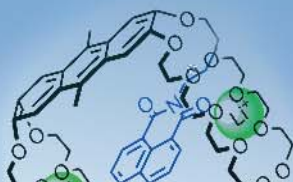


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中国科学 化学

第42卷 第10期 2012年10月 1379-1500 ISSN 1674-7224 CN 11-5838/O6

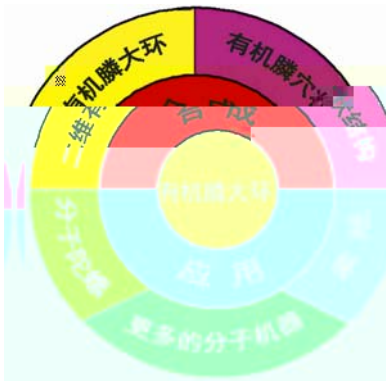


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超分子有机膦大环化合物研究进展

，
：，2012, 42(10): 1428–1437

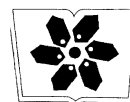


专题·论文

有机同秩物概念及单取代烷烃同秩物生成焓和电离能变化规律

，
：，2012, 42(10): 1438–1451

$X_i \downarrow$	$n \rightarrow 1$	2	3	...	n	
X_1	X_1-CH_2-H	$X_1-(CH_2)_2-H$	$X_1-(CH_2)_3-H$	...	$X_1-(CH_2)_n-H$	同 系 列
X_2	X_2-CH_2-H	$X_2-(CH_2)_2-H$	$X_2-(CH_2)_3-H$	...	$X_2-(CH_2)_n-H$	
X_3	X_3-CH_2-H	$X_3-(CH_2)_2-H$	$X_3-(CH_2)_3-H$	...	$X_3-(CH_2)_n-H$	
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	
X_m	X_m-CH_2-H	$X_m-(CH_2)_2-H$	$X_m-(CH_2)_3-H$	...	$X_m-(CH_2)_n-H$	
						同秩物



论文

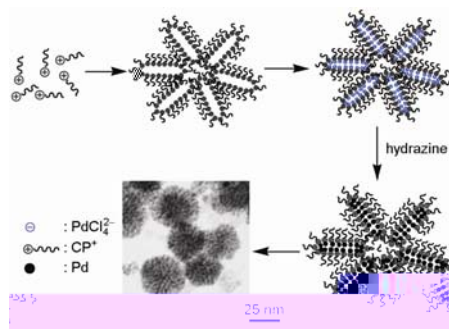
捕获含有圣杯式十六核水簇的水-甲醇二元簇合物 $(\text{H}_2\text{O})_{20}(\text{CH}_3\text{OH})_4$

