ISSN 0567-7351
CN 31-1320/O6
CODEN HHHPA4
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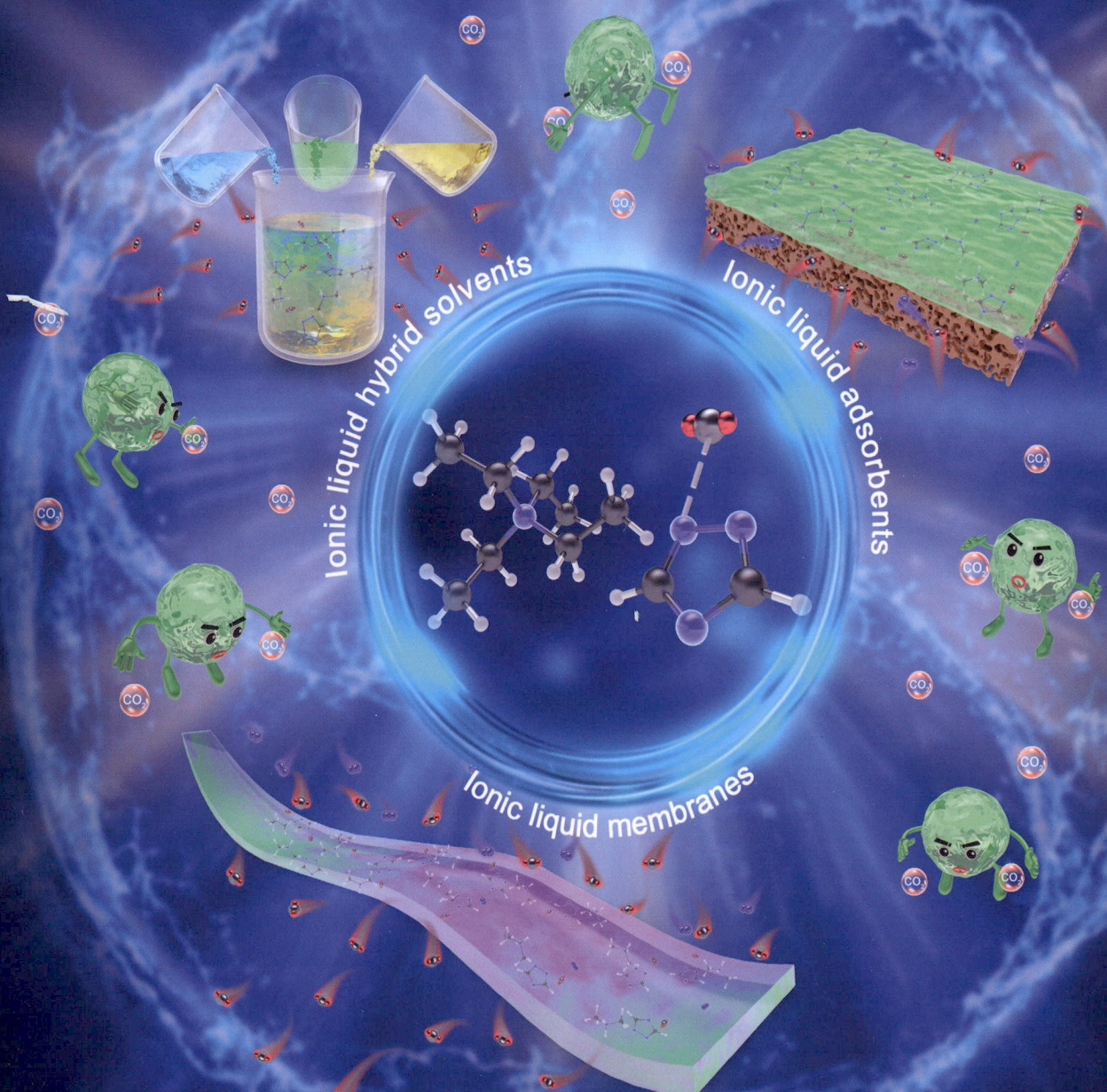
化学学报

ACTA CHIMICA SINICA

Volume 81 Number 6 June 2023



ISSN 0567-7351
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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

化 学 学 报

Acta Chimica Sinica

(Huaxue Xuebao)

第 81 卷　第 6 期　2023 年 6 月 15 日

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研究通讯

研究论文

综述

* 通信联系人.

