



Chinese Journal of Catalysis

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Editors-in-Chief Can Li (李灿) Tao Zhang (张涛)
Transaction of The Catalysis Society of China

In This Issue



Cover: Xi's group controls the synthesis of the silk-like $\text{FeS}_2/\text{NiS}_2$ hybrid nanocrystal. The material has rich interfaces and defects, which is beneficial to enhance its catalytic performance. The picture shows the flexible battery assembled by this catalyst and their promising application. Read more about the article behind the cover on pages 43–51.

封面: 席聘贤课题组控制合成了丝绸状纳米结构($\text{FeS}_2/\text{NiS}_2$)。该材料具有丰富的界面和缺陷,有利于提升其催化性能。见本期第 43–51 页。

About the Journal

Chinese Journal of Catalysis is an international journal published monthly by Chinese Chemical Society, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, and Elsevier. The journal publishes original, rigorous, and scholarly contributions in the fields of heterogeneous and homogeneous catalysis in English or in both English and Chinese. The scope of the journal includes:

- ◆ New trends in catalysis for applications in energy production, environmental protection, and production of new materials, petroleum chemicals, and fine chemicals;
- ◆ Scientific foundation for the preparation and activation of catalysts of commercial interest or their representative models;
- ◆ Spectroscopic methods for structural characterization, especially methods for in situ characterization;
- ◆ New theoretical methods of potential practical interest and impact in the science and applications of catalysis and catalytic reaction;
- ◆ Relationship between homogeneous and heterogeneous catalysis;
- ◆ Theoretical studies on the structure and reactivity of catalysts.
- ◆ The journal also accepts contributions dealing with photo-catalysis, bio-catalysis, and surface science and chemical kinetics issues related to catalysis.

Types of Contributions

- **Reviews** deal with topics of current interest in the areas covered by this journal. Reviews are surveys, with entire, systematic, and important information, of recent progress in important topics of catalysis. Rather than an assemblage of detailed information or a complete literature survey, a critically selected treatment of the material is desired. Unsolved problems and possible developments should also be discussed. Authors should have published articles in the field. Reviews should have more than 80 references.
- **Communications** rapidly report studies with significant innovation and major academic value. They are limited to four Journal pages. After publication, their full-text papers can also be submitted to this or other journals.
- **Articles** are original full-text reports on innovative, systematic and completed research on catalysis.
- **Highlights** describe and comment on very important new results in the original research of a third person with a view to highlight their significance. The results should be presented clearly and concisely without the comprehensive details required for an original article.
- **Perspectives** are short reviews of recent developments in an established or developing topical field. The authors should offer a critical assessment of the trend of the field, rather than a summary of literatures.
- **Viewpoints** describe the results of original research in general in some area, with a view to highlighting the progress, analyzing the major problems, and commenting the possible research target and direction in the future.

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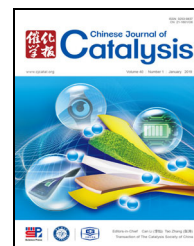
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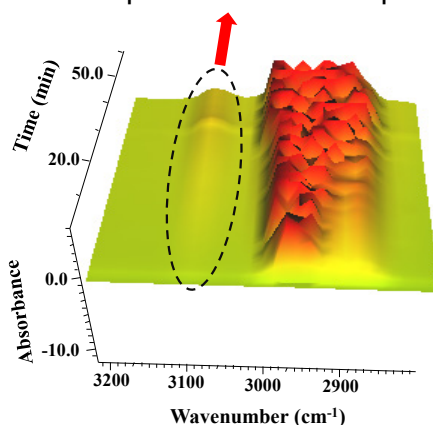
Chin. J. Catal., 2019, 40: 1–3 doi: 10.1016/S1872-2067(18)63188-2

Comment on the correction of gas-phase signals during IR operando analyses

Frederic Meunier *

Institut de Recherches sur la Catalyse et l'Environnement, France

Gas-phase or surface species?



The accuracy of dual beam Fourier transform infrared (DB-FTIR) spectrometer in eliminating the interference of gas-phase molecular vibration in gas/solid heterogeneous catalysis under reaction conditions is discussed.

