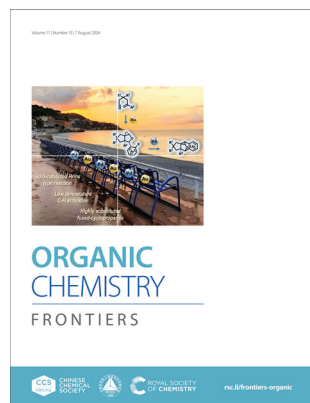


IN THIS ISSUE

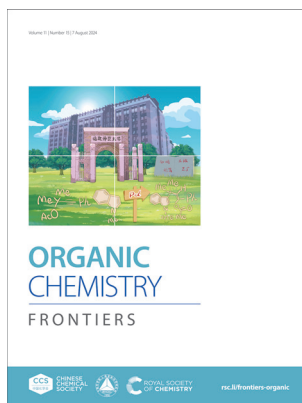
ISSN 2052-4129 CODEN OCFRA8 11(15) 4057-4344 (2024)



Cover

See Véronique Michelet *et al.*, pp. 4070–4076.

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Inside cover

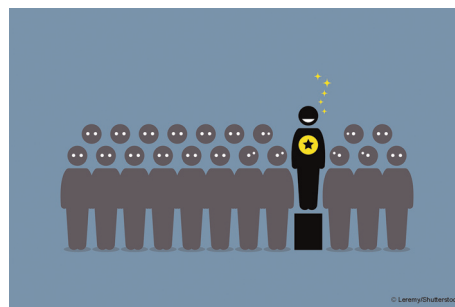
See Shenghan Teng, Shoulei Wang, Wei Huang *et al.*, pp. 4077–4083.

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EDITORIAL

4068

Outstanding Reviewers for *Organic Chemistry Frontiers* in 2023

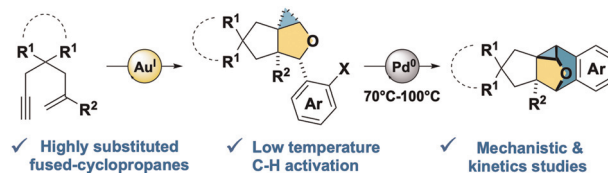


RESEARCH ARTICLES

4070

Au- and Pd-catalyzed cyclization processes: synthesis of polyfunctionalized cyclopropanes

Alexis Truchon, Aurélien Dupeux, Sandra Olivero and Véronique Michelet*



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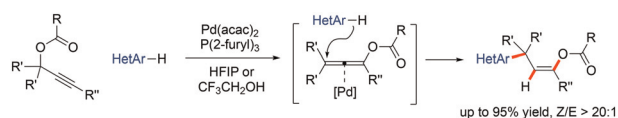
Fundamental questions
Elemental answers

RESEARCH ARTICLES

4077

Palladium(II)-catalyzed 1,3-heteroaryl acyloxylation of propargylic electrophiles

Shenghan Teng,* Peiyao Liang, Lin Hu, Siyi Chen, Shoulei Wang* and Wei Huang*



✓ One-step synthesis of heteroaryl Z-enol esters

✓ Mild conditions and high atom-economy

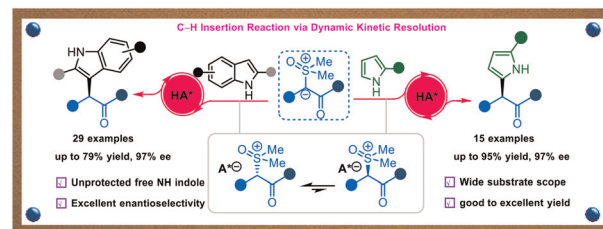
✓ Exclusive *anti*-addition and γ -regioselectivity

✓ Good functional group compatibility

4084

Enantioselective synthesis of unsymmetrical α,α -diarylacetates via organocatalyzed formal C–H insertion reactions of sulfoxonium ylides with indoles and pyrroles

