

Journal of Materials Chemistry A

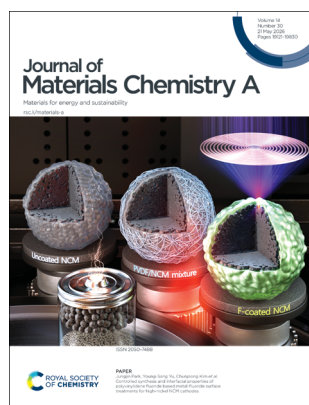
Materials for energy and sustainability

rsc.li/materials-a

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 14(30) 19121–19830 (2026)



Cover
See Jungjin Park, Young-Sang Yu, Chunjoong Kim *et al.*, pp. 19284–19293. Image reproduced by permission of Young-Sang Yu from *J. Mater. Chem. A*, 2026, **14**, 19284.



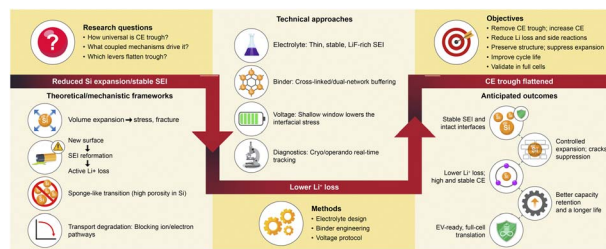
Inside cover
See Asif Latief Bhat and Yu-Sheng Su, pp. 19138–19160. Image reproduced by permission of Yu-Sheng Su from *J. Mater. Chem. A*, 2026, **14**, 19138.

REVIEWS

19138

The coulombic efficiency trough in silicon anodes for lithium-ion batteries: mechanisms, challenges, and stabilization strategies

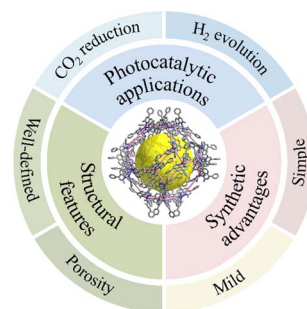
Asif Latief Bhat and Yu-Sheng Su*



19161

π frameworks: emerging porous supramolecular framework materials for photocatalysis

Zhao-Ming Ge, Heng-Yi Wang, Ji-Hua Deng,* Di-Chang Zhong* and Tong-Bu Lu



Advance your career in science

with professional recognition that showcases
your **experience, expertise and dedication**

Stand out from the crowd

Prove your commitment
to attaining excellence in
your field

Gain the recognition you deserve

Achieve a professional
qualification that inspires
confidence and trust

Unlock your career potential

Apply for our professional
registers (RSci, RSciTech)
or chartered status
(CChem, CSci, CEnv)

Apply now

rsc.li/professional-development

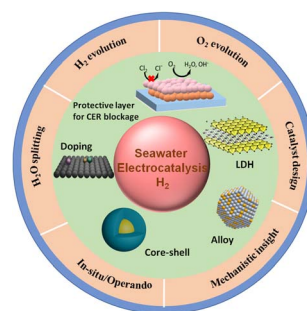


REVIEWS

19172

Electrocatalytic hydrogen generation from seawater: advances, opportunities, challenges and future roadmap

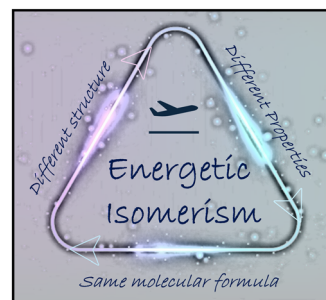
Rashmi Chetry, Deepak S. Gavali,
Mohsen Ahmadipour and Ujjwal Pat*



19206

Isomerism in energetic materials: where structure defines performance

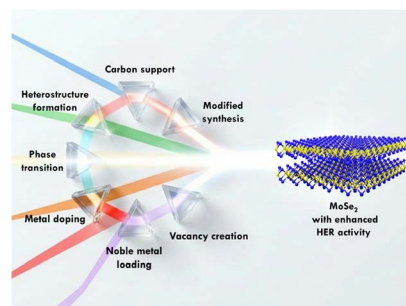
Abhishek Kumar Yadav and Jean'ne M. Shreeve*



19233

Emerging strategies for designing MoSe₂-based electrocatalysts for renewable hydrogen technologies

Gautham Kumar G, Surjit Sahoo,
Vinodkumar Etacheri and Aniruddha Kundu*

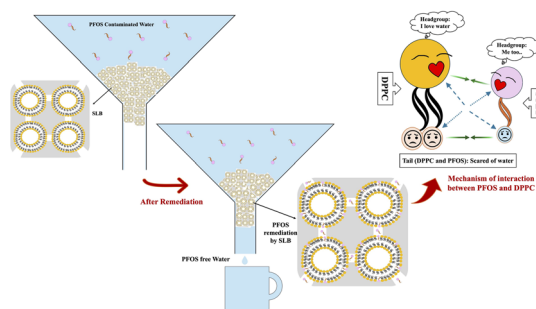


COMMUNICATION

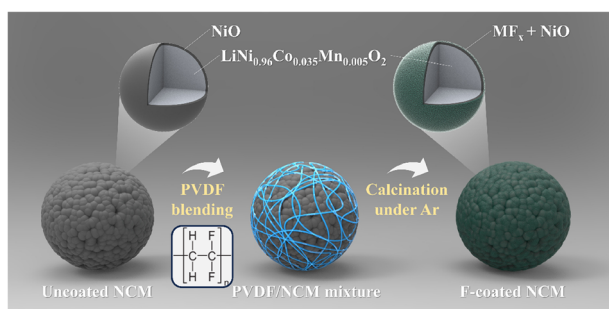
19271

Remediation of perfluorooctane sulfonic acid (PFOS) using supported lipid bilayers on mesoporous-SiO₂

