

Catalysis Science & Technology

A multidisciplinary journal focussing on all fundamental science and technological aspects of catalysis

rsc.li/catalysis

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 2044-4761 CODEN CSTAGD 15(1) 1-222 (2025)



Cover
See Hajime Kawanami *et al.*, pp. 52–61.
Image reproduced by permission of Hajime Kawanami from *Catal. Sci. Technol.*, 2025, 15, 52.



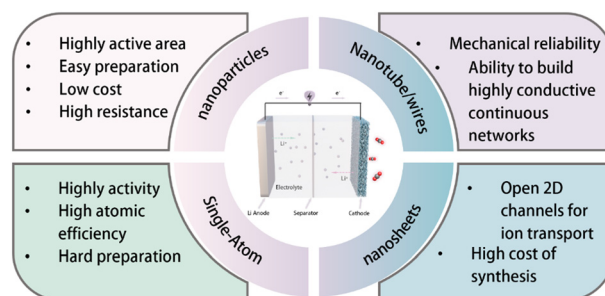
Inside cover
See Andrew C. Chien and Corinna C. Chi, pp. 62–70.
Image reproduced by permission of Andrew C. Chien from *Catal. Sci. Technol.*, 2025, 15, 62.

REVIEW

11

Scale and morphology design of metal-based catalysts for enhanced Li–CO₂ battery performance

Jingzhao Wang, Xiangming Cui, Mi Zhou, Xin Chen, Shiyi Sun, Kai Yang, Jianan Wang* and Wei Yan

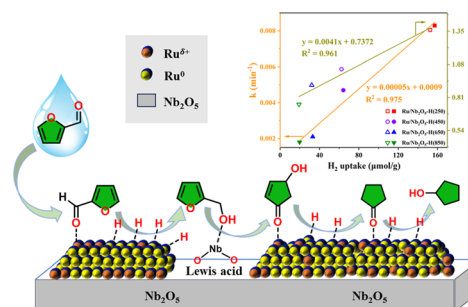


COMMUNICATIONS

33

Correlation of the catalytic performance with Ru^{δ+} species on Ru/Nb₂O₅ in furfural aqueous reductive conversion

Yulong Deng, Binyu Zhang, Huiru Wu, Zhuo He, Xiaorui Du, Jiayi Ou, Tianyu Ren, Haiyong Wang, Yuhe Liao, Qiying Liu,* Chenguang Wang* and Yanbin Cui*





EES Batteries

Exceptional research on
batteries and energy storage

Part of the EES family

**Join
in** | Publish with us
rsc.li/EESBatteries

Registered charity number: 207890

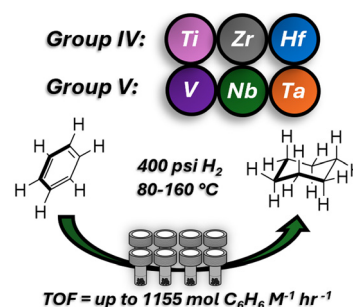


COMMUNICATIONS

41

Benzene hydrogenation utilizing organometallic early transition metal precursors

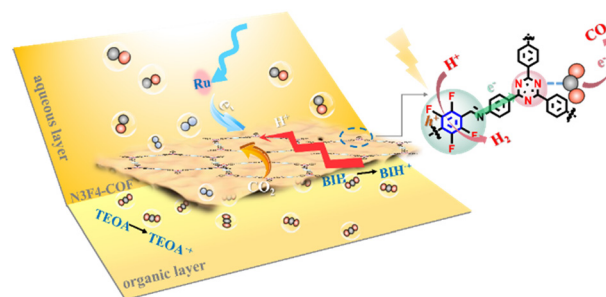
Reece Johnson, Peijie Hu, James Pugh, Rahul Kootanil Haridasan and Keith Searles*



46

Fluorinated covalent organic frameworks for visible-light driven CO₂ reduction

Wei-Jia Wang,* Bin Li, Jing Gao and Kaihong Chen*



PAPERS

52

Iridium complexes supported on cross-linked polyacrylic acid as release-and-catch catalysts for continuous formic acid dehydrogenation

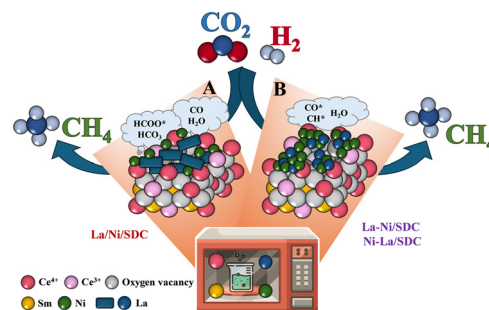
Keito Sawahara, Shinji Tanaka, Ryota Gemma, Ryoichi Kanega and Hajime Kawanami*



