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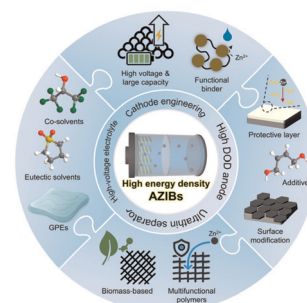
Fundamental questions  
Elemental answers

## REVIEWS

1398

### Challenges and design opportunities for high-energy-density aqueous zinc-ion batteries: from electrochemically active to functional components

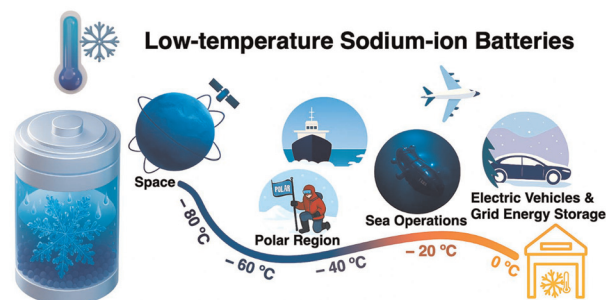
Yubin Lee, Sangyeop Lee and Soojin Park\*



1444

### Low-temperature sodium-ion batteries: challenges, engineering strategies, safety considerations, and future directions

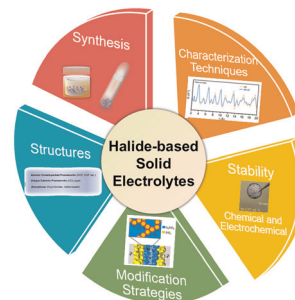
M. Sai Bhargava Reddy,\* Daecheol Jeong, Shampa Aich and Vilas G. Pol\*



1481

### Halide-based solid electrolytes: opportunities and challenges in the synergistic development of all-solid-state Li/Na batteries

Xiaohan Tang, Fei Xie,\* Yaxiang Lu, Xiaohui Rong, Liqian Chen and Yong-Sheng Hu\*

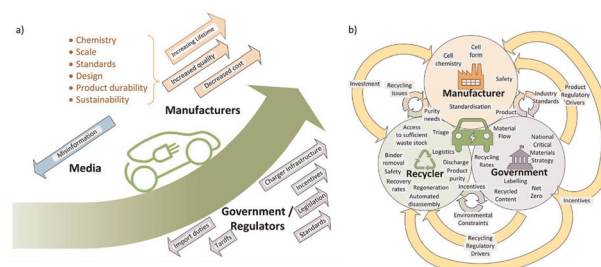


## PERSPECTIVE

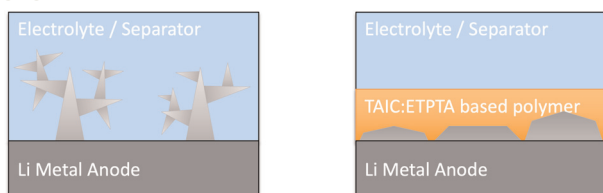
1502

### Timeline for establishing a circular economy for lithium-ion batteries

Jennifer M. Hartley, Sean Scott, Jake M. Yang, Paul A. Anderson, Gavin D. J. Harper, Jyoti Ahuja, Evi Petavratzi, Hari Krishnan Tulsidas and Andrew P. Abbott\*



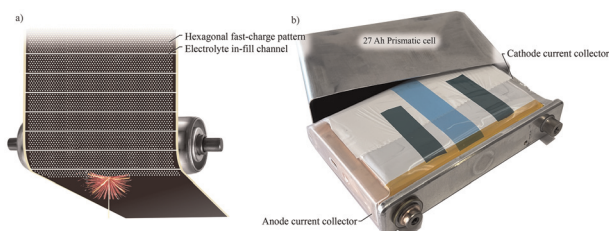
1515



### Artificial solid electrolyte interphase composed of a tris(2-acryloyloxyethyl) isocyanurate-based polymer for lithium metal anode

