

# Catalysis Science & Technology

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

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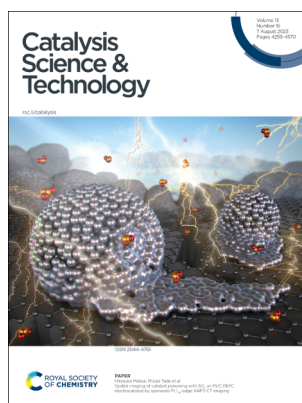
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ISSN 2044-4761 CODEN CSTAGD 13(15) 4259–4570 (2023)



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See Evgenii V. Kondratenko *et al.*, pp. 4353–4359.  
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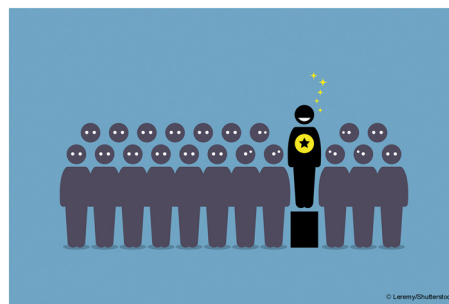
### Inside cover

See Hirosuke Matsui, Mizuki Tada *et al.*, pp. 4360–4366.  
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## EDITORIAL

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### Outstanding Reviewers for *Catalysis Science & Technology* in 2022



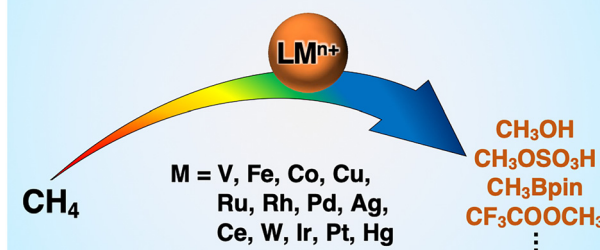
## MINI REVIEWS

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### Functionalization of methane using molecular metal complexes as catalysts

Hiroto Fujisaki and Takahiko Kojima\*

#### Methane functionalization by molecular catalysts



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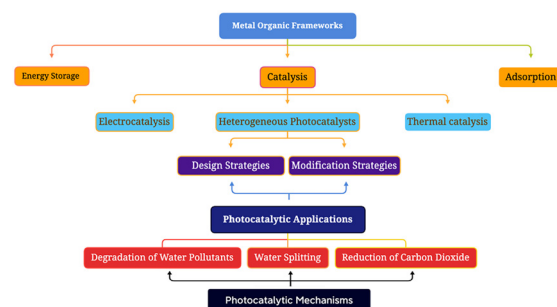


## MINI REVIEWS

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# State of the art and prospectives of heterogeneous photocatalysts based on metal–organic frameworks (MOFs): design, modification strategies, and their applications and mechanisms in photodegradation, water splitting, and CO<sub>2</sub> reduction

Zeren Ma, Bin Guan,\* Jiangfeng Guo, Xingze Wu, Yujun Chen, Jinhe Zhang, Xing Jiang, Shibo Bao, Lei Chen, Kaiyou Shu, Hongtao Dang, Zelong Guo, Zekai Li, Shunyu Yao and Zhen Huang

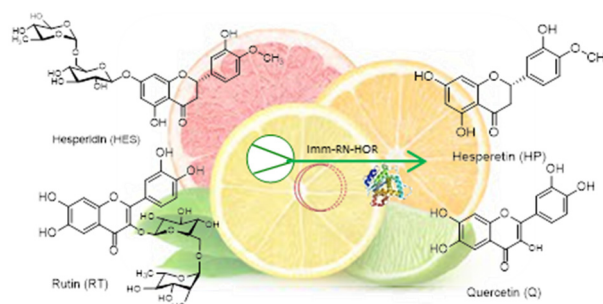


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# Flow bioprocessing of citrus glycosides for high-value aglycone preparation

Agostina Colacicco, Giorgia Catinella, Cecilia Pinna, Alessandro Pellis, Stefano Farris, Lucia Tamborini, Sabrina Dallavalle, Francesco Molinari, Martina Letizia Contente\* and Andrea Pinto

