

# Journal of Materials Chemistry A

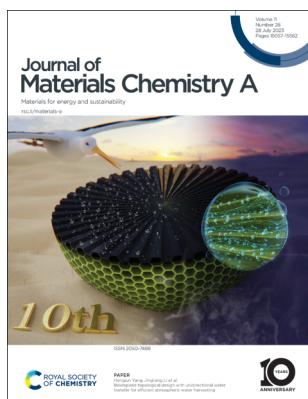
Materials for energy and sustainability

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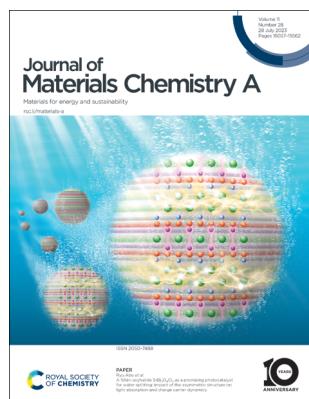
## IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 11(28) 15057–15562 (2023)



### Cover

See Hongjun Yang, Jingliang Li et al., pp. 15147–15158. Image reproduced by permission of Jingliang Li from *J. Mater. Chem. A*, 2023, **11**, 15147.



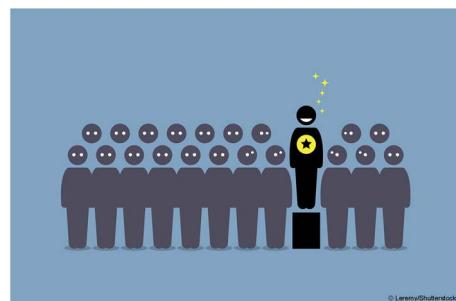
### Inside cover

See Ryu Abe et al., pp. 15159–15167. Image reproduced by permission of Ryu Abe from *J. Mater. Chem. A*, 2023, **11**, 15159.

## EDITORIAL

15072

**Outstanding Reviewers for *Journal of Materials Chemistry A* in 2022**

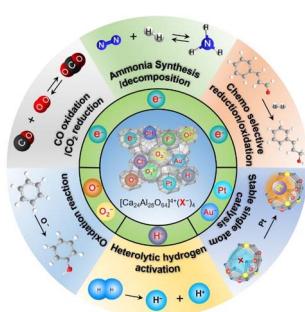


## REVIEWS

15074

**Recent progress and prospects in active anion-bearing C12A7-mediated chemical reactions**

Xiangyu Zhang, Zichuang Li, Miao Xu, Hideo Hosono and Tian-Nan Ye\*



# Journal of Materials Chemistry A

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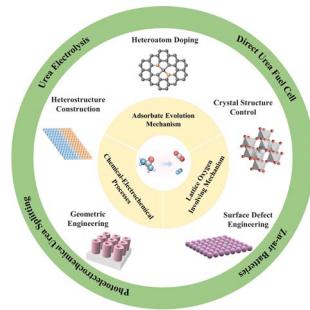


## REVIEWS

15100

**Electrocatalytic urea oxidation: advances in mechanistic insights, nanocatalyst design, and applications**

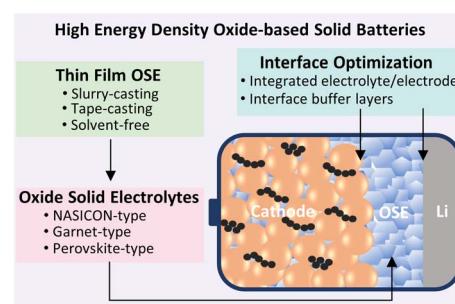
Weiyi Ge, Liping Lin, Shu-Qi Wang, Yechen Wang, Xiaowei Ma, Qi An\* and Lu Zhao\*



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**Thin film oxide solid electrolytes towards high energy density batteries: progress of preparation methods and interface optimization**

Qing Zhang, Junjie Zhou, Peng Cui, Zhongyue Wang, Peng Lv, Kehan Yu and Wei Wei\*

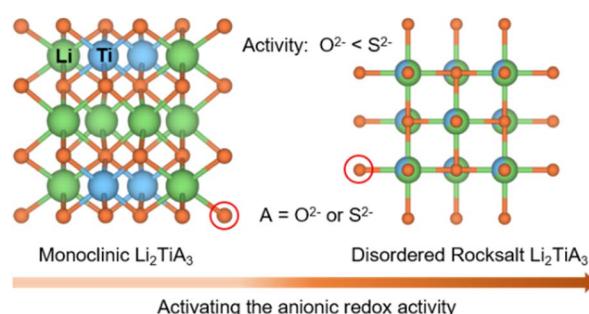


## COMMUNICATION

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**Structural factors for activating anionic redox in Li-rich Ti-based cathodes**