Hiroki Nara,\* Takumi Miyamoto, Takahiro Kosaki, Hiroki Hayashi and Toshiyuki Momma\*

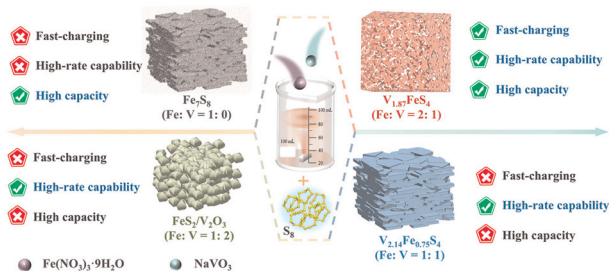
1522



### Demonstration of and future perspective on scaling ultrafast-laser-ablation microstructuring of Li-ion battery electrodes to roll-to-roll production and large-format cells

Ryan J. Tancin,\* Bertan Özdoğru, Nathaniel Sunderlin, Peter J. Weddle, Francois L. E. Usseglio-Viretta, David R. Boone, Quentin Mocaer, Eric Audouard, Kevin W. Knehr, Joseph J. Kubal, Shabbir Ahmed, Donal P. Finegan and Bertrand J. Tremolet de Villers

1544

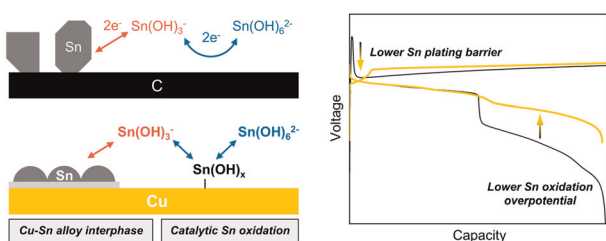


### Sodium *in situ* modulated phase transition to construct iron/vanadium bimetallic sulfide anodes for "fast-charging" sodium-ion batteries

Tianqi He, Xiaoya Kang, Gaoyang Li, Hao Dang and Fen Ran\*

1557

#### Cu–Sn affinity promotes efficient 4e<sup>-</sup> Sn redox



### Cu substrate as a bi-directional kinetic promoter for high-efficiency four-electron Sn aqueous batteries

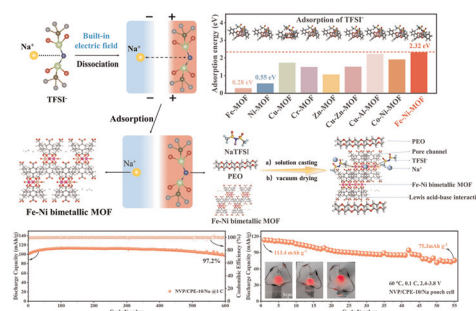
Jianbo Wang, Sofia K. Catalina, Xin Xu, Zhelong Jiang, Qin Tracy Zhou, William C. Chueh\* and J. Tyler Mefford\*



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### Electronic structure modulation of MOF-based host–guest recognition polymer electrolytes for high-performance all-solid-state sodium metal batteries

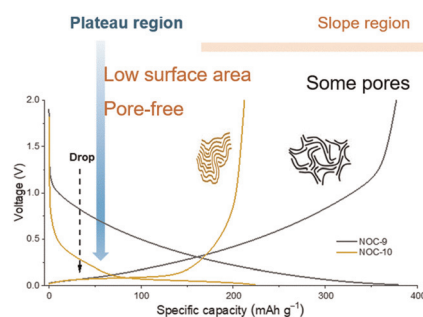
Xiaorong Dong, Huan Chen, B. V. R. Chowdari, Xiangwei Wu\* and Zhaoyin Wen\*



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### Key factors influencing the plateau region in N-doped hard carbon for sodium storage

