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Cover
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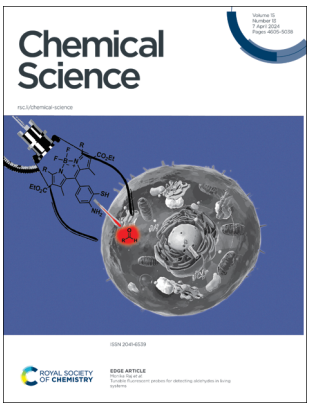


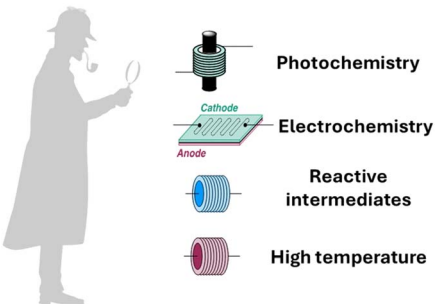
Inside cover
See Monika Raj *et al.*, pp. 4763–4769. Image reproduced by permission of Monika Raj from *Chem. Sci.*, 2024, **15**, 4763.

PERSPECTIVE

4618

Continuous flow synthesis enabling reaction discovery

Antonella Ilenia Alfano, Jorge García-Lacuna, Oliver M. Griffiths, Steven V. Ley* and Marcus Baumann*

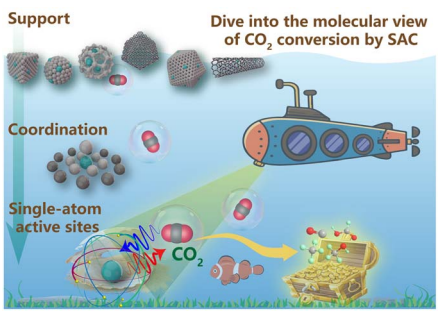


REVIEWS

4631

A molecular view of single-atom catalysis toward carbon dioxide conversion

Xin Shang, Xiaofeng Yang, Guodong Liu, Tianyu Zhang* and Xiong Su*



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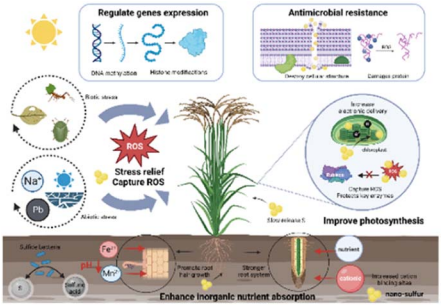
REVIEWS

4709

Unlocking the potential of nanoscale sulfur in sustainable agriculture

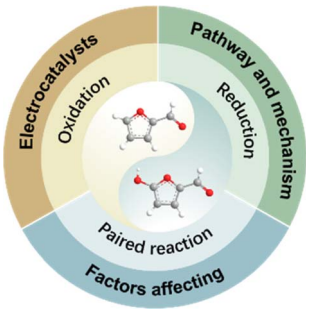
Yi Sun, Yaqi Jiang, Yuanbo Li, Qibin Wang, Guikai Zhu, Tianjing Yi, Quanlong Wang, Yi Wang, Om Parkash Dhankher, Zhiqiang Tan, Iseult Lynch, Jason C. White,* Yukui Rui* and Peng Zhang*



4723

Electrocatalytic conversion of biomass-derived furan compounds: mechanisms, catalysts and perspectives

Peipei Zhu,* Mingzhu Shi, Zhipeng Shen, Xunfan Liao and Yiwang Chen*

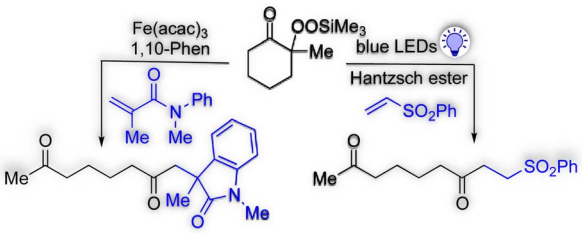


EDGE ARTICLES

4757

Synthetic utility of functionalized alkylsilyl peroxides for Fe-catalyzed and visible-light-promoted radical transformation

