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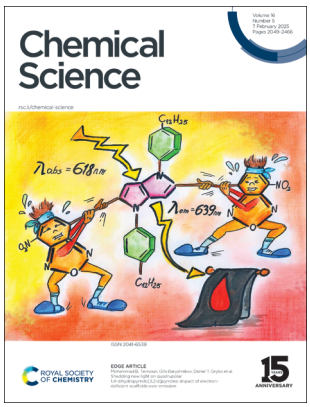
IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 16(5) 2049–2466 (2025)



Cover
See Mohammad B. Teimouri, Glib Baryshnikov, Daniel T. Gryko *et al.*, pp. 2170–2179. Image reproduced by permission of Daniel T. Gryko from *Chem. Sci.*, 2025, **16**, 2170. Image created by Dominika Bednarska.

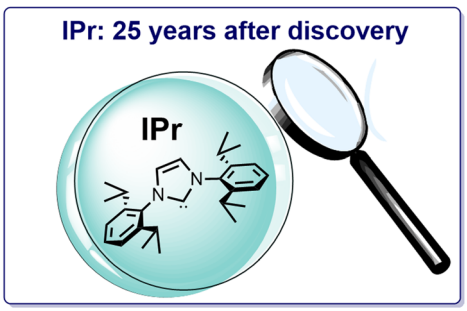
Inside cover
See Rachel Codd *et al.*, pp. 2180–2190. Image reproduced by permission of Ramona Codd-Miller from *Chem. Sci.*, 2025, **16**, 2180.

PERSPECTIVES

2062

The influential IPr: 25 years after its discovery

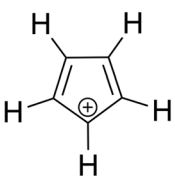
Vladislav A. Voloshkin, Leandros P. Zorba and Steven P. Nolan*

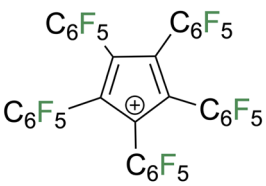


2083

Cyclopentadienyl cations

Sameera Ranasinghe, Caleb D. Martin* and Jason L. Dutton*





A 99 year journey from observation to isolation

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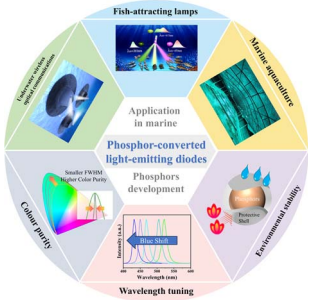
REVIEWS

2089

Phosphor-converted light-emitting diodes in the marine environment: current status and future trends

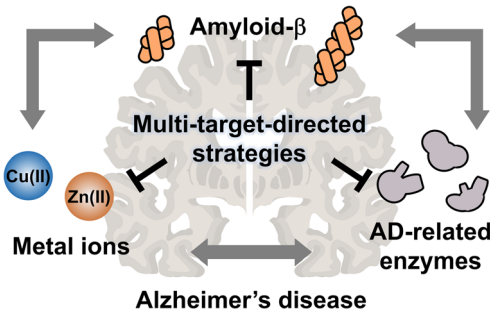
Maofeng Hua, Shuifu Liu, Lei Zhou,* Jean-Claude Bünzli* and Mingmei Wu*



2105

Multi-target-directed therapeutic strategies for Alzheimer's disease: controlling amyloid-β aggregation, metal ion homeostasis, and enzyme inhibition

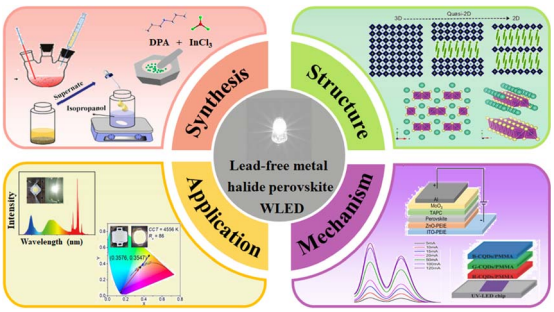
Jeasang Yoo, Jimin Lee, Byeongha Ahn, Jiyeon Han* and Mi Hee Lim*



2136

Opportunities and challenges of lead-free metal halide perovskites for luminescence