ACTA CHIMICA SINICA

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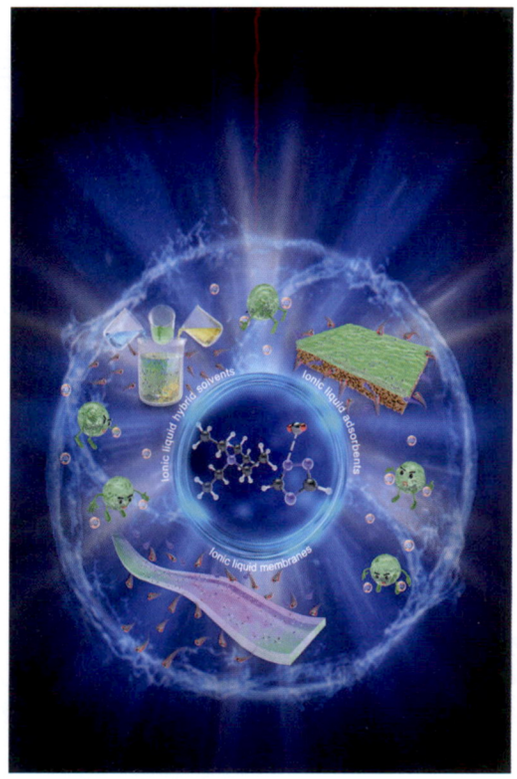
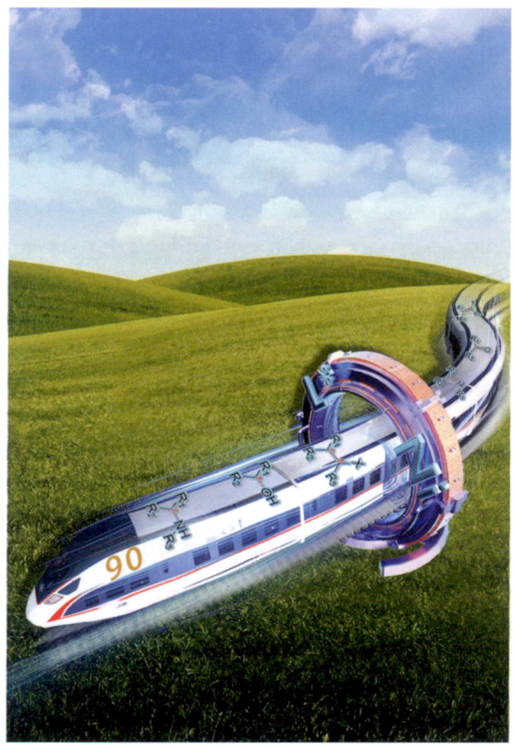


