

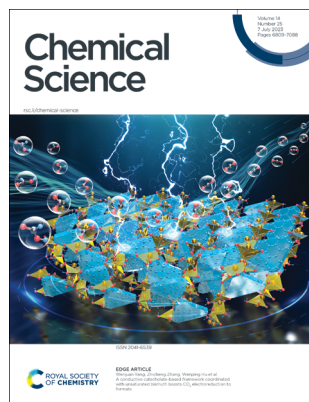
Chemical Science

rsc.li/chemical-science

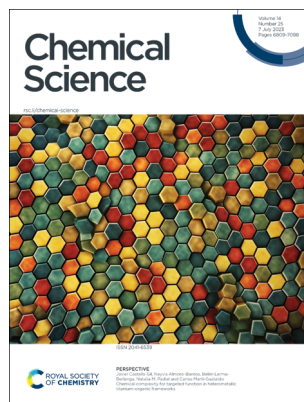
The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 14(25) 6809–7088 (2023)



Cover
See Wenjuan Yang, Zhicheng Zhang, Wenping Hu *et al.*, pp. 6860–6866.
Image reproduced by permission of Zhicheng Zhang from *Chem. Sci.*, 2023, 14, 6860.



Inside cover
See Carlos Martí-Gastaldo *et al.*, pp. 6826–6840.
Image reproduced by permission of Carlos Martí-Gastaldo from *Chem. Sci.*, 2023, 14, 6826.

EDITORIAL

6820

Addressing the sustainability challenges for polymers in liquid formulations

Caroline Louise Kelly

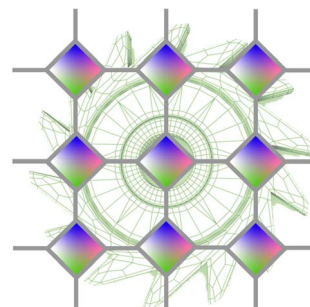


PERSPECTIVES

6826

Chemical complexity for targeted function in heterometallic titanium–organic frameworks

Javier Castells-Gil, Neyvis Almora-Barrios, Belén Lerma-Berlanga, Natalia M. Padial and Carlos Martí-Gastaldo*



Editorial Staff

Executive Editor

May Copsy

Deputy Editor

Samantha Apps

Senior Editor

James Moore

Scientific Editors

Ellis Crawford, Jingtao Huang, Esther Johnston, Sophie Orchard, Richard Thompson and Amy Welch

Editorial Assistant

Karina Webster

Publishing Assistant

David Bishop

For queries about submitted articles please contact James Moore, Senior Editor, in the first instance. E-mail chemicalscience@rsc.org

For pre-submission queries please contact May Copsy, Executive Editor. E-mail chemicalscience-rsc@rsc.org

Chemical Science (electronic: ISSN 2041-6539) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK.

Chemical Science is a Gold Open Access journal and all articles from 2015 onwards are free to read.

Please email orders@rsc.org to register your interest or contact Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail orders@rsc.org

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

Chemical Science

rsc.li/chemical-science

Editorial Board

Editor-in-Chief

Andrew Cooper, University of Liverpool

Associate Editors

Vincent Artero, CEA-Grenoble
Luis M. Campos, Columbia University
Michelle Chang, University of California, Berkeley
Lin X. Chen, Northwestern University
Graeme Day, University of Southampton
Serena DeBeer, Max Planck Institute for Chemical Energy Conversion

Mircea Dincă, MIT

François Gabbai, Texas A&M University
Subi George, JNCASR
Jinlong Gong, Tianjin University
Stephen Goldup, University of Birmingham
Zaiping Guo, University of Adelaide
Christopher A. Hunter, University of Cambridge
Malika Jefferies-EL, Boston University
Ning Jiao, Peking University
Tanja Junkers, Monash University
Hemamala Karunadasa, Stanford University

Maja Köhn, University of Freiburg
Yi-Tao Long, Nanjing University
Gabriel Merino, CINVESTAV Merida
James K. McCusker, Michigan State University
Thomas Meade, Northwestern University
Paolo Melchiorre, University of Bologna
Carsten Schultz, Oregon Health & Science University
Dmitri Talapin, The University of Chicago
Toshiharu Teranishi, Kyoto University
Andrei Yudin, University of Toronto

