

有机化学

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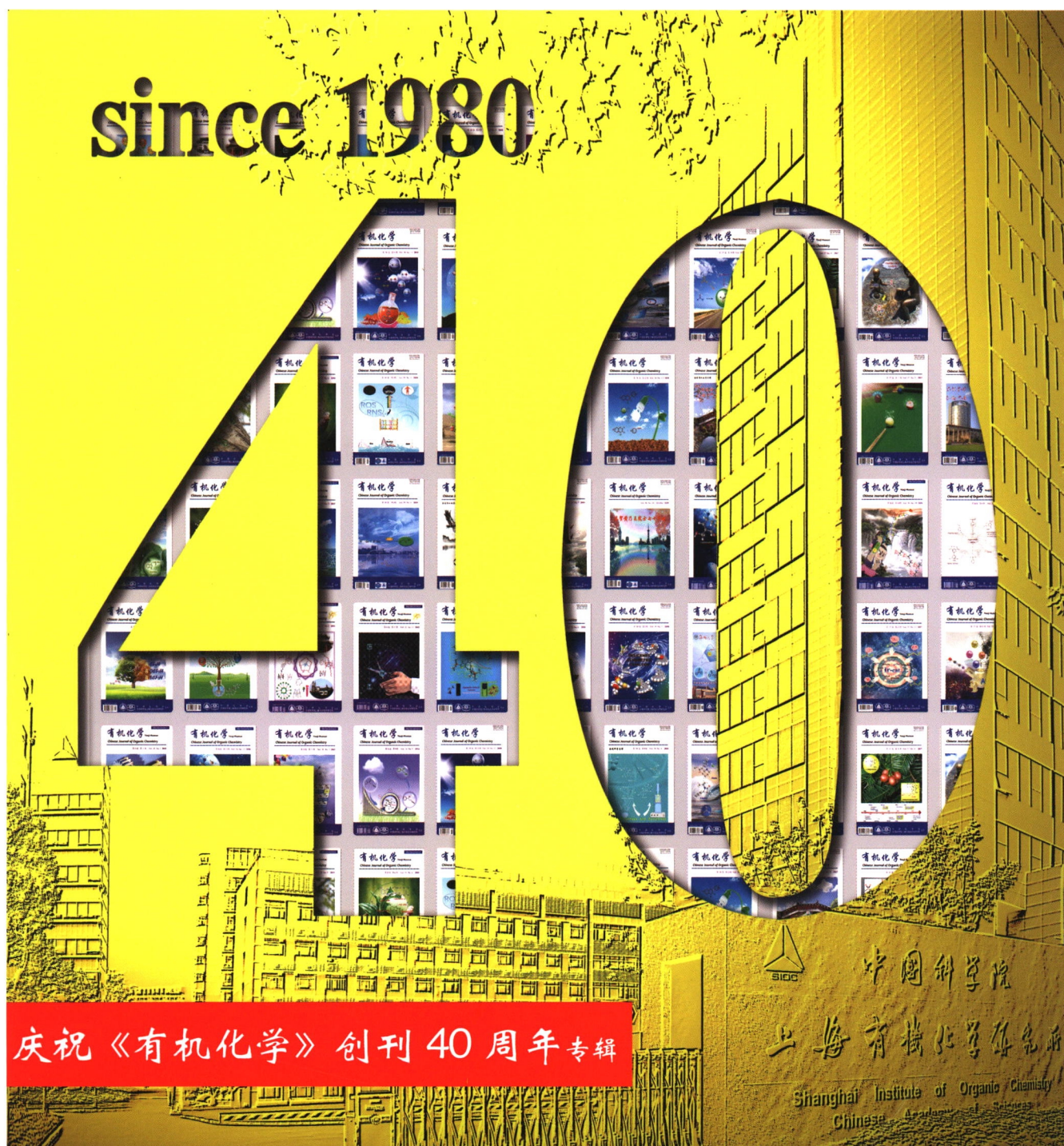
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研究简报

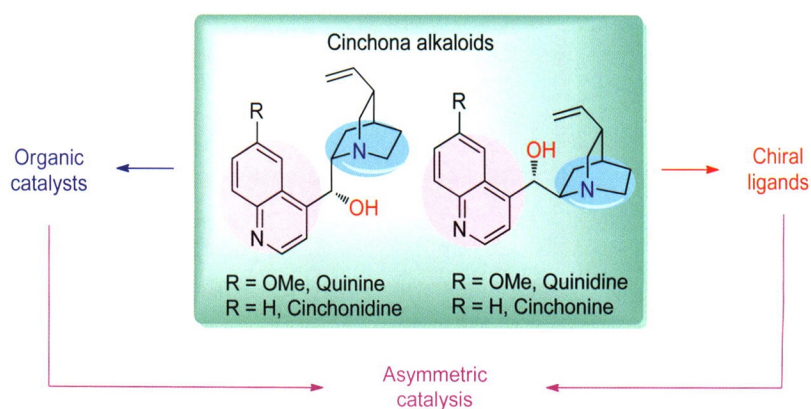
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REVIEWS

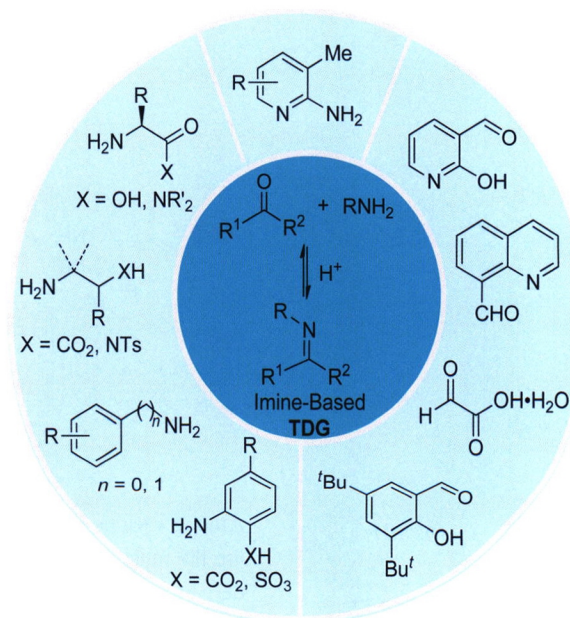
Recent Progress in Applications of Cinchona Alkaloids and Their Derivatives in Asymmetric Catalysis



Cinchona alkaloids widely exist in nature, which have attracted extensive interest of researchers because of their readily availability, biological activity, unique structural properties, and easy modification. With the development of asymmetric synthetic chemistry, cinchona alkaloids and their derivatives have been used as a privileged class of chiral catalysts or ligands in many catalytic asymmetric reactions. In particular, a variety of cinchona alkaloid-derived chiral catalysts and ligands have been developed and applied by organic chemists in catalytic asymmetric synthesis in recent years. The recent progress made in this field over the past few years is summarized. Moreover, the related reaction mechanisms and future development prospects are also discussed.

Xu, Shuanghua; Chen, Jun; Chen, Jiarong*;
Xiao, Wenjing*
Chin. J. Org. Chem. **2020**, 40(11), 3493

Transition Metal-Catalyzed C—H Activation via Imine-Based Transient Directing Group Strategy



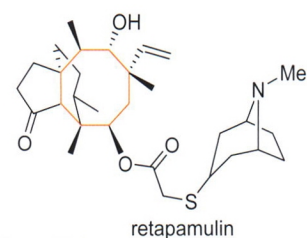
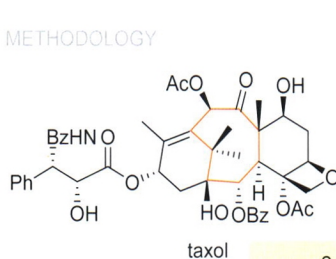
Transition metal-catalyzed C—H activation via transient directing group strategy has emerged as an efficient and powerful approach for site selective C—H functionalization. The major progress in this blooming field is summarized.

