

# Catalysis Science & Technology

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

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## IN THIS ISSUE

ISSN 2044-4761 CODEN CSTAGD 14(7) 1693–2014 (2024)



### Cover

See Zhiwei Wu, Yanlong Gu, Jianguo Wang *et al.*, pp. 1760–1774.  
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### Inside cover

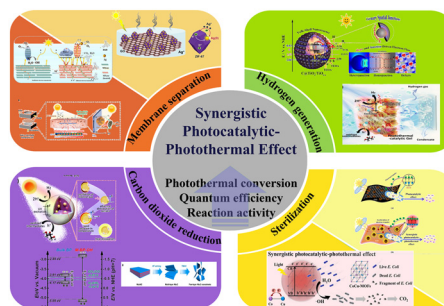
See Moritz Wolf *et al.*, pp. 1775–1790.  
Image reproduced by permission of Moritz Wolf from *Catal. Sci. Technol.*, 2024, **14**, 1775.

## PERSPECTIVE

1703

### A pragmatic perspective article: synergistic photocatalytic–photothermal effect with its practical applications and future prospects

Mengna Ding, Xiaolin Xu, Kaiquan Liu, Shiwen Yu, Fujian Lv, Yingchun Miao,\* Yuning Huo\* and Hexing Li

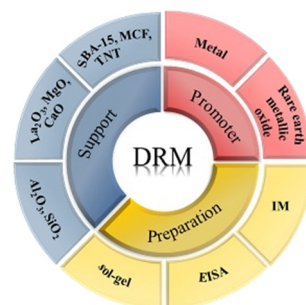


## REVIEWS

1712

### Recent advances in promoting dry reforming of methane using nickel-based catalysts

Haibin Zhu, Huichao Chen,\* Menghan Zhang, Cai Liang and Lunbo Duan



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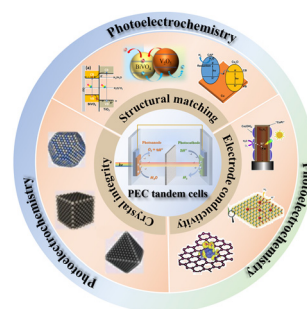


## REVIEWS

1730

### Fabrication strategies for high-performance unbiased PEC water splitting cells

Lingling Ding, Yaqian Zhang, Tao Wang, Peng Li and Kun Chang\*

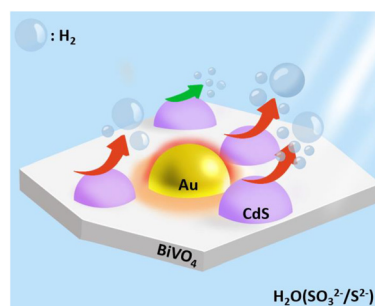


## COMMUNICATION

1756

### Boosting photocatalytic hydrogen production of CdS/BiVO<sub>4</sub> nanoplates by transferring in-plane plasmon resonant energy of gold nanoparticles

Ming-Han Liu\* and Yukina Takahashi\*

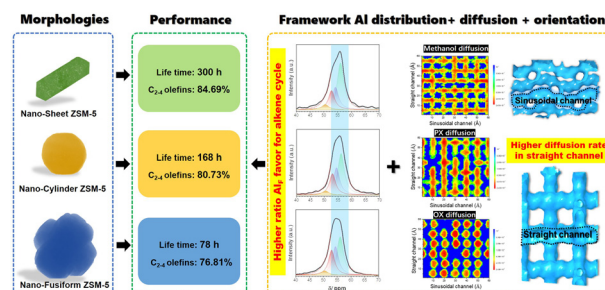


## PAPERS

1760

### Controlling the morphologies and crystal growth orientations of H-ZSM-5: their impact on the structure-diffusion-performance relationship in the methanol-to-propylene reaction

