ISSN 0253-2786
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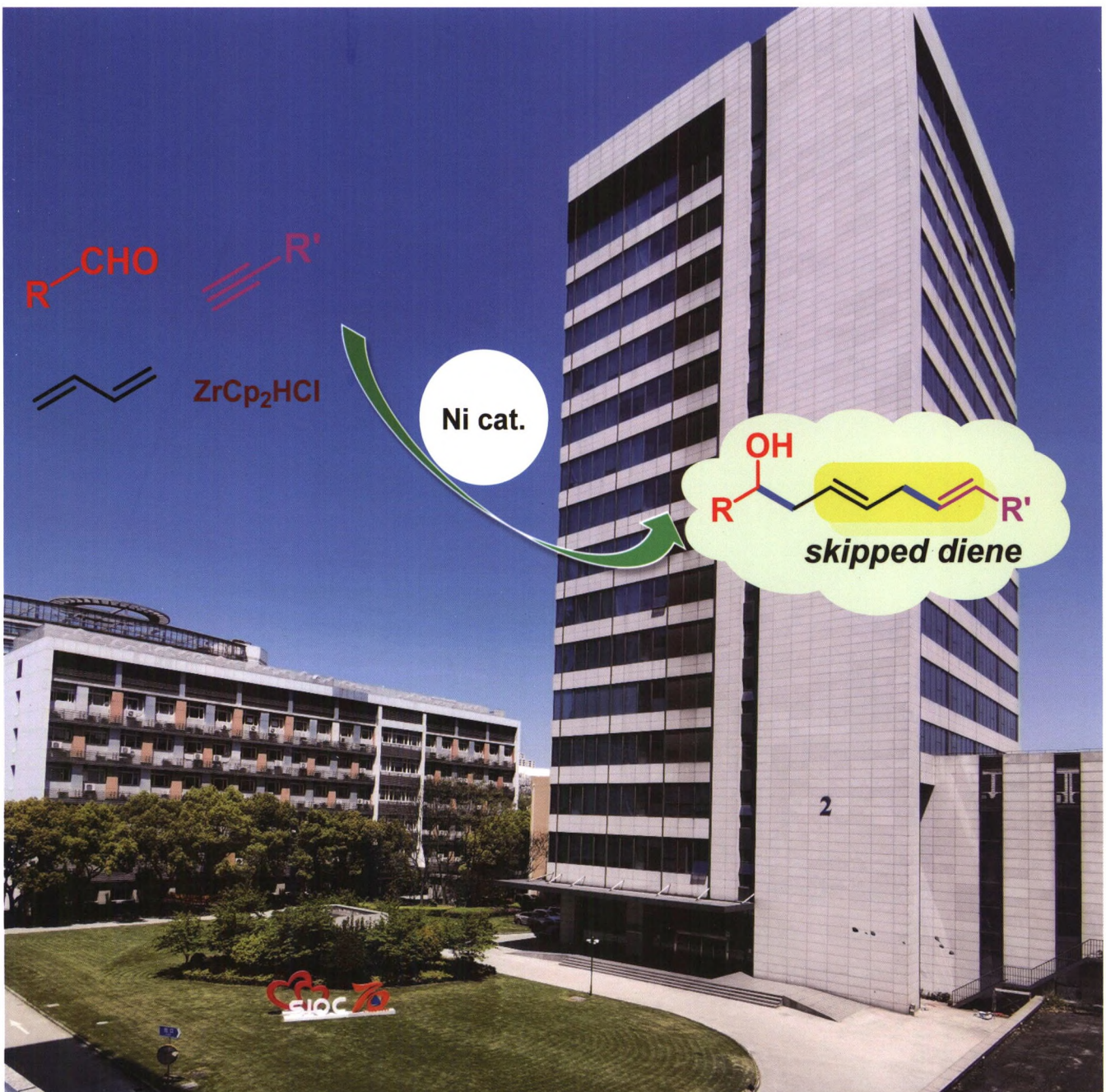
Chinese Journal of Organic Chemistry

Vol. 41 No. 5 May 2021



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中国化学会
中国科学院上海有机化学研究所 主办

有 机 化 学 （月刊）

Chinese Journal of Organic Chemistry

(YOUJI HUAXUE)

第 41 卷 第 5 期 (总 390 期) 2021 年 5 月

目 次

综述与进展

研究论文

* 通讯联系人.

