Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

Energy & Environmental Science

rsc.li/ees

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 1754–5706 CODEN EESNBY 17(8) 2673–2958 (2024)

Cover
See Wengao Zhao, Zhengliang Gong, Yong Yang *et al.*, pp. 2743–2752. Image reproduced by permission of Yong Yang from *Energy Environ. Sci.*, 2024, **17**, 2743.

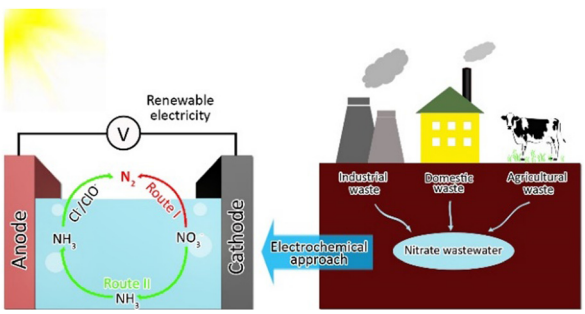
Inside cover
See Thibaut Jousseaume, Samuel Tardif *et al.*, pp. 2753–2764. Image reproduced by permission of Thibaut Jousseaume from *Energy Environ. Sci.*, 2024, **17**, 2753.

OPINION

2682

Rethinking nitrate reduction: redirecting electrochemical efforts from ammonia to nitrogen for realistic environmental impacts

Hao Huang, Karthik Peramaiah and Kuo-Wei Huang*

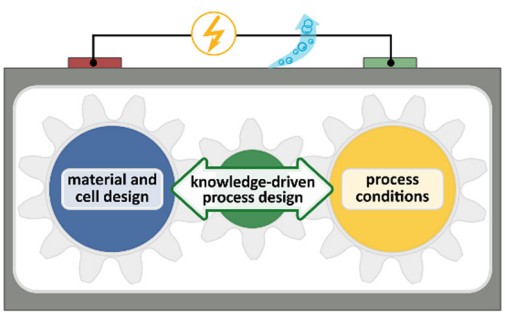


REVIEW

2686

Lithium-ion battery cell formation: status and future directions towards a knowledge-based process design

Felix Schomburg, Bastian Heidrich, Sarah Wennemar, Robin Drees, Thomas Roth, Michael Kurrat, Heiner Heimes, Andreas Jossen, Martin Winter, Jun Young Cheong* and Fridolin Röder*



View Article Online

ROYAL SOCIETY OF CHEMISTRY

Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

Environmental Science: Atmospheres

GOLD OPEN ACCESS

Connecting communities and inspiring new ideas

rsc.li/submittoEA

Fundamental questions
Elemental answers

Registered charity number: 207890

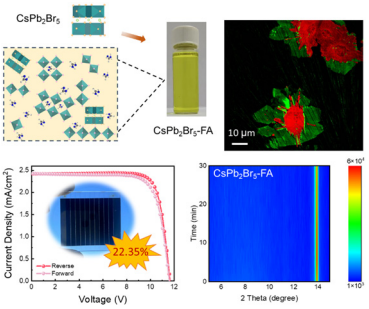
Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

COMMUNICATION

2734

$CsPb_2Br_5$-assisted direct crystallization of the 3D perovskite phase for highly efficient and stable solar cells

Caiyun Gao, Kun Gao, Bingqian Zhang, Xiuhong Sun, Qiangqiang Zhao, Xiao Wang, Feng Wang, Mingliang Sun,* Guanglei Cui* and Shuping Pang*

