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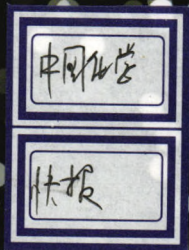


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Chinese Chemical Letters

Volume 29 | Number 8 | AUGUST 2018 | Special Column: Organocatalysis

Light scattering based analyses of the effects of bovine serum albumin on interactions of magnetite spherical particles with cells



Provided by

Nongyue He's group, Southeast Univ., China



COMMUNICATION

Ruopeng Bai, Yu Lan et al.
Theoretical insight into phosphoric acid-catalyzed asymmetric conjugate addition of indolizines to α,β -unsaturated ketones

REVIEW

Hongxia Wang et al.
Inorganic p-type semiconductors and carbon materials based hole transport materials for perovskite solar cells

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Chinese Chemical Society

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Graphical Abstracts/Chin Chem Lett 29 (2018) iii–x

Special Column: Organocatalysis

Introduction to the special column on organocatalysis

Chinese Chemical Letters 29 (2018) 1179

Yu Lan^a, Xiaohua Liu^b^aChongqing University, Chongqing 400030, China^bSichuan University, Chengdu 610064, China

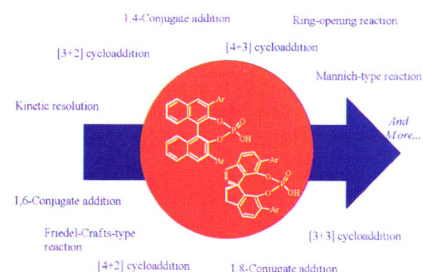
Recent advances in asymmetric reactions catalyzed by chiral phosphoric acids

Chinese Chemical Letters 29 (2018) 1181

Xin Li, Qijuling Song

Institute of Next Generation Matter Transformation, College of Chemical Engineering at Huaqiao University, Xiamen 361021, China

The very recent advances in chiral phosphoric acids (CPAs) catalyzed asymmetric reactions are discussed.

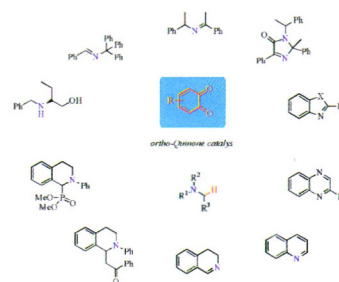


Bio-inspired quinone catalysis

Chinese Chemical Letters 29 (2018) 1193

Ruipu Zhang^{a,b}, Sanzhong Luo^{a,b}^aKey Laboratory of Molecular Recognition and Function, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100190, China^bUniversity of Chinese Academy of Sciences, Beijing 100049, China

Inspired by quinone-redox enzymes, small molecular quinone catalysts have been developed to promote C–H functionalization of amines. Recent efforts in this area have been summarized.



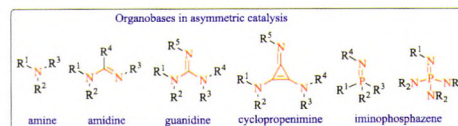
Chiral organobases: Properties and applications in asymmetric catalysis

Weidi Cao, Xiaohua Liu, Xiaoming Feng

Key Laboratory of Green Chemistry & Technology, Ministry of Education, College of Chemistry, Sichuan University, Chengdu 610064, China

Chiral organobases are efficient catalysts used in asymmetric reactions. This review provided a summary of chiral organobases in the aspects of their properties and applications.

Chinese Chemical Letters 29 (2018) 1201



N-Heterocyclic carbene-catalyzed [4 + 2] cyclization of α -chloroaldehydes and aurones: Highly enantioselective synthesis of benzofuran-fused dihydropyran-2-ones

Yao Li^{a,b}, Kunquan Chen^{b,c}, Yan Zhang^b, Dequn Sun^a, Song Ye^{b,c}

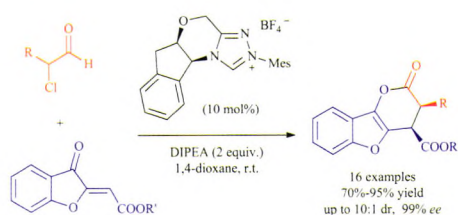
^a Marine College, Shandong University at Weihai, Weihai 264209, China

^b Beijing National Laboratory for Molecular Sciences, CAS Key Laboratory of Molecular Recognition and Function, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100190, China

^c University of Chinese Academy of Sciences, Beijing 100049, China

The chiral N-heterocyclic carbene-catalyzed [4 + 2] annulation of α -chloroaldehydes and aurones was developed, giving the corresponding benzofuran-fused dihydropyranones in good to high yields with good *cis*-selectivities and excellent enantioselectivities. The catalytic cycle features with the generation of enolate from chloroaldehyde and its following [4 + 2] cycloaddition with aurones.