Tutun Das Aka, Thomas Boller, Graham Dobereiner and
Stephanie L. Wunder*



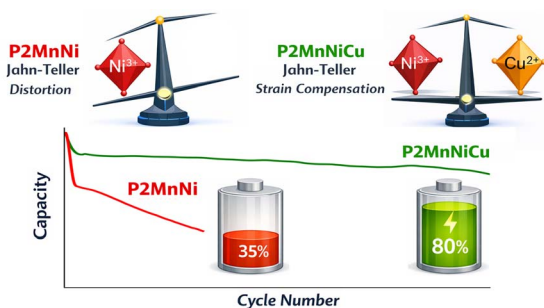
19284



Controlled synthesis and interfacial properties of polyvinylidene fluoride based metal-fluoride surface treatments for high-nickel NCM cathodes

HeeSang Lee, Wonchan Hwang, Jahun Koo, Hendrik Ohldag, David A. Shapiro, Eun-Jung Shin, Min-Su Kim, Moonjung Jung, Namdong Kim, Jungjin Park,* Young-Sang Yu* and Chunjoong Kim*

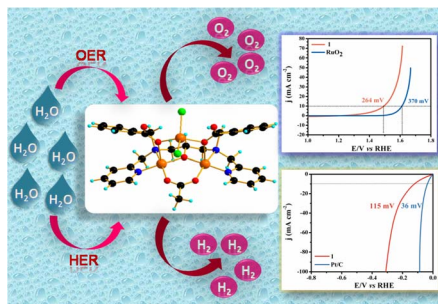
19294



Elucidating the stabilizing effect of copper substitution in high voltage P2-type layered oxides for sodium-ion batteries

Remy Lecordier, Jon Serrano-Sevillano,* Amaia Saracibar, Carlos Escudero, Gaël Minart, Naiara Etxebarria, François Fauth, Carlo Marini, Alessandro Longo, Lorenzo Stievano, Marcus Fehse and Damien Saurel*

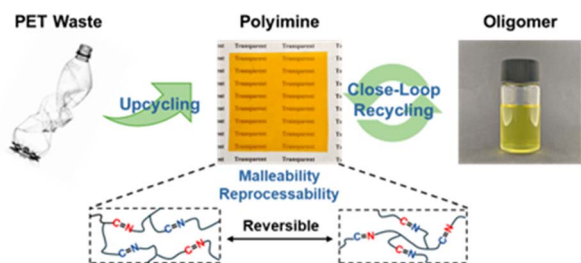
19312



Unveiling the role of a trinuclear copper(II) cluster in bifunctional OER and HER electrocatalysis: insights from experiments and theory

Sujan Sk, Trishna Ghosh, Aditi De, Julia Klak, Yutaka Hitomi, Subrata Kundu* and Manindranath Bera*

19332



Dynamic polyimine networks with good malleability and closed-loop recyclability from upcycled poly(ethylene terephthalate) waste

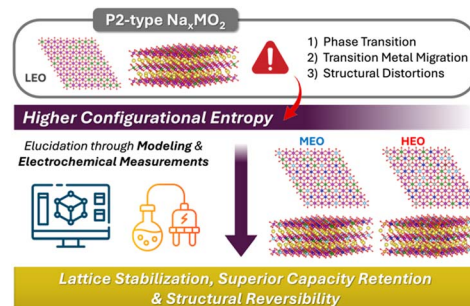
Mengzhe Han, Ying Zheng,* Maolin Li, Xing Zhang, Jing Li, Chengtao Yu, Junfeng Liu, Guorong Shan, Yongzhong Bao and Pengju Pan*



19341

Entropy-driven mechanisms in P2-type layered oxide cathodes for sodium-ion batteries: new insights from first-principles and electrochemical analysis

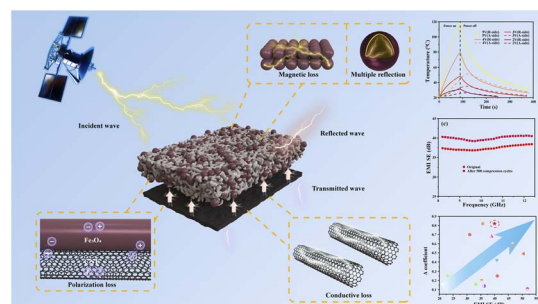
Arianna Massaro,^{*} Silvia Porporato, Miriam Botros,^{*} Alessandro Piovano,^{*} Hamideh Darjazi, David Stenzel, Giuseppina Meligrana, Ana B. Muñoz-García, Ben Breitung, Michele Pavone and Claudio Gerbaldi