Wu, Yongjie; Shi, Bingfeng*
Chin. J. Org. Chem. **2020**, 40(11), 3517

CONTENT

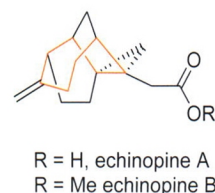
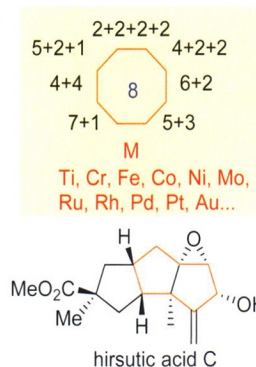
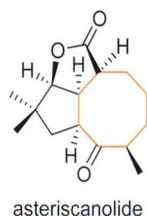
Transition-Metal-Catalyzed Cycloadditions for the Synthesis of Eight-Membered Carbocycles: an Update from 2010 to 2020

METHODOLOGY



MATERIAL

TOTAL SYNTHESIS



DRUG MOLECULE

FRAGRANCE

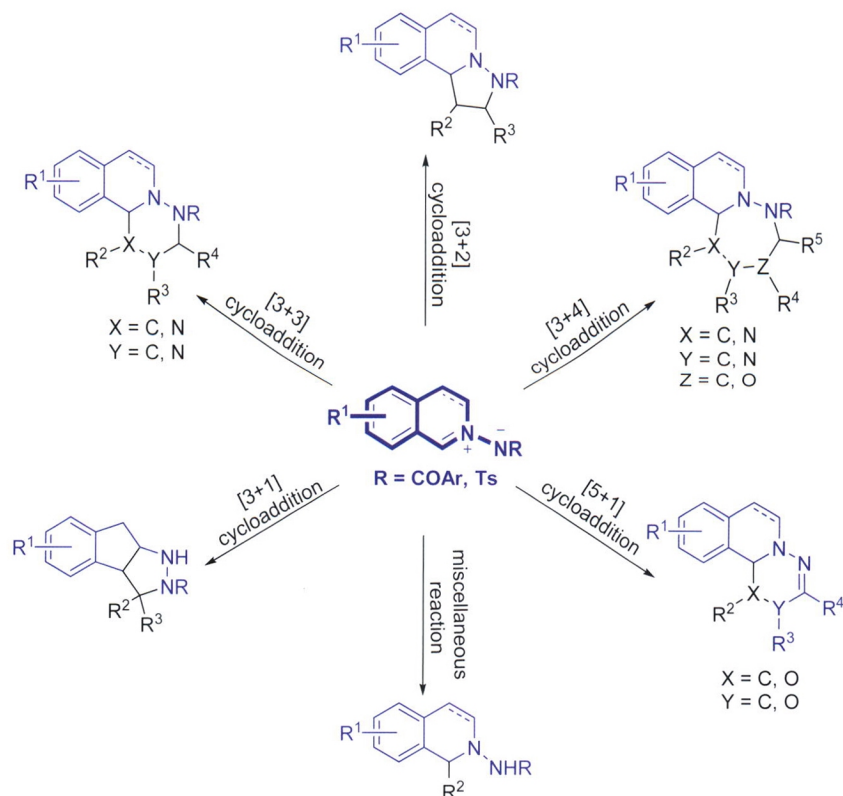
NATURAL PRODUCT

Transition-metal-catalyzed cycloadditions have evolved as powerful tools to construct eight-membered carbocycles. This topic has been reviewed in 2010. Summarized here are many new developments in this field and applications of the previously developed reactions in natural product synthesis since then.

Wang, Lu-Ning; Yu, Zhi-Xiang*

Chin. J. Org. Chem. **2020**, 40(11), 3536

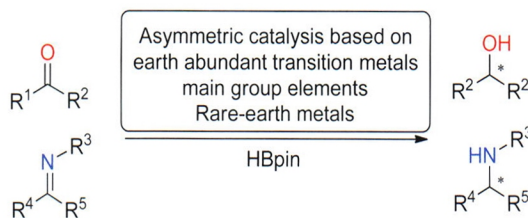
Recent Developments of Reactions with C,N-Cyclic Azomethine Imines



Among various 1,3-dipoles of cyclic azomethine imines, C,N-cyclic azomethine imines are the most widely used reagents in the construction of diverse tetrahydroisoquinoline derivatives. The developments of reactions with C,N-cyclic azomethine imines including [3+2], [3+3], [3+4], [5+1], [3+1] cycloaddition reactions and miscellaneous reactions are summarized. The properties of reactions, reaction processes and synthetic applications are discussed. Finally, the prospects of the reaction with this reagent are also proposed.

Hua, Tingbi; Yang, Qingqing*; Xiao, Weng-jing*

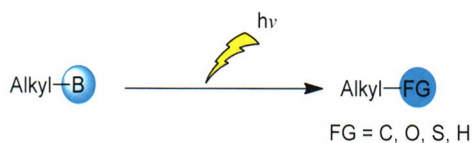
Chin. J. Org. Chem. **2020**, 40(11), 3559

Application of Pinacolborane in Catalytic
Enantioselective Hydroboration of Ketones
and Imines

The enantioselective catalytic hydroboration of ketones and imines with pinacolborane is reviewed. Catalytic systems based on earth abundant transition metals, main group elements, and rare-earth metals are discussed.

Liu, Wenbo; Lu, Zhan*

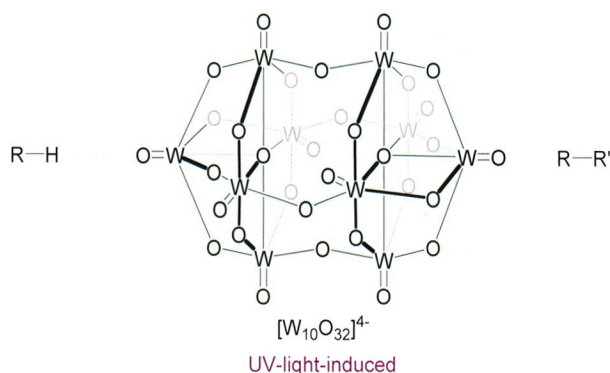
Chin. J. Org. Chem. **2020**, 40(11), 3596

Recent Advances in Visible-Light-Promo-
ted Transformation of Alkyl Boron Com-
pounds

Organoboron compounds are valuable synthetic intermediates and widely used in the synthesis of medicine, pesticide and organic optoelectronic materials due to their extensive resource and highly transformable ability. As a sustainable and green energy, visible light shows an important effect in organic synthesis. Tetracoordinated alkylboron compounds could occur single electron transfer (SET) process to generate alkyl radical for further transformations. Herein, the recent advances in the photoinduced transformation of alkyl boron compounds are summarized.

Shi, Dunfa; Wang, Lu; Xia, Chungu; Liu, Chao*

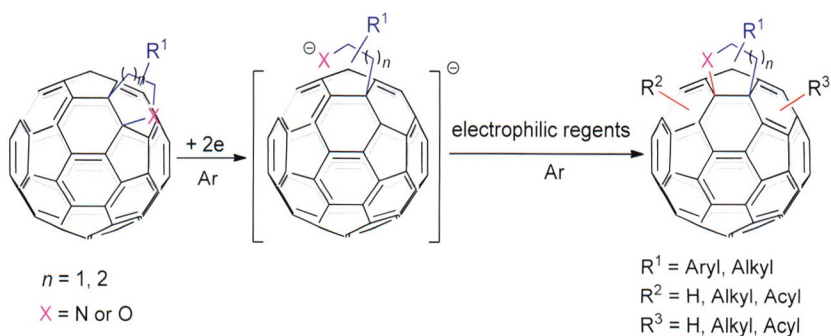
Chin. J. Org. Chem. **2020**, 40(11), 3605

Photoinduced Decatungstate-Catalyzed
C—H Functionalization

In recent years, decatungstate [W₁₀O₃₂]⁴⁻ as a catalyst has attracted much attention in the field of photocatalytic organic synthesis. With the catalysis of decatungstate, the C—H bond of substrate can be converted into the corresponding radical via a hydrogen atom transfer (HAT) process under light irradiation. In this review, the recent advances of the application of decatungstate as a photocatalyst for the C—H functionalization to construct C—C, C—N, C—F bonds are summarized.

Yuan, Xiaoya; Yang, Guoping; Yu, Bing*

Chin. J. Org. Chem. **2020**, 40(11), 3620

Progress in Electrochemical Reactions of
[60]Fullerene-Fused Heterocycles

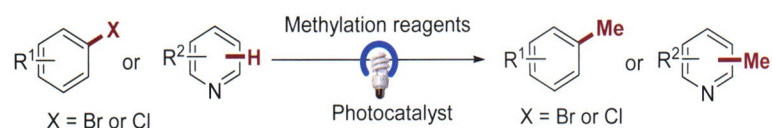
The recent progress in the electrochemical reactions of [60]fullerene-fused heterocycles is reviewed. Electroreduction leads to the carbon-heteroatom bond breaking and rearrangement of the heterocyclic moieties on the fullerene skeleton, consequently providing new addition patterns of fullerene derivatives.

