

ChemComm

Chemical Communications

rsc.li/chemcomm

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 1359-7345 CODEN CHCOFS 59(40) 5933-6098 (2023)



Cover

See Szymon Chorazy *et al.*, pp. 5961–5986. Image reproduced by permission of Szymon Chorazy and Robert Jankowski from *Chem. Commun.*, 2023, 59, 5961.



Inside cover

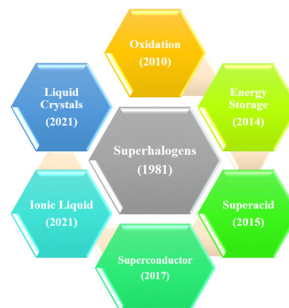
See Frerk-Ulfert Wehmeyer and Robert Langer, pp. 6004–6007. Image reproduced by permission of Robert Langer, Frerk-Ulfert Wehmeyer and Ellen Ohst from *Chem. Commun.*, 2023, 59, 6004. Artwork by Ellen Ohst.

HIGHLIGHT

5943

Recent progress on the design and applications of superhalogens

Ambrish Kumar Srivastava

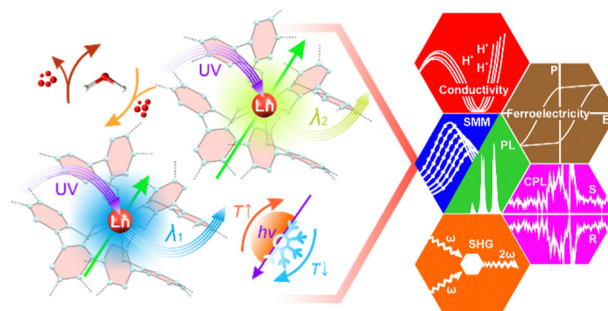


FEATURE ARTICLES

5961

Multifunctionality of luminescent molecular nanomagnets based on lanthanide complexes

Robert Jankowski, Maciej Wyczesany and Szymon Chorazy*



Editorial Staff

Executive Editor

Richard Kelly

Deputy Editor

Harriet Riley

Editorial Production Manager

Helen Saxton

Development Editor

Danny Andrews, Ershad Abubacker

Senior Publishing Editor

Becky Webb

Publishing Editors

Kirstine Anderson, Matthew Bown, Laura Cooper, Hannah Fielding, Clare Fitzgerald, Anoushka Handa, Claire Harding, Alan Holder, Charlie Palmer, Rosie Rothwell, Donna Smith, Laura Smith

Editorial Assistant

Jade Holliday

Publishing Assistant

Natalie Ford

Publisher

Jeanne Andres

For queries about submitted papers, please contact Helen Saxton, Editorial Production Manager in the first instance. E-mail chemcomm@rsc.org

For pre-submission queries please contact Richard Kelly, Executive Editor.

Email chemcomm-rsc@rsc.org

Chemical Communications (print: ISSN 1359-7345; electronic: ISSN 1364-548X) is published 100 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the 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

2023 Annual (electronic) subscription price: £3,553 / US\$6,258. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

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

ChemComm

Chemical Communications

rsc.li/chemcomm

Editorial Board

Chair

Douglas Stephan, University of Toronto

Associate Editors

Lutz Ackermann, University of Göttingen

Davide Bonifazi, University of Vienna

Rachel Caruso, RMIT University

Fengtao Fan, Chinese Academy of Sciences

Itaru Hamachi, Kyoto University

Michael Hardie, University of Leeds

Kim Jelfs, Imperial College London

Chao-Jun Li, McGill University

Connie Lu, University of Minnesota, US

Marinella Mazzanti, EPFL, Switzerland

Amy Prieto, Colorado State University

Yang Tian, East China Normal University

Sandeep Verma, Indian Institute of

Technology Kanpur

Advisory Board

Brendan Abrahams, University of Melbourne
Polly Arnold, University of Edinburgh

Louise Berben, University of California, Davis

Penny Brothers, Australian National University

Wesley Browne, University of Groningen

Raffaella Buonsanti, EPFL

Luiz Henrique Catalani, University of São Paulo

Xiao-Ming Chen, Sun Yat-Sen University

Lifeng Chi, Soochow University

Arindam Chowdhury, Indian Institute of

Technology Bombay

Derrick Clive, University of Alberta

Seth Cohen, University of California, San Diego

Marcetta Darensbourg, Texas A&M University

Jyotirmayee Dash, Indian Association for the

Cultivation of Science

Gautam R. Desiraju, Indian Institute of

Science, Bangalore

Abhishek Dey, Indian Association for the

Cultivation of Science (IACS)

