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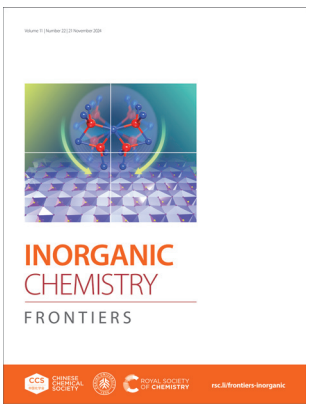
IN THIS ISSUE

ISSN 2052-1553 CODEN ICFNAW 11(22) 7669–8150 (2024)



Cover
See Ruiling Zhang, Xiaojing Liu *et al.*, pp. 7793–7802.

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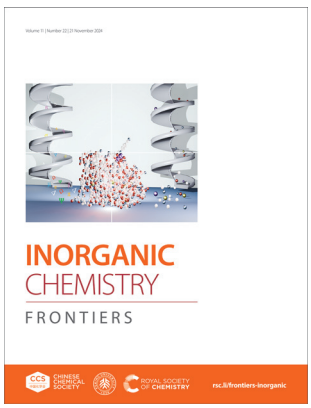

Inside cover
See Ana Belén Muñoz-García, Antonello Merlino *et al.*, pp. 7803–7811.

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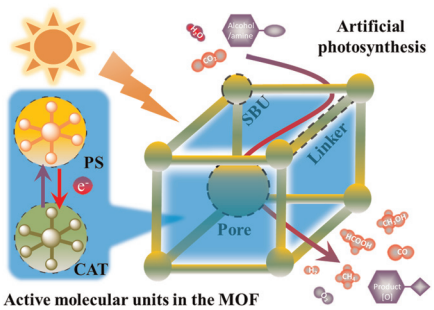
REVIEWS

7682

Active molecular units in metal organic frameworks for artificial photosynthesis

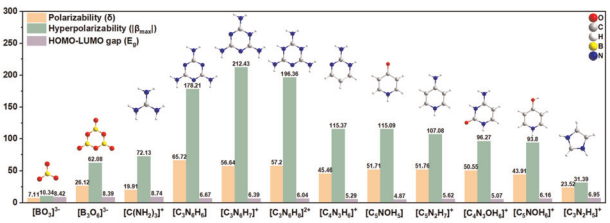
Subrata Mandal, Sahar Yoosefi, Alexander K. Mengele, Sven Rau* and Andrea Pannwitz*



7756

Research progress in optical materials with cationic organic planar π-conjugated groups containing C═N bonds

Hangwei Jia, Xueling Hou* and Shilie Pan*



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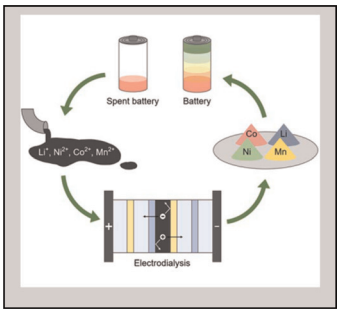
REVIEWS

7775

Critical metal recovery from spent lithium-ion batteries' leaching solution using electrodialysis technologies: strategies and challenges

Tianshu Zhang, Yijun Qian,* Changyong Zhang, Tao Qian and Chenglin Yan*

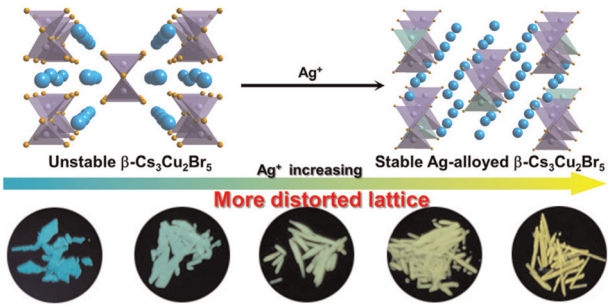


RESEARCH ARTICLES

7793

High-efficiency tunable self-trapped exciton emission in one-dimensional β-$Cs_3Cu_2Br_5$ *via* Ag alloying for optoelectronic applications