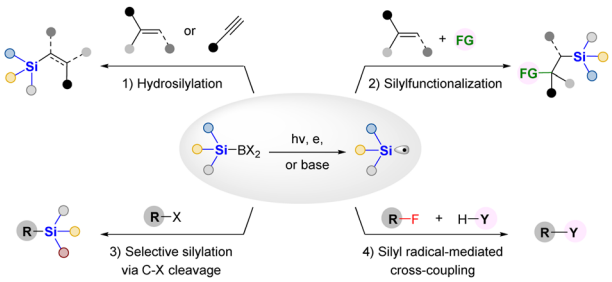
Run Tan, Zhenyu Liu, Zhigang Zang* and Shuangyi Zhao*



2154

Recent advances and perspectives in synthetic applications of silylboronates as silyl radical precursors

Zhihua Cai, Qing-Qing Bu, Xi-Yu Wang, Shengchao Yang,* Jian Zhou and Jin-Sheng Yu*



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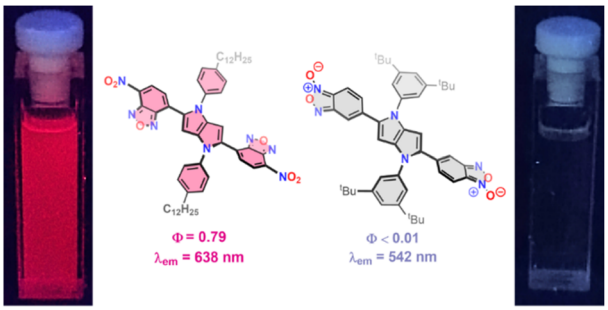
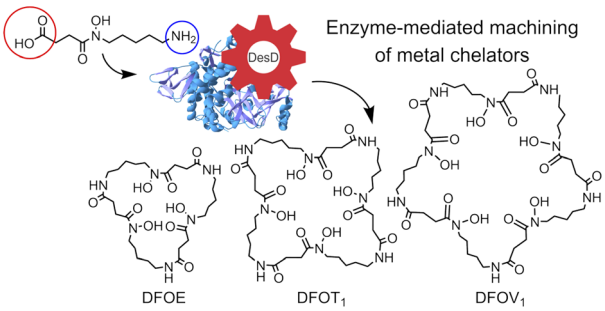


Shedding new light on quadrupolar 1,4-dihydropyrrolo[3,2-*b*]pyrroles: impact of electron-deficient scaffolds over emission

Bartosz Szymański, Smruti Ranjan Sahoo, Olena Vakuliuk, Rashid Valiev, Ruslan Ramazanov, Piotr Łaski, Katarzyna N. Jarzembska, Radosław Kamiński, Mohammad B. Teimouri,* Glib Baryshnikov* and Daniel T. Gryko*

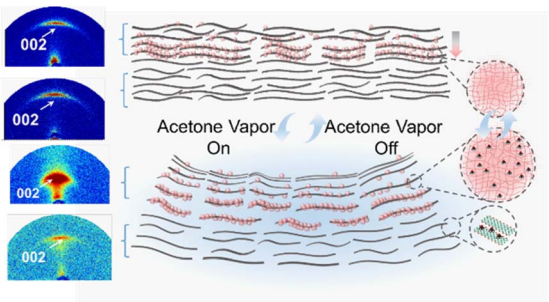
2180



An elastic siderophore synthetase and rubbery substrates assemble multimeric linear and macrocyclic hydroxamic acid metal chelators

Kate P. Nolan, Callum A. Rosser, James L. Wood, Josep Font, Athavan Sresutharsan, Joseph Wang, Todd E. Markham, Renae M. Ryan and Rachel Codd*

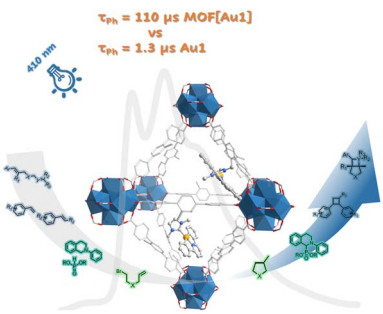
2191



MXene-based solvent-responsive actuators with a polymer-intercalated gradient structure

Andi Di, Chenlu Wang, Yanlei Wang, Hongyan He,* Wentao Deng, Pierre Stiernet, Lennart Bergström,* Jiayin Yuan* and Miao Zhang*

2202



Luminescent cyclometalated gold(III) complexes covalently linked to metal–organic frameworks for heterogeneous photocatalysis

