Chemical Science

rsc.li/chemical-science

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 15(24) 9003–9378 (2024)

Cover
See Leoní A. Barrios, Valentin Novikov, Guillem Aromí *et al.*, pp. 9047–9053. Image reproduced by permission of Guillem Aromí from *Chem. Sci.*, 2024, **15**, 9047.

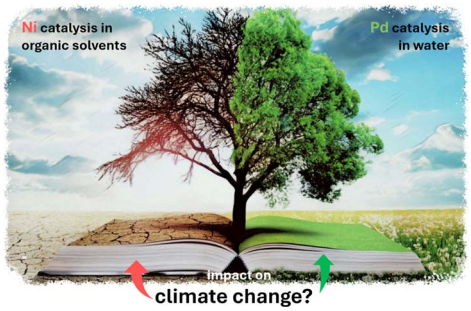
Inside cover
See Mathieu S. Prévot *et al.*, pp. 9054–9086. Image reproduced by permission of Mathieu S. Prévot from *Chem. Sci.*, 2024, **15**, 9054.

PERSPECTIVE

9016

The impact of earth-abundant metals as a replacement for Pd in cross coupling reactions

Michael U. Luescher,* Fabrice Gallou* and Bruce H. Lipshutz*

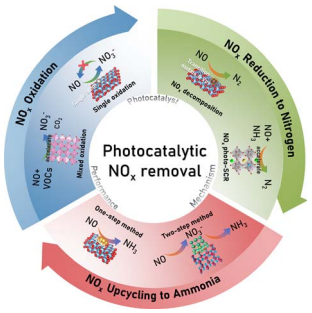


REVIEW

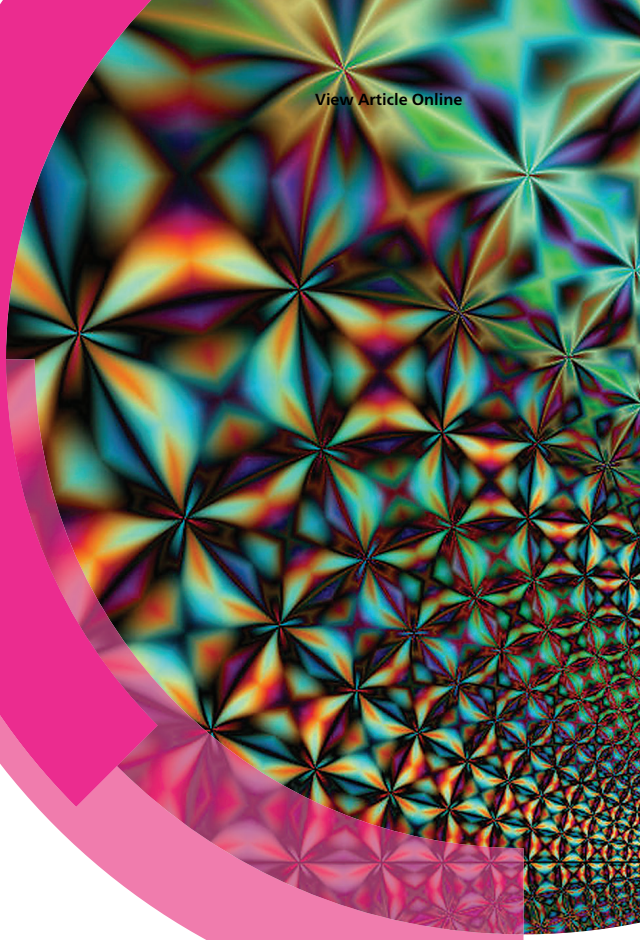
9026

Photocatalytic NO_x removal and recovery: progress, challenges and future perspectives

Ting Xue, Jing Li, Lvcun Chen, Kanglu Li, Ying Hua, Yan Yang* and Fan Dong*



ROYAL SOCIETY OF CHEMISTRY



RSC Advances

At the heart of open access for the global chemistry community

Editor-in-chief

Russell J Cox
Leibniz Universität Hannover, Germany

We stand for:

Breadth We publish work in all areas of chemistry and reach a global readership

Affordability Low APCs, discounts and waivers make publishing open access achievable and sustainable

