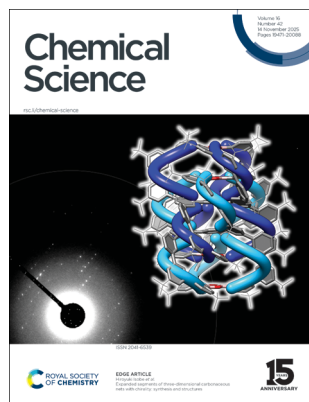


## IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 16(42) 19471–20088 (2025)



**Cover**  
See Hiroyuki Isobe *et al.*, pp. 19594–19600. Image reproduced by permission of Hiroyuki Isobe from *Chem. Sci.*, 2025, **16**, 19594.



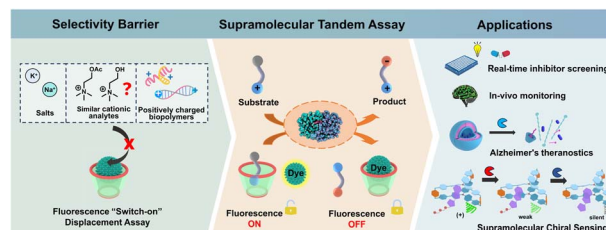
**Inside cover**  
See Shun Dekura, Motohiro Mizuno and Hatsumi Mori, pp. 19601–19607. Image reproduced by permission of Shun Dekura, Motohiro Mizuno and Hatsumi Mori from *Chem. Sci.*, 2025, **16**, 19601. The artwork was designed by ART ACTION Inc., Japan.

## COMMENTARY

19489

### A reflection on enzyme-coupled supramolecular sensing: overcoming selectivity barriers with macrocyclic reporter pairs

Shuangqi Song and Yu Liu\*

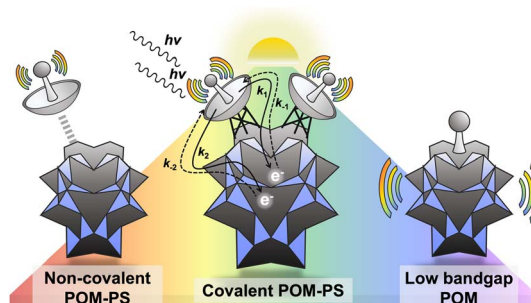


## PERSPECTIVES

19493

### Unveiling photoinduced electron transfers in photosensitized polyoxometalates for solar energy conversion

Christian Cariño, Anna Proust, Geoffroy Guillemot, Ludivine K/Bidi, Sébastien Blanchard, Elizabeth A. Gibson and Guillaume Izzet\*



# Industrial Chemistry & Materials

GOLD  
OPEN  
ACCESS

Focus on industrial chemistry  
Advance material innovations  
Highlight interdisciplinary feature

Innovative.  
Interdisciplinary.  
Problem solving

APCs currently waived

Learn more about ICM  
Submit your high-quality article

 [@IndChemMater](https://www.facebook.com/IndChemMater)

 [@IndChemMater](https://twitter.com/IndChemMater)

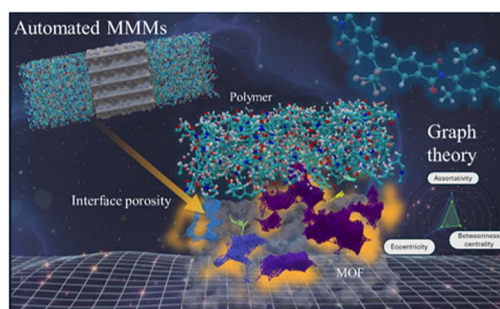
[rsc.li/icm](https://rsc.li/icm)

## PERSPECTIVES

19519

**MOF surface morphology governs interfacial pore architecture and CO<sub>2</sub> dynamics in mixed matrix membranes**

Alejandro Diaz-Marquez, Supriyo Naskar, Dong Fan, Mohamed Eddaoudi and Guillaume Maurin\*

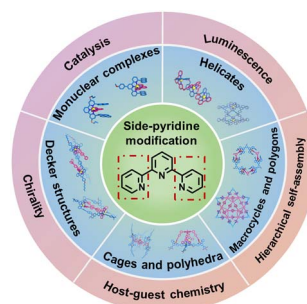


## REVIEWS

19532

**Novel metallo-supramolecular architectures based on side-pyridine-modified terpyridines: design, self-assembly, and properties**

Ningxu Han, Xin Jiang\* and Ming Wang\*



19570

**Antioxidant activity at the molecular level: exploring ways of action and computational tools to investigate them**

Annia Galano\*

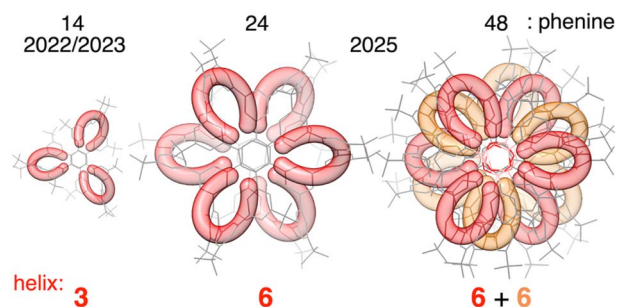


## EDGE ARTICLES

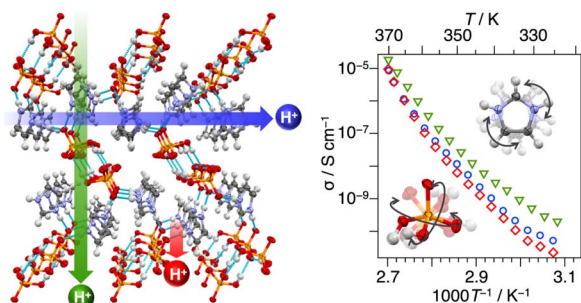
19594

**Expanded segments of three-dimensional carbonaceous nets with chirality: synthesis and structures**

Toshiya M. Fukunaga, Kiyofumi Takaba, Satoshi Yoshida, Saori Maki-Yonekura, Koji Yonekura and Hiroyuki Isobe\*