，
：，2012, 42(10): 1452–1460



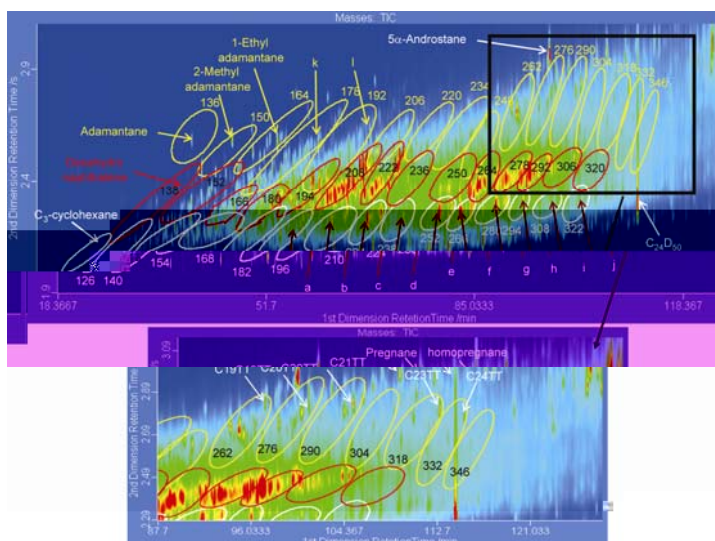
球状多孔 Pd 纳米粒子超结构的合成及其对甲酸
的电催化氧化

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：，2012, 42(10): 1461–1468



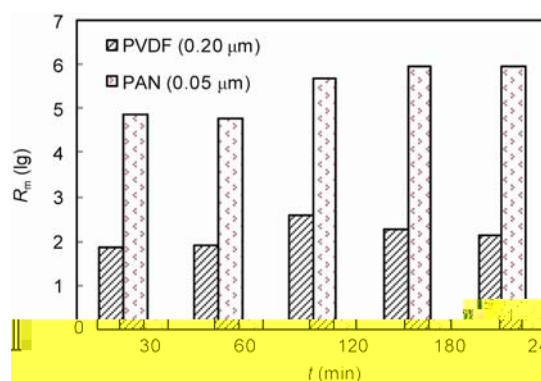
稠油中饱和烃复杂混合物成分解析及其意义

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：，2012, 42(10): 1469–1478



膜吸附反应器(MAR)对饮用水系统中病毒的去

， ， ，
： ， 2012, 42(10): 1479–1486



摘要

Computational mechanistic studies of acceptorless dehydrogenation reactions catalyzed by transition metal complexes

LI HaiXia & WANG ZhiXiang

： ， 2012, 42(10): 1487

Ferric perchlorate-mediated radical reactions of [60]fullerene

LI FaBao & WANG GuanWu

： ， 2012, 42(10): 1488

N H X (X = F, Cl, Br, and I) hydrogen bonding in aromatic amide derivatives in crystal structures

WANG DongYun, WANG JiLiang, ZHANG DanWei & LI ZhanTing

： ， 2012, 42(10): 1489

Mechanistic aspects of oxidation of palladium with O₂

JIN LiQun & LEI AiWen

： ， 2012, 42(10): 1490

Heterolytic and homolytic C D bond dissociation energies of NADH models in acetonitrile and primary isotopic effects on hydride versus hydrogen atom transfer reactions

CAO ChaoTun, TAN Yue & ZHU Xiao-Qing

： ， 2012, 42(10): 1491–1492

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JIANG YuanYe, FU Yao & LIU Lei

： ， 2012, 42(10): 1493

Supramolecular vesicles of cationic gemini surfactants modulated by *p*-sulfonatocalix[4]arene

LI ZhenQuan, HU ChunXiu, CHENG YuQiao, XU Hui, CAO XuLong, SONG XinWang, ZHANG HengYi & LIU Yu

: , 2012, 42(10): 1494

Li⁺-templated complexation of cylindrical macrotricyclic host with naphthalene diimide: Cation-controlled switchable complexation processes

ZENG Fei, SU YongSheng & CHEN ChuanFeng

: , 2012, 42(10): 1495

Theoretical study on formation of thioesters via O-to-S acyl transfer

WANG Chen & GUO Qing-Xiang

: , 2012, 42(10): 1496

Car-Parinello molecular dynamics simulations of thionitroxide and S-nitrosothiol in the gas phase, methanol, and water —A theoretical study of S-nitrosylation

LIANG Juan, CHENG ShangLi, HOU JunWei, XU ZhenHao & ZHAO Yi-Lei

: , 2012, 42(10): 1497–1498

Azomethine ylide-formation from *N*-phthaloylglycine by photoinduced decarboxylation: A theoretical study

