistry A

[rsc.li/materials-a](http://rsc.li/materials-a)

*Journal of Materials Chemistry A, B & C* cover high quality studies across all fields of materials chemistry. The journals focus on those theoretical or experimental studies that report new understanding, applications, properties and synthesis of materials. *Journal of Materials Chemistry A* covers materials with applications in energy & sustainability.

## Editorial Board

**Editor-in-Chief**

Anders Hagfeldt, EPFL, Switzerland

**Scientific Editors**

Frank Osterloh, University of California, Davis, USA

**Associate Editors**

Veronica Augustyn, North Carolina State University, USA

Viola Birrs, University of Calgary, Canada

Goutami De, S N Bose National Centre for

Basic Sciences, India

Ghim Wei Ho, National University of

Singapore, Singapore

Yun Jeong Hwang, Seoul National University, South Korea

Kisuk Kang, Seoul National University, South Korea

Subrata Kundu, Central Electrochemical Research Institute (CECRI), India

Dan Li, Jinan University, China

David Lou, Nanyang Technological University, Singapore

Yi-Chun Lu, Chinese University of Hong Kong, Hong Kong

Shizhang Qiao, University of Adelaide, Australia

Jennifer Rupp, Massachusetts Institute of Technology, USA

Miriam Unterlass, University of Konstanz, Germany

Lydia Wong, Nanyang Technological University, Singapore

Li-Zhu Wu, Technical Institute of Physics and Chemistry, China

Yusuke Yamauchi, University of Queensland, Australia

Zhen Zhou, Nankai University, China

## Advisory Board

P. Adelhelm, Humboldt-University Berlin, Germany

R. Ahuja, Uppsala University, Sweden

C. Ania, CNRS Orleans, France

J.-B. Baek, Ulsan National Institute of Science and Technology, Korea

C. Berlinguette, University of British Columbia, Canada

K. Biswas, Jawaharlal Nehru Centre for Advanced Scientific Research, India

E. Bucher, University of Leoben, Austria

M. Chabiny, University of California, Santa Barbara, USA

A. Chatterpadhyay, IIT Guwahati, India

J.-S. Chen, Shanghai Jiao Tong University, China

W. Chueh, Stanford University, USA

S. Cussen, University of Sheffield, UK

M. Eddaoudi, King Abdullah University of Science and Technology, Saudi Arabia

T. Edvinsson, Uppsala University, Sweden

X. Feng, Dresden University of Technology, Germany

J. Fleig, Dresden University of Technology, Germany

M. Florea, University of Bucharest, Romania

G. Galli, University of Chicago, USA

N. Garcia-Araez, University of Southampton, UK

G. Grancini, University of Pavia, Italy

J. Huang, Northwestern University, USA

H. Imahori, Kyoto University, Japan

T. Ishihara, Kyushu University, Japan

S. Islam, University of Bath, UK

F. Jiao, University of Delaware, USA

E. Kendrick, University of Birmingham, UK

B. Kim, KAIST, Korea

D.-H. Kim, Ewha Womans University, Korea

U. Kramm, TU Darmstadt, Germany

Y.J. Lee, Hanyang University, Korea

B. Li, Tsinghua University, China

J. Li, Rutgers University, USA

Z. Lin, National University of Singapore, Singapore

B. Lotsch, Max Planck Institute for Solid State Research, Stuttgart, Germany

J. Luo, Nankai University, China

C.-B. Mullins, University of Texas at Austin, USA

A. K. Nandi, IACS, India

L. Nazar, University of Waterloo, Canada

M. Niederberger, ETH Zürich, Switzerland

A.F. Nogueira, University of Campinas, Brazil

C. Osuji, University of Pennsylvania, USA

S. Parker, University of Bath, UK

S. Patil, Indian Institute of Science, Bangalore, India

Z. Schnepp, University of Birmingham, UK

Z. Shao, Curtin University, Australia

Y. Shimakawa, Kyoto University, Japan

S. Skinner, Imperial College London, UK

M.C. Stefan, University of Texas at Dallas, USA

C.-Y. Su, Sun Yat-Sen University, China

S.-G. Sun, Xiamen University, China

V. Thangadurai, University of Calgary, Canada

M. Titirici, Imperial College London, UK

S. Ukk, Sungkyunkwan University, Korea

E. Unger, Lung University, Sweden

R.-N. Vannier, ENSC Lille, France

M. Wang, Sun Yat-Sen University, China

M. Wei, Beijing University of Chemical Technology, China

E. Weiss, Northwestern University, USA

C. Williams, University of Oxford, UK

C. Xiong, Boise State University, USA

Y. Xu, University College London, UK

Y.-J. Xu, Fuzhou University, China

M. Ye, Xiamen University, China

Q. Zhang, Tsinghua University, China

X.-S. Zhao, University of Queensland, Australia

G. Zheng, Fudan University, China

## Information for Authors

Full details on how to submit material for publication in *Journal of Materials Chemistry A* 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/materials-a](http://rsc.li/materials-a). Submissions: The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Reviews, Highlights and Applications. Full Papers and Communications should describe original work of high quality and impact which must highlight the novel properties or applications (or potential properties/applications) of the materials studied.

