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Journal of Materials Chemistry A

Materials for energy and sustainability

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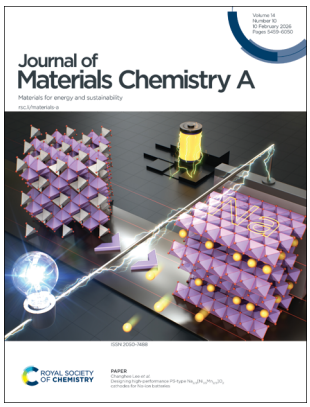

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See Wei Sun, Deren Yang *et al.*, pp. 5639–5649. Image reproduced by permission of Wei Sun from *J. Mater. Chem. A*, 2026, **14**, 5639.

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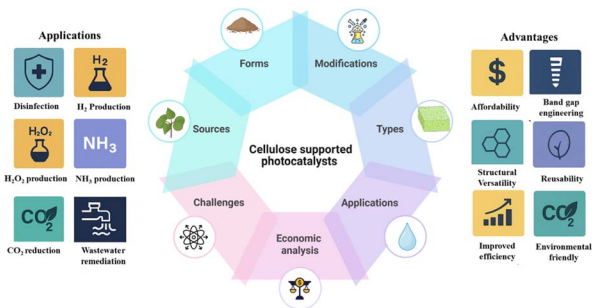
Engineered cellulose-supported photocatalysts for clean energy and environmental remediation: progress and prospects

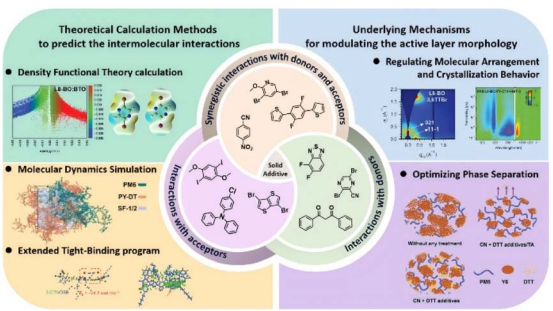
Akash Balakrishnan,* Frency P. Mathew, Milan Tom Joseph, Mona Mary Varghese, K. S. Aryamol, Mahendra Chinthala, Natarajan Rajamohan* and Bo Weng*



5520

Solid additive engineering for high-efficiency organic solar cells: categories, mechanisms, and perspectives

Wenlong Wu, Shuaikang Ren, Jingyang Xiao,* Guichuan Zhang* and Yonggang Min



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REVIEWS

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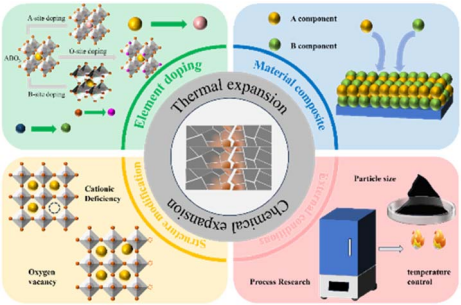
Bridging the thermal expansion gap in solid oxide fuel cells: towards robust and efficient energy conversion

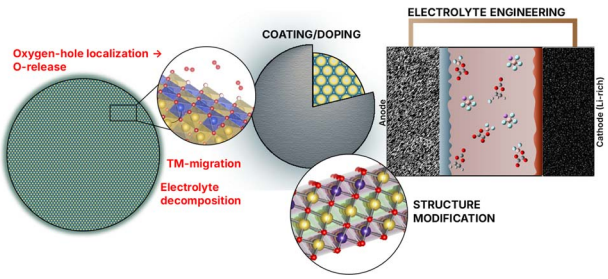
Yufan Shen, Yu Liu,* Xinyu Zhao, Yimiao Shao, Hualiang Zhang, Yujie Xu, Xuezhi Zhou, Zongping Shao* and Haisheng Chen*



5564

Decoupling oxygen redox from O_2 release in Li- and Mn-rich layered cathodes: mechanisms, metrics, and design rules

Techin Mamiamuang and Montree Sawangphruk*



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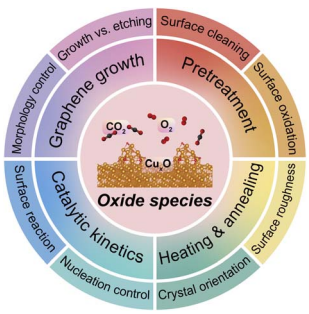
Toward controllable CVD synthesis of graphenes on copper substrates: roles of oxygen species

