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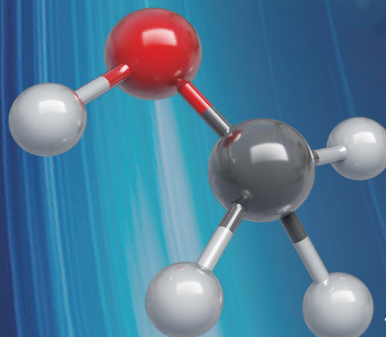
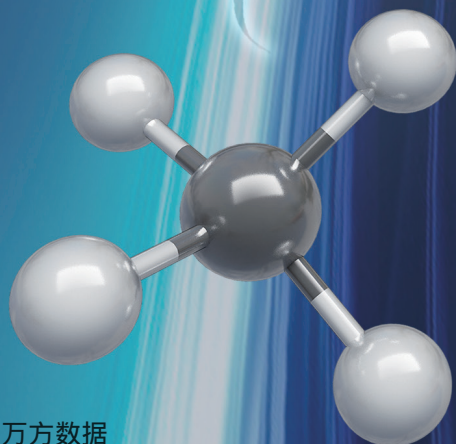
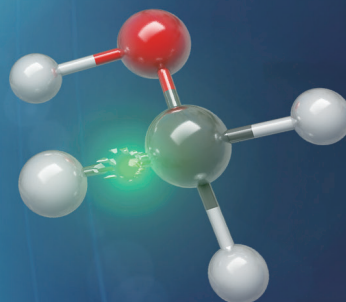
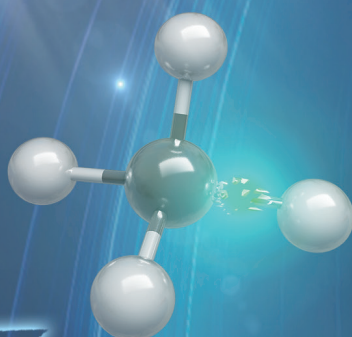
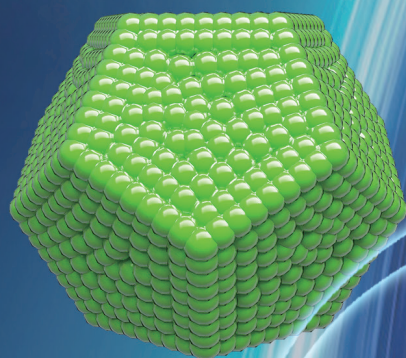
# 物理化学学报

ACTA PHYSICO-CHIMICA SINICA

第35卷 Vol. 35 No. 9 2019

第9期

碳氢键活化专刊  
C-H Activation  
Guest Editor: Chao-Jun Li (李朝军)



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中国化学会、北京大学主办  
北京大学化学学院物理化学学报编辑部出版

万方数据

物理化学学报

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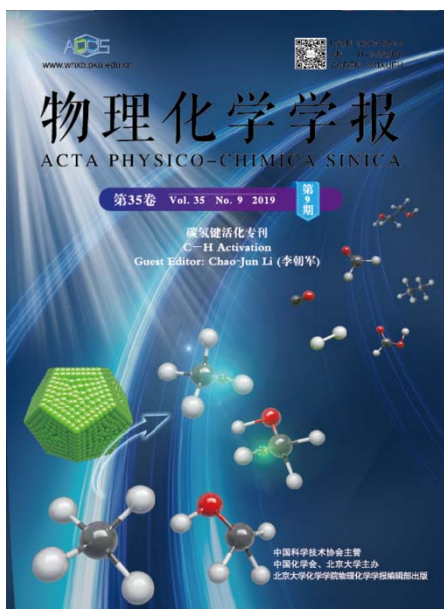
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COVER



The cover image presents the activation of C—H bond in methane and methanol *via* light irradiation. On page 923, Zhang *et al.* summarize the recent progress in the photocatalytic conversion of methane and methanol, and discuss the perspectives and challenges for further research.