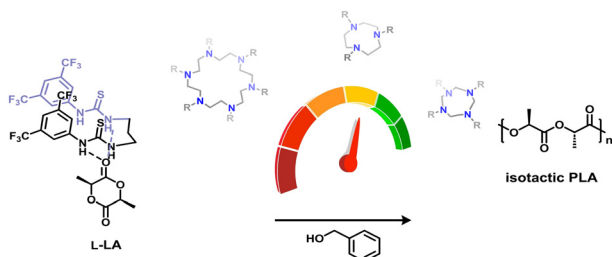
62

Effect of metal loading sequences in CO₂ methanation activity on samarium-doped ceria supported bimetallic catalysts

Andrew C. Chien* and Corinna C. Chi



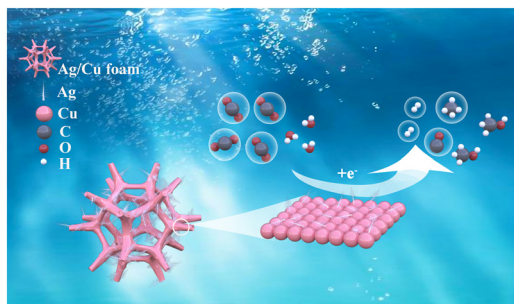
71



Bis-thiourea and macrocyclic polyamines as binary organocatalysts for the ROP of lactide

Assunta D'Amato, Maria Voccia, Filippo Bruno, Sara D'Aniello, Lucia Caporaso,* Francesco De Riccardis, Irene Izzo, Giorgio Della Sala* and Mina Mazzeo*

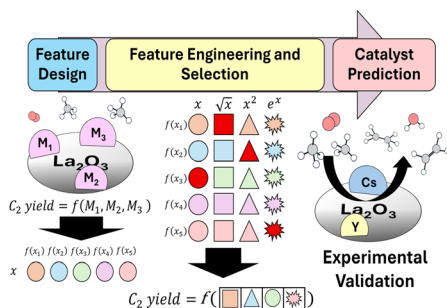
81



Ag/Cu foam catalyst for selective reduction of CO₂ to CH₃OH at low potential

Ruitao Nie, Xiaolong Deng, Haoyu Yang, Hongwei Chen, Jie Yang, Meiyi Lu, Keqi Peng, Xiaoyu Zhou, Chen Yang, Juan Xie* and Hu Wang*

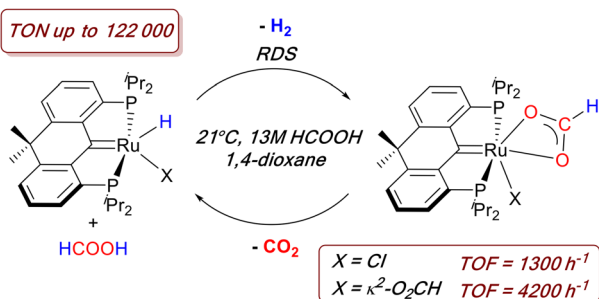
92



Design of low temperature La₂O₃ oxidative coupling of methane catalysts using feature engineering and automated sampling

Fernando Garcia-Escobar,* Lauren Takahashi, Ali Shaaban, Shun Nishimura and Keisuke Takahashi*

100



Rapid and selective formic acid dehydrogenation catalysis by molecular ruthenium hydrides supported by rigid PC_{carbene}P pincer ligands

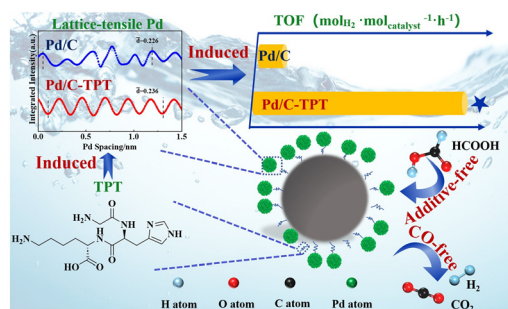
Laurie J. Donnelly, Benjamin S. Gelfand and Warren E. Piers*



107

Exploiting tripeptide in Pd/C for boosting hydrogen production from formic acid dehydrogenation

