

# Catalysis Science & Technology

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

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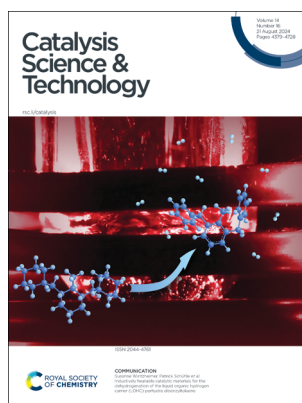
## IN THIS ISSUE

ISSN 2044-4761 CODEN CSTAGD 14(16) 4379–4728 (2024)



### Cover

See Ayaka Shigemoto, Yasushi Sekine *et al.*, pp. 4471–4478.  
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### Inside cover

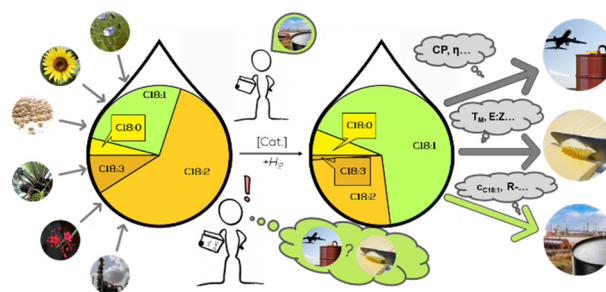
See Susanne Wintzheimer, Patrick Schühle *et al.*, pp. 4450–4457.  
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## REVIEWS

4390

### Catalytic processes for the selective hydrogenation of fats and oils: reevaluating a mature technology for feedstock diversification

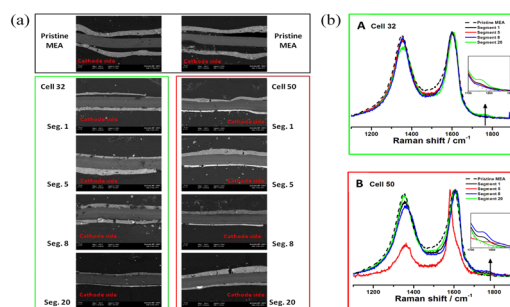
Maximilian L. Spiekermann and Thomas Seidensticker\*



4420

### A review on durability of key components of PEM fuel cells

Zhenyang Xie, Jian Wang, Guangyao Zhao, Qinyi Zhang, Hua Fan, Aohua Zeng and Wei Ding\*





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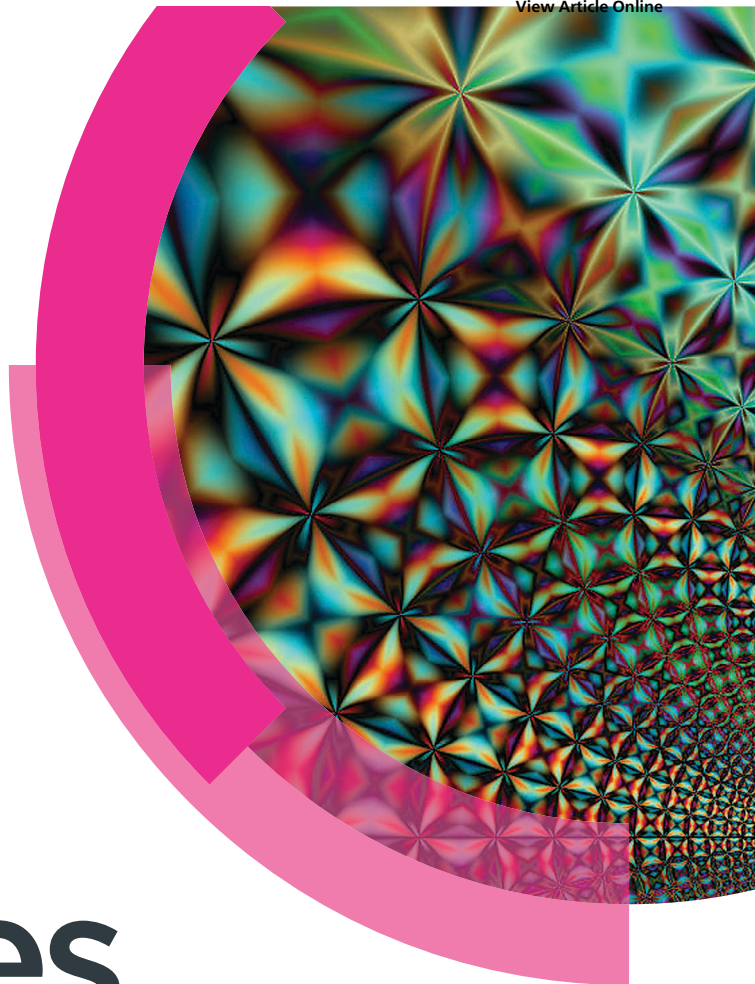
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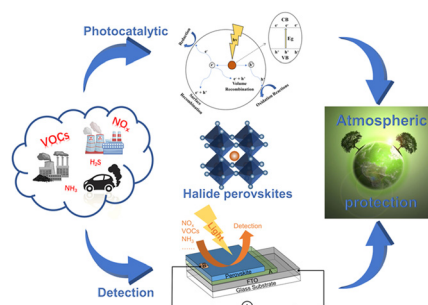


