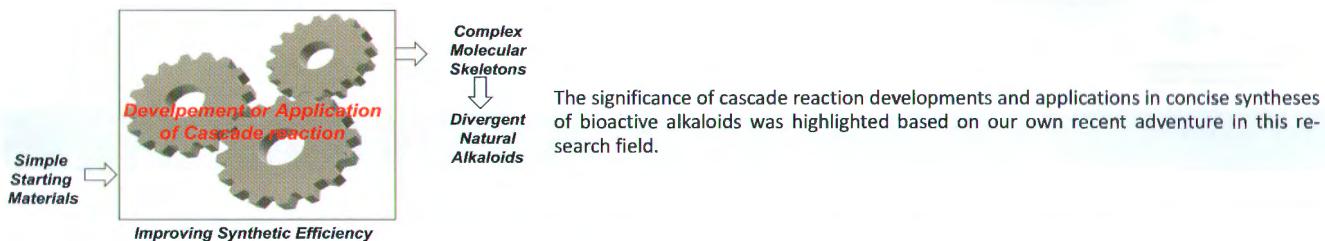


Chemistry Authors Up Close

Concise Total Syntheses of Bioactive Alkaloids Enabled by Development or Application of Cascade Reactions: A Personnel Adventure

Xingang Xie* and Xuegong She*

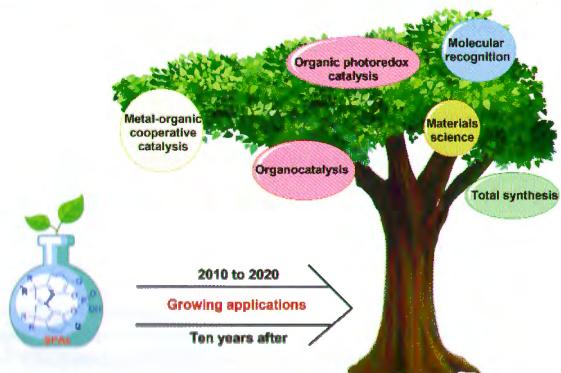
Chin. J. Chem. 2021, 39, 795–801. DOI: 10.1002/cjoc.202000522



Chiral Spirocyclic Phosphoric Acids and Their Growing Applications

Xufeng Lin,* Lei Wang, Zhao Han, and Zhiqui Chen

Chin. J. Chem. 2021, 39, 802–824. DOI: 10.1002/cjoc.202000446

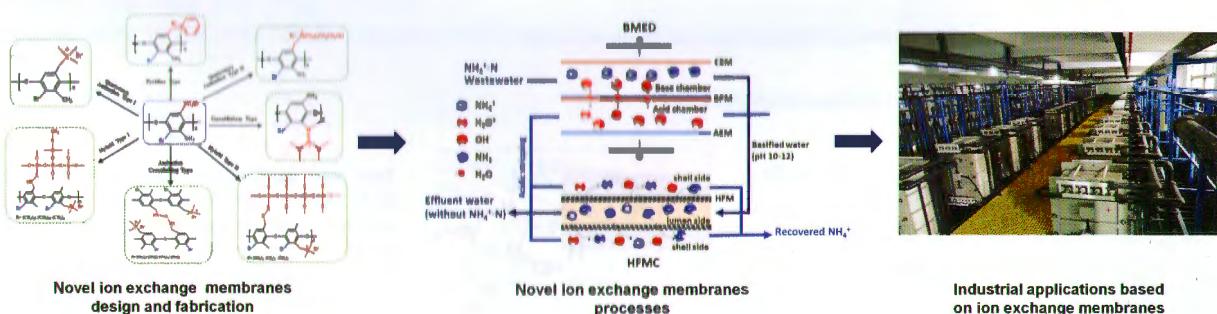


Chiral spirocyclic phosphoric acids are versatile catalysts capable of promoting a wide range of organocatalytic reactions, and also illustrate broad applications in metal-organic cooperative catalysis, organic photoredox catalysis, total synthesis, materials science and molecular recognition.

Ion Exchange Membrane "ABC" – A Key Material for Upgrading Process Industries

Yaoming Wang, Zhengjin Yang, Liang Wu, Liang Ge, and Tongwen Xu*

Chin. J. Chem. 2021, 39, 825–837. DOI: 10.1002/cjoc.202000473

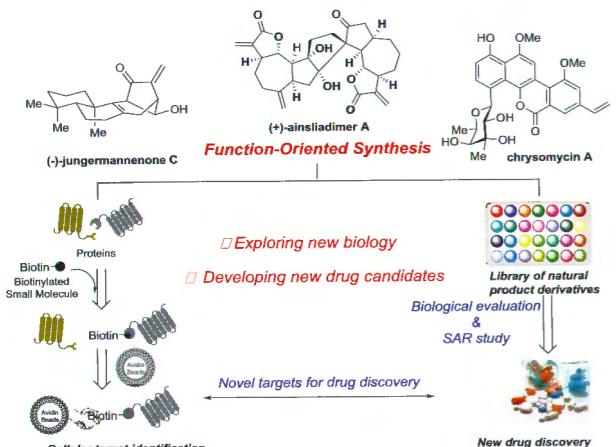


Ion exchange membrane "ABC" plays a crucial role in transforming and upgrading traditional chemical manufacturing procedures and boosting a multitude of new applications.

