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IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 16(41) 18961–19470 (2025)

Cover
See Rudi Plesch, Takeshi Yamazaki *et al.*, pp. 19099–19109. Image reproduced by permission of SandboxAQ from *Chem. Sci.*, 2025, **16**, 19099. Adobe Firefly was used in the process of creating this image.

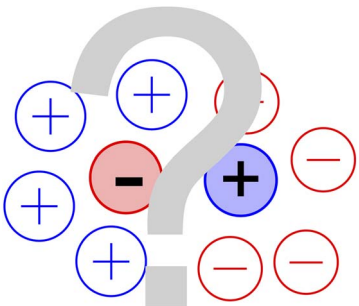
Inside cover
See Zi-Shu Yang, Jun-Long Zhang *et al.*, pp. 19110–19117. Image reproduced by permission of Zi-Shu Yang and Jun-Long Zhang from *Chem. Sci.*, 2025, **16**, 19110.

COMMENTARY

18976

A reflection on salts dissolved in salts: ionic liquid mixtures – ion pairs, ion pairing and ionic liquids

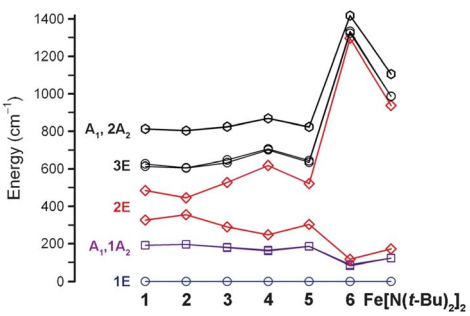
Tom Welton



18985

A reflection on modelling and examination of paramagnetic molecules for magnetic storage and molecular spintronics

Mihail Atanasov,* Shashank Vittal Rao and Frank Neese



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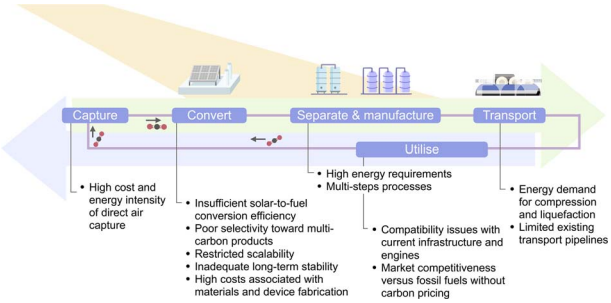
PERSPECTIVES

18990

Artificial photosynthetic processes using carbon dioxide, water and sunlight: can they power a sustainable future?

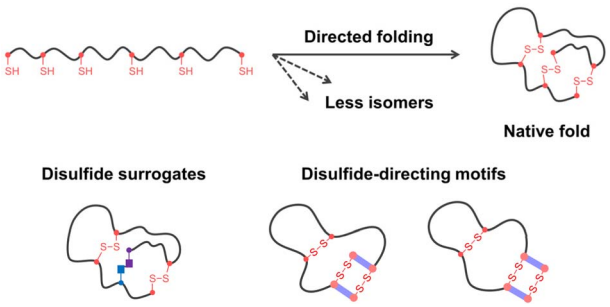
Qian Wang* and Chanon Pornrungroj*



19012

Directing the oxidative folding of disulfide-rich peptides for enhanced engineering and applications

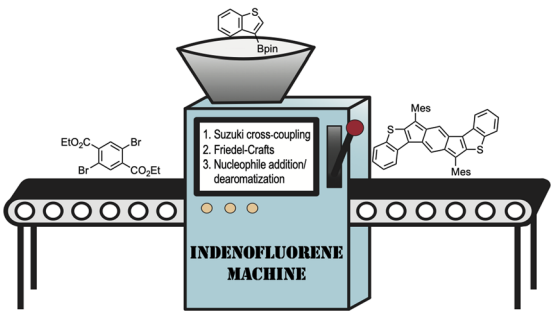
Xueting Cheng and Chuanliu Wu*



19026

The interplay of antiaromaticity and diradical character in diarenoindacenes and diindenoarenes

Efrain Vidal, Jr, Gabrielle I. Warren, Joshua E. Barker and Michael M. Haley*



REVIEWS

19048

Roles of adhesives in forming mechanically robust superhydrophobic coatings

Jinfei Wei, Mingyuan Mao, Bucheng Li and Junping Zhang*

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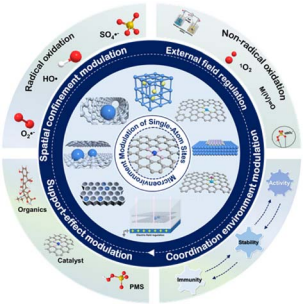
REVIEWS