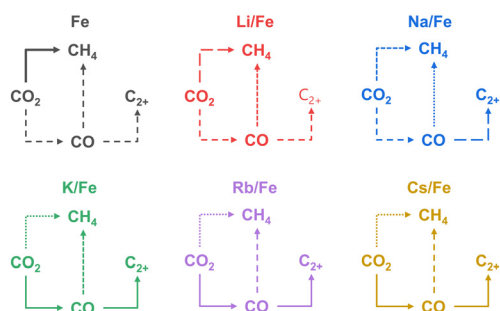


## PAPERS

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# Spatial analysis of CO<sub>2</sub> hydrogenation to higher hydrocarbons over alkali-metal promoted iron(II) oxalate-derived catalysts

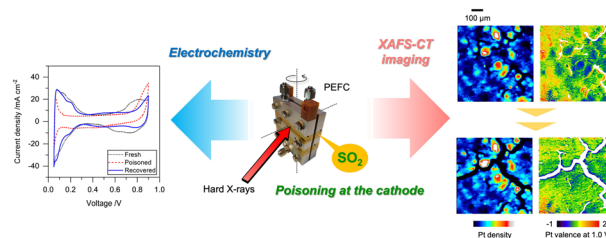
Andrey S. Skrypnik, Henrik Lund, Qingxin Yang and Evgenii V. Kondratenko\*



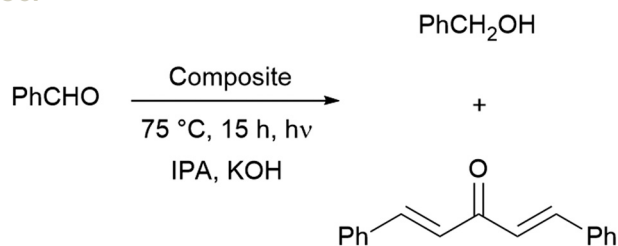
4360

# Spatial imaging of catalyst poisoning with SO<sub>2</sub> on Pt/C PEFC electrocatalyst by *operando* Pt L<sub>III</sub>-edge XAFS-CT imaging

Hirosuke Matsui,\* Koshin Sato, Naoko Isobe, Gabor Samjeské, Tomoya Uruga and Mizuki Tada\*



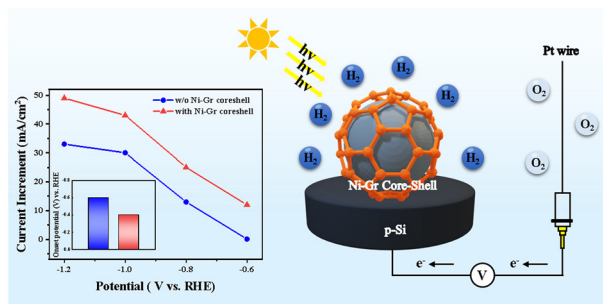
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### Synthesis of new graphene oxide/TiO<sub>2</sub> and TiO<sub>2</sub>/SiO<sub>2</sub> nanocomposites and their evaluation as photocatalysts

Marta Rosenthal, Timur Biktagirov,  
Wolf Gero Schmidt and René Wilhelm\*

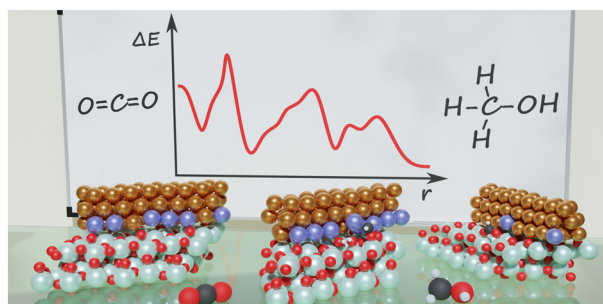
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### A surface-engineered Si photocathode with synergistic Ni-graphene core-shell for efficient hydrogen evolution

Chaewon Seong, Hyesu Ryu, Hokyun Rho, Hyojung Bae,  
Pratik Mane, Sang Hyun Lee\* and Jun-Seok Ha\*

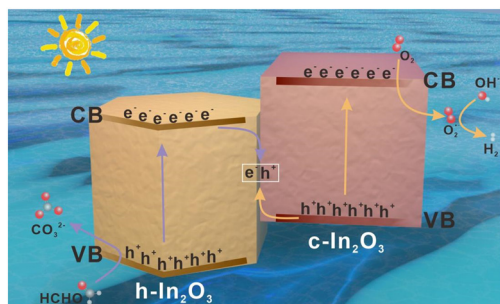
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### Exploring CO<sub>2</sub> hydrogenation to methanol at a CuZn-ZrO<sub>2</sub> interface via DFT calculations