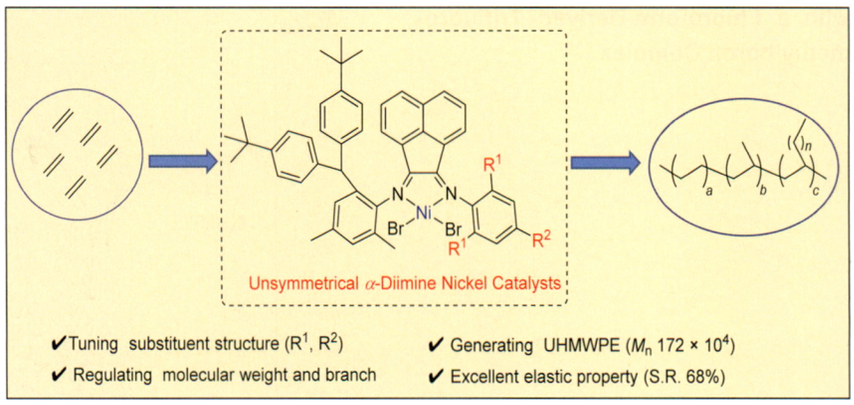
On the front cover: Various types of functionalized ionic liquid-based materials including pure ionic liquids, ionic liquid hybrid solvents, ionic liquid modified adsorbents and membranes for enhancing CO_2 capture and separation owing to special interaction between ionic liquids and CO_2 molecules in recent five years are summarized. [Zhang, Suojiang *et al.* on page 627-645.]



On the back cover: Similar to China's modern high-speed rail, nickel-catalyzed asymmetric hydrogenation for the construction of chiral C—X bonds is efficient, economical, and environmentally friendly. [Zhang, Wanbin *et al.* on page 646-656.]

Communication

Catalytic Synthesis of Polyolefin Elastomer Using Unsymmetrical α-Diimine Nickel Catalyst

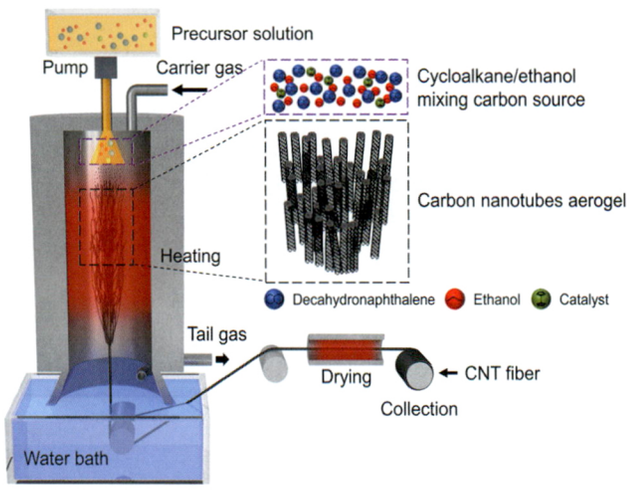


Wang, Zihao; Chen, Min*; Chen, Changle*

Acta Chim. Sinica **2023**, *81*(6), 559-564

A series of unsymmetrical α-diimine nickel catalysts with different steric effects were prepared and we explored their catalytic performance in ethylene polymerization.

Continuous Preparation of High-performing Carbon Nanotube Fibers Based on Cycloalkane/ethanol Mixing Carbon Source

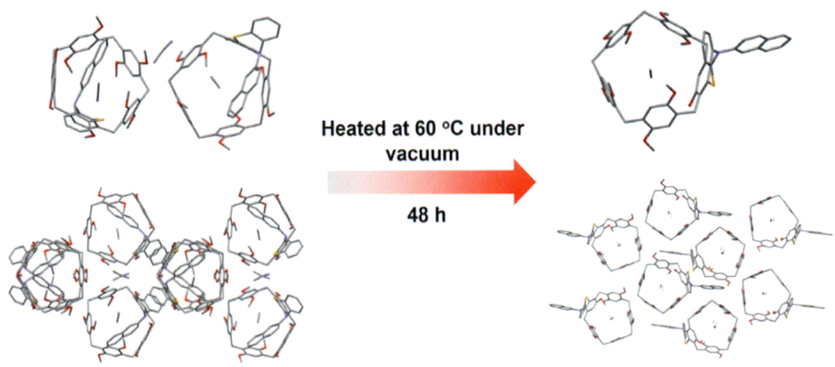


Zhao, Tiancheng; Jiang, Hongyu; Zhang, Kun; Xu, Yifan; Kang, Xinyue; Xu, Jiancheng; Zhou, Xufeng; Chen, Peining*; Peng, Huisheng*

Acta Chim. Sinica **2023**, *81*(6), 565-571

Through floating catalyst chemical vapor deposition method, high-performing carbon nanotube fibers are continuously prepared by using decahydronaphthalene/ethanol mixing carbon source. The relationships between preparation parameters and mechanical/electrical performances of carbon nanotube fibers are carefully studied. The application of carbon nanotube fibers in fiber-shaped lithium-carbon dioxide battery is also demonstrated.