Function-Oriented Natural Product Synthesis

Kaiqi Chen, Fan Wu, and Xiaoguang Lei*

Chin. J. Chem. 2021, 39, 838–854. DOI: 10.1002/cjoc.202000509



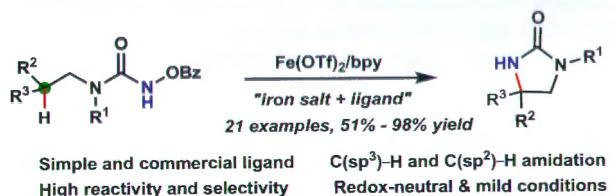
Our research programs focus on the interface between chemistry and biology. In this account, we describe several research accomplishments from our laboratory, merging the function-oriented natural product synthesis, the mechanism driven biological elucidation of the bioactive natural products and the subsequent drug discovery endeavours.

Concise Reports

Iron-Catalyzed Intramolecular C—H Amidation of N-Benzoyloxyureas

Dayou Zhong, Lin-Yang Wu, Xing-Zhen Wang, and Wen-Bo Liu*

Chin. J. Chem. 2021, 39, 855–858. DOI: 10.1002/cjoc.202100005

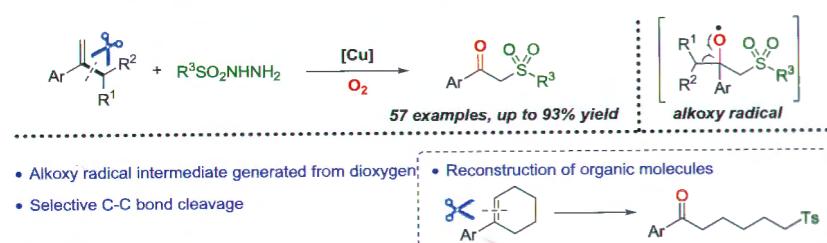


A redox-neutral Fe/bpy-catalyzed intramolecular C—H amidation of *N*-benzoyloxyureas under external oxidant-free conditions is reported. An array of cyclic ureas were synthesized via C—H bond nitrene insertion in moderate to excellent yields.

Copper-Catalyzed Aerobic Oxidative Cleavage of Unstrained Carbon-Carbon Bonds of 1,1-Disubstituted Alkenes with Sulfonyl Hydrazides

Dong Yi*, Linying He, Zhongyu Qi, Zhijie Zhang, Mengshun Li, Ji Lu, Jun Wei, Xi Du, Qiang Fu,* and Siping Wei*

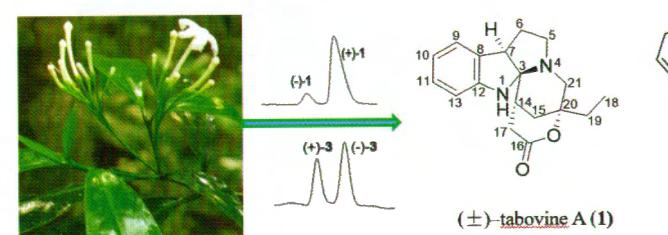
Chin. J. Chem. 2021, 39, 859–865. DOI: 10.1002/cjoc.202000549



Discovery of Natural Co-occurring Enantiomers of Monoterpene Indole Alkaloids

Yang Yu, Mei-Fen Bao, and Xiang-Hai Cai*

Chin. J. Chem. 2021, 39, 866–872. DOI: 10.1002/cjoc.202000574

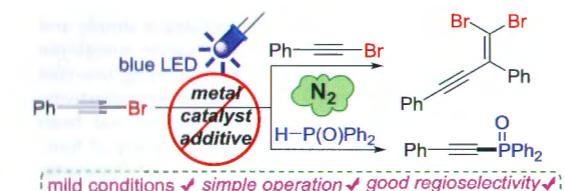


Two new pairs of monoterpene indole alkaloids (MIAs) enantiomers were isolated from stems of *Tabernaemontana bovina* Lour. (Apocynaceae). It is the first time to report co-occurring enantiomers of MIAs. Additionally, the explanation concerning biogenesis of MIAs was provided. The findings would open a new window, where we could disclose more diverse MIAs.

