

# 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 53(9) 3895-4346 (2024)



### Cover

See Augusto I. Costa,  
Miguel Julve and  
Maria Vanda Marinho *et al.*,  
pp. 3994–4004.

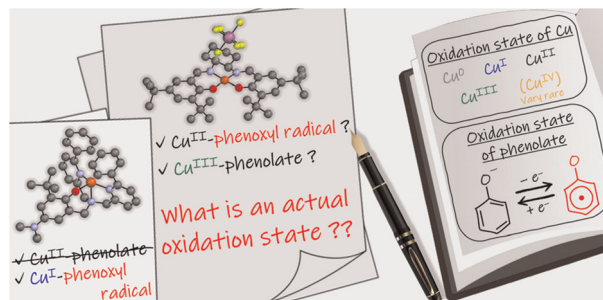
Image reproduced by  
permission of  
Augusto I. Costa,  
Miguel Julve and  
Maria Vanda Marinho from  
*Dalton Trans.*, 2024, **53**,  
3994.

## PERSPECTIVES

3911

### Diversity of oxidation state in copper complexes with phenolate ligands

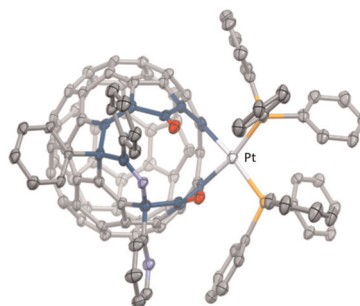
Tomoyuki Takeyama\* and Yuichi Shimazaki\*



3930

### Open-cage fullerenes as ligands for metals

Alan L. Balch



# Royal Society of Chemistry approved training courses

Explore your options.  
Develop your skills.  
Discover learning  
that suits you.

**Courses in the classroom,  
the lab, or online**

Find something for every  
stage of your professional  
development. Search our  
database by:

- subject area
- location
- event type
- skill level

Members **get at least 10% off**

Visit [rsc.li/cpd-training](https://rsc.li/cpd-training)

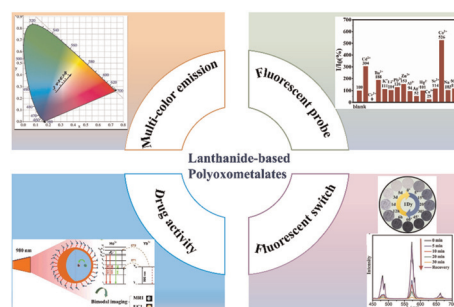
**SAVE  
10%**



3949

## Recent advances in lanthanide-based POMs for photoluminescent applications

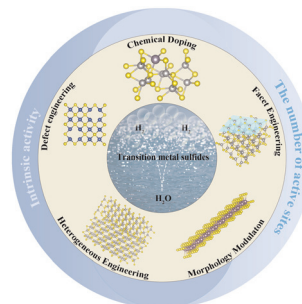
Kangting Zheng and Pengtao Ma\*



3959

## A review of modulation strategies for improving the catalytic performance of transition metal sulfide self-supported electrodes for the hydrogen evolution reaction

Qianqian Liu, Kehan Liu, Jianfeng Huang, Chiyuan Hui,\* Xiaoyi Li and Liangliang Feng\*

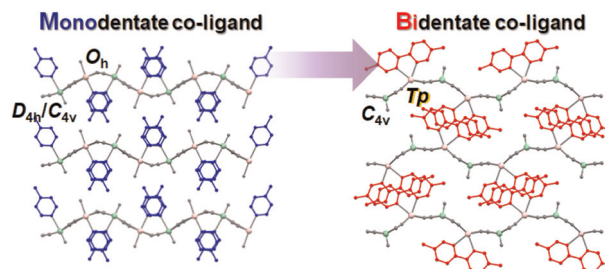


## COMMUNICATIONS

3970

## A novel style of 2D Hofmann-type coordination polymer incorporated trigonal prismatic coordination geometry with bidentate co-ligands

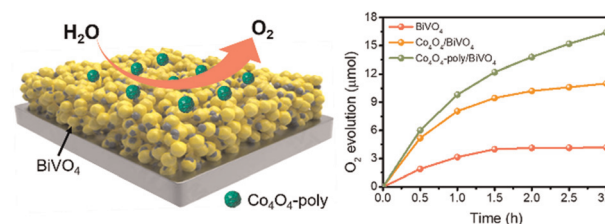
Yuki Imamura, Haruka Yoshino, Benjamin Le Ouay, Ryo Ohtani and Masaaki Ohba\*



