

# Chem Soc Rev

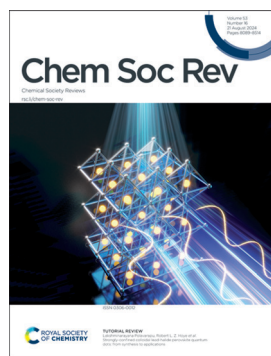
Chemical Society Reviews

rsc.li/chem-soc-rev

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 0306-0012 CODEN CSRVBR 53(16) 8089-8514 (2024)



### Cover

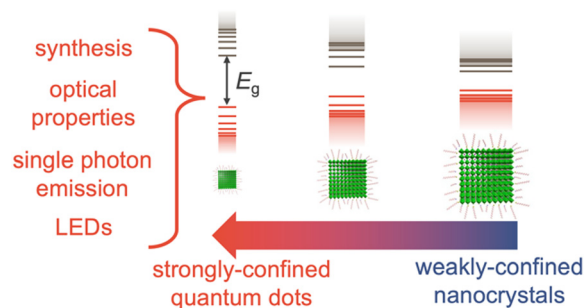
See Lakshminarayana Polavarapu, Robert L. Z. Hoye *et al.*, pp. 8095-8122. Image reproduced by permission of Robert Hoye and Junzhi Ye from *Chem. Soc. Rev.*, 2024, 53, 8095.

## TUTORIAL REVIEWS

8095

### Strongly-confined colloidal lead-halide perovskite quantum dots: from synthesis to applications

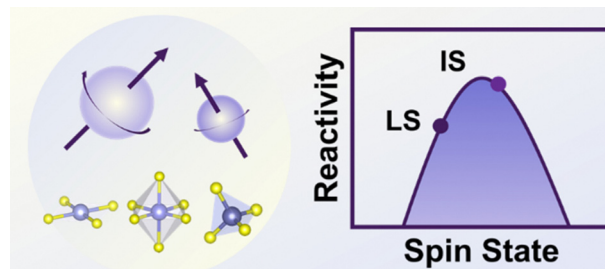
Junzhi Ye, Deepika Gaur, Chenjia Mi, Zijian Chen, Iago López Fernández, Haitao Zhao, Yitong Dong, Lakshminarayana Polavarapu\* and Robert L. Z. Hoye\*



8123

### Spin states of metal centers in electrocatalysis

Yuwei Zhang, Qian Wu, Justin Zhu Yeow Seow, Yingjie Jia, Xiao Ren\* and Zhichuan J. Xu\*



# Advance your career in science

with professional recognition that showcases  
your **experience, expertise and dedication**

## Stand out from the crowd

Prove your commitment  
to attaining excellence in  
your field

## Gain the recognition you deserve

Achieve a professional  
qualification that inspires  
confidence and trust

## Unlock your career potential

Apply for our professional  
registers (RSci, RSciTech)  
or chartered status  
(CChem, CSci, CEnv)

## Apply now

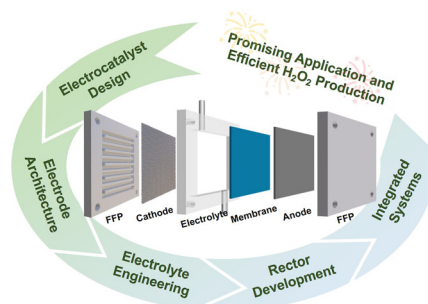
[rsc.li/professional-development](https://rsc.li/professional-development)



8137

## Advancing H<sub>2</sub>O<sub>2</sub> electrosynthesis: enhancing electrochemical systems, unveiling emerging applications, and seizing opportunities

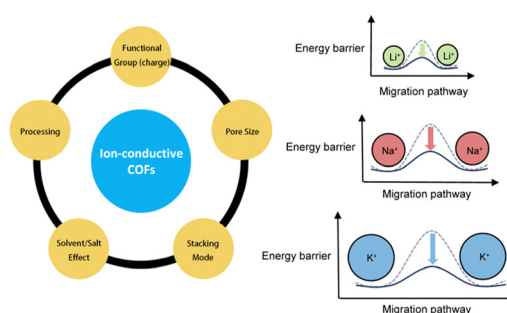
Zhiping Deng, Seung Joon Choi, Ge Li\* and Xiaolei Wang\*