Advisory Board

Dave Adams, University of Glasgow
Ayyappanpillai Ajayaghosh, NIIST
Ulf-Peter Apfel, Ruhr-University Bochum
Polly Arnold, University of California, Berkeley
Xinhe Bao, Dalian Institute of Chemical Physics
Zhenan Bao, Stanford University
Gonçalo Bernardes, University of Cambridge
Frank Biedermann, Karlsruhe Institute of Technology
Donna Blackmond, Scripps Research Institute
Jeffrey Bode, ETH Zurich
Jennifer S. Brodbelt, University of Texas at Austin, USA
Christopher Chang, University of California, Berkeley
Chi-Ming Che, University of Hong Kong
Jun Chen, Nankai University
R. Graham Cooks, Purdue University
Christophe Copéret, ETH Zurich
Eugenio Coronado, University of Valencia
Leroy Cronin, University of Glasgow
James Crowley, University of Otago
Christopher C. Cummins, Massachusetts Institute of Technology
Ben Davis, University of Oxford
Jillann Dempsey, University of North Carolina at Chapel Hill
Kazunari Domen, University of Tokyo
James Durrant, Imperial College London
Xinlang Feng, TU Dresden
Ben Feringa, University of Groningen
Makoto Fujita, University of Tokyo
Phillip Gale, University of Technology Sydney
Song Gao, Peking University
Jeremiah Gassensmith, University of Texas at Dallas
Elizabeth Gibson, Newcastle University
Ryan Gilmour, WWU Münster
Hubert Girault, EPFL
Frank Glorius, WWU Münster
Leticia González, University of Vienna
Duncan Graham, University of Strathclyde

Vicki Grassian, University of California, San Diego
Alexis Grimaud, Boston College
Christian Hackenberger, FMP Berlin
Brecht Han, Chinese Academy of Sciences
Christy Haynes, University of Minnesota
Patrick Holland, Yale University
Kim Jelfs, Imperial College London
Yousung Jung, KAIST
Stephanie Kath-Schorr, University of Cologne
Takashi Kato, University of Tokyo
Christopher Kelly, Janssen Research & Development
Jérôme Lacour, University of Geneva
Ai-Lan Lee, Heriot-Watt University
Daniele Leonori, RWTH Aachen University
Chao-Jun Li, McGill University
Yi Li, Jilin University
Mi Hee Lim, KAIST
Wenbin Lin, University of Chicago
Kopin Liu, Academia Sinica
Watson Loh, UNICAMP
Bettina Lotsch, Max Planck Institute
Xiong Wen (David) Lou, Nanyang Technological University
Kazuhiko Maeda, Tokyo Institute of Technology
Satoshi Maeda, Hokkaido University
Swadhin Mandal, IISER Kolkata
Ellen Matson, University of Rochester
Scott Miller, Yale University
Daniel Mndiola, University of Pennsylvania
Wonwoo Nam, Ewha Womans University
Jonathan Nitschke, University of Cambridge
Allie Obermeyer, Columbia University
Martin Oestreich, Technical University of Berlin
Takashi Ooi, Nagoya University
Rachel O'Reilly, University of Birmingham
Oleg Ozerov, Texas A&M University
Xiulian Pan, Dalian Institute of Chemical Physics
Nicolas Plumeré, Technical University of

Munich
Rasmita Raval, University of Liverpool
Erwin Reisner, University of Cambridge
Andrea Rentmeister, WWU Münster
Jeffrey Rinehart, University of California, San Diego
Stuart Rowan, University of Chicago
Richmond Sarpong, University of California, Berkeley
Danielle Schultz, Merck
Dwight Seferos, University of Toronto
Oliver Seitz, Humboldt University of Berlin
Roberta Sessoli, University of Florence
Kay Severin, Federal Polytechnic School of Lausanne
Mikiko Sodeoka, RIKEN
Galo Soler-Illia, Universidad Nacional de San Martín
David Spring, University of Cambridge
Brian Stoltz, California Institute of Technology
Brent Sumerlin, University of Florida
Raghavan B. Sunoj, IIT Bombay
Yogesh Surendranath, MIT
Mizuki Tada, Nagoya University
Ben Zhong Tang, The Hong Kong University of Science and Technology
Zhiyong Tang, National Center for Nanoscience and Nanotechnology
Christine Thomas, Ohio State University
He Tian, East China University of Science & Technology
Zhong-Qun Tian, Xiamen University
F. Dean Toste, University of California, Berkeley
Takashi Uemura, University of Tokyo
Jan van Hest, Radboud University
Latha Venkataraman, Columbia University
Chu Wang, Peking University
Julia Weinstein, University of Sheffield
Tom Welton, Imperial College London
Charlotte Williams, University of Oxford
Vivian Yam, University of Hong Kong
Qi-Lin Zhou, Nankai University
Jenny Zhang, University of Cambridge