Josh Figueroa, University of California, San

Diego

Lutz Gade, University of Heidelberg

Sujit Ghosh, Indian Institute of Science

Education of Research, India

Nathan Gianneschi, University of California,

San Diego

Robert Gilliard Jr., University of Virginia

David Gonzalez-Rodriguez, Autonomous

University of Madrid

Rebecca Goss, University of

St Andrews

Mike Greaney, University of Manchester

Shaojun Guo, Peking University

Michael Hardie, University of Leeds

Amanda Hargrove, Duke University

Craig Hawker, University of California, Santa Barbara

Feihe Huang, Zhejiang University

Todd Hudnall, Texas State University

Ilich A. Ibarra Alvarado, National University

of Mexico

Hiroshi Kageyama, Kyoto University

Jong Seung Kim, Korea University

Shu Kobayashi, University of Tokyo

Mi Hee Lim, Ulsan National Institute of

Science and Technology (UNIST)

Tek-Peng Loh, Nanyang

Technological University

Tien-Yau Luh, National Taiwan University

Doug MacFarlane, Monash University

Hiromitsu Maeda, Ritsumeikan University

Silvia Marchesan, University of Trieste

Nazario Martin, Complutense University of

Madrid

Keiji Maruoka, Kyoto University

Alexander Miller, University of North Carolina

at Chapel Hill

Wonwoo Nam, Ewha Womans University

Jean-Francois Nierengarten, University of

Strasbourg

Thalappil Pradeep, Indian Institute of

Technology Madras

S Ramakrishnan, Indian Institute of Science

Erwin Reisner, University of Cambridge

Robin Rogers, McGill University

Paolo Samori, University of Strasbourg

Ellen Sletten, University of California, Los

Angeles

David Smith, University of York

Mizuki Tada, Nagoya University

Christine Thomas, Ohio State University

Zhong-Qun Tian, Xiamen University

Tomas Torres, Autonomous University of

Madrid

Helma Wennemers, ETH Zurich

Judy Wu, University of Houston

Yi Xie, University of Science and Technology

of China

Xianran Xing, University of Science and

Technology Beijing

Shuli You, Shanghai Institute of Organic

Chemistry, Chinese Academy of Sciences

Atsuo Yamada, University of Tokyo

Qiang Zhang, Tsinghua University

Xi Zhang, Tsinghua University

Wenwan Zhong, University of California,

Riverside

Eli Zysman-Colman, University of St. Andrews

Information for Authors

Full details on how to submit material for publication in Chemical Communications 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/chemcomm

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.

© The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

Registered charity number: 207890

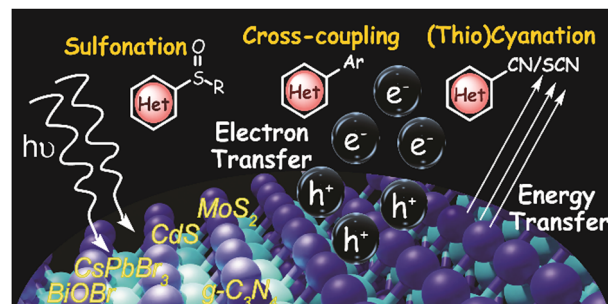


FEATURE ARTICLES

5987

Nanomaterials in photocatalysed organic transformations: development, prospects and challenges

Komal Jaiswal, Madhusmita Mahanta and Mrinmoy De*

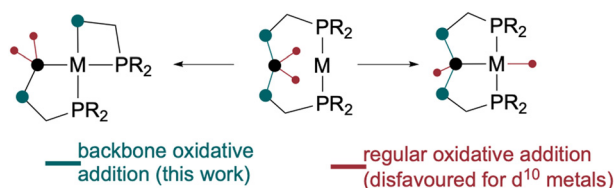


COMMUNICATIONS

6004

A hampered oxidative addition of pre-coordinated pincer ligands can favour alternative pathways of activation

