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Journal of Materials Chemistry A

Materials for energy and sustainability

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See Nagendra Singh Chauhan and Takao Mori, pp. 32703–32711. Image reproduced by permission of Takao Mori from *J. Mater. Chem. A*, 2024, **12**, 32703.

Inside cover
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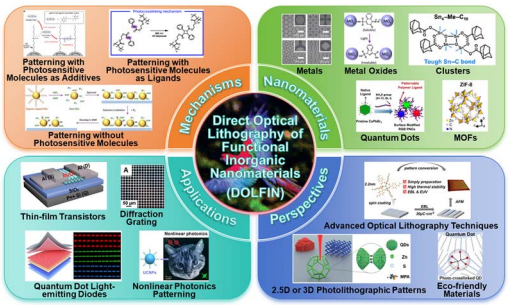
REVIEWS

32505

Advances in direct optical lithography of nanomaterials

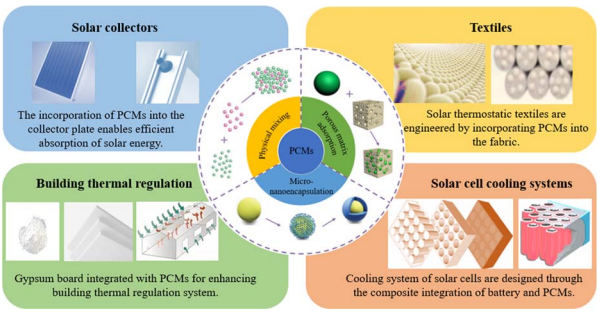
Yuelin Yang, Jie Guan, Nannan Zhang, Lin Ru, Yihao Zou and Yuanyuan Wang*



32526

Micro/nano encapsulated phase change material: materials, preparation, and emerging advances in the solar energy field

Qi Zhang,* Yanfang Li, Chongyang Liu, Xuehong Wu, Xueling Zhang, Jun Song, Yiqiu Mao and Kunjie Yuan*



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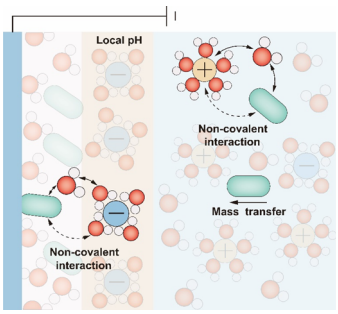
REVIEWS

32548

The ion effect on electrocatalytic oxidation reactions

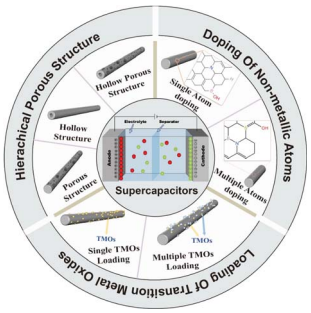
Shuangshuang Cha, Xueting Cao, Wei Du, Hanlin Jin, Yujia Liu, Ran Wang, Yizhou Yang, Bing Sun, Xuejing Yang and Ming Gong*



32566

Review of electro-spun carbon nanofiber electrode materials for electrochemical capacitors

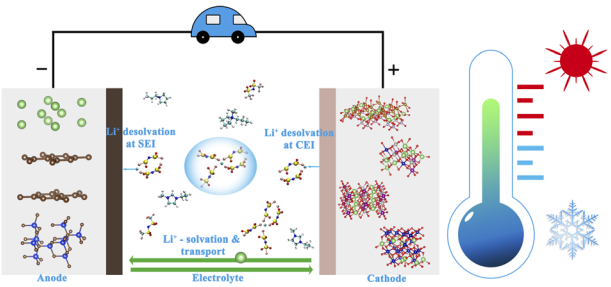
Yutian Peng, Xingyu Zhang, Ruiling Sun, Xunlong Zhang,* Can Ge* and Yuqing Liu*



32593

Electrode–electrolyte interphases in lithium-based rechargeable batteries with ionic liquid electrolytes: recent advances and future perspectives

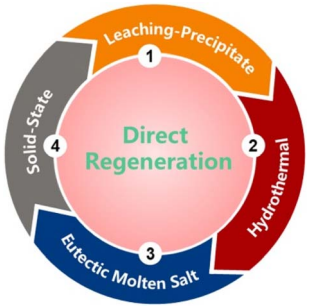
Taohong He, Yushan Han, Bofang Shi, Jianan Wang* and Honghui Yang*



32613

Sustainable regeneration of a spent layered lithium nickel cobalt manganese oxide cathode from a scrapped lithium-ion battery

Yachao Jin,* Xijun Qu, Liyun Ju, Zihao Zhou, Weijian Sun, Li Song and Mingdao Zhang*



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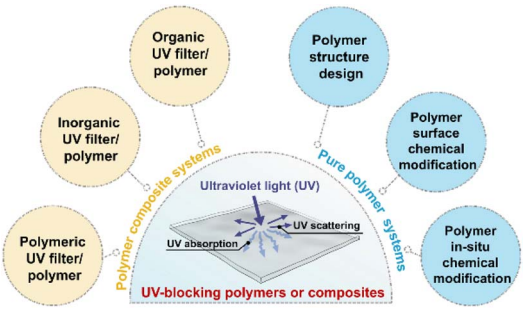
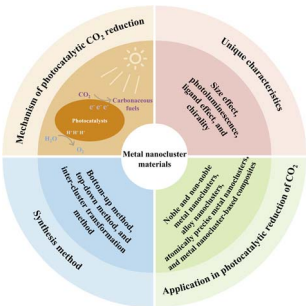


Ultraviolet-blocking polymers and composites: recent advances and future perspectives

Huan Zhang,* Xue Cheng, Cuiping Liu, Zejun Liu, Lan Liu, Can Feng, Jie Ju* and Xi Yao*

32665



Research progress in photocatalytic reduction of CO_2 based on metal nanocluster materials

Ming-yang Liu, Rui-tang Guo,* Cong Liu, Heng-fei Cui, Hao-wen Zhu and Wei-guo Pan