FANG Qiu, DING LiNa & FANG WeiHai

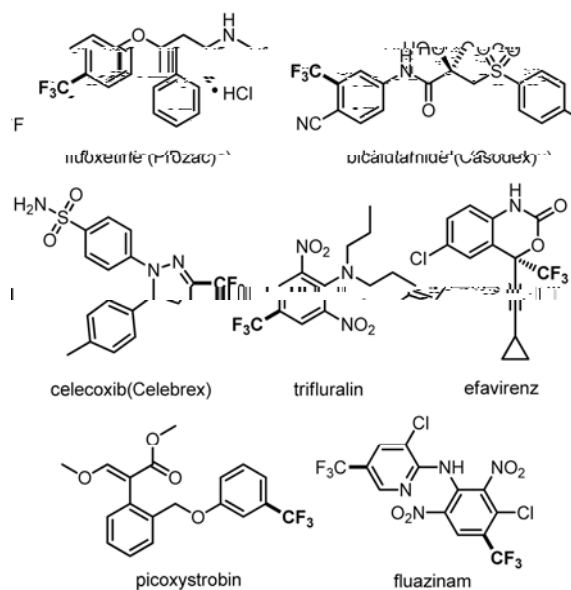
: , 2012, 42(10): 1499–1500

doi: 10.1360/032012-266

[1, 2]

(IR)

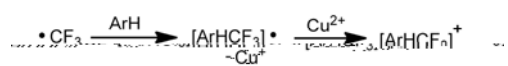
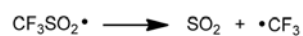
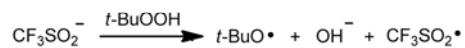
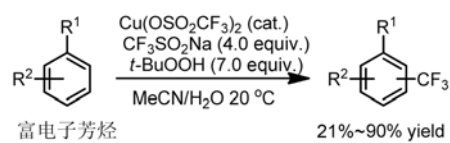
σ^*



1

$$\begin{array}{ccc} & (& 2). \\ & & (\cdot\text{CFH}_2) \\ (\cdot\text{CF}_2\text{H}) & & (\cdot\text{CF}_3), \end{array}$$

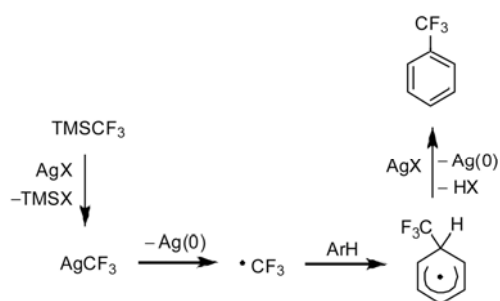
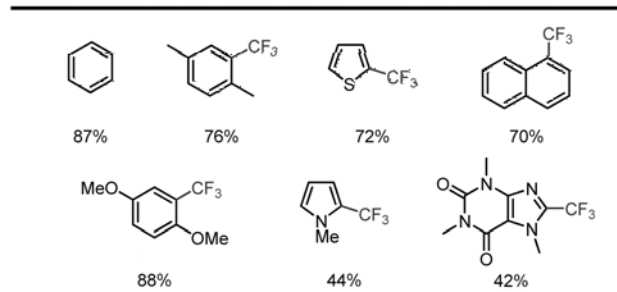
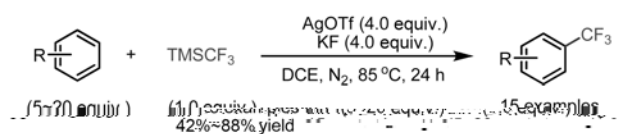
[5]



4

(ArH)

([ArHCF₃][•]),



6 Ag(I)

,

(

)

,

.

[14].

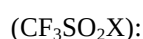
2.3



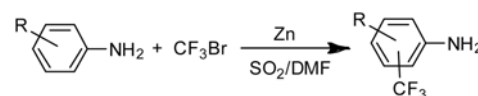
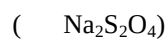
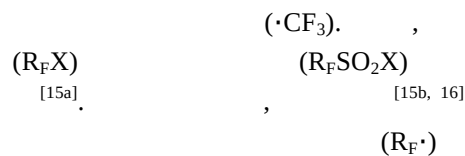
,



