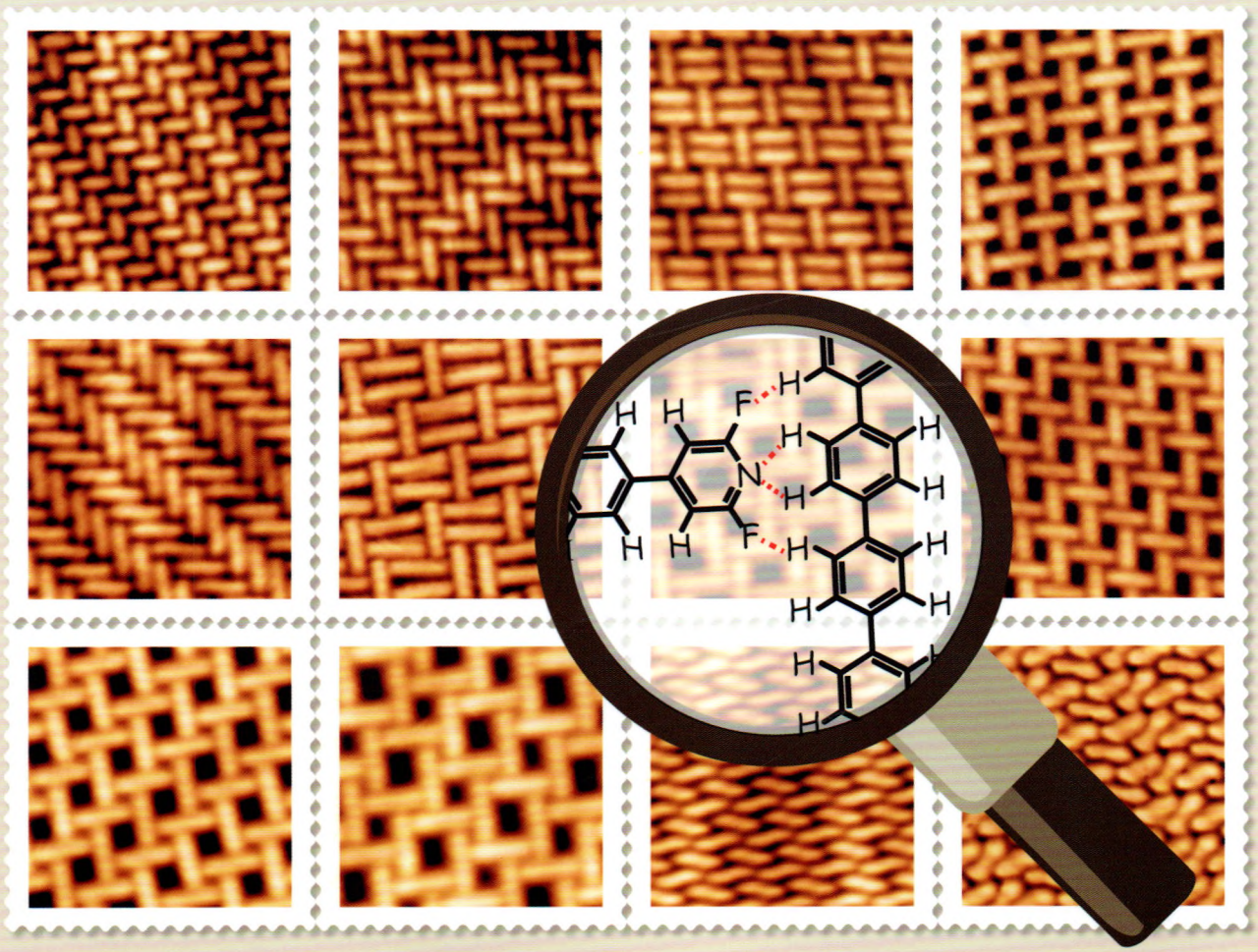
ISSN 1001-8417
CN 11-2710/O6

CCL

Chinese Chemical Letters

| Volume 28 | Number 3 | MARCH 2017 |

Molecular Self-assemblies Tweaked by Weak C-H···F and C-H···N Hydrogen Bonds



Provided by Prof. WU Kai's Group, Peking University, China

ISSN 1001-8417
03

Chinese Chemical Society
Institute of Materia Medica, Chinese Academy of Medical Sciences

Contents lists available at ScienceDirect

Chinese Chemical Letters

journal homepage: www.elsevier.com/locate/cclet

Graphical Abstracts/Chin Chem Lett 28 (2017) iii-x

Reviews

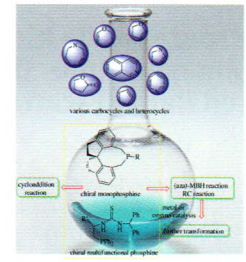
Chinese Chemical Letters 28 (2017) 493

Phosphine-mediated enantioselective synthesis of carbocycles and heterocycles

Yu-Ning Gao, Min Shi

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

This minireview summarizes chiral phosphine-catalyzed acycloaddition reactions and cycloaddition reactions to synthesize carbocycles and heterocycles.