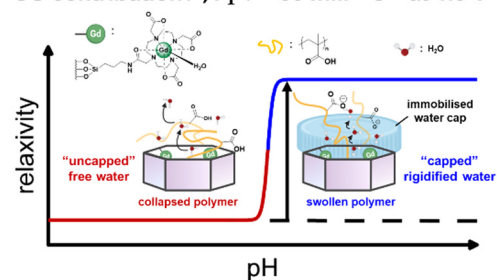
Frerk-Ulfert Wehmeyer and Robert Langer*



6008

Ultrahigh magnetic resonance contrast switching with water gated polymer-silica nanoparticles

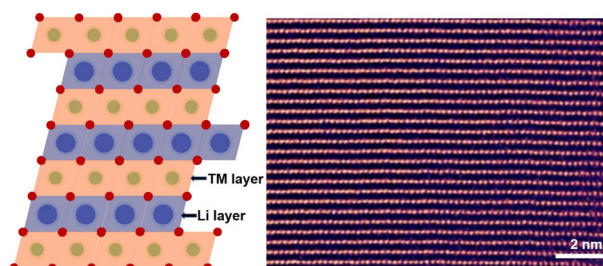
Daohe Yuan, Connor M. Ellis, Ferenc E. Mózes and Jason J. Davis*

OS contribution \uparrow , $r_1 \uparrow > 50 \text{ mM}^{-1} \text{ s}^{-1}$ at 1.5 T

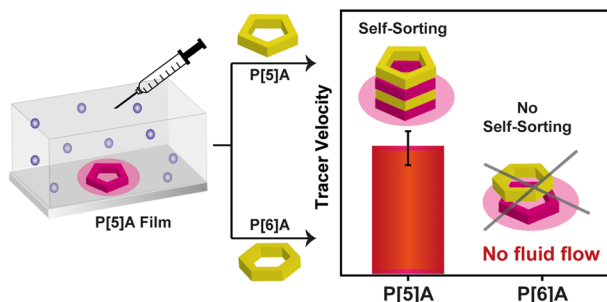
6012

Fabrication of a $\text{LiNi}_{0.5}\text{Mn}_{0.4}\text{Ti}_{0.03}\text{Mg}_{0.03}\text{Nb}_{0.01}\text{Mo}_{0.03}\text{O}_2$ cathode for low-cost long-life lithium-ion batteries

Kangwen Qiu,* Liuyang Bai, Jun Song, Yuge Ouyang, Jinbing Cheng* and Yongsong Luo



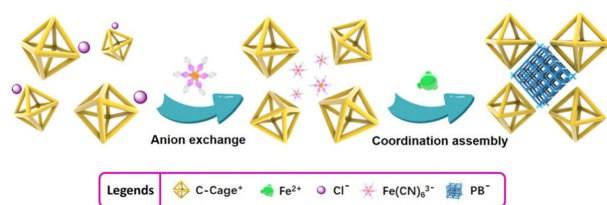
6016



Autonomous macroscopic signal deciphering the geometric self-sorting of pillar[n]arenes

Mujeeb Alam, Rekha Sangwan, Chinmayee Agashe, Arshdeep Kaur Gill and Debabrata Patra*

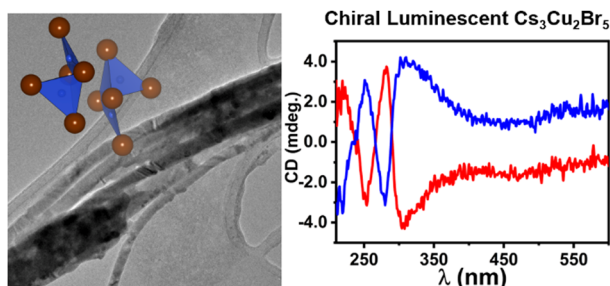
6020



Cooperative cage hybrids enabled by electrostatic marriage

Liyong Zhu, Xinchun Yang* and Jian-Ke Sun*

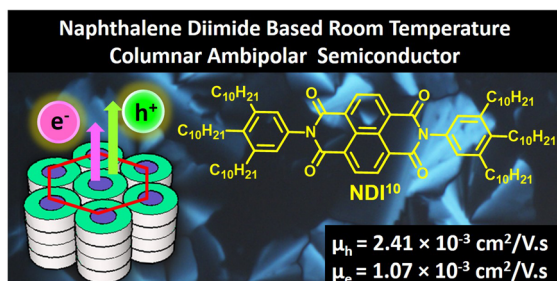
6024



Chirality in luminescent Cs₃Cu₂Br₅ microcrystals produced *via* ligand-assisted reprecipitation