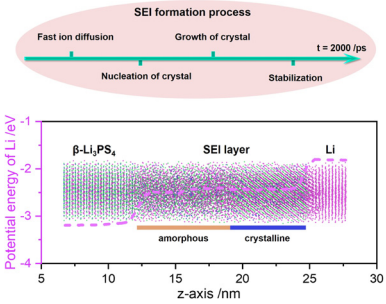


PAPERS

2743

Visualizing the SEI formation between lithium metal and solid-state electrolyte

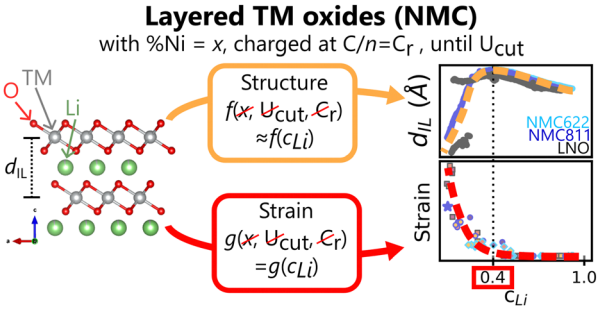
Fucheng Ren, Yuqi Wu, Wenhua Zuo, Wengao Zhao,* Siyuan Pan, Hongxin Lin, Haichuan Yu, Jing Lin, Min Lin, Xiayin Yao, Torsten Brezesinski, Zhengliang Gong* and Yong Yang*



2753

Strain and collapse during lithiation of layered transition metal oxides: a unified picture

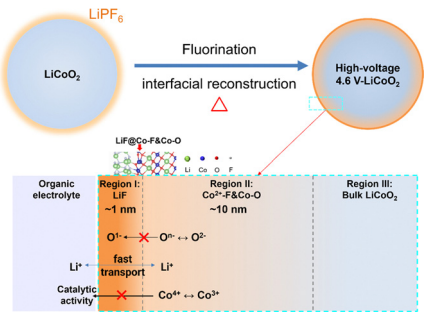
Thibaut Jousseaume, Jean-François Colin, Marion Chandesris, Sandrine Lyonnard and Samuel Tardif*



2765

Ultrathin dense LiF coverage coupled with a near-surface gradient fluorination lattice enables fast-charging long-life 4.6 V $LiCoO_2$

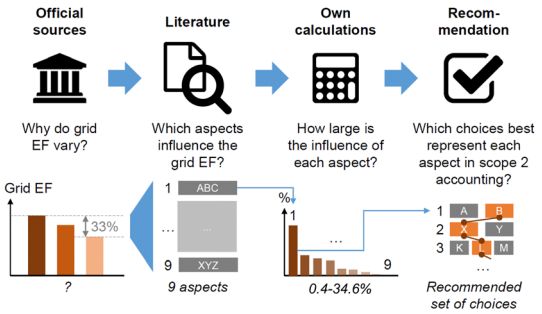
Zhihong Bi, Zonglin Yi, Liangzhu Zhang, Gongrui Wang, Anping Zhang, Shihao Liao, Qinghe Zhao, Zhangquan Peng, Li Song, Yi Wang, Zhiwei Zhao, Shiqiang Wei, Wenguang Zhao, Xiaoyu Shi, Mingrun Li, Na Ta, Jinxing Mi, Shunning Li, Pratteek Das, Yi Cui, Chengmeng Chen,* Feng Pan* and Zhong-Shuai Wu*



Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

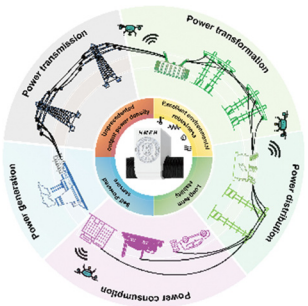
2776



Towards standardized grid emission factors: methodological insights and best practices

Malte Schäfer,* Felipe Cerdas and Christoph Herrmann

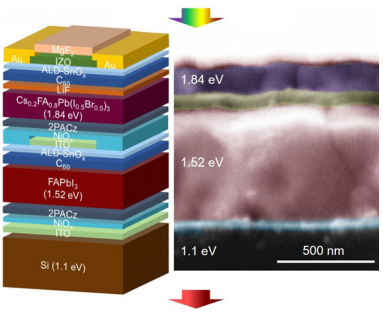
2787



Compact, robust, and regulated-output hybrid generators for magnetic energy harvesting and self-powered sensing applications in power transmission lines

Qingtong Li, Lei Zhang,* Chi Zhang, Yu Tian, Yanyun Fan, Bo Li, Zhengang An, Dachao Li* and Zhong Lin Wang*