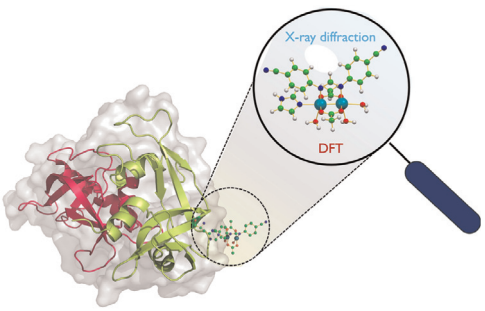
Xin Xu, Zhongyi Wang, Qingkun Kong, Siping Liu, Ruiling Zhang,* Xiaojing Liu* and Keli Han



7803

Exchange of equatorial ligands in protein-bound paddlewheel Ru_2^{5+} complexes: new insights from X-ray crystallography and quantum chemistry

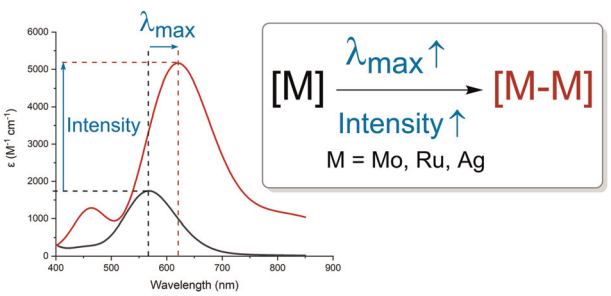
Aarón Terán, Francesca Fasulo, Giarita Ferraro, Ana Edilia Sánchez-Peláez, Santiago Herrero, Michele Pavone, Ana Belén Muñoz-García* and Antonello Merlino*



7812

Effects of metal–metal bonding in photosensitizers: red-shifted absorption and oscillator strength enhancement

Oshan J. Jinarathne and Malkanthi K. Karunananda*



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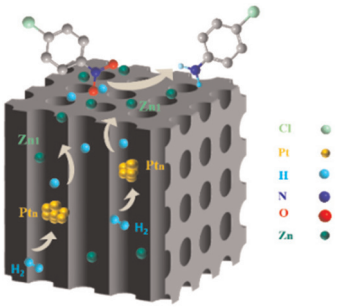
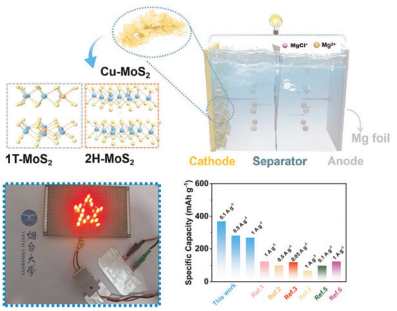


A long-range synergistic effect between Pt_n clusters and Zn_1 single atoms for efficient selective hydrogenations

Haisheng Wei,* Jing Li, Xiaorui Yan, Tiantian Liu, Kairui Li, Dan Feng and Yujing Ren*

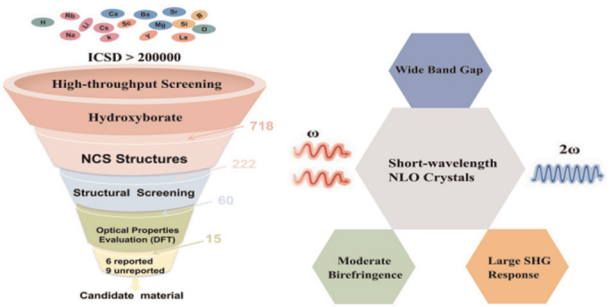
7831



Highly defective and conductive Cu-doped 1T/2H-MoS_2 nanosheets as high-capacity cathode materials for enhanced magnesium-ion storage