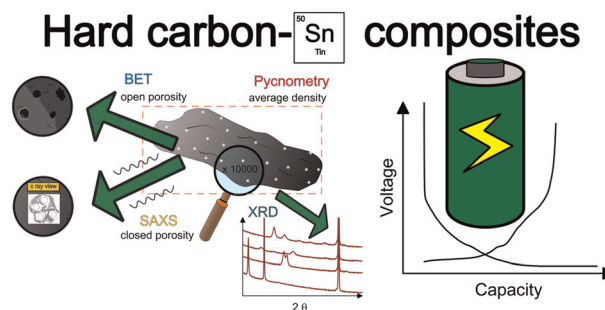
Xingqi Chang, Xiaolong Zhou,\* Pornsuwan Buangam, Nuntaporn Kamonsutthipajit, Sarayut Tunmee and Andreu Cabot\*



1596

### Spray-dried hard carbon–Sn composites for energy-dense Na-ion batteries

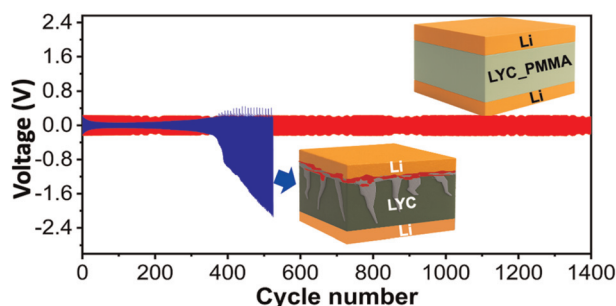
Giovanni Gammaitoni, Gihoon Cha, Rajkumar Reddy Kolan, Silke Christiansen, François Fauth and Matteo Bianchini\*



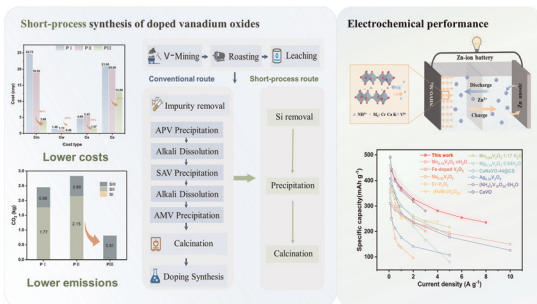
1612

### Lithium-metal all-solid-state batteries enabled by polymer-coated halide solid electrolytes

Pravin N. Didwal and Guoying Chen\*



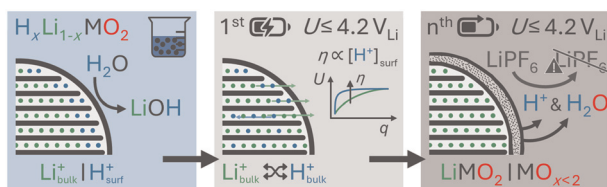
1626



### Low-carbon upcycling of vanadium slag into doped cathodes for high-performance zinc batteries

Lin Guo, Wenting Jia, Junmei Zhao, Gaojie Xu, Pengge Ning\* and Hongbin Cao\*

1637

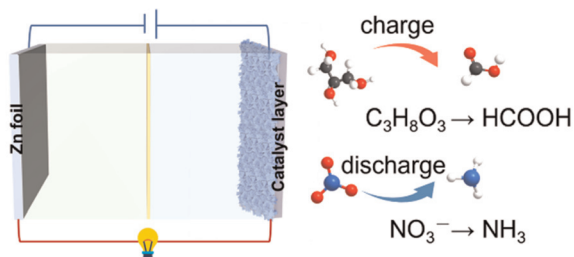


### Elucidating the detrimental effect of intercalated protons in Ni-rich NCMs on structural stability and cycle life

Rebecca Wilhelm,\* Simon Helmer, Hubert A. Gasteiger and Stefan Oswald\*

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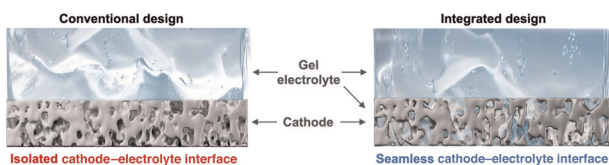
### Energy conversion & Chemical valorization



