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(18) 5809-6196 (2023)



See Xiaoshu Qu, Yanyan Yang et al., pp. 5870-5881.

Image reproduced by permission of Xiaoshu Qu from Dalton Trans., 2023. 52. 5870.



Inside cover

See Marta E. G. Mosquera, Alex Hamilton, Christopher J. Whiteoak et al., pp. 5882-5894.

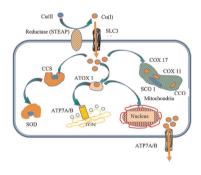
Image reproduced by permission of Alex Hamilton and Christopher J. Whiteoak from Dalton Trans., 2023, 52, 5882.

PERSPECTIVE

5823

Addressing the gaps in homeostatic mechanisms of copper and copper dithiocarbamate complexes in cancer therapy: a shift from classical platinum-drug mechanisms

Lydia W. Njenga, Simon N. Mbugua,* Ruth A. Odhiambo and Martin O. Onani

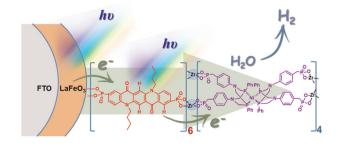


COMMUNICATIONS

5848

Optimized H₂-evolving dye-sensitized LaFeO₃ photocathodes prepared via the layer-by-layer assembly of dyes and catalysts

Ximeng Xu, Yingzheng Li, Chang Liu, Peili Zhang, Ke Fan, Xiujuan Wu, Yu Shan and Fusheng Li*



Editorial Staff

Executive Editor

Sally Howells

Deputy Editor

Mike Andrews

Development Editors

Michelle Canning, Emily Cuffin-Munday

Editorial Production Manager

Susannah Davies

Publishing Editors

Debora Giovanelli, 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, 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 organic and organometallic chemistry incorporating Acta Chemica Scandinavica

rsc.li/dalton

Editorial Board

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, Warren Piers, University of Calgary, Canada

Wolfgang Tremel, Johannes Gutenberg-Universität, Germany Takashi Uemura, University of Tokyo, Japan Li-Min Zheng, Nanjing University, China

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,

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 Christine Thomas, The Ohio State University, Jian-Ping Lang, Suzhou University, China Jennifer Love, University of British Columbia,

Laurent Maron, Université de Toulouse, France Stuart Macgregor, Heriot Watt University, UK Ellen Matson, Rochester University, USA Marinella Mazzanti, Ecole Polytechnique Fédérale de Lausanne (EPFL). Switzerland. Nils Metzler-Nolte, Ruhr-Universität Bochum. Germany

Barbara Milani, Universita 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 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

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

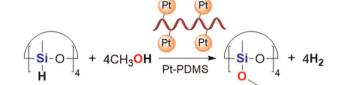


COMMUNICATIONS

5854

Platinum macrocatalyst for heterogeneous Si-O dehydrocoupling

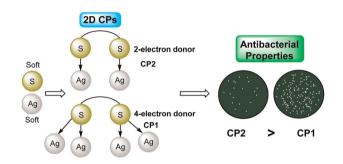
Konstantin V. Deriabin, Ekaterina A. Golovenko, Nikita S. Antonov, Sergey V. Baykov, Vadim P. Boyarskiy* and Regina M. Islamova*



5859

Silver-based coordination polymers assembled by dithioether ligands: potential antibacterial materials despite received ideas

Quentin Gaudillat, Anna Krupp, Thibaut Zwingelstein, Vincent Humblot, Carsten Strohmann, Isabelle Jourdain, Michael Knorr and Lydie Viau*



5865

Water-based synthesis and nitrate release properties of a Zr^{IV}-based metal-organic framework derived from L-aspartic acid

Temitope Olabisi Abodunrin, Matouŝ Kloda, Jan Demel and Marco Taddei*

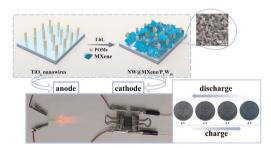


PAPERS

5870

Porous polyoxotungstate/MXene hybrid films allowing for visualization of the energy storage status in high-performance electrochromic supercapacitors

Xiaoshu Qu,* Zefeng Liu, Lili Zhou, Dongxue Chu, Jilong Wang and Yanyan Yang*



Electrochromic Supercapacitor

S882

CO₂

All

Ga

Bu

Bu

Bu

M = Al, Ga, In

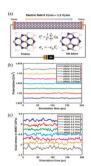
X = Cl, Br, I

Beyond the Lewis acid catalyst paradigm

Group 13 salphen compounds (In, Ga and Al): a comparison of their structural features and activities as catalysts for cyclic carbonate synthesis

