

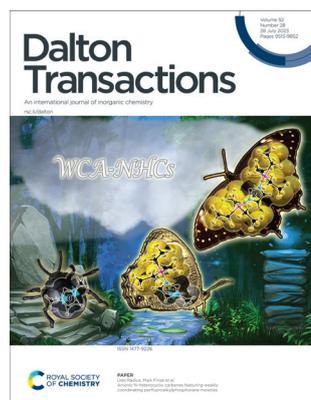
Dalton Transactions

An international journal of inorganic chemistry incorporating Acta Chemica Scandinavica
rsc.li/dalton

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 1477-9226 CODEN DTARAF 52(28) 9513-9852 (2023)



Cover
See Udo Radius, Maik Finze
et al., pp. 9553–9561.

Image reproduced by
permission of Ludwig Zapf
from *Dalton Trans.*, 2023, **52**,
9553.

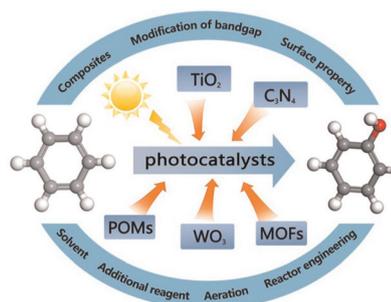
Acknowledgement required:
The cover was designed by
Ludwig Zapf.

PERSPECTIVE

9525

Recent trends in phenol synthesis by photocatalytic oxidation of benzene

Ziru Wang and Einaga Hisahiro*

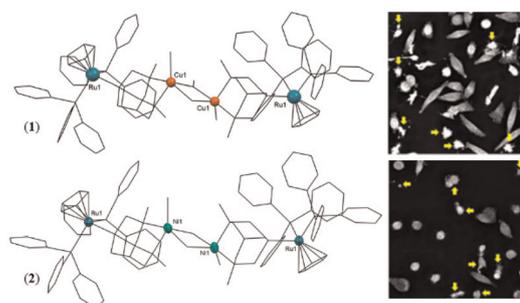


COMMUNICATIONS

9541

Tetranuclear Ru₂Cu₂ and Ru₂Ni₂ complexes with nanomolar anticancer activity

Andrés Alguacil, Franco Scalambra, Pablo Lorenzo-Luis, Adrián Puerta, Aday González-Bakker, Zenaida Mendoza, José M. Padrón and Antonio Romerosa*



Editorial Staff

Executive Editor

Sally Howells-Wyllie

Deputy Editor

Mike Andrews

Development Editors

Michelle Canning, Emily Cuffin-Munday

Editorial Production Manager

Susannah Davies

Publishing Editors

Debora Giovannelli, Helen Lunn, Samuel Oldknow, Kate Tustain

Editorial Assistant

Daphne Houston

Publishing Assistant

Huw Hedges

Publisher

Jeanne Andres

For queries about submitted articles please contact Susannah Davies, Editorial Production Manager in the first instance. E-mail dalton@rsc.org

For pre-submission queries please contact Sally Howells-Wyllie, Editor. Email dalton-rsc@rsc.org

Dalton Transactions (electronic: ISSN 1477-9234) is published 48 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: £4441; US\$7972.

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

Dalton Transactions

An international journal for high quality, original research in inorganic and organometallic chemistry incorporating Acta Chemica Scandinavica
rsc.li/dalton

Editorial Board

Chair

Russell Morris, University of St Andrews, UK

Associate Editors

Paola Ceroni, University of Bologna, Italy
Vadapalli Chandrasekhar, Indian Institute of Technology Kanpur, India
Maarit Karpinnen, Aalto University, Finland
Mi Hee Lim, Korea Advanced Institute of

Science and Technology, South Korea
Neal Mankad, University of Illinois at Chicago, USA
Warren Piers, University of Calgary, Canada
Wolfgang Tremel, Johannes Gutenberg-Universität, Germany
Takashi Uemura, University of Tokyo, Japan
Li-Min Zheng, Nanjing University, China