Quality Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal

Community Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

rsc.li/rsc-advances

@RSC_Adv

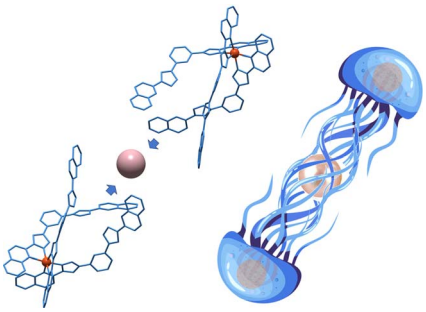
Registered charity number: 207890

EDGE ARTICLES

9047

Engineered π···π interactions favour supramolecular dimers X@[FeL$_3$]$_2$ (X = Cl, Br, I): solid state and solution structure

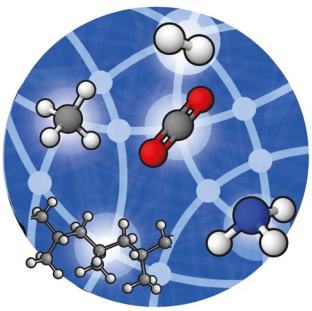
Arnau Risa, Leoní A. Barrios,* Rosa Diego, Olivier Roubeau, Dmitry Y. Aleshin, Yulia Nelyubina, Valentin Novikov,* Simon J. Teat, Jordi Ribas-Ariño and Guillem Aromí*



9054

An anthropocene-framed transdisciplinary dialog at the chemistry-energy nexus

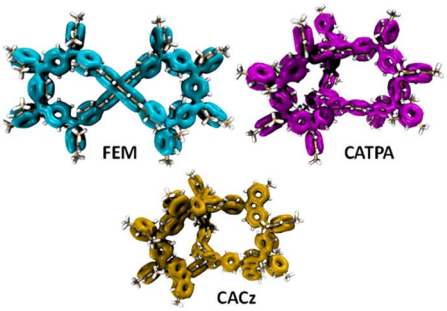
Mathieu S. Prévot, Valeria Finelli, Xavier Carrier, Gabriele Deplano, Margherita Cavallo, Elsje Alessandra Quadrelli, Juliette Michel, Marie-Hélène Pietraru, Clément Camp, Giulia Forghieri, Anna Gagliardi, Sebastian Seidel, Antoine Missemer, Bertrand Reuillard, Barbara Centrella, Silvia Bordiga, María Grace Salamanca González, Vincent Artero, Keanu V. A. Birkelbach and Niklas von Wolff



9087

Facile synthesis and characterization of aza-bridged all-benzenoid quinoidal figure-eight and cage molecules

Shaoqiang Dong,* Yi Han, Zekun Tong, Jinfeng Wang, Yishan Zhang, Aisen Li, Tullimilli Y. Gopalakrishna, Hongkun Tian and Chunyan Chi*



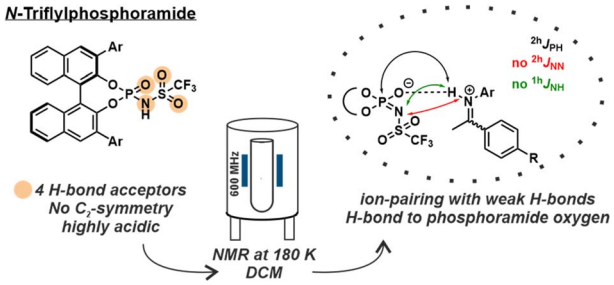
9096

Re-pairing DNA: binding of a ruthenium phi complex to a double mismatch

Tayler D. Prieto Otoya, Kane T. McQuaid, Neil G. Paterson, David J. Cardin, Andrew Kellett and Christine J. Cardin*

EDGE ARTICLES

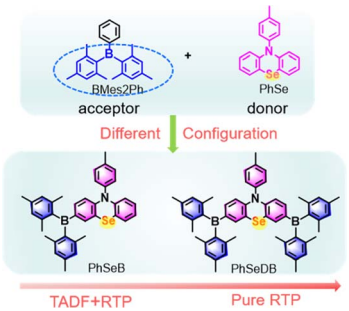
9104



Highly acidic *N*-triflylphosphoramides as chiral Brønsted acid catalysts: the effect of weak hydrogen bonds and multiple acceptors on complex structures and aggregation