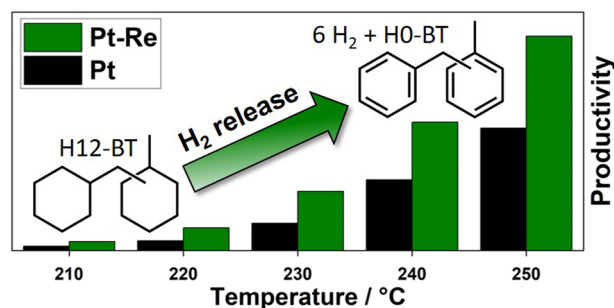
Wei Zhang, Xiaohu Wang, Zhiwei Wu,\* Zhikai Li, Xiaojing Yong, Yanlong Gu\* and Jianguo Wang\*



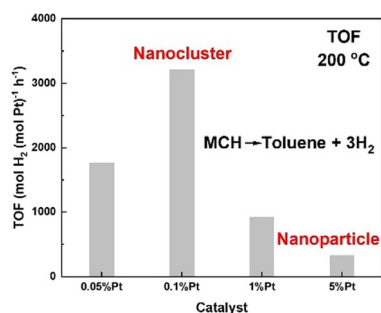
1775

### Bimetallic platinum rhenium catalyst for efficient low temperature dehydrogenation of perhydro benzyltoluene

Domenic Strauch, Pia Weiner, Bidyut Bikash Sarma, Andreas Körner, Elisabeth Herzinger, Patrick Wolf, Anna Zimina, Andreas Hutzler, Dmitry E. Doronkin, Jan-Dierk Grunwaldt, Peter Wasserscheid and Moritz Wolf\*



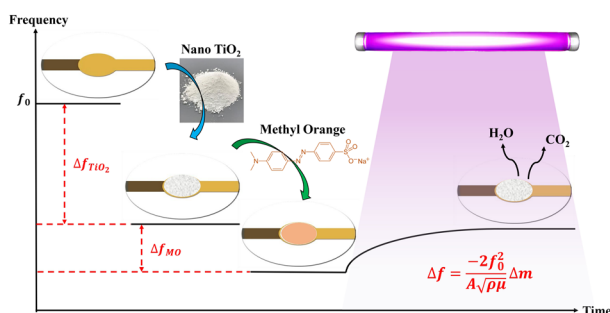
1791



### Insights into size effects of Pt/Al<sub>2</sub>O<sub>3</sub> catalysts on hydrogen production from methylcyclohexane dehydrogenation

Yiqing Wu, Yuanyuan Li, Xinbin Yu, Xiaohan Ma, Matthew Boebinger, Juliane Weber and Zili Wu\*

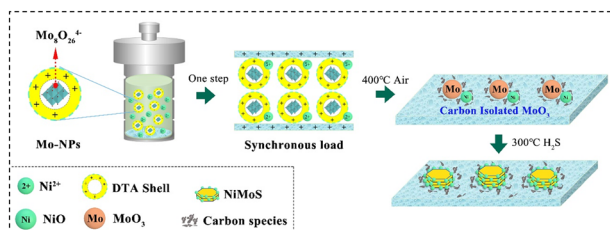
1802



### Liberation of photogenerated radicals from a nano-titania surface at the solid-air interface

K. R. Jaliya Manuda, Nimshi L. Fernando, Buddini Nissanka, Aashani Tillekaratne and Dilushan R. Jayasundara\*

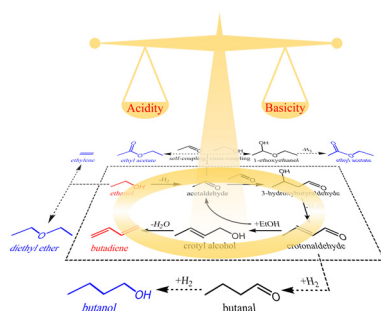
1811



### Fabrication of well-structured NiMo hydrosulfurization catalysts using electropositive Mo-based nanoparticles

Wei Han,\* Zhiwei Liu, Jiamin Zhao, Anpeng Hu and Le Zhang

1822



### Coordinating the interaction of ZnO and ZrO<sub>2</sub> for an efficient ethanol-to-butadiene process

Peng Wang, Shaowen Hou, Pengxiang Tu, Bing Xue, Weixin Guan, Dong Wang, Danfeng Zhou, Yajun He, Xinhui Chen, Yixing Wang, Kegong Fang, Xiaonian Li and Jun Ni\*



