

Journal of Materials Chemistry A

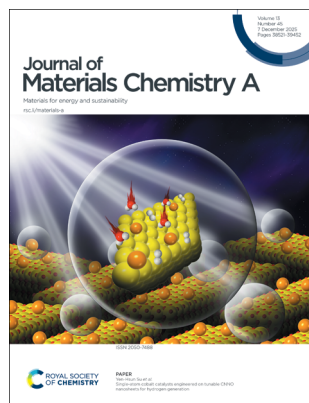
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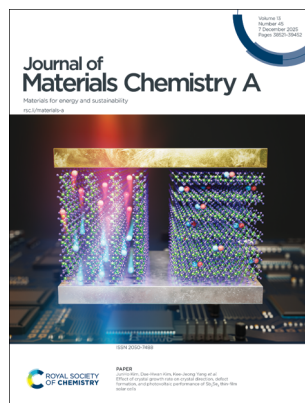
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See Yen-Hsun Su *et al.*, pp. 38807–38818. Image reproduced by permission of Yen-Hsun Su from *J. Mater. Chem. A*, 2025, **13**, 38807.



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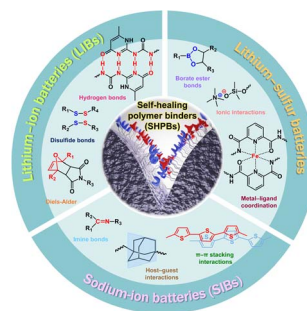
See JunHo Kim, Dae-Hwan Kim, Kee-Jeong Yang *et al.*, pp. 38819–38828. Image reproduced by permission of Kee-Jeong Yang from *J. Mater. Chem. A*, 2025, **13**, 38819.

REVIEWS

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Self-healing polymer binders: next-generation battery applications

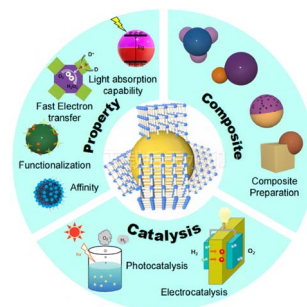
Van-Phu Vu, Hye-Mi So, Areum Kim, Jin Young Lee, Minsub Oh* and Seungmin Hyun*



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Engineering asymmetric MOF composites toward high-efficiency catalytic reactions

Hang Li, Xiaohan Huang, Yuchen Wang, Fangyu Jiao, Yongqi Luo, Yingyu Zhou, Fengwei Huo and Suoying Zhang*



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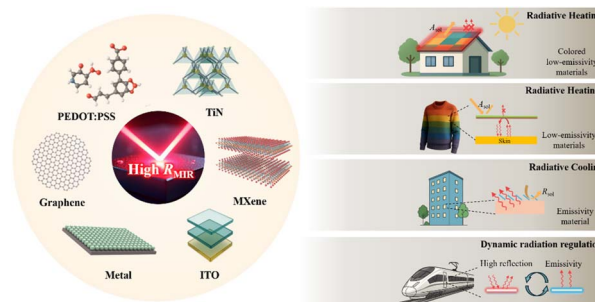
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REVIEWS

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Opaque, transparent, and colored low-emissivity materials for mid-infrared thermal management

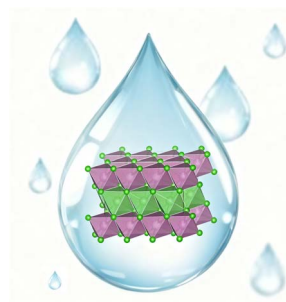
Shihao Cheng, Hanyuan Zhang, Ziyuan Zhu, Shutong Qin, Linai Zhou, Yuqi Wei, Weilin Xu, Jun Wan* and Bin Hu*



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Humidity stability of halide solid-state electrolytes

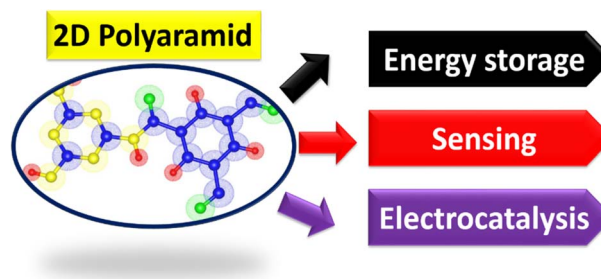
Tiancai Ren, Xingyu Chen, Haochang Zhang, Hao Zhang* and Wei Xia*



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A newly synthesized 2D polyaramid: structure, properties, and applications in energy storage, electrocatalysis, and sensing

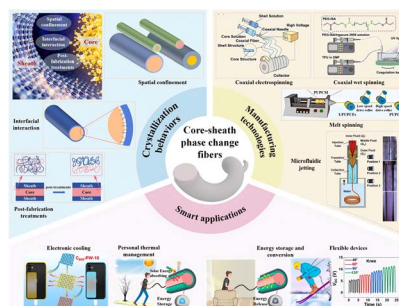
Manikandan Kandasamy, Tuya Dey, Amreetha Seetharaman, Jagadish Chandra Mahato and Brahmananda Chakraborty*



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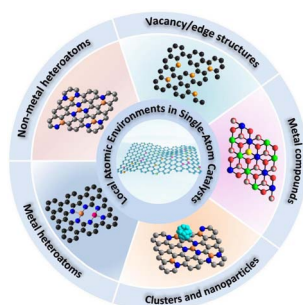
Engineering core–sheath phase change fibers for thermal energy storage: fundamentals, fabrication, and smart applications

Shuo Wang, Ruifan Wang, Xinran Zhang, Yucheng Li and Hao Ma*



REVIEWS

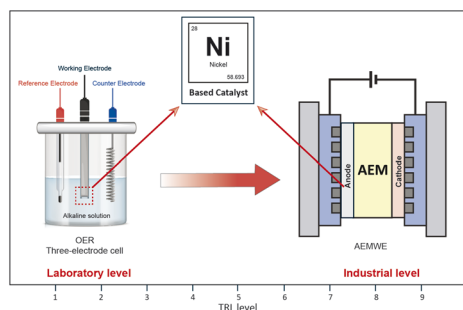
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Atomic-level environment engineering in carbon-based single-atom catalysts: a review of theoretical insights for hydrogen evolution and triiodide reduction

