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ISSN 2041-6539 CODEN CSHCBM 16(4) 1471–2048 (2025)

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See H. Janeková, S. Fisher, T. Šolomek and P. Štacko, pp. 1677–1683. Image reproduced by permission of Tomáš Šolomek from *Chem. Sci.*, 2025, **16**, 1677. Image created by Michel Rickhaus.

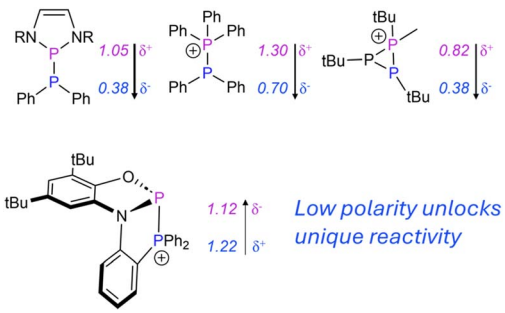
Inside cover
See Jürgen Hauer *et al.*, pp. 1684–1695. Image reproduced by permission of Jürgen Hauer from *Chem. Sci.*, 2025, **16**, 1684.

COMMENTARY

1487

A focus on phosphinophosphination of apolar bonds by a structurally constrained P–P bonded system

Tyler J. Hannah* and Saurabh S. Chitnis*

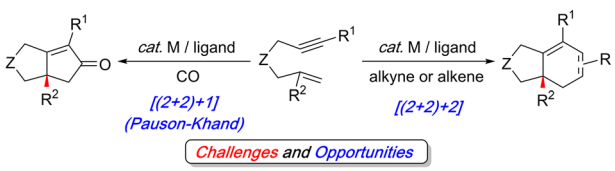


PERSPECTIVES

1490

Stereoselective transition metal-catalyzed [(2+2)+1] and [(2+2)+2] carbocyclization reactions using 1,6-enynes with 1,1-disubstituted olefins: construction of quaternary centers

Ridge Michael P. Ylagan, Yu Zhu and P. Andrew Evans*



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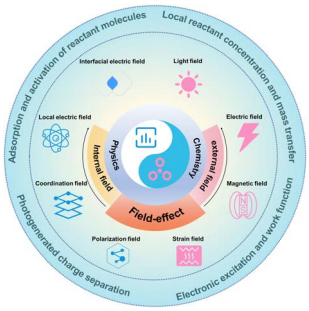
PERSPECTIVES

1506

A perspective on field-effect in energy and environmental catalysis

HuangJingWei Li, Hongmei Li, Mengzhen Du, Erjun Zhou, Wan Ru Leow and Min Liu*

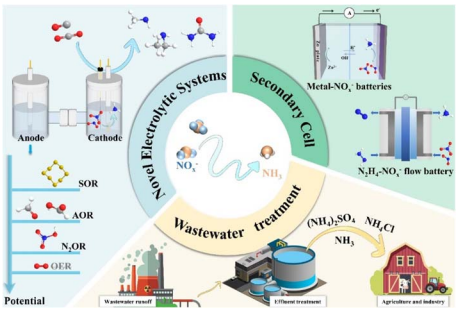


REVIEWS

1528

Valorization systems based on electrocatalytic nitrate/nitrite conversion for energy supply and valuable product synthesis

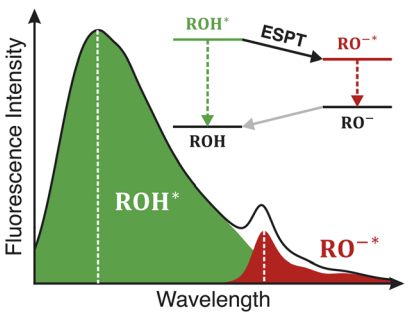
Yi Feng, Jin-Tao Ren, Ming-Lei Sun and Zhong-Yong Yuan*



1560

A dual experimental–theoretical perspective on ESPT photoacids and their challenges ahead

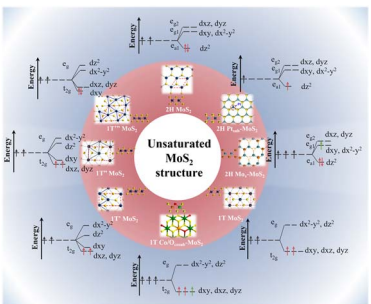
Niklas Sülzner,* Gregor Jung* and Patrick Nuernberger*



1597

Enhancing electrocatalytic hydrogen evolution *via* engineering unsaturated electronic structures in MoS_2

