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See Mantae Kim, Seul-Yi Lee, Soo-Jin Park *et al.*, pp. 14580–14587. Image reproduced by permission of Soo-Jin Park from *J. Mater. Chem. A*, 2025, 13, 14580.



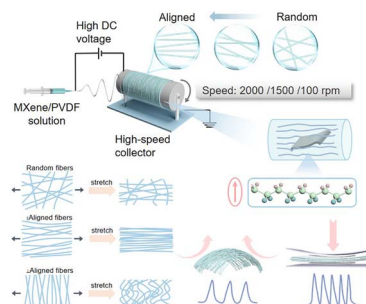
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See Ho-Hsiu Chou *et al.*, pp. 14588–14600. Image reproduced by permission of Ya-Ting Chang from *J. Mater. Chem. A*, 2025, 13, 14588.

COMMUNICATIONS

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Confined orientation PVDF/MXene nanofibers for wearable piezoelectric nanogenerators

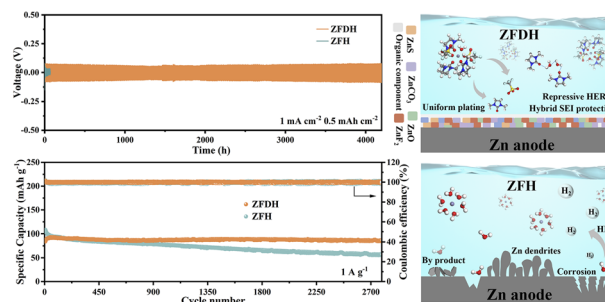
Long Jin, Yong Ao, Tianpei Xu, Jieling Zhang, Yulin Zou, Boling Lan, Shenglong Wang, Weili Deng and Weiqing Yang*



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Modulating an anion-enriched Zn²⁺ solvation structure via a dual weak interaction for stable zinc-metal batteries

Guimei Yao, Weimin Gao, Rongxian Wang, Jing Xu, Xianfa Rao,* Bingjun Yang,* Lingyang Liu* and Bao Liu*



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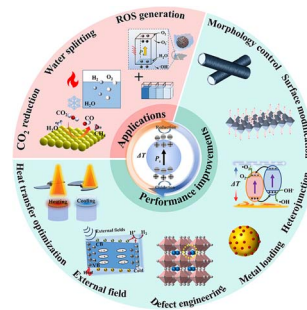
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Fundamental questions
Elemental answers

14465

Toward enhanced pyro-catalysis performance: mechanisms, strategies and challenges

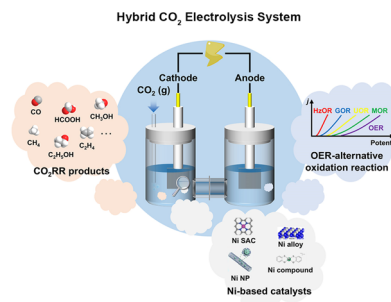
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Recent advances in Ni-based catalysts for hybrid CO₂ electrolysis

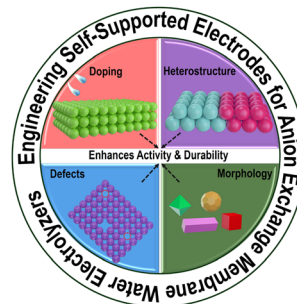
Kang Lian, Junyang Ding, Yifan Liu,* Qian Liu, Yinghong Wu,* Guangzhi Hu and Xijun Liu*



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Impact of catalyst engineering on the durability performance of self-supported catalysts in anion exchange membrane water electrolyzers: recent advances and perspectives

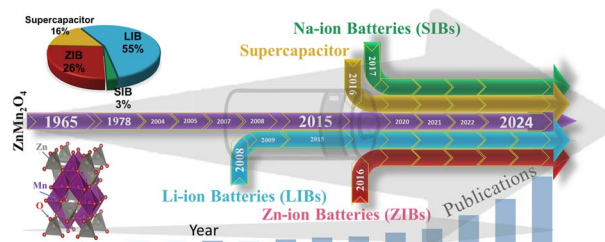
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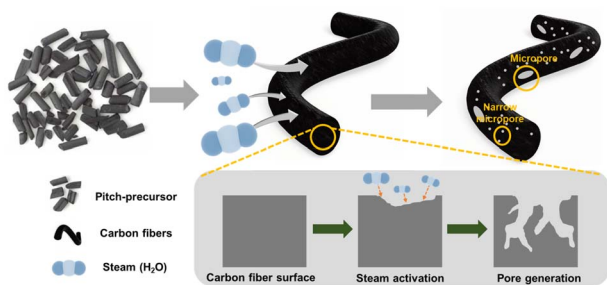
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ZnMn₂O₄ applications in batteries and supercapacitors: a comprehensive review

Joel Kingston Ramesh, Sasan Rostami, Jayaprakasan Rajesh, R. Margrate Bhackiyavathi Princess, Radhika Govindaraju, Jinho Kim, Rainer Adelung, Palanisamy Rajkumar* and Mozaffar Abdollahifar*



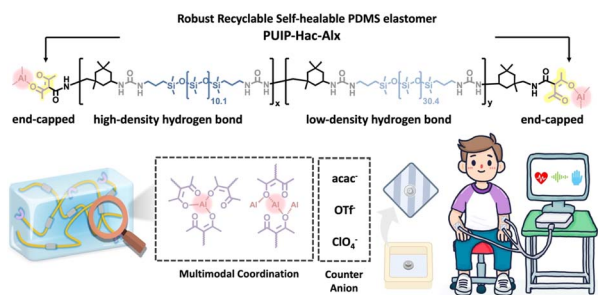
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Steam activation of pitch-based carbon fibers for increasing CO₂ adsorption behaviors

Choong-Hee Kim, Mantae Kim,* Jaein Lee, Hokab Choi, Seul-Yi Lee* and Soo-Jin Park*

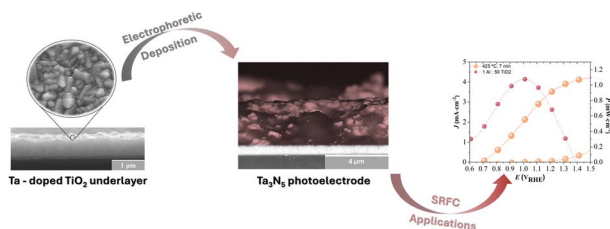
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Toughening self-healable and recyclable PDMS supramolecular elastomers through an end-capping agent and a metallic crosslinker

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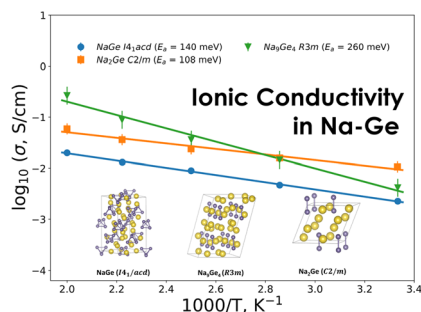
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Unlocking the potential of semi-transparent Ta₃N₅ photoelectrodes for high-performance, reproducible solar redox flow cells