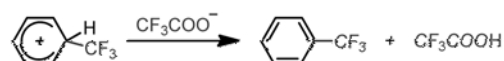
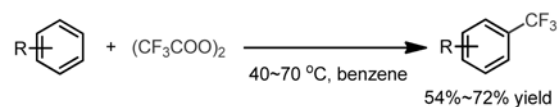
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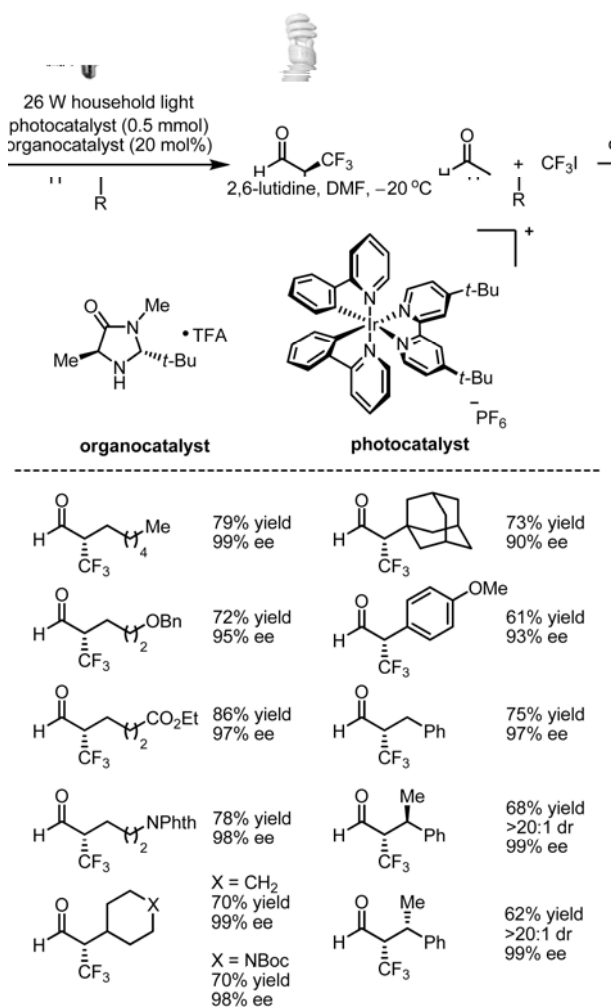
7



2

(ArH) (SET), 1
 $((\text{CF}_3\text{COO})_2^\cdot)$,
 (CO_2) ,
 $(\text{CF}_3\text{COO}^\cdot)$ 1 $(\text{ArH}^\cdot)$.
 (ArHCF_3^+) , $(\text{CF}_3\text{COO}^\cdot)$
 (H^+) (ArCF_3) .
 2010, Yamakawa^[19],
 (H_2O_2) , (CF_3I) ,
 ,
 (9).

噁 2- -1,3,4- 1,2,4- .
 : (FeSO_4) (H_2O_2)
 $(\cdot\text{OH})$, DMSO $(\cdot\text{OH})$ $\hat{\text{I}}$ $\hat{\text{e}}$ i h
 $(\cdot\text{H}$



12

(•CF₃).

:

Re

(•CF₃)