Yifan Zhu, Yan Jin, Qian Yang, Chao Cheng and Baoshan Hu*



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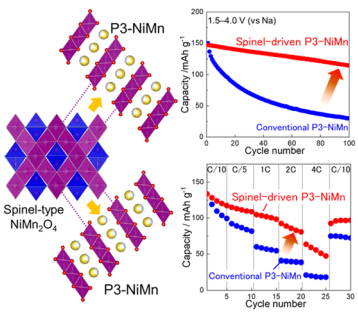
Designing high-performance P3-type $Na_{2/3}[Ni_{1/3}Mn_{2/3}]O_2$ cathodes for Na-ion batteries

Changhee Lee, Shun Nakajima, Shinichi Kumakura, Tomooki Hosaka, Eun Jeong Kim and Shinichi Komaba*



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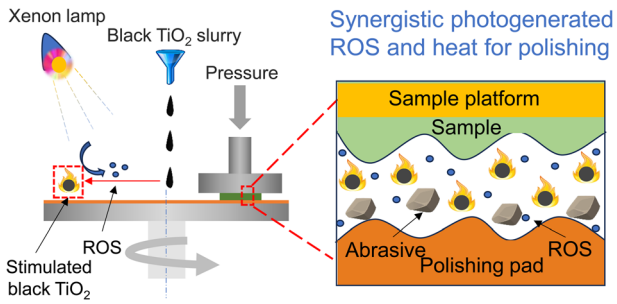
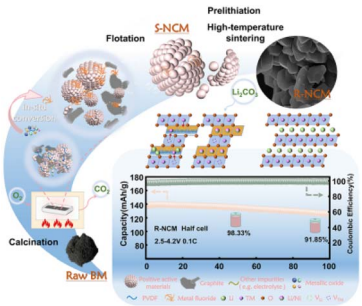


Photothermal chemical mechanical polishing: a synergistic mechanism for fast and atomic level surface perfection

Shichang Wang, Chuanwang Xing, Shenghua Wang, Chengcheng Zhang, Hailong Feng, Yuhang Dong, Yuxuan Zhou, Shuai Yuan, Zuozuo Wu, Zijian Hong, Wantang Wang, Ziyi Wang, Wei Sun* and Deren Yang*

5650



Direct regeneration of cathodes from spent LIB black mass through an integrated roasting-flotation method with impurity-tailored self-decontamination

Yuchen Li, Zhengni Ye, Shuai Wang, Hong Zhong, Zhanfang Cao* and Xin Ma*

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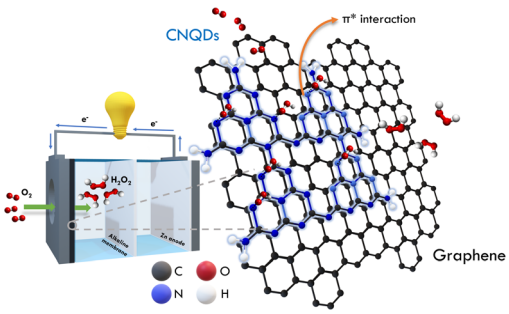

Oxygen-rich g-C_3N_4 quantum dot engineered graphene cathode enabling highly selective $2e^-$ oxygen reduction reaction in a value-added reaction assisted Zn–air battery

Sofiannisa Aulia, Mia Rinawati, Ming-Hsien Lin, Ling-Yu Chang, Tzu-Ting Liu, Wei-Hsiang Huang, Wei-Hung Chiang, Heru Setyawan, Bing-Joe Hwang and Min-Hsin Yeh*

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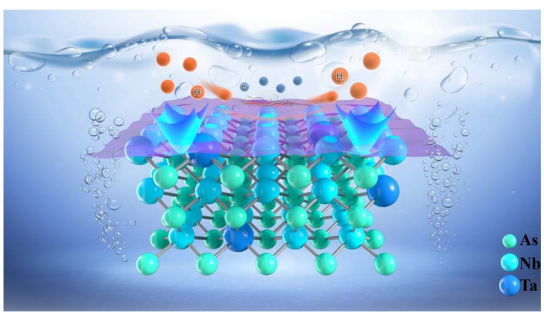

Doping design on reconstructed NbAs(001) surfaces for enhanced hydrogen evolution: theoretical calculations and experimental validation

Bojin Zhao, Hongwei Zhang, Yanjie Yang, Tiantian She, Yukai An, Hui Wei, Delin Yuan, Zhanggui Hu, Hailong Qiu,* Shihui Ma,* Yuke Li* and Ning Han*

