

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.

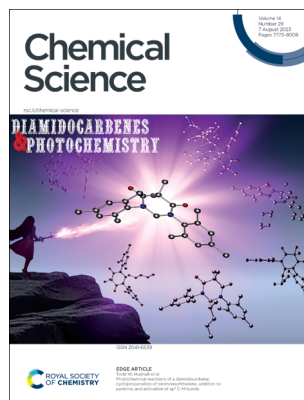
IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 14(29) 7773–8008 (2023)



Cover

See Arnab Mukherjee, Rituparna Sinha Roy *et al.*, pp. 7842–7866.
Image reproduced by permission of Arnab Mukherjee, Rituparna Sinha Roy *et al.* from *Chem. Sci.*, 2023, **14**, 7842.



Inside cover

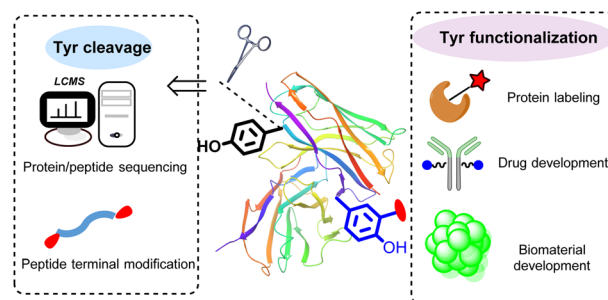
See Todd W. Hudnall *et al.*, pp. 7867–7874.
Image reproduced by permission of Todd W. Hudnall and M. Brenton Gildner, from *Chem. Sci.*, 2023, **14**, 7867. The background image, including the human figure, was created via the AI software NightCafe.

REVIEW

7782

Recent developments in the cleavage, functionalization, and conjugation of proteins and peptides at tyrosine residues

Shengping Zhang, Luis M. De Leon Rodriguez, Freda F. Li and Margaret A. Brimble*

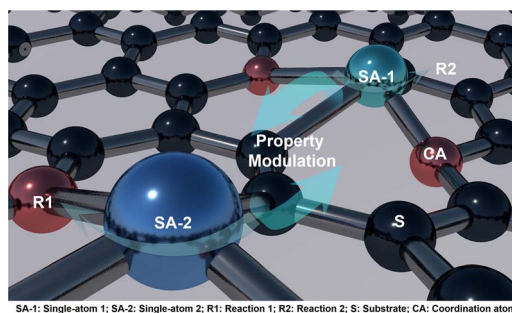


PERSPECTIVES

7818

Diatomic catalysts for Fenton and Fenton-like reactions: a promising platform for designing/regulating reaction pathways

Fan Mo, Qixing Zhou,* Chenghao Li, Zongxin Tao, Zelin Hou, Tong Zheng, Qi Wang, Shaohu Ouyang and Sihui Zhan



SA-1: Single-atom 1; SA-2: Single-atom 2; R1: Reaction 1; R2: Reaction 2; S: Substrate; CA: Coordination atom

Editorial Staff

Executive Editor

May Copsey

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 Copsey, 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
Jillian 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
Buxing 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 Mindiola, 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 Plummer, 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 Chinese University of Hong Kong
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

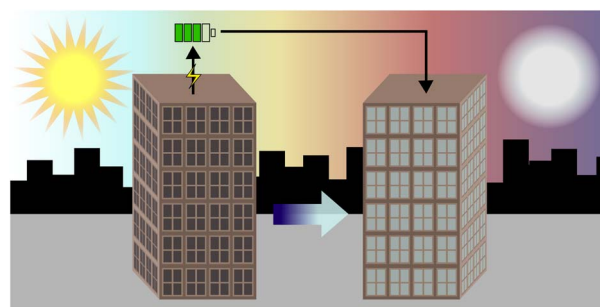


PERSPECTIVES

7828

Can we make color switchable photovoltaic windows?

