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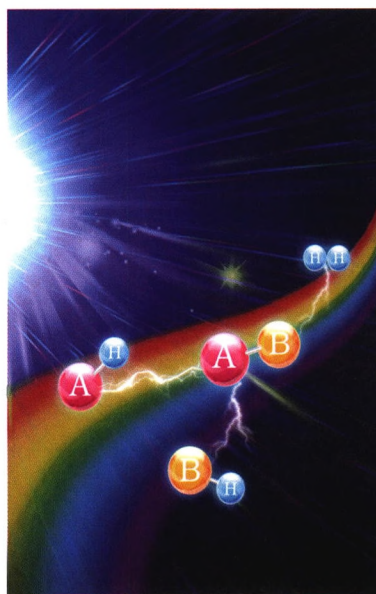
纳米 $\alpha\text{-Fe}_2\text{O}_3$ /(IPDI-HTPB) 复合粒子的制备及其催化性能研究 武艳, 庞爱民, 胡磊, 何根升, 张莹莹, 张利雄, 李明海*, 马振叶*, 化学学报, 2020, 78(4), 337-343

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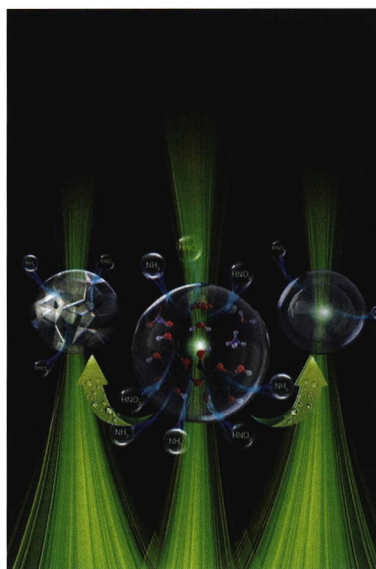
界面增强的 CeO_2/FeNi MOF 高效析氧催化剂 代迷迷, 王健, 李麟阁, 王琪, 刘美男*, 张跃钢*, 化学学报, 2020, 78(4), 355-362

* 通信联系人.

On the cover: Cross-coupling hydrogen evolution (CCHE) reactions exclude the use of external oxidants to activate R—H bond, thus offering a clean, energy-efficient and atom-economic protocol for cross-couplings. In this review, recent developments of photocatalytic and electrochemical CCHE reactions are discussed via the most prominent mechanistic pathways, the types of C—C bond, C—X (heteroatom) bond, or X—X bond formations and specific reaction classes. [Liu, Qiang *et al.* on page 299-310.]

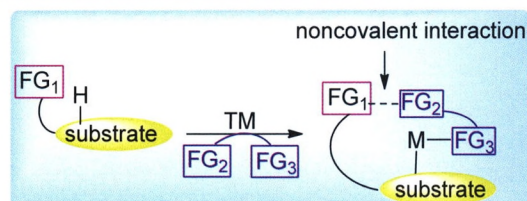


On the back cover: In order to understand the volatility of ammonium nitrate in ultra-viscous aerosol droplets, optical tweezers coupled with cavity-enhanced Raman spectroscopy were employed to observe the volatility of ammonium nitrate in the mixture of $\text{NH}_4\text{NO}_3/\text{MgSO}_4$ and $\text{NH}_4\text{NO}_3/\text{sucrose}$ droplets. The results showed that the volatilization of ammonium nitrate in droplets was inhibited at low relative humidity. [Zhang, Yunhong *et al.* on page 326-329.]



Perspective

Noncovalent Interaction in Transition Metal-Catalyzed Selective C—H Activation

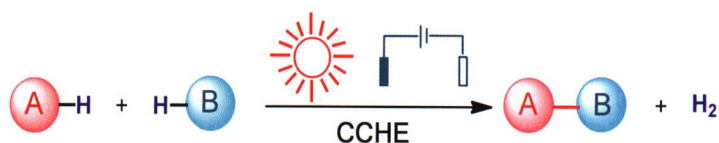


One of the fundamental challenges in C—H activation is to control the selectivity. Very recently, noncovalent interactions have emerged as a novel technology for controlling selectivity in transition metal-catalyzed C—H functionalization. In this perspective, recent advances in this cutting-edge area cataloged by the mode of noncovalent interactions are summarized.

