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* 通讯联系人.

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Cover Picture: Earth-Abundant Metal-Catalyzed Asymmetric Hydrogenation of Carbon-Nitrogen Unsaturated Bonds

Replacement of noble-metals by earth-abundant and biocompatible first-row transition metals (manganese, iron, cobalt, nickel, *etc.*) for the development of new catalysts in asymmetric hydrogenation reactions is of great significance towards sustainable synthesis of chiral *N*-containing fine chemicals. An overview of earth-abundant metal catalyzed asymmetric hydrogenation of carbon-nitrogen unsaturated bonds categorized according to the types of central metals in catalysts is provided by Liu and Liu on page 3213.



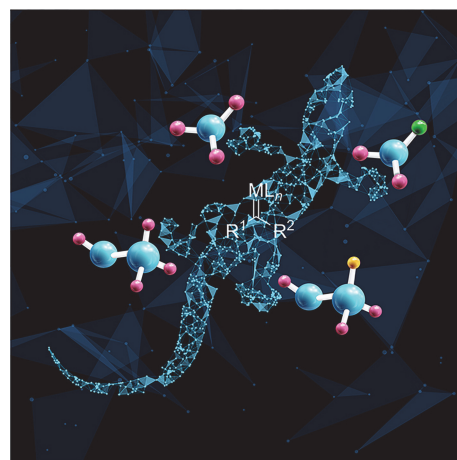
Inside Cover: Transition Metal-Catalyzed Asymmetric Cyclizations Involving Allyl or Propargyl Heteroatom-Dipole Precursors

Heteroatom-dipole precursors designed based on transition metal-catalyzed allyl or propargyl substitutions have been extensively studied in the past two decades. The research progress in transition metal-catalyzed asymmetric cyclizations with these precursors is summarized by Zhang, Chen, Wang, Sheng, Liu and Deng on page 3051.



Inside Back Cover: Research Progress on Enantioselective Desymmetrization Reactions Involving Metal Carbenes

Metal carbenes have been widely applied in organic synthesis, and they can undergo a variety of chemical transformations due to their versatile reactivities. According to the different reaction types of metal carbenes, the desymmetrization of C—H insertion reaction, Buchner reaction, Si—H insertion reaction and B—H insertion reaction involving metal carbenes is introduced by Teng, Han, Huang, and Ye on page 3295.



CONTENT

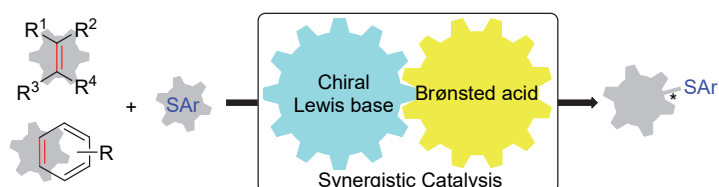
Back Cover: Recent Advances in Ni-Catalyzed Asymmetric Reductive Difunctionalization of Alkenes

Compared with traditional redox-neutral alkene difunctionalization, the reductive difunctionalization of alkenes can introduce two different electrophiles to both sides of the carbon-carbon double bond, which has the advantages of mild reaction conditions, high functional group tolerance, and no need for pre-prepared organometallic reagents. The latest research progress in nickel-catalyzed reductive difunctionalization of alkenes is summarized by Ping, Song, and Kong on page 3302.



ACCOUNT

Application of Chiral Lewis Base/Brønsted Acid Synergistic Catalysis Strategy in Enantioselective Synthesis of Organic Sulfides

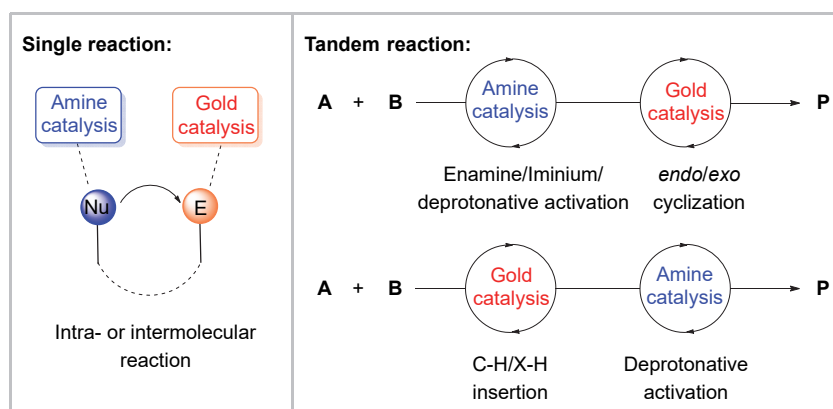


A type of chiral Lewis base/Brønsted acid synergistic catalysis strategy based on hydrogen bonding interaction was developed, and successfully applied to intra- and intermolecular asymmetric sulfenylation of different kinds of alkenes, and enantioselective sulfenylation substitution reactions of aryl compounds. The recent advances of enantioselective electrophilic arylthiolation reactions using novel synergistic catalysis strategy developed by our group are summarized, and the prospect of this research topic is also discussed.