Diego Jaraba Cabrera, Ryan D. Lewis, Carlos Díez-Poza, Lucía Álvarez-Miguel, Marta E. G. Mosquera,* Alex Hamilton* and Christopher J. Whiteoak*

5895



Piezoelectric and dielectric constants of topologically defected boron nitride nanotubes

Seunghwa Yang

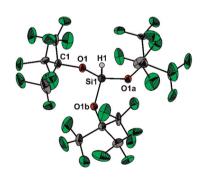
5909



Evaluating the photophysical and photochemical characteristics of green-emitting cerium(III) mono-cyclooctatetraenide complexes

Pragati Pandey, Qiaomu Yang, Michael R. Gau and Eric J. Schelter*

5918



An investigation into the Brønsted acidity of the perfluorinated alkoxy silanes $\{(F_3C)_3CO\}_3SiH$ and $\{(F_6C_5)_3CO\}_2Si(Cl)H$

Felix Feige, Lorraine A. Malaspina, Florian Kleemiss, Julius F. Kögel, Sergey Ketkov,* Emanuel Hupf,* Simon Grabowsky* and Jens Beckmann*

5926

Fluorinated linkers enable the synthesis of flexible MOFs with 1D alkaline earth SBUs and a temperature-induced phase transition

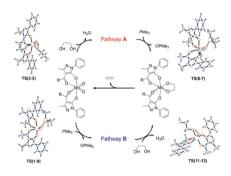
Sean S. Sebastian, Finn P. Dicke and Uwe Ruschewitz*



5935

Theoretical studies on the mechanism of molybdenum-catalysed deoxydehydration of diols

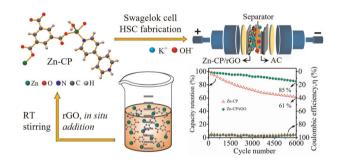
Federico Verdicchio and Agustín Galindo*



5943

Design and synthesis of mixed-ligand architectured Zn-based coordination polymers for energy storage

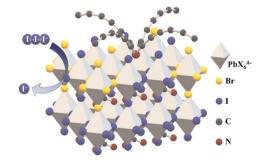
Tapan Kumar Ghosh and G. Ranga Rao*



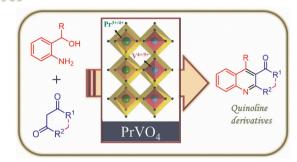
5956

Surfactant effects on electrochemically durable lead halide perovskite electro-catalysts

Ren-Jun Zhong, Kai-Wei Tsao, Chun-Hao Cheng, Cheng-Chan Liu and Chun-Ting Li*



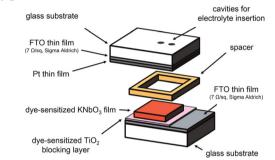
5969



Zircon PrVO₄: an efficient heterogeneous catalyst for tandem oxidative synthesis of 2,3-disubstituted quinoline derivatives

Neetu Yadav, Kovuru Gopalaiah,* Jyoti Pandey and Rajamani Nagarajan*

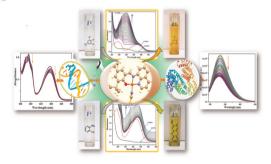
5976



KNbO₃ photoelectrode for DSSC: a structural, optical and electrical approach

Silvia Cucatti,* Luciano Timm Gularte, Cristian Dias Fernandes, Ramon Dadalto Carvalho, Mateus Meneghetti Ferrer, Pedro Lovato Gomes Jardim, Cristiane Wienke Raubach, Sérgio da Silva Cava and Mario Lucio Moreira*

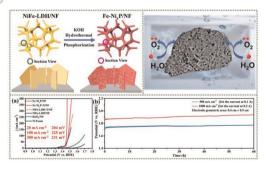
5983



Facile synthesis of novel NNO-tethered copper(II) complexes: characterization details, theoretical studies, promising enzyme-like activities, and biomolecular interactions

Subrata Mandal, Rahul Naskar, Apurba Sau Mondal, Biswajit Bera and Tapan K. Mondal*

5999



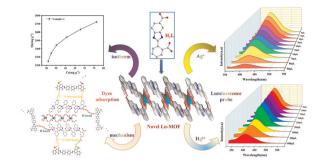
A crystalline—amorphous interface engineering in Fe-doped Ni_xP electrocatalyst for highly efficient oxygen evolution reaction

