

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 14(20) 5773–6100 (2024)



Cover

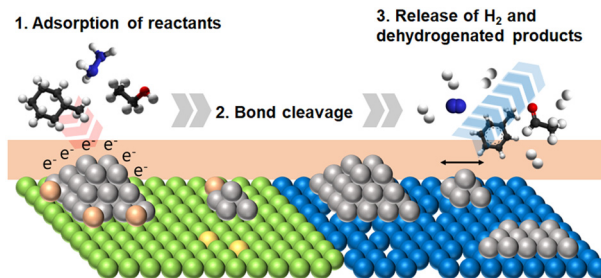
See Lukáš Grajciar *et al.*, pp. 5838–5853.
Image reproduced by permission of Lukáš Grajciar from *Catal. Sci. Technol.*, 2024, 14, 5838.

REVIEWS

5784

Catalytic dehydrogenation for hydrogen production controlled by metal-supported heterogeneous catalysts

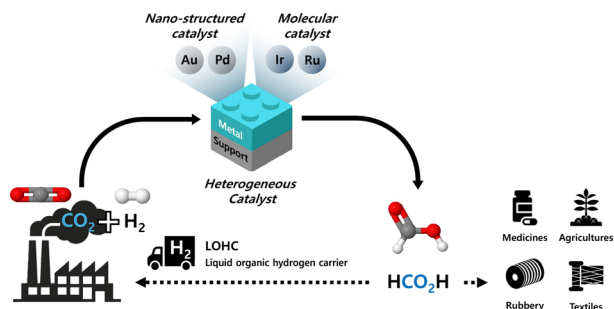
Yuyeol Choi, Xinkai Wu, Ji-Woong Lee* and Kyungsu Na*



5811

Recent progress in heterogeneous CO₂ hydrogenation to formic acid towards practical application

Kwangho Park, Hongjin Park, Hayoung Yoon, Kyung Rok Lee, Sunghye Ahn, Changsoo Kim, Ung Lee, Kwang-Deog Jung* and Sungho Yoon*



ChemComm

Uncover new possibilities with outstanding preliminary research

Original discoveries, fuelling every step of scientific progress

rsc.li/chemcomm

**Fundamental questions
Elemental answers**

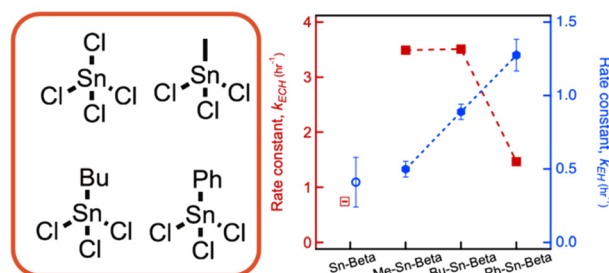


COMMUNICATION

5833

Organo tin precursors for synthesis of zeolite Sn-Beta for alcohol ring opening of epoxides

Alexander P. Spanos, Leah Ford, Jiawei Guo, Ryan Burrows, Ambarish R. Kulkarni and Nicholas A. Brunelli*

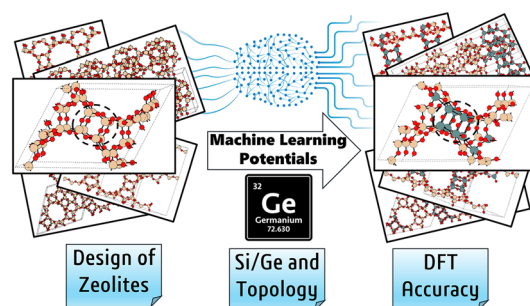


PAPERS

5838

Germanium distributions in zeolites derived from neural network potentials

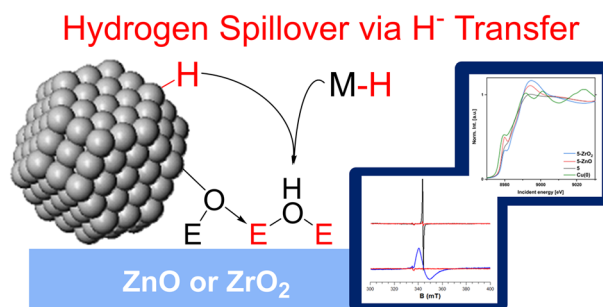
Indranil Saha, Andreas Erlebach, Petr Nachtigall, Christopher J. Heard and Lukáš Grajciar*