Dohyeong Kwon and Duho Kim\*

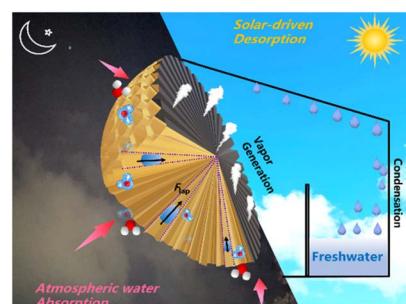


## PAPERS

15147

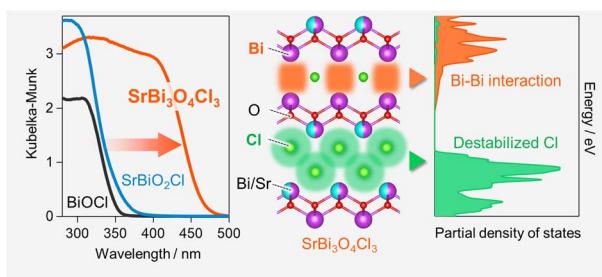
**Bioinspired topological design with unidirectional water transfer for efficient atmospheric water harvesting**

Yiming Bu, Xin Li, Weiwei Lei, Hongli Su, Hongjun Yang,\* Weilin Xu and Jingliang Li\*



## PAPERS

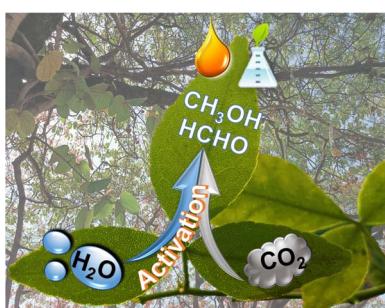
15159



**A Sillén oxyhalide  $\text{SrBi}_3\text{O}_4\text{Cl}_3$  as a promising photocatalyst for water splitting: impact of the asymmetric structure on light absorption and charge carrier dynamics**

Hajime Suzuki, Daichi Ozaki, Yusuke Ishii, Osamu Tomita, Daichi Kato, Shunsuke Nozawa, Kouichi Nakashima, Akinori Saeki, Hiroshi Kageyama and Ryu Abe\*

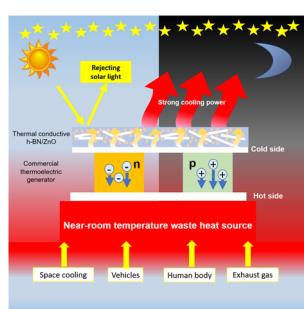
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**A baby step in assembling and integrating the components of an artificial photosynthesis device with forced heterojunctions towards improved efficiency**

Kranti N. Salgaonkar, Himanshu Bajpai, Nitin B. Mhamane, Naresh Nalajala, Inderjeet Chauhan, Kavita Thakkar, Kavita Joshi and Chinnakonda S. Gopinath\*

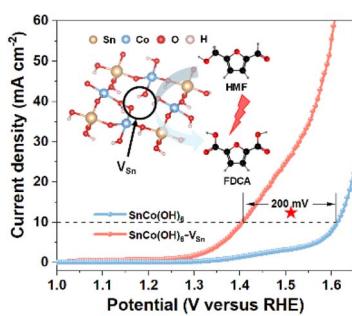
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**Near-room-temperature waste heat recovery through radiative cooling for both daytime and nighttime power generation**

Sih-Wei Chang, Yen-Jen Chen, Dehui Wan and Hsuen-Li Chen\*

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**Cationic vacancies accelerate the generation of  $\text{CoOOH}$  in perovskite hydroxides for the electrooxidation of biomass**

Rixin Peng, Yimin Jiang, Chung-Li Dong, Ta Thi Thuy Nga, Yuxuan Lu, Shengkai Li, Yun Fan, Chao Xie, Shuangyin Wang and Yuqin Zou\*

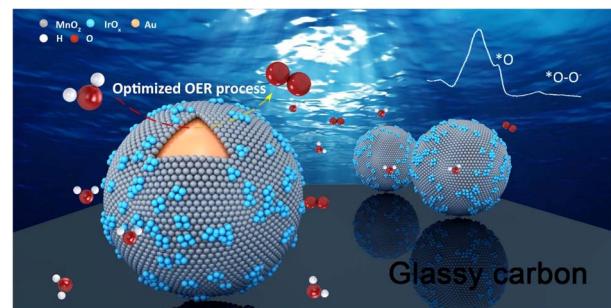


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**Metal-support interactions alter the active species on  $\text{IrO}_x$  for electrocatalytic water oxidation**