Qingqing Zhou, Hao Hu, Zhijie Chen, Xiao Ren* and Ding Ma*



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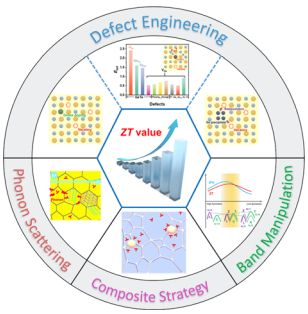
REVIEWS

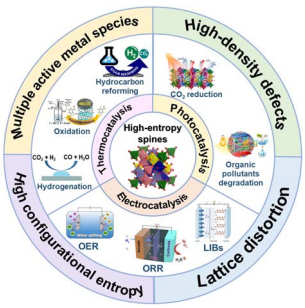
1617



Chemical modulation and defect engineering in high-performance GeTe-based thermoelectrics

Yilin Jiang, Jincheng Yu, Hezhang Li, Hua-Lu Zhuang and Jing-Feng Li*

1652

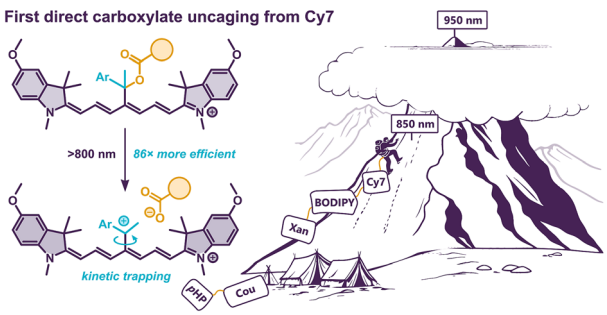


Oriented catalysis through chaos: high-entropy spinels in heterogeneous reactions

Yalan Mo, Xiaohong Guan, Shaobin Wang* and Xiaoguang Duan*

EDGE ARTICLES

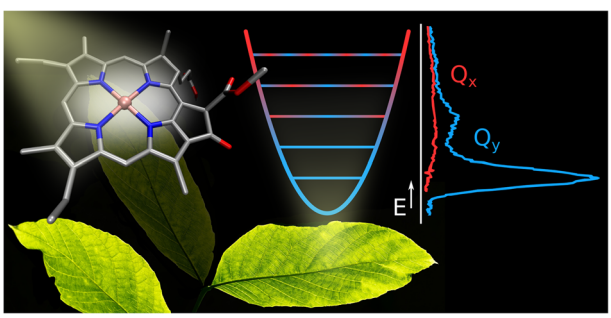
1677



Surfing the limits of cyanine photocages one step at a time

Hana Janeková, Sergey Fisher, Tomáš Šolomek* and Peter Štacko*

1684



Reassessing the role and lifetime of Q_x in the energy transfer dynamics of chlorophyll *a*

Erika Keil, Ajeet Kumar, Lena Bäuml, Sebastian Reiter, Erling Thyrhaug, Simone Moser, Christopher D. P. Duffy, Regina de Vivie-Riedle and Jürgen Hauer*

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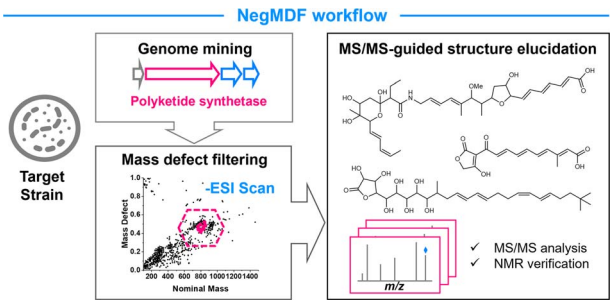
EDGE ARTICLES

1696

A metabologenomics strategy for rapid discovery of polyketides derived from modular polyketide synthases

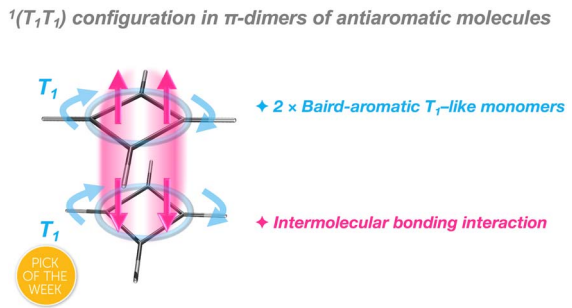
Run-Zhou Liu, Zhihan Zhang, Min Li and Lihan Zhang*