3975

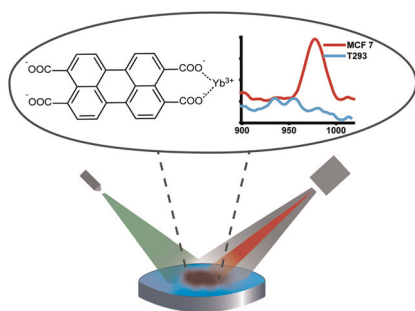
## A heterogeneous cobalt cubane polymer co-catalyst for cooperative water oxidation

Siyuan Li, Wenchao Jiang, Qi Sui, Yujie Gao and Yi Jiang\*



## COMMUNICATIONS

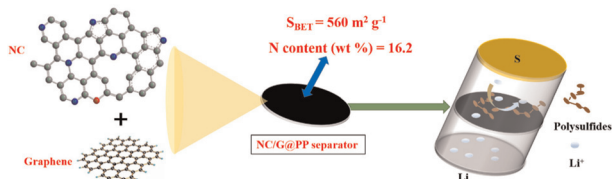
3980



### Ytterbium 10-carboxyperylen-3,4,9-tricarboxylates for targeted NIR luminescent bioimaging

Anastasia V. Orlova,\* Nazar V. Shmychkov, Kseniia Yu. Vlasova, Tamara M. Iakimova, Leonid S. Lepnev, Andrei A. Eliseev and Valentina V. Utochnikova

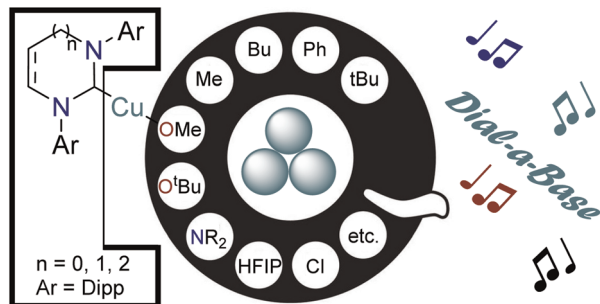
3985



### Facile preparation of a lightweight multifunctional interlayer for high-performance Li-S batteries

Yuan Lei, Zhenyu Zhang, Zhan Lin, Samiran Bhattacharjee and Chao Chen\*

3990

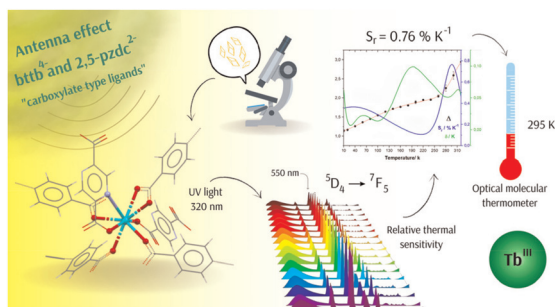


### Dial-a-base mechanochemical synthesis of N-heterocyclic carbene copper complexes

Dawid J. Babula, Rex S. C. Charman, Josie A. Hobson, Mary F. Mahon and David J. Liptrot\*

## PAPERS

3994



### Intensity and lifetime ratiometric luminescent thermometer based on a Tb(III) coordination polymer

Augusto Iwashita Costa, Rafaela M. R. da Silva, Luckerman D. G. Botelho, Sergio F. N. Coelho, Fernando A. Sigoli, João Honorato, Javier Ellena, Felipe T. Martins, Angelo M. Gomes, Wallace C. Nunes, Francesc Lloret, Miguel Julve and Maria Vanda Marinho\*

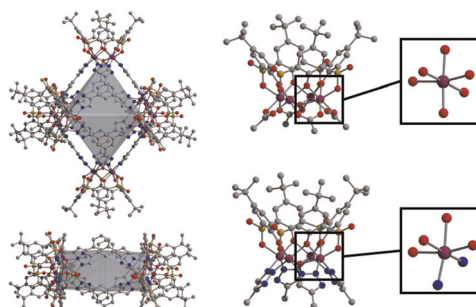


## PAPERS

4005

### Increasing the stability of calixarene-capped porous cages through coordination sphere tuning

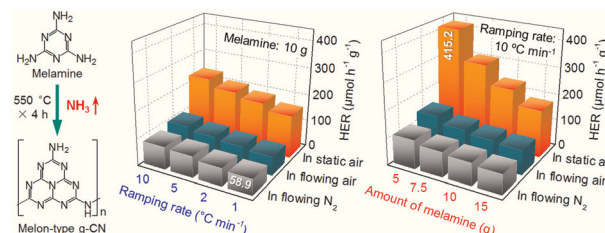
Avishek Dey, Michael R. Dworzak, Kaushalya D. P. Korathotage, Munmun Ghosh, Jahidul Hoq, Christine M. Montone, Glenn P. A. Yap and Eric D. Bloch\*



4010

### Small variation induces a big difference: the effect of polymerization kinetics of graphitic carbon nitride on its photocatalytic activity

