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有机化学

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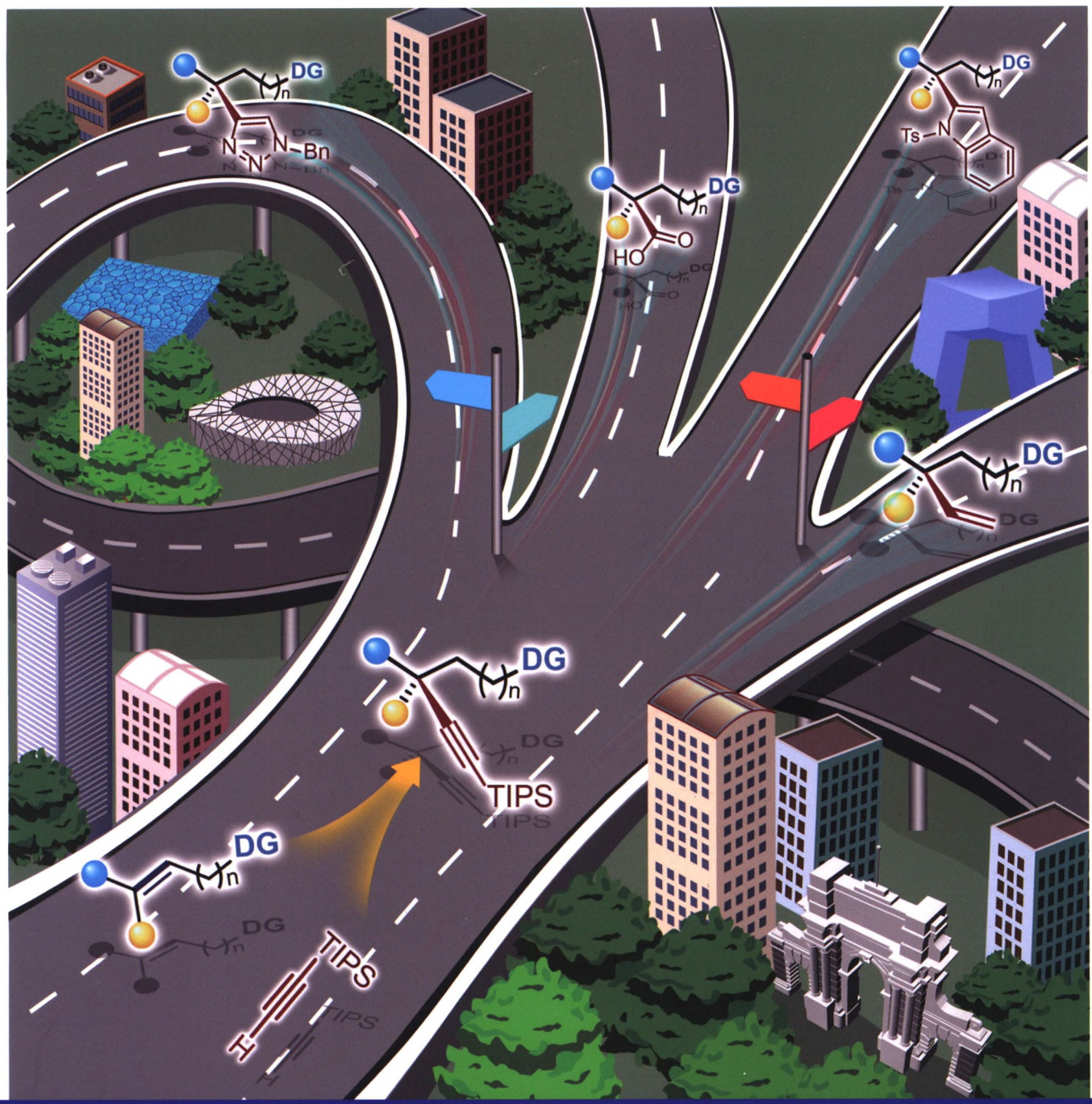

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(YOUJI HUAXUE)

第 40 卷 第 5 期 (总 378 期) 2020 年 5 月

目 次

* 通讯联系人.