1707

Stacked-ring aromaticity from the viewpoint of the effective number of π-electrons

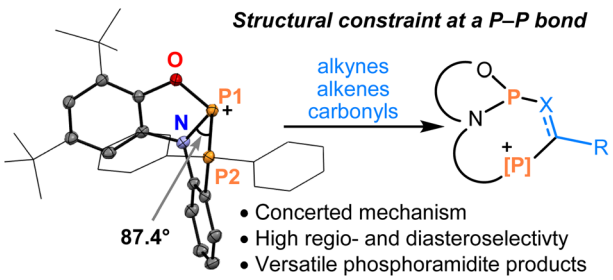
Ryota Sugimori, Kenji Okada, Ryohei Kishi* and Yasutaka Kitagawa



1716

Structural constraint at a P–P bond: phosphinophosphination of alkenes, alkynes, and carbonyls by a concerted mechanism

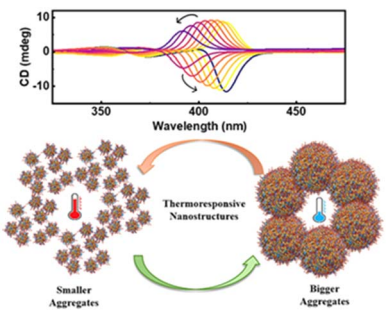
Lijun You, Daniel Roth and Lutz Greb*



1722

Intrinsically chiral thermoresponsive assemblies from achiral clusters: enhanced luminescence and optical activity through tailor-made chiral additives

Camelia Dutta, Ragul Vivaz Nataraajan and Jatish Kumar*



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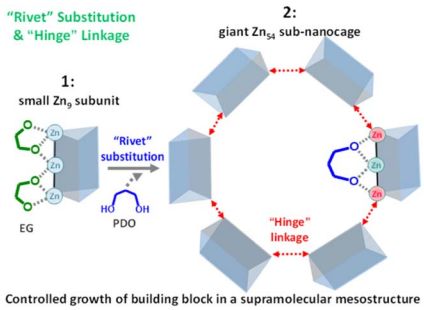
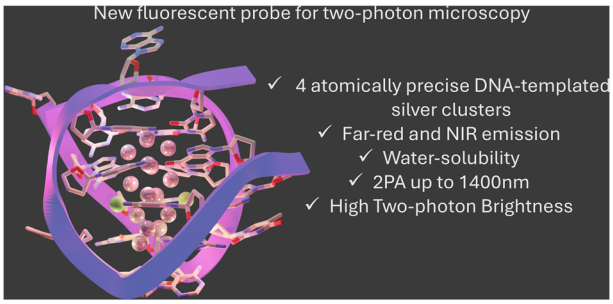


Evolution from [Zn_9] to a record-high [Zn_{54}] subblock and engineering a hierarchical supramolecular framework for enhanced iodine uptake

Ye Tao, Qiubing Dong, Jingmeng Wan, Fu-Ping Huang,* Jingui Duan* and Ming-Hua Zeng*

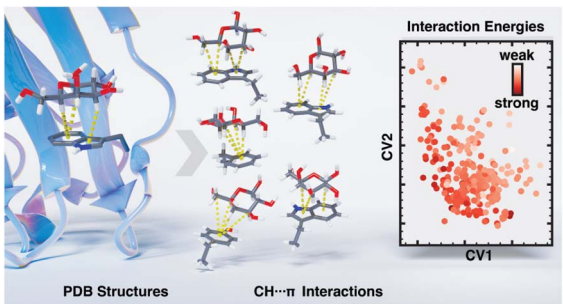
1737



Two-photon brightness of NIR-emitting, atomically precise DNA-stabilized silver nanoclusters

Agata Hajda, Rweetuparna Guha, Stacy Marla Copp and Joanna Olesiak-Bańska*

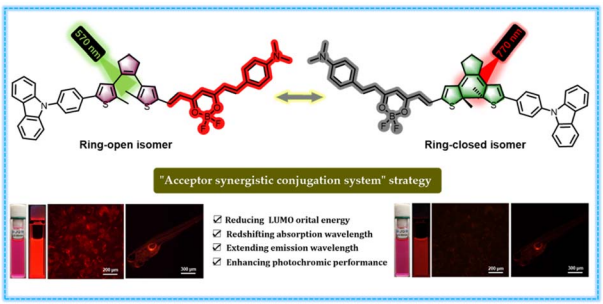
1746



The energetic landscape of CH–π interactions in protein–carbohydrate binding

Allison M. Keys, David W. Kastner, Laura L. Kiessling* and Heather J. Kulik*

1762



570 nm/770 nm light-excited deep-red fluorescence switch based on dithienylethene derived from BF_2-curcuminoid