Niu, Chuang; Wang, Guanwu*

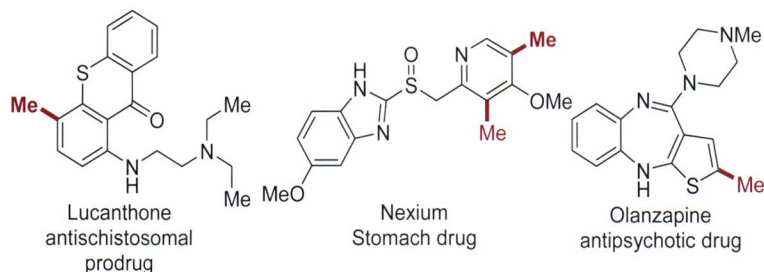
Chin. J. Org. Chem. **2020**, 40(11), 3633

CONTENT

Recent Progress of Photocatalytic Methylation of Arenes



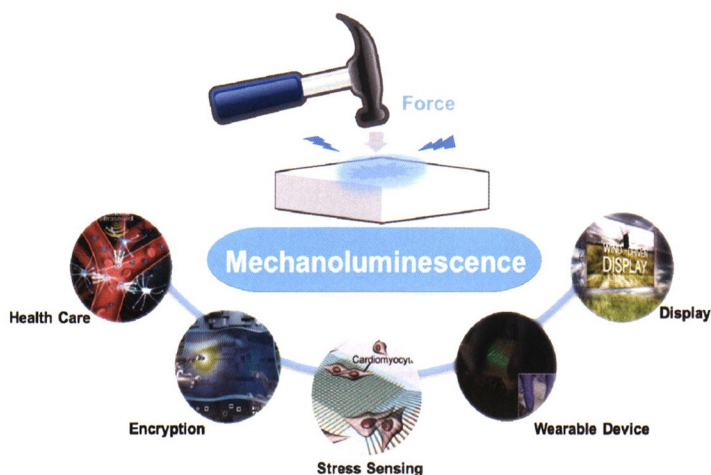
Methylation reagents: MeOTS, MeOH, CH₄, MeB(OH)₂, CH₃COOH, DMSO, MeB(O₂Ar)Li, etc.



A series of aryl methylation reactions enabled by visible light photoredox catalysis have been reported and applied in the synthesis of pharmaceutically-interested products. The recent progress of visible-light-induced aryl methylation reactions is briefly summarized with discussions of different reaction pathways.

Du, Jianbo; Chen, Yuegang; Zuo, Zhiwei*
Chin. J. Org. Chem. **2020**, 40(11), 3646

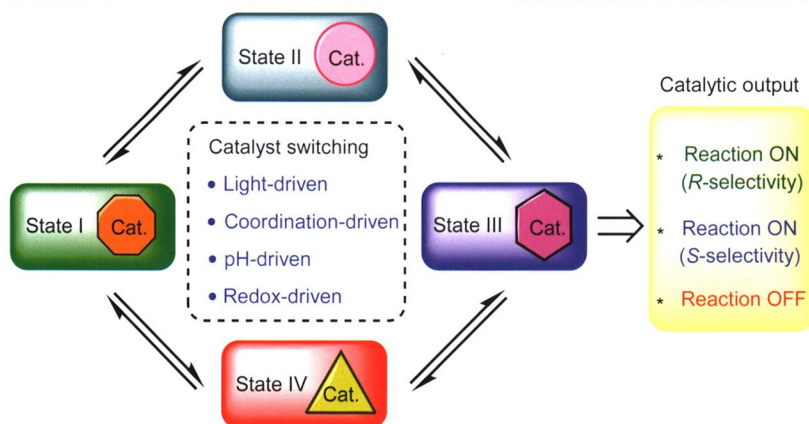
Advances in Mechanoluminescence and Its Applications



The phenomenon, mechanism and applications of mechanoluminescence are introduced, and the prospect of organic mechanoluminescence materials is proposed to inspire their development and applications.

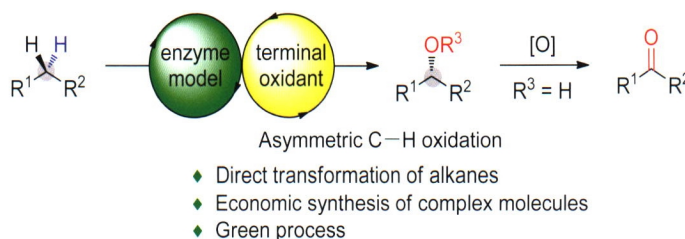
Chang, Kai; Li, Qianqian*; Li, Zhen*
Chin. J. Org. Chem. **2020**, 40(11), 3656

Artificial Stimuli-Responsive Catalytic Systems for Switchable Asymmetric Catalysis



Inspired by enzyme allosteric catalysis, artificial stimuli-responsive catalytic systems for switchable asymmetric catalysis have attracted great attention. A variety of asymmetric reactions featuring on/off-switchable catalysis and/or stereodivergent catalysis have been achieved by using light-, coordination-, pH- and redox-driven chiral switchable catalysts. The recent development in this research frontier is introduced.

Tang, Yuping; He, Yanmei*; Fan, Qinghua*
Chin. J. Org. Chem. **2020**, 40(11), 3672

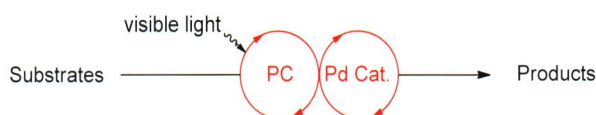
Recent Progress in C(sp³)—H Asymmetric Oxidation Catalyzed by Bioinspired Metal Complexes

The recent progress in asymmetric C(sp³)—H oxidation is reviewed. The factors that dictate the selectivity of asymmetric C—H oxidation and the mechanism of C—H oxidation catalyzed by metal complexes are demonstrated. Especially, various successful asymmetric C—H oxidations catalyzed by bioinspired metal complexes are discussed in detail.

Sun, Qiangsheng; Sun, Wei*

Chin. J. Org. Chem. **2020**, 40(11), 3686

Visible-Light Photoredox and Palladium Dual Catalysis in Organic Synthesis

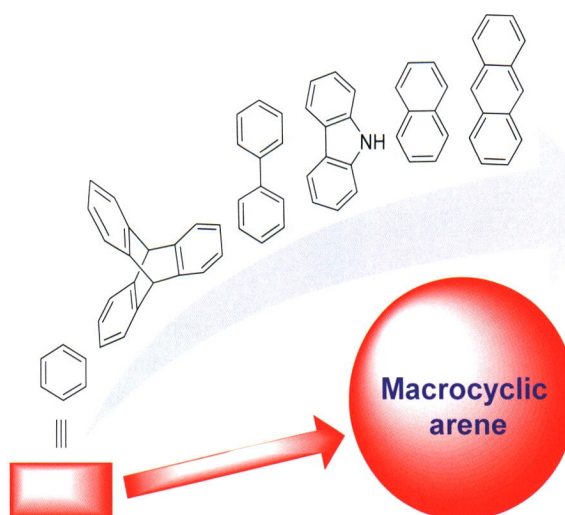


Recently, visible-light photoredox catalysis and palladium dual catalysis have realized a series of novel organic transformations under mild conditions with high efficiency and selectivity. The application of visible-light photoredox and palladium dual catalysis in organic synthesis is summarized and the future research directions in this field are analyzed.

Zhou, Wenjun*; Jiang, Yuanxu; Chen, Liang; Liu, Kaixing; Yu, Dagang*

Chin. J. Org. Chem. **2020**, 40(11), 3697

Recent Advances in Novel Macrocyclic Arenes

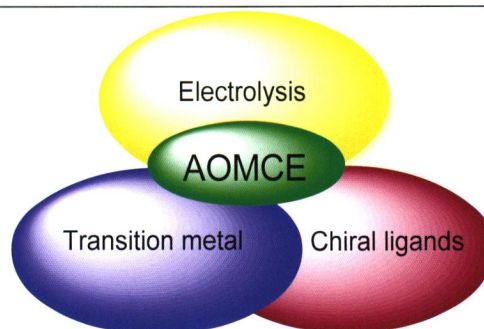


Li, Jing; Han, Ying; Chen, Chuanfeng*

Chin. J. Org. Chem. **2020**, 40(11), 3714

The recent progresses in the synthesis and applications of novel macrocyclic arenes are summarized.