Si

,

^{*}Ir(ppy)₂(dtb-bpy)⁺

, 1

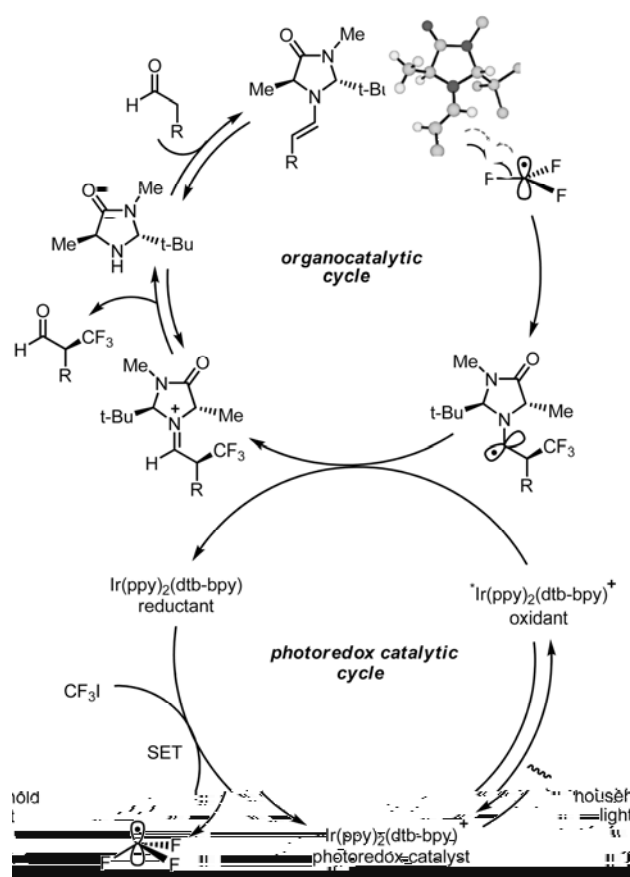
2012, Zakarian [23]

N-

(14).

:

(CF₃I)



13

:

/

, 1,

(•CF₃),

, 1,

N-

嘿

, Lewis

(ZrCl₄)

2

(Et₃N)

嘿

N-

嘿

(CF₃I)

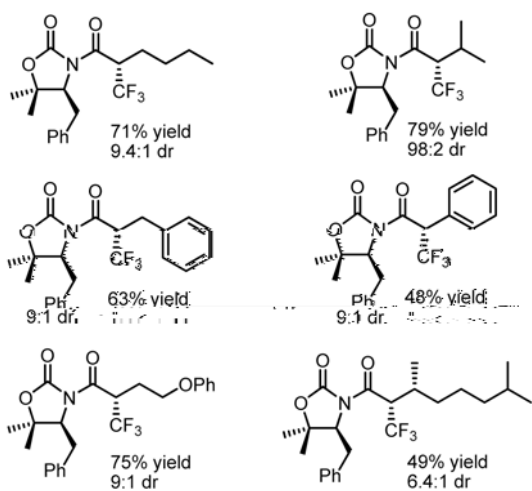
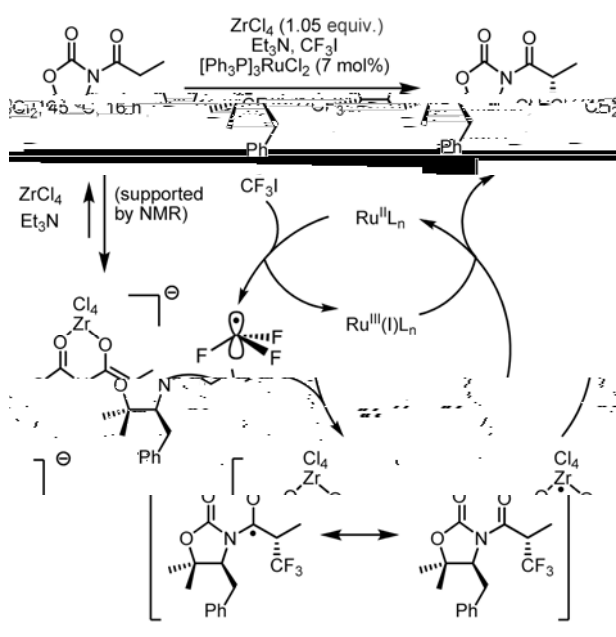
, 48%~79%,

6.4:1~98:2.

2011, Buchwald [24]

[MeCN₄Cu]PF₆

(Togni)



14

(15).

