

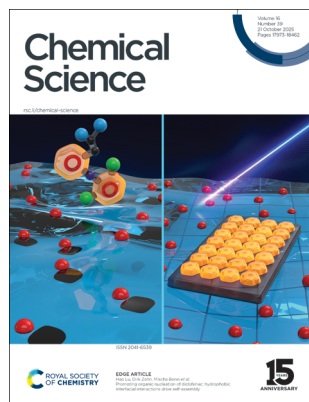
# Chemical Science

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## IN THIS ISSUE

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**Cover**  
See Hao Lu, Dirk Zahn, Mischa Bonn *et al.*, pp. 18092–18100. Image reproduced by permission of Hao Lu from *Chem. Sci.*, 2025, **16**, 18092.



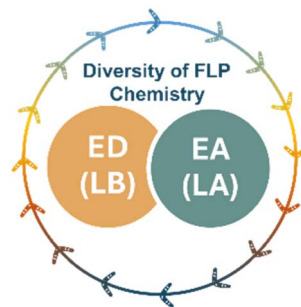
**Inside cover**  
See Dmytro F. Perepichka *et al.*, pp. 18101–18112. Image reproduced by permission of Mohammad Hossein Gohari from *Chem. Sci.*, 2025, **16**, 18101. Some parts of the image generated using Microsoft Copilot AI.

## COMMENTARY

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### A reflection on frustrated Lewis pairs 20 years on: the gift that keeps on giving

Rebecca L. Melen\* and Douglas W. Stephan\*

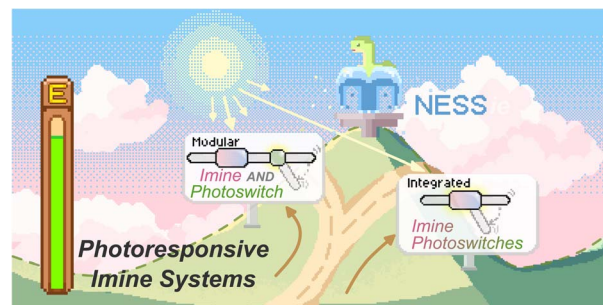


## PERSPECTIVE

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### Light them up: photoresponsive imine-containing systems

Jiarong Wu and Jake L. Greenfield\*



# Environmental Science: Atmospheres

GOLD  
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Fundamental questions  
Elemental answers

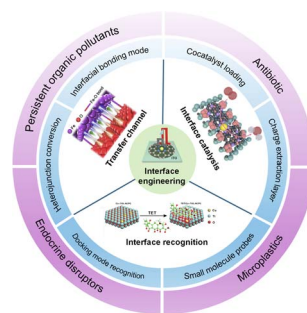


## REVIEWS

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**Recent advances in interface engineering for photoelectrochemical detection of new pollutants**

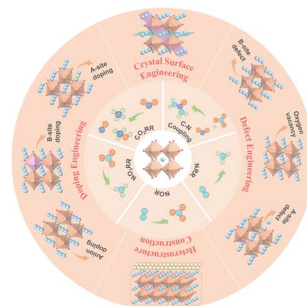
Xiaoyu Dong, Wenhong Yang, Liuyong Hu,\* Wenling Gu\* and Chengzhou Zhu\*



18023

**Perovskite oxides for electrocatalytic nitrogen/carbon fixation**

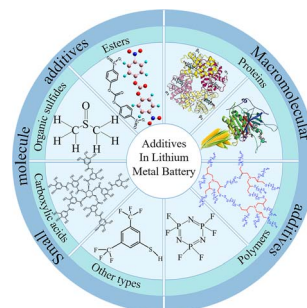
Hui Zheng, Wenping Li, Siwei Ma, Zheng Li, Zhangxing Chen, Longsheng Zhang,\* Jinguang Hu\* and Tianxi Liu\*



18050

**From efficiency to sustainability: organic additives for interfacial regulation in lithium metal batteries**

Wei Gu, Di He, Yuting Qin, Chongchong Fu, Jiahui Lu, Tianyi Wang,\* Guoxiu Wang and Bing Sun\*