Synthesis and Characterization of a Novel Pillar[5]arene That can Undergo Single-Crystal-to-Single-Crystal (SCSC) Transformation

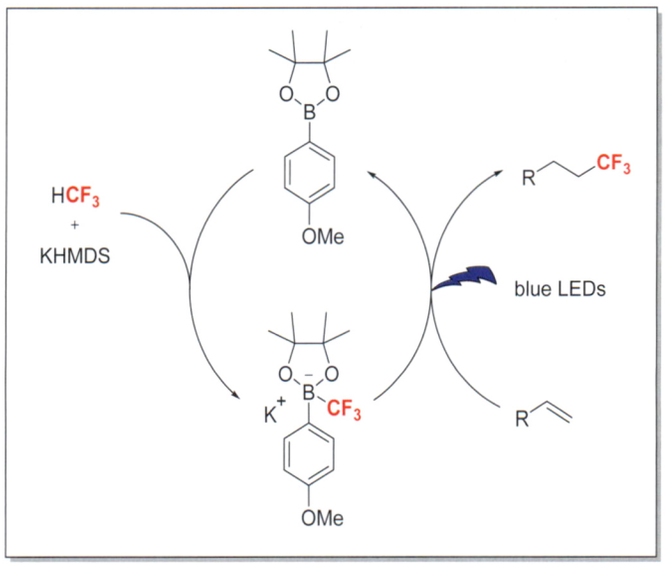


Ma, Changshun; Jin, Weihang; Tong, Fei; Gu, Ruirui*; Qu, Dahui*

Acta Chim. Sinica **2023**, *81*(6), 572-576

A novel skeletally functionalized pillar[5]arene has been developed, which exhibits thermal stimulus-responsive properties and can undergo a single-crystal-to-single-crystal (SCSC) transformation upon heating. Both the molecular conformation and stacking mode of the crystal undergo significant changes during this transformation.

Hydrotrifluoromethylation of Alkenes with a Fluoroform-Derived Trifluoromethylboron Complex

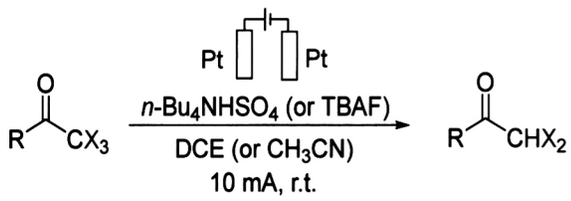


Li, Fei; Ding, Huili; Li, Chaozhong*

Acta Chim. Sinica **2023**, *81*(6), 577-581

The photoredox-catalyzed hydrotrifluoromethylation of alkenes with a fluoroform-derived trifluoromethylboron complex under redox-neutral conditions is reported, and the arylboronic acid pinacol ester generated from the reaction can be recycled.

Research on Selective Dehalogenation of *α*,*α*,*α*-Trihalogen (Chloro, Bromo) methyl Ketones Under Electrochemical Conditions



