

Chemistry Authors Up Close

New Amines and Activation Modes in Asymmetric Aminocatalysis

Zhi-Chao Chen, Wei Du, and Ying-Chun Chen*

Chin. J. Chem. **2021**, *39*, 1775–1786. DOI: 10.1002/cjoc.202100018

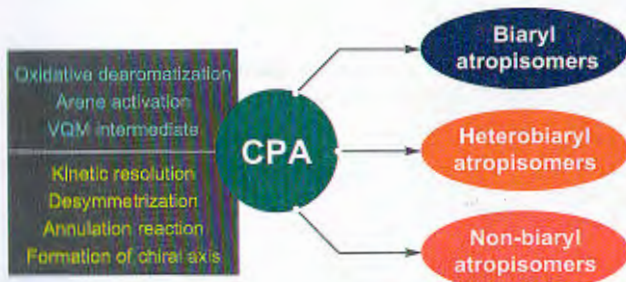


Asymmetric aminocatalysis has become one of the most powerful strategies for the transformations of carbonyl substances over the past two decades. Here, we describe the research from our laboratory that significantly expands the horizon of aminocatalysis. It includes the development and application of cinchona-based primary amines, fruitful reactions based on HOMO-raising strategy, and the disclosure of amine/thiol double activation catalysis.

Chiral Phosphoric Acid Catalyzed Asymmetric Synthesis of Axially Chiral Compounds

Bing-Chao Da, Shao-Hua Xiang, Shaoyu Li, and Bin Tan*

Chin. J. Chem. **2021**, *39*, 1787–1796. DOI: 10.1002/cjoc.202000751

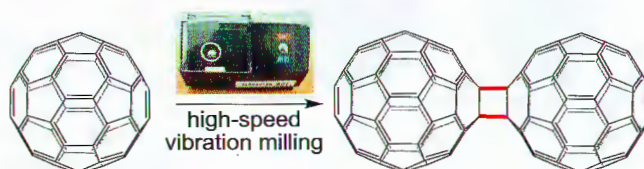


The well-defined conformational properties of axially chiral compounds bring extraordinary values to an assortment of bioactive molecules, advanced materials, organocatalysts as well as chiral ligands in asymmetric transformations. The demonstrated usefulness and untapped potential of axially chiral structural motifs stimulate increasing efforts to develop novel and efficient approaches for their preparation. In this regard, the chiral phosphoric acids broadly used in asymmetric Brønsted acid catalysis have shown high relevance for atroposelective synthesis as well. Our strong interest in reaction chemistry of atropisomers has established a rewarding research programme in our group. The course of studies will be recounted in this account, with discussion focused on the use of chiral phosphoric acids to catalyze construction of several key axially chiral structures such as BINAM, BINOL, NOBIN, arylquinones, SPINOL, arylpyrrole analogues and axially chiral alkenes.

Fullerene Mechanochemistry: Serendipitous Discovery of Dumb-Bell-Shaped C_{120} and Beyond

Guan-Wu Wang*

Chin. J. Chem. **2021**, *39*, 1797–1803. DOI: 10.1002/cjoc.202100085

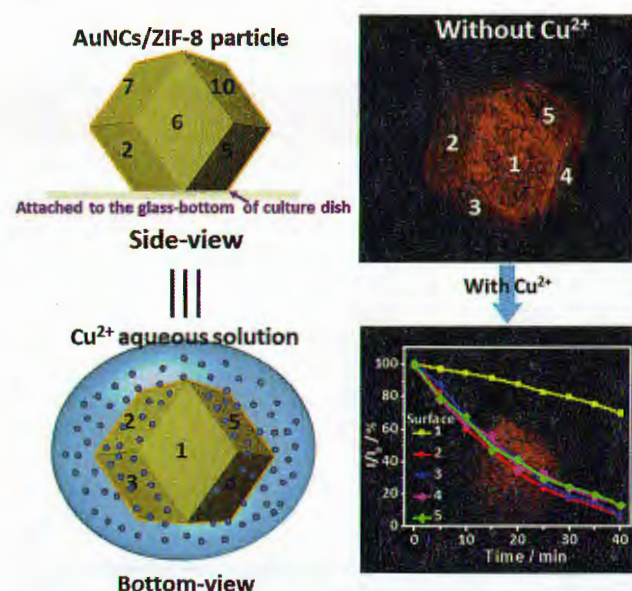


The serendipitous discovery of dumb-bell-shaped C_{120} under high-speed vibration milling conditions is described. The mechanochemical synthesis of encapsulated C_{120} , the cross-dimer C_{130} , trimer C_{180} , bridged C_{60} dimers and other molecules is presented.

Concise Reports

Single Particle-Based Confocal Laser Scanning Microscopy for Visual Detection of Copper Ions in Confined Space

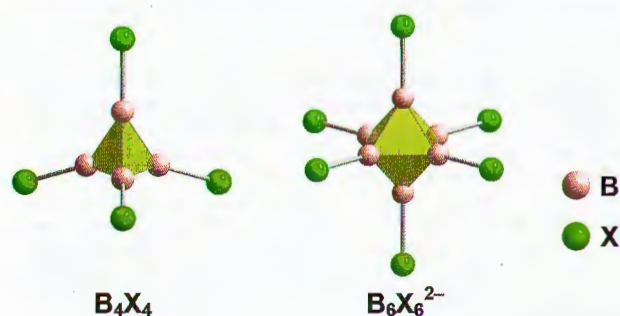
Ke Wang, Manping Qian, Honglan Qi,* Qiang Gao, and Chengxiao Zhang
Chin. J. Chem. 2021, 39, 1804–1810. DOI: 10.1002/cjoc.202000727



A single particle-based confocal laser scanning microscopy was developed for the visual detection of copper ions in confined space by using fluorescence microparticle, AuNCs/ZIF-8, which was synthesized by coating gold nanoclusters (AuNCs) onto the outer surface of zeolitic imidazolate framework-8 (ZIF-8). The synthesized AuNCs/ZIF-8 exhibits turn-off responses for Cu^{2+} via fluorescence quenching in the range of 2–15 $\mu\text{mol}\cdot\text{L}^{-1}$ with a detection limit of 0.9 $\mu\text{mol}\cdot\text{L}^{-1}$. Different distribution of AuNCs on the different surfaces of single ZIF-8 crystal and similar fluorescence quenching dynamics on the different surfaces of single AuNCs/ZIF-8 were obtained.