Filipe Moisés M. Francisco, Paula Dias* and Adélio Mendes*

14612



Structure transformations and ionic conductivity in germanides of sodium and potassium

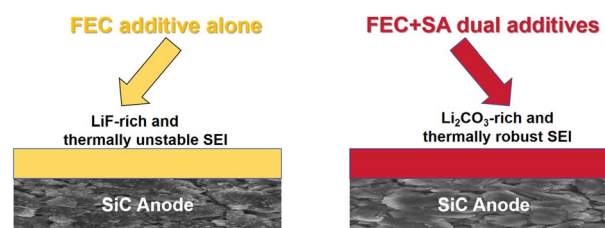
Alexey P. Maltsev,* Anastasiia V. Iosimovska, Ilya V. Chepkasov and Artem R. Oganov*



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Dual-functional additives enabling a high-performance silicon–carbon composite anode in pouch cells at high temperatures

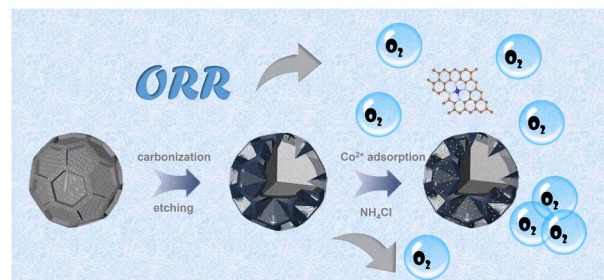
Xiaohu Hou, Jianlong Cong, Shiwen Gong, Zezhuo Li, Yuxuan Shao, Aiqi He, Yuxin Fan* and Yunhui Huang*



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Architecting hydrangea-inspired nitrogen-doped hollow carbon with isolated Co atoms for superior oxygen reduction catalysis

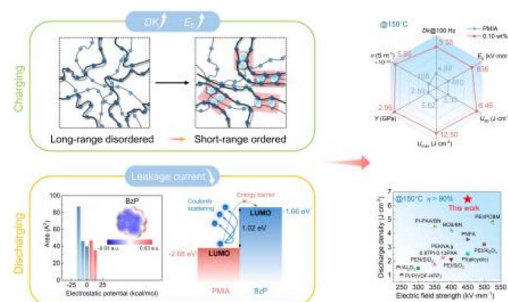
Xiaolan Gao, Yue Li, Zhiqing Zhang, Hao Zhang and Ge Li*



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Enhanced high-temperature capacitive energy storage in PMIA-based dielectric films by tailoring a short-range ordered conformation

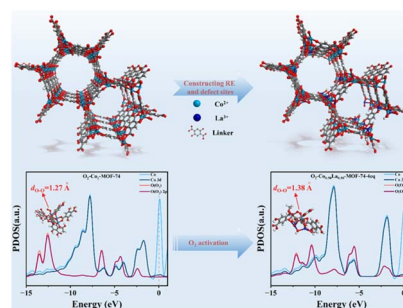
Xiang Yu, Xin Xu, Rui Yang, Wenqi Zhang, Zhipeng Zhang, Yuqi Zhang, Bang Gu* and Sidi Fan*



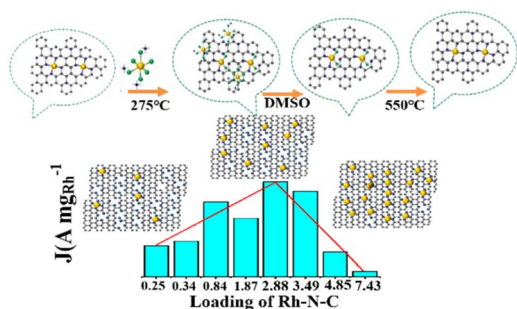
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Synergistic regulation of the Co microenvironment in MOF-74 for olefin epoxidation via lanthanum modification and defect engineering

Chang'an Wang, Zuoshuai Xi, Tao Ban, Zhiyuan Liu, Yibin Luo, Hongyi Gao,* Ge Wang* and Xingtian Shu*



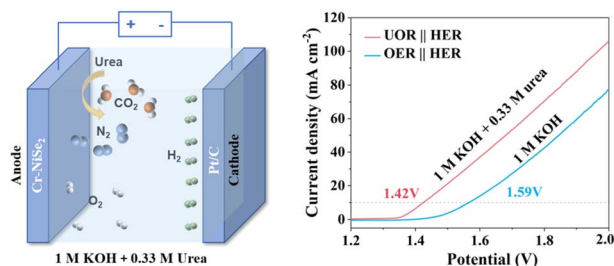
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Rh single-atom catalysts with optimized metal loading for direct CO-feed high-temperature proton exchange membrane fuel cells

Chunqiang Zhuang, Huanqiao Li, Xiaoming Zhang, Hong Zhang, Suli Wang* and Gongquan Sun*

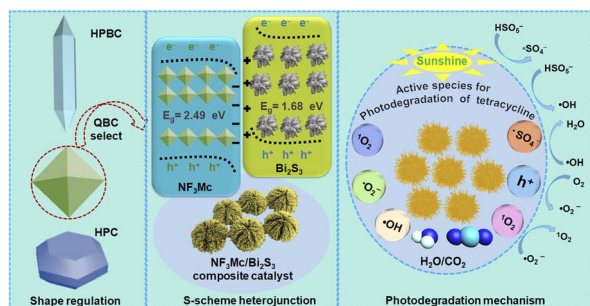
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Regulating the electronic states of NiSe₂ by Cr-doping to promote formation of active phases for high catalytic performance of the urea oxidation reaction

Shao-Lan Zheng, Hui-Min Xu, Chen-Jin Huang, Hong-Rui Zhu, Chen-Yu Song, Ruo-Zhen Xiong and Gao-Ren Li*

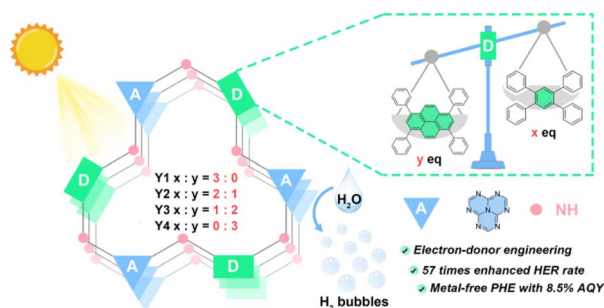
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Linker scissoring strategy enables precise shaping of Fe/Mn-MOF to construct an S-scheme heterojunction with Bi₂S₃ for enhanced photoexcitation under peroxydisulfate activation

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14708



Electron-donor engineering of heptazine-based donor-acceptor conjugated microporous polymers for efficient metal-free photocatalytic hydrogen evolution