Advances in Asymmetric Organotransition Metal-Catalyzed Electrochemistry



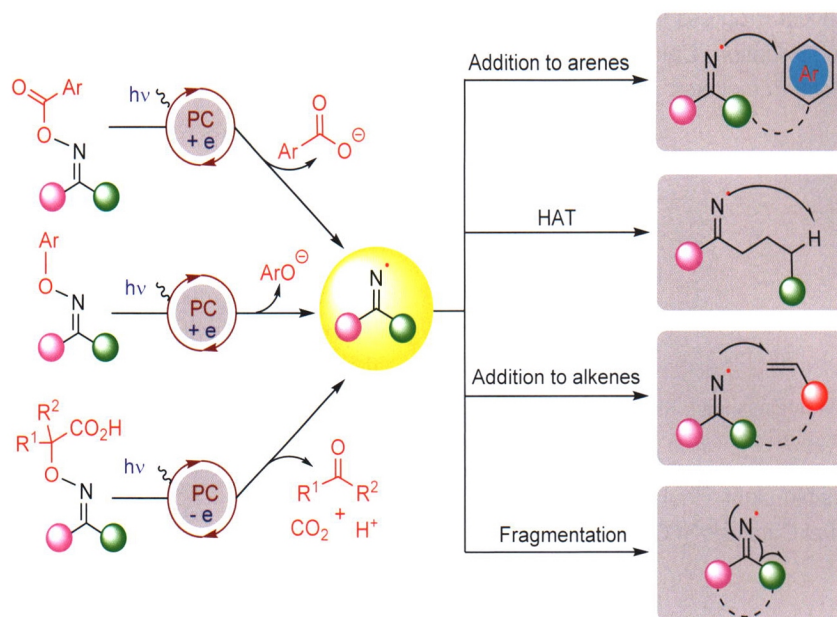
Wang, Xiangyang; Xu, Xuetao; Wang, Zhenhua; Fang, Ping*; Mei, Tiansheng*

Chin. J. Org. Chem. **2020**, 40(11), 3738

The recent developments in asymmetric organotransition metal-catalyzed electrochemistry (AOMCE) are summarized. AOMCE processes can be divided into oxidative and reductive variants. In terms of oxidations, asymmetric functionalization of olefins, oxidative kinetic resolution of secondary alcohols or aldehydes, and asymmetric C—H functionalization reactions have been developed. Reductive processes discussed include asymmetric electrochemical carboxylation with carbon dioxide, asymmetric electrochemical decarboxylation, and asymmetric reductive coupling reactions.

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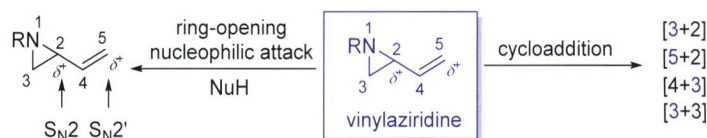
Generation and Application of Iminyl Radicals from Oxime Derivatives Enabled by Visible Light Photoredox Catalysis



Iminyl radicals can undergo four major classes of reactions, namely addition to arenes, intramolecular hydrogen atom transfer and subsequent reactions, addition to alkenes, Norrish type-I fragmentation (cleavage of α -carbon-carbon bonds) and subsequent reactions. In this review, the most significant progresses in the use of oximes and their derivatives as iminyl precursors are discussed and their engagement in photoredox-mediated transformations is outlined.

Song, Changhua; Shen, Xu; Yu, Fang; He, Yupeng*; Yu, Shouyun*
Chin. J. Org. Chem. **2020**, 40(11), 3748

Recent Progress in Applications of Vinylaziridines in Organic Synthesis



Wu, Yali; Zhou, Xuesong; Xiao, Wenjing; Chen, Jiarong*
Chin. J. Org. Chem. **2020**, 40(11), 3760

The representative examples of nucleophilic ring-opening and cyclization reactions of vinylaziridines over the past five years are summarized. Moreover, the prospects of further development are also discussed.

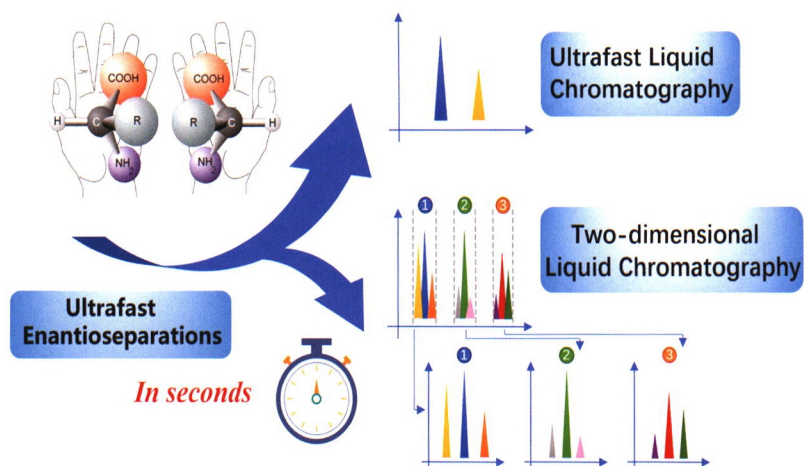
Porous Organic Polymers as Heterogeneous Catalysts for Visible Light-Induced Organic Transformations



Xu, Zi-Yue; Luo, Yi; Wang, Hui; Zhang, Dan-Wei*; Li, Zhan-Ting*
Chin. J. Org. Chem. **2020**, 40(11), 3777

Porous organic polymers are highly stable, recyclable heterogeneous catalysts for visible light-mediated organic transformations. Their synthesis and catalyzed reactions are highlighted.

Chiral Separation by Ultrafast and Two-Dimensional Liquid Chromatography

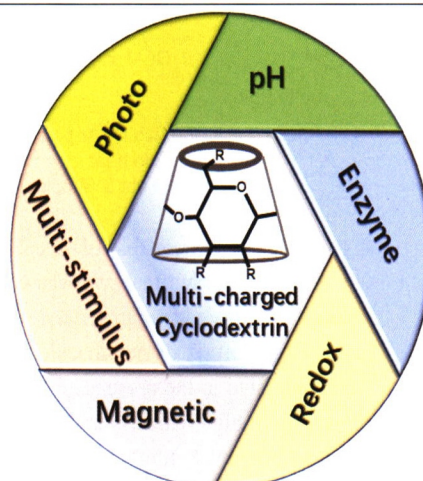


The recent progress in the application of ultrafast and two-dimensional liquid chromatography in chiral analysis is summarized. This review focuses on the recent development of ultrafast reversed-phase liquid chromatography, two-dimensional liquid chromatography and supercritical fluid chromatography, including the applications of chiral compound separation in complex samples and their prominent positions in solving biological and pharmaceutical problems.

Xu, Yao; Kang, Jingwu*

Chin. J. Org. Chem. **2020**, 40(11), 3794

Supramolecular Assemblies of Multi-Charged Cyclodextrins

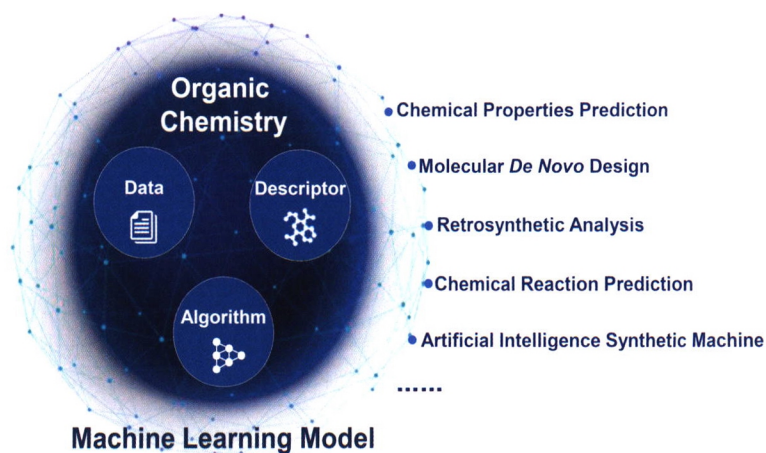


The latest research progress of pH-, photo-, enzyme-, redox-, magnetic- and multi-stimulus responsive smart supramolecular assemblies, which are constructed by typical positively/negatively charged and amphiphilic multi-charged cyclodextrins including their application in the fields of drug delivery, controlled release and sensory detection is introduced. The challenges and future developments of multicharged cyclodextrin smart supramolecular assemblies are discussed.