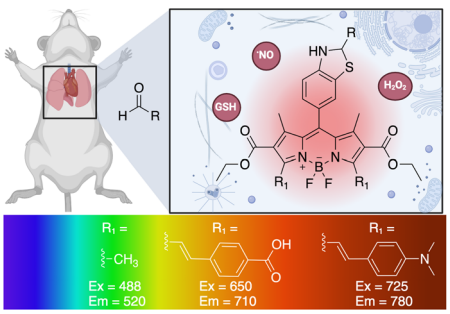
Jiahao Liu, Shiyong Liu, Zhe Wang, Terumasa Kato,* Yan Liu* and Keiji Maruoka*



4763

Tunable fluorescent probes for detecting aldehydes in living systems

Rachel Wills, Rajendra Shirke, Hannah Hrncir, John M. Talbott, Kirti Sad, Jennifer M. Spangle, Adam D. Gracz and Monika Raj*



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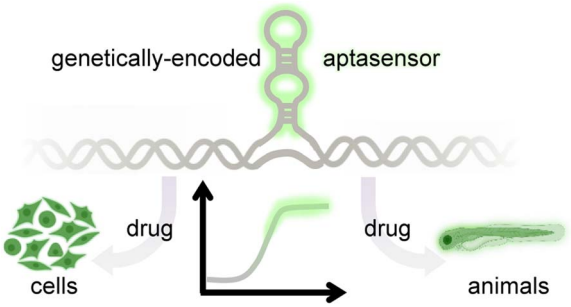
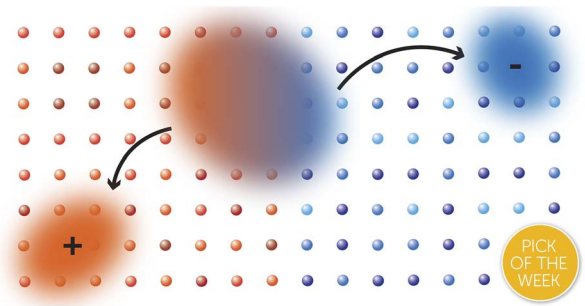


Non-invasive single cell aptasensing in live cells and animals

Eiman A. Osman, Thomas P. Rynes, Y. Lucia Wang, Karen Mruk and Maureen McKeague*

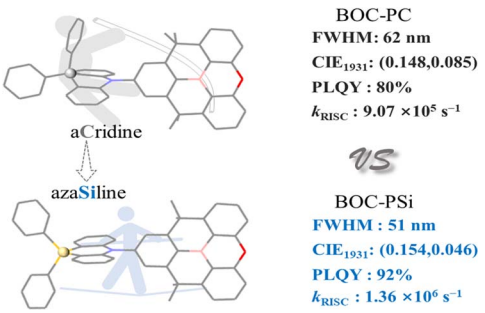
4779



Delocalisation enables efficient charge generation in organic photovoltaics, even with little to no energetic offset

Daniel Balzer and Ivan Kassal*

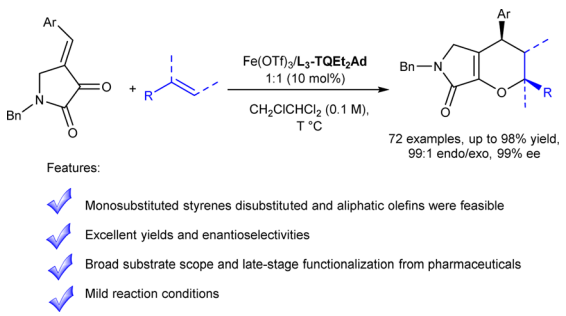
4790



Realizing highly efficient deep-blue organic light-emitting diodes towards Rec.2020 chromaticity by restricting the vibration of the molecular framework

Chuan Li, Kai Zhang, Yanju Luo, Yang Yang, Yong Huang, Mengjiao Jia, Yuling He, Yue Lei, Jian-Xin Tang,* Yan Huang and Zhiyun Lu*

4797



Iron^{III}-catalyzed asymmetric inverse-electron-demand hetero-Diels–Alder reaction of dioxopyrrolidines with simple olefins