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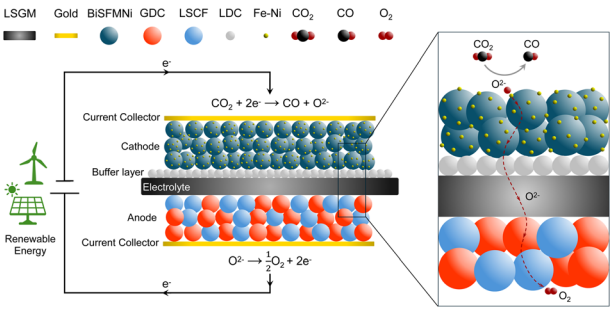
5682

A nanoparticle-decorated bismuth- and nickel-doped $Sr_2Fe_{1.5}Mo_{0.5}O_{6-\delta}$ cathode for enhanced CO_2 reduction in solid oxide electrolysis cells

Mohammadali Emadi and Eric Croiset*



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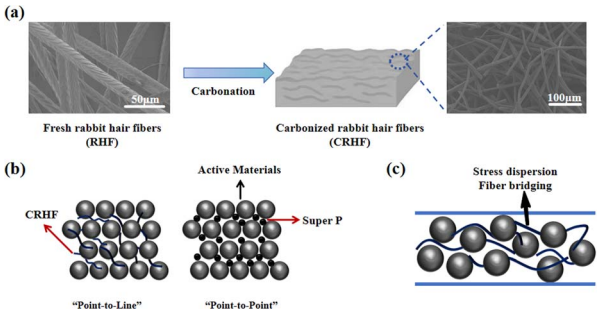
Conductive natural fibers as dual-functional conductive agents: high conductivity and stress relief in silicon-based anodes

Yiting Xiao, Fan Yang, Siying Li, Xingyu Sun, Siyu Jian, Dan Qian, Xingyu Xia, Siyu Li, Chuhan Zhou, Yangtian Lu, Ziwei Wang, Min Ling,* Bin Wang,* Chengdu Liang* and Xianbo Yu*



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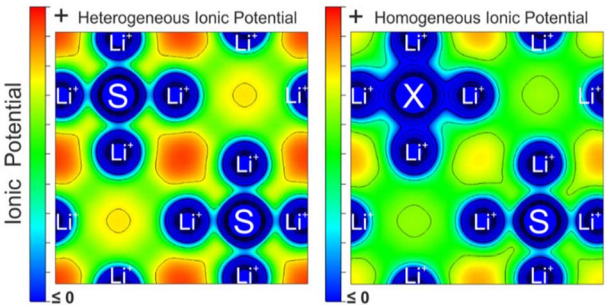
Conductivity mechanism of lithium argyrodite solid-state electrolytes

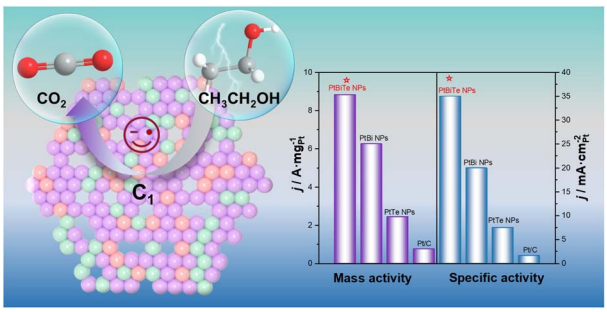
Rui Serra-Maia,* C. Damián Rodríguez-Fernández, Temple A. Douglas and Paulo J. Ferreira*



5719

Facile synthesis of porous PtBiTe nanoplates with high C_1 pathway selectivity and robust resistance to CO poisoning for the ethanol oxidation reaction

Xinyu Huo, Jinxing Gu, Baomin Luo,* Fengyun Su,* Yezhen Zhang, Dan Zhang, Ruili Shi, Bingxuan Qiao and Yixin Wang



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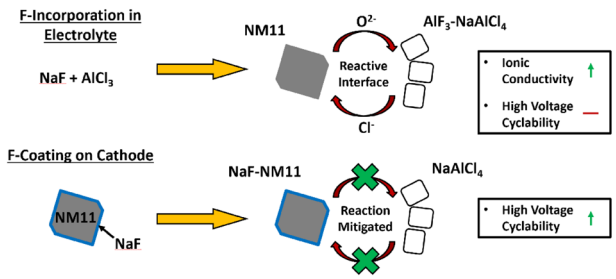

Aluminum chloride-based catholytes for stable high-voltage solid-state sodium batteries

Erick Ruoff and Arumugam Manthiram*

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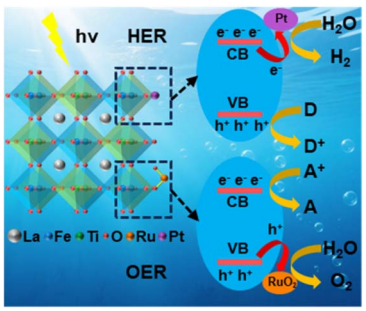