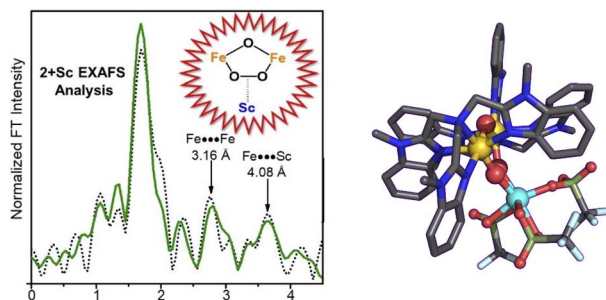
19601



### Isotropic proton conduction in an anisotropic crystal: the role of molecular rotational dynamics in imidazolium dihydrogen phosphate

Shun Dekura,\* Motohiro Mizuno and Hatsumi Mori\*

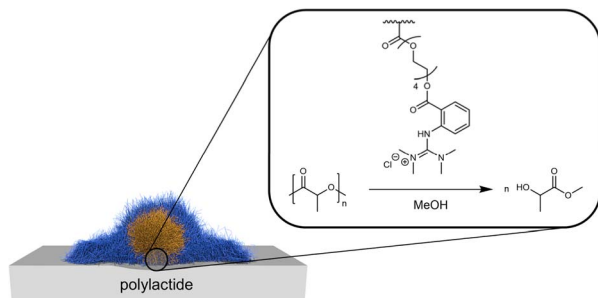
19608



### Mimicking sMMOH chemistry: trapping the Sc<sup>3+</sup>-bound nonheme Fe<sup>III</sup>-O-O-Fe<sup>III</sup> adduct prior to its conversion into an Fe<sup>IV</sup>(μ-O)<sub>2</sub> core

Patrick M. Crossland, Bittu Chandra, Saikat Banerjee, Chase S. Abelson, Yisong Guo,\* Marcel Swart\* and Lawrence Que\*

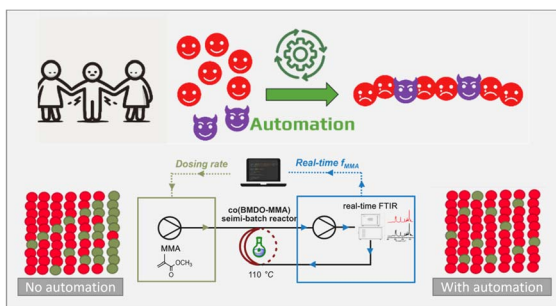
19614



### Depolymerization of PLA catalyzed by guanidine-modified microgels

Fabian Fink, Frédéric Grabowski, Sandra Oden, Paul Nisgutski, Andrij Pich\* and Sonja Herres-Pawlis\*

19624



### Synthesis of biodegradable vinyl copolymers via enforced regular sequence distribution from automated radical ring opening polymerisation

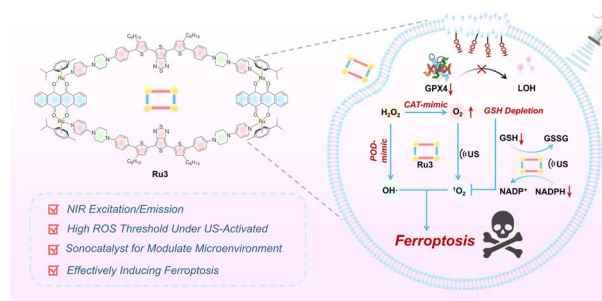
Mengyuan Wen, WeiNian Wong and Tanja Junkers\*



19632

## Rationally designed sonocatalyst-enhanced supramolecular ferroptosis inducers for effective cancer therapy

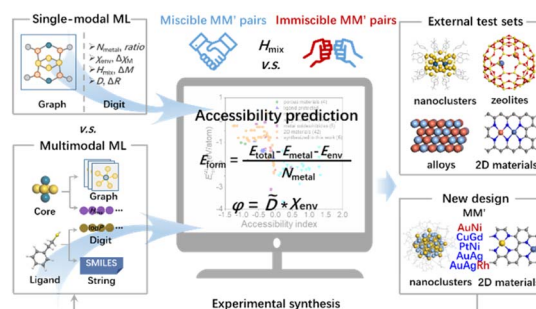
Yida Pang, Yong Luo, Ting Liu, Qian Li, Longcan Mei, Junhua Zhang, Chonglu Li,\* Junrong Li\* and Yao Sun\*



19644

## High-throughput design of bimetallic materials via multimodal machine learning and the accessibility index

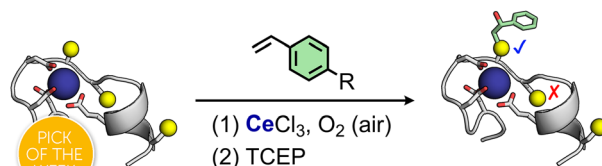
Yuming Gu, Yating Gu, Maochen Yang, Shisi Tang, Jiawei Chen, Xinyi Liang, Dong Zheng, Zekun Li, Fengqi Song, Yang Gao, Yan Zhu,\* Yinghuan Shi\* and Jing Ma\*