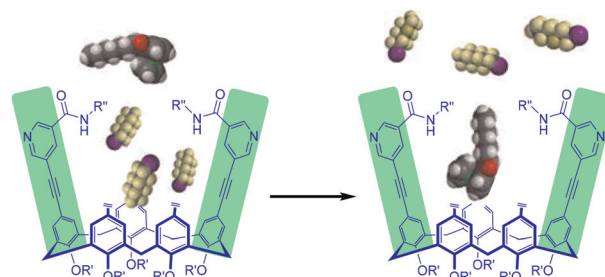
Xin Yue, Shi-Jia Li, Tianyuan Ou, Zhenying Xiong, Feng Jiang, Ying Zhou, Lijuan Song,* Yupei Zhao* and Wengang Guo*



4094

Enhancing the binding of calix[5]arene containers for ferrocenes by a fluorophobic effect through the release of high-energy perfluoro-1-iodoalkanes

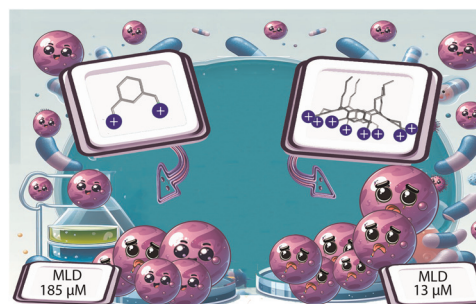
Jiabin Xing, Qihan Lin, Sheng-Yi Zhuang, Gang Wu, Jiangshan Zhang, Hui Wang, Dan-Wei Zhang* and Zhan-Ting Li*



4101

Novel octacationic-resorcin[4]arenes featuring quaternary ammonium groups as multivalent biocides

Vittoria Ferrara, Veronica Iuliano,* Placido Neri, Silvano Geremia, Neal Hickey, Luca Di Stasio, Giovanni Vigliotta,* Gaetana Paoletta, Ivana Caputo, Paolo Della Sala, Carmine Gaeta and Carmen Talotta*



The reaction scheme shows the asymmetric addition of an amine (PG-NH-R) to an α,β -unsaturated imine (2) catalyzed by ZnEt₂. The reaction is controlled by a ligand (L₂) and an aryl group (Ar-H). The product is PG-NH-R, with the stereochemistry of the amine group determined by the ligand and the aryl group. The reaction is labeled (S,S)-L₂ and (S,S)-L₄.

Below the reaction scheme, two transition state models are shown, separated by a vertical line. The left model is labeled "Si-face" and the right model is labeled "Re-face". Both models show a zinc atom coordinated to a ligand (L₂ or L₄) and an amine (PG-NH-R). The transition state is shown in a chair-like conformation, with the amine group (PG-NH-R) and the ligand (L₂ or L₄) interacting with the zinc atom. The models are labeled with "Si-face" and "Re-face" to indicate the stereochemistry of the transition state.

Xu-Yi Huang, Na Li, Yu-Hang Miao, Yuan-Zhao Hua,*
Min-Can Wang, Li-Ping Xu* and Guang-Jian Mei*

Xu-Yi Huang, Na Li, Yu-Hang Miao, Yuan-Zhao Hua,*
Min-Can Wang, Li-Ping Xu* and Guang-Jian Mei*

Previous works

Iron(II)-catalyzed annulation to construct novel quinone-fused cyclopenta[2,1-b]indoles: A Promising Type I Photosensitizer

Reaction scheme showing the synthesis of various Type I PDT PSs from different starting materials (naphthalene, anthracene, porphyrins) using reagents like Cu_2O , Pd , and CuI .

Reaction scheme showing the synthesis of a novel Type I PDT PS (1) from a quinone and an indole derivative using FeCl_2 and NaOH .

Diagram illustrating the application of Type I PDT PSs in tumor cells. The PS (1) is irradiated with 660 nm light, generating singlet oxygen ($^1\text{O}_2$) which leads to Type I PDT and Apoptosis.