Ao Xu, Yan Liu, Jiahui Wang, Yijing Wang, Fuyi Jiang* and Yanli Zhou*

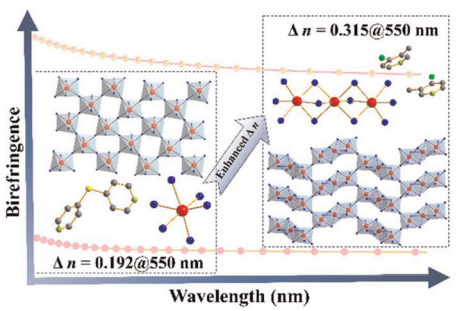
7843



Shooting short-wavelength nonlinear optical materials with targeted balance performances in hydroxyborates through first-principles high-throughput screening

Chenxu Li, Abudukadi Tudi, Huanhuan Cheng, Qingyu Liu, Zhihua Yang* and Shilie Pan*

7853



Modulating the birefringence of two-dimensional hybrid lead bromide perovskites using pyridine derivative cations

Li-Ling Zhang, Hua Huang, Qingran Ding, Hui-Ping Xiao, Qing-Yan Liu* and Yu-Ling Wang*

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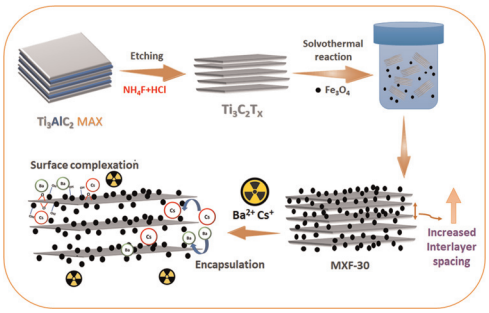
7860

Fe_3O_4-decorated MXene for the effective removal of ^{133}Ba and ^{137}Cs: synthesis, characterization, and optimization *via* response surface methodology (RSM)

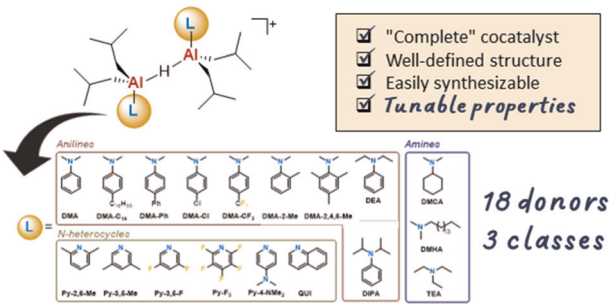
Shalu Atri,* Vipul Vilas Kusumkar, Süleyman İnan, Maros Gregor, Tomas Roch, Maria Caplovicova, Michal Galambos, Eva Viglasova, Gustav Plesch, Martin Motola and Olivier Monfort*



7872

Al-alkyl borate salt cocatalysts for olefin polymerization: exploration of N-donor ligand variations

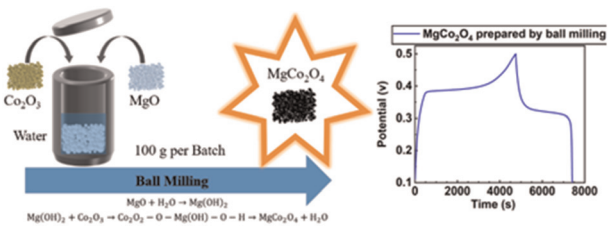
Gaia Urciuoli, Francesco Zaccaria,* Cristiano Zuccaccia,* Roberta Cipullo,* Peter H. M. Budzelaar, Leonardo Tensi, Antonio Vittoria, Christian Ehm, Alceo Macchioni and Vincenzo Busico



7886

Scalable complete conversion of $MgCo_2O_4$ by mechanochemistry for high-performance supercapacitors