19658

## Cerium-mediated site-selective cysteine functionalization

Jaewon Lee and Woon Ju Song\*

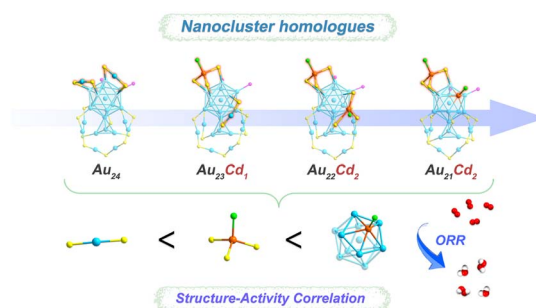


Cerium-dependent Cysteine-Modifiable Peptide (CCMP)

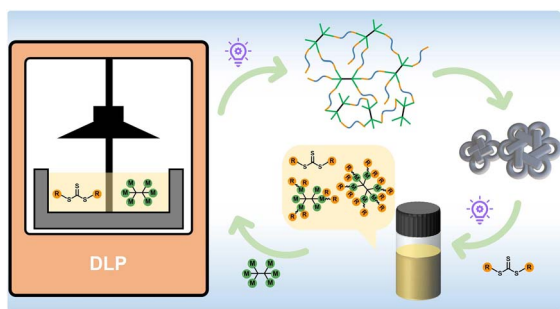
19669

## Construction of a homologous series of metal nanoclusters and implications for structure–activity correlations

Qinzhen Li, Tingting Jiang, Sha Yang, Jinsong Chai,\* Haizhu Yu\* and Manzhou Zhu\*



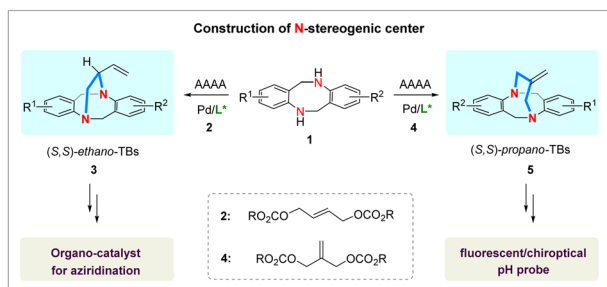
19677



### Recyclable RAFT-3D printing

Xiaofeng Pan, Xinggang Luo, Xiangqiang Pan, Jiajia Li\* and Jian Zhu\*

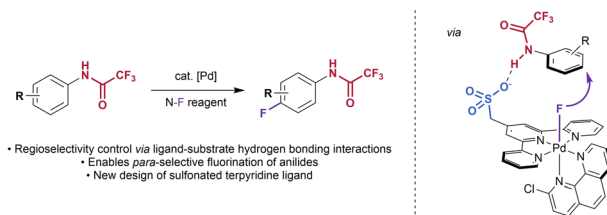
19683



### Catalytic enantioselective construction of two N-stereogenic centers of ethano- and propano-Tröger's bases

Chun-Yan Guan, Tao Lu, Ya Li, Chao-Hua Liu, Xiao Xiao and Guang-Jian Mei\*

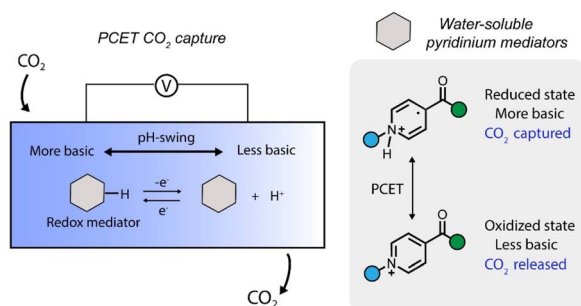
19694



### The development of sulfonated terpyridine ligands for control of regioselectivity in palladium-catalysed fluorination of anilides

Jiri Dolezel and Robert J. Phipps\*

19702



### Water-soluble pyridinium redox mediators for pH-swing CO<sub>2</sub> capture

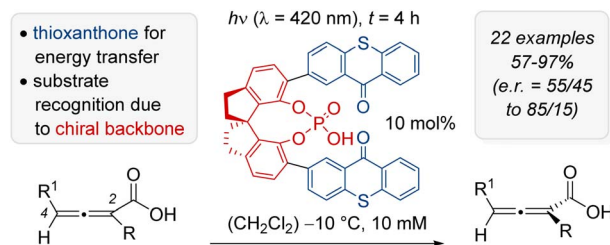
Eloi Grignon, Zhangfei Su, Jiang Tian Liu, Armanda Lima, Andrew Wang, Parisa Karimi, Shuai Chen\* and Dwight S. Seferos\*



19711

### Photochemical deracemization of 2,3-allenoic acids mediated by a sensitizing chiral phosphoric acid catalyst

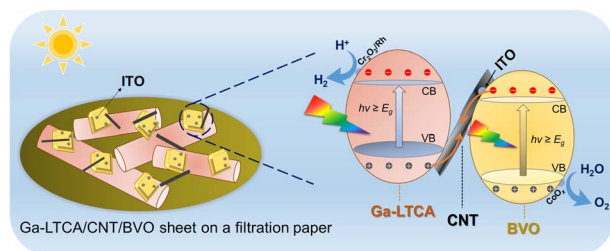
Max Stierle, Daniel Bitterlich, Julia Westermayr and Thorsten Bach\*



19720

### Z-scheme overall water splitting on photocatalyst sheet mediated by carbon nanotubes using oxysulfide photocatalyst responsive to long wavelengths

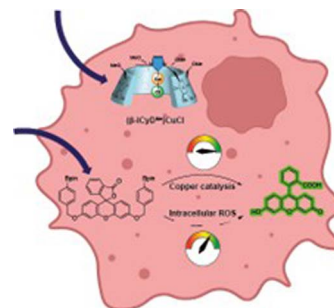
Long Wang, Chen Gu, Tsuyoshi Takata, Nobuyuki Zetsu, Swapnil S. Karade, Swarnava Nandy, Joji Yoshimura, Yasutaka Nishi, Kiyoshi Kanie, Takashi Hisatomi and Kazunari Domen\*