Key features of the novel PS (1):

- Iron-catalyzed annulation reaction
- Pure Type I PSs with NIR absorb

Hong Xu, Xiao-Chun Liu, Bei Wang, Fu-Yu Li,
Dong-Wei Huang, Yao Xiao, Ning Ma, Ya-Hui Zhang*
and Ji-Yu Wang*

Hong Xu, Xiao-Chun Liu, Bei Wang, Fu-Yu Li,
Dong-Wei Huang, Yao Xiao, Ning Ma, Ya-Hui Zhang*
and Ji-Yu Wang*

$$\text{S}_A + \text{S}_C \xrightarrow{[\text{Co}]} \text{HO} \left[\text{Si} \left(\text{Me} \right)_2 \text{C}_6\text{H}_4 \text{O} \text{C}_6\text{H}_4 \text{Si} \left(\text{Me} \right)_2 \text{O} \text{C}_6\text{H}_4 \text{Si} \left(\text{Me} \right)_2 \text{O} \text{C}_6\text{H}_4 \text{Si} \left(\text{Me} \right)_2 \text{O} \text{C}_6\text{H}_4 \text{Si} \left(\text{Me} \right)_2 \text{OH} \right]_n$$

$$\text{P}_{\text{Ac}} (79\%), M_n = 9015, \text{PDI} = 1.68, T_g = 777 \text{ K}$$

$$\text{HO} \begin{array}{c} \text{Ph} \\ | \\ \text{Si} \\ | \\ \text{Ph} \end{array} \text{OH} \quad \text{HO} \begin{array}{c} \text{Me} \\ | \\ \text{Si} \\ | \\ \text{Me} \end{array} \text{C}_6\text{H}_4 \text{O} \text{C}_6\text{H}_4 \text{Si} \begin{array}{c} \text{Me} \\ | \\ \text{Si} \\ | \\ \text{Me} \end{array} \text{OH}$$

$$\text{S}_A \quad \quad \quad \text{S}_C$$



$$\text{FZU} \xrightarrow{365 \text{ nm}} \text{FZU}$$

Bing-Bin Yang, Peng Guo, Xinglei He and Ke-Yin Ye*

Bing-Bin Yang, Peng Guo, Xinglei He and Ke-Yin Ye*

The reaction scheme shows the (5+5) cyclization of an allyl amide derivative. The starting material is an allyl amide with a substituent R^2 on the nitrogen and an R^1 group on the allyl chain. The reaction is catalyzed by a palladium complex $[Pd]$ and involves the loss of CO_2 . The product is a ten-membered N,O -containing heterocycle. The reaction is noted as having 23 examples with up to 90% yield.

Below the main reaction, a detailed mechanism is shown in a dashed box. It illustrates the equilibrium between two allyl-palladium complexes: an **aza- π -allylpalladium** complex (labeled **A**) and an **oxa- π -allylpalladium** complex (labeled **A'**). The transition from **A** to **A'** is associated with the loss of CO_2 and the formation of the heterocycle, which is labeled as **(A + A')**.

Xiao-Hui Fu, Juan Liao, Zhen-Hua Wang,*
Zhen-Zhen Ge, Ming-Qiang Zhou, Yong You,
Yan-Ping Zhang, Jian-Qiang Zhao, Ji-Hong Lu and
Wei-Cheng Yuan*

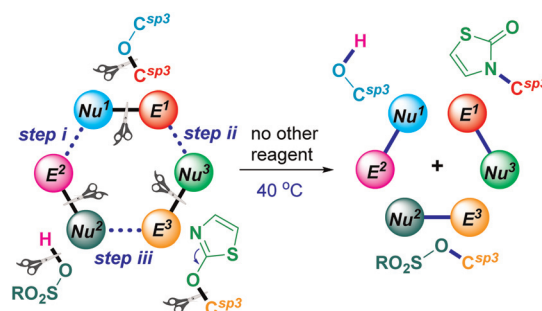
Xiao-Hui Fu, Juan Liao, Zhen-Hua Wang,*
Zhen-Zhen Ge, Ming-Qiang Zhou, Yong You,
Yan-Ping Zhang, Jian-Qiang Zhao, Ji-Hong Lu and
Wei-Cheng Yuan*

RESEARCH ARTICLES

4138

Three-component formal metathesis *via* remote activating strategy enabled (RASE) domino activation of two C(sp³)–O bonds in alkyl ethers