Ziyong Li,* Xiaoxie Ma, Jinzhao Song, Qilian Wang, Yongliang Feng, Haining Liu, Pei Zhang,* Hui Guo* and Jun Yin*

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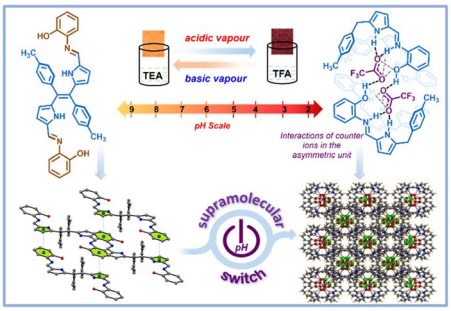
1772

pH-responsive supramolecular switch of a rationally designed dipyrroethene-based chromophore

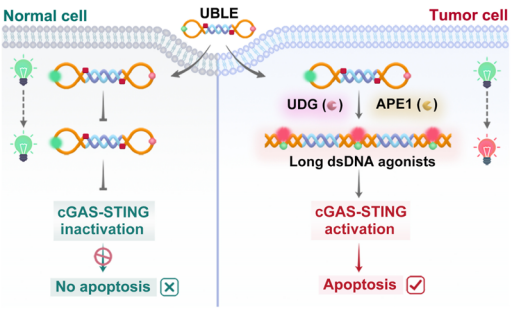
Debasish Mandal, Abani Sarkar, Kanhu Charan Behera and Mangalampalli Ravikanth*



1783

DNA lesion-gated dumbbell nanodevices enable on-demand activation of the cGAS-STING pathway for enhancing cancer immunotherapy

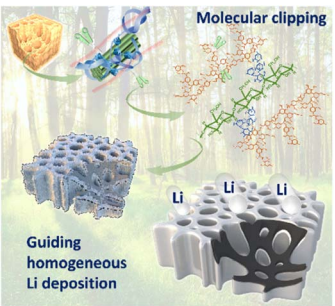
Mei-Ling Zhao, Yan-Mei Lei, Jing-Yi Tang, Wen Li, Xin-Yu Cao, Wen-Bin Liang, Ruo Yuan, Chaoyong Yang and Ying Zhuo*



1791

Controllable reconstruction of lignified biomass with molecular scissors to form carbon frameworks for highly stable Li metal batteries

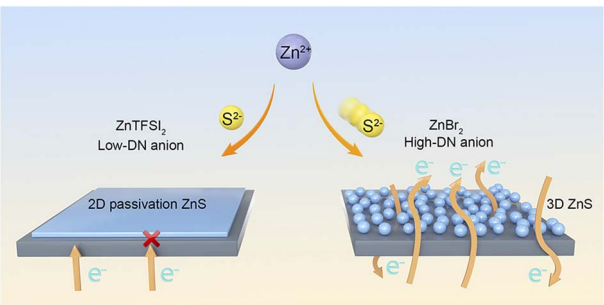
Qi Lu, Chenyu Yang, Yang Xu, Zhan Jiang, Da Ke, Runze Meng, Sijiang Hu, Yuanzhen Chen, Chaofeng Zhang, Jianping Yang and Tengfei Zhou*



1802

Uncovering ZnS growth behavior and morphology control for high-performance aqueous Zn–S batteries

Sibo Wang, Wanlong Wu,* Quanwei Jiang, Chen Li, Hua-Yu Shi, Xiao-Xia Liu and Xiaoqi Sun*



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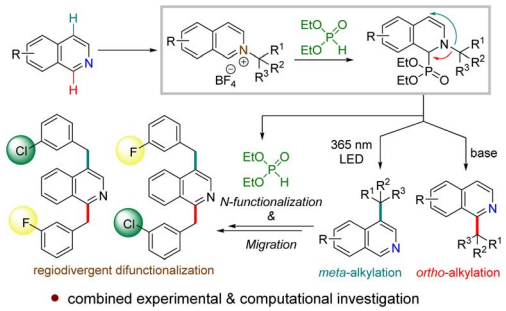
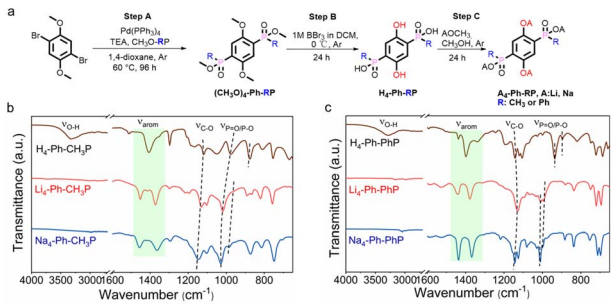
1809



