

Editorial Staff**Executive Editor**

Michaela Mühlberg

Deputy Editor

Geraldine Hay

Editorial Production Manager

Jonathon Watson

Senior Publishing Editor

Fiona Iddon

Development Editor

Rose Wedgbury

Publishing Editors

Matthew Blow, Sam Howell, Evie Karkera, Carole Martin,

Kirsty McRoberts, Ella White

Editorial Assistant

Daniel Smith

Publishing Assistant

Jane Paterson

Publisher

Sam Keltie

For queries about submitted papers, please contact Jonathon Watson, Editorial Production Manager in the first instance. E-mail: materialsC@rsc.org

For pre-submission queries please contact

Michaela Mühlberg, Executive Editor.

E-mail: materialsC@rsc.org

Journal of Materials Chemistry C (electronic: ISSN 2050-7534) 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: £2521; \$4046.

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

Journal of Materials Chemistry C

rsc.li/materials-C

Journal of Materials Chemistry A, B & C cover high quality studies across all fields of materials chemistry. The journals focus on those theoretical or experimental studies that report new understanding, applications, properties and synthesis of materials.

Journal of Materials Chemistry C covers materials with applications in optical, magnetic and electronic devices.

Editorial Board**Editor-in-Chief**

Natalie Stingelin, Georgia Institute of Technology, USA

Associate Editors

A. S. Achalkumar, Indian Institute of Technology, India

Rachel Crespo-Otero, University College London, UK

Renaud Demadrille, Interdisciplinary Research Institute of Grenoble, France

Antonio Facchetti, Northwestern University, USA

Unjong Jeong, POSTECH, South Korea

Oana Jurcescu, Wake Forest University, USA

Mingzhu Li, Chinese Academy of Sciences, China

Martyn McLachlan, Imperial College London, UK

Kasper Moth-Poulsen, Chalmers University of Technology, Sweden

Ana Nogueira, University of Campinas, Brazil

Erin Ratcliff, University of Arizona, USA

Neil Robertson, University of Edinburgh, UK

Federico Rosei, University of Trieste, Italy

Yana Vayznof, Technical University of Dresden, Germany

Ni Zhao, Chinese University of Hong Kong, Hong Kong

Zhiguo Xia, South China University of Technology, China

Hao-Li Zhang, Lanzhou University, China

Advisory Board

C. Bai, Chinese Academy of Sciences, China

E. Bittner, University of Houston, USA

T. Bunning, Air Force Research Laboratory, USA

J. Casado, University of Malaga, Spain

R. Chandrasekar, University of Hyderabad, India

Y.-J. Cheng, National Chiao Yung University, Taiwan

M. Chhowalla, Rutgers - The State University of New Jersey, USA

C. Chi, National University of Singapore, Singapore

L. Chua, National University of Singapore, Singapore

D. Evans, Beijing University of Chemical Technology, China

M. Green, King's College London, UK

E. von Hauf, VU Amsterdam, Netherlands

L. Hueso, CIC nanoGUNE, Spain

C. S. Hwang, Seoul National University, Korea

M. Kanatzidis, Northwestern University, USA

T. Kato, The University of Tokyo, Japan

J. Kido, Yamagata University, Japan

H. Kuang, Jiangnan University, China

T. Kusamoto, Institute for Molecular Science, Japan

M. Jeffries-EL, Boston University, USA

M. Lira-Cantú, Catalan Institute of Nanoscience and Nanotechnology, Spain

S. Marder, University of Colorado Boulder, USA

I. McCulloch, University of Oxford, UK

H. Mori, University of Tokyo, Japan

J. Ouyang, National University of Singapore, Singapore

P. Samori, Université de Strasbourg, France

R. Seshadri, University of California, Santa Barbara, USA

R. Sessoli, University of Florence, Italy

Z. Shuai, Tsinghua University, China

C. Silva, Georgia Institute of Technology, USA

J. Snyder, Northwestern University, Illinois, USA

C. Weder, University of Fribourg, Switzerland

G. Welch, University of Calgary, Canada

W. Wong, Hong Kong Polytechnic University, Hong Kong

P. Woodward, Ohio State University, USA

Y. Yin, UC Riverside, USA

A. Zayats, King's College London, UK

X. Zhan, Peking University, China

Q. Zhang, City University of Hong Kong, Hong Kong

Information for Authors

Full details on how to submit material for publication in Journal of Materials Chemistry C 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/materials-c. Submissions: The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Reviews, Highlights and Applications. Full Papers and Communications should describe original work of high quality and impact which must highlight the novel properties or applications (or potential properties/applications) of the materials studied.