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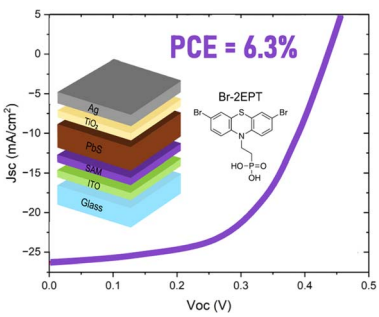
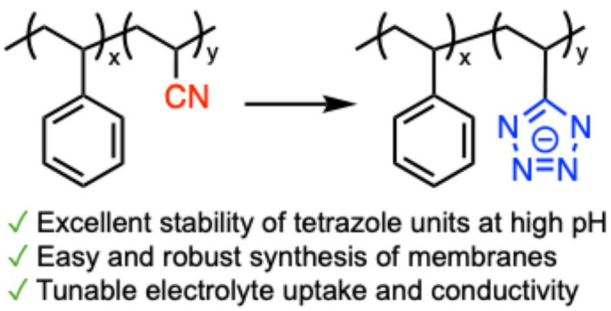
32689



Self-assembled molecules for hole extraction in efficient inverted PbS quantum dot solar cells

Raquel Dantas Campos, Shivam Singh, Herman Heffner, Markus Löffler, Fabian Paulus and Yana Vaynzof*

32697



Tetrazole functionalization: a new strategy toward stable alkaline ion-solvating polymer electrolytes

Dmytro Serhiichuk, Sinu C. Rajappan, Yogeshwaran Krishnan, Yifan Xia, Mikkel Rykær Kraglund, Heine Anton Hansen, Jens Oluf Jensen and David Aili*

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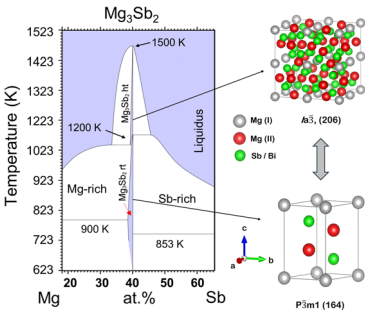
32703

Alloying induced superionic β-phase formation in Mg_3Sb_2 based Zintl compounds

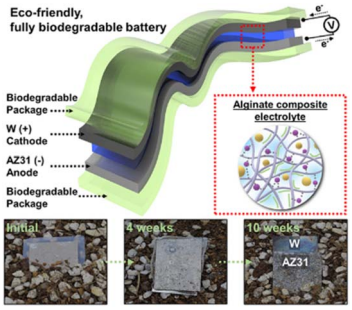
Nagendra Singh Chauhan and Takao Mori*



32712

Long-lasting, flexible and fully bioresorbable AZ31–tungsten batteries for transient, biodegradable electronics

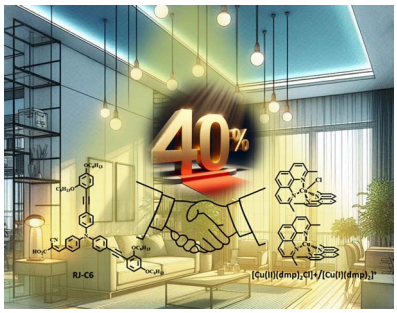
Gwan-Jin Ko, Tae-Min Jang, Daiha Shin, Heeseok Kang, Seung Min Yang, Sungkeun Han, Rajaram Kaveti, Chan-Hwi Eom, So Jeong Choi, Won Bae Han, Woon-Hong Yeo, Amay J. Bandodkar, Jiung Cho* and Suk-Won Hwang*



32721

Enhanced indoor photovoltaic efficiency of 40% in dye-sensitized solar cells using cocktail starburst triphenylamine dyes and dual-species copper electrolyte

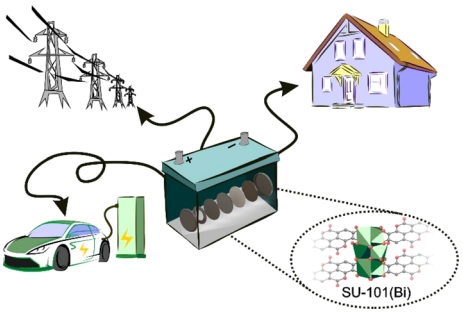
Paravakkal R. Jebin, Andrew Simon George, Rakesh K. Mishra, Jubi John* and Suraj Soman*



32735

From pollution to energy storage: leveraging hydrogen sulfide with SU-101 cathodes in lithium–sulfur batteries

Raul A. Marquez,* Juan L. Obeso, Rinish Reddy Vaidyula, Valeria B. López-Cervantes, Ricardo A. Peralta, Pablo Marín Rosas, José Antonio de los Reyes, C. Buddie Mullins* and Ilich A. Ibarra*



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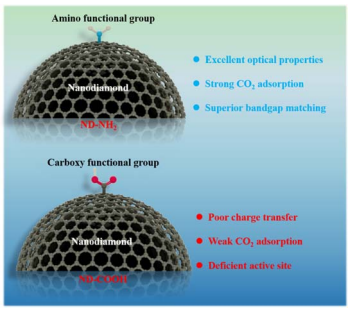
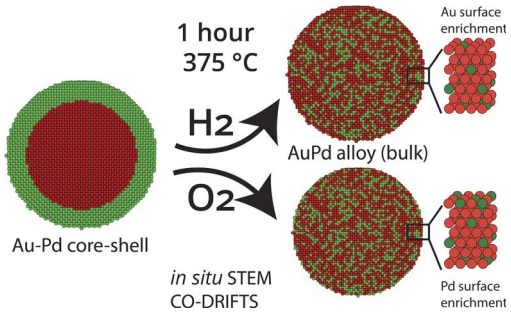
32745



Lewis functional nanodiamonds for efficient metal-free photocatalytic CO_2 reduction

Xiaowu Gao, Xinyue Han, Ziwei Zhao, Ning-Yu Huang, Keran Jiao, Pengfei Song, Jiaqi Zhu* and Yongjie Wang*

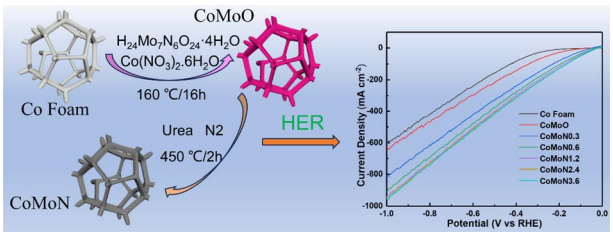
32760



***In situ* analysis of gas dependent redistribution kinetics in bimetallic Au-Pd nanoparticles**

Marta Perxés Perich, Christopher R. O'Connor, Koen M. Draijer, Nienke L. Visser, Nongnuch Artrith, Christian Reece, Petra E. de Jongh and Jessi E. S. van der Hoeven*