Flux-assisted synthesis of a visible-light-active La_2FeTiO_6 double perovskite with intrinsic bifunctional activity for photocatalytic water reduction and oxidation

Bo Chen, Ahmed Mahmoud Idris,* Ping Lu, Qiawen Shou, Khakemin Khan, Guocan Jiang* and Zhengquan Li*

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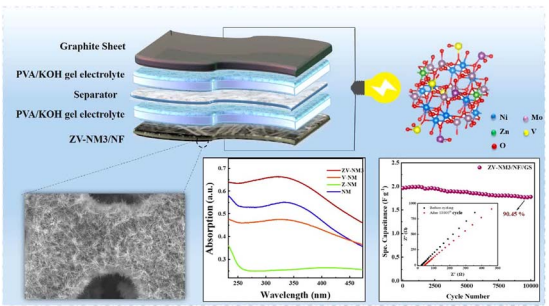

A high-performance supercapacitor electrode based on Zn/V co-doped $NiMoO_4$: a cation–cation doping strategy

Fatemeh Kazemi Kerdabadi, Parviz Kameli,* Mohamad Mohsen Momeni,* Tapati Sarkar and Bagher Aslibeiki

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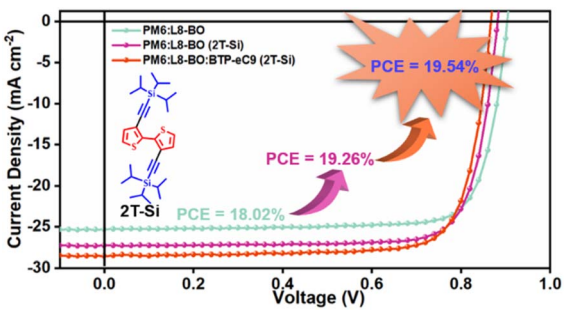

Triisopropylsilylethynyl-substituted solid additives for morphology optimization affording high-efficiency organic solar cells

Siyuan Zang, Jia Wang, Shuaiqi Wang, Wenying Zhou, Hongxiang Li,* Bin Kan and Qian Zhang*

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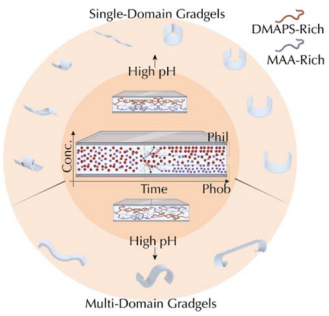
Shape-change programming of zwitterionic hydrogels *via* chemical gradients directed by surface energy

Negin Bouzari, Micahel Ali, Edward Hong, Nrushanth Suthaharan, Melanie Bouzanne, Amirreza Aghakhani and Hamed Shahsavan*



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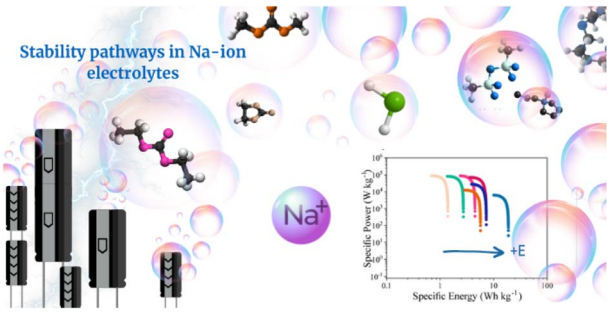
Tailoring electrolyte solvation for improved Na-based supercapacitor efficiency: an *operando* characterization approach

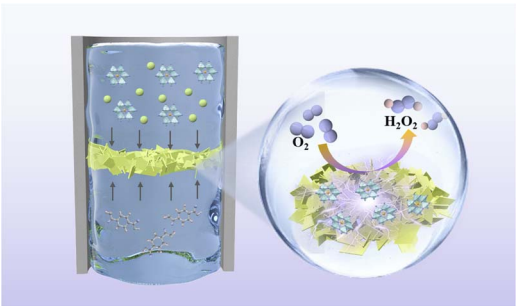
Raissa Venâncio, Manuel J. Pinzón C, João Pedro Aguiar dos Santos, Isabela Galantini, Hugo Cruz, Carlos A. Rufino, Jr., Gustavo Doubek, Luís Branco, Débora V. Franco, Leonardo M. Da Silva,* Josué M. Gonçalves* and Hudson Zanin*



5806

A polyoxometalate-anchored Ni MOF for high-efficiency, selective H_2O_2 electrosynthesis