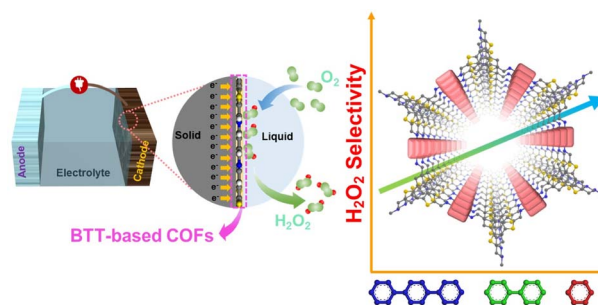
Lin-Fang Yang, Yi-Zhou Zhu,* Cheng-Cheng Zhang and Jian-Yu Zheng*



14716

Benzothiophene-based covalent organic frameworks for H₂O₂ electrosynthesis: the critical role of conjugated structure

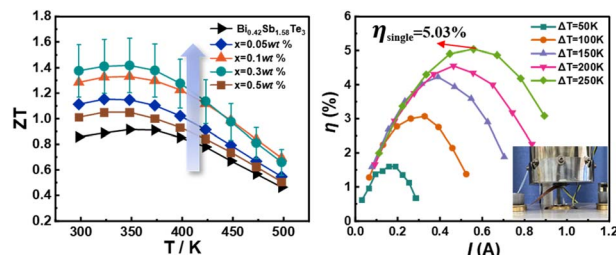
Simin Zhang, Jiawei Xu, Jiayong Lu, Zhijian Liu, Zechen Xiao, Wei Guo, Mo Zhang, Yan Wan* and Yangming Lin*



14726

Synergistic enhancement of thermoelectric and mechanical properties in Bi–Sb–Te alloys enabled by Zn based metal–organic frameworks (ZIF-8)

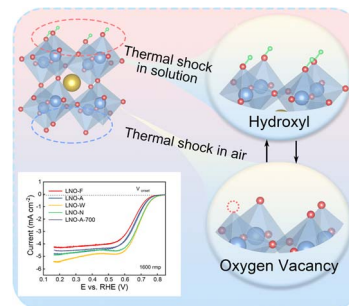
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14737

Optimizing LaNiO₃ surface structure for an efficient oxygen reduction reaction

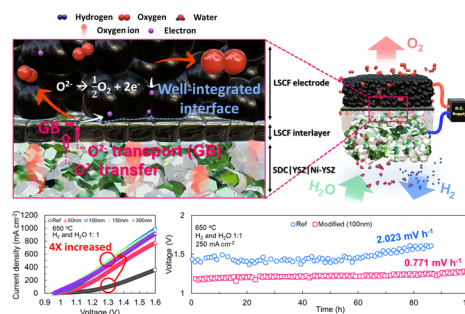
Tianzhen Ren, Lu-Kang Zhao, Xiao Zhang, Xuan-Wen Gao,* Hong Chen, Zhaomeng Liu,* Dongrun Yang and Wen-Bin Luo*



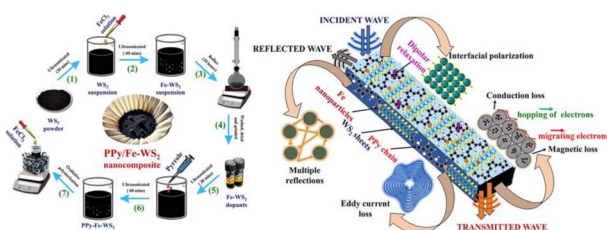
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A nanocrystalline La_{0.6}Sr_{0.4}Co_{0.4}Fe_{0.6}O_{3-δ} interlayer for an enhanced oxygen electrode–electrolyte interface in solid oxide cells

Juhwan Lee, Kyoungjae Ju, Ho Jun Yoo, Sung Eun Jo, Hyunmin Kim, Geonwoo Park, Geongu Han, Woojin Park, Gu Young Cho, Hyong June Kim* and Jihwan An*



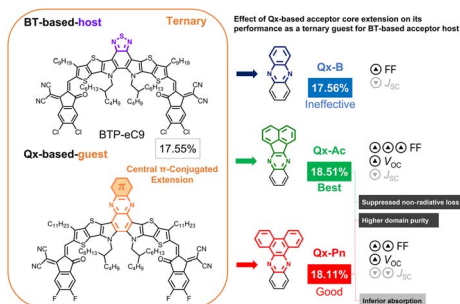
14751



EMI shielding performance of PPy/Fe-WS₂ nanocomposites in the Ku band

Raeesah Islam, Harish Mudila, Ritu Chahal, Anil Ohlan* and Anil Kumar*

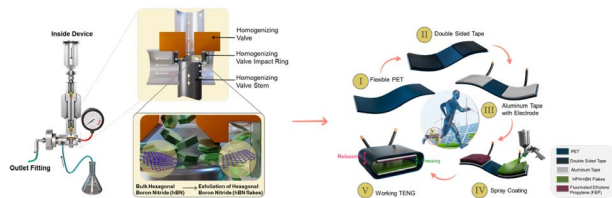
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Central π -conjugated extension in quinoxaline-based small-molecule acceptors as guest components enabling high-performance ternary organic solar cells

Chung Hang Kwok, Ho Ming Ng, Chuanlin Gao, Huawei Hu,* Top Archie Dela Peña, Joshua Yuk Lin Lai, Li Chen, Lan Xie, Mingjie Li, Jiaying Wu, Guangye Zhang, Wai-Yeung Wong,* He Yan* and Han Yu*

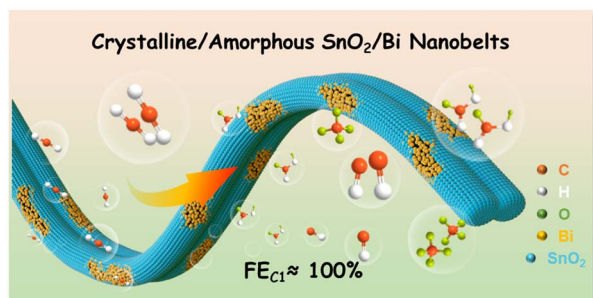
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Sustainable high-pressure homogenization of hexagonal boron nitride for triboelectric nanogenerators: advancing self-powered environmental monitoring in portable electronics

Yawar Abbas, Rohan B. Ambade, Muhammad Umair Khan, Rui Chang, Yahya Zweiri, Baker Mohammad, Dalaver Anjum* and Yarjan Abdul Samad*

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In situ construction of a crystalline/amorphous interface in SnO₂/Bi nanobelts for efficient CO₂ electroreduction

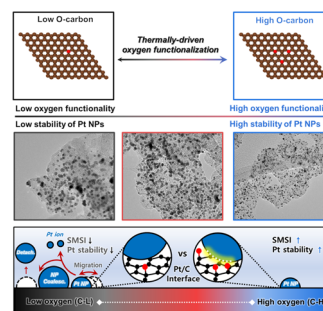
Hanjun Li, Guangtong Hai,* Zhenyu Wang, Xin Chen, Shuxing Bai, Nan Zhang* and Tianxi Liu*