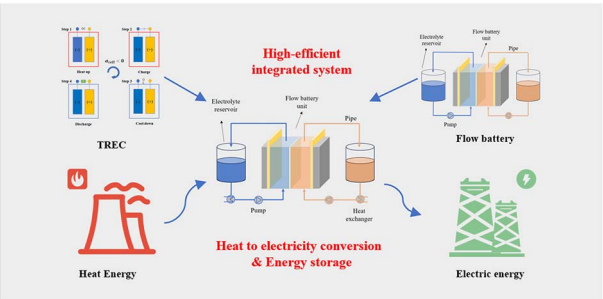
32775



***In situ* generated α-$Co(OH)_2/Co_3Mo$ derived from Co–Mo–N for enhanced electrochemical hydrogen evolution reaction**

Pengfei Zhou,* Xuncheng Liu, Xiang Ge and Jinxian Feng*

32783



A novel high-efficiency integrated system combining a thermally regenerative electrochemical cycle and a flow battery

Bo Wang, Li Zhao, Kun Ge, Weicong Xu,* Ruihua Chen* and Shuai Deng

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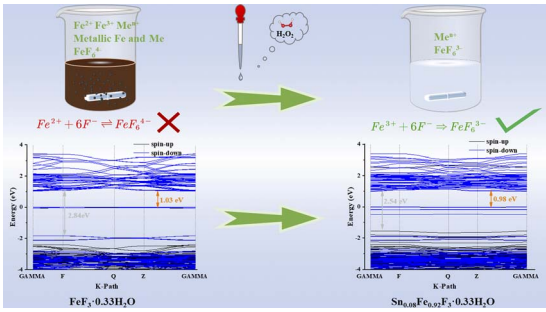
32794

An improved and scalable method for the preparation of Sn-doped hexagonal tungsten bronze-type iron fluoride materials as cathodes for sodium-ion batteries

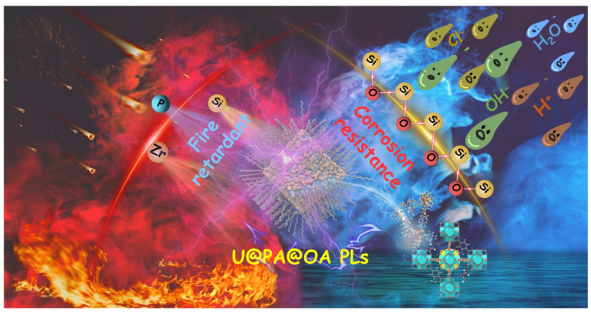
Longlong Guo, Xiang Gao, Qinjia Chen, Haoquan Li, Jian Ren, Ruiting Wang, Rongrong Shi,* Wensheng Gao* and Yongxiao Bai*



32806

MOF-based porous liquids towards a highly stressed and chemically resistant fire-safety polyurea elastomer

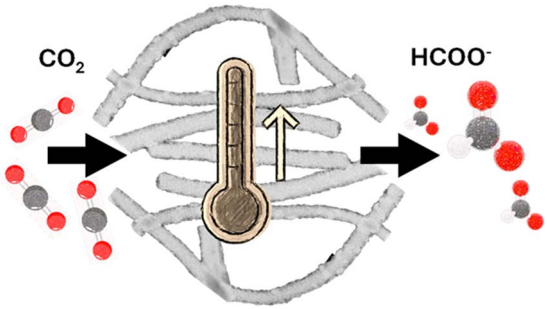
Kunpeng Song, Keshan Zhang, Xue Bi, Boyou Hou, Ye-Tang Pan,* Xingyao Li, Jiyu He* and Rongjie Yang



32821

Temperature promotes selectivity during electrochemical CO_2 reduction on NiO:SnO_2 nanofibers

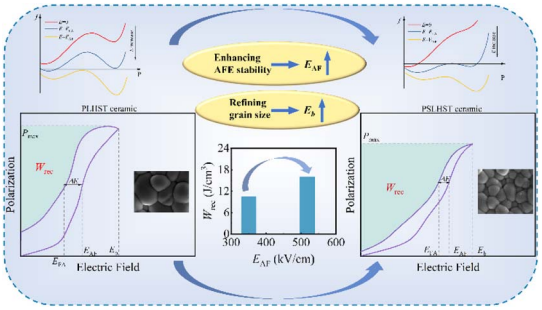
M. A. Rodriguez-Olguin, R. Lipin, M. Suominen, F. Ruiz-Zepeda, E. Castañeda-Morales, A. Manzo-Robledo, J. G. E. Gardeniers, C. Flox,* T. Kallio,* M. Vandichel* and A. Susarrey-Arce*



32836

Superb energy density of $PbHfO_3$-based antiferroelectric ceramics *via* regulating the antiferroelectric–ferroelectric transition energy barrier

Jiawen Hu, Zihao Zheng, Tao Zhang, Ling Lv, Zhixin Zhou, Jinjun Liu, Peng Li, Yunye Cao,* Jinming Guo* and Zhongbin Pan*



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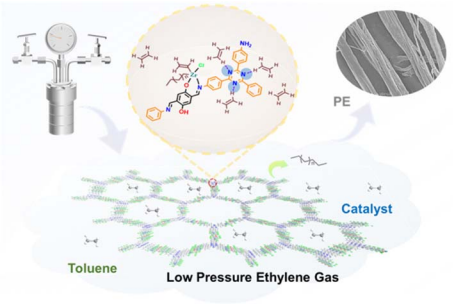
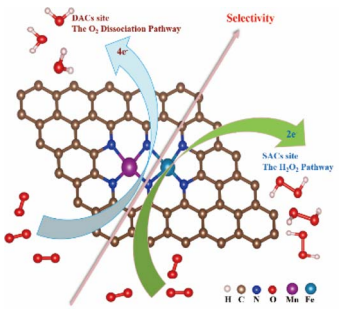


Microenvironment modulation of Zr sites in covalent organic frameworks for low-pressure preparation of UHMWPE

Hao-Tian Li, Tao Zhou, Yu-Qing Peng, Xiao-Ke Shi, Zhi-Hao Zhu, Ye-Bin Guan, Yong-Qing Li,* Zhen Liu* and Chuan-Lei Zhang*