Visible-Light-Promoted Formation of C—C and C—P Bonds Derived from Evolution of Bromoalkynes under Additive-Free Conditions: Synthesis of 1,1-Dibromo-1-en-3-yne and Alkynylphosphine Oxides

Hailong Xu, Rui Chen, Hongjie Ruan, Ruyi Ye, and Ling-Guo Meng*

Chin. J. Chem. 2021, 39, 873–878. DOI: 10.1002/cjoc.202000546

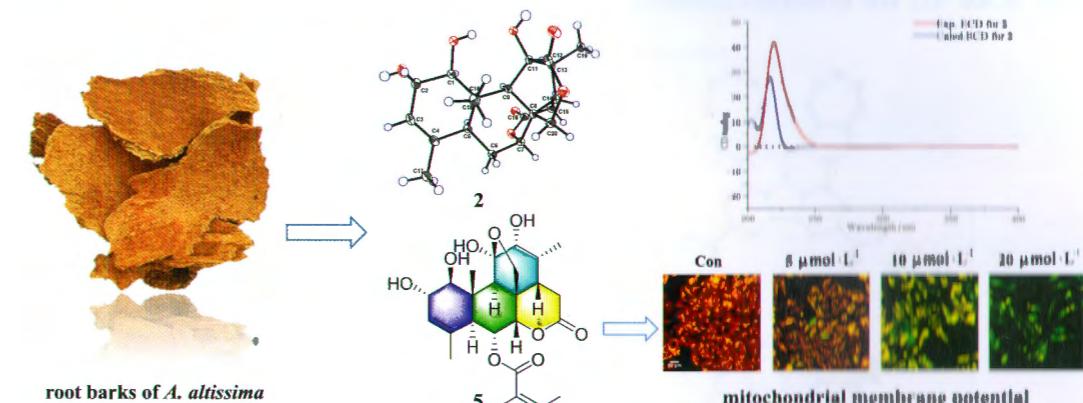


Visible-light-promoted synthesis of 1,1-dibromo-1-en-3-yne and alkynylphosphine oxides via controllable formation of C—C and C—P bonds under photocatalyst-free conditions is developed.

Quassinoids from the Root Barks of *Ailanthus altissima*: Isolation, Configurational Assignment, and Cytotoxic Activities

Ye-Qing Du, Ming Bai, Xiao-Qi Yu, Tian-Ming Lv, Bin Lin, Xiao-Xiao Huang,* and Shao-Jiang Song

Chin. J. Chem. 2021, 39, 879–886. DOI: 10.1002/cjoc.202000558

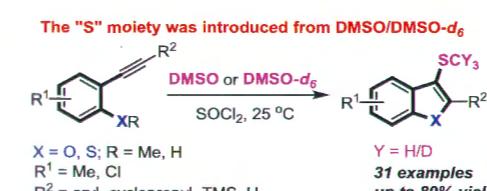


Five new quassinoids, chouchunactone A—E (1—5), and two known ones were identified from the root barks of *A. altissima* Swingle. Biologically, compound 5 showed potencies equivalent to sorafenib against HepG2 cells.

Synthesis of 3-Methylthio-benzo[b]furans/Thiophenes via Intramolecular Cyclization of 2-Alkynylanisoles/Sulfides Mediated by DMSO/DMSO-d6 and SOCl2

Beibei Zhang, Xiaoxian Li, Xuemin Li, Fengxia Sun, and Yunfei Du*

Chin. J. Chem. 2021, 39, 887–895. DOI: 10.1002/cjoc.202000566

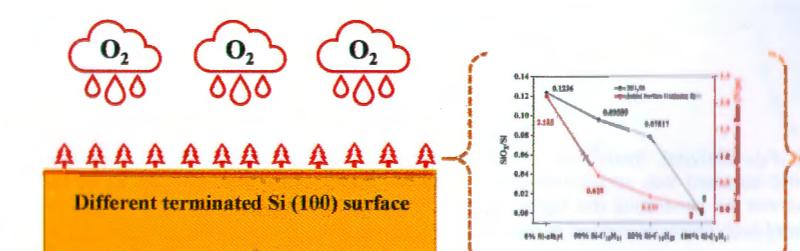


The reaction of 2-alkynylanisoles/sulfides with SOCl2 and DMSO was conducted to conveniently furnish the biologically interesting 3-(methylthio)-benzo[b]furans/thiophenes via intramolecular cyclization. DMSO acts as a solvent as well as a sulfur source and can also be replaced with DMSO-d6, enabling the incorporation of the SCd6 moiety of DMSO-d6 to the 3-position of the heterocyclic frameworks.