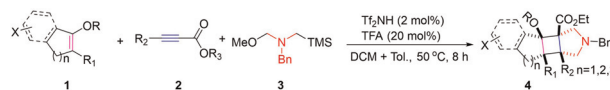
Dailin Zhuang, Le Cheng, Yichuan Yan, Yuting Tang, Zhenyang Wan, Jiahao Gu, Yuhong Lu, Xinyao Li* and Ziyuan Li*



4149

Synthesis of polysubstituted fused pyrrolidines *via* [2 + 2]/[2 + 3] cycloaddition of azomethine ylides

Chunyan Ou, Jian Wang, Pingping Yin, Bin Chen, Ping Hu, Bi-Qin Wang, Peng Cao* and Minghui Xu*



4156

An efficient platform for decarboxylative functionalization of carboxylic acids using sulfuryl fluoride: Pd-catalyzed decarboxylative dehydrogenation of alkanecarboxylic acids and decarboxylative cross-coupling of arenecarboxylic acids

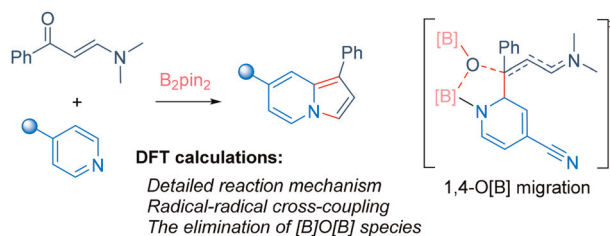
Chenfei Guan, Huijie Qi, Linjun Han, Guofu Zhang,* Jinghui Lyu and Chengrong Ding*



4168

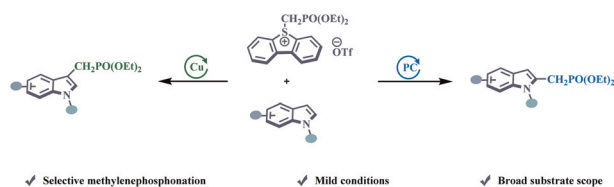
A pyridine-boryl radical mediated cascade reaction towards the synthesis of indolizines: a computational mechanistic analysis

Xinyu Zhang, Xiangxue Cao, Lanfeng Wei, Zhijun Wang, Yu Wei,* Liang Xu* and Genping Huang*



RESEARCH ARTICLES

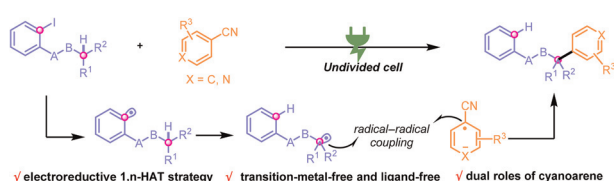
4176



Selective C2 and C3 phosphorylmethylation of indoles with a phosphorylmethyl dibenzothiophenium reagent

Xiaomin Shi, Hongmei Qu,* Yaxing Wu, Fei Wang and Chao Chen*

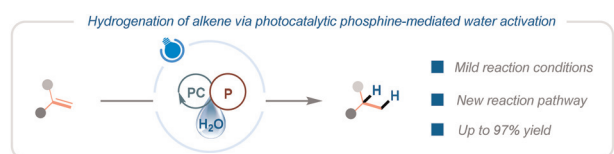
4182



An aryl-to-alkyl radical relay arylation reaction of a remote C(sp³)-H bond using 1,4-dicyanobenzene as an electrochemical redox-mediator

Weijie Yu, Hongjie Zhang, Zhipeng Shen, Lingyun Yang, Jin Luo,* Wendong Li, Kuang Zhao, Xiaolong Li, Jiale Xu, Yuan Zhou* and Tao Wang*

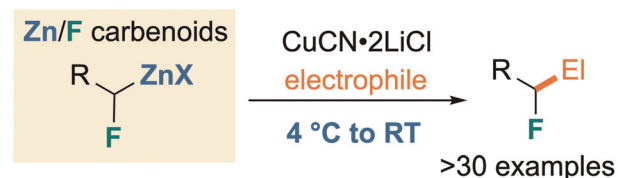
4187



Photoredox-catalyzed hydrogenation of alkenes assisted by an *in situ* generated PPh₃(OH) radical and acetic acid