Liao, Gang; Wu, Yong-Jie; Shi, Bing-Feng*
Acta Chim. Sinica **2020**, 78(4), 289-298

Review

Cross-Coupling Hydrogen Evolution Reactions

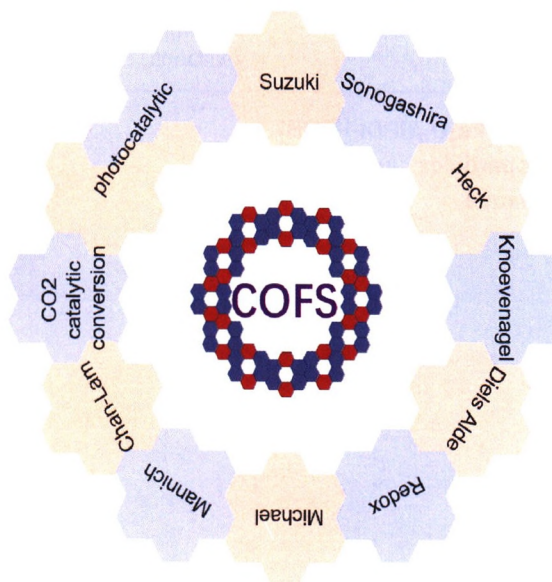


Cross-coupling hydrogen evolution (CCHE) reactions exclude the use of external oxidants to activate R—H bond, thus offering a clean, energy-efficient and atom-economic protocol for cross-couplings. In this review, recent developments of photocatalytic and electrochemical CCHE reactions are discussed via the most prominent mechanistic pathways, the types of C—C bond, C—X (heteroatom) bond, or X—X bond formations and specific reaction classes.

Dong, Kui; Liu, Qiang*; Wu, Li-Zhu*

Acta Chim. Sinica **2020**, 78(4), 299-310

Research Progress of Covalent Organic Framework Materials in Catalysis



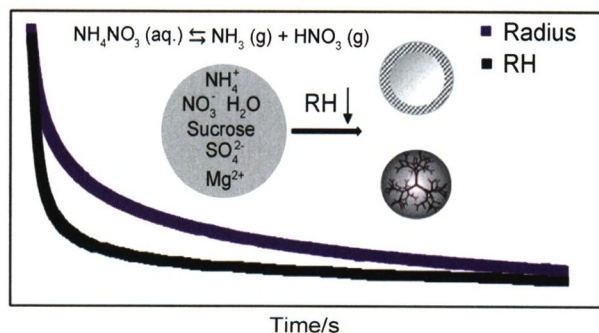
The synthetic strategy and application of COF in different types of catalytic reactions are reviewed in this paper. The catalytic reactions involved in this review are Suzuki reaction, Sonogashira reaction, Heck reaction, Knoevenagel condensation reaction, Diels Alder reaction, redox reaction, Michael addition reaction, Mannich reaction, Chan-Lam coupling reaction, CO₂ catalytic conversion reaction, photocatalytic reaction and so on. Moreover, the current research situation of COF catalyst is summarized and prospected. Finally, the remaining challenges in this field are also indicated.

Liu, Jianguo*; Zhang, Mingyue; Wang, Nan; Wang, Chenguang; Ma, Longlong*

Acta Chim. Sinica **2020**, 78(4), 311-325

Communication

Volatility of Ammonium Nitrate in Ultra-viscous Aerosol Droplets by Optical Tweezers



The volatility of ammonium nitrate in ultra-viscous aerosol droplets was explored by optical tweezers coupled with cavity-enhanced Raman spectroscopy, and the effective vapor pressures of ammonium nitrate at different relative humidity (RH) were obtained. Finally, the dependence between the vapor pressures and the RH as well as the components of droplets were discussed.

Lü, Xijuan; Zhang, Yunhong*

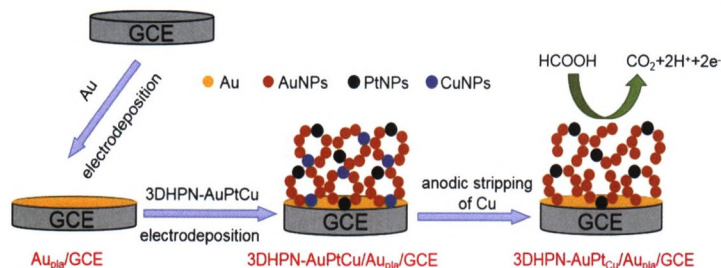
Acta Chim. Sinica **2020**, 78(4), 326-329

Article

Preparation of Honeycomb-structured AuPt_{Cu} Electrocatalyst by Dynamic Hydrogen Bubble and Sacrificial Cu Templates for Oxidation of Formic Acid

