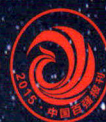




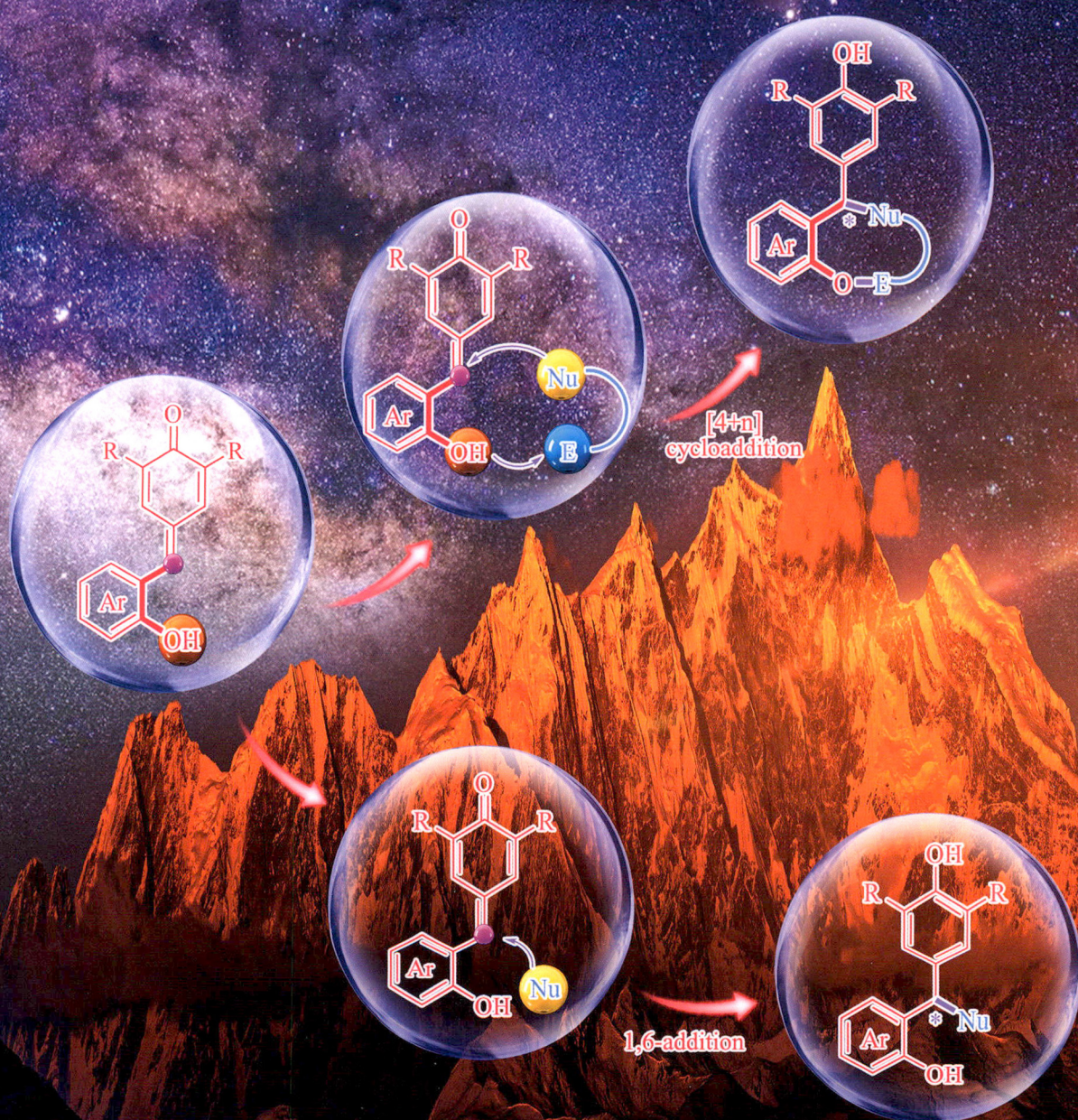
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* 通信联系人.

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On the front cover: *O*-hydroxyphenyl substituted *p*-quinone methides (*p*-QMs) not only maintain the high reactivity of *p*-QMs, but also have more reactive and activation sites owing to the introduction of hydroxyl group. This review by Shi, Zhang and coworkers summarizes the catalytic asymmetric reactions involving *o*-hydroxyphenyl substituted *p*-QMs, which include $[4+n]$ cycloadditions and 1,6-additions, thus highlighting their applications in the synthesis of chiral oxygen-containing heterocycles and aryl-methanes. Moreover, the remaining challenges have been pointed out to provide a new horizon for this research area. [Shi, Feng *et al.* on page 793-808.]