Additional details are available from the Editorial Office or <http://www.rsc.org/authors>

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

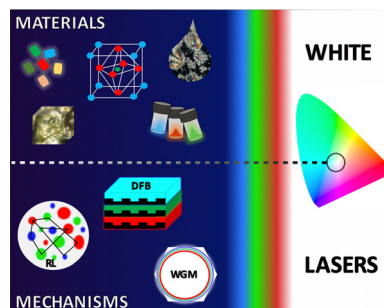


REVIEWS

8724

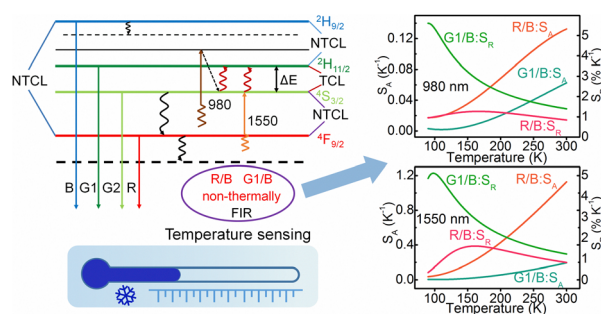
White lasing – materials, design and applications

Alina Szukalska and Jaroslaw Mysliwiec*



COMMUNICATION

8758

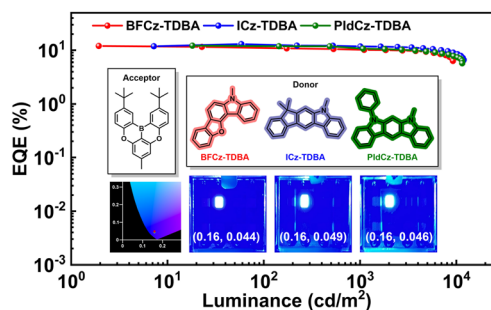
Ultra-high sensitivity upconversion low temperature sensors *via* manipulating the non-thermally coupled levels of Er³⁺ ionsWeitao Ying, Jingyi He, Xuemei Fan, Shiqing Xu,*
Jianmin Gu* and Shimin Liu*

PAPERS

8767

Ultra-deep-blue thermally activated delayed fluorescence emitters constructed by carbazole derivatives enable efficient solution-processed OLED with a CIE_y of < 0.05

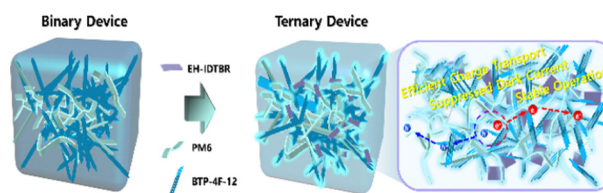
Bo Chen, Chuanxin Liao, Dewang Li,* Hongli Liu and Shirong Wang*



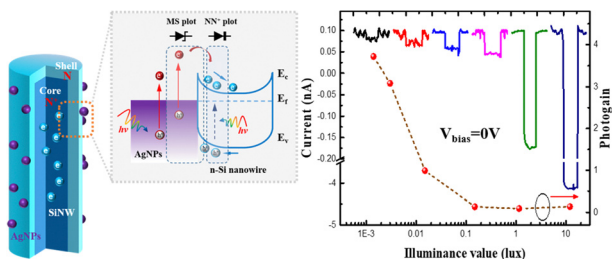
8776

Eco-compatible solvent-processed high energy level offset ternary strategy for efficient organic photodetecting and photovoltaic applications

Min Soo Kim, Woongsik Jang, Byung Gi Kim and Dong Hwan Wang*



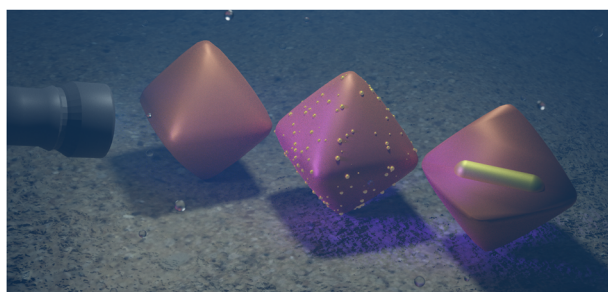
8784



A high-performance broadband double-junction photodetector based on silicon nanowire arrays wrapped by silver nanoparticles for low-light imaging