19727

### Encapsulating NHC-capped copper(i) complexes inside cyclodextrin for catalysis in living cells

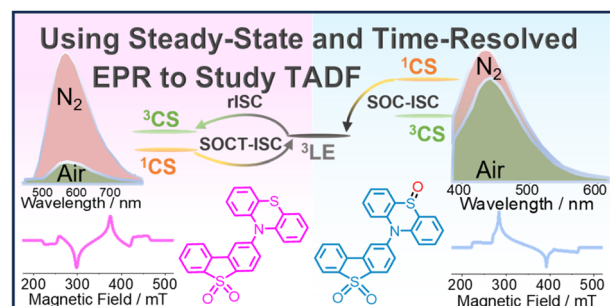
Francisca Figueiredo, Hugo Madec, Pierre Mesdom, Giulia Salluce, Yanis Tigherghar, Kevin Cariou,\* Sylvain Roland,\* Matthieu Sollogoub\* and Gilles Gasser\*



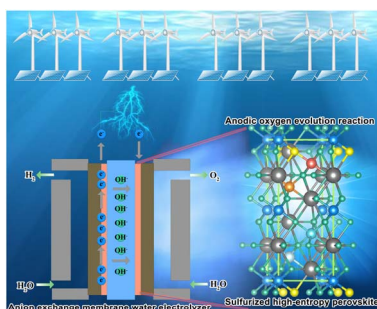
19737

### Study of the thermally-activated delayed fluorescence (TADF) mechanism of phenothiazine-dibenzothiophene-*S,S*-dioxide electron donor-acceptor dyads using steady-state and time-resolved optical and electron paramagnetic resonance spectroscopies

Yuying Pei, Andrey A. Sukhanov, Xi Chen, Greta Sambucari, Laura Bussotti, Xin Liu, Jianzhang Zhao,\* Yanqin Li,\* Yanping Huo,\* Violeta K. Voronkova,\* Huimin Guo\* and Mariangela Di Donato\*



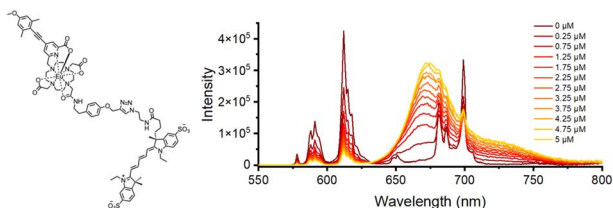
19752



### Regulating metal–oxygen covalency in reconstructed sulfurized high-entropy perovskite to activate and stabilize lattice oxygen for the oxygen evolution reaction

Xiang Li, Qiuju Li, Bingyu Chen, Mengna Wang, Chuanchuan Yan, Subhajit Jana, Ziqi Liao, Zhenyu Li,\* Dunfeng Gao and Guoxiong Wang\*

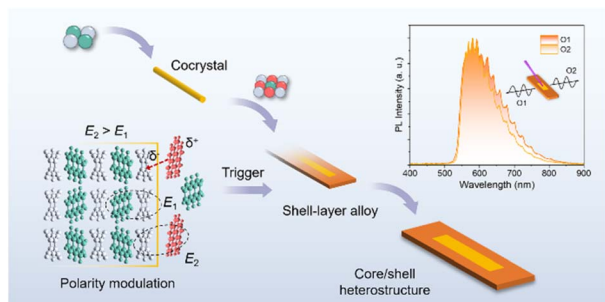
19762



### Temperature dependent luminescence of europium/cyanine FRET pairs

Tsz Lam Cheung and David Parker

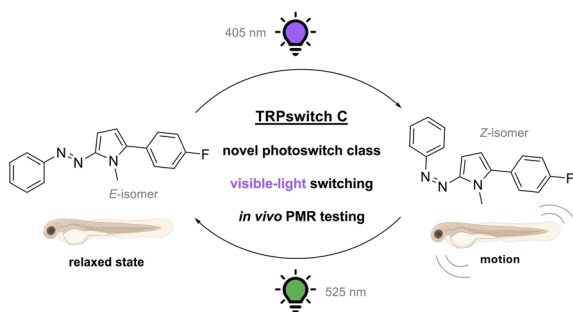
19769



### Interfacial polarity-driven self-assembly of organic core/shell heterostructures with directional Fabry–Pérot resonance

Jin Feng, Zhen-Yu Geng, Yi Zong, Chuan-Zeng Wang, Shu-Hai Chen, Hong-Tao Lin,\* Li-Wei Xie\* and Xue-Dong Wang\*

19777



### Aryl azopyrroles as visible light photoswitchable TRPA1 ligands

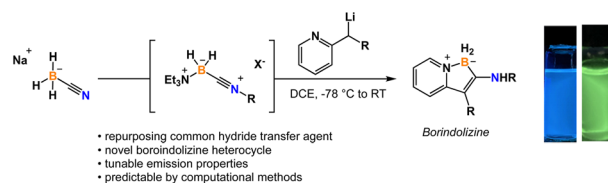
Lisa C. Dollhopf, Jordan A. Munos, Kai Y. Zheng, Rui Xin Tao, Peter R. Haycock, Philip J. Parsons, Randall T. Peterson, Pui-Ying Lam\* and Matthew J. Fuchter\*