19354

Robust flexible Janus composites for absorption-dominated EMI shielding

Yuqi Wang, Mingpu Li, Zhiwei Wang, Linli Tan,^{*} Na Han^{*} and Yingbo Chen



19365

Reimagining interface processing in solid-state batteries via electrochemical flash sintering

Riku Fukada, Claire V. Colin, Timothée Fabre, Marlu César Steil, Renaud Bouchet and Maria Diaz-Lopez^{*}

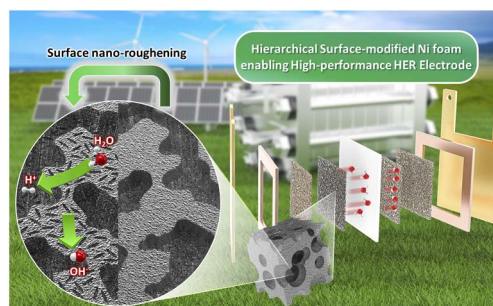
Electrochemical Flash Sintering



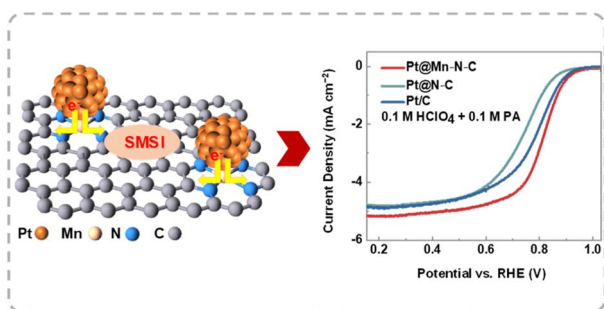
19382

Al_2O_3 -assisted hierarchical Ni–Al surface alloying for scalable fabrication of nano-roughened Ni foam cathodes with superior HER activity and durability in alkaline water electrolysis

Jeongha Kim, Hae In Lee, Seonghee Kim, Seongmin Park, Hee Soo Kim, Se-Hun Kwon^{*} and Dong-Ha Lim^{*}



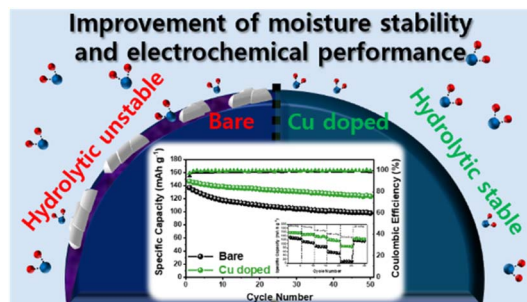
19394



Tailoring Pt–support interactions via Mn–N_x coordination for enhanced phosphoric acid tolerance in HT-PEMFC cathodes

Li Zhang, Dengzui Xu, Jiawei Shi, Jing Li, Hansong Cheng and Weiwei Cai*

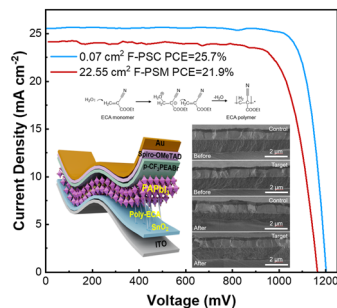
19401



Engineering hydrolytic stability and reversible O3/P3/OP2 transitions in O3-type sodium-ion battery cathodes through Cu²⁺ doping

Sang Hyuk Gong, Hyeongwoo Kim, Min Kyung Cho, Hyojun Lim, Hyun Beom Kang, Jae-Ho Park, Sung-Chul Kim, Elang Barruna, Kyung Yoon Chung, Wonyoung Chang, Wonchang Choi* and Hyung-Seok Kim*

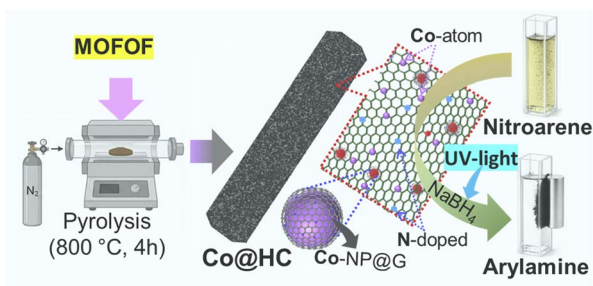
19413



In situ polymerization assisted strain release to enable efficient and mechanically robust flexible perovskite solar cells and minimodules

Zhenghao Liu, Shiyu Jiang, Rui Zhang, Xiangjin Du, Chunjie Huang, Chengyu Tan, Xinru Qin, Hongkun Wei, Yuqi Cui, Yiming Li, Jiangjian Shi, Huijue Wu, Yanhong Luo, Dongmei Li* and Qingbo Meng*

19423



Metal–organic framework on fullerene (MOFOF) derived Co-anchored hierarchical carbon nanocomposite for catalytic nitroarene reduction

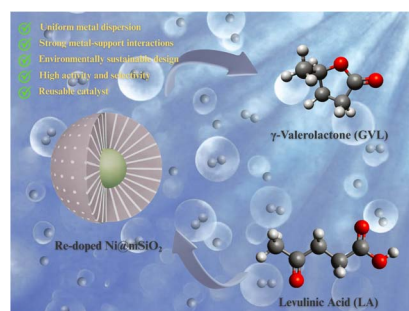
Biswa Nath Bhadra,* Rabindra Nath Acharyya, Sabina Shahi, Katsuhiko Ariga* and Lok Kumar Shrestha*