5854

Hydrogen spillover through hydride transfer: the reaction of ZnO and ZrO₂ with strong hydride donors

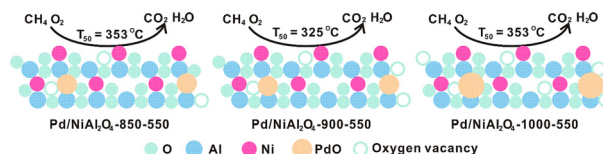
Michael Benz, Osman Bunjaku, Michal Nowakowski, Alexander Allgaier, Indro Biswas, Joris van Slageren, Matthias Bauer and Deven P. Estes*



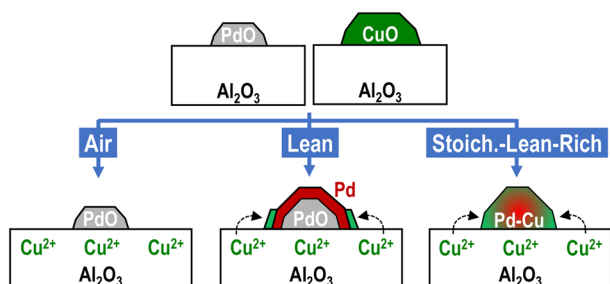
5864

Superior catalytic combustion of methane over Pd supported on oxygen vacancy-rich NiAl₂O₄

Sha Li, Jie Li, Zirui He, Yao Sheng and Wen Liu*



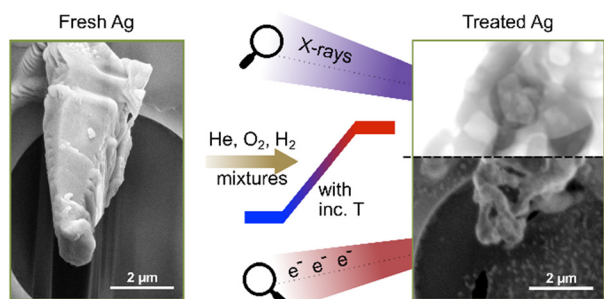
5874



Thermal deactivation of Pd/Al₂O₃-Cu/Al₂O₃-combined three-way catalysts *via* Cu migration and alloying

Zannatul Mumtarin Moushumi, Marina Takeuchi, Masayuki Tsushida, Keisuke Awaya, Hiroshi Yoshida, Junya Ohyama and Masato Machida*

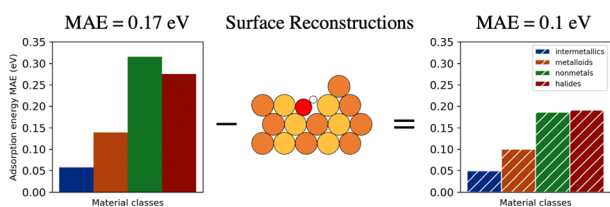
5885



Restructuring of Ag catalysts for methanol to formaldehyde conversion studied using *in situ* X-ray ptychography and electron microscopy

Srashtasrita Das, Maik Kahnt, Youri van Valen, Tina Bergh, Sara Blomberg, Mikhail Lyubomirskiy, Christian G. Schroer, Hilde J. Vervik* and Thomas L. Sheppard*

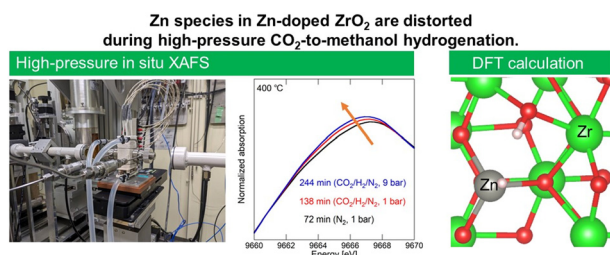
5899



Investigating the error imbalance of large-scale machine learning potentials in catalysis

Kareem Abdelmaqsood, Muhammed Shuaibi, Adeesh Kolluru, Raffaele Cheula and John R. Kitchin*

5909



High-pressure *in situ* X-ray absorption fine structure measurements for hydrogenation of CO₂ to methanol over Zn-doped ZrO₂