Rou Feng, Menglong Sun, Tianxiang Yang, Zechang Liu and Sining Yun*

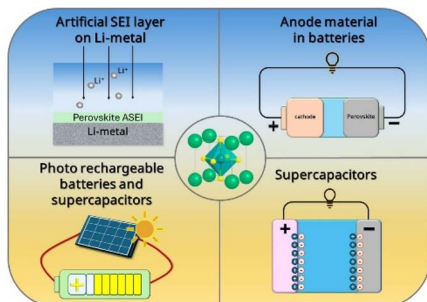
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Recent advances in nickel-based anodes for anion-exchange membrane water electrolyzers

Delvin George and Ramesh K. Singh*

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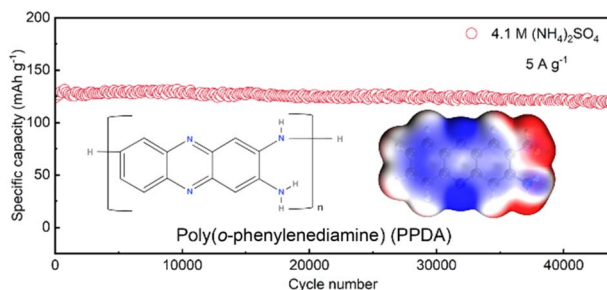


Exploring metal halide perovskites as active architectures in energy storage systems

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Decoding aromatic diamine polymer for highly stable aqueous ammonium-ion storage with multiple redox-active sites

Ying Yang, Hang Ren, Zeyu Cao, Guoyin Zhu, Yizhou Zhang, Laifa Shen and Shengyang Dong*

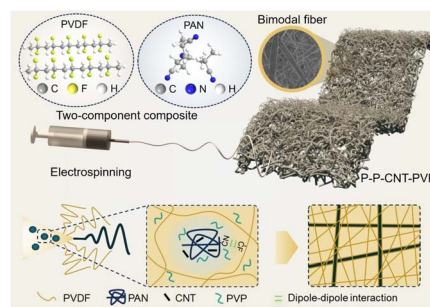


COMMUNICATIONS

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Optimizing membrane structure through interfacial instability of a two-component system to increase mechanical and separation performance

Xin Zhong and Zhiguang Guo*

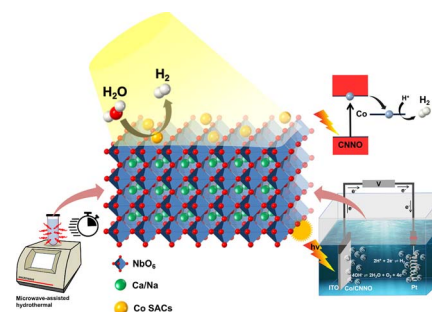


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Single-atom cobalt catalysts engineered on tunable CNNO nanosheets for hydrogen generation

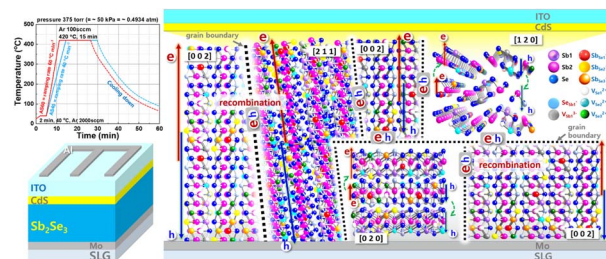
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Effect of crystal growth rate on crystal direction, defect formation, and photovoltaic performance of Sb_2Se_3 thin-film solar cells

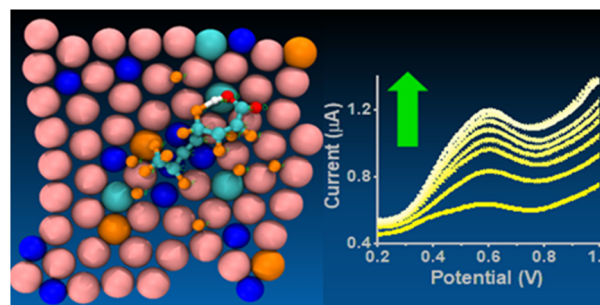
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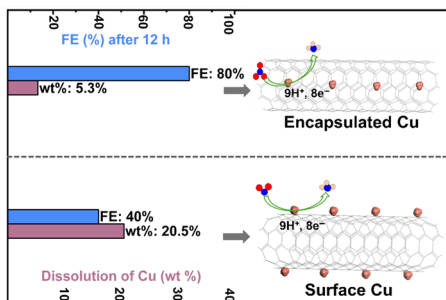
Ultrasensitive detection of forever chemical perfluorooctanoic acid using two-dimensional aluminum quasicrystal

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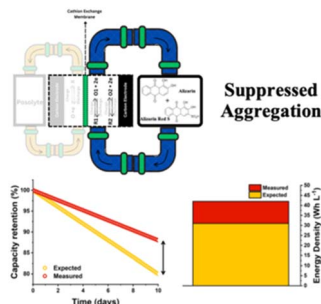


Xinyuan Chen, Yulu Wan, Yue Yu, Shangqing Chen,
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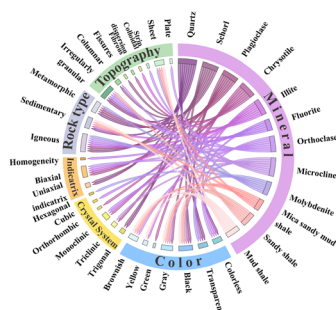
Stabilizing copper nanoparticles for electrochemical nitrate reduction *via* encapsulation inside carbon nanotubes

Tamilselvi Gurusamy, Thomas D. Pope, Samuel F. Wenzel,
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Enhanced solubility and stability of active species in flow battery electrolytes *via* suppressed anthraquinone aggregation

Meysam Maleki and Marc-Antoni Goulet*



Deep learning spectral infrared digital holography for phase analysis of shale characterization

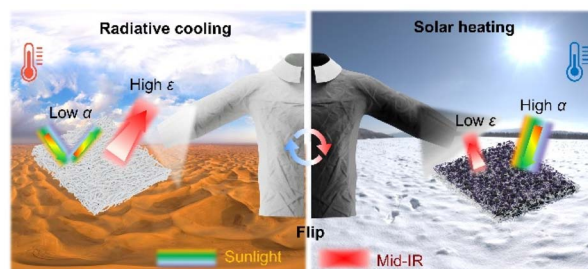
Xinyu Li, Haochong Huang,* Zhiyuan Zheng
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An electrospinning flexible textile integrating radiative cooling and solar heating for dynamic thermoregulation