Zhang, Yi; Liu, Yu*

Chin. J. Org. Chem. **2020**, 40(11), 3802

Application of Machine Learning in Organic Chemistry



The workflow of machine learning (ML) study in organic chemistry is briefly introduced. Meanwhile, the applications of ML in the accurate prediction of chemical properties, molecular *de novo* design, chemical reaction prediction, retrosynthetic analysis and artificial intelligence synthetic machine are also summarized. In the end, the current challenges in this field are analyzed and discussed.

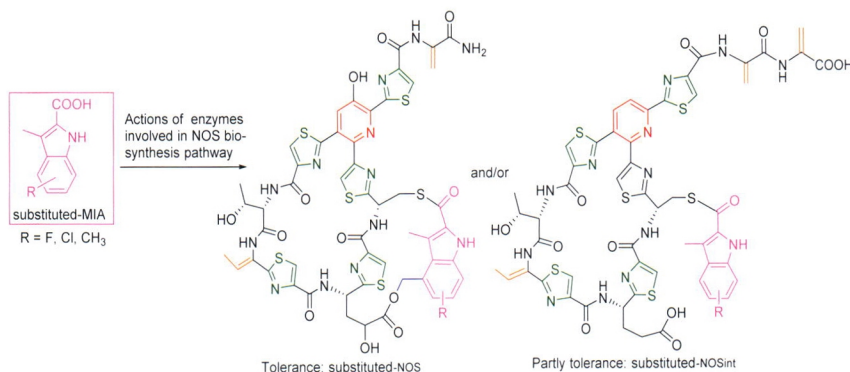
Liu, Yidi; Yang, Qi; Li, Yao; Zhang, Long*; Luo, Sanzhong*

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CONTENT

ARTICLES

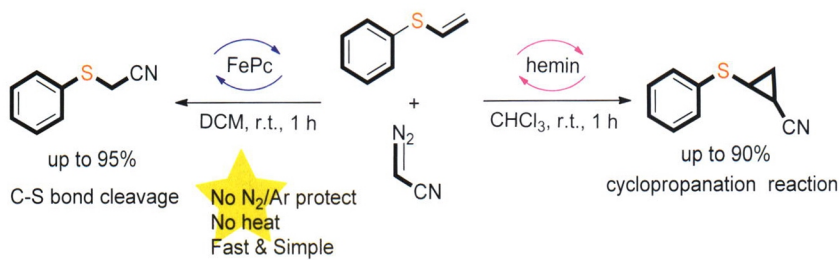
Insights into the Substrate Tolerance of Enzymes Involved in the Nosiheptide Biosynthesis Pathway Based on Indolic Acid Moiety



Fan, Yafei; Zhang, E; Guo, Heng; Mu, Ning; Chen, Dandan; Wang, Wengui; Wang, Shou-feng*; Liu, Wen*

Chin. J. Org. Chem. **2020**, 40(11), 3828

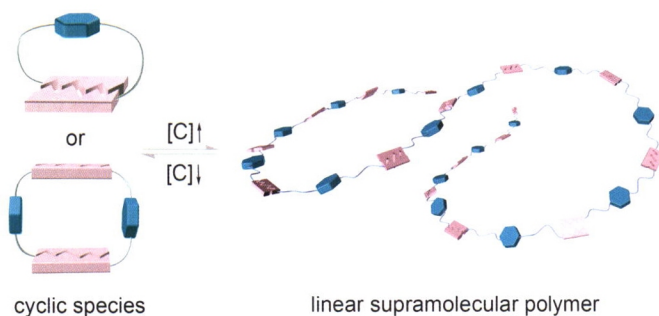
Iron Porphyrin Complexes Catalyzed Cyclopropanation Reactions and C—S Bond Cleavage Reactions for Phenyl Vinyl Sulfides and Diazoagents



Yan, Xiaojing; Li, Chang*; Jin, Zhixiong; Xu, Xiaofei; Chen, Weiwei; Pan, Yuanjiang*

Chin. J. Org. Chem. **2020**, 40(11), 3837

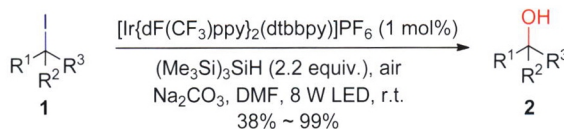
Supramolecular Self-Assembly of Dioxiphenylene Bridged Ureidopyrimidinone Derivatives



Qi, Lijie; Ding, Yihan; Xiao, Tangxin*; Wu, Haoran; Diao, Kai; Bao, Cheng; Shen, Yong; Li, Zhengyi; Sun, Xiaoqiang; Wang, Le-yong*

Chin. J. Org. Chem. **2020**, 40(11), 3847

Tris(trimethylsilyl)silane/O₂-Promoted and Photo-accelerated Conversion of Alkyl Iodides to Alcohols

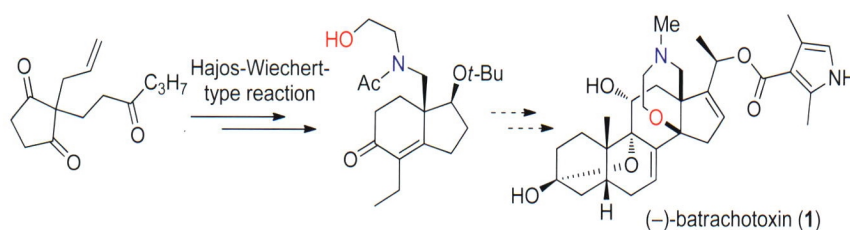


Li, Jianyu; Zeng, Jinlong; Chen, Jianfeng*; Zhao, Baoguo*

Chin. J. Org. Chem. **2020**, 40(11), 3853

Tris(trimethylsilyl)silane/O₂ promoted and photo-accelerated conversion of various alkyl iodides to alcohols under mild conditions was developed.

Exploratory Studies on a New Strategy for the Asymmetric Total Synthesis of the Arrow Poison-Frog Alkaloid Batrachotoxin: Asymmetric Synthesis of a Functionalized CD Ring

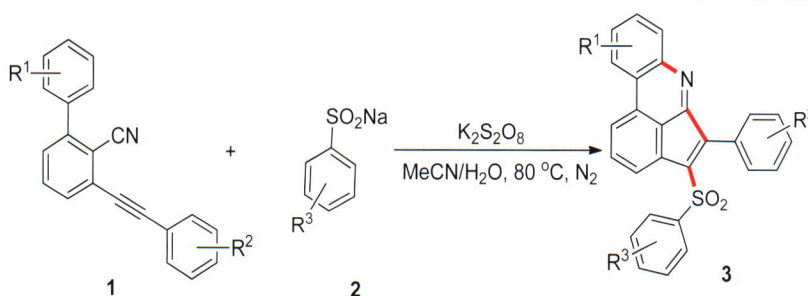


The synthesis started from the preparation of 2-allylcyclopentane-1,3-dione and its Michael addition with hex-1-en-3-one. The Hajos-Wiechert-type reaction of the adduct was investigated under optimized conditions using *L*-phenylalanine as an organocatalyst and *D*-camphorsulfonic acid as an additive, the desired Robinson annulation proceeded smoothly to give the desired cyclization product in 75% yield and 81% *ee*. The latter was converted into a functionalized CD skeleton that bears all elements for elaborating to CDE framework in seven steps.

Wang, Xiaogang; Huang, Peiqiang*

Chin. J. Org. Chem. **2020**, 40(11), 3858

$K_2S_2O_8$ -Initiated Cascade Cyclization of 2-Alkynyl nitriles with Sodium Sulfonates: Access to Fused Cyclopenta[gh]phenanthridines

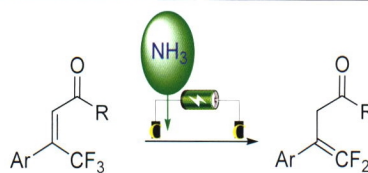


Chen, Zhichao; Zhang, Hong; Zhou, Shufeng*; Cui, Xiuling*

Chin. J. Org. Chem. **2020**, 40(11), 3866

A convenient $K_2S_2O_8$ -initiated radical cyclization cascade procedure for the construction of 4-sulfonated cyclopenta[gh]phenanthridines from 2-alkynyl nitriles and sodium sulfonates has been explored under metal-free conditions.

