

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(6) 1377-1692 (2024)



Cover

See Verónica R. Elías, Marcelo E. Domine *et al.*, pp. 1488–1500.
Image reproduced by permission of Marcelo E. Domine Maccari from *Catal. Sci. Technol.*, 2024, 14, 1488.
The authors would like to acknowledge Katya Cuevas Berkovich for the preparation of the front cover.



Inside cover

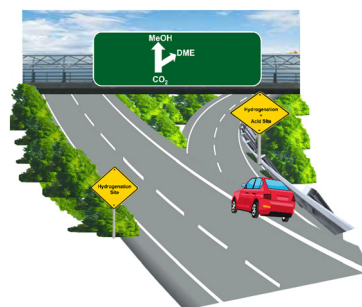
See Hirotsuke Matsui, Mizuki Tada *et al.*, pp. 1501–1511.
Image reproduced by permission of Hirotsuke Matsui from *Catal. Sci. Technol.*, 2024, 14, 1501.

REVIEWS

1387

CO₂ to dimethyl ether (DME): structural and functional insights of hybrid catalysts

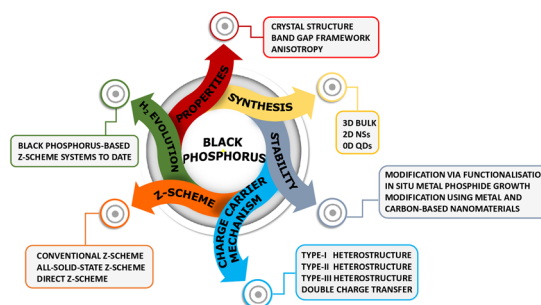
Anindya Ghosh, Debjani Nag,* Rupak Chatterjee, Aniruddha Singha, Pratik Swarup Dash, Biswajit Choudhury and Asim Bhaumik



1428

A critical review on black phosphorus mediated Z-scheme heterojunctions: properties, synthesis, and mechanistic insights towards solar H₂ evolution

Rasan Kumar Giri, Sriram Mansingh, Newmoon Priyadarshini, Jayashree Panda and Kulamani Parida*





Environmental Science: Atmospheres

GOLD
OPEN
ACCESS

Connecting communities
and inspiring new ideas

rsc.li/submittoEA

Fundamental questions
Elemental answers



Registered charity number: 207890

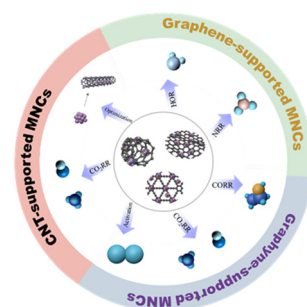


REVIEWS

1462

Application of 1D/2D carbon material supported metal nanoclusters for electrochemical conversion

Zhaoxin Song, Haiting Shi, Liangsen Liu,* Ming Zeng, Shuo Wang, Xianyan Wu* and Zhiwei Xu*

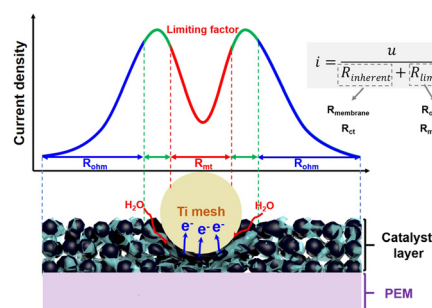


COMMUNICATION

1480

Probing current density distribution over a catalyst layer at the micrometer scale in a water electrolyzer

Yaping Pan, Han Liu, Jiawei Liu, Linrui Wen, Kejie Lao, Shuirong Li, Xiaoliang Fang, Huakun Wang,* Hua Bing Tao* and Nanfeng Zheng