Members

Jaqueline Kiplinger, Los Alamos National Laboratory, USA
Sascha Ott, Uppsala University, Sweden

Advisory Board

Simon Aldridge, University of Oxford, UK
Santiago Alvarez, University of Barcelona, Spain
John Arnold, University of California, Berkeley, USA

Mu-Hyun Baik, KAIST, Korea
Jitendra Bera, IIT Kanpur, India
Eszter Borbas, Uppsala University, Sweden
Holger Braunschweig, Universität Würzburg, Germany
Xian-He Bu, Nankai University, China
Raffaella Buonsanti, École Polytechnique Fédérale de Lausanne, Switzerland
Claire Carmalt, University College London, UK
Eric Clot, University of Montpellier 2, France
Catherine Constable-Housecroft, University of Basel, Switzerland

Amitava Das, Indian Institute of Science and Education Research Kolkata, India
Jillian Dempsey, University of North Carolina, USA
Anjana Devi, Ruhr-University Bochum, Germany
Rasika Dias, University of Texas at Arlington, USA
Jairton Dupont, University of Nottingham, UK

William Evans, University of California, Irvine, USA
Harry B. Gray, California Institute of Technology, USA
Zijian Guo, Nanjing University, China
Michael Hayward, University of Oxford, UK
Todd W. Hudnall, Texas State University, USA
Ilich Ibarra, National Autonomous University of Mexico, Mexico
Cameron Jones, Monash University, Australia
Masako Kato, Hokkaido University, Japan
Takahiko Kojima, University of Tsukuba, Japan
Jian-Ping Lang, Suzhou University, China
Jennifer Love, University of British Columbia, Canada
Stuart Macgregor, Heriot Watt University, UK
Celia Machado Ronconi, Federal Fluminense University, Brazil
Laurent Maron, Université de Toulouse, France
Ellen Matson, Rochester University, USA
Marinella Mazzanti, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Nils Metzler-Nolte, Ruhr-Universität Bochum, Germany
Barbara Milani, Università di Trieste, Italy
Georgii Nikonov, Brock University, Canada

Seiji Ogo, Kyushu University, Japan
Chris Orvig, University of British Columbia, Canada
Gerard Parkin, Columbia University, USA
Eric Rivard, University of Alberta, Canada
Douglas Stephan, University of Toronto, Canada
Matthias Tamm, Technische Universität Braunschweig, Germany
Jinkui Tang, Changchun Institute of Applied Chemistry, China
Thomas Teets, University of Houston, USA
Christine Thomas, The Ohio State University, USA
Ajay Venugopal, Indian Institute of Science Education and Research Thiruvananthapuram, India
Claudio N. Verani, Wayne State University, USA
Wai-yeung Wong, Hong Kong Baptist University, China
Zhiguo Xia, South China University of Technology, China
Zuowei Xie, Chinese University of Hong Kong, China
Lin Xu, East China Normal University, China

Information for Authors

Full details on how to submit material for publication in Dalton Transactions 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/dalton

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

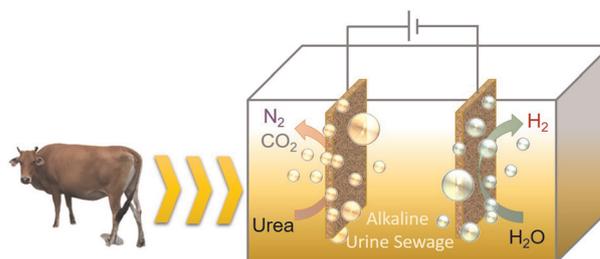


COMMUNICATIONS

9546

Amorphous vanadium-doped cobalt oxyborate as an efficient electrocatalyst for urea-assisted H₂ production from urine sewage