Tangyu Zhan, Liang Zhou, Yuqiao Zhou, Bingqian Yang, Xiaoming Feng* and Xiaohua Liu*

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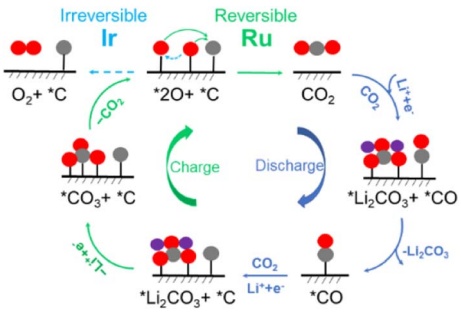
Reversible and irreversible reaction mechanisms of Li–CO_2 batteries

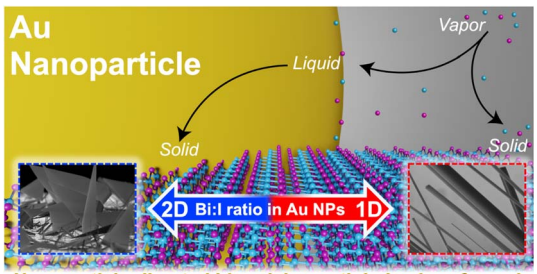
Xinxin Zhang, Yu Wang* and Yafei Li*



4811

Nanoparticle-directed bimodal crystallization of the quasi-1D van der Waals phase, Bi_4I_4

Steven Jay Allison, Dmitri Leo Mesoza Cordova, Maham Hasib, Toshihiro Aoki and Maxx Q. Arguilla*



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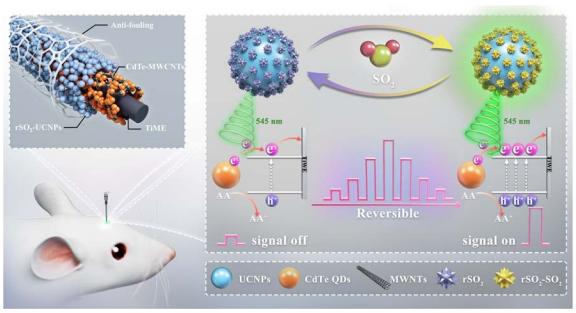
A reversible photoelectrochemical microsensor for dynamically monitoring sulfur dioxide in the epileptic brain

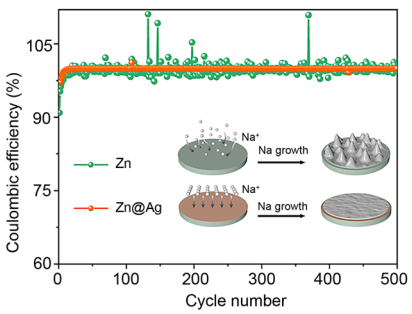
Danying Lin, Tao Lu, Xiao Wang, Xiaoxue Ye* and Zhihong Liu*



4833

A conductive and sodiophilic Ag coating layer regulating Na deposition behaviors for highly reversible sodium metal batteries

Xiaomin Chen, Xunzhu Zhou, Zhuo Yang, Zhiqiang Hao, Jian Chen, Wenxi Kuang, Xiaoyan Shi, Xingqiao Wu, Lin Li* and Shu-Lei Chou*



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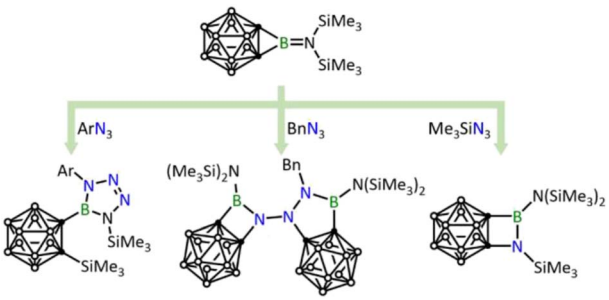
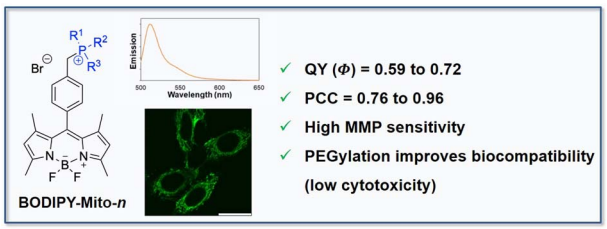