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研究简报

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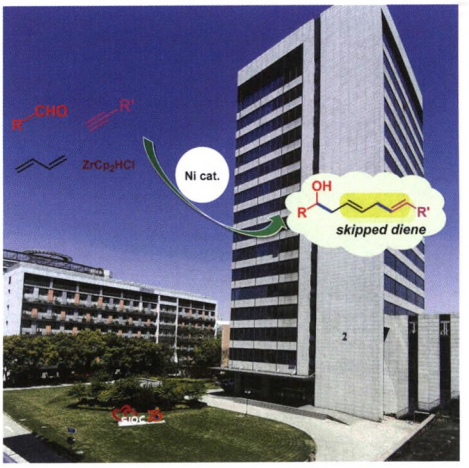
Chinese Journal of Organic Chemistry

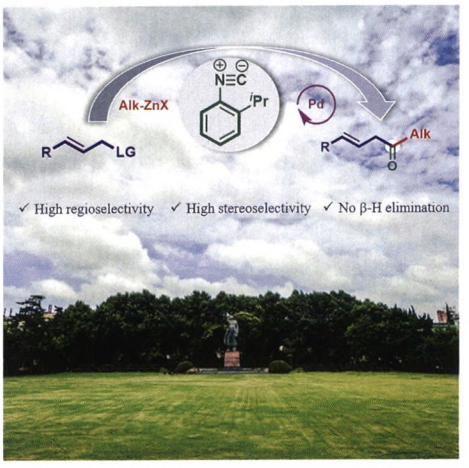
Vol. 41 No. 5 May 2021

Cover Picture: Nickel-Catalyzed Multicomponent Coupling of Butadiene, Aldehydes, Alkynes and Schwartz Reagent to Form 1,4-Dienes



The Ni-catalyzed multi-component coupling of butadiene, aldehydes, alkynes, and Schwartz reagent has been reported by Li and Shi on page 1939. Various skipped dienes were readily synthesized under mild reaction conditions with excellent regio- and stereoselectivity and good functional group tolerance.

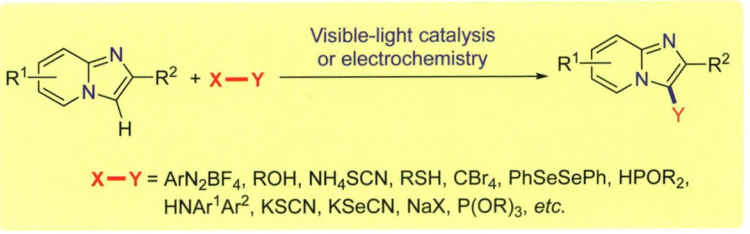
Inside Cover: Palladium-Catalyzed Allylic Carbonylative Negishi Cross-Coupling Reactions with Sterically Bulky Aromatic Isocyanides



The palladium-catalyzed allylic carbonylative reaction with alkyl zinc reagents employing sterically bulky aromatic isocyanides as the CO surrogate has been reported by Weng, Qu and Chen on page 1949. Various synthetically important β,γ-unsaturated ketones were afforded with excellent regio- and seteroselectivities under mild conditions without undesirable β-H elimination.

REVIEWS

Application on the Construction of Imidazo[1,2-*a*]pyridines C-3 Canbon-Hetero Bonds by Visible-light Catalysis and Electrochemistry



Liu, Xiang*; Li, Wen; Liu, Huanyu; Cao, Hua*

Chin. J. Org. Chem. **2021**, *41*(5), 1759

The synthesis of functionalized imidazo[1,2-*a*]pyridines via visible-light catalysis and electrochemistry based on green chemistry has become the powerful tool for the synthesis of these compounds. Based on the types of canbon-hetero bonds of imidazo[1,2-*a*]pyridines, the research on the construction of imidazo[1,2-*a*]pyridines C-3 canbon-hetero bonds by visible-light catalysis and electrochemical synthesis in recent 5 years is summarized.