Lorenzo Branzi,* Aoife Kavanagh, Michele Back, Adolfo Speghini,* Yurii K. Gun'ko* and Alvise Benedetti*

6028



First example of ambipolar naphthalene diimide exhibiting a room temperature columnar phase

Paresh Kumar Behera, Kajal Yadav, Nandan Kumar, Ravindra Kumar Gupta, D. S. Shankar Rao, Upendra Kumar Pandey* and Ammathnadu Sudhakar Achalkumar*

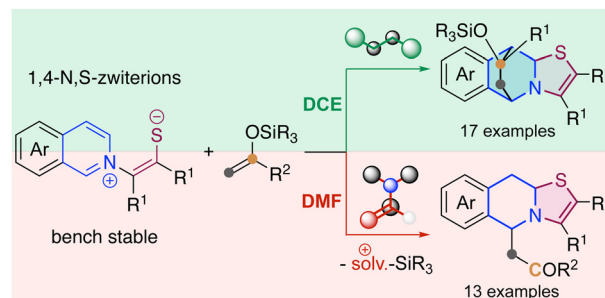


COMMUNICATIONS

6032

Divergent access to fused *N*-heterocycle-thiazolines by solvent-dependent reaction of isoquinolinium thiolates with silylketene acetals

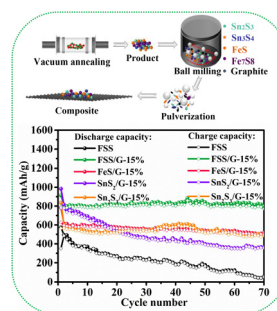
Lukas Schifferer, Leon Hoppmann, Robin Groeters, Christian Mück-Lichtenfeld, Constantin G. Daniliuc and Olga García Mancheño*



6036

Polycrystalline Fe- and Sn-based sulfides for high-capacity sodium-ion battery anodes

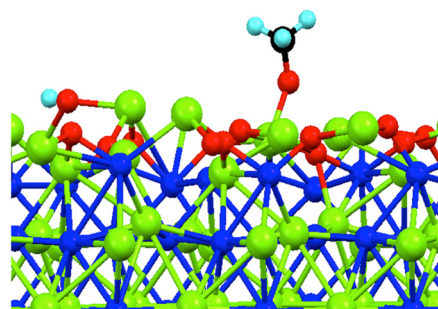
Xinxin Zhu, Peng Wang, Yihong Ding,* Ying Chu, Jie Lin, Shiqiang Zhao,* Huile Jin and Tianbiao Zeng*



6040

Cost-effective, high-performance Ni_3Sn_4 electrocatalysts for methanol oxidation reaction in acidic environments

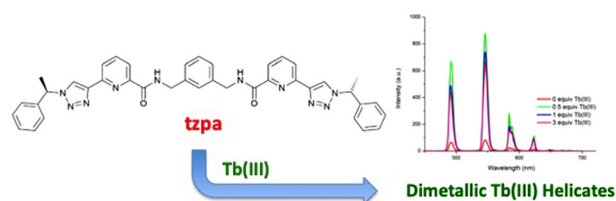
Danil W. Boukhvalov, Gianluca D'Olimpio, Junzhe Liu, Corneliu Ghica, Marian Cosmin Istrate, Chia-Nung Kuo, Grazia Giuseppina Politano, Chin Shan Lue, Piero Torelli, Lixue Zhang* and Antonio Politano*



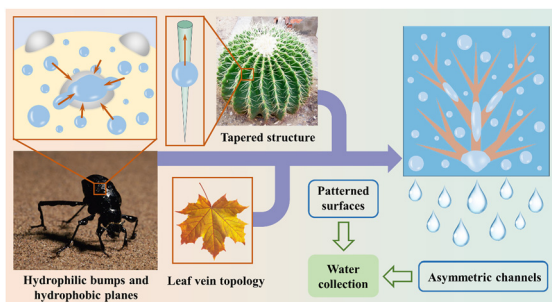
6044

Formation of lanthanide luminescent di-metallic helicates in solution using a bis-tridentate (1,2,3-triazol-4-yl)-picolinamide (tzpa) ligand