Tanbir Ahmed, Sukanya Bhattacharjee and Poulomi Roy*

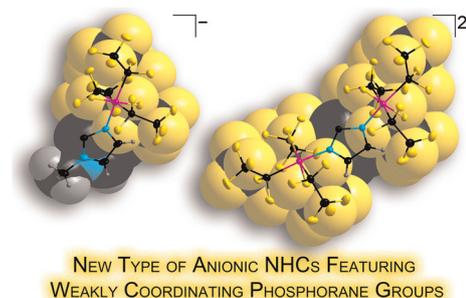


PAPERS

9553

Anionic N-heterocyclic carbenes featuring weakly coordinating perfluoroalkylphosphorane moieties

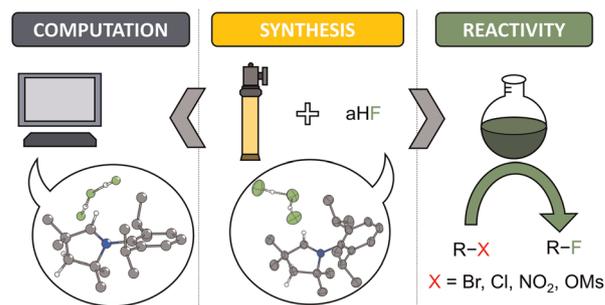
Ludwig Zapf, Udo Radius* and Maik Finze*



9562

From cyclic (alkyl)(amino)carbene (CAAC) precursors to fluorinating reagents. Experimental and theoretical study

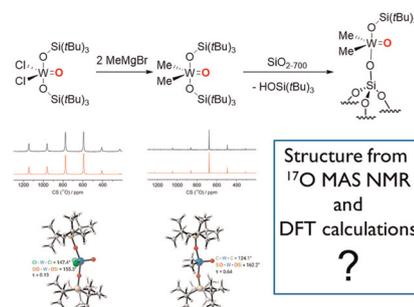
Evelin Gruden, Griša Grigorij Prinčič, Jan Hočevar, Jernej Iskra, Jaroslav Kvičala and Gašper Tavčar*



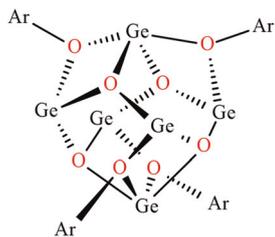
9573

On the use of ¹⁷O NMR for understanding molecular and silica-grafted tungsten oxo siloxide complexes

Y. Bouhoute, D. Grekov, N. Merle, K. C. Szeto, C. Larabi, I. Del Rosal, L. Maron, L. Delevoye, R. M. Gauvin and M. Taoufik*



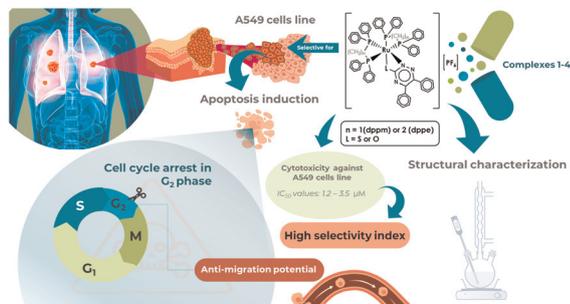
9582

Ar = -C₆H₂-2,4,6-Cy₃ (Cy=Cyclohexyl)

Rearrangement of a Ge(II) aryloxide to yield a new Ge(II) oxo-cluster [Ge₆(μ₃-O)₄(μ₂-OC₆H₂-2,4,6-Cy₃)₄](NH₃)_{0.5}: main group aryloxides of Ge(II), Sn(II), and Pb(II) [M(OC₆H₂-2,4,6-Cy₃)₂]₂ (Cy = cyclohexyl)