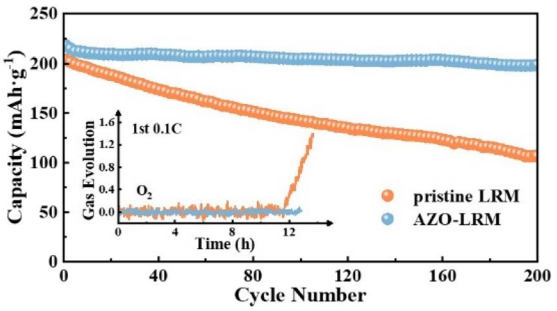
32855



Achieving the selectivity of the oxygen reduction reaction by regulating electron spin states and active centers on Fe–Mn–N_6–C dual-atom catalysts

Shiyao Li, Honghao Chen, Yue Qiu, Chengxing Cui, Wenhui Zhong* and Jun Jiang*

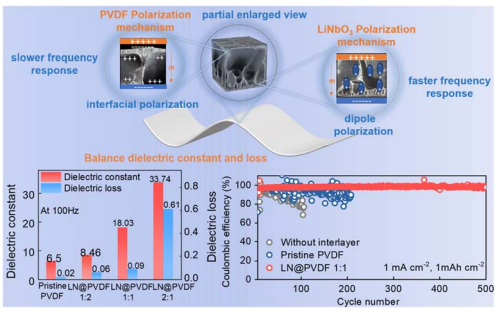
32871



Regulating oxygen redox reactions in lithium-rich materials *via* an Al_2O_3-doped ZnO layer for enhanced stability and performance

Xinyu Cheng, Yuke Wang, Jia Lu, Wangqi Dai, Huanhao Lei, Jinning Zuo, Hong Li* and Zhengwen Fu*

32885



A composite dielectric membrane with low dielectric loss for dendrite-free lithium deposition in lithium metal batteries

Zetao Ren, Sichen Gu,* Tong Li, Linkai Peng, Changhong Zou, Feiyu Kang* and Wei Lv*

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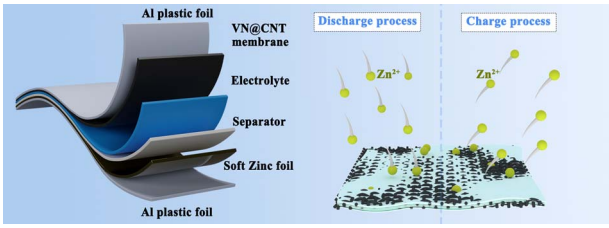
Nitridation-boosted V e_g occupation of a VN@CNT flexible electrode for high-rate Zn-ion hybrid supercapacitors

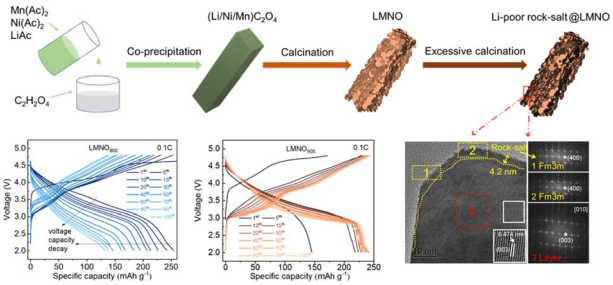
Yuyang Cao, Shiqiang Wei,* Yujian Xia, Quan Zhou, Yixiu Wang, Wenjie Xu, Changda Wang, Shuangming Chen* and Li Song



32904

Reinforcing the stability of cobalt-free lithium-rich layered oxides *via* Li-poor Ni-rich surface transformation

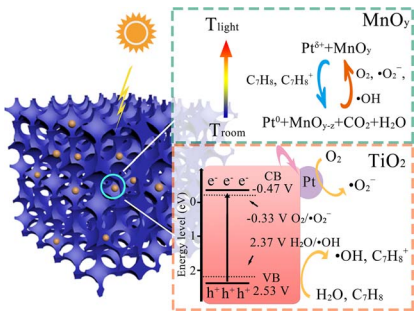
Guanjun Chen, Linwei Yu, Yihang Gan, Chunlin Zeng, Xiaolei Cheng, Linjie Xian, Linshuo Li, Qian Zhang, Chengzhi Dai, Yan Li, Ruotong Zhao, Zhilong Yang, Jinghan Qiu, Weiming Tang, Weihao Zeng, Fusheng Liu,* Jiayu Wan* and Jinlong Yang*



32913

Inverse opal structured Pt/TiO_2–MnO_y photothermocatalysts for enhanced toluene degradation activity

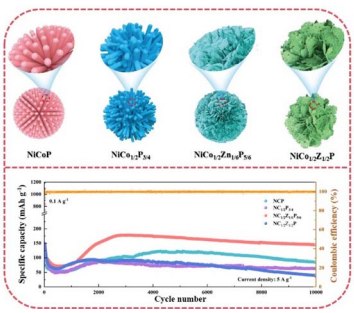
Zhili Chi, Zhiyong Liu, Wenbo Liu, Jiaqi Cai, Yiyang Zhang, Yangmei Dai, Jinlong Zhang, Ziwei Ye* and Baozhu Tian*



32925

Synergetic modulation on multiple transition metals enables $NiCo_xZn_yP_{(1+x+y)/2}$ microspheres for efficient lithium-ion storage

Wanying Zuo, Runhan Zhang, Yuxi Zou, Xiaoguang Fu, Zhibo Zhao, Bingqi Chen, Zibo Zhu, Hao Wang* and Meidan Ye*



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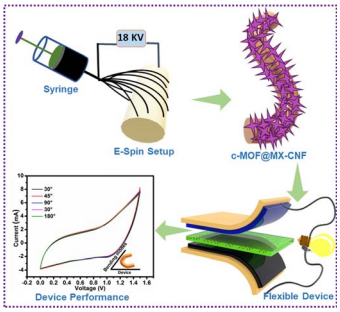
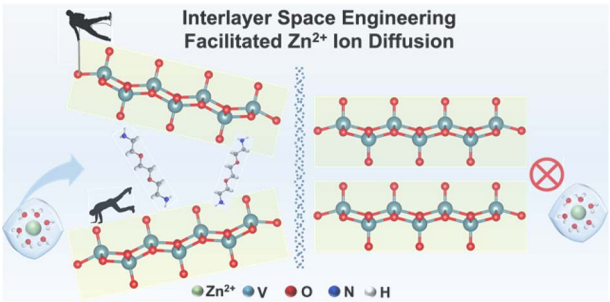
32937



A π–d conjugated metal–organic framework decorated on a MXene-carbon nanofiber as a self-standing electrode for flexible supercapacitors