Jian-Rui Chen, Dongling Zhou, Yungen Liu, Mian Li, Yonghong Xiao, Xiao-Chun Huang* and Chi-Ming Che*

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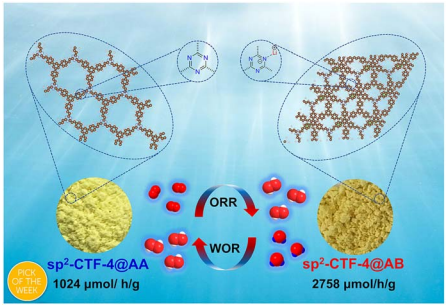
2215

Tuning the interlayer stacking of a vinylene-linked covalent organic framework for enhancing sacrificial agent-free hydrogen peroxide photoproduction

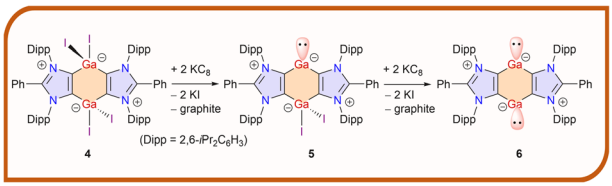
Qiujian Xie, Anqi Chen, Xiaofeng Li, Chen Xu, Shuai Bi, Weijie Zhang, Juntao Tang, Chunyue Pan, Fan Zhang* and Guipeng Yu*



2222

Annulated carbocyclic gallylene and bis-gallylene with two-coordinated Ga(I) atoms

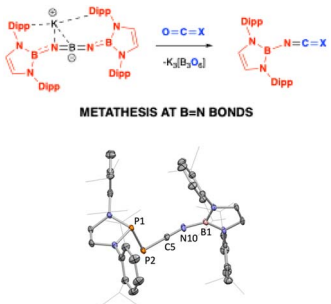
Arne Merschel, Shkelqim Heda, Yury V. Vishnevskiy, Beate Neumann, Hans-Georg Stammler and Rajendra S. Ghadwal*



2231

Metathesis chemistry of inorganic cumulenes driven by B–O bond formation

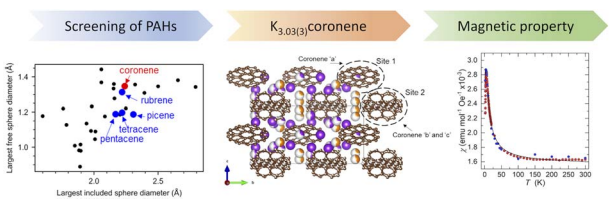
Jianqin Tang, Chenyang Hu, Agamemnon E. Crumpton, Liam P. Griffin, Jose M. Goicoechea* and Simon Aldridge*



2238

Multiple cation insertion into a polyaromatic hydrocarbon guided by data and computation

Moinak Dutta, Angelos B. Canaj, Tilen Knaflič, Christopher M. Collins, Troy D. Manning, Hongjun Niu, Luke M. Daniels, Aikaterini Vriza, Luke A. Johnson, Bhupendra P. Mali, Yuri Tanuma, T. Wesley Surta, John B. Claridge, Neil G. Berry, Denis Arčon, Matthew S. Dyer and Matthew J. Rosseinsky*



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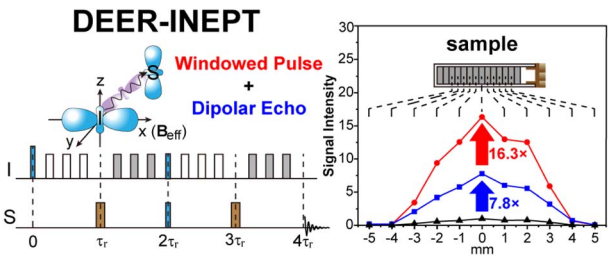
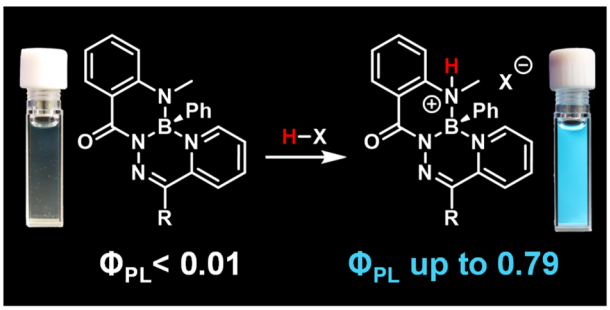