Chinese Chemical Letters 29 (2018) 1209



Catalytic asymmetric brominative dearomatization reaction of benzofurans

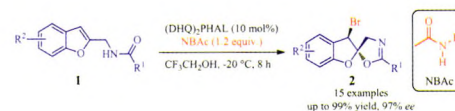
Xiao-Wei Liang^a, Xiaoling Chen^b, Zhiguo Zhang^b, Shu-Li You^a

^a State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai 200032, China

^b Key Laboratory of Biomass Chemical Engineering of Ministry of Education, College of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China

A catalytic asymmetric brominative dearomatization reaction of benzofuran derivatives was achieved by using hydroquinidine 1,4-phthalazinediyl diether [(DHQ)₂PHAL] as the catalyst and N-bromoacetamide (NBAC) as the brominating reagent. A series of brominated spiro[benzofuran-2,5'-oxazoles] bearing two contiguous stereogenic centers were obtained in high yields (up to 99%) with excellent enantioselectivity (up to 97% ee).

Chinese Chemical Letters 29 (2018) 1212



Enantioselective one-pot synthesis of β -sulfonyl ketones and trisubstituted tetrahydrothiophenes via β -elimination/cycloaddition sequence

Lu Xue, Yidong Liu, Wenling Qin, Hailong Yan

Chongqing Key Laboratory of Natural Product Synthesis and Drug Research, School of Pharmaceutical Sciences, Chongqing University, Chongqing 401331, China

A mild and efficient enantioselective one-pot synthesis of β -sulfonyl ketones and trisubstituted tetrahydrothiophenes via introducing 1,4-dithiane-2,5-diol to the simple kinetic resolution of β -sulfonyl ketones has been described herein. The one-pot reaction sequence including kinetic resolution and cascade sulfa-Michael/Aldol reaction proceeded successively to afford corresponding sulfonyl ketones and tetrahydrothiophenes with high enantioselectivities (85%–98% ee and 84%–95% ee, respectively).

Chinese Chemical Letters 29 (2018) 1215

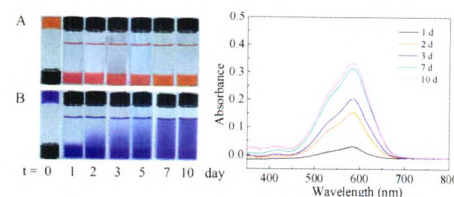


Hydrogels formed by L-histidine derivatives with highly selective release for charged dyes

Xiaoyang Li, Fanjun Zhang, Xiuping Sun, Yuanyuan Hu, Aixin Song, Jingcheng Hao
Key Laboratory of Colloid and Interface Chemistry (Ministry of Education), Shandong University, Ji'nan 250100, China

Hydrogels formed by UIPCA with CA could selectively release anionic dyes, chrome azurol S (A) and cationic dyes, methyl violet (B), showing excellent separating ability for differently charged dyes.

Chinese Chemical Letters 29 (2018) 1219



Tetrahydrobenzo[5]helicenediol derivatives as additives for efficient proline-catalyzed asymmetric List-Lerner-Barbas aldol reactions of bulky aldehyde substrates

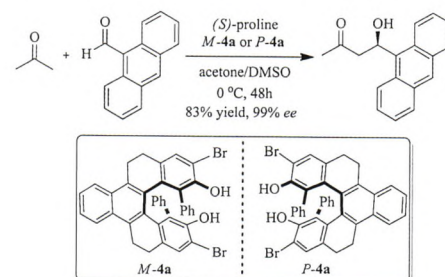
Lei Fang^{a,b}, Weibin Lin^{a,b}, Chuanfeng Chen^{a,b}

^a Beijing National Laboratory for Molecular Sciences, CAS Key Laboratory of Molecular Recognition and Function, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100190, China

^b University of Chinese Academy of Sciences, Beijing 100049, China

Proline-catalyzed asymmetric List-Lerner-Barbas aldol reactions of bulky aldehyde substrates could be efficiently carried out with dibromo-substituted helical diols **P-4a**/**M-4a** as additives. In the case of 9-anthraldehyde, the aldol product was obtained in 83% yield and 99% ee. An edge-to-face π - π stacking between the anthracenyl group in TS(R) and the phenyl group of the additive might contribute to the increase of enantioselectivity.