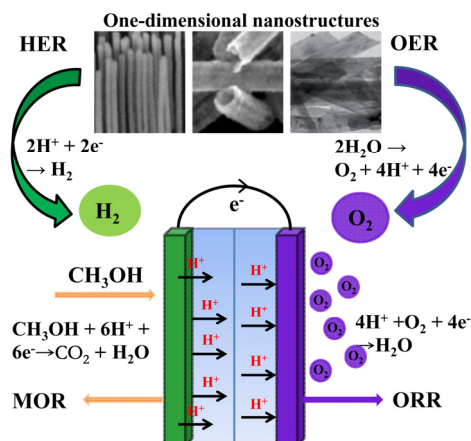
Reviews

Chin. J. Catal., 2019, 40: 4–22 doi: 10.1016/S1872-2067(18)63177-8

Recent advances in one-dimensional nanostructures for energy electrocatalysis

Ping Li, Wei Chen *

Changchun Institution of Applied Chemistry, Chinese Academic of Sciences; University of Science and Technology of China



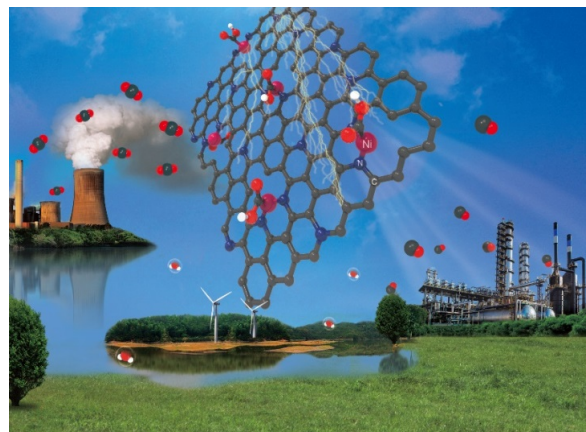
This overview summarizes the recent advances in one-dimensional metal nanostructures for energy electrocatalysis, including the main reactions in direct methanol fuel cells and water splitting.

Chin. J. Catal., 2019, 40: 23–37 doi: 10.1016/S1872-2067(18)63161-4

Transition metal-nitrogen sites for electrochemical carbon dioxide reduction reaction

Chengcheng Yan, Long Lin, Guoxiong Wang*, Xinhe Bao*
*Dalian Institute of Chemical Physics, Chinese Academy of Sciences;
 University of Chinese Academy of Sciences*

Metal-nitrogen sites constituted of earth abundant elements with maximum atom-utilization efficiency have emerged as promising catalysts for electrochemical CO₂ reduction reaction.



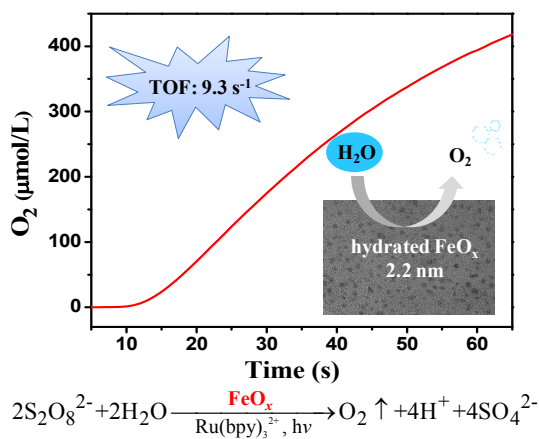
Communication

Chin. J. Catal., 2019, 40: 38–42 doi: 10.1016/S1872-2067(18)63190-0

A hydrated amorphous iron oxide nanoparticle as active water oxidation catalyst

Zheng Chen, Qinge Huang, Baokun Huang, Fuxiang Zhang*, Can Li*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

A hydrated amorphous iron oxide nanoparticle exhibits high water oxidation activity with TOF of 9.3 s⁻¹ in the photocatalytic Ru(bpy)₃²⁺-Na₂S₂O₈ system.