Additional details are available from the Editorial Office or <http://www.rsc.org/authors>

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

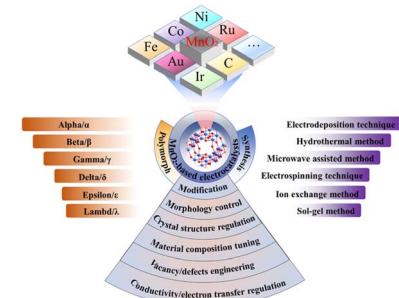


## REVIEWS

6688

## Modification of micro/nanoscaled manganese dioxide-based materials and their electrocatalytic applications toward oxygen evolution reaction

Gaihua He\* and Ye Liao\*



6747

## Functional metal–organic frameworks as adsorbents used for water decontamination: design strategies and applications

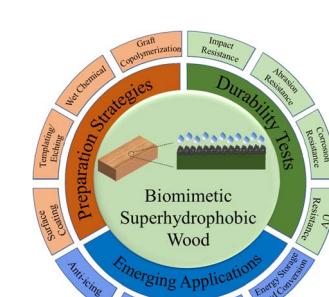
Gege Wu, Jiping Ma,\* Shuang Li, Jinhua Li, Xiaoyan Wang, Zhiyang Zhang and Lingxin Chen\*



6772

## Recent development and emerging applications of robust biomimetic superhydrophobic wood

Xiaojun Li, Likun Gao,\* Min Wang, Dong Lv, Peiyao He, Yanjun Xie, Xianxu Zhan,\* Jian Li and Zhiqun Lin\*



6796

## Various approaches to synthesize water-stable halide PeNCs

Avijit Das, Arup Ghorai, Kundan Saha, Arka Chatterjee and Unyong Jeong\*



## COMMUNICATION

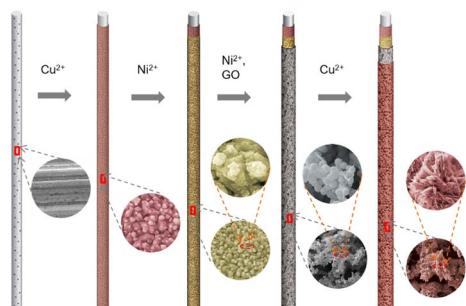
6814


**Main-group indium single-atom catalysts for electrocatalytic NO reduction to NH<sub>3</sub>**

Kai Chen, Nana Zhang, Fuzhou Wang, Jilong Kang and Ke Chu\*

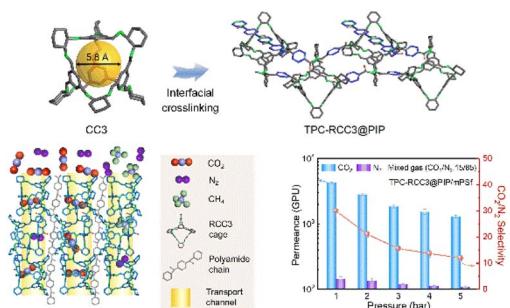
## PAPERS

6820


**Energy-dense wire-like supercapacitors based on scalable three-dimensional porous metal-graphene oxide skeleton electrodes**

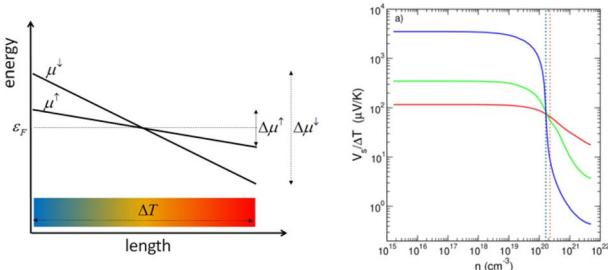
Ruitao Zhou and Kwok Ho Lam\*

6831


**A highly permeable porous organic cage composite membrane for gas separation**

Zhihao Jiang, Ying Wang, Menglong Sheng, Zhiyuan Zha, Jixiao Wang, Zhi Wang and Song Zhao\*

6842


**Giant spin-dependent Seebeck effect from fully spin-polarized carriers in n-doped EuTiO<sub>3</sub>: a prototype material for spin-caloritronic applications**

P. Wadhwa, A. Bosin and A. Filippetti\*

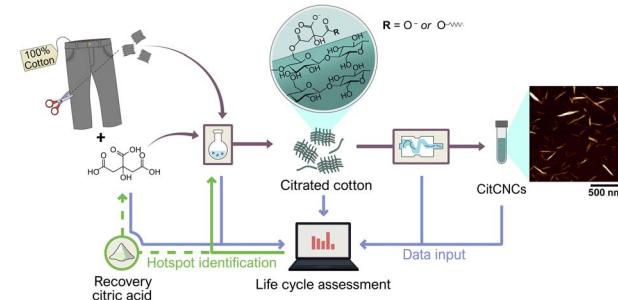


## PAPERS

6854

**Citrate cellulose nanocrystals from post-consumer cotton textiles**

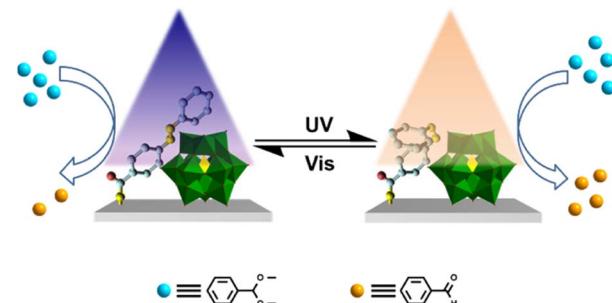
Maria-Ximena Ruiz-Caldas,  
 Varvara Apostolopoulou-Kalkavoura,  
 Anna-Karin Hellström, Jutta Hildenbrand, Mikael Larsson,  
 Aleksander Jaworski, Joseph S. M. Samec, Panu Lahtinen,  
 Tekla Tammelin and Aji P. Mathew\*



6869

**Photo-switchable phosphotungstic acid active sites in metal–organic frameworks for a tailorable deacetalization reaction**