Chinese Chemical Letters 29 (2018) 1223



Rational design of FLP catalysts for reversible H₂ activation: A DFT study of the geometric and electronic effects

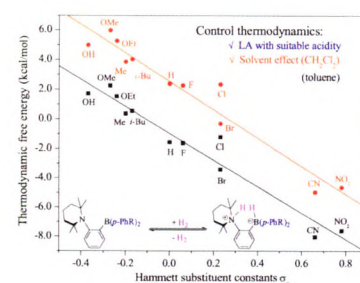
Jianguo Zhang^a, Youxiang Shao^a, Yinwu Li^a, Yan Liu^b, Zhuofeng Ke^a

^a School of Chemistry, School of Materials Science & Engineering, PCFM Lab, Sun Yat-sen University, Guangzhou 510275, China

^b School of Chemical Engineering and Light Industry, Guangdong University of Technology, Higher Education Mega Center, Guangzhou 510006, China

The thermodynamics of reversible H₂ activation could be controlled by adjusting substituents of LA group and using different polar solvents, which forges a guide to design potential FLPs catalysts for reversible H₂ activation.

Chinese Chemical Letters 29 (2018) 1226



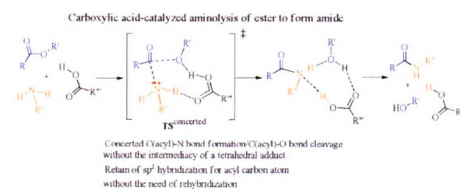
Mechanism for acetic acid-catalyzed ester aminolysis

Chang Xiao, Song-Lin Zhang

Key Laboratory of Synthetic and Biological Colloids, Ministry of Education, School of Chemical and Material Engineering, Jiangnan University, Wuxi 214122, China

A computational study is described to elucidate the mechanism for acetic acid-catalyzed ester aminolysis to produce amides. A concerted acyl substitution mechanism is proposed to involve concurrent acyl—O bond cleavage and acyl—N bond formation where acetic acid acts as a bifunctional catalyst connecting to both the alkoxide and the amino moieties. This mechanism does not involve the intermediacy of a tetrahedral adduct nor the rehybridization of acyl carbon, in sharp contrast to classic stepwise acyl substitution mechanism.

Chinese Chemical Letters 29 (2018) 1233



Theoretical insight into phosphoric acid-catalyzed asymmetric conjugate addition of indolizines to α,β -unsaturated ketones

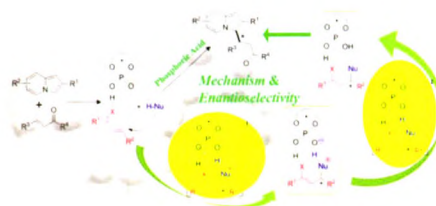
Haohua Chen^a, Lei Zhu^a, Kangbao Zhong^a, Xiaoyu Yue^a, Ling-Bo Qu^b, Ruopeng Bai^a, Yu Lan^{a,b}

^a School of Chemistry and Chemical Engineering, Chongqing University, Chongqing 400030, China

^b College of Chemistry and Molecular Engineering, Zhengzhou University, Zhengzhou 450001, China

A theoretical investigation of the mechanism and origin of enantioselectivity for phosphoric acid-catalyzed asymmetric conjugate addition of indolizines to α,β -unsaturated ketones.

Chinese Chemical Letters 29 (2018) 1237



Review

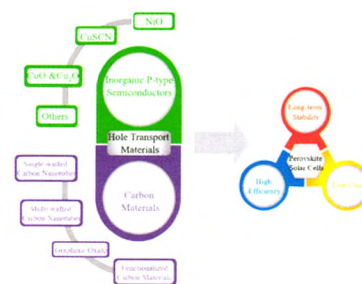
Inorganic p-type semiconductors and carbon materials based hole transport materials for perovskite solar cells

Yang Yang, Ngoc Duy Pham, Disheng Yao, Huaiyong Zhu, Prasad Yarlagadda, Hongxia Wang

School of Chemistry, Physics and Mechanical Engineering, Queensl and University of Technology, Brisbane QLD 4001, Australia

Incorporation of proper inorganic p-type semiconductors as hole transport layer has great potential to increase long-term stability while maintaining high power conversion efficiency of perovskite solar cells with low material cost.