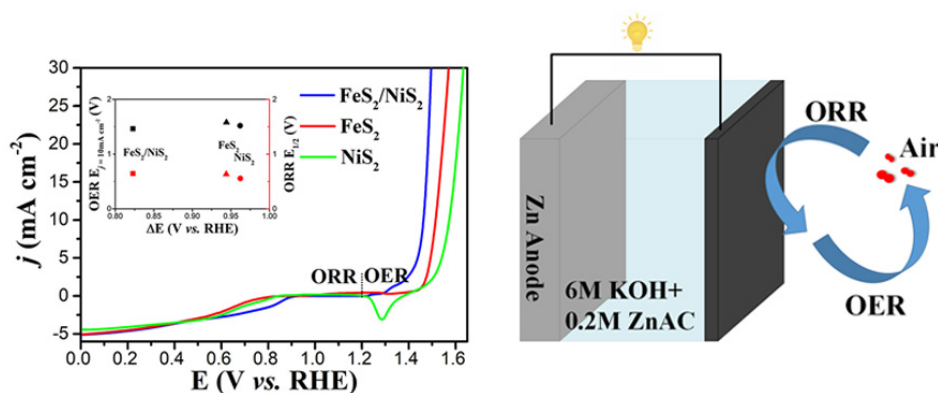


Articles

Chin. J. Catal., 2019, 40: 43–51 doi: 10.1016/S1872-2067(18)63175-4

Synthesis of silk-like FeS₂/NiS₂ hybrid nanocrystals with improved reversible oxygen catalytic performance in a Zn-air battery

Jing Jin, Jie Yin, Pinxian Xi*
Lanzhou University



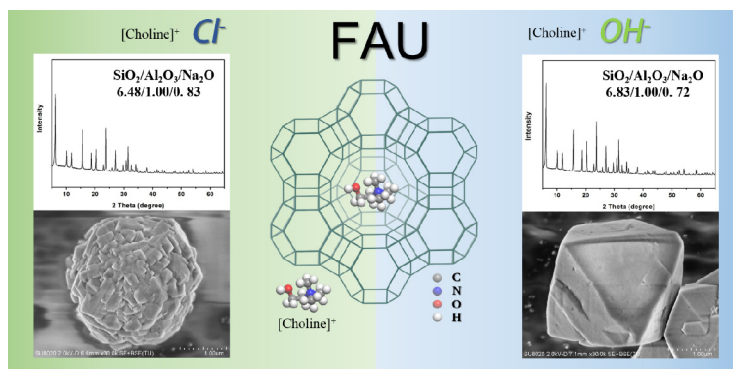
Herein, an efficient liquid exfoliation strategy was designed for producing silk-like FeS₂/NiS₂ hybrid nanocrystals with enhanced reversible oxygen catalytic performance that displayed excellent properties for Zn-air batteries.

Chin. J. Catal., 2019, 40: 52–59 doi: 10.1016/S1872-2067(18)63167-5

Eco-friendly synthesis of high silica zeolite Y with choline as green and innocent structure-directing agent

Dawei He, Danhua Yuan, Zhijia Song, Yunpeng Xu *, Zhongmin Liu *

Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences



Choline chloride or choline hydroxide was used as an eco-friendly and nontoxic organic structure-directing agent (OSDA) for the synthesis of high silica zeolite Y with $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratios of 6.5–6.8.

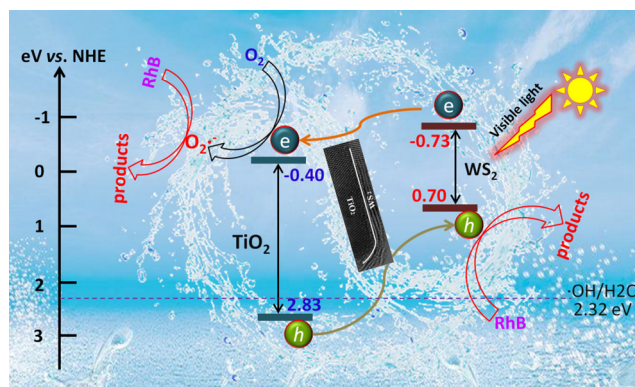
Chin. J. Catal., 2019, 40: 60–69 doi: 10.1016/S1872-2067(18)63170-5