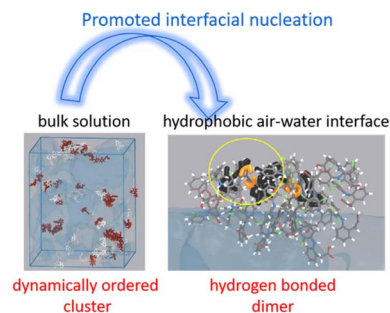


## EDGE ARTICLES

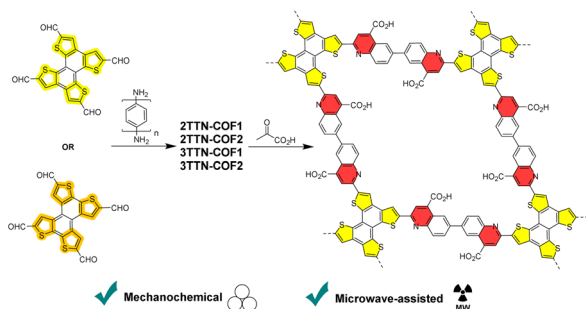
18092

**Promoting organic nucleation of diclofenac: hydrophobic interfacial interactions drive self-assembly**

Hao Lu,\* Eduard Wiedenbeck, Moritz Macht, Daizong Qi, Ali Dhinojwala, Han Zuilhof, Dirk Zahn,\* Helmut Cölfen and Mischa Bonn\*



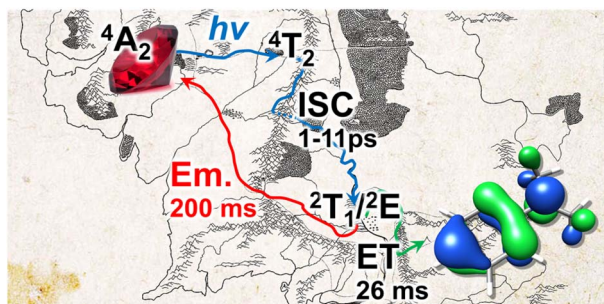
18101



### Mechanochemical synthesis of $\pi$ -conjugated naphthotetrathiphene-based covalent organic frameworks and their post-modification *via* the Doebner reaction

Mohammad Hossein Gohari, Pegah Ghamari, Ehsan Hamzehpoor, Farshid Effaty, Tomislav Frišćić and Dmytro F. Perepichka\*

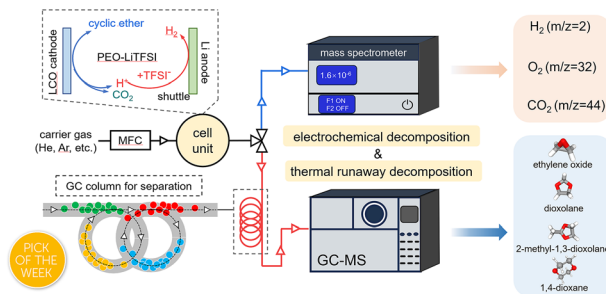
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### Unraveling the photoredox chemistry of a molecular ruby

Guangjun Yang, Georgina E. Shillito, Phillip Seeber, Oliver S. Wenger and Stephan Kupfer\*

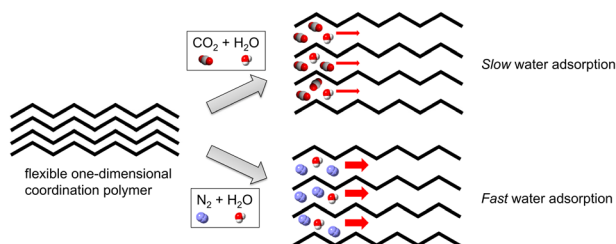
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### *In situ* analysis of gaseous products from PEO-based polymer electrolyte decomposition

Yuan Tian, Nanbiao Pei, Jiyuan Xue, Jinzhi Wang, Haitang Zhang, Wenbin Tu,\* Xin Sun,\* Peng Zhang,\* Yu Qiao\* and Shi-Gang Sun