Information for Authors

Full details on how to submit material for publication in Chemical Science are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: rsc.li/chemical-science

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

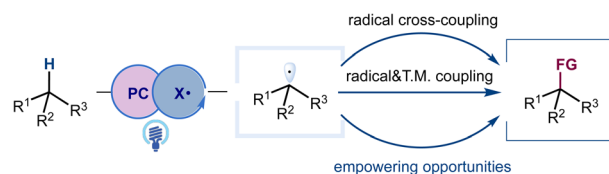


PERSPECTIVES

6841

Resurgence and advancement of photochemical hydrogen atom transfer processes in selective alkane functionalizations

Liang Chang, Shun Wang, Qing An, Linxuan Liu, Hexiang Wang, Yubo Li, Kaixuan Feng and Zhiwei Zuo*

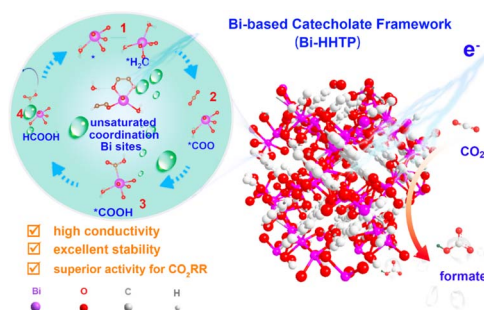


EDGE ARTICLES

6860

A conductive catechol-based framework coordinated with unsaturated bismuth boosts CO₂ electroreduction to formate

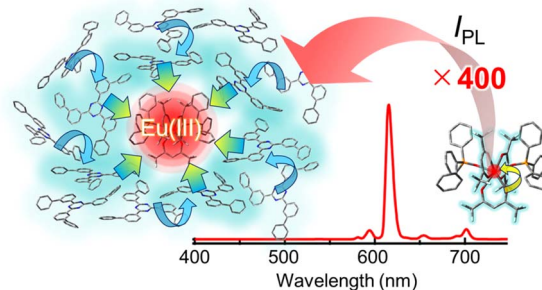
Zengqiang Gao, Man Hou, Yongxia Shi, Li Li, Qisheng Sun, Shuyuan Yang, Zhiqiang Jiang, Wenjuan Yang,* Zhicheng Zhang* and Wenping Hu*



6867

Highly efficient light harvesting of a Eu(III) complex in a host-guest film by triplet sensitization

Shiori Miyazaki, Kenichi Goushi, Yuichi Kitagawa, Yasuchika Hasegawa, Chihaya Adachi, Kiyoshi Miyata* and Ken Onda*



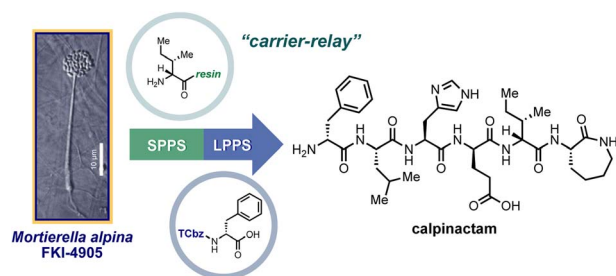
6876

Disulfide radical anion as a super-reductant in biology and photoredox chemistry

Qilei Zhu,* Cyrille Costentin, JoAnne Stubbe and Daniel G. Nocera*



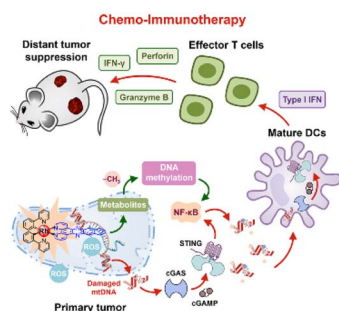
6882



Development of a nitrogen-bound hydrophobic auxiliary: application to solid/hydrophobic-tag relay synthesis of calpinactam