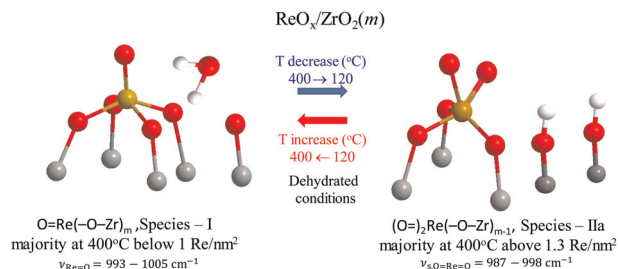
Tong Li, Bo Lai, Jing Liu, Shuangtao Yuan, Nan Liu, Xiaojia Zhao, Xiaoguang Luo, Dongli Yu\* and Yuanchun Zhao\*



4020

### Vibrational spectroscopy of dispersed $\text{Re}^{\text{VII}}\text{O}_x$ sites supported on monoclinic zirconia

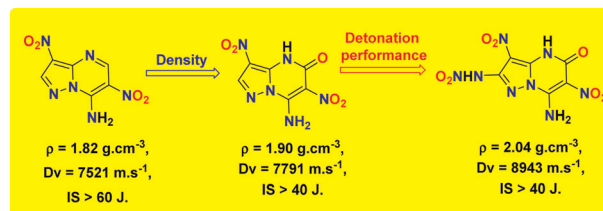
Chrysanthi Andriopoulou, Theocharis Kentri and Soghomon Boghosian\*



4035

### Obtaining superior high-density fused-ring energetic materials via the introduction of carbonyl, o- $\text{NH}_2-\text{NO}_2$ and nitroamino groups

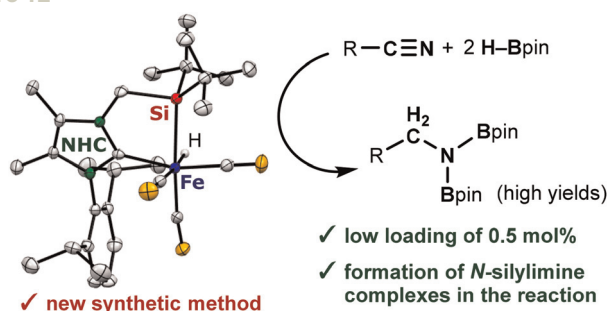
Xiaoyu Guo, Yizhen Feng, Shengjie Zhi, Yajie Fu, Yingle Liu,\* Qiangqiang Liu and Haixiang Gao\*





## PAPERS

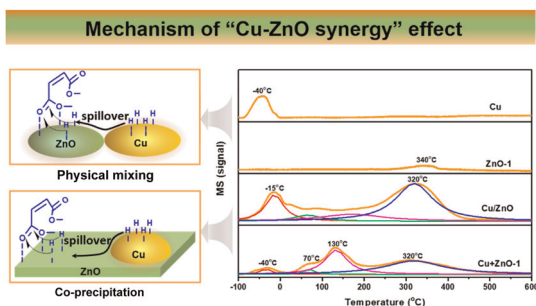
4041



### Iron complexes supported by silyl-NHC chelate ligands: synthesis and use for double hydroboration of nitriles

Takashi Komuro,\* Kohei Hayasaka, Kasumi Takahashi, Nozomu Ishiwata, Kota Yamauchi, Hiromi Tobita and Hisako Hashimoto\*

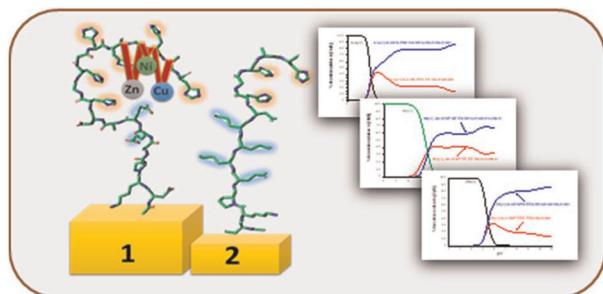
4048



### New insight into the catalytic mechanism of ester hydrogenation over the Cu/ZnO catalyst: the contribution of hydrogen spillover

Lin Gao,\* Guoqiang Ding,\* Lei Zhu, Zhanqiu Yu, Hongju Li, Guoqiang Li, Yulei Zhu, Hongwei Xiang, Xiaodong Wen,\* Yong Yang and Yongwang Li

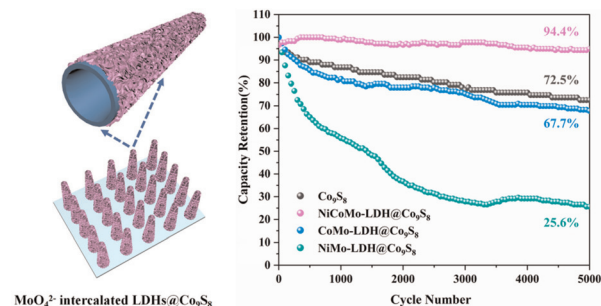
4054



### Exploring binding preferences: Cu(II), Ni(II), and Zn(II) complexes of mycobacterial GroEL1 His-rich and Glu/His-rich domains