14796

Thermally driven oxygen functionalization for durable Pt electrocatalysts in the oxygen reduction reaction

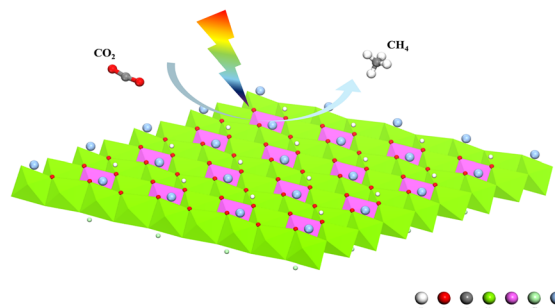
Min Woo Kim, Jong Min Lee, Chi-Young Jung, Jung-Eun Cha, Kwang Shik Myung, Nam Jin Lee, Nam Dong Kim* and Jae Young Jung*



14809

Ag single-atom modification of MgAl-LDH to enhance the CH₄ product selectivity in CO₂ reduction: a DFT study

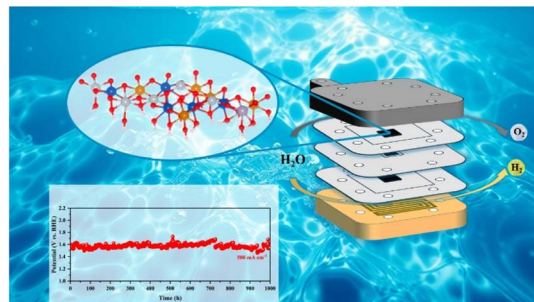
Yi-fu Liu, Feng Yang* and Rui-tang Guo*



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Multimetallic layered double hydroxides as efficient and durable oxygen evolution catalysts for anion exchange membrane water electrolysis at high current densities

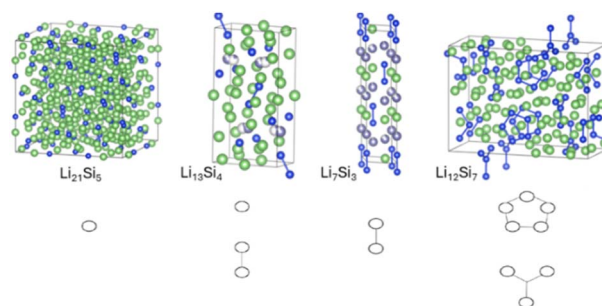
Yaowen Xu, Kaiyang Xu, Hao Tan, Haoliang Huang, Fei Lin, Chenyue Zhang, Jingwei Wang, Run Ran, Jinfeng Zeng, Zhipeng Yu, Sitaramanjaneya Mouli Thalluri, Lijian Meng, Dehua Xiong* and Lifeng Liu*



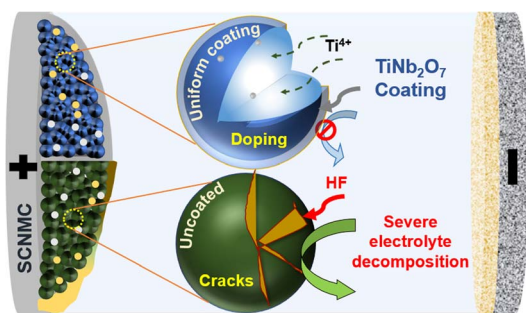
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Thermal expansion of lithiated silicon (Li₁₃Si₄ and Li₇Si₃) anodes: a powder neutron diffraction study

Atia Azad,* Katherine Bateman, Matthew Irvine, Aaron B. Naden, Stewart A. M. Dickson, Ronald I. Smith, Richard K. B. Gover and John T. S. Irvine



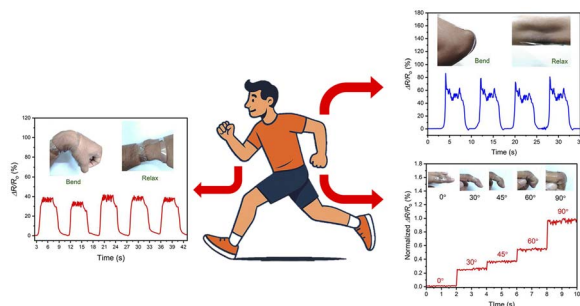
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Boosting stability in Ni-rich cathodes: a synergistic approach to surface and bulk modifications for advanced lithium-ion batteries

Shadab Ali Ahmed, Tripti Agnihotri, Ashok Ranjan, Chia-Yu Chang, Chun-Chi Chang, Rehbar Hasan, Yosef Nikodimos, Teklay Mezgebe Hagos, She-Huang Wu,* Wei-Nien Su* and Bing Joe Hwang*

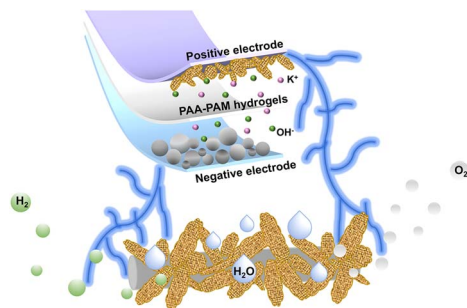
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A CNT- and ZnO nanorod-incorporated fish gelatin nanocomposite towards developing flexible pressure/strain sensors for human motion monitoring

Salvin Mustakim, Md Abdul Momin, Md Abul Kalam, Tetsu Mieno, Manisha Ahamad and Mohammad Jellur Rahman*

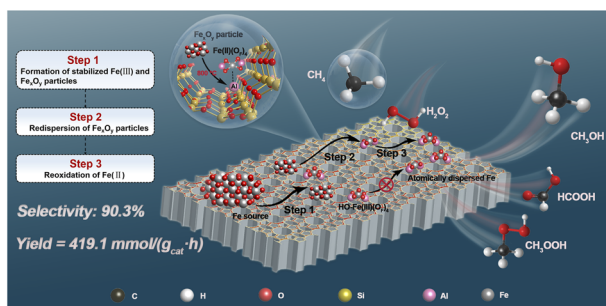
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In situ formation of heterojunction of thiophene-based metal-organic frameworks with carbon dots for efficient overall water splitting and supercapacitor applications

Qianqian Wang, Xiaoyan Ma,* Ran Bi, Xiangpan Hu, Senyang Song, Pengcheng Ma and Fang Chen

14884



Speciation evolution of iron species within ZSM-5 for selective methane oxidation: from redispersion to activation

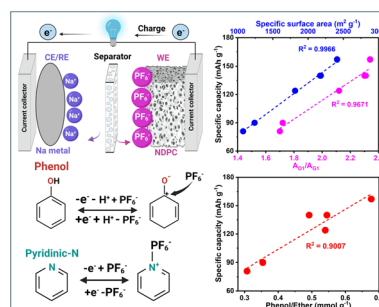
Xia Chen, Shuqing Li, Lu Bai, Jiong Li, Yu Fu* and Jun Zhang*