Hiroki Nakahara, Goh Sennari, Yoshihiko Noguchi, Tomoyasu Hirose* and Toshiaki Sunazuka*

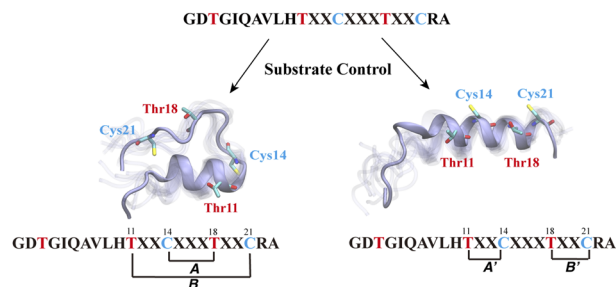
6890



Activation of the cGAS-STING pathway by a mitochondrial DNA-targeted emissive rhodium(III) metallointercalator

Yue Zheng, Xiao-Xiao Chen, Dong-Yang Zhang, Wen-Jin Wang, Kun Peng, Zhi-Yuan Li, Zong-Wan Mao* and Cai-Ping Tan*

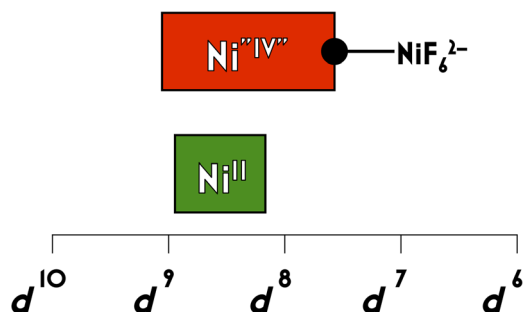
6904



Sequence controlled secondary structure is important for the site-selectivity of lanthipeptide cyclization

Xuenan Mi, Emily K. Desormeaux, Tung T. Le, Wilfred A. van der Donk* and Diwakar Shukla*

6915



Scrutinizing formally Ni^{IV} centers through the lenses of core spectroscopy, molecular orbital theory, and valence bond theory

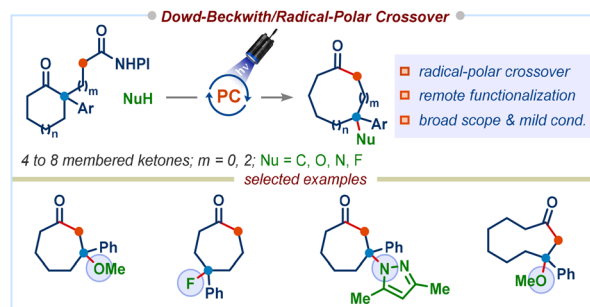
Ida M. DiMucci, Charles J. Titus, Dennis Nordlund, James R. Bour, Eugene Chong, Dylan P. Grigas, Chi-Heng Hu, Mikhail D. Kosobokov, Caleb D. Martin, Liviu M. Mirica, Noel Nebra, David A. Vicic, Lydia L. Yorks, Sam Yruegas, Samantha N. MacMillan,* Jason Shearer* and Kyle M. Lancaster*



6930

Photocatalyzed Dowd–Beckwith radical-polar crossover reaction for the synthesis of medium-sized carbocyclic compounds

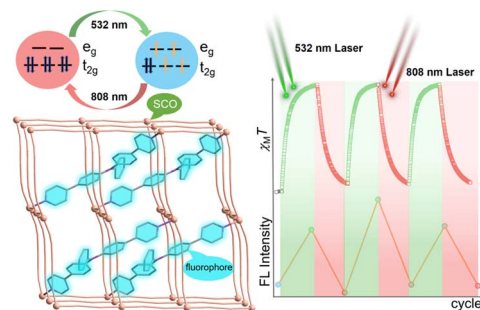
Tushar Singha, Ganesh Arjun Kadam and Durga Prasad Hari*