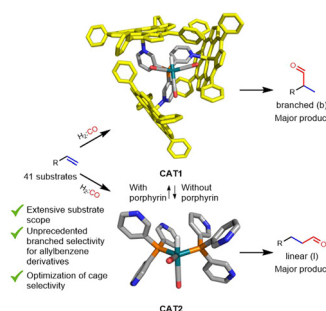


## PAPERS

1837

## Substrate scope driven optimization of an encapsulated hydroformylation catalyst

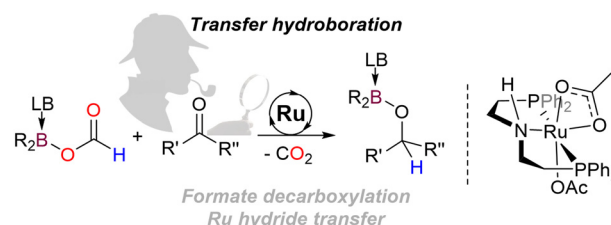
Pim R. Linnebank, Alexander M. Kluwer and Joost N. H. Reek\*



1848

## Formoxyboranes as hydroborane surrogates for the catalytic reduction of carbonyls through transfer hydroboration

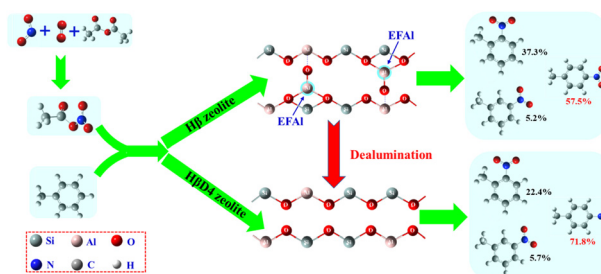
Gabriel Durin, R. Martin Romero, Timoth   Godou, Cl  ment Chauvier, Pierre Thu  ry, Emmanuel Nicolas and Thibault Cantat\*



1854

Efficient and high *para*-selective conversion of toluene with NO<sub>2</sub> to *para*-nitrotoluene in an O<sub>2</sub>-Ac<sub>2</sub>O-H  D4 composite catalytic system

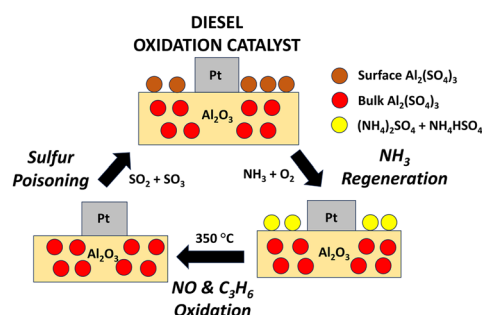
Renjie Deng,\* Huajie Liu, Haishuai Cui, Yao Tian and Hai Yang



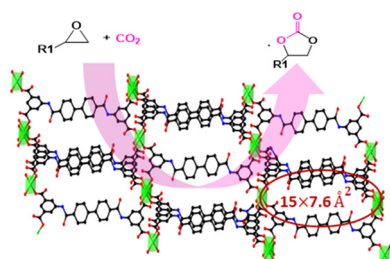
1867

Sulfur poisoning and NH<sub>3</sub> regeneration of Pt/Al<sub>2</sub>O<sub>3</sub>: oxidations of SO<sub>2</sub>, NH<sub>3</sub>, NO and C<sub>3</sub>H<sub>6</sub> as probe reactions

Chenhao Fang and Michael P. Harold\*



1888

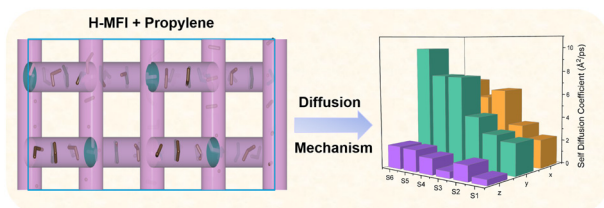


T: 40 °C, P: 1 bar CO<sub>2</sub>, Substrate: 18 mmol, Catalyst: 0.06 mmol,  
Conversion: >99%, and Selectivity: 100%