Markus Hecht, Philipp Dullinger, Wagner Silva, Dominik Horinek and Ruth M. Gschwind*

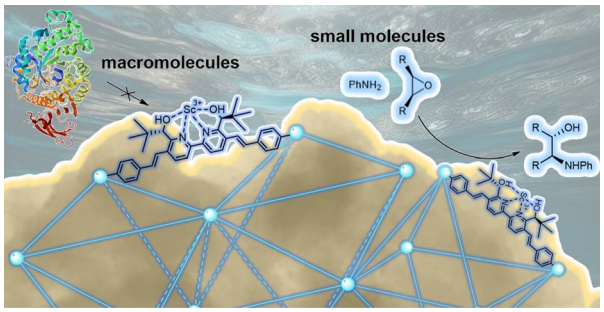
9112



Achieving pure room temperature phosphorescence (RTP) in phenoselenazine-based organic emitters through synergism among heavy atom effect, enhanced n → π* transitions and magnified electron coupling by the A–D–A molecular configuration

Daokun Zhong, Siqi Liu, Ling Yue, Zhao Feng, Hongyan Wang, Peng Yang, Bochao Su, Xiaolong Yang, Yuanhui Sun and Guijiang Zhou*

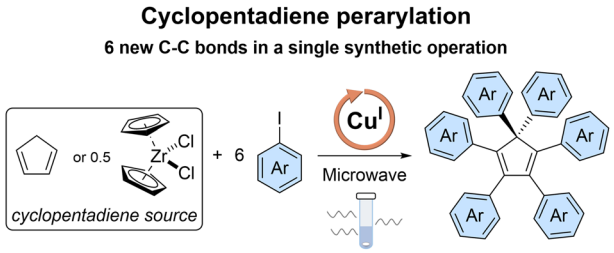
9120



Nanoscale and chiral metal–organic frameworks for asymmetric reactions in water: bridging Lewis acid catalysis and biological systems

Watchara Srimontree, Taku Kitanosono,* Yasuhiro Yamashita and Shū Kobayashi*

9127



Copper-catalysed perarylation of cyclopentadiene: synthesis of hexaarylcyclopentadienes

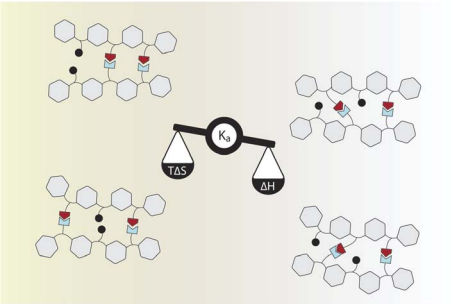
Yohan Gisbert, Pablo Simón Marqués, Caterina Baccini, Seifallah Abid, Nathalie Saffon-Merceron, Gwénaël Rapenne and Claire Kammerer*

EDGE ARTICLES

9138

Duplex-forming oligocarbamates with tunable nonbonding sites

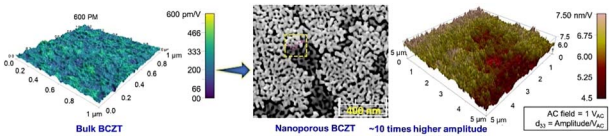
R. Kenton Weigel and Christopher A. Alabi*



9147

Giant piezoresponse in nanoporous (Ba,Ca)(Ti,Zr)O_3 thin film

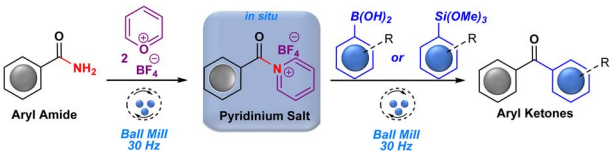
Motasim Billah, Yukana Terasawa,* Mostafa Kamal Masud, Toru Asahi, Mohamed Barakat Zakaria Hegazy, Takahiro Nagata, Toyohiro Chikyow, Fumihiko Uesugi, Md. Shahriar A. Hossain* and Yusuke Yamauchi*



9155

Mechanochemical synthesis of aromatic ketones: pyrylium tetrafluoroborate mediated deaminative arylation of amides