8182

## Ion transport mechanisms in covalent organic frameworks: implications for technology

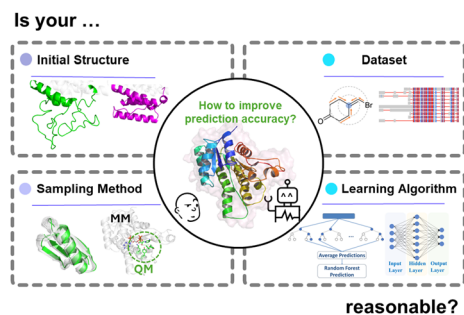
Wonmi Lee, Haochen Li, Zhilin Du and Dawei Feng\*



8202

## Navigating the landscape of enzyme design: from molecular simulations to machine learning

Jiahui Zhou and Meilan Huang\*



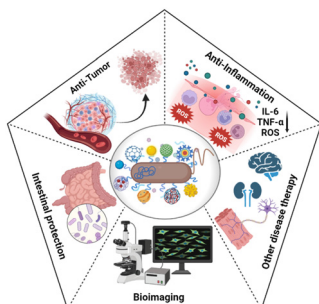
8240

## Nature-inspired adhesive systems

Ming Li,\* Anran Mao, Qingwen Guan and Eduardo Saiz\*



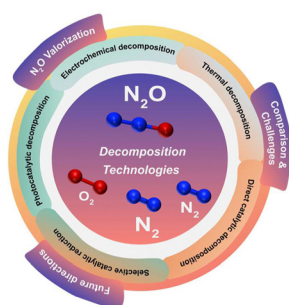
8306



### Microbe-material hybrids for therapeutic applications

Meng Chen, Lili Xia, Chenyao Wu, Zeyu Wang, Li Ding,\*  
Yujie Xie,\* Wei Feng\* and Yu Chen\*

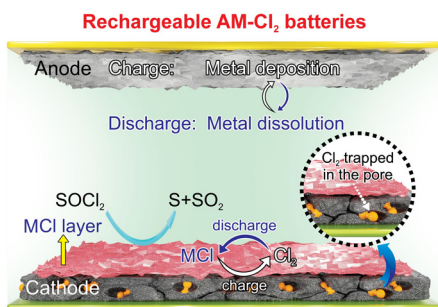
8379



### Progress and challenges in nitrous oxide decomposition and valorization

Xuanhao Wu, Jiaxin Du, Yanxia Gao, Haiqiang Wang,  
Changbin Zhang, Runduo Zhang,\* Hong He,\*  
Gaoqing (Max) Lu\* and Zhongbiao Wu\*

8424

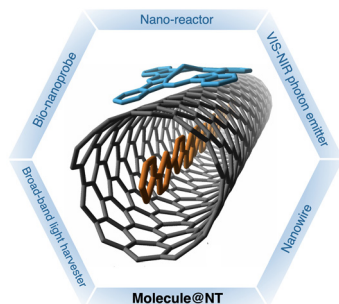


### Rechargeable AM-Cl<sub>2</sub> batteries

### Rechargeable alkali metal–chlorine batteries: advances, challenges, and future perspectives

Zehui Xie, Lidong Sun, Muhammad Sajid,  
Yuancheng Feng, Zhenshan Lv and Wei Chen\*

8457



### Advanced 1D heterostructures based on nanotube templates and molecules

Charlotte Allard, Laurent Alvarez, Jean-Louis Bantignies,  
Nedjma Bendiab, Sofie Cambré, Stéphane Campidelli,  
Jeffrey A. Fagan, Emmanuel Flahaut, Benjamin Flavel,  
Frédéric Fossard, Etienne Gaufres,\* Sebastian Heeg,  
Jean-Sebastien Lauret, Annick Loiseau,  
Jean-Baptiste Marceau, Richard Martel, Laëticia Marty,  
Thomas Pichler, Christophe Voisin, Stephanie Reich,  
Antonio Setaro, Lei Shi and Wim Wenseleers