19072

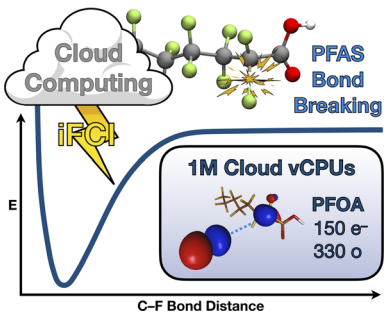


Microenvironment modulation of single-atom sites and its applications in Fenton-like reactions

Na Wang,* Jie Yang, Sixun Li, Ziqiu Ren* and Qun Xu*

EDGE ARTICLES

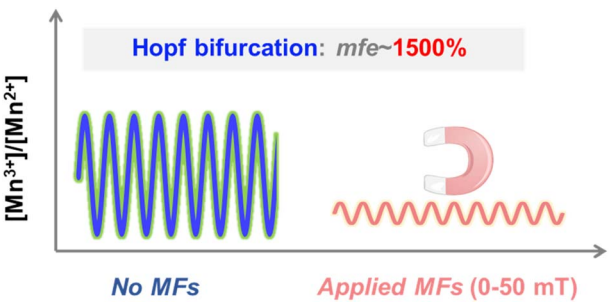
19099



Breaking down per- and polyfluoroalkyl substances (PFAS): tackling multitudes of correlated electrons

Alan E. Rask, Lee Huntington, SungYeon Kim, David Walker, Andrew Wildman, Rodrigo Wang, Nicole Hazel, Alan Judi, James T. Pegg, Punit K. Jha, Zara Mayimfor, Carl Dukatz, Hassan Naseri, Ilan Gleiser, Maxime R. Hugues, Paul M. Zimmerman, Arman Zaribafiyan, Rudi Plesch* and Takeshi Yamazaki*

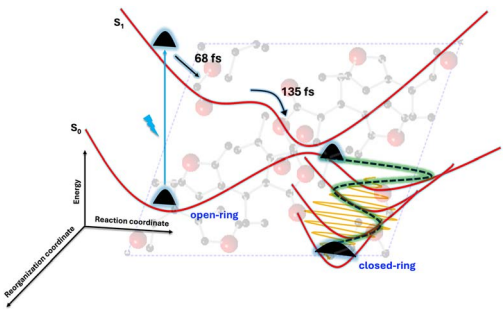
19110



Amplification of magnetic field effects *via* critical dynamics in a nonlinear oscillatory system

Shaojun Zhang, Zi-Shu Yang,* Bing-Wu Wang, Song Gao and Jun-Long Zhang*

19118



Elucidating the reaction kernel and probing the effect of anharmonicity in the ring-closing reaction of fulgide single crystals

Soumyajit Mitra, Ming Zhang, Simon F. Bittmann, Jianxin Cai, Xiaolong Dong, R. Scott Murphy, Zheng Li* and R. J. Dwayne Miller*

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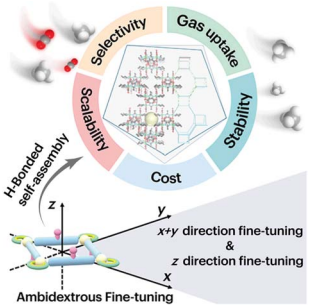
Ambidextrous fine-tuning of zeolite-like hydrogen-bonded organic frameworks (HOFs) *via* scalable green synthesis for efficient biogas upgrading

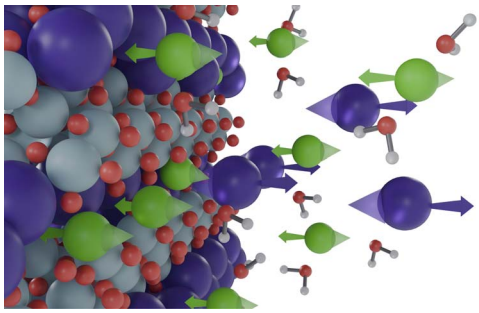
Baobing Tang, Xueyue Yu, Guanghua Li, Xin Liu,* Jiantang Li* and Yunling Liu*



19140

Enhanced ion intercalation in $Ni_xK_{1-2x}TiNbO_5$ enabled by redox active Ni exchange for potassium-ion batteries