Connor P. McLoughlin, Derrick C. Kaseman, James C. Fetting and Philip P. Power*

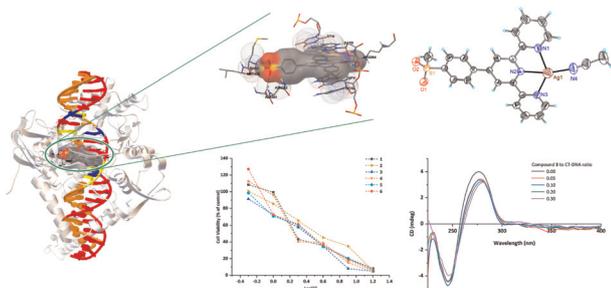
9590



New ruthenium(II) complexes with cyclic thio- and semicarbazone: evaluation of cytotoxicity and effects on cell migration and apoptosis of lung cancer cells

Y. G. Gonçalves, A. B. Becceneri, A. E. Graminha, V. M. Miranda, R. R. Rios, F. Rinaldi-Neto, M. S. Costa, A. C. R. Gonçalves, V. M. DeFlon, K. A. G. Yoneyama, P. I. S. Maia, E. F. Franca, M. R. Cominetti, R. S. Silva and G. Von Poelhsitz*

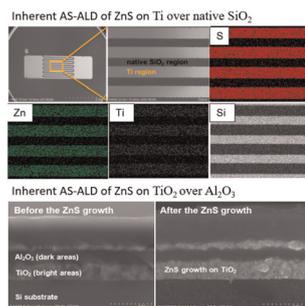
9607



Silver complexes with substituted terpyridines as promising anticancer metallodrugs and their crystal structure, photoluminescence, and DNA interactions

Jiahe Li, Zhiyuan Wang, Zhongting Chen, Xingyong Xue, Kejuan Lin, Hailan Chen, Lixia Pan, Yulin Yuan* and Zhen Ma*

9622



Inherent area-selective atomic layer deposition of ZnS

Chao Zhang,* Marko Vehkamäki, Markku Leskelä and Mikko Ritala

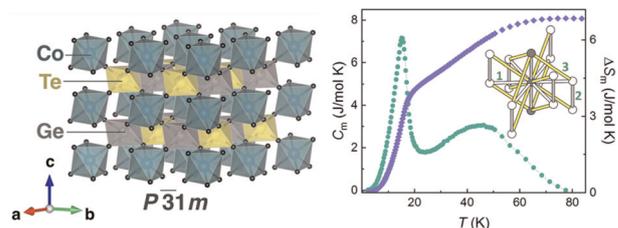


PAPERS

9631

Successive short- and long-range magnetic ordering in rosielite-type CoGeTeO_6 prepared by ion-exchange reaction

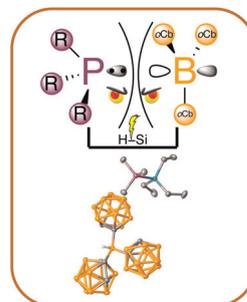
Roman V. Bazhan, Vladimir B. Nalbandyan, Tatyana M. Vasilchikova, Hyun-Joo Koo, Myung-Hwan Whangbo and Alexander N. Vasiliev*



9639

Examining the reactivity of tris(*ortho*-carboranyl) borane with Lewis bases and application in frustrated Lewis pair Si–H bond cleavage

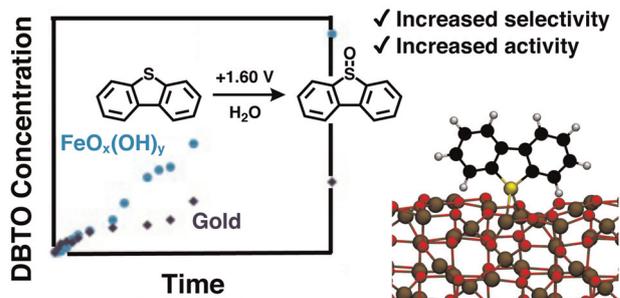
Kanika Vashisth, Sanjay Dutta, Manjur O. Akram and Caleb D. Martin*



9646

Controlling product selectivity in oxidative desulfurization using an electrodeposited iron oxide film