Josephine L. Surel and Jeffrey A. Christians*

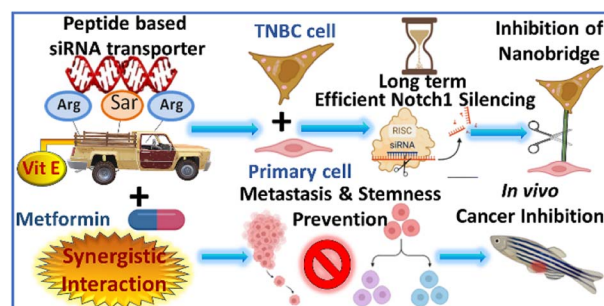


EDGE ARTICLES

7842

Engineered vitamin E-tethered non-immunogenic facial lipopeptide for developing improved siRNA based combination therapy against metastatic breast cancer

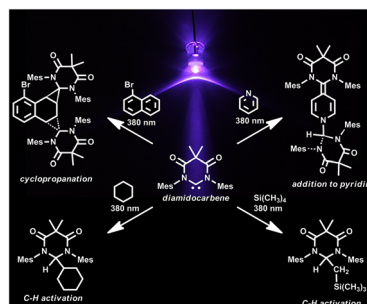
Argha Mario Mallick, Abhijit Biswas, Sukumar Mishra, Sonali Jadhav, Kasturee Chakraborty, Archana Tripathi, Arnab Mukherjee* and Rituparna Sinha Roy*



7867

Photochemical reactions of a diamidocarbene: cyclopropanation of bromonaphthalene, addition to pyridine, and activation of sp^3 C–H bonds

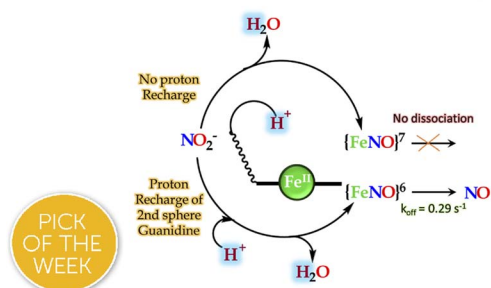
Tharushi A. Perera, William V. Taylor, M. Brenton Gildner, Eric W. Reinheimer, Sho Ito, Anna Nelson, Shane R. Yost and Todd W. Hudnall*



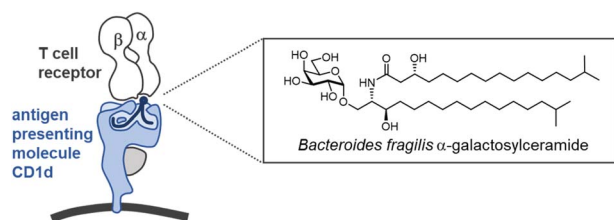
7875

Role of distal arginine residue in the mechanism of heme nitrite reductases

Ankita Sarkar, Snehadri Bhakta, Samir Chattopadhyay and Abhishek Dey*



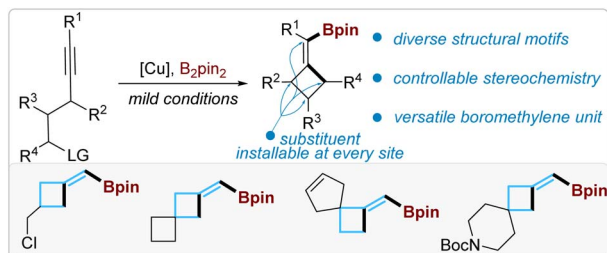
7887



Glycolipids from the gut symbiont *Bacteroides fragilis* are agonists for natural killer T cells and induce their regulatory differentiation

Garth Cameron, Tram Nguyen, Marcin Ciula, Spencer J. Williams* and Dale I. Godfrey*

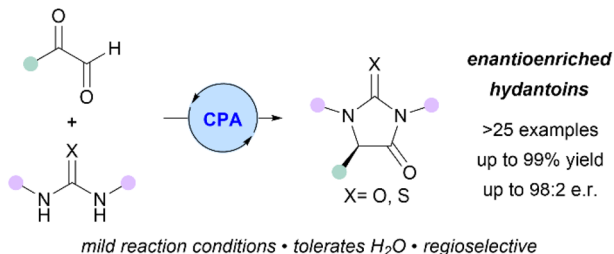
7897



A general catalytic synthetic strategy for highly strained methylenecyclobutanes and spiromethylenecyclobutanes