On the inside front cover: Rare earth ion Tb^{3+} doped β -KMg(PO₃)₃ phosphors exhibit high efficiency photoluminescence and emit bright green light under the stimulation of mechanical stress. Defects and flexible structure play a significant role in the process of mechanoluminescence. This study broadens the development of green luminescent materials. [Chen, Huimin *et al.* on page 771-776.]



On the back cover: We demonstrated a new and feasible strategy for photosensitive and temperature-controlled moisture responsive wrinkles by involving a copolymer containing anthracene and *N*-isopropylacrylamide into a bilayer wrinkling system, which may find potential applications in moisture sensing, smart display or smart windows. [Jiang, Xuesong *et al.* on page 749-756.]

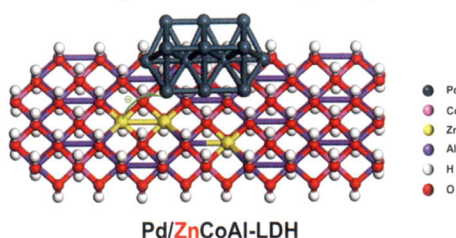


Communication

Introduction of Zn^{2+} Promotes the Catalytic Performance of Pd-based Catalyst for CO Esterification Reaction via Electron Transfer

Liu, Xun; Jiang, Hui-Bo; Jing, Kai-Qiang; Xu, Zhong-Ning*; Guo, Guo-Cong*

Acta Chim. Sinica **2023**, *81*(7), 691-696

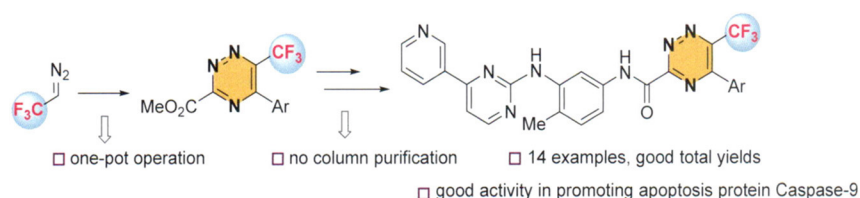


Introducing Zn^{2+} ions into the CoAl-LDH (layered double hydroxides) support enhances the Lewis basicity sites, leading to a partial electron transfer from the ZnCoAl-LDH support to the Pd active sites. This increases the electron density of the Pd atoms and promotes the adsorption and activation of CO, ultimately enhancing the catalytic activity of the Pd-based catalyst for the CO esterification reaction.

Synthesis of 6- CF_3 -1,2,4-triazine-based Tyrosine Kinase Inhibitors and The Evaluation of Biological Activities

Qin, Pei; Ma, Hai; Zhang, Fa-Guang*; Ma, Jun-An*

Acta Chim. Sinica **2023**, *81*(7), 697-702



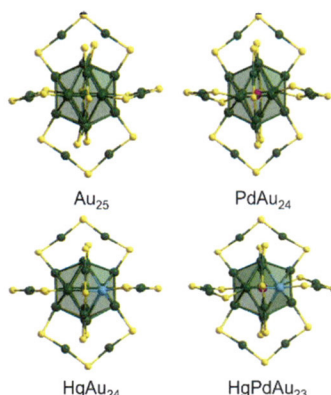
A series of trifluoromethyl group-substituted 1,2,4-triazines containing the core structure of Imatinib were obtained in good yields by using silver-catalyzed [3+3] cycloaddition reaction of *in situ* generated CF_3CHN_2 with glycine imines.