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Engineering nitrogen-doped porous carbon positive electrodes for high-performance sodium-ion capacitors: the critical role of porosity, structure and surface functionalities

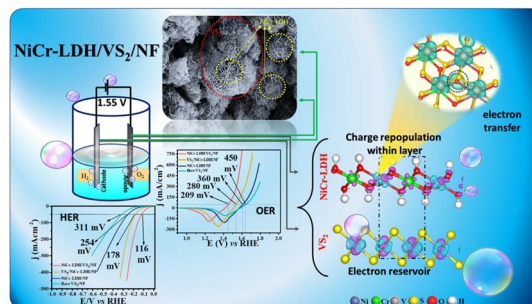
Ademola Adeniji, Adrian Beda, Philippe Fioux and Camelia Matei Ghimbeu*



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Revolutionizing water splitting performance by probing the influence of electron transfer on the NiCr-LDH/VS₂/NF heterostructure

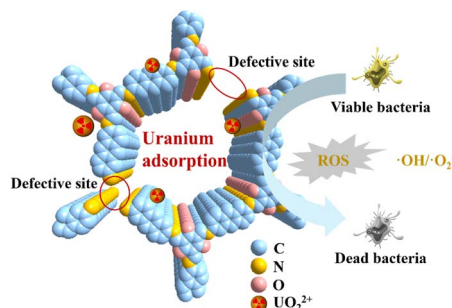
Aditi De, Pandiarajan Devi, Palanichamy Murugan and Subrata Kundu*



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Defect engineering in β -ketoenamine-linked covalent organic frameworks for high-efficiency uranium extraction

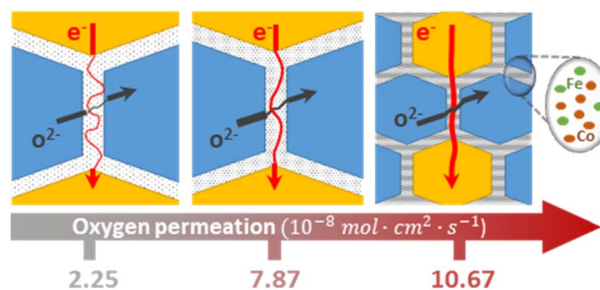
Douchao Mei and Bing Yan*



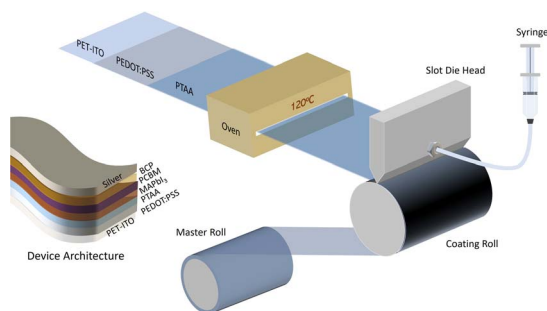
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A novel mixed-conducting network in all-oxide composites: overcoming traditional percolation constraints

Fanlin Zeng,* Ke Ran, Christian Dellen, Hartmut Schlenz, Joachim Mayer, Ruth Schwaiger, Wilhelm Albert Meulenber and Stefan Baumann



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Roll-to-roll slot-die coating of PTAA with PEDOT:PSS buffer layer for perovskite solar cells: coating analysis by XPS mapping

Rahul Patidar,* James McGettrick, Rodrigo Garcia-Rodriguez, Chris Griffiths, Kathryn Lacey, Ershad Parvazian, David Beynon, Matthew Davies and Trystan Watson*

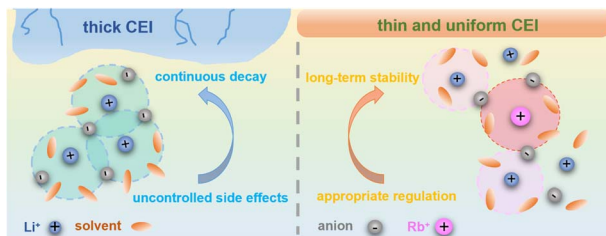
14964



Cu dopants as electron buffers for stabilizing Ru-based active layers for hydrogen evolution

Xinyu Wang, Tongtong Liu,* Jingjing Wang, Bowen Xia, Yanfei Wang,* Zhilin Li, Zhengping Zhang* and Feng Wang*

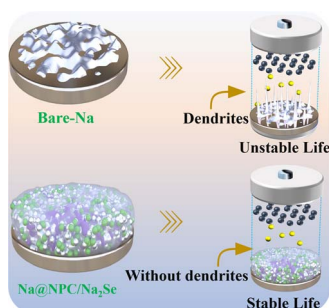
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Establishing a long-term stable cathode–electrolyte interphase through multi-cationic competitive coordination for 4.6 V LiCoO₂

Yujie Wang, Tingting Cui,* Netanel Shpigel, Zihao Meng, Fuhui Liang, Tianju Fan* and Yonggang Min*

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Introduction of a multifunctional percolated framework into Na metal for highly stable sodium metal batteries

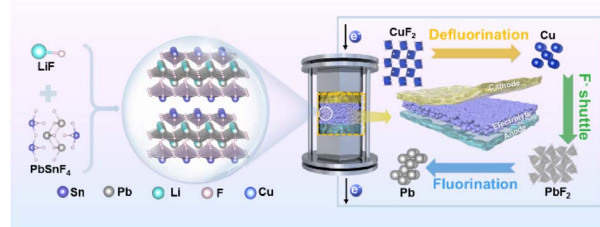
Sikandar Iqbal, Aadil Nabi Chishti, Moazzam Ali, Javed Rehman, Fakhr uz Zaman, Ting Luo, Muhammad Ali, Samia Aman, Hamid Hussain, Huiqin Huang, Shakeel Ahmad Khandy, Yinzhu Jiang* and Muhammad Yousof*



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LiF doped β - PbSnF_4 with improved ionic conductivity toward high-performance all-solid-state fluoride-ion batteries

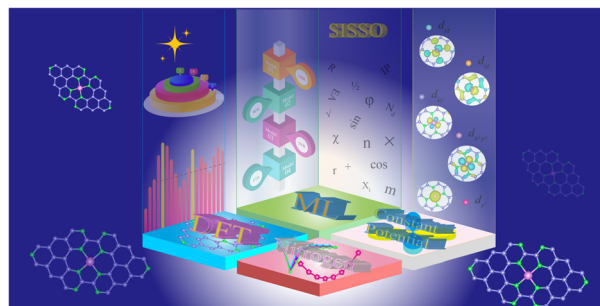
Tianyi Shen, Shaowei Li, Ke Yue, Jiale Zheng, Yile Ding, Shuangyu Song, Chenglong Li, Rongzeng Jin, Yiqun Wu, Yutong Wang, Yao Wang, Jianwei Nai, Yujing Liu, Peng Shi, Shihui Zou, Jianmin Luo,* Huadong Yuan* and Xinyong Tao*