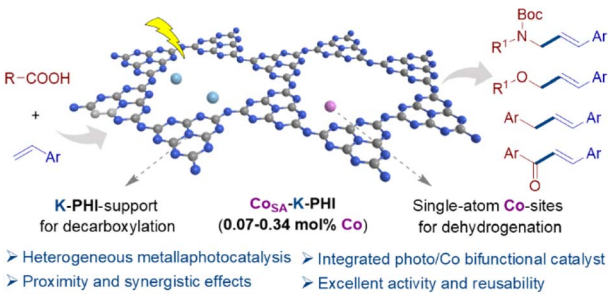
Charlie A. F. Nason, Ajay Piriya Vijaya Kumar Saroja, Wanjun Ren, Yingkangzi Mei, Asma Sarguroh, Yupei Han, Yi Lu, Jamie A. Gould, Tim I. Hyde, Veronica Celorrio, Gopinathan Sankar and Yang Xu*



19154

Atomically precise single-atom cobalt photocatalyst for enhanced decarboxylative cross-couplings

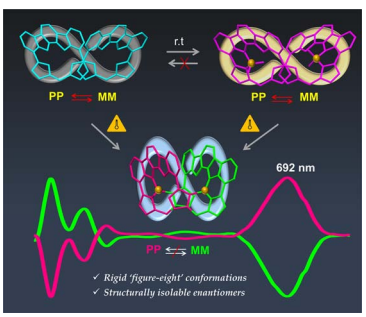
Qian Yang, Mengting Wu, Wanlin Wang, Wentao Wang,* Han Wang, Yurong Tang,* Magnus Rueping* and Yunfei Cai*



19164

Bis-subporphyrin-like boron(III) complexes derived from indolo[2,3-*a*]carbazole-based cyclic bis-BODIPYs exhibiting persistent helical chirality

Aswini Spergen, Pranav V. Bal, Asif Khan Shameer Shameem, Arun Joshy, Anjana P. Nambiar, Alex P. Andrews and Gokulnath Sabapathi*



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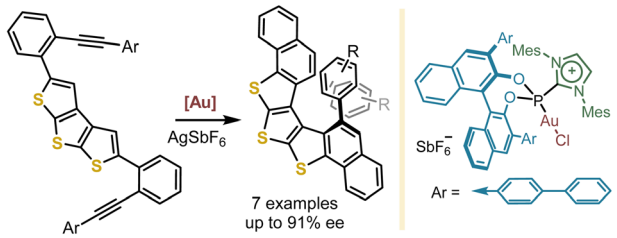
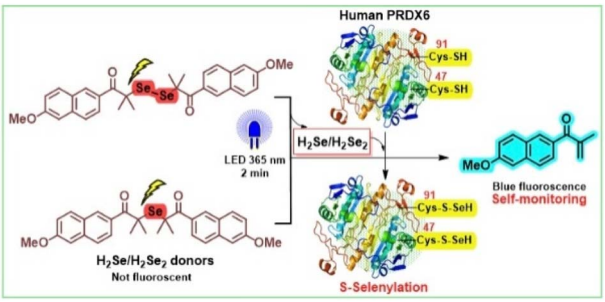


Enantioselective synthesis and racemization dynamics of trithia[5]helicenes derived from the dithieno[2,3-*b*:3′,2′-*d*]-thiophene unit

Wei Fu, Martin Simon, Christopher Golz and Manuel Alcarazo*

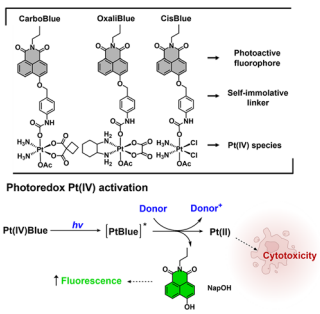
19178



Light responsive hydrogen selenide (H_2Se)/hydrogen diselenide (H_2Se_2) donors: applied for protein *S*-selenylation on PRDX6

Biswajit Roy, Eshani Das, Meg Shieh, Seiryo Ogata, Minkyung Jung, Hiroaki Fujita, Sen Zhang, Jerome R. Robinson, Takaaki Akaike and Ming Xian*

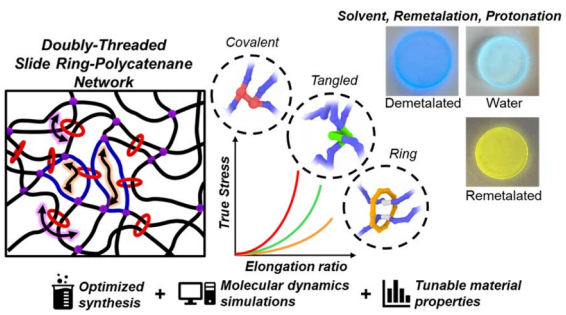
19187



Identification of a photoredox-active Pt(IV) complex that induces light-mediated cell death