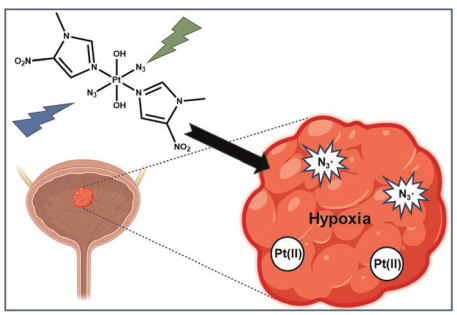
Zhiyuan Liu, Qixuan Xiang, Hao Zhang, Xianglong Zhang, Huijun Tan* and Yaping Zhao*



7898

Tuning the phototherapeutic activity of Pt(IV) complexes for bladder cancer *via* modification of *trans N*-heterocyclic ligands

Huayun Shi,* Guy J. Clarkson and Peter J. Sadler*



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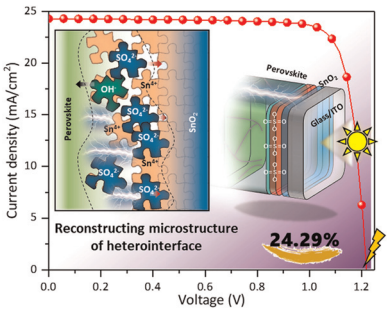
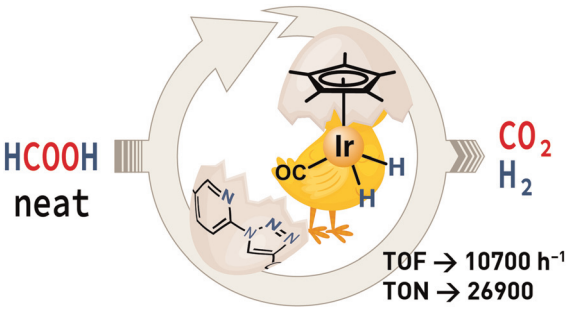


Rationally reconstructing the surface microstructure of a chemical bath deposited electron transport layer for efficient and stable perovskite solar cells

Xinxuan Yang, Lexin Wang, Meihan Liu, Jiahui Jin, Lili Yang, Lin Fan, Maobin Wei, Huilian Liu, Haoran Chen, Jinghai Yang,* Yulei Chang* and Fengyou Wang*

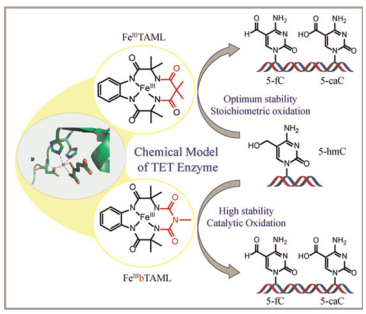
7921



Pyridyl–triazole ligands enable *in situ* generation of a highly active dihydride iridium(III) complex for formic acid dehydrogenation

Miriam Abán, J. Marco Cuenca, Irene Embid, Alba de Toro, Pilar Gómez-Sal, Ernesto de Jesús, Marta Valencia* and Cristina G. Yebra*

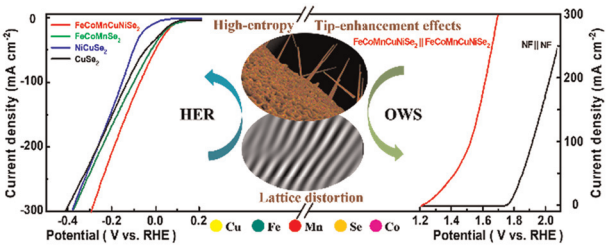
7930



Selective and catalytic conversion of hydroxymethyl cytosine into formyl cytosine using a synthetic model of TET enzymes

Dipanwita Palit and Debasish Manna*

7936



A high-entropy FeCoMnCuNi diselenide self-standing electrode with outstanding water-electrolysis performance in alkaline medium

Xinxin Guo, Mengmeng Zhou, Ziwu Liu,* Shiheng Mu, Kaijia Wang, Huanqiang Shi, Fang Wang,* Shijian Lu, Zhonghai Ni and Guiqing Liu*