Zhu, Deng; Chen, Zhi-Min*
Chin. J. Org. Chem. **2022**, 42(10), 3015

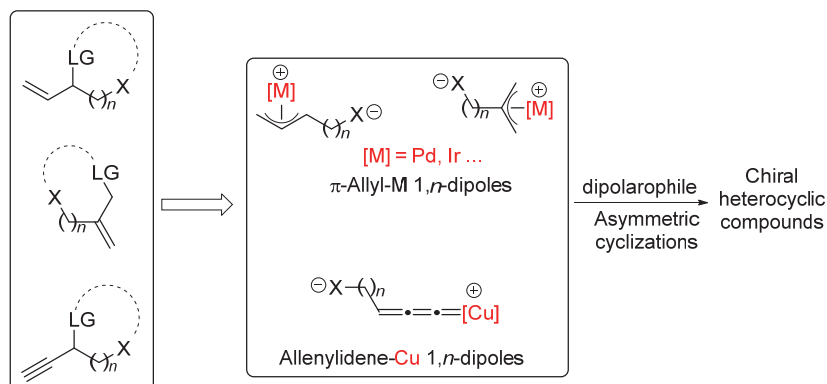
REVIEWS

Asymmetric Tandem Reactions Achieved by Chiral Amine & Gold(I) Cooperative Catalysis



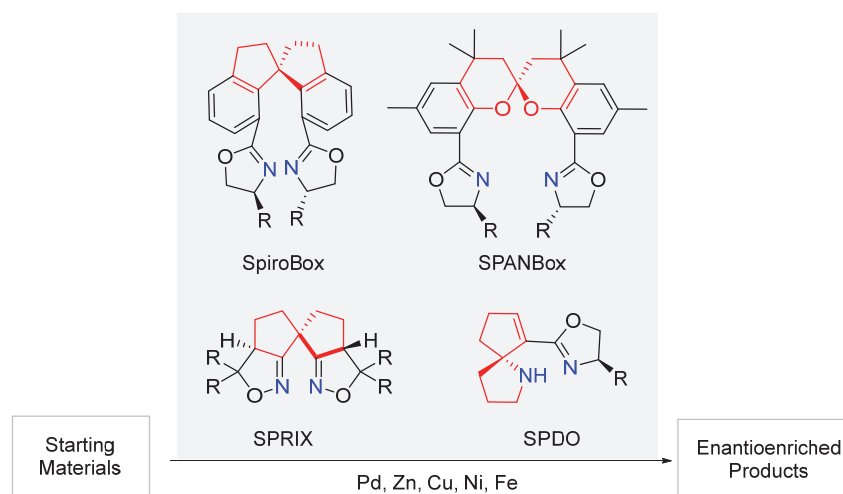
Cui, Xiaoyuan; Zhou, Feng*; Wu, Haihong*; Zhou, Jian*
Chin. J. Org. Chem. **2022**, 42(10), 3033

The asymmetric tandem reactions achieved by chiral amine & gold(I) catalysis is introduced, focusing on the advantages of such type of cooperative catalysis, the way to avoid catalyst deactivation, as well as its future development, so as to provide some useful references for researchers engaged in asymmetric catalysis.

Transition Metal-Catalyzed Asymmetric
Cyclizations Involving Allyl or Propargyl
Heteroatom-Dipole Precursors

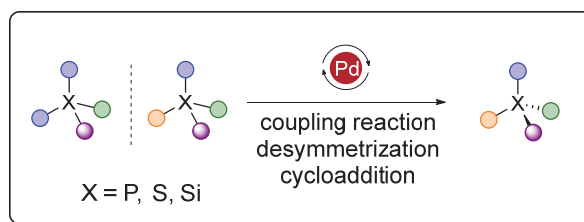
Zhang, Jian; Chen, Ying; Wang, Quannan;
Shen, Jiahuan; Liu, Yangzi*; Deng, Weiping*
Chin. J. Org. Chem. **2022**, 42(10), 3051

The progress in the field of transition metal-catalyzed asymmetric cyclizations with allyl or propargyl heteroatom-dipole precursors is reviewed. The mechanism of representative reactions, the existing problems and the prospects in this area are briefly described.

Advances of Chiral Spiro Skeleton-Based
Bisnitrogen Ligands in Transition-Metal
Catalysis

Hu, Xudong; Zhang, Xinliang; Liu, Wenbo*
Chin. J. Org. Chem. **2022**, 42(10), 3102

The developments of chiral spiro skeleton-based bisnitrogen ligands, including spiro-[4.4]nonane-based bis(isoxazoline) (SPRIX), spirobiindane-based bis(oxazoline) (SpiroBox), spirobi(chroman)-based bis(oxazoline) (SPANBox) and spirocyclic pyrrolidine oxazoline (SPDO), and their synthetic applications in transition-metal catalysis are discussed.

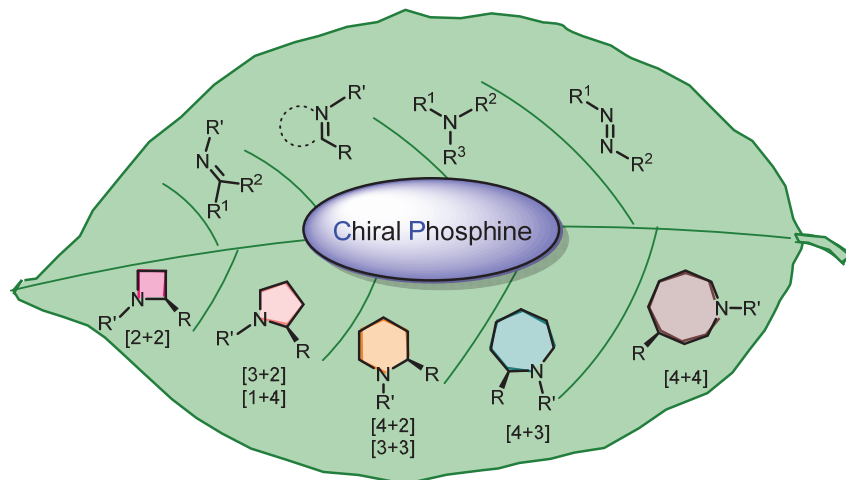
Development of P, S and Si-Stereogenic
Compounds Synthesis via Palladium
Catalysis

Zhang, Jieming; Ni, Hang; Wu, Qi; Yang,
Junfeng*; Zhang, Junliang*
Chin. J. Org. Chem. **2022**, 42(10), 3118

The recent development of Pd-catalyzed asymmetric synthesis of P, S and Si-stereogenic compounds is reviewed. The strategies including coupling reaction, desymmetrization and cycloaddition are introduced. The mechanism of some representative examples and their potential applications are also included.