Jevon W. Marsh, Lina Hacker, Sophie A. Twigger, Jake A. Vickery, Shitong Huang, Claudia Almuzara Romero, Aaron P. Langston, Ismael Diez-Perez, Rebecca A. Musgrave, Ester M. Hammond* and Adam C. Sedgwick*

19192



Structure–property relationships of responsive doubly-threaded slide-ring polycatenane networks

Guancen Liu, Jongwon Oh, Yuan Tian, Jerald E. Hertzog, Heyi Liang, Benjamin W. Rawe, Natsumi Nitta, Charlie A. Lindberg, Hojin Kim, Juan J. de Pablo* and Stuart J. Rowan*

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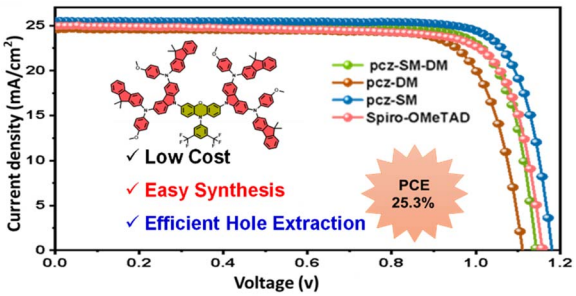
19205

Boosting planar perovskite solar cell performance *via* peripheral end-group engineering of phenoxazine-core hole transport materials

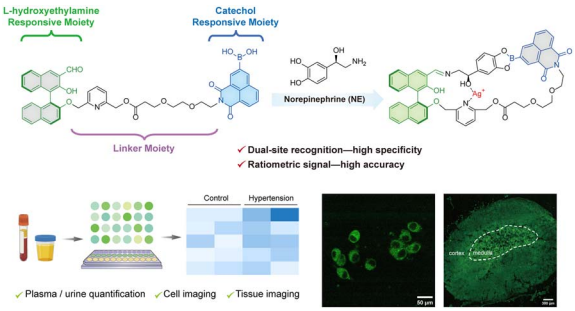
Murali Ravi, Ziyang Xia, Divya Kumar, Cheng Chen,* Haoxin Wang, Yi Tian, Balamurali Ravichandran and Ming Cheng*



19215

Dual-site recognition leads to a ratiometric fluorescent probe for norepinephrine: quantitative detection and visualization for in-depth understanding of hypertension

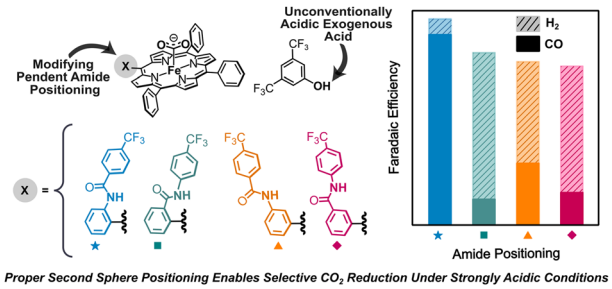
Fengzhi Wang, Jiawen Wang, Weiping Zhu, Yangyang Yang, Honglin Li,* Tony D. James,* Yufang Xu* and Xuhong Qian



19226

Promoting selective electrochemical CO_2 reduction under unconventionally acidic conditions through secondary coordination sphere positioning

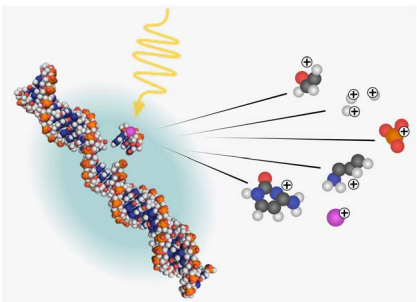
Kaeden Teindl, Jolene P. Reid and Eva M. Nichols*



19235

Unlocking atom-specific radiotherapy – DNA backbone breakage caused by X-ray photoactivation

Pamela H. W. Svensson,* Brian Rydgren, Lucas Schwob, Marta Berholts, Bo Stenerlöw, Ouassim Hocine Hafiani, Tomas André, Oscar Grånäs, Nicusor Timneanu, Juliette Leroux, Aarathi Nair, Laura Pille, Bart Oostenrijk, Sadia Bari, Olle Björneholm and Carl Caleman*