Highly efficient heteronuclear polarization transfer using dipolar-echo edited R-symmetry sequences in solid-state NMR

Lixin Liang, Kuizhi Chen and Guangjin Hou*

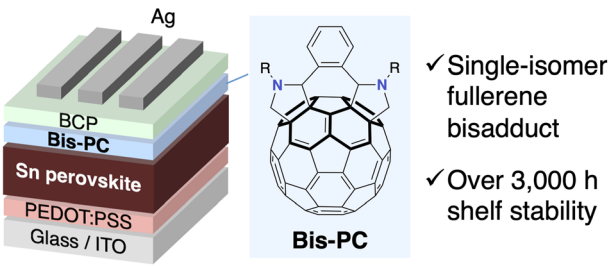
2258



Ligand protonation leads to highly fluorescent boronium cations

Alexander E. R. Watson, Paul D. Boyle, Paul J. Ragogna* and Joe B. Gilroy*

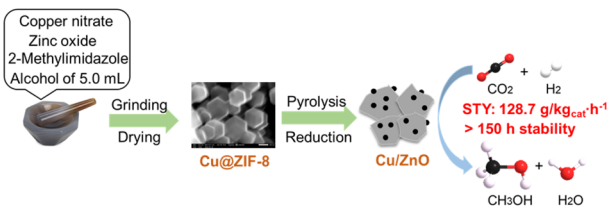
2265



Single-isomer bis(pyrrolidino)fullerenes as electron-transporting materials for tin halide perovskite solar cells

Tomoya Nakamura,* Takabumi Nagai, Yuki Miyake, Takumi Yamada, Makoto Miura, Hiroyuki Yoshida, Yoshihiko Kanemitsu, Minh Anh Truong, Richard Murdey and Atsushi Wakamiya*

2273



Fast synthesis of Cu@zeolitic imidazolate framework-8 (ZIF-8) derived Cu/ZnO catalysts *via* a facile mechanical grinding method for CO_2 hydrogenation to methanol

Fei Chen, Siyu Liu, Hao Huang, Bo Wang, Zhihao Liu, Xiuyun Jiang, Wenjie Xiang, Guohui Yang, Guangbo Liu, Xiaobo Peng,* Zhenzhou Zhang,* Zhongyi Liu* and Noritatsu Tsubaki*

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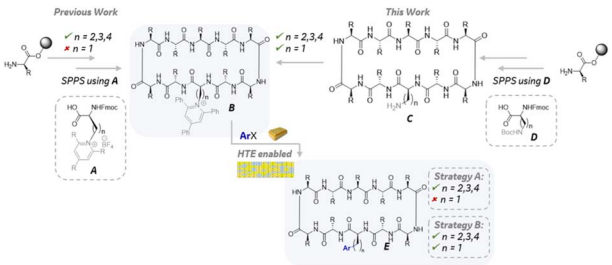
2287

Late-stage installation and functionalization of alkyl pyridiniums: a general HTE amenable strategy to access diverse aryl alanine containing macrocyclic peptides

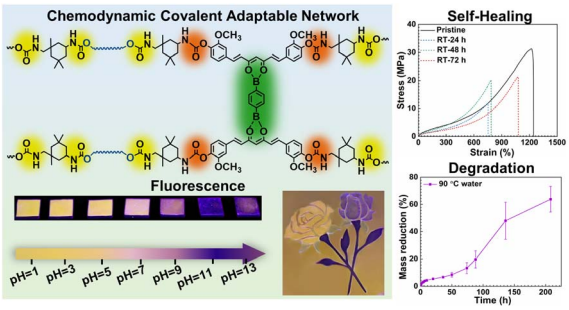
Ahmet Kekec,* Lauren My-Linh Tran, Christopher W. Plummer and Dipannita Kalyani*



2295

Chemodynamic covalent adaptable network-induced robust, self-healing, and degradable fluorescent elastomers for multicolor information encryption