Atomistic Insights into Oxidation of Chemical Passivated Silicon (100) Surface: Reactive Molecular Dynamic Simulations

Shideng Yuan, Xueyu Wang, Heng Zhang,* and Shiling Yuan*

Chin. J. Chem. 2021, 39, 896–902. DOI: 10.1002/cjoc.202000476



Passivation to oxidation : Full H-Si < 50%Si-C₁₀H₂₁ < 50%Si-C₁₂H₂₅ < Full Si-C₈H₁₇

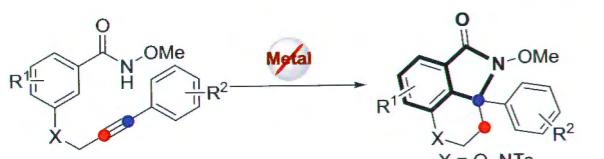
Herein, the oxidation of the full H-terminated Si surface and the chemical passivated silicon (100) surfaces at 300 K has been studied by ReaxFF molecular dynamic simulation. The results suggest that with the increase of alkyl chain length and the coverage of Si surface, the oxidized Si atoms and the initial oxidation rate also decrease.

Content

Metal-Free Catalyzed Cyclization of N-Methoxybenzamides to Construct Quaternary Carbon-Containing Isoindolinones

Lin-Bao Zhang, Zi-Chen Wang, Sheng-Zheng Sun, Shao-Fei Ni,* Li-Rong Wen,* and Ming Li*

Chin. J. Chem. 2021, 39, 903–908. DOI: 10.1002/cjoc.202000534



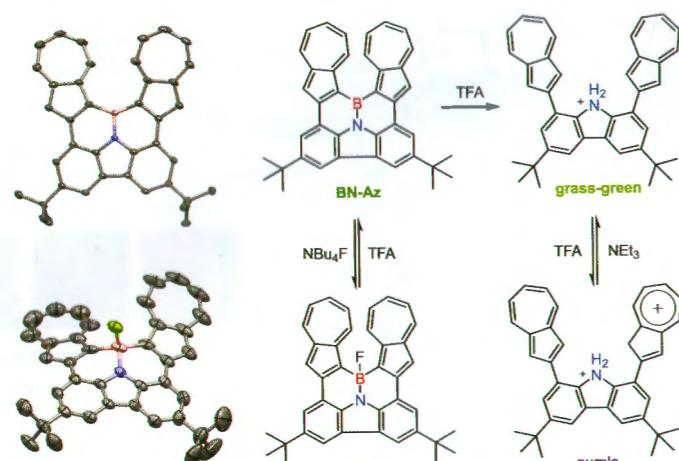
- metal-free catalysis
- construction of quaternary carbon
- 100% atomic economy
- broad substrate scope
- gram-scale synthesis
- DFT calculations

Through the intramolecular cyclization of *N*-methoxybenzamides, a simple and efficient method for constructing valuable isoindolinones under metal-free conditions was developed. The reaction was featured by employing low-cost catalyst, simple operation, 100% atomic economy and excellent regioselectivity. Moreover, a detailed computational study on the reaction system has been performed to clarify the mechanism. This protocol tolerated a variety of functional groups and provided a metal-free protocol for the synthesis of chromane- or tetrahydroquinoline-fused isoindolinones in good yields.

BN Fused Diazulenyl-Carbazole: Synthesis, Structure, and Properties

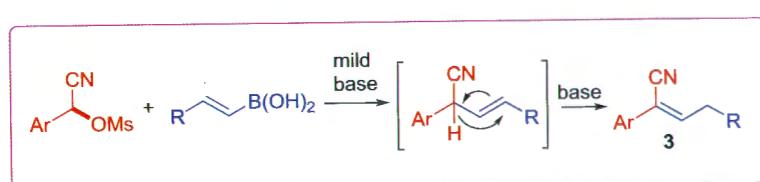
Fang-Dong Zhuang, Jing-Hui Yang, Ze-Hao Sun, Peng-Fei Zhang, Qi-Ran Chen, Jie-Yu Wang,* and Jian Pei*

Chin. J. Chem. 2021, 39, 909–912. DOI: 10.1002/cjoc.202000619

**Synthesis of Acrylonitriles via Mild Base Promoted Tandem Nucleophilic Substitution-Isomerization of α -Cyanohydrin Methanesulfonates**

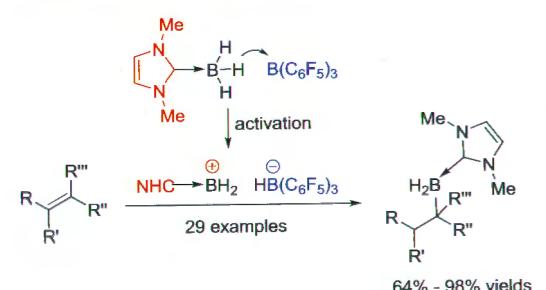
Shiwen Liu, Lingling Meng, Xiaojun Zeng, Gerald B. Hammond,* and Bo Xu*