CONTENT

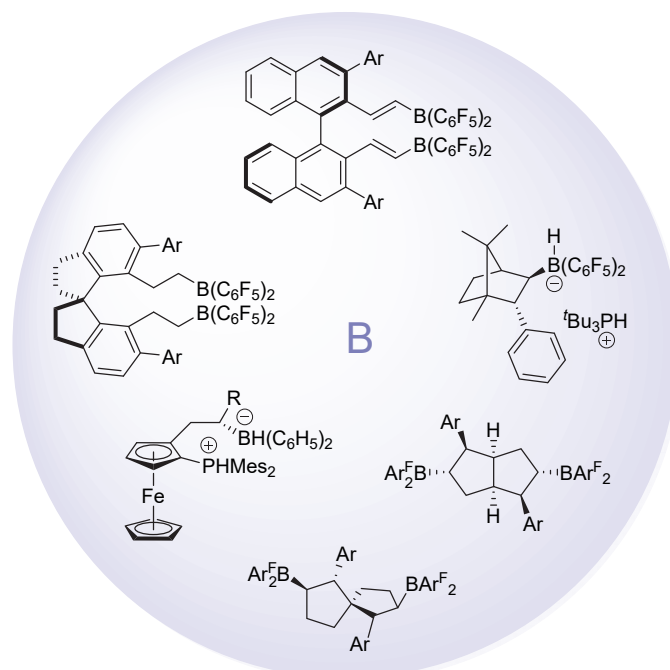
Progress in Synthesis of Nitrogen Heterocycles Catalyzed by Chiral Phosphine



Ren, Hongxia; Ma, Mengmeng; Huang, You*
Chin. J. Org. Chem. **2022**, 42(10), 3129

The advances in chiral phosphine catalyzed annulation reaction for the synthesis of chiral nitrogen heterocycles are summarized, and the development of this field is also prospected.

Chiral Borane-Catalyzed Enantioselective Reactions

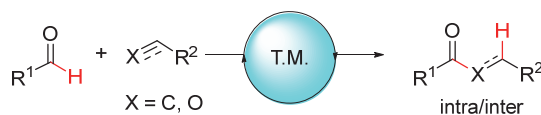


Enantioselective Hydrogenations, Hydrosilylations, Allylstannation, Vinylogous Mannich Reaction, Electrophilic Halocyclization, [2+2] Cycloaddition, And Will be More.....

Li, Xin; Song, Qiuling*
Chin. J. Org. Chem. **2022**, 42(10), 3143

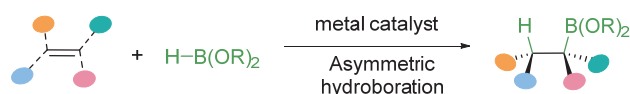
The recent progress in the chiral borane-catalyzed enantioselective reactions is summarized and discussed. This review is organized into three parts according to the reaction categories, which includes enantioselective hydrogenation, enantioselective hydrosilylation, and miscellaneous.

Research Advance on Enantioselective Transition Metal-Catalyzed Hydroacylation Reactions



Wang, Haorui; Ye, Mengchun*
Chin. J. Org. Chem. **2022**, 42(10), 3152

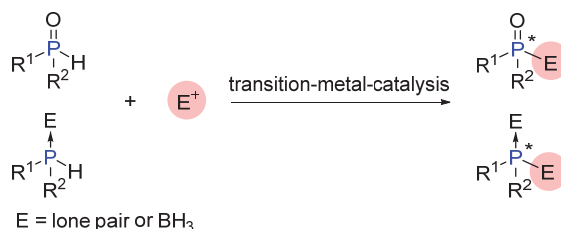
The advances on enantioselective transition metal-catalyzed hydroacylation reactions are summarized, focusing on reaction types, asymmetric strategies and reaction mechanisms.

Transition Metal Catalyzed Asymmetric
Hydroboration of Internal Alkenes

The transition metal catalyzed enantioselective hydroboration of alkenes is one of the powerful methods to prepare chiral organoboronates. Starting from easily available materials, this approach provides an atom-economical approach to access structurally diverse chiral compounds. The transition metal catalyzed enantioselective hydroboration of internal alkenes, including strained internal alkene, β -substituted styrenes, and internal alkenes bearing a coordinating group, is summarized.

Lu, Houxiang; Li, Bijie*

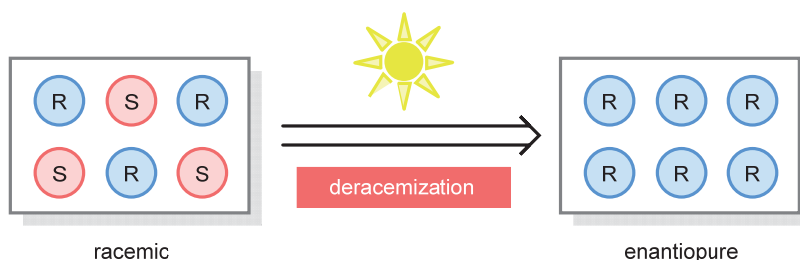
Chin. J. Org. Chem. **2022**, 42(10), 3167

Research Progress on Catalytic Asym-
metric Synthesis of *P*-Chiral Compounds

The recent progress on transition metal-catalyzed asymmetric synthesis of *P*-chiral compounds based on dynamic kinetic resolution or kinetic resolution of secondary phosphines (or their borane-adducts) and secondary phosphine oxides is reviewed. Arylation, addition to activated alkenes, alkylation, and other reactions involving asymmetric P—O and P—C bonds formation, are covered.

