

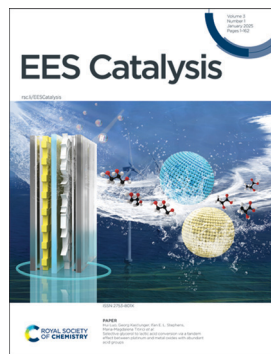
# EES Catalysis

rsc.li/eescatalysis

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

eISSN 2753–801X CODEN ECEACE 3(1) 1–162 (2025)



### Cover

See Hui Luo, Georg Kastlunger, Ifan E. L. Stephens, Maria-Magdalena Titirici *et al.*, pp. 87–96. Image reproduced by permission of Magda Titirici from *EES Catal.*, 2025, 3, 87.

## EDITORIAL

8

### **EES Catalysis: embracing energy and environmental catalysis**

Shi-Zhang Qiao

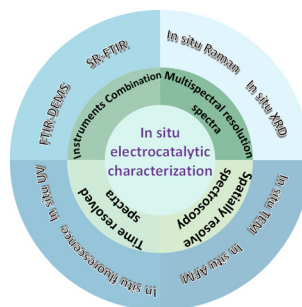


## REVIEWS

10

### **Progress in *in situ* characterization of electrocatalysis**

Wei Shen, Yizhen Ye, Qiujiu Xia and Pinxian Xi\*



# 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%**

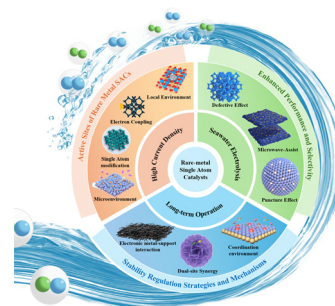


## REVIEWS

32

### Rare-metal single atom catalysts for large scale hydrogen production under actual operating conditions

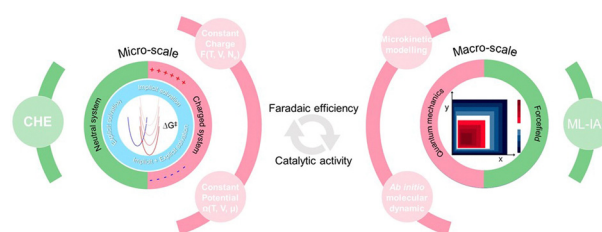
Jiaye Li, Xu Tian, Changle Yue, Han Guo, Zhidong Wang, Mengdi Guo, Siying Huang, Yang Song, Wei Lin,\* Yichuan Li, Bin Liu\* and Yuan Pan\*



57

### Advancing electrochemical N<sub>2</sub> reduction: interfacial electrolyte effects and *operando* computational approaches

Lin Jiang, Xiaowan Bai, Xing Zhi, Kenneth Davey and Yan Jiao\*

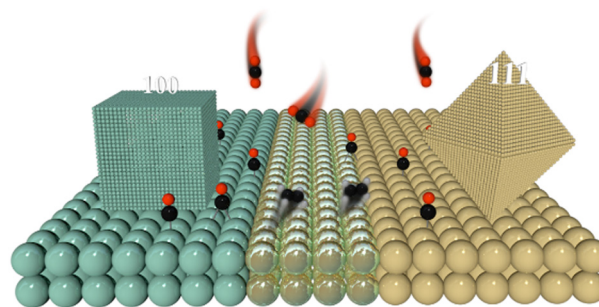


## COMMUNICATION

80

### Interplanar synergy of a copper-based electrocatalyst favors the reduction of CO<sub>2</sub> into C<sub>2+</sub> products

Jiangnan Li, Xinyi Duan, Chao Wu, Yucheng Cao, Zhiyao Duan, Wenjun Fan,\* Peng Zhang\* and Fuxiang Zhang\*

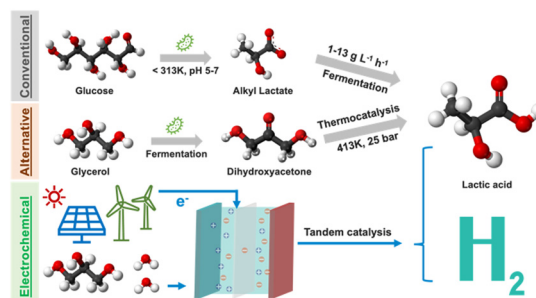


## PAPERS

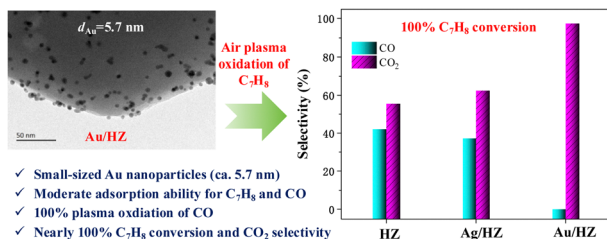
87

### Selective glycerol to lactic acid conversion *via* a tandem effect between platinum and metal oxides with abundant acid groups