### Rechargeable asymmetric zinc–nitrate/glycerol batteries synergizing chemical valorization and energy conversion

Zhijie Yan, Shuoyi Chen, Weijie Mei, Yaqiong Wu, Yanning Qie, Huilin Ge, Fangbing Li, Zengyu Luo, Feifei Wang\* and Chunpeng Yang\*

1665



### Seamlessly connected cathode–gel electrolyte interfaces enable highly stable aqueous zinc batteries

Yuguo Zheng, Liting Gao, Xin Liu, Yige Wang, Jiahao Li, Jiachen Li, Zhansheng Guo,\* Yizhou Zhang\* and Hanfeng Liang\*

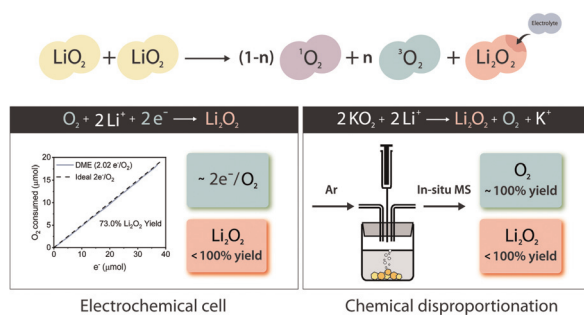


## PAPERS

1673

### Growing $\text{Li}_2\text{O}_2$ surfaces on discharge cause electrolyte degradation and capacity loss in $\text{Li}-\text{O}_2$ batteries

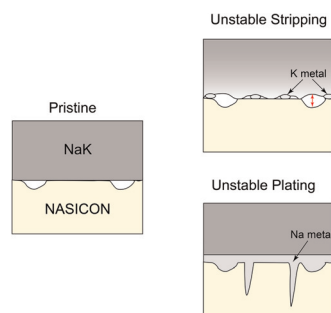
Chloe Chau, Tammy Nimmo, Daniel Dewar, Gregory J. Rees, Chuan Tan, Kieran D. Jones, Lee R. Johnson, Xiangwen Gao\* and Peter G. Bruce\*



1682

### Chemo-mechanical limitations of liquid alloy anodes for sodium solid-state batteries

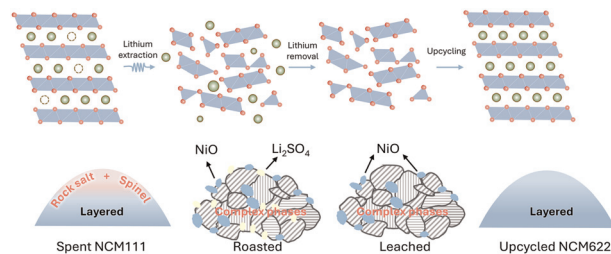
Daren Wu and Kelsey B. Hatzell\*



1693

### Scalable upcycling of spent $\text{LiNi}_x\text{Co}_y\text{Mn}_{1-x-y}\text{O}_2$ to single-crystal Ni-rich cathodes using a low-cost, multifunctional Ni salt

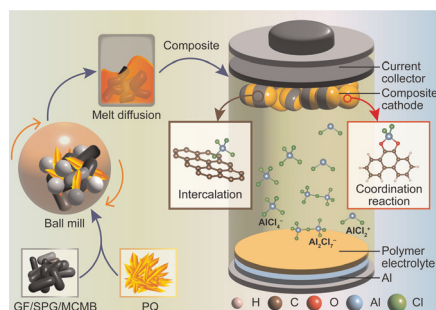
Xiaolu Yu, Greta Feague, Sicen Yu, Varun Gupta, Hongpeng Gao, Wei Li, Maura Appleberry, Ping Liu, Jiao Lin\* and Zheng Chen\*