Li, Hui*; Yin, Liang*

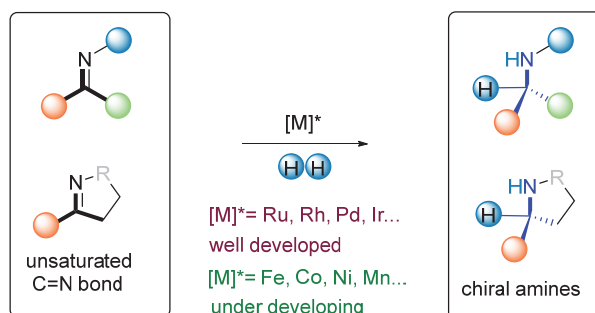
Chin. J. Org. Chem. **2022**, 42(10), 3183

Recent Advances in Photocatalytic De-
racemization

It is of great significance to obtain optically pure chiral compounds because different enantiomers have distinct physiological activities. The emerging photocatalytic deracemization attracts much attention owing to its high efficiency. The recent advances in photocatalytic deracemization are summarized.

Su, Yiwen; Zou, Youquan*; Xiao, Wenjing*

Chin. J. Org. Chem. **2022**, 42(10), 3201

Earth-Abundant Metal-Catalyzed Asym-
metric Hydrogenation of Carbon-Nitrogen
Unsaturated Bonds

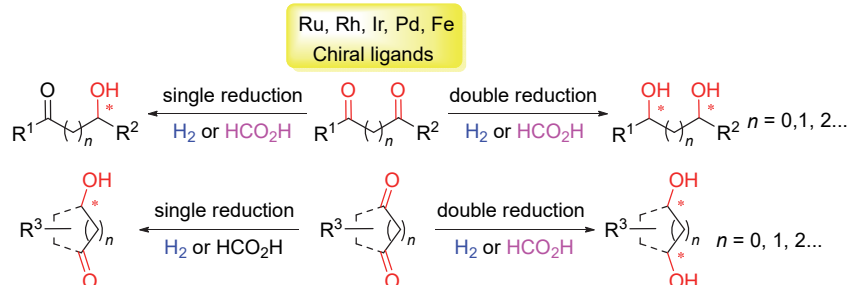
The replacement of noble-metals by earth-abundant and biocompatible first-row transition metals for development of new catalysts in asymmetric hydrogenation reactions is of great significance towards sustainable synthesis of chiral nitrogen-containing fine chemicals. This review provides an overview of earth abundant metal catalyzed asymmetric hydrogenation of C=N unsaturated bonds.

Liu, Chenguang; Liu, Qiang*

Chin. J. Org. Chem. **2022**, 42(10), 3213

CONTENT

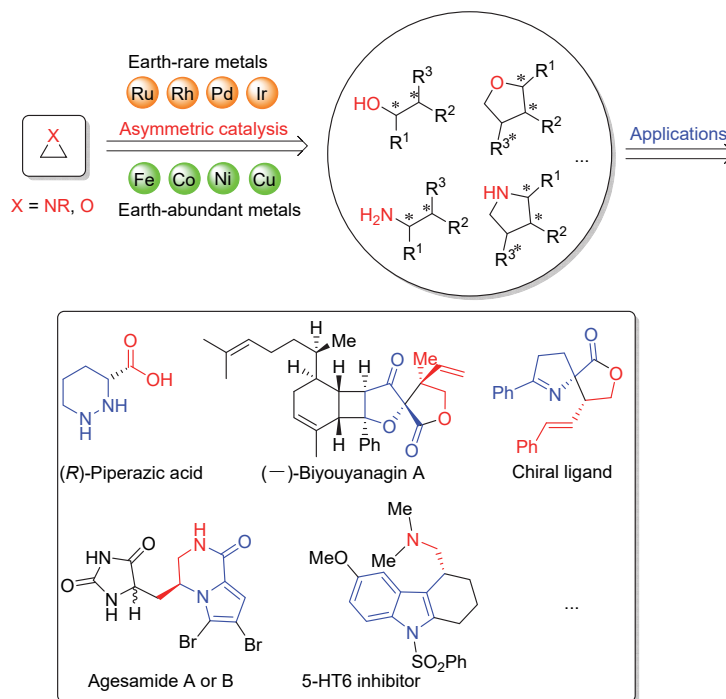
Progress in Asymmetric Catalytic Reduction of Diketones



The research progress of asymmetric hydrogenation and transfer hydrogenation of diketone compounds in recent decades is reviewed from the perspective of different substrate types (1,2-/1,3-/1,4-diketones), with emphasis on the effects of coordination modes between substrate and catalyst species on stereoselectivity. Finally, future challenges and development tendencies in this field are summarized and prospected.

Zhang, Yuxuan; Xu, Limin; Lu, Yan*; Zhang, Zhaoguo*
Chin. J. Org. Chem. **2022**, 42(10), 3221

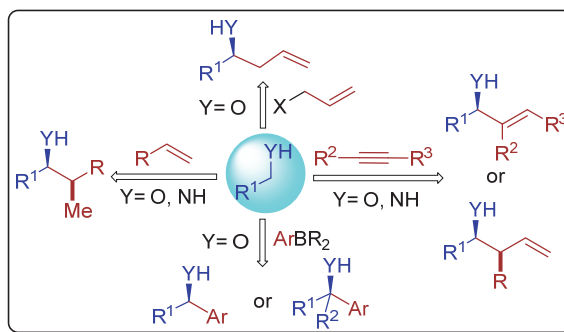
Progress in Transition Metal-Catalyzed Asymmetric Ring-Opening Reactions of Epoxides and Aziridines



The progress in transition metal-catalyzed asymmetric ring-opening reactions of epoxides and aziridines in the past two decades is reviewed, with emphasis on the influence of the kinds of transition metal catalysts, nucleophiles, and ligands. Furthermore, the possible reaction mechanisms and applications for the asymmetric ring-opening reactions are discussed, and the future development in this field is also prospected.

