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Back Cover

See Weizhou Jiao *et al.*,

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CONTENTS

Research highlight

Long-cycling and dendrite-free lithium metal anodes via salt chemistry

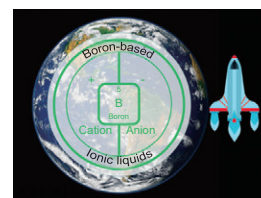
Sainan Liu, Wenchao Zhang* 791

Review articles

Boron based hypergolic ionic liquids: A review

Zhenyu Zhang, Zirui Zhao, Binshen Wang*, Jiaheng Zhang* 794

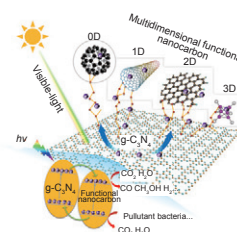
Boron-based hypergolic ionic liquids (HILs) and their derivatives are discussed herein, which is a promising family for potential bipropellant systems. Specially, physicochemical properties and ignition performance of these green fuel are highlighted.



Multidimensional (0D-3D) functional nanocarbon: Promising material to strengthen the photocatalytic activity of graphitic carbon nitride

Bin He, Mi Feng, Xinyan Chen, Jian Sun* 823

Strategies on employing multidimensional (0D~3D) functional nanocarbon materials as modifiers to strengthen visible-light photocatalytic activity of g-C₃N₄ were reviewed. And a nichetargeting outlook on the major challenges, and opportunities for high-powered carbon/g-C₃N₄ composites were also proposed.



Research papers

Building highly active hybrid double-atom sites in C₂N for enhanced electrocatalytic hydrogen peroxide synthesis

Yongyong Cao, Jinyan Zhao, Xing Zhong, Guilin Zhuang, Shengwei Deng, Zhongzhe Wei, Zihao Yao, Jianguo Wang* 846

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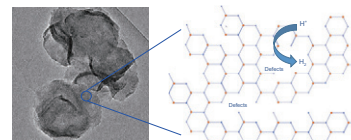
RuCu@C₂N (Rubine) and PdCu@C₂N (Emerald) for the synthesis of H₂O₂ via oxygen reduction reaction are designed. Emerald shows a higher catalytic performance for electrocatalytic H₂O₂ synthesis with lower overpotential and dynamic energy barrier compared with Rubine.



Continuous synthesis of few-layer MoS₂ with highly electrocatalytic hydrogen evolution

Meng Shao¹, Peican Wang¹, Yimeng Wang, Baoguo Wang*, Yundong Wang, Jianhong Xu* 858

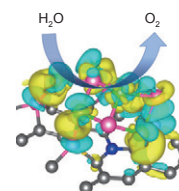
A continuous micro-reaction approach with high heat and mass transfer rates to synthesize few-layer MoS₂ nanoplates with abundant active sites was developed. The defective MoS₂ ultrathin nanoplates exhibit excellent HER performance.



Boosting oxygen evolution reactivity by modulating electronic structure and honeycomb-like architecture in Ni₂P/N,P-codoped carbon hybrids

Menglei Yuan, Yu Sun, Yong Yang, Jingxian Zhang, Sobia Dipazir, Tongkun Zhao, Shuwei Li, Yongbing Xie, He Zhao, Zhanjun Liu, Guangjin Zhang* 866

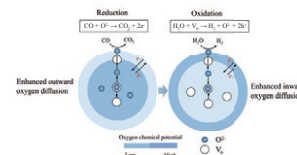
In this work, for the first time, we propose synergistic strategy that couples electronic structure and honeycomb-like architectures achieve a low-overpotential Ni₂P/N,P-codoped carbon hybrids for efficient OER.



Efficient hydrogen production through the chemical looping redox cycle of YSZ supported iron oxides

Li Ma, Yu Qiu, Min Li, Dongxu Cui, Shuai Zhang, Dewang Zeng*, Rui Xiao* 875

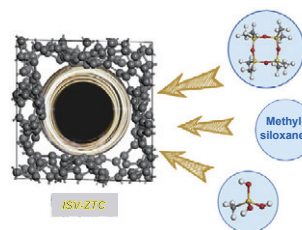
The yttria-stabilized zirconia supported Fe₂O₃ showed efficient hydrogen production in the chemical looping water splitting process. The support effect provides a promising route for the modification of oxygen carrier materials.



Zeolite-templated carbons as effective sorbents to remove methylsiloxanes and derivatives: A computational screening

Shiru Lin¹, Kaitlyn A. Jacoby¹, Jinxing Gu, Dariana R. Vega-Santander, Arturo J. Hernández-Maldonado*, Zhongfang Chen* 884

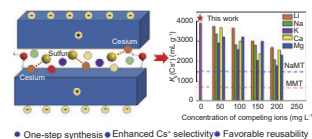
By Grand Canonical Monte Carlo simulations, we explored the potentials of the recently proposed 68 stable zeolite-templated carbons (ZTCs) as sorbents to remove methylsiloxanes and derivatives. Four ZTCs, namely ISV, FAU1, FAU3, and H8326836, were identified with better adsorption performance than activated carbons, and ISV is expected to perform the best.