19786

### A borindolizine platform for the design of fluorophores with tunable emissions

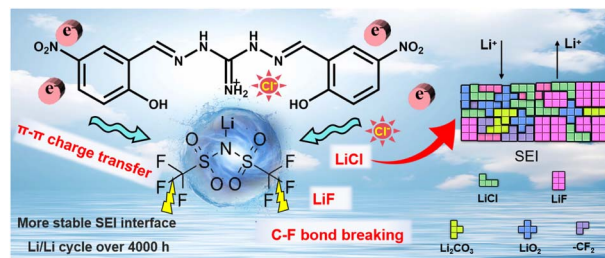
Chirag N. Apte, Nicholas W. Heller, Ben Zhen Huang, Adam Marr, Kjell Jorner, Alan Aspuru-Guzik and Andrei K. Yudin\*



19792

### Tailoring the electronic structure to enable rapid Li-ion diffusion and a stabilized LiF–LiCl rich electrode–electrolyte interface

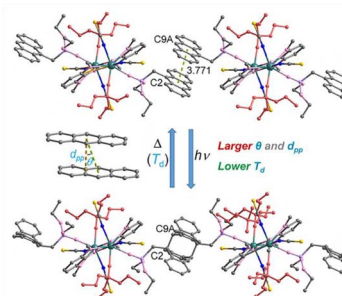
Shan Su, Xuanyi Zhou, Weizhong Liang, Zhuorui Su, Yibing Qu, Yuhan Zhong, Jinghong Qiu and Biao Zhang\*



19806

### Photoresponsive luminescent single-molecule magnets based on dysprosium–anthracene complexes: regulating the de-dimerization temperature of the photocycloaddition product by co-ligand

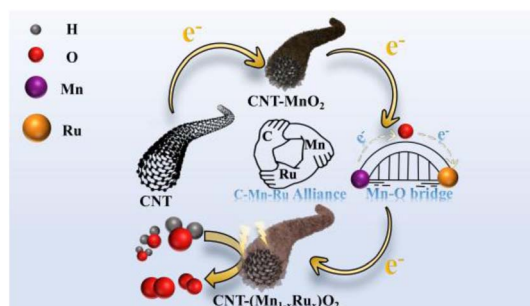
Ye-Hui Qin, Xiu-Fang Ma, Xinlan Hou, Xin-Da Huang, Song-Song Bao, Yuxi Tian, Yi-Quan Zhang\* and Li-Min Zheng\*



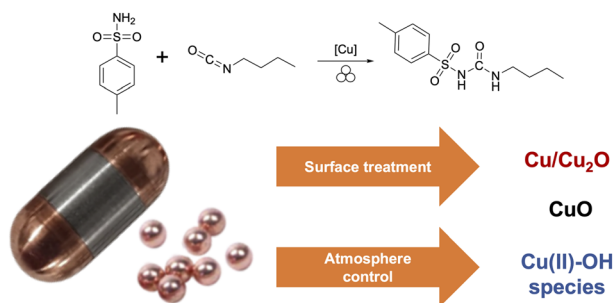
19820

### Structurally engineered CNT-confined Mn<sub>x</sub>Ru<sub>1-x</sub>O<sub>2</sub> catalysts for efficient acidic oxygen evolution at low Ru loading

Xiaolin Zheng, Xiaofei Miao, Zijie Yang, Zhaoyan Luo, Jun Yu, Huiqi Li\* and Lei Zhang\*



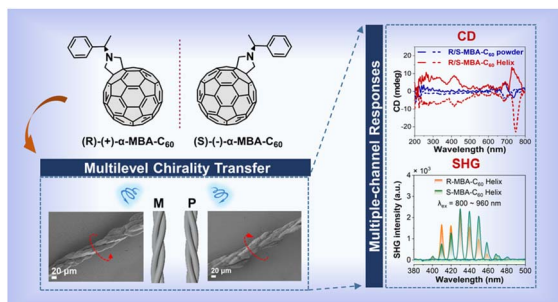
19830



### Harnessing the copper surface for direct mechanocatalysis: a case study on mechanochemical sulfonyleurea synthesis

Kathleen R. Floyd, Lizette S. Mella, Ryan W. Kwok, Mackenzie Gray, Edward J. Broker, Jr., Mateusz Marianski, Tomislav Friščić and James D. Batteas\*

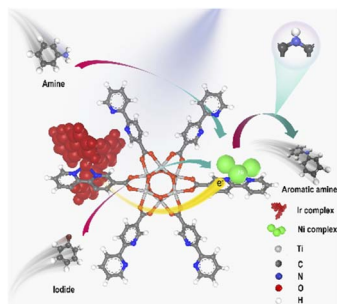
19843



### Multilevel chirality transfer and second harmonic generation in mesoscopic double helical supramolecular self-assemblies of fullerene enantiomers

Jinrui Li, Kaipeng Zhuang, Yunlong Tao, Qingfeng Zhang,\* Hongguang Li\* and Jingcheng Hao

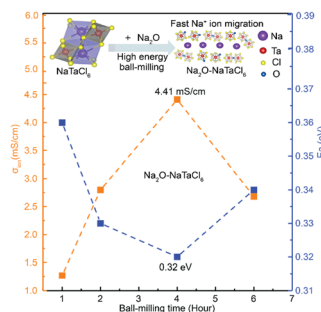
19849



### Dual-catalytic architectures accommodated by titanium-oxo clusters boosting visible-light-driven C–N cross-coupling via intramolecular electron transfer