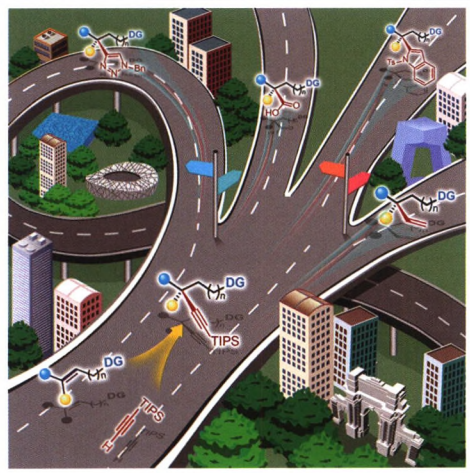
研究简报

亮点述评

Chinese Journal of Organic Chemistry

Vol. 40 No. 5 May 2020

Cover Picture: Substrate-Directed Catalytic Asymmetric Hydroalkynylation of Alkenes



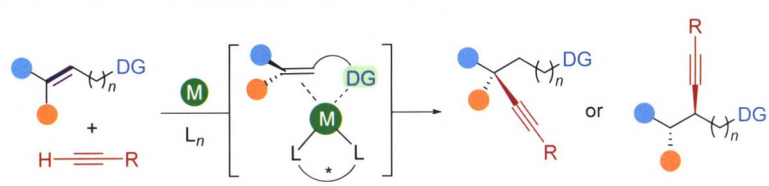
Recently, by taking advantage of substrate-directed strategy, we have developed a number of methods that functionalize internal alkenes with excellent regio-, diastereo-, and enantio-selectivities. In this account, we summarize our work on catalytic asymmetric hydroalkynylation of alkenes and analyze the mechanisms that control the reactivity and selectivity on page 1087. As illustrated in the picture, asymmetric hydroalkynylation of alkenes provides a highway through which various chiral molecules can be rapidly delivered.

Inside Cover: Recent Advances of Nickel-Catalyzed Homogeneous Asymmetric Hydrogenation

The recent progress of nickel-catalyzed homogeneous asymmetric hydrogenation of prochiral unsaturated compounds (C=O, C=C and C=N) is summarized by Liu, Dong and Zhang on page 1096. Some breakthroughs and considerable research results are achieved in recent years. The future research direction of nickel-catalyzed homogeneous asymmetric hydrogenation is also prospected.

REVIEWS

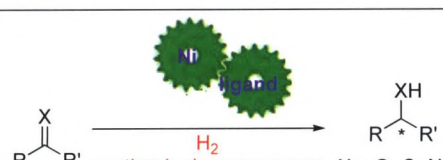
Substrate-Directed Catalytic Asymmetric Hydroalkynylation of Alkenes



Zhang, Wenwen; Wang, Zixuan; Bai, Xiaoyan; Li, Bijie*
Chin. J. Org. Chem. **2020**, *40*(5), 1087

By using substrate-directed strategy, we have developed a number of alkene functionalization methods with excellent regio-, diastereo-, and enantio-selectivities. Our recent work in the catalytic asymmetric hydroalkynylation of alkenes is summarized.

Recent Advances of Nickel-Catalyzed Homogeneous Asymmetric Hydrogenation

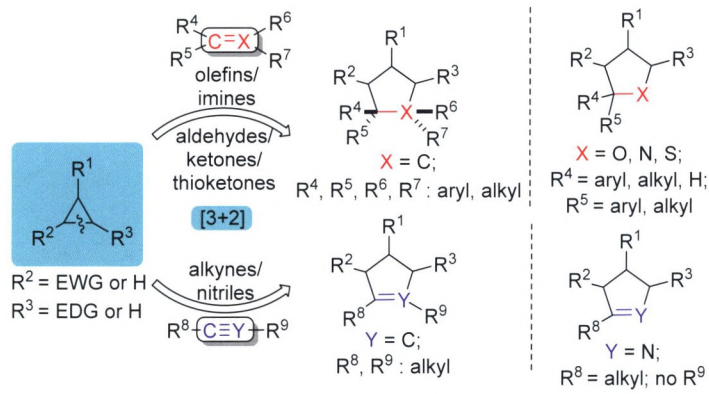


Liu, Yuanhua; Dong, Xiu-Qin*; Zhang, Xumu
Chin. J. Org. Chem. **2020**, *40*(5), 1096

The recent progress of nickel-cataly- zed homogeneous asymmetric hydrogenation of prochiral unsaturated compounds containing carbon oxygen double bond (C=O), carbon carbon double bond (C=C) and carbon nitrogen double bond (C=N) is reviewed, and some breakthroughs and considerable research results achieved are introduced.

