

QK2037281

ISSN 0567-7351
CN 31-1320/O6
CODEN HHHPA4
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化学学报

ACTA CHIMICA SINICA

2020 第78卷 第7期 Vol. 78 No. 7

ISSN 0567-7351

07>



770567 735202

万方数据



中国化学会
中国科学院上海有机化学研究所

主办

化学学报

Acta Chimica Sinica

(Huaxue Xuebao)

第 78 卷 第 7 期 2020 年 7 月 15 日

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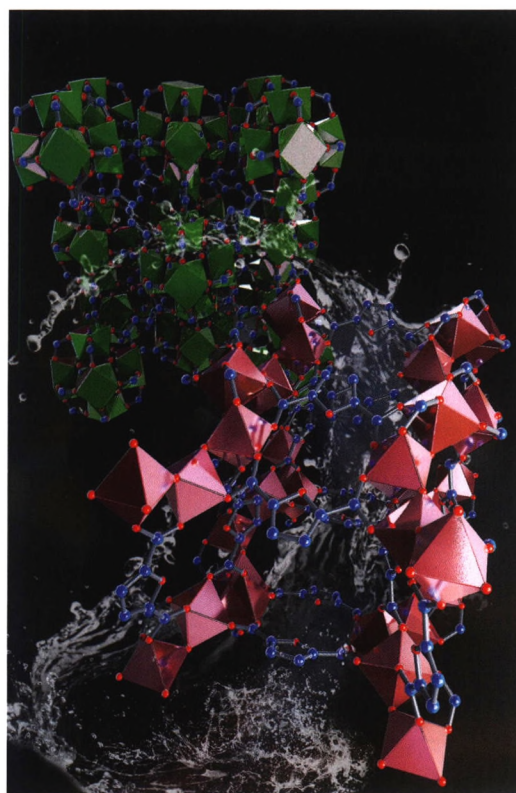
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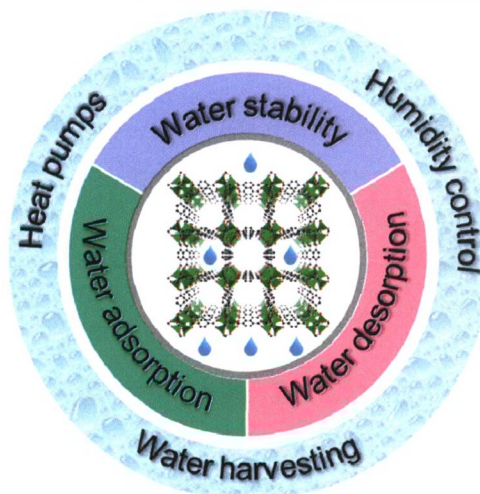
* 通信联系人.

On the cover: The geometrically tailorable pore structure, tunable cavity hydrophilicity and good stability make metal-organic frameworks (MOFs) promising adsorbing materials that exhibit steep uptake of water vapor and easy regeneration characteristic in the ideal pressure region for applications such as water harvesting, heat pump and humidity control. [Wang, Bo *et al.* on page 597-612.]



Review

Water Adsorption Properties and Applications of Stable Metal-organic Frameworks

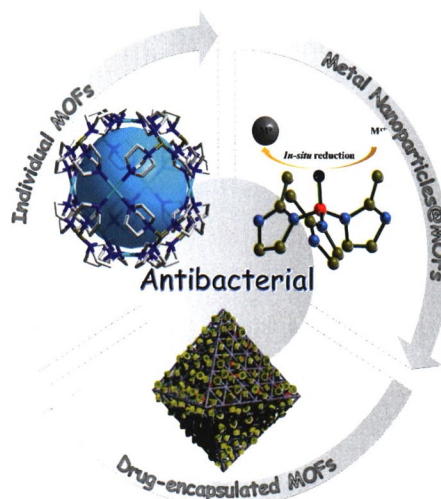


Zhang, Jinwei; Li, Ping; Zhang, Xinning;
Ma, Xiaojie*; Wang, Bo*

Acta Chim. Sinica **2020**, 78(7), 597-612

The designing and optimizing of the water stable metal-organic frameworks (MOFs) based on the reticular chemistry is presented. Water vapor adsorption/desorption performance of MOFs, as well as the applications of MOFs as water adsorbents in industrial gas dehydration, drinking water harvesting, adsorption-based heat pump and indoor humidity regulation have been discussed.