Chinese Chemical Letters 29 (2018) 1242



Communications

A streamlined high throughput screening method for the *Mycobacterium neoaurum* mutants with expected yield of biotransformation derivatives from sterols

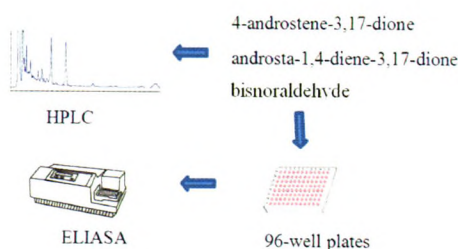
Chaoxiong Wu^a, Junqi Xu^b, Jianping Xie^b, Zhenyu Wang^a

^a College of Biomedical Engineering, Chongqing Medical University, Chongqing 400016, China

^b Institute of Modern Biopharmaceuticals, School of Life Sciences, Southwest University, Chongqing 400715, China

Mycobacterium neoaurum is ideal strain for bioconversion of sterol into steroid drugs. 96-well plate high throughput screen was validated to be able to discriminate the mimic mixtures of 4-androstene-3,17-dione (AD), androsta-1,4-diene-3,17-dione (ADD) and bisnoraldhyde (BA) optimized by uniform design, which is more rapid and higher throughput than the HPLC-based method.

Chinese Chemical Letters 29 (2018) 1251



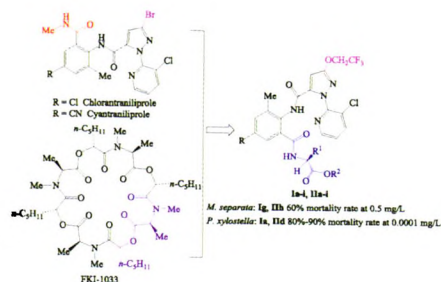
Synthesis, insecticidal activities and SAR studies of novel anthranilic diamides containing trifluoroethoxyl substituent and chiral amino acid moieties

Shaa Zhou, Sha Zhou, Yongtao Xie, Xiangde Meng, Baolei Wang, Lixia Xiong, Na Yang, Zhengming Li

State Key Laboratory of Elemento-Organic Chemistry, Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), College of Chemistry, Nankai University, Tianjin 300071, China

Based on the structures of ryanodine receptors (RyRs) activators anthranilic diamide insecticidal agents and FKI-1033, a series of 18 novel trifluoroethoxyl-containing chiral anthranilic diamides **Ia-i** and **IIa-i** were synthesized. Their insecticidal activities were evaluated systematically and the SAR was discussed.

Chinese Chemical Letters 29 (2018) 1254



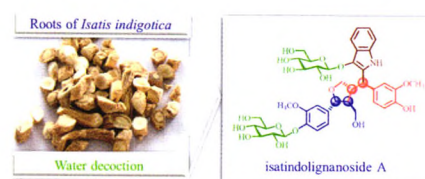
Isatindolignanose A, a glucosidic indole-lignan conjugate from an aqueous extract of the *Isatis indigotica* roots

Chinese Chemical Letters 29 (2018) 1257

Lingjie Meng, Qinglan Guo, Minghua Chen, Jiandong Jiang, Yuhuan Li, Jiangong Shi

State Key Laboratory of Bioactive Substance and Function of Natural Medicines, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China

A glucosidic indole-lignan conjugate with a novel carbon skeleton, named isatindolignanose A (**1**), was isolated from an aqueous extract of the *Isatis indigotica* roots "ban lan gen". Its structure was determined by comprehensive analysis of spectroscopic data, enzyme hydrolysis, and electronic CD calculations. Compound **1** is active against Coxsackie virus B3 and represents the first example of natural product having a structural feature of conjugation between indole and lignan, and its plausible biosynthetic pathway is postulated.



A new cytotoxic salannin-class limonoid alkaloid from seeds of *Azadirachta indica* A. Juss

Chinese Chemical Letters 29 (2018) 1261

Jianxun Zhu^{a,b}, Xiaofeng Lu^{a,b}, Xiaona Fan^c, Ruibo Wu^d, Hongjuan Diao^d, Rongmin Yu^{a,b}, Hanhong Xu^e, Jiachen Zi^{a,b}

^a Biotechnological Institute of Chinese Materia Medica, Jinan University, Guangzhou 510632, China

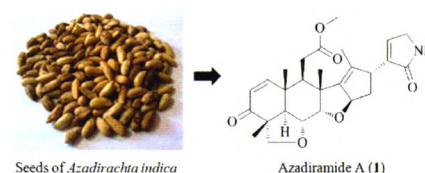
^b College of Pharmacy, Jinan University, Guangzhou 510632, China

^c School of Life Sciences, Sun Yat-sen University, Guangzhou 510275, China

^d School of Pharmaceutical Science, Sun Yat-sen University, Guangzhou 510006, China

^e State Key Laboratory for Conservation and Utilization of Subtropical Agro-Bioresources, South China Agricultural University, Guangzhou 510642, China

Azadiramide A (**1**), a new salannin-class limonoid alkaloid, inhibits growth of human breast cancer MDA-MB-231 cell line with IC₅₀ value of 2.70 ± 0.63 μmol/L.