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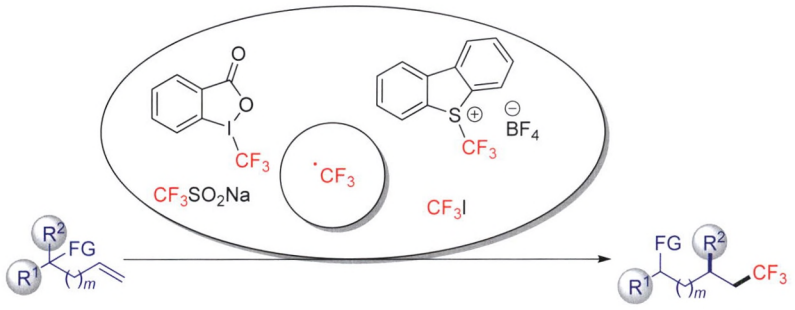
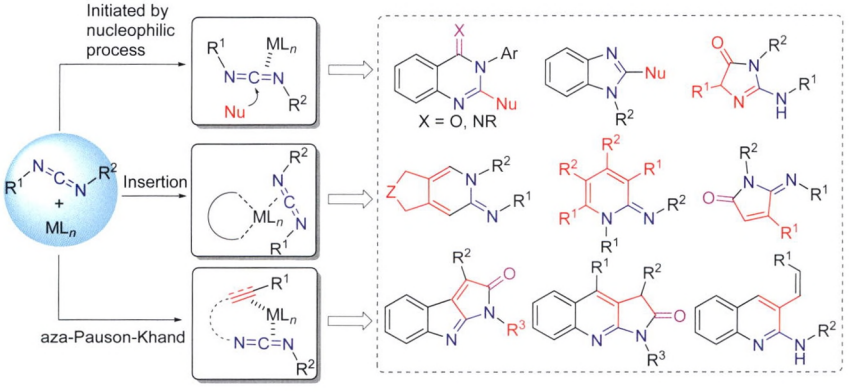
Advances in Trifluoromethylation-Promoted Functional Group Migration of Alkenes



Qiu, Yunliang*; Wei, Fengjiao; Ye, Liu; Zhao, Minyue
Chin. J. Org. Chem. **2021**, *41*(5), 1821

The recent advances in alkene trifluoromethylation-initiated functional group migration including functionalized allylic compounds and non-activated alkenes classified by different types of migrating functional groups are summarized.

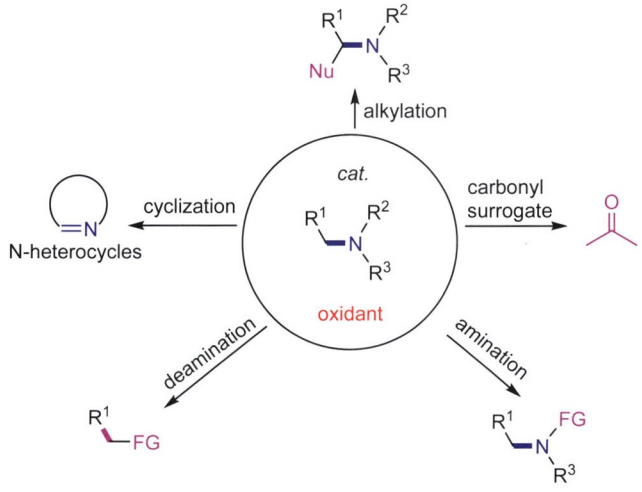
Progress in Transition-Metal-Catalyzed Cyclization of Carbodiimides



Zhang, Zhen*; Chang, Wenxu
Chin. J. Org. Chem. **2021**, *41*(5), 1835

The recent progress in the transition-metal-catalyzed cyclization of carbodiimide over last decade and some pioneering work is reviewed according to different cyclization processes. And the mechanism discussion of catalytic cyclization is highlighted. Finally, the new cyclization models involving carbodiimide are also prospected.

Application of *N*-Alkyl Amines as Versatile Building Blocks in Oxidative Coupling Reactions



Chen, Yuan; Xia, Lijing; Chang, Yiting; Ma, Wuzhen; Wang, Bin*
Chin. J. Org. Chem. **2021**, *41*(5), 1851

The oxidative functionalization of *N*-alkylamines is one of the most direct and versatile strategies for the formation of C—C and C-heteroatom bonds. In recent years, N-alkylamines as multifunctional blocks have made great progress in cross-dehydrogenation-coupling (CDC) reactions. The recent progress in the application of *N*-alkylamines is summarized on the basis of different roles in oxidative coupling reactions.