Phosphite mediated molecular editing *via* switch to *meta*-C–H alkylation of isoquinolines: emergence of a distinct photochemical [1,3] N to C rearrangement

Soniya Rani, Anuj Kumar Ray, Devendra Kumar Dewangan, Nita Aruna Ramchandra Patil, M Aarthika, Ankan Paul* and Pradip Maity*

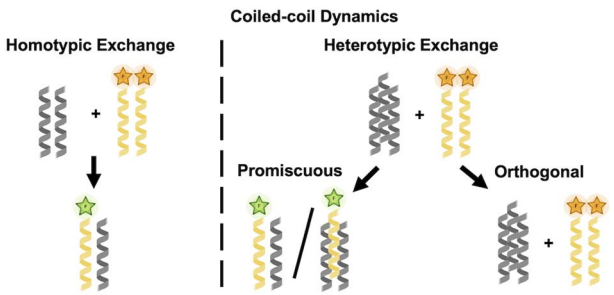
1819



Ionically conducting Li- and Na-phosphonates as organic electrode materials for rechargeable batteries

Yan Zhang, Petru Apostol, Darsi Rambabu, Xiaolong Guo, Xuelian Liu, Xiaodong Lin, Haijiao Xie, Xiaohua Chen, Koen Robeyns, Jiande Wang,* Junzhong Wang* and Alexandru Vlad*

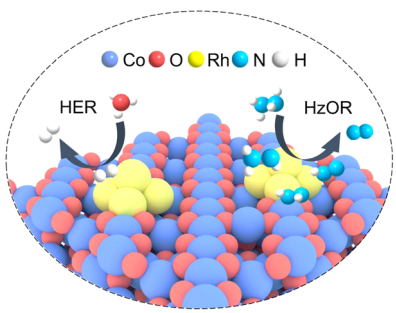
1826



Exchange, promiscuity, and orthogonality in *de novo* designed coiled-coil peptide assemblies

Kathleen W. Kurgan, Freddie J. O. Martin, William M. Dawson, Thomas Brunnock, Andrew J. Orr-Ewing and Derek N. Woolfson*

1837



Asymmetric Rh–O–Co bridge sites enable superior bifunctional catalysis for hydrazine-assisted hydrogen production

Jinrui Hu, Xuan Wang, Yi Zhou, Meihan Liu, Caikang Wang, Meng Li, Heng Liu, Hao Li, Yawen Tang* and Gengtao Fu*

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EDGE ARTICLES

1849

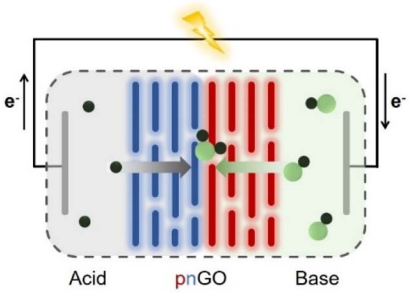
Facile preparation of sulfonium peptide and protein probes for selective crosslinking of methyllysine readers

Kun Zou, Jinyu Yang, Yingxiao Gao, Feng Feng and Mingxuan Wu*

1857

Harvesting ionic power from a neutralization reaction through a heterogeneous graphene oxide membrane

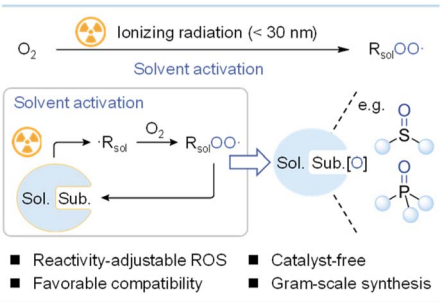
Pei Liu,* Teng Zhou, Linsen Yang, Xin Li, Lei Jiang and Liping Wen*