Zhen-Zhen Xie, Yu Zheng, Zi-Hao Liao, Chu-Ping Yuan, Ming-Zhi Li, Ke-Yi Deng, Hao-Yue Xiang, Kai Chen* and Hua Yang*

4194



- ✓ stable (half-lifetime = 2.5~19 h at 23 °C)
- ✓ elucidated structure & decomposition pathway
- ✓ applicable to various monofluoroalkylation

Zn/F carbenoids: preparation, structures, stability, and application to nucleophilic monofluoroalkylation

Kazuhiro Morisaki,* Kohei Miyamoto, Emiko Kawaguchi and Yoshihiro Sato*

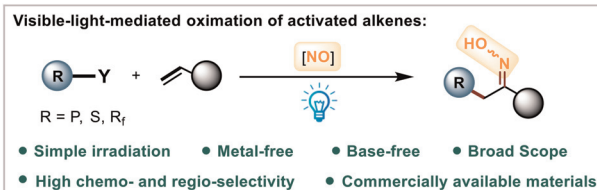


RESEARCH ARTICLES

4207

A general photochemical strategy for the oximation of activated alkenes without a catalyst

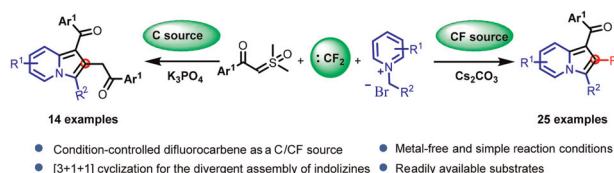
Hongyan Lan, You Su, Yikun Chen, Xiaozhi He* and Dingyi Wang*



4214

Base-controlled selective cleavage of the C–F bond of difluorocarbene for the divergent assembly of indolizines

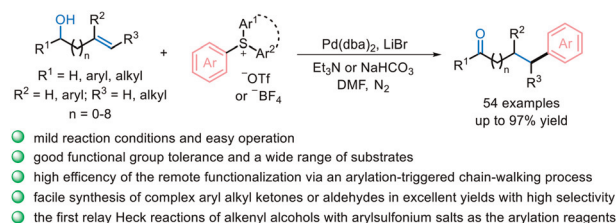
Chun-Yan Wu, Xiang-Long Chen, Dong-Sheng Yang, Yong-Xing Tang, Li-Sheng Wang, Yan-Dong Wu, Shi-Yi Zhuang* and An-Xin Wu*



4219

Pd-catalyzed relay Heck arylation of alkenyl alcohols with arylsulfonium salts

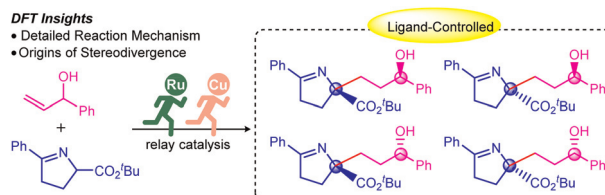
Jia-Wei Song, Fang Xia, Xiu-Lan Zhang and Cheng-Pan Zhang*



4231

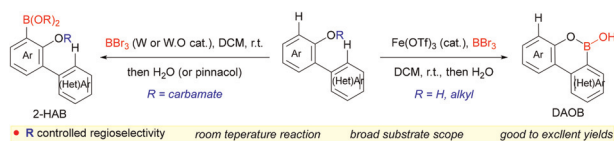
Copper/ruthenium relay catalysis for stereodivergent construction of 1,4-nonadjacent stereocenters: mechanistic investigation using DFT calculations