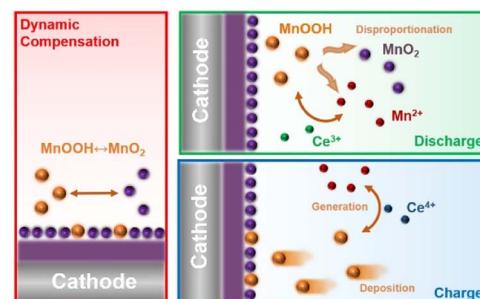
Ge-Yang Xu, Mu-Fei Yue, Zheng-Xin Qian, Zi-Yu Du, Xiao-Qun Xie, Wei-Ping Chen, Yue-Jiao Zhang\* and Jian-Feng Li\*



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**Dynamic compensation of  $\text{MnOOH}$  to mitigate the irregular dissolution of  $\text{MnO}_2$  in rechargeable aqueous  $\text{Zn}/\text{MnO}_2$  batteries**

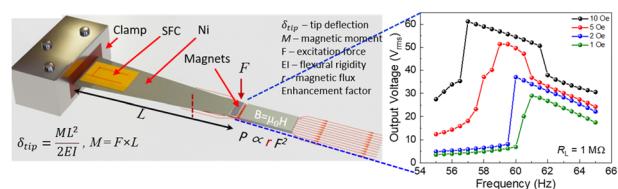
Guojun Lai, Pengchao Ruan, Xueling Hu, Bingan Lu, Shuqiang Liang, Yan Tang\* and Jiang Zhou\*



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**Obtaining a broadband magneto-mechano-electric generator with large power for IoT operation**

Deepak R. Patil, Seungah Lee, Atul Thakre, Ajeet Kumar, Dae-Yong Jeong\* and Jungho Ryu\*



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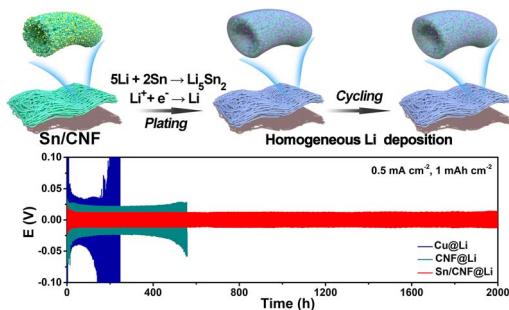
**Universal passive radiative cooling behavior of aerogels**

Bingjie Ma, Bing Wu, Peiying Hu, Ling Liu and Jin Wang\*



## PAPERS

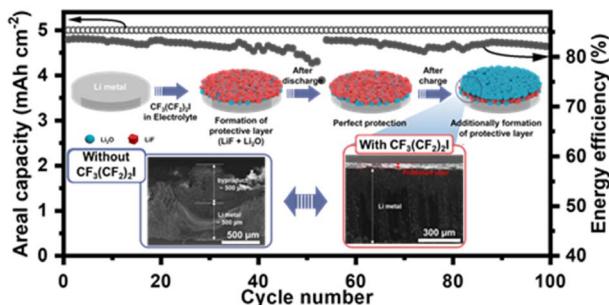
15237



### Steady cycling of lithium metal anode enabled by alloying Sn-modified carbon nanofibers

Cuimei Fu, Hao Yang, Pengfei Jia, Chengcheng Zhao, Lina Wang\* and Tianxi Liu\*

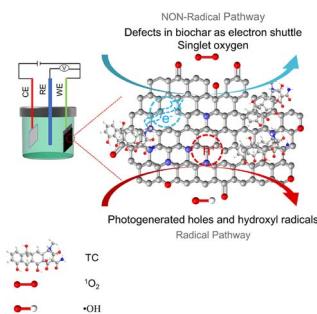
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### A fluoroalkyl iodide additive for Li–O<sub>2</sub> battery electrolytes enables stable cycle life and high reversibility

Min-Gi Jeong, Hyun Ho Lee, Hyeon-Ji Shin, Yeseul Jeong, Jang-Yeon Hwang, Won-Jin Kwak, Gwangseok Oh, Wonkeun Kim, Kyounghan Ryu, Seungho Yu, Hee-Dae Lim, Minah Lee and Hun-Gi Jung\*