19432

Tailoring Re-loaded core–shell Ni structures embedded in mesoporous silica for the selective transformation of levulinic acid into γ -valerolactone

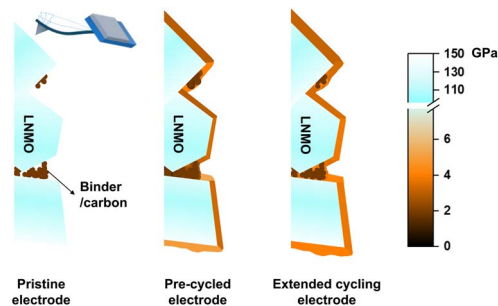
Yupawan Maneewong, Pratikkumar Lakhani, Sakhon Ratchahat, Chularat Sakdaronnarong, Wanwisa Limphirat, Suttichai Assabumrungrat, Kittisak Choojun, Tawan Sooknoi, Keichi Tomishige and Atthapon Srifa*



19454

Mechanical properties of cathode–electrolyte interphase layers in high-voltage lithium-ion batteries

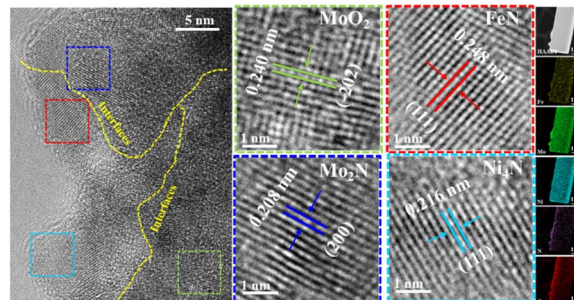
Xiaotang Shi, Andrew J. Naylor, Till Fuchs, Steffen Schröder, Franjo Weber, Anja Hens, Hans-Jürgen Butt and Rüdiger Berger*



19469

Fe-assisted nitridation-induced reconstruction of Mo–Fe–Ni molybdates enables durable alkaline seawater oxygen evolution and Zn–air batteries

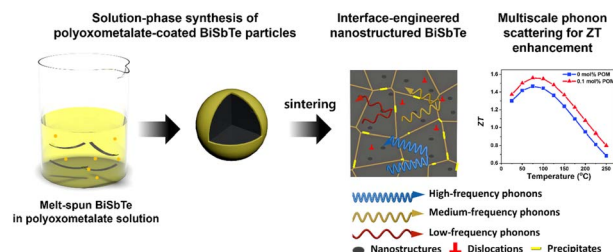
Hamza M. Haruna, Yanxiang He, Zhixiao Zhu, Hao Yang, Selvam Mathi,* Guanhua Zhang,* Zhongmin Wang and M.-Sadeeq Balogun*



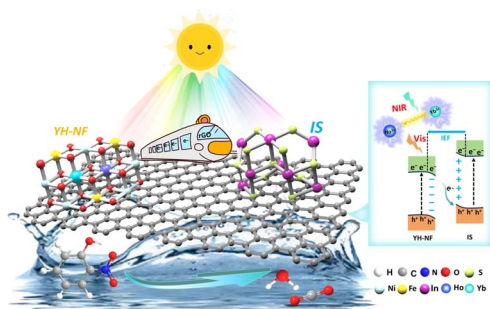
19482

Interface-engineered melt-spun BiSbTe for multiscale phonon scattering and enhanced thermoelectric performance

Yae Eun Park, Hyunjin Han, Sung-Jin Jung, Junwoo Song, Jino Kim, Jungwon Na, Kwangjoo Kim, Insub Lee, Hoon Wee, Joonhyun Lee, Sungjun Yang, Seungki Jo, Ho Seong Lee, Tae Joo Shin, Youngdeog Koh* and Jae Sung Son*



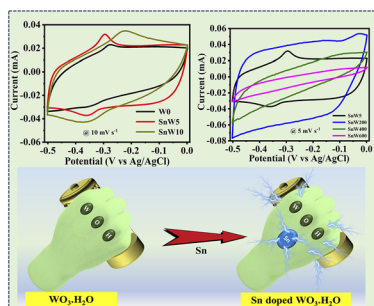
19490



Yb/Ho co-doping and rGO bridging enhance visible-to-NIR-light-driven photocatalysis in an S-scheme heterojunction

Piaopiao Wu, Lijia Xie, Weiya Huang,* Liqing Li, Kai Yang and Xianqiang Xiong*

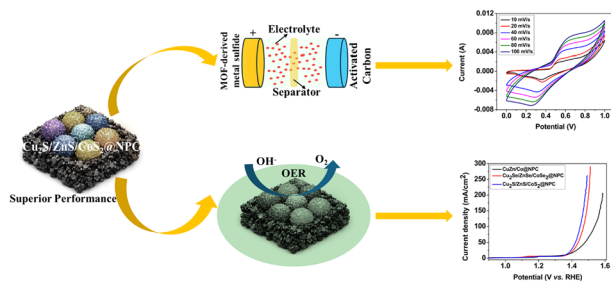
19505



Tuning the electrochemical properties of tungsten oxide nanoplates *via* Sn doping and mixed-phase formation for superior quasi-solid-state asymmetric supercapacitors