X = Br, Cl

R = aromatic, aliphatic, heterocyclic

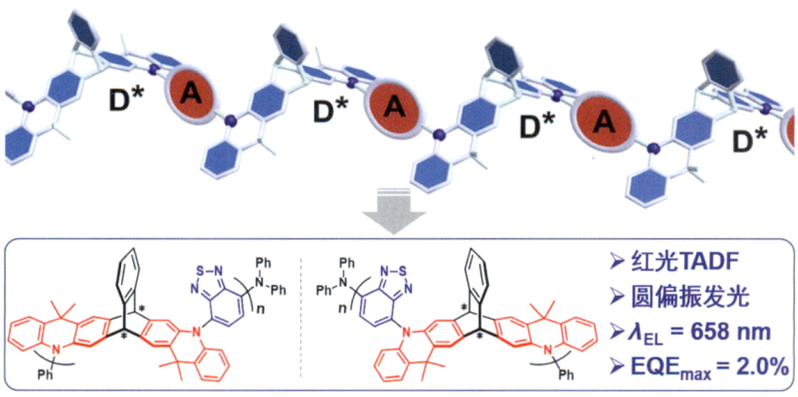
Nuermaimaiti, Kanbinuer; Wang, Chao; Luo, Shi-wei*; Abulikemu, Abudu Rexit*

Acta Chim. Sinica **2023**, *81*(6), 582-587

The selective dehalogenation of *α*,*α*,*α*-trihalogen (chloro, bromo) methyl ketones under electrochemical conditions was studied, and 17 kinds of *α*,*α*-dibromomethyl ketones and 17 kinds of *α*,*α*-dichloromethyl ketones were prepared with the highest yield of 92%. The reaction has the advantages of mild conditions, simple operation and high tolerance of functional groups.

Article

Chiral Triptycene-Based Red Thermally Activated Delayed Fluorescence Polymers and Their Organic Light-Emitting Diodes

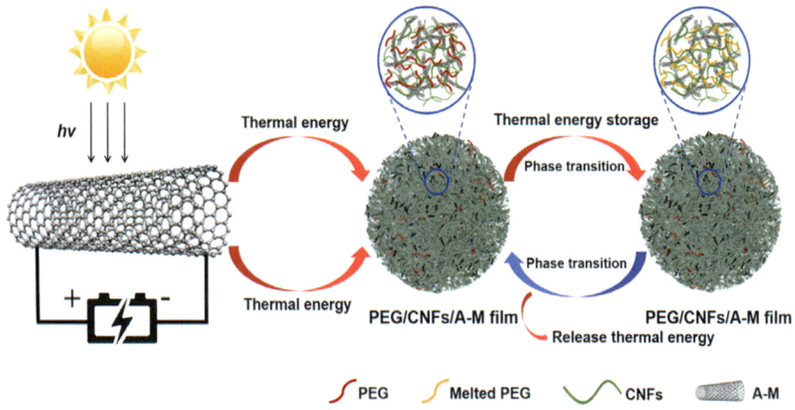


Wang, Yinfeng; Li, Meng*; Chen, Chuanfeng*

Acta Chim. Sinica **2023**, *81*(6), 588-594

By using chiral electron donor-acceptor (D*-A) copolymerization strategy, a pair of chiral triptycene-based red thermally activated delayed fluorescence (TADF) polymers were obtained, and they displayed TADF, circularly polarized luminescence (CPL) and red λ_{EL} at 658 nm with EQE_{max} of 2.0%.

Preparation and Properties of Flexible Phase Change Composite Films with Photo/electric-thermal Conversion

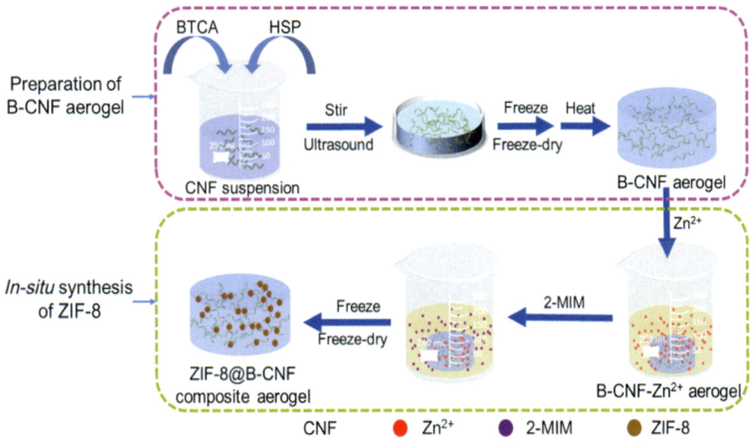


Wang, Wentao*; Geng, Weiwei; Guo, Xiaolong; Wang, Kanghui; Yao, Yuyuan; Ding, Liming*