Electrochemical Allylic Hydrodefluorination Reaction Using Gaseous Ammonia as Hydrogen Source

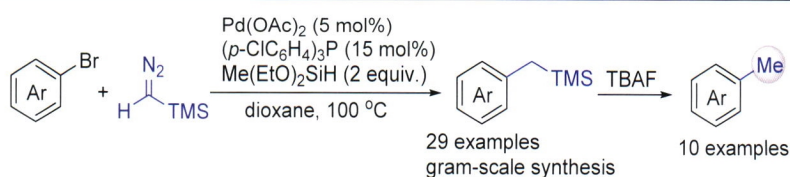


Sheng, Jie; Wu, Na; Liu, Xu; Liu, Feng; Liu, Shuai; Ding, Weijie; Liu, Chang; Cheng, Xu*

Chin. J. Org. Chem. **2020**, 40(11), 3873

The first example of electrochemical allylic hydrodefluorination reaction was achieved with α -trifluoromethyl cinnamates as substrate, giving *gem*-difluorostyrenes in moderate to good yields. By using graphite felt as cathode and ammonia as hydrogen source, the reduction of substrate underwent electron transfer pathway selectively.

Palladium-Catalyzed Reductive Coupling of Aromatic Bromides and Trimethylsilyldiazomethane: Its Application to Methylation of Aromatic Compounds

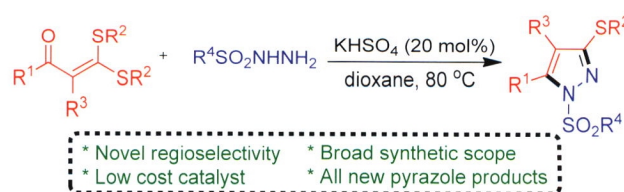


Wang, Shuai; Yang, Cheng; Sun, Shuo; Sun, Hanli; Wang, Jianbo*

Chin. J. Org. Chem. **2020**, 40(11), 3881

A new methylation strategy using a reductive coupling/desilylation cascade process with TMSCHN₂ as methylation reagent is reported. A wide range of functional groups and hetero aromatic rings were well-tolerated in this reaction. The transformation provides a new method for the introduction of methyl group and silylmethyl group into aromatic rings.

Synthesis of 3-Alkylthiol Pyrazoles via Regioselective Annulation Reactions of Sulfonyl Hydrazines and Ketene Dithioacetals



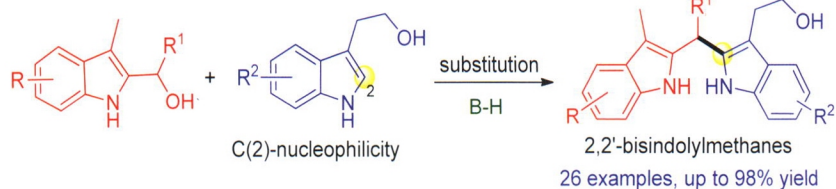
Li, Yi; Wan, Jieping*

Chin. J. Org. Chem. **2020**, 40(11), 3889

The regioselective annulation of ketene dithioacetals and sulfonyl hydrazine providing 3-alkylthiopyrazoles has been achieved via simple KHSO₄ catalysis, leading to the synthesis of a series of unprecedented pyrazoles bearing *N*-sulfonyl and 3-alkylthio structure.

CONTENT

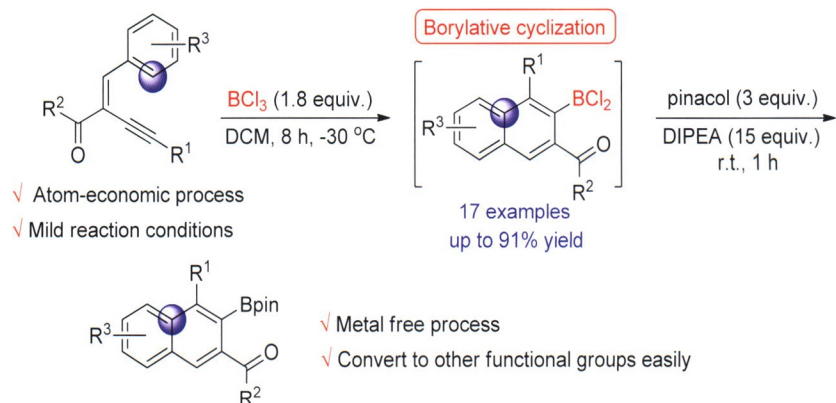
Brønsted Acid-Catalyzed Substitution Reactions of 2-Indolylmethanols with Tryptophols: Chemoselective Synthesis of 2,2'-Bisindolylmethanes



Mao, Yujia; Lu, Yinan; Li, Tianzhen; Wu, Qiong*; Tan, Wei*; Shi, Feng*
Chin. J. Org. Chem. **2020**, 40(11), 3895

A Brønsted acid-catalyzed substitution reaction of 2-indolylmethanols with tryptophols has been established, which afforded a series of 2,2'-bisindolylmethanes in high yields (up to 98% yield) with chemoselectivity.

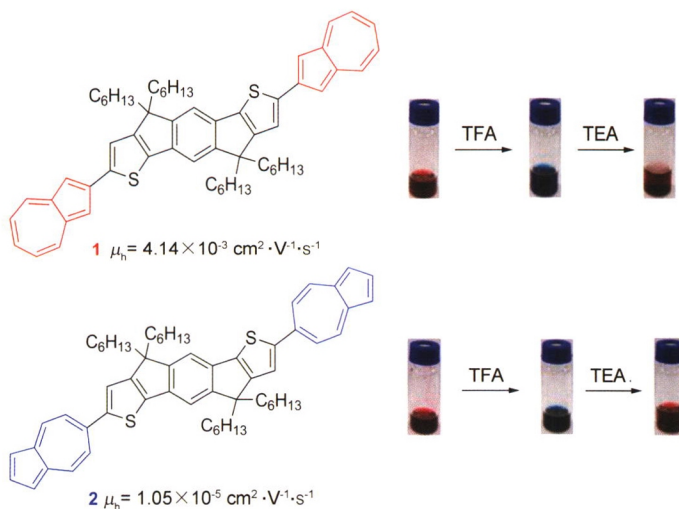
BCl₃ Mediated Borylative Cyclization of 2-(1-Alkynyl)-2-alken-1-ones



Wu, Yi; Xiao, Yuanjing*; Zhang, Junliang*
Chin. J. Org. Chem. **2020**, 40(11), 3908

A metal-free, BCl₃ mediated borylative cyclization of 2-(1-alkynyl)-2-alken-1-ones leading to synthetic valuable multi-functionalized naphthalene boronates in one step was developed.

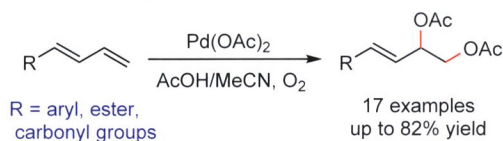
Design, Synthesis and Properties of Indacenodithiophene Derivatives End-Capped with Azulene



Peng, Peizhen; Li, Jing; Hou, Bin; Xin, Hanshen; Cheng, Tanyu*; Gao, Xike*
Chin. J. Org. Chem. **2020**, 40(11), 3916

Two isomers of azulene and indacenodithiophene (IDT)-based compounds **1** and **2** were designed and synthesized, according to the different connections of azulene unit with IDT through its electron-rich five-membered ring and the electron-deficient seven-membered ring, respectively. The UV-Vis spectra, electrochemical properties and proton-responsive properties of **1** and **2** were studied.

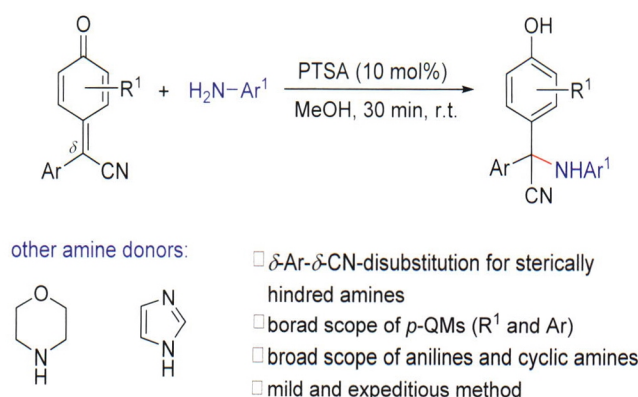
Palladium(II)-Catalyzed Aerobic 1,2-Diacetoxylation of Conjugated Dienes



Ju, Chenyang; Wu, Zhengxing*; Li, Yunyi; Zhang, Wanbin*
Chin. J. Org. Chem. **2020**, 40(11), 3925

A Pd(II)-catalyzed 1,2-diacetoxylation method using readily available acetic acid as oxygen source and oxygen as oxidant was developed. This protocol has good substrate scope for conjugated dienes possessing aryl, ester and carbonyl groups. The catalytic products can be transformed to 1,2-diols through simple alcoholysis or hydrolysis.