Zahir Abbas and Shaikh M. Mobin*

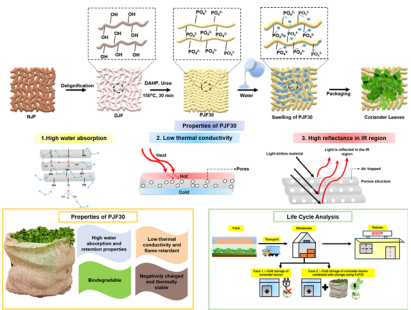
32947



A layer separated V_2O_5-PEG-amine hybrid cathode material for high capacity zinc-ion batteries

Saad Zafar, Muskan Sharma, Krithik Shai MP, Naiwrit Karmodak, Santosh K. Singh* and Bimlesh Lochab*

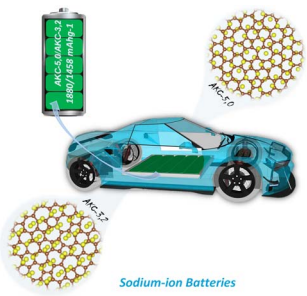
32957



Functionalized jute with high-water absorption, low thermal conductivity and efficient radiative cooling for the preservation of perishable green vegetables with reduced cold storage energy requirements

Smruti B. Bhatt, Rahul Ranjan, Sandeep Dahiya, Bhola Nath Pal and Prodyut Dhar*

32972



Two-dimensional azulenoid kekulene-based metallic allotropes for energy storage applications

Umer Younis,* Fizzah Qayyum, Waqas Ahmad, Arzoo Hassan, Nisha Singh, Muhammad Yaseen, Yanning Zhang* and Zhiming Wang*

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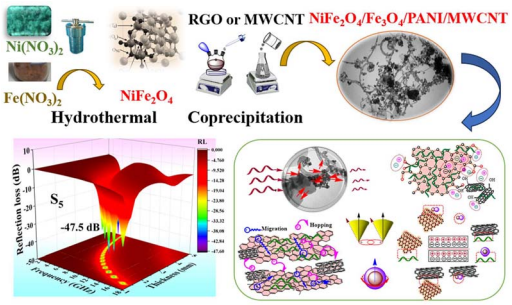
PAPERS

32981

The impact of RGO and MWCNT/RGO on the microwave absorption of $NiFe_2O_4$@Fe_3O_4 in the presence or absence of PANI

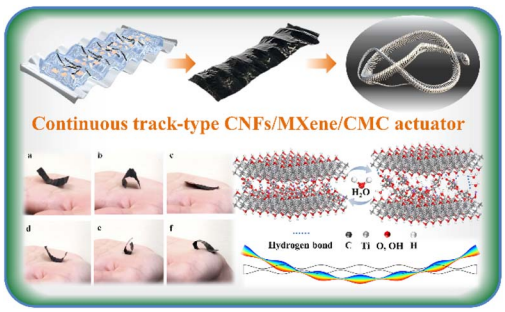
Farnaz Jamadi, Jamileh Seyed-Yazdi,* Fatemeh Ebrahimi-Tazangi* and Seyed Mohammad Hosseiny



33003

A carbon nanofiber/$Ti_3C_2T_x$/carboxymethyl cellulose composite-based highly sensitive, reversible, directionally controllable humidity actuator and generator *via* continuous track-inspired self-assembly

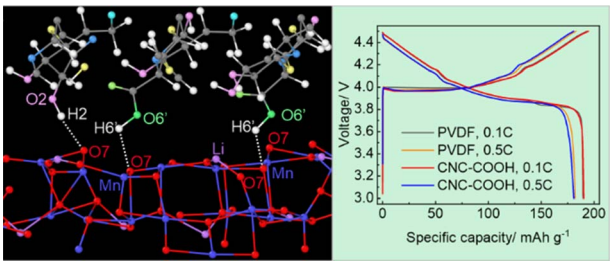
Xin Tong,* Guangjie Chen, Md Sohel Ahommed, Xiangling Shen, Lizheng Sha,* Daliang Guo, Jing Li and Yonghao Ni*



33015

Environmentally sustainable lithium-ion battery cathode binders based on cellulose nanocrystals

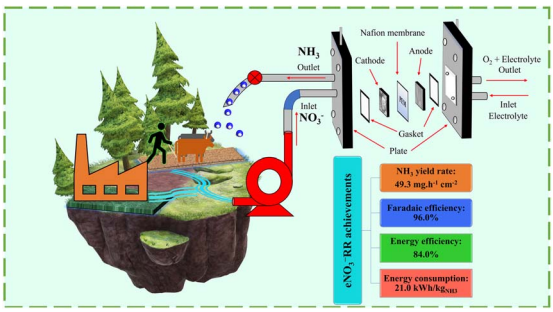
Xingkang Huang,* Haoyang You, Xiaoli Yan, Olaf J. Borkiewicz, Kamila M. Wiaderek, Janan Hui, Mark C. Hersam, Santanu Chaudhuri,* Stuart J. Rowan* and Junhong Chen*



33023

84.0% energy-efficient nitrate conversion by a defective $(Fe,Cu,Ni)_2O_3$ electrocatalyst

Tadele Negash Gemeda, Dong-Hau Kuo,* Quoc-Nam Ha, Noto Susanto Gultom and Girma Sisay Wolde



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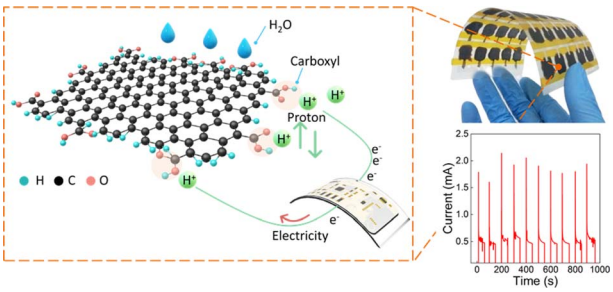
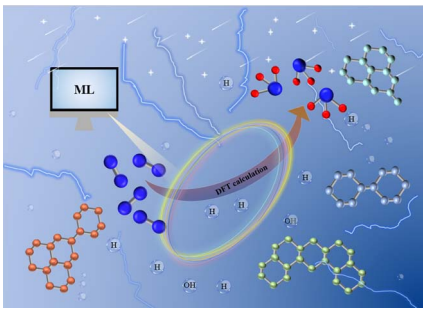
33039