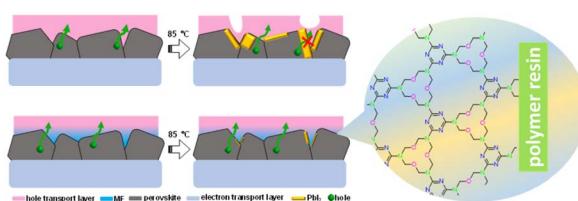
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### Assessing the potential of biochar derived from sewage sludge for photoelectrode fabrication: methods, mechanisms, and conclusions

Chuangxin Peng, Jing Huang, Min Ruan, Haihao Peng, Meiyi Jia, Jing Tong, Weiping Xiong\* and Zhaohui Yang\*

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### Surface polymerization of melamine resin on a perovskite: enhancing the efficiency and stability of solar cells

Tianyu Li, Yuyan Zhang, Lingyi Fang, Bing Zhang, Yi Yuan, Jing Zhang and Peng Wang\*



## PAPERS

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**Hydrophobic dispersion-derived Si/rGO nanocomposites in SiOC ceramic matrix as anode materials for high performance lithium-ion batteries**

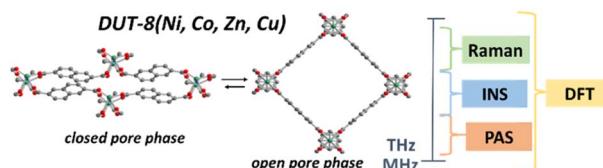
Minkyeong Ku, Dohyub Park, Minjun Kim, Minsu Choi and Wonchang Choi\*



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**The role of phonons in switchable MOFs: a model material perspective**

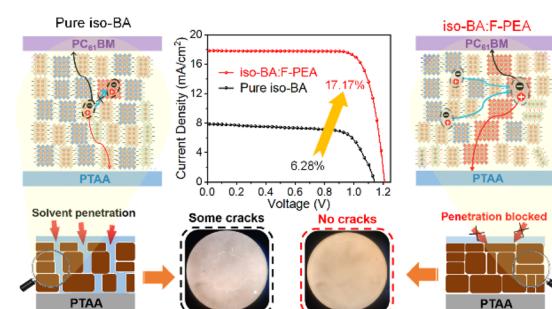
Alexander E. J. Hoffman, Irena Senkovska,\* Leila Abylgazina, Volodymyr Bon, Veronika Grzimek, Anna Maria Dominic, Margarita Russina, Marvin A. Kraft, Inez Weidinger, Wolfgang G. Zeier, Veronique Van Speybroeck\* and Stefan Kaskel\*



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**Strain relaxation and phase regulation in quasi-2D perovskites for efficient solar cells**

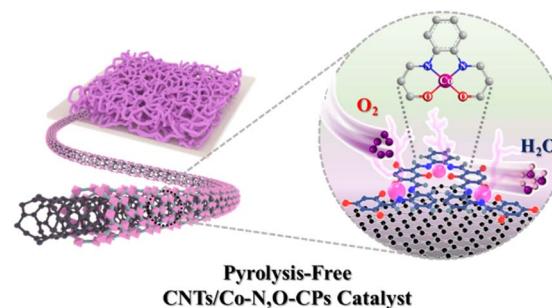
Haolin Zhang, Ze Wang, Haoyu Wang, Xianghua Yao, Furong Wang, Shuya Wang, Sai Bai, Jiang Huang, Xiao Luo,\* Shuanghong Wu\* and Xiaodong Liu\*



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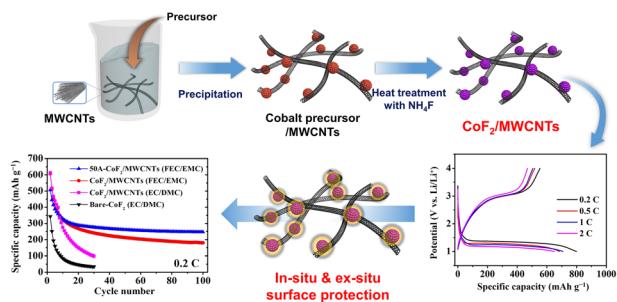
**Crafting core–shell heterostructures of carbon nanotubes and N,O-coordinated cobalt site-impregnated conjugated porous polymers for highly efficient oxygen reduction**

Rui Ma, Zhengjiao Xie, Xiaoxue Xu, Chenglong Tang, Xueqin Liu, Yunhai Zhu, Xun Cui\* and Yingkui Yang\*