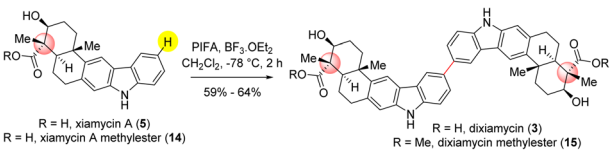
Satenik Mkrtchyan,* Oleksandr Shalimov, Michael G. Garcia, Jiří Zapletal and Viktor O. Iaroshenko*



9164

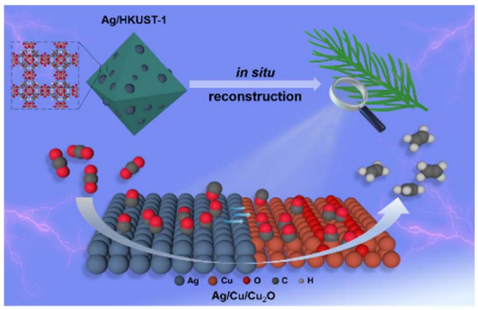
Highly chemoselective oxidative dimerization of indolosesquiterpene alkaloids: a biomimetic approach to dixiamycin

Mintu Munda, Ayan Mondal, Nanda Kishore Roy, Ranjit Murmu, Sovan Niyogi and Alakesh Bisai*



EDGE ARTICLES

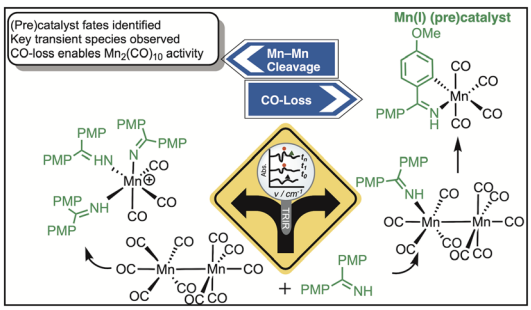
9173



Restructuring multi-phase interfaces from Cu-based metal–organic frameworks for selective electroreduction of CO_2 to C_2H_4

Jiye Feng, Wenbiao Zhang, Danni Shi, Yingshuai Jia, Yi Tang, Yuying Meng and Qingsheng Gao*

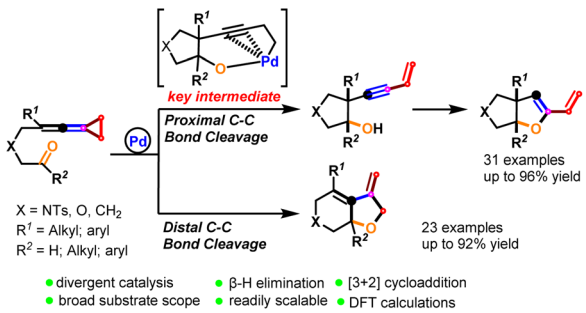
9183



The importance of understanding (pre)catalyst activation in versatile C–H bond functionalisations catalysed by $[Mn_2(CO)_{10}]$

Jonathan B. Eastwood, Thomas J. Burden, L. Anders Hammarback, Chris Horbaczewskyj, Theo F. N. Tanner, Ian P. Clark, Gregory Greetham, Michael Towrie, Ian J. S. Fairlamb* and Jason M. Lynam*

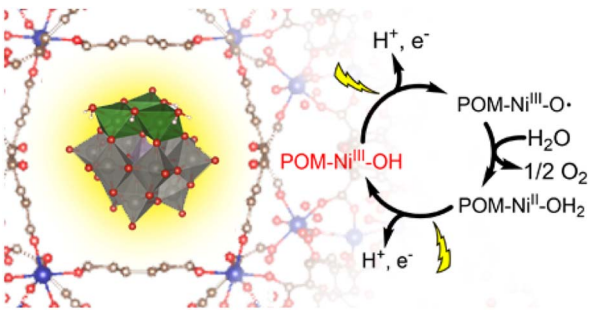
9192



Palladium-catalyzed selective C–C bond cleavage of keto-vinylidenecyclopropanes: construction of structurally rich dihydrofurans and tetrahydrofurans

Chao Ning, Ziqi Yu, Min Shi* and Yin Wei*

9201



Stabilization of Ni-containing Keggin-type polyoxometalates with variable oxidation states as novel catalysts for electrochemical water oxidation