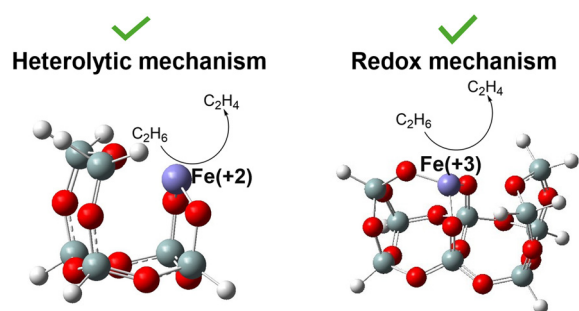
Yan Gu, Hongli Wang,* Yaohao Zhang, Lu Yang, Xiaoshan Liu and Xuesong Li*



114

On the mechanisms of ethane dehydrogenation on silica-supported mononuclear Fe

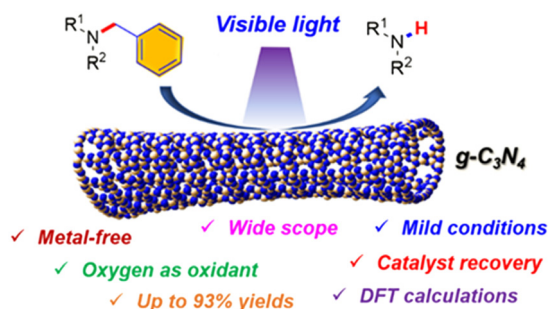
Sakshi Satyanand, Sanjana Srinivas, Dionisios G. Vlachos* and Stavros Caratzoulas



123

Green photocatalytic N-debenzylations with molecular oxygen catalyzed by recyclable metal-free tubular carbon nitride

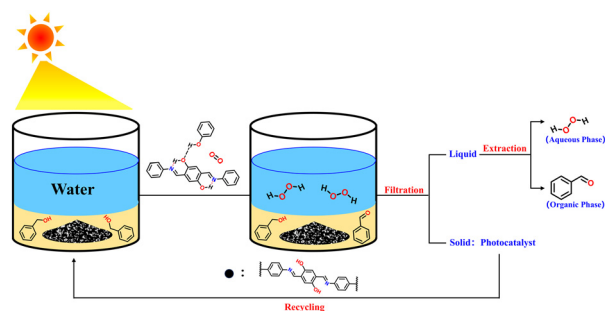
Yufeng Wu,* Jiajie Kang, Jianing Li, Mingshu Bi and Qingwei Meng



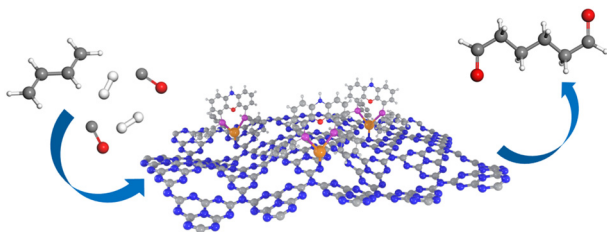
135

Phenol hydroxyl-modified imine-based covalent organic frameworks for enhanced solar-driven generation of H₂O₂ via hydrogen bonds

Lang Chen, Song Qin, Jiahui Hang, Bo Chen, Jinyang Kang, Yang Zhao, Shanyong Chen, Yongdong Jin, Hongjian Yan, Yuanhua Wang* and Chuanqin Xia*



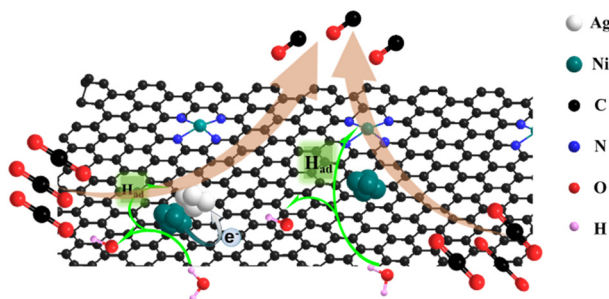
145



Investigation on heterogeneous Rh catalysts for the hydroformylation of 1,3-butadiene to adipic aldehyde

Lijin Gan, Zekun Liu, Lei Feng, Yi Duan, Guangyuan Xu, Si Chen and Huan Yan*

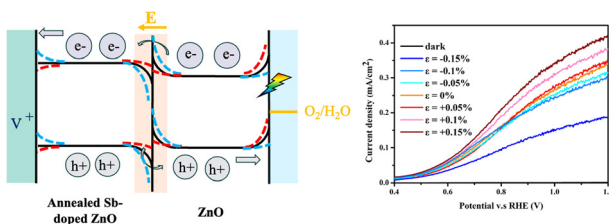
154



Alignment of active sites on Ag–Ni catalysts for highly selective CO₂ reduction to CO