Anna Rola, Elżbieta Gumienna-Kontecka and Sławomir Potocki\*

4067



### Design and fabrication of $\text{MoO}_4^{2-}$ -intercalated LDH nanosheets coated on $\text{Co}_9\text{S}_8$ nanotubes with enhanced cycling stability for high-performance supercapacitors

Lei Wu, Linli Chen, Hao Chen, Guochang Li, Wenna Zhao\* and Lei Han\*

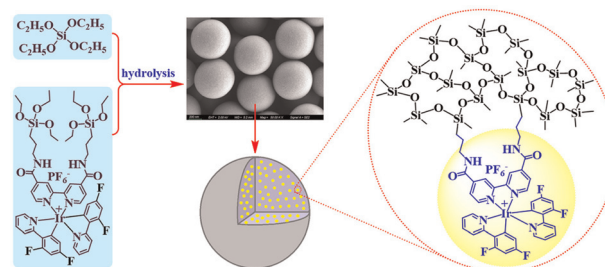


## PAPERS

4080

### Hybrid nanospheres of silica covalently containing yellow-emitting cationic iridium(III) complex: preparation and application in white light-emitting diodes

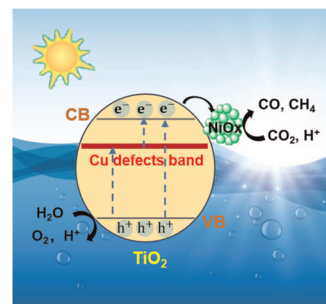
Haoju Li, Jing Qin, Shanglan Xian, Huaijun Tang,\*  
Yuxiang Jiao, Meifang Zhang,\* Long Wang, Qiang Zhou  
and Zhengliang Wang



4088

### Constructing Cu defect band within TiO<sub>2</sub> and supporting NiO<sub>x</sub> nanoparticles for efficient CO<sub>2</sub> photoreduction

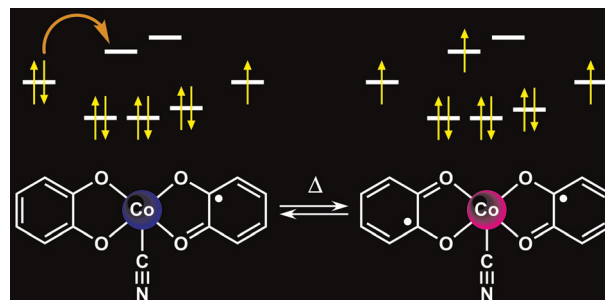
Jun-ying Tang, Xiao-jing Liu,\* Rui-tang Guo,\*  
Juan Wang, Qing-shan Wang and Wei-guo Pan\*



4098

### Low-spin to low-spin valence tautomeric transition in cobalt bis-dioxolenes

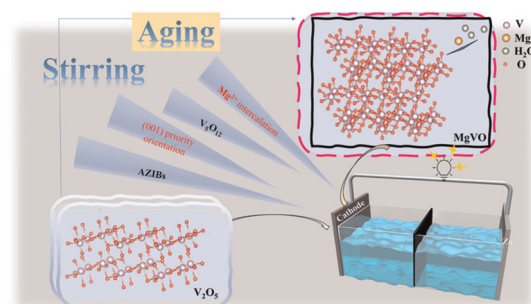
Max Mörtel, Stephen J. Goodner, Johannes Oschwald,  
Andreas Scheurer, Thomas Drewello and  
Marat M. Khusniyarov\*



4108

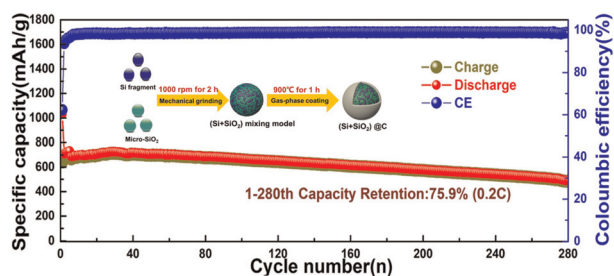
### Tailoring vanadium oxide crystal orientation for high-performance aqueous zinc-ion batteries

Rong Li, Yifei Yuan, Linyu Yang,\* Jun Wang,\*  
Shuying Wang,\* Ablat Abliz, Xuefang Xie, Hongyu Mi  
and Haibing Li