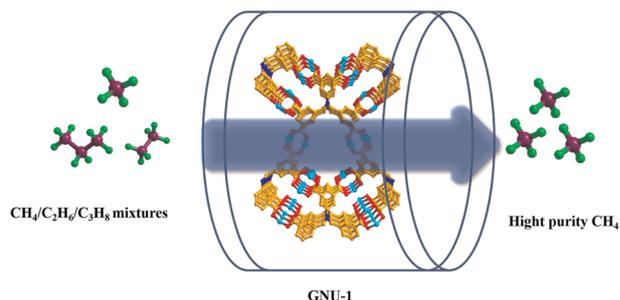
Victoria Kompanijec, Gil M. Repa, Lisa A. Fredin* and John R. Swierk*



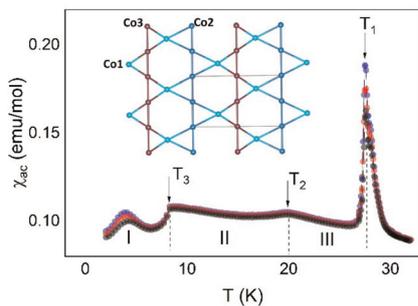
9655

A linker conformation induced metal–organic framework with high stability and efficient upgrading of natural gas

Shi-Ming Li, Hong-Chan Jiang, Qing-Ling Ni, Liu-Cheng Gui* and Xiu-Jian Wang*



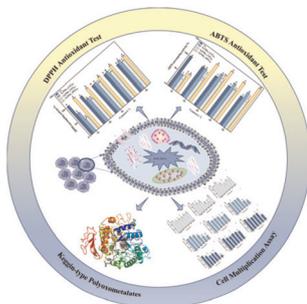
9664



A cascade of magnetic phase transitions and a 1/3-magnetization plateau in selenite–selenate $\text{Co}_3(\text{SeO}_3)(\text{SeO}_4)(\text{OH})_2$ with kagomé-like Co^{2+} ion layer arrangements: the importance of identifying a correct spin lattice

A. F. Murtazoev, P. S. Berdonosov, K. A. Lyssenkov, V. A. Dolgikh, M. Y. Geidorf, O. S. Volkova, H.-J. Koo, M.-H. Whangbo and A. N. Vasiliev

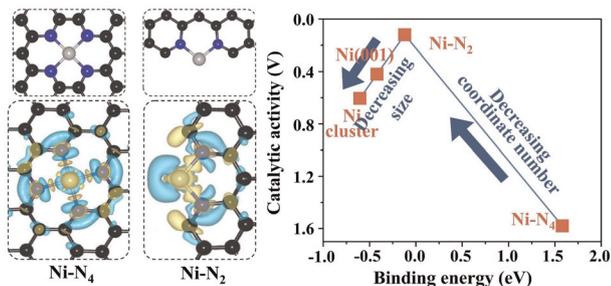
9673



A study of the antioxidant properties of Keggin-type polyoxometalates

Shan Lei, Han Yang, Jiaxin Li, Yao Li, Li Wang,* Bingnian Chen* and Jian Li*

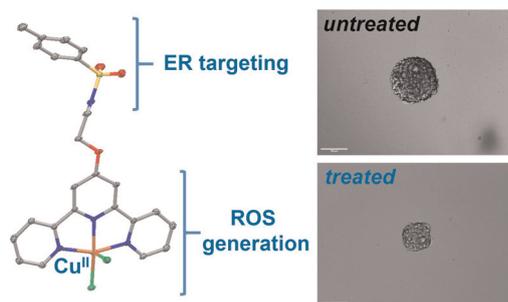
9684



High-density low-coordination Ni single atoms anchored on Ni-embedded nanoporous carbon nanotubes for boosted alkaline hydrogen evolution

Liangliang Feng,* Changle Fu, Dongming Li, Xuan Ai,* Hongyan Yin, Yuhang Li, Xiaoyi Li, Liyun Cao and Jianfeng Huang*