Avenue to novel *o*-carboranyl boron compounds – reactivity study of *o*-carborane-fused aminoborirane towards organic azides

Junyi Wang, Libo Xiang, Xiaocui Liu, Alexander Matler, Zhenyang Lin* and Qing Ye*

4846



Mitochondria-targeting biocompatible fluorescent BODIPY probes

Edward R. H. Walter, Lawrence Cho-Cheung Lee, Peter Kam-Keung Leung, Kenneth Kam-Wing Lo* and Nicholas J. Long*

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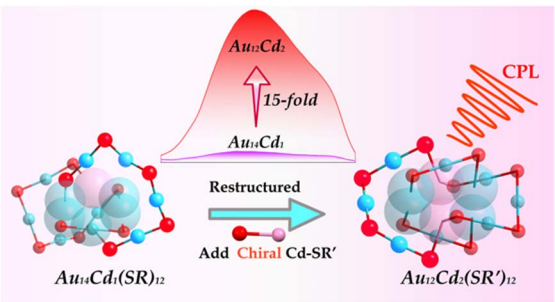
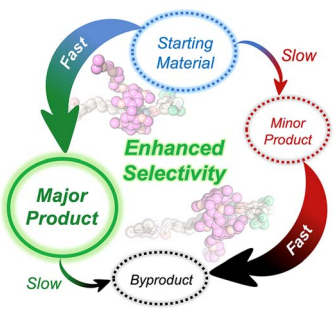


Construction of an $Au_{12}Cd_2$ nanocluster with circularly polarized luminescence by a metal- and ligand-exchange strategy

Jun Zhou, Xiaofei Yang, Peisen Zheng, Qinzhen Li, Xiaowu Li, Jinsong Chai, Baoyu Huang,* Sha Yang* and Manzhou Zhu*

4860



Kinetically controlled synthesis of rotaxane geometric isomers

Dillon R. McCarthy, Ke Xu, Mica E. Schenkelberg, Nils A. N. Balegamire, Huiming Liang, Shea A. Bellino, Jianing Li and Severin T. Schneebeli*

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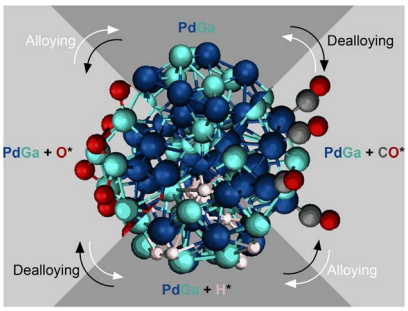
Metadynamics simulations reveal alloying-dealloying processes for bimetallic PdGa nanoparticles under CO_2 hydrogenation

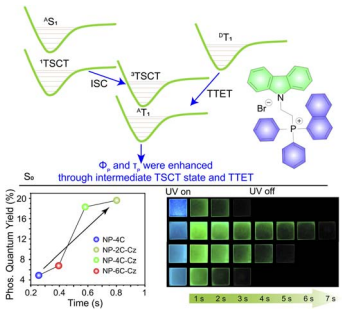
Julian F. Baumgärtner, Andreas Müller, Scott R. Docherty, Aleix Comas-Vives, Pierre-Adrien Payard* and Christophe Copéret*



4881

Simultaneously enhancing organic phosphorescence quantum yields and lifetimes for triphenylphosphine salt doped polymer films

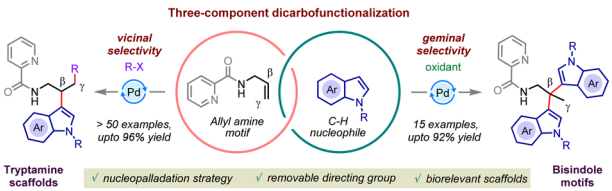
Jiangang Li, Kuanjian Wei, Jilong Wu, Yuchang Wang, Shujuan Liu, Yun Ma* and Qiang Zhao*