Construction of 2D-2D TiO_2 nanosheet/layered WS_2 heterojunctions with enhanced visible-light-responsive photocatalytic activity

Yongchuan Wu, Zhongmin liu, Yaru Li, Jitao Chen, Xixi Zhu, Ping Na *

Tianjin University; College of Chemistry and Chemical Engineering; Shandong University of Science and Technology

The 2D-2D TNS/ WS_2 heterojunction was successfully constructed by in-situ growing the layered WS_2 on the surface of TiO_2 nanosheet. The 2D-2D nanointerfaces boosted the separation of photogenerated carriers, thereby resulting in a higher photocatalytic activity.

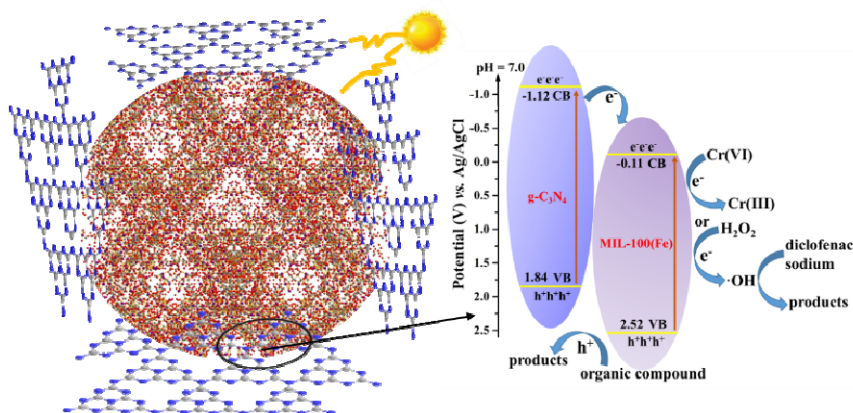


Chin. J. Catal., 2019, 40: 70–79 doi: 10.1016/S1872-2067(18)63160-2

Enhanced photocatalytic Cr(VI) reduction and diclofenac sodium degradation under simulated sunlight irradiation over MIL-100(Fe)/g- C_3N_4 heterojunctions

Xuedong Du, Xiaohong Yi, Peng Wang, Jiguang Deng *, Chong-chen Wang *

Beijing University of Civil Engineering and Architecture; Beijing University of Technology