Shuai Cao, Xiaoming Fan,* Li Wei, Ting Cai, Yuping Lin and Zeheng Yang*

6008

Effective detection of Ag⁺, Hg²⁺ and dye adsorption properties studies of Ln-MOFs based on a benzimidazole carboxylic acid ligand

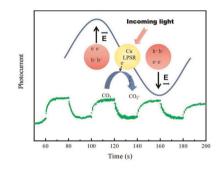
Qing-Wei Cao, Tian-Cai Yue, Qing-Wei Dong, Qi-Chao Ma, Ze-Bei Xie, Duo-Zhi Wang* and Lu-Lu Wang*



6019

Aerosol-assisted synthesis of mesoporous Cu/ZnO-ZrO₂ catalyst with highly selective photothermal CO₂ reduction to methanol

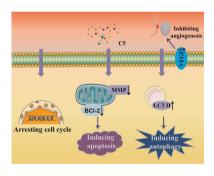
Jian Wang, Qingrun Meng* and Qijian Zhang*



6029

Development of a zinc(II) 2-pyridinecarboxaldehyde thiosemicarbazone complex with remarkable antitumor and antiangiogenic activities

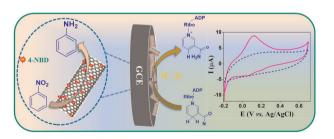
Ming Jiang, Jinhui Pang, Xiaoying Jia, Yong Chu, Wenjuan Li, Hong Liang and Feng Yang*



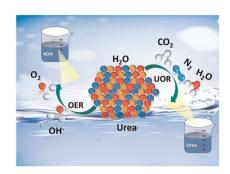
6041

Electrochemical sensing of NADH using 4-nitrobenzenediazonium tetrafluoroborate salt functionalized multiwalled carbon nanotubes

Tamilselvi Gurusamy,* Rajendran Rajaram, Ganapathi Rao Kandregula and Kothandaraman Ramanujam*



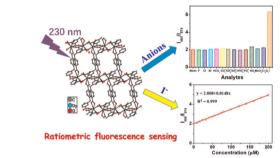
6052



In situ construction of WNiM-WNi LDH (M = Se, S, or P) with heterostructure as highly efficient electrocatalyst for overall water splitting and urea oxidation reaction

Chenyi Zhang, Xiaoqiang Du,* Xiaoshuang Zhang, Yanhong Wang and Tuoping Hu

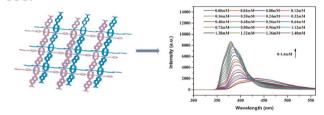
6061



Ratiometric detection of I⁻ using a dysprosiumbased metal-organic framework with a single emission center

Qing-Zhong Guo, Feng-Ying Yi, Meng-Yao Zhang, Jun-Fang Guo* and Fa-Liang Luo*

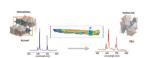
6067



A turn-on fluorescent Zn(II) metal-organic framework sensor for quantitative anthrax biomarker detection

Chao Hong, Ling Li,* Ji-Yong Zou,* Li Zhang and Sheng-Yong You

6077



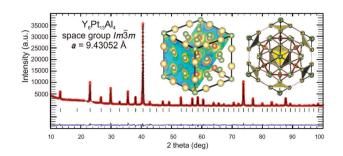
Understanding the power of luminescence ratiometric thermal history indicators driven by phase transitions: the case of Eu³⁺ doped LaVO₄

K. Elzbieciak-Piecka,* W. M. Piotrowski, M. D. Dramicanin and L. Marciniak*

6085

Electronic and structural properties of Y₆Pt₁₃X₄, site occupancy variants of the Ba₆Na₁₆N subnitride (X = Al, Ga)

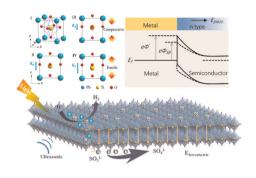
Leonid Salamakha.* Oksana Sologub, Berthold Stöger. Herwig Michor, Ernst Bauer, Peter Rogl and Stepan Mudry



6097

Modulating the Schottky barrier of Pt/PbTiO₃ for efficient piezo-photocatalytic hydrogen evolution

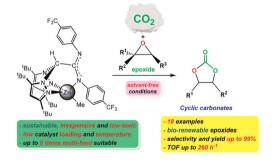
Xueyan Huang,* Zhi-Bin Fang,* Wenhui Feng, Qinfen Tian, Zhiqiang Li and Ping Liu*



6105

Very efficient organo-zinc scorpionates for CO₂ fixation into a variety of cyclic carbonates: synthesis, coordination ability and catalytic studies