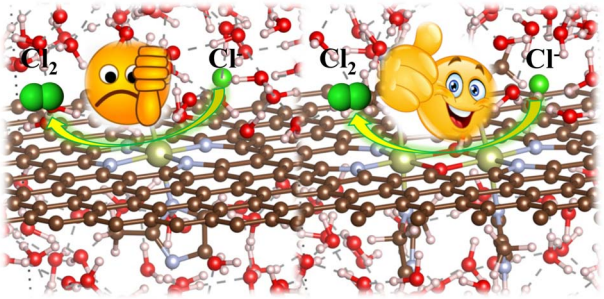
Xiang Li, Bryan Kit Yue Ng, Ping-Luen Ho, Chunbo Jia, Jining Shang, Tatchamapan Yoskamtorn, Xuelei Pan, Yiyang Li, Guangchao Li, Tai-Sing Wu, Yun-Liang Soo, Heyong He,* Bin Yue* and Shik Chi Edman Tsang*

EDGE ARTICLES

9216

Atomically dispersed dinuclear iridium active sites for efficient and stable electrocatalytic chlorine evolution reaction

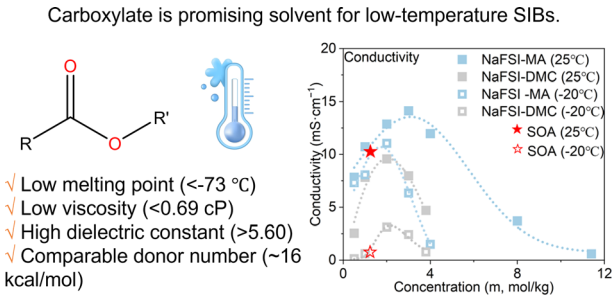
Zhipeng Yu, Guangjie Xia, Vlad Martin Diaconescu, Laura Simonelli, Alec P. LaGrow, Zhixin Tai, Xinyi Xiang, Dehua Xiong and Lifeng Liu*



9224

Carboxylate ester-based electrolytes for Na-ion batteries

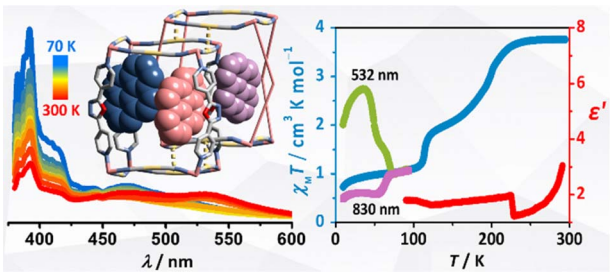
Yunan Qin, Seong-Gyu Choi, Lucia Mason, Jing Liu, Zongjian Li and Tao Gao*



9240

Bidirectional photomagnetism, exciplex fluorescence and dielectric anomalies in a spin crossover Hofmann-type coordination polymer

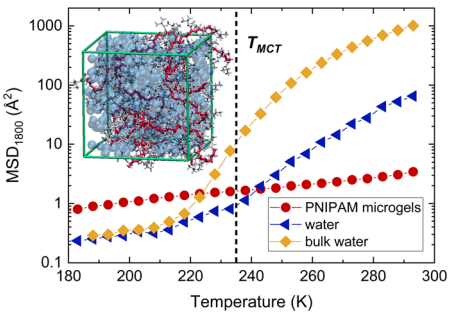
Yan-Ru Chen, Ting-Ting Ying, Yan-Cong Chen, Pei-Yu Liao, Zhao-Ping Ni* and Ming-Liang Tong*



9249

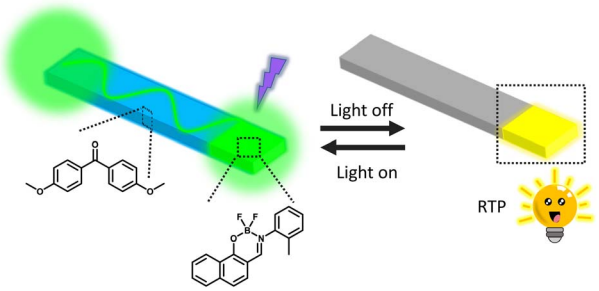
Water slowing down drives the occurrence of the low temperature dynamical transition in microgels

Letizia Tavagnacco, Marco Zanatta, Elena Buratti, Monica Bertoldo, Ester Chiessi, Markus Appel, Francesca Natali, Andrea Orecchini and Emanuela Zaccarelli*