Isabel N. Hegarty, Dawn E. Barry, Joseph P. Byrne, Oxana Kotova and Thorfinnur Gunnlaugsson*



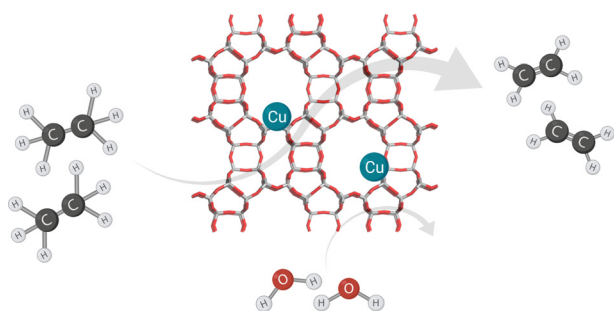
6048



Design and construction of a Laplace and wettability gradient field for efficient water collection

Qiuyue Wang, Fuchao Yang* and Zhiguang Guo

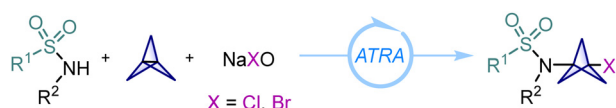
6052



Cu-loaded zeolites enable the selective activation of ethane to ethylene at low temperatures and pressure

Karoline Kvande, Sebastian Proding, Bjørn Gading Solemsli, Silvia Bordiga, Elisa Borfecchia, Unni Olsbye, Pablo Beato and Stian Svelle*

6056

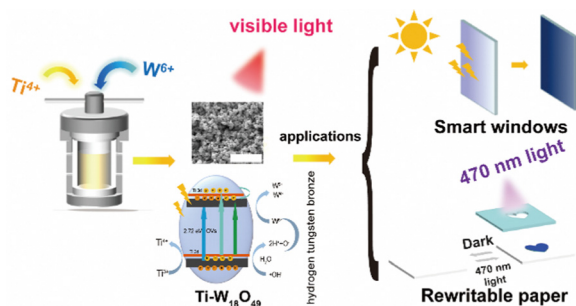


- Catalyst-free
- One-step synthesis
- Mild conditions
- Good functional group tolerance
- High atom economy

Synthesis of C3-halo substituted bicyclo[1.1.1]pentylamines via halosulfoamidation of [1.1.1]propellane with sodium hypohalites and sulfonamides

Zhi Li, Deyou Lan, Wei Zhou, Jiacheng Li, Hui Zhu, Chuanming Yu and Xinpeng Jiang*

6060



Coupling Ti doping with oxygen vacancies in tungsten oxide for high-performance photochromism applications

Jiamin Tang, Hongxi Gu,* Yating Zhao, Mengdi Tan, Weiwei Zhao, Rong Ma, Sheng Zhang and Dengwei Hu

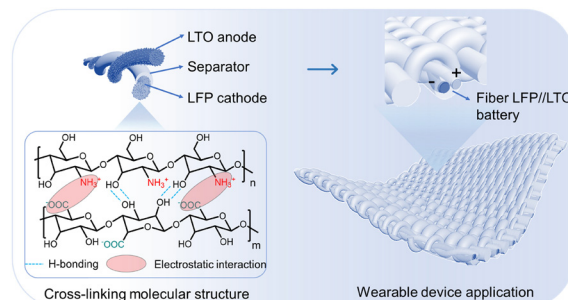


COMMUNICATIONS

6064

High-performance fiber-shaped Li-ion battery enabled by a surface-reinforced self-supporting electrode

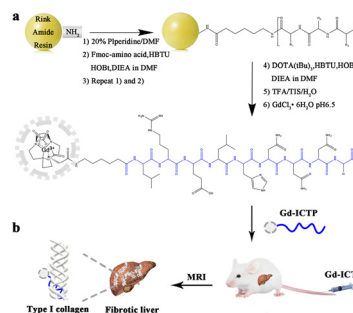
Cong Liu, Yining Lao, Fan Yang, Xiaoqi Gong, Xiaotong Wang, Lu Jiang,* Zhiping Zeng* and Dingshan Yu*



6068

A robust collagen-targeting MRI peptide contrast agent for *in vivo* imaging of hepatic fibrosis