CONTENT

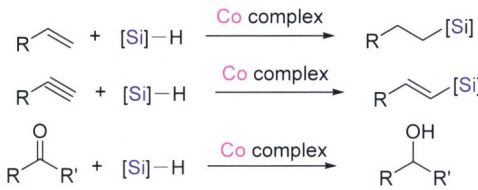
Recent Progress on [3 + 2] Ring-Expansion Reaction of Cyclopropane with Unsaturated Compounds



Five-membered carbo- and hetero-cycles selective construction through [3+2] ring-expansion reaction of cyclopropanes with unsaturated compounds such as olefins, aldehydes, ketones and nitriles is reviewed, to benefit better controlling of this reaction selectivity and fast development of focus area.

Liu, Wenzhu; Dou, Lijuan; Mu, Weihua*
Chin. J. Org. Chem. **2020**, *40*(5), 1150

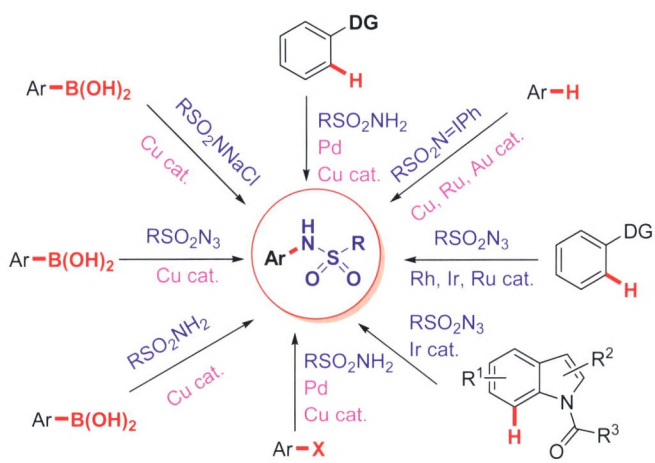
Progress in Catalysis of Hydrosilylation by Cobalt Complexes



The recent progress in the application of cobalt complexes in the catalytic hydrosilylation of alkenes, alkynes, carbonyl compounds and other unsaturated double bond is reviewed. Furthermore, the deficiencies of the catalysts are discussed. Finally, the future development and prospects of these complexes as catalysts are proposed.

Dai, Zinan; Yu, Zehao; Bai, Ying*; Li, Jiayun; Peng, Jiajian*
Chin. J. Org. Chem. **2020**, *40*(5), 1177

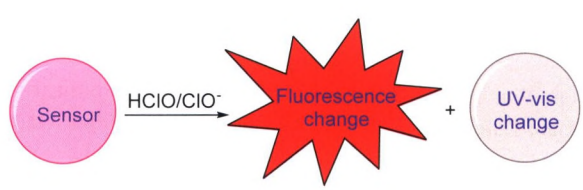
Recent Progress in Transition Metal Catalyzed Sulfonamidation of Aromatic Compounds



The recent progress in the transition metal-catalyzed sulfonamidation reactions is reviewed. The aromatic substrates, transition metal-catalysts, ligands, sulfonamidating reagents, mechanisms of the sulfonamidation reactions are mainly discussed. Finally, the future development of them is also prospected.