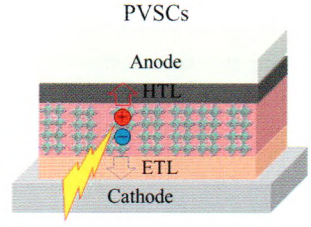
Chinese Chemical Letters 28 (2017) 503

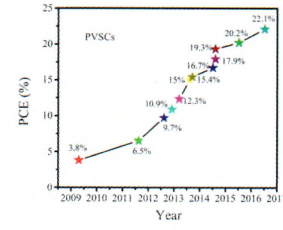
Organic functional materials based buffer layers for efficient perovskite solar cells

Fateh Ullah, Hongzheng Chen, Chang-Zhi Li

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

This review highlights the recent development of organic π-functional materials as buffer layers in constructing efficient perovskite solar cells (PVSCs).





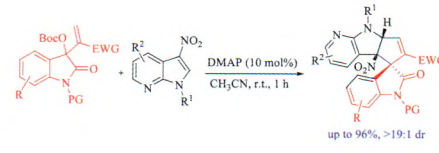
Original Articles

Chinese Chemical Letters 28 (2017) 512

Construction of polycyclic spirooxindoles through [3+2] annulations of Morita–Baylis–Hillman carbonates and 3-nitro-7-azaindoles

Kai-Kai Wang[a,c], Wei Du[b], Jin Zhu[a], Ying-Chun Chen[b]

[a]*Chengdu Institute of Organic Chemistry, Chinese Academy of Sciences, Chengdu 610041, China*
[b]*Key Laboratory of Drug-Targeting and Drug Delivery System of the Ministry of Education, West China School of Pharmacy, Sichuan University, Chengdu 610041, China*
[c]*University of Chinese Academy of Sciences, Beijing 100049, China*



An array of polycyclic spirooxindoles containing fused azaindoline frameworks and vicinal quaternary centers have been constructed in excellent yields and diastereoselectivity through a DMAP-catalysed dearomatic [3+2] annulation reaction.

doi:10.1016/S1001-8417(17)30056-6

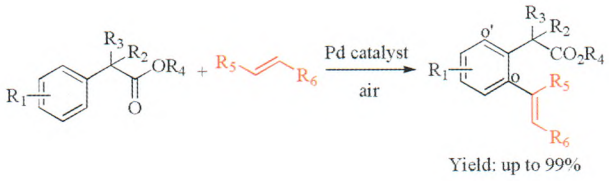
Chinese Chemical Letters 28 (2017) 517

Pd-catalyzed *ortho*-olefination of aromatic acetyl esters

Lei Xiang[a,b], Kai Yang[a], Qiu-Ling Song[a]

[a]*Institute of Next Generation Matter Transformation, College of Chemical Engineering at Huaqiao University, Xiamen 361021, China*
[b]*Institute of Pharmacy and Pharmacology, Learning Key Laboratory for Pharmacoproteomics University of South China, Hengyang 421001, China*

A Pd(II)-catalyzed *ortho*-olefination of aromatic acetic esters is described which features with an excellent functional group tolerance, good yields, mild reaction conditions, good scalability as well as high chemo- and regio-selectivity.



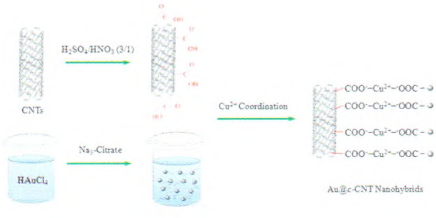
Chinese Chemical Letters 28 (2017) 521

A facile route to the hierarchical assembly of Au nanoparticles on carbon nanotubes through Cu^{2+} coordination for surface-enhanced Raman scattering

Zhi-Qiang Duan[a], Xin-Bao Gao[a], Tian-Peng Li[a], Kai Yao[a,b], Xu-Ming Xie[c]

[a]*Shijiazhuang Mechanical Engineering College, Shijiazhuang 050003, China*
[b]*Department of Graduate Management, Equipment Academy, Beijing 101416, China*
[c]*Key Laboratory of Advanced Materials (MOE), Department of Chemical Engineering, Tsinghua University, Beijing 100084, China*

We report the hierarchical assembly of Au nanoparticles on carboxylized carbon nanotubes (*c*-CNTs) through Cu^{2+} coordination. The resulting Au@*c*-CNT nanohybrids exhibit a remarkable synergy in SERS compared to neat Au nanoparticles.