Article

Pd and Hg Atoms Co-doped $\text{HgPdAu}_{23}(\text{PET})_{18}$ Nanocluster

Zhang, Yuying; Cai, Xiao; Hu, Weigang; Li, Guangjun; Zhu, Yan*

Acta Chim. Sinica **2023**, *81*(7), 703-708

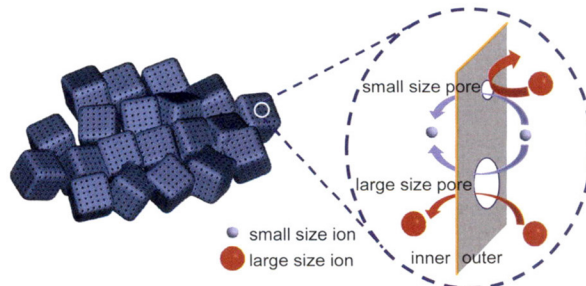


Here the Pd and Hg co-doped ternary metal nanocluster $\text{HgPdAu}_{23}(\text{PET})_{18}$ (PET = 2-phenylethanethiol) is reported, which shows a 13-atom icosahedral core and a 12-atom shell capped by 18 thiolate ligands, and the possible doping location of Pd and Hg atoms in the $\text{HgPdAu}_{23}(\text{PET})_{18}$ nanocluster is determined: Pd is located on the center of the icosahedron of the nanocluster and Hg is located on the surface of the icosahedron of $\text{HgPdAu}_{23}(\text{PET})_{18}$.

Boosting the Supercapacitance Performance of Mesoporous Carbon Nanocages by Enlarging Pore Sizes via Carbothermal Reduction

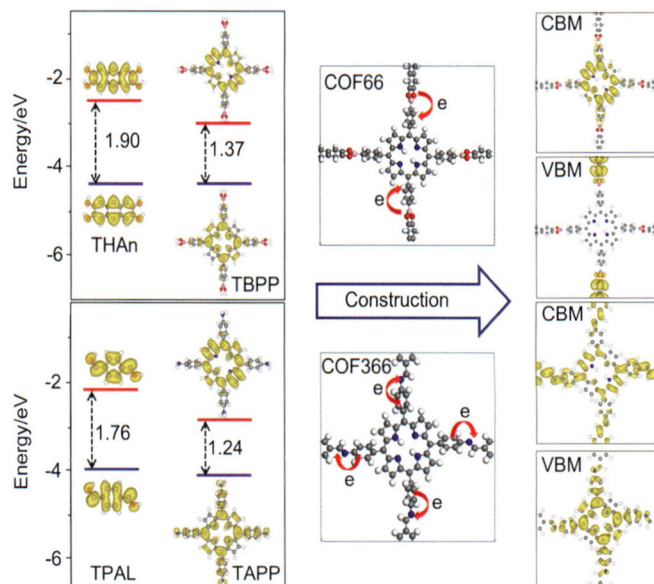
Liu, Jia; Chen, Guanghai; Chen, Yiqun; Jiang, Jietao; Xiao, Xiao; Wu, Qiang*; Yang, Lijun; Wang, Xizhang*; Hu, Zheng

Acta Chim. Sinica **2023**, *81*(7), 709-716



Based on the rule of solubility product and the carbothermal reduction method, a new route to regulate the pore size distribution of hierarchical carbon nanocage (hCNC) and to effectively increase the number and size of the microchannels across the shells of hCNCs is developed, which much increases the specific surface area and benefits the rapid transport of ions through the microchannels. Consequently, the optimized sample exhibits significantly improved supercapacitive performances in both KOH and 1-ethyl-3-methylimidazolium tetrafluoroborate (EMIMBF₄) electrolytes.

Electronic Structure of Covalent Organic Frameworks COF66 and COF366: from Monomers to Two-Dimensional Framework

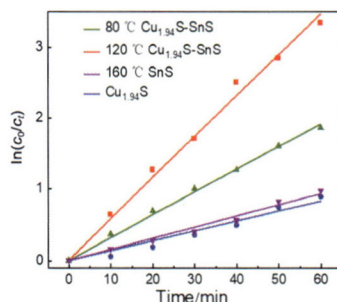


Liang, Xuefeng; Jing, Jian; Feng, Xin; Zhao, Yongze; Tang, Xinyuan; He, Yan; Zhang, Lisheng; Li, Huifang*

Acta Chim. Sinica **2023**, *81*(7), 717-724

Based on density functional theory, the present work analyses the electronic orbital energy levels/distribution of COF66 and COF366 organic building unit molecules and fragment molecules, and illustrates the changes in electronic structure that occur after the formation of two-dimensional planar periodic structures, providing a basis for the construction of an intrinsic relationship between the structure and properties of COFs materials.