### Ambient conversion of CO<sub>2</sub> and epoxides to cyclic carbonates using 3D amide-functionalized MOFs

Zafar A. K. Khattak, Nazir Ahmad,\* Hussein A. Younus, Habib Ullah, Baoyi Yu, Khurram S. Munawar, Muhammad Ashfaq, Muhammad Yaseen, Muhammad Danish, Mohammed Al-Abri, Rashid AlHajri and Francis Verpoort\*

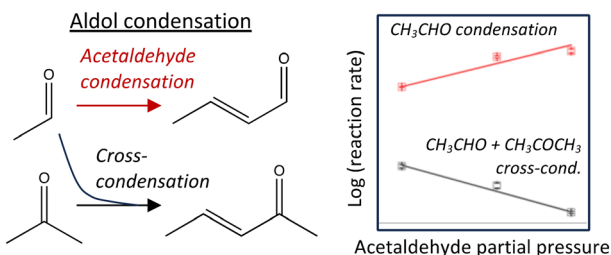
1902



### Influence of temperatures and loadings on olefin diffusion in MFI-type zeolites in one- to three- dimensions

Jiahuan Tong, Takumi Miyakage, Takashi Toyao and Ken-ichi Shimizu\*

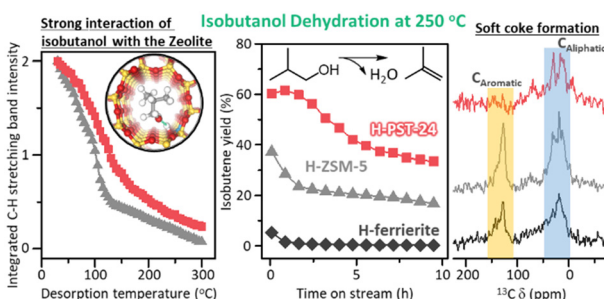
1911



### Aldol condensation of mixed oxygenates on TiO<sub>2</sub>

Brandon Elliott Oliphant, Mathew Rasmussen, Laura Paz Herrera, Michael B. Griffin and J. Will Medlin\*

1923



### Disordered medium-pore zeolite PST-24 as an efficient low-temperature isobutanol dehydration catalyst

Jeong Hwan Lee, Donghui Jo and Suk Bong Hong\*

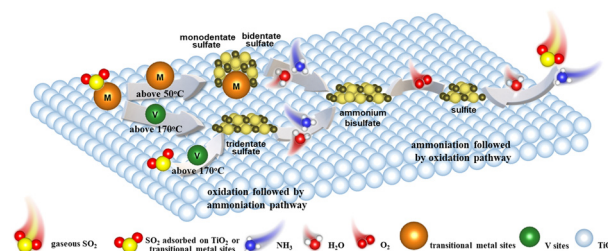


## PAPERS

1931

### Mechanism of ammonium bisulfate deposition on $V_1M_5/Ti$ catalysts with synergistic effects of V and M (M = Ce, Co, Fe, and Mn) in low-temperature $NH_3$ -SCR

Zhicheng Xu, Jin Xiong, Yuran Li,\* Junxiang Guo, Bin Wang and Tingyu Zhu\*

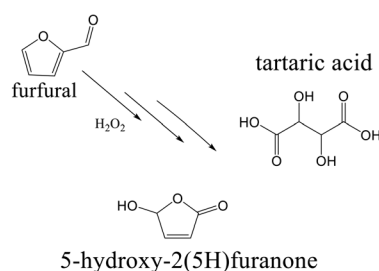


1942

### Heterogeneous catalytic oxidation of furfural with hydrogen peroxide over a niobia catalyst

Wander Y. Perez-Sena, Maëlle Paya, Kari Eränen, Robert Lassfolk, Lucas Lagerquist, Narendra Kumar, Atte Aho, Antonio D'Angelo, Tapio Salmi, Johan Wärnå and Dmitry Yu. Murzin\*