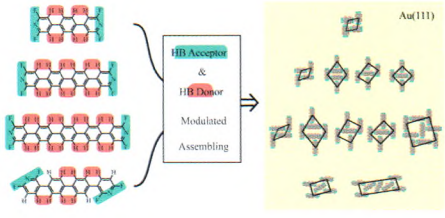
Chinese Chemical Letters 28 (2017) 525

Pinning-down molecules in their self-assemblies with multiple weak hydrogen bonds of C—H · · · F and C—H · · · N

Xin Jin[a], Jacob R. Cramer[b], Qi-Wei Chen[a], Hai-Lin Liang[a], Jian Shang[a], Xiang Shao[c], Wei Chen[d,e], Guo-Qin Xu[d,e], Kurt V. Gothelf[b], Kai Wu[a,e]

[a]*BNLMS, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China*
[b]*Danish-Chinese Centre for Self-Assembly and Function of Molecular Nanostructures on Surfaces at iNANO, Department of Chemistry, Aarhus University, 8000 Aarhus C, Denmark*
[c]*Department of Chemical Physics, School of Chemistry and Materials Science, University of Science and Technology of China, Hefei 230026, China*
[d]*Department of Chemistry, National University of Singapore, 117543, Singapore*
[e]*SPURc, 1 CREATE Way, #15-01, CREATE Tower, 138602, Singapore*

A series of fluorinated pyridyl molecules containing H—C—C—C—C—H and F—C—N—C—F moieties form grouped weak hydrogen bonds of C—H · · · F and C—H · · · N that dictate the patterns and orientations of their self-assemblies on Au(111).



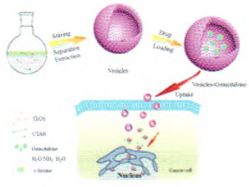
Chinese Chemical Letters 28 (2017) 531

Enhancement of gemcitabine against pancreatic cancer by loading in mesoporous silica vesicles

Jun-Tao Dai[a], Yu Zhang[b], Heng-Chao Li[a], Yong-Hui Deng[b,c], Ahmed A. Elzatahry[d], Abdulaziz Alghamdi[e], De-Liang Fu[a], Yong-Jian Jiang[a], Dong-Yuan Zhao[b]

[a]*Department of Pancreatic Surgery, Huashan Hospital, Fudan University, Shanghai 200040, China*
[b]*Department of Chemistry, State Key Laboratory of Molecular Engineering of Polymers, and Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials, Collaborative Innovation Center of Chemistry for Energy Materials (iChEM), Fudan University, Shanghai 200433, China*
[c]*State Key Lab of Transducer Technology, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, Shanghai 200050, China*
[d]*Materials Science and Technology Program, College of Arts and Sciences, Qatar Department of Chemistry, Qatar University, PO Box 2713, Doha, Qatar*
[e]*College of Science, King Saud University, Riyadh 11451, Saudi Arabia*

Mesoporous silica vesicles might represent a promising novel drug delivery platform for the treatment of pancreatic cancer.



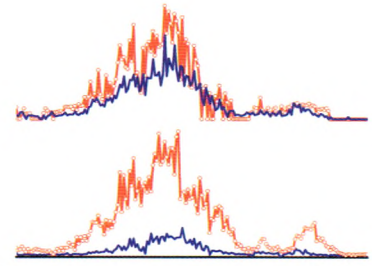
Chinese Chemical Letters 28 (2017) 537

Investigation of L/D-threonine substituted L-serine octamer ions by mass spectrometry and infrared photodissociation spectroscopy

Juan Ren[a], Yi-Yun Wang[a], Ru-Xia Feng[a], Xiang-Lei Kong[a,b]

[a]*The State Key Laboratory of Elemento-Organic Chemistry, Nankai University, Tianjin 300071, China*
[b]*Collaborative Innovation Center of Chemical Science and Engineering, Nankai University, Tianjin 300071, China*

Chiral differentiation was achieved by comparing IRPD spectra of L-Thr and D-Thr substituted serine octamers.