Synthesis and Photocatalytic Degradation of $\text{Cu}_{1.94}\text{S-SnS}$ Nano-heterojunction

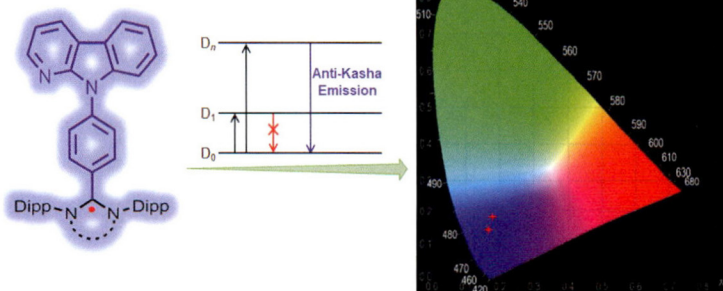


Liu, Jiawen; Lin, Weihuang; Wang, Weijia; Guo, Xueyi*; Yang, Ying*

Acta Chim. Sinica **2023**, *81*(7), 725-734

$\text{Cu}_{1.94}\text{S-SnS}$ nano-heterostructures were synthesized to enhance the activity of photocatalytic degradation. The influence of different temperatures on the products obtained by cationic partial exchange was investigated. The difference in the rate of degradation of methylene blue (MB) and tetracycline (TC) between single particle $\text{Cu}_{1.94}\text{S}$ and each heterojunction was compared under simulated solar light. The construction of $\text{Cu}_{1.94}\text{S-SnS}$ effectively improved the separation of photogenerated carriers and achieved the energy level reconstruction of the material, thus increasing the photocatalytic activity.

Synthesis and Optical Property Studies of Blue-Light Organic Radicals Based on N-Heterocyclic Carbenes

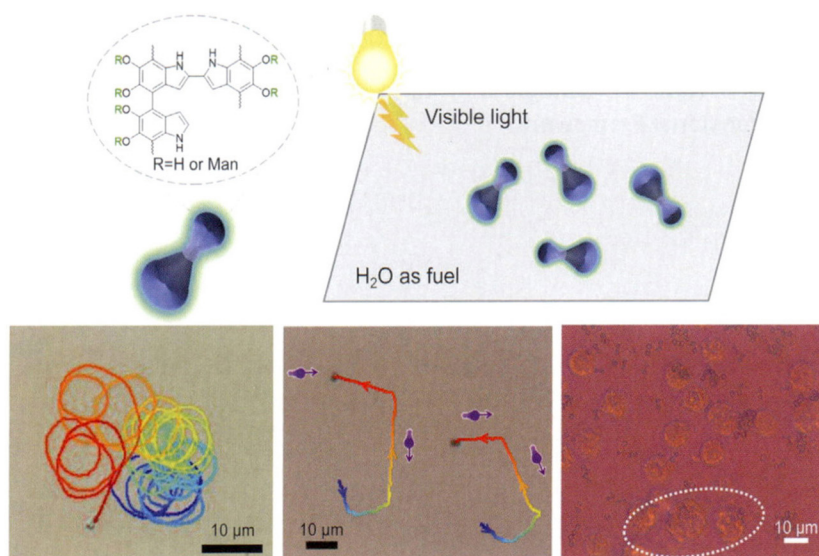


Ren, Yanyan; Li, Xin; Han, Yingfeng*

Acta Chim. Sinica **2023**, *81*(7), 735-740

Two novel luminescent radicals with the Anti-Kasha emission were designed and synthesized by combining the N-heterocyclic carbene groups and carboline fluorophore. The experimental results show that radicals have blue emission in tetrahydrofuran solution, and their maximum emission wavelengths are 450 and 428 nm, respectively.

Preparation and Preliminary Study on Immune Function of Mannose-modified Micromotor

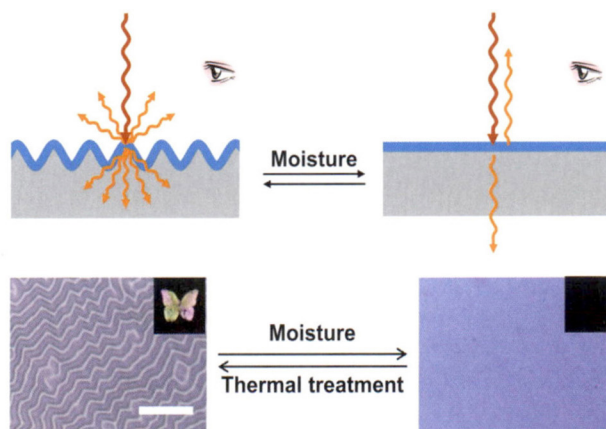


Du, Sinan; Zhao, Liman*; Zhang, Zexin; Chen, Guosong*

Acta Chim. Sinica **2023**, *81*(7), 741-748

A dumbbell micromotor modified with mannose was designed and synthesized. By adjusting the intensity and irradiation direction of visible light, the speed and direction of micromotor can be precisely controlled. Meanwhile, the micromotor can act as an immune activator and polarize macrophages.