Harishchandra S. Nishad, Rajesh R. Jaiswar, Diwakar Singh, Shekhar Bhame, Shashikant P. Patole and Pravin S. Walke*

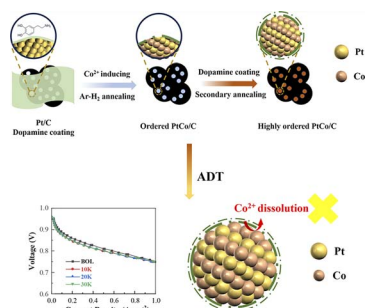
19518



MOF-derived chalcogenides multifunctional heterostructure materials for high-performance supercapacitor and oxygen evolution reaction catalytic activity

Muhammad Nasir Hussain,* Nesrin Bugday, Stephen G. Hickey, Umair Shamraiz, Christopher A. Howard, Xiaobo Ji and Sedat Yaşar*

19534



Dual confinement strategy for Pt–Co intermetallic electrocatalysts with superior durability in proton exchange membrane fuel cells

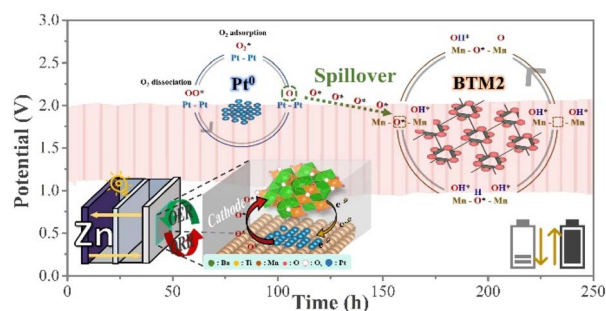
Shuoyao Yin,* Yuankai Shao, Weikang Zhu, Bingjie Zhou, Lingwei Meng, Anqi Dong and Zhenguo Li*



19542

Structure-dependent electronic modulation of Pt on perovskite surfaces: bifunctional oxygen catalysts for rechargeable Zn–air batteries

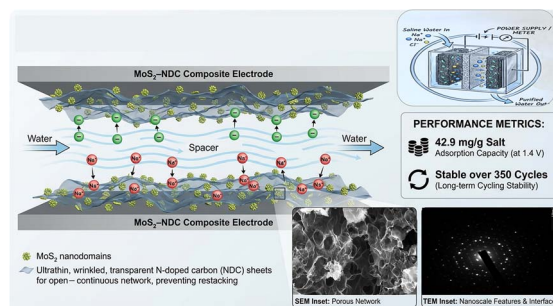
Boyeon Kim, Kyeongwon Han, Yuri Ko, Chanmin Lee* and Yukwon Jeon*



19552

Ultrathin MoS₂-decorated N-doped carbon with hierarchical porosity for high-capacity, low-energy capacitive deionization with outstanding cycling stability

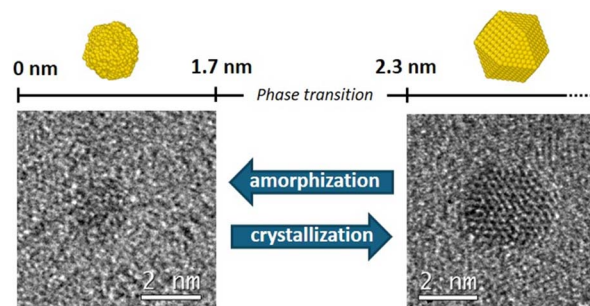
Mai A. Hassan, Manar M. Taha, Gehad Hamdy, Fatma A. Taher and Nageh K. Allam*



19569

Size-dependent amorphous–crystalline phase transitions in ultra-small gold colloids

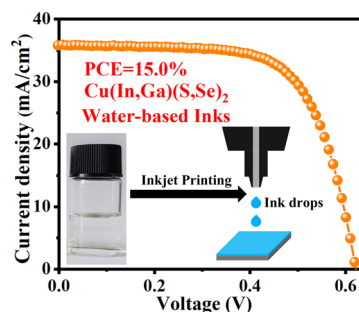
Vinavadini Ramnarain, Adrien Moncomble, Maxime Moreaud, Ricardo Gatti, Romain Moreau, Guillaume Wang, Christian Ricolleau, Jaysen Nelayah, Nathaly Ortiz Peña, Alexandre Gelabert, Hakim Amara and Damien Alloyeau*



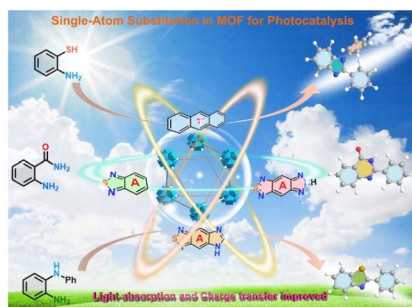
19576

Water-based inks for inkjet-printed Cu(In, Ga)(S, Se)₂ thin film solar cells with a power conversion efficiency of 15%

Bowen Liu, Dongdong Shen, Zhuoer Deng, Chunyi Li, Xinan Shi,* Bingsuo Zou* and Daocheng Pan*