Yuting Huang, Haifeng Liang,* Yingli Zhang, Shujing Yin, Xuyang Li, Changlong Cai, Weiguo Liu and Tiantian Jia

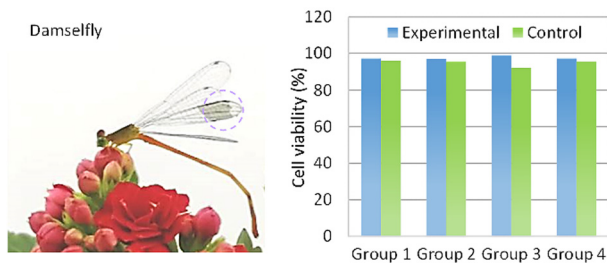
8796



Position of gold dictates the photophysical and photocatalytic properties of Cu₂O in Cu₂O/Au multicompartment nanoparticles

Dávid Kovács, András Deák, György Z. Radnóczy, Zsolt E. Horváth, Attila Sulyok, Róbert Schiller, Ottó Czömpöly and Dániel Zámbo*

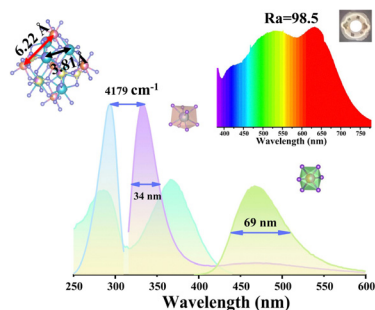
8808



Edible polysaccharide-based ultraflexible organic transistors for nutritive electronics

Yahan Yang, Baoying Sun, Xiaoli Zhao,* Hongyan Yu, Bin Wang, Juntong Li, Yanhong Tong, Qingxin Tang* and Yichun Liu

8818



Novel highly efficient Bi³⁺-activated phosphors for warm WLEDs

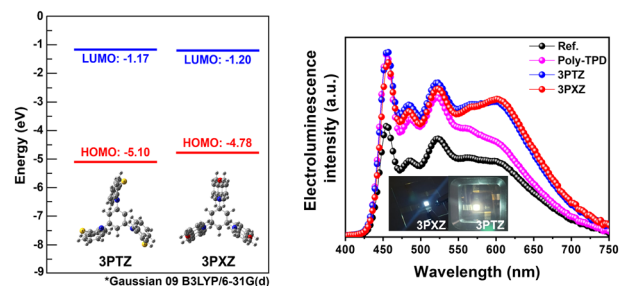
Xiudi Wu, Xibao Zhang, Yonghui Xu, Shuwen Yin, Chuansheng Zhong, Liang Zhou* and Hongpeng You*



8826

3PTZ and 3PXZ small molecular hole-transporting materials in polymer light-emitting diodes

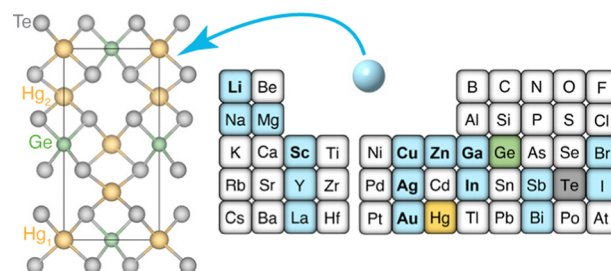
Dong Su Shin, Young Jae Park, Jae Hyeon Lee, Ji-Yeon Kim, Hyunbok Lee, Kitae Kim, Yeonjin Yi, Ji Eon Kwon, Kyunam Lee, Soo Young Park, Sang-Youp Yim, Donghee Park* and Dong Ick Son*



8838

Extrinsic doping of Hg_2GeTe_4 in the face of defect compensation and phase competition