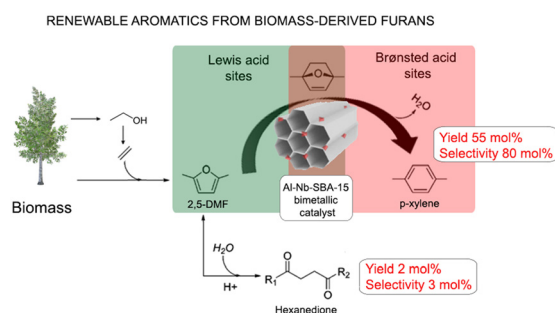


PAPERS

1488

From biomass-derived furans to aromatic compounds: design of Al-Nb-SBA-15 mesoporous structures and study of their acid properties on catalytic performance

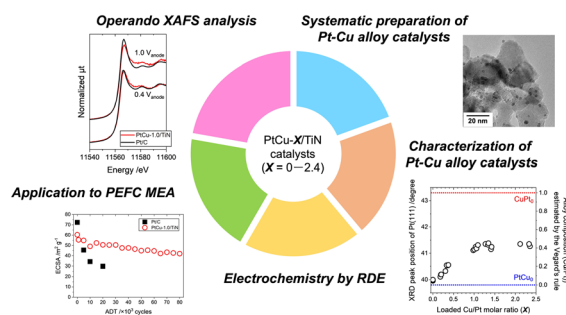
Verónica R. Elías,* Gabriel O. Ferrero, Madalina G. Idriceanu, Griselda A. Eimer and Marcelo E. Domine*



1501

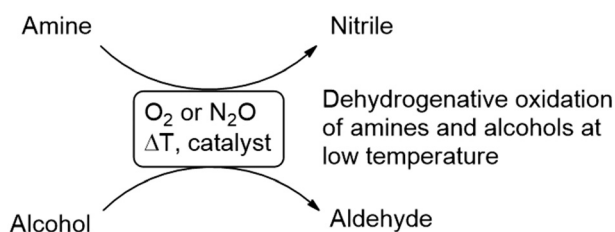
Local structures and robust oxygen reduction performances of TiN-supported bimetallic Pt-Cu electrocatalysts for fuel cells

Hirosuke Matsui,* Asako Shoji, Chaoqi Chen, Xiao Zhao, Tomoya Uruga and Mizuki Tada*



PAPERS

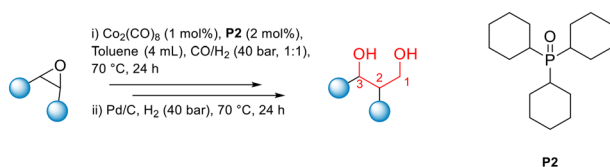
1512



Mild and selective transformations of amines and alcohols through bioinspired oxidation with nitrous oxide or oxygen

Bruce A. Lobo Sacchelli, Ruben S. M. Almeida, Abdallah G. Mahmoud, Dmytro S. Nesterov, Leandro H. Andrade, Ana M. M. Faisca Phillips,* Elisabete C. B. A. Alegria* and Martin H. G. Prechtl*

1524

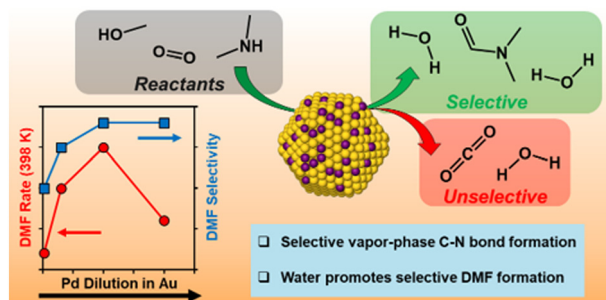


- Simple cobalt precursors and promoters
- Mild conditions

Cobalt-catalysed hydroformylation of epoxides in the presence of phosphine oxides

Fábio G. Delolo, Christoph Kubis, Baoxin Zhang, Helfried Neumann, Eduardo N. dos Santos, Elena V. Gusevskaya* and Matthias Beller*

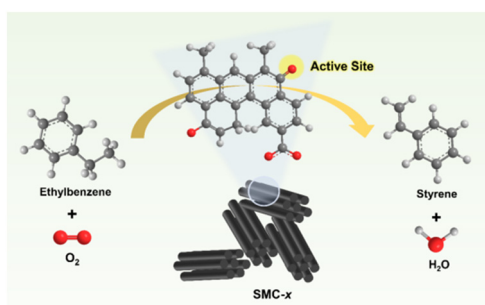
1534



Selective vapor-phase formation of dimethylformamide via oxidative coupling of methanol and dimethylamine over bimetallic catalysts