Chin. J. Chem. 2021, 39, 913–917. DOI: 10.1002/cjoc.202000579

 **$B(C_6F_5)_3$ -Catalyzed Hydroboration of Alkenes with *N*-Heterocyclic Carbene Boranes via B–H Bond Activation**

Qiaotian Wang, Wei Meng, Xiangqing Feng,* and Haifeng Du*

Chin. J. Chem. 2021, 39, 918–926. DOI: 10.1002/cjoc.202000489

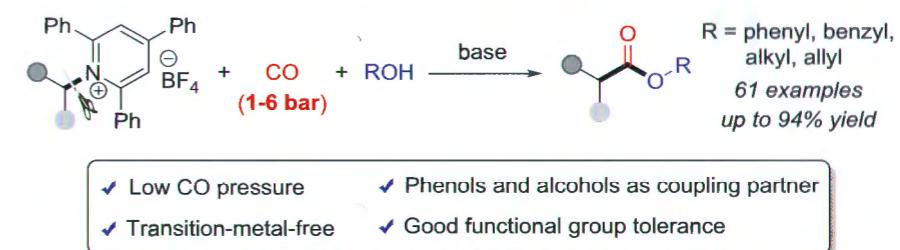


$B(C_6F_5)_3$ -catalyzed hydroboration of alkenes with *N*-heterocyclic carbene boranes (*NHC*-boranes) was successfully realized by the activation of *NHC*-boranes in an FLP manner for generating the highly reactive zwitterion species to furnish the desired organoboron products in good to high yields.

Radical Carbonylation under Low CO Pressure: Synthesis of Esters from Activated Alkylamines at Transition Metal-Free Conditions

Fengqian Zhao, Han-Jun Ai, and Xiao-Feng Wu*

Chin. J. Chem. 2021, 39, 927–932. DOI: 10.1002/cjoc.202000624

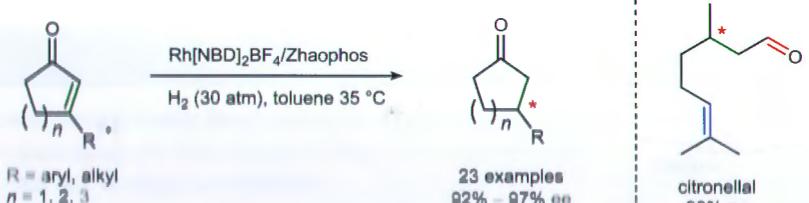


Transition-metal-free radical carbonylation of activated alkylamines with phenols and alcohols has been successfully developed. This radical carbonylative strategy can be carried out under low CO pressure (1–6 bar). Esters with various functional groups were obtained in moderate to good yields.

Enantioselective Hydrogenation of Endocyclic Enones: the Solution to a Historical Problem

Qiwei Lang, Huaxin Yang, Guoxian Gu, Qiang Feng, Jialin Wen,* and Xumu Zhang*

Chin. J. Chem. 2021, 39, 933–936. DOI: 10.1002/cjoc.202000617

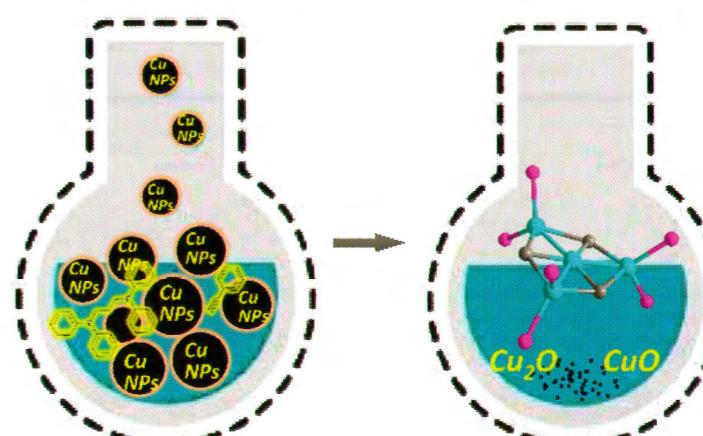


The enantioselective hydrogenation of cyclic enones has been a historical problem for homogeneous catalysis. We herein report an efficient method to reduce cyclic enones with molecular hydrogen. Catalyzed by a rhodium/Zhaophos complex, variety of enones with five-, six- or seven-member ring were hydrogenated with high enantioselectivity (92%–99% ee). Excellent chemo- and enantioselectivity demonstrated this method was successfully applied in the enantioselective hydrogenation of citral to produce enantio-enriched citronellal.