Understanding the Electronic Structure and Stability of $\text{B}_n\text{X}_n^{0/2-}$ ($n = 4, 6$; $\text{X} = \text{H}, \text{F}, \text{Cl}, \text{Br}, \text{I}, \text{At}, \text{Ts}$) Clusters

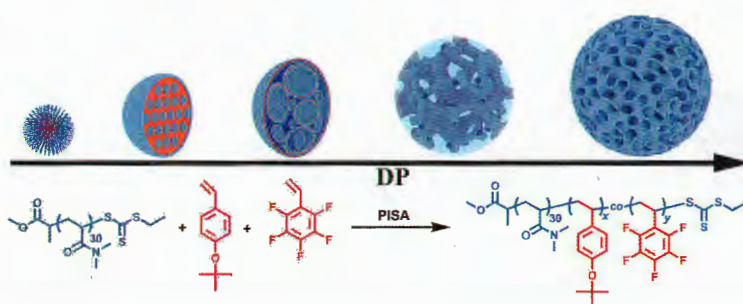
Ruo-Ya Wang, Jing-Xuan Zhang, Xue-Lian Jiang, Nana Ma, Xuenian Chen, Cong-Qiao Xu,* and Jun Li
Chin. J. Chem. 2021, 39, 1811–1818. DOI: 10.1002/cjoc.202100072



This work reveals the electronic structure and stability of $\text{B}_n\text{X}_n^{0/2-}$ ($n = 4, 6$; $\text{X} = \text{H}, \text{F}, \text{Cl}, \text{Br}, \text{I}, \text{At}, \text{Ts}$) clusters through a chemical bonding point of view.

Polymerization-Induced Self-Assembly for the Preparation of Poly(*N,N*-dimethylacrylamide)-*b*-Poly(4-*tert*-butoxystyrene-co-pentafluorostyrene) Particles with Inverse Bicontinuous Phases

Xin Luo and Zesheng An*
Chin. J. Chem. 2021, 39, 1819–1824. DOI: 10.1002/cjoc.202100134



Poly(*N,N*-dimethylacrylamide)-*b*-poly(4-*tert*-butoxystyrene-co-pentafluorostyrene) particles with inverse bicontinuous phases were prepared via polymerization-induced self-assembly (PISA). The effect of solvent composition and the degrees of polymerization of the core-forming and the stabilizer block was investigated.

Photoinduced NaI-Promoted Radical Borylation of Alkyl Halides and Pseudohalides

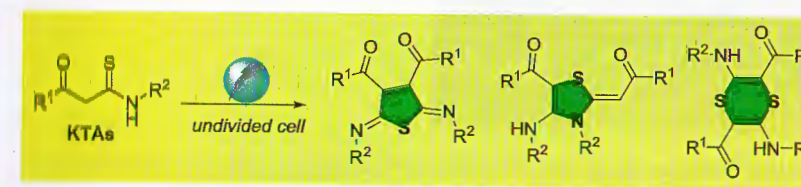
Chenglan Wang, Lu Zhou, Kai Yang, Feng Zhang, and Qiuling Song*
Chin. J. Chem. 2021, 39, 1825–1830. DOI: 10.1002/cjoc.202100115



A method for photoinduced NaI-promoted radical borylation of aliphatic halides and pseudohalides has been developed that enables synthesis of a series of alkylboronates.

Electrochemical Selective Oxidative Synthesis of Diversified Sulfur Heterocycles from β -Ketothioamides

Li-Rong Wen, Ning-Ning Wang, Wu-Bo Du, Ming-Zhe Zhu, Chao Pan, Lin-Bao Zhang,* and Ming Li*
Chin. J. Chem. 2021, 39, 1831–1837. DOI: 10.1002/cjoc.202100132



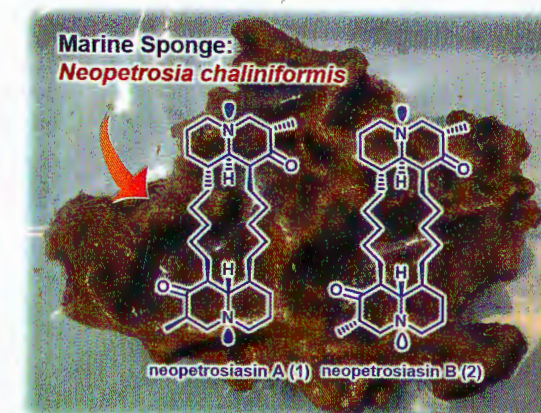
✓ metal-, oxidant-free ✓ mild condition and magnifiable ✓ multi task, multi choice

were generated through varying solvent and DABCO could enable the HAT process of this transformation.

A general and practical protocol for the construction of diversified sulfur heterocycles has been described through organic electrosynthesis means. In undivided cell, dihydrothiophenes, thiazolines and 1,4-dithiines could be easily generated from various available β -ketothioamides under metal-free and external oxidant-free conditions. The transformation underwent smoothly under mild conditions and could be easily scaled-up. Moreover, different sulfur heterocycles

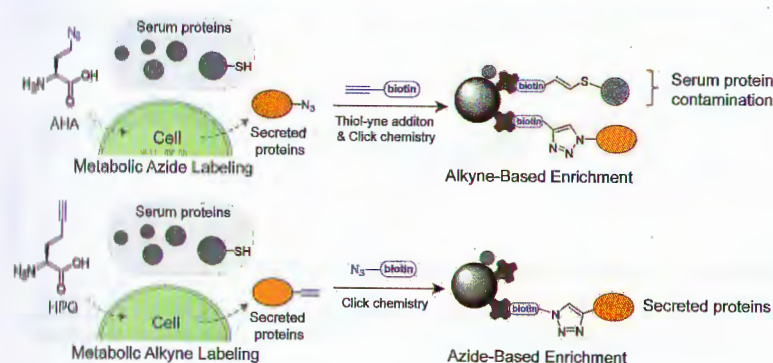
Uncommon Bis-quinolizidine Alkaloids from the Hainan Sponge *Neopetrosia chaliniformis*

Bao Chen, Xia-Juan Huan, Ze-Hong Miao, Nicole J. de Voogd, Yu-Cheng Gu, Chang-Yun Wang,* Yue-Wei Guo,* and Xu-Wen Li*
Chin. J. Chem. 2021, 39, 1838–1842. DOI: 10.1002/cjoc.202100091



Combining Metabolic Alkyne Labeling and Click Chemistry for Secretome Analysis of Serum-Containing Conditioned Medium

Jiangnan Zheng, Yuan Mao, Shun Feng,* and Ruijun Tian*
Chin. J. Chem. 2021, 39, 1843–1848. DOI: 10.1002/cjoc.202000752

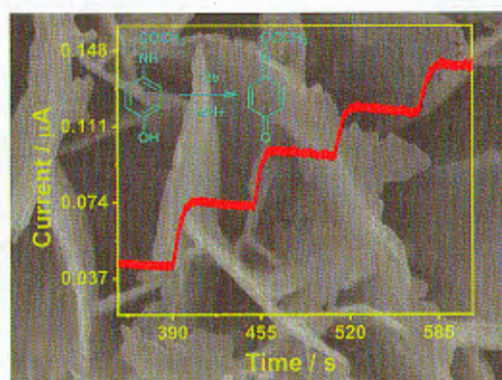


Two orientations of the azide-alkyne click chemistry mediated enrichment for secretome analysis resulted in significantly different background contaminants from serum-containing conditioned medium.