9694



Cancer stem cell activity of copper(II)-terpyridine complexes with aryl sulfonamide groups

Karampal Singh, Joshua Northcote-Smith, Kuldip Singh and Kogularamanan Suntharalingam*

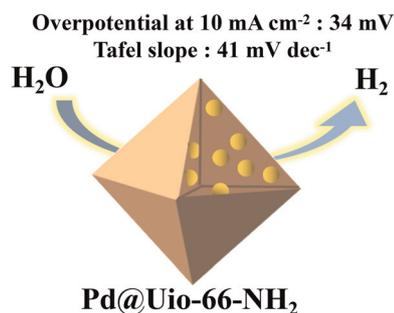


PAPERS

9705

Palladium nanoparticles confined in uncoordinated amine groups of metal–organic frameworks as efficient hydrogen evolution electrocatalysts

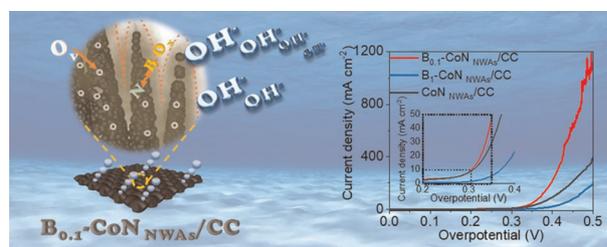
Huimin Liu, Chen Wang, Chang Liu, Xing Zong, Yongfei Wang,* Zhizhi Hu and Zhiqiang Zhang*



9714

Special NaBH₄ hydrolysis achieving multiple-surface-modifications promotes the high-throughput water oxidation of CoN nanowire arrays

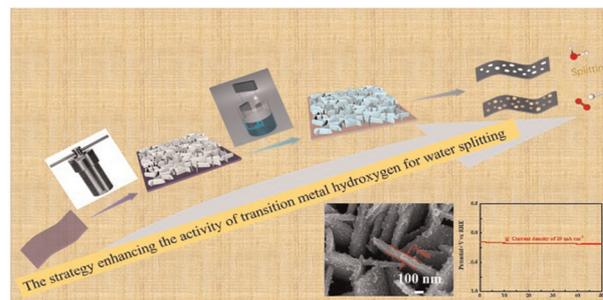
Sirui Liu, Yuxin Shi, Lingling Xu,* Weican Zhan, Meixi Chen, Xiaoyue Pan, Yuqing Yao, Jiajie Cai, Mingyi Zhang* and Xinzhi Ma*



9721

Modulating surface electron density of Ni(OH)₂ nanosheets with longitudinal Ti₃C₂T_x MXene-nanosheets by Schottky effect toward enhanced hydrogen evolution reaction

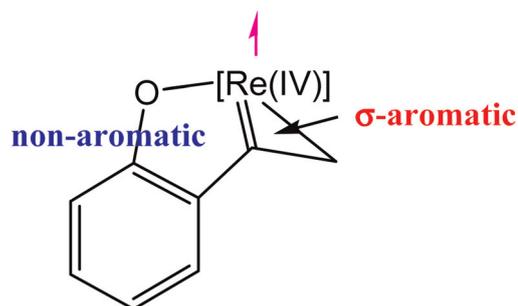
Xinyu Liu, Lan Wang,* Shan Ji, Vladimir Linkov, Qianqian Fu, Zhichao Li and Hui Wang*



9731

Radical metallacyclopropene: synthesis, structure and aromaticity

Wei Bai,* Lei Li, Yukang Fu, Junping Tang, Yue Zhao, Yilun Wang and Yang Li*



PAPERS

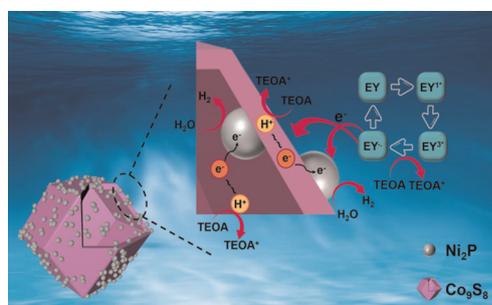
9737



Synthesis and characterization of sulfide/sulfone-containing 18-8-18-membered-ring ladder-type siloxanes