6936

Manipulating fluorescence by photo-switched spin-state conversions in an iron(II)-based SCO-MOF

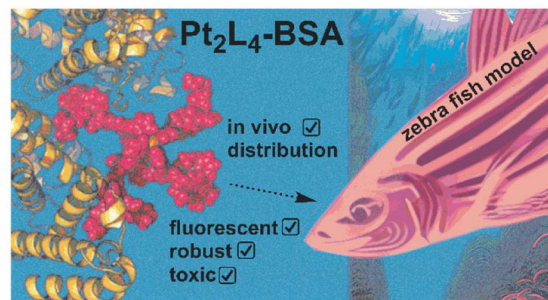
Fei-Fei Yan, Wen-Jing Jiang, Nian-Tao Yao, Pan-Dong Mao, Liang Zhao, Hui-Ying Sun, Yin-Shan Meng and Tao Liu*



6943

In vivo biodistribution of kinetically stable Pt₂L₄ nanospheres that show anti-cancer activity

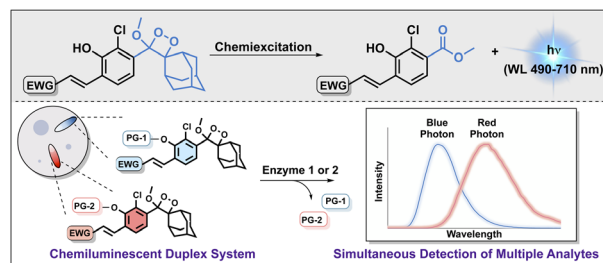
Eduard O. Bobylev, Renzo A. Knol, Simon Mathew, David A. Poole, III, Ioli Kotsogianni, Nathaniel I. Martin, Bas de Bruin, Alexander Kros* and Joost N. H. Reek*



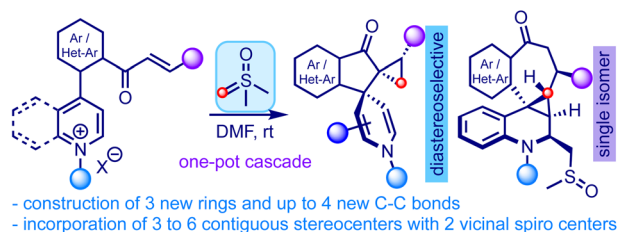
6953

Chemiluminescent duplex analysis using phenoxy-1,2-dioxetane luminophores with color modulation

Sara Gutkin, Rozan Tannous, Qais Jaber, Micha Fridman and Doron Shabat*



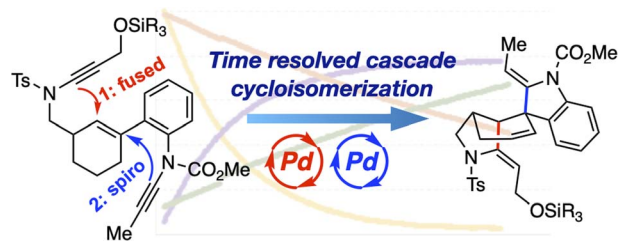
6963



An interrupted Corey–Chaykovsky reaction of designed azaarenium salts: synthesis of complex polycyclic spiro- and fused cyclopropanoids

Bara Singh, Arshad J. Ansari, Nirmal Malik and S. S. V. Ramasastry*

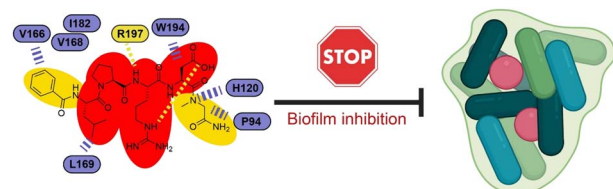
6970



Sequencing palladium-catalyzed cycloisomerization cascades in a synthesis of the gelsemine core