## PAPERS

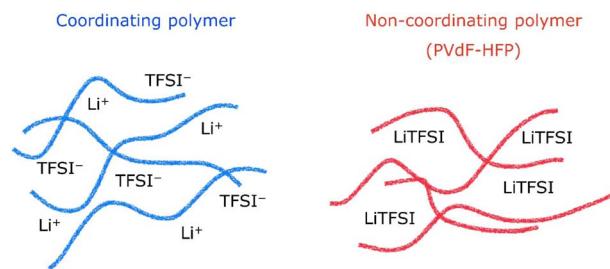
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### Facile synthesis of cobalt fluoride ( $\text{CoF}_2$ )/multi-walled carbon nanotube (MWCNT) nanocomposites and improvement of their electrochemical performance as cathode materials for Li-ion batteries

Hayoung Park, Il-Seop Jang, Bo-Ye Song, Yun Chan Kang, Seongseop Kim\* and Jinyoung Chun\*

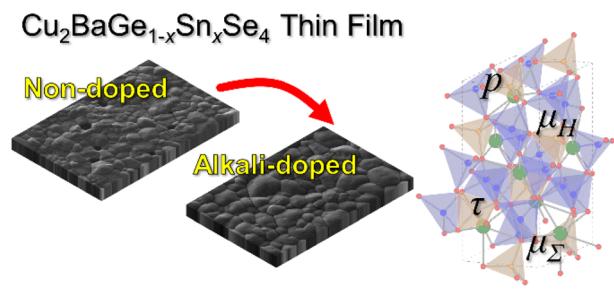
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### Do non-coordinating polymers function as host materials for solid polymer electrolytes? The case of PVdF-HFP

Guimara Hernández,\* Tian Khoon Lee, Máté Erdélyi, Daniel Brandell and Jonas Mindemark\*

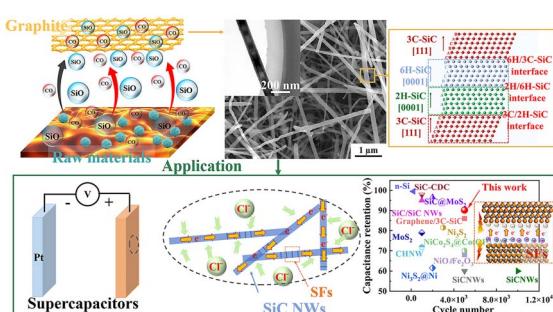
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### Alkali element (Li, Na, K, and Rb) doping of $\text{Cu}_2\text{BaGe}_{1-x}\text{Sn}_x\text{Se}_4$ films

Yongshin Kim, Hannes Hempel, Steven P. Harvey, Nelson A. Rivera, Jr, Thomas Unold and David B. Mitzi\*

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### Synthesis of 3C/2H/6H heterojunction SiC nanowires with high-performance supercapacitors by thermal evaporation

Pengchao Kang,\* Qiqi Zhao, Tien Zhang, Wei Xue, Jinrui Qian, Zengyan Wei,\* Pingping Wang\* and Gaohui Wu

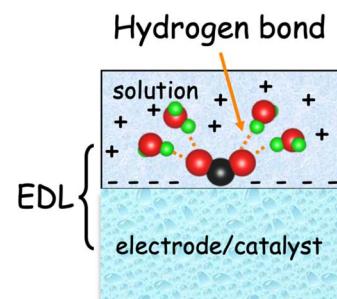


## PAPERS

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**Origin and predictive principle for selective products of electrocatalytic carbon dioxide reduction**

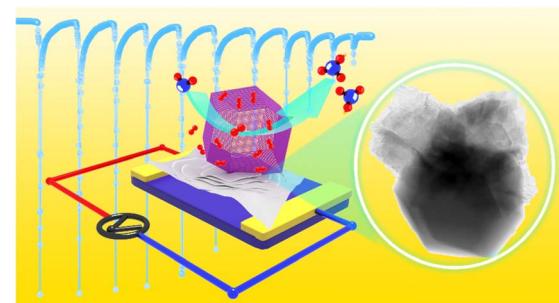
Lele Gong, Xiaowei Wang, Rahman Daiyan, Xiaofeng Zhu, Joshua Leverett, Zhiyao Duan, Lipeng Zhang,\* Rose Amal, Liming Dai and Zhenhai Xia\*



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**ZIF-67/BiOCl nanocomposites for highly efficient detection of NO<sub>2</sub> gas at room temperature**