## REVIEWS

4432

## Halide perovskite-based nanomaterials for the detection and photocatalytic removal of gaseous pollutants

Zhijian Xiao, Jialin Li, Xueyi Mai, Jingling Yang\* and Mingshan Zhu\*

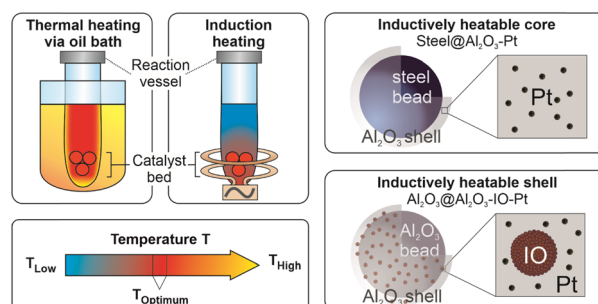


## COMMUNICATIONS

4450

## Inductively heatable catalytic materials for the dehydrogenation of the liquid organic hydrogen carrier (LOHC) perhydro dibenzyltoluene

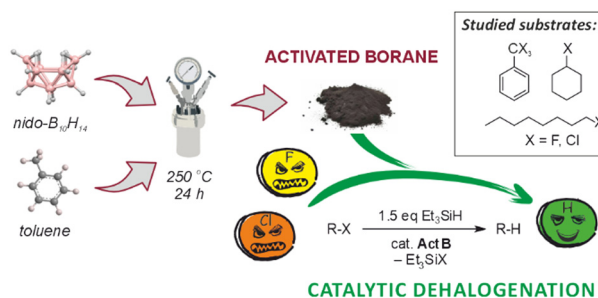
Markus Schörner, Thomas Solymosi, Theodor Razcka, Phillip Nathrath, Nicolas Patrick Johner, Thomas Zimmermann, Karl Mandel, Peter Wasserscheid, Susanne Wintzheimer\* and Patrick Schühle\*



4458

## Catalytic dehalogenation with activated borane, a porous borane cluster polymer

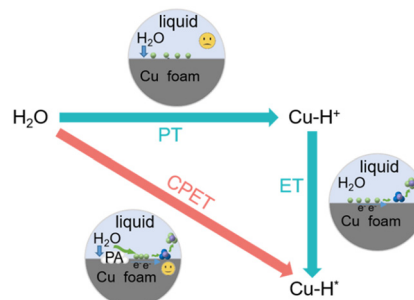
Abhishek Udnoor, Béla Urbán, Karel Škoch, Jan Hynek, Michal Horáček, Martin Lamač\* and Jan Demel\*



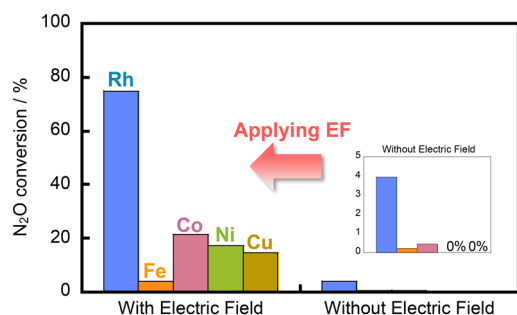
4466

## Improved nitrate-to-ammonia electrocatalysis through concerted proton-coupled electron transfer

Guanqiao Yu, Zilu Guo, Yuefei Li, Shan Huang\* and Jiayuan Li\*



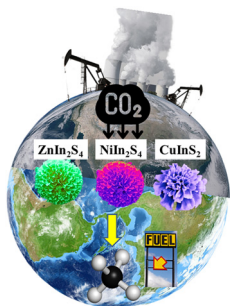
4471



### Catalytic N<sub>2</sub>O decomposition in an electric field at low temperatures

Ayaka Shigemoto,\* Takuma Higo, Chihiro Ukai, Yuki Inoda, Kenta Mitarai and Yasushi Sekine\*