Guoduan Liang and Edward A. Anderson*

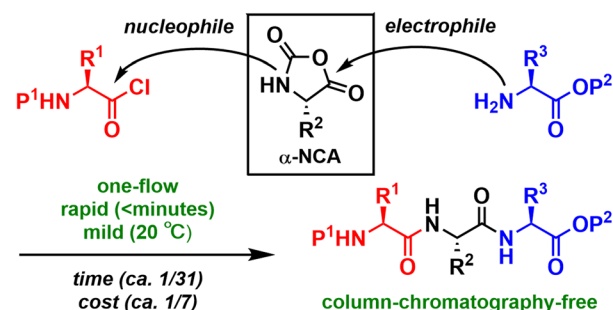
6975



Substrate-derived Sortase A inhibitors: targeting an essential virulence factor of Gram-positive pathogenic bacteria

Helal Abujubara, Jordi C. J. Hintzen, Shadi Rahimi, Ivan Mijakovic, Daniel Tietze and Alesia A. Tietze*

6986



Rapid and column-chromatography-free peptide chain elongation via a one-flow, three-component coupling approach

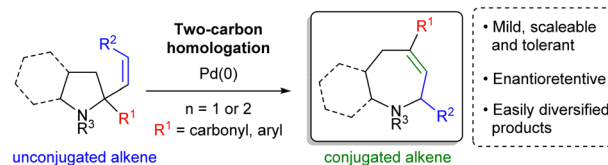
Naoto Sugisawa, Akira Ando and Shinichiro Fuse*



6992

Stereoselective two-carbon ring expansion of allylic amines via electronic control of palladium-promoted equilibria

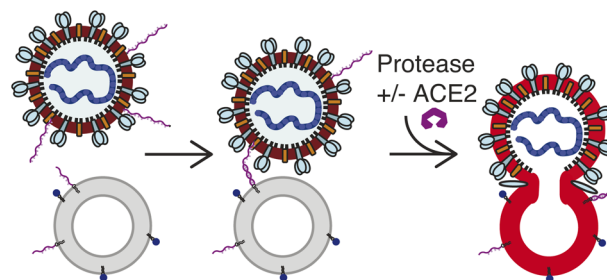
Charles P. Mikan, Aidan Matthews, Daniel Harris, Charlotte E. McIvor, Paul G. Waddell, Mark T. Sims and Jonathan P. Knowles*



6997

The ACE2 receptor accelerates but is not biochemically required for SARS-CoV-2 membrane fusion

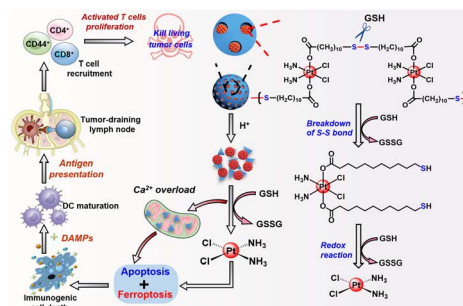
Marcos Cervantes, Tobin Hess, Giorgio G. Morbioli, Anjali Sengar and Peter M. Kasson*



7005

In situ oxidative polymerization of platinum(IV) prodrugs in pore-confined spaces of CaCO₃ nanoparticles for cancer chemoimmunotherapy

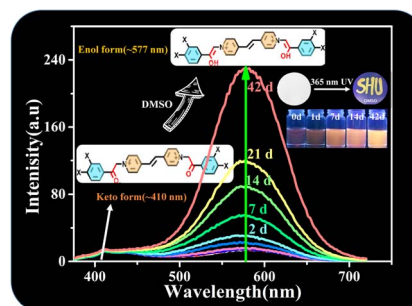
Fangmian Wei, Libing Ke, Siyuan Gao, Johannes Karges, Jinqian Wang, Yu Chen, Liangnian Ji and Hui Chao*



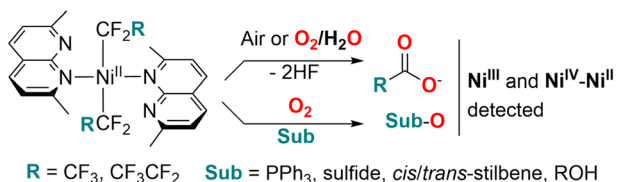
7016

Isomerization-induced fluorescence enhancement of two new viologen derivatives: mechanism insight and DFT calculations

Xiuping Yin, Xinxing Li, Xuyi Li, Malgorzata Biczysko,* Shourong Zhu, Jiaqiang Xu and Yue-Ling Bai*