CONTENTS

专访 SPOTLIGHT

专访全球绿色化学代表人物：李朝军院士(Interview with the Leader of Global Green Chemistry: Academician Chao-Jun Li) ..... 《物理化学学报》编辑部(Editorial Office of Acta Physico-Chimica Sinica) (903)

前言 PREFACE

C—H Activation ..... LI Chao-Jun (905)

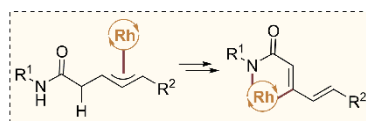
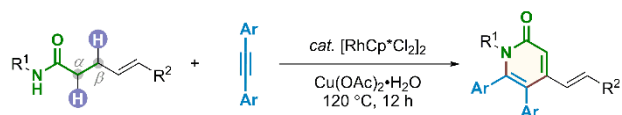
通讯 COMMUNICATION

基于双重碳氢活化的  $\gamma,\delta$ -不饱和酰胺与炔烃的脱氢环化反应

王珍, 李恩, 和志奇, 陈杰安, 黄湧

Dehydrogenative Annulation of  $\gamma,\delta$ -Unsaturated Amides and Alkynes *via* Double C—H Activation

WANG Zhen, LI En, HE Zhiqi, CHEN Jiean, HUANG Yong



- cascade transformation
- enhanced  $\alpha$ -acidity by a Rh-ally species
- readily available amides
- dehydrogenative annulation

A streamlined double C—H activation of  $\gamma,\delta$ -unsaturated amides was achieved *via* a Rh-mediated reaction cascade, and used in the synthesis of polysubstituted pyridones.

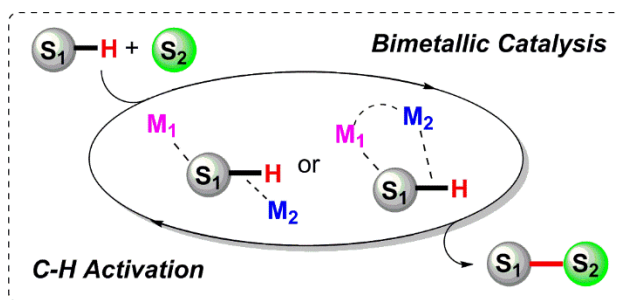
Acta Phys. -Chim. Sin. 2019, 35 (9), 906–912

双金属促进的均相碳氢键活化反应

胡媛媛, 王从洋

Bimetallic C—H Activation in Homogeneous Catalysis

HU Yuanyuan, WANG Congyang



The reactivity and selectivity in C—H activation reactions rely heavily on the use of directing groups and acidic reactive sites. This unique bimetallic synergy enables various regio- and stereoselective C—H activation reactions.

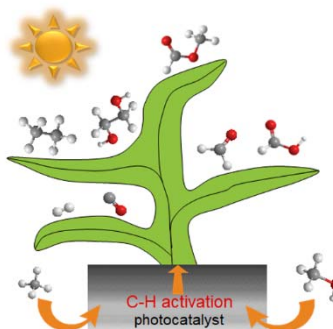
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 913–922

甲烷/甲醇光催化转化研究进展

张舒怡, 鲍静娴, 吴博, 钟良枢, 孙予罕

Research Progress on the Photocatalytic Conversion of Methane and Methanol

ZHANG Shuyi, BAO Jingxian, WU Bo, ZHONG Liangshu, SUN Yuhuan



Photocatalysis provides a promising route for the efficient and highly selective conversion of methane/methanol under mild reaction conditions.

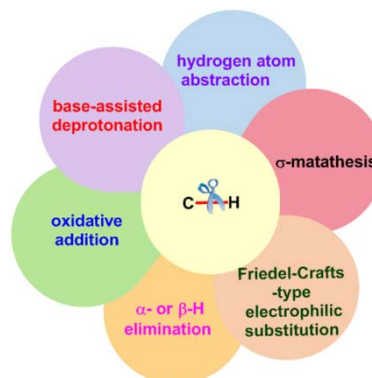
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 923–939

过渡金属参与 C—H 键切断模式的理论研究进展

单春晖, 白若鹏, 蓝宇

Theoretical Advances of Transition Metals Mediated C—H Bonds Cleavage

SHAN Chunhui, BAI Ruopeng, LAN Yu



This review summarized recent advances in the mechanistic study of transition metals mediated C—H bond cleavage from theoretical perspective.