Aku Lempelto, Lars Gell, Toni Kiljunen  
and Karoliina Honkala\*

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### Enhanced adsorption of oxygen species on c/h-In<sub>2</sub>O<sub>3</sub> Z-scheme heterophase junctions for oxygen-mediated photocatalytic hydrogen production

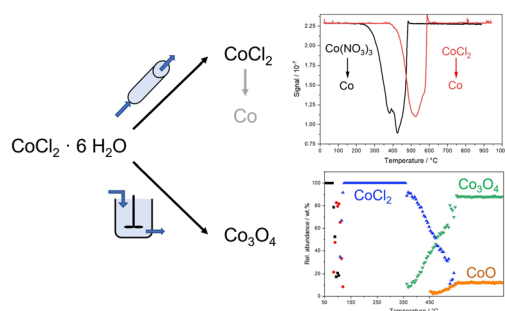
Zhengxin Peng, Xiangbowen Du, Nan Lu, Jing Sui,  
Xiaofan Zhang, Renhong Li and Xiaoqing Yan\*



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### On the problem of cobalt chloride-based catalysts in the Fischer–Tropsch synthesis

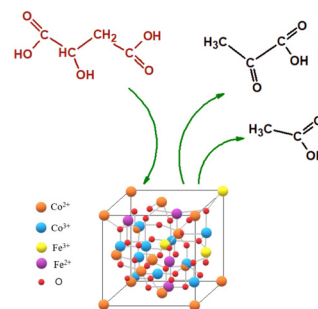
Madita Einemann,\* Simon Haida, Nico Fischer, Nattawut Osakoo, Jatuporn Wittayakun and Frank Roessner



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### Iron-doped $\text{Co}_3\text{O}_4$ catalysts prepared by a surfactant-assisted method as effective catalysts for malic acid oxidative decarboxylation

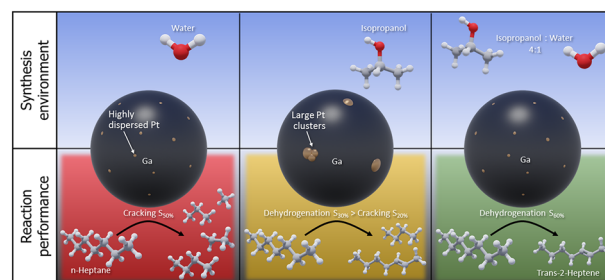
Gheorghița Mitran,\* Ștefan Neațu, Octavian Dumitru Pavel, Adriana Urdă, Anca G. Mirea, Mihaela Florea and Florentina Neațu\*



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### Ga–Pt supported catalytically active liquid metal solutions (SCALMS) prepared by ultrasonication – influence of synthesis conditions on *n*-heptane dehydrogenation performance

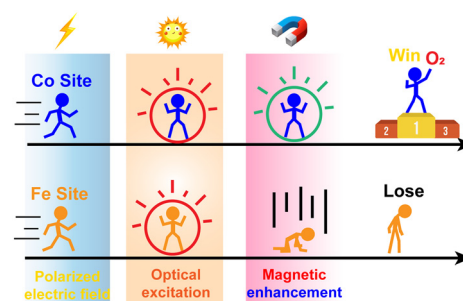
Oshin Sebastian, Asem Al-Shaibani, Nicola Taccardi, Umair Sultan, Alexandra Inayat, Nicolas Vogel, Marco Haumann\* and Peter Wasserscheid\*



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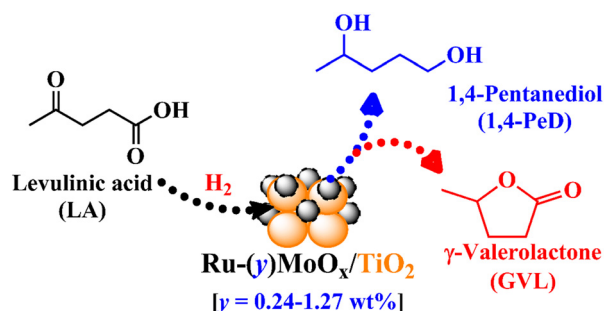
### Magnetic field enhancement of the $\text{FeCoSe}_2$ photoanode for the oxygen evolution reaction by adjusting the hole density to reduce competitive adsorption between Fe and Co in a photoelectrochemical water-splitting system