Changyang Li, Xing Su,* Chuanbao Cao, Xiaodong Li and Meishuai Zou*



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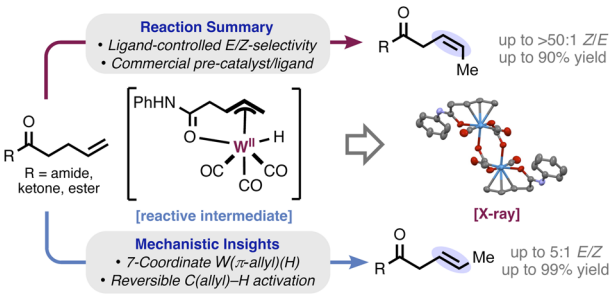
Tungsten-catalyzed stereodivergent isomerization of terminal olefins

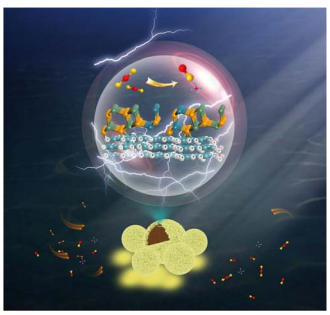
Tanner C. Jankins, Camille Z. Rubel, Hang Chi Ho, Raul Martin-Montero and Keary M. Engle*



2316

Hollow core–shell heterojunction TAPB-COF@$ZnIn_2S_4$ as highly efficient photocatalysts for carbon dioxide reduction

Huitao Fan,* Minglin Hu, Yabing Duan, Luyang Zuo, Ronggui Yu, Zhuwei Li, Qi Liu, Bo Li* and Liya Wang



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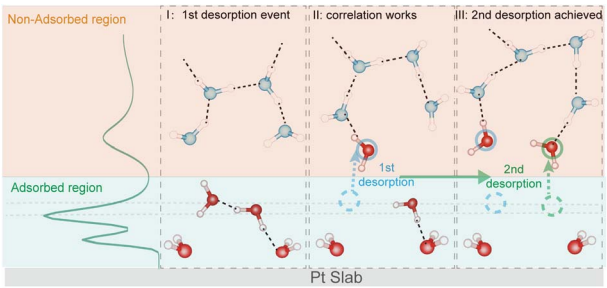
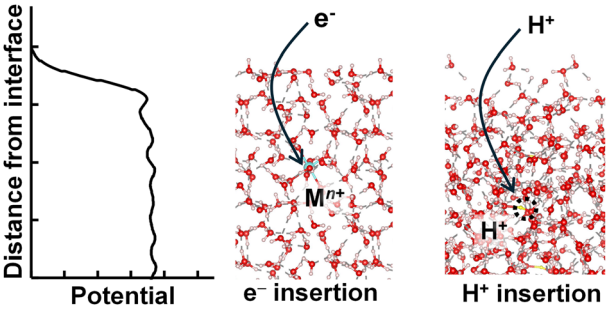


Spatial correlation of desorption events accelerates water exchange dynamics at Pt/water interfaces

Fei-Teng Wang, Jia-Xin Zhu, Chang Liu, Ke Xiong, Xiandong Liu* and Jun Cheng*

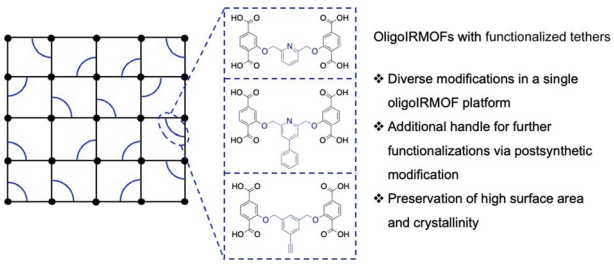
2335



Absolute standard hydrogen electrode potential and redox potentials of atoms and molecules: machine learning aided first principles calculations

Ryosuke Jinnouchi,* Ferenc Karsai and Georg Kresse

2344



Metal–organic frameworks generated from oligomeric ligands with functionalized tethers

Hyunyong Kim and Seth M. Cohen*

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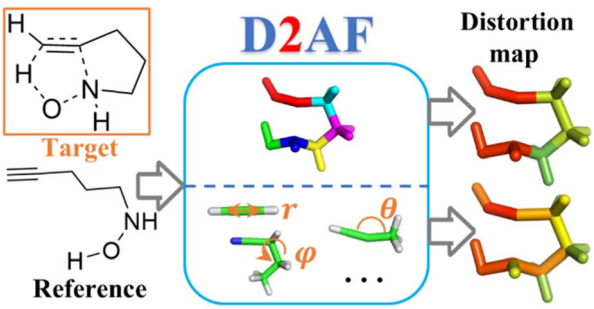