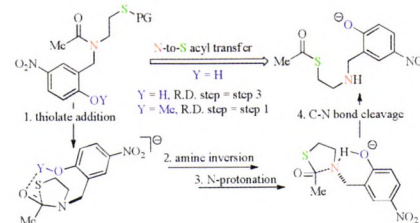
Mechanism of N-to-S acyl transfer of N-(2-hydroxybenzyl) cysteine derivatives and origin of phenol acceleration effect

Chinese Chemical Letters 29 (2018) 1264

Siwei Bi, Peng Liu, Baoping Ling, Xiangai Yuan, Yuanye Jiang

School of Chemistry and Chemical Engineering, Qufu Normal University, Qufu 273165, China

The mechanism of N-to-S acyl transfer of N-(2-hydroxybenzyl) cysteine derivatives and the origin of acceleration effect of phenol substitutes were investigated by DFT methods.



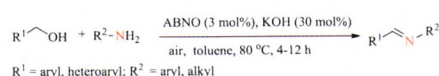
Direct synthesis of imines by 9-azabicyclo-[3,3,1]nonan-N-oxyl/KOH-catalyzed aerobic oxidative coupling of alcohols and amines

Chinese Chemical Letters 29 (2018) 1269

Yan Wan, Jia-Qi Ma, Chao Hong, Mei-Chao Li, Li-Qun Jin, Xin-Quan Hu, Bao-Xiang Hu, Wei-Min Mo, Nan Sun, Zhen-Lu Shen

College of Chemical Engineering, Zhejiang University of Technology, Hangzhou 310014, China

A simple and efficient method for preparation of imines by the oxidative coupling of alcohols and amines using ABNO/KOH as the catalysts, and air as the economic and green oxidant was developed.



- transition-metal free
- air as the environmentally benign oxidant
- general: 26 examples, up to 96% isolated yield

Organocatalytic cascade 1,6-conjugate addition/annulation/tautomerization of functionalized *para*-quinone methides: Access to chiral 2-amino-4-aryl-4*H*-chromenes

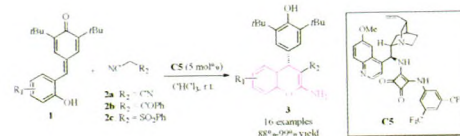
Cong Duan^a, Ling Ye^b, Wenqin Xu^a, Xinying Li^a, Feng Chen^a, Zhigang Zhao^a, Xuefeng Li^a

^a College of Chemistry and Environment Protection Engineering, Southwest Minzu University, Chengdu 610041, China

^b Faculty of Geosciences and Environmental Engineering, Southwest Jiaotong University, Chengdu 610031, China

A novel organocatalytic cascade process initiated by 1,6-conjugate addition has been successfully developed. A range of pharmaceutically active 2-amino-4-aryl-4*H*-chromenes were readily obtained in high yields (88%-99%) and excellent enantiopurities (86%-99% ee).

Chinese Chemical Letters 29 (2018) 1273



Facile preparation of holmium(III)-doped carbon nanodots for fluorescence/magnetic resonance dual-modal bioimaging

Yaning Fang^a, Jun Jia^a, Jun Yang^b, Junhui Zheng^b, Changqing Yi^{a,c}

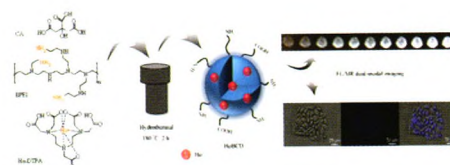
^a Key Laboratory of Sensing Technology and Biomedical Instruments of Guangdong Province, School of Engineering, Sun Yat-sen University, Guangzhou 510006, China

^b Guangdong General Hospital, Guangzhou 510080, China

^c Research Institute of Sun Yat-sen University in Shenzhen, Shenzhen 518057, China

Holmium(III)-doped carbon nanodots (HoBCDs) were synthesized for the first time via hydrothermal treatment of citrate acid (CA), branched-polyethylenimine (BPEI) and diethylenetriamine pentaacetic acid hydrate holmium(III) dihydrogen salt (Ho-DTPA), and their dual-modality bioimaging applications were demonstrated by the use of HeLa cells. The as-prepared nanoprobe exhibited bright fluorescence with an absolute quantum yield of 8% and apparent contrast enhancement in T₁-weighted images.