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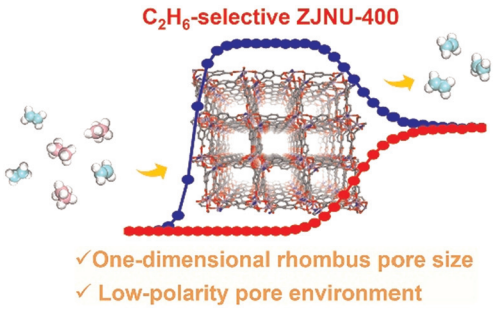
A tetranuclear-cluster-based MOF with a low-polarity pore environment for efficient C_2H_6/C_2H_4 separation

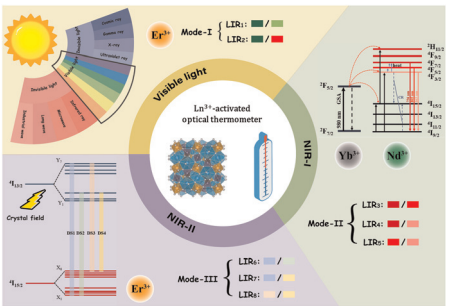
Meng Feng, Jiantang Li, Xirong Wang, Jingyu Wang, Dongmei Wang* and Banglin Chen*



7955

Towards ultra-sensitive multimodal luminescent thermometers enabled by high crystal field strength of $Lu_2CaMg_2Ge_3O_{12}$:Yb^{3+},Nd^{3+},Er^{3+} phosphors

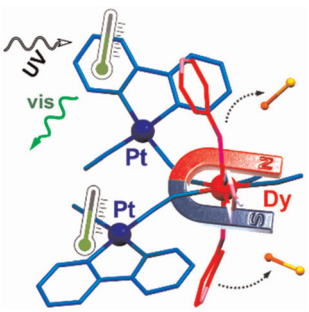
Zhijiao Zhao, Mengmeng Dai, Kejie Li, Guiying Liang, Yanling Wei* and Zuoling Fu*



7966

Design of Dy^{III} single-molecule magnets with molecularly installed luminescent thermometers based on bridging $[Pt^{II}(CN)_2(C^\wedge N)]^-$ complexes

Pawel J. Bonarek, Mikolaj Zychowicz, Jan Rzepiela, Michal Liberka, Sebastian Baś, Jakub J. Zakrzewski* and Szymon Chorazy*



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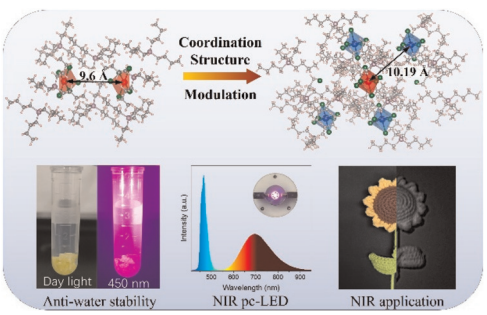
Realizing efficient broadband near-infrared emission under blue light excitation in Sb^{3+}-doped zero-dimensional organic tin(IV)-based metal halides *via* coordination structure modulation

Bao Ke, Hui Peng,* Yongqi Yang, Chengzhi Yang, Shangfei Yao, Arfan Bukhtiar, Qilin Wei,* Jialong Zhao and Bingsuo Zou*



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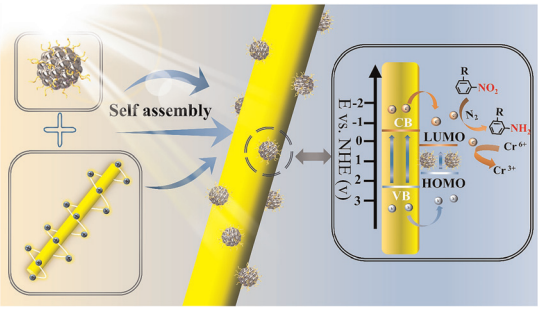
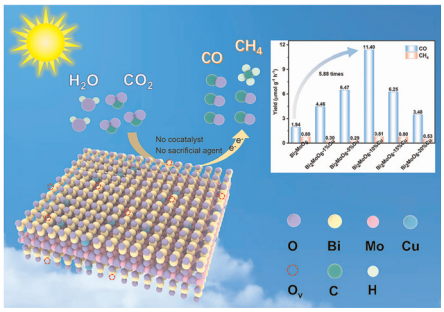