4479

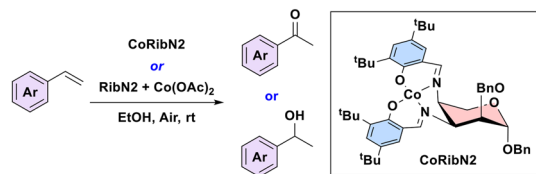


### Nanosheet assembled microspheres of metal (Zn, Ni, and Cu) indium sulfides for highly selective CO<sub>2</sub> electroreduction to methane

Schindra Kumar Ray, Rabin Dahal, Moses D. Ashie, Gayani Pathiraja and Bishnu Prasad Bastakoti\*

4487

Room temperature, aerial oxidation or non-aqueous hydration of styrenes

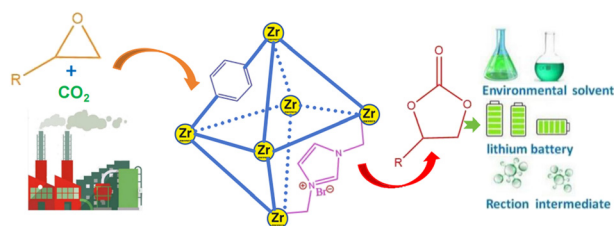


- Sugar-derived ligand
- Catalysis by preformed or in-situ generated CoRibN2
- Air as O-source & Room temperature reaction
- Ketone/Alcohol selectivity by HAT agent

### A sugar-derived ligand for room temperature aerial oxidation or non-aqueous Markovnikov hydration of styrenes using a preformed or *in situ* generated Co complex

Sachchida Nand Pandey, Arunava Sengupta, Rajib Bera, Sohel Ali and Somnath Yadav\*

4496



### Incorporation of a carboxyl-functionalized imidazolium-based ionic liquid into a UiO-66 type MOF for chemical fixation of CO<sub>2</sub> into carbonates

Jianghui Lin, Jiamei Luo, Mengjia Zhang, Lei Zhang, Guohui Cai, Jiahua Zou and Ling Li\*

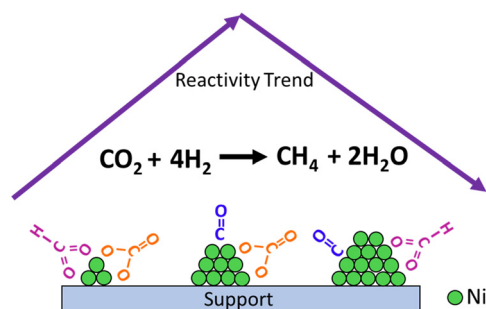


## PAPERS

4506

Investigation of titania and ceria support effects in nickel catalyzed CO<sub>2</sub> methanation

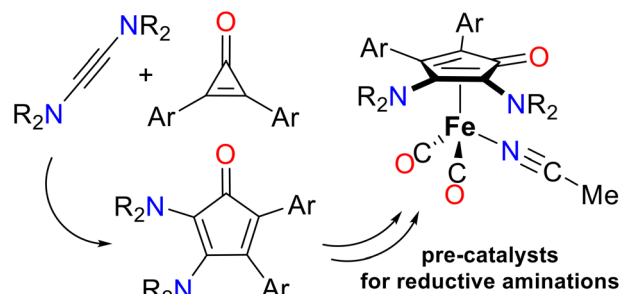
Majed Alam Abir, Rachel E. Phillips, Joseph Z. M. Harrah and Madelyn R. Ball\*



4522

## 2,3-Diamino-4,5-diarylcyclopentadienone iron carbonyl complexes as catalysts for reductive amination reactions

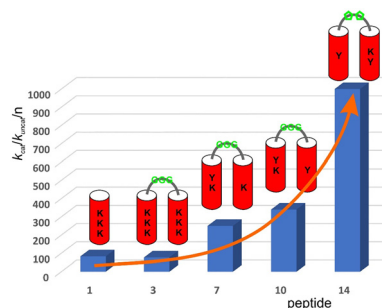
Lukas Körner, Dirk Bockfeld, Thomas Bannenberg and Matthias Tamm\*