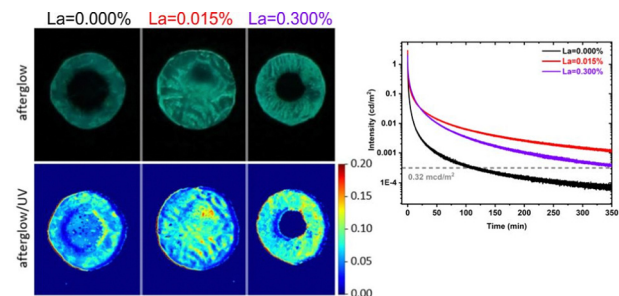
Claire E. Porter,* Jiaying Qu,* Kamil Cielski, Elif Ertekin and Eric S. Toberer



8850

Towards deliberate design of persistent phosphors: a study of La–Ga admixing in LuAG:Ce crystals to engineer elemental homogeneity and carrier trap depths

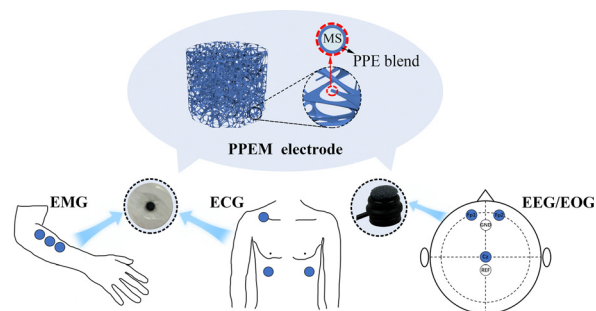
Karol Bartosiewicz,* Verena Fritz, David Van der Heggen, Damian Szymanski, Justyna Zeler, Jan Pejchal, Akihiro Yamaji, Romana Kucerkova, Alena Beitlerova, Shunsuke Kurosawa, Akira Yoshikawa, Philippe F. Smet, Eugeniusz Zych and Martin Nikl



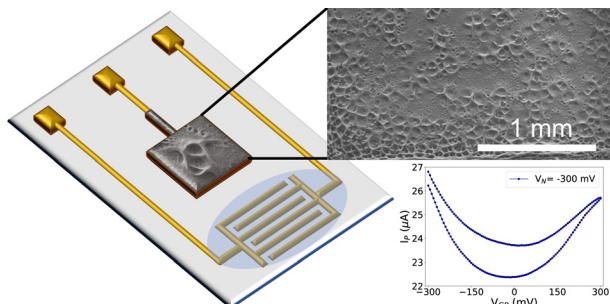
8866

A reversible gel-free electrode for continuous noninvasive electrophysiological signal monitoring

Qing Liu, Jie Zhou, Liangtao Yang,* Jijia Xie, Chenhui Guo, Zimo Li, Jun Qi, Shuo Shi, Zhilin Zhang, Hui Yang, Jinlian Hu, Jinglong Wu and Yi Zhang*



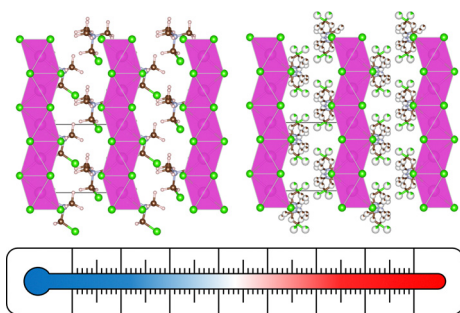
8876



Cu-modified electrolyte-gated transistors based on reduced graphene oxide

Rafael Cintra Hensel, Nicola Comisso, Marco Musiani, Francesco Sedona, Mauro Sambri, Andrea Cester, Nicolò Lago and Stefano Casalini*

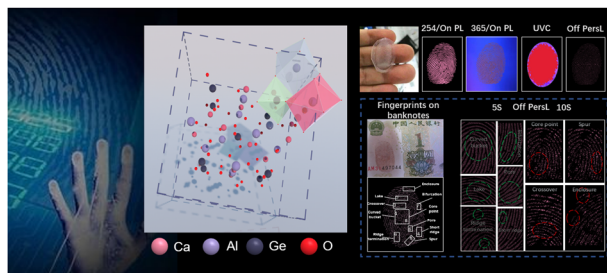
8885



Models of orientational disorder in hybrid organic–inorganic piezoelectric materials