Ouyang, Banlai*; Zheng, Yanxia; Xia, Kejian; Xu, Xiaoling; Wang, Yi
Chin. J. Org. Chem. **2020**, *40*(5), 1188

Recent Progress in Colorimetric and Fluorimetric Probes for the Detection of Hypochlorous Acid



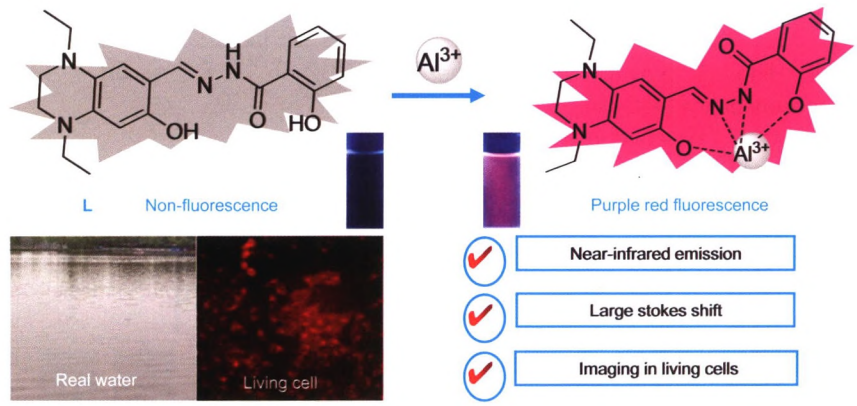
The design, characteristics and practical application of hypochlorite colorimetric fluorescent probes in the past five years are summarized and evaluated.

Yu, Qing; Chen, Xiaoli; Liu, Hua; Zhang, Qilong*
Chin. J. Org. Chem. **2020**, *40*(5), 1206

CONTENT

ARTICLES

Synthesis of Novel 7-Hydroxytetrahydroquinoxaline-6-formaldehyde Acylhydrazone Derivative and Its Recognition for Al^{3+}

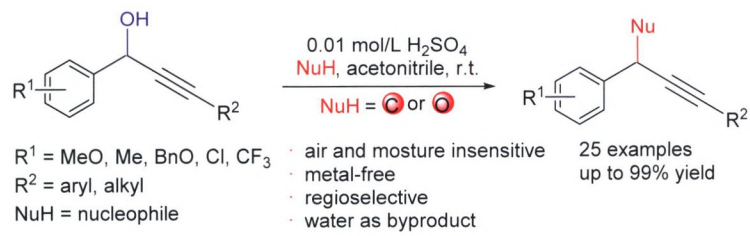


Zhong, Keli; Zhou, Lulu; Deng, Longlong; Tang, Lijun*; Gao, Xue; Liu, Xiuying; Yan, Xiaomei*

Chin. J. Org. Chem. **2020**, *40*(5), 1251

A novel acylhydrazone derivative was designed and synthesized. Probe **L** can recognize for Al^{3+} with highly selectivity in DMSO/Tris (V : V=7 : 3) solution. When Al^{3+} is added into the solution of **L**, the fluorescence color of solution changes from non-fluorescence to purple red fluorescence, and the maximum emission wavelength of **L** is 640 nm within range of the near-infrared. Probe **L** possesses a large Stokes shift (170 nm) and the detection limit of **L** is 0.521 μmol/L. In addition, **L** can detect Al^{3+} in the real water samples and imaging for Al^{3+} in MCF-7 cells.

Sulfuric Acid Catalyzed Rapid Nucleophilic Substitution of Propargyl Alcohols

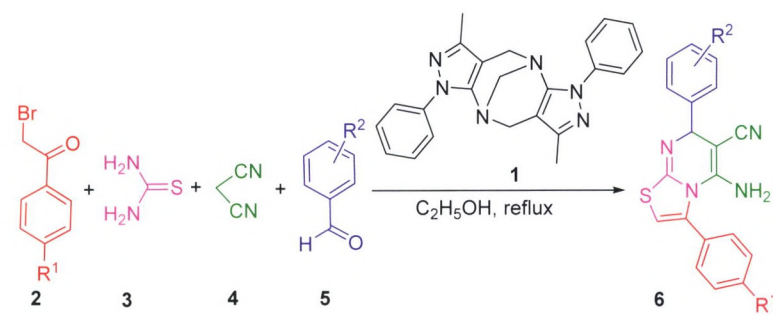


Zhang, Shunji*; Liu, Huili

Chin. J. Org. Chem. **2020**, *40*(5), 1257

Sulfuric acid efficiently catalyzes the direct substitution of the hydroxyl group of propargylic alcohols with various nucleophiles in acetonitrile at room temperature for C—C and C—O bond formation. This method does not require expensive catalysts, explosive solvents, heating or a long reaction time. Furthermore, the reactions can be performed under mild conditions without the need for precautions to exclude moisture or air from the reaction system. In most cases, the reaction proceeds to completion within 1 min.