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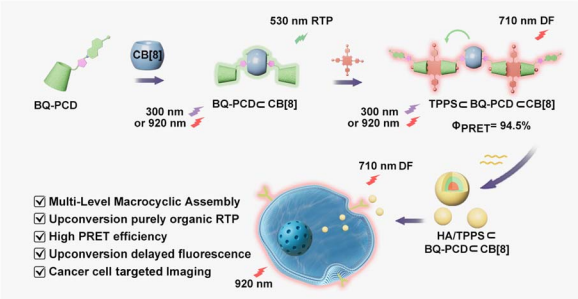
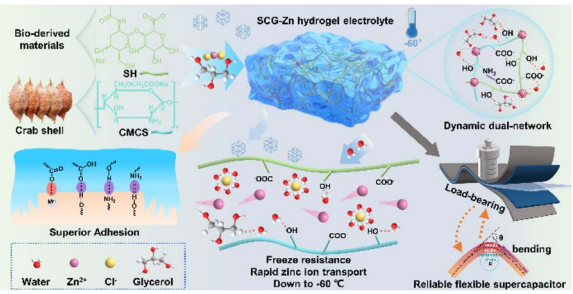


Multi-level macrocyclic assembly achieving organic upconversion delayed fluorescence for targeted cell imaging

Jie Niu, Xuan Wu, Jie Yu, Zhuo Lei, Ying-Ming Zhang,* Li-Hua Wang, Jing Wu, Jie Han* and Yu Liu*

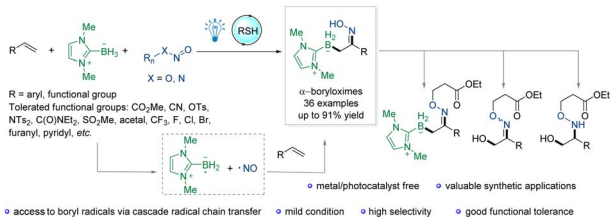
19253



Unlocking ultra-low temperature performance: an anti-freezing, high-conductivity, biodegradable hydrogel electrolyte for supercapacitors down to −60 °C

Yibin Xing, Nannan Zhu, Ruixi He, Xiyao Wang, Renyang Han, Bing Du and Xuejuan Wan*

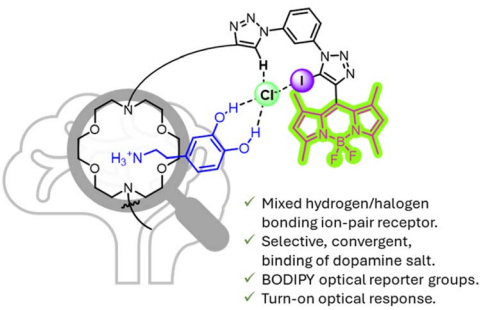
19263



Photoinduced boryl-oximation of alkenes *via* NHC-boryl radical generation

Qiang Huang,* Na Li, Panke Zhang and Hongji Li*

19271



A halogen bonding BODIPY-appended aza-crown ether for selective optical sensing of inorganic and organic ion-pair species

Jamie T. Wilmore, Andrew J. Taylor, Igor Marques, Vítor Félix and Paul D. Beer*

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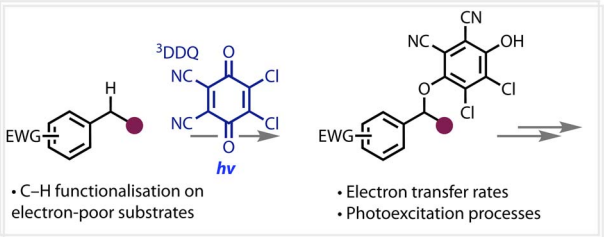
19280

Oxidative benzylic C(sp^3)–H functionalisation of electron-poor substrates with photoexcited DDQ

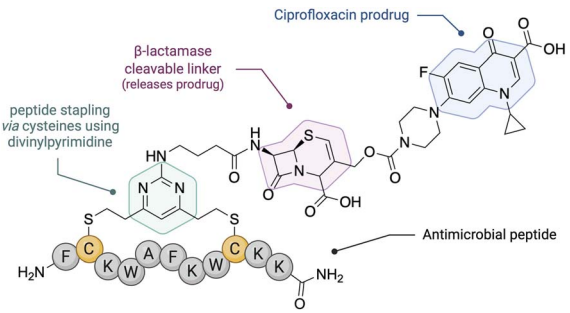
Alexander P. Atkins, Charlotte A. Smith, Deborin Ghosh, Hallam J. M. Greene, Ria G. Binyahan, Ciaran J. Greene, Joseph A. Tate, Andrew J. Orr-Ewing and Alastair J. J. Lennox*