Temperature-controlled Dynamic Moisture-responsive Wrinkled Patterns

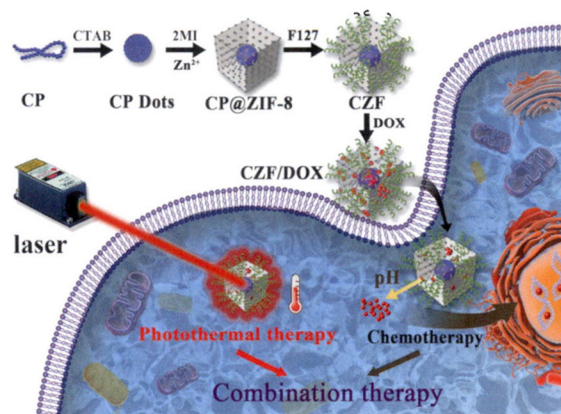


Ma, Tianjiao*; Li, Jin; Ma, Xiaodong; Jiang, Xuesong*

Acta Chim. Sinica **2023**, *81*(7), 749-756

A new and feasible strategy for moisture responsive wrinkles is realized by involving a copolymer containing anthracene and *N*-isopropylacrylamide into a bilayer wrinkling system. These moisture responsive wrinkled patterns are photosensitive and can be controlled by temperature, which may find potential applications in moisture sensing, smart display or smart windows.

Preparation of Highly-dispersed Conjugated Polymer-Metal Organic Framework Nanocubes for Antitumor Application



Sun, Bo; Ju, Wenwen; Wang, Tao; Sun, Xiaojun; Zhao, Ting; Lu, Xiaomei*; Lu, Feng*; Fan, Quli

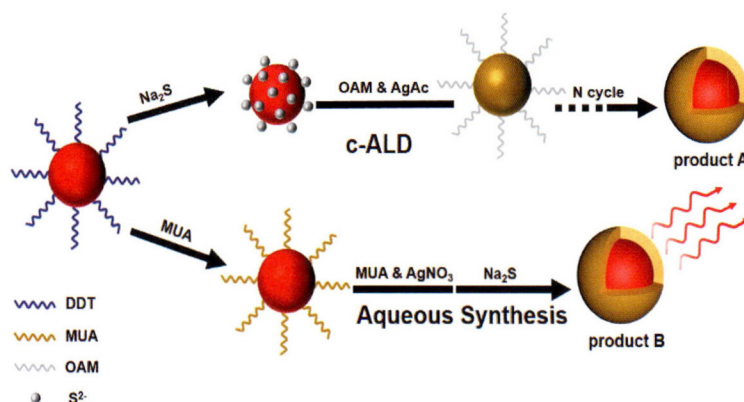
Acta Chim. Sinica **2023**, *81*(7), 757-762

By encapsulating near-infrared (NIR)-absorbing conjugated polymer and chemotherapy drug within F127 functionalized ZIF-8 nanocubes, an efficient nanoplatfrom was fabricated for the combination of photothermal and chemotherapy.

Room Temperature Synthesis and Near-infrared Fluorescence Performance Optimization of Ag₂Se@Ag₂S Core-shell Quantum Dots