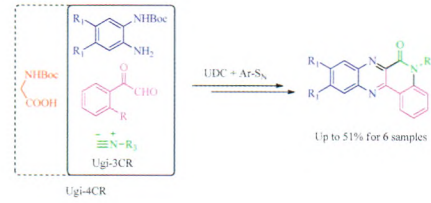


Chinese Chemical Letters 28 (2017) 541

A facile method for building fused quinoxaline-quinolinones *via* an acidless post-Ugi cascade reaction

Yong Li[a,b], Jie Lei[a,b], Jia Xu[a,b], Dian-Yong Tang[b], Zhong-Zhu Chen[b], Jin Zhu[a,b], Chuan Xu[c]

[a]*Key Laboratory for Asymmetric Synthesis and Chiral Technology of Sichuan Province Chengdu Institute of Organic Chemistry, Chinese Academy of Sciences, Chengdu 610041, China*
[b]*Chongqing Engineering Laboratory of Targeted and Innovative Therapeutics, Chongqing Key Laboratory of Kinase Modulators as Innovative Medicine, IATTI, Chongqing University of Arts and Sciences, Chongqing 402160, China*
[c]*Department of Oncology, Chengdu Military General Hospital, Chengdu 610083, China*



A series of quinolino[3,4-*b*]quinoxalin-6(5*H*)-ones have been synthesized using an Ugi/deprotection/cyclization (UDC) strategy, followed by a nucleophilic aromatic substitution reaction. This scaffold was thought to be a very important intermediate for building bioactive compounds.

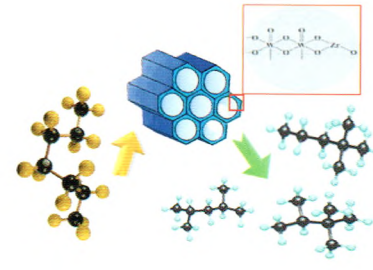
Chinese Chemical Letters 28 (2017) 546

Effect of WO_x promoter on Pt/ZrO_2-HMS catalysts for *n*-heptane isomerization: Catalytic performance and kinetics study

Nastaran Parsafard[a,b], Mohammad Hasan Peyrovi[a], Nasibeh Parsafard[a]

[a]*Faculty of Chemistry and Petroleum Sciences, Department of Petroleum Chemistry and Catalysis, University of Shahid Beheshti, Tehran, P.O. Box 1983963113, Iran*
[b]*Kosar University of Bojnord, Department of Applied Chemistry, North Khorasan, Iran*

Isomerization reaction with suitable catalyst is the best process to prevent the loss of the gasoline octane number and reduce harmful effects on human health and environment. In the present work, 64% conversion, 90% *i*-C_7 selectivity, 58% RON and the smallest coke amount after 72 h were obtained for Pt-WO_3/ZrO_2-HMS(10).



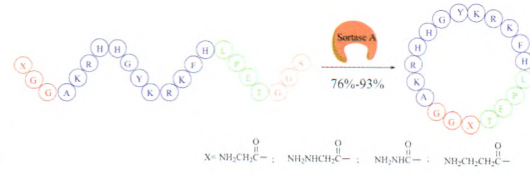
Chinese Chemical Letters 28 (2017) 553

High yield synthesis of cyclic analogues of antibacterial peptides P-113 by Sortase A-mediated ligation and their conformation studies

Zhi-Meng Wu, Shao-Zhong Liu, Xiao-Zhong Cheng, Xin-Rui Zhao, Hao-Fei Hong

The Key Laboratory of Carbohydrate Chemistry & Biotechnology, Ministry of Education, School of Biotechnology, Jiangnan University, Wuxi 214122, China

Four cyclized antibacterial peptides P-113 analogs were designed and synthesized by Sortase A-mediated ligation. The conformation studies by CD spectrum in aqueous buffers and in trifluroethanol (TFE) suggested that α-helix structures were produced progressively in hydrophobic environment independent of the cyclization, which displayed the similar behavior as parent peptide P-113.



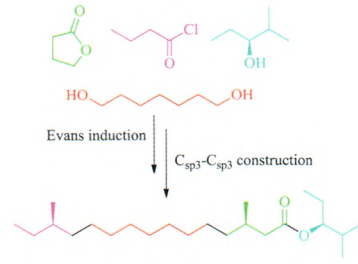
Chinese Chemical Letters 28 (2017) 558

Stereoselective synthesis of the Paulownia bagworm sex pheromone

Zhi-Feng Sun[a,b], Lu-Nan Zhou[a], Tao Zhang[a], Zhen-Ting Du[a]

[a]*Shaanxi Key Laboratory of Natural Products & Chemical Biology, College of Science, Northwest A&F University, Yangling 712100, China*
[b]*College of Chemical and Environment Science, Shaanxi University of Technology, Hanzhong, 723001, China*

The synthesis of the Paulownia bagworm sex pheromone has been achieved through a C5 + C7 + C5 strategy, using Evans induction and Csp^3—Csp^3 bond construction.