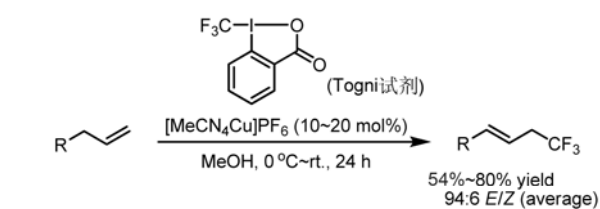
, 56%

, 10%

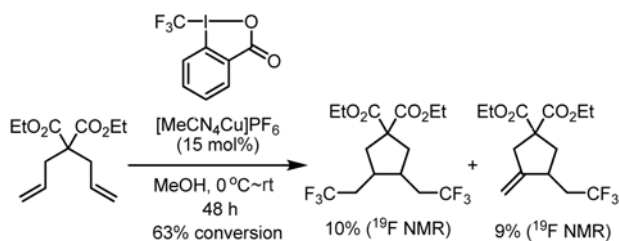
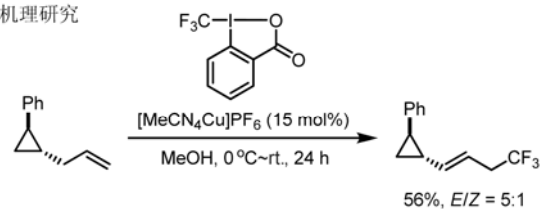
5-exo-trig

5-exo-trig

9%



机理研究



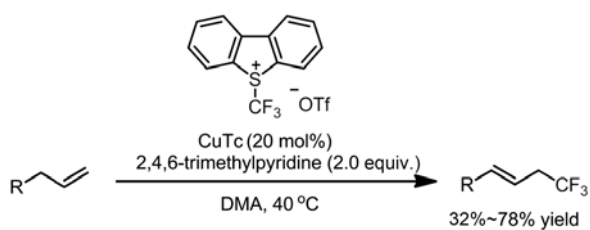
15 Buchwald Cu(I)

(16).

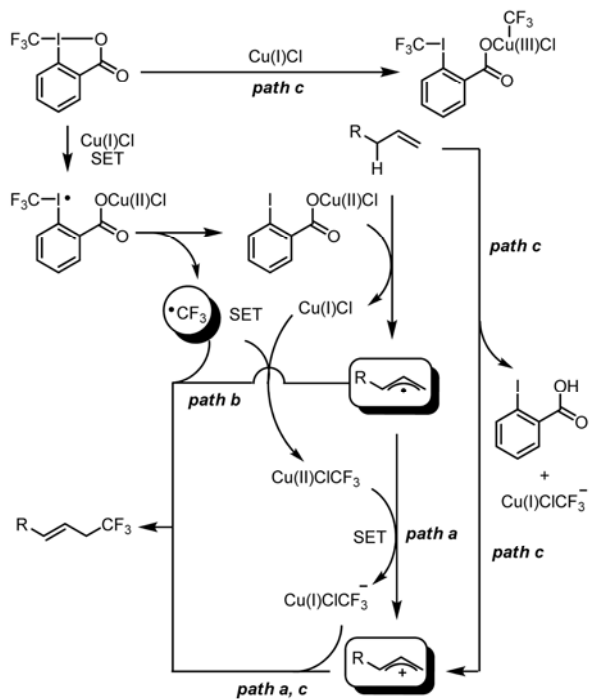
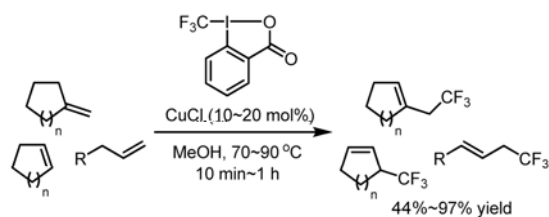
:

 $\text{R}[\text{Cu}]^n$

(CuCl), , 70 10 min, (18). 44% TEMPO-CF₃.
2,2,6,6-(TEMPO),
GC-MS . ¹⁹F NMR , (Togni),
GC-MS , 79% TEMPO-CF₃,
CF₃ , TEMPO , 3 , Togni



17 Cu(I)



18 Cu(I)

(CuCl) , (II)

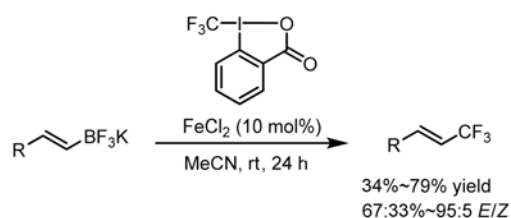
(path b).