A high-current and tunable moisture-enabled electric generator for wireless wearable electronics

Yumei Li, Song Tian, Xiao Chen, Yifan Liao, Fan Jiang, Jin Ye, Yang He, Yingang Gui, Zheng Lian, Gang Liu, Jun Dai, Linhua Li, Jiang Chen, Sheng Liu, Renbo Zhu, Yuerui Lu and Mingyuan Gao*

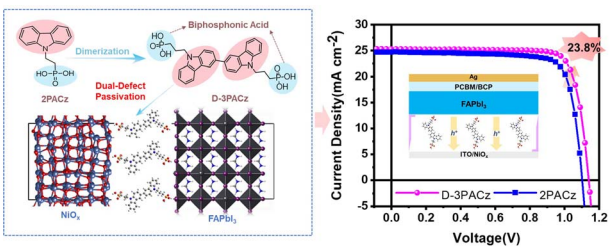
33053



High-throughput screening of carbon nitride single-atom catalysts for nitrogen fixation based on machine learning

LinTao Xu, Yuhong Huang,* Haiping Lin, Ruhai Du, Min Wang, Fei Ma,* Xiumei Wei, Gangqiang Zhu and Jianmin Zhang

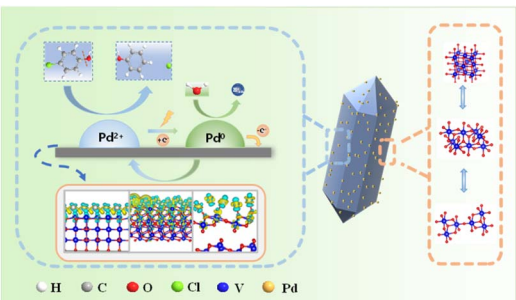
33066



Self-assembled hole-transport material incorporating biphosphonic acid for dual-defect passivation in NiO_x-based perovskite solar cells

Ting Su, Wenjun Liu, Hao Xu, Huilong Chen, Kin Long Wong, Wanru Zhang, Qingting Su, Tongxin Wang, Shanlei Xu, Xingting Liu, Weiwei Lv, Renyong Geng,* Jun Yin* and Xin Song*

33076



Vanadium oxide as an electron buffer to stabilize palladium for electrocatalytic hydrodechlorination

Meiqin Shi, Yifei Ren, Shuyuan Xu, Xiaofeng Xu, Fanfei Sun* and Yuanbin She*

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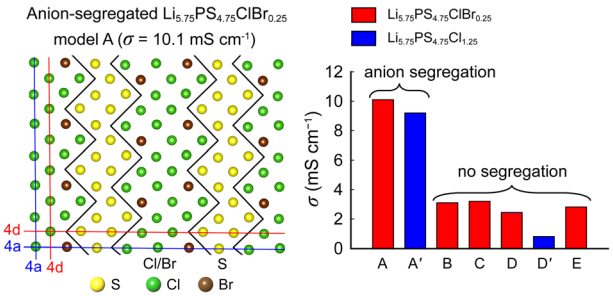
33088

Unexpected anion segregation enabling high conductivity in argyrodite $Li_{6-x}PS_{5-x}ClBr_x$ solid electrolytes

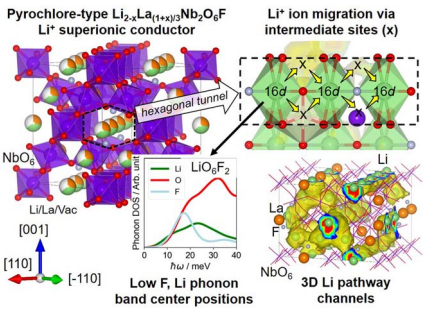
Seho Yi, Taegon Jeon, Gyeong Ho Cha, Young-Kyu Han* and Sung Chul Jung*



33099

Crystal structure, stability and Li superionic conductivity of pyrochlore-type solid electrolyte $Li_{2-x}La_{(1+x)/3}Nb_2O_6F$: a first-principles calculation study

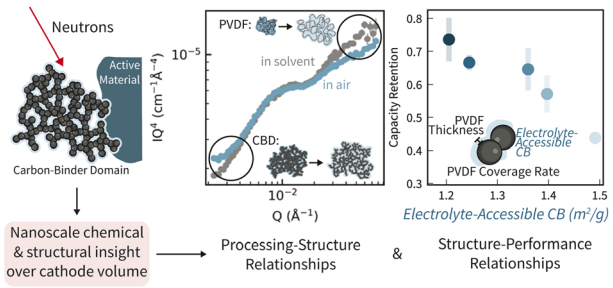
Randy Jalem,* Kazunori Takada, Hitoshi Onodera and Shuhei Yoshida



33114

Structure–performance relationships of lithium-ion battery cathodes revealed by contrast-variation small-angle neutron scattering

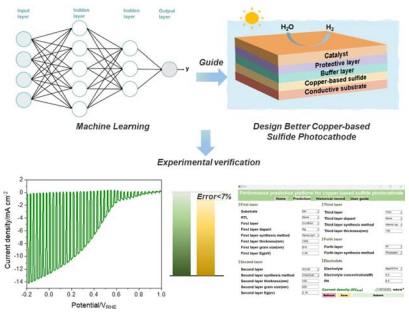
Qingsong Liu, Willa Brenneis, Gergely Nagy, Mathieu Doucet, Jeffrey Lopez* and Jeffrey J. Richards*



33125

Machine learning aided design of high performance copper-based sulfide photocathodes

Yuxi Cao, Kaijie Shen, Yuanfei Li, Fumei Lan, Zeyu Guo, Kelu Zhang, Kang Wang* and Feng Jiang*



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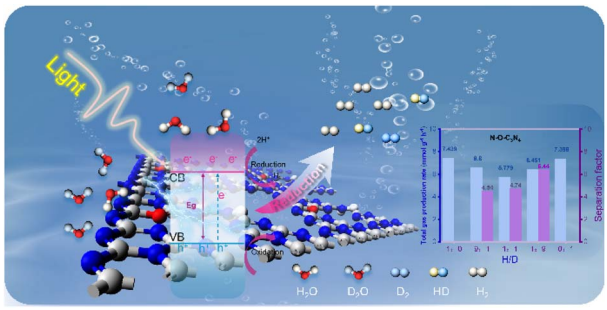
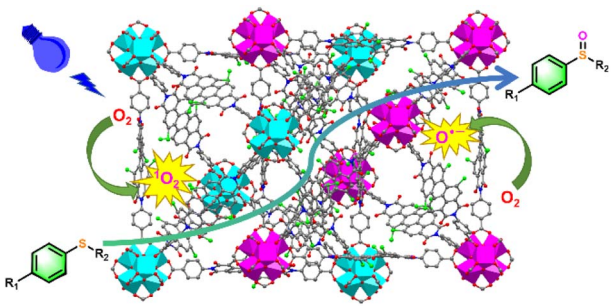
33133