Zhanjiang Zheng,* Yujia Liu,* Nobuhiro Takeda and Masafumi Unno*

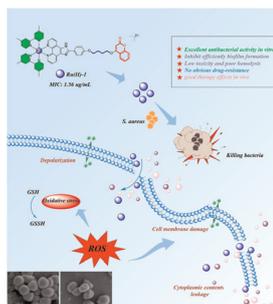
9744



Co–P bond effect on an MOF-derived Co_9S_8 hollow polyhedron supported Ni_2P co-catalyst for efficient photocatalytic hydrogen evolution

Yanxia Wang* and Xiude Hu

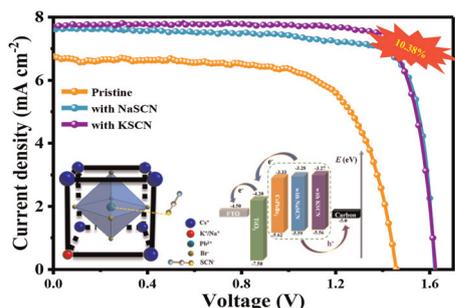
9757



Coumarin-modified ruthenium complexes by disrupting bacterial membrane to combat Gram-positive bacterial infection

Hai-Yan Huang, Pei Wang, Wei Deng, Li-Xin Dou, Xiang-Wen Liao, Jin-Tao Wang, Xue-Min Duan, Ru-Jian Yu* and Yan-Shi Xiong*

9772



Synergistic effect of alkali metal doping and thiocyanate passivation in CsPbBr_3 for HTM-free all-inorganic perovskite solar cells

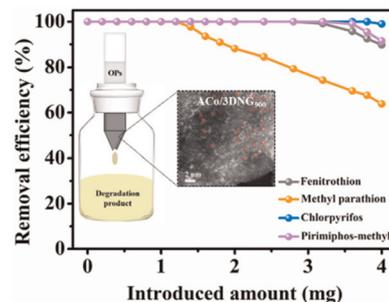
Shiqiang Jiang, Haojie Sui, Benlin He,* Xinyi Zhang, Zhihao Zong, Haiyan Chen* and Qunwei Tang*



9780

Removal of organophosphorus agents via atomically dispersed Co on nitrogen-doped graphene: catalytic degradation and adsorption

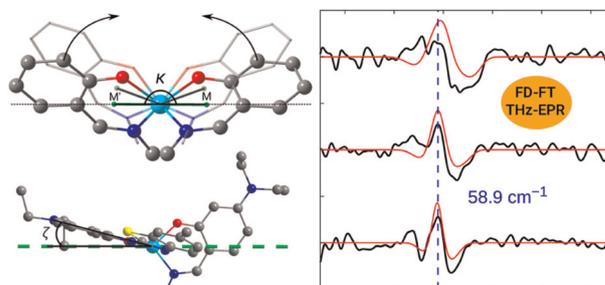
Yanfang Li, Jiali Zhang,* Puyi Lei and Shouwu Guo*



9787

Kink distortion of the pseudo- S_4 axis in pseudotetrahedral $[N_2O_2]$ bis-chelate cobalt(II) single-ion magnets leads to increased magnetic anisotropy

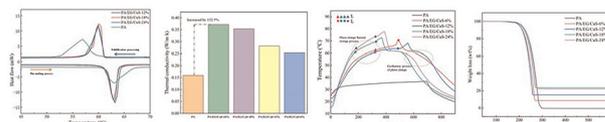
Sudhir Lima, Maximilian H. Pohle, Michael Böhme, Helmar Görls, Thomas Lohmiller, Alexander Schnegg, Rupam Dinda* and Winfried Plass*