Kasper Tolborg* and Aron Walsh*

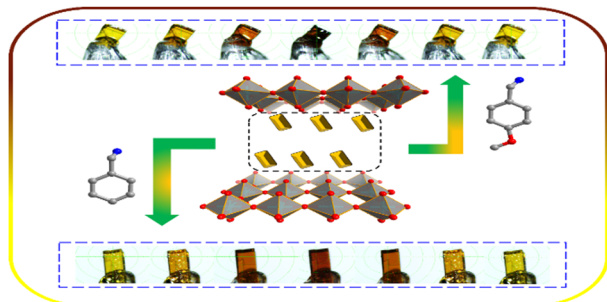
8892



Achieving multicolour and multimodal luminescence in $\text{Ca}_3\text{Al}_2\text{Ge}_3\text{O}_{12}:\text{Bi}^{3+}/\text{Ln}^{3+}$ ($\text{Ln} = \text{Tb}, \text{Eu}, \text{Sm}, \text{and Dy}$) persistent phosphors for multiple applications

Jiawei Zhang, Zhijun Wang,* Yecheng Zhu, Xiaoxue Huo, Yu Wang, Hao Suo, Leipeng Li and Panlai Li*

8903



Reversible phase transition and thermochromic response in hybrid copper-based perovskites

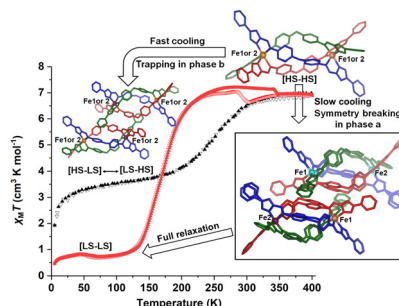
Gele Teri, Qiang-Qiang Jia, Qing-Feng Luo, Hao-Fei Ni, Da-Wei Fu* and Qiang Guo*



8908

Unique spin crossover pathways differentiated by scan rate in a new dinuclear Fe(II) triple helicate: mechanistic deductions enabled by synchrotron radiation studies

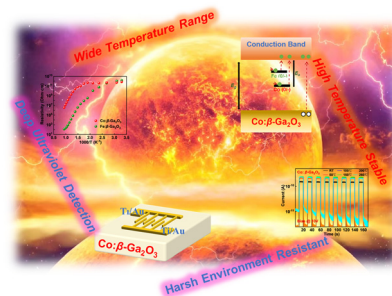
Matthew J. Wallis, Alexander R. Craze, Hikaru Zenno, Ryuya Tokunaga, Takahiro Taira, Hyunsung Min, Mohan M. Bhadbhade, Saroj Kumar Bhattacharyya, Ruoming Tian, Anne M. Rich, Shinya Hayami, Jack K. Clegg, Christopher E. Marjo, Leonard F. Lindoy and Feng Li*



8919

Solar-blind photodetectors prepared using semi-insulating Co:β-Ga₂O₃ single crystals that are stable over a wide temperature range

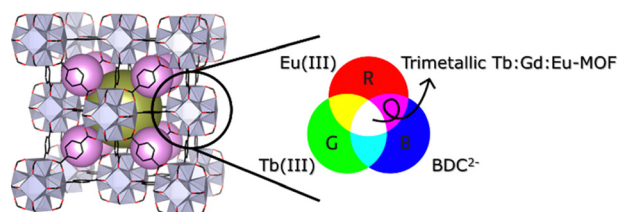
Xuyang Dong, Shunjie Yu, Wenxiang Mu,* Xiaolong Zhao,* Yiyuan Liu, Tong Hou, Jin Zhang, Boyang Chen, Zhengyuan Li, Zhitai Jia,* Xiaohu Hou, Shibing Long and Xutang Tao



8929

Tuning the rare-earth UiO-66 metal–organic framework platform for white light emission

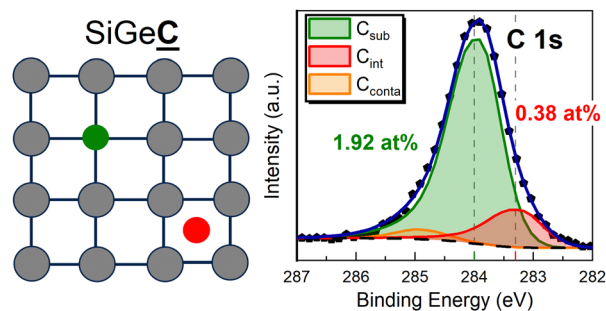
Zvart Ajoyan, Hudson A. Bicalho, P. Rafael Donnarumma, Artsiom Antanovich and Ashlee J. Howarth*