Ben Fan, Zebin Yu,\* Ling Ding, Ronghua Jiang, Yanping Hou, Shuang Li and Jianhua Chen





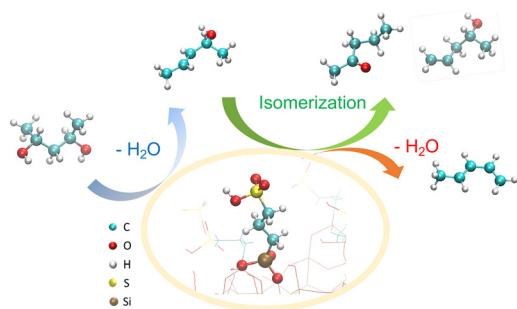
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### MoO<sub>x</sub>-decorated Ru/TiO<sub>2</sub> with a monomeric structure boosts the selective one-pot conversion of levulinic acid to 1,4-pentanediol

Rodiansono,\* Atina Sabila Azzahra, Heny Puspita Dewi, Indri Badria Adilina and Kiky Corneliasari Sembiring

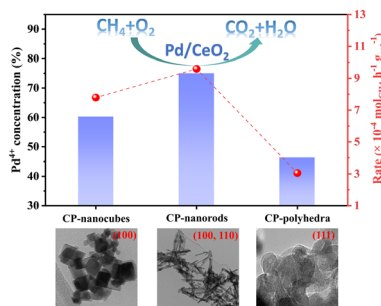
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### Mechanistic insights into the conversion of polyalcohols over Brønsted acid sites

Quy P. Nguyen, Han K. Chau, Lance Lobban, Steven Crossley and Bin Wang\*

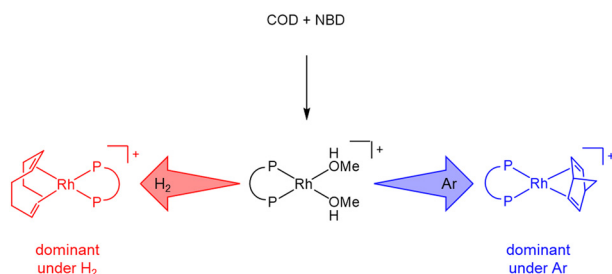
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### Ceria crystal facet impact for methane C–H activation in Pd/CeO<sub>2</sub> catalysts

Kewu Yang, Ke Wang, Xianfeng Shen, Fanxing Zhang, Bei Huang, Keping Yan, Yao Shi, Yi He\* and Pengfei Xie\*

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### Major–minor concept revisited: causes for the reversal of thermodynamically determined intermediate ratios under reaction conditions

Nora Jannsen, Julia Jurrat, Helfried Neumann, Christian Fischer, Richard Thede and Detlef Heller\*

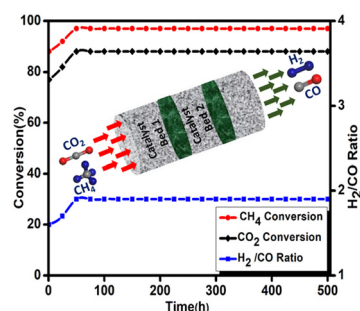


## PAPERS

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**Enhanced coke-resistant Co-modified Ni/modified alumina catalyst for the bireforming of methane**

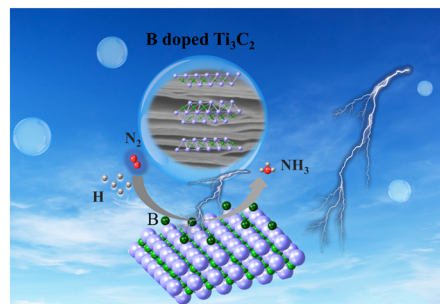
Satyajit Panda, Vedant Joshi, Vivek Kumar Shrivastaw, Subhashis Das, Mukesh Poddar, Rajaram Bal and Ankur Bordoloi\*



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**Facile fabrication of boron-doped titanium carbide for efficient electrocatalytic nitrogen reduction**