A Top-Down Approach towards Cu(I) Alkynyl Clusters with Unusual Geometry

Huan Li,* Ting Li, Shuimiao Liu, Mei Qu,* Linfeng Liang, Fengwei Zhang, and Xian-Ming Zhang*

Chin. J. Chem. 2021, 39, 937–941. DOI: 10.1002/cjoc.202000613



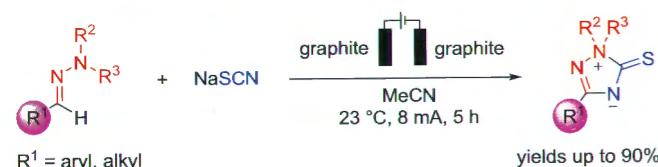
A top-down approach has been developed to synthesize three novel alkynyl and phosphine protected Cu clusters from Cu nanoparticles. A peculiar centered triangle Cu₄ and a Cu₆ uniform triangular prism clusters are discovered by simply using different bidentate phosphine ligands.

Content

Direct Electrochemical Synthesis of Sulfur-Containing Triazolium Inner Salts

Yueheng Li, Zhixing Huang, Guangquan Mo, Wei Jiang, Chengwei Zheng, Pengju Feng,* and Zhixiong Ruan*

Chin. J. Chem. 2021, 39, 942–946 DOI: 10.1002/cjoc.202000586

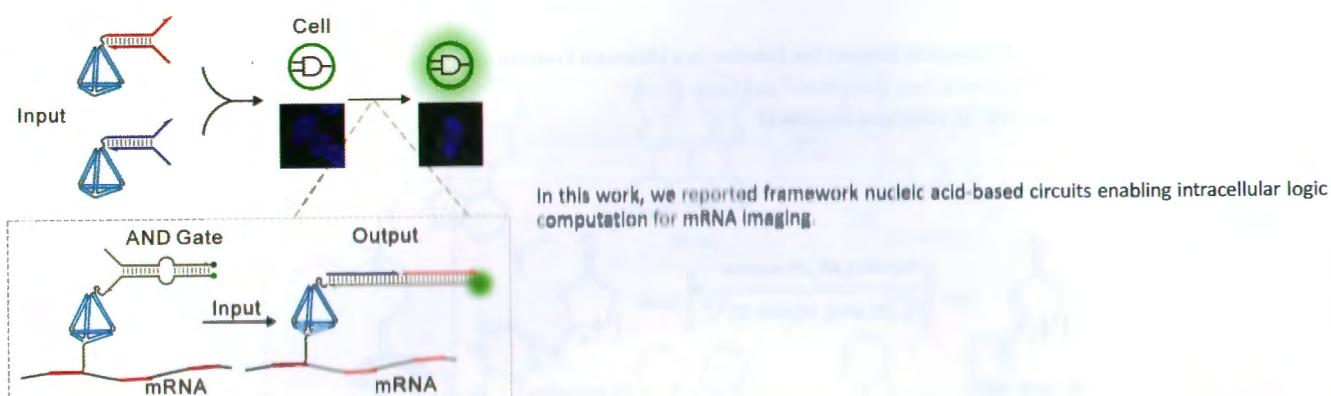


In this protocol, functionalized triazolium inner salts are achieved through the electrochemical thiocyanation and cyclization of aldehyde hydrazone derivative with ample scope and diverse functional group tolerance, under mild catalyst- and external oxidant-free conditions.

Intracellular Logic Computation with Framework Nucleic Acid-Based Circuits for mRNA Imaging