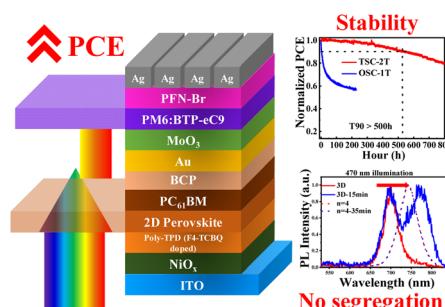
Hui Wen, Guoliang Liu, Shi-Chao Qi, Chen Gu, Tao Yang,  
 Peng Tan and Lin-Bing Sun\*



6877

**Phase-segregation free quasi-2D perovskite/organic tandem solar cells with low  $V_{oc}$  loss and efficiency beyond 21%**

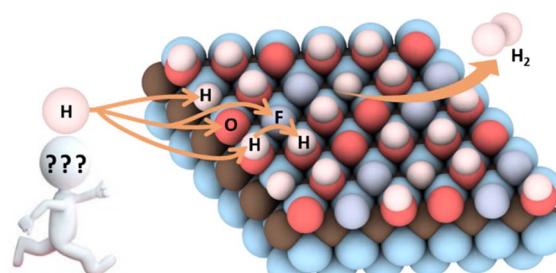
Haotian Wu, Tianyi Chen, Yaokai Li, Shitao Guan,  
 Lin Zhang, Tingjun Chen, Yang Liu, Yizheng Jin, Lijian Zuo,  
 Weifei Fu,\* Gang Wu\* and Hongzheng Chen\*



6886

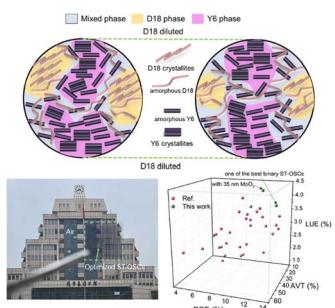
**Effect of terminations on the hydrogen evolution reaction mechanism on  $Ti_3C_2$  MXene**

Ling Meng, Li-Kai Yan,\* Francesc Viñes\* and Francesc Illas



## PAPERS

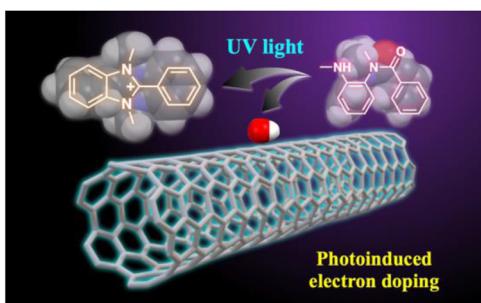
6901



## A paradigm study of polymer donor diluted bulk heterojunction films for application in semitransparent organic photovoltaics

Zhenyu Chen, Wei Ma and Han Yan\*

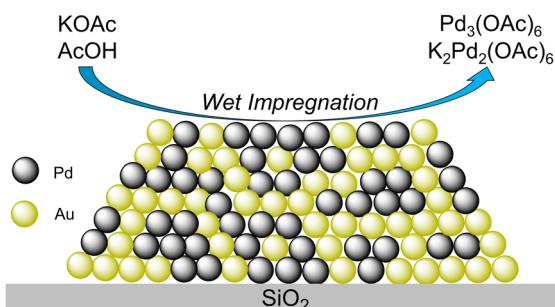
6909



## Photoinduced electron doping of single-walled carbon nanotubes based on carboxamide photochemical reactions

Naoki Tanaka, Taiki Ishii, Itsuki Yamaguchi, Aoi Hamasuna and Tsuyohiko Fujigaya\*

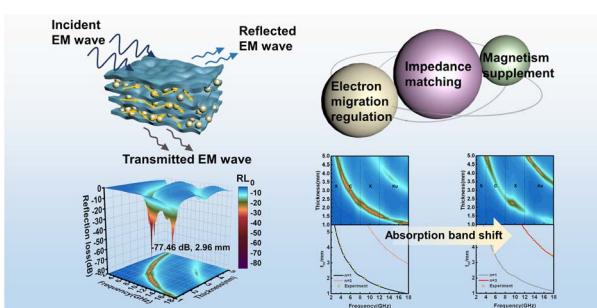
6918



## Impregnation of KOAc on PdAu/SiO<sub>2</sub> causes Pd-acetate formation and metal restructuring

Hunter P. Jacobs, Welman C. Elias, Kimberly N. Heck, David P. Dean, Justin J. Dodson, Wenqing Zhang, Jacob H. Arredondo, Christian J. Breckner, Kiheon Hong, Christopher R. Botello, Laiyuan Chen, Sean G. Mueller, Steven R. Alexander, Jeffrey T. Miller and Michael S. Wong\*

6934



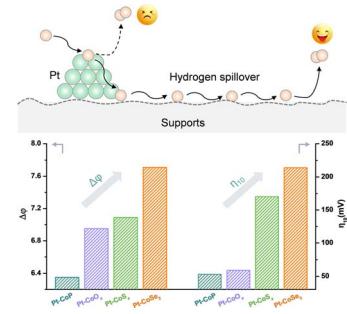
## Regulated electron migration in sandwich-like m-Ti<sub>3</sub>C<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> composites derived from electrostatic assembly boosted electromagnetic wave absorption