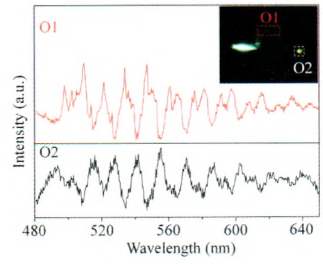
Chinese Chemical Letters 28 (2017) 563

One-step synthesis of organic microwire-disk interconnected structure for miniaturized channel filters

Qiu-Hong Cui, Lan Peng, Zhi-Dong Lou, Yu-Feng Hu, Feng Teng

Key Laboratory of Luminescence and Optical Information, Ministry of Education, School of Science, Beijing Jiaotong University, Beijing 100044, China

The microwire-disk interconnected structure have been fabricated via one-step assembly, which can be utilized as a channel drop filter.



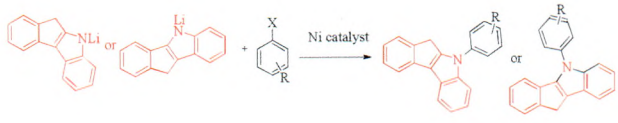
Chinese Chemical Letters 28 (2017) 569

Nickel-catalyzed *C-N* crossing coupling reaction: The synthetic method for *N*-aryl substituted indenoindole

Xin-Le Li[a], Xiao-Mei Lang[a], Lian-Ming Yang[b], Sheng-Yuan Zhou[a], Hong-Fan Hu[a], Shan Xue[a], Xin Sun[a], Shi-Xuan Xin[a]

[a]*Polyolefin Research Department, Petrochina Petrochemical Research Institute, Beijing 102206, China*
[b]*Beijing National Laboratory for Molecular Sciences (BNLMS), Key Laboratory of Green Printing, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100190, China*

A nickel-based catalyst was employed for the first time in the crossing-coupling of indenoindoles with bromo-/iodoarenes. A simple and practical method was provided for the synthesis of *N*-aryl substituted indenoindole and the mechanism of this reaction was discussed.



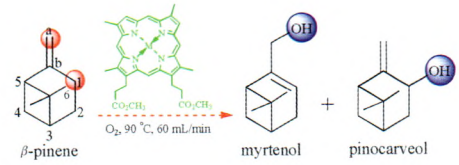
Chinese Chemical Letters 28 (2017) 575

Solvent and additive-free selective aerobic allylic hydroxylation of β-pinene catalyzed by metalloporphyrins

Shi-Chao Xu[a,b,c,d,e,f], Shou-Ji Zhu[a,b,c,d], Liang-Wu Bi[a,b,c,d,e,f], Yu-Xiang Chen[a,b,c,d,e], Jing Wang[a,b,c,d], Yan-Ju Lu[a,b,c,d,e], Yan Gu[a,b,c,d], Zhen-Dong Zhao[a,b,c,d,e,f]

[a]*Institute of Chemical Industry of Forest Products, Chinese Academy of Forestry, Nanjing 210042, China*
[b]*Key Lab. of Biomass Energy and Material, Jiangsu Province, Nanjing 210042, China*
[c] *National Engineering Lab. for Biomass Chemical Utilization, Nanjing 210042, China*
[d]*Key and Open Lab. on Forest Chemical Engineering, State Forestry Administration, Nanjing 210042, China*
[e]*Institute of Forestry New Technology, Chinese Academy of Forestry, Beijing, 100091, China*
[f]*2011 Collaborative Innovation Center of Jiangxi Typical Trees Cultivation and Utilization in Jiangxi Agricultural University, Nanchang, 330045, China*

An efficient MPs catalyzed aerobic oxidation method of β-pinene was established. Allylic hydroxylation products could be obtained in high selectivity.

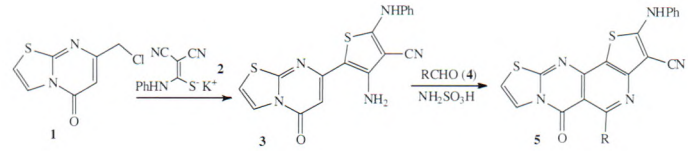


Chinese Chemical Letters 28 (2017) 579

An efficient method for the synthesis of thieno[3′,2′:2,3]pyrido [4,5-d]-thiazolo[3,2-a] pyrimidinones

Dao-Lin Wang, Dong Wang, Jin-Juan Xing, Jian-Hua Qian

College of Chemistry and Chemical Engineering, Liaoning Key Laboratory of Synthesis and Application of Functional Compound, Bohai University, Jinzhou 121003, China



An efficient method for the preparation of thieno[3′,2′:2,3]pyrido-[4,5-d]thiazolo[3,2-a]pyrimidin-5-ones 5 is described. The key intermediate, 7-(3-amino-4-cyano-5-phenylaminothieno-2-yl)-5*H*-thiazolo[3,2-a]pyrimidin-5-one (**3**), was synthesized from 7-chloro methyl-5*H*-thiazolo[3,2-a]pyrimidin-5-one (**1**) with potassium-(2,2-dicyano-1-phenylaminoethen-1-yl)thiolate (**2**) by Thorpe–Ziegler isomerization. Subsequent reaction of the intermediate amine with aromatic aldehydes *via* Pictet–Spengler reaction provided thieno-pyridine fused thiazolo[3,2-a]pyrimidines under *p*-TsOH as catalyst in good yields.