Shiyu Wang, Jianfeng Jia, Yongqi Wang, Qiang Gao\* and Gang Ye\*

19857



### Break it down to speed it up: Na<sub>2</sub>O–NaTaCl<sub>6</sub>

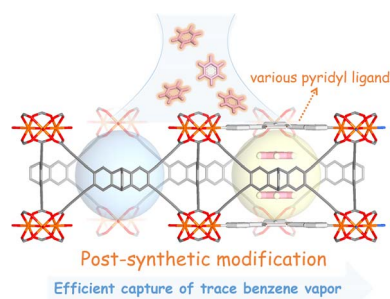
Islamiyat A. Ojelade, Erica Truong, Ifeoluwa P. Oyekunle, Tej P. Poudel, Yudan Chen, Michael J. Deck, Yongkang Jin, Bright Ogbolu, Pawan K. Ojha, Md. Mahinur Islam, Thilina N. D. D. Gamaralage, J. S. Raj Vellore Winfred and Yan-Yan Hu\*



19867

### Efficient capture of trace benzene vapor by metal-organic frameworks modified with macrocyclic pyridyl ligands

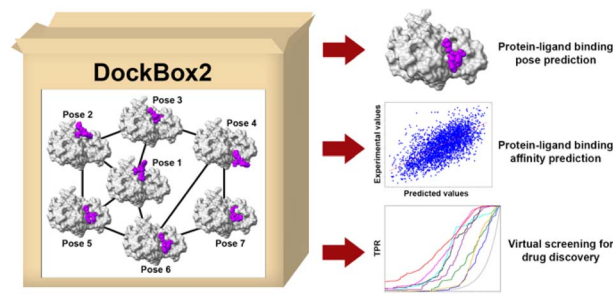
Gang Liang, De-Jian Chen, Zhu-Jun Long, Hao Zhuo, Xiao-Feng Zhong, Xiong-Hai Chen, Huai-Yu Shao, Zong-Wen Mo\* and Xiao-Ming Chen



19876

### Pose ensemble graph neural networks to improve docking performances

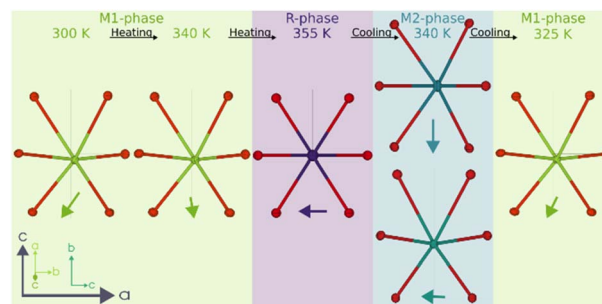
Thanawat Thaingtamtanha, Jordane Preto and Francesco Gentile\*



19888

### Single-crystal synchrotron X-ray diffraction study reveals bulk intermediate M2 phase during the VO<sub>2</sub> insulator-to-metal transition

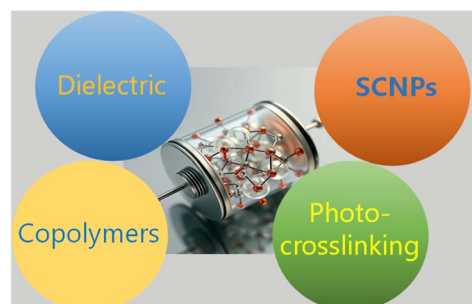
Jacob Svane, Michael Anthony Quintero, Emilie Skytte Vosegaard, Magnus Kløve, Daniel Alexander Mayoh, Geetha Balakrishnan and Bo Brummerstedt Iversen\*



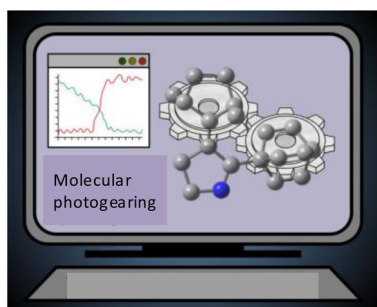
19898

### Anthracene-functionalized dipolar glass copolymers as precursors for high-dielectric single-chain nanoparticles

Sebastian Bonardd,\* Jon Maiz, Javier Maisueche, Ester Verde-Sesto and José A. Pomposo\*



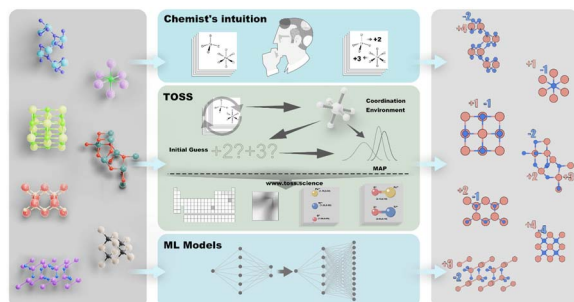
19910



### Achieving one-step molecular photogearing in a minimal light-driven molecular motor

Enrique M. Arpa\* and Bo Durbeej\*

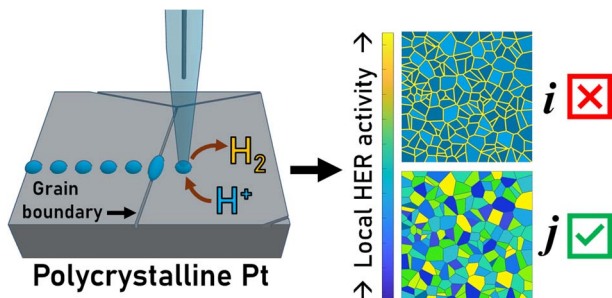
19917



### Oxidation states in solids from data-driven paradigms

Yue Yin and Hai Xiao\*

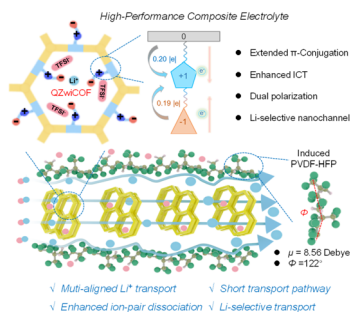
19929



### Intrinsic electrocatalytic activity of platinum grain boundaries: correcting measurement artefacts in scanning electrochemical cell microscopy (SECCM)