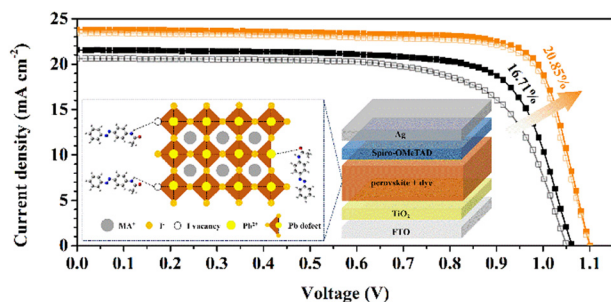
8935

Quantification of substitutional and interstitial carbon in thin SiGeC films using in-line X-ray-photoelectron spectroscopy

Jeremy Vives,* Stephane Verdier, Fabien Deprat, Marvin Frauenrath, Romain Duru, Marc Juhel, Gregory Berthome and Didier Chaussende



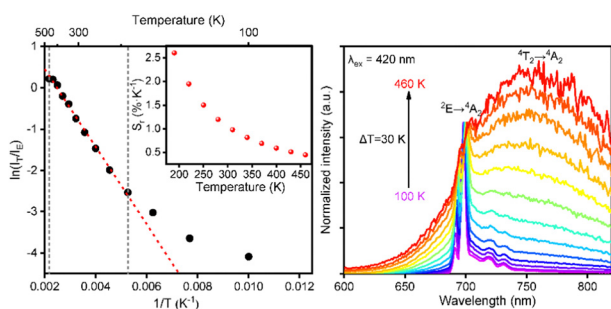
8942



A novel azo dye molecule enables defect passivation and crystallization toward efficient perovskite solar cells

Ningxia Gu, Ye Feng, Lixin Song,* Pengyun Zhang, Pingfan Du, Lei Ning, Zeyuan Sun, Hua Jiang* and Jie Xiong*

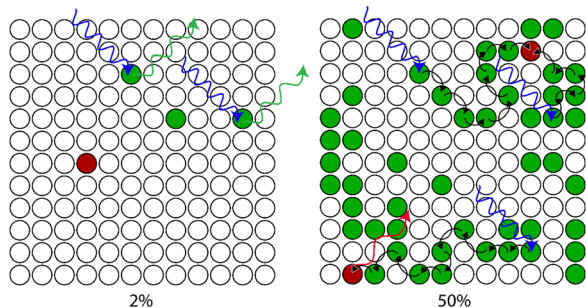
8952



A reliable and stable ratiometric luminescence thermometer based on dual near-infrared emission in a Cr³⁺-doped LaSr₂Ga₁₁O₂₀ phosphor

Xihui Shan, Michele Back, Dongxun Chen, Shihai Miao, Ruiqi Shi and Yanjie Liang*

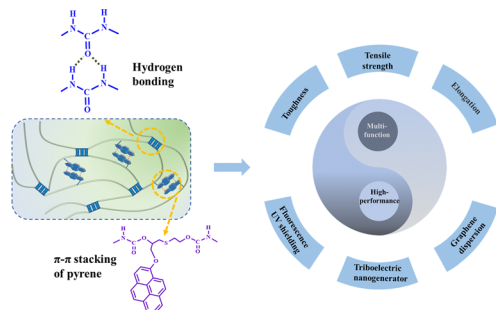
8961



Understanding enormous redshifts in highly concentrated Mn²⁺ phosphors

Arnoldus J. van Bunningen,* Simon Tobias Keizer and Andries Meijerink*

8971



High-performance, fluorescent, UV-shielding, triboelectric, super-flexible polyurea elastomers via strong π - π stacking of pyrene and hydrogen bonding strategies