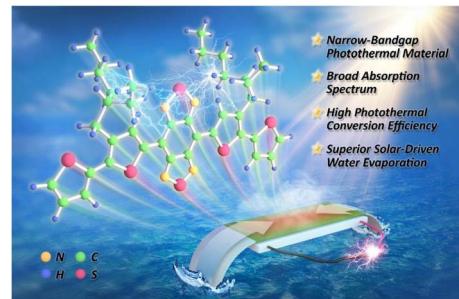
Jiahui Fan, Lin Jiang, He Lv, Fangjie Qin, Yihe Fan, Jue Wang, Muhammad Ikram\* and Keying Shi\*



15380

**A narrow-bandgap photothermal material based on a donor–acceptor structure for the solar–thermal conversion application**

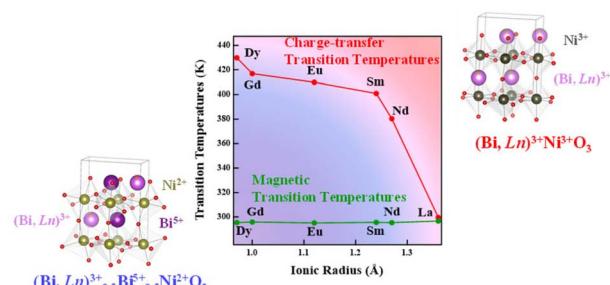
Ruoyu Zhang, Nanxi Jin, Tao Jia,\* Luoqing Wang, Jing Liu, Mengmeng Nan, Shuo Qi, Siqi Liu and Yuyu Pan\*



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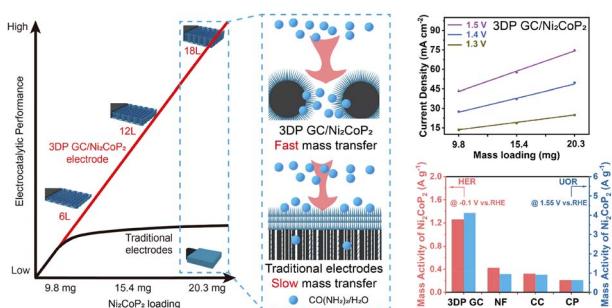
**Thermal properties and phase transition behaviors of possible caloric materials Bi<sub>0.95</sub>Ln<sub>0.05</sub>NiO<sub>3</sub>**

Chen Chen, Yoshihisa Kosugi, Masato Goto and Yuichi Shimakawa\*



## PAPERS

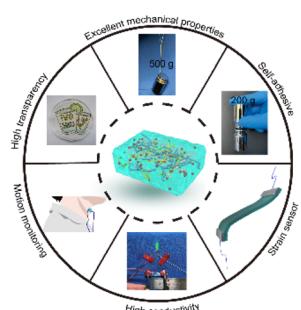
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### Enabling high loading of well-dispersed $\text{Ni}_2\text{CoP}_2$ catalysts on a 3D-printed electrode for efficient electrocatalysis

Meiwen Peng, Bo Zhao, Danli Shi, Yawen Wang, Dong Li, Wenkai Liang, He Yang, Zhiqiang Liang, Yinghui Sun\* and Lin Jiang\*

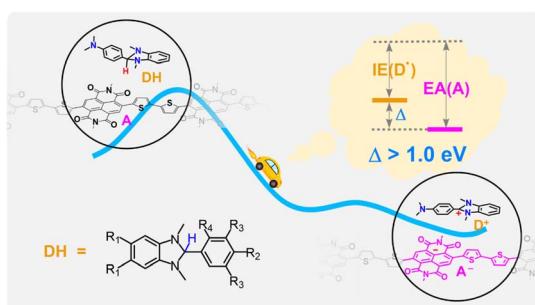
15404



### A highly tough, fatigue-resistant, low hysteresis hybrid hydrogel with a hierarchical cross-linked structure for wearable strain sensors

Shiqiang Guan, Chang Xu, Xufeng Dong\* and Min Qi

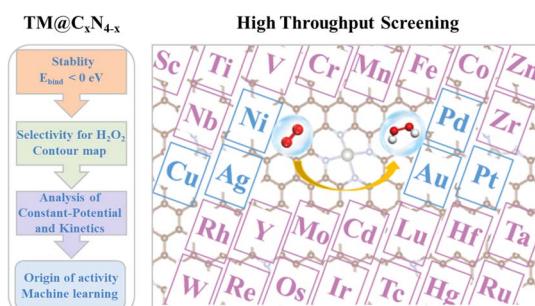
15416



### Electron transfer driving force as the criterion for efficient n-doping of organic semiconductors with DMBI-H derivatives