An efficient and flexible approach for local distortion: distortion distribution analysis enabled by fragmentation

Zeyin Yan, Yunteng Sam Liao, Xin Li and Lung Wa Chung*

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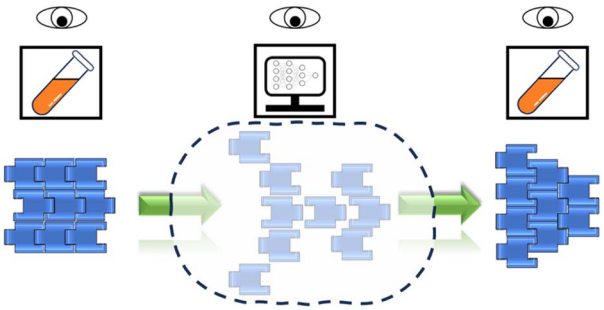
A machine learned potential for investigating single crystal to single crystal transformations in complex organic molecular systems

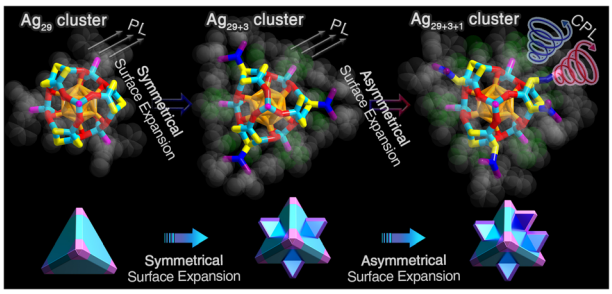
Chengxi Zhao,* Honglai Liu, Da-Hui Qu, Andrew I. Cooper and Linjiang Chen*



2373

Symmetrical and asymmetrical surface structure expansions of silver nanoclusters with atomic precision

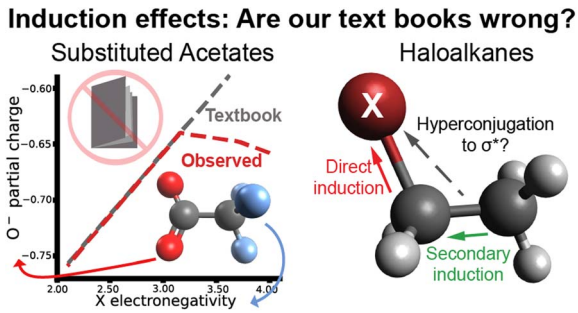
Honglei Shen, Pu Wang, Jiawei Xu, Ziwei Fu, Xi Kang,* Yong Pei* and Manzhou Zhu*



2382

The inductive effect does not explain electron density in haloacetates: are our textbooks wrong?

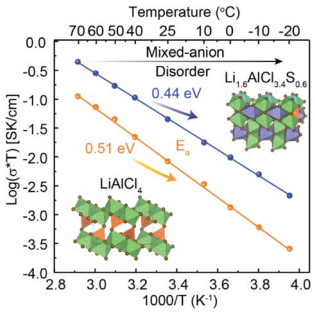
Edwin C. Johnson,* Kasimir P. Gregory, Hayden Robertson, Isaac J. Gresham, Andrew R. J. Nelson, Vincent S. J. Craig, Stuart W. Prescott, Alister J. Page, Grant B. Webber and Erica J. Wanless



2391

$Li_{1.6}AlCl_{3.4}S_{0.6}$: a low-cost and high-performance solid electrolyte for solid-state batteries

Tej P. Poudel, Ifeoluwa P. Oyekunle, Michael J. Deck, Yudan Chen, Dewen Hou, Pawan K. Ojha, Bright O. Ogbolu, Chen Huang, Hui Xiong and Yan-Yan Hu*



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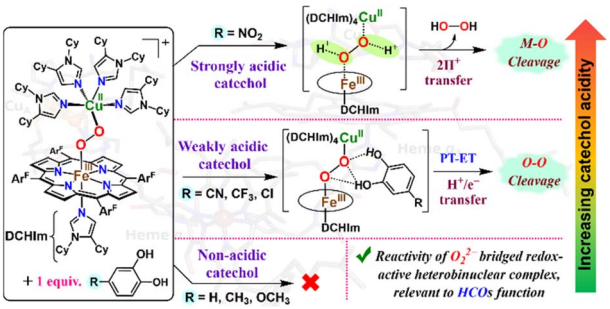