19288

β-Lactamase cleavable antimicrobial peptide–drug conjugates

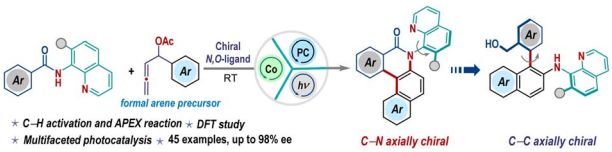
Tomas Deingruber, Josephine S. Gaynord, Bee Ha Gan, Kristina A. Kostadinova, Thomas J. O'Brien, Yaw Sing Tan, Jeremy S. Parker, Thomas A. Hunt, Jason S. Carroll, Martin Welch* and David R. Spring*



19296

Multifaceted photocatalysis enables cobalt catalyzed enantioselective C–H activation and APEX reaction for C–N axially chiral molecules

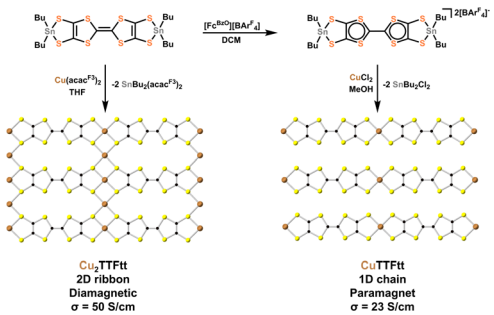
Mainak Koner, Nityananda Ballav, Anirudh J. Varma, Suman Ghosh, Tuhin Mondal, Rositha Kuniyil* and Mahiuddin Baidya*



19304

Pre-synthetic redox control of structure and properties in copper TTFtt coordination polymers

Ningxin Jiang, Saranya Velliyarat, Chen-Yu Lien, Ha L. Nguyen, Jan Hofmann, Jie-Hao Chen, Arun Ramanathan, Alexander S. Filatov, Henry S. La Pierre, Shrayesh Patel, Karena W. Chapman, Jan-Niklas Boyn and John S. Anderson*



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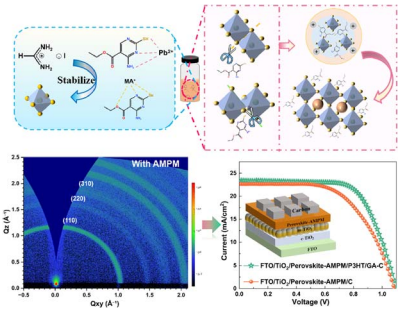
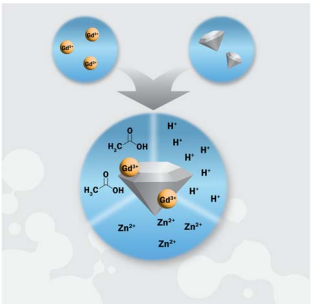
19317



Multiple functional bulk passivator pyrimidine derivative stabilizing perovskite precursors for efficient carbon-based perovskite solar cells

Mengqi Geng, Jialiang Li, Ke Wang, Le Jiang, Dan Lu, Shoaib Iqbal, Yu Gu, Lixin Chen and Tingting Xu*

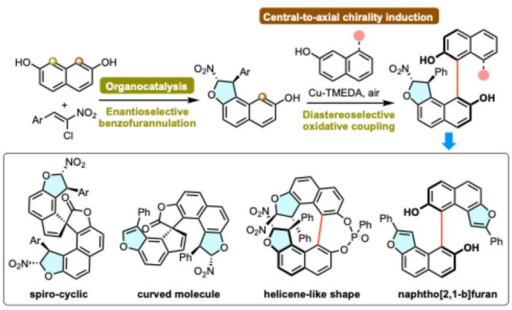
19328



Quantum sensing of paramagnetic analytes by nanodiamonds in levitated microdroplets and aqueous solutions

Emily K. Brown, Zachary R. Jones, Adrisha Sarkar, Brandon J. Wallace, Ashok Ajoy* and Kevin R. Wilson*

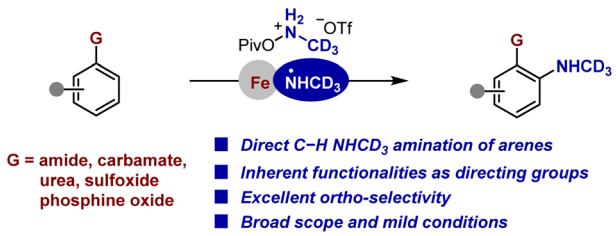
19342



Atroposelective synthesis of sterically hindered stereochemically complex BINOL derivatives *via* central-to-axial chirality induction