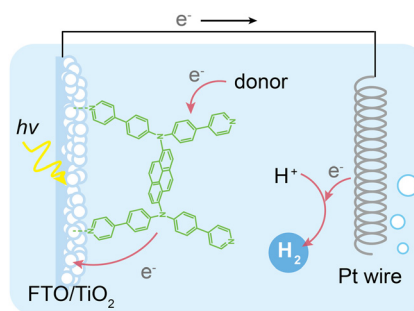
Zhao Liu, Linge Nian, Xiangdong Cai, Yue Hu, Junqiang Lei* and Jianxi Xiao*



6072

Photoelectrochemical cells with a pyridine-anchored organic dye photoanode for efficient H₂ generation by water reduction

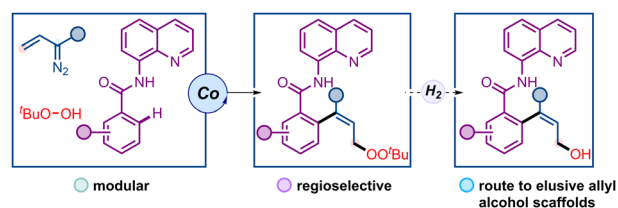
Kun Tang, Jiang-Yang Shao and Yu-Wu Zhong*



6076

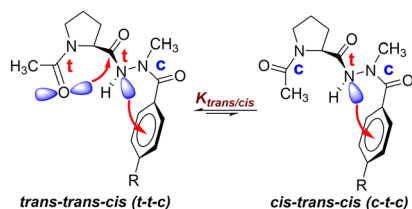
A three component 1,3-difunctionalization of vinyl diazo esters enabled by a cobalt catalyzed C–H activation/carbene migratory insertion

Nandkishor Prakash Khot, Prajyot Jayadev Nagtilak, Nitish Kumar Deo and Manmohan Kapur*



6080

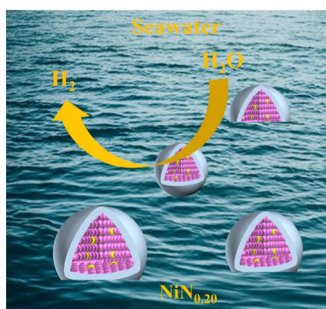
Synergistic $n \rightarrow \pi^*$ and $n_N \rightarrow \pi^*_{Ar}$ interactions stabilize *trans* Xaa-Pro amide geometry



Synergistic $n \rightarrow \pi^*$ and $n_N \rightarrow \pi^*_{Ar}$ interactions in C-terminal modified prolines: effect on Xaa-Pro *cis/trans* equilibrium

Jugal Kishore Rai Deka, Debashree Borah, Paramesh Das, Biswajit Sahariah, Pratap Vishnoi and Bani Kanta Sarma*

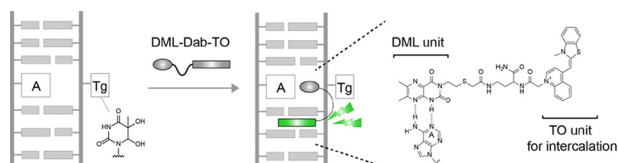
6084



Nitrogen substitution induced lattice contraction in nickel nanoparticles for electrochemical hydrogen evolution from simulated seawater

Baghendra Singh, Ajit Kumar Singh, Adyasa Priyadarsini, Yu-Cheng Huang, Sanchaita Dey, Toufik Ansari, Shaohua Shen, Goutam Kumar Lahiri,* Chung-Li Dong,* Bhabani S. Mallik* and Arindam Indra*

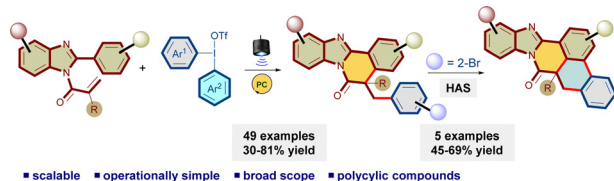
6088



Synthetic DNA binders for fluorescent sensing of thymine glycol-containing DNA duplexes and inhibition of endonuclease activity

Yusuke Sato,* Yoshihide Takaku, Toshiaki Nakano, Ken Akamatsu,* Dai Inamura and Seiichi Nishizawa*

6092



Visible light photoredox-catalyzed arylation cyclization to access benzimidazo[2,1-a]isoquinolin-6(5H)-ones

Prahallad Meher, Raj Kumar Samanta, Sourav Manna and Sandip Murarka*