Harry B. Swan, Lachlan F. Gaudin, Alannah J. Hunt and Cameron L. Bentley\*

19944



### Dual polarization in extended $\pi$ -conjugated zwitterionic COF facilitates $Li^+$ aligned transportation for high-performance solid-state lithium–metal batteries

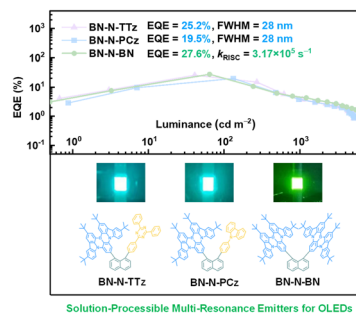
Linchu Xu, Feng Chen, Ju Duan, Kexiang Wang, Jiaqiang Li, Jingzhao Wang, Jianan Wang, Wei Lyu\* and Yaozu Liao\*



19956

### Enhancing the reverse intersystem crossing (RISC) rates and efficiencies of MR-TADF emitters with a U-shaped molecular structure for solution-processed OLEDs

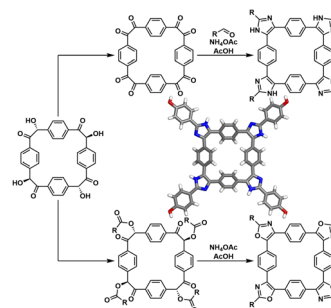
Shipan Xu, Wenping Liu, An Yan, Xuyang Du, Yuanhui Sun,\* Junfei Tao, Guijiang Zhou,\* Zhao Chen\* and Xiaolong Yang\*



19967

### Inverted azolophanes: alternant *o*-heteroarene/*p*-arene macrocycles

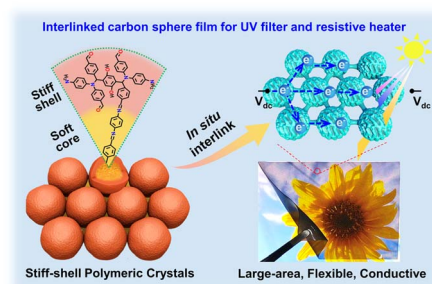
Yun-Hsien Lin, Xiqu Wang, Dariusz W. Szczepaniak,\* Paweł A. Wieczorkiewicz and Ognjen Š. Miljanić\*



19973

### Large-area, flexible, and conductive porous films of interlinked carbon nanospheres for UV light filters and resistive heaters

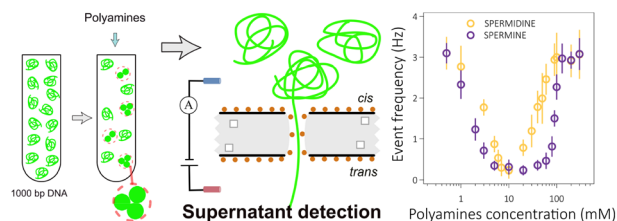
Meng-Qi Zhao, Tian-Yi Li, Chuan-Bin Li, Hui-Qun Huang, Yong-Sheng Wang, Ling-Yu Dong, Xiao-Dong Shi, Yu-Tai Wu, Guang-Ping Hao\* and An-Hui Lu\*



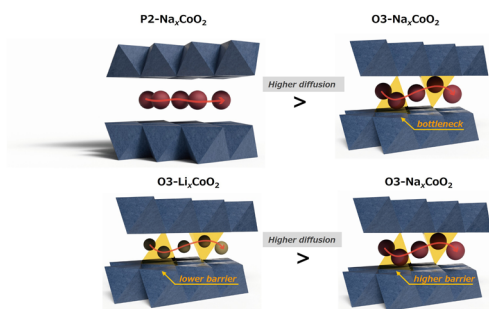
19981

### DNA aggregation and resolubilization in the presence of polyamines probed at the single molecule level using nanopores

Yuhua Cai, Benjamin Cressiot, Sébastien Balme, Eric Raspaud, Laurent Bacri\* and Juan Pelta\*



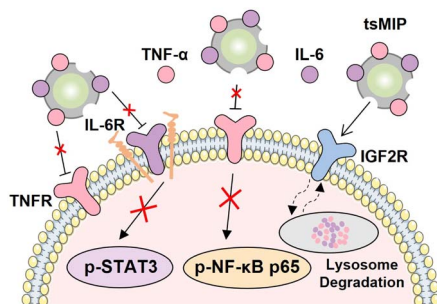
19990



## Revisiting the ion dynamics in $\text{Li}_x\text{CoO}_2$ and $\text{Na}_x\text{CoO}_2$

Ryoichi Tataru,\* Daisuke Igarashi, Masanobu Nakayama, Tomooki Hosaka, Kazuki Ohishi, Izumi Umegaki, Jumpei G. Nakamura, Akihiro Koda, Hiroto Ohta, Rasmus Palm, Martin Månsson, Eun Jeong Kim, Kei Kubota, Jun Sugiyama and Shinichi Komaba\*

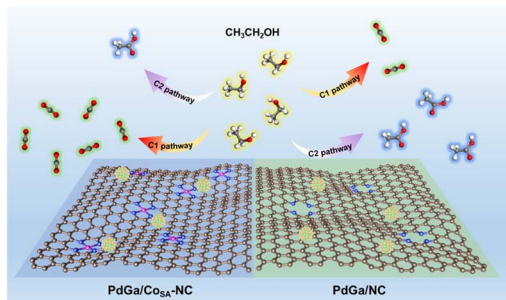
20002



## Tri-specific molecularly imprinted lysosomal nanodegrader enables synergistic therapy of cytokine storm

Jingran Chen, Weihua Lu, Ying Li, Zhanchen Guo, Qian Liu, Weiwei Liu, Lisheng Wang and Zhen Liu\*