Chinese Chemical Letters 29 (2018) 1277



Identification of glycerophospholipid fatty acid remodeling by using mass spectrometry imaging in bisphenol S induced mouse liver

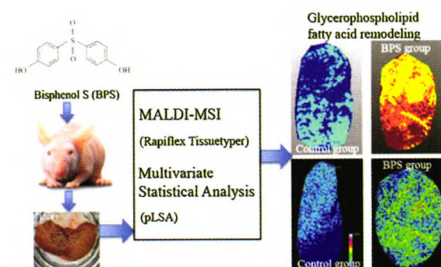
Chao Zhao^{a,b}, Peisi Xie^a, Ti Yang^a, Hailin Wang^b, Arthur Chi Kong Chung^a, Zongwei Cai^a

^a State Key Laboratory of Environmental and Biological Analysis, Department of Chemistry, Hong Kong Baptist University, Hong Kong 518000, China

^b State Key Laboratory of Environmental Chemistry and Ecotoxicology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing 100085, China

Exposure to BPS induced glycerophospholipid fatty acid remodeling, which might be useful in toxicity evaluation for bisphenols-induced hepatic diseases.

Chinese Chemical Letters 29 (2018) 1281



A rapid and sensitive UPLC-MS/MS method for quantitative determination of arformoterol in rat plasma, lung and trachea tissues

Chenglong Sun^a, Jiuming He^a, Hongbo Wu^b, Xiaowei Song^a, Jiangshuo Li^a, Luoqiao Huang^a, Xiaoyu Xu^a, Manjiangcuo Wang^a, Ruiping Zhang^a, Zeper Abliz^{a,c}

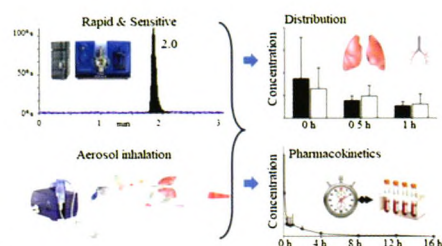
^a State Key Laboratory of Bioactive Substance and Function of Natural Medicines, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China

^b Beijing Jialin Pharmaceutical Co., Ltd., Beijing 100121, China

^c Center for Imaging and Systems Biology, Minzu University of China, Beijing 100081, China

A rapid and sensitive ultra-performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) method was developed and fully validated for determination of arformoterol in rat plasma, lung and trachea tissues.

Chinese Chemical Letters 29 (2018) 1284



A dual-amplification system for colorimetric DNA detection based on the assembly of biomolecules

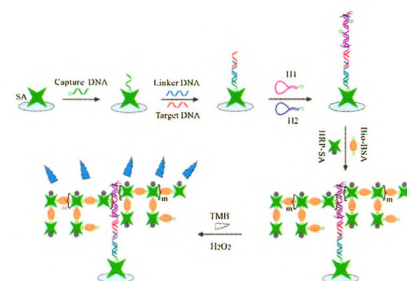
Chaohui Chen^{a,b}, Xinghu Ji^b

^a Institute for Interdisciplinary Research, Jiangnan University, Wuhan 430056, China

^b Key Laboratory of Analytical Chemistry for Biology and Medicine, Ministry of Education, College of Chemistry and Molecular Sciences, Wuhan University, Wuhan 430072, China

A sensitive and selective colorimetric biosensor for the detection of DNA is described, which combines the amplification of self-assembly with the enrichment of horseradish peroxidase.

Chinese Chemical Letters 29 (2018) 1287



Light scattering based analyses of the effects of bovine serum proteins on interactions of magnetite spherical particles with cells

Lingling Guo^a, Ting Wang^a, Zhan Chen^b, Nongyue He^a, Yaozhong Chen^a, Tao Yuan^c

^a State Key Laboratory of Bioelectronics, National Demonstration Center for Experimental Biomedical Engineering Education, School of Biological Science and Medical Engineering, Southeast University, Nanjing 210096, China

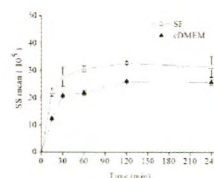
^b Department of Chemistry, University of Michigan, Ann Arbor MI 48109, United States

^c Department of Orthopedic, Nanjing Jinling Hospital, Nanjing 210096, China

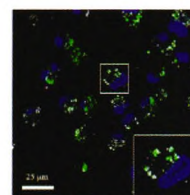
Cellular uptake of magnetite spherical particles (MSPs) were increased with incubation time and were decreased in the presence of medium serum proteins. Results also showed the cell internalized MSPs induced the cellular autophagosome accumulation.