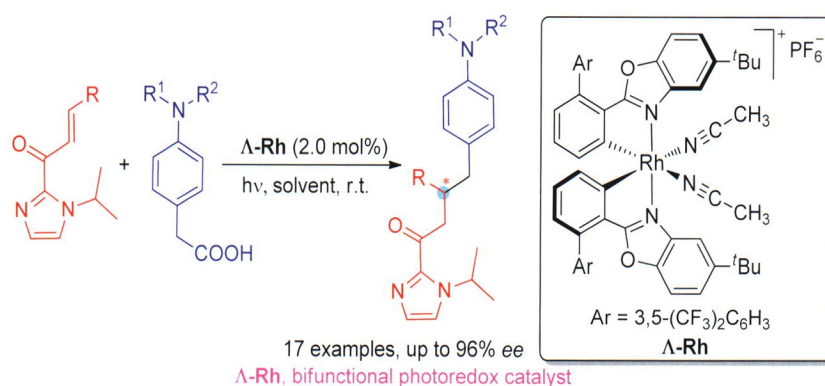
Synthesis of Sterically Hindered α -Aminonitriles through 1,6-Aza-conjugate Addition of Anilines to δ -Cyano Substituted *para*-Quinone Methides



Wang, Lin; Wang, Nan; Qi, Yue; Sun, Shutao; Liu, Xigong*; Li, Wei*; Liu, Lei*
Chin. J. Org. Chem. **2020**, 40(11), 3934

An efficient 1,6-aza-conjugate addition of primary anilines to pre-prepared δ -CN- δ -aryl disubstituted *para*-quinone methides for facile access to sterically hindered amines with a fully substituted α -carbon center has been described.

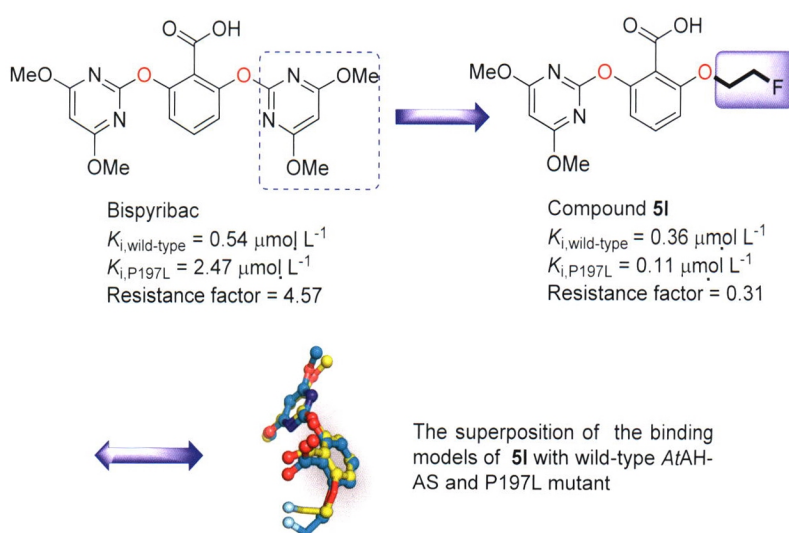
Asymmetric Photoinduced Giese Radical Addition Enabled by a Single Chiral-at-Metal Rhodium Complex



Chen, Liang; Hu, Liangjian; Du, Yu; Su, Weiping*; Kang, Qiang*
Chin. J. Org. Chem. **2020**, 40(11), 3944

A photoinduced asymmetric Giese radical addition enabled by a bifunctional chiral rhodium complex has been developed. The corresponding adducts were obtained in moderate to high yields with excellent enantioselectivities.

Design, Synthesis and Biological Activity of Pyrimidyl-Salicylate Derivatives Containing Alkoxy Moiety



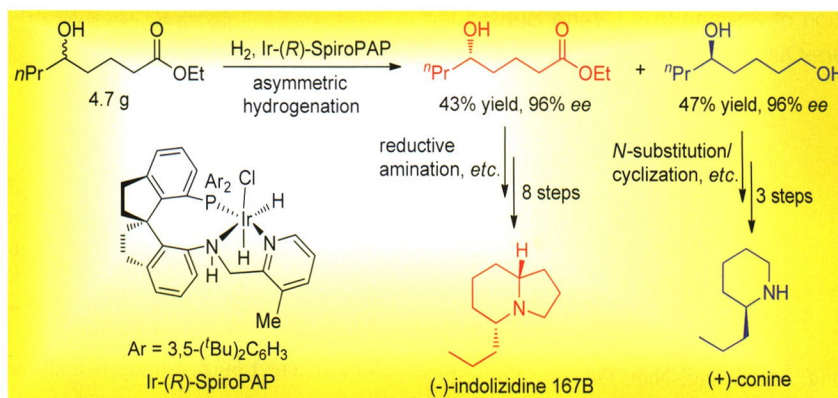
Qu, Renyu; Cai, Zhoumei; Yang, Jingfang; Liu, Yuchao; Chen, Qiong; Niu, Congwei; Xi, Zhen; Yang, Guangfu*
Chin. J. Org. Chem. **2020**, 40(11), 3953

16 new pyrimidyl-salicylate derivatives were designed and synthesized based on the "conformation flexibility analysis" strategy. Thereinto, 2-((4,6-dimethoxypyrimidin-2-yl)oxy)-6-(2-fluoroethoxy)benzoic acid (5I) exhibited excellent inhibition toward both wild-type AtAHAS and P197L mutant, which was considered as the most promising antiresistance inhibitor in this series. Also, this compound showed potent weed control against both sensitive and resistant (P197L-AHAS) *Descurainia sophia*.

CONTENT

NOTE

Asymmetric Synthesis of (–)-Indolizidine 167B and (+)-Coniine

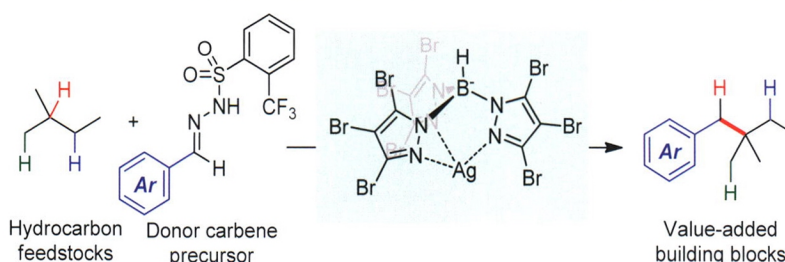


Yang, Xiaohui; Gu, Xuesong; Bin, Huaiyu; Xie, Jianhua*; Zhou, Qilin*
Chin. J. Org. Chem. **2020**, 40(11), 3963

Enantioselective syntheses of (–)-indolizidine 167B and (+)-coniine were achieved by using intramolecular reductive amination and *N*-substitution/cyclization, respectively, as a key step to construct the chiral *aza*-bicyclic[4.3.0]nonane skeleton and chiral piperidine ring.