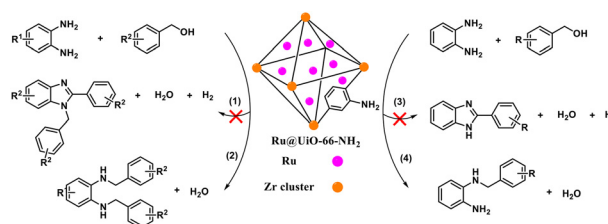
#### Furfural Oxidation



1958

### Highly dispersed ruthenium capsulated in UiO-66- $NH_2$ for hydrogen-borrowing-mediated $N$ -alkylation reactions

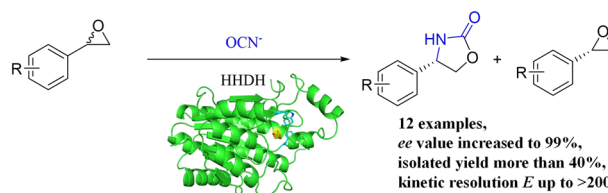
Jiahao Li, Shiguo Ou, Xinxin Sang,\* Ruirui Chai and Dawei Wang\*



1967

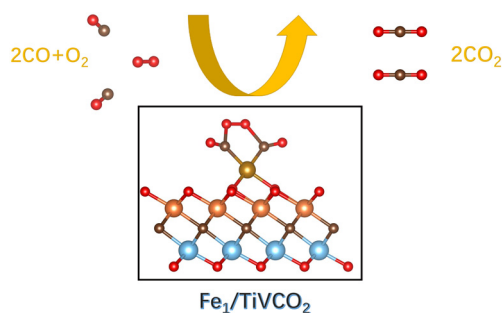
### Engineering of halohydrin dehalogenases for the regio- and stereoselective synthesis of (*S*)-4-aryl-2-oxazolidinones

Jinsong Song, Chuanhua Zhou, Xi Chen, Yang Gu, Feng Xue,\* Qiaqing Wu\* and Dunming Zhu



## PAPERS

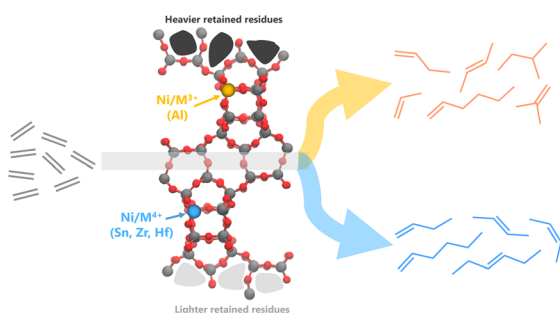
1977



### First-principles study of an efficient non-noble metal single-atom catalyst $\text{Fe}_1/\text{TiVCO}_2$ for CO oxidation

Yongkang Zhang, Kaibin Su, Yuhang Wang and Fengping Wang\*

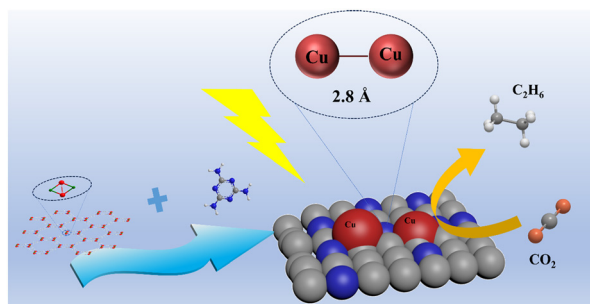
1991



### Selective linear ethylene oligomerization over nickel-containing zeotypes with tetravalent framework heteroatoms

Yunfei Bai, Tomás Cordero-Lanzac, Ainara Nova, Unni Olsbye, Esben Taarning and Juan S. Martinez-Espin\*

2003



### Dual-atom-site $\text{Cu@PCN}$ photocatalyst selectively produces ethane from $\text{CO}_2$ reduction

Xin Cao, Chun-Yu Liu, Yuming Dong,\* Tingyu Yang, Xinying Chen and Yongfa Zhu