(path a).

2012 , Buchwald [27]
Togni

(19).

Sn(OTf)₂



19

(FeCl₂) , Ru(phen)₃²⁺.
 , 1994 Kamigata [29] đ
 ,
 -BF₃K E

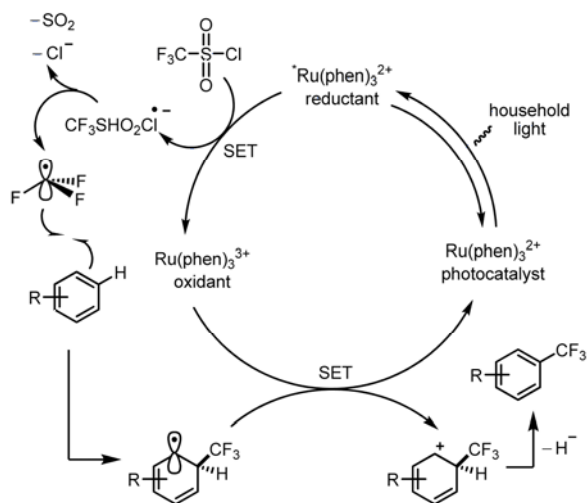
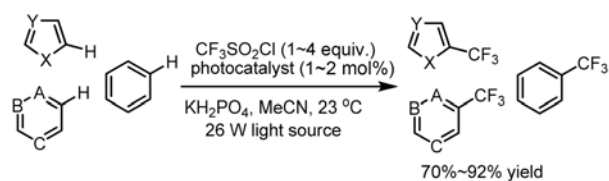
2011 , MacMillan [28]

(20).

;
 Ru(phen)₃²⁺ 1 *Ru(phen)₃²⁺,
 , (CF₃SO₂Cl)
 , 1
 Ru(phen)₃³⁺; (CF₃SO₂Cl) 1
 ,
 (SO₂) (Cl⁻), (·CF₃),

;
 Ru(phen)₃³⁺

Ru(phen)₃³⁺ 1 ,



20

C H

(973 , 2012CB821600)

(21072009, 20902005, 20832002)

;

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Trifluoromethylation reactions through trifluoromethyl radical

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Key Laboratory of Bioorganic Chemistry and Molecular Engineering of Ministry of Education; Beijing National Laboratory for Molecular Sciences (BNLMS); College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China

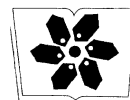
^{*}Corresponding author (email: Wangjb@pku.edu.cn)

Abstract: Organic molecules that contain trifluoromethyl group have found wide applications in diverse areas such as functional materials, agrochemicals, pharmaceuticals and so on. Consequently, the development of novel methods of trifluoromethylation has become a hot topic in recent years. In this context, carbon-carbon bond formation through trifluoromethyl radical is an important strategy. In this review, the recent development of carbon-carbon bond formation through trifluoromethyl radical has been discussed according to the different approach toward trifluoromethyl radicals.

Keywords: trifluoromethyl, radicals, carbon-carbon bond formation, organic synthesis



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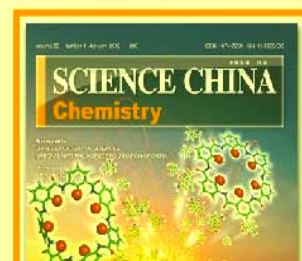
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