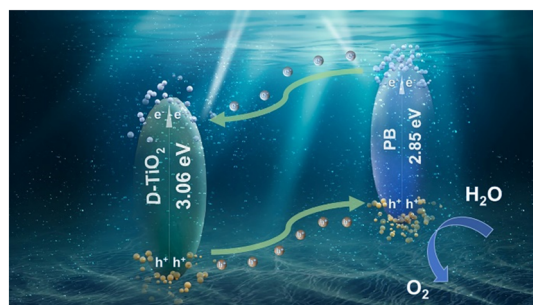
Shohei Tada,* Kazumasa Oshima, Tastuya Joutsuka, Masahiko Nishijima, Ryuji Kikuchi and Tetsuo Honma*



5918

Defective TiO₂ composite photoanodes with surface-modified Prussian blue for efficient photoelectrochemical water splitting

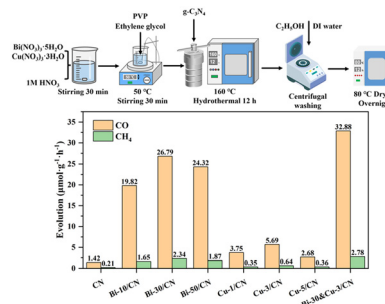
Lipeng Wang, Rui Wang, Longjie Lai,* Waqar Younas, Guobing Mao, Li Zhang and Qi Liu*



5925

Study on graphitic carbon nitride catalysts with Bi and Cu loaded for carbon dioxide photothermal reduction

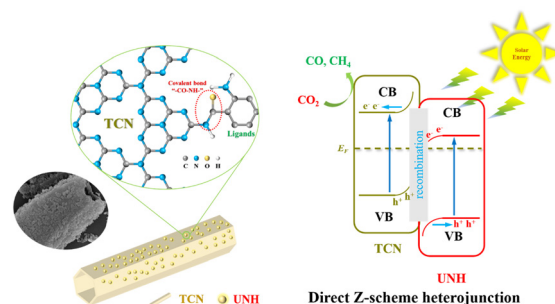
Bin Guan,* Junyan Chen, Zhongqi Zhuang, Lei Zhu, Zeren Ma, Xuehan Hu, Chenyu Zhu, Sikai Zhao, Kaiyou Shu, Hongtao Dang and Zhen Huang



5938

Fabrication of a direct Z-scheme heterojunction of UiO-66-NH₂ and tubular g-C₃N₄ for the stable photocatalytic reduction of CO₂ to CO and CH₄

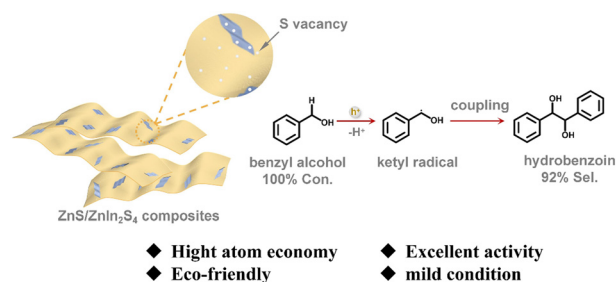
Hongyang Liu, Yang Yang, Chaojun Guo and Yonghua Zhou*



5949

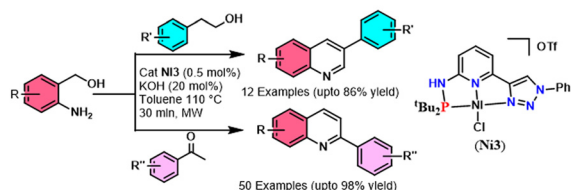
Photocatalytic C–C coupling reactions of benzyl alcohol for obtaining hydrobenzoin over Z-scheme ZnS/ZnIn₂S₄

Xinyu Jin and Chun Cai*



5959

Microwave assisted synthesis of quinolines

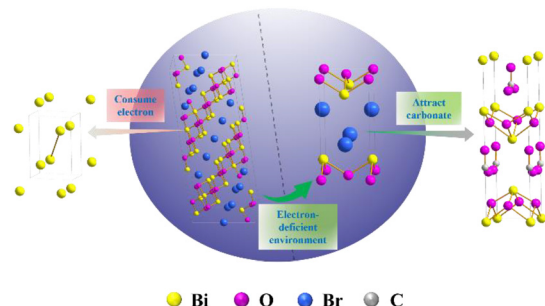


- ✓ Clean reaction
- ✓ H_2O and H_2 are byproducts
- ✓ Mild reaction conditions
- ✓ Earth abundant catalyst
- ✓ Acceptorless dehydrogenation
- ✓ Wide substrate scope