Alexander P. Minne, Tristan Maxson, Tibor Szilvási and James W. Harris*

1550



Oxidative dehydrogenation of ethylbenzene on mesoporous carbon catalysts: effect of the active site number on the apparent catalytic activity

Miao Guo, Xueya Dai,* Yunli Bai, Xingyu Lu, Zhiwei Yao* and Wei Qi*

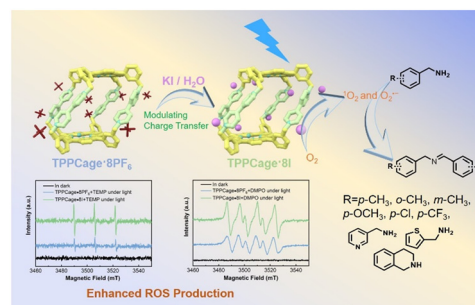


PAPERS

1558

Ionic porous porphyrin cage as a superior catalyst for photocatalytic oxidation

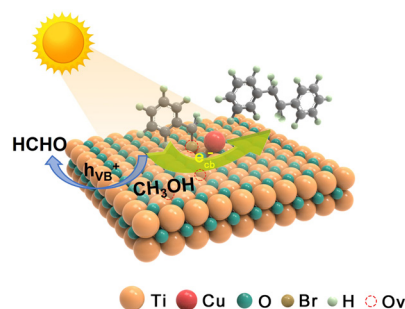
Cheng Li, Jing-Wang Cui, Jun-Hao Zhou, Yanqing Xu* and Jian-Ke Sun*



1568

Dual active sites of single-atom copper and oxygen vacancies formed *in situ* on ultrathin TiO₂(B) nanosheets boost the photocatalytic dehalogenative C–C coupling synthesis of bibenzyl

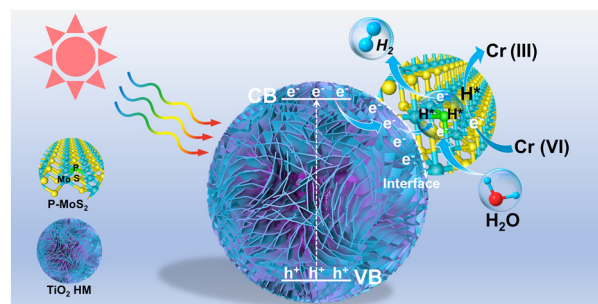
Qifeng Chen,* Peng Zheng, Haodi Liu, Yuanrong Zhang, Shuaitao Li, Hongpian Guo, Yanfen Fang,* Xun Hu* and Ran Duan



1579

Mo–P sites boosting interfacial charge transfer of 2D/3D MoS₂/TiO₂ heterostructure for efficient photocatalytic hydrogen production and chromium(vi) reduction

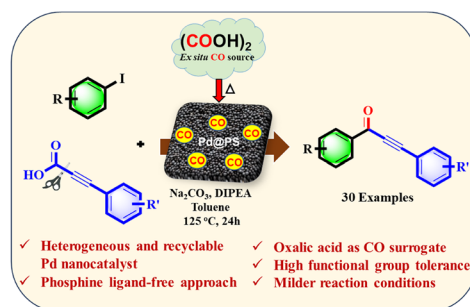
Yaoyao Wu,* Jiachun Cao, Ruihao Peng, Miao Cao, Guan Peng, Wenjing Yuan and Xianping Luo*