Manyu Liu, Shixiang Lu, Guilin Hu,* Yan Jiang, Tianyang Li, Sa-Sa Wang,* Nan Wang,* Qipu Dai* and Zhiyu Jia*



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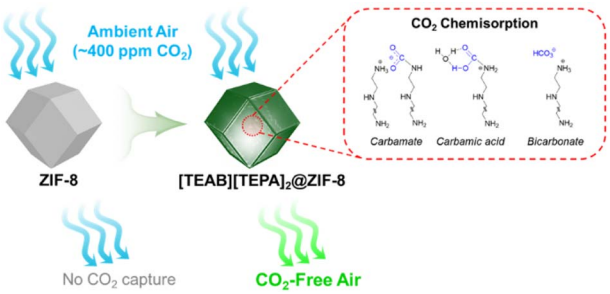
Unlocking liquid chemisorption in solid matrices: immobilized deep eutectic solvent-ZIF-8 composites for next-generation CO_2 capture

Yunsung Yoo, Xiaoliang Wang, Haomiao Xie, Geun-Ho Han, Ji-Yoon Song, Milad Ahmadi Khoshooei, Kent O. Kirlikovali, Justin M. Notestein, Edward H. Sargent and Omar K. Farha*



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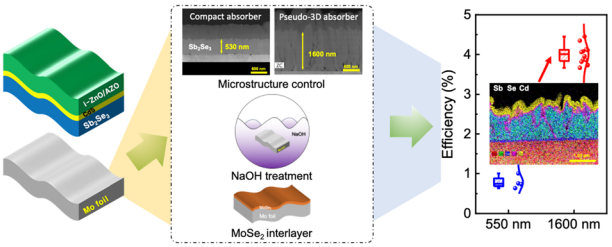

Growth behavior and interface engineering for photovoltaic applications of co-evaporated Sb_2Se_3 thin films on Mo foil

Van-Quy Hoang, Sinae Park, Jaebaek Lee, Dae-Ho Son, Dae-Kue Hwang, Quynh Le-Van, Vo Pham Hoang Huy, Se Yun Kim, Kee-Jeong Yang, Jin-Kyu Kang, Shi-Joon Sung* and Dae-Hwan Kim*

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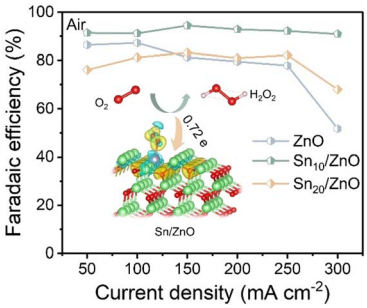

A Sn/ZnO nano-island hybrid catalyst for neutral H_2O_2 electrosynthesis from O_2 or air

Yuxiang Zhang, Shan Ding,* Minmin Yan, Jingjing Duan and Sheng Chen*

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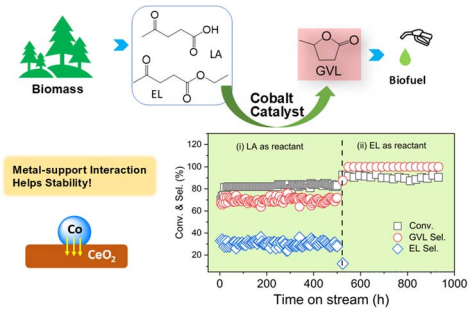

Engineering metal–support interactions of ceria-supported cobalt catalysts for durable hydrogenation of levulinic acid to γ-valerolactone

Dong Liu, Junhong Fu,* Zuoyi Xiao, Wenhao Cui, Qingda An* and Jiahui Huang*

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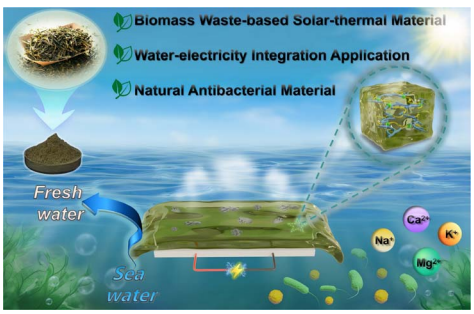

A highly efficient antibacterial solar-thermal evaporator based on waste tea leaves for water evaporation and thermoelectric generation

Yijun Zhao, Fei Wang, Zuoyu Wang, Yingyuan Zhang, Nanxi Jin,* Tao Jia* and Xiuhua Zhao