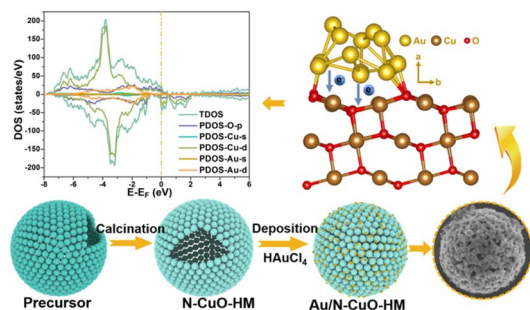
19586



Benzothiadiazoles incorporated in a metal–organic framework for improved photocatalysis in azacycle synthesis

Hua Liu, Lang Liu,* Yu-Feng Zhang, Ya-Xin Sun and Yi-Ming Liu*

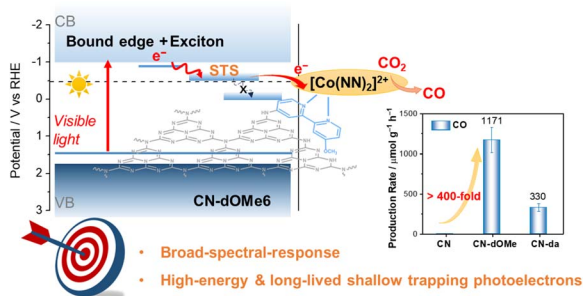
19592



Au-decorated hollow CuO with modulated electronic structure for efficient electrocatalytic glucose oxidation

Yan Yang, Hao Chen, Jiahui Ding, Yonghui Shao, Yanjie Fu, Yunrui Huang, Xiaodi Liu,* Bicheng Zhu and Jadranka Travas-Sejdic*

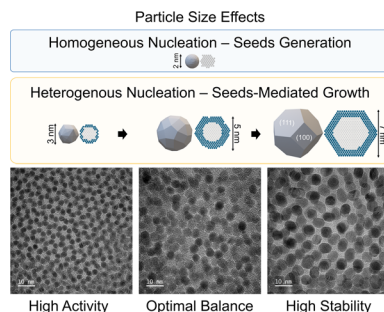
19602



Deciphering carrier thermodynamics and kinetics manipulation in the molecular engineering of graphitic carbon nitrides for improved visible-light-driven CO₂ reduction

Ying Zhang* and Jingxing Li

19613



High-precision synthesis and electrochemistry of Pt nanoparticles

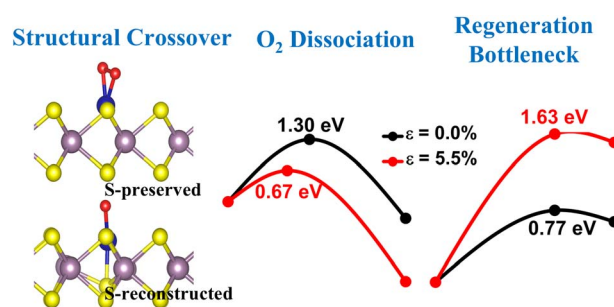
Chaewon Lim, Alasdair R. Fairhurst, Minki Jun, Filip Mackowicz, Sanshray Dutta, Katya Poliektova, Dominik Haering and Vojislav R. Stamenkovic*



19620

Trade-off between O₂ activation and active-site regeneration on biaxially strained Co-doped MoS₂ monolayers: a density functional theory study

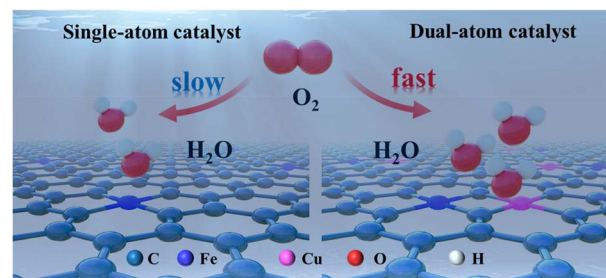
Soon-Dong Park and Sung Youb Kim*



19632

Asymmetric electronic coupling in Fe–Cu dual-atom sites enables accelerated oxygen electrocatalysis for high-performance Zn–air batteries

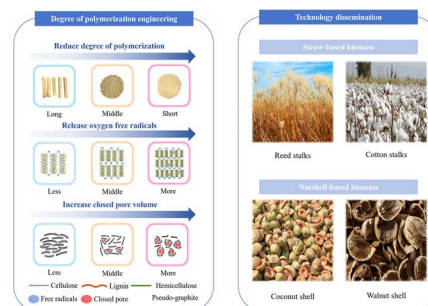
Ze Lv, Yang Qiu, Jiawei Luo, Zheng Shu, Kaibing Xu, Linping Zhang, Hong Xu and Zhiping Mao*



19642

Precursor degree of polymerization engineering to understand the sodium storage behavior of closed pores in hard carbon

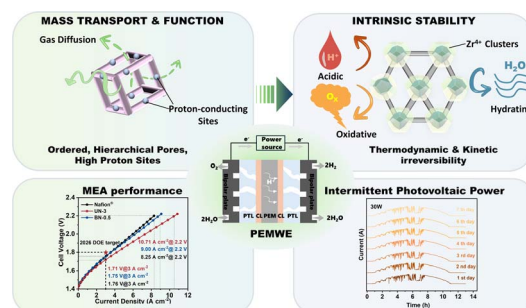
Haojie Du, Lu Zhou, Rucan Chen, Lei Zhang,* Xueyi Guo, Qinghua Tian, Qimeng Wang,* Hui Tong and Shuo Wang