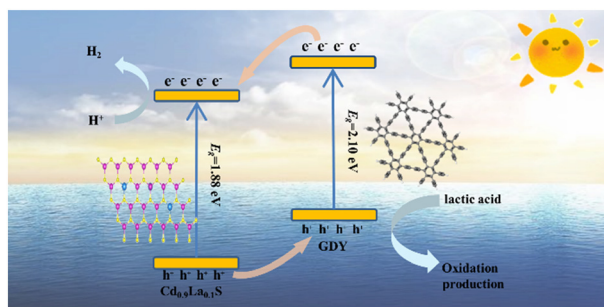
1588

Supported Pd-catalyzed decarboxylative carbonylation reaction of 2-alkynoic acids and aryl iodides

Poonam Sharma, Pushkar Mehara, Ajay Kumar Sharma and Pralay Das*



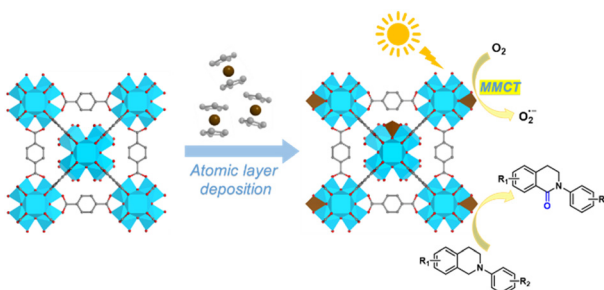
1595



Cd_{0.9}La_{0.1}S/graphdiyne type-II heterojunction structure for efficient photocatalytic hydrogen production

Yihu Ke, Shuai Wang, Fei Jin,* Zhenkun Liu and Zhiliang Jin*

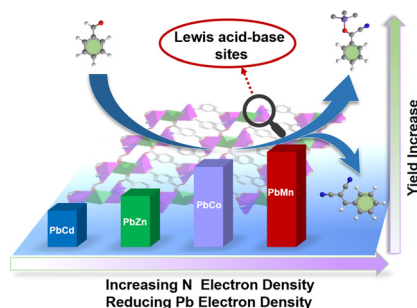
1605



Enhanced photocatalytic activity of Fe@UiO-66 for aerobic oxidation of *N*-aryl tetrahydroisoquinolines

Kai Zhou, Yuanyuan Zhang, Mingjie Liu, Zhenghua Zhao, Xiang Liu,* Zongbi Bao, Qiwei Yang, Qilong Ren and Zhiguo Zhang*

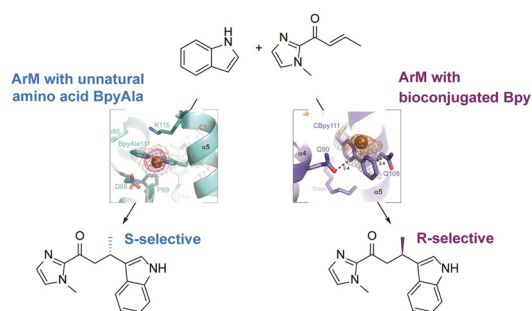
1613



Catalytic comparison of cyanosilylation/Knoevenagel condensation reactions by Pb-based heterometallic organic frameworks with different second metal ions

Xiyu Wang, Guo-Ping Yang* and Yao-Yu Wang

1622



Using BpyAla to generate copper artificial metalloenzymes: a catalytic and structural study

E. Klemencic, R. C. Brewster, H. S. Ali, J. M. Richardson and A. G. Jarvis*

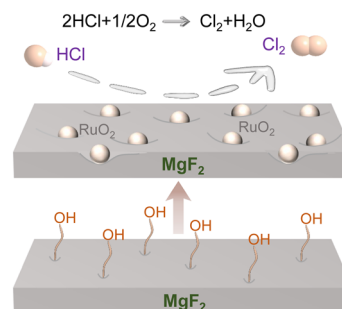


PAPERS

1633

Highly active and stable RuO₂/MgF₂ catalysts for efficient HCl oxidation in the fluorochemical industry