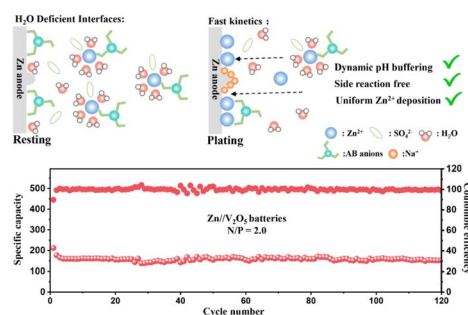
Rui Zhang, Yuting Li, Baojian Yao and Meijie Chen*



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Boosting the practical applications of zinc-ion batteries via zwitterion-mediated solvation and interfacial chemistry

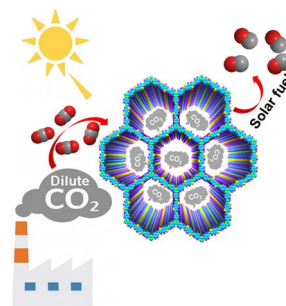
Xiaobin Wu, Shuang Zhang, Yimin Yang, Ying Wang,* Qinghong Wang and Chao Lai*



38898

Photochemical reduction of low concentration CO₂ to solar fuel in a metal free 2D-covalent organic framework

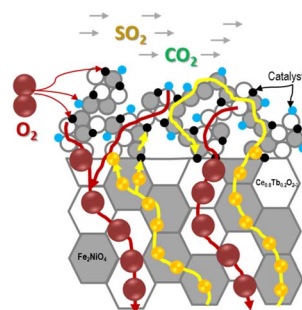
Sandip Biswas, Souvik Mondal, Faruk Ahamed Rahimi, Anupam Dey, Jatin Chauhan and Tapas Kumar Maji*



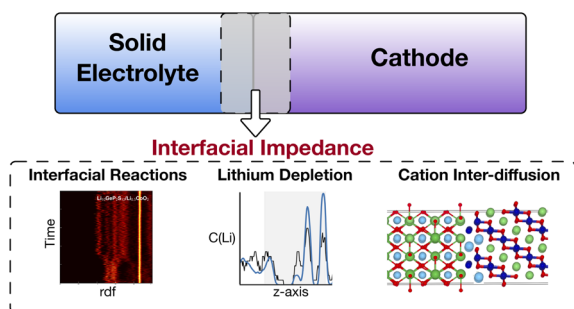
38908

Maximizing oxygen permeation via catalytic functionalization under oxyfuel conditions

Laura Almar, Julio Garcia-Fayos, Rian Ruhl, Laura Navarrete, Maria Balaguer, Marwan Laqdiem, Jong Hoon Joo, Henny J. M. Bouwmeester and José M. Serra*



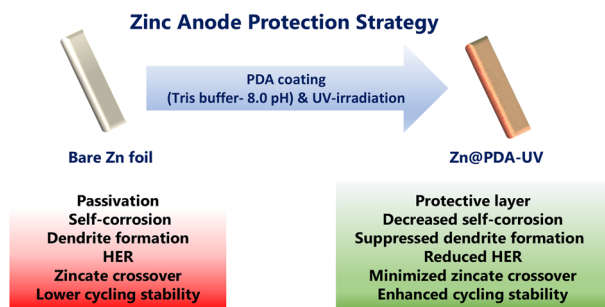
38919



Kinetic analysis of cathode-solid electrolyte interface in all-solid-state batteries

Xingyu Guo*

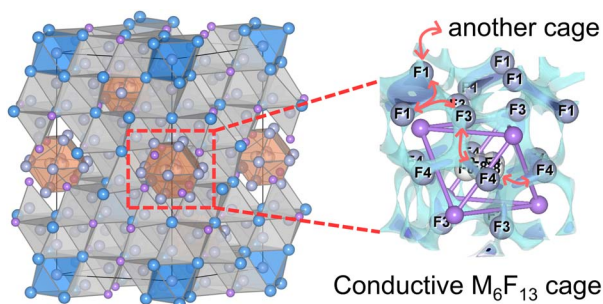
38928



UV-modified polydopamine zincophilic protective layer for durable and alkaline-stable zinc anodes in zinc-air batteries

Maria Kurian, Ajmal Pandikassala and Sreekumar Kurungot*

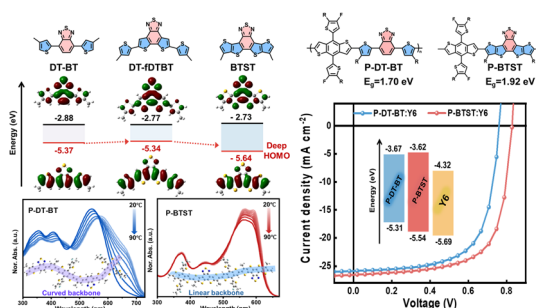
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Fluoride-ion conduction in $\text{Ba}_4\text{M}_3\text{F}_{17}$ ($\text{M} = \text{Bi}^{3+}, \text{Y}^{3+}$) with conductive M_6F_{13} cage units

Chengchao Zhong,* Saya Hirakawa, Keiji Shimoda, Ken-ichi Okazaki and Yuki Orikasa*

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Linear fused-ring donor polymer with suppressed aggregation and a deep HOMO level for efficient organic solar cells

Meng Qiang Li, Yifan Yu, Shabaz Alam, Kyu Chan Song, Seoju Yang, Sang Shin Park, Dong-Won Kang, Sungyun Son, Hyungju Ahn, Minsoo P. Kim, Jung Won Yoon,* Hyosung Choi* and Jaewon Lee*

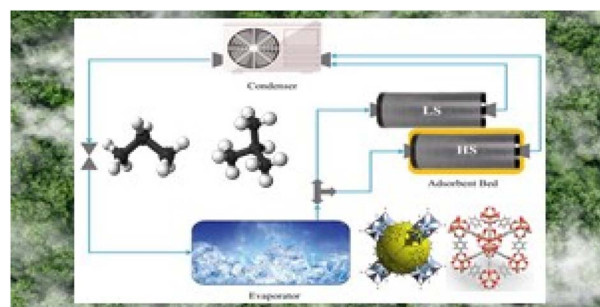


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Exploring cascaded adsorption cooling cycles with MOF-hydrocarbon integration: an accelerated computational framework using Bayesian optimisation and Monte Carlo simulations

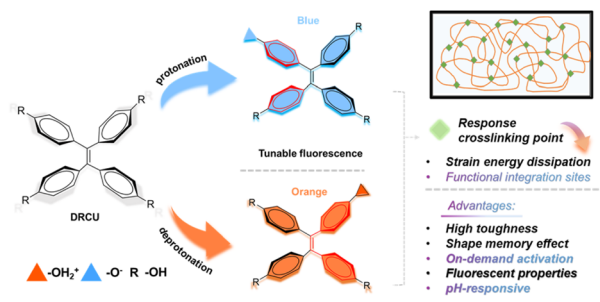
S. Muthu Krishnan and Jayant K. Singh*



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Dynamic response crosslinking units endow polyurethane elastomers with synergistic mechanical robustness, multiphase pH sensing capability, and recyclability for sustainable environmental monitoring