Yuxiao Yang, Jianyun Zhao, Juhong Wang, Yinhuan Li, Wei Yu\* and Shuijiang Ding

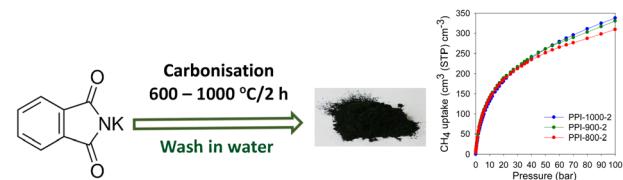


## PAPERS

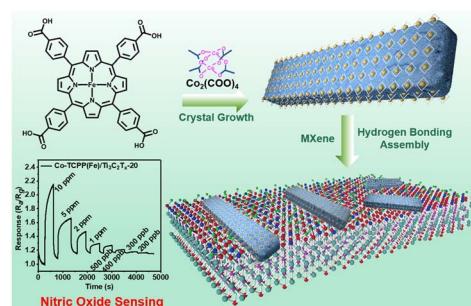
6945

**Boosting hydrogen evolution through hydrogen spillover promoted by Co-based support effect**Ya-Nan Zhou, Xin Liu, Cheng-Jie Yu, Bin Dong,<sup>\*</sup> Guan-Qun Han, Hai-Jun Liu, Ren-Qing Lv, Bin Liu and Yong-Ming Chai<sup>\*</sup>

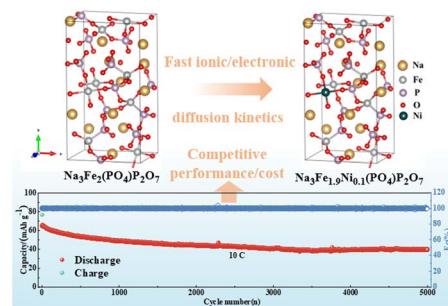
6952

**Direct synthesis of organic salt-derived porous carbons for enhanced  $CO_2$  and methane storage**Ibtisam Alali and Robert Mokaya<sup>\*</sup>

6966

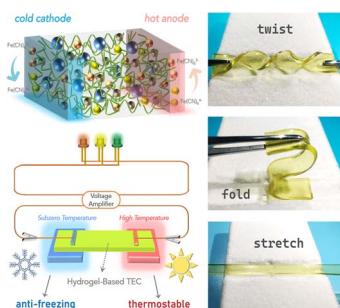
**Building porphyrin-based MOFs on MXenes for ppb-level NO sensing**Yanwei Chang, Minyi Chen, Zijing Fu, Ruofei Lu, Yixun Gao, Fengjia Chen, Hao Li, Nicolaas Frans de Rooij, Yi-Kuen Lee, Yao Wang<sup>\*</sup> and Guofu Zhou

6978

**Unlocking fast and highly reversible sodium storage in Fe-based mixed polyanion cathodes for low-cost and high-performance sodium-ion batteries**Xu Wang, Huangxu Li, Wei Zhang, Xiaochen Ge, Liang He, Liuyun Zhang, Shihao Li, Naifeng Wen, Juanlang Guo, Yanqing Lai, Simin Li and Zhian Zhang<sup>\*</sup>

## PAPERS

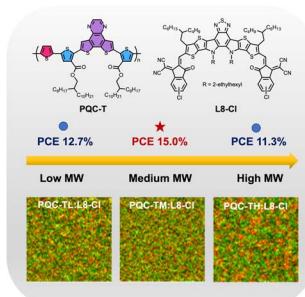
6986



**Aqueous eutectic hydrogel electrolytes enable flexible thermocells with a wide operating temperature range**

Peng Peng, Zhao Li, Daibin Xie, Kaihua Zhu, Chunyu Du, Lirong Liang, Zhuoxin Liu\* and Guangming Chen\*

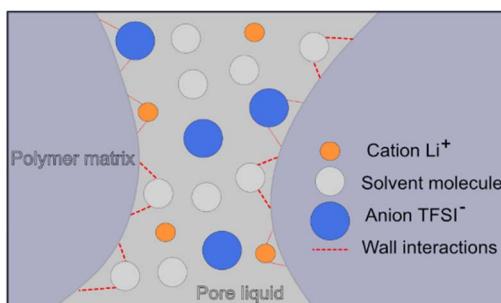
6997



**Aggregation state tuning via controlling molecular weights of D-A<sub>1</sub>-A<sub>2</sub> type polymer donors for efficient organic photovoltaics**

Shanlu Wang, Tianyi Chen, Shuixing Li,\* Lei Ye, Yuang Fu, Xinhui Lu, Haiming Zhu, Lijian Zuo, Minmin Shi and Hongzheng Chen\*

7006



**Hybrid polymer–liquid lithium ion electrolytes: effect of porosity on the ionic and molecular mobility**

Martina Cattaruzza, Yuan Fang, István Furó, Göran Lindbergh, Fang Liu and Mats Johansson\*

7016



**Fabrication of Ru nanoclusters on Co-doped NiSe nanorods with efficient electrocatalytic activity towards alkaline hydrogen evolution via hydrogen spillover effect**

Ce Mu, Hongqiang Xin, Qiaomei Luo, Yan Li\* and Fei Ma\*

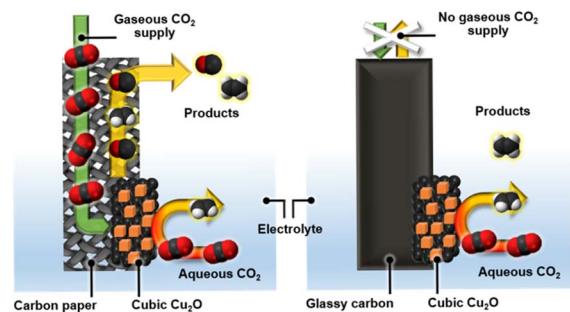


## PAPERS

7025

**Tailoring electrochemical  $\text{CO}_2$  reduction via substrate-induced gas diffusion**

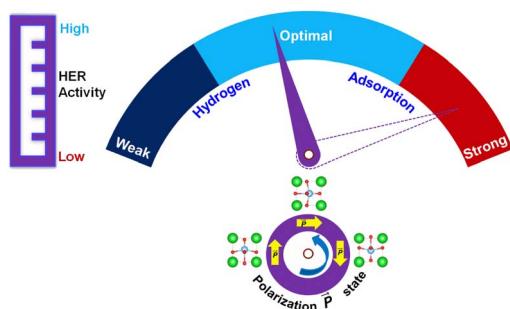
Younghyun Chae, Kyeongsu Kim, Hyewon Yun, Dongjin Kim, Wonsang Jung, Yun Jeong Hwang, Ung Lee, Dong Ki Lee, Byoung Koun Min, Woong Choi\* and Da Hye Won\*