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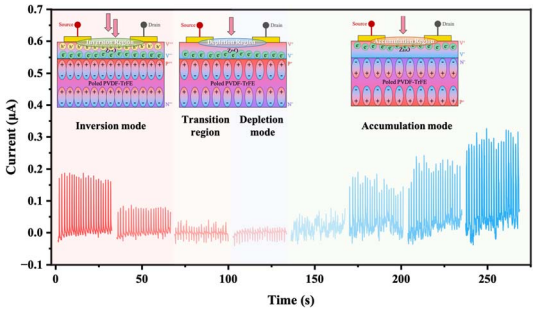
Highly sensitive piezo-gated bilayer thin-film transistors with all operation mode switching *via* the synergistic effect of ZnO and porous PVDF-TrFE

Yi-Miao Lin, Yu-Zhen Zhang, Jit Dutta, Jow-Lay Huang, Chia-Shing Wu and Chuan-Pu Liu*



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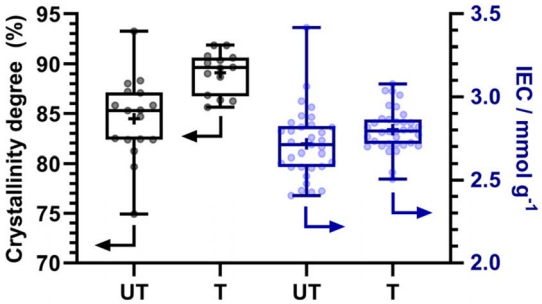
Thermal treatment of high-density polyethylene films to increase crystallinity for the fabrication of superior radiation-grafted anion-exchange membranes for fuel cells

Siân A. Franklin, Mozhdeh Mohammadpour, Yingdan Cui, Rachida Bance-Soualhi, Carol Crean, William E. Mustain, Hungyen Lin and John R. Varcoe*



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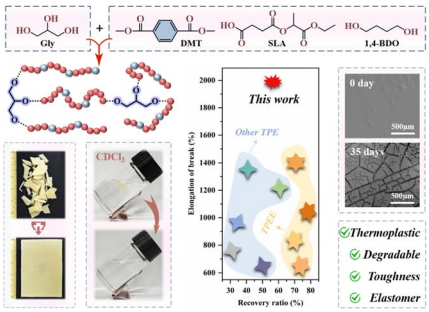
Preparation of copolyester elastomers by introducing a lactic acid-based monomer with enhanced mechanical properties *via* micro-crosslinking

Caohong Chen, Hongran Zhao, Linrong Wu, Caiqi Liu, Fei Liu,* Jin Zhu and Jinggang Wang*



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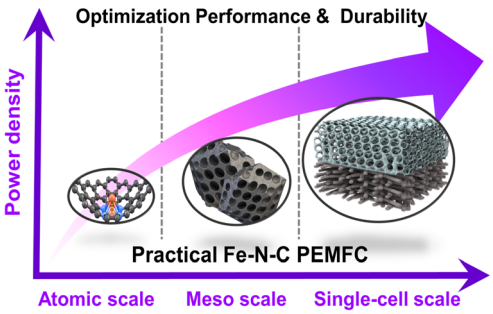
Integrated multiscale structural engineering of Fe–N–C electrocatalysts and device components for high-performance PEMFCs

Seung Yeop Yi, Sanghyeok Lee, Jaemin Kim, Jinyeop Kim, Daeeun Choi, Minkyeong Ban, Dongyoon Woo, Hyunwoo Jun, Yeju Jang, Jiyoung An, Wonhyeong Lee, Dong Young Chung, Seoin Back,* Segeun Jang* and Jinwoo Lee*



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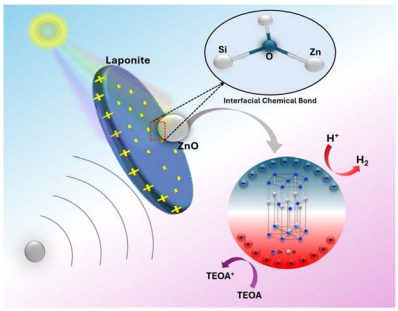
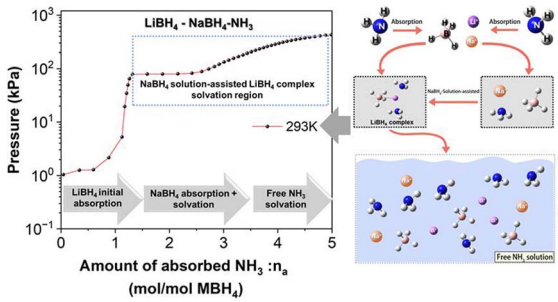


LAPONITE® nanoclay as a solid-state charge transfer mediator for piezocatalytic hydrogen evolution