18135



### Coexisting gases regulate the rates of water adsorption by a flexible one-dimensional coordination polymer

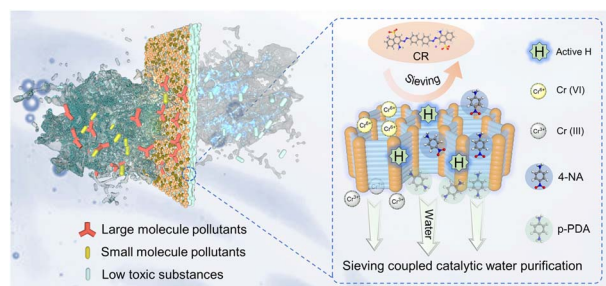
AnQi Wang, Xin Zheng, Yuki Saito, Arata Tateishi, Yuan Huang, Yuichi Kamiya, Hiroyasu Sato, Atsushi Kondo, Kiyonori Takahashi, Takayoshi Nakamura and Shin-ichiro Noro\*



18141

### Covalent organic framework catalytic membranes for durable multitasking water purification

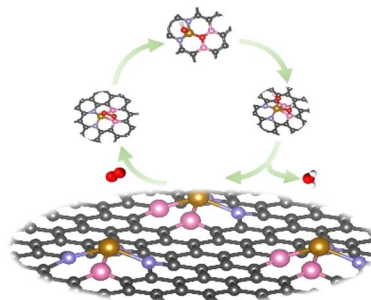
Guishan Hu, Binyu Zhou, Yu Zhen, Junyong Zhu,\*  
Jingwei Hou, Yatao Zhang,\* Yong Wang\*  
and Bart Van der Bruggend



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### Dual-function synergy in boron-doped Fe–N–C: enhanced site density and intrinsic activity

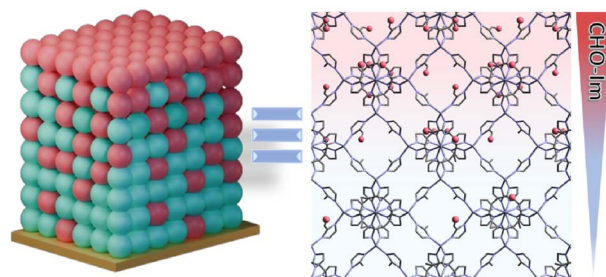
Jinjing Tao, Xin Guan, Xiaolong Yang, Jingsen Bai,  
Chuanfu Li, Xiaohui Liu, Minhua Shao, Meiling Xiao,\*  
Changpeng Liu\* and Wei Xing\*



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### Spatial functionality gradient in a ZIF-8 thin film membrane

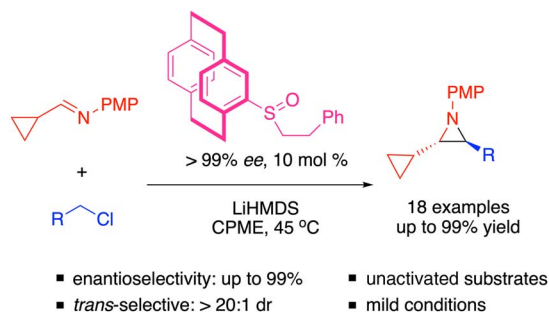
KM. Archana Yadav, Girish Mishra, Susmita Kundu,  
Soumya Ghosh and Ritesh Halder\*