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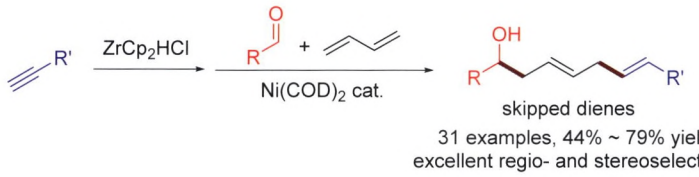
ARTICLES

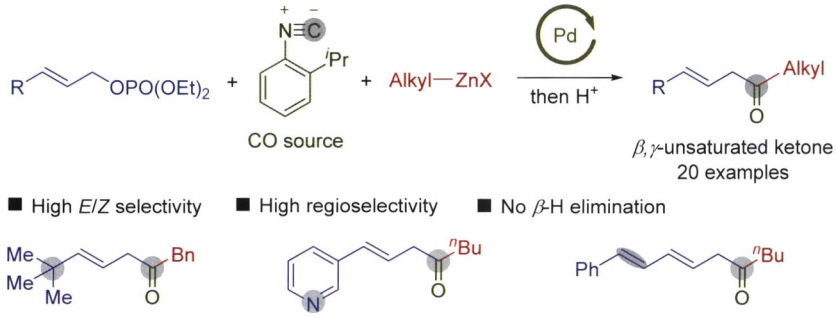
Nickel-Catalyzed Multicomponent Coupling of Butadiene, Aldehydes, Alkynes and Schwartz Reagent to Form 1,4-Dienes



A nickel-catalyzed multi-component coupling of 1,3-butadiene, aldehydes, alkynes, and Schwartz reagents to prepare skipped dienes is described. The reagents are common feedstock chemicals. Moreover, the hydrozirconation of alkynes using Schwartz reagent was applied to *in-situ* prepare the alkenylzirconium reagents, which were used directly without further treatment. Various (*E*,*E*)-1,4-diene products were synthesized with excellent regio- and stereoselectivity.

Li, Yu-Qing; Shi, Shi-Liang*
Chin. J. Org. Chem. **2021**, *41*(5), 1939

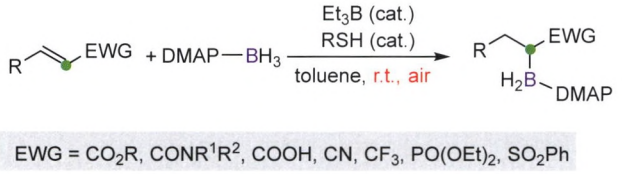
Palladium-Catalyzed Allylic Carbonylative Negishi Cross-Coupling Reactions with Sterically Bulky Aromatic Isocyanides



Pd-catalyzed three components allylic carbonylative Negishi coupling employing sterically bulky aromatic isocyanide as CO source has been reported. This method could provide versatile building blocks β,γ-unsaturated ketones with high selectivity and mild conditions.

Weng, Yangyang; Qu, Jingping; Chen, Yifeng*
Chin. J. Org. Chem. **2021**, *41*(5), 1949

4-Dimethylaminopyridine-Boryl Radical Promoted Regioselective Radical Hydroboration of Electron-Deficient Alkenes



EWG = CO_2R, $CONR^1R^2$, COOH, CN, CF_3, $PO(OEt)_2$, SO_2Ph

A radical hydroboration reaction of electron-deficient alkenes using DMAP-BH_3 as the boryl radical precursor and Et_3B/air as radical initiator is reported. The reaction is carried out at ambient conditions and features excellent α-regioselectivity. α-Borylated esters, amides, carboxylic acid, nitrile, trifluoromethyl molecule, sulfone, and phosphonate have been easily accessed.

Huang, Yunshuai; Jin, Xiaohui; Zhang, Fenglian*; Wang, Yifeng*
Chin. J. Org. Chem. **2021**, *41*(5), 1957

Study on the Cyanide Substitution Reaction of Acetone Cannolhydrin as Cyanogen Source

In this paper, a series of cyano compounds were synthesized by nucleophilic substitution reaction using acetone cyanohydrin as cyanation reagent and aliphatic haloalkanes R—X (X=Cl, Br, I) as substrates.