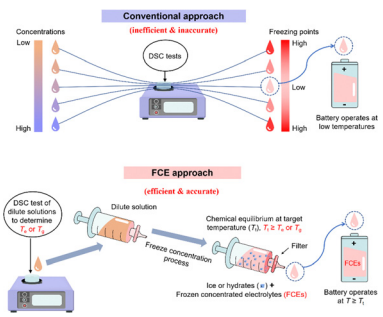
2800



Triple-junction perovskite–perovskite–silicon solar cells with power conversion efficiency of 24.4%

Hang Hu, Sophie X. An, Yang Li, Seyedamir Orooji, Roja Singh, Fabian Schackmar, Felix Laufer, Qihao Jin, Thomas Feeney, Alexander Diercks, Fabrizio Gota, Somayeh Moghadamzadeh, Ting Pan, Michael Rienäcker, Robby Peibst, Bahram Abdollahi Nejand* and Ulrich W. Paetzold*

2815



Rational design of anti-freezing electrolyte concentrations *via* freeze concentration process

Liwei Jiang, Yuan-Chao Hu, Fei Ai, Zhuojian Liang and Yi-Chun Lu*

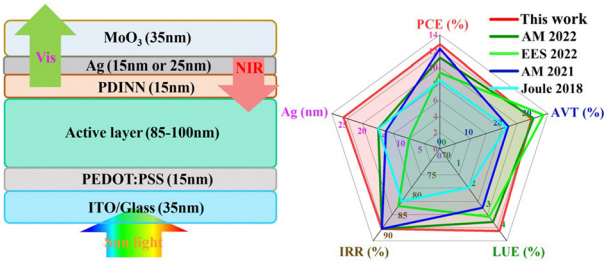
This journal is © The Royal Society of Chemistry 2024

Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

2825

Collaborative regulation strategy of donor and acceptor analogues realizes multifunctional semitransparent organic solar cells with excellent comprehensive performance

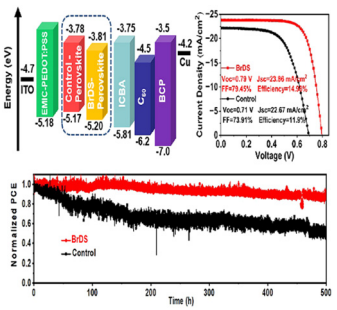
Xuexiang Huang, Xinyuan Ren, Yujun Cheng, Youhui Zhang, Zhe Sun, Sangjin Yang, Seoyoung Kim, Changduk Yang, Feiyan Wu and Lie Chen*



2837

Additive engineering with 2,8-dibromo-dibenzothiophene-*S*,*S*-dioxide enabled tin-based perovskite solar cells with 14.98% power conversion efficiency

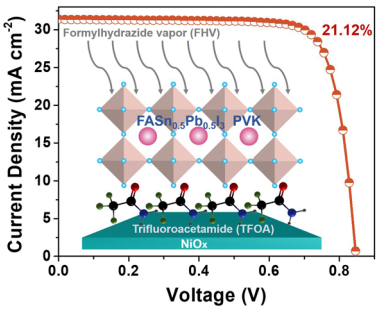
Xianyong Zhou, Wenbo Peng, Zhixin Liu, Yong Zhang, Luozheng Zhang, Meiqing Zhang, Chang Liu, Lei Yan, Xingzhu Wang* and Baomin Xu*



2845

Defect-less formamidinium Sn–Pb perovskite grown on a fluorinated substrate with top-down crystallization control for efficient and stable photovoltaics

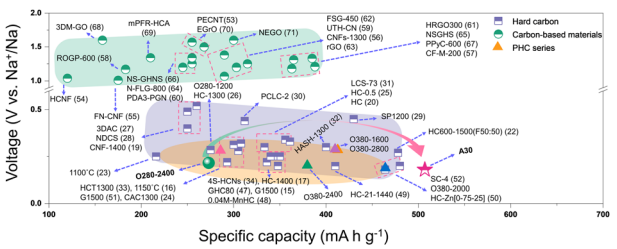
Yuan Zhou, Tonghui Guo, Junjun Jin, Zhenkun Zhu, Yanyan Li, Shuxin Wang, Sisi Zhou, Qianqian Lin, Jinhua Li, Weijun Ke, Guojia Fang, Xianggong Zhang* and Qidong Tai*