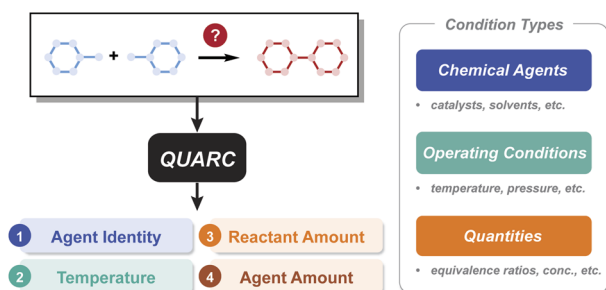
18167

### Sulfonate anion catalyzed enantio- and diastereoselective aziridination

Youge Pu, Anthony M. Smaldone, Javier Adrio\*  
and Patrick J. Walsh\*



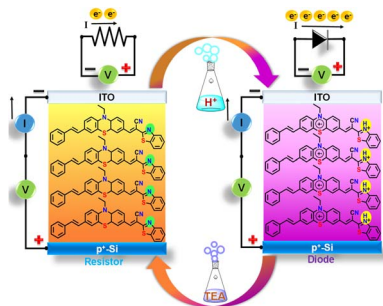
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### Data-driven recommendation of agents, temperature, and equivalence ratios for organic synthesis

Xiaoqi Sun, Jiannan Liu, Babak Mahjour, Klavs F. Jensen and Connor W. Coley\*

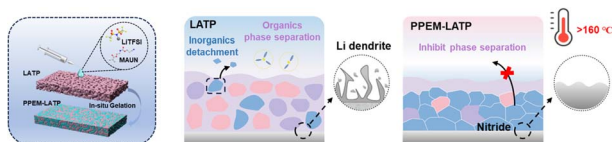
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### Acid vapor-induced enhanced electrical current rectification in phenothiazine-based electronic devices

Reshma Kumari, Nila Pal, Rajwinder Kaur, Gunjan, Ritika Sharma, Debashree Manna, Konstantin Katin, Prakash Chandra Mondal\* and Marilyn Daisy Milton\*

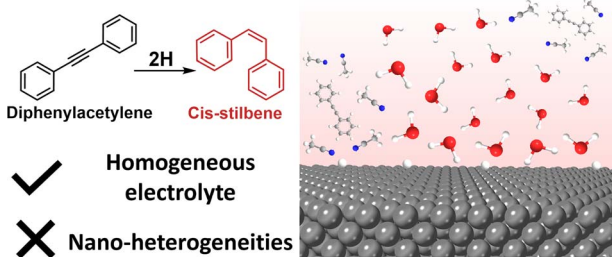
18201



### A cyanate-functionalized polymer composite electrolyte with a self-healing gradient SEI affords ultra-thermally stable lithium batteries

Jiakai Wang, Siyu Zhang, Linchen Zhang, Shenzhen Deng, Yuanyuan Sun, Yimou Wang, Jinglin Wang, Weidong Zhou,\* Zhongtao Li\* and Mingbo Wu

18211



### Optimizing semi-hydrogenation of unsaturated hydrocarbons by electrolyte engineering approach

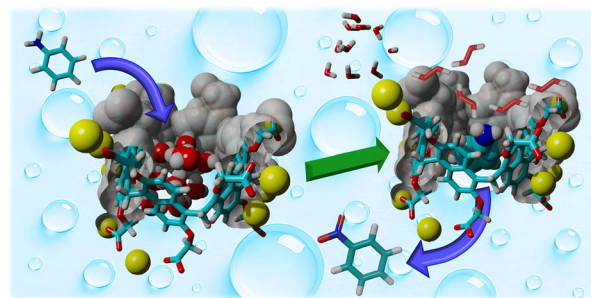
Rongyu Zhang, Xingyi Lyu, Tao Li and Alexis Grimaud\*



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### Carboxylato-prism[6]arene as a supramolecular catalyst in water: exploiting its deep hydrophobic cavity for green oxidation of aromatic amines

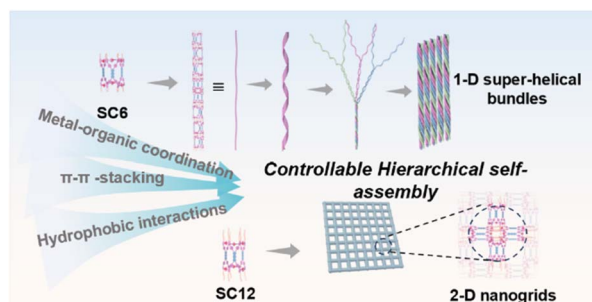
Rocco Del Regno, Giuseppa Campanile, Placido Neri, Carmen Talotta, Antonio Rescifina,\* Carmelo Sgarlata,\* Giuseppina D. G. Santonoceta, Carmine Gaeta and Margherita De Rosa\*