7034

**Tunable hydrogen evolution activity by modulating polarization states of ferroelectric  $\text{BaTiO}_3$** 

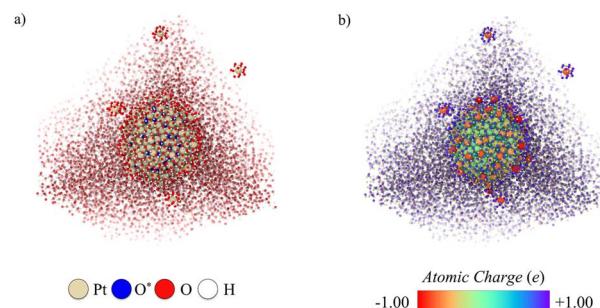
Haifa Qiu, Tong Yang, Jun Zhou, Ke Yang, Yiran Ying, Keda Ding, Ming Yang\* and Haitao Huang\*



7043

**Atomic-scale modeling of the dissolution of oxidized platinum nanoparticles in an explicit water environment**

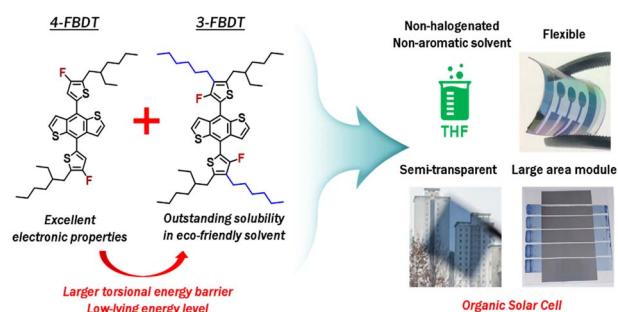
Robert E. Slapikas, Ismaila Dabo and Susan B. Sinnott\*



7053

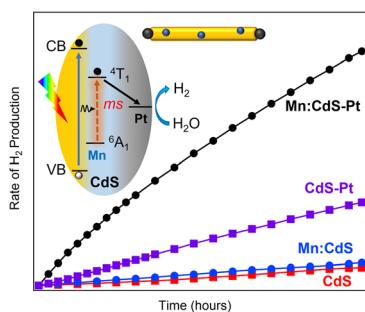
**A newly designed benzodithiophene building block: tuning of the torsional barrier for non-halogenated and non-aromatic solvent-processible photovoltaic polymers**

Hee Won Cho, Sang Young Jeong, Ziang Wu, Hyojin Lim, Won-Woo Park, Woojin Lee, Jonnadula Venkata Suman Krishna, Oh-Hoon Kwon, Jin Young Kim\* and Han Young Woo\*



## PAPERS

7066



### Facilitated electron transfer by Mn dopants in 1-dimensional CdS nanorods for enhanced photocatalytic hydrogen generation

Walker MacSwain, Hanjie Lin, Zhi-Jun Li, Shuya Li, Chun Chu, Lacie Dube, Ou Chen, Gyu Leem and Weiwei Zheng\*

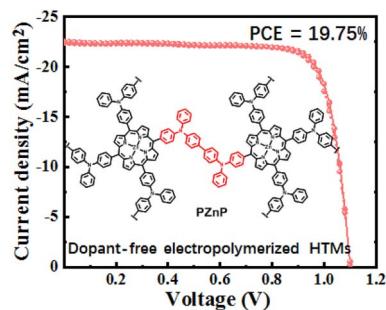
7077



### Terpyridine-zinc(II) coordination nanosheets as modulators of perovskite crystallization to enhance solar cell efficiency

Ying-Chiao Wang, Chun-Hao Chiang, Chun-Jen Su, Je-Wei Chang, Chi-Ying Lin, Chia-Chun Wei, Shao-Ku Huang, Hiroaki Maeda, Wen-Bin Jian, U-Ser Jeng,\* Kazuhito Tsukagoshi,\* Chun-Wei Chen\* and Hiroshi Nishihara\*

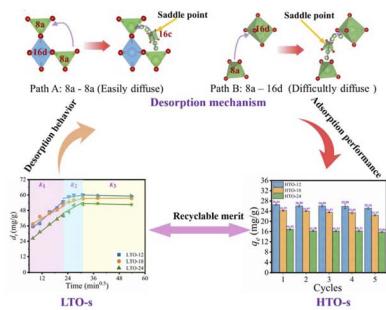
7085



### Thermally stable inverted perovskite solar cells using an electropolymerized Zn-porphyrin film as a dopant-free hole-transporting layer

Yangjie Lan, Yu-Duan Wang, Zhong-Rui Lan, Yang Wang, Bin-Bin Cui,\* Jiang-Yang Shao\* and Yu-Wu Zhong\*

7094



### Unraveling the Li<sup>+</sup> desorption behavior and mechanism of Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> with different facets to enhance lithium extraction