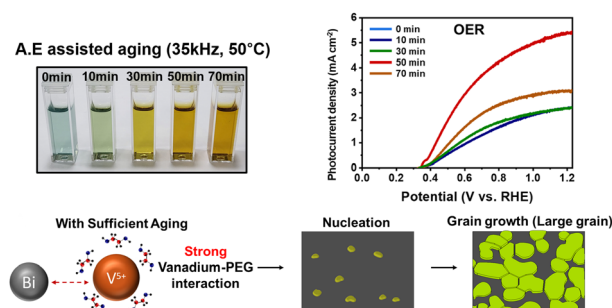
Yanlong Luo,* Qingchuang Lu, Wentong Gao, Wu Cai, Fengping Shuai, Zhenyang Luo and Cheng-Hui Li*



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Control of crystallization dynamics *via* vanadium–polyethylene glycol interactions toward high-performance BiVO₄ photoanodes

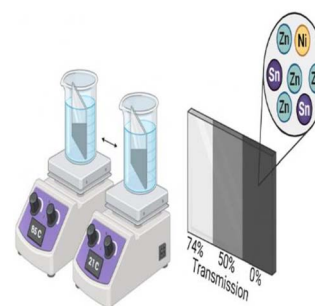
Jihong Min, Donggu Kim, Hyewon Park, Jinwoo Chu, Nakyung Kim, Gihun Jung, Choongman Moon, Chang Hyun Kim, Yungi Nam, Sungbin Yang, Jeong Young Park and Byungha Shin*



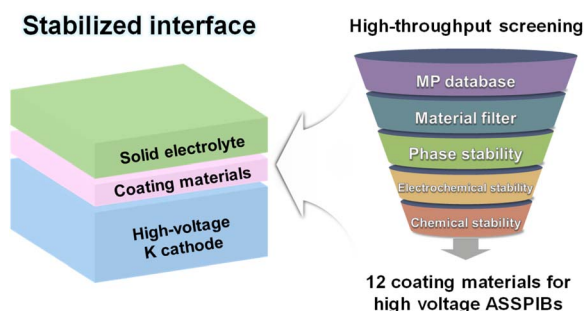
39001

Zinc alloy dynamic windows with excellent cyclability and thermal stability

Nikhil C. Bhoumik, Samantha M. Thompson, Tyler S. Hernandez and Christopher J. Barile*



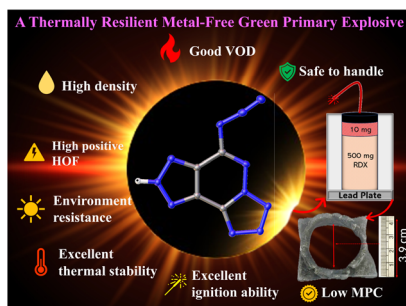
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Rational materials design for stable interfaces in all-solid-state potassium-ion batteries

Sooyeon Kim,^{*} Myeongcho Jang and Seungho Yu^{*}

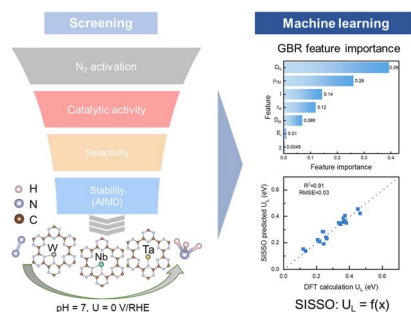
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A thermally resilient high-performing metal-free primary explosive

Sonali Kukreja, Abhishek Kumar Yadav and Srinivas Dharavath^{*}

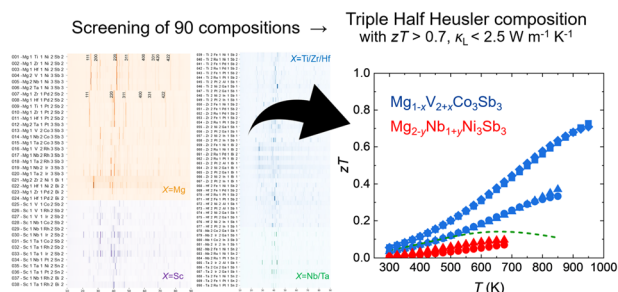
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Charge-state-regulated transition metal doped g-C₃N₃ for the electrochemical nitrogen reduction reaction: defect physics and constant potential study

Chengwei Yang, Chao Yang, Hongxia Yan, Guixian Ge,^{*} Wentao Wang^{*} and Pengfei Ou^{*}

39042



Achieving high thermoelectric performance of triple half-Heusler compositions enabled by high-throughput screening

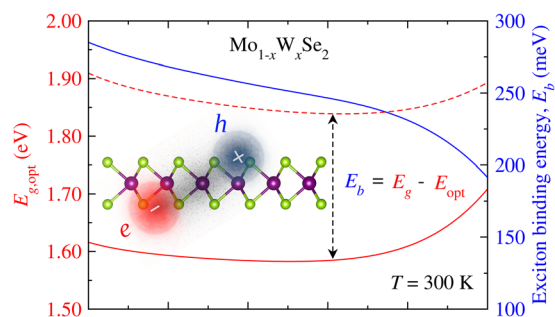
Kazuki Imasato,^{*} Haruhiko Morito, Hidetoshi Miyazaki, Fumikazu Hosono, Philipp Sauerschnig, Masanobu Miyata, Takao Ishida, Atsushi Yamamoto, Yukari Katsura and Michihiro Ohta



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First-principles statistical investigation of thermodynamic behavior with excitonic effects in $\text{Mo}_{1-x}\text{W}_x\text{Se}_2$ alloys through a data-driven workflow approach

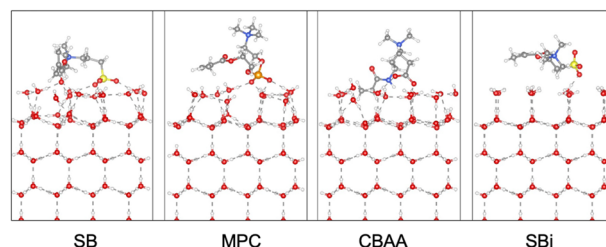
Carlos Maciel de O. Bastos,* Alexandre C. Dias,* Ana Carolina Ferreira de Brito, Ingrid D. Barcelos, Andréia Luisa da Rosa, Danilo Neves Silveira, Maurício J. Piotrowski, Wolfgang Wenzel, Celso R. C. Rêgo and Diego Guedes-Sobrinho*