Guo, Fang; You, Jun*; Wu, Wenju; Yu, Yanchao*; Jing, Bin; Liu, Bo
Chin. J. Org. Chem. **2021**, *41*(5), 1968

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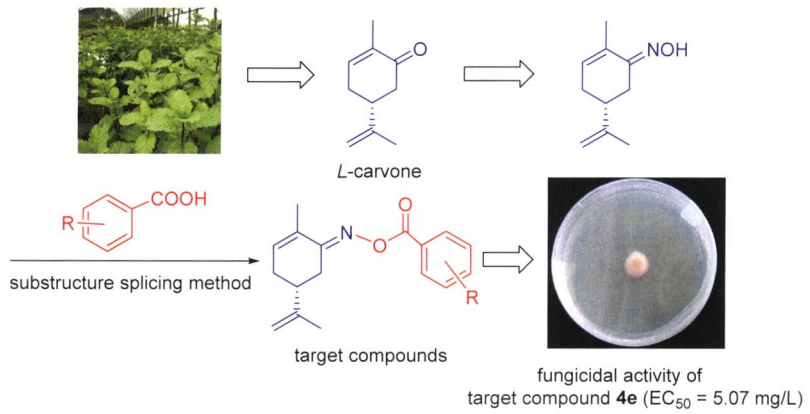
Design, Synthesis, Crystal Structure, and Fungicidal Activity of *L*-Carvone Derivatives Containing an Oxime Ester Moiety

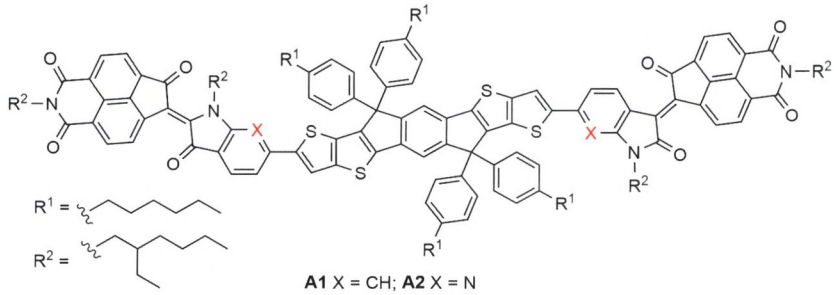


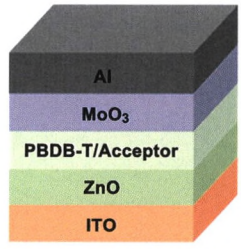
Jin, Can; Deng, Xile; Zhou, Yong; Zhou, Xiaomao*

Chin. J. Org. Chem. **2021**, *41*(5), 2008

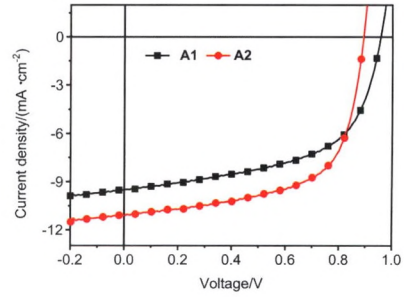
L-Carvone is a natural product with fungicidal activity. Herein, a series of *L*-carvone derivatives containing an oxime ester moiety was synthesized by splicing active substructure strategy with *L*-carvone as the lead compound. Fungicidal activities of *L*-carvone derivatives were evaluated. The results indicated that these *L*-carvone derivatives have good development and application prospects.

Synthesis and Optoelectronic Properties of A-D-A Type Small Molecule Acceptors Containing Isatin-Fused Acenaphthenequinone Imide Terminal Groups





Structure of non-fullerene solar cells

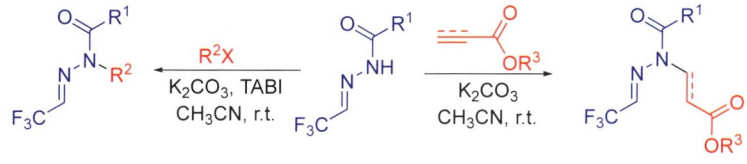


Wu, Sai; Tao, Wuxi; Wang, Guo; Zhao, Bin*; Chen, Huajie*

Chin. J. Org. Chem. **2021**, *41*(5), 2019

Two novel A-D-A type small molecule acceptors (**A1** and **A2**) are designed and synthesized by using isatin-fused acenaphthenequinone imide or nitrogen-doped isatin-fused acenaphthoquinone imide as the terminal groups and indacenodithiophene derivative as the donor core. The effect of pyridal nitrogen on the molecular structure, optical absorption, energy level, and energy conversion efficiency of **A1** and **A2** is studied systematically.