Huangdong Wang, Zhihua Guo, Heng Zhang, Lin Jia, Min Sun, Lifeng Han, Haorun Li, Yan Guo* and Shanghong Zeng*

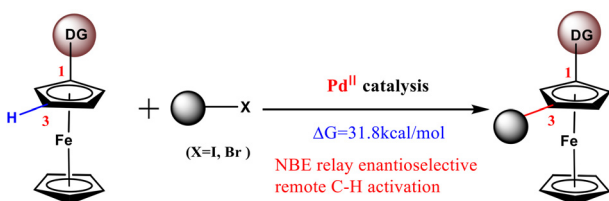
165



Enhancing the photoelectrochemical water splitting efficiency of ZnO P–N homojunction nanorod arrays under the piezocatalyst effect

Yi-Miao Lin, Yu-Liang Hsiao, Chia-Shing Wu, Ying-Chih Pu and Chuan-Pu Liu*

173



Mechanistic insights into an enantioselective synthetic strategy for 1,3-disubstituted planar chiral ferrocenes

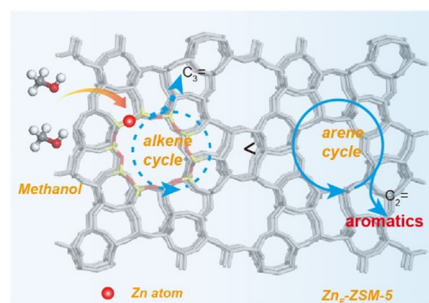
Feiyun Jia,* Chenghua Zhang, Yongsheng Yang, Xueting Zheng and Mingsong Shi*



185

The catalytic relevance of hydrothermally substituted Zn on the zeolite ZSM-5 during the methanol-to-aromatics process

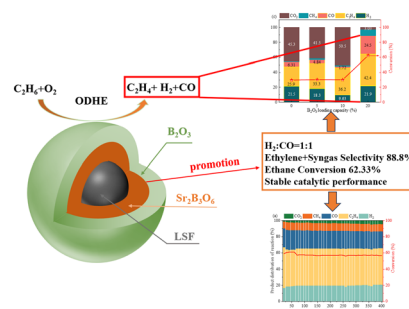
Xin Zhang, Xinyu You, Yunfan Wang, Hexun Zhou, Xue Zhou and Abhishek Dutta Chowdhury*



193

B₂O₃ supported La_{0.8}Sr_{0.2}FeO₃ for direct ethane oxidation into ethylene and syngas for hydroformylation synthesis

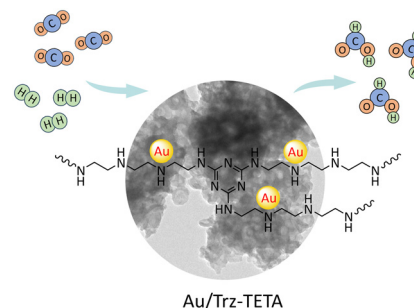
Shan Hu, Yunfei Gao,* Lu Ding, Xueli Chen, Weitong Pan and Fuchen Wang



203

Modulating the electronic interaction between Au and nitrogen-rich porous organic polymers for enhanced CO₂ hydrogenation to formic acid

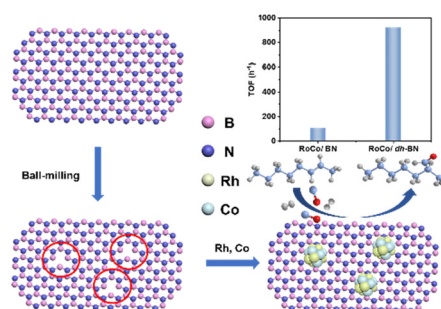
Huixin Yan, Xingyan Wang, Xiaoyu Liang, Xinxin Zhang, Longfei Liu, Min Ji, Min Wang* and Xinkui Wang*



211

Heterogeneous hydroformylation of internal alkenes over a defect-laden hexagonal BN supported RhCo alloy: reaction performance modulated by N vacancies

Bowen Qiu, Shujuan Liu, Shimin Liu, Xinjiang Cui, Dongcheng He, Kang Zhao, Bin Wang and Feng Shi*



CORRECTION

219

Correction: Integrated adsorption and photocatalytic degradation of VOCs using a TiO₂/diatomite composite: effects of relative humidity and reaction atmosphere

Guangxin Zhang,* Arman Peyravi, Zaher Hashisho,* Zhiming Sun,* Yangyu Liu, Shuilin Zheng and Lexuan Zhong