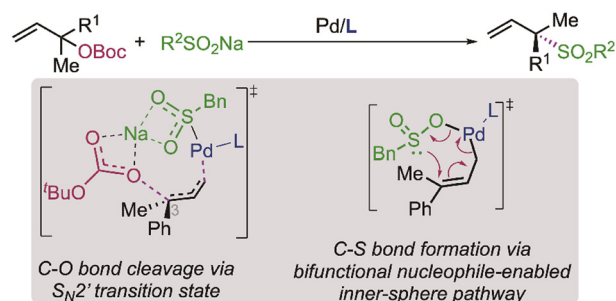
Yufeng Gong, Siheng Nie, Honglin Ji, Linying Fu, Rui Ma,* Xinqing Lu, Yanghe Fu and Weidong Zhu*



1642

Mechanism of palladium-catalyzed allylic substitution of tertiary allylic carbonates with sodium sulfinates: unusual bifunctional nucleophile-enabled inner-sphere pathway and origin of regio- and enantioselectivities

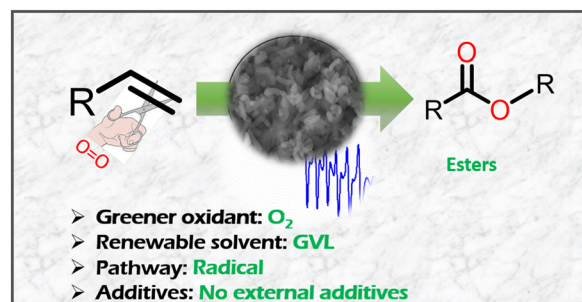
Hongli Wu, Botao Wu, Arjan W. Kleij* and Genping Huang*



1653

Additive- and base-free tandem aerobic oxidative cleavage of olefins to esters using bifunctional mesoporous copper-incorporated Al-SBA-15

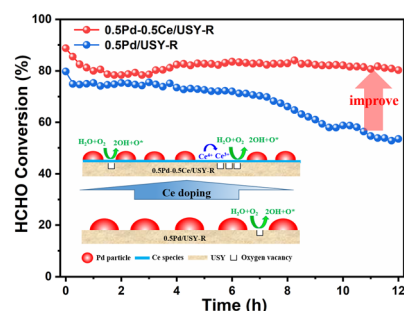
Krishnan Ravi, Yash S. Dalal, Anjana C. Sabu, Mohd. Shadab A. Khalifa and Ankush V. Biradar*



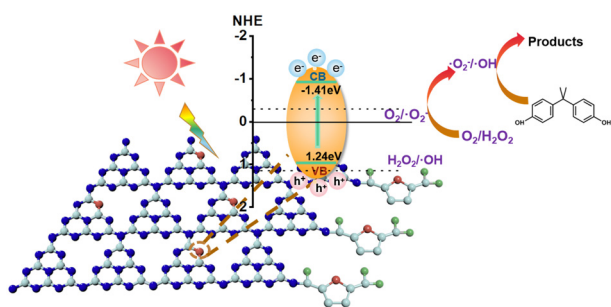
1666

Cerium modification enhances the performance of Pd/USY for formaldehyde catalytic oxidation at room temperature

Xiaofeng Liu, Chunying Wang, Yaobin Li,* Jingyi Wang, Xudong Chen and Hong He*



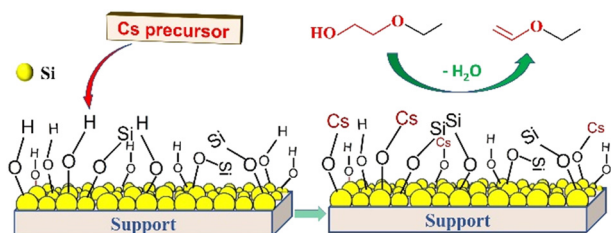
1673



Enhanced photocatalytic performance of thiophene-modified graphitic carbon nitrides as donor-acceptor conjugated organic polymers

Yanan Liu, Shuaishuai Lu, Tong Yuan, Siyuan Wang, Janina Bahnemann, Fang Jiang* and Huan Chen*

1682



Highly dispersed Cs₂O/SiO₂ catalysts for selective intramolecular dehydration of ethylene glycol monoethyl ether to ethyl vinyl ether

Huiqin Tao, Chenju Chen,* An Bao, Tiangang Ji, Chao Wei* and Chunlei Zhang*