Haotian Zhao, Yu Lin, Mingyu Jiang and Bo Su*

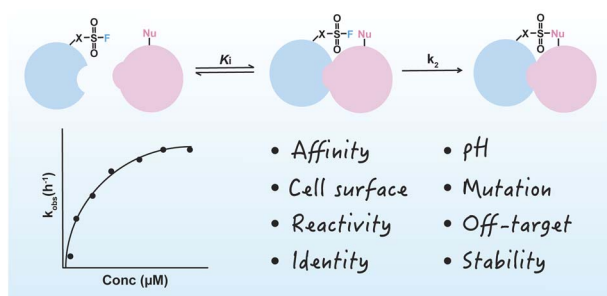
7905



Enantioselective synthesis of hydantoins by chiral acid-catalysed condensation of glyoxals and ureas

Sushant Aryal, Christopher A. Hone, Matthew I. J. Polson and Daniel J. Foley*

7913



The proximity-enabled sulfur fluoride exchange reaction in the protein context

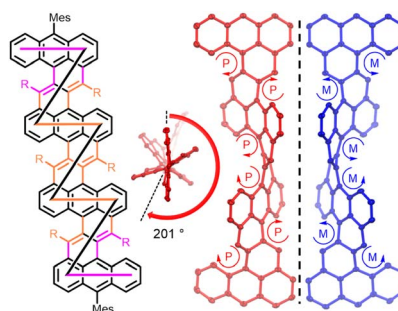
Bingchen Yu, Li Cao, Shanshan Li, Paul C. Klauser and Lei Wang*



7922

Helical fused 1,2:8,9-dibenzozethrene oligomers with up to 201° end-to-end twist: "one-pot" synthesis and chiral resolution

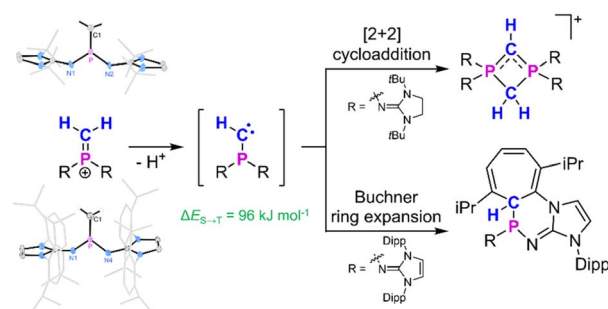
Zhitao Sun, Wei Fan, Yi Han, Wei Yuan, Yong Ni, Jinyi Wang, Haipeng Wei, Yanli Zhao, Zhe Sun* and Jishan Wu*



7928

Terminal methylene phosphonium ions: precursors for transient monosubstituted phosphinocarbenes

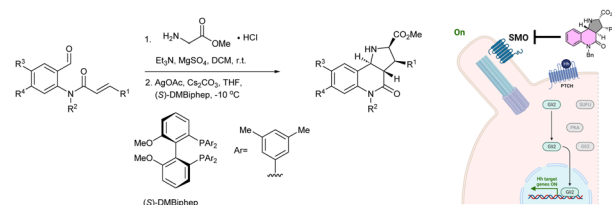
Pawel Löwe, Marius A. Wünsche, Felix R. S. Purtscher, Jakob Gamper, Thomas S. Hofer, Lukas F. B. Wilm, Maike B. Röthel and Fabian Dielmann*



7936

A highly enantioselective intramolecular 1,3-dipolar cycloaddition yields novel pseudo-natural product inhibitors of the Hedgehog signalling pathway

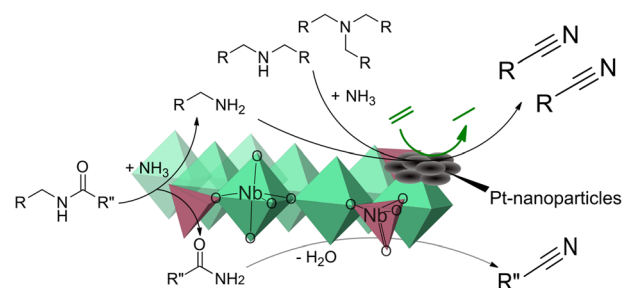
Jie Liu, Ruirui Zhang, Shubhadip Mallick, Sohan Patil, Chantal Wientjens, Jana Flegel, Anna Krupp, Carsten Strohmann, Corentin Grassin, Christian Merten, Axel Pahl, Michael Grigalunas and Herbert Waldmann*