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### Tailoring multi-dimensional hierarchical self-assembly of metallacages through balancing non-covalent interactions

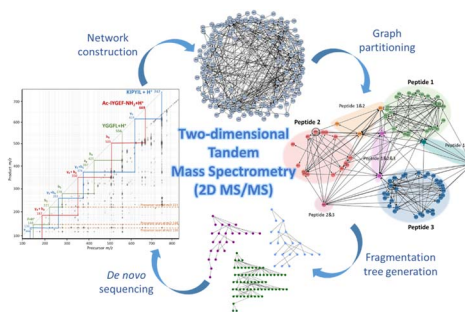
Xin Jiang, Yaping Xu, Haixin Zhang, Hao Yu, Ningxu Han, Xu Guo, Zinuo Gao, Xinrui Zhang, Haopeng Li, Lei Ge, Jiaqi Han, Shaocheng Shen, Jing Yu,\* Kun Wang,\* Yunyan Qiu\* and Ming Wang\*



18243

### Framework for *de novo* sequencing of peptide mixtures via network analysis and two-dimensional tandem mass spectrometry

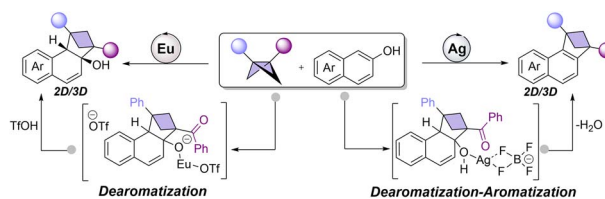
MyPhuong T. Le, Yu Zhu, Eric T. Dziekonski, Dylan T. Holden, David F. Gleich and R. Graham Cooks\*



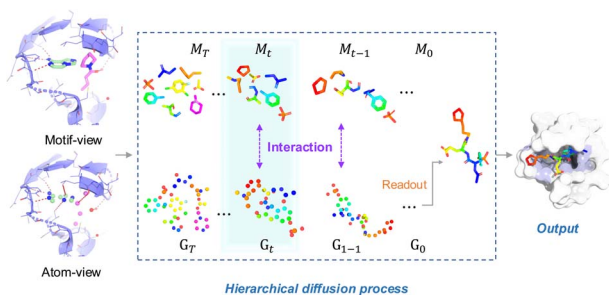
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### Regiodivergent Lewis acid catalysis of bicyclo[1.1.0]butanes with 2-naphthols

Lin Fan, Pengyang Wang, Chang He, Xiaoyu Chen, Linlong Dai, Daokai Xiong and Guofu Zhong\*



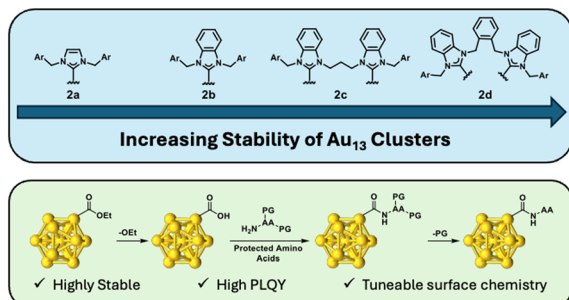
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### Molecule generation for target protein binding with hierarchical consistency diffusion model

Guanlue Li, Chenran Jiang, Ziqi Gao, Yu Liu, Chenyang Liu, Jian Chen, Yong Huang\* and Jia Li\*

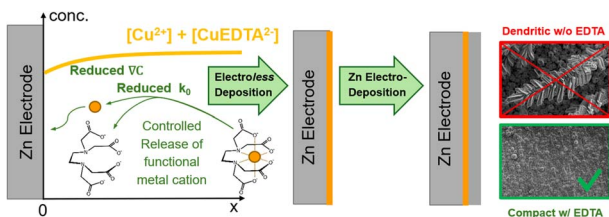
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### Tuning the surface chemistry of NHC-protected Au<sub>13</sub> nanoclusters via a robust amide coupling procedure