Study on *N*-Alkylation Reaction of Trifluoromethylated Acylhydrazones



Yang, Jinyu; Huang, Danfeng; Wang, Kehu; Wang, Junjiao; Su, Yingpeng; Deng, Zhoubin; Yang, Tianyu; Hu, Yulai*

Chin. J. Org. Chem. **2021**, *41*(5), 2029

The *N*-alkylation reaction of trifluoromethylated acylhydrazones with halogenated hydrocabons or *α,β*-unsaturated esters was investigated, and a series of *N*-alkyl acylhydraones compounds containing trifluoromethyl group were obtained in good yield.

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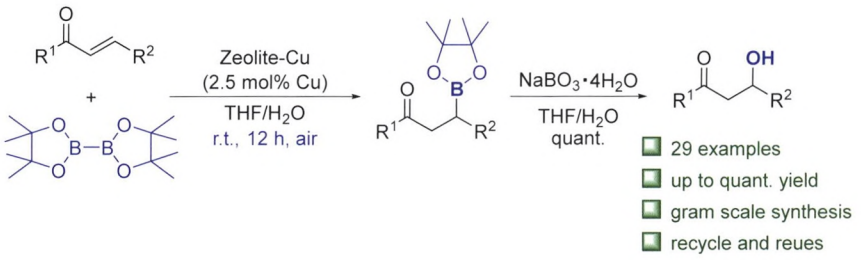
Zeolite Immobilized Copper Catalyzed Conjugate Borylation of α,β-Unsaturated Compounds in Aqueous Media

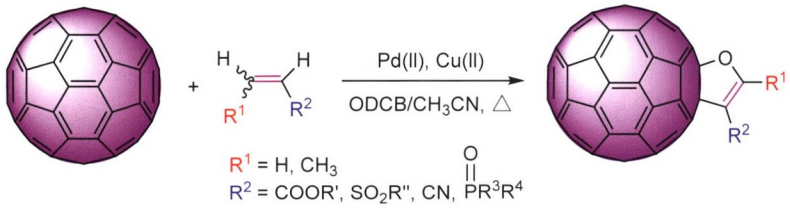


Yan, Feng; Zhou, Lijie; Han, Biao; Zhang, Yaoyao*; Li, Bojie*; Wang, Liansheng; Zhu, Lei*

Chin. J. Org. Chem. **2021**, *41*(5), 2074

A new β-borylation strategy towards α,β-unsaturated acceptors using easily prepared zeolite immobilize copper catalyst was reported. This method exhibited quite a broad substrate scope and the desired products were obtained in good to excellent yields with broad substrate scope. Remarkably, this zeolite supported copper catalyst could be recovered easily by simple centrifugation and reused for seven times without any significant decrease of catalytic activity.

Palladium-Catalyzed Synthesis of Dihydrofuran-Fused [60]Fullerene Derivatives via Heteroannulation of Olefins



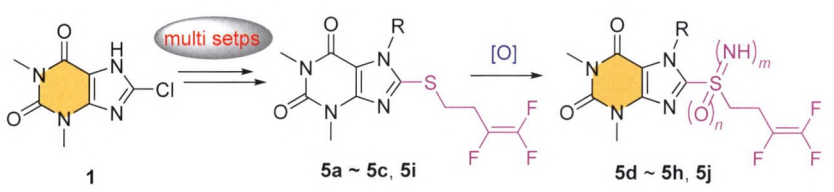
Zhu, San'e*; Dou, Lifeng; Zhang, Jianhui; Wu, Ying; Yang, Wei; Lu, Hongdian; Wei, Chunxiang; Deng, Chonghai; Dong, Qiang*

Chin. J. Org. Chem. **2021**, *41*(5), 2082

A series of monosubstituted and disubstituted dihydrofuran-fused [60]fullerene derivatives were synthesized by heterocyclic reaction using palladium chloride as catalyst, copper trifluoromethanesulfonate as oxidant, olefin and [60] fullerenes as raw materials. A possible reaction mechanism was proposed.