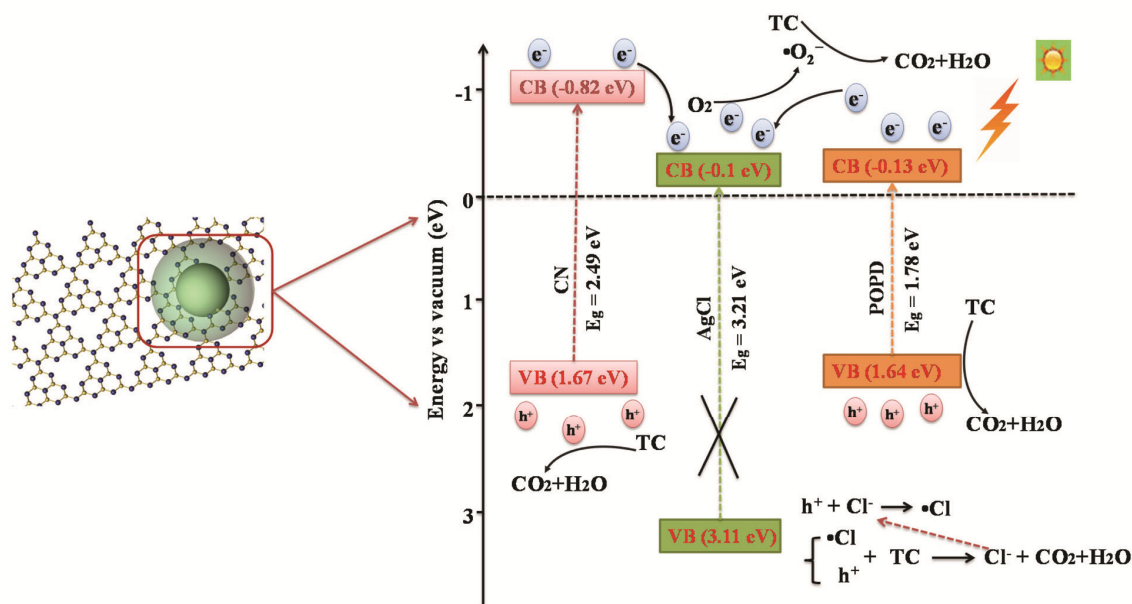


The MIL-100(Fe)/g- C_3N_4 hybrids show high photocatalytic activity under simulated sunlight and can reduce Cr(VI) to Cr(III) and decompose diclofenac sodium effectively.

Chin. J. Catal., 2019, 40: 80–94 doi: 10.1016/S1872-2067(18)63172-9

Fast electron transfer and enhanced visible light photocatalytic activity by using poly-o-phenylenediamine-modified AgCl/g-C₃N₄ nanosheets

Linlin Sun, Chongyang Liu, Jinze Li, Yaju Zhou, Huiqin Wang *, Pengwei Huo *, Changchang Ma, Yongsheng Yan
Jiangsu University

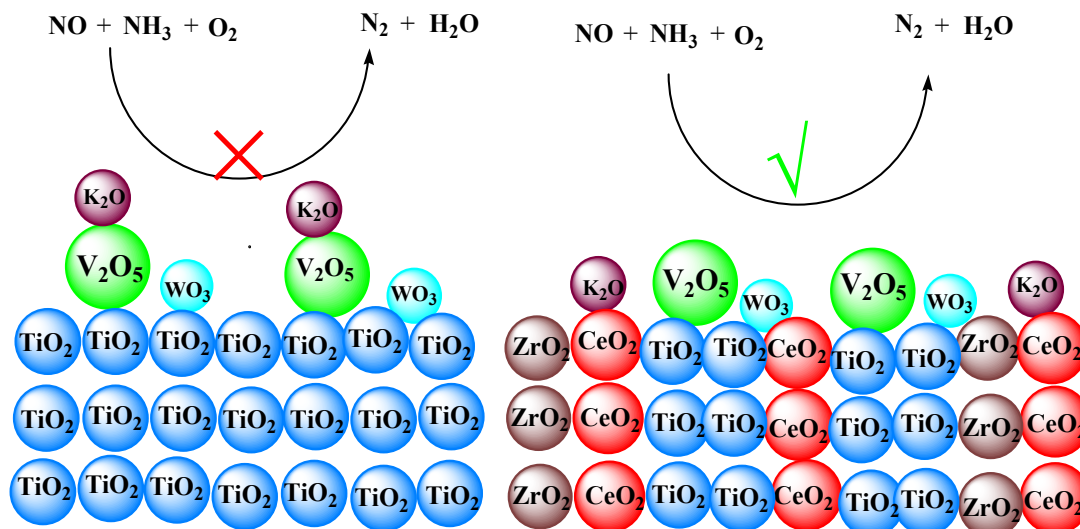


The degradation efficiency of tetracycline over PoPD/AgCl/CN composites synthesized by precipitation reaction and photoinitiated polymerization approach was three times higher than that over pure CN; $\cdot\text{O}_2^-$ and h^+ are the main reactive species in the case of PoPD/AgCl/CN.

Chin. J. Catal., 2019, 40: 95–104 doi: 10.1016/S1872-2067(18)63184-5

Improving the denitration performance and K-poisoning resistance of the V₂O₅-WO₃/TiO₂ catalyst by Ce⁴⁺ and Zr⁴⁺ co-doping

Jun Cao, Xiaojiang Yao *, Fumo Yang, Li Chen, Min Fu *, Changjin Tang, Lin Dong
Chongqing Technology and Business University; Chongqing Institute of Green and Intelligent Technology, Chinese Academy of Sciences;
Sichuan University; Nanjing University



Co-doping of Ce⁴⁺ and Zr⁴⁺ enhances the denitration performance and K-poisoning resistance of V₂O₅-WO₃/TiO₂ catalyst because more K atoms can be combined with Ce⁴⁺ to yield the better protection of active vanadium species.