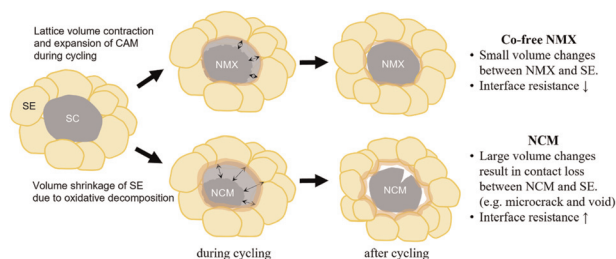
1705

### Composite cathode material for improved aluminum–polymer batteries

Shuvrodev Biswas,\* Thomas Köhler, Amir Mohammad, Hartmut Stöcker and Dirk C. Meyer



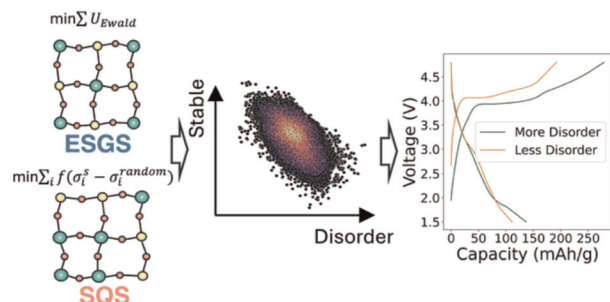
1720



### Electrochemo-mechanical effects of Co-free layered cathode on interfacial stability in all-solid-state batteries under high-voltage operation

Jinhee Jung, Joonhyeok Park, Jun Lim, Jinwoo Jeong, Yeseung Lee, Jaeik Kim, Seungwoo Lee, Byungjin Choi, Seong Ji Ye, Jong Sung Jin, Ji Yeong Sung, Ungyu Paik\* and Taeseup Song\*

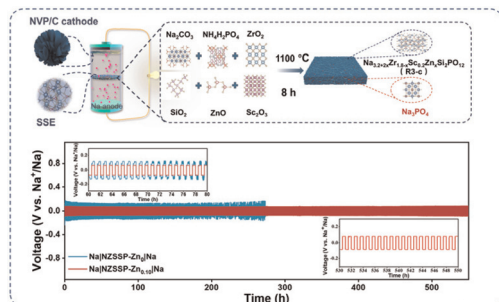
1731



### Origin of enhanced disorder in high entropy rocksalt type Li-ion battery cathodes

Lin Wang, You Wang, Jayden Martin, Elena Scivally, Zhengda He, Do-hoon Kim, Dong-hee Yeon, Yan Zeng, Dongchang Chen\* and Bin Ouyang\*

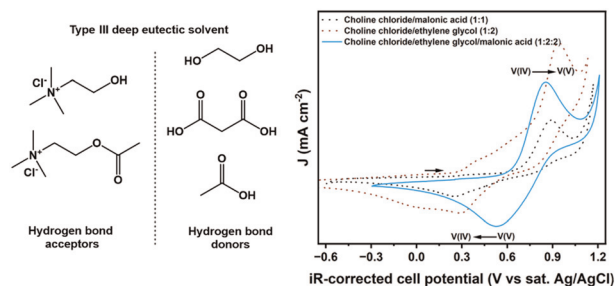
1740



### Sc/Zn co-doped NASICON electrolyte with high ionic conductivity for stable solid-state sodium batteries

Zichen Li, Mengdi Zhang, Yingchun Yan,\* Weimin Zhang, Xiuxia Meng and Naitao Yang\*

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### Feasibility studies of acidic type III deep eutectic solvents as supporting electrolytes for the posolyte in vanadium flow batteries

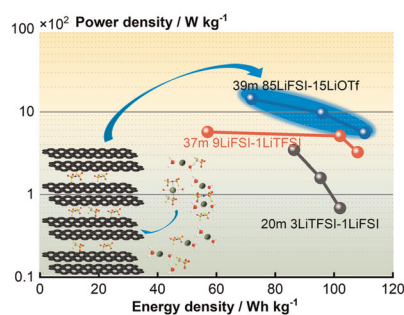
L. Mauricio Murillo-Herrera\* and Ana B. Jorge Sobrido