Bing Zhao, Yingjun Qiao, Zhiqiang Qian, Wenfei Wei,\* Jun Li, Zhijian Wu and Zhong Liu\*

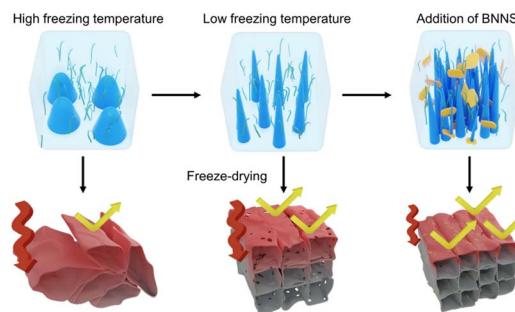


## PAPERS

7105

**Engineering anisotropic structures of thermally insulating aerogels with high solar reflectance for energy-efficient cooling applications**

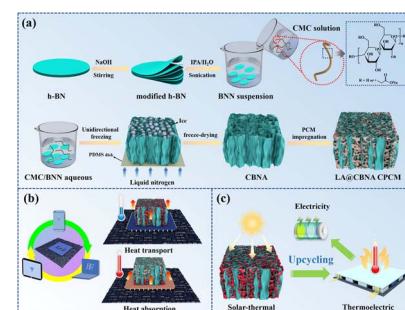
Eunyoung Kim, Kit-Ying Chan, Jie Yang, Harun Venkatesan, Miracle Hope Adegun, Heng Zhang, Jeng-Hun Lee, Xi Shen\* and Jang-Kyo Kim\*



7115

**A green, robust, and versatile BN nanosheet unidirectional aerogel encapsulated phase change material for effective thermal management of electronics and solar-thermoelectric conversion**

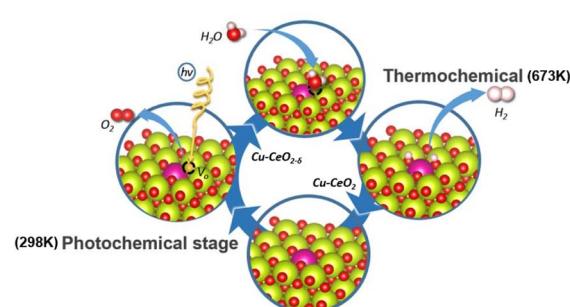
Linda Lv, Hong Ai, Taorui Chen, Wanting Zhu, Yi Guo, Lijie Dong\* and Shaokun Song\*



7128

**The water splitting cycle for hydrogen production at photo-induced oxygen vacancies using solar energy: experiments and DFT calculation on pure and metal-doped  $\text{CeO}_2$**

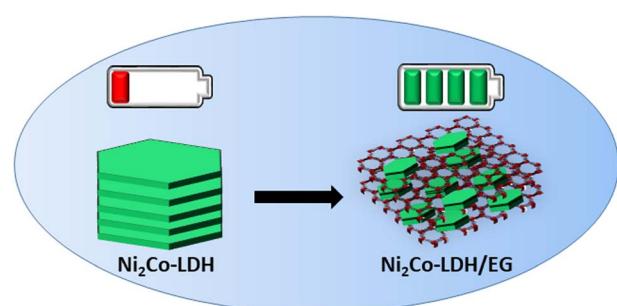
Rui Li, Chang Wen,\* Kai Yan, Tianyu Liu, Bohan Zhang, Mingtao Xu and Zijian Zhou



7142

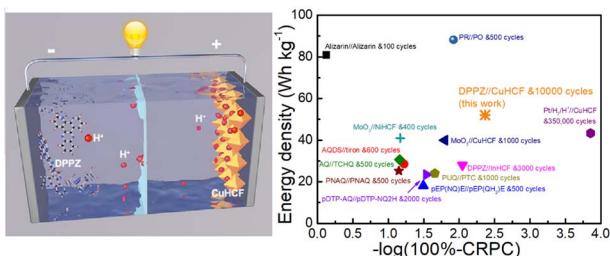
**Enhanced charge storage capacity and high rate capabilities of  $\text{Ni}_2\text{Co}$ -layered double hydroxides/expanded-graphite composites as anodes for Li-ion batteries**

Ramesh Chandra Sahoo, Sreejesh Moolayadukkam, Jun Ho Seok, Sang Uck Lee\* and H. S. S. Ramakrishna Matte\*



## PAPERS

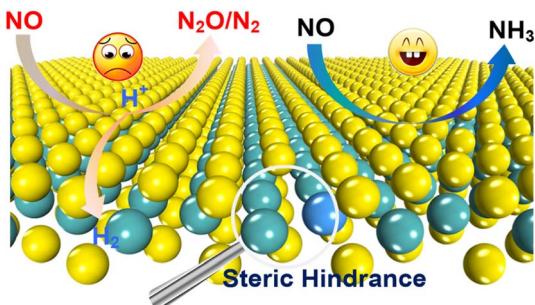
7152



## A rechargeable aqueous phenazine-Prussian blue proton battery with long cycle life

Xiaoqing Zhang, Xin Zhang, Yao Miao, Qinghong Huang, Zhidong Chen, Dengfeng Guo, Juan Xu,\* Yong-Miao Shen and Jianyu Cao\*