Efficient hydrogen isotope separation utilizing photocatalytic capability

Linzhen Wu, Sifan Zeng, Weiwei Wang, Shengtai Zhang, Hongbo Li* and Xiaosong Zhou*

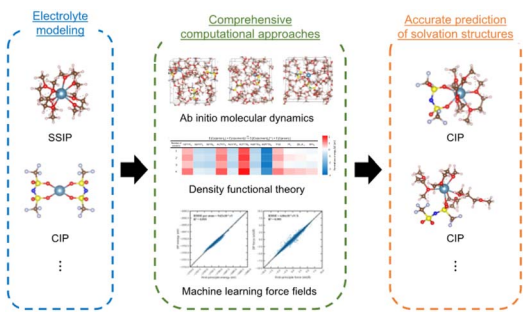
33142



A doubly interpenetrated perylene diimide-based zirconium metal–organic framework for selective oxidation of sulfides powered by blue light

Chao Wei, Ming Lu, Jing-Jing Li, Ze-Jiu Diao, Guoliang Liu,* Xiao-Qin Liu and Lin-Bing Sun*

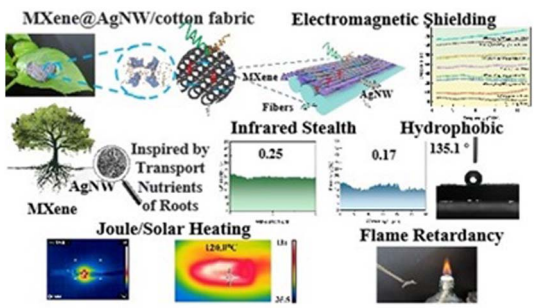
33150



Computational prediction of solvation structures in calcium battery electrolytes

Heonjae Jeong,* Haimeng Wang and Lei Cheng

33162



Flexible multifunctional MXene@Ag nanowires/cotton fabric inspired by transport of nutrients by roots for electromagnetic shielding, infrared stealth, Joule/solar heating and flame retardancy

Jiatong Yan, Meimei Chen, Rui Tan, Chuanxi Lin, Shan Jiang, Weijie Wang, Songyue Pan, Hongyan Xiao, Erhui Ren and Ronghui Guo*

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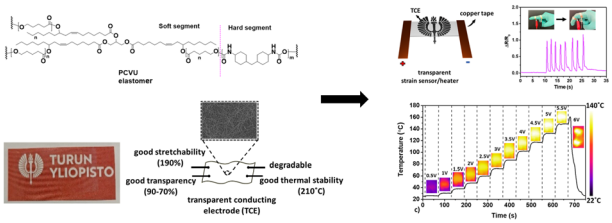
33177

Sustainable castor oil-derived cross-linked poly(ester-urethane) elastomeric films for stretchable transparent conductive electrodes and heaters

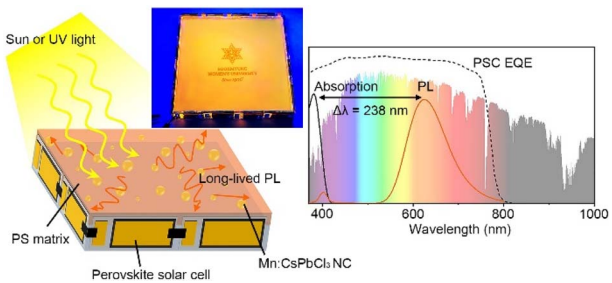
Timo Laukkanen, Pulikanti Guruprasad Reddy,* Amit Barua, Manish Kumar, Kristofer Kolpakov, Teija Tirri and Vipul Sharma*



33193

Highly transparent all-perovskite luminescent solar concentrator/photovoltaic windows

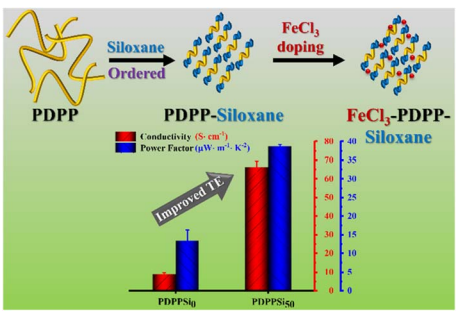
Seungju Oh, Sang Woo Bae, Tae Hyung Kim, Gumin Kang, Heesuk Jung, Young-Hoon Kim* and Minwoo Park*



33203

Siloxane engineered polydiketopyrrolopyrrole derivatives with improved crystallinity and doping efficiency for thermoelectric power generation

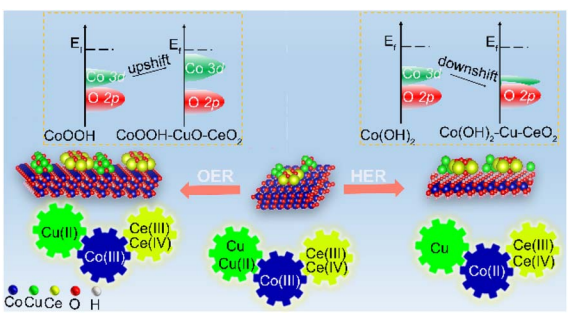
Shabab Hussain, Yufeng Wu, Zhifu Chen, Zhiyong Luo, Fei Zhong, Yu Chen,* Chunmei Gao* and Lei Wang



33212

Regulating the electronic structure of catalysts *via* stable ceria and adjustable copper metal/oxide towards efficient overall water splitting

Huan Zheng, Tao Yin, Jialong Yu, Wei Xu, Weizhen Zhang, Qihui Yu, Yingnan Guo, Li Guan,* Xiaolei Huang* and Fenghe Wang*