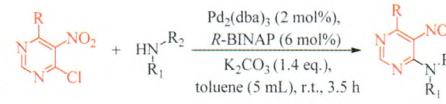
Chinese Chemical Letters 28 (2017) 583

Palladium-catalyzed amination of chloro-substituted 5-nitropyrimidines with amines

Meng-Meng Liu[a,b], Qiong Mei[a,b], Yi-Xiao Zhang[a,b], Peng Bai[a,b], Xiang-Hai Guo[a,b]

[a]*Department of Pharmaceutical Engineering, School of Chemical Engineering and Technology, Tianjin University, Tianjin 300350, China*

[b]*Key Laboratory of Systems Bioengineering (Ministry of Education), Tianjin University, Tianjin 300350, China*



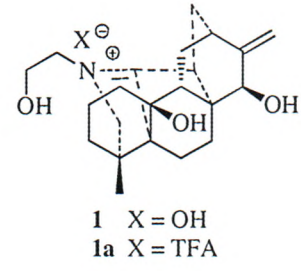
Chloro-substituted 5-nitropyrimidines are synthesized using a palladium-catalyst method and has proved the generality of this reaction system. A series of mono-substituted and di-substituted 5-nitropyrimidines are synthesized with a high yield, which can act as the important intermediates of pharmaceutical nucleosides and purines.

Chinese Chemical Letters 28 (2017) 588

A minor arcutine-type C_{20}-diterpenoid alkaloid iminium constituent of "fu zi"

Xian-Hua Meng, Zhi-Bo Jiang, Qing-Lan Guo, Jian-Gong 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 rare arcutine-type C_{20}-diterpenoid alkaloid was characterized as a minor constituent of "fu zi" (the lateral roots of *Aconitum carmichaelii*). The C_{20}-diterpenoid alkaloid is an iminium named aconicarmicharcutinium A and obtained as hydroxide (**1**) and trifluoroacetate (**1a**) forms. Structures of **1** and **1a** were elucidated by comprehensive analysis of spectroscopic data including ^{19}F and 2D NMR experiments. Compounds **1** and **1a** represent the first examples of the arcutine-type C_{20}-diterpenoid alkaloid iminium.

Chinese Chemical Letters 28 (2017) 593

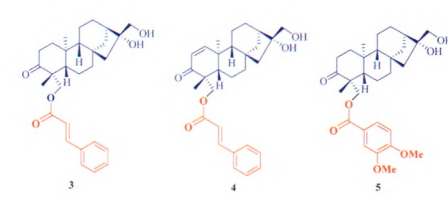
Fimbrialtols K–M, highly functionalized *ent*-kaurane diterpenoids from traditional Chinese plant *Flickingeria fimbriata* (B1.) Hawkes

Gang Ding[a], Jing Wang[a,b], Jiao-Dong Fei[a,b], Rong-Tao Li[c], Hong-Mei Jia[a], Tao Zhang[a], Chang-Yuan Yu[b], Zhong-Mei Zou[a]

[a]*Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100193, China*

[b]*Beijing University of Chemical Technology, Beijing 100029, China*

[c]*Hainan Branch of Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100193, China*



Three new *ent*-kaurane diterpenoids fimbrialtols K–M (**3–5**) with highly substituted functionalities were isolated from the extract of *Flickingeria fimbriata* (B1.) Hawkes. Compounds **3** and **4** contain a cinnamic carboxyl group, whereas compound **5** possesses a benzoic carboxyl group representing the first report in more than known 600 *ent*-kaurane diterpenoids.

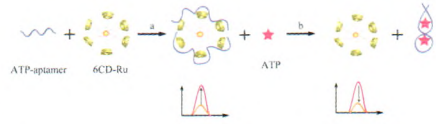
Chinese Chemical Letters 28 (2017) 619

A fluorescent aptasensing strategy for adenosine triphosphate detection using tris(bipyridine)ruthenium(II) complex containing six cyclodextrin units

Xin Nie[a], Xin Ning[a], Ying-Ying Zhao[a], Li-Zhu Yang[b], Fan Zhang[a], Pin-Gang He[a]

[a]*School of Chemistry and Molecular Engineering, East China Normal University, Shanghai 200241, China*
[b]*School of Pharmaceutical Sciences, Wenzhou Medical University, Wenzhou 325035, China*

A fluorescent aptasensing strategy based on a metallocyclodextrin—tris(bipyridine)ruthenium(II) complex containing six cyclodextrin units (6CD-Ru) with much enhanced fluorescent signal by ATP (adenosine triphosphate)-aptamer (ssDNA), was developed to detect ATP quantitatively, exhibiting high sensitivity and specificity.