Zheng, Wenshan; Gao, Guanbin*; Deng, Hao; Sun, Taolei*

Acta Chim. Sinica **2023**, 81(7), 763-770

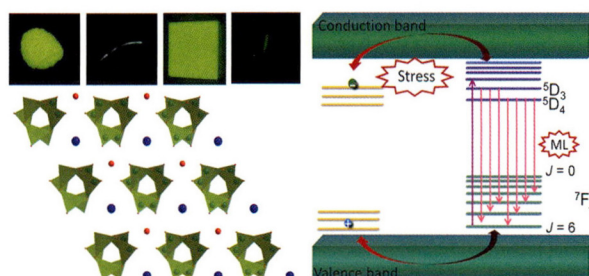


In this work, colloidal atomic layer deposition (c-ALD) and one-pot aqueous synthesis were adopted to synthesize oil/water-soluble Ag₂Se@Ag₂S core-shell quantum dots (QDs) at room temperature, respectively. In c-ALD, 1-dodecanethiol (DDT) capped Ag₂Se QDs were taken as seed, oleylamine (OAM) capped AgAc and Na₂S were taken as shell precursors, the oil-soluble Ag₂Se@Ag₂S core-shell QDs exhibited fluorescence quenching. In aqueous synthesis, 11-mercaptoundecanoic acid (MUA) capped Ag₂Se QDs were taken as seed, MUA-AgNO₃ and Na₂S were taken as shell precursors, the water-soluble Ag₂Se@Ag₂S core-shell QDs exhibited enhanced fluorescence.

Investigation on Photoluminescence and Mechanoluminescence of Single Tb³⁺-doped Intense Green Phosphor

Chen, Huimin*; Wang, Long; Zhang, Pan; Bai, Xilin; Zhou, Guojun*

Acta Chim. Sinica **2023**, 81(7), 771-776



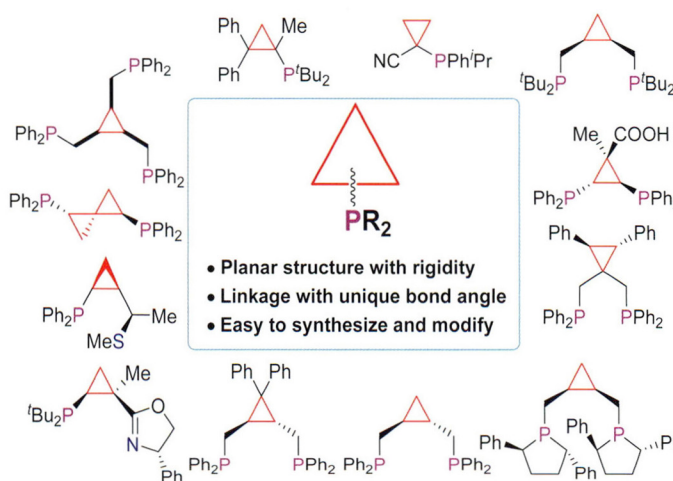
Single Tb³⁺ doped phosphate phosphor not only has intense photoluminescence, but also has excellent mechanoluminescent properties. The lattice structure of β -KMg(PO₃)₃ has a large space to accommodate defects, which are crucial for its good thermal stability and mechanoluminescence.

Perspective

Perspective for Phosphine Ligands with Cyclopropane Backbone

Zhang, Yandong; Zhu, Shoufei*

Acta Chim. Sinica **2023**, 81(7), 777-783

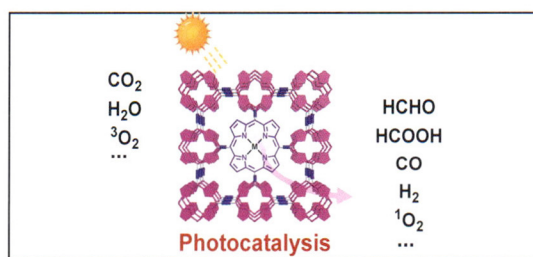


Backbone to a ligand is what foundation to a building. Among various types of ligand backbone, cyclopropane represents a unique one. Due to the distinctive electronic structure and rigidity of cyclopropane, ligands with such a backbone may show unexpected performance in catalysis. However, reported phosphine-containing ligands with cyclopropane as a backbone are scarce. To draw researchers' attention and tap the potentials of related ligands, the structures and applications about phosphine ligands bearing cyclopropane backbone are summarized.

Research Progress of Porphyrin-Based Covalent Organic Frameworks in Photocatalysis

He, Minghui; Ye, Ziqiu; Lin, Guiqing; Yin, Sheng; Huang, Xinyi; Zhou, Xu; Yin, Ying; Gui, Bo; Wang, Cheng*

Acta Chim. Sinica **2023**, 81(7), 784-792



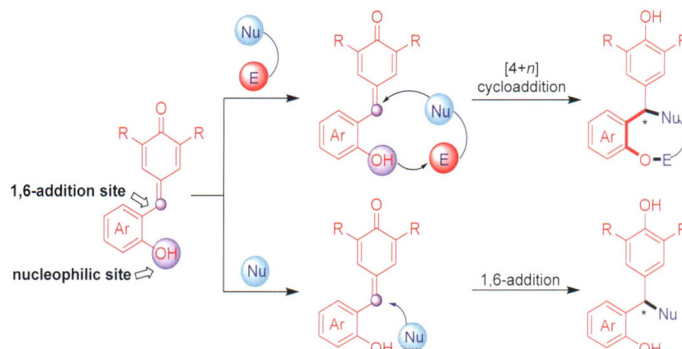
The research of porphyrin-based covalent organic frameworks for photocatalytic CO₂ reduction, photocatalytic water splitting, photocatalytic organic transformation, and photocatalytic reduction of hexavalent uranium was summarized.