Atomically precise $Ag_{25}(SR)_{18}$ nanoclusters: a stable photosensitizer for photocatalysis

Linjian Zhan, Junyi Zhang, Boyuan Ning, Yunhui He,* Guangcan Xiao, Zhixin Chen and Fang-Xing Xiao*

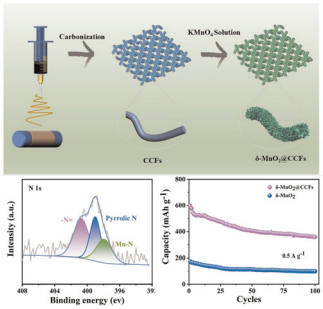
8003



Copper-doped Bi_2MoO_6 with concurrent oxygen vacancies for enhanced CO_2 photoreduction

Jiawei Liu, Xin Liu, Chunhui Dai, Chao Zeng,* Sajjad Ali,* Mohamed Bououdina and Yushuai Jia*

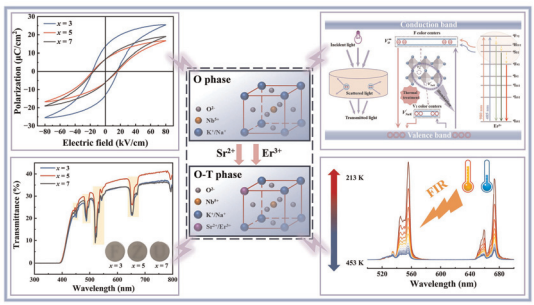
8016



***In situ* growth of δ-MnO_2/C fibers as a binder-free and free-standing cathode for advanced aqueous Zn-ion batteries**

Yan Li, Fei Zhang, Miaomiao Wu, Yong Guo,* Yuanyuan Liang, Reyihanguli Ababaikeri, Luyang Wang, Qiao Liu and Xingchao Wang*

8025



Photochromism-induced multi-mode optical modulations and fluorescent temperature sensing in Sr/Er-codoped $(K_{0.5}Na_{0.5})NbO_3$ ceramics

Fangyuan Yu, Qifa Lin, Xiangfu Zeng, Ping Zhou, Xiao Wu,* Cong Lin, Chunlin Zhao, Min Gao, Tengfei Lin, Xingan Jiang, Laihui Luo and Qiwei Zhang

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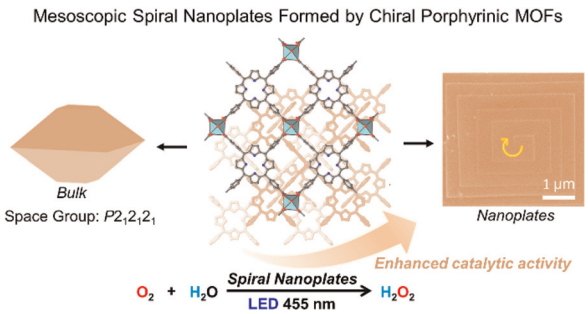
8037

Mesoscopic spiral nanoplates formed by porphyrin-spaced coordination frameworks for enhanced H_2O_2 photosynthesis

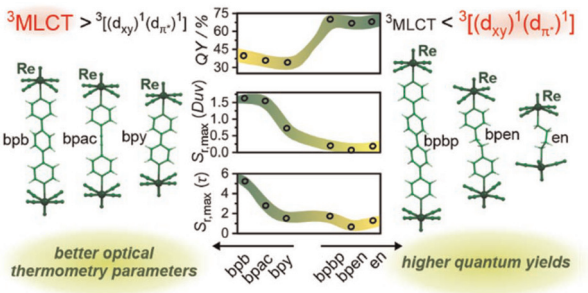
Liang He, Er-Xia Chen, Ju-Qiang Xiang, Yu-Jun Guo, Jian Zhang* and Qipu Lin*