Nickel–PNN catalysed sustainable synthesis of polysubstituted quinolines under microwave irradiation

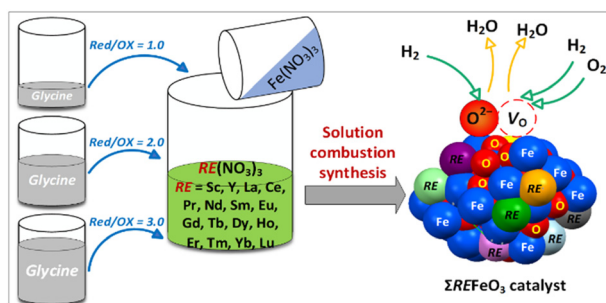
Manali A. Mohite, Sonu Sheokand and Maravanji S. Balakrishna*

5970

Halide-guided carbon-affinity active sites in $\text{Bi}_m\text{O}_n\text{Br}_p$ -derived $\text{Bi}_2\text{O}_2\text{CO}_3$ for efficient electrocatalytic CO_2 reduction to formate

Dengye Yang, Qing Mao,* Yuting Feng and Wei Zhou

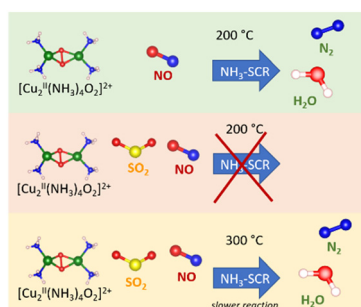
5978



Structure and catalytic activity of ultra-high-entropy rare-earth orthoferrite (UHE REO) towards thermal hydrogen oxidation

Bui Manh Long,* Thanh Son Cam,* Shamil O. Omarov, Lev A. Lebedev, Anna S. Seroglazova, Ekaterina Yu. Stovpiaga, Evgeny Yu. Gerasimov and Vadim I. Popkov

5989

The chemical nature of SO_2 poisoning of Cu-CHA-based SCR catalysts for NO_x removal in diesel exhausts

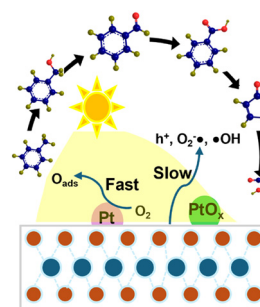
Anastasia Yu. Molokova, Davide Salusso, Elisa Borfecchia, Fei Wen, Stefano Magliocco, Silvia Bordiga, Ton V. W. Janssens,* Kirill A. Lomachenko* and Gloria Berlier*



5996

Synergistic combination of active Pt species and light-driven photothermal catalysis for highly efficient toluene oxidation

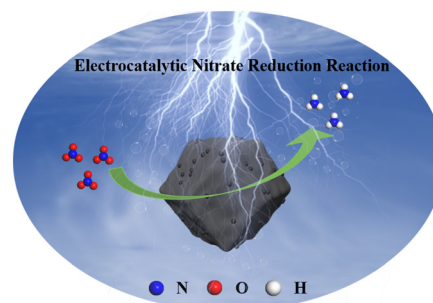
Meng Zhang, Ying Zhang, Qianglong Xu, Xiaolan Li, Jing Chen* and Hongpeng Jia*



6007

Ni-loaded Co-NC catalysts for promoting electrocatalytic nitrate reduction to ammonia

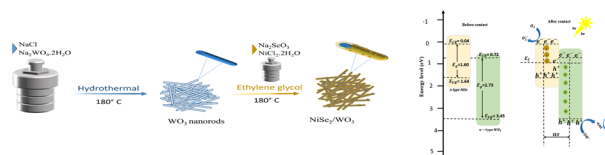
Fang Zhao, Yidi Liu, Chengjie Li, Zhen Yuan, Qianqian Hua, Liguang Gao, Xuefeng Ren,* Peixia Yang* and Anmin Liu*



6015

Synergistically enhanced photoelectrocatalytic degradation of ciprofloxacin via oxygen vacancies and internal electric field on a NiSe₂/WO₃ photoanode