Ni₂P Nanosheets: A High Catalytic Activity Platform for Electrochemical Detection of Acetaminophen

Ming Wei, Wenbo Lu,* Guoqin Liu, Yimin Jiang, Xuebo Liu, Liwei Bai, Xiaowei Cao, Jianfeng Jia, and Haishun Wu*

Chin. J. Chem. 2021, 39, 1849–1854. DOI: 10.1002/cjoc.202100043

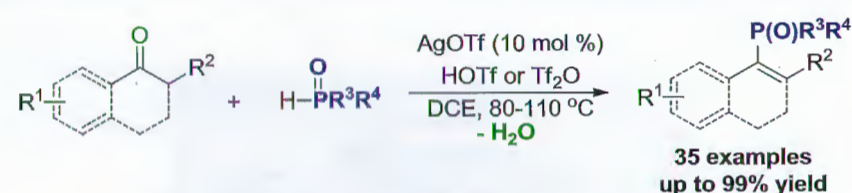


The Ni₂P nanosheets have been synthesized by two steps of hydrothermal and phosphating. The prepared Ni₂P NS can be used as an electrochemical platform to detect acetaminophen in commercial medical drugs.

Lewis Acid Enables Ketone Phosphorylation: Synthesis of Alkenyl Phosphonates

Xiao-Hong Wei,* Chun-Yuan Bai, Lian-Biao Zhao, Ping Zhang, Zhen-Hua Li, Yan-Bin Wang, and Qiong Su*

Chin. J. Chem. 2021, 39, 1855–1860. DOI: 10.1002/cjoc.202100083

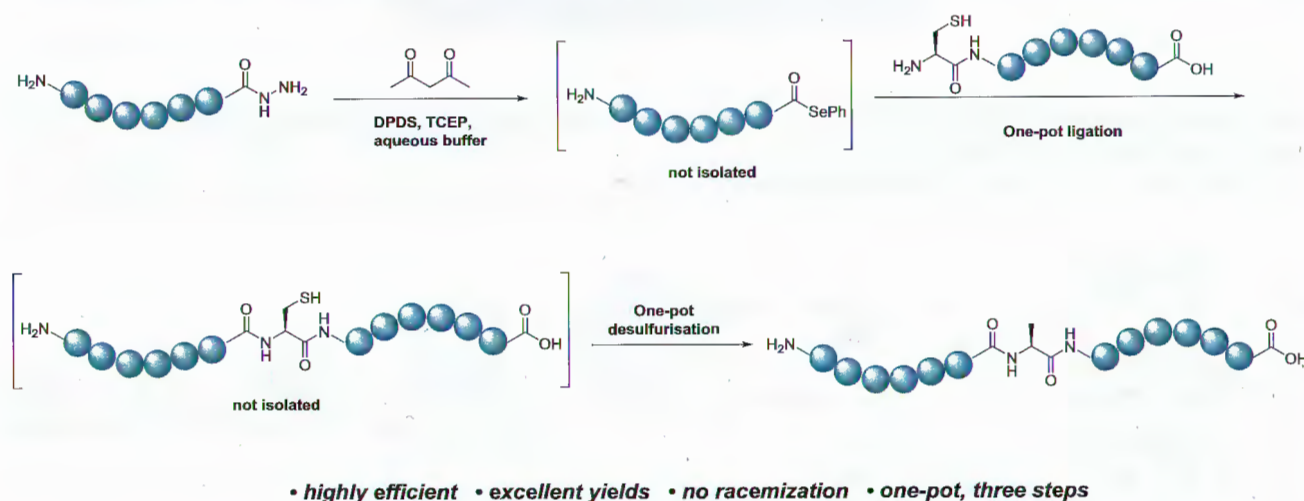


A Lewis acid catalyzed cascade reaction of ketone phosphorylation has been developed that enables synthesis of vinylphosphonate derivatives in moderate to excellent yields.

Preparation of Peptide Selenoesters from Their Corresponding Acyl Hydrazides

Yunxue Li, Jiazhi Liu, Qingqing Zhou, Jie Zhao, and Ping Wang*

Chin. J. Chem. 2021, 39, 1861–1866. DOI: 10.1002/cjoc.202100086

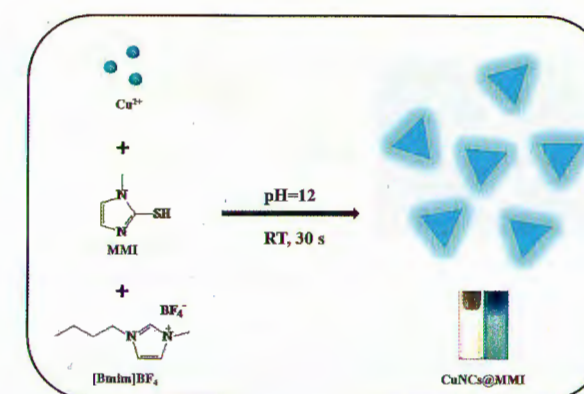


Fully-deprotected peptide acyl hydrazides can be converted into their corresponding selenoesters upon treatment with acetylacetone, tris(2-carboxyethyl)phosphine and diphenyldiselenide in aqueous buffer. This reaction enabled one-pot selenoesterification, ligation and desulfurization in the synthesis of protein targets.

Ionic Liquids-Assisted Highly Luminescent Copper Nanoclusters with Triangle Supramolecular Nanostructures

Bingyan Han,* Qin Yan, Ze Xin, Qifang Yan, and Jingmei Jiang

Chin. J. Chem. 2021, 39, 1867–1870. DOI: 10.1002/cjoc.202100012



Enzymatic Synthesis of a Diastereomer of Neoabyssomicin Derivative Using the Diels-Alderase AbyU

Wenjuan Ding, Changbiao Chi, Xiaoyi Wei, Changli Sun, Jiajia Tu, Ming Ma, Qinglian Li,* and Jianhua Ju*

Chin. J. Chem. 2021, 39, 1871–1877. DOI: 10.1002/cjoc.202100081



AbyU is shown to convert the native substrate 4 of another Diels-Alderase (DAase), AbmU, to a new abyssomicin derivative, abyssomicin 7. Abyssomicin 7 is a diastereomer of the AbmU-derived, abyssomicin 6.