Synthesis and Biological Evaluation of Polysubstituted 5-Amino-3,7-diphenyl-7*H*-thiazolo[3,2-*a*]pyrimidine-6-carbonitriles



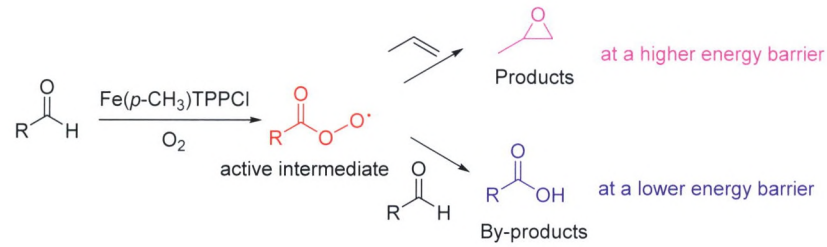
Ren, Xuanxuan; Yuan, Rui; Chen, Wen; Zhou, Hang; Ye, Fei; Shi, Xueying; Hu, Juan; Zhang, Peng; Zhou, Shengliang; Wan, Yu*; Wu, Hui*

Chin. J. Org. Chem. **2020**, *40*(5), 1266

A series of thiazolo[3,2-*a*]pyrimidine derivatives were synthesized from the reaction of *α*-bromoacetophenone, aromatic aldehyde, malononitrile and thiourea which was catalyzed by Tröger's base derivative **1**. The reaction mechanism was discussed by the ^1H NMR analysis and chemical experiments. The pharmacological activity results of the products indicated that most of products showed high inhibitory on one or more cancer cells in human hepatocarcinoma cell (HepG2), human non-small cell lung cancer cell (247) and human non-small cell lung cancer cell (A549) *in vitro*.

CONTENT

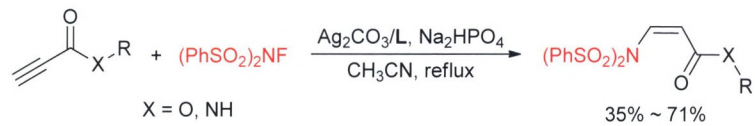
Study on the Effect of Co-reductant Aldehydes on Epoxidation of Propylene Catalyzed by Metalloporphyrins



Qi, Lianshan; Wang, Tao; Wei, Yongmei; Tian, Hengshui*
Chin. J. Org. Chem. **2020**, *40*(5), 1305

The possible mechanism proposed before has been further verified by the results of other aldehydes. There is a competition between autooxidation process and epoxidation process in the consumption of active intermediate. The former has a lower reaction energy barrier.

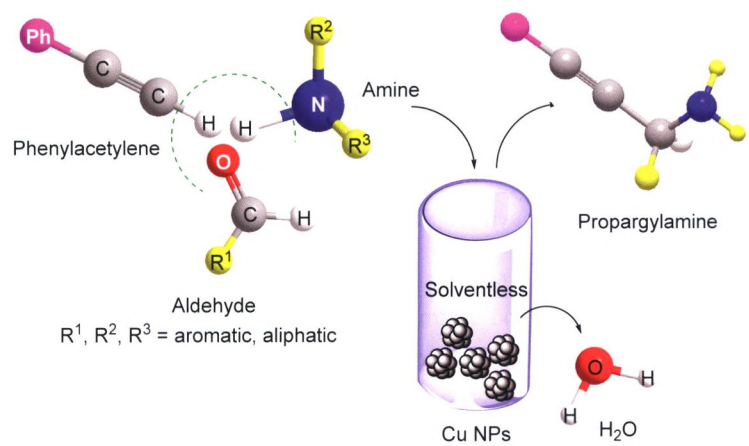
Hydroamination of Propiolic Derivatives with *N*-Fluorobenzenesulfonimide Catalyzed by Silver Carbonate