NOTES

Synthesis and Biological Activities of Novel 8-((3,4,4-Trifluorobut-3-en-1-yl)thio)-substituted Methylxanthines and Their Derivatives

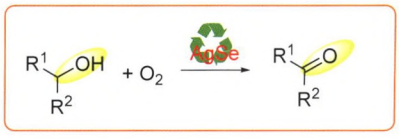


Liu, Hang; Zhang, Shuyun; Li, Huan; Zhang, Yan; Li, Zhengming; Wang, Baolei*

Chin. J. Org. Chem. **2021**, *41*(5), 2091

A series of novel 8-((3,4,4-trifluorobut-3-en-1-yl)thio)-substituted methylxanthines and their derivatives were designed and synthesized, and their biological activities were investigated. The relationships between the structures and bioactivities of the compounds were summarized. The insecticidal leading structures found in this work will provide useful information for further research and development of new agrochemicals.

Silver Selenide as the Novel Catalytic Material for Alcohol Oxidation



Liu, Feng*; Zhan, Jie; Sun, Yangyang; Jing, Xiaobi*

Chin. J. Org. Chem. **2021**, *41*(5), 2099

The easily prepared Ag/Se material possessed very strong oxygen carrier features and could activate the molecular oxygen to achieve the selective oxidation of primary and secondary alcohols to synthesize ketones and aldehydes. Ag/Se as the novel Se-containing catalytic material may be comprehensively applied in future and significantly pushes forward the development of the chemistry of Se catalysis.

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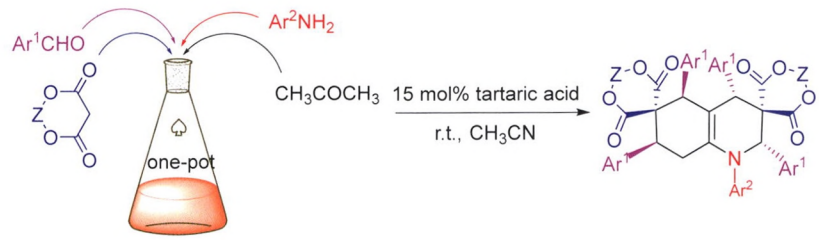
A Four-Component Reaction for the Synthesis of Dispirotetrahydroquinoline-bis-(1,3-dioxane-4,6-dione) Derivatives Catalyzed by Tartaric acid

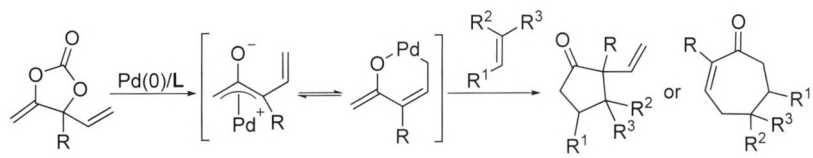


Eleven dispiro[tetrahydroquinoline-bis(1,3-dioxane-4,6-dione)] derivatives were synthesized by a four-component reaction of 1,3-dioxane-4,6-dione, aromatic aldehydes, arylamines and acetone in the presence of tartaric acid. This method can provide the advantages of high yields, broader substrate scope, mild conditions, simple operation and environmental friendliness.

Xu, Zhaohui*; Ye, Huatao; Zhang, Wenfeng; Xiao, Qiang*
Chin. J. Org. Chem. **2021**, *41*(5), 2127

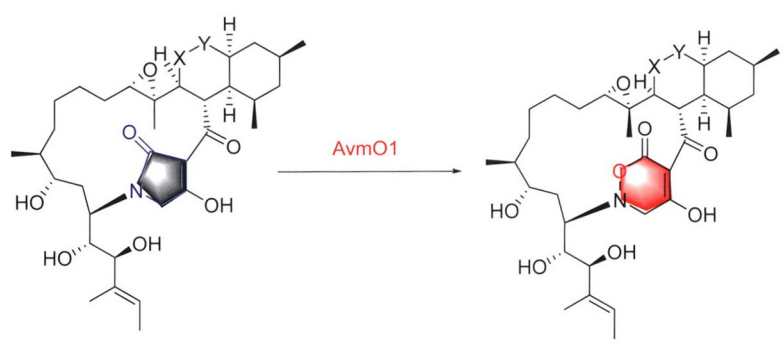
HIGHLIGHTS

Vinyl Methylene Cyclic Carbonate: A New Type of Synthon for Pd-Catalyzed Cycloaddition Reactions