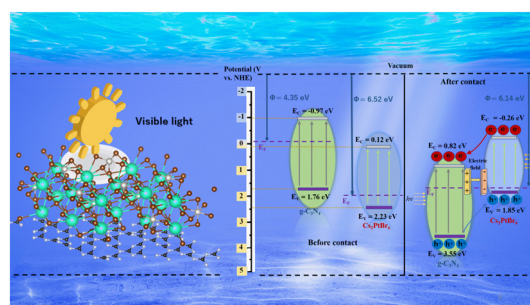
Tunde L. Yusuf,* Babatope O. Ojo, Talifhani Mushiana, Nonhlangabezo Mabuba, Omotayo A. Arotiba and Seshibe Makgato



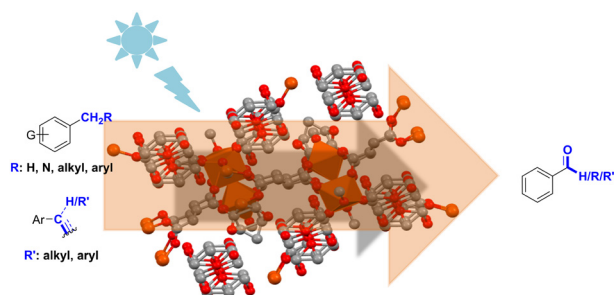
6027

Insights into the photocatalytic mechanism of g-C₃N₄/Cs₂BBr₆ (B = Pt, Sn, Ti) heterojunction photocatalysts by density functional theory calculations

Xinyu Ye, Yuanmiao Sun,* Anmin Liu,* Shizheng Wen and Tingli Ma*



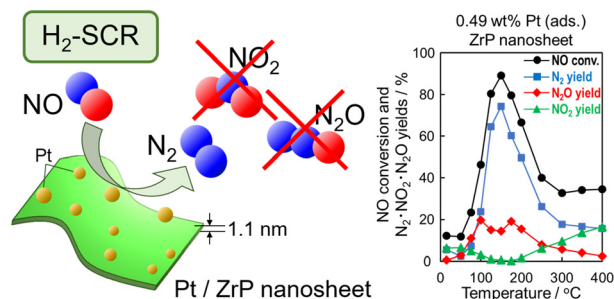
6041



Efficient LED-driven MOF-catalysis for aerobic C–H and C–C bond oxidation

Mehdi Sheykhani,* Mona Bahmani and Masoumeh Abbasnia

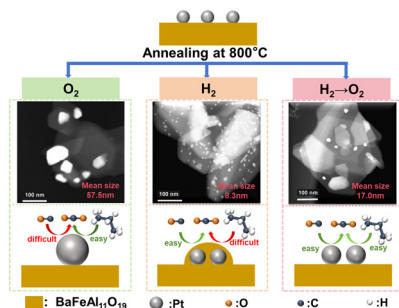
6055



Selective catalytic NO_x reduction by H₂ in excess O₂ over Pt/zirconium phosphate nanosheets

Keisuke Awaya,* Yuka Sato, Aoi Miyazaki, Mana Furukubo, Koshi Nishiyama, Masayuki Tsushida, Shintaro Ida, Junya Ohyama and Masato Machida*

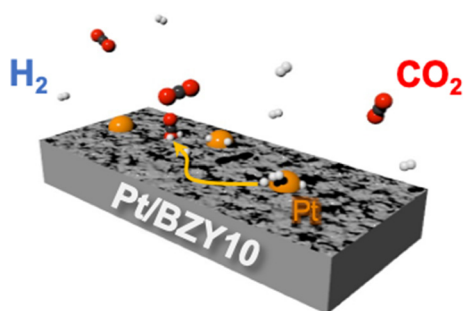
6065



High temperature reductive treatment promotes thermal stability of Pt/hexaaluminate catalysts for CO and C₃H₈ oxidation

Yumeng Xu, Rongzhou Chen, Hailian Tang, Lu Yan, Fei Huang,* Ming Tian, Kaibao Wu, Yanliang Zhou, Jian Lin,* Ying Zheng and Xiaodong Wang*

6076



Selective CO production from CO₂ over a metal catalyst supported on perovskite oxide in the presence of excess hydrogen

Keigo Tashiro, Shinnosuke Sekizawa, Wataru Doi, Hikaru Konno, Kensuke Izutani, Takayuki Furukawa, Akihide Yanagita and Shigeo Satokawa*



6085

Arsenene/PtO₂ heterojunction: a potential Z-scheme photocatalyst with tunable electronic properties and efficient catalytic activity

Wentao Luo, Jiaxin Wang, Xing Wei, Yan Zhang, Yun Yang, Jian Liu, Ye Tian, Ziyuan Li, Shijie Wei and Li Duan*