Talha Kuru, Emre Aslan* and Imren Hatay Patir*

5925



Thermodynamic and spectroscopic analysis of the ammonia absorption mechanism of a borohydride system

Zixin Xu, Takahiro Ide, Norio Ogita, Shinsuke Ohyagi, Takashi Wakabayashi, Toru Hamanaka, Taisho Higuchi, Tomoyuki Ichikawa, Fangqin Guo,* Hiroki Miyaoka* and Takayuki Ichikawa

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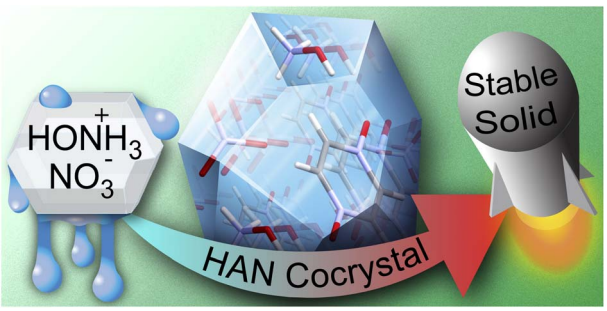
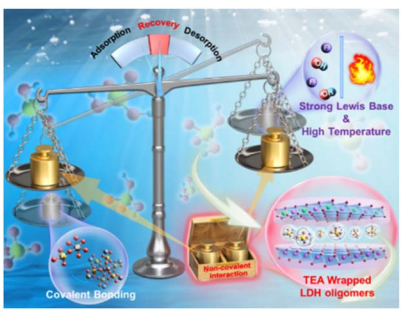


Hydroxylammonium nitrate: synthesis, cocrystals, and properties

Andrew J. Bennett, Haley R. Froberg, Michael K. Bellas, Leila M. Foroughi and Adam J. Matzger*

5944



Non-covalent interaction of hydroxyl-capped layered double hydroxide oligomers for high-performance P recovery

Yuchi Chen,* Guangyu Zhu, Bo Zuo, Junxia Yu and Qingbai Chen*

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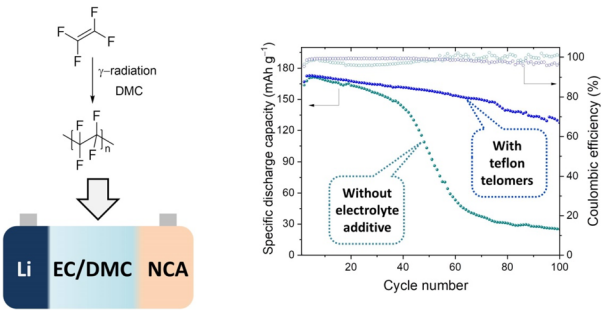
5955

Tetrafluoroethylene telomers as electrolyte additives for high-performance, radiation-tolerant lithium and potassium batteries

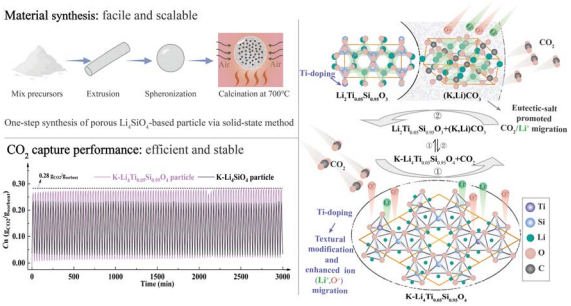
Guzaliya R. Baymuratova, Elena V. Shchurik, Galina A. Kichigina, Yuri S. Fedotov, Pavel P. Kushch, Nikita A. Emelianov, Dmitry P. Kiryukhin, Olga V. Yarmolenko, Olga A. Kraevaya,* Sergey M. Aldoshin and Pavel A. Troshin*



5964

Facile synthesis of molten-salt promoted and hetero-element doped Li_4SiO_4 particles for efficient and stable CO_2 capture

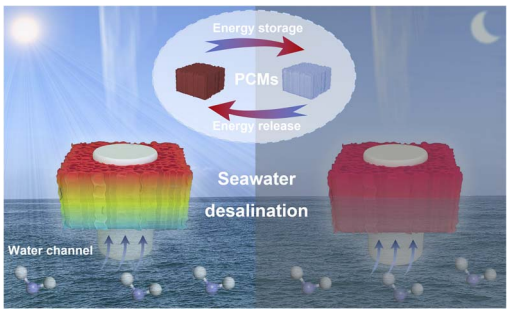
Yunlian Liu, Mingkai Liu, Ruqi Zhang, Lizhuang Dou, Zihan Wan, Qian Jia, Ying Pan* and Hongguang Jin