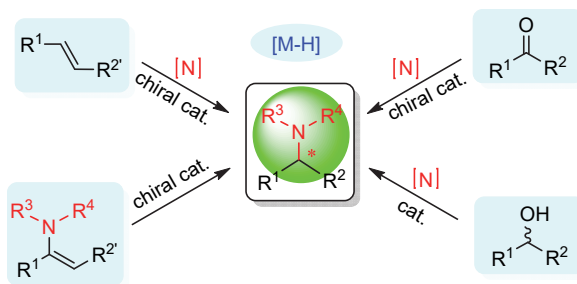
Du, Qingfeng; Zhang, Lu; Gao, Feng*; Wang, Le*; Zhang, Wanbin
Chin. J. Org. Chem. **2022**, 42(10), 3240

Recent Progress in Upgrading of Alcohol and Amine via Asymmetric Dehydrogenative Coupling



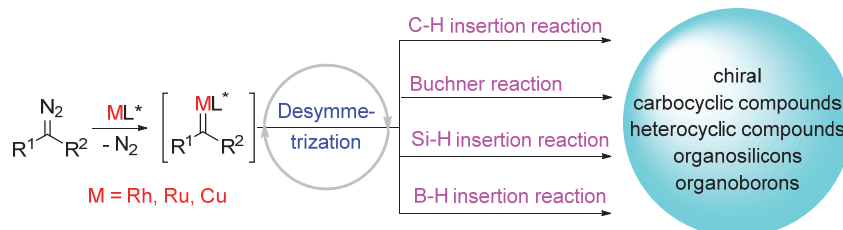
The recent progress in the asymmetric dehydrogenative coupling of alcohol and amine with other components to advanced chiral alcohol and amine is discussed. The outlook on the development of this field is also provided.

Jiang, Binyang; Shi, Shi-Liang*
Chin. J. Org. Chem. **2022**, 42(10), 3263

Recent Advances in Synthesis of Chiral
Tertiary Amines via Asymmetric Catalysis
involving Metal-Hydride Species

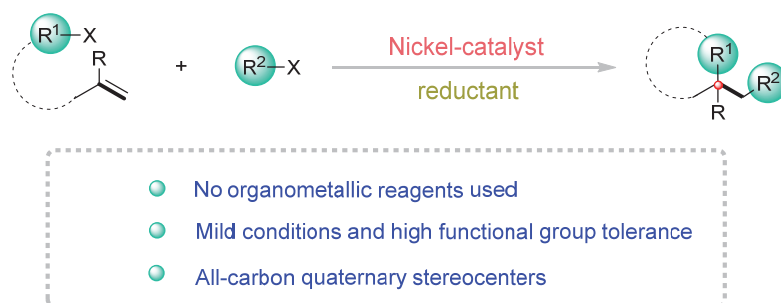
The recent advances in asymmetric catalytic synthesis of chiral tertiary amines via metal-hydride species are summarized. The corresponding reaction mechanism for each strategy is also introduced.

Fan, Tianxiang; Liu, Yuanyuan*
Chin. J. Org. Chem. **2022**, 42(10), 3280

Research Progress on Enantioselective
Desymmetrization Reactions Involving
Metal Carbenes

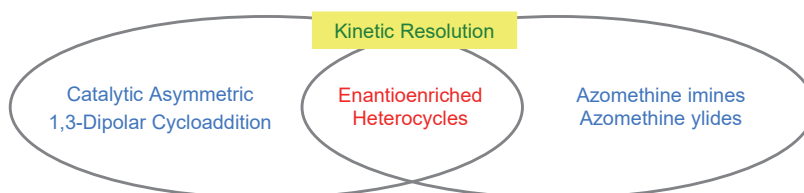
The desymmetrization of C—H insertion reaction, Buchner reaction, Si—H insertion reaction and B—H insertion reaction involving metal carbenes is introduced according to the different reaction types of metal carbenes. Under the catalysis of chiral rhodium, ruthenium and copper catalysts, chiral carbocycles, heterocycles, organosilicon and organoboron can be obtained with high enantioselectivity by this strategy.

Teng, Ming-Yu*; Han, Tao; Huang, En-He;
Ye, Long-Wu*
Chin. J. Org. Chem. **2022**, 42(10), 3295

Recent Advances in Ni-Catalyzed Asym-
metric Reductive Difunctionalization of
Alkenes

Alkenes are cheap and easily available bulk industrial feedstocks. Difunctionalization of alkenes can rapidly construct complex molecules, which have broad applications in organic synthesis. The latest research progress in nickel-catalyzed reductive difunctionalization of alkenes is summarized. The development prospect of the reaction is prospected.