Review

Advances in Catalytic Asymmetric Reactions Involving *o*-Hydroxyphenyl Substituted *p*-Quinone Methides

Yang, Shuang; Wang, Ningyi; Hang, Qingqing; Zhang, Yuchen*; Shi, Feng*

Acta Chim. Sinica **2023**, 81(7), 793-808

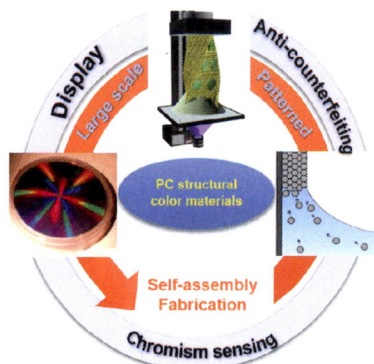


The catalytic asymmetric reactions involving *o*-hydroxyphenyl substituted *p*-QMs have become efficient strategies for the synthesis of chiral oxygen-containing heterocycles and arylmethanes with potential bioactivity. This review summarizes the catalytic asymmetric reactions involving *o*-hydroxyphenyl substituted *p*-QMs and points out the remaining challenges in this research area, which will open a new window for the design of new type of *o*-hydroxyphenyl substituted *p*-QMs and their involved catalytic asymmetric reactions.

Self-assembly Fabrication and Applications of Photonic Crystal Structure Color Materials

Hu, Liwei; Liu, Xianhu*; Liu, Chuntai; Song, Yanlin; Li, Mingzhu*

Acta Chim. Sinica **2023**, 81(7), 809-819

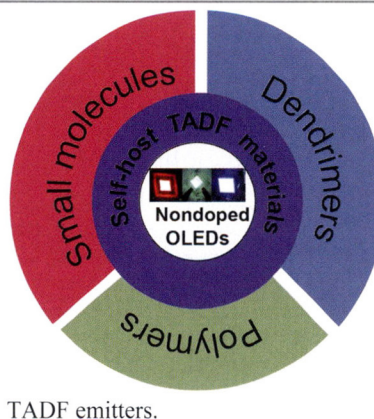


The recent research progress on photonic crystal structural color materials, including their basic color production mechanisms, fabrication methods, and practical applications in displays, color sensing, and information anti-counterfeiting encryption is reviewed with focuses on the fabrication of photonic crystal structural colors using a “bottom-up” self-assembly approach. And the methods for producing photonic crystal patterns and large-area structural color films are emphasized.

Research Progress of Solution-Processed Self-Host Thermally Activated Delayed Fluorescence Materials

Liu, Zhenyu; Rao, Junfeng; Zhu, Shoujia; Wang, Bingyang; Yu, Fan; Feng, Quanyou*; Xie, Linghai*

Acta Chim. Sinica **2023**, 81(7), 820-835



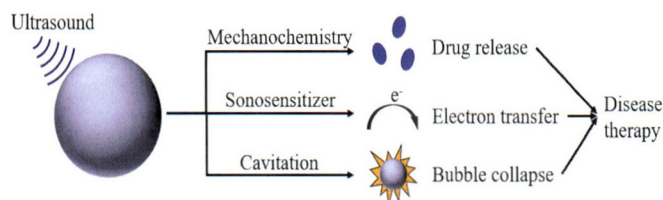
TADF emitters.