Double-Coated Fe₂N@TiO₂@C Yolk-Shell Submicrocubes as an Advanced Anode for Potassium-Ion Batteries

Yichen Du, Wangsuo Weng, Zhuangzhuang Zhang, Yanan He, Jingyi Xu, Tian Yang, Jianchun Bao,* and Xiaosi Zhou*

Chin. J. Chem. 2021, 39, 1878–1884. DOI: 10.1002/cjoc.202100065

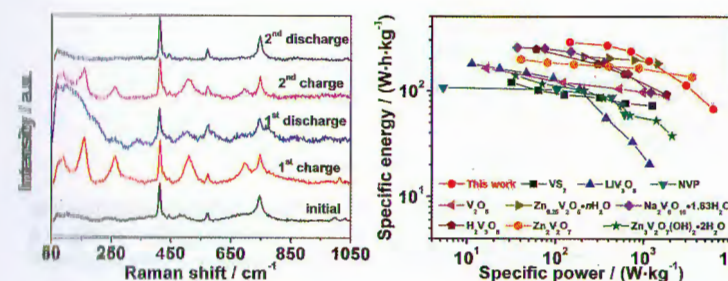


Double-shelled Fe₂N@TiO₂@C submicrocubes with porous Fe₂N yolk are successfully fabricated by a multistep templating method. Benefiting from the structural and compositional merits, the as-obtained Fe₂N@TiO₂@C yolk-shell submicrocubes deliver high specific capacity, long-term cyclability, and remarkable rate property.

Ammonium Ion and Structural Water Co-Assisted Zn²⁺ Intercalation/De-Intercalation in NH₄V₄O₁₀·0.28H₂O

Ting Zhu, Bo Mai, Ping Hu, Ziang Liu, Congcong Cai, Xuanpeng Wang, and Liang Zhou*

Chin. J. Chem. 2021, 39, 1885–1890. DOI: 10.1002/cjoc.202100004

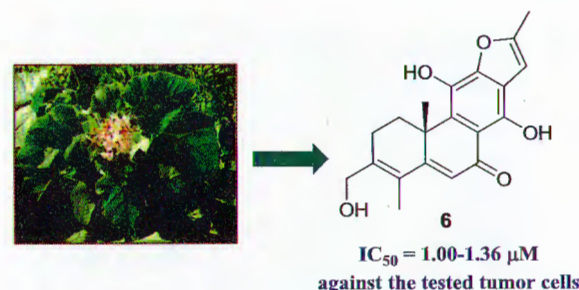


As zinc ion battery cathode material, the NH₄V₄O₁₀·0.28H₂O microflowers deliver a high discharge capacity (410 mA·h·g⁻¹ at 0.2 A·g⁻¹) and an ideal rate performance, which is significantly better than most vanadium-based materials. The *ex-situ* and *in-situ* characterizations demonstrate the impressive electrochemical performance, which can be attributed to the ammonium ion and structural water co-assisted Zn²⁺ intercalation/de-intercalation.

Clorodenoids A–F: C-ring Aromatized and/or Rearranged Abietane Diterpenoids from *Clorodendrum chinense* var. *simplex*

Jingjing Qi, Yan Zhang, Qunfang Liu, Hongchun Liu,* Yaoyue Fan,* and Jianmin Yue*

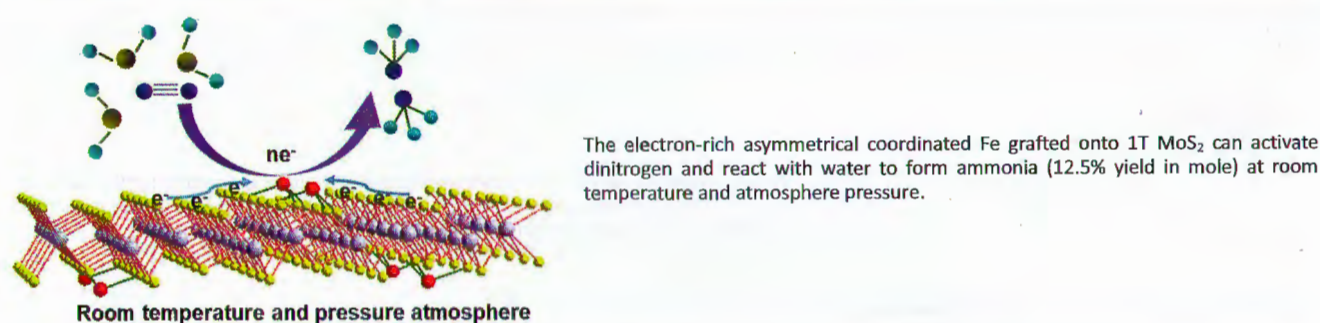
Chin. J. Chem. 2021, 39, 1891–1897. DOI: 10.1002/cjoc.202100117



Bioinspired Activation of N₂ on Asymmetrical Coordinated Fe Grafted 1T MoS₂ at Room Temperature

Jiaojiao Guo, Maoyu Wang, Liang Xu, Xiaomin Li, Asma Iqbal, George E. Sterbinsky, Hao Yang, Miao Xie, Jiantao Zai,* Zhenxing Feng,* Tao Cheng,* and Xuefeng Qian

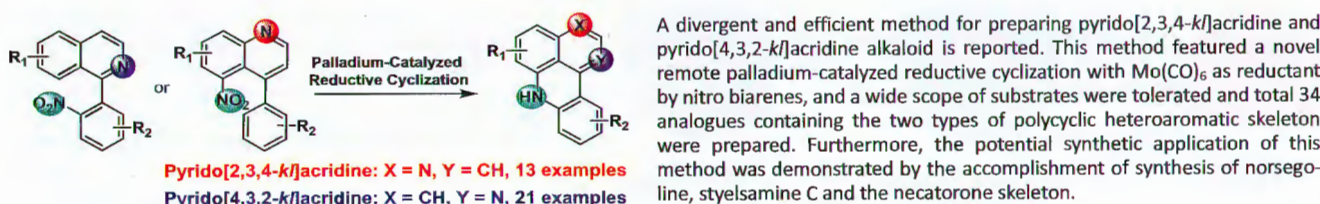
Chin. J. Chem. 2021, 39, 1898–1904. DOI: 10.1002/cjoc.202000675



Divergent Syntheses of Pyridoacridine Alkaloids via Palladium-Catalyzed Reductive Cyclization with Nitro-Biarenes

Bo Liu, Shuping Wang, Changhao Bian, Hongze Liao,* and Hou-Wen Lin*

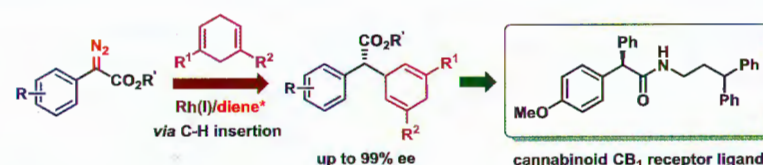
Chin. J. Chem. 2021, 39, 1905–1910. DOI: 10.1002/cjoc.202100094