4890

Three-component dicarbofunctionalization of allylamines *via* nucleopalladation pathway: unlocking vicinal and geminal selectivity

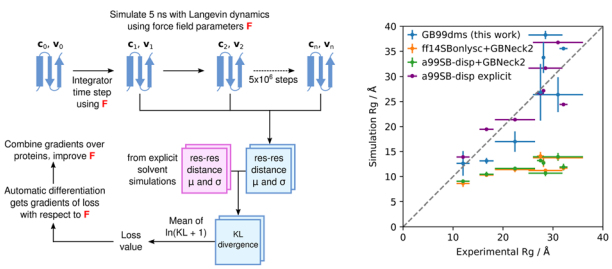
Nityananda Ballav, Shib Nath Saha, Shailesh Yadav and Mahiuddin Baidya*



4897

Differentiable simulation to develop molecular dynamics force fields for disordered proteins

Joe G. Greener



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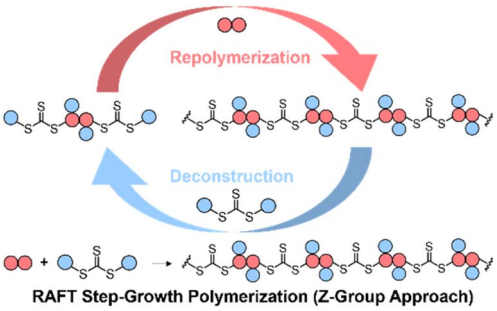
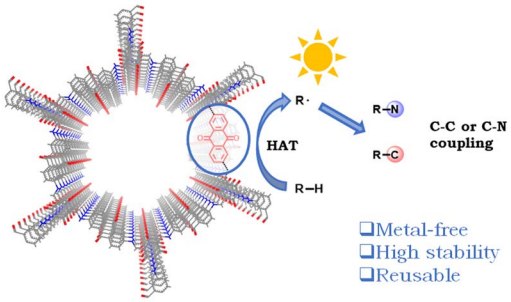


RAFT step-growth polymerization *via* the Z-group approach and deconstruction by RAFT interchange

Jiajia Li, Joji Tanaka,* Qing Li, Claire Jing Jing Wang, Sergei Sheiko, Samantha Marie Clouthier, Jian Zhu and Wei You*

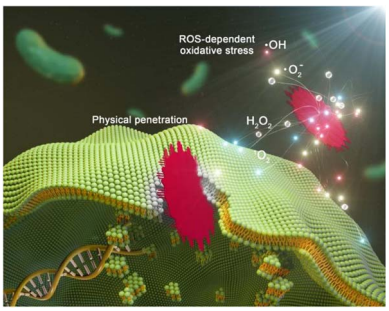
4920



Anthraquinone-based covalent organic framework as a recyclable direct hydrogen atom transfer photocatalyst for C–H functionalization

Zitong Wang, Pierce Yeary, Yingjie Fan and Wenbin Lin*

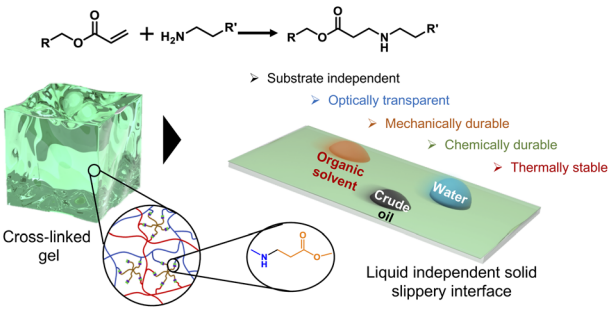
4926



Bacterial elimination *via* cell membrane penetration by violet phosphorene peripheral sub-nanoneedles combined with oxidative stress

Qiudi Shen, Jing Kang,* Xuewen Zhao, Wanqing Lou, Zhihao Li, Lihui Zhang, Bo Zhang, Jinying Zhang,* Bailiang Wang* and Alideertu Dong*