Chunlin Xu and Dong Wang\*

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### Accelerating high-throughput screening of hydrogen peroxide production via DFT and machine learning

Wenwen Li, Ge Feng, Shibin Wang,\* Xing Zhong, Zihao Yao, Shengwei Deng and Jianguo Wang\*

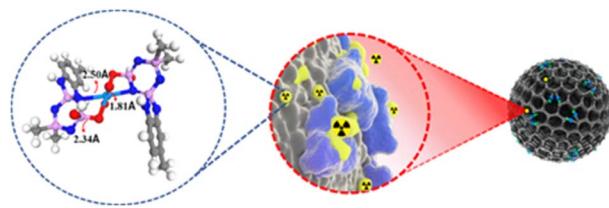


## PAPERS

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**Speeding up the selective extraction of uranium through *in situ* formed nano-pockets**

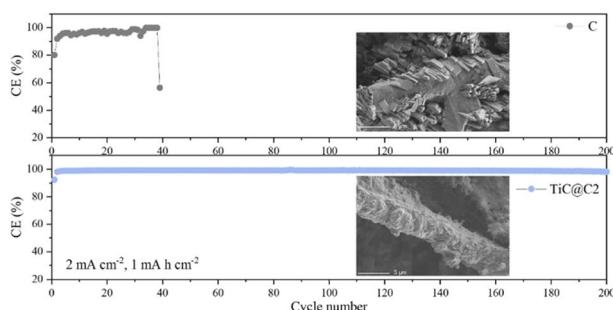
Zhihao Pan, Lin Zhao, Lirong Cai,\* Shiyong Wang, Bing Lu, Pingyu Zhang and Gang Wang\*



15444

**Self-standing TiC-modified carbon fibre electrodes derived from cellulose and their use as an ultrahigh efficiency lithium metal anode**

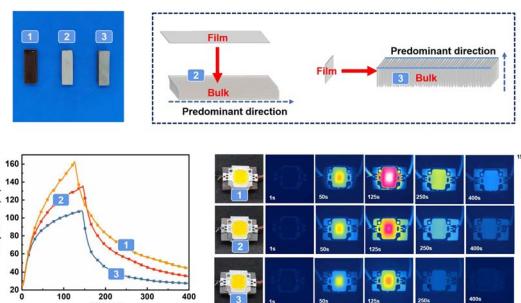
Junren Wang, Huimian Zhong, Bowen Liu, Min Zhang, Andrew L. Hector\* and Andrea E. Russell



15456

**Thermal conductivity and closed-loop recycling of bulk biphenyl epoxy composites with directional controllable thermal pathways**

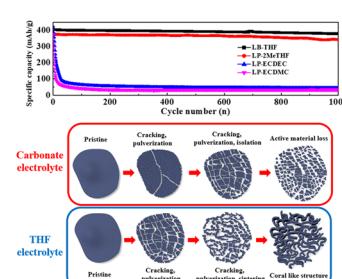
Fubin Luo,\* Wenqi Cui, Yingbing Zou, Hongzhou Li and Qingrong Qian



15466

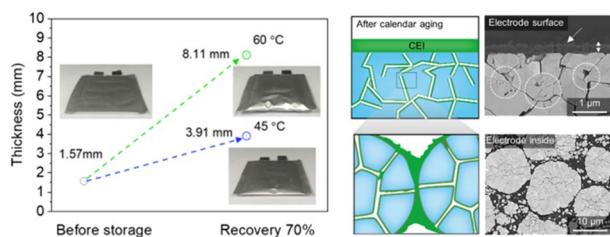
**Extended cycling performance of micron-sized bismuth anodes for lithium-ion batteries: self-healing of an alloy-type anode for lithium batteries**

Milan K. Sadan, Eunji Song, Hooam Yu, Jimin Yun, Taehong Kim, Jou-Hyeon Ahn, Kwon-Koo Cho\* and Hyo-Jun Ahn\*



## PAPERS

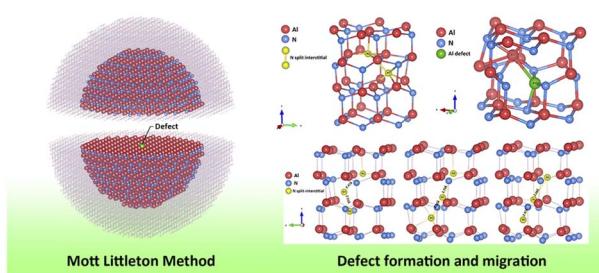
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### Exploring the degradation pathways of a nickel-rich cathode during high-temperature storage in high-energy lithium-ion batteries