Solution-processed devices fabricated using self-host thermally activated delayed fluorescence (TADF) materials can effectively balance charge carrier transport and avoid phase separation, thereby maintaining film uniformity, enhancing device performance and improving device stability. This review provides a detailed discussion on the research progress of solution-processed self-host TADF materials within various classifications (including small molecules, dendrimers, and polymers), with the aim of providing effective references for the design and synthesis of high-efficiency solution-processed self-host

Research Progress in Sonochemistry for Biomedical Applications

Luo, Chuwen; Kong, Chaoying; Tang, Zhaohui*

Acta Chim. Sinica **2023**, *81*(7), 836-842

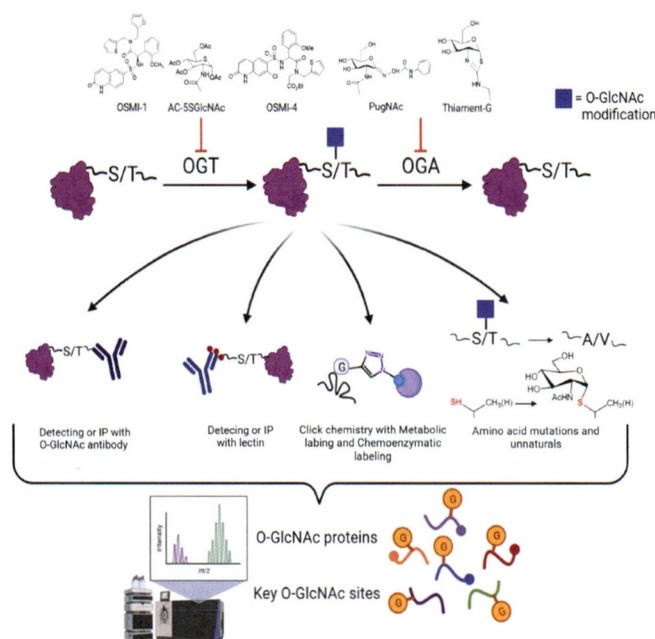


The application of sonochemistry in biomedicine could be roughly divided into three categories: mechanochemical effect, sonosensitizer and ultrasonic cavitation. They treat diseases by carrying drugs or producing reactive oxygen species (ROS).

Application of Chemical Biology to Reveal the Function of O-GlcNAcylation in Diseases: Research Tools and Tactics

Zhang, Nana; Yu, Kairan; Li, Jiting; Zhang, Jianing; Liu, Yubo*

Acta Chim. Sinica **2023**, *81*(7), 843-856

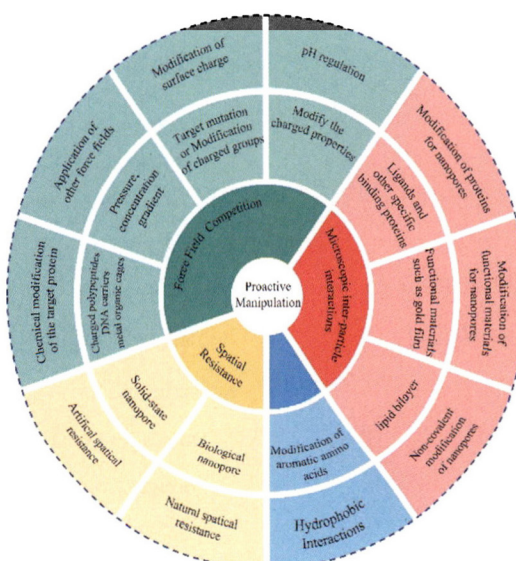


O-GlcNAcylation plays an important regulatory role in cellular physiological and pathological processes as a widespread intracellular monosaccharide modification, and chemical biology approaches have made rapid improvements in the application of O-GlcNAcylation studies. Researchers have developed many new molecular tools and omics analysis strategies that allow for a more comprehensive and systematic study of the functions of O-GlcNAcylation in disease evolution and also provide new approaches for the diagnosis and treatment of human diseases.

Proactive Manipulation Techniques for Protein Transport at Confined Nanoscale

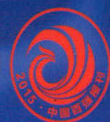
Ma, Chaofan; Xu, Wei; Liu, Wei; Xu, Changhui; Sha, Jingjie*

Acta Chim. Sinica **2023**, *81*(7), 857-868



Proactive manipulation techniques for protein transport at the nanoscale are presented mainly from the perspectives of external force field competition, internal force field interactions, hydrophobic interactions, and spatial resistance. Modulation of external force field competition includes pH regulation, modification of surface charge, modification of target proteins, and application of other gradient force fields imposed. Internal force field interactions are mainly specific or non-specific modifications of nanopores. Nanopores or target proteins modified with more hydrophobic groups can

benefit from temporal resolution. Spatial resistance includes the natural spatial resistance structure of biological nanopores and the artificial spatial resistance of solid nanopores. Besides, some other proactive manipulation methods of protein transport are also presented in this paper.



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