Ping, Yuanyuan; Song, Haixia*; Kong,
Wangqing*
Chin. J. Org. Chem. **2022**, 42(10), 3302

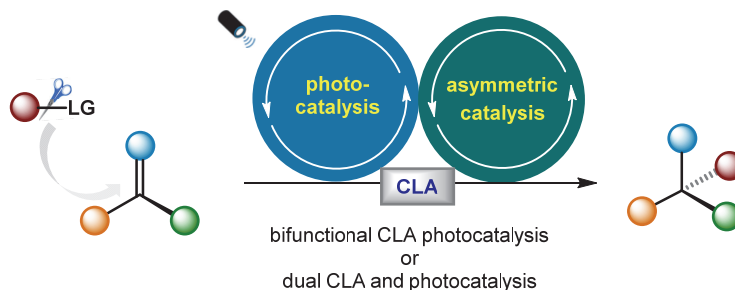
Recent Advances in Catalytic Asymmet-
ric 1,3-Dipolar Cycloaddition Reactions
with Kinetic Resolution

The recent progress of kinetic resolution strategy in azomethine imine and azomethine ylide-involved catalytic asymmetric 1,3-dipole cycloaddition reactions is reviewed, and the related limitations and development prospects are also discussed.

Liu, Huachao; Shen, Chong; Chang, Xin;
Wang, Chunjiang*
Chin. J. Org. Chem. **2022**, 42(10), 3322

CONTENT

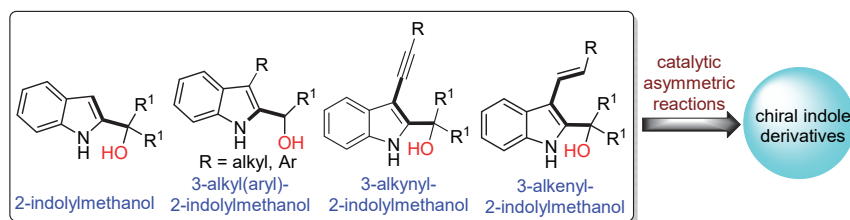
Recent Advances in Visible-Light Photocatalytic Asymmetric Synthesis Enabled by Chiral Lewis Acids



Cheng, Xiuliang; Li, Dong; Yang, Boxuan; Lin, Yumei; Gong, Lei*
Chin. J. Org. Chem. **2022**, 42(10), 3335

The recent advances in the field of visible-light photocatalytic asymmetric synthesis enabled by chiral Lewis acids are presented.

Advances in Catalytic Asymmetric Reactions Using 2-Indolylmethanols as Platform Molecules

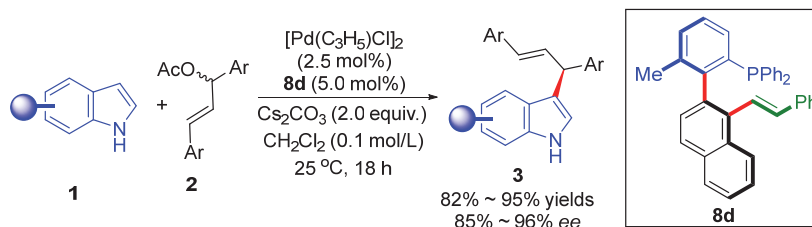


Zhang, Honghao; Shi, Feng*
Chin. J. Org. Chem. **2022**, 42(10), 3351

The design and development of 2-indolylmethanols as platform molecules have provided a new strategy for the efficient and highly enantioselective synthesis of chiral indole derivatives. The advances in catalytic asymmetric reactions using 2-indolylmethanols as platform molecules are summarized.

ARTICLES

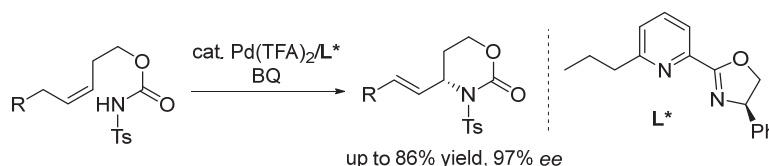
Pd/Novel Axially Chiral Phosphine-Alkene Ligands Catalyzed Asymmetric Allylic Alkylation of Indoles



Jia, Shihu; Chen, Siyuan; Liu, Zeshui; Cheng, Honggang*; Zhou, Qianghui*
Chin. J. Org. Chem. **2022**, 42(10), 3373

A new type of axially chiral phosphine-alkene ligands have been developed via a two-step modular synthesis for Pd-catalyzed asymmetric allylic alkylation of indoles. Under optimized reaction conditions, a series of chiral allylindole products are obtained in generally high yields (up to 95%) and excellent enantioselectivities (up to 96% ee).

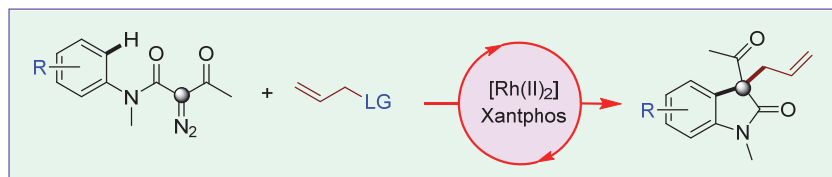
Asymmetric Palladium-Catalyzed Aza-Wacker Reaction of Alkenes: Efficient Synthesis of Chiral 1,3-Oxazinan-2-ones



Yang, Xintuo; Chen, Pinhong; Liu, Guosheng*
Chin. J. Org. Chem. **2022**, 42(10), 3382

A Pd-catalyzed asymmetric aza-Wacker-type reaction with N-Ts carbamate as the nucleophile is developed, which employed a C-6 substituted pyridinyl-oxazoline as the chiral ligand and benzoquinone as the oxidant. This reaction provides an efficient access to chiral 1,3-oxazinan-2-ones with good efficiency and excellent enantioselectivity.