Research Progress of Metal-Organic Frameworks Based Antibacterial Materials

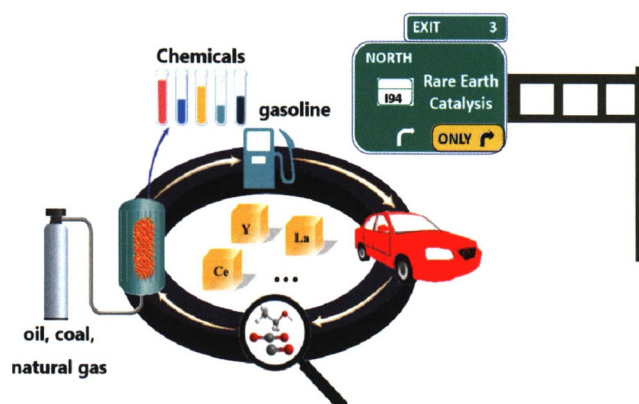


Qi, Ye; Ren, Shuangsong; Che, Ying; Ye, Junwei*; Ning, Guiling*

Acta Chim. Sinica **2020**, 78(7), 613-624

The recent research progress of the different metal centers-constructed MOFs (metal-organic frameworks), metal nanoparticles@MOFs, and drug-encapsulated MOFs, as well as their excellent applications in antibacterial, is reported.

A Brief Summary of Research Progress on the Application of Rare Earth Materials in Heterogeneous Catalysis

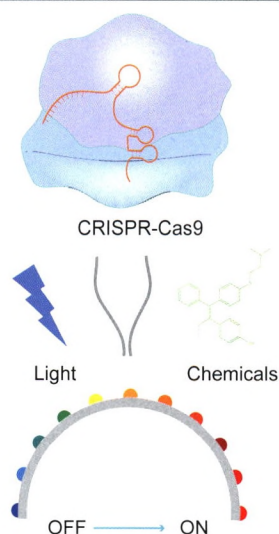


Guo, Jinqiu; Du, Yaping*; Zhang, Hongbo*

Acta Chim. Sinica **2020**, 78(7), 625-633

Rare earth elements, including scandium, yttrium and lanthanides, feature stable overall chemical properties, variable valence states and special Lewis acidity due to the unique electron configuration in the outermost and secondary outer orbitals of lanthanide elements, especially on their 4f electron shell structure, having been extensively used in catalysis. These materials show superior properties for acting as Lewis acid sites, supports or electronic/structural promoters to catalyze platform molecules, derived from fossil energies, and biomass materials like CO₂, CO and ethanol into value added chemicals, gasoline or even diesels.

Recent Progress in Regulating CRISPR-Cas9 System for Gene Editing

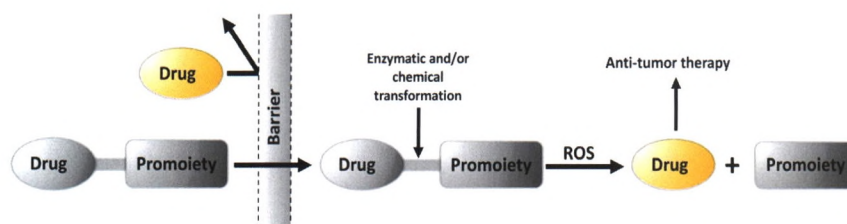


Gong, Shaohua; Li, Na*; Tang, Bo

Acta Chim. Sinica **2020**, 78(7), 634-641

The recent progress in regulating the function of CRISPR-Cas9 by chemicals and light for gene editing is summarized in this review, and the challenges and perspectives in this area are discussed.