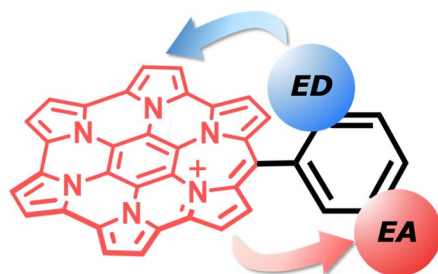


7026

Oxygenation by O₂ via Ni long-chain perfluoroalkyl complexes**Oxygen transfer reactivity mediated by nickel perfluoroalkyl complexes using molecular oxygen as a terminal oxidant**

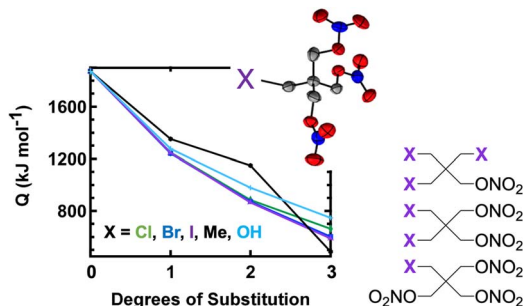
Shubham Deolka, R. Govindarajan, Eugene Khaskin, Serhii Vasylevskyi, Janet Bahri, Robert R. Fayzullin, Michael C. Roy and Julia R. Khusnutdinova*

7036

**24π Antiaromatic****Substituent effects on paratropicity and diatropicity in π-extended hexapyrrolohexaazacoronene**

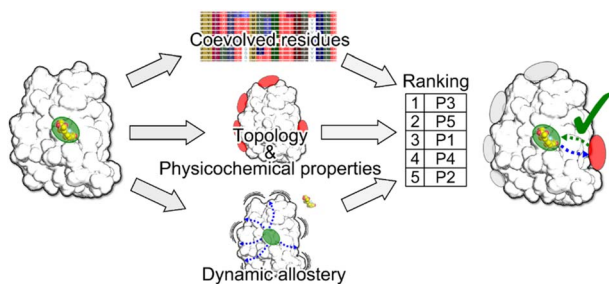
Masayoshi Takase,* Toranosuke Takata, Kosuke Oki, Shigeki Mori and Hidemitsu Uno*

7044

**Halogenated PETN derivatives: interplay between physical and chemical factors in explosive sensitivity**

Nicholas Lease,* Kyle D. Spielvogel, Jack V. Davis, Jeremy T. Tisdale, Lisa M. Klamborowski, M. J. Cawkwell and Virginia W. Manner

7057

**Combining structural and coevolution information to unveil allosteric sites**

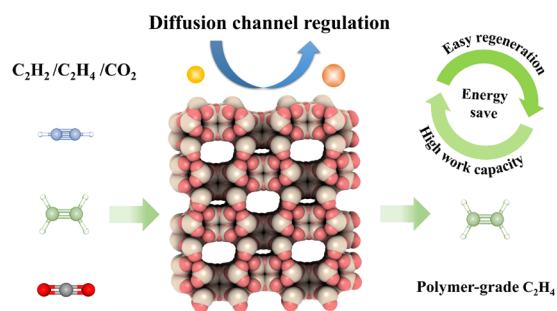
Giuseppina La Sala,* Christopher Pflieger, Helena Käck, Lisa Wissler, Philip Nevin, Kerstin Böhm, Jon Paul Janet, Marianne Schimpl, Christopher J. Stubbs, Marco De Vivo, Christian Tyrchan, Anders Hogner, Holger Gohlke* and Andrey I. Frolov*



7068

Deep removal of trace C_2H_2 and CO_2 from C_2H_4 by using customized potassium-exchange mordenite

Hongwei Chen, Binyu Wang, Bin Zhang, JiuHong Chen, Jiabao Gui, Xiufeng Shi, Wenfu Yan, Jinping Li and Libo Li*



7076

Near-infrared AIEgens with high singlet-oxygen yields for mitochondria-specific imaging and antitumor photodynamic therapy

Shasha Zhang, Wenfang Yang, Xiao Lu, Xinyi Zhang, Zhichao Pan, Da-Hui Qu, Dong Mei,* Ju Mei* and He Tian