Acta Chim. Sinica **2023**, *81*(6), 595-603

Flexible phase change composite films were prepared with polyethylene glycol as phase change component, carboxyl cellulose nanofibers as supporting material, and acid-treated multi-walled carbon nanotubes (A-M) as light absorber, thermal and electrical conductive filler. The films had high enthalpy (>100 $J \cdot g^{-1}$), good thermal stability and flexibility that could be folded and bent arbitrarily. What's more, the film with 7% (*w*) of A-M could achieve a photo-thermal conversion efficiency of 90.01% and an electric-thermal conversion efficiency of 64.71%.

Preparation and Adsorption Properties of ZIF-8@B-CNF Composite Aerogel

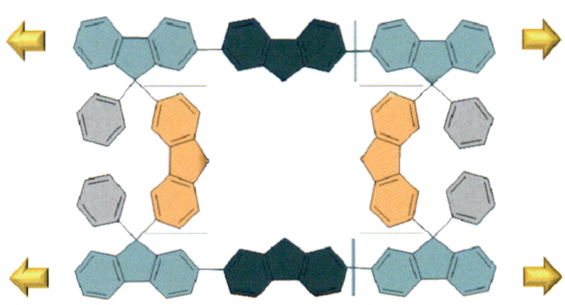


Wang, Kaiqing; Yuan, Shuo; Xu, Wangdong; Huo, Dan; Yang, Qiulin*; Hou, Qingxi*; Yu, Dehai

Acta Chim. Sinica **2023**, *81*(6), 604-612

Cellulose nanofibrils (CNF) were chemically cross-linked with 1,2,3,4-butane tetracarboxylic acid (BTCA) and freeze-dried to obtain aerogel. The aerogel was fully esterified to prepare aerogel B-CNF, then Zn^{2+} and 2-methylimidazole were synthesized *in situ* on its surface. Finally, ZIF-8@B-CNF composite aerogel was successfully prepared, which had an excellent adsorption property on the methylene blue (MB).

A Theoretical Study on the Effective Reduction of Internal Reorganization Energy Based on the Macrocyclic Structure of Fluorene

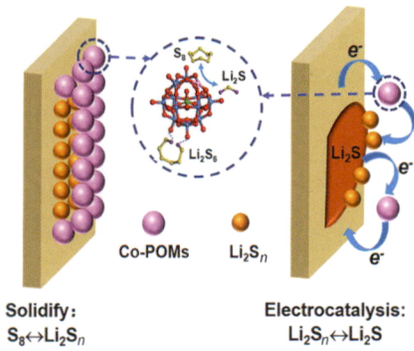


Yang, Lei; Ge, Jiaoyang; Wang, Fangli; Wu, Wangyang; Zheng, Zongxiang; Cao, Hongtao; Wang, Zhou; Ran, Xueqin*; Xie, Linhai*

Acta Chim. Sinica **2023**, *81*(6), 613-619

The electron reorganization energy of a macrocyclic molecule designed based on 9-phenylfluorene was reduced by about 0.018～0.134 eV, and the hole reorganization energy was reduced by about 0.029～0.21 eV.