Hyunyeon Cha, Jaeseong Hwang, Taeyong Lee, Jihyeon Kang, Minjoon Park\* and Jaephil Cho\*

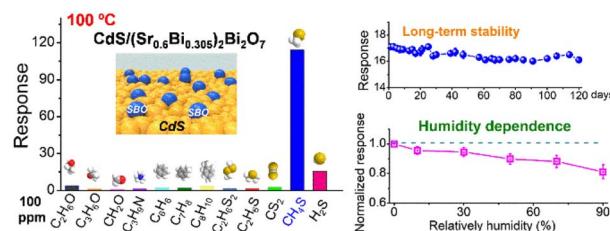
15482



### Computational study of native defects and defect migration in wurtzite AlN: an atomistic approach

Lei Zhu, C. Richard A. Catlow,\* Qing Hou, Xingfan Zhang, John Buckeridge and Alexey A. Sokol\*

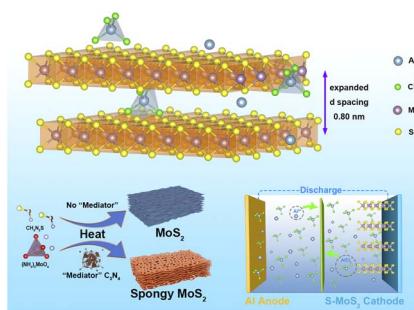
15499



### Highly selective and sensitive detection of methyl mercaptan by heterostructural CdS/(Sr<sub>0.6</sub>Bi<sub>0.305</sub>)<sub>2</sub>Bi<sub>2</sub>O<sub>7</sub> chemiresistor

Junqing Chang, Chaohao Hu, Zanhong Deng, Meng Li, Chengyin Shen, Shimao Wang, Longqing Mi, Ruofan Zhang, Qingli Zhang and Gang Meng\*

15509



### Modification of 2D materials using MoS<sub>2</sub> as a model for investigating the Al-storage properties of diverse crystal facets

Rongkai Kang, Yiqun Du, Dongmei Zhang, Chenyi Sun, Wei Zhou, Han Wang, Guowen Chen\* and Jianxin Zhang\*

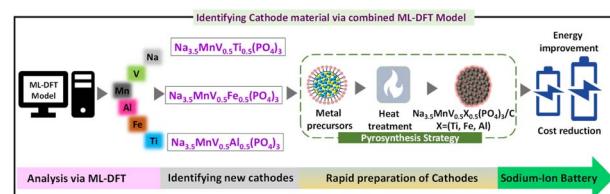


## PAPERS

15518

## Exploring low-cost high energy NASICON cathodes for sodium-ion batteries via a combined machine-learning, *ab initio*, and experimental approach

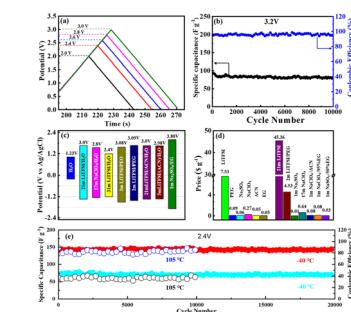
Vaiyapuri Soundharajan, Muhammad Hilmy Alfaruqi, Ghalib Alfaza, Jun Lee, Seulgi Lee, Sohyun Park, Subramanian Nithiananth, Duong Tung Pham, Jang-Yeon Hwang\* and Jaekook Kim\*



15532

## Ultrahigh-voltage aqueous electrolyte for wide-temperature supercapacitors

Shan Huang, Zhuo Li, Peng Li, Xianfeng Du,\* Mingbo Ma, Zhongshuai Liang, Yaqiong Su and Lilong Xiong\*



15540

## Electrolyte ions-matching hierarchically porous biochar electrodes with an extended potential window for next-generation supercapacitors

Ganji Seeta Rama Raju, Svyatoslav Kondrat, Nilesh R. Chodankar, Seung-Kyu Hwang, Jeong Han Lee, Teng Long, Eluri Pavitra, Swati J. Patil, Kugalur Shanmugam Ranjith, M. V. Basaveswara Rao, Peng Wu,\* Kwang Chul Roh,\* Yun Suk Huh\* and Young-Kyu Han\*



15553

## Enhancing intermolecular packing and light harvesting through asymmetric non-fullerene acceptors for achieving 18.7% efficiency ternary organic solar cells

Zhiliang Zhang, Jingnan Wu, Ji Lin, Rui Zhang, Junfang Lv, Linfeng Yu, Xia Guo\* and Maojie Zhang\*