*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 940–953

C—H 官能化构建硫醚

陈世豪, 王明, 姜雪峰

C—H Functionalization Strategies for the Construction of Thioethers

CHEN Shihao, WANG Ming, JIANG Xuefeng



The review covers the development of thioether construction via C—H functionalization.

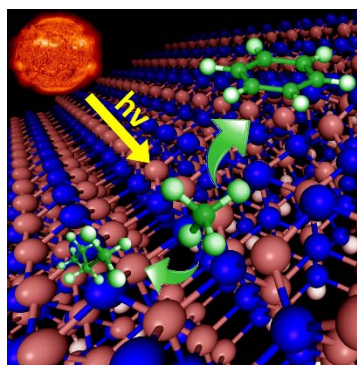
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 954–967

## 室温光驱动甲烷活化

母晓玥, 李路

### Photo-Induced Activation of Methane at Room Temperature

MU Xiaoyue, LI Lu



The photocatalytic conversion of methane to other more valuable organic derivatives and hydrogen under mild conditions was reviewed.

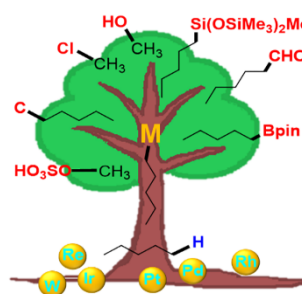
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 968–976

## 普通烷烃 C—H 键的活化官能化

赵梦迪, 陆文军

### Alkanes Functionalization via C—H Activation

ZHAO Mengdi, LU Wenjun



The functionalization of alkyl  $sp^3$ C—H bonds is described through electrophilic activation or oxidative addition by using transition-metal catalysts.

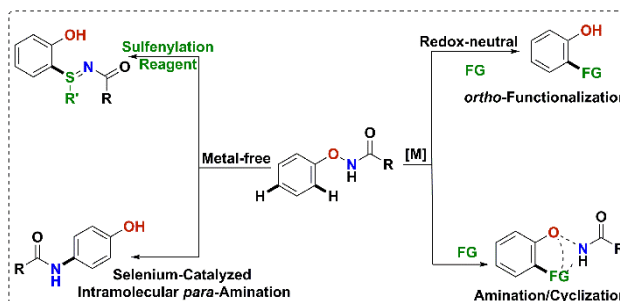
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 977–988

## 多功能氧酰胺导向基在碳氢键活化反应中的研究进展

朱月路, 赵鑫阳, 吴谦, 陈颖, 赵劲

### Research Advances in C—H Bond Activation of Multitasking *N*-Phenoxyamides

ZHU Yuelu, ZHAO Xinyang, WU Qian, CHEN Ying, ZHAO Jing



This minireview summarizes the reaction mechanism of the reported O—NHCOR directed C—H activation/functionalization reactions.

*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 989–1004

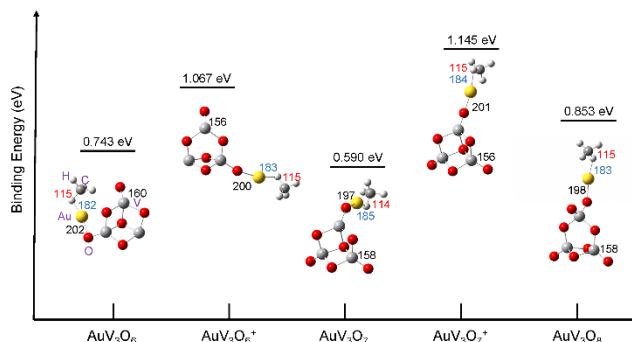
## 论文 ARTICLE

## 单个金或银原子掺杂的氧化钒团簇上的甲烷活化反应

王丹, 丁迅雷, 廖珩璐, 戴佳钰

### Methane Activation on (Au/Ag)<sub>1</sub>-Doped Vanadium Oxide Clusters

WANG Dan, DING Xunlei, LIAO Henglu, DAI Jiayu



Theoretical calculations reveal five Au<sub>1</sub>-containing clusters, which can activate methane, mimicking the single-atom catalysts of Au<sub>1</sub> on vanadia.