8047

Governing efficiency and thermoresponsivity of luminescence in dirhenium(v) molecules by a highly tunable emission mechanism

Michal Liberka, Mikolaj Zychowicz, Laurine Vasseur, James Hooper and Szymon Chorazy*



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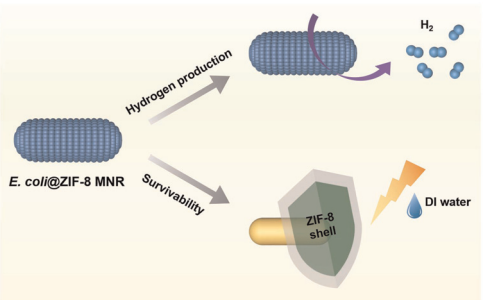
Metal–organic framework micro-nano reactors as armour of *Escherichia coli* for hydrogen production in air

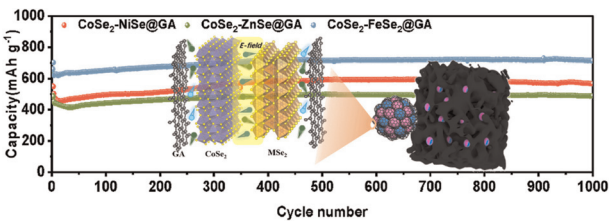
Yun Fan, Junyang Yan, Siyao Zhang, Ruifa Su, Baoli Zha and Weina Zhang*



8078

A general strategy for the *in situ* construction of $CoSe_2$–MSe_x@GA (M = Zn, Ni, and Fe) heterostructures for effective sodium storage

Zhengzheng Xu, Yanjiao Li, Shiqi Li, Yingying Chen,* Majid Farahmandjou, Guoxiu Wang, Hongxun Yang* and Hao Tian*



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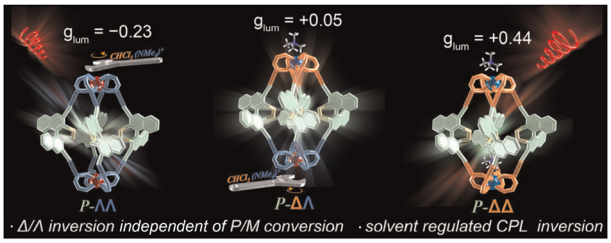
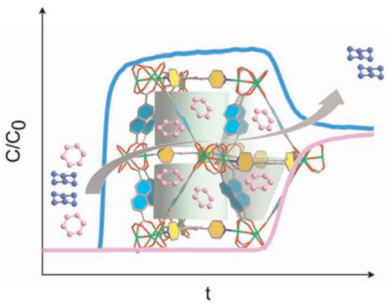


Unusual solvent-regulated inversion of a metal stereocenter in an enantiopure Eu_2L_4 helicate: a new strategy for CPL inversion

Qing Ma, Sen Yin, Ziye Song, Ting Gao, Pengfei Yan, Yanyan Zhou and Hongfeng Li*

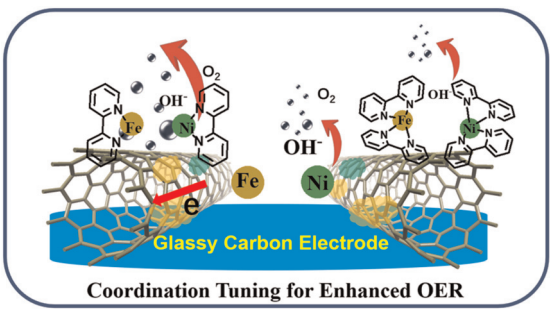
8101



Linker engineering in mixed-ligand metal–organic frameworks for simultaneously enhanced benzene adsorption and benzene/cyclohexane separation