Rhodium(I)-Catalyzed Enantioselective C(sp³)–H Functionalization via Carbene-Induced Asymmetric Intermolecular C–H Insertion

Bo Liu and Ming-Hua Xu*

Chin. J. Chem. 2021, 39, 1911–1915. DOI: 10.1002/cjoc.202100040

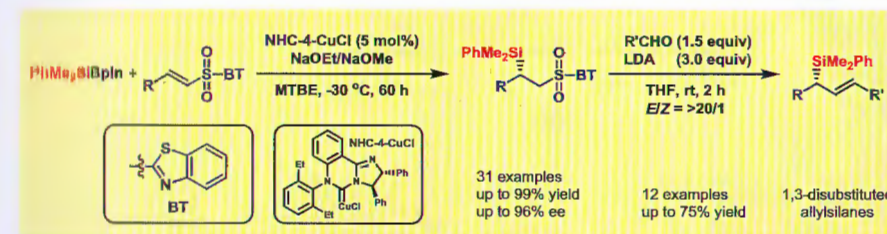


A room temperature highly enantioselective rhodium(I)-catalyzed C(sp³)–H functionalization of 1,4-cyclohexadienes with α-aryl-α-diazoacetates was accomplished by means of carbene-induced C–H insertion process using a chiral bicyclo[2.2.2]octadiene as ligand. The reaction allows access to a broad range of C–H insertion products in good yields with good to excellent enantioselectivities (up to 99% ee). By employing this protocol, a diverse variety of *gem*-diaryl-containing highly enantiomerically enriched acetates can be easily obtained.

Asymmetric Synthesis of Chiral 1,3-Disubstituted Allylsilanes via Copper(I)-Catalyzed 1,4-Conjugate Silylation of α,β-Unsaturated Sulfones and Subsequent Julia-Kocienski Olefination

Xian-Liang Wang, Xing-Hao Yin, Jun-Zhao Xiao, Xue-Shun Jia, and Liang Yin*

Chin. J. Chem. 2021, 39, 1916–1922. DOI: 10.1002/cjoc.202100101

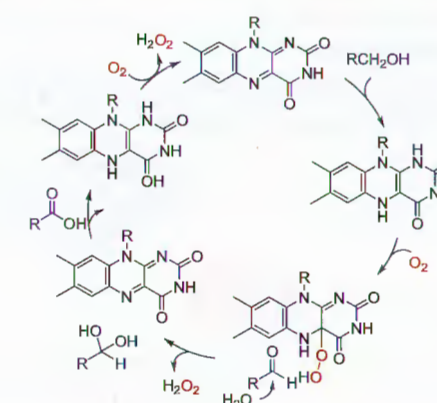


A general method for asymmetric synthesis of chiral 1,3-disubstituted allylsilanes was developed, including a new copper(I)-NHC complex-catalyzed asymmetric 1,4-conjugate silylation of α,β-unsaturated sulfones and Julia-Kocienski olefination.

Mechanistic Study of Oxidoreductase AprQ Involved in Biosynthesis of Aminoglycoside Antibiotic Apramycin

Jinxiu Wang, Suze Ma, Wei Ding, Tuo Chen,* and Qi Zhang*

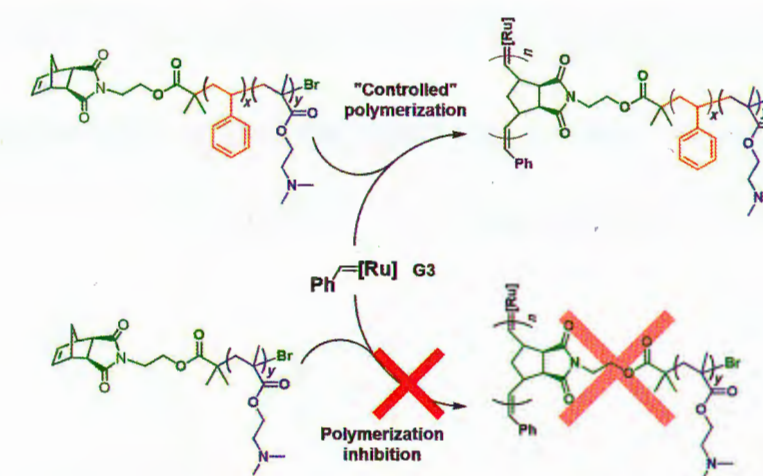
Chin. J. Chem. 2021, 39, 1923–1926. DOI: 10.1002/cjoc.202100070



From Polymerization Inhibition to Controlled Ring-Opening Metathesis Polymerization of Macromonomers with Tertiary Amine Groups: The Effect of Spacer Chain

Tengda Zhao, Kongying Zhu, Xiaoliang Yu, Xiaoyan Yuan, and Lixia Ren*

Chin. J. Chem. 2021, 39, 1927–1935. DOI: 10.1002/cjoc.202100152

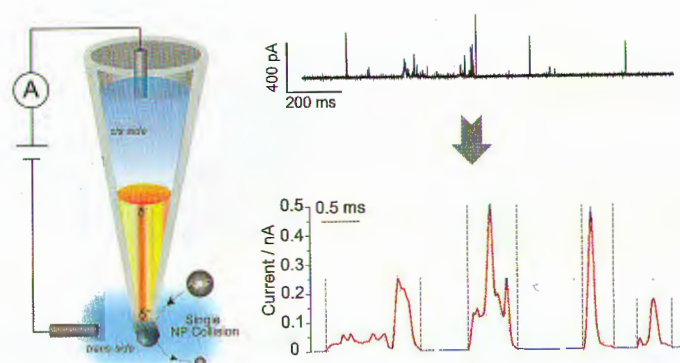


When the NB-PDMAEMA macromonomer with high density of tertiary amine groups undergoes ROMP, the third generation Grubbs catalyst is inactive due to the coordination of the tertiary amine groups with the ruthenium metal center, the polymerization is thus inhibited. Our work is to insert proper length non-coordinating spacer chain between the norbornenyl groups and the PDMAEMA chains, which changes the local environment of the ruthenium center to non-coordinating, the ROMP of the NB-PS-*b*-PDMAEMA is controlled.