1867

Radiation-induced aerobic oxidation *via* solvent-derived peroxyl radicals

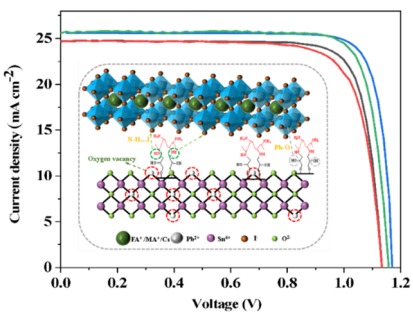
Yang Xu, Bo-Shuai Mu,* Zhiyu Tu, Weiqiu Liang, Jiahao Li, Ziyang Sang and Zhibo Liu*



1876

Buried interface management toward high-performance perovskite solar cells

Bin Du,* Yuexin Lin, Jintao Ma, Weidan Gu, Fei Liu, Yijun Yao* and Lin Song*



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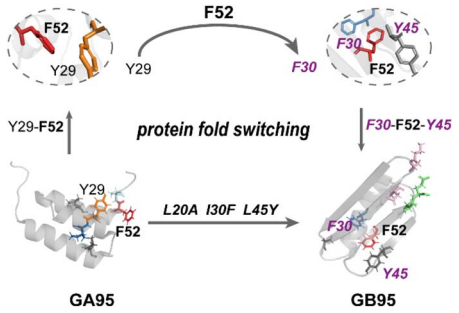
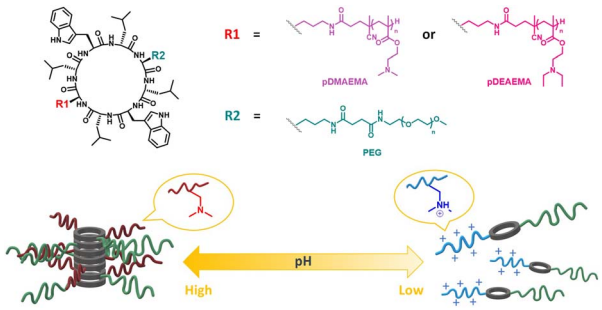
1885



Aromatic–aromatic interactions drive fold switch of GA95 and GB95 with three residue difference

Chen Chen, Zeting Zhang,* Mojie Duan,* Qiong Wu, Minghui Yang, Ling Jiang, Maili Liu and Conggang Li*

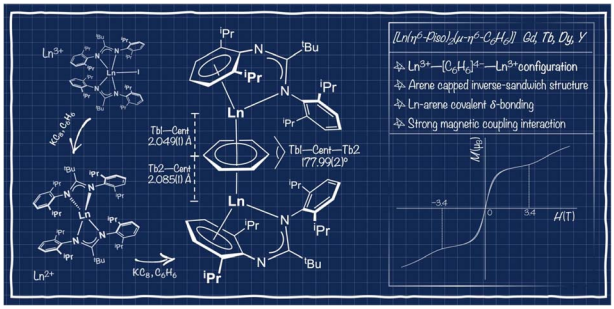
1894



pH-Responsive nanotubes from asymmetric cyclic peptide–polymer conjugates

Zihe Cheng, Qiao Song, Stephen C. L. Hall and Sébastien Perrier*

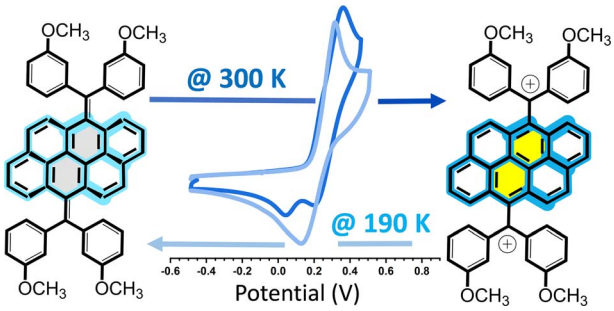
1907



Rare earth benzene tetraanion-bridged amidinate complexes

Peng-Bo Jin, Qian-Cheng Luo, Gemma K. Gransbury, Richard E. P. Winpenny,* David P. Mills* and Yan-Zhen Zheng*

1925



Folded–twisted mechanisms control dynamic redox properties, photophysics and electron transfer of anthanthrene-quinodimethanes

Abel Cárdenas Valdivia, Frédéric Lirette, José M. Marín-Beloqui,* Abel Carreras,* David Casanova, Joël Boismenu-Lavoie, Jean-François Morin* and Juan Casado*