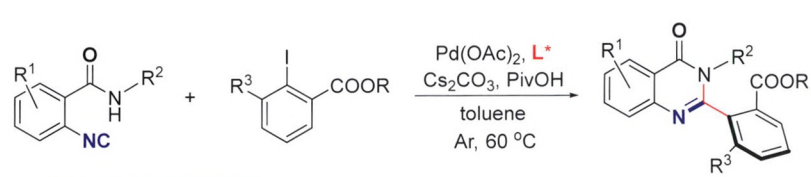
Hao, Xianghong; Guo, Hongchao*
Chin. J. Org. Chem. **2021**, *41*(5), 2134

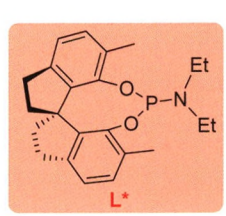
A Flavin-Dependent Monooxygenase Catalyzing Bayer-Villiger Reaction in an Amide Bond



Tang, Zhijun; Liu, Wen*
Chin. J. Org. Chem. **2021**, *41*(5), 2136

Pd-Catalyzed Enantioselective Synthesis of Axially Chiral 2-Aryl-quinozolinones

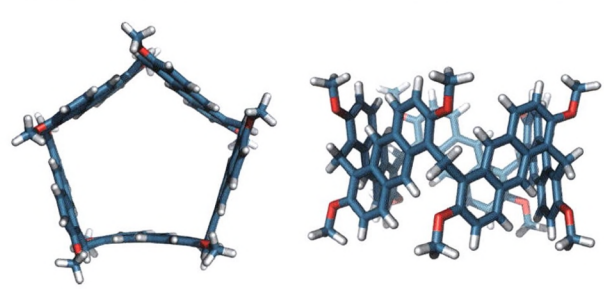




- first coupling-cyclization for six membered heteroaryls
- first chiral 2-arylquinazolinones synthesis
- both C2- and C3-aryl chiral axes formation

Zhang, Hong; Cui, Xiuling*
Chin. J. Org. Chem. **2021**, *41*(5), 2138

Pagoda[5]arene: An Emerging Anthracene-Based Macrocyclic Arene with a Deep and Well-Defined Cavity



Wang, Yanfang; Jiang, Wei*
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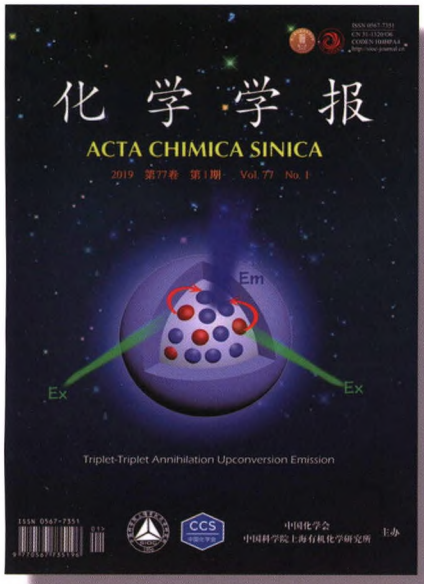

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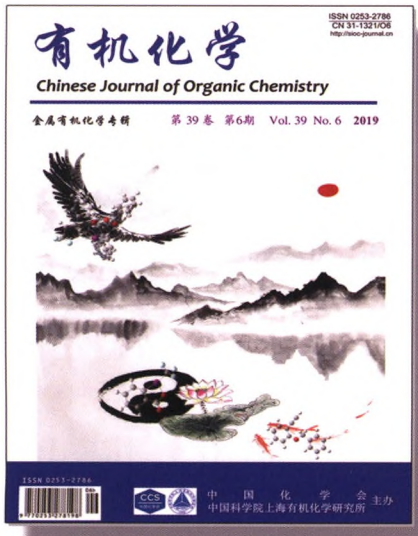

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