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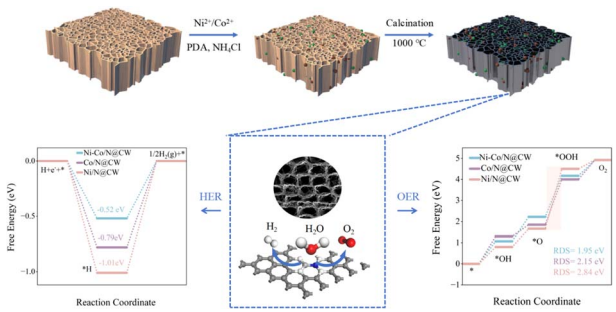
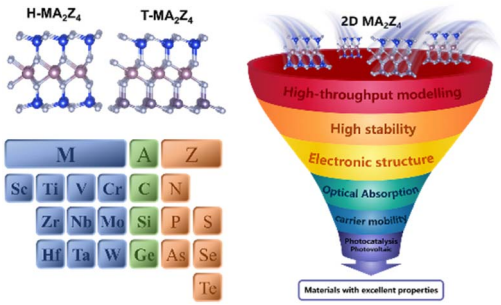
33222



Self-supported N-doped carbon-coupled Ni–Co binary nanoparticle electrodes derived from bionic design of wood cell walls for durable overall water splitting

Congcong Yang, Ruixi Jin, Zhihang Liu, Shilei Li, Dong Lv, Jingshuo Liu, Jian Li, Zhiqun Lin* and Likun Gao*

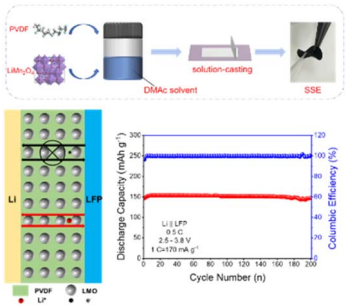
33233



High-throughput computational screening of novel MA_2Z_4-type Janus structures with excellent photovoltaic and photocatalytic properties

Yongli Yang, Yadong Yu,* Zhe Liu,* Lijun Shang, Pan Xiang, Yu Xin, Tong Zhang, Zhonglu Guo* and Mengyan Dai*

33241



A solid-state electrolyte based on electrochemically active $LiMn_2O_4$ for lithium metal batteries

Jingzhen Du, Zhichao Chen, Bohao Peng, Zewen Sun, Wenzhuo Wu, Qi Zhou, Shuang Xia, Lili Liu,* Lijun Fu, Yuhui Chen, Tao Wang and Yuping Wu*

33249

Towards advanced N-rich energetic explosives: based on tetrazole and triazole groups with large conjugated systems and extensive hydrogen bonds

Guofeng Zhang, Xue Hao, Yongbin Zou, Shichang Liu, Junjie Wei, Zhen Dong* and Zhiwen Ye*

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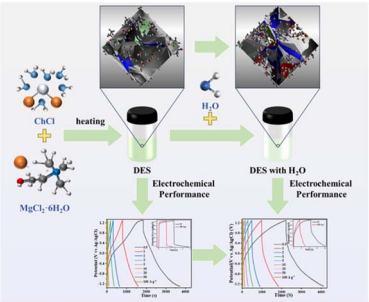
33257

H_2O assisted in improving the electrochemical performance of a deep eutectic electrolyte formed by choline chloride and magnesium chloride hexahydrate

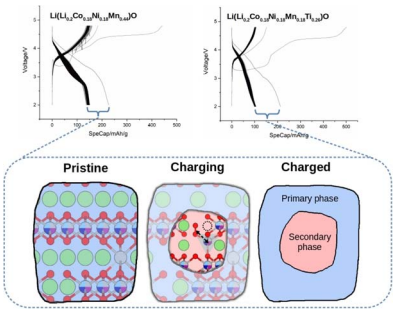
Kaixiang Zou, Xiao Wang and Yuanfu Deng*



33268

Delithiation-induced secondary phase formation in Li-rich cathode materials

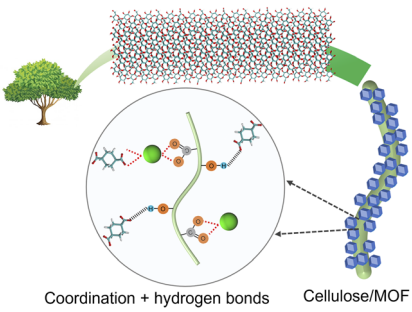
Yin-Ying Ting, Ben Breitung, Simon Schweidler, Junbo Wang, Michael Eikerling, Piotr M. Kowalski, Olivier Guillon and Payam Kaghazchi*



33277

Molecular insights into the *in situ* early-stage assembly of metal–organic frameworks on cellulose nanofibrils

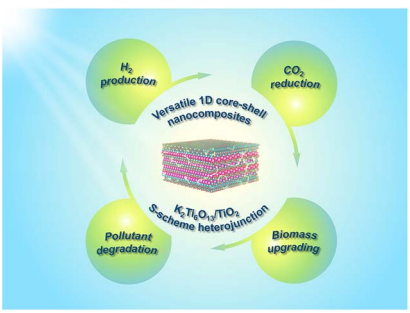
Kailong Zhang, Micholas Dean Smith and Mi Li*



33290

Rational design of versatile 1D Ti–O-based core–shell nanostructures for efficient pollutant removal and solar fuel production

Qiang Wang,* Xiaoqiang Zhan, Chenming Fan, Xiaofan Yang, Bing Li, Hong Liu,* Yangjiang Wu, Kaihuan Zhang and Pengyi Tang*



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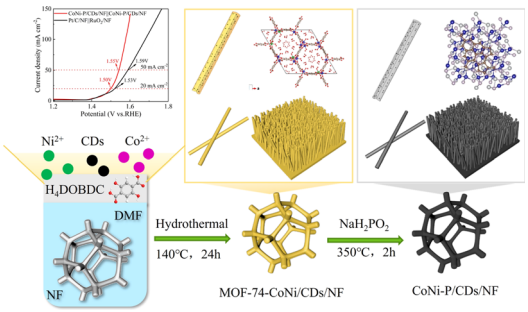
33301



Carbon dot embedded CoNi bimetallic phosphide nanorods as an efficient electrocatalyst for overall water splitting

Yantong Long, Guoliang Zhao, Liuxin Yang, Yongjun Xu* and Chen Xu*

RETRACTION

33314

Retraction: Thermally reduced graphene oxide/polymelamine formaldehyde nanocomposite as a high specific capacitance electrochemical supercapacitor electrode

Ali A. Ensafi,* Hossein A. Alinajafi and B. Rezaei

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