## PAPERS

4119



### Facile synthesis of multi-phase (Si+SiO<sub>2</sub>)@C anode materials for lithium-ion batteries

Shuai Wang, Zhenfei Cai, Rui Cao, Ziyang Ma, Qinyu Wu, Muhammad Moin, Zishan Ahsan, Yangzhou Ma,\* Guangsheng Song,\* Weidong Yang and Cuie Wen

4127

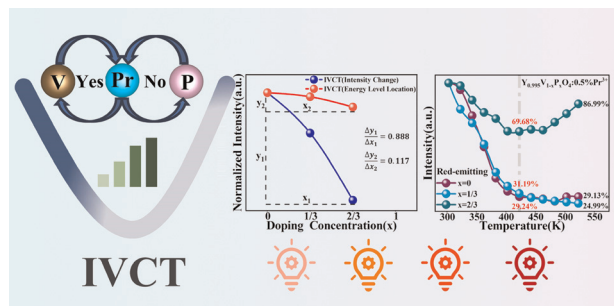


- trans metal free
- low-cost and environmentally friendly catalyst
- mild condition and wide substrate scope
- excellent yield and chemoselective reduction

### Chemoselective Luche-type reduction of $\alpha,\beta$ -unsaturated ketones by aluminium hydride catalysis

Ben Yan, Xiaoli Ma,\* Ziyuan Pang and Zhi Yang\*

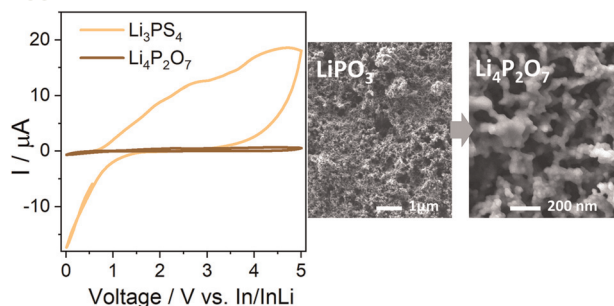
4132



### Enhanced thermally stable performance of Pr<sup>3+</sup>-doped vanadate phosphor by inhibiting the intervalence charge transfer quenching channel

Jianxia Liu, Chunwei Yang, Hong Chai, Yanmei Xin, Song Qu and Ning Guo\*

4139



### Morphology-controlled synthesis of novel nanostructured Li<sub>4</sub>P<sub>2</sub>O<sub>7</sub> with enhanced Li-ion conductivity for all-solid-state battery applications

Hany El-Shinawi,\* Edmund J. Cussen and Serena A. Cussen



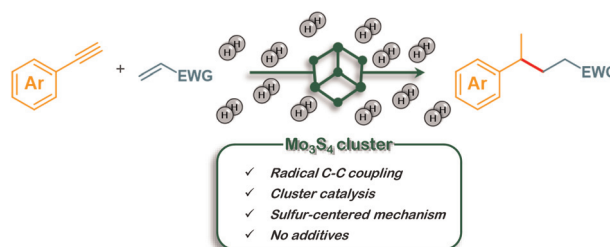


## PAPERS

4147

# Unprecedented $\text{Mo}_3\text{S}_4$ cluster-catalyzed radical C–C cross-coupling reactions of aryl alkynes and acrylates

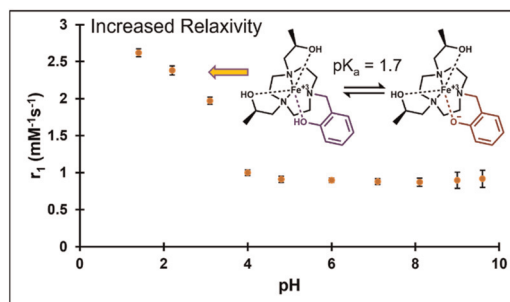
Juanjo Mateu-Campos, Eva Guillaumon, Vicent S. Safont, Kathrin Junge, Henrik Junge, Matthias Beller\* and Rosa Llugar\*<sup>\*</sup>



4154

# Macrocyclic complexes of Fe(III) with mixed hydroxypropyl and phenolate or amide pendants as $T_1$ MRI probes

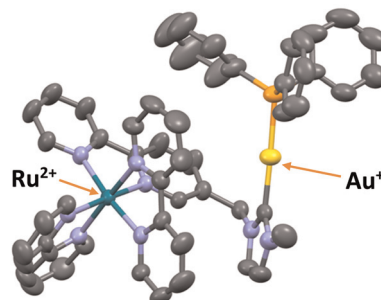
Elizabeth A. Kras, Roy Cineus, Matthew R. Crawley and Janet R. Morrow\*<sup>\*</sup>



4165

# Synthesis and luminescent properties of hetero-bimetallic and hetero-trimetallic Ru(II)/Au(I) or Ir(III)/Au(I) complexes