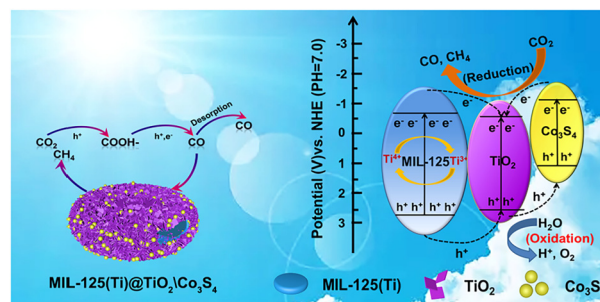
Tao Leiming,\* Pang Kui, Qin Wen, Huang Liming, Duan Linhai, Zhu Guanhua, Li Qiuye\* and Yu Changlin\*



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**MIL-125(Ti)@ZIF-67-derived MIL-125(Ti)@TiO2 hollow nanodiscs decorated with Co3S4 for remarkable photocatalytic CO2 reduction**

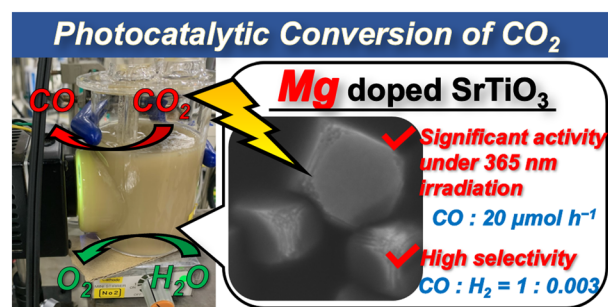
Qiuyu Zhang, Yajie Chen, Xinyan Yu, Yuejia Yin, Yaxin Ru and Guohui Tian\*



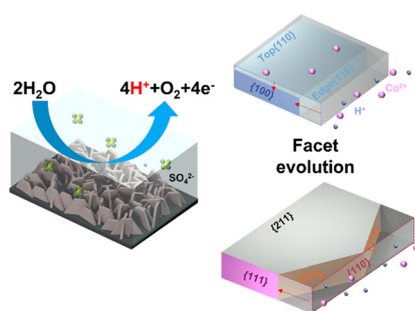
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**Mg-doped SrTiO3 photocatalyst with Ag-Co cocatalyst for enhanced selective conversion of CO2 to CO using H2O as the electron donor**

Takechi Nakamoto, Shoji Iguchi,\* Shimpei Naniwa, Tsunehiro Tanaka and Kentaro Teramura\*



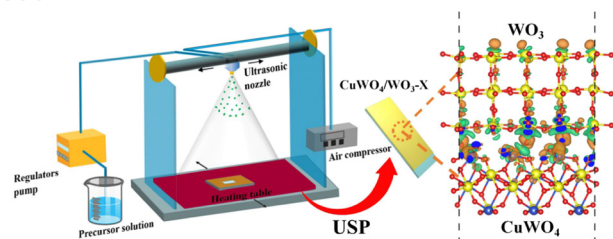
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### Crystal facet evolution of spinel $\text{Co}_3\text{O}_4$ nanosheets in acidic oxygen evolution catalysis

Ziyang Sheng, Sihong Wang, Qu Jiang, Yuanman Ni, Chaoran Zhang, Ashfaq Ahmad and Fang Song\*

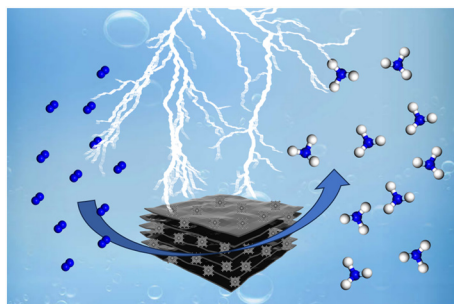
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### Interfacial engineering of $\text{CuWO}_4/\text{WO}_3$ thin films precisely fabricated by ultrasonic spray pyrolysis for improved solar water splitting

Feng Cao, Yuhua Sun, Xiaoyu Duan, Mengyang Li, Biao Chen, Yang Cao, Qinghua Liang,\* Amany M. El Nahrawy and Gaowu Qin\*

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### A simple approach to synthesize NiFe-LDH- $\text{Nb}_2\text{C}$ MXene for enhanced electrochemical nitrogen reduction reactions by a synergistic effect

Qianqian Hua, Haidong Zhu, Sensen Xue, Fang Zhao, Zhuangzhuang Liang, Xuefeng Ren, Liguang Gao, Tingli Ma and Anmin Liu\*