Chinese Chemical Letters 29 (2018) 1291

Cellular uptake kinetics



Autophagosome accumulation



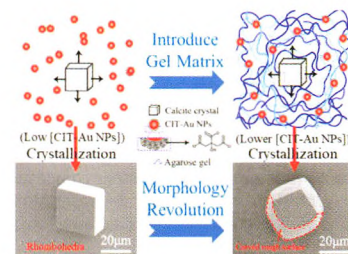
Assessing the synergy effect of additive and matrix on single-crystal growth: Morphological revolution resulted from gel-mediated enhancement on CIT-calcite interaction

Yujing Liu, Ying Tan, Jie Ren, Hongzheng Chen, Hanying Li

MOE Key Laboratory of Macromolecular Synthesis and Functionalization, Department of Polymer Science and Engineering, State Key Laboratory of Silicon Materials, Zhejiang University, Hangzhou 310027, China

CIT additives are active in crystal morphology modification at relatively high concentration. Once agarose gel is simultaneously introduced, the curved morphological feature of calcite crystal emerges at a much lower concentration of CIT additives.

Chinese Chemical Letters 29 (2018) 1296



Synthesis of Fe₃O₄@SiO₂-Au/Cu magnetic nanoparticles and its efficient catalytic performance for the Ullmann coupling reaction of bromamine acid

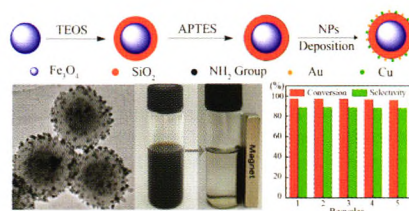
Aiqin Gao^a, Hui Liu^a, Liu Hu^a, Hongjuan Zhang^a, Ai Qin Hou^b, Kongliang Xie^a

^a College of Chemistry, Chemical Engineering and Biotechnology, Donghua University, Shanghai 201620, China

^b National Engineering Research Center for Dyeing and Finishing of Textiles, Donghua University, Shanghai 200051, China

Over bimetallic Au/Cu catalyst supported on magnetic Fe₃O₄ nanoparticles, water-mediated bromamine acid could be selectively converted into 4,4'-diamino-1,1'-dianthraquinonyl-3,3'-disulfonic acid (DAS) with a yield of 88.67%. The magnetic catalyst could be readily separated and reused.

Chinese Chemical Letters 29 (2018) 1301



Morphology-controlled synthesis of mesoporous silica with co-template of surfactant P123 and ionic liquid [Dmim]Cl

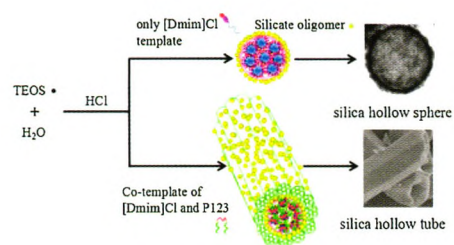
Pei Han^a, Tuanchun Liu^a, Xiaowei Ji^a, Shaokun Tang^{a,b}

^a Key Laboratory for Green Chemical Technology of Ministry of Education, School of Chemical Engineering & Technology, Tianjin University, Tianjin 300072, China

^b Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin University, Tianjin 300072, China

Hollow silica spheres with mesoporous wall have been synthesized with only ionic liquid ([Dmim]Cl) as the template, and meanwhile, prism-like silica tubes with mesoporous wall have been constructed with the ionic liquid and a nonionic surfactant (P123) as the co-template via sol-gel method for the first time.

Chinese Chemical Letters 29 (2018) 1305



Polyvinylpyrrolidone-assisted growth and optical properties of ZnO hexagonal bilayer disk-like microstructures

Quping Zhu^{a,b}, Xinying Shen^a, Lingling Wang^a, Luping Zhu^a, Lijun Wang^a, Guihong Liao^c

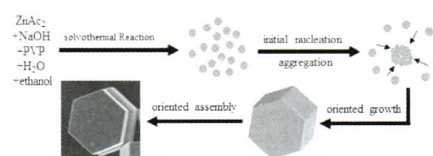
^a School of Environmental and Materials Engineering, Shanghai Polytechnic University, Shanghai 201209, China

^b School of Civil Engineering, Chongqing Institute of Engineering, Chongqing 400054, China

^c Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China

ZnO hexagonal bilayer disk-like microstructures are successfully prepared assisted with polyvinylpyrrolidone (PVP), and the photoluminescence (PL) spectrum of as-prepared ZnO samples showed a very strong ultraviolet (UV) emission at the UV region.

Chinese Chemical Letters 29 (2018) 1310



Synthesis of MXene-supported layered MoS₂ with enhanced electrochemical performance for Mg batteries

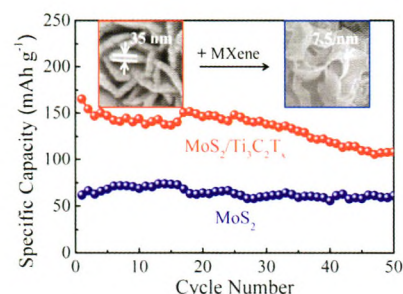
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In this paper, the petal-like MoS₂/MXene composite has been successfully synthesized by one-step hydrothermal method. With the combination of few-layer MoS₂ nanosheets and the high conductive MXene substrate, the composite exhibits enhanced capacities and rate performance as cathode material of Mg batteries.

