

Front Cover

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Back Cover

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CONTENTS

Research highlight

Emerging high-power NIR-emitting phosphor-converted LEDs

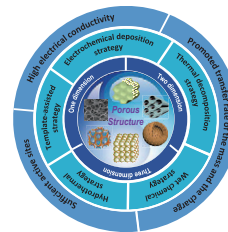
Xiaoyong Huang* 617

Review articles

Fabrication strategies of porous precious-metal-free bifunctional electrocatalysts for overall water splitting: Recent advances

Jin-Tao Ren, Yali Yao, Zhong-Yong Yuan* 620

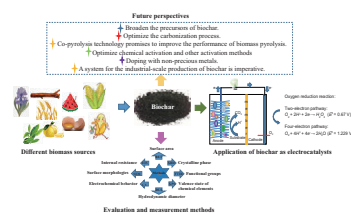
This overview summarized recent advances in different methodologies for the preparation of porous materials for electrocatalytic overall water splitting, including thermal decomposition, electrochemical deposition, template-assisted strategy, hydrothermal strategy, wet chemical and other strategies.



Sustainable biochar as an electrocatalysts for the oxygen reduction reaction in microbial fuel cells

Shengnan Li, Shih-Hsin Ho, Tao Hua, Qixing Zhou, Fengxiang Li*, Jingchun Tang 644

Biochars are produced from neutral sources (i.e., agricultural wastes). The morphology and catalytic performance of biochar electrodes must be elucidated through measurements. Overall, biochars possess remarkable electrocatalytic properties for ORRs and are considered to be ORR electrocatalysts with developmental potential.

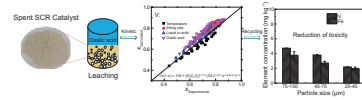


Research papers

Removal of V and Fe from spent denitrification catalyst by using oxalic acid: Study of dissolution kinetics and toxicity

Wenfen Wu, Chenye Wang*, Xingrui Wang, Huiquan Li 660

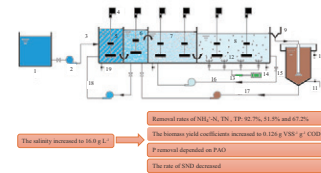
V and Fe from Spent SCR catalyst could be efficiently leaching by oxalic acid and the leaching behaviors were successfully predicted by Avrami kinetic model. Toxicity risk of V and Fe in spent SCR catalyst reduced significantly after recovery.



Salt effect on MUCT system performance of nitrogen and phosphorus removal

Huining Zhang*, Zhuowei Zhang, Kewei Jiang, Zhili Li, Kefeng Zhang, Jianqing Ma, Yongxing Qian..... 670

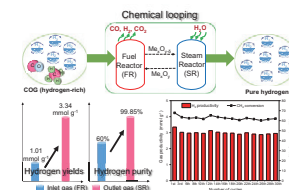
The effect of salinity on biological nitrogen and denitrifying phosphorus removal was investigated in a MUCT system. All the COD, $\text{NH}_4^+\text{-N}$, TN and TP removal rates exhibited a trend of decline with the salt concentration increasing, so increased salinity had a detrimental effect on PAOs, DPAOs, SND.



Hydrogen production via chemical looping reforming of coke oven gas

Kun Yang, Zhenhua Gu, Yanhui Long, Shen Lin, Chunqiang Lu, Xing Zhu, Hua Wang, Kongzhai Li*..... 678

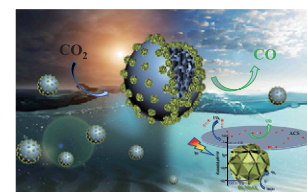
Chemical looping reforming of coke oven gas to produce pure H_2 is proposed in the present work by using $\text{La}_{1-x}\text{Sr}_x\text{FeO}_3$ perovskite oxides as oxygen carriers. The doping of suitable amounts of Sr in LaFeO_3 perovskite (e.g., $\text{La}_{0.5}\text{Sr}_{0.5}\text{FeO}_3$) significantly promotes the reactivity for selective oxidation of methane to syngas and inhibits the formation of carbon deposition.



Assisting Bi_2MoO_6 microspheres with phenolic resin-based ACSs as attractive tailor-made supporter for highly-efficient photocatalytic CO_2 reduction

Xiaochao Zhang*, Guangmin Ren, Changming Zhang, Jinbo Xue, Qiang Zhao, Rui Li, Yunfang Wang, Caimei Fan..... 693

There exist effective synergistic effects between ACSs, with enhanced CO_2 absorption and admirable electrical conductivity, and Bi_2MoO_6 , with suitable oxidation reduction potentials and bandgap, realizing that $\text{Bi}_2\text{MoO}_6/\text{ACSs}$ displays as 1.8 times CO_2 reduction activity to CO as bulk Bi_2MoO_6 under simulated sunlight irradiation.