2856

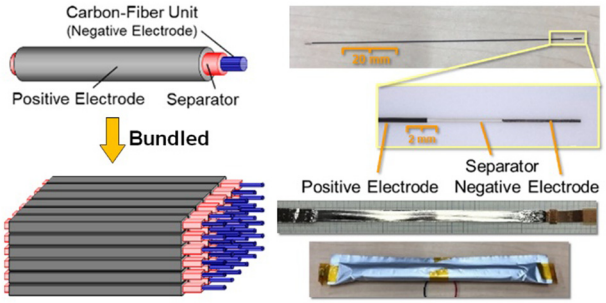
Design guidelines for a high-performance hard carbon anode in sodium ion batteries

Jong Chan Hyun, Hyeong Min Jin, Jin Hwan Kwak, Son Ha, Dong Hyuk Kang, Hyun Soo Kim, Sion Kim, Minhyuck Park, Chan Yeol Kim, Juhee Yoon, Ji Sung Park, Ji-Young Kim, Hee-Dae Lim, Se Youn Cho, Hyoung-Joon Jin and Young Soo Yun*



Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

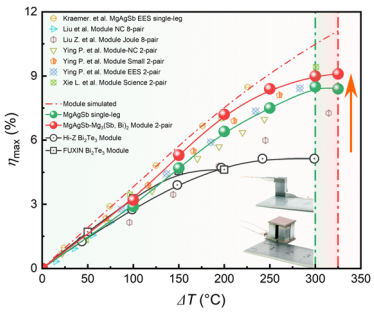
2864



Three-dimensional electrode characteristics and size/shape flexibility of coaxial-fibers bundled batteries

Yoshinari Makimura,* Chikaaki Okuda, Toshihisa Munekata, Azusa Tsukigase, Hideaki Oka, Tooru Saeki, Ryohei Morimoto, Megumi Sasaki, Hiroyuki Nakano, Yuichi Itou, Mamoru Mizutani and Tsuyoshi Sasaki

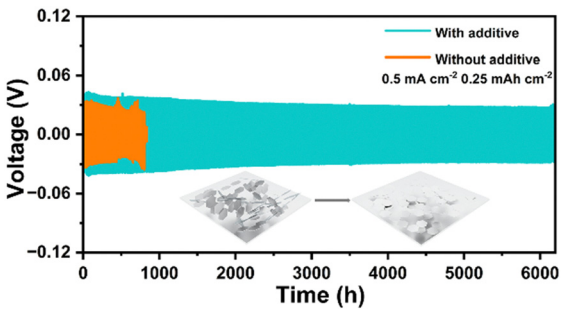
2879



A high performance eco-friendly MgAgSb-based thermoelectric power generation device near phase transition temperatures

Xinzhi Wu, Yangjian Lin, Chengyan Liu, Yupeng Wang, Huan Li, Binghui Ge* and Weishu Liu*

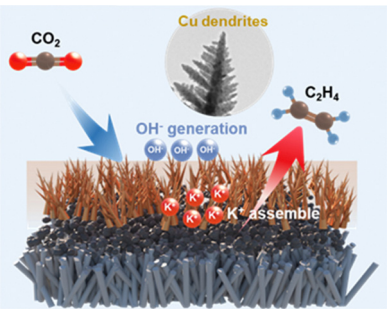
2888



A preferentially adsorbed layer on the Zn surface manipulating ion distribution for stable Zn metal anodes

Qiang Guo,* Gele Teri, Weixing Mo, Jianhang Huang, Feng Liu,* Minghui Ye* and Dawei Fu

2897



Which dominates industrial–current–density CO_2-to-C_{2+} electroreduction: $Cu^{\delta+}$ or the microenvironment?