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A polarization method for quickly distinguishing the morphology of electro-spun ultrafine fibers

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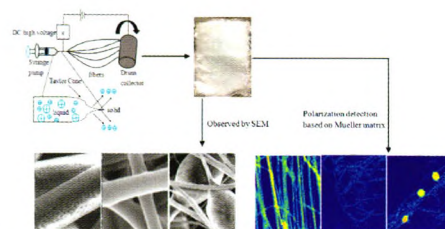
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A polarization method was tested to quickly distinguish different morphological features of the samples, such as smooth surface, multi-mesh surface, and beaded microspheres.

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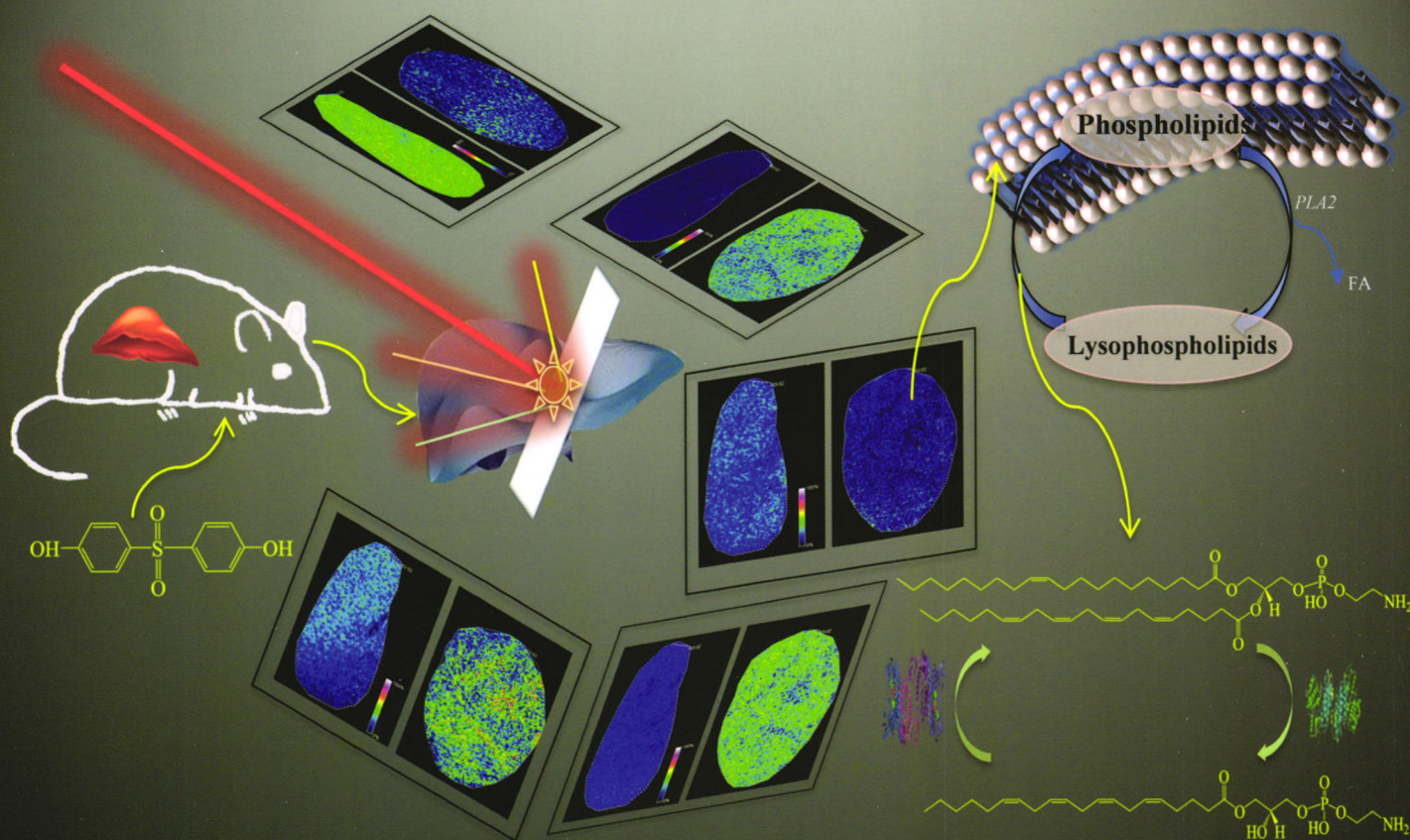


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