4938



Covalent crosslinking chemistry for controlled modulation of nanometric roughness and surface free energy

Debasmita Sarkar, Manideepa Dhar, Avijit Das, Sohini Mandal, Anirban Phukan and Uttam Manna*

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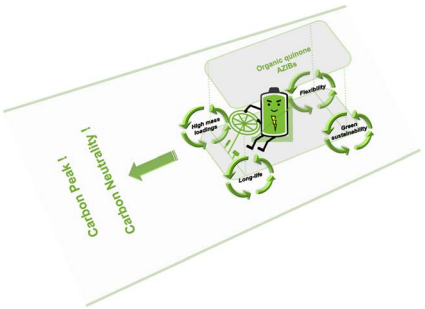
Constructing ultra-stable, high-energy, and flexible aqueous zinc-ion batteries using environment-friendly organic cathodes

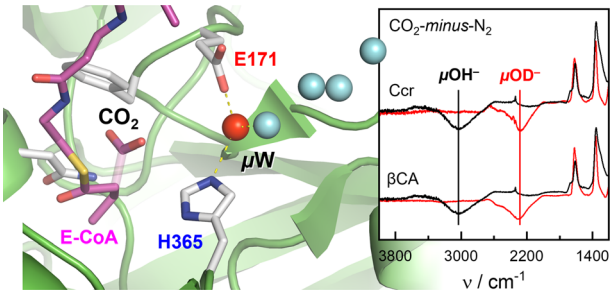
Chaojian Ding, Yonghui Wang, Chaobo Li, Jiawen Wang, Qichun Zhang* and Weiwei Huang*



4960

Infrared spectroscopy reveals metal-independent carbonic anhydrase activity in crotonyl-CoA carboxylase/reductase

Aharon Gomez, Matthias Tinzl, Gabriele Stoffel, Hendrik Westedt, Helmut Grubmüller, Tobias J. Erb, Esteban Vöhringer-Martinez* and Sven T. Stripp*



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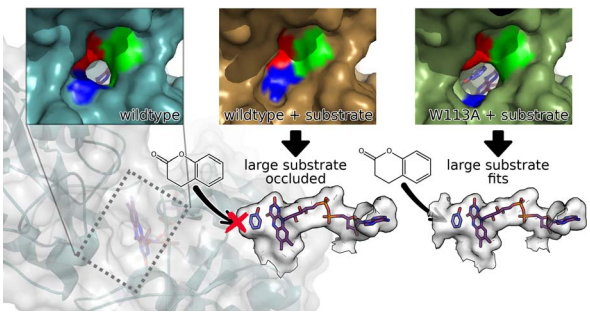
Rational design of a cyclohexanone dehydrogenase for enhanced α,β-desaturation and substrate specificity

Warispreet Singh, Nicola L. Brown, Hannah V. McCue, Sophie R. Marriott, Richard C. Wilson, Justin Perry, Johan P. Turkenburg, Kshatresh D. Dubey, Stephen H. Prior, Andrew J. Carnell, Edward J. Taylor* and Gary W. Black*



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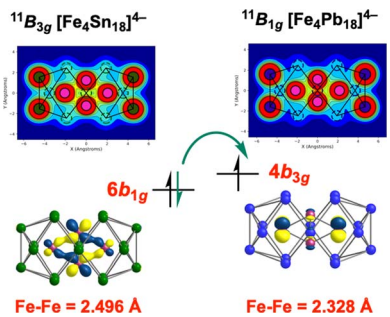
Fe–Fe bonding in the rhombic Fe_4 cores of the Zintl clusters $[Fe_4E_{18}]^{4-}$ (E = Sn and Pb)

Wei-Xing Chen, Zi-Sheng Li, Harry W. T. Morgan, Cong-Cong Shu, Zhong-Ming Sun* and John E. McGrady*