An Envelope Algorithm for Single Nanoparticle Collision Electrochemistry

Chun-Yu Xu, Ru-Jia Yu,* Xue Ni, Su-Wen Xu, Xi-Xin Fu, Yong-Jing Wan,* Yi-Lun Ying, and Yi-Tao Long

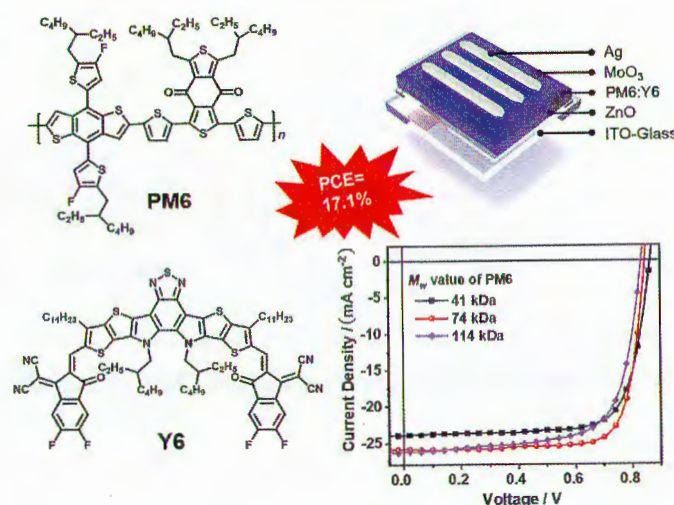
Chin. J. Chem. 2021, 39, 1936–1940. DOI: 10.1002/cjoc.202100079



Tuning Aggregation Behavior of Polymer Donor via Molecular-Weight Control for Achieving 17.1% Efficiency Inverted Polymer Solar Cells

Qi Liu, Jin Fang, Jingnan Wu, Lei Zhu, Xia Guo, Feng Liu, and Maojie Zhang*

Chin. J. Chem. 2021, 39, 1941–1947. DOI: 10.1002/cjoc.202100112

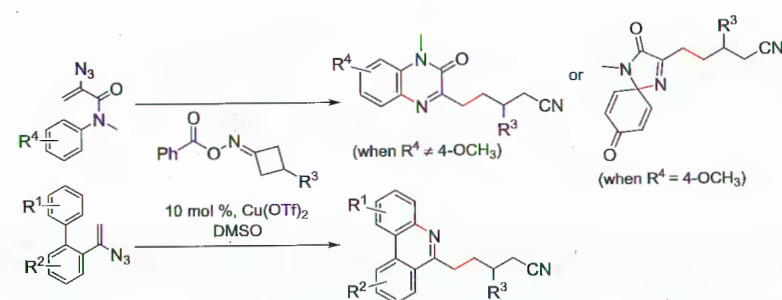


The aggregation behavior of polymer donor has profound impact on the blend film morphology and final device performance. In this work, the aggregation behavior of polymer donor was tuned by molecular weight control to form favorable three-phase system morphology. Consequently, the optimal device achieved a splendid PCE of 17.1% and FF of 78.2%.

Synthesis of Phenanthridine and Quinoxaline Derivatives via Copper-Catalyzed Radical Cyanoalkylation of Cyclobutanone Oxime Esters and Vinyl Azides

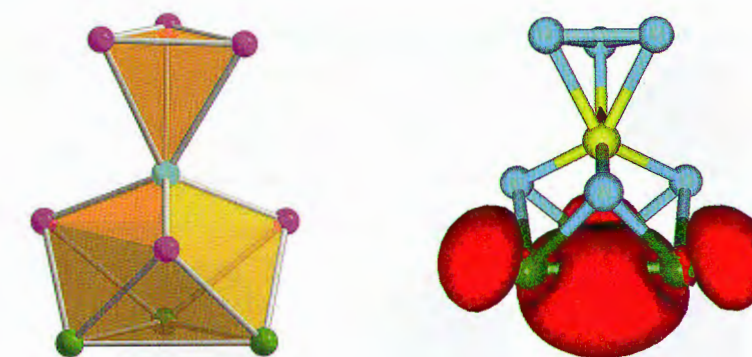
Qi Liang, Long Lin, Guodong Li, Xianqiang Kong,* and Bo Xu*

Chin. J. Chem. 2021, 39, 1948–1952. DOI: 10.1002/cjoc.202100050

[As₃M(As₃Pb₃)]³⁻ (M = Nb, Ta): Ternary Heterometallic Clusters with Early Transition Metal Atoms and Aromatic [Pb₃]²⁻

Geng-Cong Shu, Lei Qiao, Alvaro Muñoz-Castro,* and Zhong-Ming Sun*

Chin. J. Chem. 2021, 39, 1953–1957. DOI: 10.1002/cjoc.202100161

[As₃MAs₃Pb₃]³⁻ (M = Nb, Ta)

3c-2e Pb-Pb-Pb σ bond

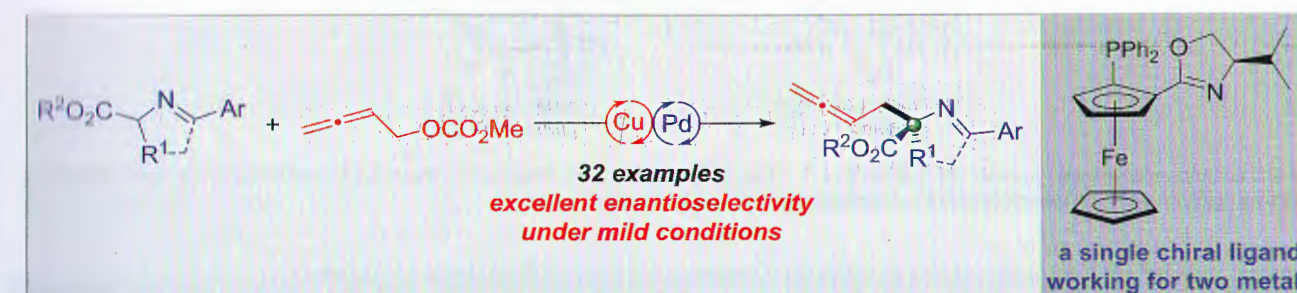
Ternary clusters [As₃MAs₃Pb₃]³⁻ (M = Nb, Ta), directly extracted from quaternary intermetallic solid K₈MPbAs₅, are made up of electron-deficient transition atoms, an As₃ triangle and a hypho As₃Pb₃ unit. The σ-aromaticity of the [Pb₃]²⁻ unit was demonstrated by DFT calculations.