Yang Yang, Guishun Bai, Mengmeng Qin, Juelian Wang, Yihuan Yang, Hong Wang,* Damien Bonne,* Jean Rodriguez and Xiaoze Bao*

19350



Synthesis of N-CD_3 aryl amines *via* iron-catalysed site-selective aromatic C–H amination

Meng-Meng Ren, Yin Yang and Fei Wang*

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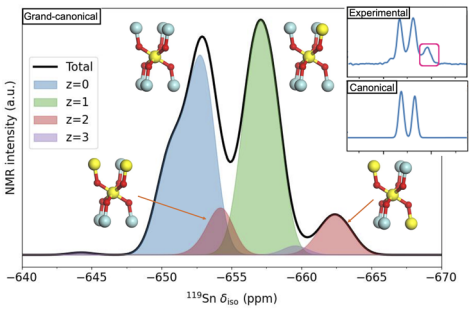
19357

Capturing local compositional fluctuations in NMR modelling of solid solutions

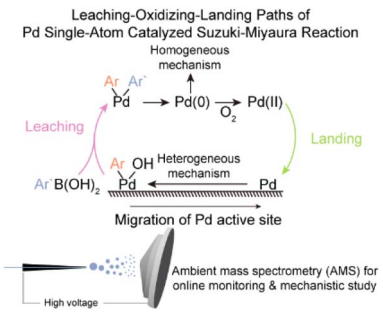
Ricardo Grau-Crespo,* Said Hamad, Salvador R. G. Balestra, Ramsey Issa, Taylor D. Sparks, Arantxa Fernandes, Ben L. Griffiths, Robert F. Moran, David McKay and Sharon E. Ashbrook*



19370

Unveiling leaching–oxidizing–landing paths of Pd single-atom catalyzed Suzuki–Miyaura reaction by ambient mass spectrometry

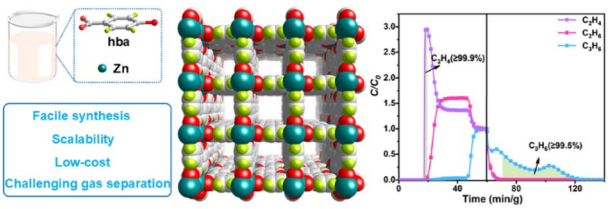
Yiyan Yin, Xiaorong Wang, Xiyang Ge, Xiaotong Shen, Xiaomin Liu, Xiang Li, Jin Ouyang and Na Na*



19381

Scalable synthesis of a low-cost Zn–MOF with a nonpolar pore surface for efficient separation of methanol-to-olefin products

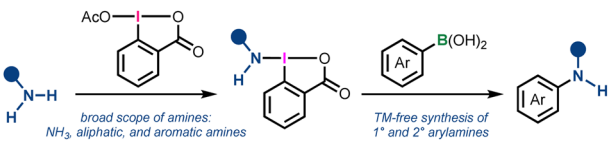
Yingying Zhang, Suyun Deng, Xingye Cui, Jixiang Yue, Hongliang Huang, Chaozhuang Xue,* Huajun Yang* and Lei Gan*



19389

Versatile method for the synthesis of aminobenziodoxolones and its application to one-pot coupling of arylboronic acids with simple amines

Kazuki Kawanaka, Shusuke Narita, Kensuke Kiyokawa* and Satoshi Minakata*



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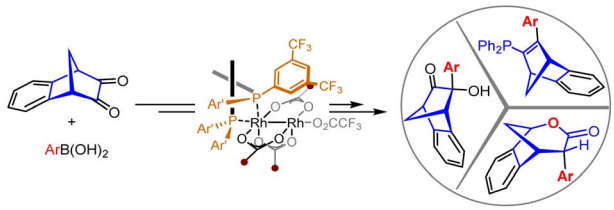
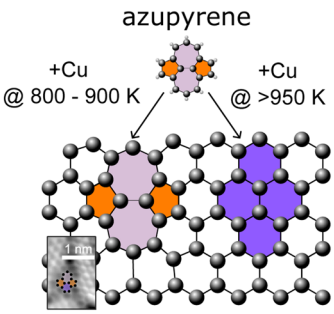
19397



Chiral benzo[2.2.1] α-hydroxyketones from a dirhodium(II)/bisphosphine-catalyzed desymmetrization addition reaction