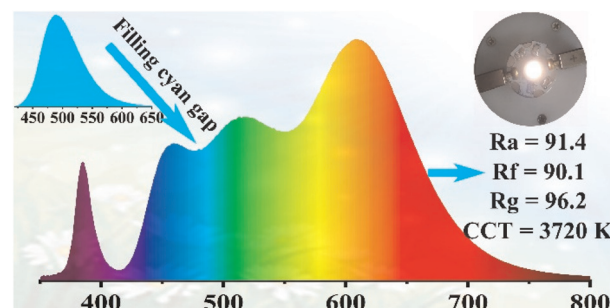
Richard C. Knighton and Simon J. A. Pope\*<sup>\*</sup>



4175

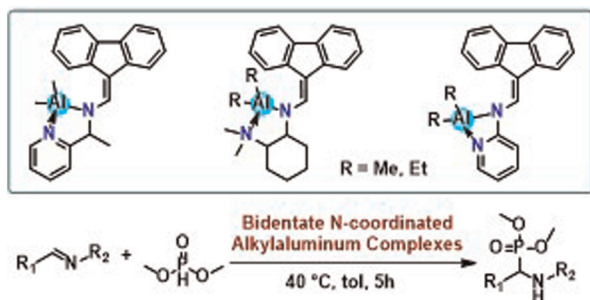
# Development of a novel $\text{Eu}^{2+}$ activated oxonitrido-silicate cyan phosphor for enhancing the color quality of a violet-chip-based white LED

Langping Dong,\* Jinqing Gao, Yijia Guo, Jingshan Hou,\* Baiqi Shao and Yongzheng Fang\*<sup>\*</sup>



## PAPERS

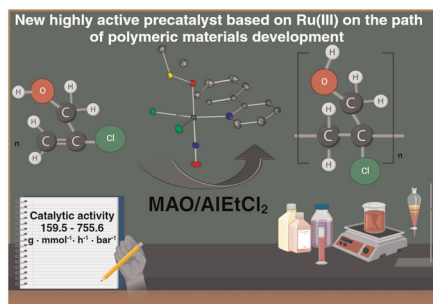
4185



### Novel bidentate N-coordinated alkylaluminum complexes: synthesis, characterization, and efficient catalysis for hydrophosphonylation

Biao Wei, Chaoqun Wang, Hui Miao,\* Zhibiao Qin, Mengna Huang, Yan Xu, Wenhui Xue, Shucheng Yang, Chenxu Liu, Cuibing Bai and Zheng Chen\*

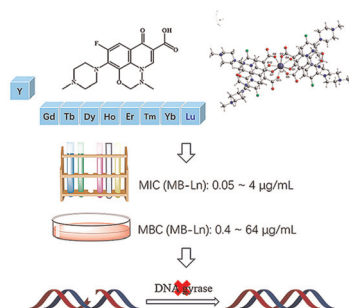
4194



### Porous oligomeric materials synthesised using a new, highly active precatalyst based on ruthenium(III) and 2-phenylpyridine

Kacper Pobłocki,\* Katarzyna N. Jarzemska, Radosław Kamiński, Joanna Drzeżdżon, Krystyna A. Deresz, Dominik Schaniel, Anna Gołąbiewska, Barbara Gawdzik, Przemysław Rybiński and Dagmara Jacewicz\*

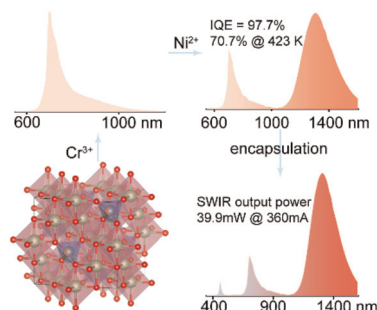
4204



### Marbofloxacin combined with heavy rare-earth ions makes better candidates for veterinary drugs: crystal structure and bio-activity studies

Zhi-chuan Chen, Rui-xue Liu, Yan-jie Xie, Qin Hu, Fu-ping Huang, Yan-cheng Liu\* and Hong Liang\*

4214



### Boosting broadband short-wave infrared emission to achieve near-unity quantum efficiency via bridging Cr<sup>3+</sup>–Ni<sup>2+</sup> in spinel solid-solutions towards light-emitting diode applications

Geng Chen, Lifang Yuan,\* Chaoyue Peng, Haoyi Wu and Yahong Jin\*

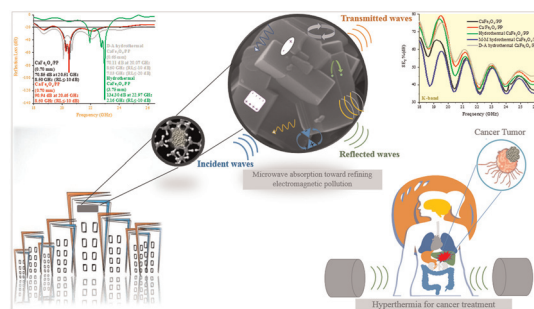


## PAPERS

4222

### Dendrimer-assisted defect and morphology regulation for improving optical, hyperthermia, and microwave-absorbing features