4533

## Optimization of peptide foldamer-based artificial retro-aldolase

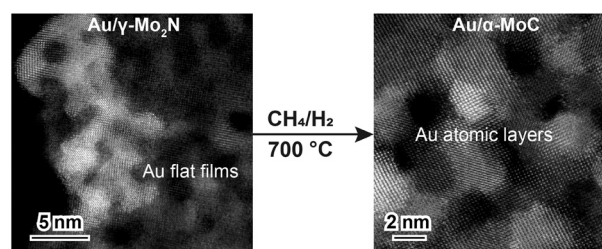
Katarzyna Ożga, Ewa Rudzińska-Szostak and Łukasz Berlicki\*



4542

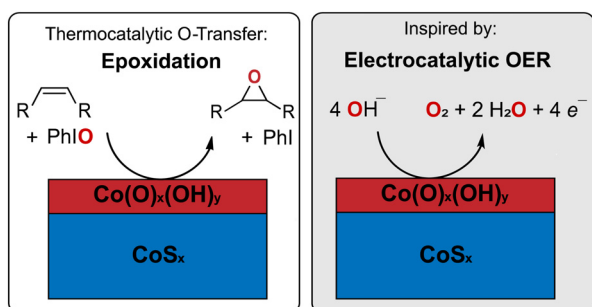
Dispersion of Au entities over Mo<sub>2</sub>N and MoC for the low-temperature water-gas shift reaction

Peiyao Guo, Chuanchuan Jin, Shaobo Han, Yan Zhou\* and Wenjie Shen





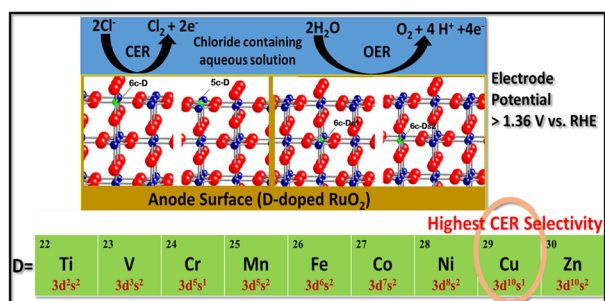
4550



### Thermocatalytic epoxidation by cobalt sulfide inspired by the material's electrocatalytic activity for oxygen evolution reaction

Vanessa Wyss, Ionel Adrian Dinu, Laurent Marot, Cornelia G. Palivan and Murielle F. Delley\*

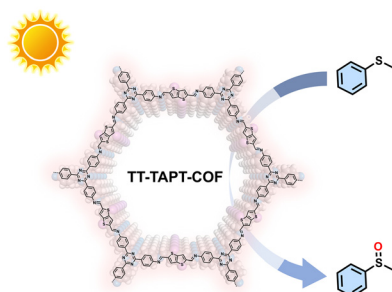
4566



### Increasing electrochemical chlorine selectivity over oxygen selectivity through the optimal weakening of oxygen bonds in transition metal-doped RuO<sub>2</sub>

Sulay Saha, Koshal Kishor and Raj Ganesh S. Pala\*

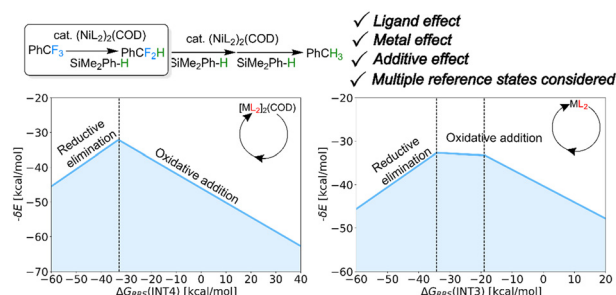
4575



### Thienothiophene-based covalent organic frameworks for visible light-triggered oxidation of sulfides to sulfoxides

Keke Zhang, Kanghui Xiong, Fengwei Huang, Xiaoyun Dong, Bing Zeng and Xianjun Lang\*

4587



### Computational design of transition metal catalysts for hydrodefluorination of trifluoromethylarenes using hydrosilane

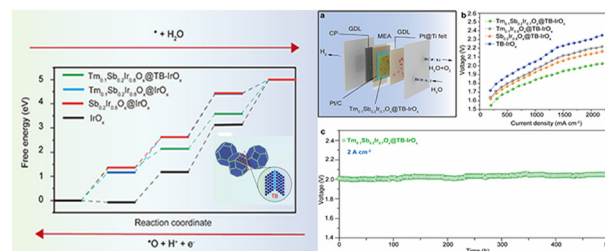
Thanapat Worakul, Boodsarin Sawatlon and Panida Surawatanawong\*