Yong-Zheng Zhang, Xin-Dan Zhang, Yan-Kai Zhang, Fu-Tian Wang, Longlong Geng,* Hui Hu, Zhen Li, Da-Shuai Zhang,* Hongliang Huang* and Xiuling Zhang

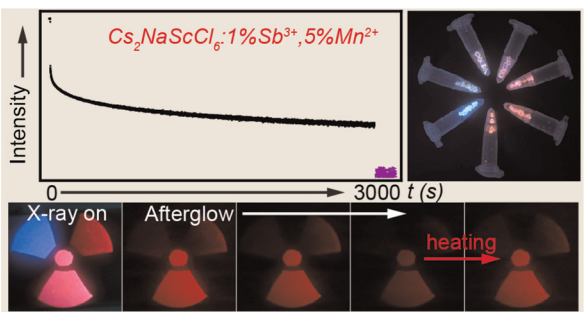
8110



Coordination tuning of Ni/Fe complex-based electrocatalysts for enhanced oxygen evolution

Hongbo Zhou, Xuan Hao, Jiexin Guan, Yilin Deng, Zi Wei, Yashu Liu and Guoxing Zhu*

8123



Multicolor luminescence and afterglow from $Cs_2NaScCl_6$:Sb^{3+},Mn^{2+} crystals

Xiaojia Wang, Wei Zheng, Xiangzhou Zhang, Xiangxiang Chen and Yuhai Zhang*

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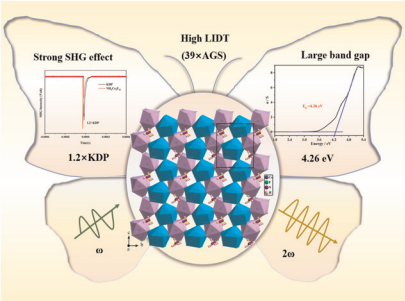
RESEARCH ARTICLES

8130

Equivalent cation-tuning to realize a new Ce(IV) fluoride with excellent comprehensive nonlinear optical performances

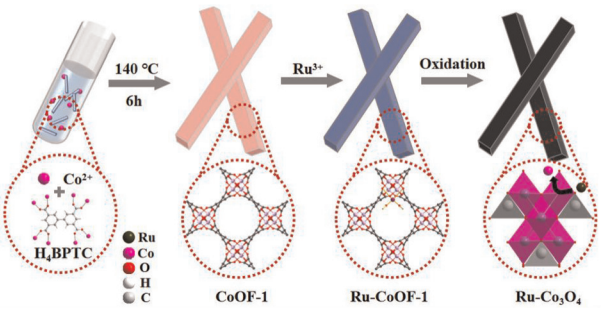
Bei-Bei Zhang, Wen-Ye Gao, Wei Xu, Liang Ma, Wenlong Liu, Ru-Ling Tang* and Sheng-Ping Guo



8139

Ru-anchoring Co-MOF-derived porous Ru-Co_3O_4 nanomaterials for enhanced oxygen evolution activity and structural stability

Nan Li, Lujiao Mao, Yuting Fu, Haoran Wang, Yuchang Shen, Xuemei Zhou,* Qipeng Li* and Jinjie Qian*



CORRECTIONS

8146

Correction: $BaSc_2(HPO_3)_4(H_2O)_2$: a new nonlinear optical phosphite exhibiting a 3D $\{[Sc_2(HPO_3)_4]^{2-}\}_\infty$ anionic framework and phase-matchable SHG effect

Ru-Ling Tang,* Gang-Xiang Liu, Wen-Dong Yao, Li-Nan Zhang, Wenlong Liu and Sheng-Ping Guo*

8147

Correction: Unexpected *in crystallo* reactivity of the potential drug bis(maltolato)oxidovanadium(IV) with lysozyme

Maddalena Paolillo, Giarita Ferraro, Irene Cipollone, Eugenio Garribba, Maria Monti* and Antonello Merlino*