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Ab initio investigations of zwitterionic polymers and their interactions with water and ice

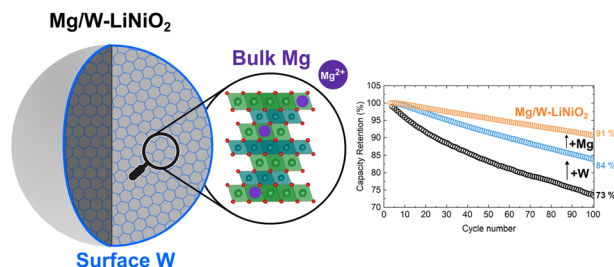
Sara A. Tolba, Tamalika Ash and Wenjie Xia*



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Enhanced cycling stability of LiNiO_2 cathodes through a Mg/W dual-cation modification strategy

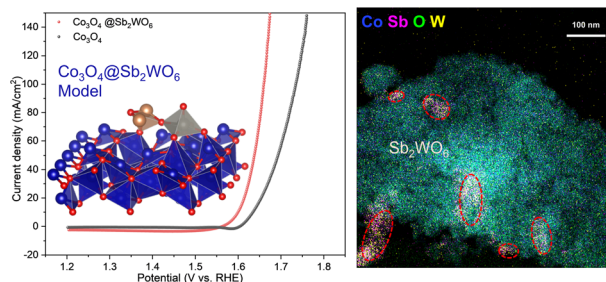
Beth I. J. Johnston,* Satish Bolloju, Stephen W. T. Price, Alexander G. Squires, Lavan Ganeshkumar, Muhammad Ans, James A. Gott, Narayan Simrit Kaur, Innes McClelland, Samuel G. Booth, Andrew M. Beale, Simon D. M. Jacques, Ashok S. Menon, David O. Scanlon, Louis F. J. Piper and Serena A. Cussen*



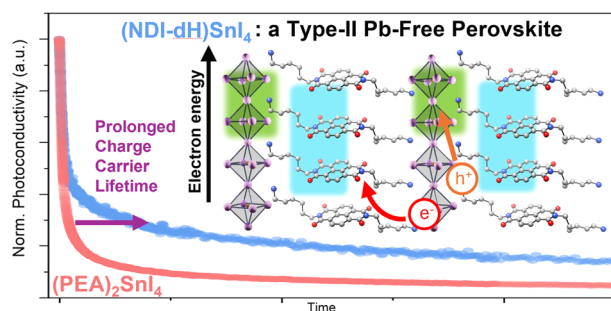
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Sb_2WO_6 modulated Co_3O_4 with preferential adsorption enables efficient acidic oxygen evolution at low cost

Sanjiang Pan,* Sheng Tan, Zishuo Xie, Shenao Wang, Yang Fu and Desong Wang*



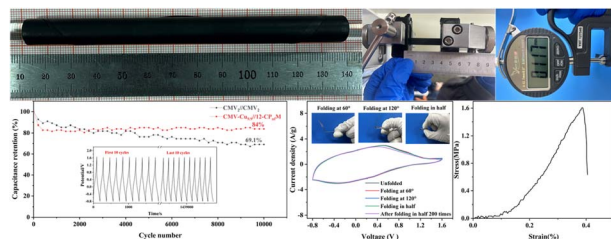
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Semiconducting divalent organic spacer-assisted charge transport in lead-free layered perovskites

Waygen Thor, Louise De Cian, Nicolas J. Diercks, Dennis Friedrich, Jun-Ho Yum* and Kevin Sivula*

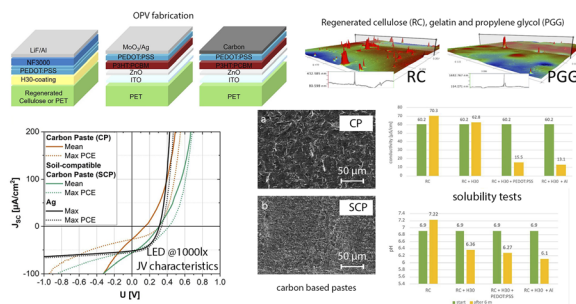
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Electrochemical properties of superflexible CNTs/MXene/Cu-doped V₂O₅ buckypaper electrodes and wide-voltage all-solid-state supercapacitors

Yanzhi Cai,* Shaoxiong Ren, Laifei Cheng, Siyu Guo, Yibing Yuan, Mingxing Chen, Zixuan Yu, Xue Huang, Yalong Chai and Yuzhao Ma

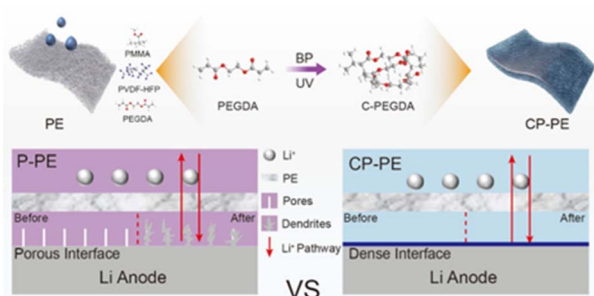
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Sustainable materials for organic photovoltaic devices towards transient electronics in digital agriculture

Beata Synkiewicz-Musialska,* Kaisa-Leena Väisänen, Marja Välimäki,* Kiranmai Uppuluri, Maria Smolander, Krzysztof Szostak and Liisa Hakola

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Semi-interpenetrating network polymer electrolytes with increased mechanical robustness and ionic conductivity for stable lithium metal batteries

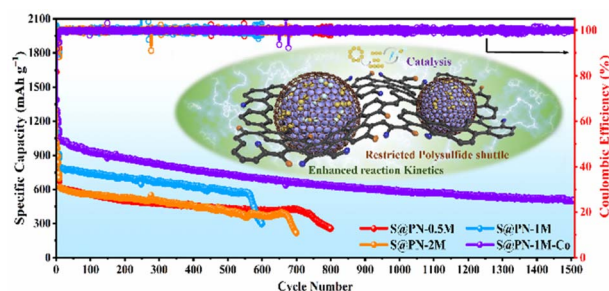
Zewen Sun, Shiyi Wang, Xiaoyun Zhan, Xinhai Yuan, Lili Liu,* Lijun Fu, Yuhui Chen, Yuan Ma, Tao Wang* and Yuping Wu*