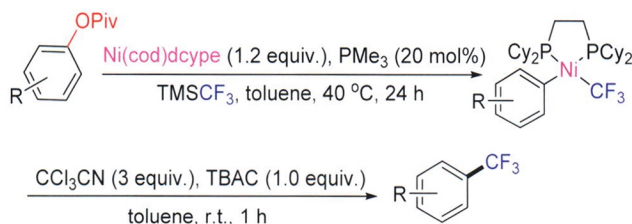
HIGHLIGHTS

Silver-Catalyzed Site-Selective C—H Benzoylation of Hydrocarbon Feedstocks



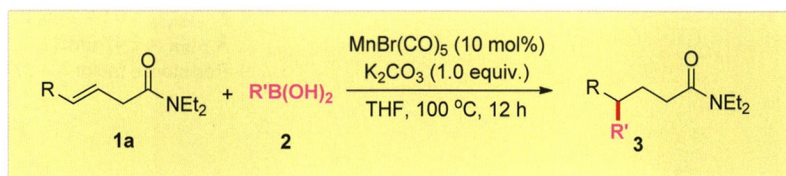
Wang, Fei; Liu, Guosheng*
Chin. J. Org. Chem. **2020**, 40(11), 3969

Synthesis of Trifluoromethylarenes via Nickel-Mediated C—O Bond Activation of Phenol Derivatives



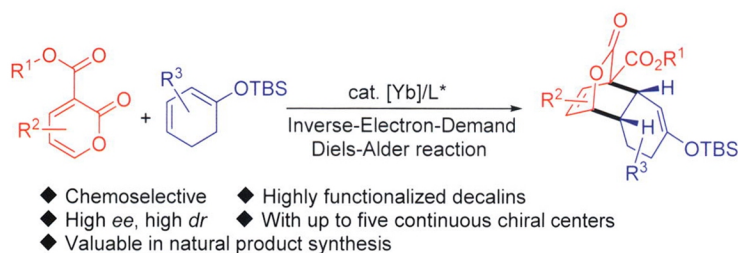
Wang, Zhenyu; Dai, Huixiong*
Chin. J. Org. Chem. **2020**, 40(11), 3971

Manganese-Catalyzed Hydroarylation of Unactivated Alkenes

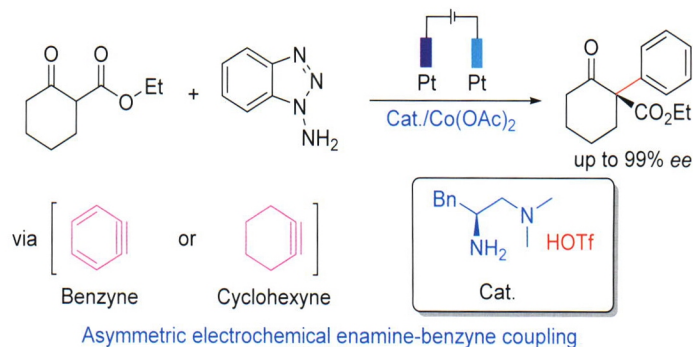


He, Hengchi; Xie, Jin*
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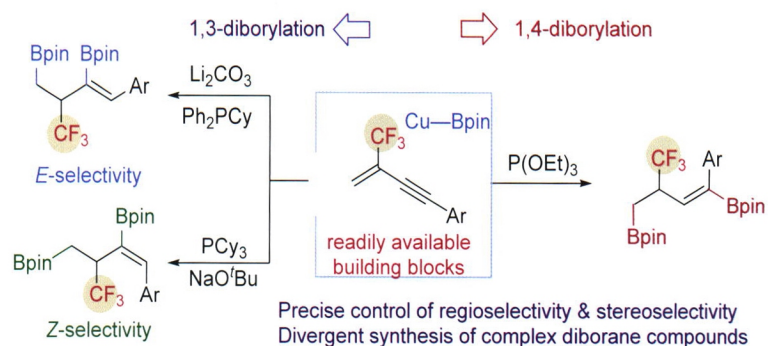
Asymmetric Inverse-Electron-Demand Diels-Alder Reaction of 2-Pyrones



Ding, Xiangfeng; Deng, Weiping*
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Catalytic Asymmetric Electrochemical α -Arylation of Cyclic β -Ketocarboxyls with Anodic Benzyne Intermediates

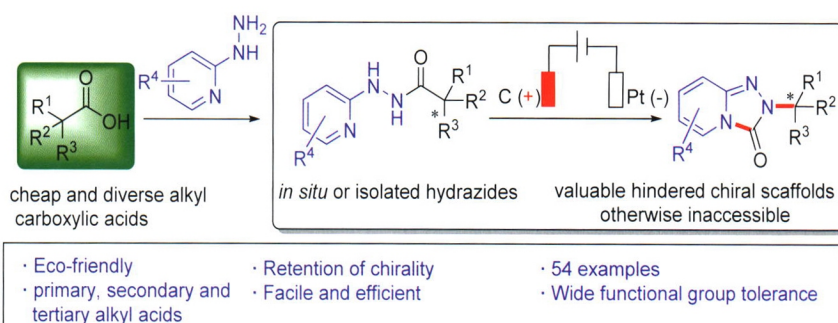
Zhang, Qinglin; Guo, Chang*

Chin. J. Org. Chem. **2020**, 40(11), 3978Cu-Catalyzed Regio- and Stereo-selective 1,3- and 1,4-Diborylations of CF_3 -Containing 1,3-Enynes

Zhu, Shengqing; Chu, Lingling*

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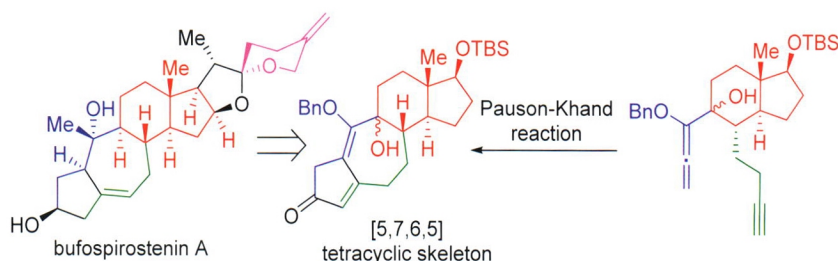
Electrochemical Rearrangement Cyclization Based on Alkyl Carboxylic Acids: Synthesis of Triazolopyridinone Derivatives



Ma, Hongxing; Mei, Tiansheng*

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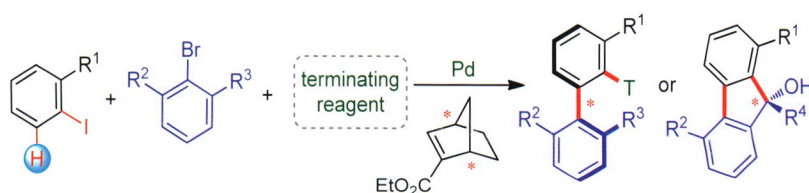
Asymmetric Total Synthesis of Spirostanol Bufospirostenin A



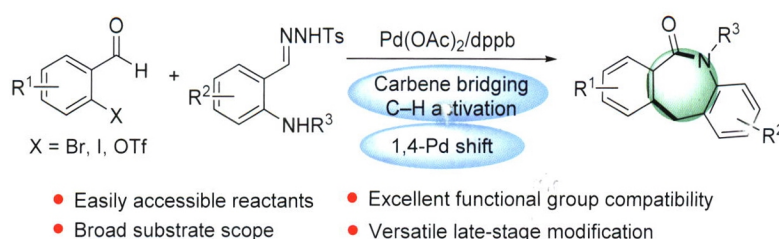
Tong, Zhenzhong; Ding, Hanfeng*

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Construction of Axial Chirality via Palladium/Chiral Norbornene Cooperative Catalysis



Zhang, Ziyu; Wang, Xiaochen*

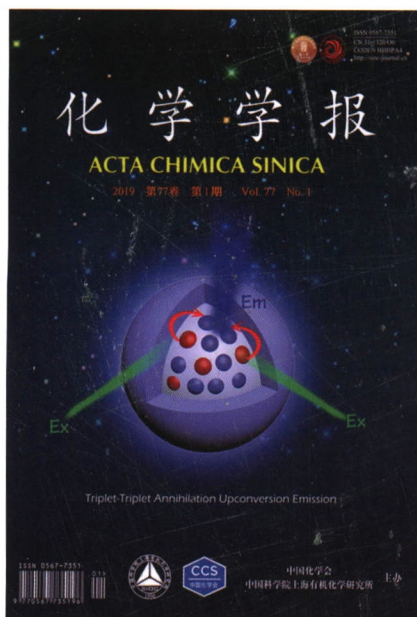
Chin. J. Org. Chem. **2020**, 40(11), 3986A Modular Approach to Dibenzo-Fused ϵ -Lactams: Palladium Carbene Bridging C-H Activation

Yan, Xufei; Xia, Ying*

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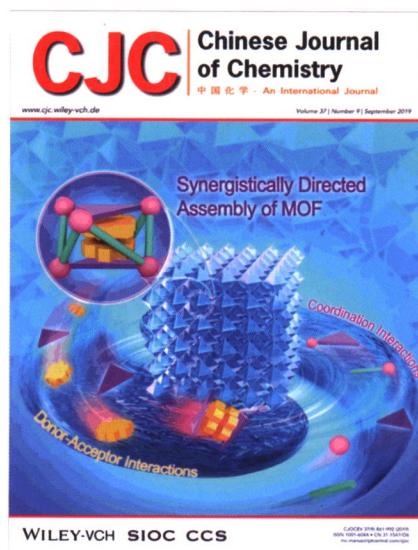
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