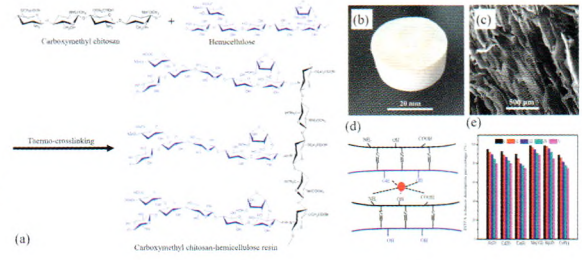
Chinese Chemical Letters 28 (2017) 625

Fabrication of carboxymethyl chitosan–hemicellulose resin for adsorptive removal of heavy metals from wastewater

Shu-Ping Wu, Xiang-Zi Dai, Jia-Rui Kan, Fang-Di Shilong, Mai-Yong Zhu

Institute of Polymer Materials, School of Materials Science and Engineering, Jiangsu University, Zhenjiang 212013, China

Carboxymethyl chitosan–hemicellulose resin (CMCH) was fabricated *via* thermal cross-linking process and demonstrated to be recyclable and effective adsorbent for removal of heavy metal ions.



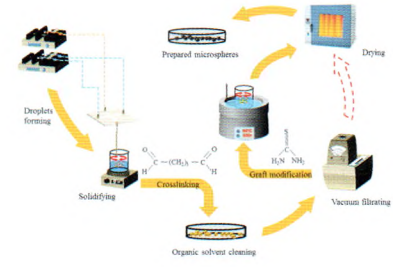
Chinese Chemical Letters 28 (2017) 633

Microfluidic synthesis of thiourea modified chitosan microsphere of high specific surface area for heavy metal wastewater treatment

Yong Zhu, Zhi-Shan Bai, Hua-Lin Wang

State Environmental Protection Key Laboratory of Environmental Risk Assessment and Control on Chemical Process, East China University of Science and Technology, Shanghai 200237, China

The graph shows the flow chart of preparing thiourea modified chitosan microspheres through microfluidic platform. Through droplets forming, chemical crosslinking, pores creating, graft modifying and drying, chitosan microspheres with high specific surface area were obtained.



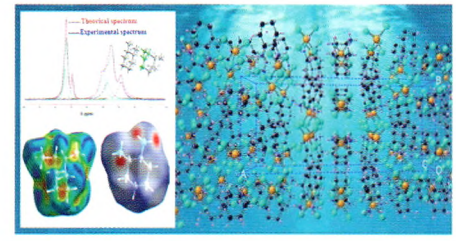
Chinese Chemical Letters 28 (2017) 642

Structural elucidation, theoretical investigation using DFT calculations, thermal and dielectric analyses of new zinc(II) based inorganic–organic hybrid

Nejla Chihaoui, Besma Hamdi, Ridha Zouari

Faculty of Sciences of Sfax, Laboratory of Materials Science and Environment, Department of Chemistry, University of Sfax, BPN1171, 3000 Sfax, Tunisia

This research work elucidates the structural, vibrational (FT-IR and Raman) and dielectric properties of a new zero dimensional compound $[1,2\text{-}C_6H_{10}(NH_3)_2]ZnCl_4$.



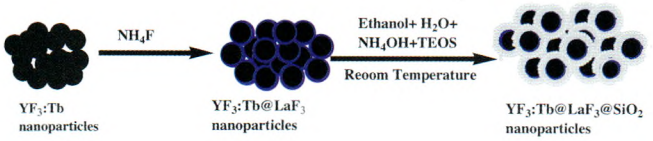
Chinese Chemical Letters 28 (2017) 651

Impact of surface coating on morphological, optical and photoluminescence properties of YF_3:Tb^{3+} nanoparticles

Anees A. Ansari

King Abdullah Institute for Nanotechnology, King Saud University, Riyadh 11451, Saudi Arabia

Facile polyol and sol–gel Stober methods were used for synthesis of YF_3:Tb^+ (core), YF_3:Tb^+@LaF_3 (core/shell) and YF_3:Tb^+@LaF_3@SiO_2 (core/shell/SiO_2) nanoparticles (NPs). We investigated the crystalinity, morphology, surface chemistry, optical absorption and luminescence properties of these core and core/shell nanoparticles.