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Breaking the Brønsted–Evans–Polanyi relationship in N_2 adsorption driven by potential-dependent repositioning of frontier orbitals: a sweet marriage of machine learning-assisted screening and the electric double-layer effect

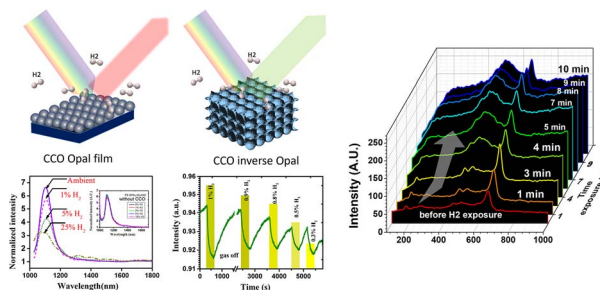
Yali Lu, Ning Guo, Qiang Zhang,* Zongjin Hu, Chenglong Shi, Weiju Hao, Yuling Song, Qingjun Zhou and Jianglong Mu



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Novel CuCo_2O_4 photonic crystals for optical hydrogen sensing: catalyst-free detection and mechanistic insights via *in situ* Raman spectroscopy

S. Silpa, Nidha Mariyam, Kritika Sharu, Saptak Majumder, Joy Mitra and Vinayak B. Kamble*



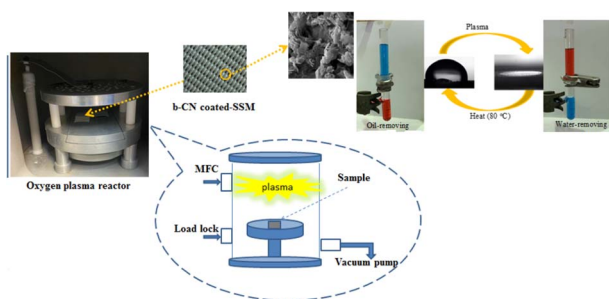
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Mixed anion *closo*-carbaborates as Na-superionic conductors

Jakob B. Grinderslev, Therese S. S. Kjær, Lasse N. Skov and Torben R. Jensen*



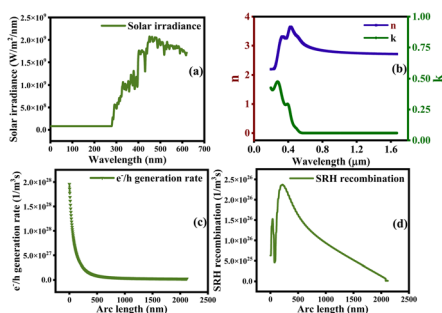
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Development of a smart plasma-treated nano-filter using carbon nitride nanostructures for oil–water emulsion separation: experimental and theoretical studies

Sonia Mir, Alimorad Rashidi,* Abbas Naderifar, Abdolvahab Seif, Pier Luigi Silvestrelli and Julio A. Alonso

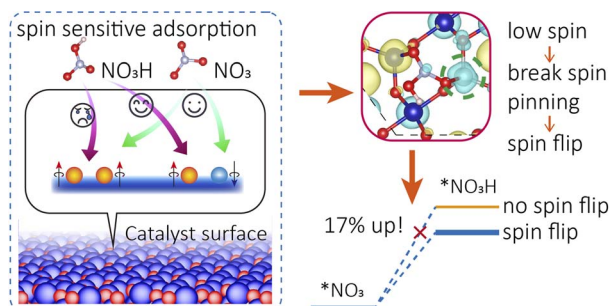
15057



Influence of acceptor/donor densities and layer thicknesses on the efficiency of 2D ZnO/BFO/spiro-OMeTAD perovskite solar cells: a COMSOL simulation-based optimization

Muhammad Umar Salman, Muhammad Bilal, Yumnah Khan Karmani, Umair Ali, Shahid M. Ramay, M. Younis and Shahid Atiq*

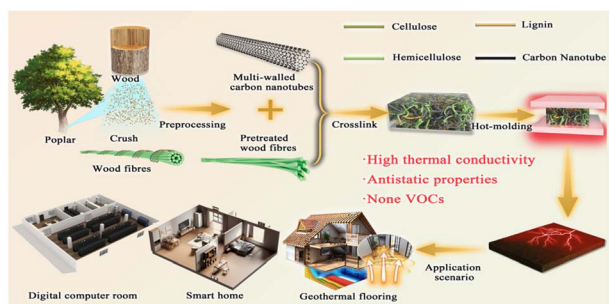
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Role of magnetic exchange in catalytic spin effects: insights from nitrite reduction on Co_3O_4

Haoyun Bai, Junxian Liu, Di Liu, Shuyang Peng, Hongling Liu, Kin Ho Lo, Hui Pan* and Liangzhi Kou*

15075



Sustainable wood fiber composites with antistatic and high-thermal-conductivity performance for energy-efficient home environments

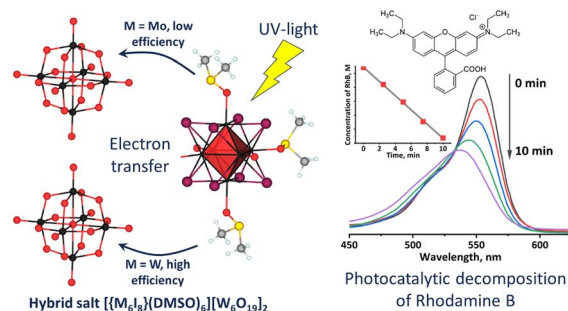
Yang Yang, Lei Zhang, Shengbo Ge,* Hongfei Huo, Kai Huang, Mashallah Rezakazemi* and Zhongfeng Zhang*



15088

Unity of opposites: stabilization of cationic M_6 metal cluster and anionic Lindqvist-type polyoxotungstate in hybrid salts and synergism in photodegradation of organic pollutants

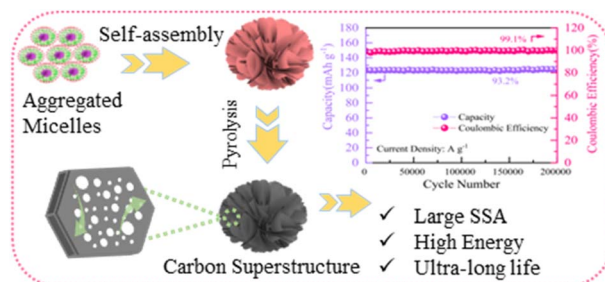
Anton A. Petunin, Arina V. Tomilenko, Darya V. Evtushok, Anton A. Ivanov, Alexey A. Ryadun, Taisiya S. Sukhikh, Igor P. Asanov, Michael A. Shestopalov and Yuri A. Vorotnikov*