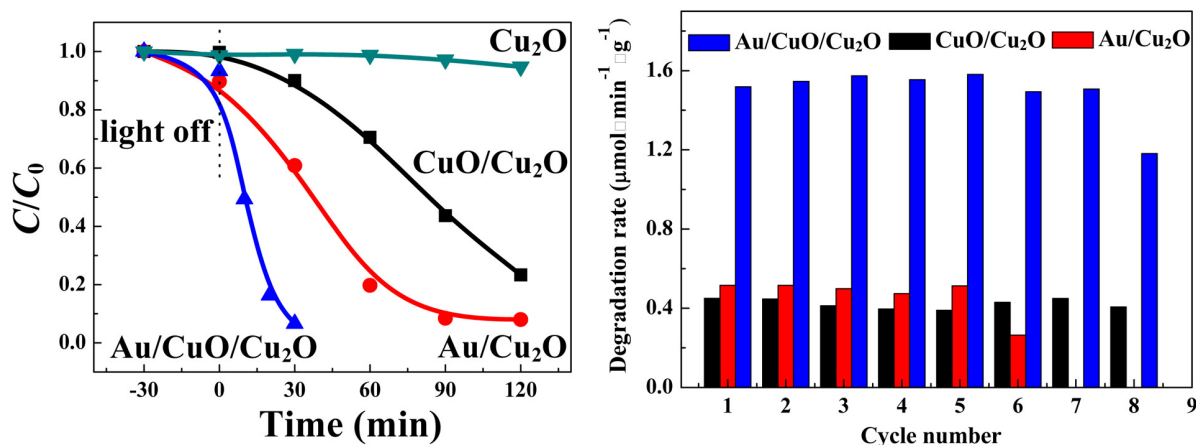
Chin. J. Catal., 2019, 40: 105–113 doi: 10.1016/S1872-2067(18)63164-X

Synergistic effects of CuO and Au nanodomains on Cu₂O cubes for improving photocatalytic activity and stability

Denghui Jiang, Yuegang Zhang, Xinheng Li *

Lanzhou Institute of Chemical Physics (LICP), Chinese Academy of Sciences; Central South University;

Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences



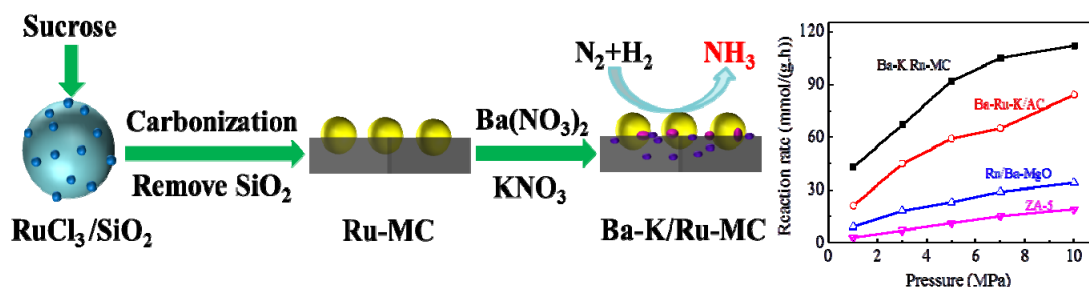
Au/CuO/Cu₂O catalysts were synthesized by sequential surface oxidative and reductive deposition on Cu₂O surfaces improving both the photocatalytic activity and stability of Cu₂O.