Cobalt-Substituted Polyoxometalates as Soluble Mediators to Boost the Lithium-sulfur Battery Performance



Li, Ziqi; Liu, Liwei; Mao, Chenghui; Zhou, Changkai; Xia, Minqi; Shen, Zhen; Guo, Yue; Wu, Qiang*; Wang, Xizhang; Yang, Lijun; Hu, Zheng*

Acta Chim. Sinica **2023**, *81*(6), 620-626

Cobalt-substituted polyoxometalates are used as the soluble mediator of Li-S batteries, which can solidify soluble polysulfides by chemical adsorption of abundant Lewis acid-base sites and promote the reversible conversion of $S_8 \leftrightarrow Li_2S$ by electrocatalysis simultaneously, leading to the effectively suppressed shuttle and polarization effects, and thereby the improved performance.

Review

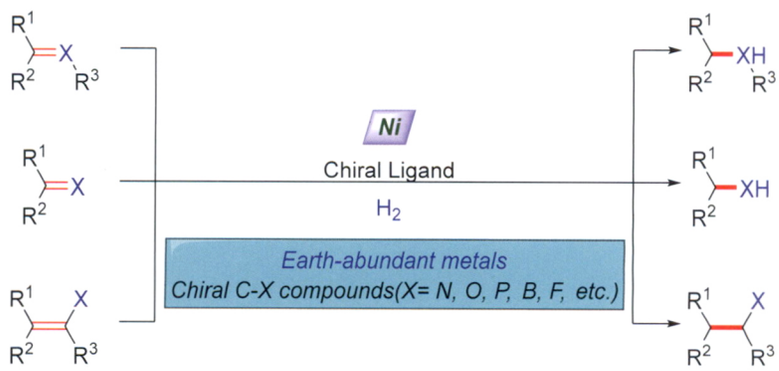
Research Progress of CO_2 Capture and Separation by Functionalized Ionic Liquids and Materials

Zeng, Shaojuan; Sun, Xueqi; Bai, Yinge; Bai, Lu; Zheng, Shuang; Zhang, Xiangping; Zhang, Suojiang*

Acta Chim. Sinica **2023**, *81*(6), 627-645

The amino and non-amino functionalized ionic liquids, ionic liquid hybrid solvents, ionic liquid modified adsorbents and membranes for CO_2 capture and separation were summarized.

Development of Construction of Chiral C—X Bonds through Nickel Catalyzed Asymmetric Hydrogenation

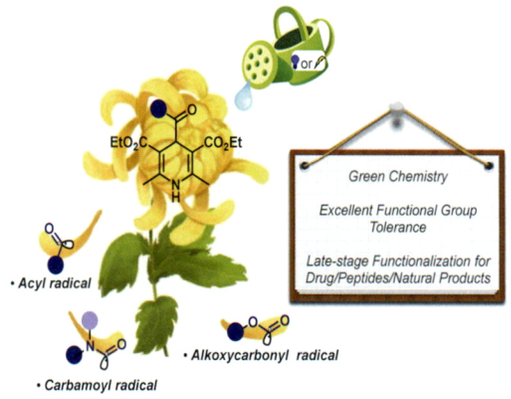


Cai, Xinhong; Chen, Jianzhong*; Zhang, Wanbin*

Acta Chim. Sinica **2023**, *81*(6), 646-656

Transition metal-catalyzed asymmetric hydrogenation is one of the most attractive strategies for the construction of chiral C—X bonds. As a prominent trend in modern organic chemistry, earth-abundant transition metals used in asymmetric hydrogenation to replace rare metals has attracted extensive attention due to their abundant reserves, low toxicity, and environmental friendliness. The article will review the latest research in the earth-abundant transition metal Ni-catalyzed asymmetric hydrogenation under hydrogen conditions for preparation of compounds with chiral C—X bonds.