Comprehensive Reports

One Stone Two Birds—Enantioselective Bimetallic Catalysis for α-Amino Acid Derivatives with an Allene Unit

Junzhe Xiao, Haibo Xu, Xiaohong Huo, Wanbin Zhang,* and Shengming Ma*

Chin. J. Chem. 2021, 39, 1958–1964. DOI: 10.1002/cjoc.202100002

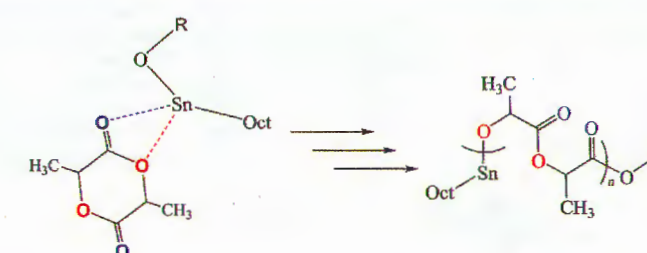


A highly enantioselective synergistic bimetallic Pd/Cu catalysis with a single chiral ligand affording optically active 2,3-butadienyl α-amino acids derivatives is described. The product can be converted to useful basic chemicals, such as α-amino acid and β-amino alcohol bearing an allenic moiety, and bicyclic skeleton.

Coordination Insertion Mechanism of Ring-Opening Polymerization of Lactide Catalyzed by Stannous Octoate

Wei Han Rao, Caiyun Cai, Jingyu Tang, Yiman Wei, Caiyun Gao, Lin Yu, and Jiandong Ding*

Chin. J. Chem. 2021, 39, 1965–1974. DOI: 10.1002/cjoc.202000519

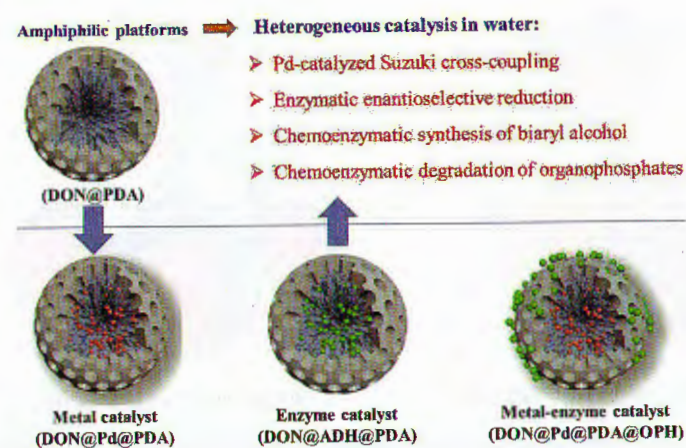


This work employs the density functional theory to deal with eight geometry types of monomer and trigger complex through two pathways of catalytic reaction to proceed the ring-opening polymerization of lactide leading to the identical polymer product. The ring-opening mechanism is revealed, and the whole polymerization process is summarized.

Polydopamine-Encapsulated Dendritic Organosilica Nanoparticles as Amphiphilic Platforms for Highly Efficient Heterogeneous Catalysis in Water

Yunting Liu, Zihan Wang, Na Guo, Pengbo Liu, Guanhua Liu, Jing Gao, Lei Zhang,* and Yanjun Jiang*

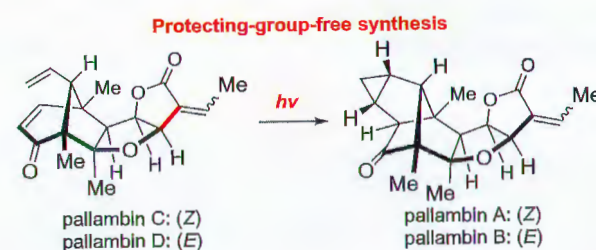
Chin. J. Chem. 2021, 39, 1975–1982. DOI: 10.1002/cjoc.202100128



Protecting-Group-Free Total Synthesis of (–)-Pallambins A–D

Xiwu Zhang, Yuan Wang, Peng Chen, Xinxian Cai, and Yanxing Jia*

Chin. J. Chem. 2021, 39, 1983–1996. DOI: 10.1002/cjoc.202100001

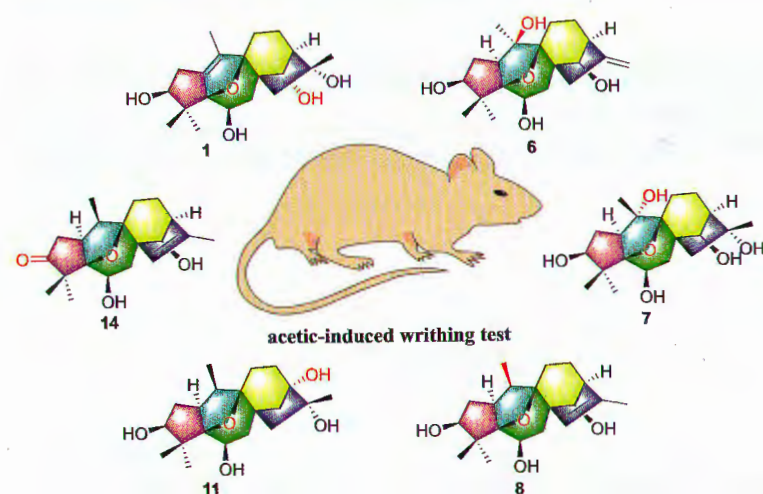


The first enantioselective total synthesis of (–)-pallambins A–D has been achieved. The described synthesis avoids protecting-group manipulations by designing highly chemo- and stereoselective transformations.

Epoxymicranthols A–N, 5,9-Epoxygrayanane Diterpenoids as Potent Analgesics from *Rhododendron micranthum*

Pengfei Jin, Xinghua Yuan, Xiaomin Ma, Guijuan Zheng, Ru Wang, Na Sun, and Guangmin Yao*

Chin. J. Chem. 2021, 39, 1997–2008. DOI: 10.1002/cjoc.202100077

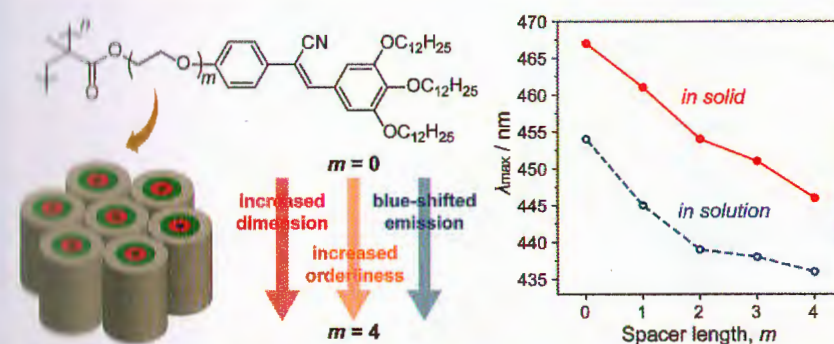


Fifteen 5,9-epoxygrayanane diterpenoids including fourteen new ones were isolated from the leaves of *Rhododendron micranthum*. Epoxymicranthols A–C (1–3) represent the first examples of 14 α -hydroxygrayanane diterpenoids. Epoxymicranthols C–F (3–6) are the first examples of 10 β -hydroxy-5,9-epoxygrayanane diterpenoids. All the isolates exhibited significant analgesic activities. A preliminary structure-activity relationship is discussed.