15101

Hydrogen-bond-guided micellar self-assembly-directed carbon superstructures for high-energy and ultralong-life zinc-ion hybrid capacitors

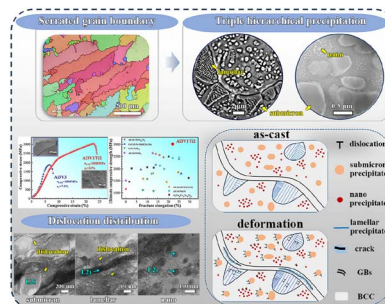
Shreeti Jha, Yang Qin, Yumin Chen, Ziyang Song, Ling Miao,* Yaokang Lv, Lihua Gan* and Mingxian Liu*



15111

Triple hierarchical precipitation and serrated grain boundaries strengthened co-free medium-entropy alloys

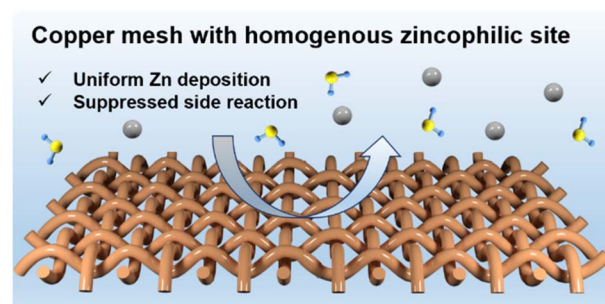
Peng Sang, Ningning Liang, Yi Liu, Lei Gu, Zan Zhang and Yongsheng Li*



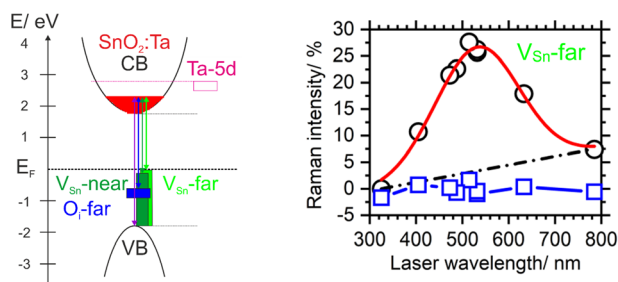
15118

Uniformly dispersed zincophilic Cu sites on copper mesh enable a dendrite-free Zn metal anode

Dandan Liu, Qi Wang, Wanying Fang, Ge Tian, Xiaobo Chen, Huijuan Yue* and Shouhua Feng



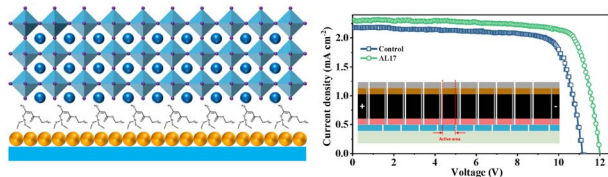
15128



Resonant defect states of the SnO₂:Ta transparent conductive oxide revealed by excitation wavelength-dependent Raman spectroscopy and hybrid functional DFT calculations

Matthias Krause,* Carlos Romero-Muñiz, Oleksandr Selyshchev, Dietrich R. T. Zahn and Ramon Escobar-Galindo

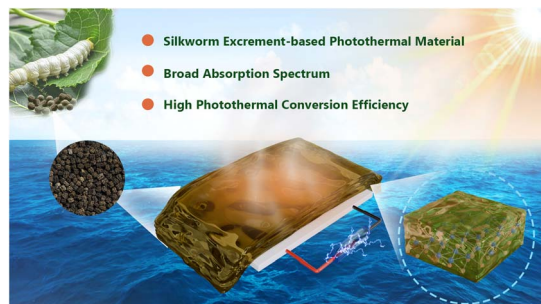
15140



Enhancing inverted perovskite solar cells via hydrophilic surface modification of NiO_x using aluminate coupling agents

Hanhong Zhang, Wenjing Hou, Yuanlong Deng, Jun Song* and Fan Zhang*

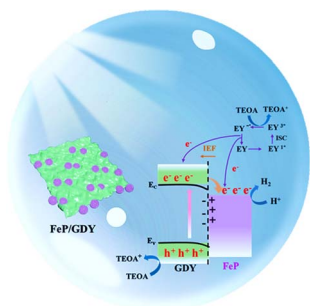
15149



High-performance biomass-based solar-thermal hydrogel based on silkworm excrement for water evaporation and thermoelectric integration application

Shuqing Ao, Zhifei Chen, Haoyang Chen, Liuke Zhang, Yanan Wang, Yingyuan Zhang, Tao Jia,* Gaolei Xi* and Tai Peng*

15157



Boosting visible-light hydrogen evolution via d-band center engineering in an FeP/graphdiyne heterointerface

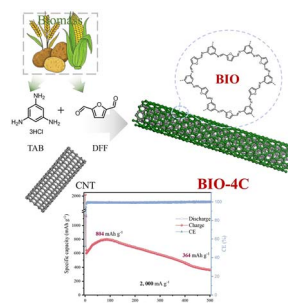
Nini Zhao, Jingzhi Wang, Zhengyu Zhou, Miao Wang, Kai Wang* and Zhiliang Jin



15169

Facile synthesis of a biomass-based sustainable covalent organic network (CON) anode for high-performance LIBs

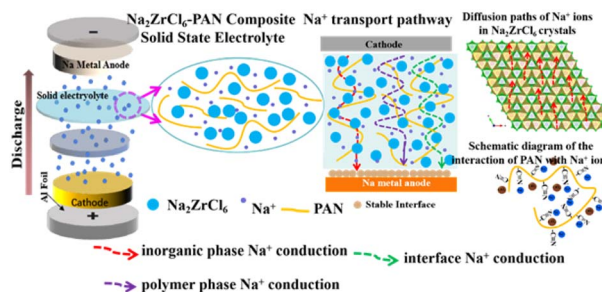
Changyu Weng, Hongmei Yuan, Yuxin Ji, Weidong Liu, Longlong Ma and Jianguo Liu*



15178

Dendrite-free, interfacially compatible Na₂ZrCl₆ composite halide solid-state electrolyte for solid-state sodium-ion batteries

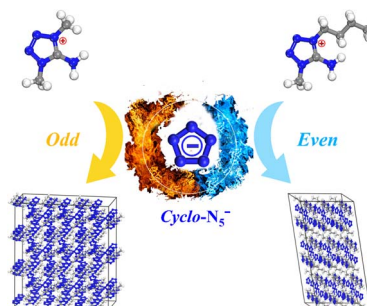
Hualing Tian, Jiajia Li, Yanjun Cai,* Xiang Yao and Zhi Su*



15189

The effects of cationic odd–even alkyl chains on the crystal structure and energetic properties of cyclo-N₅[−] salts