39150

Graphitic carbon cage structure encapsulating cobalt nanoparticles in nitrogen-doped biomass-derived carbon materials enables high-performance sodium–sulfur batteries

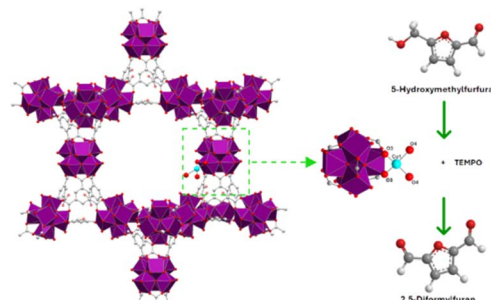
Minghui Zhang, Shengrui Cui, Youjun Xing, Kang Dong, Haoran Li, Yilian Song, Yukui Wang, Dingyi Yu, Zengqi Zhang,* Seung-Taek Myung* and Yongcheng Jin*



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Catalytic oxidation of 5-hydroxymethylfurfural to 2,5-diformylfuran using MOF-808(Cu) under near ambient conditions

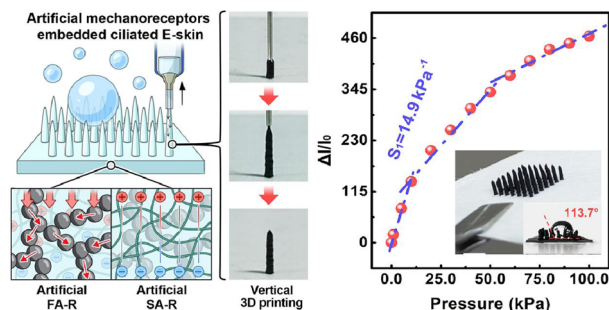
Fabio Raspante, Xiang Zhou, Donald R. Inns, Nusik Gedikoglu, Muralidharan Shanmugam, Adam Brookfield, Alexandros P. Katsoulidis and Matthew J. Rosseinsky*



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Multiple artificial mechanoreceptor-embedded waterproof ciliated E-skin via direct-ink-writing vertically 3D printing toward health management of seafarers

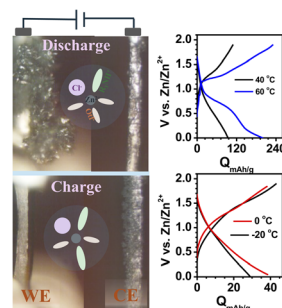
Chunlei Jiang, Zhe Yu,* Cairong Liu, Shaohao Wang, Tianhong Zhu, Junhao Shen, Zhuoyun Liu, Muxi Ai, Hengchang Bi and Wu Bin Ying*



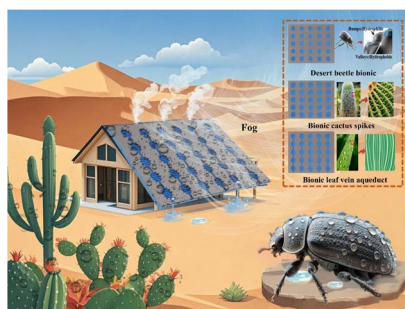
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Eutectic electrolytes enable dendrite-free and ultradurable zinc metal anodes for rechargeable zinc batteries

Raju Vadthya, Sergei Ivanov, Mohammed Radha Al Khazraji, Christabel Adjah-Tetteh, Bin Li and Shuya Wei*



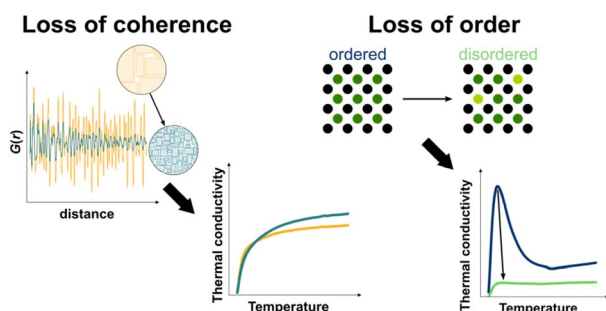
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Bioinspired multi-structured hybrid surfaces for directional droplet transport and ultra-efficient atmospheric water collection

Jing Zhao,^{*} Zijin Cheng, Jiangpeng Qu, Yujun Liu, Wenjun Wu, Pengcheng He and Jiliang Mo

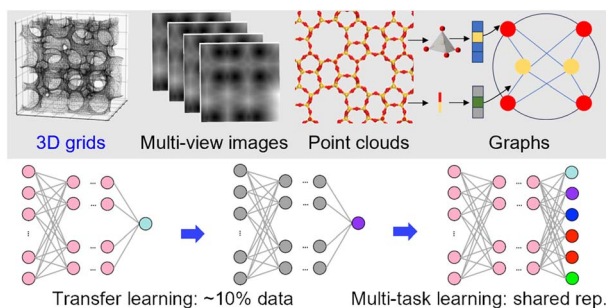
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Impact of structural coherence and disorder on the ionic transport and lattice dynamics in Li⁺-conducting argyrodites

Thorben Böger, Kyra Strotmann, Vasiliki Faka, Oliver Maus, Douglas L. Abernathy, Garrett E. Granroth, Niina H. Jalarvo, Cheng Li, Emmanuelle Suard and Wolfgang G. Zeier^{*}

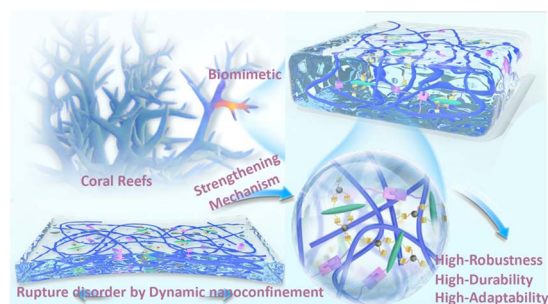
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Representation learning for long-chain hydrocarbon adsorption in zeolites

Yachan Liu, Ping Yang, Gustavo Perez, Aaron Sun, Wei Fan, Subhransu Maji^{*} and Peng Bai^{*}

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Nature-inspired dynamic nanoconfinement enables life-like mechanical adaptability and robust environmental resilience in polyurethane-urea elastomers