9797

Palmitic acid/expanded graphite/CuS composite phase change materials toward efficient thermal storage and photothermal conversion

Ying-Jie Huo, Ting Yan,* Zhi-Hui Li, Shu-Yao Li and Wei-Guo Pan*

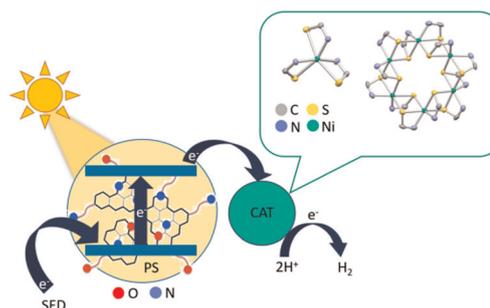


Excellent thermal stability, thermal storage capacity and photothermal conversion efficiency

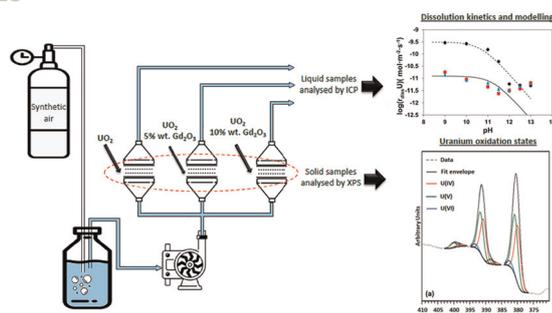
9809

Light-induced hydrogen production from water using nickel(II) catalysts and N-doped carbon-dot photosensitizers: catalytic efficiency enhancement by increase of catalyst nuclearity

Dimitra K. Giftofidou, Georgios Landrou, Charikleia Tzatzia, Antonios Hatzidimitriou, Emmanouil Orfanos, Georgios Charalambidis, Kalliopi Ladomenou, Athanassios G. Coutsoules* and Panagiotis A. Angaridis*



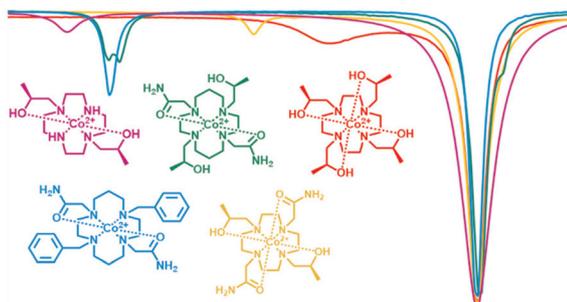
9823



Oxidative dissolution mechanism of both undoped and Gd₂O₃-doped UO₂(s) at alkaline to hyper-alkaline pH

Sonia García-Gómez,* Javier Giménez, Ignasi Casas, Jordi Llorca and Joan De Pablo

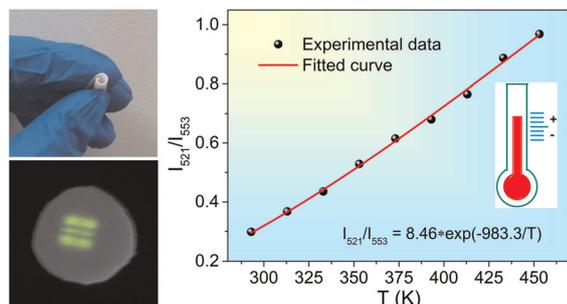
9831



Co(II) complexes of tetraazamacrocycles appended with amide or hydroxypropyl groups as paraCEST agents

Jaclyn J. Raymond, Samira M. Abozeid, Gregory E. Sokolow, Christopher J. Bond, Constance E. Yap, Alexander Y. Nazarenko and Janet R. Morrow*

9840



Optical temperature-sensing phosphors with high sensitivities in a wide temperature range based on different strategies

Songsong An, Jia Zhang,* Zhenghe Hua and Jiajun Chen