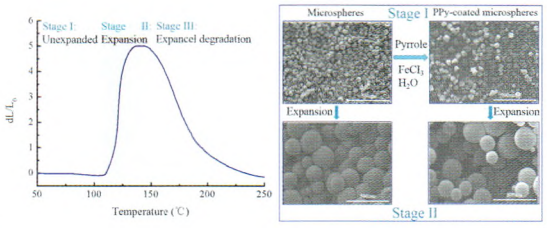
Chinese Chemical Letters 28 (2017) 658

Preparation and characterization of conducting polymer-coated thermally expandable microspheres

Shu-Ying Chen[a], Zhi-Cheng Sun[a], Lu-Hai Li[a], Yong-Hao Xiao[a], Yan-Min Yu[b]

[a]*Beijing Engineering Research Center of Printed Electronics, School of Printing and Packaging Engineering, Beijing Institute of Graphic Communication, Beijing 102600, China*
[b]*College of Environmental & Energy Engineering, Beijing University of Technology, Beijing 100124, China*

In this paper, the thermally expandable microspheres were prepared *via* suspension polymerization, meanwhile, polypyrrole-coated microspheres with core/shell structure were successfully prepared by *in situ* deposition from solution and the structure and property were characterized.



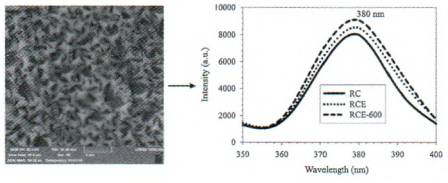
Chinese Chemical Letters 28 (2017) 663

Hydrothermal synthesis of triangular $CeCO_3OH$ particles and photoluminescence properties

Md. Hasan Zahir[a,b], Shamseldin A. Mohamed[a], Mohammad Mizanur Rahman[c], Ateeq Ur Rehman[d]

[a]*Center of Research Excellence in Renewable Energy, Research Institute, King Fahd University of Petroleum and Minerals, Dhahran 31261, Saudi Arabia*
[b]*Center of Research Excellence in Nanotechnology, King Fahd University of Petroleum and Minerals, Dhahran 31261, Saudi Arabia*
[c]*Center of Research Excellence in Corrosion, King Fahd University of Petroleum and Minerals, Dhahran 31261, Saudi Arabia*
[d]*Center for Engineering Research, King Fahd University of Petroleum and Minerals, Dhahran 31261, Saudi Arabia*

Ru/CeO_2 [RC] and Ru/CeO_2/ethylene glycol (EG) [RCE] nanoparticles were produced by hydrothermal reaction. The RC are phase pure CeO_2; triangular highly crystalline $CeCO_3OH$ are formed from the solution containing EG under the same hydrothermal reaction conditions.



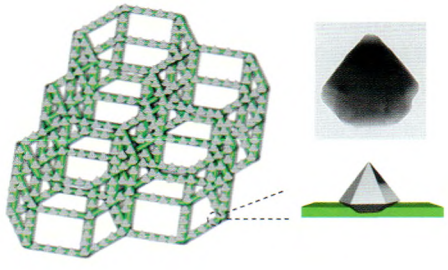
Chinese Chemical Letters 28 (2017) 670

Fabrication of the ZnO/NiO *p–n* junction foam for the enhanced sensing performance

Jing-Jing Liang, Ming-Gang Zhao, Long-Jiang Ding, Si-Si Fan, Shou-Gang Chen

Department of Materials Science and Engineering, Ocean University of China, Qingdao 266100, China

P-Type NiO foam with rough nanostructured surface was prepared by the surface treatment of Ni foam, and then it was decorated with *n*-type ZnO nanopyramids to construct a 3D *p–n* junction foam. The *p–n* junction foam was used for electrochemical detection of dopamine with the significantly improved sensing performance.



Responsible Institution:	China Association for Science and Technology
Sponsor:	Chinese Chemical Society Institute of Materia Medica, Chinese Academy of Medical Sciences
Editor-in-Chief:	Xu-Hong Qian
Editor:	Editorial Board of Chinese Chemical Letters
Address:	Institute of Materia Medica, Chinese Academy of Medical Sciences 1 Xian Nong Tan Street, Beijing 100050, China
Tel:	86-10-63165638
E-mail:	cclbj@imm.ac.cn
Website:	www.chinchemlett.com.cn
Online Submission:	www.ees.elsevier.com/cclet
Publisher:	Editorial Office of Chinese Chemical Letters ELSEVIER B.V.

国内发行：全国各地邮局　　邮发代号：2-915　　定价：50元/本；600元/年