Chin. J. Catal., 2019, 40: 114–123 doi: 10.1016/S1872-2067(18)63192-4

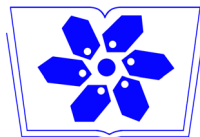
A highly stable and active mesoporous ruthenium catalyst for ammonia synthesis prepared by a RuCl₃/SiO₂-templated approach

Yaping Zhou, Yongcheng Ma, Guojun Lan, Haodong Tang, Wenfeng Han, Huazhang Liu, Ying Li *

Zhejiang University of Technology; Sichuan Huadi Construction Engineering Co., Ltd.



Semi-embedded Ru-MC has stable Ru NPs and strong interaction between Ru and C that promote the catalytic performance for ammonia synthesis.



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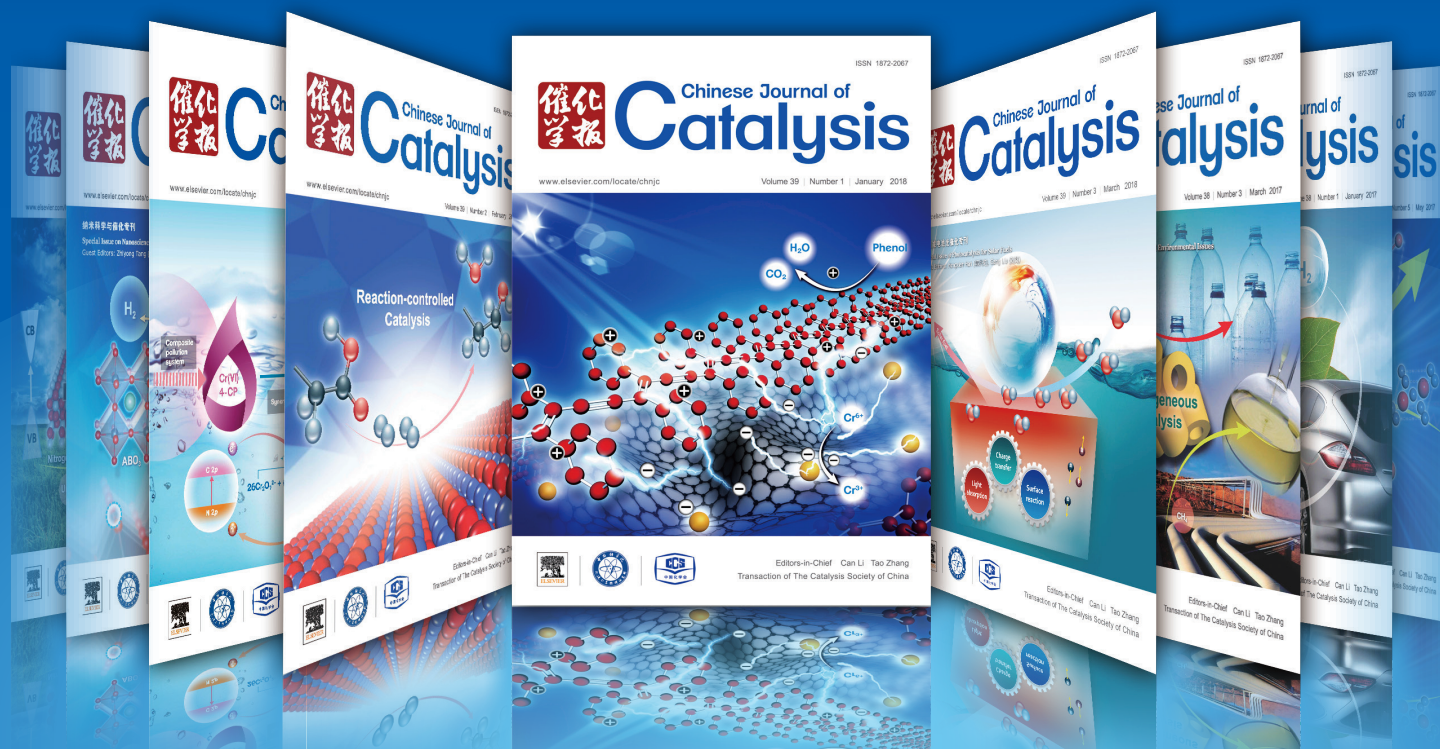


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