Ren, Haiping; Tian, Zaiwen; Li, Ke; Zhang, Wanxuan*
Chin. J. Org. Chem. **2020**, *40*(5), 1310

In the presence of Na_2HPO_4, the hydroamination of propiolates or propiolamides with *N*-fluorobenzenesulfonimide (NFSI) was realized, where Ag_2CO_3 and the derivatives of 1,10-phenanthroline were added as catalysts. It leads to *N*-vinyldibenzenesulfonimides in high selectivity of Z isomers in the yields of 35%～71%.

Propargylamine Synthesis via Three-Component Coupling Reaction Catalyzed by Recyclable Cu Nanoparticles under Solvent-Free Conditions



Shi, Dapeng; Duan, Zhongyu*
Chin. J. Org. Chem. **2020**, *40*(5), 1316

Copper nanoparticles exhibit favorable catalytic and reusable properties for the formation of propargylamine via three-component coupling reaction under mild conditions.

"On Water" Nucleophilic Addition of Pyrazolones to Trifluoromethyl Ketones

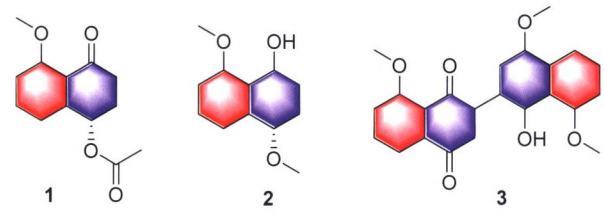
Luo, Liang; Cao, Xiaomei; Lai, Guowei; Liu, Jinxiang; Luo, Haiqing; Lu, Dongliang; Zhang, Yong*
Chin. J. Org. Chem. **2020**, *40*(5), 1323

A green and efficient nucleophilic addition reaction of trifluoromethyl ketone with pyrazolone was developed under "on water" conditions, affording pyrazolone substituted tertiary trifluoromethyl alcohols in high yields. The advantages of being catalyst-free, column chromatography-free, environmentally benign and easy workup make it a promising method for preparation of a variety of pyrazolone substituted tertiary trifluoromethyl alcohols.

CONTENT

NOTES

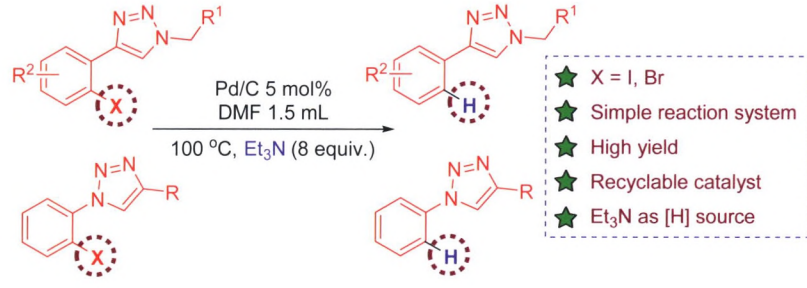
Cytotoxic Secondary Metabolites from a sea-Derived Fungal Strain of *Hypoxylon rubiginosum* FS521



Zhang, Jie; Chen, Yuchan; Liu, Zhaoming; Guo, Bohong; Gao, Xiaoxia; Liu, Hongxin*; Zhang, Weimin*
Chin. J. Org. Chem. **2020**, *40*(5), 1367

One new compound, named hypoxone A (**1**), together with two new natural products 4,8-dimethoxy-1-naphthol (**2**) and 1'-hydroxy-4',8,8'-trimethoxy[2,2']binaphthalenyl-1,4-dione (**3**), and fourteen known derivatives **4**～**17** were isolated from the broth extract of the marine fungus *Hypoxylon rubiginosum* FS521