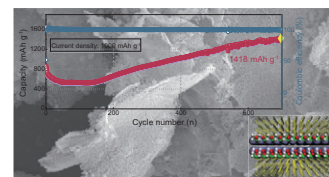


MOF-derived zinc manganese oxide nanosheets with valence-controllable composition for high-performance Li storage

Yu Du¹, Yihan Xu¹, Weiwei Zhou*, Yaoyang Yu, Xinzhou Ma, Fei Liu, Jinglong Xu, Yongming Zhu..... 703

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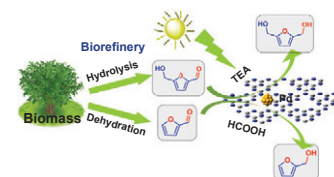
The porous ZMO nanosheets were obtained from 2D MOF precursors using PVP as a soft template. By analyzing ZMOs from different annealing temperature, we disclosed that the higher-valent Mn the ZMO contains, the more additional capacity it gains upon cycling.



Visible-light-induced hydrogenation of biomass-based aldehydes by graphitic carbon nitride supported metal catalysts

Shenghong Dong¹, Mingzhe Chen¹, Jiarui Zhang, Jinzhu Chen*, Yisheng Xu* 715

The photocatalyst of Pd supported on graphitic carbon nitride (Pd/g-C₃N₄) exhibits excellent catalytic activity in photo-induced hydrogenation of biomass-based furfural and 5-hydroxymethylfurfural with environmental benign reagents of formic acid as proton source and triethylamine as sacrificial electron donor.



Effective regeneration of high-performance anode material recycled from the whole electrodes in spent lithium-ion batteries via a simplified approach

Long Ye, Chunhui Wang, Liang Cao, Hougui Xiao, Jiafeng Zhang*, Bao Zhang, Xing Ou* 725

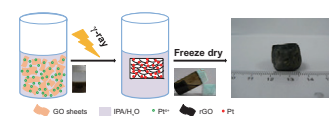
In this research, a simplified recycling process is explored to recycle all valuable components from electrodes in spent LiCoO₂-graphite battery and regenerate CoO/CoFe₂O₄/EG as a high-performance anode material for LIBs.



Facile γ -ray irradiation synthesis of Pt/GA nanocomposite for catalytic reduction of 4-nitrophenol

Yu Zhang*, Chao Li, Xianfu Liu, Jing Xu, Xingkun Yang, Zhang Zhang* 734

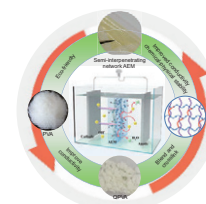
The platinum/graphene aerogel (Pt/GA) nanocomposite was synthesized by a clean, green route. What's more, Pt/GA exhibited outstanding catalytic activity for the reduction of 4-nitrophenol.



Semi-interpenetrating network anion exchange membranes based on quaternized polyvinyl alcohol/poly(diallyldimethylammonium chloride)

Xinming Du, Hongyu Zhang, Yongjiang Yuan, Zhe Wang* 743

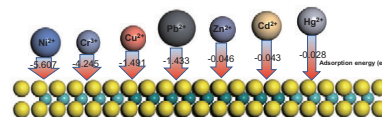
Quaternized PVA and PDDA are introduced to improve the conductivity, the ring structure of PDDA also improves alkaline stability of AEMs. The semi-interpenetrating network AEMs with microporous structure exhibit good ionic conductivity, mechanical strength and alkaline durability.



Comparative adsorption of heavy metal ions in wastewater on monolayer molybdenum disulfide

Zheng Zhang, Kai Chen, Qiang Zhao*, Mei Huang, Xiaoping Ouyang..... 751

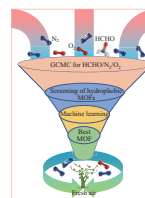
Among the heavy metal ions, the monolayer MoS₂ sheet is the most suitable for absorbing Ni²⁺ and Cr³⁺, followed by Cu²⁺ and Pb²⁺, and the monolayer MoS₂ sheet has weak adsorption strength to Zn²⁺, Cd²⁺, and Hg²⁺.



Machine learning and high-throughput computational screening of hydrophobic metal-organic frameworks for capture of formaldehyde from air

Xueying Yuan, Xiaomei Deng, Chengzhi Cai, Zenan Shi, Hong Liang, Shuhua Li, Zhiwei Qiao* 759

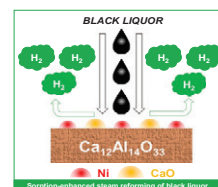
The combination of machine learning and high-throughput computational screening were employed to calculate and to identify the top-performing hydrophobic metal-organic frameworks for the removal of formaldehyde from N₂ and O₂.



Production of high-purity hydrogen from paper recycling black liquor via sorption enhanced steam reforming

Hanke Li¹, Shijie Wu¹, Chengxiong Dang, Guangxing Yang, Yonghai Cao, Hongjuan Wang, Feng Peng, Hao Yu*..... 771

H₂ production with 96% purity and 0.9 mol H₂ mol⁻¹ C yield was achieved by sorption-enhanced steam reforming of black liquor over a Ni-CaO-Ca₁₂Al₁₄O₃₃ bi-functional catalyst, the sulfur removal was also realized by storing it as CaSO₃.



Earth abundant spinel for hydrogen production in a chemical looping scheme at 550 °C

YuQiu, Li Ma, Qingfeng Kong, Min Li, Dongxu Cui, Shuai Zhang, Dewang Zeng*, Rui Xiao* 780

Mn addition in earth-abundant spinels improves the reduction reaction by enhancing the oxygen-ion diffusion and the reactivity with steam to produce hydrogen at 550 °C, enabling its potential for chemical looping applications at mid-temperatures.