Hui Luo,\* Mianle Xu, Sihang Liu, Giulia Tarantino, Hanzhi Ye, Hossein Yadegari, Alain Y. Li, Ceri Hammond, Georg Kastlunger,\* Ifan E. L. Stephens\* and Maria-Magdalena Titirici\*



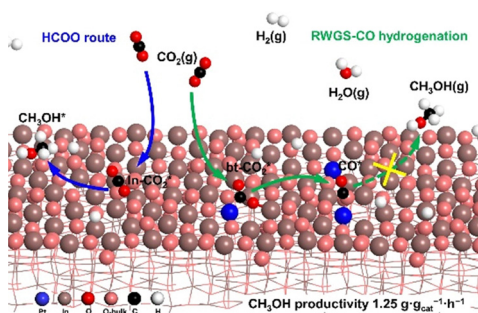
97



### A supported Au/HZSM-5 catalyst for toluene removal by air plasma catalytic oxidation using the cycled storage-discharge (CSD) mode

Amin Zhou, Xiao-Song Li,\* Jing-Lin Liu, Lan-Bo Di\* and Ai-Min Zhu

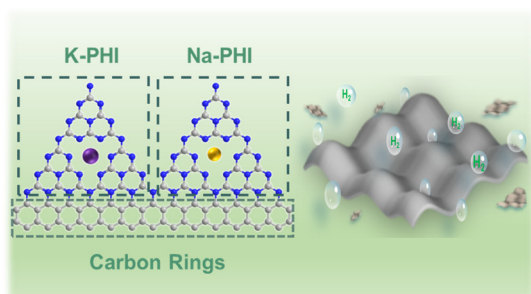
106



### Computer-aided design of Pt/In<sub>2</sub>O<sub>3</sub> single-atom catalysts for CO<sub>2</sub> hydrogenation to methanol

Yuchen Wang, Zixuan Zhou, Bin Qin, Qingyu Chang, Shanshan Dang, Yiqin Hu, Kun Li, Yuanjie Bao, Jianing Mao, Haiyan Yang, Yang Liu, Jiong Li, Shenggang Li,\* David A. Dixon,\* Yuhan Sun and Peng Gao\*

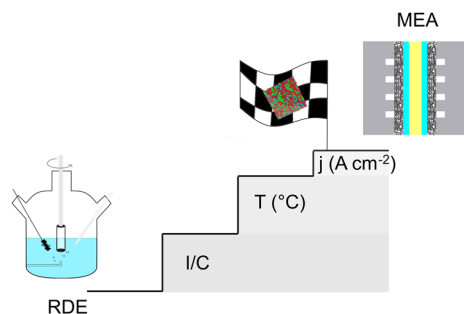
119



### Carbon incorporated isotype heterojunction of poly(heptazine imide) for efficient visible light photocatalytic hydrogen evolution

Ping Niu,\* Haoqing Zhang, Jian Zeng, Tianjian Hu, Meixue Zhang, Chengyao Xie, Boyin Zhai, Jérémy Odent, Shulan Wang and Li Li\*

128



### Unveiling the origins of the activity gap between rotating disk electrodes and membrane electrode assemblies: Pt seed-mediated iridium-doped octahedral platinum nickel catalysts for proton exchange membrane fuel cells

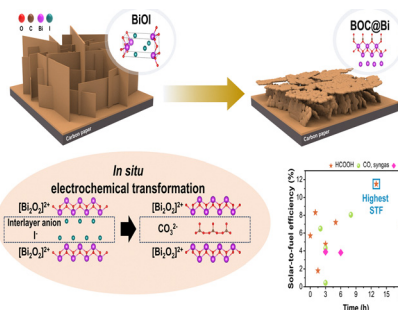
Lujin Pan, Jiasheng Lu, Olivia Dunseath, Michal Ronovský, An Guo, Malte Klingenhof, Xingli Wang, Elisabeth Hornberger, Alex Martinez Bonastre, Harriet Burdett, Jonathan Sharman, Fabio Dionigi\* and Peter Strasser\*



140

### Solar production of fuels from CO<sub>2</sub> with high efficiency and stability via *in situ* transformation of Bi electrocatalysts

Woo Seok Cheon, Su Geun Ji, Jaehyun Kim, Sungkyun Choi, Jin Wook Yang, Sang Eon Jun, Changyeon Kim, Jeewon Bu, Sohyeon Park, Tae Hyung Lee, Jinghan Wang, Jae Young Kim, Sol A Lee, Jin Young Kim\* and Ho Won Jang\*



152

### Unidirectional bubble transportation on slippery micro-cone array electrodes enables spontaneous 99.99% gas separation in membrane-less water electrolysis

Linfeng Yu, Yingze Yang, Pengpeng Xie, Qingzhen Xu, Anuj Kumar, Liang Luo,\* Hui Li, Haijun Xu, Haohong Duan\* and Xiaoming Sun\*