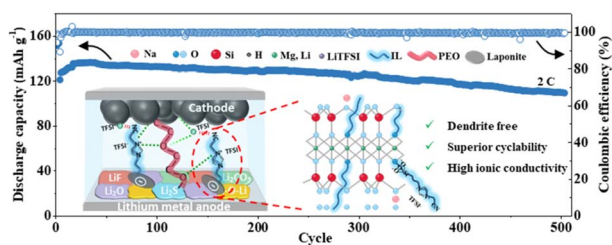
7944

Ammonolytic transfer dehydrogenation of amines and amides: a versatile method to valorize nitrogen compounds to nitriles

Robin Coeck, Margot Houbrechts and Dirk E. De Vos*



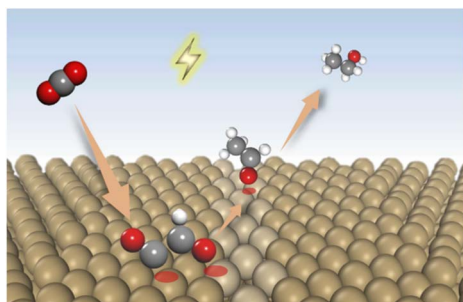
7956



Composite polymer electrolytes with ionic liquid grafted-Laponite for dendrite-free all-solid-state lithium metal batteries

BiYu Jin, Dongyun Wang, Yuan He, Jianjiang Mao, Yunqing Kang, Chao Wan,* Wei Xia,* Jeonghun Kim, MiHaru Eguchi and Yusuke Yamauchi*

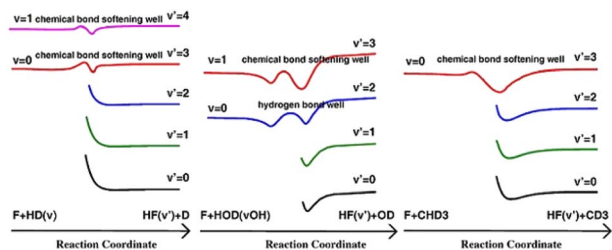
7966



Guiding catalytic CO₂ reduction to ethanol with copper grain boundaries

Dongfang Cheng, Gong Zhang, Lulu Li, Xiangcheng Shi, Shiyu Zhen, Zhi-Jian Zhao* and Jinlong Gong*

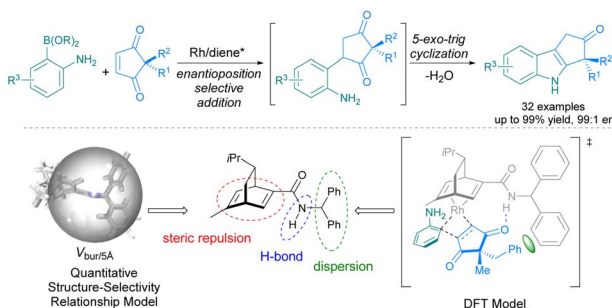
7973



Feshbach resonances in the F + CHD₃ → HF + CD₃ reaction

Shu Liu,* Jun Chen, Xiaoren Zhang and Dong H. Zhang*

7980



Catalytic asymmetric indolization by a desymmetrizing [3 + 2] annulation strategy

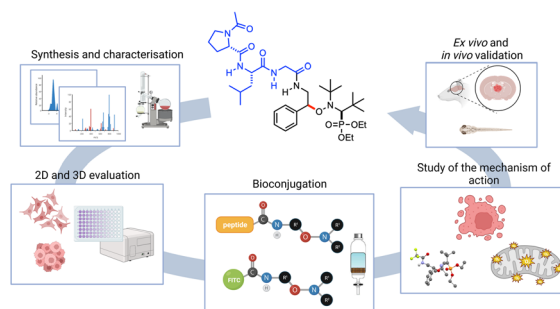
Changhui Wu, Zhiqian Chang, Chuanyong Peng, Chen Bai, Junhao Xing and Xiaowei Dou*



7988

Conditional generation of free radicals by selective activation of alkoxyamines: towards more effective and less toxic targeting of brain tumors

Patricia Piris, Dujé Buric, Toshihide Yamasaki, Paul Huchedé, Mailys Rossi, Mélanie Matteudi, Marie-Pierre Montero, Anne Rodallec, Romain Appay, Christine Roux, Sébastien Combes, Eddy Pasquier, Marie Castets, Nicolas André, Paul Brémont* and Manon Carré*



7999

Rhodium-catalyzed atroposelective access to trisubstituted olefins via C–H bond olefination of diverse arenes

Xiaohan Zhu, Ruijie Mi, Jie Yin, Fen Wang* and Xingwei Li*