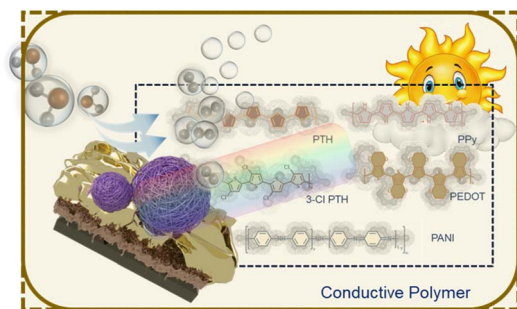
19655

A stability-directed dual-filter strategy for MOF electrolytes to achieve durable high-power PEM water electrolysis under dynamic operation

Ruiyao Yu, Yan Xu, Yali Li, Shilin Ling, Yiqun Fan* and Xiaoyan Luo*



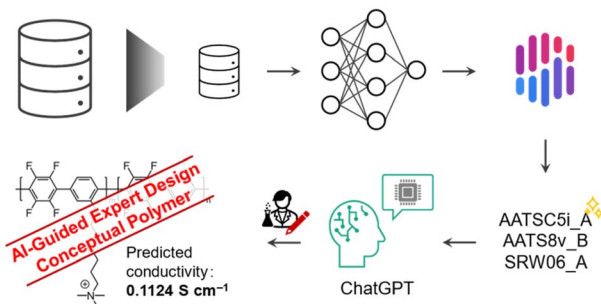
19665



Engineering a buried interface using a conductive polymer to mediate carrier behavior for efficient Solar-driven water splitting on a Si-based photocathode

Ying Qiang, Xiyang Fu and Yongjian Jia*

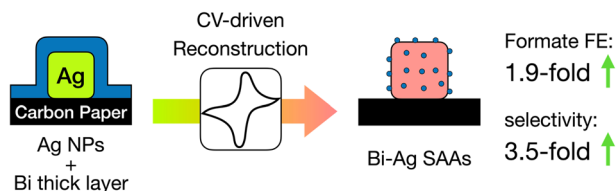
19675



Orchestrating explainable AI, ChatGPT, and human expertise: a framework for extracting polymer design guidelines

Yin Kan Phua, Nana Terasoba, Manabu Tanaka, Tsuyohiko Fujigaya* and Koichiro Kato*

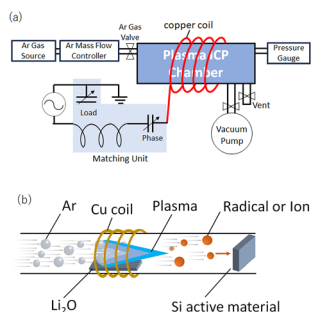
19694



Cyclic voltammetry driven Bi–Ag single-atom alloy electrocatalysts for enhanced CO₂-to-formate conversion

Yongsu An, Sunglun Kwon, Young Heon Kim, Chan Woo Lee* and Duk-Young Jung*

19705



ICP-assisted pre-lithiation of silicon thin-film electrodes for achieving high initial coulombic efficiency for lithium-ion batteries using inductively coupled plasma for lithium impregnation

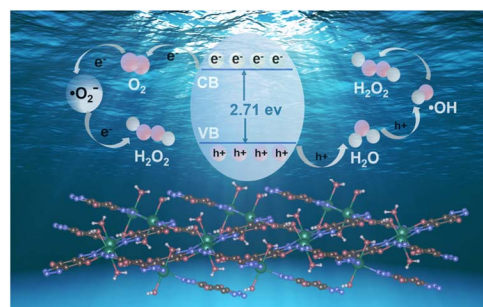
Norihiro Shimoi,* Tatsuyuki Sato and Masae Komatsu



19717

Nanocrystallization of triazolate-based metal–organic frameworks boosting photocatalytic hydrogen peroxide production

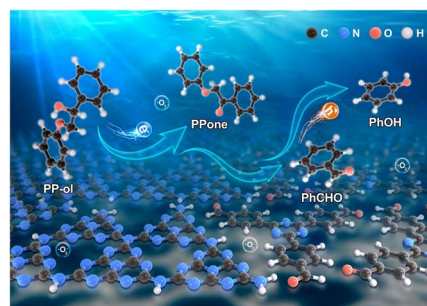
Shujun Xing, Rundong Chen, Yuan Gu, Huimin Cheng, Chenxi Li, Kun Fan,* Bingquan Xia, Shantang Liu* and Chengliang Wang*



19726

Molecularly modulated π -conjugated carbon nitride heterojunctions for efficient photocatalytic C–C bond cleavage in lignin models

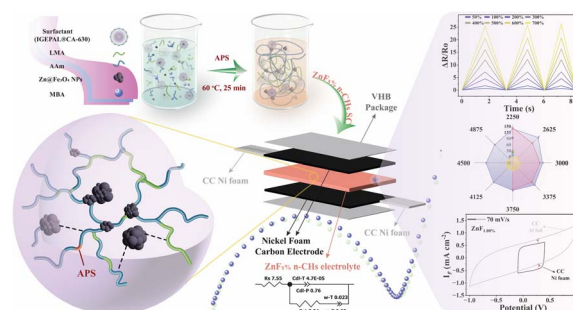
Gelan Wang, Peihe Li,* Chen Chen, Na Liu, Ye Lu, Shuai Zhu, Limei Duan, Yuliang Li, Sarina Sarina and Jinghai Liu*