EDGE ARTICLES

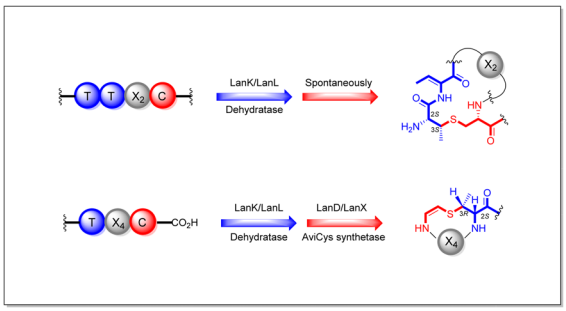
9258



Surface coating induced room-temperature phosphorescence in flexible organic single crystals

Prodipta Samadder, Khalid Naim, Subash Chandra Sahoo and Prakash P. Neelakandan*

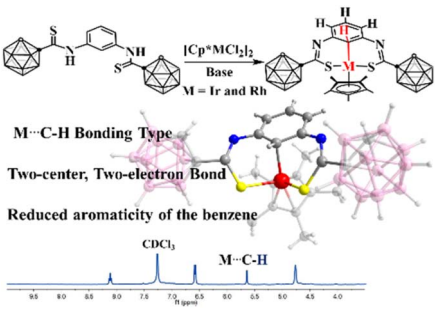
9266



Characterization of a LanC-free pathway for the formation of an LL-MeLan residue and an *allo*AviMeCys residue in the newly identified class V lanthipeptide triantimycins

Weizhong Ding, Xiaofeng Wang, Yu Yin, Jiang Tao,* Yanqing Xue* and Wen Liu*

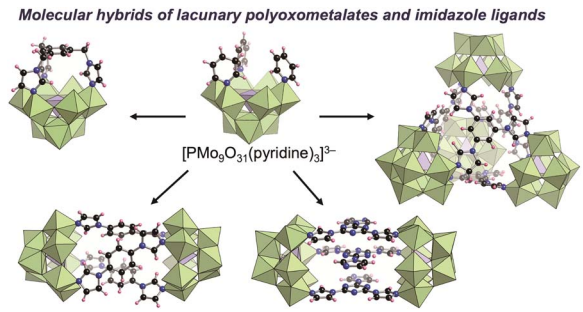
9274



Formation and reactivity of a unique M···C–H interaction stabilized by carborane cages

Xin-Ran Liu, Peng-Fei Cui, Yago García-Rodeja, Miquel Solà and Guo-Xin Jin*

9281



Self-assembled molecular hybrids comprising lacunary polyoxometalates and multidentate imidazole ligands

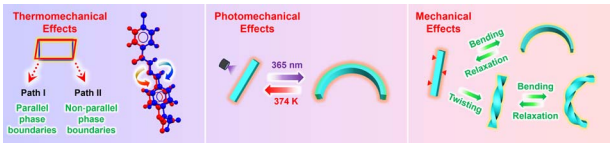
Haoran Sun, Atsuhiro Jimbo, Chifeng Li, Kentaro Yonesato, Kazuya Yamaguchi and Kosuke Suzuki*

EDGE ARTICLES

9287

Trimodal operation of a robust smart organic crystal

Wenbo Wu, Kui Chen, Hui Yu, Jiaxuan Zhu, Yaoguang Feng, Jingkang Wang, Xin Huang, Liang Li, Hongxun Hao, Ting Wang,* Na Wang* and Panče Naumov*



9298

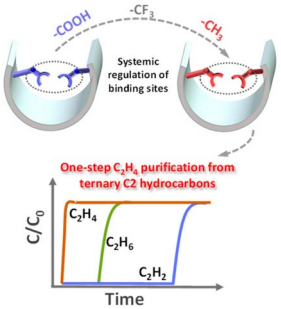
Sulphur-atom positional engineering in perylenimide: structure–property relationships and H-aggregation directed type-I photodynamic therapy

Mst Nasima Khatun, Satyendu Nandy, Hirakjyoti Roy, Siddhartha Sankar Ghosh,* Sachin Kumar* and Parameswar Krishnan Iyer*