Advances in Reactive Oxygen Species Responsive Anti-cancer Prodrugs

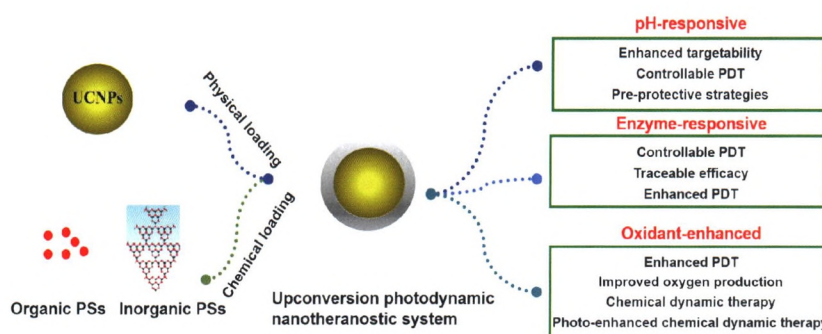


Zhang, Liuwei; Chen, Qixian*; Wang, Jingyun*

Acta Chim. Sinica **2020**, 78(7), 642-656

The occurrence and growth of tumors are often accompanied by high concentration of reactive oxygen species (ROS), which has inspired researchers to exploit the relatively high levels of ROS for the development of ROS-responsive prodrug systems. Herein, the design and synthesis strategies of ROS-responsive prodrugs for optimizing biochemical properties of drugs and improving anti-cancer potency are reviewed.

Construction and Development of Tumor Microenvironment Stimulus-Responsive Upconversion Photodynamic Diagnosis and Treatment System



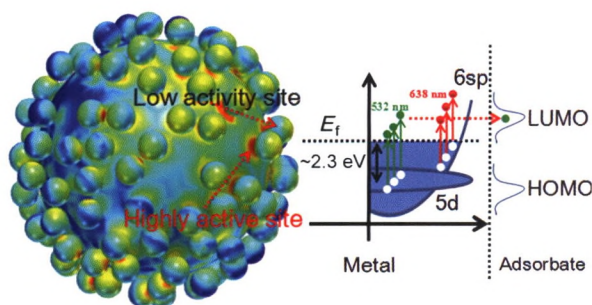
Yan, Tao; Liu, Zhenhua; Song, Xinyue*; Zhang, Shusheng*

Acta Chim. Sinica **2020**, 78(7), 657-669

Based on the luminescence resonance energy transfer process, upconversion photodynamic nanotheranostic systems use the emitted fluorescence of upconversion nanoparticles under the excitation of the near-infrared laser to further excite the loaded photosensitizer, thus it is advantageous to the treatment of deep-seated tumors. At present, researchers focused on the construction of tumor microenvironment responsive nanotheranostic system to improve the targeting to the tumor section, enhance the photodynamic efficacy, and reduce the toxicity to the surrounding normal tissues. This work mainly discusses the construction and development of upconversion nanotheranostic systems responsive to pH, enzyme and oxidant.

Communication

Plasmon-induced Hot Electrons Influenced by Electric Field



Yang, Jing-Liang; Yang, Wei-Min; Lin, Jia-Sheng; Wang, An; Xu, Juan*; Li, Jian-Feng*

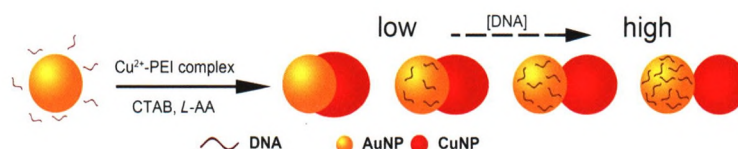
Acta Chim. Sinica **2020**, 78(7), 670-674

A 3D Ag SHINs-Au (SHINs: shell-isolated nanoparticles) superstructure was prepared and *p*-aminothiophenol (pATP) was used as probe molecule to study the influence of electric field on plasmon-induced hot electrons (HEs). By combining theoretical calculation with experimental results, it is found that 638 nm laser excitation gave the highest conversion rate from pATP to 4,4'-dimercaptoazobenzene, which also showed the strongest electric field intensity. This study is helpful for understanding how the electric field intensity affect the excitation efficiency of the HEs.