Ling Song, Mingshu Xiao, Wei Lai, Li Li, Ying Wan, and Hao Pei*

Chin. J. Chem. 2021, 39, 947–953. DOI: 10.1002/cjoc.202000575

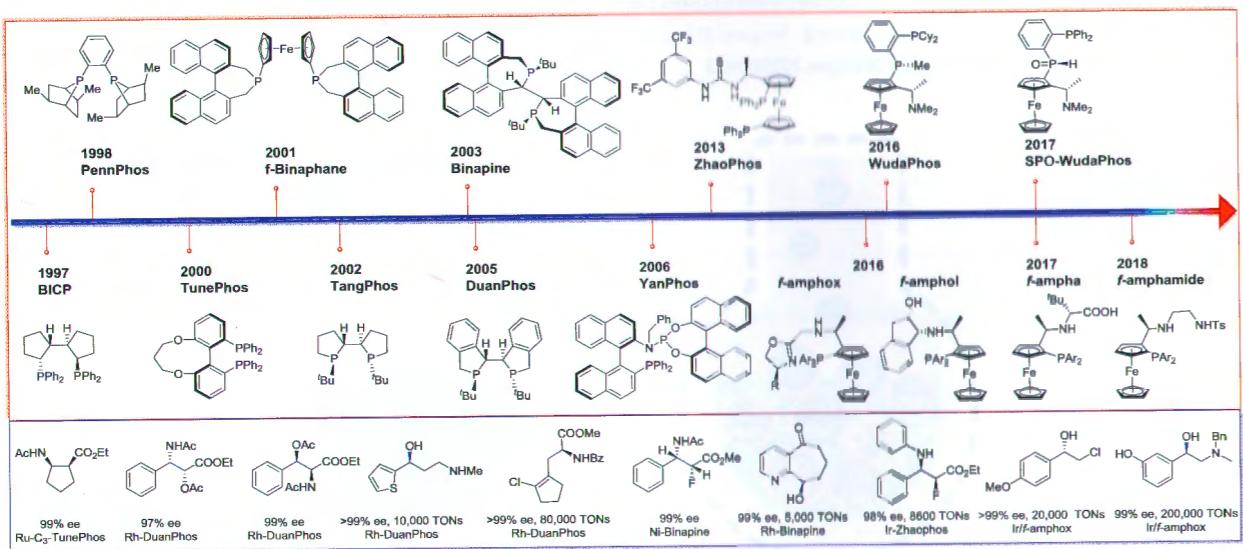


Cornerstones in Chemistry

Phosphorus Ligands from the Zhang Lab: Design, Asymmetric Hydrogenation, and Industrial Applications

Feng Wan and Wenjun Tang*

Chin. J. Chem. 2021, 39, 954–968. DOI: 10.1002/cjoc.202000605

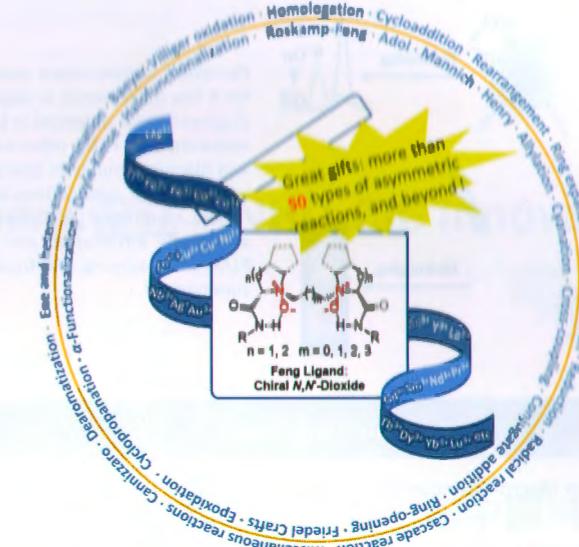


Chiral phosphorus ligands have played a crucial role for the recent advances in asymmetric catalysis. This review summarizes chiral phosphorus ligands developed from the Laboratory of Professor Xumu Zhang in the latest 25 years. A number of iconic phosphorus ligands including bisphosphorus ligands with rigid chiral backbone such as BICP, PennPhos, TunePhos, and β -Binaphane, *P*-chiral bisphosphorus ligands TangPhos, Binapine, and DuanPhos, phosphine-phosphoramidite ligand YanPhos, noncovalent interaction-assisted ferrocenyl phosphorus ligand ZhaoPhos and WudaPhos, and tridentate ferrocenyl phosphorus ligands β -amphox are introduced, and their applications in asymmetric hydrogenation are emphasized.

Feng Ligand: Privileged Chiral Ligand In Asymmetric Catalysis

Ming-Yang Wang and Wei Li*

Chin. J. Chem., 2021, 39, 969–984, DOI: 10.1002/cjoc.202000508

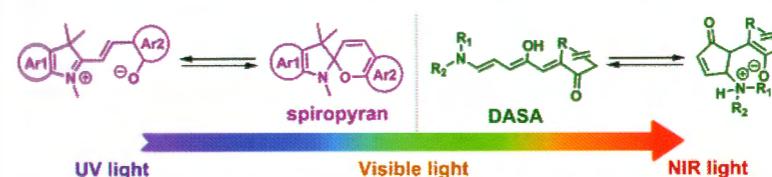


Recent Advances

Learning from Spiropyrans: How to Make Further Developments of Donor-Acceptor Stenhouse Adducts

Yongli Duan, Haiquan Zhao, Chaoyue Xiong, Lijun Mao, Dongsheng Wang,* and Yonghao Zheng*

Chin. J. Chem., 2021, 39, 985–998. DOI: 10.1002/cjoc.202000532



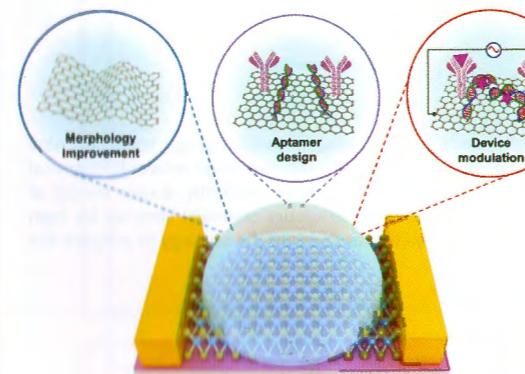
open-to-closed isomerization occurs under visible light or heat. The well-studied SPs have important reference values to the comprehensive developments of DASAs.