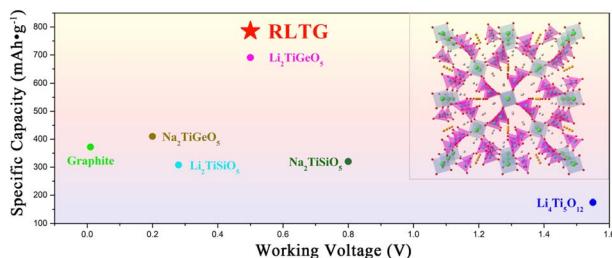
7159



## Using ternary steric hindrance synergy of a defective MoS<sub>2</sub> monolayer to manipulate the electrocatalytic mechanism toward nitric oxide reduction: a first-principles and machine learning study

Lei Yang, Jiake Fan and Weihua Zhu\*

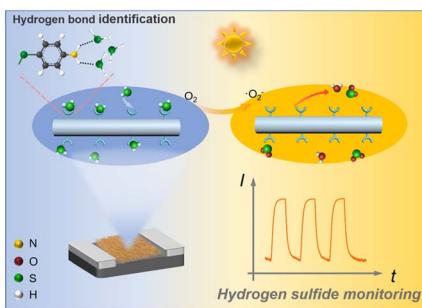
7170



## Rb<sub>4</sub>Li<sub>2</sub>TiOGe<sub>4</sub>O<sub>12</sub>: a novel high-performance titanyl germanate anode for Li-ion batteries

Chuan Tang, Siliang Chang, Qian Wu,\* Lei Kang, Kai Feng,\* Xianghe Meng, Shengqi Chu, Hongwei Huang and Mingjun Xia\*

7179



## Surface fully functionalized metal chalcogenide nanowires for highly sensitive H<sub>2</sub>S sensing

Ying-Xue Jin, Jie Chen, Yong-Jun Chen, Wei-Hua Deng, Xiao-Liang Ye, Guan-E Wang\* and Gang Xu\*

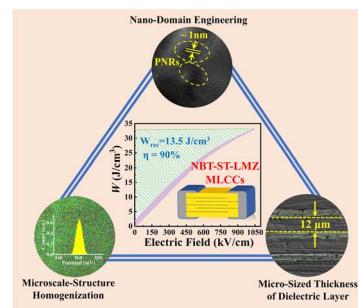


## PAPERS

7184

## High-performance energy-storage ferroelectric multilayer ceramic capacitors *via* nano-micro engineering

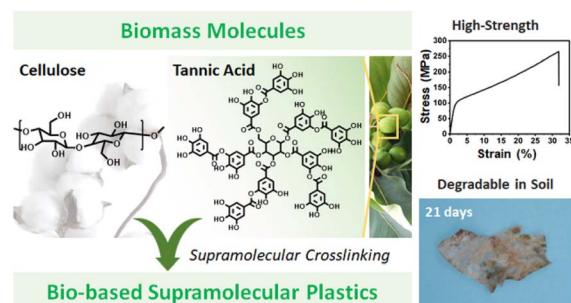
Ziyue Ma, Yong Li,\* Ye Zhao, Ningning Sun, Chunxiao Lu, Pei Han, Dawei Wang,\* Yanhua Hu, Xiaojie Lou and Xihong Hao\*



7193

## Highly tough, degradable, and water-resistant bio-based supramolecular plastics comprised of cellulose and tannic acid

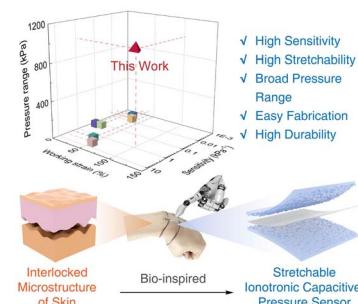
Haoxiang Sun, Xu Fang, Youliang Zhu, Zhuochen Yu, Xingyuan Lu and Junqi Sun\*



7201

## Highly stretchable ionotronic pressure sensors with broad response range enabled by microstructured ionogel electrodes

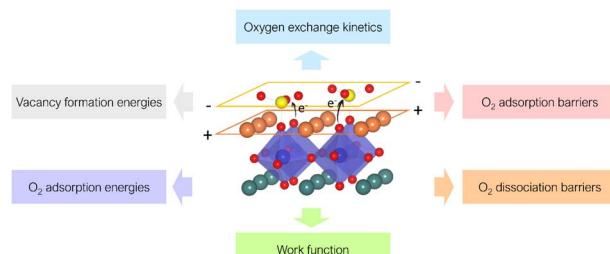
Zhenkai Huang, Yutong Chen, Jianping Peng, Tianrui Huang, Faqi Hu, Xiang Liu, Liguo Xu and Kan Yue\*



7213

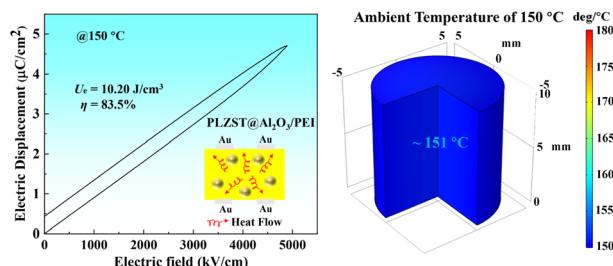
## Electronic and ionic effects of sulphur and other acidic adsorbates on the surface of an SOFC cathode material

Matthäus Siebenhofer,\* Andreas Nenning, George E. Wilson, John A. Kilner, Christoph Rameshan, Markus Kubicek, Jürgen Fleig and Peter Blaha



## PAPERS

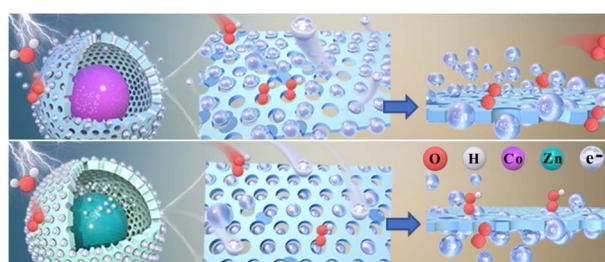
7227



**Ultra-superior high-temperature energy storage properties in polymer nanocomposites *via* rational design of core–shell structured inorganic antiferroelectric fillers**