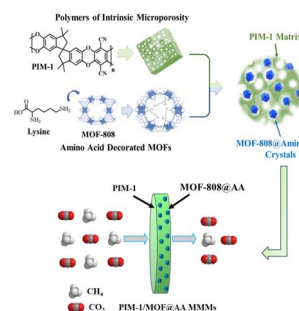
Hao Wu,^{*} Zhou Lu, Ming Jin, Junhao Xie, Jinqiu Tao, Chengjun Yue, Lei Dong and Qianping Ran^{*}



39254

Mixed matrix membranes of PIM-1 incorporating MOF-808 functionalized with amino acids for enhanced CO₂/CH₄ separation

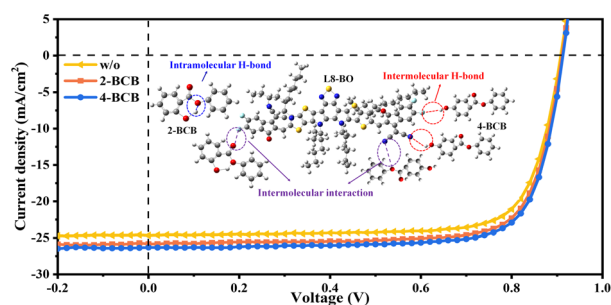
Dalia Refaat, Mohamed Yahia,* Harol David Martínez-Hernández, Monica Jimenez-Ruiz, Vanessa Galván, Viktor Petrenko, Roberto Fernández de Luis* and Joaquín Coronas



39271

Simultaneous morphology control and excited-state engineering in organic photovoltaics using volatile solid additives

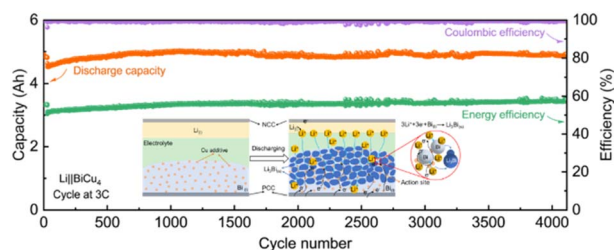
You-Dan Zhang,* Rong-Rong Liu, Bo-Yang Zhang, Xue Chen, Yan-Hua Zhang, Cheng-Long Wang and Hao-Li Zhang*



39279

Overcoming sluggish kinetics in bismuth electrodes via electronic networking enabling a 4000-cycle liquid metal battery

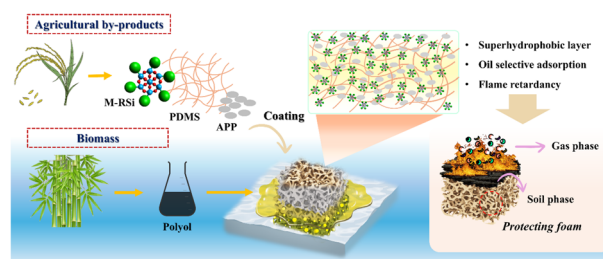
Yan Zhou, Cheng Yi and Xiaohui Ning*



39287

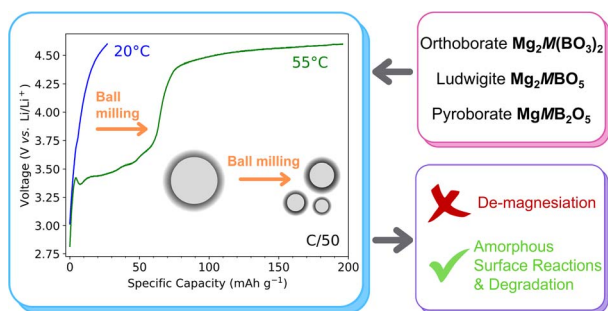
Nature-inspired foam for treating oil-polluted water with enhanced fire protection

Doan Q. Tran, Tuyet Minh Nguyen-Ha, Khoa T. D. Nguyen, Minh Phuong Nguyen-Hoang, Tuan An Nguyen, Tien Trung Vu, Jonghwan Suhr and DongQuy Hoang*



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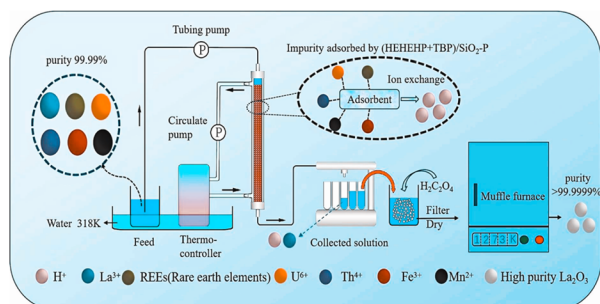
39301



Deciphering the origin of the high capacities seen in magnesium borate polyanion cathodes

Camilla Tacconis,^{*} Sunita Dey, Carson D. McLaughlin, Debashis Tripathy, Heather F. Greer, Shaoliang Guan, Iuliia Mikulska, Israel Temprano, Clare P. Grey and Siân E. Dutton^{*}

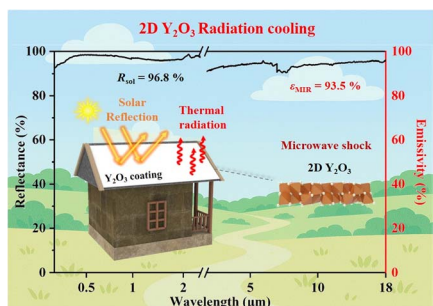
39315



Study on the efficient preparation of low radioactivity ultra-high purity lanthanum oxide (≥ 6 N) by a single chromatographic column using a phosphonic acid functional resin

Ming Huang, Shunyan Ning,^{*} Juan Liu, Lifeng Chen, Mohammed F. Hamza and Yuezhou Wei

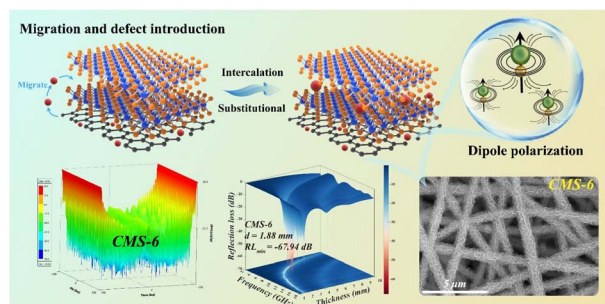
39330



Near-unity solar reflectance and mid-infrared transparency via microwave-engineered 2D Y_2O_3 for passive radiative cooling

Haoran Tian, Hanyuan Zhang, Ziyuan Zhu, Jiao Dai, Shutong Qin, Ruiyao Xu, Weilin Xu and Jun Wan^{*}