Tunable Charge Transfer Plasmon at Gold/Copper Heterointerface

Zhu, Qingqing; Song, Xiaojun; Deng, Zhaoxiang*

Acta Chim. Sinica **2020**, 78(7), 675-679



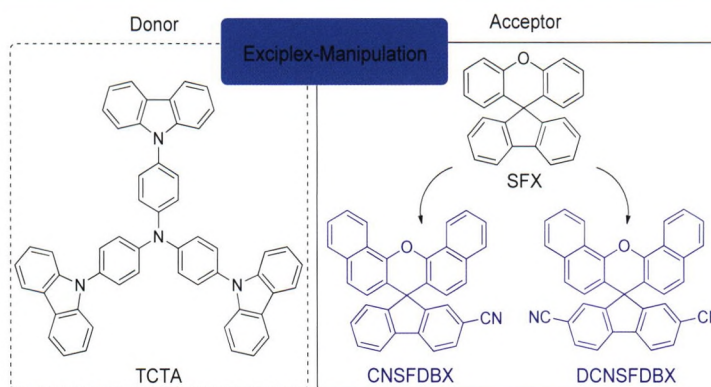
Nonspecific DNA adsorption on a seeding gold nanoparticle tailors the conductive Au/Cu interface during a heterogeneous nucleation of copper on gold, providing an especially facile and robust way to realize highly tunable charge transfer plasmon in a compositionally asymmetric dimeric metastructure.

Article

Cyano-substituted Spiro[fluorine-9,9'-xanthene] Derivatives: Exciplex Emission and Property Manipulation

Cao, Hongtao; Li, Bo; Wan, Jun; Yu, Tao; Xie, Linghai*; Sun, Chen; Liu, Yuyu*; Wang, Jin; Huang, Wei*

Acta Chim. Sinica **2020**, 78(7), 680-687

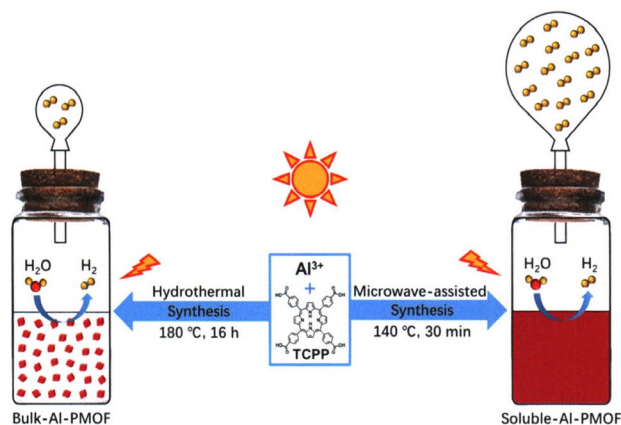


Two cyano-substituted spiro[fluorine-9,9'-xanthene] derivatives were designed and synthesized as electron acceptors to achieve exciplex-emission and property manipulation.