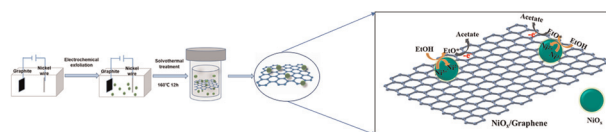
Somayeh Sheykhmoradi, Arezoo Ghaffari, Ali Mirkhan, Guangbin Ji, Shujuan Tan and Reza Peymanfar\*



4237

### Facile electrolysis-solvothermal synthesis of NiO<sub>x</sub>/graphene for enhanced ethanol oxidation to acetate

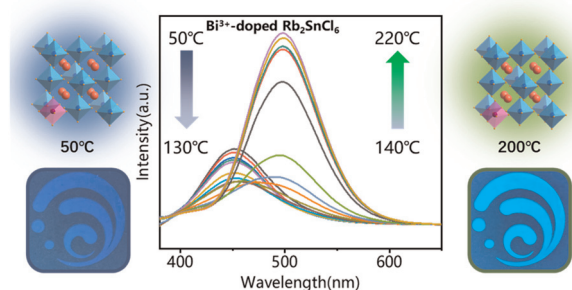
Man Zhao, Xuemin Yang, Zimei Fu, Wenxiang Wang, Wei Wen, He Xiao,\* Li Zhang, Junming Zhang, Baoliang Lv and Jianfeng Jia\*



4243

### Temperature-controlled tunable emission of Bi<sup>3+</sup>-doped Rb<sub>2</sub>SnCl<sub>6</sub> all-inorganic vacancy ordered lead-free perovskite for advanced anticounterfeiting

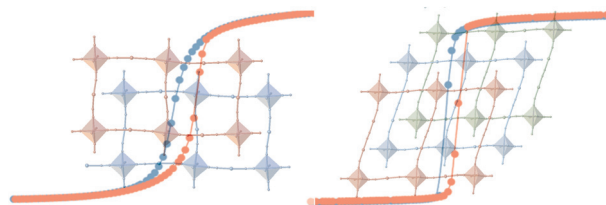
Chengyue Xin, Wenjun Zhang,\* Zhongfa Li, Zihan Chen and Zhongyu Duan\*



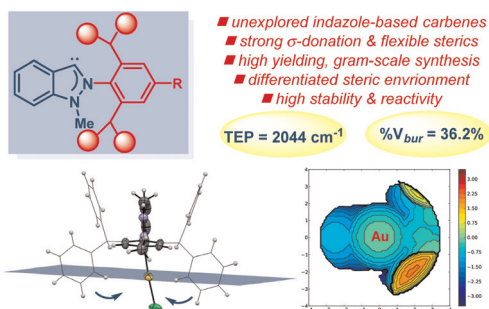
4251

### Nature of cyanoargentate bridges defining spin crossover in new 2D Hofmann clathrate analogues

Valerii Y. Sirenko, Olesia I. Kucheriv, Sergiu Shova, Sergii I. Shylin, Vadim Ksenofontov, Igor O. Fritsky, Wolfgang Tremel and Il'ya A. Gural'skiy\*



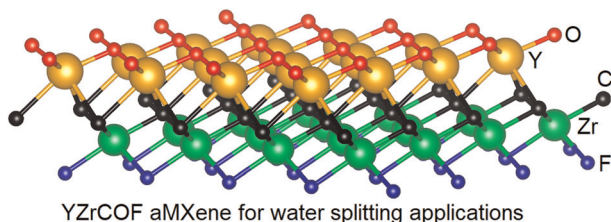
4260



### Indazolin-3-ylidenes (Indy\*): easily accessible, sterically-hindered indazole-derived N-heterocyclic carbenes and their application in gold catalysis

Jin Zhang,\* Ting Liu, Gaopeng Zhang, Jianglong Cai, Yue Wang, Jianbo Tong,\* Yangmin Ma, Roman Szostak and Michal Szostak\*

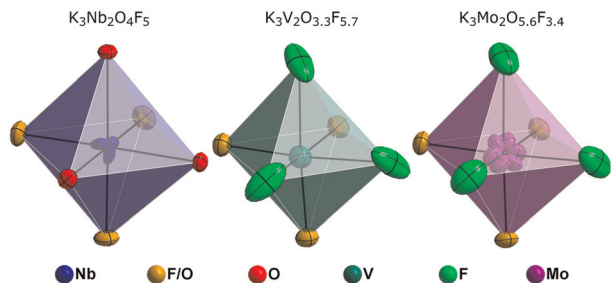
4266



### Tuning the electronic properties of asymmetric YZrCOF MXene for water splitting applications: an *ab initio* study

Mounir Ould-Mohamed,\* Tarik Ouahrani,\* Chewki Ougherb, Ruth Franco and Daniel Errandonea\*