Zhenhao Fan, Shuaibing Gao, Yunfei Chang,\* Dawei Wang, Xin Zhang, Haitao Huang,\* Yunbin He\* and Qingfeng Zhang\*

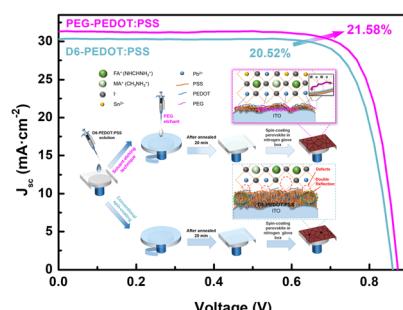
7239



**Ligand-based modulation of the electronic structure at metal nodes in MOFs to promote the oxygen evolution reaction**

Hao Wang, Mingzheng Gu, Xiaomin Huang, An Gao, Xudong Liu, Ping Sun and Xiaojun Zhang\*

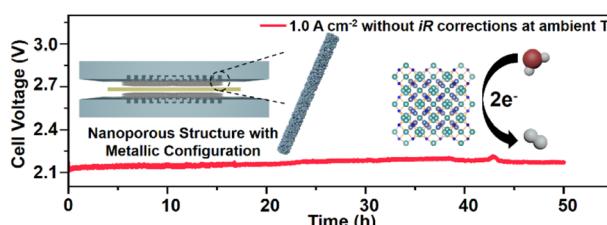
7246



**Fabrication of an ultrathin PEG-modified PEDOT:PSS HTL for high-efficiency Sn–Pb perovskite solar cells by an eco-friendly solvent etching technique**

Pengju Guo, Jun Dong, Cunyun Xu, Yanqing Yao, Jiayu You, Hongyu Bian, Wenqi Zeng, Guangdong Zhou, Xiaofeng He, Meng Wang, Xianju Zhou, Min Wang\* and Qunliang Song\*

7256



**Rational nitrogen alloying in nickel–molybdenum nitride can mediate efficient and durable alkaline hydrogen evolution**

Jia Yue Zhao, Zhen Xin Lou, Liang Yao Xue, Yeliang Ding, Xiaoxia Li, Xuefeng Wu, Yuanwei Liu, Hai Yang Yuan, Hai Feng Wang, Peng Fei Liu,\* Sheng Dai\* and Hua Gui Yang\*

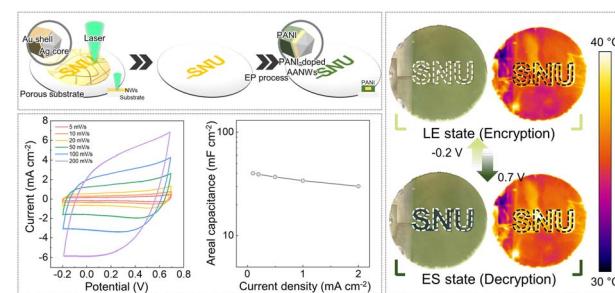


## PAPERS

7264

## An Ag–Au–PANI core–shell nanowire network for visible-to-infrared data encryption and supercapacitor applications

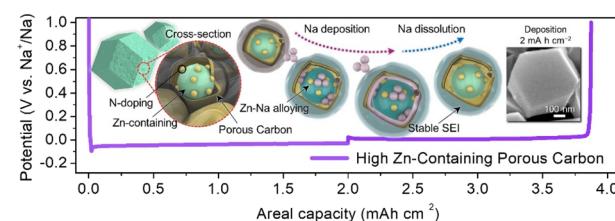
Yeongju Jung, Kyung Rok Pyun, JinKi Min, Hyeokjun Yoon, Minjae Lee, Byung-Wook Kim, Jinwoo Lee\* and Seung Hwan Ko\*



7265

## Superior metal storage behavior of Zn-containing porous carbon nanostructures for Na and Li metal batteries

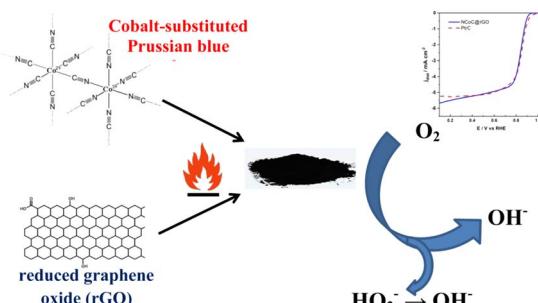
Kyungbae Kim, Seunghwan Jeon, Han-Seul Kim, Hyungeun Seo, Hyun-seung Kim, Marca M. Doeff, Sang-Gil Woo\* and Jae-Hun Kim\*



7286

## Pyrolyzed cobalt hexacyanocobaltate dispersed on reduced-graphene-oxide as an electrocatalyst of the oxygen reduction reaction in an alkaline medium

B. Zakrzewska, A. Jabłońska, L. Adamczyk, B. Dembińska, A. Kostuch, M. Strawski, I. A. Rutkowska, P. J. Kulesza, M. Marcinek, J. A. Cox and K. Miecznikowski\*



7299

## Cation deficiency enables reversal of dopant segregation at perovskite oxide surfaces under anodic potential

Dongha Kim, Adrian Hunt, Iradwikanari Waluyo and Bilge Yildiz\*