Microwave-Assisted Synthesis and Photocatalytic Performance of a Soluble Porphyrinic MOF

Wu, Qianye; Zhang, Chenxi; Sun, Kang; Jiang, Hai-Long*

Acta Chim. Sinica **2020**, 78(7), 688-694

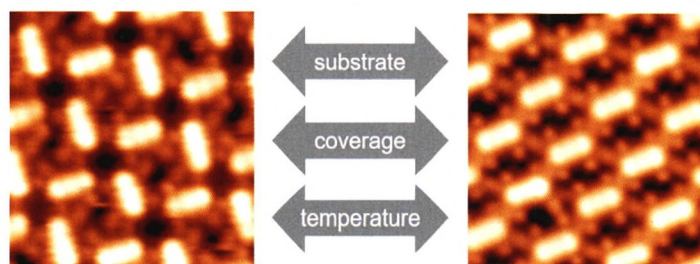


The Soluble-Al-PMOF in small sizes has been successfully fabricated by a microwave-assisted synthetic approach. In contrast to the insoluble Bulk-Al-PMOF synthesized by the conventional hydrothermal route, the Soluble-Al-PMOF exhibits much higher activity in photocatalytic H_2 production by water splitting.

Adsorption and Self-assembly of meso-tetra(p-methoxyphenyl)porphyrinatocobalt(II) on Coinage Metal Surfaces

Yin, Cen; Wang, Zikuan; Liu, Dan; Peng, Zhantao; Song, Huanjun; Zhu, Hao; Chen, Qiwei*; Wu, Kai*

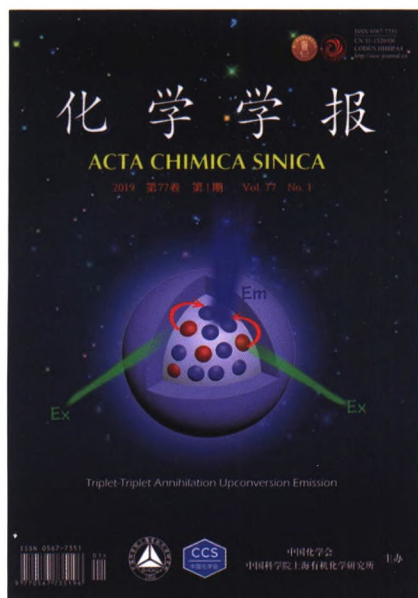
Acta Chim. Sinica **2020**, 78(7), 695-702



The adsorption and self-assembly structures of Co(TAP) molecule were investigated by scanning tunneling microscopy on coinage metal surfaces. The substrate-molecule interaction, molecular coverage and substrate temperature turned out to be important parameters that could tweak the molecular configuration and self-assembled structures on single crystalline coinage metal substrates.

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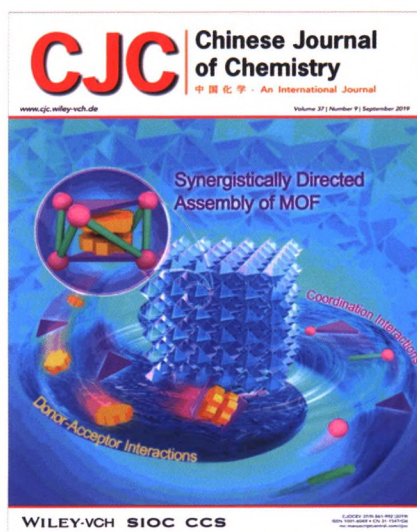
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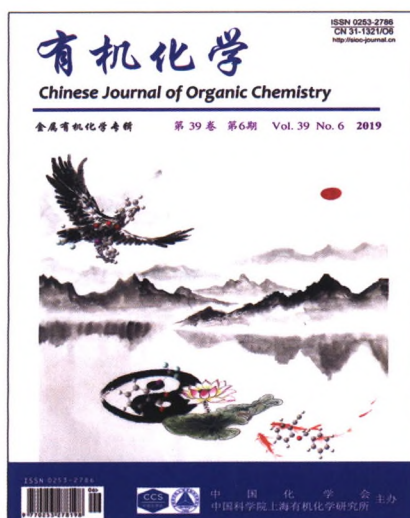
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主编：麻生明 院士

- SCI收录、入选卓越计划
- 1983年创刊(原名Acta Chimica Sinica English Edition)
- 与Wiley-VCH合作出版
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