Fluorescent Columnar Liquid-Crystalline Polymers: Synthesis, Mesomorphic Behaviors and Tunable Emission Wavelengths

Bin Mu, Zhelin Zhang, Yu Zhao, Xiangnan Hao, and Wei Tian*

Chin. J. Chem. 2021, 39, 2009–2015. DOI: 10.1002/cjoc.202100051



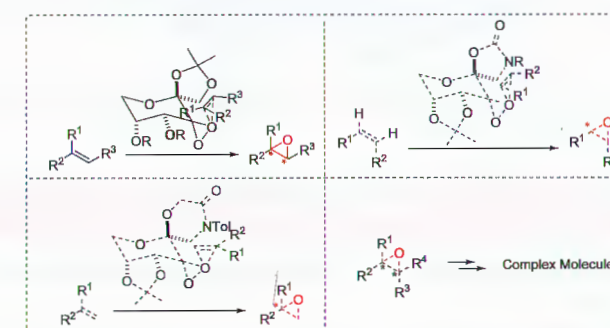
A series of fluorescent polymers in hexagonal columnar liquid crystals were prepared, and their mesomorphic behaviors and emission wavelengths were tuned by the lengths of flexible spacers.

Cornerstones in Chemistry

Shi Epoxidation: A Great Shortcut to Complex Compounds

Xiangqing Feng and Haifeng Du*

Chin. J. Chem. 2021, 39, 2016–2026. DOI: 10.1002/cjoc.202000744



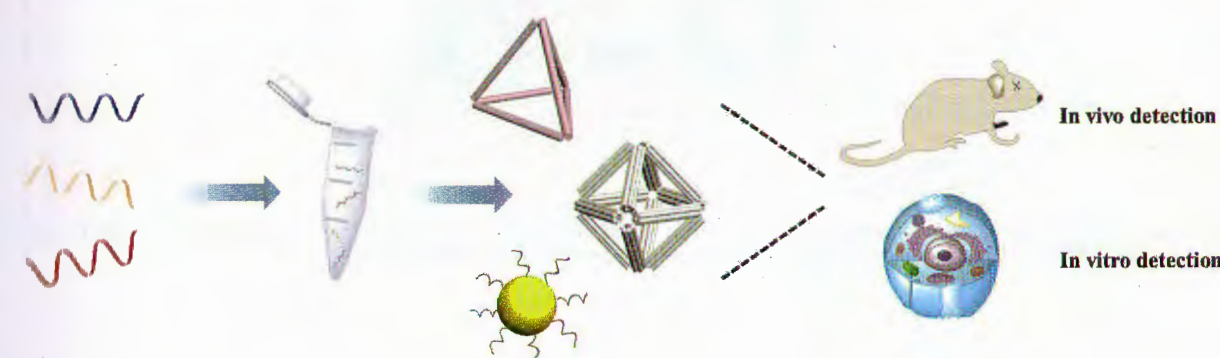
This review describes the initial discovery of Shi epoxidation, the development of the carbohydrate-based chiral ketones, and the typical applications of Shi epoxidation in the synthesis of complex compounds.

Recent Advances

DNA-Based Architectures for *in situ* Target Biomolecule Analysis in Confined Nano-space

Xiaoxue Hu, Yide Huang, Hao Yin, Lizhi Dai, and Ye Tian*

Chin. J. Chem. 2021, 39, 2027–2034. DOI: 10.1002/cjoc.202000753

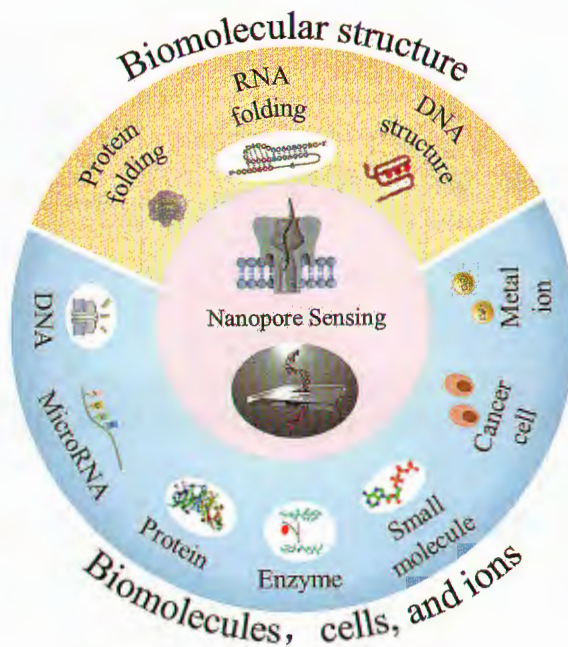


Structural DNA nanotechnology has established an attractive toolbox for biological analysis and medical detection. In this mini review, we focus on the research progress of *in situ* analysis of DNA nanostructured biosensors in confined space.

Recent Advances in Nanopore Sensing

Mengjie Cui, Yaxian Ge, Xiao Zhuge, Xin Zhou, Dongmei Xi,* and Shusheng Zhang*

Chin. J. Chem. **2021**, *39*, 2035–2043. DOI: 10.1002/cjoc.202000721



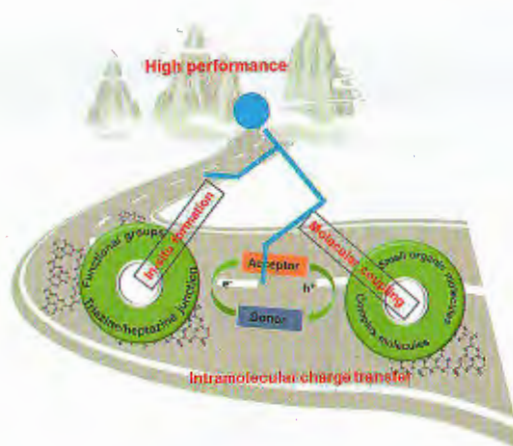
Recently, nanopores have been used to sense a variety of analytes, including DNA, RNA, proteins, enzymes, small molecules, cancer cells, and metal ions, and can also provide information on biomolecular structures.

Critical Review

In-depth Understanding of the Effects of Intramolecular Charge Transfer on Carbon Nitride Based Photocatalysts

Zongzhao Sun, Yueyang Tan, Jianyong Wan, and Limin Huang*

Chin. J. Chem. **2021**, *39*, 2044–2053. DOI: 10.1002/cjoc.202000743



Intramolecular charge transfer in donor-acceptor conjugated carbon nitride polymers synthesized by different methods is reviewed. The resultant effects on electronic structure including light absorption and charge separation are systematically discussed.