39340



Hierarchical multi-dimensional nanostructures enabled by Cu/Cu²⁺-doped MoS₂ with synergistic polarization–conduction loss for broadband electromagnetic wave absorption

Xianhan Shao, Hankun Wang, Yingzan Zhuang, Qin Guo, Hao Zhang, Tingxi Li^{*} and Yong Ma^{*}

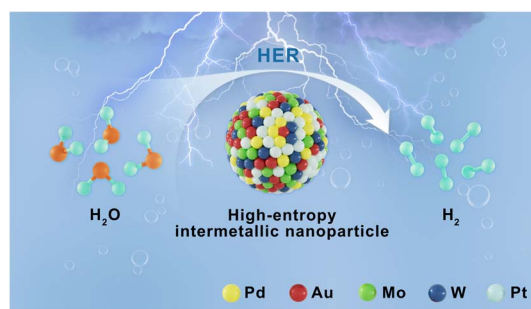


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39357

Tailoring platinum content in a PdAuMoWPt high-entropy alloy for efficient and durable hydrogen evolution across a broad pH range

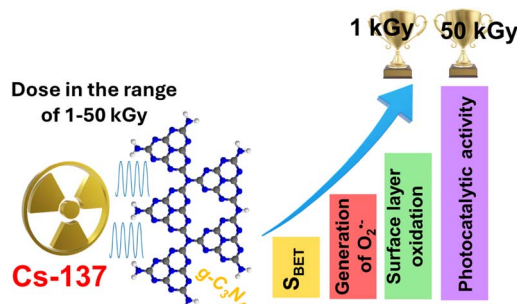
Liyi Pan, Qian Wang, Dongmei Huang, Xinhang Ma, Yao Qin, Qian Sun, Peng Xie, Shuangliang Zhao and Zengxi Wei*



39369

High-energy gamma photon engineering of g-C₃N₄: low dose rate radiation as a metal-free modification enhancing solar-driven photoactivity

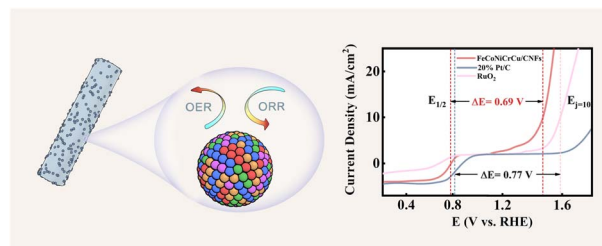
Patrycja Wilczewska,* Karol Szczodrowski, Natalia Górecka, Jacek Ryl, Beata Kalska-Szostko, Inna Soroka, Mats Jonsson and Ewa Maria Siedlecka



39382

High-entropy alloy self-supporting bifunctional electrocatalysts with exceptional performance for flexible zinc–air batteries

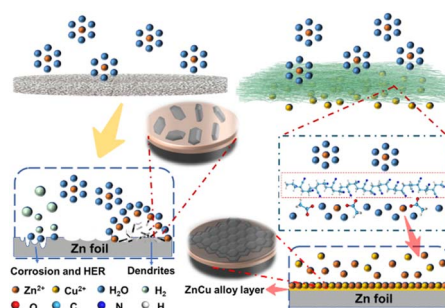
Lingli Xia, Peng Dai,* Cheng Qu, Zelin Yang, Haoran Zhen, Kaiwen Wang and Mingzai Wu*



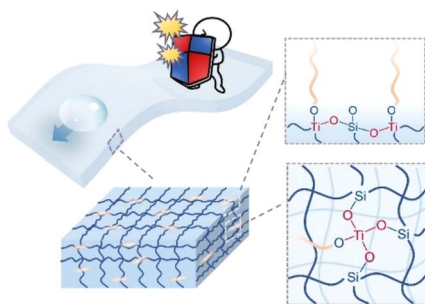
39393

Controllable ion-release separators: *in situ* engineering of zincophilic/hydrophobic interfaces and solvation regulation for durable Zn metal anodes

Yu Zong, Haichao Chen, Danyang Yu, Lu Wang, Yamei Liu, Xiaofan Tian, Lei Wang,* Kuikui Wang, Xin Ning and Xiaochuan Ren*



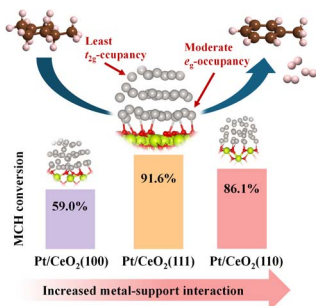
39404



Adaptive liquid-like surface coatings: balancing mechanical strength, optical clarity, and dynamic liquid repellency

Shouzheng Jiao,* Siying Guan, Chenshun Hu, Rongxue Xi, Jingjing Ren, Zhicheng Sun,* Qian Li,* Taolin Zhang, Rui Ma and Zhongjun Cheng*

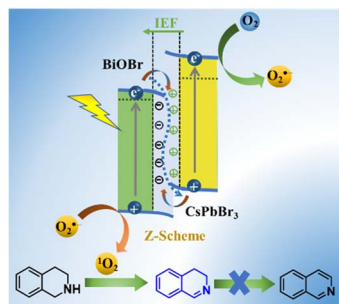
39414



Support-facet-mediated metal–support interaction regulation of Pt-based catalysts for efficient dehydrogenation

Ying Xu, Kang Xue, Furong Li, Chang Song, Minhua Ai, Zehao Han, Chengxiang Shi, Ruijie Gao, Zhen-Feng Huang, Xiangwen Zhang, Lun Pan* and Ji-Jun Zou*

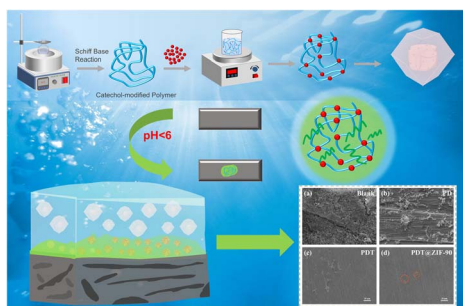
39426



Z-Scheme heterojunction formation between CsPbBr₃ and BiOBr: key to singlet oxygen formation for selective semidehydrogenation of tetrahydroisoquinoline

Vishesh Kumar, Sunil Kumar Patel, Shivali Dhingra, Deepak Kumar, Ved Vyas, Kamalakannan Kailasam,* E. Siva Subramaniam Iyer* and Arindam Indra*

39436



pH-responsive intelligent anticorrosion protection: catechol-driven organic–inorganic hybridization with TiO₂ and encapsulation by ZIF-90

Jianfeng Hu* and Huiyi Cheng