Andrew L. D. M. Laluk, Dennis A. Buschmann, Shinjiro Takano, Angus I. Sullivan, Parimah Aminfar, Kevin Stamplecoskie,\* Tatsuya Tsukuda\* and Cathleen M. Crudden\*

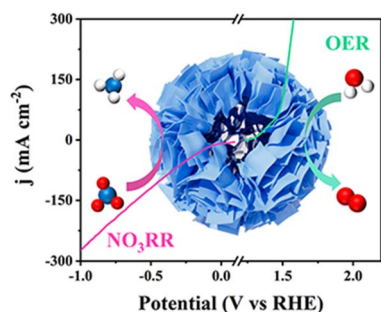
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### Chelation-regulated release of alloying species stabilizes electrochemical interfaces on metal anodes in batteries

Rustam K. Gandhi, Sydney Manning and J. X. Kent Zheng\*

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### High-entropy sulfide nanoflowers with multi-atomic catalytic sites for efficient nitrate-to-ammonia conversion

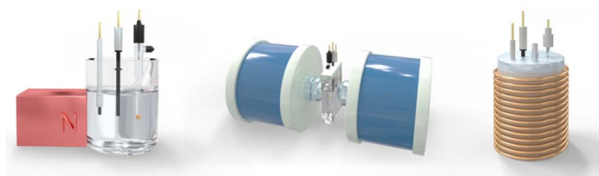
Yuanting Lei, Lili Zhang, Xiaochen Wang, Dan Wang, Yafei Zhao, Bing Zhang, Ning Zhang\* and Huishan Shang\*



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### Harnessing magnetic fields: temporal–spatial enabling in water-splitting electrocatalysis

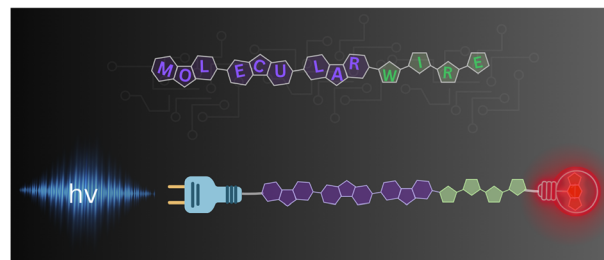
Jin-Hua Liu, Jie Zheng, Lingyun Li, Wenhua Yang, Shuaijie Wang, Yu-Ze Sun, Jun Zhang, Seeram Ramakrishna, Yun-Ze Long\* and Yusuke Yamauchi\*



18318

### Exciton structure and dynamics in $\pi$ -conjugated molecular wires

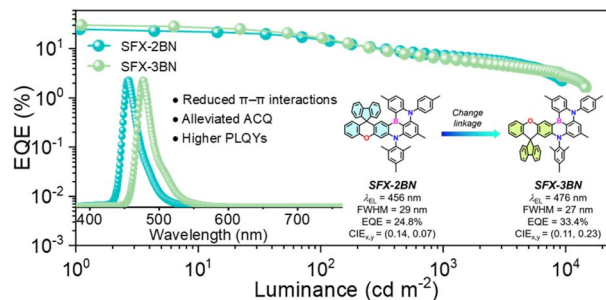
Naresh Duva, Habtom B. Gobeze, Isai Barboza-Ramos and Kirk S. Schanze\*



18332

### Peripherally fused spiro structures enable the development of narrowband TADF emitters for highly efficient blue OLEDs

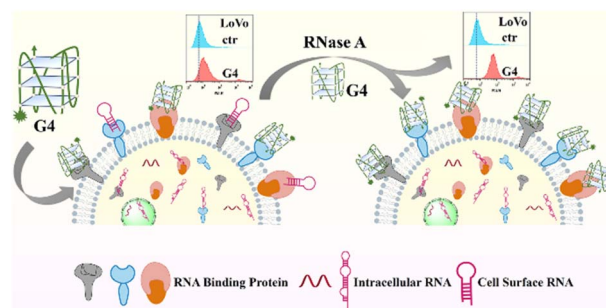
Deli Li, Denghui Liu, Mengke Li, Qingchao Liu, Wei Liu, Wei Li,\* Shi-Jian Su\* and Xuchuan Jiang\*