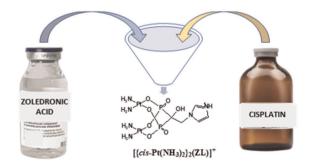
Marta Navarro, Andrés Garcés,* Luis F. Sánchez-Barba,* David González-Lizana and Agustín Lara-Sánchez



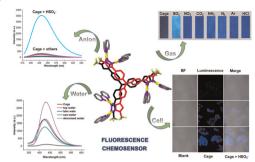
6117

Cisplatin and zoledronic acid: two drugs combined in a Pt(II) complex with potential antitumor activity towards bone tumors and metastases

Alessandra Barbanente, Nicoletta Ditaranto, Antonio Laghezza, Paolo Tortorella, Francesco P. Intini, Concetta Pacifico, Giovanni Natile and Nicola Margiotta*



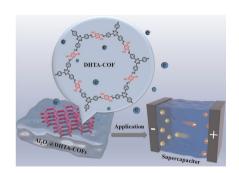
6129



Self-assembly of tripyrazolate-linked [M₆L₂] cages for the selective sensing of HSO₃⁻ and gaseous SO₂ by turn-on fluorescence

Peipei Wang, Jin Tong,* Cong Meng, Qing Yuan, Wei Deng, Shu-Yan Yu* and Hong-Wei Ma

6138



Triazine covalent organic framework (COF)/θ-Al₂O₃ composites for supercapacitor application

Lei Liu, Di Cui, Shuran Zhang, Wei Xie,* Chan Yao, Na Xu and Yanhong Xu*

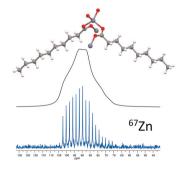
6146 cm_ Current density (mA 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8

Voltage (V)

Charge transfer doping of graphene oxide with nickel oxide nanoparticles for stable and efficient carbon-based, all-inorganic CsPbBr₃ perovskite solar cells

Jie Dou, Jin Tan,* Benlin He, Jialong Duan and Qunwei Tang

6152



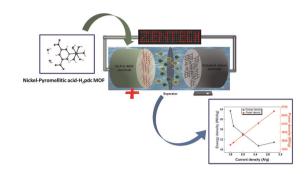
Multi-technique structural analysis of zinc carboxylates (soaps)

Molly Wagner,* Roberta Pigliapochi, Valeria Di Tullio, Jaclyn Catalano, Nicholas Zumbulyadis, Silvia A. Centeno, Xiaoling Wang, Kuizhi Chen, Ivan Hung, Zhehong Gan, Michael R. Dworzak, Glenn P. A. Yap and Cecil Dybowski*

6166

Nickel centered pyromellitic acid/pyridine-3,5dicarboxylic acid bi-linker organic webbing for battery-supercapacitor hybrids

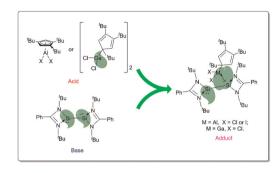
Muhammad Zahir Igbal.* Muhammad Wagas Khan. Sikandar Aftab, Saikh Mohammad Wabaidur and Salma Siddique



6175

One silicon atom of bis(silylene) functions as a selective Lewis base under adduct formation with a Lewis acid

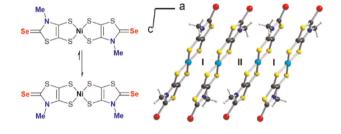
Yi Ding,* Mohd Nazish, Paul Niklas Ruth, Regine Herbst-Irmer, Dietmar Stalke* and Herbert W. Roesky*



6180

A highly conducting mixed-valence nickel bis(dithiolene) salt [Et₄N][Ni(Me-thiazSe-dt)₂]₂ with selone substitution

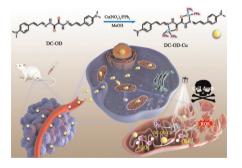
Hadi Hachem, Olivier Jeannin, Hengbo Cui, Reizo Kato, Marc Fourmigué* and Dominique Lorcy*



6187

A Cu(ı)-based Fenton-like agent inducing mitochondrial damage for photo-assisted enhanced chemodynamic therapy

Zhaoguo Hong, Jingjing Zhong, Dangdang Ding, Sihui Gong, Liangliang Zhang, Shulin Zhao, Xing-Can Shen, Hong Liang and Fu-Ping Huang*



CORRECTION

6194

Correction: Characterisation of intergrowth in metal oxide materials using structure-mining: the case of $\gamma\text{-MnO}_2$

Nicolas P. L. Magnard, Andy S. Anker, Olivia Aalling-Frederiksen, Andrea Kirsch and Kirsten M. Ø. Jensen*