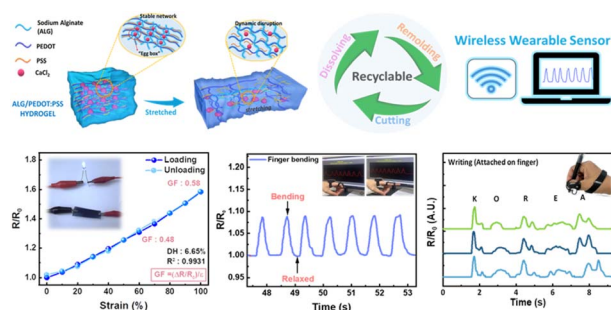
Zhiyu Jin, Bin Song, Xiang Chen, Lei Shi, Feng Zhao, Pengxiang Gao, Chong Zhang* and Bingcheng Hu*



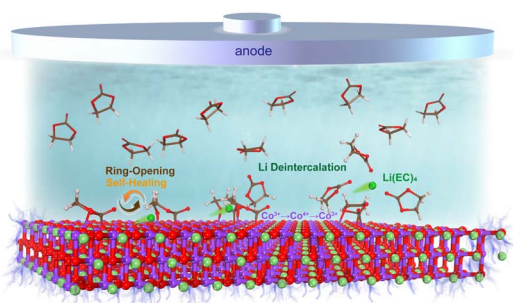
15200

Recyclable, conductive alginate-based hydrogels with high stretchability and low electrical hysteresis for wireless wearable sensors

Yulia Shara br Sembiring, Truong Tien Vo, Siti Aisyah Nurmaulia Entifar, Anky Fitriani Wibowo, Jung Ha Kim, Nisa Aqilla Ellenahaya Entifar, Jang Hyeok Lee, Si Won Baek, Soo In Lee, Min Seong Kim, Sang Min Jeon, Jincheol Kim, Junghwan Oh* and Yong Hyun Kim*



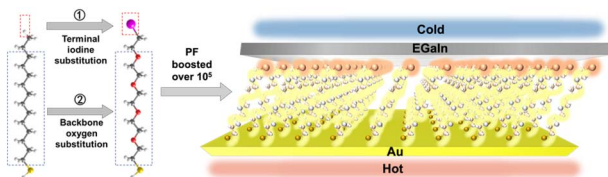
15213



Microscopic insights into the ring-opening reaction of ethylene carbonate on LiCoO₂ by on-the-fly machine learning molecular dynamics

Fanghui Mi, Ying Ou, Rui Luo, Shixian Wang, Zhijun Zhang,* Chunwen Sun,* Zhaoxiang Wang* and Yurui Gao*

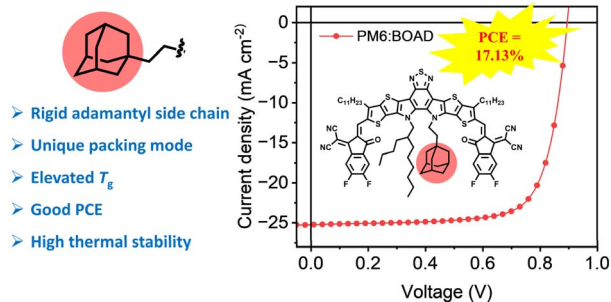
15222



Heteroatom engineering for enhancing the thermoelectric power factor of molecular junctions

Wuxian Peng, Ningyue Chen, Yu Xie, Liang Ma,* Jing-Tao Lü* and Yuan Li*

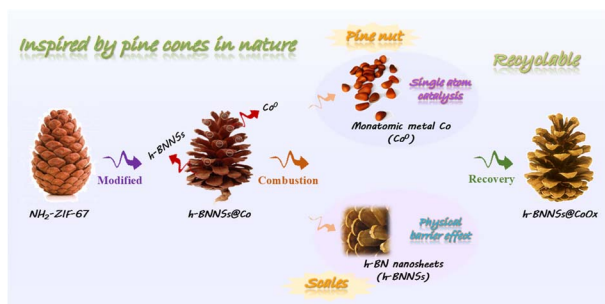
15232



Chemical modification of a small-molecule acceptor with an adamantyl side chain for efficient and thermally stable organic solar cells

Yecheng Shen, Yiming Wang, Chenhe Wang, Yimei Zhang, Shanghui Su, Yibo Hu, Yuxuan Zhu, Caiwei Zhang, Mengting Wang, Xiukun Ye, Guang-Peng Wu, Zaifei Ma, Haiming Zhu, Minmin Shi* and Hongzheng Chen*

15240



Fire-safe polymer composites enabled by a nature-inspired MOF-derived single atom catalysis strategy for thermal management with recyclability

Xue Bi, Jinhua Hu, Zeqi Zhang, Ye-Tang Pan,* Wenchao Zhang, Jun Sun, Xiaodong Qian, Pingan Song, Jiyu He* and Rongjie Yang

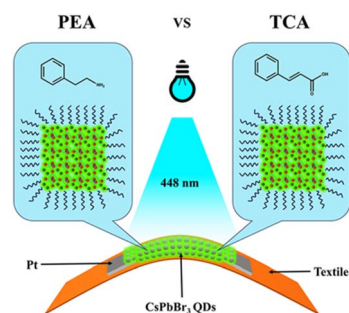


PAPERS

15257

Organic shell engineering of CsPbBr₃ perovskite quantum dots for efficient textile-based photodetectors

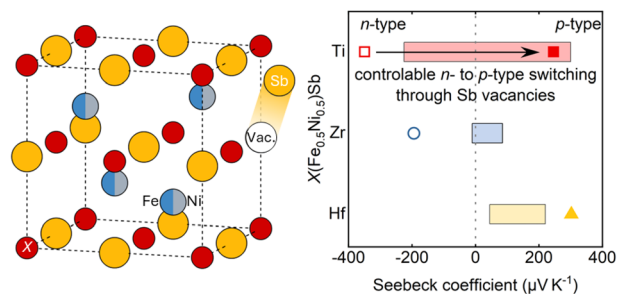
Jan Nawrocki, Vishnu Anilkumar, Guobin Jia, Apurba Mahapatra,* Piotr Bernatowicz, Jan Dellith, Gayatri, Mateusz Raczyński, Arka Karmakar, Pankaj Yadav, Seckin Akin, Benjamin Dietzek-Ivanšić, Maciej R. Molas, Jonathan Plentz and Daniel Prochowicz*



15268

Pivotal role of Sb vacancies in quaternary half-Heusler thermoelectrics

Illia Serhienko, Michael Parzer, Fabian Garmroudi, Andrei Novitskii, Naohito Tsujii, Tarachand, Ernst Bauer, Yuri Grin and Takao Mori*



CORRECTION

15278

Correction: Efficient ethane production via SnCl₄ Lewis acid-enhanced CO₂ electroreduction in a flow cell electrolyser

Sankeerthana Bellamkonda,* Ian Brewis, Venkateswara Rao Gedela, Rana Faisal Shahzad, Mohamed Mamlouk and Shahid Rasul*