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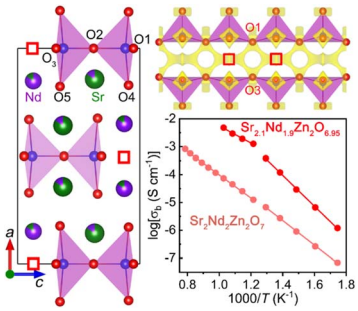
1932

Interplay between A-site and oxygen-vacancy ordering, and mixed electron/oxide-ion conductivity in $n = 1$ Ruddlesden–Popper perovskite $Sr_2Nd_2Zn_2O_7$

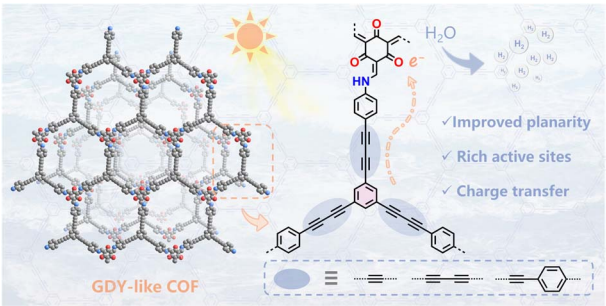
Danhe Li, Guangxiang Lu, Zien Cheng, Maxim Avdeev,* Jungu Xu, Zhengyang Zhou, Rihong Cong, Tao Yang* and Pengfei Jiang*



1948

Diacetylene-bridged covalent organic framework as crystalline graphdiyne analogue for photocatalytic hydrogen evolution

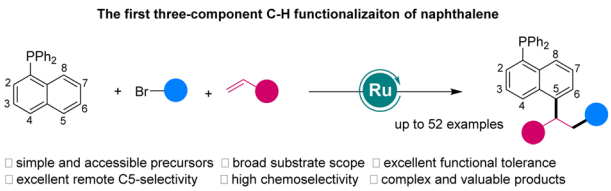
Zhiqing Lin, Songyao Dai, Shan Yao, Qia-Chun Lin, Mengying Fu, Lai-Hon Chung,* Bin Han* and Jun He*



1957

Ruthenium-catalyzed three-component tandem remote C–H functionalization of naphthalenes: modular and concise synthesis of multifunctional naphthalenes

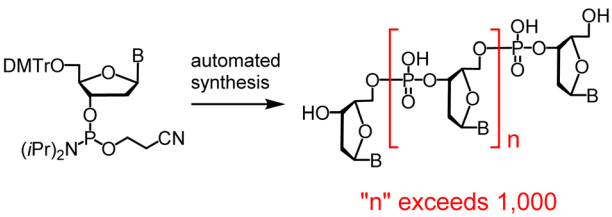
Mao-Gui Huang, Yue-Liu-Ting Fu, Jia-Wei Li and Yue-Jin Liu*



1966

Long oligos: direct chemical synthesis of genes with up to 1728 nucleotides

Yipeng Yin, Reed Arneson, Yinan Yuan* and Shiyue Fang*



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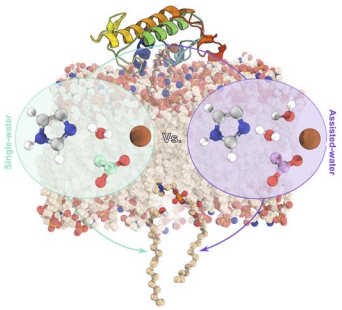
EDGE ARTICLES

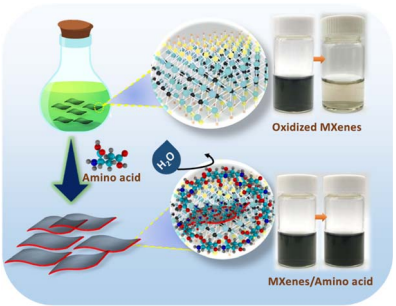
1974



Beyond Fang's fury: a computational study of the enzyme–membrane interaction and catalytic pathway of the snake venom phospholipase A_2 toxin

Juliana Castro-Amorim, Alexandre V. Pinto, Ashis K. Mukherjee, Maria J. Ramos and Pedro A. Fernandes*