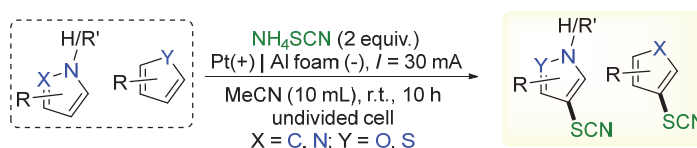
Dirhodium/Xantphos-Catalyzed Tandem
C—H Functionalization/Allylic Alkylation:
Direct Access to 3-Acyl-3-allyl Oxindole
Derivatives from *N*-Aryl- α -diazo- β -keto
Amides



A [Rh₂]/Xantphos-enabled one-pot sequence for the synthesis of diverse 3-acyl-3-allyl oxindole derivatives from easily available *N*-aryl- α -diazo- β -keto amides and allylic compounds is reported. The notable features of this work include ease of operation, mild reaction conditions, good functional group compatibility and facile diversification of the products.

Li, Fangjie; Lu, Bin; Liu, Yang*; Wang, Xiaoming*
Chin. J. Org. Chem. **2022**, 42(10), 3390

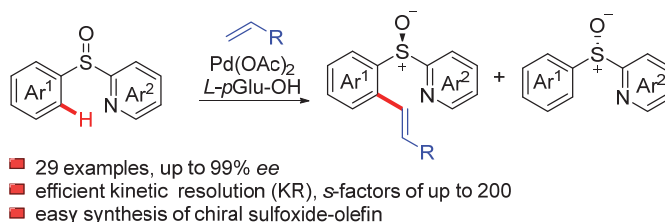
Electrochemical Oxidative Cross-Dehydrogenative
Coupling of Five-Membered
Aromatic Heterocycles with NH₄SCN



A practical method for the synthesis of various thiocyanated five-membered aromatic heterocycles (pyrazoles, pyrroles, furans and thiophenes) through electrochemical cross-coupling of five-membered heterocycles and NH₄SCN under chemical oxidant- and exogenous electrolyte-free conditions was developed.

Li, Hongxia; Chen, Peng; Wu, Zhilin; Lu, Yuhang; Peng, Junmei*; Chen, Jingyang; He, Weimin*
Chin. J. Org. Chem. **2022**, 42(10), 3398

Pd(II)-Catalyzed Enantioselective C—H
Olefination of 2-(Arylsulfinyl)pyridines
through Kinetic Resolution

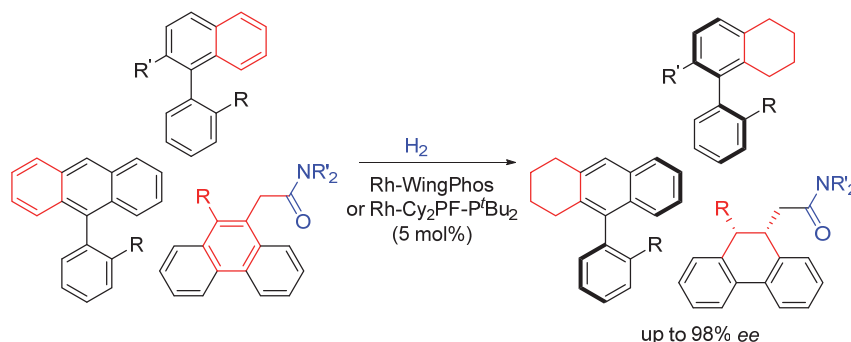


A Pd(II)-catalyzed enantioselective C—H olefination of 2-(arylsulfinyl)pyridines through kinetic resolution is reported. A wide range of chiral sulfoxides were prepared in good to high yields and selectivity (up to 99% *ee*, *s*-factor of up to 200) under mild conditions using cheap and commercially available *L*-pGlu-OH as chiral ligand.

Fan, Lingjie; Zhou, Tao*; Yang, Xu; Jiang, Mengxue; Hu, Xinquan; Shi, Bingfeng*
Chin. J. Org. Chem. **2022**, 42(10), 3405

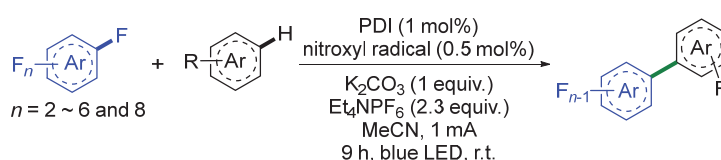
HIGHLIGHTS

Rhodium-Catalyzed Asymmetric Hydrogenation
of All-Carbon Aromatic Rings



Wang, Nan; Tang, Wenjun*
Chin. J. Org. Chem. **2022**, 42(10), 3419

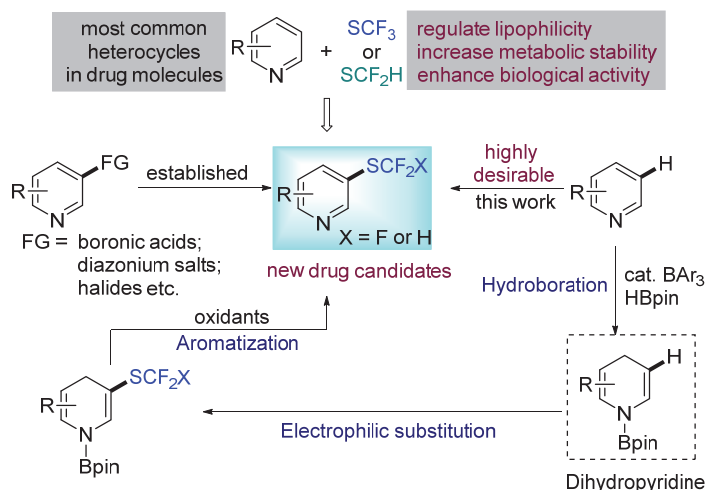
Transition-Metal Free, Electrophotocatalyzed
Selective C—F Arylation of Polyfluoroarenes