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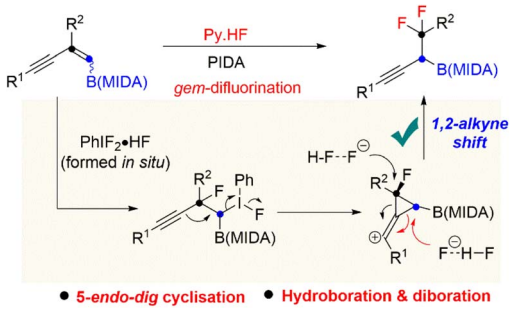
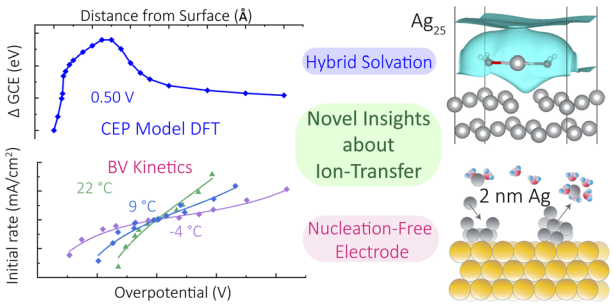


Reactivity of 1,3-enyne MIDA boronates: exploration of novel 1,2-alkyne shift *via gem*-difluorination

Samir Manna, Debasis Aich, Subrata Hazra, Shivam Khandelwal and Santanu Panda*

4996



Understanding ion-transfer reactions in silver electrodissolution and electrodeposition from first-principles calculations and experiments

Richard Kang,* Yang Zhao, Diptarka Hait, Joseph A. Gauthier, Paul A. Kempler, Kira A. Thurman, Shannon W. Boettcher* and Martin Head-Gordon*

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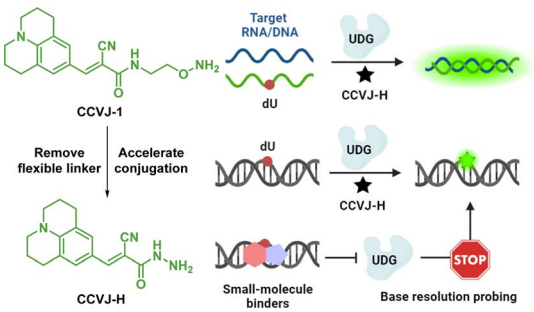
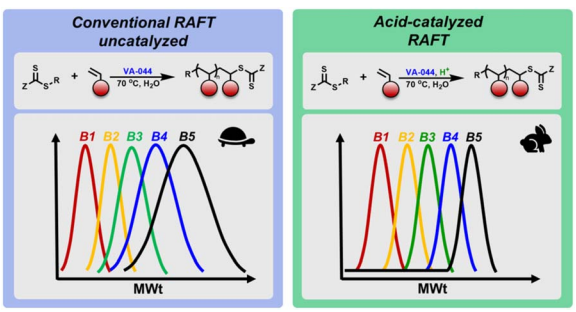


Multifaceted nucleic acid probing with a rationally upgraded molecular rotor

Tuan-Khoa Kha, Qi Shi, Nirali Pandya and Ru-Yi Zhu*

5019



Enhanced synthesis of multiblock copolymers *via* acid-triggered RAFT polymerization

Maria-Nefeli Antonopoulou, Nghia P. Truong and Athina Anastasaki*

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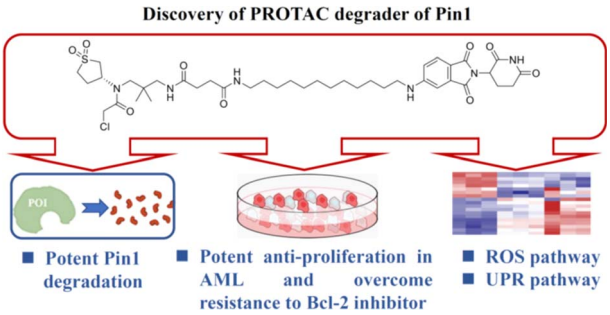
Discovery of potent PROTAC degraders of Pin1 for the treatment of acute myeloid leukemia

Yunkai Shi, Minmin Liu, Mengna Li, Yiwen Mao, Jingkun Ma, Ruikai Long, Miaomiao Xu, Yaxi Yang, Wenlong Wang,* Yubo Zhou,* Jia Li* and Bing Zhou*



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