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### Water-in-bisalt electrolyte for high-performance aqueous dual-ion battery

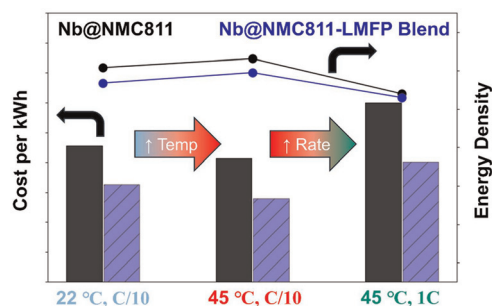
Dengyao Yang, Huan Li, Motonori Watanabe, Miki Inada, Aleksandar Staykov and Tatsumi Ishihara\*



1773

### Harnessing the kinetics of $\text{LiMn}_{0.5}\text{Fe}_{0.5}\text{PO}_4$ in energy-dense layered-olivine blend cathodes for lithium-ion batteries

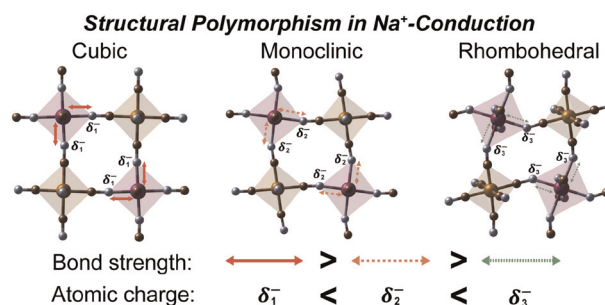
Seamus Ober and Arumugam Manthiram\*



1785

### Structural polymorphism and carrier effects in sodium-ion conducting Prussian blue-type solid electrolytes

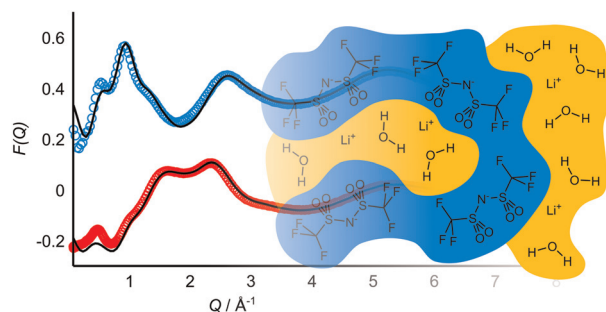
Taewon Kim, You-Yeob Song, Seungwoo Ryu, Sang Hyeok Ahn, Beom Jin Park, Chanhee Lee, Min-Ho Kim, Dong-Hwa Seo,\* Sung-Kyun Jung\* and Hyun-Wook Lee\*



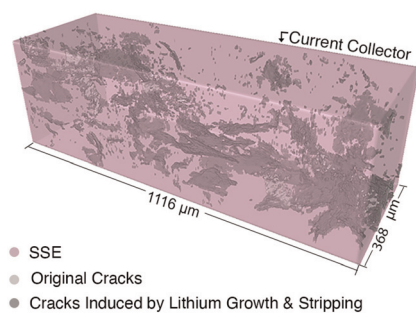
1797

### Lithium solvation and anion-dominated domain structure in water-in-salt electrolytes

Timothy S. Groves,\* Kieran J. Agg, Shurui Miao, Thomas F. Headen, Tristan G. A. Youngs, Gregory N. Smith, Susan Perkin and James E. Hallett\*



1809



### Visualizing diverse lithium growth and stripping behaviors in anode-free solid-state batteries with *operando* X-ray tomography

Stephanie Elizabeth Sandoval, Douglas Lars Nelson, Hari Sridhara, Talia A. Thomas, John A. Lewis, Kelsey Anne Cavallaro, Pavel Shevchenko, Neil P. Dasgupta, Francois L. E. Usseglio-Viretta, Donal P. Finegan and Matthew T. McDowell\*