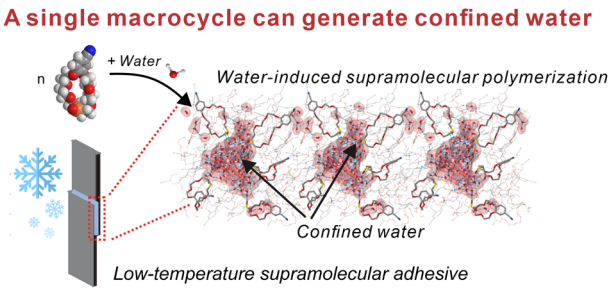
1986



Probing the synergistic effects of amino compounds in mitigating oxidation in 2D $Ti_3C_2T_x$ MXene nanosheets in aqueous environments

Jai Kumar, Jiayi Tan, Razium Ali Soomro, Ning Sun* and Bin Xu*

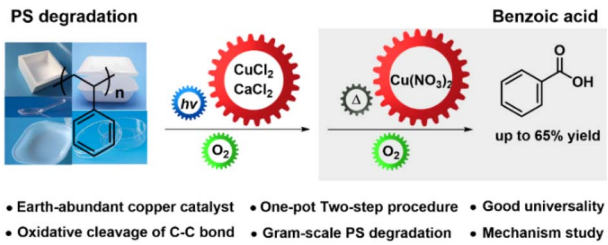
1995



Molecular engineering of supramolecular polymer adhesive with confined water and a single crown ether

Qiangqiang Xu, Paulina Szymoniak, Mohamed Aejaz Kolmangadi, Zerui Yang, Shixian Wang, Yurui Gao,* Jie Shang, Johannes Hunger, Aitkazy Kaisha, Abdurakhman Aldiyarov, Andreas Schönhals,* Yan Ge* and Zhenhui Qi*

2004



Aerobic oxidation of alkylarenes and polystyrene waste to benzoic acids *via* a copper-based catalyst

Enjie Xu, Tianwei Liu, Fuyu Xie, Jianghua He* and Yuetao Zhang*

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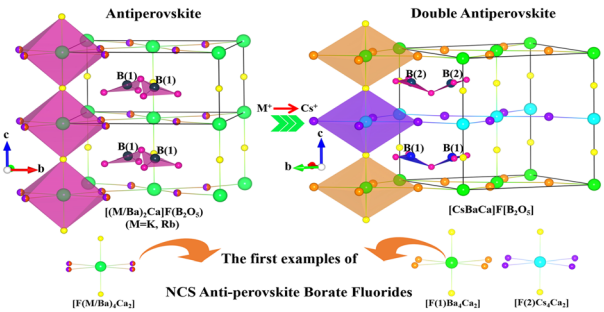
2015

Rational design of a series of non-centrosymmetric antiperovskite and double antiperovskite borate fluorides

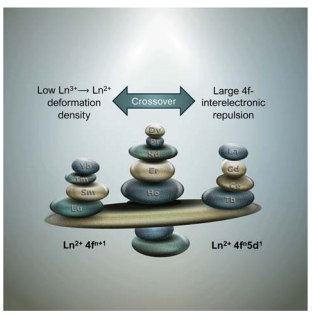
Fuqiang Chen, Hongping Wu,* Zhanggui Hu, Jiyang Wang, Yicheng Wu and Hongwei Yu*



2024

A comprehensive approach for elucidating the interplay between $4f^{n+1}$ and $4f^{n}5d^{1}$ configurations in Ln^{2+} complexes

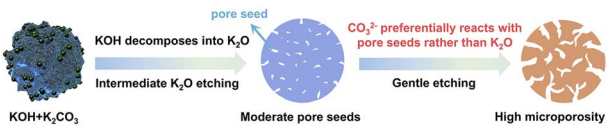
Maria J. Beltran-Leiva, William N. G. Moore, Tener F. Jenkins, William J. Evans,* Thomas E. Albrecht* and Cristian Celis-Barros*



2034

Redefining the roles of alkali activators for porous carbon

Yonghui Zhang, Xin Xu, Qingxuan Geng, Qingwei Li,* Xiuli Li, Yixuan Wang, Zihuan Tang, Biao Gao, Xuming Zhang, Paul K. Chu and Kaifu Huo*



CORRECTIONS

2044

Correction: Reconstructing the phase of vanadium oxides enables redox-catalysis manipulated reversible sulfur conversion for stable Zn–S batteries

Hao Luo,* Fan Li, Mingli Wang,* Shang Sun, Min Zhou, Wenjing Zhang, Hengrui Guo, Xueyin Su, Xiaolong Li* and Lina Ma*

CORRECTIONS

2046

Correction: Radical ligand transfer: mechanism and reactivity governed by three-component thermodynamics

Zuzanna Wojdyla and Martin Srnec*

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