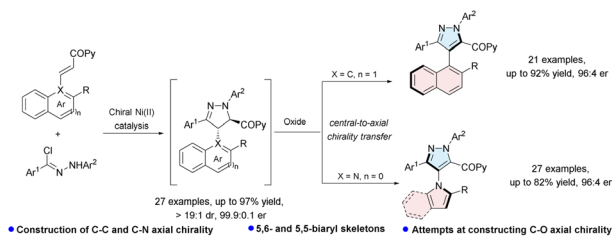
20012



## PdGa nanoalloys loaded on single atom Co dispersed nitrogen doped carbon for ethanol electrooxidation: improved C1 pathway selectivity and durability

Chengming Huang, Xia Chen, Wenjing Zhang, Fangzheng Wang, Yunchuan Tu,\* Jing Li\* and Zidong Wei\*

20021



## Enantioselective synthesis of C–C and C–N axially chiral pyrazole-based heterobiaryls

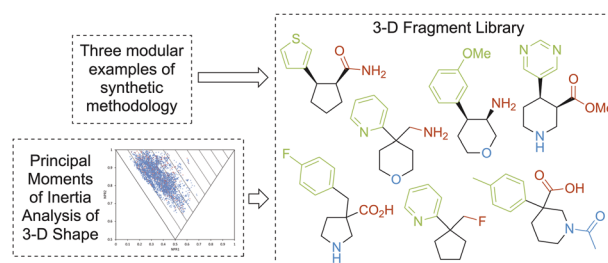
Jun He, Zun Yang, Lili Lin\* and Xiaoming Feng\*



20030

## Design, modular synthesis and screening of 58 shape-diverse 3-D fragments

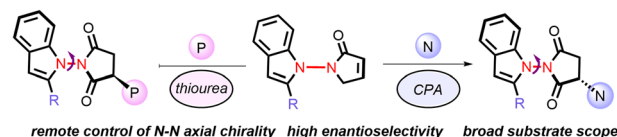
Thomas D. Downes, S. Paul Jones, James D. Firth, John F. Darby, Amelia K. Gilio, Hanna F. Klein, Xinyu Wang, David C. Blakemore, Claudia De Fusco, Stephen D. Roughley, Lewis R. Vidler, Maria Ann Whatton, Alison J.-A. Woolford, Gail L. Wrigley, Roderick E. Hubbard, Liang Wu, Gideon J. Davies and Peter O'Brien\*



20042

## Remote generation of N–N axial chirality through asymmetric hydrophosphinylation/hydroamination of maleimides

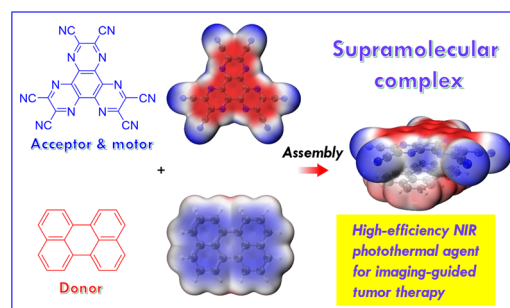
Yu-Li Sun, Lei Dai, Kun Zhu, Qingqin Huang, Yushuang Chen, Zugen Wu and Yixin Lu\*



20048

## An acceptor motor-driven electronic donor–acceptor supramolecular scaffold towards imaging-guided tumor therapy

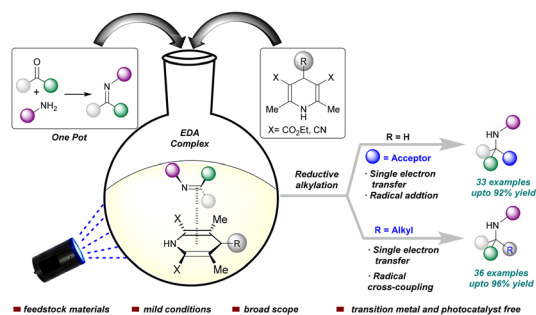
Canze Zheng, Liwei Zhu, Jianyu Zhang, Xin Deng, Zhengyao Zhong, Xiang He, Qiaoyun Zhang, Junkai Liu, Miao Meng, Jacky W. Y. Lam, Ying Li,\* Ming Chen\* and Ben Zhong Tang\*



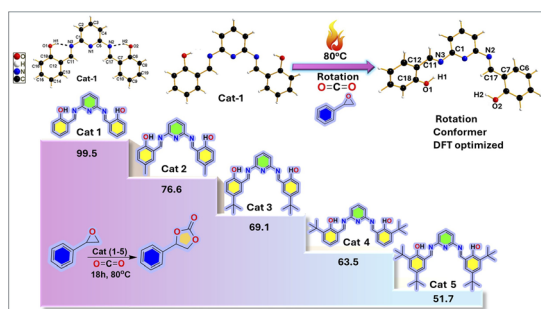
20061

## Electron donor–acceptor complex offers a diverse approach for carbonyl alkylative amination

Hrshikesh Paul, Arijit Chakraborty, Animesh Mandal, Dibyangshu Das, Sanat Kumar Mahapatra, Lisa Roy\* and Indranil Chatterjee\*



20073



## Thermally driven conformational tuning of pyridine bis-salicylaldimine for efficient CO<sub>2</sub> activation and cyclic carbonate formation under mild conditions

Veenu Mishra, Siddhi Kediya, Devender Goud, Diku Raj Deka, Subhajit Chakraborty and Sebastian C. Peter\*