Novel montmorillonite-sulfur composite for enhancement of selective adsorption toward cesium

Shanqing Chen, Jiayin Hu*, Guoliang Mi, Yafei Guo, Tianlong Deng* 893

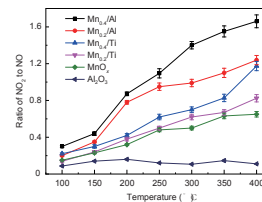
Novel montmorillonite-sulfur composite was developed for the efficient and selective removal of cesium from complicated wastewater containing various competing ions.



Assisting effect of Al₂O₃ on MnOₓ for NO catalytic oxidation

Denghui Wang*, Hui Li, Qi Yao, Shien Hui, Yanqing Niu 903

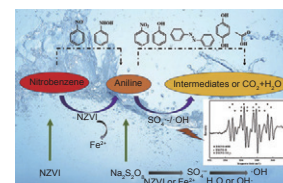
Efficient catalysts for NO oxidation were prepared using MnOₓ as active compound, with TiO₂ or Al₂O₃ as support. Performance of the catalysts followed as Mn₀.₄/Al > Mn₀.₂/Al > Mn₀.₄/Ti > Mn₀.₂/Ti > MnOₓ > Al₂O₃ on the whole, indicating the effective assisting influence of Al₂O₃ on MnOₓ for NO catalytic oxidation.



Degradation of nitrobenzene-containing wastewater by sequential nanoscale zero valent iron-persulfate process

Jingjuan Qiao, Weizhou Jiao*, Youzhi Liu 910

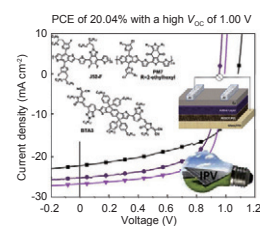
NZVI was prepared by IS-RPB, and sequential NZVI-Na₂S₂O₈ process was first proposed to degrade nitrobenzene-containing wastewater. The degradation mechanism was studied by EPR and radical capture experiments, and degradation pathway was studied by GC-MS.



Ternary blend strategy in benzotriazole-based organic photovoltaics for indoor application

Yinglong Bai, Runnan Yu, Yiming Bai, Erjun Zhou*, Tasawar Hayat, Ahmed Alsaedi, Zhan'ao Tan*... 920

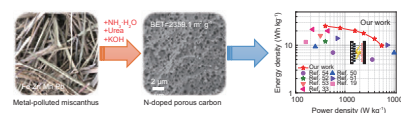
Benzotriazole-based polymer donor J52-F, chlorinated polymer donor PM7 and A₂-A₁-D-A₁-A₂-structured acceptor BTA3 are used to construct ternary OPVs for indoor light applications. Benefitting from the introduction of PM7 as the third component in J52-F:BTA3-based blend, a gratifying PCE of 20.04% with a high VOC of 1.00 V has been achieved under the test conditions with an illumination of 300 lx from an LED lighting source with a color temperature of 3000 K.



Controllable synthesis of nitrogen-doped porous carbon from metal-polluted miscanthus waste boosting for supercapacitors

Zuo Chen, Man Zhang, Yuchen Wang, Zhiyu Yang, Di Hu, Yetao Tang, Kai Yan* 929

In this study, we fabricated nitrogen-doped nanoporous carbon with large specific area and good conductivity from metal-polluted miscanthus wastes. Furthermore, the symmetric supercapacitor assembled by the synthesized porous carbon achieved remarkable electrochemical performance.

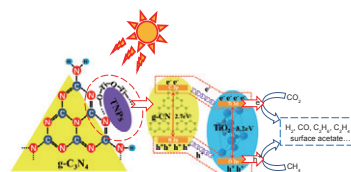


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Photoreduction of CO₂ in the presence of CH₄ over g-C₃N₄ modified with TiO₂ nanoparticles at room temperature

Ming Chen, Jiachen Wu, Chongchong Lu, Xiao Luo*, Yangqiang Huang*, Bo Jin, Hongxia Gao, Xiaowen Zhang, Morris Argyle, Zhiwu Liang*..... 938

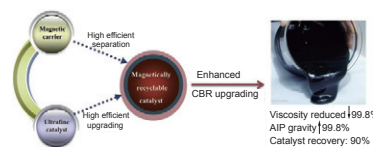
CO₂ and CH₄ are possible alternative energy sources. In this work, the noble-metal-free TNP-CN photocatalyst was used to convert them into value added chemicals, such as H₂, CO, C₂H₆, C₂H₄ and surface acetate.



Novel magnetic carbon supported molybdenum disulfide catalyst and its application in residue upgrading

Xiangyang Zhu, Dong Qiao, Liangrong Yang*, Qinling Bi, Huifang Xing, Shan Ni, Menglei Yuan, Huizhou Liu*, Luhai Wang, An Ma..... 952

In this work, for the first time, we report the magnetically retrievable Fe₃O₄/C–MoS₂ catalysts by a synergistic strategy that achieves enhanced hydrocracking performance for the actual heavy oil upgrading.



Synthesis of HTLcs modified by K₃PO₄ for side chain alkylation of toluene with methanol

Chunyao Hao¹, Yueli Wen¹, Bin Wang*, Faraz Ahmad, Yuhua Liu, Huijun Li, Wei Huang*..... 961

The addition of K₃PO₄ could adjust the acid-base site distribution and significantly improve the catalytic activity of calcined hydrotalcite catalysts for side chain alkylation of toluene with methanol, where the highest selectivities of styrene and ethylbenzene were 39.25% and 40.68%, respectively.