Ruoou Yang, Mao Wu, Danji Huang, Yan Yang, Yan Liu, Leiqian Zhang, Feili Lai, Bo You, Jiakun Fang, Tianxi Liu, Youwen Liu* and Tianyou Zhai*

This journal is © The Royal Society of Chemistry 2024

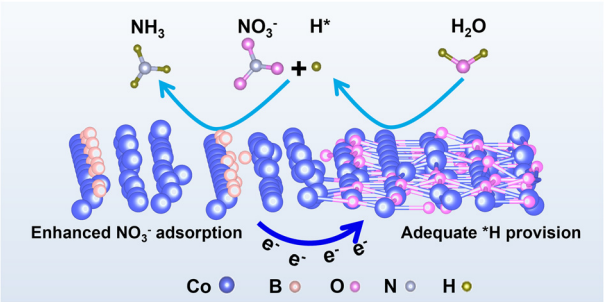
Open Access Article. Published on 23 April 2024. Downloaded on 2/14/2026 8:51:51 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

2908

Mott–Schottky contact synergistically boosts the electroreduction of nitrate to ammonia under low-nitrate concentration

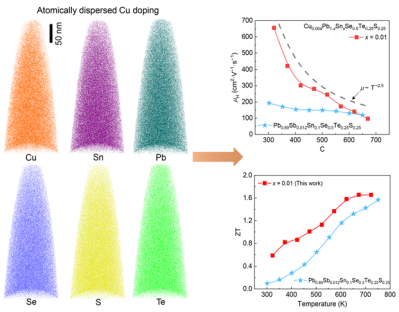
Xiaojuan Zhu, Chaoqun Ma, Yi-Chi Wang, Kaiyu Qu, Leyang Song, Jing Wang, Yushuang Gong, Xiang Liu, Jintao Zhang,* Qipeng Lu* and An-Liang Wang*



2921

Entropy engineering enabled atomically dispersed Cu doping leading to an exceptionally high thermoelectric figure of merit in n-type lead chalcogenides

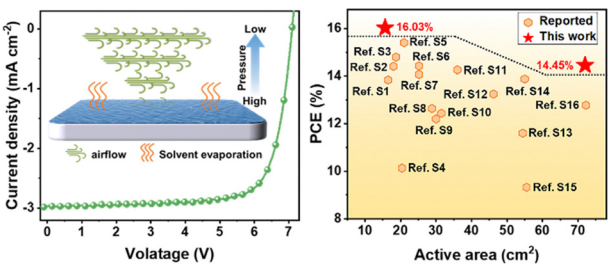
Ziling Yuan, Mengyue Wu, Shuai Han, Pengfei Liu, Zhenhua Ge, Bangzhi Ge, Menghua Zhu, Yadong Xu, Wanqi Jie, Dongyao Zhao, Bingchao Yang, Yongsheng Zhang, Ming Liu, Min Zhu, Chao Li,* Yuan Yu* and Chongjian Zhou*



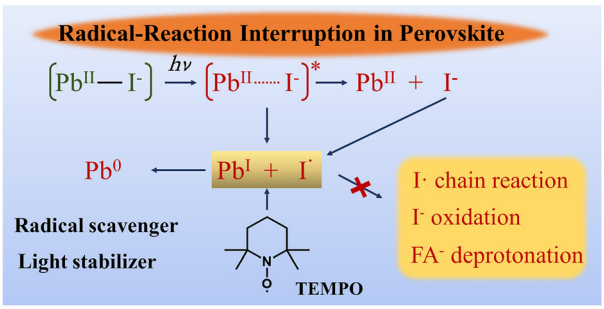
2935

Rapid solidification for green-solvent-processed large-area organic solar modules with >16% efficiency

Ben Zhang, Weijie Chen, Haiyang Chen, Guang Zeng, Rui Zhang, Hongxiang Li, Yunfei Wang, Xiaodan Gu, Weiwei Sun, Hao Gu, Feng Gao, Yaowen Li* and Yongfang Li



2945

A novel radical-reaction interruption strategy for enhancing the light stability of perovskite solar cells

Binyang Tuo, Ziyu Wang, Ziqiu Ren,* Hanwen Zhang, Xinqi Lu, Yiqiang Zhang, Shuangquan Zang and Yanlin Song*