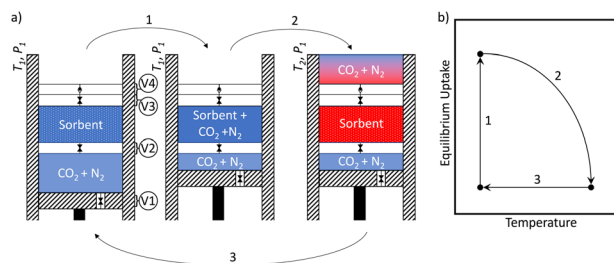
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### A preliminary profile of RNA bound on the cell surface

Xiangru Zhang, Weiwei Li, Guomiao Liao, Yu Zhang, Jing Sheng, Zhenhao Long, Nan Zhang, Ji Zhu, Xiangjun Liu and Dihua Shangguan\*



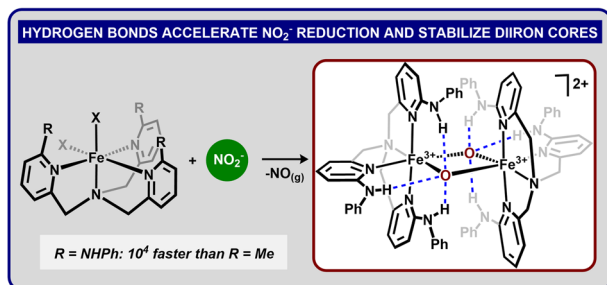
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### Intrinsic direct air capture

Austin McDannald,\* Daniel W. Siderius, Brian DeCost, Kamal Choudhary and Diana L. Ortiz-Montalvo

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### Rapid nitrite reduction enabled by secondary sphere hydrogen bonds within non-heme iron complexes

Andrew R. LaDuca, Jared E. Gonder, Writhabrata Sarkar, John D. Gilbertson\* and Nathaniel K. Szymczak\*

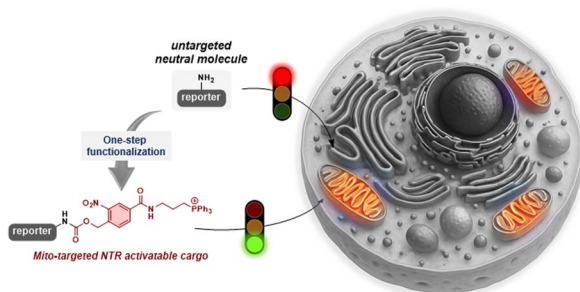
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### Potential-driven dynamic strain in chemical bonds for urea electrosynthesis

Xin Zhang, Hao Sun, Hai-Yan Zheng, Zhan Shi, Jian-Rong Zeng, Jing-Yao Liu,\* Chun-Yi Sun\* and Zhong-Min Su\*

18383



### A mitochondria targeted nitroreductase-sensitive self-immolative spacer as an efficient shuttle for uncharged amine-based molecules

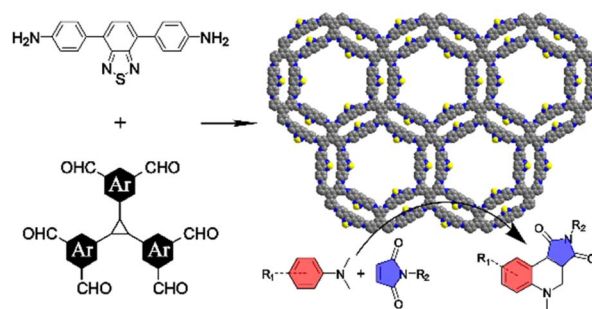
Laurane Michel, Vincent Steinmetz, Sophia Godel-Pastre, Philippe Durand and Arnaud Chevalier\*