Chen, Yingying; Liu, Huan; Cheng, Yan; Xie, Qingji*

Acta Chim. Sinica **2020**, 78(4), 330-336

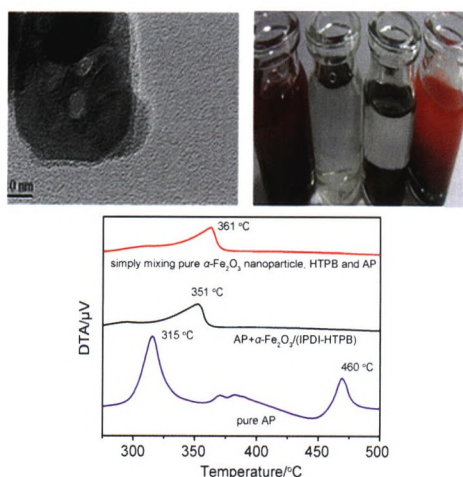


A 3DHPN-AuPt_{Cu}/Au_{pl}/GCE was prepared by the dynamic hydrogen bubble template electrodeposition of a three-dimensional honeycomb-like porous nano-AuPtCu (3DHPN-AuPtCu) on a gold-plated glassy carbon electrode (Au_{pl}/GCE) and then anodic stripping of Cu, which exhibited high electrocatalytic performance for formic acid oxidation.

Preparation of α -Fe₂O₃/(IPDI-HTPB) Composite Nanoparticles and Their Catalytic Performance

Wu, Yan; Pang, Aimin; Hu, Lei; He, Gen-sheng; Zhang, Yingying; Zhang, Lixiong; Li, Minghai*; Ma, Zhenye*

Acta Chim. Sinica **2020**, 78(4), 337-343

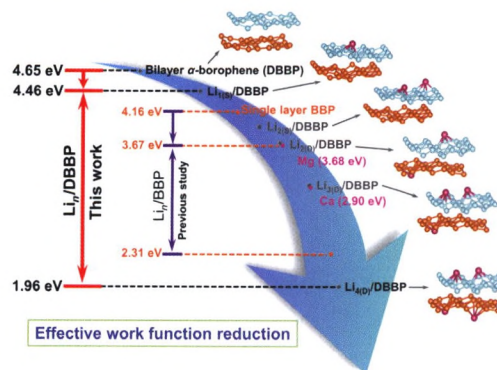


The α -Fe₂O₃/(IPDI-HTPB) composite nanoparticles were prepared by choosing isophorone diisocyanate (IPDI) as grafting bridge. In α -Fe₂O₃/(IPDI-HTPB) composite nanoparticles, HTPB were successfully grafting on the surface of α -Fe₂O₃ nanoparticles by the grafting activity of IPDI. The depth of the HTPB was nearly 5 nm. After the composite process for hydrophilic α -Fe₂O₃, the composite nanoparticles showed hydrophobicity. Compare with the pure α -Fe₂O₃ nanoparticles, α -Fe₂O₃ nanoparticles in α -Fe₂O₃/IPDI-HTPB composite nanoparticles showed better catalytic activity on the thermal decomposition of AP.

Effect of Li Adsorption on Work Function Modulation of Bilayer α -Borophene: A Theoretical Study

Deng, Yingyi; Qian, Yinyin; Xie, Ying; Zhang, Lei; Zheng, Bing*; Lou, Yuanqing; Yu, Haitao

Acta Chim. Sinica **2020**, 78(4), 344-354

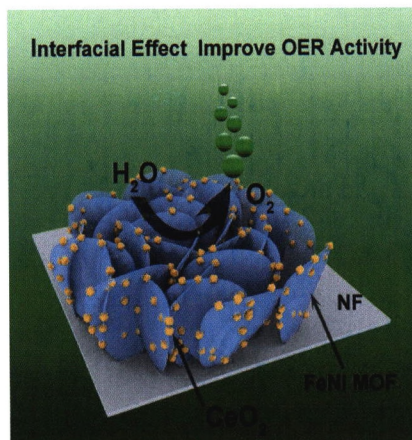


Borophene-based nanocomposite is an electrode material with strong potential, and thus, the work function modulation of borophene is highly important to maximize the energy conversion efficiency and performance of the device. The effects of Li adsorption on the structure, electronic properties and work function of double-layer α -borophene (DBBP), particularly the factors that affect the work function reduction of Li_n/DBBP relative to DBBP are theoretically studied. Due to its metallic character and extremely low work function, Li-adsorbed DBBP nanomaterials can be utilized as nanoscale cathode materials in electronic devices.