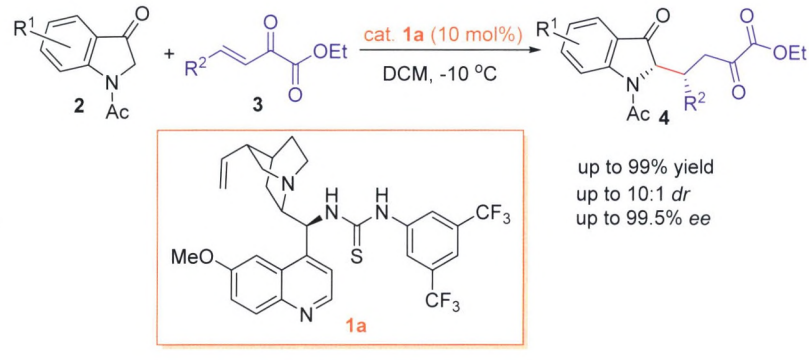
Researches on the Hydrodehalogenation of *o*-Triazole Aryl Halides in the System of Pd/C and Et_3N



Qiu, Huihua; Lin, Baiyin; Zhou, Peng*; Zhang, Jiantao; Liu, Weibing
Chin. J. Org. Chem. **2020**, *40*(5), 1372

A Pd-catalyzed hydrodehalogenation of *o*-triazole aryl halides was developed, taking Pd/C as catalyst and Et_3N as base, reductant and hydrogen source.

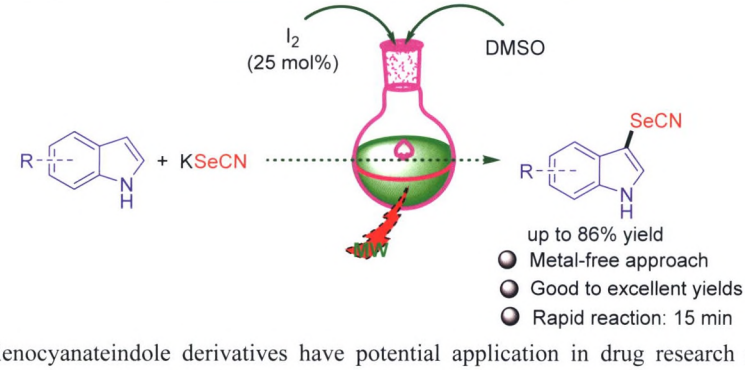
Bifunctional Thioureas Catalyzed Asymmetric Michael Addition of 1-Acetylindolin-3-ones to β,γ-Unsaturated α-Keto Esters



Liu, Yaozong*; Xu, Pengfei; Ma, Jianjun; Li, Xiaoming; Liang, Ruiyuan; Teng, Zhijun
Chin. J. Org. Chem. **2020**, *40*(5), 1378

The asymmetric Michael addition of 1-acetylindolin-3-ones to β,γ-unsaturated α-keto esters catalyzed by bifunctional thioureas has been developed. Enantio-pure 2-substituted indolin-3-one derivatives were obtained easily in excellent yields (up to 99%) with good diastereoselectivity (up to 10∶1) and enantioselectivities (up to 99.5%).

Microwave-Assisted Iodine-Catalzyed 3-Selenocyanation of Indole for the Synthesis of 3-Selenocyanateindole Derivatives



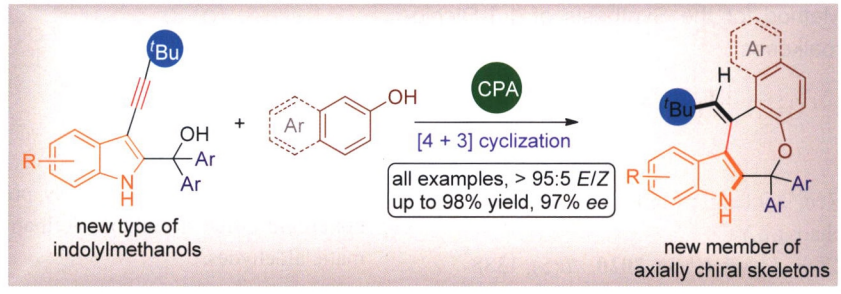
Wu, Yan; Tian, Xianzhi; Zhang, Hailing; Chen, Rui; Cao, Tuanwu*
Chin. J. Org. Chem. **2020**, *40*(5), 1384

3-Selenocyanateindole derivatives have potential application in drug research due to their good biological activity. An efficient protocol for 3-selenocyanateindoles is reported via the microwave-assisted iodine-catalyzed 3-selenocyanation of indole derivatives, affording the corresponding products in good yields.