9318

Systemic regulation of binding sites in porous coordination polymers for ethylene purification from ternary C2 hydrocarbons

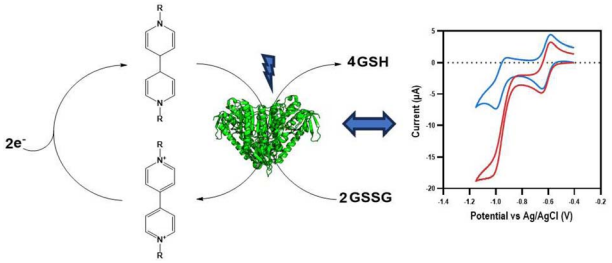
Yi Li, Yanxin Wu, Jiaxin Zhao, Jingui Duan* and Wanqin Jin*



9325

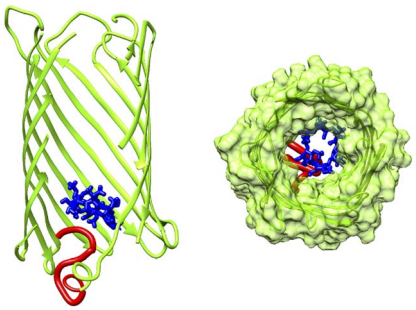
Re-assessing viologens for modern bio-electrocatalysis

Desmond Ato Koomson, Jake H. Nicholson, Alex P. S. Brogan* and Leigh Aldous*



EDGE ARTICLES

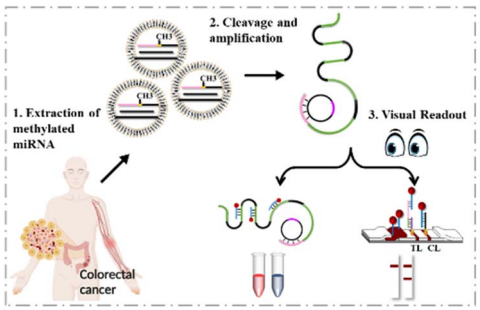
9333



Conformational flexibility driving charge-selective substrate translocation across a bacterial transporter

Devika Vikraman, Bibhab Bandhu Majumdar, Sharavanakkumar SK, Conrad Weichbrodt, Niels Fertig, Mathias Winterhalter, Jagannath Mondal* and Kozhinjampara R. Mahendran*

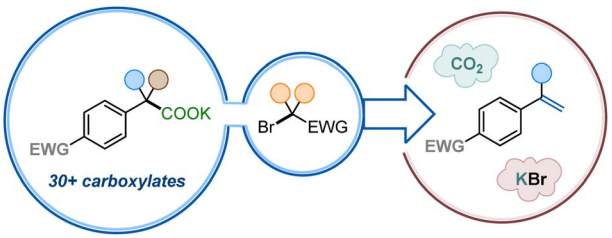
9345



DNAzyme-RCA-based colorimetric and lateral flow dipstick assays for the point-of-care testing of exosomal m5C-miRNA-21

Hao Zhang, Yue Tang, Yingshun Zhou, Yiguo Wang, Haibin Si,* Lu Li* and Bo Tang*

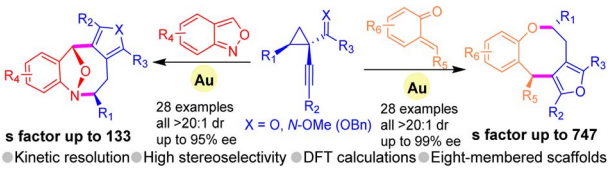
9353



Transition metal-free decarboxylative olefination of carboxylic acid salts

Ebbin Joseph, Deshkanwar S. Brar, Gaven Stuhlsatz and Jon A. Tunge*

9361



Kinetic resolution of 1-(1-alkynyl)cyclopropyl ketones *via* gold-catalyzed divergent (4 + 4) cycloadditions: stereoselective access to furan fused eight-membered heterocycles

Xunhua Wang, Ruifeng Lv and Xiaoxun Li*

α-Phenylthioaldehydes for the effective generation of acyl azolium and azolium enolate intermediates

Paul M. D. A. Ewing, Pankaj Kumar Majhi, Callum Prentice, Claire M. Young, Karlotta van Rees, Polly L. Arnold,* Eli Zysman-Colman* and Andrew D. Smith*