Congcong Huang, Biyao Yang, Keying Zhang and Juan Li*



RESEARCH ARTICLES

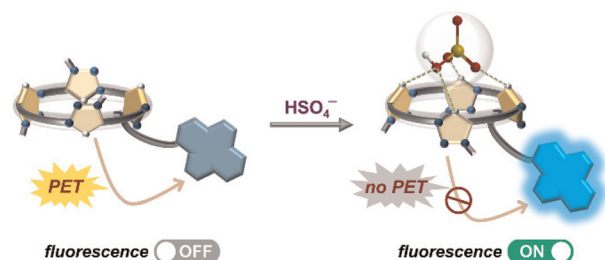
4249



Directing group controlled regioselective C–H borylation of 2-arylphenolic compounds at room temperature

Jiao Kang, Jing Liu and Zhilong Chen*

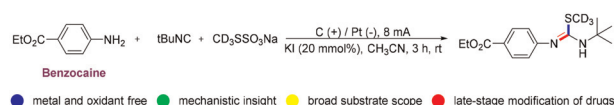
4258



A pyrene–calix[4]triazolium conjugate for fluorescence recognition of hydrogen sulfate

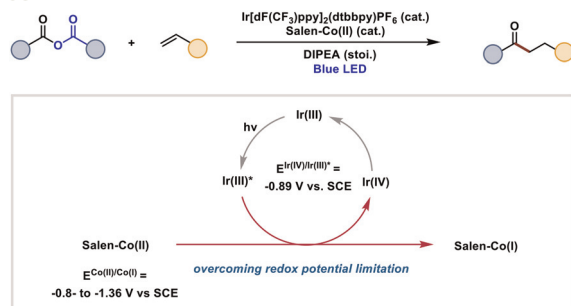
Jihee Cho, Rakesh Parida, Changyun Lim, Jin Yong Lee,* Jong Seung Kim* and Sanghee Kim*

4264

Electrochemical aminotrideuteromethylthiolation of isocyanides with anilines and $\text{CD}_3\text{SSO}_3\text{Na}$

Lin Zhao, Xinyu Zhou, Kemeng Zhang, Siyu Han and Ge Wu*

4269



Ir/Co dual catalyzed hydroacylation of electron-deficient alkenes overcoming redox potential limitations

Yi Zhou, Yong-Qin He, Xia Nie, Lin Lu, Xian-Rong Song, Zhao-Zhao Zhou, Wan-Fa Tian* and Qiang Xiao*

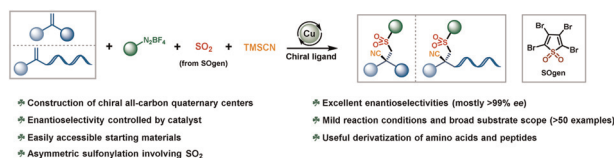


RESEARCH ARTICLES

4275

Access to chiral sulfones with an all-carbon quaternary stereocenter from sulfur dioxide

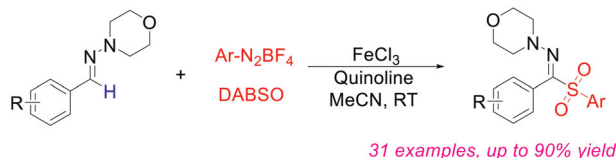
Chunxi Huang, Xuemei Zhang, Liping Luo, Xiuwen Jia, Jian Liao* and Zhong Lian*



4284

Direct C–H sulfonylation of hydrazones involving the insertion of SO₂

Mengzhao Yu, Shuizhen Lin, Shuoshuo Zhang, Xinkui Lin and Xiaolei Huang*

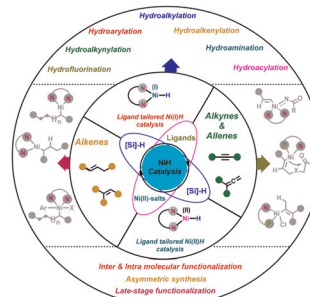


REVIEWS

4290

Silanes as a versatile hydride source for Ni–H catalysis: a promising tool for π -hydro functionalization

Yafia Kousin Mirza, Partha Sarathi Bera, Sachin Balaso Mohite, Ajeet Kumar Pandey and Milan Bera*



4318

Electroreduction strategy: a sustainable tool for the generation of aryl radicals

Xiao-Qing Xie, Wei Zhou, Ruchun Yang, Xian-Rong Song, Mu-Jia Luo* and Qiang Xiao*