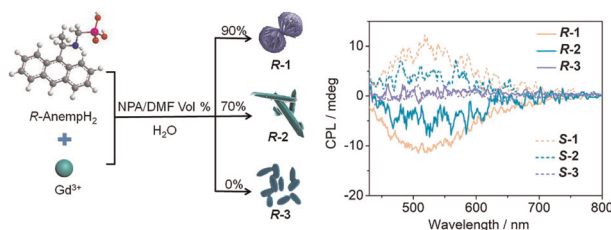
4278



### K<sub>3</sub>Mo<sub>2</sub>O<sub>5.6</sub>F<sub>3.4</sub> and K<sub>3</sub>V<sub>2</sub>O<sub>3.3</sub>F<sub>5.7</sub> – exploring transition metal cation valence and anion distribution in oxyfluorides

Fabian Zimmerhofer, Eric Wolf, Baris Öcal, Selina Olthof, Maximilian Kai Reimann, Rainer Pöttgen and Hubert Huppertz\*

4291



### Solvent modulation of the morphology of homochiral gadolinium coordination polymers and its impact on circularly polarized luminescence

Ting Hou, Chen-Chen Zhao, Song-Song Bao, Zhi-Min Zhai and Li-Min Zheng\*

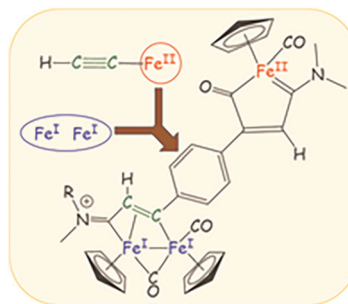


## PAPERS

4299

### Mixed valence triiron complexes from the conjugation of $[\text{Fe}^{\text{I}}\text{Fe}^{\text{I}}]$ and $[\text{Fe}^{\text{II}}]$ complexes via intermolecular carbyne/alkyne coupling

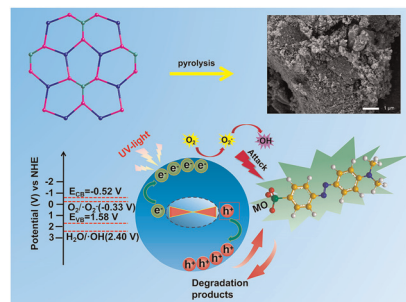
Giulio Bresciani,\* Gianluca Ciancaleoni, Stefano Zacchini, Lorenzo Biancalana, Guido Pampaloni, Tiziana Funaioli\* and Fabio Marchetti



4314

### Fabrication of carbon-based materials derived from a cobalt-based organic framework for enhancing photocatalytic degradation of dyes

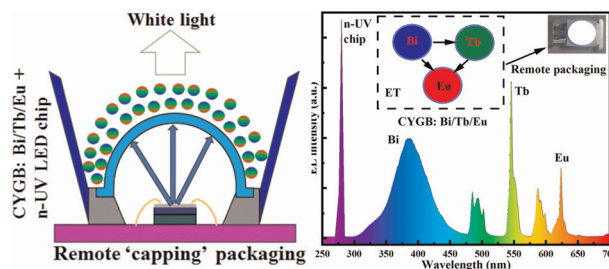
Wan-Lin Ma, Ya-Qian Zhang,\* Wen-Ze Li,\* Jing Li and Jian Luan\*



4325

### Stable color-tunable $\text{Ca}_3\text{Y}(\text{GaO})_3(\text{BO}_3)_4:\text{Bi}^{3+}/\text{Tb}^{3+}/\text{Eu}^{3+}$ phosphors for application in $n$ -UV-pumped $w$ LEDs

P. J. Xia, X. Z. Zheng, L. Yue, Y. F. Lei, M. Xu and W. B. Dai\*



## CORRECTION

4342

### Correction: The $\{\text{Cu}_2\text{I}_2\}$ cluster bearing metal organic frameworks: crystal structures and fluorescence detecting performances towards cysteine and explosive molecules

Jiang Jiang,\* Zi-Wei Li, Zhi-Zhuan Zhang, Bin Tan, Simon Teat, Zhao-Feng Wu\* and Xiao-Ying Huang





## RETRACTION

4343

**Retraction: Synthesis of a chiral dinuclear Cu(II)-benzothiazolamine complex: evidence of cuprophilic interaction in its structure and exploration of its electrochemical properties and catalytic performance**

O. Stephen Ojo,\* Halilu Sale, Mark D. Symes and Claire Wilson