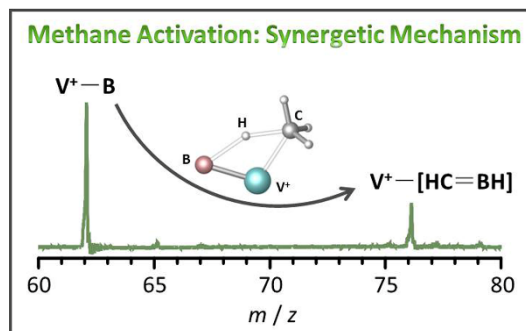
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 1005–1013

## 钒硼双原子阳离子活化甲烷研究

陈强, 姜利学, 李海方, 陈娇娇, 赵艳霞, 何圣贵

### Thermal Activation of Methane by Diatomic Vanadium Boride Cations

CHEN Qiang, JIANG Li-Xue, LI Hai-Fang,  
CHEN Jiao-Jiao, ZHAO Yan-Xia, HE Sheng-Gui



The  $\text{VB}^+$  ion can activate and transform methane under thermal collision conditions. The V-B unit synergistically participates in the initial C-H bond activation.

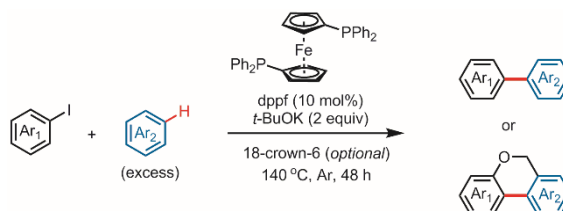
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 1014–1020

## 1,1'-双(二苯基膦基)二茂铁介导的芳烃碳氢键芳基化反应制备联芳基骨架

王庆兵, 郭政伟, 陈弓, 何刚

### DPPF-Mediated C-H Arylation of Arenes with Aryl Iodides for Synthesis of Biaryl Linkages

WANG Qingbing, GUO Zhengwei, CHEN Gong,  
HE Gang



A DPPF-mediated process for C-H arylation of unactivated arenes with aryl iodides was developed for the synthesis of biaryl linkages.

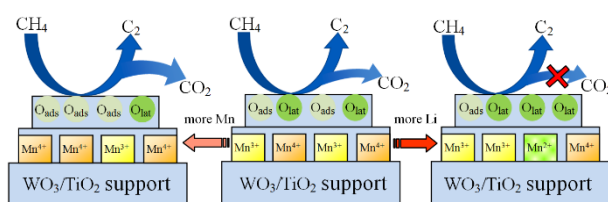
*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 1021–1026

## 固体酸 $\text{WO}_3/\text{TiO}_2$ 负载锂锰催化剂组成对其甲烷氧化偶联反应性能的影响

程飞, 杨建, 闫亮, 赵军, 赵华华, 宋焕玲,  
丑凌军

### Influence of the Composition/Texture of Solid Acid $\text{WO}_3/\text{TiO}_2$ -Supported Lithium-Manganese Catalysts on the Oxidative Coupling of Methane

CHENG Fei, YANG Jian, YAN Liang, ZHAO Jun,  
ZHAO Huahua, SONG Huanling, CHOU Lingjun



Li and Mn alter the Mn valence state, basicity, and oxygen property of catalysts, which control the reaction performance.

*Acta Phys. -Chim. Sin.* **2019**, 35 (9), 1027–1036