Critical Review

Overcome Debye Length Limitations for Biomolecule Sensing Based on Field Effective Transistors

Zhi Zheng, Hongyuan Zhang, Tianyou Zhai, and Fan Xia*

Chin. J. Chem. 2021, 39, 999–1008. DOI: 10.1002/cjoc.202000584

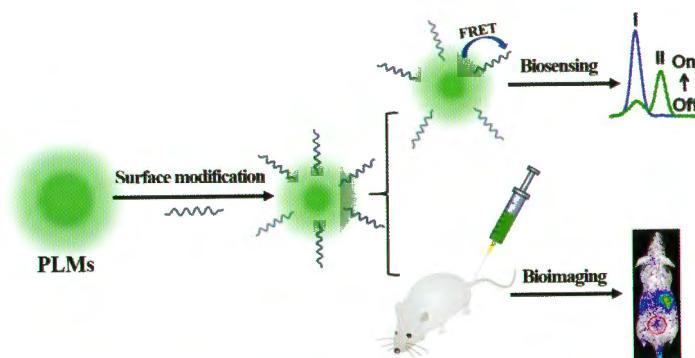


The performance of field effect transistor (FET) biosensors is limited to the charge screening in the solution, and previous reviews have not systematically elucidate this mechanism. In this review, we first expound the generation mechanism of this charge screening, then highlight recent advances to overcome this Debye screening, including morphology improvements, aptamer design and device modulation. Finally, the challenges and perspectives involving overcoming charge screening are discussed. This review is beneficial to the development of label free, real-time and ultra-sensitivity FET biosensors.

Surface Modified Persistent Luminescence Probes for Biosensing and Bioimaging: A Review

Qiang Luo, Wenjie Wang, Jie Tan,* and Quan Yuan*

Chin. J. Chem. 2021, 39, 1009–1021. DOI: 10.1002/cjoc.202000583



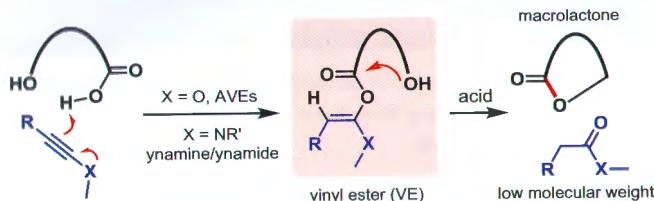
Persistent luminescence materials (PLMs) can remain luminescent for a few milliseconds to days without constant excitation and have displayed great potential in biosensing and bioimaging applications. However, bare PLMs often suffer from the poor stability, selectivity, and biocompatibility in biological system and *in vivo*, which greatly impedes their applications in biomedicine and bioanalysis. In this review, commonly used strategies for surface modification of PLMs are briefly introduced, and the applications of surface modified PLMs in biosensing and bioimaging as well as their challenges are summarized.

Emerging Topic

Awakening Sleeping Beauty: Vinyl Esters for Macrolactonization

Qi Song, Luyao Kong, Lili Zhu, Ran Hong*, and Sha-Hua Huang*

Chin. J. Chem. 2021, 39, 1022–1024. DOI: 10.1002/cjoc.202000571

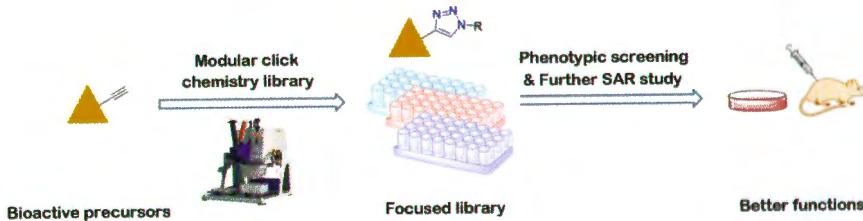


The renaissance of two half-century-old acyl donors, derived from AVEs and ynamines or ynamides, reminds us that the reactivities of specific functional groups are still waiting to be explored. The macrocyclization *via* the vinyl ester intermediates is mild, racemization-free, and an ease of work-up due to readily depletion of ester or amide derived from the coupling reagent. This novel approach is complementary to other macrolactonization methods and thus are of great expectation to future application.

Modular Click Chemistry Library: Searching for Better Functions

Jiong Zhang and Jiajia Dong*

Chin. J. Chem. 2021, 39, 1025–1027. DOI: 10.1002/cjoc.202000596



High throughput screening towards chemical libraries is the primary way to discover lead compounds in developing innovative drugs, especially new molecular entities. Accordingly, the preparation of chemical libraries is the key step for drug development. Now, conventional small molecule chemical libraries and DNA-encoded chemical libraries are the main models of chemical libraries for high-throughput screening. Recently, a new model of chemical library, called modular click chemistry library, was proposed, which gives us an alternative choice to construct chemical libraries for high throughput screening and exhibits broad prospects to accelerate drug development. Herein, this article mainly focuses on the strategy to prepare the modular click chemistry library.