CONTENT

HIGHLIGHTS

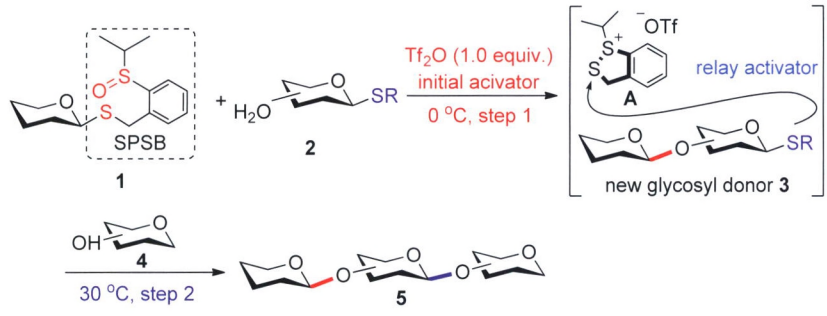
Design and Catalytic Asymmetric Construction of Axially Chiral Aryl-Alkene-Indole Frameworks



Tan, Bin*

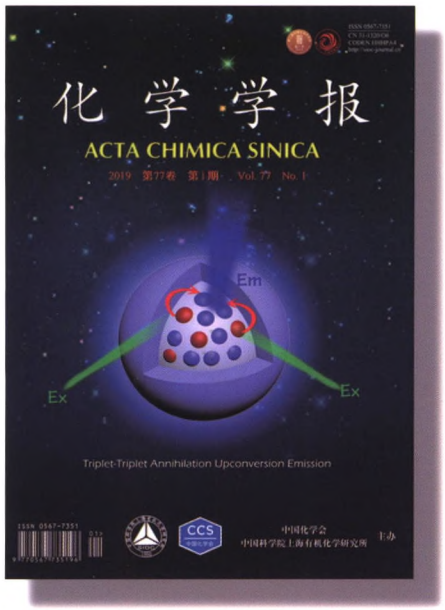
Chin. J. Org. Chem. **2020**, *40*(5), 1404

One-Pot Relay Glycosylation



Ding, Han; Li, Ming*

Chin. J. Org. Chem. **2020**, *40*(5), 1406



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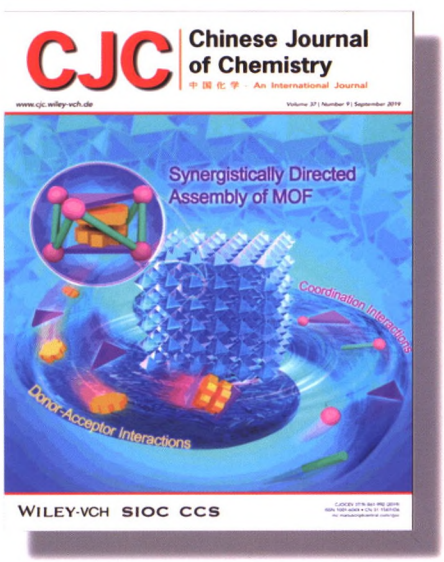

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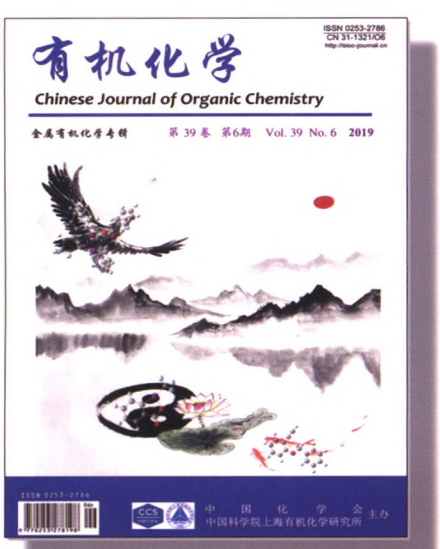

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