4599

## Synergistically optimizing the electrocatalytic performance of $\text{IrO}_2$ with double doping and bi-directional strains for acidic oxygen evolution reaction

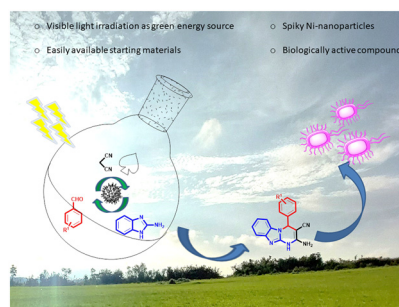
Xiao Wu, Weiwei Han, Shaoyun Hao, Yi He, Lecheng Lei and Xingwang Zhang\*



4608

## White-light-emitting diode (LED)-promoted one-pot synthesis of 1,2-dihydropyrimido[1,2-a]benzimidazoles in the presence of a new spiky magnetic nanocatalyst and their anthelmintic studies

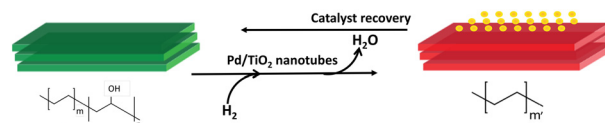
George Kupar Kharmawlong, Bhusan Chettri, Ridashisha Rymbai, Ridaphun Nongrum, Arun Kumar Yadav, Surya Bhan and Rishanlang Nongkhaw\*



4622

## Selective deoxygenation of polar polymers using metal supported on $\text{TiO}_2$ nanotubes

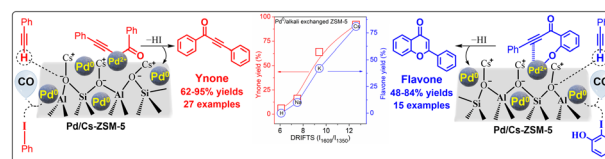
Dai-Phat Bui, Laura A. Gomez, Ismael Alalq, Luis Trevisi, Ana Carolina Jerdy, Han K. Chau, Lance L. Lobban and Steven P. Crossley\*



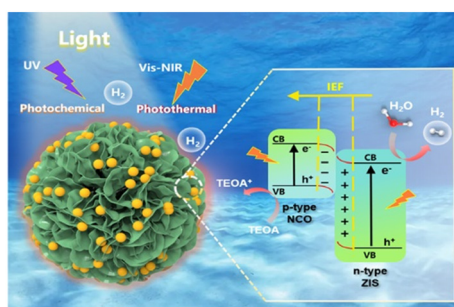
4631

## Surface Lewis basic site enabled proton abstraction for the regioselective synthesis of ynones and flavones over the $\text{Pd}^0/\text{Cs-ZSM-5}$ catalyst: mechanistic understanding and structure–activity correlation

Sasikumar Boggala, Vishali Bilakanti, Hari Padmasri Aytam, Kalpana Manda, Shirisha Varimalla and Venugopal Akula\*



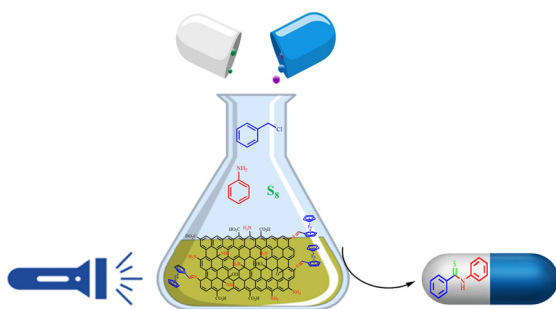
4646



### Broad-spectrum response of $\text{NiCo}_2\text{O}_4\text{-ZnIn}_2\text{S}_4$ p-n junction synergizing photothermal and photocatalytic effects for efficient $\text{H}_2$ evolution

Biao Wang, Yitao Si,\* Mingyue Du, Shidong Zhao, Jie Huang, Xinyuan Zhao, Shujian Wang, Kejian Lu and Maochang Liu\*