5976

Photothermal halloysite aerogel encapsulating phase change materials for solar-driven seawater desalination

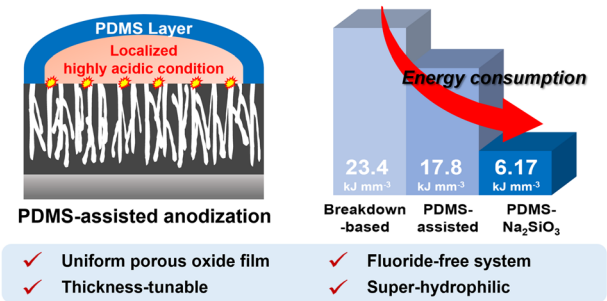
Jianhua Bian, Lili Wang,* Libing Liao and Guocheng Lv*



5989

Polydimethylsiloxane-assisted low-energy anodization: a fluoride-free tunable strategy for engineering porous TiO_2 films

Hyerin Jeon, Jaehyun Lee, Jaebong Park, Sunghwan Kim, Jinhee Lee* and Jinsub Choi*



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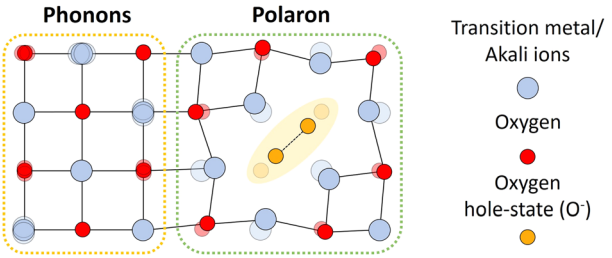
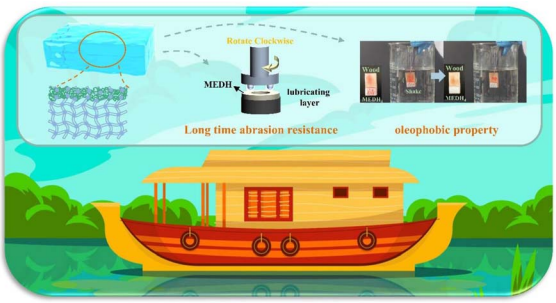
6003



Phonon RIXS signatures reveal polaron formation in oxygen redox Li- and Na-ion battery cathodes

Moritz Hirsbrunner,* Pontus Törnblom, Sahil Tippireddy, Ke-Jin Zhou, Mirian Garcia-Fernandez, Robert A. House, Håkan Rensmo and Laurent C. Duda*

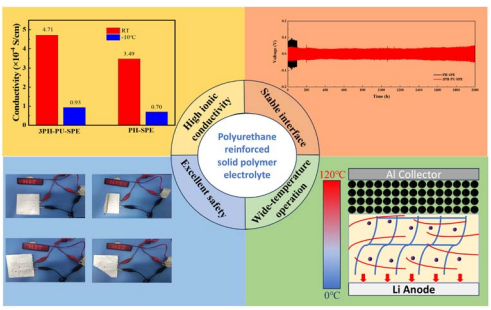
6012



Demulsification-enabled entanglement anchoring prepared superlubrication hydrogel for antifouling of vessel surfaces

Shijia He, Shuhang Deng, Li Wang, Jingjuan Lai, Jing Yi, Dong Xiang, Chunxia Zhao, Hui Li, Xuezhong Zhang, Dong Li, Guilong Yan and Yuanpeng Wu*

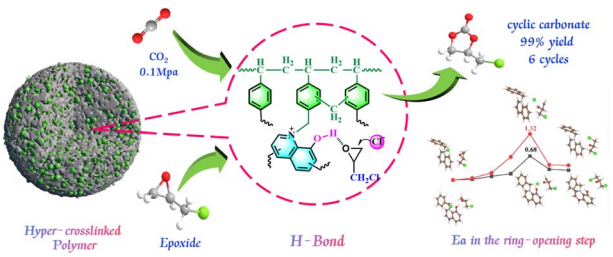
6024



Wide-temperature flexible polyurethane network reinforced PVDF-HFP electrolytes for solid-state lithium metal batteries operated under extreme conditions

Kaidong Zhang, Jing Yang, Kangshuai Zhu, Tongle Xu and Qinmin Pan*

6035



A hydroxyl-assisted ionic bifunctional hyper-crosslinked polymer as an efficient and recyclable heterogeneous catalyst for CO_2 cycloaddition

Jingjing Liu, Shulei Xiang, Dexuan Xiang,* Jingao Wu, Hongliang Xu, Gui Chen, Zaixing Zhang, Feipeng Yuan and Yuejun Ouyang

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