Research Progress in Organic Reactions Involving 4-Acyl/Carbamoyl/Alkoxycarbonyl Substituted Hantzsch Esters

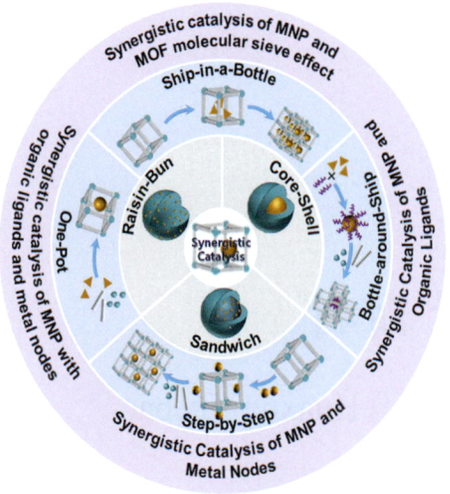


Liu, Li; Zheng, Gang; Fan, Guoqiang; Du, Hongguang*; Tan, Jiajing*

Acta Chim. Sinica **2023**, *81*(6), 657-668

4-Acyl/carbamoyl/alkoxycarbonyl substituted Hantzsch esters have emerged as a novel class of radical reservoirs, which displayed unique reactivities under photochemical and electrochemical conditions.

Research Progress on the Preparation of Metal-Organic Frameworks Encapsulated Metal Nanoparticle Composites and Their Catalytic Applications

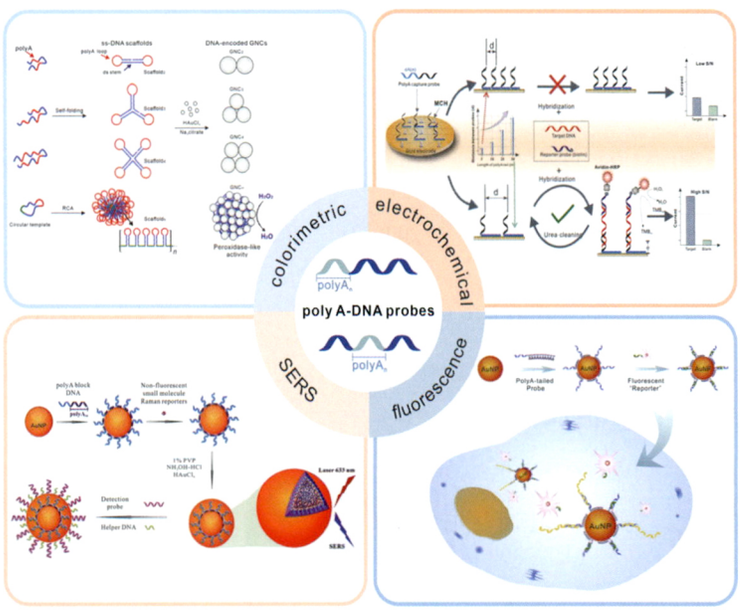


Zheng, Fengbin; Wang, Kun; Lin, Tian; Wang, Yinglong*; Li, Guodong*; Tang, Zhiyong*

Acta Chim. Sinica **2023**, *81*(6), 669-680

The recent research progress on the preparation methods of metal nanoparticles encapsulated by metal-organic frameworks (MOFs) and their catalytic applications in terms of synergy among metal nanoparticles, pore structure, organic ligands or/and metal nodes of MOFs are summarized.

Poly-adenine-based DNA Probes and Their Applications in Biosensors



Li, Lanying; Tao, Qing; Wen, Yanli; Wang, Lele; Guo, Ruiyan; Liu, Gang*; Zuo, Xiaolei*

Acta Chim. Sinica **2023**, *81*(6), 681-690

The polyA-DNA probes are uniquely difunctional with the capability of both anchoring and recognition, which have been applied in various biosensors, including colorimetric biosensors, fluorescence biosensors, surface-enhanced Raman scattering (SERS) biosensors and electrochemical biosensors.

ISSN 0567-7351
CN 31-1320/O6
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90 Years 1933-2023

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ACTA CHIMICA SINICA

Volume 81 Number 6 June 2023

中国化学会
中国科学院上海有机化学研究所 主办

中国标准连续出版物号：ISSN 0567-7351 CN 31-1320/O6 国内邮发代号：4-209 国外发行代号：M56