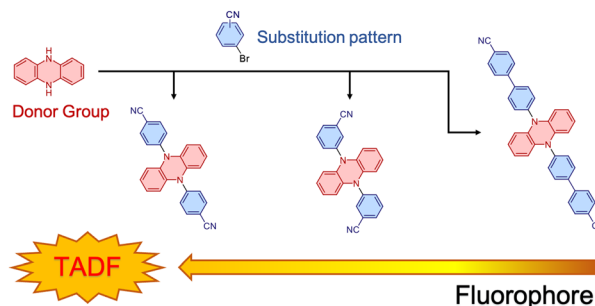
Zheng Yuan, Jun Yan, Feng Gao, Jue Cheng* and Junying Zhang*



8982

Molecular design of phenazine-5,10-diyl-dibenzonitriles and the impact on their thermally activated delayed fluorescence properties

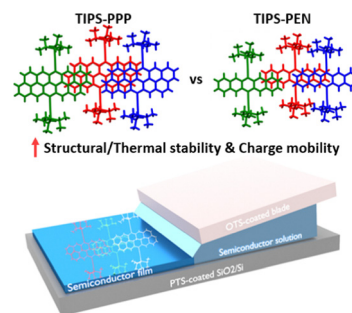
Dietrich Püschel, Julia Wiefemann, Simon Hédé, Tobias Heinen, Leo Pfeifer, Oliver Weingart,* Markus Suta,* Thomas J. J. Müller* and Christoph Janiak*



8992

Shear-aligned large-area organic semiconductor crystals through extended π - π interaction

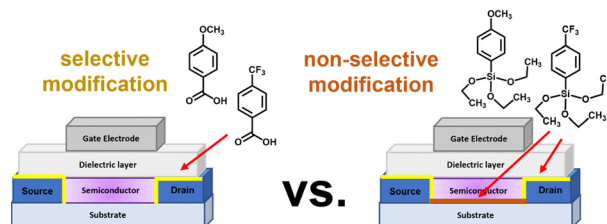
Song Zhang, Felix Talnack, Tanguy Jousselin-Oba, Vinayak Bhat, Yilei Wu, Yusheng Lei, Yoko Tomo, Huaxin Gong, Lukas Michalek, Donglai Zhong, Can Wu, Abderrahim Yassar, Stefan Mannsfeld,* Chad Risko,* Michel Frigoli* and Zhenan Bao*



9002

Selective and non-selective modification of electrodes in organic thin film transistors by self-assembled monolayers

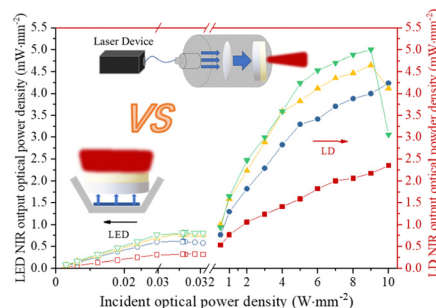
Meng-Tieh Liu, Cheng-Yu Chi, Michael Zharnikov* and Yian Tai*



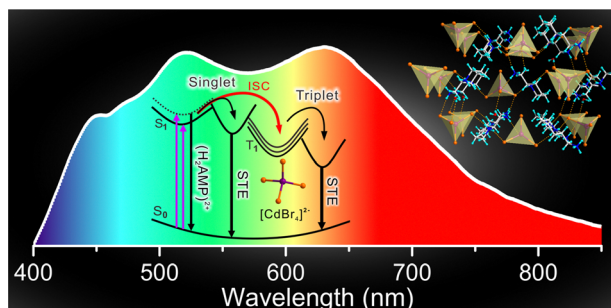
9014

Laser-driven NIR light source based on MgO:Cr³⁺,Ni²⁺ phosphor-in-glass film for NIR spectroscopy application

Simin Gu, Bomei Liu,* Shuaichen Si and Jing Wang*



9023



Singlet exciton and singlet/triplet self-trapped excitons for ultra-broadband white-light emission in a zero-dimensional cadmium bromide hybrid

Huizhi Gao, Zhuoya Lu, Xingxing Zhao, Ke Zhang, Xudong Zhu, Rixin Cheng, Shi-Li Li, Zhikai Qi* and Xian-Ming Zhang*

9030



Broadband emitting phosphor $\text{Sr}_6\text{Sc}_2\text{Al}_4\text{O}_{15}:\text{Cr}^{3+}$ for near-infrared LEDs

Jinyi Wang, Xudong Wang, Chenjie Zhang, Xinyu Zhang, Tianliang Zhou* and Rong-Jun Xie*