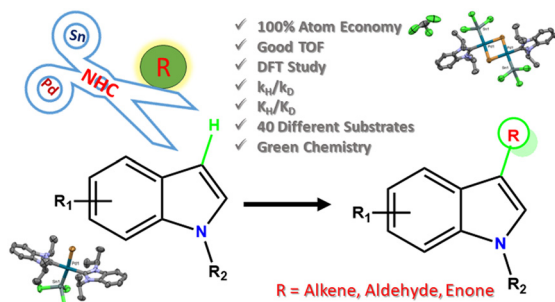
4655



### A comprehensive investigation into the synthesis, characterization, and photocatalytic performance of modified graphene oxide *via* imino bond with ferrocene as a novel photocatalyst for thioamide synthesis

Mohammad Bashiri and Mona Hosseini-Sarvari\*

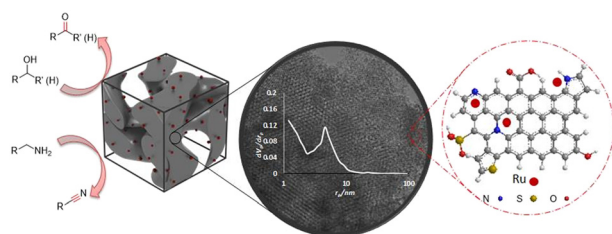
4674



### Effect of N-heterocyclic carbene in palladium–tin heterobimetallic catalysis: a DFT supported study on the C3–H functionalization of unprotected indoles

Mukesh Kumar Nayak, Rajat Rajiv Maharana, Anuradha Mohanty, Kousik Samanta\* and Sujit Roy\*

4684



### Ru nanoclusters supported on a bimodal N,S-doped mesoporous carbon: an efficient and reusable catalyst for selective aerobic oxidation of alcohols and amines

Mohsen Heydari, Nasim Ganji,\* Hamzeh Hassanaki Veisi, Babak Karimi\* and Hojatollah Vali



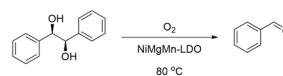


## PAPERS

4697

### Rational design of a bifunctional catalyst utilizing Mn-containing layered double oxide for the highly efficient oxidative cleavage of 1,2-diols

Xuan Dai, Pengfei Chen, Xin Wang, Junfeng Qian, Weiyu Zhou\* and Mingyang He\*



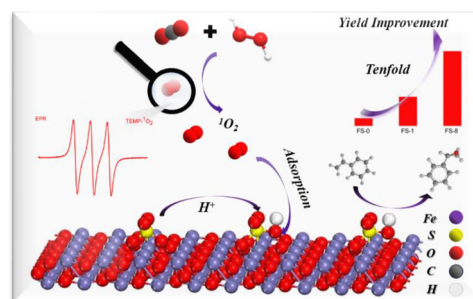
- ◆ Catalyst: heterogeneous, easily recycled and prepared
- ◆ Solvent: green solvent, ethanol
- ◆ Additive: additive free
- ◆ Reaction condition: mild conditions

Ni <sub>2</sub> Mg <sub>2</sub> Mn-LDO (350)		
the incorporation of nickel	➡	plentiful active Mn <sup>3+</sup> sites
heat treatment		ample basic sites

4704

### Sulfate-modified iron oxide catalyzed epoxidation of styrene with CO<sub>2</sub> activated hydrogen peroxide in water

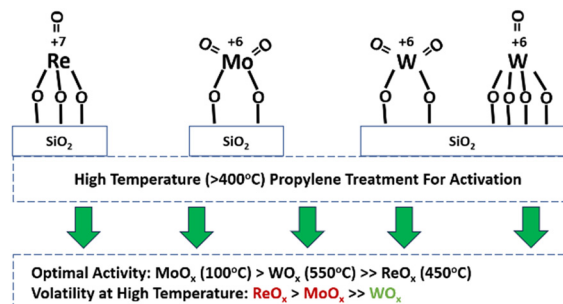
Fangchao Wang, Wei Yang, Ding Ding, Hongyi Cui and Guoying Zhang\*



4716

### Comparison of SiO<sub>2</sub>-supported molybdena, tungsta and rhenia catalysts for olefin metathesis

Bin Zhang and Israel E. Wachs\*



## CORRECTION

4725

### Correction: Influence of the preparation method on Ni/SiO<sub>2</sub> catalysts for selective hydrogenation of succinic anhydride to $\gamma$ -butyrolactone

An Bao, Chenju Chen,\* Huiqin Tao, Baigang Yang, Huirong Lai and Chunlei Zhang\*