Shuming Zhan, Chengyu Wang, Longhui Duan* and Zhenhua Gu*

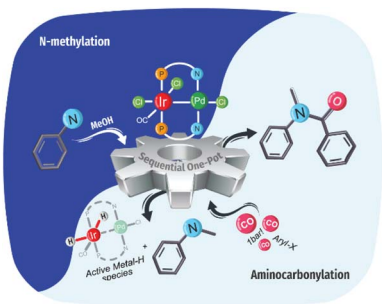
19403



One-step synthesis of graphene containing topological defects

Benedikt P. Klein, Matthew A. Stoodley, Joel Deyerling, Luke A. Rochford, Dylan B. Morgan, David Hopkinson, Sam Sullivan-Allsop, Henry Thake, Fulden Eratam, Lars Sattler, Sebastian M. Weber, Gerhard Hilt, Alexander Generalov, Alexei Preobrajenski, Thomas Liddy, Leon B. S. Williams, Mhairi A. Buchan, Graham A. Rance, Tien-Lin Lee, Alex Saywell, Roman Gorbachev, Sarah J. Haigh, Christopher S. Allen, Willi Auwärter, Reinhard J. Maurer* and David A. Duncan*

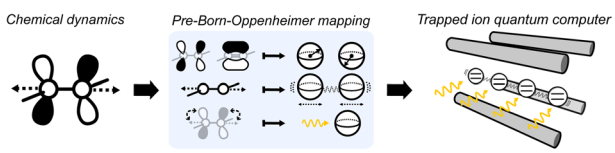
19414



Sequential one-pot *N*-alkylation and aminocarbonylation of primary amines catalyzed by heterobimetallic Ir/Pd complexes

Amin Abdolrahimi, Philipp Woite, Konrad Kretschmar, Michael Roemelt,* Thomas Braun* and Ouchan He

19423



Analog quantum simulation of coupled electron-nuclear dynamics in molecules

Jong-Kwon Ha and Ryan J. MacDonell*

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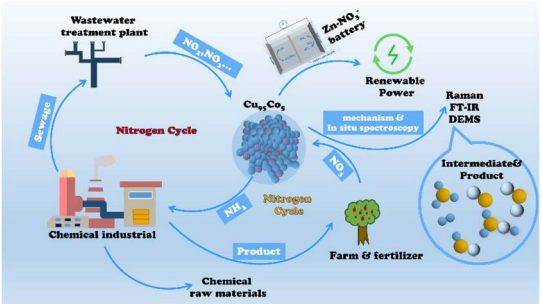
19436

Insights into interfacial water and key intermediates on $Cu_{95}Co_5$ aerogels for electrocatalytic nitrate-to-ammonia conversion

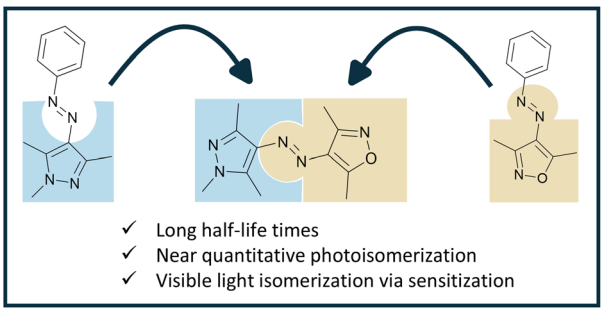
Ming Mu, Junjie Chen, Xiangxin Xue, Yumei Yang, Ruikai Qi, Yuezhu Wang, Di Liu, Lijia Shang, Wenji Jiang, Xinyi Shao, Zheng-jie Chen,* Bing Zhao and Wei Song*



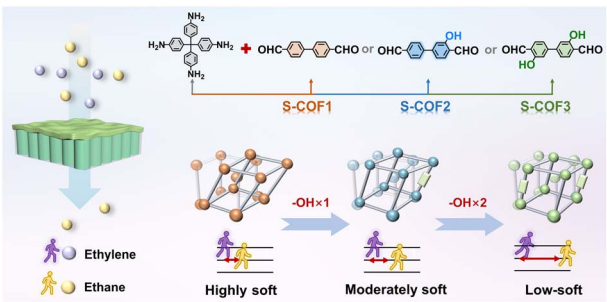
19448

Azobisheteroarene photoswitches based on isoxazoles and pyrazoles: tunable photostationary states, thermal relaxation and sensitization under confinement

Maximilian D. Seyfried, Julius Gemen, Leonard Wyszynski, Carl L. Giard, Constantin G. Daniliuc, Monika Schönhoff, Nikos L. Doltsinis, Frank Glorius and Bart Jan Ravoo*



19456

Tailoring flexibility of nanofluidic membranes for efficient separation of gases with similar kinetic diameters

Huijie Wang, Shuang Huan, Zhenyu Chu, Zongyou Yin and Chen Wang*