18390

## Reticular chemistry guided construction of Olympic rings-inspired two-dimensional covalent organic frameworks for photocatalysis

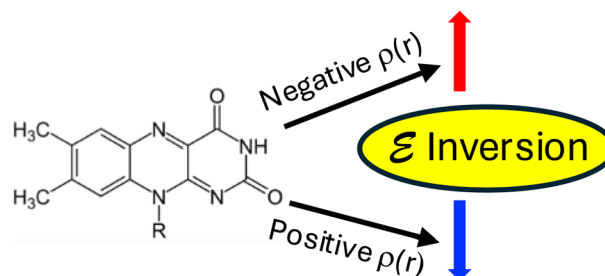
Ze-Yang Wang, Chao-Qin Han, Jia-Xin Guo, Shuai Sun and Xiao-Yuan Liu\*



18398

## The influence of protein electrostatics on potential inversion in flavoproteins

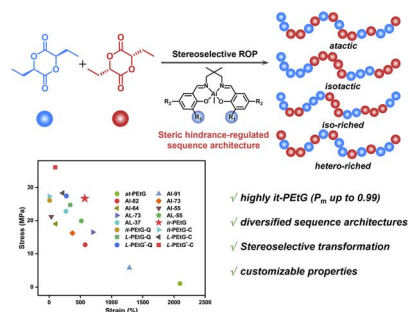
Niven Singh, Peng Zhang and David N. Beratan\*



18411

## Stereoselective ring-opening polymerization of racemic ethylglycolide: precisely regulated polyester properties via stereomicrostructure control

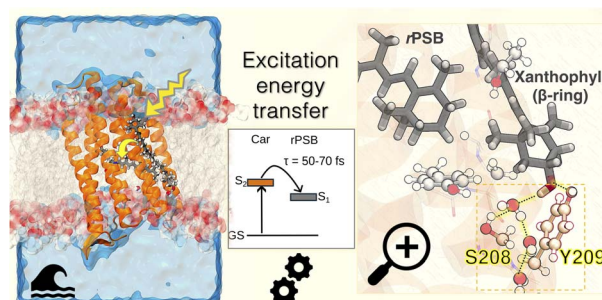
Jinbo Hu, Xinyan Liu, Yeqi Du, Wenbo Wang, Tianchang Wang, Hao Zhang, Ranlong Duan,\* Xinchao Bian\* and Xuesi Chen



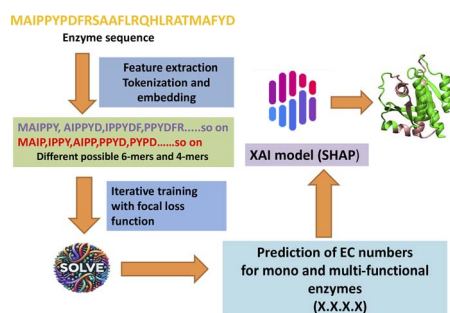
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## Structural and spectroscopic basis of excitation energy transfer in microbial rhodopsins binding xanthophylls

Giacomo Salvadori, Piermarco Saraceno, Alisia Santomieri, Chris John and Laura Pedraza-González\*



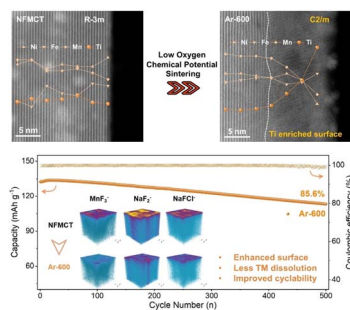
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## Prediction of enzyme function using an interpretable optimized ensemble learning framework

Saikat Dhivar, Sumon Basak and Biman Jana\*

18450



## Surface reconstruction driven by low oxygen chemical potential sintering: unlocking superior material properties

Shuai Zhang, Jiexi Wang, Zhengwei Xu, Muzhou Li, Zhixing Wang, Huajun Guo, Xinhai Li, Wenjie Peng, Hui Duan, Guangchao Li and Guochun Yan\*