19736

Ionically engineered Zn@Fe₃O₄ nanocomposite hydrogels with stretchable mechanics and high-performance electrochemical storage for wearable supercapacitors and strain sensors

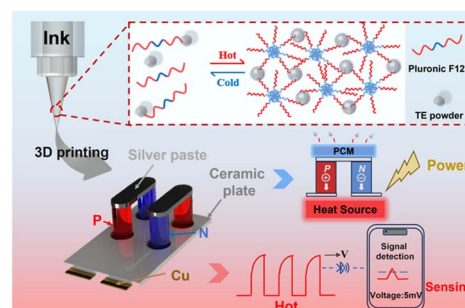
Azaz Ali Khan, Ibrar Ahmad, Daixin Ye and Luqman Ali Shah*



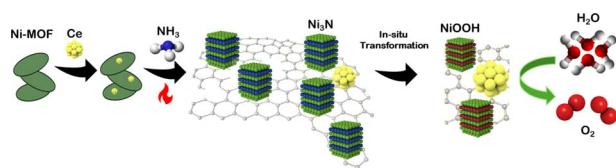
19752

3D-printed Bi₂Te₃-based thermoelectric devices with phase-change heat sinks: toward efficient energy harvesting and ultra-fast temperature sensing

Jian Song, Gong-Peng Cui, Chang-Ping Feng,* Zheng-Ting Song, Chen-Yu Zhang, Hong-Bo Lan, Hong-Jing Shang* and Fa-Zhu Ding*



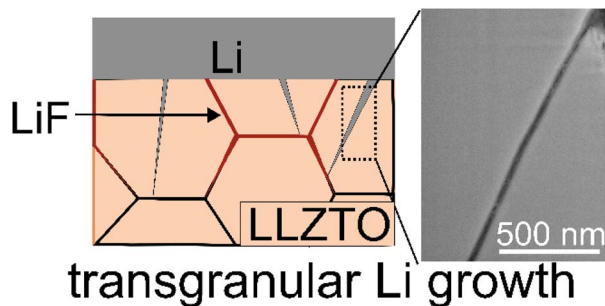
19762



Cerium-doping and nitridation effects on nickel-based metal organic frameworks for alkaline water oxidation

Chikaodili E. Chukwunke, Kenta Kawashima, Tran Phuoc Anh Nguyen, Gabriella Ruiz, Johnpaul Smith, Raul A. Marquez, Jay T. Bender, Jing Lian Ng, Xun Zhan, Wennie Wang, Delia J. Milliron, Michael J. Rose and C. Buddie Mullins*

19774



Intergranular to transgranular lithium filamentation in a garnet solid-state electrolyte

Ajeet Kumar Rana, Kaustubh G. Naik, Bairav S. Vishnugopi, Sayan Ghosh, Sohan Maity, Rohit Raj, Syed Shaheer Tanveer, Partha P. Mukherjee and Naga Phani B. Aetukuri*

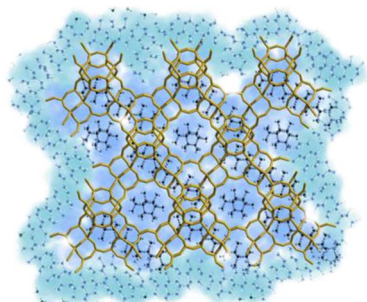
19784



Developing a series of calcium-doped pyrochlore iridates for the oxygen evolution reaction in PEM water electrolysis

Felix Kerner, Kohei Miyazaki and Daniel Schröder*

19794



Lattice vs. surface water: correlation between the proton conductivity and microstructure of faujasite zeolites upon water adsorption

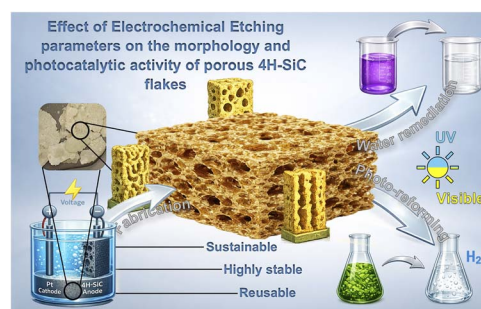
Glorija Medak Spahić,* Marko Dunatov, Jan Marčec, Josip Bronić, Andreas Puškarić and Lidija Androš Dubraja*



19803

Effect of electrochemical etching parameters on the morphology and photocatalytic activity of porous 4H-SiC flakes

Vanessa Spanò, Matteo Barcellona, Angelo Ferlazzo, Marcello Condorelli, Luca Calantropo, Roberto Fiorenza, Salvatore Scirè, Antonino Gulino, Thomas Defforge, Gaël Gautier and Maria Elena Fragalà*



19815

Development of high-performance deicing coatings through engineered weak interfacial domains

Zhile Han, Xinchun Tian,* Yipeng Peng,* Linchuan Tian, Jingyi Tu, Jiangnan Liu, Wei Sun, Zhaowen Xu, Dong Wang and Zhuang Ma