High-performance Oxygen Evolution Catalyst Enabled by Interfacial Effect between CeO_2 and FeNi Metal-organic Framework

Dai, Mimi; Wang, Jian; Li, Linge; Wang, Qi; Liu, Meinan*; Zhang, Yuegang*

Acta Chim. Sinica **2020**, 78(4), 355-362



The introduction of CeO_2 nanoclusters significantly enhances the OER (oxygen evolution reaction) performance of FeNi metal-organic framework nanosheets through the formation of Fe/Ni—O—Ce bonds on the interface.

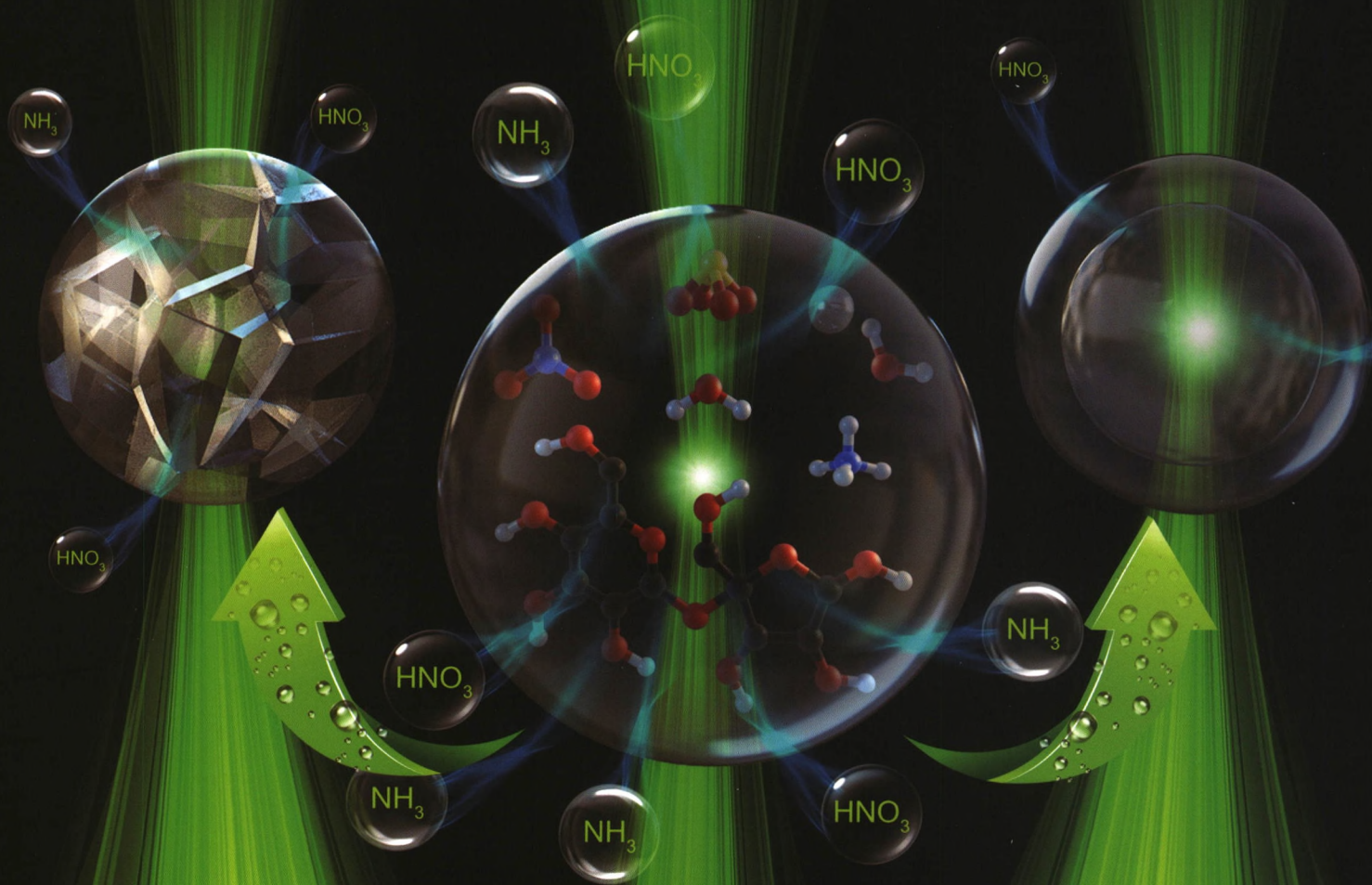


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