Jiao, Kejin*; Mei, Tiansheng*
Chin. J. Org. Chem. **2022**, 42(10), 3421

CONTENT

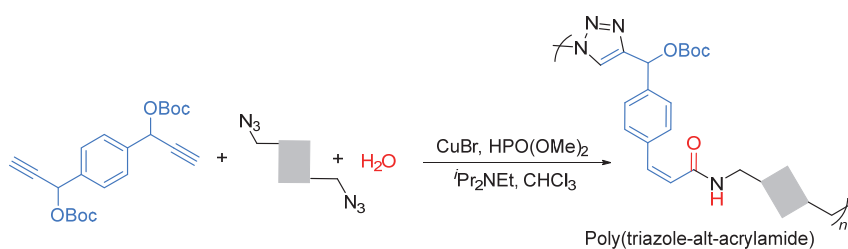
Selective Trifluoromethylation and Difluoromethylation of Pyridines at C(3) Position



Chen, Feng; Qing, Fengling*

Chin. J. Org. Chem. **2022**, 42(10), 3423

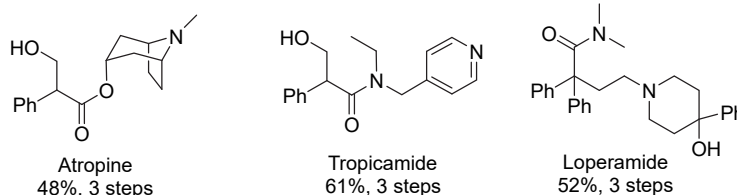
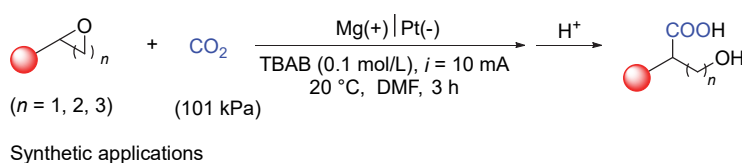
Copper-Catalyzed Z-Selective Synthesis of Acrylamides and Polyacrylamides via Alkylidene Ketenimines



Jiang, Mingyi; Liu, Xiaohua*

Chin. J. Org. Chem. **2022**, 42(10), 3425

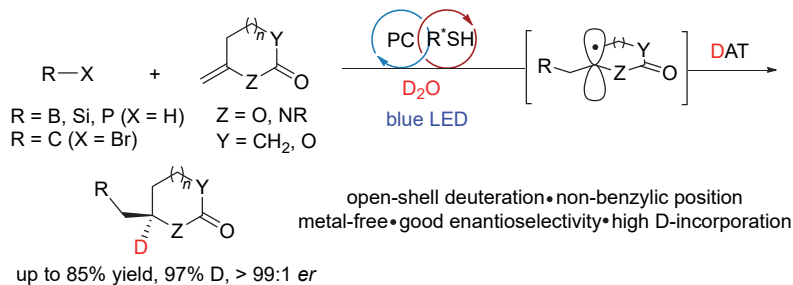
Electrocarboxylation of Aryl Epoxides with CO_2 to Selectively Synthesize β -Hydroxy Acids



Xie, Wenjun; He, Liangnian*

Chin. J. Org. Chem. **2022**, 42(10), 3427

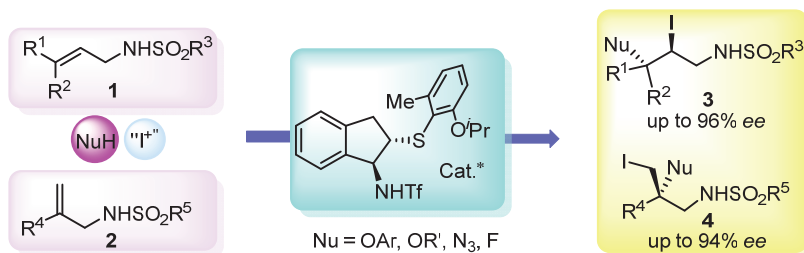
Enantioselective Radical Deuteration of Non-Benzylic Positions via Visible Light Catalysis



Zhang, Bin; Chen, Jiarong*

Chin. J. Org. Chem. **2022**, 42(10), 3429

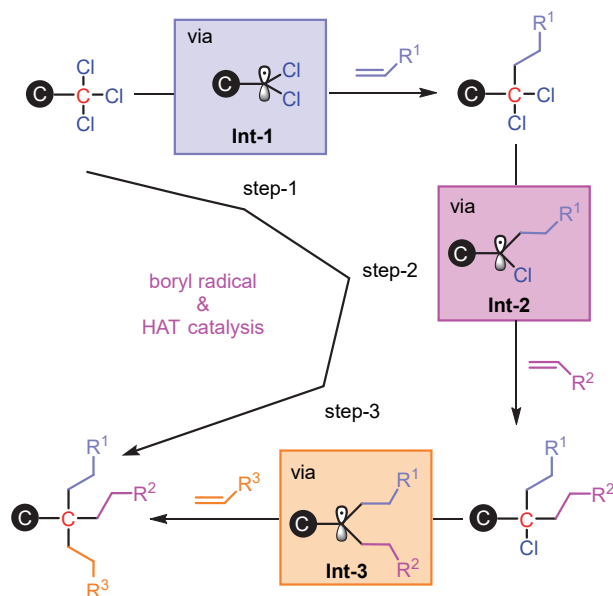
Organosulfide-Catalyzed Enantioselective Intermolecular Iodination Difunctionalization of Allylic Sulfonamides



Cao, Ren-Fei; Chen, Zhi-Min*

Chin. J. Org. Chem. **2022**, 42(10), 3431

Stepwise Construction of All-Carbon
Quaternary Centers Starting from Acti-
vated Trichloromethyl Group in Three
Steps



He, Xinglei; Ye, Keyin*
Chin. J. Org. Chem. **2022**, 42(10), 3434