Reactivity of a heterobinuclear heme–peroxo–Cu complex with *para*-substituted catechols shows a pK_a-dependent change in mechanism

Sanjib Panda, Suzanne M. Adam, Hai Phan, Patrick J. Rogler, Pradip Kumar Hota, Joshua R. Helms, Brad S. Pierce, Gayan B. Wijeratne* and Kenneth D. Karlin*

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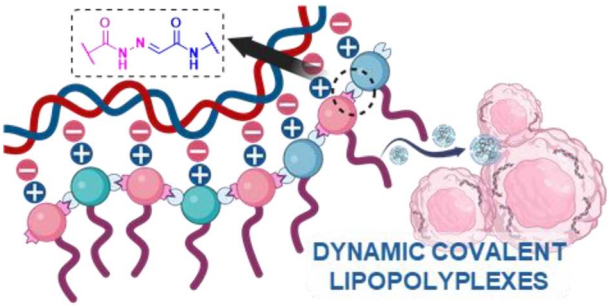
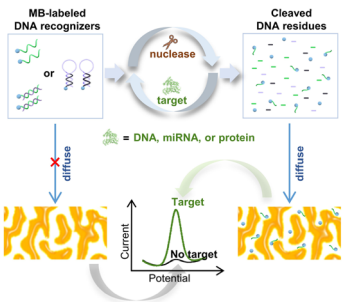


Amphiphilic dynamic covalent polymer vectors of siRNA

José García Coll, Pauline Trousselier, Sachin Dattram Pawar, Yannick Bessin, Laure Lichon, Jeanne Leblond Chain, Emmanuelle Sachon,* Nadir Bettache* and Sébastien Ulrich*

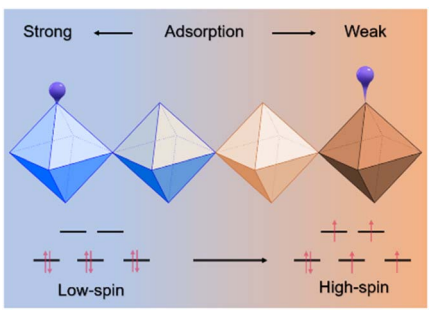
2420



Exploring the diffusion of DNA strands into nanoporous structures for establishing a universal electrochemical biosensor

Cong-Lin Zhao, Runlei Gao, Yinzheng Niu, Bin Cai* and Ye Zhu*

2429



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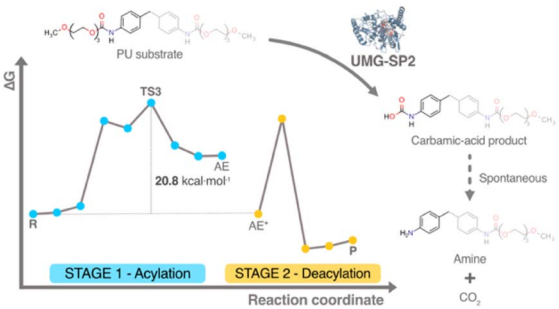
EDGE ARTICLES

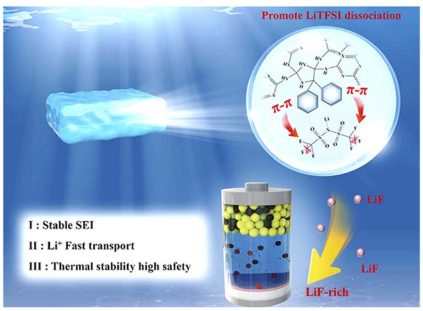
2437

Unveiling the enzymatic pathway of UMG-SP2 urethanase: insights into polyurethane degradation at the atomic level

P. Paiva, L. M. C. Teixeira, R. Wei, W. Liu, G. Weber, J. P. Morth, P. Westh, A. R. Petersen, M. B. Johansen, A. Sommerfeldt, A. Sandahl, D. E. Otzen, P. A. Fernandes and M. J. Ramos*



2453

Catalysis of a LiF-rich SEI by aromatic structure modified porous polyamine for stable all-solid-state lithium metal batteries

Lijie Dai, Min Cai, Xuanyi Zhou, Weizhong Liang, Zishao Zhao, Zixiang Xia, Fenfen Huang, Jie Jiang,* Wenjuan Jiang,* Biao Zhang* and Zengsheng Ma